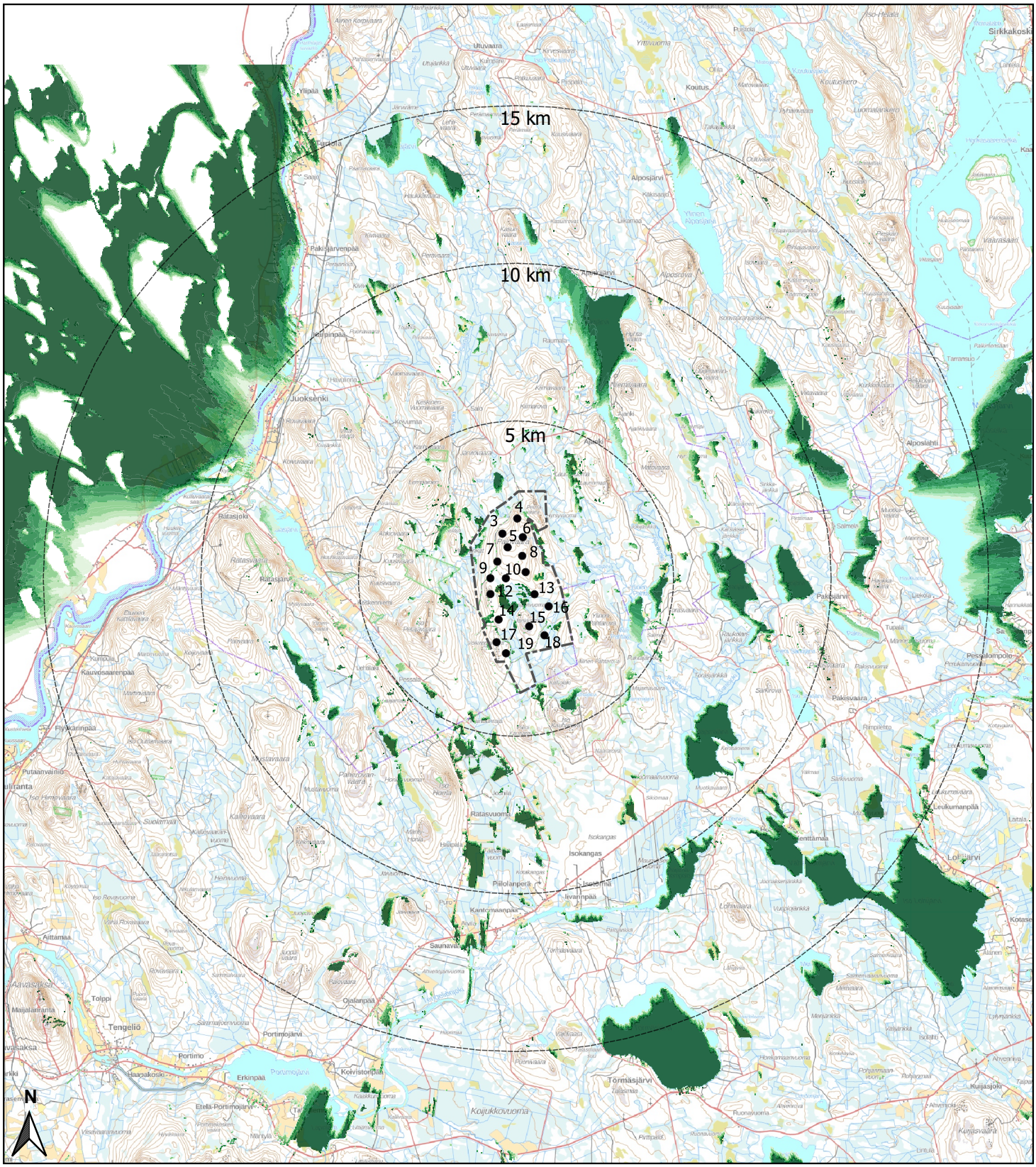
Näkyvyysalueanalyysi - wpd Palovaaran tuulipuisto - Pello



- Voimalat (17 kpl 250 m)

Näkyvien voimaloiden määrä

- 1 - 2
- 2 - 4
- 4 - 7
- 7 - 10
- 10 - 14
- 14 - 17

Koordinaattijärjestelmä: EUREF FIN TM35FIN. wpd Finland Oy / Taustakartta Maanmittauslaitos 10/2021

0 5 10 km

Mittakaava (A4): 1:170 000
Tekijä: Simon Strömgård
Päivämäärä: 20.10.2021

wpd think energy

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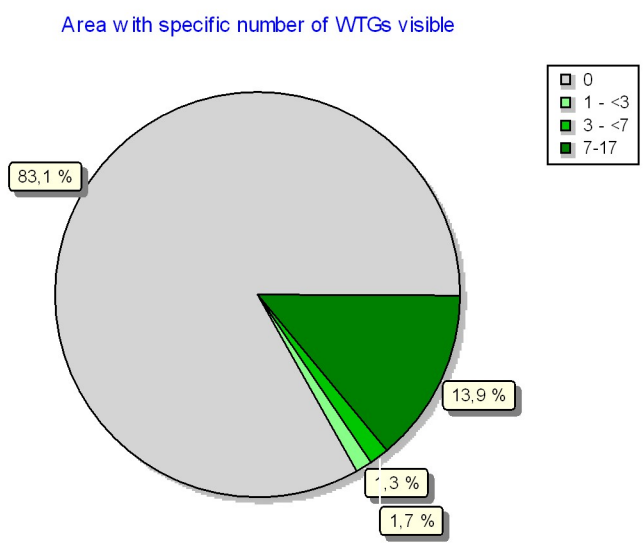
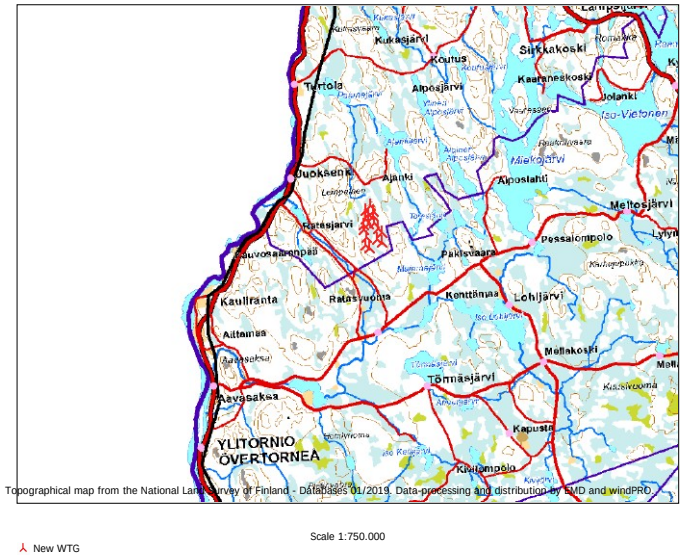
21.09.2021 23:20/3.4.415

ZVI - Standard ZVI summary

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m





Assumptions for ZVI calculation

Center for calculation	Finish TM ETRS-TM35FIN-ETRS89 East: 367.763 North: 7.380.038
Width of calculation area	35.000 m
Height of calculation area	35.000 m
Calculation step	25 m
Eye height	1,5 m
Calculation area	129.100 ha
Highest relevant visible part of a WTG	Hub height + ½ rotor diameter
Obstacles used in calculation	0
DHM object	DEM FI+SE
Area object(s) used in calculation	LUKE stand heights 2019
Height of background area type	0,00 m
New WTGs used in calculation	17
Existing WTGs used in calculation	0

No maximum distance to WTG

ZVI Results

WTGs visible	Area [ha]	Area [%]
0	107.302	83,1
1	881	0,7
2	769	0,6
3	596	0,5
4	490	0,4
5	555	0,4
6	500	0,4
7	512	0,4
8	383	0,3
9	428	0,3
10	528	0,4
11	512	0,4
12	557	0,4
13	515	0,4
14	631	0,5
15	874	0,7
16	1.061	0,8
17	12.005	9,3

WTGs

	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	East	North	Z [m]
WTG 03	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.490	7.382.686	224,8
WTG 04	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.962	7.383.166	231,2
WTG 05	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.656	7.382.253	240,0
WTG 06	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.135	7.382.575	229,4
WTG 07	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.329	7.381.799	208,6
WTG 08	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.118	7.381.981	239,3
WTG 09	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.107	7.381.273	191,0
WTG 10	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.598	7.381.270	198,9
WTG 11	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.227	7.381.467	229,2
WTG 12	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.108	7.380.770	199,4
WTG 13	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.508	7.380.765	193,7
WTG 14	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.369	7.379.963	190,0
WTG 15	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.338	7.379.748	201,8
WTG 16	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.959	7.380.380	174,8
WTG 17	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.303	7.379.244	180,0
WTG 18	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	369.824	7.379.462	179,3
WTG 19	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	368.603	7.378.892	170,1

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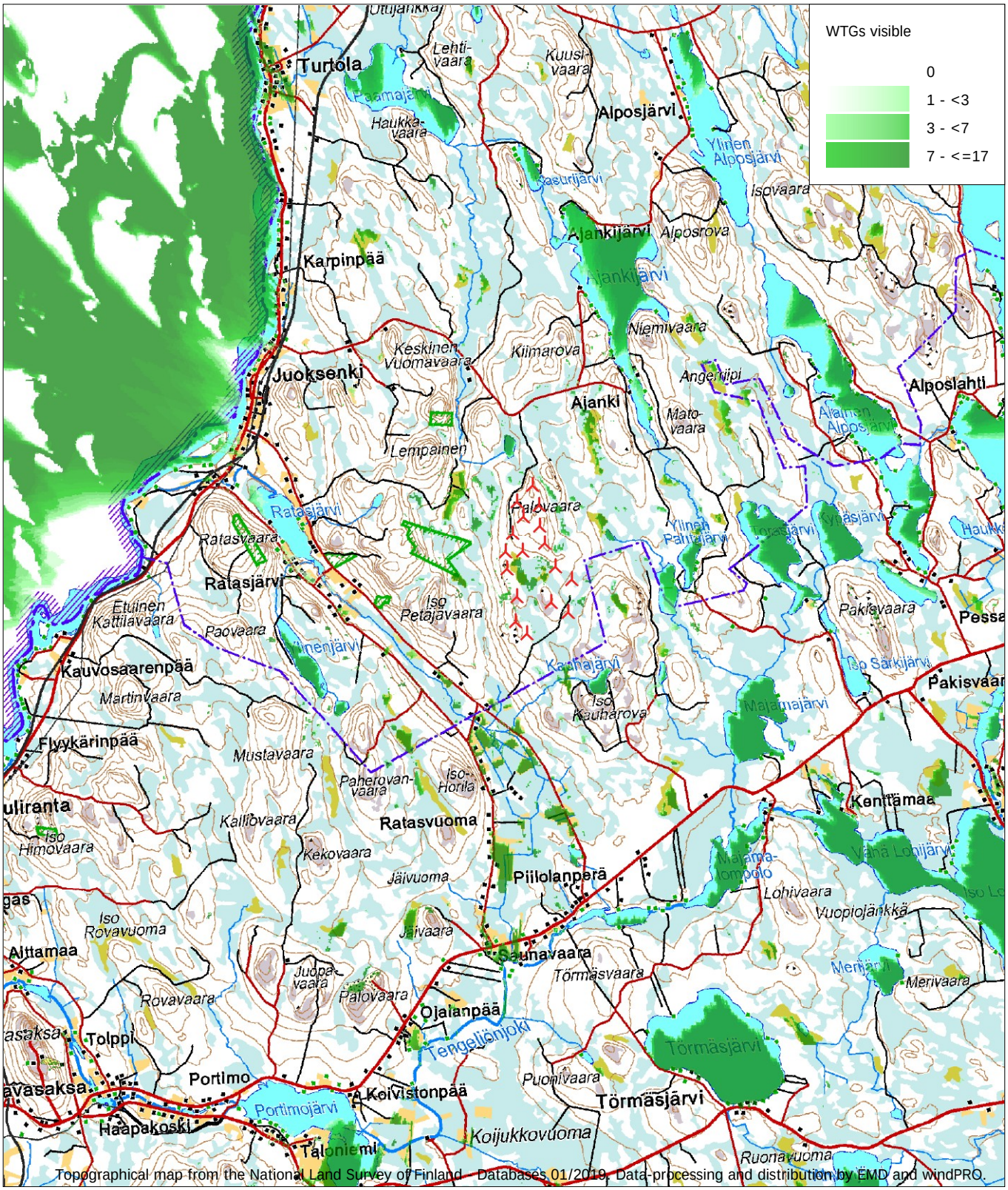
ZVI - Map Standard ZVI summary

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m



Map: Finnish Topographic Map , Print scale 1:160.000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 368.832 North: 7.380.754

New WTG

Project:
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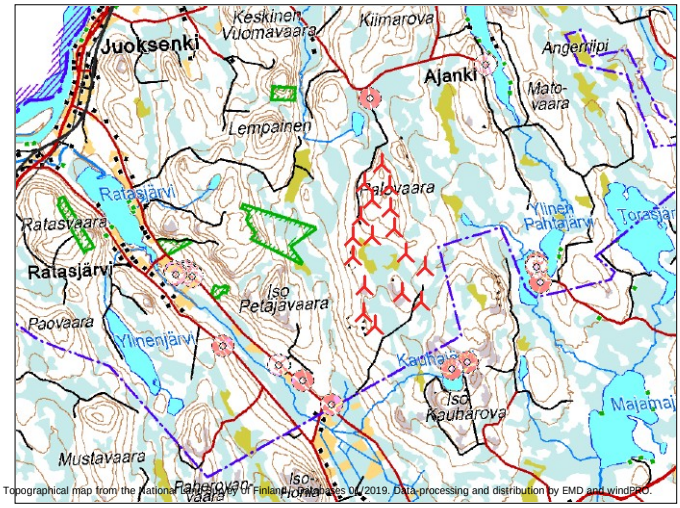
17.09.2021 08:24/3.4.415

DECIBEL - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m

Calculation is done according to Finnish guideline " Ympäristöhallinnon ohjeita 2 | 2014 " from the Ministry of the Environment of Finland

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



WTGs

	East	North	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Noise data Creator	Name	Wind speed	LwA,ref
			[m]					[kW]	[m]	[m]			[m/s]	[dB(A)]
WTG 03	368.490	7.382.686	224,8	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 04	368.962	7.383.166	231,2	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 05	368.656	7.382.253	240,0	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 06	369.135	7.382.575	229,4	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 07	368.329	7.381.799	208,6	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 08	369.118	7.381.981	239,3	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 09	368.107	7.381.273	191,0	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 10	368.598	7.381.270	198,9	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 11	369.227	7.381.467	229,2	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 12	368.108	7.380.770	199,4	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 13	369.508	7.380.765	193,7	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 14	368.369	7.379.963	190,0	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 15	369.338	7.379.748	201,8	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 16	369.959	7.380.380	174,8	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 17	368.303	7.379.244	180,0	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 18	369.824	7.379.462	179,3	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2
WTG 19	368.603	7.378.892	170,1	NORDEX N163/6.X 680...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	109,2

Calculation Results

Sound level

Noise sensitive area No.	Name	East	North	Z	Immission height	Demands Noise	Sound level From WTGs	2 dB penalty applied for one or more WTGs
				[m]	[m]	[dB(A)]	[dB(A)]	
Ajanki 1	Noise sensitive point: Demands defined in calculation setup. (444)	371.874	7.385.678	120,0	4,0	40,0	26,9	No
Ajanki 2	Noise sensitive point: Demands defined in calculation setup. (445)	371.842	7.385.676	120,1	4,0	40,0	26,9	No
Asuntola	Noise sensitive point: Demands defined in calculation setup. (449)	366.608	7.377.543	73,4	4,0	40,0	33,0	Yes
Kainuunraja	Noise sensitive point: Demands defined in calculation setup. (450)	367.325	7.376.870	72,9	4,0	40,0	32,3	Yes
Kauhajärvi 1	Noise sensitive point: Demands defined in calculation setup. (439)	370.975	7.377.840	184,2	4,0	40,0	33,4	No
Kauhajärvi 2	Noise sensitive point: Demands defined in calculation setup. (440)	370.574	7.377.669	180,5	4,0	40,0	33,9	No
Koskenniemi 1	Noise sensitive point: Demands defined in calculation setup. (451)	363.667	7.380.593	72,2	4,0	40,0	26,7	No
Koskenniemi 2	Noise sensitive point: Demands defined in calculation setup. (452)	363.362	7.380.565	66,0	4,0	40,0	26,0	No
Koskenniemi 3	Noise sensitive point: Demands defined in calculation setup. (453)	363.662	7.380.526	70,0	4,0	40,0	26,7	No
Koskenniemi 4	Noise sensitive point: Demands defined in calculation setup. (454)	363.375	7.380.502	65,3	4,0	40,0	26,0	No
Koskenniemi 5	Noise sensitive point: Demands defined in calculation setup. (455)	363.805	7.380.458	73,3	4,0	40,0	27,0	No
Koskenniemi 6	Noise sensitive point: Demands defined in calculation setup. (463)	363.785	7.380.418	70,7	4,0	40,0	27,0	No

To be continued on next page...

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DECIBEL - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m

...continued from previous page

Noise sensitive area

No.	Name	East	North	Z	Immission height	Demands Noise	Sound level From WTGs	2 dB penalty applied for one or more WTGs
				[m]	[m]	[dB(A)]	[dB(A)]	
Lehtilaki	Noise sensitive point: Demands defined in calculation setup. (446)	364.527	7.378.562	93,8	4,0	40,0	27,7	No
Metsästysmaja	Noise sensitive point: Demands defined in calculation setup. (438)	368.740	7.384.928	190,0	4,0	40,0	34,3	No
Pahtajärvi 1	Noise sensitive point: Demands defined in calculation setup. (441)	372.940	7.380.355	110,0	4,0	40,0	30,6	Yes
Pahtajärvi 2	Noise sensitive point: Demands defined in calculation setup. (442)	372.919	7.380.235	110,0	4,0	40,0	30,7	Yes
Pahtajärvi 3	Noise sensitive point: Demands defined in calculation setup. (443)	373.024	7.379.850	110,0	4,0	40,0	29,7	No
Pessala 1	Noise sensitive point: Demands defined in calculation setup. (447)	365.959	7.377.974	71,0	4,0	40,0	31,8	Yes
Pessala 2	Noise sensitive point: Demands defined in calculation setup. (448)	365.996	7.377.961	70,5	4,0	40,0	31,9	Yes

Distances (m)

NSA	WTG WTG 03	WTG 04	WTG 05	WTG 06	WTG 07	WTG 08	WTG 09	WTG 10	WTG 11	WTG 12	WTG 13	WTG 14	WTG 15	WTG 16	WTG 17	WTG 18	WTG 19
Ajanki 1	4517	3846	4699	4139	5255	4611	5796	5492	4974	6186	5453	6704	6449	5633	7358	6545	7533
Ajanki 2	4492	3820	4676	4116	5232	4590	5774	5471	4955	6165	5437	6686	6435	5621	7341	6533	7517
Asuntola	5477	6096	5136	5631	4591	5099	4020	4225	4718	3559	4335	2993	3509	4391	2401	3745	2408
Kainuunraja	5932	6505	5545	5985	5030	5416	4472	4580	4975	3978	4465	3264	3512	4388	2568	3601	2392
Kauhajärvi 1	5446	5694	4985	5080	4762	4538	4473	4173	4026	4099	3272	3361	2514	2736	3018	1989	2595
Kauhajärvi 2	5433	5728	4969	5113	4701	4551	4367	4107	4030	3962	3274	3182	2419	2780	2764	1943	2319
Koskenniemi 1	5258	5887	5258	5816	4816	5625	4492	4977	5628	4445	5844	4744	5734	6296	4828	6260	5221
Koskenniemi 2	5549	6175	5557	6113	5118	5928	4798	5283	5934	4751	6149	5043	6032	6600	5115	6556	5502
Koskenniemi 3	5289	5921	5284	5844	4838	5647	4507	4992	5644	4453	5851	4741	5729	6299	4815	6253	5204
Koskenniemi 4	5562	6190	5564	6122	5121	5931	4795	5279	5931	4741	6139	5023	6011	6585	5086	6532	5470
Koskenniemi 5	5188	5825	5173	5735	4719	5527	4379	4861	5515	4314	5711	4591	5579	6155	4659	6101	5047
Koskenniemi 6	5223	5861	5205	5769	4749	5557	4406	4888	5542	4337	5734	4607	5593	6174	4668	6114	5054
Lehtilaki	5720	6393	5538	6111	4993	5724	4491	4890	5525	4207	5447	4090	4955	5728	3837	5373	4089
Metsästysmaja	2256	1776	2676	2386	3156	2971	3709	3661	3495	4206	4233	4979	5214	4709	5701	5572	6038
Pahtajärvi 1	5023	4871	4685	4405	4832	4153	4919	4437	3876	4850	3456	4588	3653	2981	4768	3241	4577
Pahtajärvi 2	5062	4924	4716	4449	4849	4183	4923	4443	3892	4841	3452	4558	3614	2963	4721	3190	4520
Pahtajärvi 3	5348	5244	4985	4749	5083	4449	5119	4648	4127	5001	3633	4656	3687	3110	4760	3223	4523
Pessala 1	5349	5998	5058	5591	4500	5103	3937	4222	4783	3527	4515	3125	3817	4668	2666	4142	2799
Pessala 2	5343	5991	5050	5581	4492	5090	3928	4210	4768	3514	4494	3105	3790	4643	2640	4112	2768

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17.09.2021 08:24/3.4.415

DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m

Noise calculation model:
ISO 9613-2 Finland
Wind speed (in 10 m height):
8,0 m/s
Ground attenuation:
General, Ground factor: 0,4
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tones penalty is added to total noise impact at receptors
Noise sensitive area
Height above ground level, when no value in NSA object:
4,0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
0,0 dB; Uncertainty margin in NSA has priority
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)
Octave data required
Frequency dependent air absorption

63	125	250	500	1.000	2.000	4.000	8.000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,10	0,38	1,12	2,36	4,08	8,78	26,60	95,00

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N163/6.X 6800 163.0 !O!
Noise: SPL wo/ STE M0

Source	Source/Date	Creator	Edited
F008_276_A17_EN Revision 00, 2019-05-21 (5.7 MW version octave data)	09.07.2019	USER	14.09.2021 20:53

					Octave data							
Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	168,0	8,0	109,2	No	89,5	95,7	99,9	103,2	104,6	102,2	93,4	84,6

Noise sensitive area: Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Asuntola Noise sensitive point: Demands defined in calculation setup. (449)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m

Noise sensitive area: Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

Noise sensitive area: Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m
Noise sensitive area: Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)
Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)
No distance demand
Pure tone penalty: 0 dB

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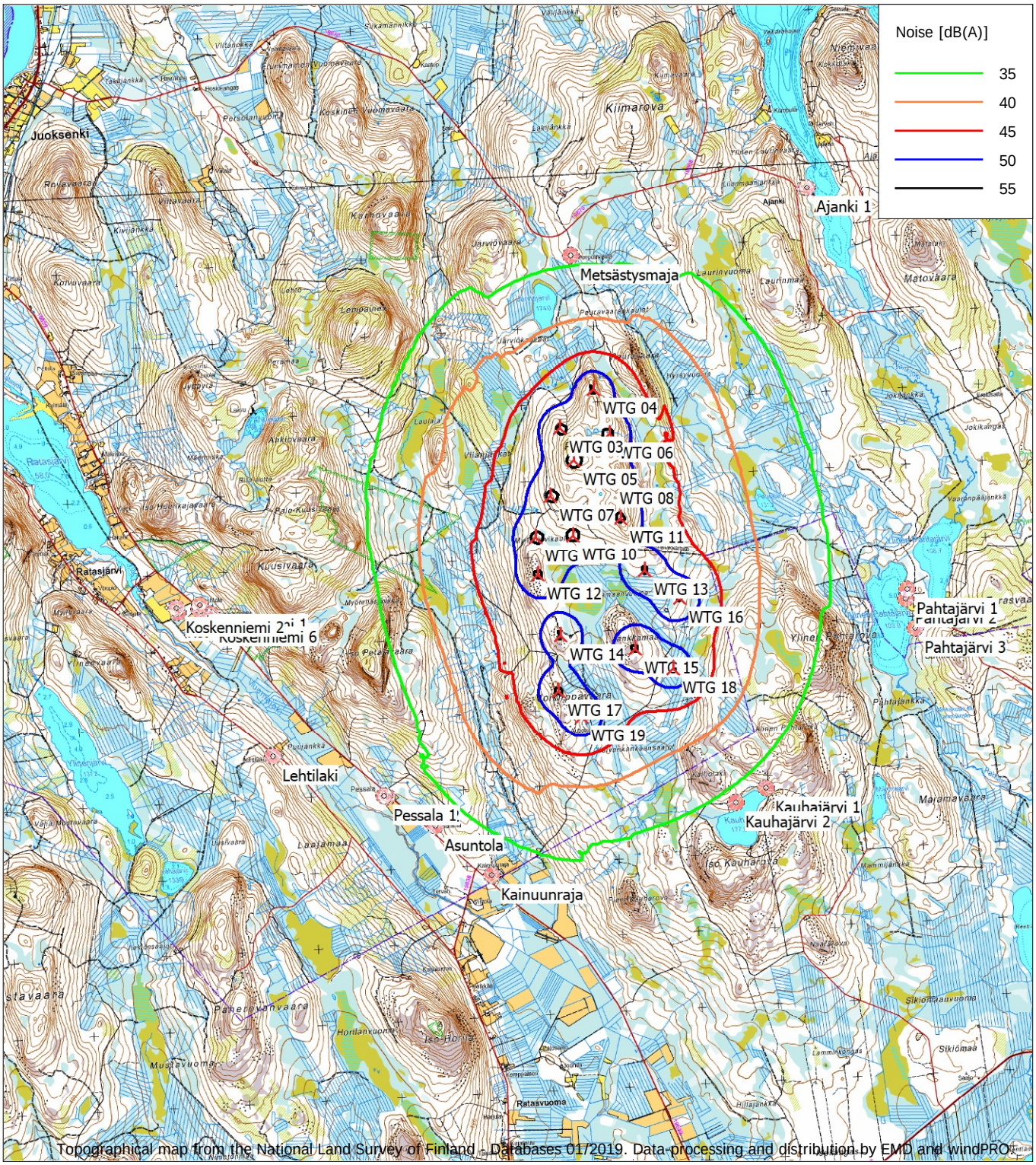
DECIBEL - Map 8,0 m/s

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m



0 1 2 3 4 km

Map: Finnish Topographic Map , Print scale 1:75.000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 368.193 North: 7.381.035

New WTG Noise sensitive area

Noise calculation model: ISO 9613-2 Finland. Wind speed: 8,0 m/s
Height above sea level from active line object

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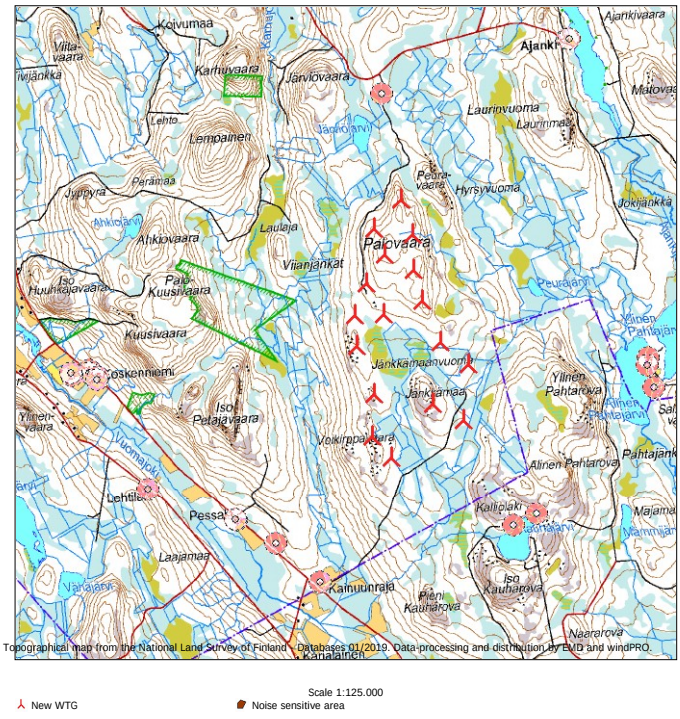
DECIBEL - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

Noise calculation model:
Finland Low frequency
Wind speed (in 10 m height):
Highest noise value at receptor
Spectral distribution:
From 20,0 Hz to 200,0 Hz
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tone penalty is subtracted from demand
Model: 5,0 dB(A)
Height above ground level, when no value in NSA object:
4,0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
0,0 dB; Uncertainty margin in model has priority
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTGs

	East	North	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Noise data Creator	Name	First wind speed	LwaRef	Last wind speed	LwaRef
			[m]					[kW]	[m]	[m]			[m/s]	[dB(A)]	[m/s]	[dB(A)]
WTG 03	368.490	7.382.686	224,8	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 04	368.962	7.383.166	231,2	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 05	368.656	7.382.253	240,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 06	369.135	7.382.575	229,4	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 07	368.329	7.381.799	208,6	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 08	369.118	7.381.981	239,3	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 09	368.107	7.381.273	191,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 10	368.598	7.381.270	198,9	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 11	369.227	7.381.467	229,2	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 12	368.108	7.380.770	199,4	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 13	369.508	7.380.765	193,7	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 14	368.369	7.379.963	190,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 15	369.338	7.379.748	201,8	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 16	369.959	7.380.380	174,8	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 17	368.303	7.379.244	180,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 18	369.824	7.379.462	179,3	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 19	368.603	7.378.892	170,1	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2

Calculation Results

Sound level

Noise sensitive area No.	Name	East	North	Z	Immission height	Most critical demand Frequency	Noise	Predicted sound level WTG noise
				[m]	[m]	[Hz]	[dB]	[dB]
Ajanki 1	Noise sensitive point: Demands defined in calculation setup. (444)	371.874	7.385.678	120,0	4,0	50,0	44,0	30,9
Ajanki 2	Noise sensitive point: Demands defined in calculation setup. (445)	371.842	7.385.676	120,1	4,0	50,0	44,0	31,0
Asuntola	Noise sensitive point: Demands defined in calculation setup. (449)	366.608	7.377.543	73,4	4,0	50,0	44,0	33,9
Kainuunraja	Noise sensitive point: Demands defined in calculation setup. (450)	367.325	7.376.870	72,9	4,0	50,0	44,0	33,5
Kauhajärvi 1	Noise sensitive point: Demands defined in calculation setup. (439)	370.975	7.377.840	184,2	4,0	50,0	44,0	34,9
Kauhajärvi 2	Noise sensitive point: Demands defined in calculation setup. (440)	370.574	7.377.669	180,5	4,0	50,0	44,0	35,2
Koskenniemi 1	Noise sensitive point: Demands defined in calculation setup. (451)	363.667	7.380.593	72,2	4,0	50,0	44,0	31,0
Koskenniemi 2	Noise sensitive point: Demands defined in calculation setup. (452)	363.362	7.380.565	66,0	4,0	50,0	44,0	30,5
Koskenniemi 3	Noise sensitive point: Demands defined in calculation setup. (453)	363.662	7.380.526	70,0	4,0	50,0	44,0	31,0
Koskenniemi 4	Noise sensitive point: Demands defined in calculation setup. (454)	363.375	7.380.502	65,3	4,0	50,0	44,0	30,5
Koskenniemi 5	Noise sensitive point: Demands defined in calculation setup. (455)	363.805	7.380.458	73,3	4,0	50,0	44,0	31,2
Koskenniemi 6	Noise sensitive point: Demands defined in calculation setup. (463)	363.785	7.380.418	70,7	4,0	50,0	44,0	31,2
Lehtilaki	Noise sensitive point: Demands defined in calculation setup. (446)	364.527	7.378.562	93,8	4,0	50,0	44,0	31,5
Metsästysmaja	Noise sensitive point: Demands defined in calculation setup. (438)	368.740	7.384.928	190,0	4,0	50,0	44,0	35,3

To be continued on next page...

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DECIBEL - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

...continued from previous page

Noise sensitive area No.	Name	East	North	Z	Immission height	Most critical demand Frequency	Noise	Predicted sound level WTG noise
				[m]	[m]	[Hz]	[dB]	[dB]
Pahtajärvi 1	Noise sensitive point: Demands defined in calculation setup. (441)	372.940	7.380.355	110,0	4,0	50,0	44,0	33,1
Pahtajärvi 2	Noise sensitive point: Demands defined in calculation setup. (442)	372.919	7.380.235	110,0	4,0	50,0	44,0	33,2
Pahtajärvi 3	Noise sensitive point: Demands defined in calculation setup. (443)	373.024	7.379.850	110,0	4,0	50,0	44,0	32,8
Pessala 1	Noise sensitive point: Demands defined in calculation setup. (447)	365.959	7.377.974	71,0	4,0	50,0	44,0	33,4
Pessala 2	Noise sensitive point: Demands defined in calculation setup. (448)	365.996	7.377.961	70,5	4,0	50,0	44,0	33,5

*)Spectral distribution, please see details in report "Detailed results"

Distances (m)

NSA	WTG WTG 03	WTG 04	WTG 05	WTG 06	WTG 07	WTG 08	WTG 09	WTG 10	WTG 11	WTG 12	WTG 13	WTG 14	WTG 15	WTG 16	WTG 17	WTG 18	WTG 19
Ajanki 1	4517	3846	4699	4139	5255	4611	5796	5492	4974	6186	5453	6704	6449	5633	7358	6545	7533
Ajanki 2	4492	3820	4676	4116	5232	4590	5774	5471	4955	6165	5437	6686	6435	5621	7341	6533	7517
Asuntola	5477	6096	5136	5631	4591	5099	4020	4225	4718	3559	4335	2993	3509	4391	2401	3745	2408
Kainuunraja	5932	6505	5545	5985	5030	5416	4472	4580	4975	3978	4465	3264	3512	4388	2568	3601	2392
Kauhajärvi 1	5446	5694	4985	5080	4762	4538	4473	4173	4026	4099	3272	3361	2514	2736	3018	1989	2595
Kauhajärvi 2	5433	5728	4969	5113	4701	4551	4367	4107	4030	3962	3274	3182	2419	2780	2764	1943	2319
Koskenniemi 1	5258	5887	5258	5816	4816	5625	4492	4977	5628	4445	5844	4744	5734	6296	4828	6260	5221
Koskenniemi 2	5549	6175	5557	6113	5118	5928	4798	5283	5934	4751	6149	5043	6032	6600	5115	6556	5502
Koskenniemi 3	5289	5921	5284	5844	4838	5647	4507	4992	5644	4453	5851	4741	5729	6299	4815	6253	5204
Koskenniemi 4	5562	6190	5564	6122	5121	5931	4795	5279	5931	4741	6139	5023	6011	6585	5086	6532	5470
Koskenniemi 5	5188	5825	5173	5735	4719	5527	4379	4861	5515	4314	5711	4591	5579	6155	4659	6101	5047
Koskenniemi 6	5223	5861	5205	5769	4749	5557	4406	4888	5542	4337	5734	4607	5593	6174	4668	6114	5054
Lehtilaki	5720	6393	5538	6111	4993	5724	4491	4890	5525	4207	5447	4090	4955	5728	3837	5373	4089
Metsästysmaja	2256	1776	2676	2386	3156	2971	3709	3661	3495	4206	4233	4979	5214	4709	5701	5572	6038
Pahtajärvi 1	5023	4871	4685	4405	4832	4153	4919	4437	3876	4850	3456	4588	3653	2981	4768	3241	4577
Pahtajärvi 2	5062	4924	4716	4449	4849	4183	4923	4443	3892	4841	3452	4558	3614	2963	4721	3190	4520
Pahtajärvi 3	5348	5244	4985	4749	5083	4449	5119	4648	4127	5001	3633	4656	3687	3110	4760	3223	4523
Pessala 1	5349	5998	5058	5591	4500	5103	3937	4222	4783	3527	4515	3125	3817	4668	2666	4142	2799
Pessala 2	5343	5991	5050	5581	4492	5090	3928	4210	4768	3514	4494	3105	3790	4643	2640	4112	2768

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Assumptions

Cmet: Meteorological correction

Calculation Results

Noise sensitive area: Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	4.517	4.525						
WTG 03			20	29,89	64,5	0,00	5,60	6,60
WTG 03			25	26,00	68,5	0,09	5,40	8,40
WTG 03			32	23,55	74,0	0,14	5,20	10,80
WTG 03			40	21,36	77,5	0,23	5,00	11,40
WTG 03			50	20,07	82,6	0,32	4,70	13,00
WTG 03			63	13,19	83,9	0,50	4,30	16,60
WTG 03			80	8,36	86,7	0,72	3,70	19,70
WTG 03			100	7,06	91,4	1,13	3,00	21,20
WTG 03			125	1,77	89,9	1,72	1,80	20,20
WTG 03			160	-3,29	91,2	2,58	0,00	21,20
WTG 03			200	-9,12	92,8	3,71	0,00	25,00
WTG 04	3.846	3.856						
WTG 04			20	31,28	64,5	0,00	5,60	6,60
WTG 04			25	27,40	68,5	0,08	5,40	8,40
WTG 04			32	24,96	74,0	0,12	5,20	10,80
WTG 04			40	22,79	77,5	0,19	5,00	11,40
WTG 04			50	21,51	82,6	0,27	4,70	13,00
WTG 04			63	14,65	83,9	0,42	4,30	16,60
WTG 04			80	9,86	86,7	0,62	3,70	19,70
WTG 04			100	8,61	91,4	0,96	3,00	21,20
WTG 04			125	3,41	89,9	1,47	1,80	20,20
WTG 04			160	-1,52	91,2	2,20	0,00	21,20
WTG 04			200	-7,18	92,8	3,16	0,00	25,00
WTG 05	4.699	4.708						
WTG 05			20	29,54	64,5	0,00	5,60	6,60
WTG 05			25	25,65	68,5	0,09	5,40	8,40
WTG 05			32	23,20	74,0	0,14	5,20	10,80
WTG 05			40	21,01	77,5	0,24	5,00	11,40
WTG 05			50	19,71	82,6	0,33	4,70	13,00
WTG 05			63	12,83	83,9	0,52	4,30	16,60
WTG 05			80	7,99	86,7	0,75	3,70	19,70
WTG 05			100	6,67	91,4	1,18	3,00	21,20
WTG 05			125	1,35	89,9	1,79	1,80	20,20
WTG 05			160	-3,74	91,2	2,68	0,00	21,20
WTG 05			200	-9,62	92,8	3,86	0,00	25,00
WTG 06	4.139	4.148						
WTG 06			20	30,64	64,5	0,00	5,60	6,60
WTG 06			25	26,76	68,5	0,08	5,40	8,40
WTG 06			32	24,32	74,0	0,12	5,20	10,80
WTG 06			40	22,14	77,5	0,21	5,00	11,40
WTG 06			50	20,85	82,6	0,29	4,70	13,00
WTG 06			63	13,99	83,9	0,46	4,30	16,60
WTG 06			80	9,18	86,7	0,66	3,70	19,70
WTG 06			100	7,91	91,4	1,04	3,00	21,20
WTG 06			125	2,67	89,9	1,58	1,80	20,20
WTG 06			160	-2,32	91,2	2,36	0,00	21,20
WTG 06			200	-8,06	92,8	3,40	0,00	25,00
WTG 07	5.255	5.261						
WTG 07			20	28,58	64,5	0,00	5,60	6,60
WTG 07			25	24,67	68,5	0,11	5,40	8,40
WTG 07			32	22,22	74,0	0,16	5,20	10,80
WTG 07			40	20,02	77,5	0,26	5,00	11,40
WTG 07			50	18,71	82,6	0,37	4,70	13,00
WTG 07			63	11,80	83,9	0,58	4,30	16,60
WTG 07			80	6,94	86,7	0,84	3,70	19,70
WTG 07			100	5,56	91,4	1,32	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 07			125	0,18	89,9	2,00	1,80	20,20
WTG 07			160	-5,02	91,2	3,00	0,00	21,20
WTG 07			200	-11,04	92,8	4,31	0,00	25,00
WTG 08	4.611	4.620						
WTG 08			20	29,71	64,5	0,00	5,60	6,60
WTG 08			25	25,82	68,5	0,09	5,40	8,40
WTG 08			32	23,37	74,0	0,14	5,20	10,80
WTG 08			40	21,18	77,5	0,23	5,00	11,40
WTG 08			50	19,88	82,6	0,32	4,70	13,00
WTG 08			63	13,00	83,9	0,51	4,30	16,60
WTG 08			80	8,17	86,7	0,74	3,70	19,70
WTG 08			100	6,85	91,4	1,15	3,00	21,20
WTG 08			125	1,55	89,9	1,76	1,80	20,20
WTG 08			160	-3,53	91,2	2,63	0,00	21,20
WTG 08			200	-9,38	92,8	3,79	0,00	25,00
WTG 09	5.796	5.801						
WTG 09			20	27,73	64,5	0,00	5,60	6,60
WTG 09			25	23,81	68,5	0,12	5,40	8,40
WTG 09			32	21,36	74,0	0,17	5,20	10,80
WTG 09			40	19,14	77,5	0,29	5,00	11,40
WTG 09			50	17,82	82,6	0,41	4,70	13,00
WTG 09			63	10,89	83,9	0,64	4,30	16,60
WTG 09			80	6,00	86,7	0,93	3,70	19,70
WTG 09			100	4,58	91,4	1,45	3,00	21,20
WTG 09			125	-0,87	89,9	2,20	1,80	20,20
WTG 09			160	-6,18	91,2	3,31	0,00	21,20
WTG 09			200	-12,33	92,8	4,76	0,00	25,00
WTG 10	5.492	5.497						
WTG 10			20	28,20	64,5	0,00	5,60	6,60
WTG 10			25	24,29	68,5	0,11	5,40	8,40
WTG 10			32	21,83	74,0	0,16	5,20	10,80
WTG 10			40	19,62	77,5	0,27	5,00	11,40
WTG 10			50	18,31	82,6	0,38	4,70	13,00
WTG 10			63	11,39	83,9	0,60	4,30	16,60
WTG 10			80	6,52	86,7	0,88	3,70	19,70
WTG 10			100	5,12	91,4	1,37	3,00	21,20
WTG 10			125	-0,29	89,9	2,09	1,80	20,20
WTG 10			160	-5,54	91,2	3,13	0,00	21,20
WTG 10			200	-11,61	92,8	4,51	0,00	25,00
WTG 11	4.974	4.981						
WTG 11			20	29,05	64,5	0,00	5,60	6,60
WTG 11			25	25,15	68,5	0,10	5,40	8,40
WTG 11			32	22,70	74,0	0,15	5,20	10,80
WTG 11			40	20,50	77,5	0,25	5,00	11,40
WTG 11			50	19,20	82,6	0,35	4,70	13,00
WTG 11			63	12,31	83,9	0,55	4,30	16,60
WTG 11			80	7,46	86,7	0,80	3,70	19,70
WTG 11			100	6,11	91,4	1,25	3,00	21,20
WTG 11			125	0,76	89,9	1,89	1,80	20,20
WTG 11			160	-4,39	91,2	2,84	0,00	21,20
WTG 11			200	-10,33	92,8	4,08	0,00	25,00
WTG 12	6.186	6.191						
WTG 12			20	27,16	64,5	0,00	5,60	6,60
WTG 12			25	23,24	68,5	0,12	5,40	8,40
WTG 12			32	20,78	74,0	0,19	5,20	10,80
WTG 12			40	18,56	77,5	0,31	5,00	11,40
WTG 12			50	17,23	82,6	0,43	4,70	13,00
WTG 12			63	10,28	83,9	0,68	4,30	16,60
WTG 12			80	5,37	86,7	0,99	3,70	19,70
WTG 12			100	3,92	91,4	1,55	3,00	21,20
WTG 12			125	-1,59	89,9	2,35	1,80	20,20
WTG 12			160	-6,96	91,2	3,53	0,00	21,20
WTG 12			200	-13,21	92,8	5,08	0,00	25,00
WTG 13	5.453	5.458						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 13			20	28,26	64,5	0,00	5,60	6,60
WTG 13			25	24,35	68,5	0,11	5,40	8,40
WTG 13			32	21,90	74,0	0,16	5,20	10,80
WTG 13			40	19,69	77,5	0,27	5,00	11,40
WTG 13			50	18,38	82,6	0,38	4,70	13,00
WTG 13			63	11,46	83,9	0,60	4,30	16,60
WTG 13			80	6,59	86,7	0,87	3,70	19,70
WTG 13			100	5,19	91,4	1,36	3,00	21,20
WTG 13			125	-0,22	89,9	2,07	1,80	20,20
WTG 13			160	-5,45	91,2	3,11	0,00	21,20
WTG 13			200	-11,52	92,8	4,48	0,00	25,00
WTG 14	6.704	6.708						
WTG 14			20	26,47	64,5	0,00	5,60	6,60
WTG 14			25	22,53	68,5	0,13	5,40	8,40
WTG 14			32	20,07	74,0	0,20	5,20	10,80
WTG 14			40	17,83	77,5	0,34	5,00	11,40
WTG 14			50	16,50	82,6	0,47	4,70	13,00
WTG 14			63	9,53	83,9	0,74	4,30	16,60
WTG 14			80	4,59	86,7	1,07	3,70	19,70
WTG 14			100	3,09	91,4	1,68	3,00	21,20
WTG 14			125	-2,48	89,9	2,55	1,80	20,20
WTG 14			160	-7,96	91,2	3,82	0,00	21,20
WTG 14			200	-14,33	92,8	5,50	0,00	25,00
WTG 15	6.449	6.454						
WTG 15			20	26,80	64,5	0,00	5,60	6,60
WTG 15			25	22,87	68,5	0,13	5,40	8,40
WTG 15			32	20,41	74,0	0,19	5,20	10,80
WTG 15			40	18,18	77,5	0,32	5,00	11,40
WTG 15			50	16,85	82,6	0,45	4,70	13,00
WTG 15			63	9,89	83,9	0,71	4,30	16,60
WTG 15			80	4,97	86,7	1,03	3,70	19,70
WTG 15			100	3,49	91,4	1,61	3,00	21,20
WTG 15			125	-2,05	89,9	2,45	1,80	20,20
WTG 15			160	-7,48	91,2	3,68	0,00	21,20
WTG 15			200	-13,79	92,8	5,29	0,00	25,00
WTG 16	5.633	5.638						
WTG 16			20	27,98	64,5	0,00	5,60	6,60
WTG 16			25	24,07	68,5	0,11	5,40	8,40
WTG 16			32	21,61	74,0	0,17	5,20	10,80
WTG 16			40	19,40	77,5	0,28	5,00	11,40
WTG 16			50	18,08	82,6	0,39	4,70	13,00
WTG 16			63	11,16	83,9	0,62	4,30	16,60
WTG 16			80	6,28	86,7	0,90	3,70	19,70
WTG 16			100	4,87	91,4	1,41	3,00	21,20
WTG 16			125	-0,56	89,9	2,14	1,80	20,20
WTG 16			160	-5,84	91,2	3,21	0,00	21,20
WTG 16			200	-11,94	92,8	4,62	0,00	25,00
WTG 17	7.358	7.362						
WTG 17			20	25,66	64,5	0,00	5,60	6,60
WTG 17			25	21,71	68,5	0,15	5,40	8,40
WTG 17			32	19,24	74,0	0,22	5,20	10,80
WTG 17			40	16,99	77,5	0,37	5,00	11,40
WTG 17			50	15,64	82,6	0,52	4,70	13,00
WTG 17			63	8,65	83,9	0,81	4,30	16,60
WTG 17			80	3,68	86,7	1,18	3,70	19,70
WTG 17			100	2,12	91,4	1,84	3,00	21,20
WTG 17			125	-3,54	89,9	2,80	1,80	20,20
WTG 17			160	-9,14	91,2	4,20	0,00	21,20
WTG 17			200	-15,68	92,8	6,04	0,00	25,00
WTG 18	6.545	6.549						
WTG 18			20	26,68	64,5	0,00	5,60	6,60
WTG 18			25	22,75	68,5	0,13	5,40	8,40
WTG 18			32	20,28	74,0	0,20	5,20	10,80
WTG 18			40	18,05	77,5	0,33	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 18			50	16,72	82,6	0,46	4,70	13,00
WTG 18			63	9,76	83,9	0,72	4,30	16,60
WTG 18			80	4,83	86,7	1,05	3,70	19,70
WTG 18			100	3,34	91,4	1,64	3,00	21,20
WTG 18			125	-2,21	89,9	2,49	1,80	20,20
WTG 18			160	-7,66	91,2	3,73	0,00	21,20
WTG 18			200	-13,99	92,8	5,37	0,00	25,00
WTG 19	7.533	7.536						
WTG 19			20	25,46	64,5	0,00	5,60	6,60
WTG 19			25	21,51	68,5	0,15	5,40	8,40
WTG 19			32	19,03	74,0	0,23	5,20	10,80
WTG 19			40	16,78	77,5	0,38	5,00	11,40
WTG 19			50	15,43	82,6	0,53	4,70	13,00
WTG 19			63	8,43	83,9	0,83	4,30	16,60
WTG 19			80	3,45	86,7	1,21	3,70	19,70
WTG 19			100	1,87	91,4	1,88	3,00	21,20
WTG 19			125	-3,81	89,9	2,86	1,80	20,20
WTG 19			160	-9,44	91,2	4,30	0,00	21,20
WTG 19			200	-16,02	92,8	6,18	0,00	25,00
Sum								
Sum			20	40,80				
Sum			25	36,89				
Sum			32	34,44				
Sum			40	32,24				
Sum			50	30,93				
Sum			63	24,02				
Sum			80	19,16				
Sum			100	17,80				
Sum			125	12,43				
Sum			160	7,26				
Sum			200	1,29				

Noise sensitive area: Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	4.492	4.500						
WTG 03			20	29,94	64,5	0,00	5,60	6,60
WTG 03			25	26,05	68,5	0,09	5,40	8,40
WTG 03			32	23,60	74,0	0,13	5,20	10,80
WTG 03			40	21,41	77,5	0,22	5,00	11,40
WTG 03			50	20,12	82,6	0,31	4,70	13,00
WTG 03			63	13,24	83,9	0,49	4,30	16,60
WTG 03			80	8,42	86,7	0,72	3,70	19,70
WTG 03			100	7,11	91,4	1,12	3,00	21,20
WTG 03			125	1,83	89,9	1,71	1,80	20,20
WTG 03			160	-3,23	91,2	2,56	0,00	21,20
WTG 03			200	-9,05	92,8	3,69	0,00	25,00
WTG 04	3.820	3.830						
WTG 04			20	31,34	64,5	0,00	5,60	6,60
WTG 04			25	27,46	68,5	0,08	5,40	8,40
WTG 04			32	25,02	74,0	0,11	5,20	10,80
WTG 04			40	22,84	77,5	0,19	5,00	11,40
WTG 04			50	21,57	82,6	0,27	4,70	13,00
WTG 04			63	14,71	83,9	0,42	4,30	16,60
WTG 04			80	9,92	86,7	0,61	3,70	19,70
WTG 04			100	8,68	91,4	0,96	3,00	21,20
WTG 04			125	3,48	89,9	1,46	1,80	20,20
WTG 04			160	-1,45	91,2	2,18	0,00	21,20
WTG 04			200	-7,10	92,8	3,14	0,00	25,00
WTG 05	4.676	4.685						
WTG 05			20	29,59	64,5	0,00	5,60	6,60
WTG 05			25	25,69	68,5	0,09	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 05			32	23,25	74,0	0,14	5,20	10,80
WTG 05			40	21,05	77,5	0,23	5,00	11,40
WTG 05			50	19,76	82,6	0,33	4,70	13,00
WTG 05			63	12,87	83,9	0,52	4,30	16,60
WTG 05			80	8,04	86,7	0,75	3,70	19,70
WTG 05			100	6,71	91,4	1,17	3,00	21,20
WTG 05			125	1,41	89,9	1,78	1,80	20,20
WTG 05			160	-3,68	91,2	2,67	0,00	21,20
WTG 05			200	-9,56	92,8	3,84	0,00	25,00
WTG 06	4.116	4.125						
WTG 06			20	30,69	64,5	0,00	5,60	6,60
WTG 06			25	26,81	68,5	0,08	5,40	8,40
WTG 06			32	24,37	74,0	0,12	5,20	10,80
WTG 06			40	22,18	77,5	0,21	5,00	11,40
WTG 06			50	20,90	82,6	0,29	4,70	13,00
WTG 06			63	14,04	83,9	0,45	4,30	16,60
WTG 06			80	9,23	86,7	0,66	3,70	19,70
WTG 06			100	7,96	91,4	1,03	3,00	21,20
WTG 06			125	2,72	89,9	1,57	1,80	20,20
WTG 06			160	-2,26	91,2	2,35	0,00	21,20
WTG 06			200	-7,99	92,8	3,38	0,00	25,00
WTG 07	5.232	5.238						
WTG 07			20	28,62	64,5	0,00	5,60	6,60
WTG 07			25	24,71	68,5	0,10	5,40	8,40
WTG 07			32	22,26	74,0	0,16	5,20	10,80
WTG 07			40	20,06	77,5	0,26	5,00	11,40
WTG 07			50	18,75	82,6	0,37	4,70	13,00
WTG 07			63	11,84	83,9	0,58	4,30	16,60
WTG 07			80	6,98	86,7	0,84	3,70	19,70
WTG 07			100	5,61	91,4	1,31	3,00	21,20
WTG 07			125	0,23	89,9	1,99	1,80	20,20
WTG 07			160	-4,97	91,2	2,99	0,00	21,20
WTG 07			200	-10,98	92,8	4,30	0,00	25,00
WTG 08	4.590	4.599						
WTG 08			20	29,75	64,5	0,00	5,60	6,60
WTG 08			25	25,85	68,5	0,09	5,40	8,40
WTG 08			32	23,41	74,0	0,14	5,20	10,80
WTG 08			40	21,22	77,5	0,23	5,00	11,40
WTG 08			50	19,92	82,6	0,32	4,70	13,00
WTG 08			63	13,04	83,9	0,51	4,30	16,60
WTG 08			80	8,21	86,7	0,74	3,70	19,70
WTG 08			100	6,90	91,4	1,15	3,00	21,20
WTG 08			125	1,60	89,9	1,75	1,80	20,20
WTG 08			160	-3,48	91,2	2,62	0,00	21,20
WTG 08			200	-9,33	92,8	3,77	0,00	25,00
WTG 09	5.774	5.778						
WTG 09			20	27,76	64,5	0,00	5,60	6,60
WTG 09			25	23,85	68,5	0,12	5,40	8,40
WTG 09			32	21,39	74,0	0,17	5,20	10,80
WTG 09			40	19,17	77,5	0,29	5,00	11,40
WTG 09			50	17,86	82,6	0,40	4,70	13,00
WTG 09			63	10,93	83,9	0,64	4,30	16,60
WTG 09			80	6,04	86,7	0,92	3,70	19,70
WTG 09			100	4,62	91,4	1,44	3,00	21,20
WTG 09			125	-0,83	89,9	2,20	1,80	20,20
WTG 09			160	-6,13	91,2	3,29	0,00	21,20
WTG 09			200	-12,27	92,8	4,74	0,00	25,00
WTG 10	5.471	5.477						
WTG 10			20	28,23	64,5	0,00	5,60	6,60
WTG 10			25	24,32	68,5	0,11	5,40	8,40
WTG 10			32	21,87	74,0	0,16	5,20	10,80
WTG 10			40	19,66	77,5	0,27	5,00	11,40
WTG 10			50	18,35	82,6	0,38	4,70	13,00
WTG 10			63	11,43	83,9	0,60	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 10			80	6,55	86,7	0,88	3,70	19,70
WTG 10			100	5,16	91,4	1,37	3,00	21,20
WTG 10			125	-0,25	89,9	2,08	1,80	20,20
WTG 10			160	-5,49	91,2	3,12	0,00	21,20
WTG 10			200	-11,56	92,8	4,49	0,00	25,00
WTG 11	4.955	4.963						
WTG 11			20	29,09	64,5	0,00	5,60	6,60
WTG 11			25	25,19	68,5	0,10	5,40	8,40
WTG 11			32	22,74	74,0	0,15	5,20	10,80
WTG 11			40	20,54	77,5	0,25	5,00	11,40
WTG 11			50	19,24	82,6	0,35	4,70	13,00
WTG 11			63	12,34	83,9	0,55	4,30	16,60
WTG 11			80	7,49	86,7	0,79	3,70	19,70
WTG 11			100	6,15	91,4	1,24	3,00	21,20
WTG 11			125	0,80	89,9	1,89	1,80	20,20
WTG 11			160	-4,34	91,2	2,83	0,00	21,20
WTG 11			200	-10,28	92,8	4,07	0,00	25,00
WTG 12	6.165	6.170						
WTG 12			20	27,19	64,5	0,00	5,60	6,60
WTG 12			25	23,27	68,5	0,12	5,40	8,40
WTG 12			32	20,81	74,0	0,19	5,20	10,80
WTG 12			40	18,59	77,5	0,31	5,00	11,40
WTG 12			50	17,26	82,6	0,43	4,70	13,00
WTG 12			63	10,32	83,9	0,68	4,30	16,60
WTG 12			80	5,41	86,7	0,99	3,70	19,70
WTG 12			100	3,95	91,4	1,54	3,00	21,20
WTG 12			125	-1,55	89,9	2,34	1,80	20,20
WTG 12			160	-6,92	91,2	3,52	0,00	21,20
WTG 12			200	-13,17	92,8	5,06	0,00	25,00
WTG 13	5.437	5.443						
WTG 13			20	28,28	64,5	0,00	5,60	6,60
WTG 13			25	24,38	68,5	0,11	5,40	8,40
WTG 13			32	21,92	74,0	0,16	5,20	10,80
WTG 13			40	19,71	77,5	0,27	5,00	11,40
WTG 13			50	18,40	82,6	0,38	4,70	13,00
WTG 13			63	11,49	83,9	0,60	4,30	16,60
WTG 13			80	6,61	86,7	0,87	3,70	19,70
WTG 13			100	5,22	91,4	1,36	3,00	21,20
WTG 13			125	-0,18	89,9	2,07	1,80	20,20
WTG 13			160	-5,42	91,2	3,10	0,00	21,20
WTG 13			200	-11,48	92,8	4,46	0,00	25,00
WTG 14	6.686	6.690						
WTG 14			20	26,49	64,5	0,00	5,60	6,60
WTG 14			25	22,56	68,5	0,13	5,40	8,40
WTG 14			32	20,09	74,0	0,20	5,20	10,80
WTG 14			40	17,86	77,5	0,33	5,00	11,40
WTG 14			50	16,52	82,6	0,47	4,70	13,00
WTG 14			63	9,56	83,9	0,74	4,30	16,60
WTG 14			80	4,62	86,7	1,07	3,70	19,70
WTG 14			100	3,12	91,4	1,67	3,00	21,20
WTG 14			125	-2,45	89,9	2,54	1,80	20,20
WTG 14			160	-7,92	91,2	3,81	0,00	21,20
WTG 14			200	-14,29	92,8	5,49	0,00	25,00
WTG 15	6.435	6.440						
WTG 15			20	26,82	64,5	0,00	5,60	6,60
WTG 15			25	22,89	68,5	0,13	5,40	8,40
WTG 15			32	20,43	74,0	0,19	5,20	10,80
WTG 15			40	18,20	77,5	0,32	5,00	11,40
WTG 15			50	16,87	82,6	0,45	4,70	13,00
WTG 15			63	9,91	83,9	0,71	4,30	16,60
WTG 15			80	4,99	86,7	1,03	3,70	19,70
WTG 15			100	3,51	91,4	1,61	3,00	21,20
WTG 15			125	-2,02	89,9	2,45	1,80	20,20
WTG 15			160	-7,45	91,2	3,67	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 15			200	-13,76	92,8	5,28	0,00	25,00
WTG 16	5.621	5.625						
WTG 16			20	28,00	64,5	0,00	5,60	6,60
WTG 16			25	24,09	68,5	0,11	5,40	8,40
WTG 16			32	21,63	74,0	0,17	5,20	10,80
WTG 16			40	19,42	77,5	0,28	5,00	11,40
WTG 16			50	18,10	82,6	0,39	4,70	13,00
WTG 16			63	11,18	83,9	0,62	4,30	16,60
WTG 16			80	6,30	86,7	0,90	3,70	19,70
WTG 16			100	4,89	91,4	1,41	3,00	21,20
WTG 16			125	-0,54	89,9	2,14	1,80	20,20
WTG 16			160	-5,81	91,2	3,21	0,00	21,20
WTG 16			200	-11,91	92,8	4,61	0,00	25,00
WTG 17	7.341	7.345						
WTG 17			20	25,68	64,5	0,00	5,60	6,60
WTG 17			25	21,73	68,5	0,15	5,40	8,40
WTG 17			32	19,26	74,0	0,22	5,20	10,80
WTG 17			40	17,01	77,5	0,37	5,00	11,40
WTG 17			50	15,67	82,6	0,51	4,70	13,00
WTG 17			63	8,67	83,9	0,81	4,30	16,60
WTG 17			80	3,71	86,7	1,18	3,70	19,70
WTG 17			100	2,14	91,4	1,84	3,00	21,20
WTG 17			125	-3,51	89,9	2,79	1,80	20,20
WTG 17			160	-9,11	91,2	4,19	0,00	21,20
WTG 17			200	-15,64	92,8	6,02	0,00	25,00
WTG 18	6.533	6.537						
WTG 18			20	26,69	64,5	0,00	5,60	6,60
WTG 18			25	22,76	68,5	0,13	5,40	8,40
WTG 18			32	20,30	74,0	0,20	5,20	10,80
WTG 18			40	18,07	77,5	0,33	5,00	11,40
WTG 18			50	16,73	82,6	0,46	4,70	13,00
WTG 18			63	9,77	83,9	0,72	4,30	16,60
WTG 18			80	4,85	86,7	1,05	3,70	19,70
WTG 18			100	3,36	91,4	1,63	3,00	21,20
WTG 18			125	-2,19	89,9	2,48	1,80	20,20
WTG 18			160	-7,63	91,2	3,73	0,00	21,20
WTG 18			200	-13,97	92,8	5,36	0,00	25,00
WTG 19	7.517	7.521						
WTG 19			20	25,48	64,5	0,00	5,60	6,60
WTG 19			25	21,52	68,5	0,15	5,40	8,40
WTG 19			32	19,05	74,0	0,23	5,20	10,80
WTG 19			40	16,80	77,5	0,38	5,00	11,40
WTG 19			50	15,45	82,6	0,53	4,70	13,00
WTG 19			63	8,45	83,9	0,83	4,30	16,60
WTG 19			80	3,47	86,7	1,20	3,70	19,70
WTG 19			100	1,89	91,4	1,88	3,00	21,20
WTG 19			125	-3,78	89,9	2,86	1,80	20,20
WTG 19			160	-9,41	91,2	4,29	0,00	21,20
WTG 19			200	-15,99	92,8	6,17	0,00	25,00
Sum								
Sum			20	40,83				
Sum			25	36,93				
Sum			32	34,48				
Sum			40	32,27				
Sum			50	30,97				
Sum			63	24,06				
Sum			80	19,20				
Sum			100	17,84				
Sum			125	12,48				
Sum			160	7,31				
Sum			200	1,35				

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency
Noise sensitive area: Asuntola Noise sensitive point: Demands defined in calculation setup. (449)
Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.477	5.486						
WTG 03			20	28,22	64,5	0,00	5,60	6,60
WTG 03			25	24,31	68,5	0,11	5,40	8,40
WTG 03			32	21,85	74,0	0,16	5,20	10,80
WTG 03			40	19,64	77,5	0,27	5,00	11,40
WTG 03			50	18,33	82,6	0,38	4,70	13,00
WTG 03			63	11,41	83,9	0,60	4,30	16,60
WTG 03			80	6,54	86,7	0,88	3,70	19,70
WTG 03			100	5,14	91,4	1,37	3,00	21,20
WTG 03			125	-0,27	89,9	2,08	1,80	20,20
WTG 03			160	-5,51	91,2	3,13	0,00	21,20
WTG 03			200	-11,58	92,8	4,50	0,00	25,00
WTG 04	6.096	6.104						
WTG 04			20	27,29	64,5	0,00	5,60	6,60
WTG 04			25	23,37	68,5	0,12	5,40	8,40
WTG 04			32	20,90	74,0	0,18	5,20	10,80
WTG 04			40	18,68	77,5	0,31	5,00	11,40
WTG 04			50	17,36	82,6	0,43	4,70	13,00
WTG 04			63	10,42	83,9	0,67	4,30	16,60
WTG 04			80	5,51	86,7	0,98	3,70	19,70
WTG 04			100	4,06	91,4	1,53	3,00	21,20
WTG 04			125	-1,43	89,9	2,32	1,80	20,20
WTG 04			160	-6,79	91,2	3,48	0,00	21,20
WTG 04			200	-13,02	92,8	5,01	0,00	25,00
WTG 05	5.136	5.147						
WTG 05			20	28,77	64,5	0,00	5,60	6,60
WTG 05			25	24,87	68,5	0,10	5,40	8,40
WTG 05			32	22,41	74,0	0,15	5,20	10,80
WTG 05			40	20,21	77,5	0,26	5,00	11,40
WTG 05			50	18,91	82,6	0,36	4,70	13,00
WTG 05			63	12,00	83,9	0,57	4,30	16,60
WTG 05			80	7,15	86,7	0,82	3,70	19,70
WTG 05			100	5,78	91,4	1,29	3,00	21,20
WTG 05			125	0,41	89,9	1,96	1,80	20,20
WTG 05			160	-4,76	91,2	2,93	0,00	21,20
WTG 05			200	-10,75	92,8	4,22	0,00	25,00
WTG 06	5.631	5.640						
WTG 06			20	27,97	64,5	0,00	5,60	6,60
WTG 06			25	24,06	68,5	0,11	5,40	8,40
WTG 06			32	21,61	74,0	0,17	5,20	10,80
WTG 06			40	19,39	77,5	0,28	5,00	11,40
WTG 06			50	18,08	82,6	0,39	4,70	13,00
WTG 06			63	11,15	83,9	0,62	4,30	16,60
WTG 06			80	6,27	86,7	0,90	3,70	19,70
WTG 06			100	4,86	91,4	1,41	3,00	21,20
WTG 06			125	-0,57	89,9	2,14	1,80	20,20
WTG 06			160	-5,84	91,2	3,21	0,00	21,20
WTG 06			200	-11,95	92,8	4,62	0,00	25,00
WTG 07	4.591	4.601						
WTG 07			20	29,74	64,5	0,00	5,60	6,60
WTG 07			25	25,85	68,5	0,09	5,40	8,40
WTG 07			32	23,41	74,0	0,14	5,20	10,80
WTG 07			40	21,21	77,5	0,23	5,00	11,40
WTG 07			50	19,92	82,6	0,32	4,70	13,00
WTG 07			63	13,04	83,9	0,51	4,30	16,60
WTG 07			80	8,21	86,7	0,74	3,70	19,70
WTG 07			100	6,89	91,4	1,15	3,00	21,20
WTG 07			125	1,60	89,9	1,75	1,80	20,20
WTG 07			160	-3,48	91,2	2,62	0,00	21,20
WTG 07			200	-9,33	92,8	3,77	0,00	25,00
WTG 08	5.099	5.109						
WTG 08			20	28,83	64,5	0,00	5,60	6,60
WTG 08			25	24,93	68,5	0,10	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 08			32	22,48	74,0	0,15	5,20	10,80
WTG 08			40	20,28	77,5	0,26	5,00	11,40
WTG 08			50	18,97	82,6	0,36	4,70	13,00
WTG 08			63	12,07	83,9	0,56	4,30	16,60
WTG 08			80	7,22	86,7	0,82	3,70	19,70
WTG 08			100	5,86	91,4	1,28	3,00	21,20
WTG 08			125	0,49	89,9	1,94	1,80	20,20
WTG 08			160	-4,68	91,2	2,91	0,00	21,20
WTG 08			200	-10,66	92,8	4,19	0,00	25,00
WTG 09	4.020	4.030						
WTG 09			20	30,89	64,5	0,00	5,60	6,60
WTG 09			25	27,01	68,5	0,08	5,40	8,40
WTG 09			32	24,57	74,0	0,12	5,20	10,80
WTG 09			40	22,39	77,5	0,20	5,00	11,40
WTG 09			50	21,11	82,6	0,28	4,70	13,00
WTG 09			63	14,25	83,9	0,44	4,30	16,60
WTG 09			80	9,45	86,7	0,64	3,70	19,70
WTG 09			100	8,19	91,4	1,01	3,00	21,20
WTG 09			125	2,96	89,9	1,53	1,80	20,20
WTG 09			160	-2,00	91,2	2,30	0,00	21,20
WTG 09			200	-7,71	92,8	3,30	0,00	25,00
WTG 10	4.225	4.235						
WTG 10			20	30,46	64,5	0,00	5,60	6,60
WTG 10			25	26,58	68,5	0,08	5,40	8,40
WTG 10			32	24,14	74,0	0,13	5,20	10,80
WTG 10			40	21,95	77,5	0,21	5,00	11,40
WTG 10			50	20,67	82,6	0,30	4,70	13,00
WTG 10			63	13,80	83,9	0,47	4,30	16,60
WTG 10			80	8,99	86,7	0,68	3,70	19,70
WTG 10			100	7,70	91,4	1,06	3,00	21,20
WTG 10			125	2,45	89,9	1,61	1,80	20,20
WTG 10			160	-2,55	91,2	2,41	0,00	21,20
WTG 10			200	-8,31	92,8	3,47	0,00	25,00
WTG 11	4.718	4.729						
WTG 11			20	29,51	64,5	0,00	5,60	6,60
WTG 11			25	25,61	68,5	0,09	5,40	8,40
WTG 11			32	23,16	74,0	0,14	5,20	10,80
WTG 11			40	20,97	77,5	0,24	5,00	11,40
WTG 11			50	19,67	82,6	0,33	4,70	13,00
WTG 11			63	12,79	83,9	0,52	4,30	16,60
WTG 11			80	7,95	86,7	0,76	3,70	19,70
WTG 11			100	6,62	91,4	1,18	3,00	21,20
WTG 11			125	1,31	89,9	1,80	1,80	20,20
WTG 11			160	-3,79	91,2	2,70	0,00	21,20
WTG 11			200	-9,67	92,8	3,88	0,00	25,00
WTG 12	3.559	3.570						
WTG 12			20	31,95	64,5	0,00	5,60	6,60
WTG 12			25	28,07	68,5	0,07	5,40	8,40
WTG 12			32	25,64	74,0	0,11	5,20	10,80
WTG 12			40	23,47	77,5	0,18	5,00	11,40
WTG 12			50	22,20	82,6	0,25	4,70	13,00
WTG 12			63	15,35	83,9	0,39	4,30	16,60
WTG 12			80	10,57	86,7	0,57	3,70	19,70
WTG 12			100	9,35	91,4	0,89	3,00	21,20
WTG 12			125	4,19	89,9	1,36	1,80	20,20
WTG 12			160	-0,69	91,2	2,04	0,00	21,20
WTG 12			200	-6,28	92,8	2,93	0,00	25,00
WTG 13	4.335	4.344						
WTG 13			20	30,24	64,5	0,00	5,60	6,60
WTG 13			25	26,35	68,5	0,09	5,40	8,40
WTG 13			32	23,91	74,0	0,13	5,20	10,80
WTG 13			40	21,72	77,5	0,22	5,00	11,40
WTG 13			50	20,44	82,6	0,30	4,70	13,00
WTG 13			63	13,56	83,9	0,48	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 13			80	8,75	86,7	0,70	3,70	19,70
WTG 13			100	7,46	91,4	1,09	3,00	21,20
WTG 13			125	2,19	89,9	1,65	1,80	20,20
WTG 13			160	-2,83	91,2	2,48	0,00	21,20
WTG 13			200	-8,62	92,8	3,56	0,00	25,00
WTG 14	2.993	3.006						
WTG 14			20	33,44	64,5	0,00	5,60	6,60
WTG 14			25	29,58	68,5	0,06	5,40	8,40
WTG 14			32	27,15	74,0	0,09	5,20	10,80
WTG 14			40	24,99	77,5	0,15	5,00	11,40
WTG 14			50	23,73	82,6	0,21	4,70	13,00
WTG 14			63	16,91	83,9	0,33	4,30	16,60
WTG 14			80	12,16	86,7	0,48	3,70	19,70
WTG 14			100	10,99	91,4	0,75	3,00	21,20
WTG 14			125	5,90	89,9	1,14	1,80	20,20
WTG 14			160	1,13	91,2	1,71	0,00	21,20
WTG 14			200	-4,33	92,8	2,47	0,00	25,00
WTG 15	3.509	3.522						
WTG 15			20	32,07	64,5	0,00	5,60	6,60
WTG 15			25	28,19	68,5	0,07	5,40	8,40
WTG 15			32	25,76	74,0	0,11	5,20	10,80
WTG 15			40	23,59	77,5	0,18	5,00	11,40
WTG 15			50	22,32	82,6	0,25	4,70	13,00
WTG 15			63	15,48	83,9	0,39	4,30	16,60
WTG 15			80	10,70	86,7	0,56	3,70	19,70
WTG 15			100	9,48	91,4	0,88	3,00	21,20
WTG 15			125	4,33	89,9	1,34	1,80	20,20
WTG 15			160	-0,54	91,2	2,01	0,00	21,20
WTG 15			200	-6,12	92,8	2,89	0,00	25,00
WTG 16	4.391	4.399						
WTG 16			20	30,13	64,5	0,00	5,60	6,60
WTG 16			25	26,25	68,5	0,09	5,40	8,40
WTG 16			32	23,80	74,0	0,13	5,20	10,80
WTG 16			40	21,61	77,5	0,22	5,00	11,40
WTG 16			50	20,33	82,6	0,31	4,70	13,00
WTG 16			63	13,45	83,9	0,48	4,30	16,60
WTG 16			80	8,63	86,7	0,70	3,70	19,70
WTG 16			100	7,33	91,4	1,10	3,00	21,20
WTG 16			125	2,06	89,9	1,67	1,80	20,20
WTG 16			160	-2,97	91,2	2,51	0,00	21,20
WTG 16			200	-8,77	92,8	3,61	0,00	25,00
WTG 17	2.401	2.417						
WTG 17			20	35,34	64,5	0,00	5,60	6,60
WTG 17			25	31,49	68,5	0,05	5,40	8,40
WTG 17			32	29,06	74,0	0,07	5,20	10,80
WTG 17			40	26,91	77,5	0,12	5,00	11,40
WTG 17			50	25,67	82,6	0,17	4,70	13,00
WTG 17			63	18,87	83,9	0,27	4,30	16,60
WTG 17			80	14,15	86,7	0,39	3,70	19,70
WTG 17			100	13,03	91,4	0,60	3,00	21,20
WTG 17			125	8,02	89,9	0,92	1,80	20,20
WTG 17			160	3,36	91,2	1,38	0,00	21,20
WTG 17			200	-1,95	92,8	1,98	0,00	25,00
WTG 18	3.745	3.755						
WTG 18			20	31,51	64,5	0,00	5,60	6,60
WTG 18			25	27,63	68,5	0,08	5,40	8,40
WTG 18			32	25,20	74,0	0,11	5,20	10,80
WTG 18			40	23,02	77,5	0,19	5,00	11,40
WTG 18			50	21,75	82,6	0,26	4,70	13,00
WTG 18			63	14,89	83,9	0,41	4,30	16,60
WTG 18			80	10,11	86,7	0,60	3,70	19,70
WTG 18			100	8,87	91,4	0,94	3,00	21,20
WTG 18			125	3,68	89,9	1,43	1,80	20,20
WTG 18			160	-1,23	91,2	2,14	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 18			200	-6,87	92,8	3,08	0,00	25,00
WTG 19	2.408	2.423						
WTG 19			20	35,31	64,5	0,00	5,60	6,60
WTG 19			25	31,47	68,5	0,05	5,40	8,40
WTG 19			32	29,04	74,0	0,07	5,20	10,80
WTG 19			40	26,89	77,5	0,12	5,00	11,40
WTG 19			50	25,65	82,6	0,17	4,70	13,00
WTG 19			63	18,85	83,9	0,27	4,30	16,60
WTG 19			80	14,13	86,7	0,39	3,70	19,70
WTG 19			100	13,01	91,4	0,61	3,00	21,20
WTG 19			125	7,99	89,9	0,92	1,80	20,20
WTG 19			160	3,33	91,2	1,38	0,00	21,20
WTG 19			200	-1,97	92,8	1,99	0,00	25,00
Sum								
Sum			20	43,66				
Sum			25	39,79				
Sum			32	37,35				
Sum			40	35,18				
Sum			50	33,90				
Sum			63	27,06				
Sum			80	22,27				
Sum			100	21,05				
Sum			125	15,88				
Sum			160	11,01				
Sum			200	5,43				

Noise sensitive area: Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.932	5.940						
WTG 03			20	27,52	64,5	0,00	5,60	6,60
WTG 03			25	23,61	68,5	0,12	5,40	8,40
WTG 03			32	21,15	74,0	0,18	5,20	10,80
WTG 03			40	18,93	77,5	0,30	5,00	11,40
WTG 03			50	17,61	82,6	0,42	4,70	13,00
WTG 03			63	10,67	83,9	0,65	4,30	16,60
WTG 03			80	5,77	86,7	0,95	3,70	19,70
WTG 03			100	4,34	91,4	1,49	3,00	21,20
WTG 03			125	-1,13	89,9	2,26	1,80	20,20
WTG 03			160	-6,46	91,2	3,39	0,00	21,20
WTG 03			200	-12,65	92,8	4,87	0,00	25,00
WTG 04	6.505	6.513						
WTG 04			20	26,72	64,5	0,00	5,60	6,60
WTG 04			25	22,79	68,5	0,13	5,40	8,40
WTG 04			32	20,33	74,0	0,20	5,20	10,80
WTG 04			40	18,10	77,5	0,33	5,00	11,40
WTG 04			50	16,77	82,6	0,46	4,70	13,00
WTG 04			63	9,81	83,9	0,72	4,30	16,60
WTG 04			80	4,88	86,7	1,04	3,70	19,70
WTG 04			100	3,40	91,4	1,63	3,00	21,20
WTG 04			125	-2,15	89,9	2,48	1,80	20,20
WTG 04			160	-7,59	91,2	3,71	0,00	21,20
WTG 04			200	-13,92	92,8	5,34	0,00	25,00
WTG 05	5.545	5.555						
WTG 05			20	28,11	64,5	0,00	5,60	6,60
WTG 05			25	24,20	68,5	0,11	5,40	8,40
WTG 05			32	21,74	74,0	0,17	5,20	10,80
WTG 05			40	19,53	77,5	0,28	5,00	11,40
WTG 05			50	18,22	82,6	0,39	4,70	13,00
WTG 05			63	11,30	83,9	0,61	4,30	16,60
WTG 05			80	6,42	86,7	0,89	3,70	19,70
WTG 05			100	5,02	91,4	1,39	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 05			125	-0,40	89,9	2,11	1,80	20,20
WTG 05			160	-5,66	91,2	3,17	0,00	21,20
WTG 05			200	-11,75	92,8	4,56	0,00	25,00
WTG 06	5.985	5.994						
WTG 06			20	27,45	64,5	0,00	5,60	6,60
WTG 06			25	23,53	68,5	0,12	5,40	8,40
WTG 06			32	21,07	74,0	0,18	5,20	10,80
WTG 06			40	18,85	77,5	0,30	5,00	11,40
WTG 06			50	17,53	82,6	0,42	4,70	13,00
WTG 06			63	10,59	83,9	0,66	4,30	16,60
WTG 06			80	5,69	86,7	0,96	3,70	19,70
WTG 06			100	4,25	91,4	1,50	3,00	21,20
WTG 06			125	-1,23	89,9	2,28	1,80	20,20
WTG 06			160	-6,57	91,2	3,42	0,00	21,20
WTG 06			200	-12,77	92,8	4,91	0,00	25,00
WTG 07	5.030	5.039						
WTG 07			20	28,95	64,5	0,00	5,60	6,60
WTG 07			25	25,05	68,5	0,10	5,40	8,40
WTG 07			32	22,60	74,0	0,15	5,20	10,80
WTG 07			40	20,40	77,5	0,25	5,00	11,40
WTG 07			50	19,10	82,6	0,35	4,70	13,00
WTG 07			63	12,20	83,9	0,55	4,30	16,60
WTG 07			80	7,35	86,7	0,81	3,70	19,70
WTG 07			100	5,99	91,4	1,26	3,00	21,20
WTG 07			125	0,64	89,9	1,91	1,80	20,20
WTG 07			160	-4,52	91,2	2,87	0,00	21,20
WTG 07			200	-10,48	92,8	4,13	0,00	25,00
WTG 08	5.416	5.427						
WTG 08			20	28,31	64,5	0,00	5,60	6,60
WTG 08			25	24,40	68,5	0,11	5,40	8,40
WTG 08			32	21,95	74,0	0,16	5,20	10,80
WTG 08			40	19,74	77,5	0,27	5,00	11,40
WTG 08			50	18,43	82,6	0,38	4,70	13,00
WTG 08			63	11,51	83,9	0,60	4,30	16,60
WTG 08			80	6,64	86,7	0,87	3,70	19,70
WTG 08			100	5,25	91,4	1,36	3,00	21,20
WTG 08			125	-0,15	89,9	2,06	1,80	20,20
WTG 08			160	-5,38	91,2	3,09	0,00	21,20
WTG 08			200	-11,44	92,8	4,45	0,00	25,00
WTG 09	4.472	4.481						
WTG 09			20	29,97	64,5	0,00	5,60	6,60
WTG 09			25	26,08	68,5	0,09	5,40	8,40
WTG 09			32	23,64	74,0	0,13	5,20	10,80
WTG 09			40	21,45	77,5	0,22	5,00	11,40
WTG 09			50	20,16	82,6	0,31	4,70	13,00
WTG 09			63	13,28	83,9	0,49	4,30	16,60
WTG 09			80	8,46	86,7	0,72	3,70	19,70
WTG 09			100	7,15	91,4	1,12	3,00	21,20
WTG 09			125	1,87	89,9	1,70	1,80	20,20
WTG 09			160	-3,18	91,2	2,55	0,00	21,20
WTG 09			200	-9,00	92,8	3,67	0,00	25,00
WTG 10	4.580	4.590						
WTG 10			20	29,76	64,5	0,00	5,60	6,60
WTG 10			25	25,87	68,5	0,09	5,40	8,40
WTG 10			32	23,43	74,0	0,14	5,20	10,80
WTG 10			40	21,23	77,5	0,23	5,00	11,40
WTG 10			50	19,94	82,6	0,32	4,70	13,00
WTG 10			63	13,06	83,9	0,50	4,30	16,60
WTG 10			80	8,23	86,7	0,73	3,70	19,70
WTG 10			100	6,92	91,4	1,15	3,00	21,20
WTG 10			125	1,62	89,9	1,74	1,80	20,20
WTG 10			160	-3,45	91,2	2,62	0,00	21,20
WTG 10			200	-9,30	92,8	3,76	0,00	25,00
WTG 11	4.975	4.985						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 11			20	29,05	64,5	0,00	5,60	6,60
WTG 11			25	25,15	68,5	0,10	5,40	8,40
WTG 11			32	22,70	74,0	0,15	5,20	10,80
WTG 11			40	20,50	77,5	0,25	5,00	11,40
WTG 11			50	19,20	82,6	0,35	4,70	13,00
WTG 11			63	12,30	83,9	0,55	4,30	16,60
WTG 11			80	7,45	86,7	0,80	3,70	19,70
WTG 11			100	6,10	91,4	1,25	3,00	21,20
WTG 11			125	0,75	89,9	1,89	1,80	20,20
WTG 11			160	-4,40	91,2	2,84	0,00	21,20
WTG 11			200	-10,34	92,8	4,09	0,00	25,00
WTG 12	3.978	3.988						
WTG 12			20	30,98	64,5	0,00	5,60	6,60
WTG 12			25	27,10	68,5	0,08	5,40	8,40
WTG 12			32	24,66	74,0	0,12	5,20	10,80
WTG 12			40	22,48	77,5	0,20	5,00	11,40
WTG 12			50	21,20	82,6	0,28	4,70	13,00
WTG 12			63	14,35	83,9	0,44	4,30	16,60
WTG 12			80	9,55	86,7	0,64	3,70	19,70
WTG 12			100	8,29	91,4	1,00	3,00	21,20
WTG 12			125	3,07	89,9	1,52	1,80	20,20
WTG 12			160	-1,89	91,2	2,27	0,00	21,20
WTG 12			200	-7,59	92,8	3,27	0,00	25,00
WTG 13	4.465	4.474						
WTG 13			20	29,99	64,5	0,00	5,60	6,60
WTG 13			25	26,10	68,5	0,09	5,40	8,40
WTG 13			32	23,65	74,0	0,13	5,20	10,80
WTG 13			40	21,46	77,5	0,22	5,00	11,40
WTG 13			50	20,17	82,6	0,31	4,70	13,00
WTG 13			63	13,29	83,9	0,49	4,30	16,60
WTG 13			80	8,47	86,7	0,72	3,70	19,70
WTG 13			100	7,17	91,4	1,12	3,00	21,20
WTG 13			125	1,89	89,9	1,70	1,80	20,20
WTG 13			160	-3,16	91,2	2,55	0,00	21,20
WTG 13			200	-8,98	92,8	3,67	0,00	25,00
WTG 14	3.264	3.277						
WTG 14			20	32,69	64,5	0,00	5,60	6,60
WTG 14			25	28,83	68,5	0,07	5,40	8,40
WTG 14			32	26,39	74,0	0,10	5,20	10,80
WTG 14			40	24,23	77,5	0,16	5,00	11,40
WTG 14			50	22,96	82,6	0,23	4,70	13,00
WTG 14			63	16,13	83,9	0,36	4,30	16,60
WTG 14			80	11,37	86,7	0,52	3,70	19,70
WTG 14			100	10,17	91,4	0,82	3,00	21,20
WTG 14			125	5,05	89,9	1,25	1,80	20,20
WTG 14			160	0,22	91,2	1,87	0,00	21,20
WTG 14			200	-5,30	92,8	2,69	0,00	25,00
WTG 15	3.512	3.524						
WTG 15			20	32,06	64,5	0,00	5,60	6,60
WTG 15			25	28,19	68,5	0,07	5,40	8,40
WTG 15			32	25,75	74,0	0,11	5,20	10,80
WTG 15			40	23,58	77,5	0,18	5,00	11,40
WTG 15			50	22,31	82,6	0,25	4,70	13,00
WTG 15			63	15,47	83,9	0,39	4,30	16,60
WTG 15			80	10,69	86,7	0,56	3,70	19,70
WTG 15			100	9,48	91,4	0,88	3,00	21,20
WTG 15			125	4,32	89,9	1,34	1,80	20,20
WTG 15			160	-0,55	91,2	2,01	0,00	21,20
WTG 15			200	-6,13	92,8	2,89	0,00	25,00
WTG 16	4.388	4.397						
WTG 16			20	30,14	64,5	0,00	5,60	6,60
WTG 16			25	26,25	68,5	0,09	5,40	8,40
WTG 16			32	23,81	74,0	0,13	5,20	10,80
WTG 16			40	21,62	77,5	0,22	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 16			50	20,33	82,6	0,31	4,70	13,00
WTG 16			63	13,45	83,9	0,48	4,30	16,60
WTG 16			80	8,63	86,7	0,70	3,70	19,70
WTG 16			100	7,34	91,4	1,10	3,00	21,20
WTG 16			125	2,07	89,9	1,67	1,80	20,20
WTG 16			160	-2,97	91,2	2,51	0,00	21,20
WTG 16			200	-8,77	92,8	3,61	0,00	25,00
WTG 17	2.568	2.582						
WTG 17			20	34,76	64,5	0,00	5,60	6,60
WTG 17			25	30,91	68,5	0,05	5,40	8,40
WTG 17			32	28,48	74,0	0,08	5,20	10,80
WTG 17			40	26,33	77,5	0,13	5,00	11,40
WTG 17			50	25,08	82,6	0,18	4,70	13,00
WTG 17			63	18,28	83,9	0,28	4,30	16,60
WTG 17			80	13,55	86,7	0,41	3,70	19,70
WTG 17			100	12,42	91,4	0,65	3,00	21,20
WTG 17			125	7,38	89,9	0,98	1,80	20,20
WTG 17			160	2,69	91,2	1,47	0,00	21,20
WTG 17			200	-2,66	92,8	2,12	0,00	25,00
WTG 18	3.601	3.611						
WTG 18			20	31,85	64,5	0,00	5,60	6,60
WTG 18			25	27,98	68,5	0,07	5,40	8,40
WTG 18			32	25,54	74,0	0,11	5,20	10,80
WTG 18			40	23,37	77,5	0,18	5,00	11,40
WTG 18			50	22,10	82,6	0,25	4,70	13,00
WTG 18			63	15,25	83,9	0,40	4,30	16,60
WTG 18			80	10,47	86,7	0,58	3,70	19,70
WTG 18			100	9,25	91,4	0,90	3,00	21,20
WTG 18			125	4,08	89,9	1,37	1,80	20,20
WTG 18			160	-0,81	91,2	2,06	0,00	21,20
WTG 18			200	-6,41	92,8	2,96	0,00	25,00
WTG 19	2.392	2.406						
WTG 19			20	35,37	64,5	0,00	5,60	6,60
WTG 19			25	31,52	68,5	0,05	5,40	8,40
WTG 19			32	29,10	74,0	0,07	5,20	10,80
WTG 19			40	26,95	77,5	0,12	5,00	11,40
WTG 19			50	25,70	82,6	0,17	4,70	13,00
WTG 19			63	18,91	83,9	0,26	4,30	16,60
WTG 19			80	14,19	86,7	0,39	3,70	19,70
WTG 19			100	13,07	91,4	0,60	3,00	21,20
WTG 19			125	8,06	89,9	0,91	1,80	20,20
WTG 19			160	3,40	91,2	1,37	0,00	21,20
WTG 19			200	-1,90	92,8	1,97	0,00	25,00
Sum								
Sum			20	43,26				
Sum			25	39,38				
Sum			32	36,94				
Sum			40	34,76				
Sum			50	33,49				
Sum			63	26,64				
Sum			80	21,85				
Sum			100	20,61				
Sum			125	15,42				
Sum			160	10,52				
Sum			200	4,91				

Noise sensitive area: Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.446	5.450						
WTG 03			20	28,27	64,5	0,00	5,60	6,60
WTG 03			25	24,36	68,5	0,11	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03			32	21,91	74,0	0,16	5,20	10,80
WTG 03			40	19,70	77,5	0,27	5,00	11,40
WTG 03			50	18,39	82,6	0,38	4,70	13,00
WTG 03			63	11,47	83,9	0,60	4,30	16,60
WTG 03			80	6,60	86,7	0,87	3,70	19,70
WTG 03			100	5,21	91,4	1,36	3,00	21,20
WTG 03			125	-0,20	89,9	2,07	1,80	20,20
WTG 03			160	-5,43	91,2	3,11	0,00	21,20
WTG 03			200	-11,50	92,8	4,47	0,00	25,00
WTG 04	5.694	5.698						
WTG 04			20	27,89	64,5	0,00	5,60	6,60
WTG 04			25	23,97	68,5	0,11	5,40	8,40
WTG 04			32	21,52	74,0	0,17	5,20	10,80
WTG 04			40	19,30	77,5	0,28	5,00	11,40
WTG 04			50	17,99	82,6	0,40	4,70	13,00
WTG 04			63	11,06	83,9	0,63	4,30	16,60
WTG 04			80	6,17	86,7	0,91	3,70	19,70
WTG 04			100	4,76	91,4	1,42	3,00	21,20
WTG 04			125	-0,68	89,9	2,17	1,80	20,20
WTG 04			160	-5,96	91,2	3,25	0,00	21,20
WTG 04			200	-12,09	92,8	4,67	0,00	25,00
WTG 05	4.985	4.990						
WTG 05			20	29,04	64,5	0,00	5,60	6,60
WTG 05			25	25,14	68,5	0,10	5,40	8,40
WTG 05			32	22,69	74,0	0,15	5,20	10,80
WTG 05			40	20,49	77,5	0,25	5,00	11,40
WTG 05			50	19,19	82,6	0,35	4,70	13,00
WTG 05			63	12,29	83,9	0,55	4,30	16,60
WTG 05			80	7,44	86,7	0,80	3,70	19,70
WTG 05			100	6,09	91,4	1,25	3,00	21,20
WTG 05			125	0,74	89,9	1,90	1,80	20,20
WTG 05			160	-4,41	91,2	2,84	0,00	21,20
WTG 05			200	-10,35	92,8	4,09	0,00	25,00
WTG 06	5.080	5.084						
WTG 06			20	28,88	64,5	0,00	5,60	6,60
WTG 06			25	24,97	68,5	0,10	5,40	8,40
WTG 06			32	22,52	74,0	0,15	5,20	10,80
WTG 06			40	20,32	77,5	0,25	5,00	11,40
WTG 06			50	19,02	82,6	0,36	4,70	13,00
WTG 06			63	12,12	83,9	0,56	4,30	16,60
WTG 06			80	7,26	86,7	0,81	3,70	19,70
WTG 06			100	5,90	91,4	1,27	3,00	21,20
WTG 06			125	0,54	89,9	1,93	1,80	20,20
WTG 06			160	-4,62	91,2	2,90	0,00	21,20
WTG 06			200	-10,59	92,8	4,17	0,00	25,00
WTG 07	4.762	4.766						
WTG 07			20	29,44	64,5	0,00	5,60	6,60
WTG 07			25	25,54	68,5	0,10	5,40	8,40
WTG 07			32	23,09	74,0	0,14	5,20	10,80
WTG 07			40	20,90	77,5	0,24	5,00	11,40
WTG 07			50	19,60	82,6	0,33	4,70	13,00
WTG 07			63	12,71	83,9	0,52	4,30	16,60
WTG 07			80	7,88	86,7	0,76	3,70	19,70
WTG 07			100	6,55	91,4	1,19	3,00	21,20
WTG 07			125	1,23	89,9	1,81	1,80	20,20
WTG 07			160	-3,88	91,2	2,72	0,00	21,20
WTG 07			200	-9,77	92,8	3,91	0,00	25,00
WTG 08	4.538	4.544						
WTG 08			20	29,85	64,5	0,00	5,60	6,60
WTG 08			25	25,96	68,5	0,09	5,40	8,40
WTG 08			32	23,52	74,0	0,14	5,20	10,80
WTG 08			40	21,32	77,5	0,23	5,00	11,40
WTG 08			50	20,03	82,6	0,32	4,70	13,00
WTG 08			63	13,15	83,9	0,50	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 08			80	8,33	86,7	0,73	3,70	19,70
WTG 08			100	7,02	91,4	1,14	3,00	21,20
WTG 08			125	1,73	89,9	1,73	1,80	20,20
WTG 08			160	-3,34	91,2	2,59	0,00	21,20
WTG 08			200	-9,17	92,8	3,73	0,00	25,00
WTG 09	4.473	4.477						
WTG 09			20	29,98	64,5	0,00	5,60	6,60
WTG 09			25	26,09	68,5	0,09	5,40	8,40
WTG 09			32	23,65	74,0	0,13	5,20	10,80
WTG 09			40	21,46	77,5	0,22	5,00	11,40
WTG 09			50	20,17	82,6	0,31	4,70	13,00
WTG 09			63	13,29	83,9	0,49	4,30	16,60
WTG 09			80	8,46	86,7	0,72	3,70	19,70
WTG 09			100	7,16	91,4	1,12	3,00	21,20
WTG 09			125	1,88	89,9	1,70	1,80	20,20
WTG 09			160	-3,17	91,2	2,55	0,00	21,20
WTG 09			200	-8,99	92,8	3,67	0,00	25,00
WTG 10	4.173	4.177						
WTG 10			20	30,58	64,5	0,00	5,60	6,60
WTG 10			25	26,70	68,5	0,08	5,40	8,40
WTG 10			32	24,26	74,0	0,13	5,20	10,80
WTG 10			40	22,07	77,5	0,21	5,00	11,40
WTG 10			50	20,79	82,6	0,29	4,70	13,00
WTG 10			63	13,92	83,9	0,46	4,30	16,60
WTG 10			80	9,11	86,7	0,67	3,70	19,70
WTG 10			100	7,84	91,4	1,04	3,00	21,20
WTG 10			125	2,60	89,9	1,59	1,80	20,20
WTG 10			160	-2,40	91,2	2,38	0,00	21,20
WTG 10			200	-8,14	92,8	3,43	0,00	25,00
WTG 11	4.026	4.032						
WTG 11			20	30,89	64,5	0,00	5,60	6,60
WTG 11			25	27,01	68,5	0,08	5,40	8,40
WTG 11			32	24,57	74,0	0,12	5,20	10,80
WTG 11			40	22,39	77,5	0,20	5,00	11,40
WTG 11			50	21,11	82,6	0,28	4,70	13,00
WTG 11			63	14,25	83,9	0,44	4,30	16,60
WTG 11			80	9,45	86,7	0,65	3,70	19,70
WTG 11			100	8,18	91,4	1,01	3,00	21,20
WTG 11			125	2,96	89,9	1,53	1,80	20,20
WTG 11			160	-2,01	91,2	2,30	0,00	21,20
WTG 11			200	-7,72	92,8	3,31	0,00	25,00
WTG 12	4.099	4.103						
WTG 12			20	30,74	64,5	0,00	5,60	6,60
WTG 12			25	26,86	68,5	0,08	5,40	8,40
WTG 12			32	24,41	74,0	0,12	5,20	10,80
WTG 12			40	22,23	77,5	0,21	5,00	11,40
WTG 12			50	20,95	82,6	0,29	4,70	13,00
WTG 12			63	14,09	83,9	0,45	4,30	16,60
WTG 12			80	9,28	86,7	0,66	3,70	19,70
WTG 12			100	8,01	91,4	1,03	3,00	21,20
WTG 12			125	2,78	89,9	1,56	1,80	20,20
WTG 12			160	-2,20	91,2	2,34	0,00	21,20
WTG 12			200	-7,93	92,8	3,36	0,00	25,00
WTG 13	3.272	3.277						
WTG 13			20	32,69	64,5	0,00	5,60	6,60
WTG 13			25	28,83	68,5	0,07	5,40	8,40
WTG 13			32	26,39	74,0	0,10	5,20	10,80
WTG 13			40	24,23	77,5	0,16	5,00	11,40
WTG 13			50	22,96	82,6	0,23	4,70	13,00
WTG 13			63	16,13	83,9	0,36	4,30	16,60
WTG 13			80	11,37	86,7	0,52	3,70	19,70
WTG 13			100	10,17	91,4	0,82	3,00	21,20
WTG 13			125	5,05	89,9	1,25	1,80	20,20
WTG 13			160	0,22	91,2	1,87	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 13			200	-5,30	92,8	2,69	0,00	25,00
WTG 14	3.361	3.366						
WTG 14			20	32,46	64,5	0,00	5,60	6,60
WTG 14			25	28,59	68,5	0,07	5,40	8,40
WTG 14			32	26,16	74,0	0,10	5,20	10,80
WTG 14			40	23,99	77,5	0,17	5,00	11,40
WTG 14			50	22,72	82,6	0,24	4,70	13,00
WTG 14			63	15,89	83,9	0,37	4,30	16,60
WTG 14			80	11,12	86,7	0,54	3,70	19,70
WTG 14			100	9,92	91,4	0,84	3,00	21,20
WTG 14			125	4,78	89,9	1,28	1,80	20,20
WTG 14			160	-0,06	91,2	1,92	0,00	21,20
WTG 14			200	-5,60	92,8	2,76	0,00	25,00
WTG 15	2.514	2.521						
WTG 15			20	34,97	64,5	0,00	5,60	6,60
WTG 15			25	31,12	68,5	0,05	5,40	8,40
WTG 15			32	28,69	74,0	0,08	5,20	10,80
WTG 15			40	26,54	77,5	0,13	5,00	11,40
WTG 15			50	25,29	82,6	0,18	4,70	13,00
WTG 15			63	18,49	83,9	0,28	4,30	16,60
WTG 15			80	13,77	86,7	0,40	3,70	19,70
WTG 15			100	12,64	91,4	0,63	3,00	21,20
WTG 15			125	7,61	89,9	0,96	1,80	20,20
WTG 15			160	2,93	91,2	1,44	0,00	21,20
WTG 15			200	-2,40	92,8	2,07	0,00	25,00
WTG 16	2.736	2.740						
WTG 16			20	34,24	64,5	0,00	5,60	6,60
WTG 16			25	30,39	68,5	0,05	5,40	8,40
WTG 16			32	27,96	74,0	0,08	5,20	10,80
WTG 16			40	25,81	77,5	0,14	5,00	11,40
WTG 16			50	24,55	82,6	0,19	4,70	13,00
WTG 16			63	17,74	83,9	0,30	4,30	16,60
WTG 16			80	13,01	86,7	0,44	3,70	19,70
WTG 16			100	11,86	91,4	0,69	3,00	21,20
WTG 16			125	6,80	89,9	1,04	1,80	20,20
WTG 16			160	2,08	91,2	1,56	0,00	21,20
WTG 16			200	-3,30	92,8	2,25	0,00	25,00
WTG 17	3.018	3.023						
WTG 17			20	33,39	64,5	0,00	5,60	6,60
WTG 17			25	29,53	68,5	0,06	5,40	8,40
WTG 17			32	27,10	74,0	0,09	5,20	10,80
WTG 17			40	24,94	77,5	0,15	5,00	11,40
WTG 17			50	23,68	82,6	0,21	4,70	13,00
WTG 17			63	16,86	83,9	0,33	4,30	16,60
WTG 17			80	12,11	86,7	0,48	3,70	19,70
WTG 17			100	10,94	91,4	0,76	3,00	21,20
WTG 17			125	5,84	89,9	1,15	1,80	20,20
WTG 17			160	1,07	91,2	1,72	0,00	21,20
WTG 17			200	-4,39	92,8	2,48	0,00	25,00
WTG 18	1.989	1.995						
WTG 18			20	37,00	64,5	0,00	5,60	6,60
WTG 18			25	33,16	68,5	0,04	5,40	8,40
WTG 18			32	30,74	74,0	0,06	5,20	10,80
WTG 18			40	28,60	77,5	0,10	5,00	11,40
WTG 18			50	27,36	82,6	0,14	4,70	13,00
WTG 18			63	20,58	83,9	0,22	4,30	16,60
WTG 18			80	15,88	86,7	0,32	3,70	19,70
WTG 18			100	14,80	91,4	0,50	3,00	21,20
WTG 18			125	9,84	89,9	0,76	1,80	20,20
WTG 18			160	5,26	91,2	1,14	0,00	21,20
WTG 18			200	0,06	92,8	1,64	0,00	25,00
WTG 19	2.595	2.599						
WTG 19			20	34,70	64,5	0,00	5,60	6,60
WTG 19			25	30,85	68,5	0,05	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 19			32	28,43	74,0	0,08	5,20	10,80
WTG 19			40	26,27	77,5	0,13	5,00	11,40
WTG 19			50	25,02	82,6	0,18	4,70	13,00
WTG 19			63	18,22	83,9	0,29	4,30	16,60
WTG 19			80	13,49	86,7	0,42	3,70	19,70
WTG 19			100	12,35	91,4	0,65	3,00	21,20
WTG 19			125	7,32	89,9	0,99	1,80	20,20
WTG 19			160	2,62	91,2	1,48	0,00	21,20
WTG 19			200	-2,73	92,8	2,13	0,00	25,00
Sum								
Sum			20	44,60				
Sum			25	40,73				
Sum			32	38,30				
Sum			40	36,13				
Sum			50	34,87				
Sum			63	28,04				
Sum			80	23,28				
Sum			100	22,09				
Sum			125	16,97				
Sum			160	12,17				
Sum			200	6,70				

Noise sensitive area: Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.433	5.437						
WTG 03			20	28,29	64,5	0,00	5,60	6,60
WTG 03			25	24,38	68,5	0,11	5,40	8,40
WTG 03			32	21,93	74,0	0,16	5,20	10,80
WTG 03			40	19,72	77,5	0,27	5,00	11,40
WTG 03			50	18,41	82,6	0,38	4,70	13,00
WTG 03			63	11,50	83,9	0,60	4,30	16,60
WTG 03			80	6,62	86,7	0,87	3,70	19,70
WTG 03			100	5,23	91,4	1,36	3,00	21,20
WTG 03			125	-0,17	89,9	2,07	1,80	20,20
WTG 03			160	-5,41	91,2	3,10	0,00	21,20
WTG 03			200	-11,46	92,8	4,46	0,00	25,00
WTG 04	5.728	5.732						
WTG 04			20	27,83	64,5	0,00	5,60	6,60
WTG 04			25	23,92	68,5	0,11	5,40	8,40
WTG 04			32	21,46	74,0	0,17	5,20	10,80
WTG 04			40	19,25	77,5	0,29	5,00	11,40
WTG 04			50	17,93	82,6	0,40	4,70	13,00
WTG 04			63	11,00	83,9	0,63	4,30	16,60
WTG 04			80	6,12	86,7	0,92	3,70	19,70
WTG 04			100	4,70	91,4	1,43	3,00	21,20
WTG 04			125	-0,75	89,9	2,18	1,80	20,20
WTG 04			160	-6,03	91,2	3,27	0,00	21,20
WTG 04			200	-12,17	92,8	4,70	0,00	25,00
WTG 05	4.969	4.974						
WTG 05			20	29,07	64,5	0,00	5,60	6,60
WTG 05			25	25,17	68,5	0,10	5,40	8,40
WTG 05			32	22,72	74,0	0,15	5,20	10,80
WTG 05			40	20,52	77,5	0,25	5,00	11,40
WTG 05			50	19,22	82,6	0,35	4,70	13,00
WTG 05			63	12,32	83,9	0,55	4,30	16,60
WTG 05			80	7,47	86,7	0,80	3,70	19,70
WTG 05			100	6,12	91,4	1,24	3,00	21,20
WTG 05			125	0,78	89,9	1,89	1,80	20,20
WTG 05			160	-4,37	91,2	2,84	0,00	21,20
WTG 05			200	-10,31	92,8	4,08	0,00	25,00
WTG 06	5.113	5.117						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 06			20	28,82	64,5	0,00	5,60	6,60
WTG 06			25	24,92	68,5	0,10	5,40	8,40
WTG 06			32	22,47	74,0	0,15	5,20	10,80
WTG 06			40	20,26	77,5	0,26	5,00	11,40
WTG 06			50	18,96	82,6	0,36	4,70	13,00
WTG 06			63	12,06	83,9	0,56	4,30	16,60
WTG 06			80	7,20	86,7	0,82	3,70	19,70
WTG 06			100	5,84	91,4	1,28	3,00	21,20
WTG 06			125	0,48	89,9	1,94	1,80	20,20
WTG 06			160	-4,70	91,2	2,92	0,00	21,20
WTG 06			200	-10,68	92,8	4,20	0,00	25,00
WTG 07	4.701	4.705						
WTG 07			20	29,55	64,5	0,00	5,60	6,60
WTG 07			25	25,66	68,5	0,09	5,40	8,40
WTG 07			32	23,21	74,0	0,14	5,20	10,80
WTG 07			40	21,01	77,5	0,24	5,00	11,40
WTG 07			50	19,72	82,6	0,33	4,70	13,00
WTG 07			63	12,83	83,9	0,52	4,30	16,60
WTG 07			80	8,00	86,7	0,75	3,70	19,70
WTG 07			100	6,67	91,4	1,18	3,00	21,20
WTG 07			125	1,36	89,9	1,79	1,80	20,20
WTG 07			160	-3,73	91,2	2,68	0,00	21,20
WTG 07			200	-9,61	92,8	3,86	0,00	25,00
WTG 08	4.551	4.557						
WTG 08			20	29,83	64,5	0,00	5,60	6,60
WTG 08			25	25,94	68,5	0,09	5,40	8,40
WTG 08			32	23,49	74,0	0,14	5,20	10,80
WTG 08			40	21,30	77,5	0,23	5,00	11,40
WTG 08			50	20,01	82,6	0,32	4,70	13,00
WTG 08			63	13,13	83,9	0,50	4,30	16,60
WTG 08			80	8,30	86,7	0,73	3,70	19,70
WTG 08			100	6,99	91,4	1,14	3,00	21,20
WTG 08			125	1,70	89,9	1,73	1,80	20,20
WTG 08			160	-3,37	91,2	2,60	0,00	21,20
WTG 08			200	-9,21	92,8	3,74	0,00	25,00
WTG 09	4.367	4.371						
WTG 09			20	30,19	64,5	0,00	5,60	6,60
WTG 09			25	26,30	68,5	0,09	5,40	8,40
WTG 09			32	23,86	74,0	0,13	5,20	10,80
WTG 09			40	21,67	77,5	0,22	5,00	11,40
WTG 09			50	20,38	82,6	0,31	4,70	13,00
WTG 09			63	13,51	83,9	0,48	4,30	16,60
WTG 09			80	8,69	86,7	0,70	3,70	19,70
WTG 09			100	7,40	91,4	1,09	3,00	21,20
WTG 09			125	2,13	89,9	1,66	1,80	20,20
WTG 09			160	-2,90	91,2	2,49	0,00	21,20
WTG 09			200	-8,70	92,8	3,58	0,00	25,00
WTG 10	4.107	4.112						
WTG 10			20	30,72	64,5	0,00	5,60	6,60
WTG 10			25	26,84	68,5	0,08	5,40	8,40
WTG 10			32	24,40	74,0	0,12	5,20	10,80
WTG 10			40	22,21	77,5	0,21	5,00	11,40
WTG 10			50	20,93	82,6	0,29	4,70	13,00
WTG 10			63	14,07	83,9	0,45	4,30	16,60
WTG 10			80	9,26	86,7	0,66	3,70	19,70
WTG 10			100	7,99	91,4	1,03	3,00	21,20
WTG 10			125	2,76	89,9	1,56	1,80	20,20
WTG 10			160	-2,22	91,2	2,34	0,00	21,20
WTG 10			200	-7,95	92,8	3,37	0,00	25,00
WTG 11	4.030	4.035						
WTG 11			20	30,88	64,5	0,00	5,60	6,60
WTG 11			25	27,00	68,5	0,08	5,40	8,40
WTG 11			32	24,56	74,0	0,12	5,20	10,80
WTG 11			40	22,38	77,5	0,20	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 11			50	21,10	82,6	0,28	4,70	13,00
WTG 11			63	14,24	83,9	0,44	4,30	16,60
WTG 11			80	9,44	86,7	0,65	3,70	19,70
WTG 11			100	8,17	91,4	1,01	3,00	21,20
WTG 11			125	2,95	89,9	1,53	1,80	20,20
WTG 11			160	-2,02	91,2	2,30	0,00	21,20
WTG 11			200	-7,73	92,8	3,31	0,00	25,00
WTG 12	3.962	3.966						
WTG 12			20	31,03	64,5	0,00	5,60	6,60
WTG 12			25	27,15	68,5	0,08	5,40	8,40
WTG 12			32	24,71	74,0	0,12	5,20	10,80
WTG 12			40	22,53	77,5	0,20	5,00	11,40
WTG 12			50	21,25	82,6	0,28	4,70	13,00
WTG 12			63	14,40	83,9	0,44	4,30	16,60
WTG 12			80	9,60	86,7	0,63	3,70	19,70
WTG 12			100	8,34	91,4	0,99	3,00	21,20
WTG 12			125	3,13	89,9	1,51	1,80	20,20
WTG 12			160	-1,83	91,2	2,26	0,00	21,20
WTG 12			200	-7,52	92,8	3,25	0,00	25,00
WTG 13	3.274	3.279						
WTG 13			20	32,68	64,5	0,00	5,60	6,60
WTG 13			25	28,82	68,5	0,07	5,40	8,40
WTG 13			32	26,39	74,0	0,10	5,20	10,80
WTG 13			40	24,22	77,5	0,16	5,00	11,40
WTG 13			50	22,96	82,6	0,23	4,70	13,00
WTG 13			63	16,12	83,9	0,36	4,30	16,60
WTG 13			80	11,36	86,7	0,52	3,70	19,70
WTG 13			100	10,16	91,4	0,82	3,00	21,20
WTG 13			125	5,04	89,9	1,25	1,80	20,20
WTG 13			160	0,22	91,2	1,87	0,00	21,20
WTG 13			200	-5,30	92,8	2,69	0,00	25,00
WTG 14	3.182	3.187						
WTG 14			20	32,93	64,5	0,00	5,60	6,60
WTG 14			25	29,07	68,5	0,06	5,40	8,40
WTG 14			32	26,64	74,0	0,10	5,20	10,80
WTG 14			40	24,47	77,5	0,16	5,00	11,40
WTG 14			50	23,21	82,6	0,22	4,70	13,00
WTG 14			63	16,38	83,9	0,35	4,30	16,60
WTG 14			80	11,62	86,7	0,51	3,70	19,70
WTG 14			100	10,44	91,4	0,80	3,00	21,20
WTG 14			125	5,32	89,9	1,21	1,80	20,20
WTG 14			160	0,52	91,2	1,82	0,00	21,20
WTG 14			200	-4,98	92,8	2,61	0,00	25,00
WTG 15	2.419	2.426						
WTG 15			20	35,30	64,5	0,00	5,60	6,60
WTG 15			25	31,45	68,5	0,05	5,40	8,40
WTG 15			32	29,03	74,0	0,07	5,20	10,80
WTG 15			40	26,88	77,5	0,12	5,00	11,40
WTG 15			50	25,63	82,6	0,17	4,70	13,00
WTG 15			63	18,84	83,9	0,27	4,30	16,60
WTG 15			80	14,12	86,7	0,39	3,70	19,70
WTG 15			100	13,00	91,4	0,61	3,00	21,20
WTG 15			125	7,98	89,9	0,92	1,80	20,20
WTG 15			160	3,32	91,2	1,38	0,00	21,20
WTG 15			200	-1,99	92,8	1,99	0,00	25,00
WTG 16	2.780	2.784						
WTG 16			20	34,11	64,5	0,00	5,60	6,60
WTG 16			25	30,25	68,5	0,06	5,40	8,40
WTG 16			32	27,82	74,0	0,08	5,20	10,80
WTG 16			40	25,67	77,5	0,14	5,00	11,40
WTG 16			50	24,41	82,6	0,19	4,70	13,00
WTG 16			63	17,60	83,9	0,31	4,30	16,60
WTG 16			80	12,86	86,7	0,45	3,70	19,70
WTG 16			100	11,71	91,4	0,70	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 16			125	6,65	89,9	1,06	1,80	20,20
WTG 16			160	1,92	91,2	1,59	0,00	21,20
WTG 16			200	-3,48	92,8	2,28	0,00	25,00
WTG 17	2.764	2.768						
WTG 17			20	34,16	64,5	0,00	5,60	6,60
WTG 17			25	30,30	68,5	0,06	5,40	8,40
WTG 17			32	27,87	74,0	0,08	5,20	10,80
WTG 17			40	25,72	77,5	0,14	5,00	11,40
WTG 17			50	24,46	82,6	0,19	4,70	13,00
WTG 17			63	17,65	83,9	0,30	4,30	16,60
WTG 17			80	12,91	86,7	0,44	3,70	19,70
WTG 17			100	11,76	91,4	0,69	3,00	21,20
WTG 17			125	6,70	89,9	1,05	1,80	20,20
WTG 17			160	1,98	91,2	1,58	0,00	21,20
WTG 17			200	-3,41	92,8	2,27	0,00	25,00
WTG 18	1.943	1.950						
WTG 18			20	37,20	64,5	0,00	5,60	6,60
WTG 18			25	33,36	68,5	0,04	5,40	8,40
WTG 18			32	30,94	74,0	0,06	5,20	10,80
WTG 18			40	28,80	77,5	0,10	5,00	11,40
WTG 18			50	27,56	82,6	0,14	4,70	13,00
WTG 18			63	20,78	83,9	0,21	4,30	16,60
WTG 18			80	16,09	86,7	0,31	3,70	19,70
WTG 18			100	15,01	91,4	0,49	3,00	21,20
WTG 18			125	10,06	89,9	0,74	1,80	20,20
WTG 18			160	5,49	91,2	1,11	0,00	21,20
WTG 18			200	0,30	92,8	1,60	0,00	25,00
WTG 19	2.319	2.325						
WTG 19			20	35,67	64,5	0,00	5,60	6,60
WTG 19			25	31,83	68,5	0,05	5,40	8,40
WTG 19			32	29,40	74,0	0,07	5,20	10,80
WTG 19			40	27,26	77,5	0,12	5,00	11,40
WTG 19			50	26,01	82,6	0,16	4,70	13,00
WTG 19			63	19,22	83,9	0,26	4,30	16,60
WTG 19			80	14,50	86,7	0,37	3,70	19,70
WTG 19			100	13,39	91,4	0,58	3,00	21,20
WTG 19			125	8,39	89,9	0,88	1,80	20,20
WTG 19			160	3,75	91,2	1,33	0,00	21,20
WTG 19			200	-1,53	92,8	1,91	0,00	25,00
Sum								
Sum			20	44,88				
Sum			25	41,02				
Sum			32	38,59				
Sum			40	36,42				
Sum			50	35,16				
Sum			63	28,33				
Sum			80	23,58				
Sum			100	22,40				
Sum			125	17,30				
Sum			160	12,53				
Sum			200	7,08				

Noise sensitive area: Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.258	5.267						
WTG 03			20	28,57	64,5	0,00	5,60	6,60
WTG 03			25	24,66	68,5	0,11	5,40	8,40
WTG 03			32	22,21	74,0	0,16	5,20	10,80
WTG 03			40	20,00	77,5	0,26	5,00	11,40
WTG 03			50	18,70	82,6	0,37	4,70	13,00
WTG 03			63	11,79	83,9	0,58	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03			80	6,93	86,7	0,84	3,70	19,70
WTG 03			100	5,55	91,4	1,32	3,00	21,20
WTG 03			125	0,17	89,9	2,00	1,80	20,20
WTG 03			160	-5,03	91,2	3,00	0,00	21,20
WTG 03			200	-11,05	92,8	4,32	0,00	25,00
WTG 04	5.887	5.896						
WTG 04			20	27,59	64,5	0,00	5,60	6,60
WTG 04			25	23,67	68,5	0,12	5,40	8,40
WTG 04			32	21,21	74,0	0,18	5,20	10,80
WTG 04			40	18,99	77,5	0,29	5,00	11,40
WTG 04			50	17,68	82,6	0,41	4,70	13,00
WTG 04			63	10,74	83,9	0,65	4,30	16,60
WTG 04			80	5,85	86,7	0,94	3,70	19,70
WTG 04			100	4,41	91,4	1,47	3,00	21,20
WTG 04			125	-1,05	89,9	2,24	1,80	20,20
WTG 04			160	-6,37	91,2	3,36	0,00	21,20
WTG 04			200	-12,55	92,8	4,83	0,00	25,00
WTG 05	5.258	5.269						
WTG 05			20	28,57	64,5	0,00	5,60	6,60
WTG 05			25	24,66	68,5	0,11	5,40	8,40
WTG 05			32	22,21	74,0	0,16	5,20	10,80
WTG 05			40	20,00	77,5	0,26	5,00	11,40
WTG 05			50	18,70	82,6	0,37	4,70	13,00
WTG 05			63	11,79	83,9	0,58	4,30	16,60
WTG 05			80	6,92	86,7	0,84	3,70	19,70
WTG 05			100	5,55	91,4	1,32	3,00	21,20
WTG 05			125	0,16	89,9	2,00	1,80	20,20
WTG 05			160	-5,04	91,2	3,00	0,00	21,20
WTG 05			200	-11,05	92,8	4,32	0,00	25,00
WTG 06	5.816	5.825						
WTG 06			20	27,69	64,5	0,00	5,60	6,60
WTG 06			25	23,78	68,5	0,12	5,40	8,40
WTG 06			32	21,32	74,0	0,17	5,20	10,80
WTG 06			40	19,10	77,5	0,29	5,00	11,40
WTG 06			50	17,79	82,6	0,41	4,70	13,00
WTG 06			63	10,85	83,9	0,64	4,30	16,60
WTG 06			80	5,96	86,7	0,93	3,70	19,70
WTG 06			100	4,54	91,4	1,46	3,00	21,20
WTG 06			125	-0,92	89,9	2,21	1,80	20,20
WTG 06			160	-6,23	91,2	3,32	0,00	21,20
WTG 06			200	-12,38	92,8	4,78	0,00	25,00
WTG 07	4.816	4.825						
WTG 07			20	29,33	64,5	0,00	5,60	6,60
WTG 07			25	25,43	68,5	0,10	5,40	8,40
WTG 07			32	22,99	74,0	0,14	5,20	10,80
WTG 07			40	20,79	77,5	0,24	5,00	11,40
WTG 07			50	19,49	82,6	0,34	4,70	13,00
WTG 07			63	12,60	83,9	0,53	4,30	16,60
WTG 07			80	7,76	86,7	0,77	3,70	19,70
WTG 07			100	6,42	91,4	1,21	3,00	21,20
WTG 07			125	1,10	89,9	1,83	1,80	20,20
WTG 07			160	-4,02	91,2	2,75	0,00	21,20
WTG 07			200	-9,93	92,8	3,96	0,00	25,00
WTG 08	5.625	5.635						
WTG 08			20	27,98	64,5	0,00	5,60	6,60
WTG 08			25	24,07	68,5	0,11	5,40	8,40
WTG 08			32	21,61	74,0	0,17	5,20	10,80
WTG 08			40	19,40	77,5	0,28	5,00	11,40
WTG 08			50	18,09	82,6	0,39	4,70	13,00
WTG 08			63	11,16	83,9	0,62	4,30	16,60
WTG 08			80	6,28	86,7	0,90	3,70	19,70
WTG 08			100	4,87	91,4	1,41	3,00	21,20
WTG 08			125	-0,56	89,9	2,14	1,80	20,20
WTG 08			160	-5,83	91,2	3,21	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 08			200	-11,94	92,8	4,62	0,00	25,00
WTG 09	4.492	4.501						
WTG 09			20	29,93	64,5	0,00	5,60	6,60
WTG 09			25	26,04	68,5	0,09	5,40	8,40
WTG 09			32	23,60	74,0	0,14	5,20	10,80
WTG 09			40	21,41	77,5	0,23	5,00	11,40
WTG 09			50	20,12	82,6	0,32	4,70	13,00
WTG 09			63	13,24	83,9	0,50	4,30	16,60
WTG 09			80	8,41	86,7	0,72	3,70	19,70
WTG 09			100	7,11	91,4	1,13	3,00	21,20
WTG 09			125	1,82	89,9	1,71	1,80	20,20
WTG 09			160	-3,23	91,2	2,57	0,00	21,20
WTG 09			200	-9,06	92,8	3,69	0,00	25,00
WTG 10	4.977	4.986						
WTG 10			20	29,05	64,5	0,00	5,60	6,60
WTG 10			25	25,15	68,5	0,10	5,40	8,40
WTG 10			32	22,70	74,0	0,15	5,20	10,80
WTG 10			40	20,50	77,5	0,25	5,00	11,40
WTG 10			50	19,20	82,6	0,35	4,70	13,00
WTG 10			63	12,30	83,9	0,55	4,30	16,60
WTG 10			80	7,45	86,7	0,80	3,70	19,70
WTG 10			100	6,10	91,4	1,25	3,00	21,20
WTG 10			125	0,75	89,9	1,89	1,80	20,20
WTG 10			160	-4,40	91,2	2,84	0,00	21,20
WTG 10			200	-10,34	92,8	4,09	0,00	25,00
WTG 11	5.628	5.638						
WTG 11			20	27,98	64,5	0,00	5,60	6,60
WTG 11			25	24,07	68,5	0,11	5,40	8,40
WTG 11			32	21,61	74,0	0,17	5,20	10,80
WTG 11			40	19,40	77,5	0,28	5,00	11,40
WTG 11			50	18,08	82,6	0,39	4,70	13,00
WTG 11			63	11,16	83,9	0,62	4,30	16,60
WTG 11			80	6,28	86,7	0,90	3,70	19,70
WTG 11			100	4,87	91,4	1,41	3,00	21,20
WTG 11			125	-0,56	89,9	2,14	1,80	20,20
WTG 11			160	-5,84	91,2	3,21	0,00	21,20
WTG 11			200	-11,94	92,8	4,62	0,00	25,00
WTG 12	4.445	4.454						
WTG 12			20	30,02	64,5	0,00	5,60	6,60
WTG 12			25	26,14	68,5	0,09	5,40	8,40
WTG 12			32	23,69	74,0	0,13	5,20	10,80
WTG 12			40	21,50	77,5	0,22	5,00	11,40
WTG 12			50	20,21	82,6	0,31	4,70	13,00
WTG 12			63	13,33	83,9	0,49	4,30	16,60
WTG 12			80	8,51	86,7	0,71	3,70	19,70
WTG 12			100	7,21	91,4	1,11	3,00	21,20
WTG 12			125	1,93	89,9	1,69	1,80	20,20
WTG 12			160	-3,11	91,2	2,54	0,00	21,20
WTG 12			200	-8,93	92,8	3,65	0,00	25,00
WTG 13	5.844	5.851						
WTG 13			20	27,66	64,5	0,00	5,60	6,60
WTG 13			25	23,74	68,5	0,12	5,40	8,40
WTG 13			32	21,28	74,0	0,18	5,20	10,80
WTG 13			40	19,06	77,5	0,29	5,00	11,40
WTG 13			50	17,75	82,6	0,41	4,70	13,00
WTG 13			63	10,81	83,9	0,64	4,30	16,60
WTG 13			80	5,92	86,7	0,94	3,70	19,70
WTG 13			100	4,49	91,4	1,46	3,00	21,20
WTG 13			125	-0,97	89,9	2,22	1,80	20,20
WTG 13			160	-6,28	91,2	3,33	0,00	21,20
WTG 13			200	-12,44	92,8	4,80	0,00	25,00
WTG 14	4.744	4.753						
WTG 14			20	29,46	64,5	0,00	5,60	6,60
WTG 14			25	25,57	68,5	0,10	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 14			32	23,12	74,0	0,14	5,20	10,80
WTG 14			40	20,92	77,5	0,24	5,00	11,40
WTG 14			50	19,63	82,6	0,33	4,70	13,00
WTG 14			63	12,74	83,9	0,52	4,30	16,60
WTG 14			80	7,90	86,7	0,76	3,70	19,70
WTG 14			100	6,57	91,4	1,19	3,00	21,20
WTG 14			125	1,26	89,9	1,81	1,80	20,20
WTG 14			160	-3,85	91,2	2,71	0,00	21,20
WTG 14			200	-9,74	92,8	3,90	0,00	25,00
WTG 15	5.734	5.741						
WTG 15			20	27,82	64,5	0,00	5,60	6,60
WTG 15			25	23,90	68,5	0,11	5,40	8,40
WTG 15			32	21,45	74,0	0,17	5,20	10,80
WTG 15			40	19,23	77,5	0,29	5,00	11,40
WTG 15			50	17,92	82,6	0,40	4,70	13,00
WTG 15			63	10,99	83,9	0,63	4,30	16,60
WTG 15			80	6,10	86,7	0,92	3,70	19,70
WTG 15			100	4,68	91,4	1,44	3,00	21,20
WTG 15			125	-0,76	89,9	2,18	1,80	20,20
WTG 15			160	-6,05	91,2	3,27	0,00	21,20
WTG 15			200	-12,19	92,8	4,71	0,00	25,00
WTG 16	6.296	6.301						
WTG 16			20	27,01	64,5	0,00	5,60	6,60
WTG 16			25	23,09	68,5	0,13	5,40	8,40
WTG 16			32	20,62	74,0	0,19	5,20	10,80
WTG 16			40	18,40	77,5	0,32	5,00	11,40
WTG 16			50	17,07	82,6	0,44	4,70	13,00
WTG 16			63	10,12	83,9	0,69	4,30	16,60
WTG 16			80	5,20	86,7	1,01	3,70	19,70
WTG 16			100	3,74	91,4	1,58	3,00	21,20
WTG 16			125	-1,78	89,9	2,39	1,80	20,20
WTG 16			160	-7,18	91,2	3,59	0,00	21,20
WTG 16			200	-13,46	92,8	5,17	0,00	25,00
WTG 17	4.828	4.836						
WTG 17			20	29,31	64,5	0,00	5,60	6,60
WTG 17			25	25,41	68,5	0,10	5,40	8,40
WTG 17			32	22,97	74,0	0,15	5,20	10,80
WTG 17			40	20,77	77,5	0,24	5,00	11,40
WTG 17			50	19,47	82,6	0,34	4,70	13,00
WTG 17			63	12,58	83,9	0,53	4,30	16,60
WTG 17			80	7,74	86,7	0,77	3,70	19,70
WTG 17			100	6,40	91,4	1,21	3,00	21,20
WTG 17			125	1,07	89,9	1,84	1,80	20,20
WTG 17			160	-4,05	91,2	2,76	0,00	21,20
WTG 17			200	-9,96	92,8	3,97	0,00	25,00
WTG 18	6.260	6.266						
WTG 18			20	27,06	64,5	0,00	5,60	6,60
WTG 18			25	23,13	68,5	0,13	5,40	8,40
WTG 18			32	20,67	74,0	0,19	5,20	10,80
WTG 18			40	18,45	77,5	0,31	5,00	11,40
WTG 18			50	17,12	82,6	0,44	4,70	13,00
WTG 18			63	10,17	83,9	0,69	4,30	16,60
WTG 18			80	5,26	86,7	1,00	3,70	19,70
WTG 18			100	3,79	91,4	1,57	3,00	21,20
WTG 18			125	-1,72	89,9	2,38	1,80	20,20
WTG 18			160	-7,11	91,2	3,57	0,00	21,20
WTG 18			200	-13,38	92,8	5,14	0,00	25,00
WTG 19	5.221	5.228						
WTG 19			20	28,63	64,5	0,00	5,60	6,60
WTG 19			25	24,73	68,5	0,10	5,40	8,40
WTG 19			32	22,28	74,0	0,16	5,20	10,80
WTG 19			40	20,07	77,5	0,26	5,00	11,40
WTG 19			50	18,77	82,6	0,37	4,70	13,00
WTG 19			63	11,86	83,9	0,58	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 19			80	7,00	86,7	0,84	3,70	19,70
WTG 19			100	5,63	91,4	1,31	3,00	21,20
WTG 19			125	0,25	89,9	1,99	1,80	20,20
WTG 19			160	-4,95	91,2	2,98	0,00	21,20
WTG 19			200	-10,95	92,8	4,29	0,00	25,00
Sum								
Sum			20	40,85				
Sum			25	36,95				
Sum			32	34,50				
Sum			40	32,29				
Sum			50	30,99				
Sum			63	24,08				
Sum			80	19,21				
Sum			100	17,84				
Sum			125	12,46				
Sum			160	7,27				
Sum			200	1,27				

Noise sensitive area: Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.549	5.559						
WTG 03			20	28,10	64,5	0,00	5,60	6,60
WTG 03			25	24,19	68,5	0,11	5,40	8,40
WTG 03			32	21,73	74,0	0,17	5,20	10,80
WTG 03			40	19,52	77,5	0,28	5,00	11,40
WTG 03			50	18,21	82,6	0,39	4,70	13,00
WTG 03			63	11,29	83,9	0,61	4,30	16,60
WTG 03			80	6,41	86,7	0,89	3,70	19,70
WTG 03			100	5,01	91,4	1,39	3,00	21,20
WTG 03			125	-0,41	89,9	2,11	1,80	20,20
WTG 03			160	-5,67	91,2	3,17	0,00	21,20
WTG 03			200	-11,76	92,8	4,56	0,00	25,00
WTG 04	6.175	6.183						
WTG 04			20	27,18	64,5	0,00	5,60	6,60
WTG 04			25	23,25	68,5	0,12	5,40	8,40
WTG 04			32	20,79	74,0	0,19	5,20	10,80
WTG 04			40	18,57	77,5	0,31	5,00	11,40
WTG 04			50	17,24	82,6	0,43	4,70	13,00
WTG 04			63	10,30	83,9	0,68	4,30	16,60
WTG 04			80	5,39	86,7	0,99	3,70	19,70
WTG 04			100	3,93	91,4	1,55	3,00	21,20
WTG 04			125	-1,57	89,9	2,35	1,80	20,20
WTG 04			160	-6,95	91,2	3,52	0,00	21,20
WTG 04			200	-13,20	92,8	5,07	0,00	25,00
WTG 05	5.557	5.567						
WTG 05			20	28,09	64,5	0,00	5,60	6,60
WTG 05			25	24,18	68,5	0,11	5,40	8,40
WTG 05			32	21,72	74,0	0,17	5,20	10,80
WTG 05			40	19,51	77,5	0,28	5,00	11,40
WTG 05			50	18,20	82,6	0,39	4,70	13,00
WTG 05			63	11,28	83,9	0,61	4,30	16,60
WTG 05			80	6,40	86,7	0,89	3,70	19,70
WTG 05			100	5,00	91,4	1,39	3,00	21,20
WTG 05			125	-0,43	89,9	2,12	1,80	20,20
WTG 05			160	-5,69	91,2	3,17	0,00	21,20
WTG 05			200	-11,78	92,8	4,56	0,00	25,00
WTG 06	6.113	6.122						
WTG 06			20	27,26	64,5	0,00	5,60	6,60
WTG 06			25	23,34	68,5	0,12	5,40	8,40
WTG 06			32	20,88	74,0	0,18	5,20	10,80
WTG 06			40	18,66	77,5	0,31	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 06			50	17,33	82,6	0,43	4,70	13,00
WTG 06			63	10,39	83,9	0,67	4,30	16,60
WTG 06			80	5,48	86,7	0,98	3,70	19,70
WTG 06			100	4,03	91,4	1,53	3,00	21,20
WTG 06			125	-1,46	89,9	2,33	1,80	20,20
WTG 06			160	-6,83	91,2	3,49	0,00	21,20
WTG 06			200	-13,06	92,8	5,02	0,00	25,00
WTG 07	5.118	5.127						
WTG 07			20	28,80	64,5	0,00	5,60	6,60
WTG 07			25	24,90	68,5	0,10	5,40	8,40
WTG 07			32	22,45	74,0	0,15	5,20	10,80
WTG 07			40	20,25	77,5	0,26	5,00	11,40
WTG 07			50	18,94	82,6	0,36	4,70	13,00
WTG 07			63	12,04	83,9	0,56	4,30	16,60
WTG 07			80	7,18	86,7	0,82	3,70	19,70
WTG 07			100	5,82	91,4	1,28	3,00	21,20
WTG 07			125	0,45	89,9	1,95	1,80	20,20
WTG 07			160	-4,72	91,2	2,92	0,00	21,20
WTG 07			200	-10,70	92,8	4,20	0,00	25,00
WTG 08	5.928	5.937						
WTG 08			20	27,53	64,5	0,00	5,60	6,60
WTG 08			25	23,61	68,5	0,12	5,40	8,40
WTG 08			32	21,15	74,0	0,18	5,20	10,80
WTG 08			40	18,93	77,5	0,30	5,00	11,40
WTG 08			50	17,61	82,6	0,42	4,70	13,00
WTG 08			63	10,68	83,9	0,65	4,30	16,60
WTG 08			80	5,78	86,7	0,95	3,70	19,70
WTG 08			100	4,34	91,4	1,48	3,00	21,20
WTG 08			125	-1,13	89,9	2,26	1,80	20,20
WTG 08			160	-6,46	91,2	3,38	0,00	21,20
WTG 08			200	-12,64	92,8	4,87	0,00	25,00
WTG 09	4.798	4.806						
WTG 09			20	29,36	64,5	0,00	5,60	6,60
WTG 09			25	25,47	68,5	0,10	5,40	8,40
WTG 09			32	23,02	74,0	0,14	5,20	10,80
WTG 09			40	20,82	77,5	0,24	5,00	11,40
WTG 09			50	19,53	82,6	0,34	4,70	13,00
WTG 09			63	12,63	83,9	0,53	4,30	16,60
WTG 09			80	7,79	86,7	0,77	3,70	19,70
WTG 09			100	6,46	91,4	1,20	3,00	21,20
WTG 09			125	1,14	89,9	1,83	1,80	20,20
WTG 09			160	-3,98	91,2	2,74	0,00	21,20
WTG 09			200	-9,88	92,8	3,94	0,00	25,00
WTG 10	5.283	5.292						
WTG 10			20	28,53	64,5	0,00	5,60	6,60
WTG 10			25	24,62	68,5	0,11	5,40	8,40
WTG 10			32	22,17	74,0	0,16	5,20	10,80
WTG 10			40	19,96	77,5	0,26	5,00	11,40
WTG 10			50	18,66	82,6	0,37	4,70	13,00
WTG 10			63	11,75	83,9	0,58	4,30	16,60
WTG 10			80	6,88	86,7	0,85	3,70	19,70
WTG 10			100	5,51	91,4	1,32	3,00	21,20
WTG 10			125	0,12	89,9	2,01	1,80	20,20
WTG 10			160	-5,09	91,2	3,02	0,00	21,20
WTG 10			200	-11,11	92,8	4,34	0,00	25,00
WTG 11	5.934	5.943						
WTG 11			20	27,52	64,5	0,00	5,60	6,60
WTG 11			25	23,60	68,5	0,12	5,40	8,40
WTG 11			32	21,14	74,0	0,18	5,20	10,80
WTG 11			40	18,92	77,5	0,30	5,00	11,40
WTG 11			50	17,60	82,6	0,42	4,70	13,00
WTG 11			63	10,67	83,9	0,65	4,30	16,60
WTG 11			80	5,77	86,7	0,95	3,70	19,70
WTG 11			100	4,33	91,4	1,49	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 11			125	-1,14	89,9	2,26	1,80	20,20
WTG 11			160	-6,47	91,2	3,39	0,00	21,20
WTG 11			200	-12,65	92,8	4,87	0,00	25,00
WTG 12	4.751	4.760						
WTG 12			20	29,45	64,5	0,00	5,60	6,60
WTG 12			25	25,55	68,5	0,10	5,40	8,40
WTG 12			32	23,11	74,0	0,14	5,20	10,80
WTG 12			40	20,91	77,5	0,24	5,00	11,40
WTG 12			50	19,61	82,6	0,33	4,70	13,00
WTG 12			63	12,72	83,9	0,52	4,30	16,60
WTG 12			80	7,89	86,7	0,76	3,70	19,70
WTG 12			100	6,56	91,4	1,19	3,00	21,20
WTG 12			125	1,24	89,9	1,81	1,80	20,20
WTG 12			160	-3,87	91,2	2,71	0,00	21,20
WTG 12			200	-9,76	92,8	3,90	0,00	25,00
WTG 13	6.149	6.156						
WTG 13			20	27,21	64,5	0,00	5,60	6,60
WTG 13			25	23,29	68,5	0,12	5,40	8,40
WTG 13			32	20,83	74,0	0,18	5,20	10,80
WTG 13			40	18,61	77,5	0,31	5,00	11,40
WTG 13			50	17,28	82,6	0,43	4,70	13,00
WTG 13			63	10,34	83,9	0,68	4,30	16,60
WTG 13			80	5,43	86,7	0,99	3,70	19,70
WTG 13			100	3,97	91,4	1,54	3,00	21,20
WTG 13			125	-1,53	89,9	2,34	1,80	20,20
WTG 13			160	-6,90	91,2	3,51	0,00	21,20
WTG 13			200	-13,13	92,8	5,05	0,00	25,00
WTG 14	5.043	5.051						
WTG 14			20	28,93	64,5	0,00	5,60	6,60
WTG 14			25	25,03	68,5	0,10	5,40	8,40
WTG 14			32	22,58	74,0	0,15	5,20	10,80
WTG 14			40	20,38	77,5	0,25	5,00	11,40
WTG 14			50	19,08	82,6	0,35	4,70	13,00
WTG 14			63	12,18	83,9	0,56	4,30	16,60
WTG 14			80	7,32	86,7	0,81	3,70	19,70
WTG 14			100	5,97	91,4	1,26	3,00	21,20
WTG 14			125	0,61	89,9	1,92	1,80	20,20
WTG 14			160	-4,55	91,2	2,88	0,00	21,20
WTG 14			200	-10,51	92,8	4,14	0,00	25,00
WTG 15	6.032	6.039						
WTG 15			20	27,38	64,5	0,00	5,60	6,60
WTG 15			25	23,46	68,5	0,12	5,40	8,40
WTG 15			32	21,00	74,0	0,18	5,20	10,80
WTG 15			40	18,78	77,5	0,30	5,00	11,40
WTG 15			50	17,46	82,6	0,42	4,70	13,00
WTG 15			63	10,52	83,9	0,66	4,30	16,60
WTG 15			80	5,61	86,7	0,97	3,70	19,70
WTG 15			100	4,17	91,4	1,51	3,00	21,20
WTG 15			125	-1,31	89,9	2,29	1,80	20,20
WTG 15			160	-6,66	91,2	3,44	0,00	21,20
WTG 15			200	-12,87	92,8	4,95	0,00	25,00
WTG 16	6.600	6.605						
WTG 16			20	26,60	64,5	0,00	5,60	6,60
WTG 16			25	22,67	68,5	0,13	5,40	8,40
WTG 16			32	20,20	74,0	0,20	5,20	10,80
WTG 16			40	17,97	77,5	0,33	5,00	11,40
WTG 16			50	16,64	82,6	0,46	4,70	13,00
WTG 16			63	9,68	83,9	0,73	4,30	16,60
WTG 16			80	4,75	86,7	1,06	3,70	19,70
WTG 16			100	3,25	91,4	1,65	3,00	21,20
WTG 16			125	-2,31	89,9	2,51	1,80	20,20
WTG 16			160	-7,76	91,2	3,77	0,00	21,20
WTG 16			200	-14,11	92,8	5,42	0,00	25,00
WTG 17	5.115	5.122						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 17			20	28,81	64,5	0,00	5,60	6,60
WTG 17			25	24,91	68,5	0,10	5,40	8,40
WTG 17			32	22,46	74,0	0,15	5,20	10,80
WTG 17			40	20,25	77,5	0,26	5,00	11,40
WTG 17			50	18,95	82,6	0,36	4,70	13,00
WTG 17			63	12,05	83,9	0,56	4,30	16,60
WTG 17			80	7,19	86,7	0,82	3,70	19,70
WTG 17			100	5,83	91,4	1,28	3,00	21,20
WTG 17			125	0,46	89,9	1,95	1,80	20,20
WTG 17			160	-4,71	91,2	2,92	0,00	21,20
WTG 17			200	-10,69	92,8	4,20	0,00	25,00
WTG 18	6.556	6.561						
WTG 18			20	26,66	64,5	0,00	5,60	6,60
WTG 18			25	22,73	68,5	0,13	5,40	8,40
WTG 18			32	20,26	74,0	0,20	5,20	10,80
WTG 18			40	18,03	77,5	0,33	5,00	11,40
WTG 18			50	16,70	82,6	0,46	4,70	13,00
WTG 18			63	9,74	83,9	0,72	4,30	16,60
WTG 18			80	4,81	86,7	1,05	3,70	19,70
WTG 18			100	3,32	91,4	1,64	3,00	21,20
WTG 18			125	-2,23	89,9	2,49	1,80	20,20
WTG 18			160	-7,68	91,2	3,74	0,00	21,20
WTG 18			200	-14,02	92,8	5,38	0,00	25,00
WTG 19	5.502	5.508						
WTG 19			20	28,18	64,5	0,00	5,60	6,60
WTG 19			25	24,27	68,5	0,11	5,40	8,40
WTG 19			32	21,81	74,0	0,17	5,20	10,80
WTG 19			40	19,60	77,5	0,28	5,00	11,40
WTG 19			50	18,29	82,6	0,39	4,70	13,00
WTG 19			63	11,37	83,9	0,61	4,30	16,60
WTG 19			80	6,50	86,7	0,88	3,70	19,70
WTG 19			100	5,10	91,4	1,38	3,00	21,20
WTG 19			125	-0,31	89,9	2,09	1,80	20,20
WTG 19			160	-5,56	91,2	3,14	0,00	21,20
WTG 19			200	-11,64	92,8	4,52	0,00	25,00
Sum								
Sum			20	40,37				
Sum			25	36,46				
Sum			32	34,00				
Sum			40	31,79				
Sum			50	30,48				
Sum			63	23,56				
Sum			80	18,68				
Sum			100	17,28				
Sum			125	11,86				
Sum			160	6,61				
Sum			200	0,54				

Noise sensitive area: Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.289	5.299						
WTG 03			20	28,52	64,5	0,00	5,60	6,60
WTG 03			25	24,61	68,5	0,11	5,40	8,40
WTG 03			32	22,16	74,0	0,16	5,20	10,80
WTG 03			40	19,95	77,5	0,26	5,00	11,40
WTG 03			50	18,65	82,6	0,37	4,70	13,00
WTG 03			63	11,73	83,9	0,58	4,30	16,60
WTG 03			80	6,87	86,7	0,85	3,70	19,70
WTG 03			100	5,49	91,4	1,32	3,00	21,20
WTG 03			125	0,10	89,9	2,01	1,80	20,20
WTG 03			160	-5,10	91,2	3,02	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03			200	-11,13	92,8	4,35	0,00	25,00
WTG 04	5.921	5.930						
WTG 04			20	27,54	64,5	0,00	5,60	6,60
WTG 04			25	23,62	68,5	0,12	5,40	8,40
WTG 04			32	21,16	74,0	0,18	5,20	10,80
WTG 04			40	18,94	77,5	0,30	5,00	11,40
WTG 04			50	17,62	82,6	0,42	4,70	13,00
WTG 04			63	10,69	83,9	0,65	4,30	16,60
WTG 04			80	5,79	86,7	0,95	3,70	19,70
WTG 04			100	4,36	91,4	1,48	3,00	21,20
WTG 04			125	-1,11	89,9	2,25	1,80	20,20
WTG 04			160	-6,44	91,2	3,38	0,00	21,20
WTG 04			200	-12,62	92,8	4,86	0,00	25,00
WTG 05	5.284	5.295						
WTG 05			20	28,52	64,5	0,00	5,60	6,60
WTG 05			25	24,62	68,5	0,11	5,40	8,40
WTG 05			32	22,16	74,0	0,16	5,20	10,80
WTG 05			40	19,96	77,5	0,26	5,00	11,40
WTG 05			50	18,65	82,6	0,37	4,70	13,00
WTG 05			63	11,74	83,9	0,58	4,30	16,60
WTG 05			80	6,88	86,7	0,85	3,70	19,70
WTG 05			100	5,50	91,4	1,32	3,00	21,20
WTG 05			125	0,11	89,9	2,01	1,80	20,20
WTG 05			160	-5,10	91,2	3,02	0,00	21,20
WTG 05			200	-11,12	92,8	4,34	0,00	25,00
WTG 06	5.844	5.853						
WTG 06			20	27,65	64,5	0,00	5,60	6,60
WTG 06			25	23,74	68,5	0,12	5,40	8,40
WTG 06			32	21,28	74,0	0,18	5,20	10,80
WTG 06			40	19,06	77,5	0,29	5,00	11,40
WTG 06			50	17,74	82,6	0,41	4,70	13,00
WTG 06			63	10,81	83,9	0,64	4,30	16,60
WTG 06			80	5,92	86,7	0,94	3,70	19,70
WTG 06			100	4,49	91,4	1,46	3,00	21,20
WTG 06			125	-0,97	89,9	2,22	1,80	20,20
WTG 06			160	-6,28	91,2	3,34	0,00	21,20
WTG 06			200	-12,45	92,8	4,80	0,00	25,00
WTG 07	4.838	4.847						
WTG 07			20	29,29	64,5	0,00	5,60	6,60
WTG 07			25	25,39	68,5	0,10	5,40	8,40
WTG 07			32	22,94	74,0	0,15	5,20	10,80
WTG 07			40	20,75	77,5	0,24	5,00	11,40
WTG 07			50	19,45	82,6	0,34	4,70	13,00
WTG 07			63	12,56	83,9	0,53	4,30	16,60
WTG 07			80	7,71	86,7	0,78	3,70	19,70
WTG 07			100	6,38	91,4	1,21	3,00	21,20
WTG 07			125	1,05	89,9	1,84	1,80	20,20
WTG 07			160	-4,07	91,2	2,76	0,00	21,20
WTG 07			200	-9,98	92,8	3,97	0,00	25,00
WTG 08	5.647	5.657						
WTG 08			20	27,95	64,5	0,00	5,60	6,60
WTG 08			25	24,04	68,5	0,11	5,40	8,40
WTG 08			32	21,58	74,0	0,17	5,20	10,80
WTG 08			40	19,37	77,5	0,28	5,00	11,40
WTG 08			50	18,05	82,6	0,40	4,70	13,00
WTG 08			63	11,13	83,9	0,62	4,30	16,60
WTG 08			80	6,24	86,7	0,91	3,70	19,70
WTG 08			100	4,83	91,4	1,41	3,00	21,20
WTG 08			125	-0,60	89,9	2,15	1,80	20,20
WTG 08			160	-5,88	91,2	3,22	0,00	21,20
WTG 08			200	-11,99	92,8	4,64	0,00	25,00
WTG 09	4.507	4.517						
WTG 09			20	29,90	64,5	0,00	5,60	6,60
WTG 09			25	26,01	68,5	0,09	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 09			32	23,57	74,0	0,14	5,20	10,80
WTG 09			40	21,38	77,5	0,23	5,00	11,40
WTG 09			50	20,09	82,6	0,32	4,70	13,00
WTG 09			63	13,21	83,9	0,50	4,30	16,60
WTG 09			80	8,38	86,7	0,72	3,70	19,70
WTG 09			100	7,07	91,4	1,13	3,00	21,20
WTG 09			125	1,79	89,9	1,72	1,80	20,20
WTG 09			160	-3,27	91,2	2,57	0,00	21,20
WTG 09			200	-9,10	92,8	3,70	0,00	25,00
WTG 10	4.992	5.001						
WTG 10			20	29,02	64,5	0,00	5,60	6,60
WTG 10			25	25,12	68,5	0,10	5,40	8,40
WTG 10			32	22,67	74,0	0,15	5,20	10,80
WTG 10			40	20,47	77,5	0,25	5,00	11,40
WTG 10			50	19,17	82,6	0,35	4,70	13,00
WTG 10			63	12,27	83,9	0,55	4,30	16,60
WTG 10			80	7,42	86,7	0,80	3,70	19,70
WTG 10			100	6,07	91,4	1,25	3,00	21,20
WTG 10			125	0,72	89,9	1,90	1,80	20,20
WTG 10			160	-4,43	91,2	2,85	0,00	21,20
WTG 10			200	-10,38	92,8	4,10	0,00	25,00
WTG 11	5.644	5.653						
WTG 11			20	27,95	64,5	0,00	5,60	6,60
WTG 11			25	24,04	68,5	0,11	5,40	8,40
WTG 11			32	21,58	74,0	0,17	5,20	10,80
WTG 11			40	19,37	77,5	0,28	5,00	11,40
WTG 11			50	18,06	82,6	0,40	4,70	13,00
WTG 11			63	11,13	83,9	0,62	4,30	16,60
WTG 11			80	6,25	86,7	0,90	3,70	19,70
WTG 11			100	4,84	91,4	1,41	3,00	21,20
WTG 11			125	-0,59	89,9	2,15	1,80	20,20
WTG 11			160	-5,87	91,2	3,22	0,00	21,20
WTG 11			200	-11,98	92,8	4,64	0,00	25,00
WTG 12	4.453	4.463						
WTG 12			20	30,01	64,5	0,00	5,60	6,60
WTG 12			25	26,12	68,5	0,09	5,40	8,40
WTG 12			32	23,67	74,0	0,13	5,20	10,80
WTG 12			40	21,49	77,5	0,22	5,00	11,40
WTG 12			50	20,20	82,6	0,31	4,70	13,00
WTG 12			63	13,32	83,9	0,49	4,30	16,60
WTG 12			80	8,49	86,7	0,71	3,70	19,70
WTG 12			100	7,19	91,4	1,12	3,00	21,20
WTG 12			125	1,91	89,9	1,70	1,80	20,20
WTG 12			160	-3,14	91,2	2,54	0,00	21,20
WTG 12			200	-8,95	92,8	3,66	0,00	25,00
WTG 13	5.851	5.858						
WTG 13			20	27,64	64,5	0,00	5,60	6,60
WTG 13			25	23,73	68,5	0,12	5,40	8,40
WTG 13			32	21,27	74,0	0,18	5,20	10,80
WTG 13			40	19,05	77,5	0,29	5,00	11,40
WTG 13			50	17,73	82,6	0,41	4,70	13,00
WTG 13			63	10,80	83,9	0,64	4,30	16,60
WTG 13			80	5,91	86,7	0,94	3,70	19,70
WTG 13			100	4,48	91,4	1,46	3,00	21,20
WTG 13			125	-0,98	89,9	2,23	1,80	20,20
WTG 13			160	-6,29	91,2	3,34	0,00	21,20
WTG 13			200	-12,46	92,8	4,80	0,00	25,00
WTG 14	4.741	4.749						
WTG 14			20	29,47	64,5	0,00	5,60	6,60
WTG 14			25	25,57	68,5	0,09	5,40	8,40
WTG 14			32	23,13	74,0	0,14	5,20	10,80
WTG 14			40	20,93	77,5	0,24	5,00	11,40
WTG 14			50	19,64	82,6	0,33	4,70	13,00
WTG 14			63	12,75	83,9	0,52	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 14			80	7,91	86,7	0,76	3,70	19,70
WTG 14			100	6,58	91,4	1,19	3,00	21,20
WTG 14			125	1,26	89,9	1,80	1,80	20,20
WTG 14			160	-3,84	91,2	2,71	0,00	21,20
WTG 14			200	-9,73	92,8	3,89	0,00	25,00
WTG 15	5.729	5.737						
WTG 15			20	27,83	64,5	0,00	5,60	6,60
WTG 15			25	23,91	68,5	0,11	5,40	8,40
WTG 15			32	21,45	74,0	0,17	5,20	10,80
WTG 15			40	19,24	77,5	0,29	5,00	11,40
WTG 15			50	17,92	82,6	0,40	4,70	13,00
WTG 15			63	11,00	83,9	0,63	4,30	16,60
WTG 15			80	6,11	86,7	0,92	3,70	19,70
WTG 15			100	4,69	91,4	1,43	3,00	21,20
WTG 15			125	-0,75	89,9	2,18	1,80	20,20
WTG 15			160	-6,04	91,2	3,27	0,00	21,20
WTG 15			200	-12,18	92,8	4,70	0,00	25,00
WTG 16	6.299	6.305						
WTG 16			20	27,01	64,5	0,00	5,60	6,60
WTG 16			25	23,08	68,5	0,13	5,40	8,40
WTG 16			32	20,62	74,0	0,19	5,20	10,80
WTG 16			40	18,39	77,5	0,32	5,00	11,40
WTG 16			50	17,07	82,6	0,44	4,70	13,00
WTG 16			63	10,11	83,9	0,69	4,30	16,60
WTG 16			80	5,20	86,7	1,01	3,70	19,70
WTG 16			100	3,73	91,4	1,58	3,00	21,20
WTG 16			125	-1,79	89,9	2,40	1,80	20,20
WTG 16			160	-7,19	91,2	3,59	0,00	21,20
WTG 16			200	-13,46	92,8	5,17	0,00	25,00
WTG 17	4.815	4.823						
WTG 17			20	29,33	64,5	0,00	5,60	6,60
WTG 17			25	25,44	68,5	0,10	5,40	8,40
WTG 17			32	22,99	74,0	0,14	5,20	10,80
WTG 17			40	20,79	77,5	0,24	5,00	11,40
WTG 17			50	19,50	82,6	0,34	4,70	13,00
WTG 17			63	12,60	83,9	0,53	4,30	16,60
WTG 17			80	7,76	86,7	0,77	3,70	19,70
WTG 17			100	6,43	91,4	1,21	3,00	21,20
WTG 17			125	1,10	89,9	1,83	1,80	20,20
WTG 17			160	-4,01	91,2	2,75	0,00	21,20
WTG 17			200	-9,92	92,8	3,95	0,00	25,00
WTG 18	6.253	6.259						
WTG 18			20	27,07	64,5	0,00	5,60	6,60
WTG 18			25	23,14	68,5	0,13	5,40	8,40
WTG 18			32	20,68	74,0	0,19	5,20	10,80
WTG 18			40	18,46	77,5	0,31	5,00	11,40
WTG 18			50	17,13	82,6	0,44	4,70	13,00
WTG 18			63	10,18	83,9	0,69	4,30	16,60
WTG 18			80	5,27	86,7	1,00	3,70	19,70
WTG 18			100	3,80	91,4	1,56	3,00	21,20
WTG 18			125	-1,71	89,9	2,38	1,80	20,20
WTG 18			160	-7,10	91,2	3,57	0,00	21,20
WTG 18			200	-13,36	92,8	5,13	0,00	25,00
WTG 19	5.204	5.211						
WTG 19			20	28,66	64,5	0,00	5,60	6,60
WTG 19			25	24,76	68,5	0,10	5,40	8,40
WTG 19			32	22,31	74,0	0,16	5,20	10,80
WTG 19			40	20,10	77,5	0,26	5,00	11,40
WTG 19			50	18,80	82,6	0,36	4,70	13,00
WTG 19			63	11,89	83,9	0,57	4,30	16,60
WTG 19			80	7,03	86,7	0,83	3,70	19,70
WTG 19			100	5,66	91,4	1,30	3,00	21,20
WTG 19			125	0,28	89,9	1,98	1,80	20,20
WTG 19			160	-4,91	91,2	2,97	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 19			200	-10,91	92,8	4,27	0,00	25,00
Sum								
Sum			20	40,84				
Sum			25	36,93				
Sum			32	34,48				
Sum			40	32,27				
Sum			50	30,97				
Sum			63	24,06				
Sum			80	19,20				
Sum			100	17,82				
Sum			125	12,44				
Sum			160	7,25				
Sum			200	1,25				

Noise sensitive area: Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.562	5.571						
WTG 03			20	28,08	64,5	0,00	5,60	6,60
WTG 03			25	24,17	68,5	0,11	5,40	8,40
WTG 03			32	21,71	74,0	0,17	5,20	10,80
WTG 03			40	19,50	77,5	0,28	5,00	11,40
WTG 03			50	18,19	82,6	0,39	4,70	13,00
WTG 03			63	11,27	83,9	0,61	4,30	16,60
WTG 03			80	6,39	86,7	0,89	3,70	19,70
WTG 03			100	4,99	91,4	1,39	3,00	21,20
WTG 03			125	-0,44	89,9	2,12	1,80	20,20
WTG 03			160	-5,69	91,2	3,18	0,00	21,20
WTG 03			200	-11,79	92,8	4,57	0,00	25,00
WTG 04	6.190	6.199						
WTG 04			20	27,15	64,5	0,00	5,60	6,60
WTG 04			25	23,23	68,5	0,12	5,40	8,40
WTG 04			32	20,77	74,0	0,19	5,20	10,80
WTG 04			40	18,54	77,5	0,31	5,00	11,40
WTG 04			50	17,22	82,6	0,43	4,70	13,00
WTG 04			63	10,27	83,9	0,68	4,30	16,60
WTG 04			80	5,36	86,7	0,99	3,70	19,70
WTG 04			100	3,90	91,4	1,55	3,00	21,20
WTG 04			125	-1,60	89,9	2,36	1,80	20,20
WTG 04			160	-6,98	91,2	3,53	0,00	21,20
WTG 04			200	-13,23	92,8	5,08	0,00	25,00
WTG 05	5.564	5.574						
WTG 05			20	28,08	64,5	0,00	5,60	6,60
WTG 05			25	24,16	68,5	0,11	5,40	8,40
WTG 05			32	21,71	74,0	0,17	5,20	10,80
WTG 05			40	19,50	77,5	0,28	5,00	11,40
WTG 05			50	18,19	82,6	0,39	4,70	13,00
WTG 05			63	11,26	83,9	0,61	4,30	16,60
WTG 05			80	6,38	86,7	0,89	3,70	19,70
WTG 05			100	4,98	91,4	1,39	3,00	21,20
WTG 05			125	-0,44	89,9	2,12	1,80	20,20
WTG 05			160	-5,70	91,2	3,18	0,00	21,20
WTG 05			200	-11,79	92,8	4,57	0,00	25,00
WTG 06	6.122	6.131						
WTG 06			20	27,25	64,5	0,00	5,60	6,60
WTG 06			25	23,33	68,5	0,12	5,40	8,40
WTG 06			32	20,87	74,0	0,18	5,20	10,80
WTG 06			40	18,64	77,5	0,31	5,00	11,40
WTG 06			50	17,32	82,6	0,43	4,70	13,00
WTG 06			63	10,38	83,9	0,67	4,30	16,60
WTG 06			80	5,47	86,7	0,98	3,70	19,70
WTG 06			100	4,02	91,4	1,53	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 06			125	-1,48	89,9	2,33	1,80	20,20
WTG 06			160	-6,84	91,2	3,49	0,00	21,20
WTG 06			200	-13,08	92,8	5,03	0,00	25,00
WTG 07	5.121	5.130						
WTG 07			20	28,80	64,5	0,00	5,60	6,60
WTG 07			25	24,89	68,5	0,10	5,40	8,40
WTG 07			32	22,44	74,0	0,15	5,20	10,80
WTG 07			40	20,24	77,5	0,26	5,00	11,40
WTG 07			50	18,94	82,6	0,36	4,70	13,00
WTG 07			63	12,03	83,9	0,56	4,30	16,60
WTG 07			80	7,18	86,7	0,82	3,70	19,70
WTG 07			100	5,81	91,4	1,28	3,00	21,20
WTG 07			125	0,45	89,9	1,95	1,80	20,20
WTG 07			160	-4,73	91,2	2,92	0,00	21,20
WTG 07			200	-10,71	92,8	4,21	0,00	25,00
WTG 08	5.931	5.940						
WTG 08			20	27,52	64,5	0,00	5,60	6,60
WTG 08			25	23,61	68,5	0,12	5,40	8,40
WTG 08			32	21,15	74,0	0,18	5,20	10,80
WTG 08			40	18,93	77,5	0,30	5,00	11,40
WTG 08			50	17,61	82,6	0,42	4,70	13,00
WTG 08			63	10,67	83,9	0,65	4,30	16,60
WTG 08			80	5,77	86,7	0,95	3,70	19,70
WTG 08			100	4,34	91,4	1,49	3,00	21,20
WTG 08			125	-1,13	89,9	2,26	1,80	20,20
WTG 08			160	-6,46	91,2	3,39	0,00	21,20
WTG 08			200	-12,65	92,8	4,87	0,00	25,00
WTG 09	4.795	4.803						
WTG 09			20	29,37	64,5	0,00	5,60	6,60
WTG 09			25	25,47	68,5	0,10	5,40	8,40
WTG 09			32	23,03	74,0	0,14	5,20	10,80
WTG 09			40	20,83	77,5	0,24	5,00	11,40
WTG 09			50	19,53	82,6	0,34	4,70	13,00
WTG 09			63	12,64	83,9	0,53	4,30	16,60
WTG 09			80	7,80	86,7	0,77	3,70	19,70
WTG 09			100	6,47	91,4	1,20	3,00	21,20
WTG 09			125	1,14	89,9	1,83	1,80	20,20
WTG 09			160	-3,97	91,2	2,74	0,00	21,20
WTG 09			200	-9,87	92,8	3,94	0,00	25,00
WTG 10	5.279	5.288						
WTG 10			20	28,53	64,5	0,00	5,60	6,60
WTG 10			25	24,63	68,5	0,11	5,40	8,40
WTG 10			32	22,18	74,0	0,16	5,20	10,80
WTG 10			40	19,97	77,5	0,26	5,00	11,40
WTG 10			50	18,66	82,6	0,37	4,70	13,00
WTG 10			63	11,75	83,9	0,58	4,30	16,60
WTG 10			80	6,89	86,7	0,85	3,70	19,70
WTG 10			100	5,51	91,4	1,32	3,00	21,20
WTG 10			125	0,13	89,9	2,01	1,80	20,20
WTG 10			160	-5,08	91,2	3,01	0,00	21,20
WTG 10			200	-11,10	92,8	4,34	0,00	25,00
WTG 11	5.931	5.940						
WTG 11			20	27,52	64,5	0,00	5,60	6,60
WTG 11			25	23,61	68,5	0,12	5,40	8,40
WTG 11			32	21,15	74,0	0,18	5,20	10,80
WTG 11			40	18,93	77,5	0,30	5,00	11,40
WTG 11			50	17,61	82,6	0,42	4,70	13,00
WTG 11			63	10,67	83,9	0,65	4,30	16,60
WTG 11			80	5,77	86,7	0,95	3,70	19,70
WTG 11			100	4,34	91,4	1,49	3,00	21,20
WTG 11			125	-1,13	89,9	2,26	1,80	20,20
WTG 11			160	-6,46	91,2	3,39	0,00	21,20
WTG 11			200	-12,65	92,8	4,87	0,00	25,00
WTG 12	4.741	4.750						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 12			20	29,47	64,5	0,00	5,60	6,60
WTG 12			25	25,57	68,5	0,10	5,40	8,40
WTG 12			32	23,12	74,0	0,14	5,20	10,80
WTG 12			40	20,93	77,5	0,24	5,00	11,40
WTG 12			50	19,63	82,6	0,33	4,70	13,00
WTG 12			63	12,74	83,9	0,52	4,30	16,60
WTG 12			80	7,91	86,7	0,76	3,70	19,70
WTG 12			100	6,58	91,4	1,19	3,00	21,20
WTG 12			125	1,26	89,9	1,81	1,80	20,20
WTG 12			160	-3,84	91,2	2,71	0,00	21,20
WTG 12			200	-9,73	92,8	3,90	0,00	25,00
WTG 13	6.139	6.146						
WTG 13			20	27,23	64,5	0,00	5,60	6,60
WTG 13			25	23,31	68,5	0,12	5,40	8,40
WTG 13			32	20,84	74,0	0,18	5,20	10,80
WTG 13			40	18,62	77,5	0,31	5,00	11,40
WTG 13			50	17,30	82,6	0,43	4,70	13,00
WTG 13			63	10,35	83,9	0,68	4,30	16,60
WTG 13			80	5,45	86,7	0,98	3,70	19,70
WTG 13			100	3,99	91,4	1,54	3,00	21,20
WTG 13			125	-1,51	89,9	2,34	1,80	20,20
WTG 13			160	-6,87	91,2	3,50	0,00	21,20
WTG 13			200	-13,11	92,8	5,04	0,00	25,00
WTG 14	5.023	5.031						
WTG 14			20	28,97	64,5	0,00	5,60	6,60
WTG 14			25	25,07	68,5	0,10	5,40	8,40
WTG 14			32	22,62	74,0	0,15	5,20	10,80
WTG 14			40	20,41	77,5	0,25	5,00	11,40
WTG 14			50	19,11	82,6	0,35	4,70	13,00
WTG 14			63	12,21	83,9	0,55	4,30	16,60
WTG 14			80	7,36	86,7	0,81	3,70	19,70
WTG 14			100	6,01	91,4	1,26	3,00	21,20
WTG 14			125	0,65	89,9	1,91	1,80	20,20
WTG 14			160	-4,50	91,2	2,87	0,00	21,20
WTG 14			200	-10,46	92,8	4,13	0,00	25,00
WTG 15	6.011	6.018						
WTG 15			20	27,41	64,5	0,00	5,60	6,60
WTG 15			25	23,49	68,5	0,12	5,40	8,40
WTG 15			32	21,03	74,0	0,18	5,20	10,80
WTG 15			40	18,81	77,5	0,30	5,00	11,40
WTG 15			50	17,49	82,6	0,42	4,70	13,00
WTG 15			63	10,55	83,9	0,66	4,30	16,60
WTG 15			80	5,65	86,7	0,96	3,70	19,70
WTG 15			100	4,21	91,4	1,50	3,00	21,20
WTG 15			125	-1,28	89,9	2,29	1,80	20,20
WTG 15			160	-6,62	91,2	3,43	0,00	21,20
WTG 15			200	-12,82	92,8	4,93	0,00	25,00
WTG 16	6.585	6.591						
WTG 16			20	26,62	64,5	0,00	5,60	6,60
WTG 16			25	22,69	68,5	0,13	5,40	8,40
WTG 16			32	20,22	74,0	0,20	5,20	10,80
WTG 16			40	17,99	77,5	0,33	5,00	11,40
WTG 16			50	16,66	82,6	0,46	4,70	13,00
WTG 16			63	9,70	83,9	0,73	4,30	16,60
WTG 16			80	4,77	86,7	1,05	3,70	19,70
WTG 16			100	3,27	91,4	1,65	3,00	21,20
WTG 16			125	-2,28	89,9	2,50	1,80	20,20
WTG 16			160	-7,74	91,2	3,76	0,00	21,20
WTG 16			200	-14,08	92,8	5,40	0,00	25,00
WTG 17	5.086	5.094						
WTG 17			20	28,86	64,5	0,00	5,60	6,60
WTG 17			25	24,96	68,5	0,10	5,40	8,40
WTG 17			32	22,51	74,0	0,15	5,20	10,80
WTG 17			40	20,30	77,5	0,25	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 17			50	19,00	82,6	0,36	4,70	13,00
WTG 17			63	12,10	83,9	0,56	4,30	16,60
WTG 17			80	7,24	86,7	0,82	3,70	19,70
WTG 17			100	5,89	91,4	1,27	3,00	21,20
WTG 17			125	0,52	89,9	1,94	1,80	20,20
WTG 17			160	-4,64	91,2	2,90	0,00	21,20
WTG 17			200	-10,62	92,8	4,18	0,00	25,00
WTG 18	6.532	6.538						
WTG 18			20	26,69	64,5	0,00	5,60	6,60
WTG 18			25	22,76	68,5	0,13	5,40	8,40
WTG 18			32	20,29	74,0	0,20	5,20	10,80
WTG 18			40	18,06	77,5	0,33	5,00	11,40
WTG 18			50	16,73	82,6	0,46	4,70	13,00
WTG 18			63	9,77	83,9	0,72	4,30	16,60
WTG 18			80	4,84	86,7	1,05	3,70	19,70
WTG 18			100	3,36	91,4	1,63	3,00	21,20
WTG 18			125	-2,19	89,9	2,48	1,80	20,20
WTG 18			160	-7,64	91,2	3,73	0,00	21,20
WTG 18			200	-13,97	92,8	5,36	0,00	25,00
WTG 19	5.470	5.477						
WTG 19			20	28,23	64,5	0,00	5,60	6,60
WTG 19			25	24,32	68,5	0,11	5,40	8,40
WTG 19			32	21,86	74,0	0,16	5,20	10,80
WTG 19			40	19,66	77,5	0,27	5,00	11,40
WTG 19			50	18,35	82,6	0,38	4,70	13,00
WTG 19			63	11,43	83,9	0,60	4,30	16,60
WTG 19			80	6,55	86,7	0,88	3,70	19,70
WTG 19			100	5,16	91,4	1,37	3,00	21,20
WTG 19			125	-0,25	89,9	2,08	1,80	20,20
WTG 19			160	-5,49	91,2	3,12	0,00	21,20
WTG 19			200	-11,56	92,8	4,49	0,00	25,00
Sum								
Sum			20	40,38				
Sum			25	36,47				
Sum			32	34,01				
Sum			40	31,80				
Sum			50	30,49				
Sum			63	23,57				
Sum			80	18,69				
Sum			100	17,30				
Sum			125	11,88				
Sum			160	6,63				
Sum			200	0,56				

Noise sensitive area: Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.188	5.198						
WTG 03			20	28,68	64,5	0,00	5,60	6,60
WTG 03			25	24,78	68,5	0,10	5,40	8,40
WTG 03			32	22,33	74,0	0,16	5,20	10,80
WTG 03			40	20,12	77,5	0,26	5,00	11,40
WTG 03			50	18,82	82,6	0,36	4,70	13,00
WTG 03			63	11,91	83,9	0,57	4,30	16,60
WTG 03			80	7,05	86,7	0,83	3,70	19,70
WTG 03			100	5,68	91,4	1,30	3,00	21,20
WTG 03			125	0,31	89,9	1,98	1,80	20,20
WTG 03			160	-4,88	91,2	2,96	0,00	21,20
WTG 03			200	-10,88	92,8	4,26	0,00	25,00
WTG 04	5.825	5.834						
WTG 04			20	27,68	64,5	0,00	5,60	6,60
WTG 04			25	23,76	68,5	0,12	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 04			32	21,31	74,0	0,18	5,20	10,80
WTG 04			40	19,09	77,5	0,29	5,00	11,40
WTG 04			50	17,77	82,6	0,41	4,70	13,00
WTG 04			63	10,84	83,9	0,64	4,30	16,60
WTG 04			80	5,95	86,7	0,93	3,70	19,70
WTG 04			100	4,52	91,4	1,46	3,00	21,20
WTG 04			125	-0,94	89,9	2,22	1,80	20,20
WTG 04			160	-6,24	91,2	3,33	0,00	21,20
WTG 04			200	-12,40	92,8	4,78	0,00	25,00
WTG 05	5.173	5.183						
WTG 05			20	28,71	64,5	0,00	5,60	6,60
WTG 05			25	24,80	68,5	0,10	5,40	8,40
WTG 05			32	22,35	74,0	0,16	5,20	10,80
WTG 05			40	20,15	77,5	0,26	5,00	11,40
WTG 05			50	18,85	82,6	0,36	4,70	13,00
WTG 05			63	11,94	83,9	0,57	4,30	16,60
WTG 05			80	7,08	86,7	0,83	3,70	19,70
WTG 05			100	5,71	91,4	1,30	3,00	21,20
WTG 05			125	0,34	89,9	1,97	1,80	20,20
WTG 05			160	-4,85	91,2	2,95	0,00	21,20
WTG 05			200	-10,84	92,8	4,25	0,00	25,00
WTG 06	5.735	5.744						
WTG 06			20	27,82	64,5	0,00	5,60	6,60
WTG 06			25	23,90	68,5	0,11	5,40	8,40
WTG 06			32	21,44	74,0	0,17	5,20	10,80
WTG 06			40	19,23	77,5	0,29	5,00	11,40
WTG 06			50	17,91	82,6	0,40	4,70	13,00
WTG 06			63	10,98	83,9	0,63	4,30	16,60
WTG 06			80	6,10	86,7	0,92	3,70	19,70
WTG 06			100	4,68	91,4	1,44	3,00	21,20
WTG 06			125	-0,77	89,9	2,18	1,80	20,20
WTG 06			160	-6,06	91,2	3,27	0,00	21,20
WTG 06			200	-12,19	92,8	4,71	0,00	25,00
WTG 07	4.719	4.728						
WTG 07			20	29,51	64,5	0,00	5,60	6,60
WTG 07			25	25,61	68,5	0,09	5,40	8,40
WTG 07			32	23,16	74,0	0,14	5,20	10,80
WTG 07			40	20,97	77,5	0,24	5,00	11,40
WTG 07			50	19,68	82,6	0,33	4,70	13,00
WTG 07			63	12,79	83,9	0,52	4,30	16,60
WTG 07			80	7,95	86,7	0,76	3,70	19,70
WTG 07			100	6,62	91,4	1,18	3,00	21,20
WTG 07			125	1,31	89,9	1,80	1,80	20,20
WTG 07			160	-3,79	91,2	2,70	0,00	21,20
WTG 07			200	-9,67	92,8	3,88	0,00	25,00
WTG 08	5.527	5.537						
WTG 08			20	28,13	64,5	0,00	5,60	6,60
WTG 08			25	24,22	68,5	0,11	5,40	8,40
WTG 08			32	21,77	74,0	0,17	5,20	10,80
WTG 08			40	19,56	77,5	0,28	5,00	11,40
WTG 08			50	18,25	82,6	0,39	4,70	13,00
WTG 08			63	11,33	83,9	0,61	4,30	16,60
WTG 08			80	6,45	86,7	0,89	3,70	19,70
WTG 08			100	5,05	91,4	1,38	3,00	21,20
WTG 08			125	-0,37	89,9	2,10	1,80	20,20
WTG 08			160	-5,62	91,2	3,16	0,00	21,20
WTG 08			200	-11,71	92,8	4,54	0,00	25,00
WTG 09	4.379	4.388						
WTG 09			20	30,16	64,5	0,00	5,60	6,60
WTG 09			25	26,27	68,5	0,09	5,40	8,40
WTG 09			32	23,82	74,0	0,13	5,20	10,80
WTG 09			40	21,64	77,5	0,22	5,00	11,40
WTG 09			50	20,35	82,6	0,31	4,70	13,00
WTG 09			63	13,47	83,9	0,48	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 09			80	8,65	86,7	0,70	3,70	19,70
WTG 09			100	7,36	91,4	1,10	3,00	21,20
WTG 09			125	2,09	89,9	1,67	1,80	20,20
WTG 09			160	-2,95	91,2	2,50	0,00	21,20
WTG 09			200	-8,74	92,8	3,60	0,00	25,00
WTG 10	4.861	4.870						
WTG 10			20	29,25	64,5	0,00	5,60	6,60
WTG 10			25	25,35	68,5	0,10	5,40	8,40
WTG 10			32	22,90	74,0	0,15	5,20	10,80
WTG 10			40	20,71	77,5	0,24	5,00	11,40
WTG 10			50	19,41	82,6	0,34	4,70	13,00
WTG 10			63	12,51	83,9	0,54	4,30	16,60
WTG 10			80	7,67	86,7	0,78	3,70	19,70
WTG 10			100	6,33	91,4	1,22	3,00	21,20
WTG 10			125	1,00	89,9	1,85	1,80	20,20
WTG 10			160	-4,13	91,2	2,78	0,00	21,20
WTG 10			200	-10,04	92,8	3,99	0,00	25,00
WTG 11	5.515	5.525						
WTG 11			20	28,15	64,5	0,00	5,60	6,60
WTG 11			25	24,24	68,5	0,11	5,40	8,40
WTG 11			32	21,79	74,0	0,17	5,20	10,80
WTG 11			40	19,58	77,5	0,28	5,00	11,40
WTG 11			50	18,27	82,6	0,39	4,70	13,00
WTG 11			63	11,35	83,9	0,61	4,30	16,60
WTG 11			80	6,47	86,7	0,88	3,70	19,70
WTG 11			100	5,07	91,4	1,38	3,00	21,20
WTG 11			125	-0,35	89,9	2,10	1,80	20,20
WTG 11			160	-5,59	91,2	3,15	0,00	21,20
WTG 11			200	-11,68	92,8	4,53	0,00	25,00
WTG 12	4.314	4.324						
WTG 12			20	30,28	64,5	0,00	5,60	6,60
WTG 12			25	26,40	68,5	0,09	5,40	8,40
WTG 12			32	23,95	74,0	0,13	5,20	10,80
WTG 12			40	21,77	77,5	0,22	5,00	11,40
WTG 12			50	20,48	82,6	0,30	4,70	13,00
WTG 12			63	13,61	83,9	0,48	4,30	16,60
WTG 12			80	8,79	86,7	0,69	3,70	19,70
WTG 12			100	7,50	91,4	1,08	3,00	21,20
WTG 12			125	2,24	89,9	1,64	1,80	20,20
WTG 12			160	-2,78	91,2	2,46	0,00	21,20
WTG 12			200	-8,56	92,8	3,55	0,00	25,00
WTG 13	5.711	5.718						
WTG 13			20	27,85	64,5	0,00	5,60	6,60
WTG 13			25	23,94	68,5	0,11	5,40	8,40
WTG 13			32	21,48	74,0	0,17	5,20	10,80
WTG 13			40	19,27	77,5	0,29	5,00	11,40
WTG 13			50	17,95	82,6	0,40	4,70	13,00
WTG 13			63	11,03	83,9	0,63	4,30	16,60
WTG 13			80	6,14	86,7	0,91	3,70	19,70
WTG 13			100	4,72	91,4	1,43	3,00	21,20
WTG 13			125	-0,72	89,9	2,17	1,80	20,20
WTG 13			160	-6,01	91,2	3,26	0,00	21,20
WTG 13			200	-12,13	92,8	4,69	0,00	25,00
WTG 14	4.591	4.600						
WTG 14			20	29,75	64,5	0,00	5,60	6,60
WTG 14			25	25,85	68,5	0,09	5,40	8,40
WTG 14			32	23,41	74,0	0,14	5,20	10,80
WTG 14			40	21,22	77,5	0,23	5,00	11,40
WTG 14			50	19,92	82,6	0,32	4,70	13,00
WTG 14			63	13,04	83,9	0,51	4,30	16,60
WTG 14			80	8,21	86,7	0,74	3,70	19,70
WTG 14			100	6,90	91,4	1,15	3,00	21,20
WTG 14			125	1,60	89,9	1,75	1,80	20,20
WTG 14			160	-3,48	91,2	2,62	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 14			200	-9,33	92,8	3,77	0,00	25,00
WTG 15	5.579	5.586						
WTG 15			20	28,06	64,5	0,00	5,60	6,60
WTG 15			25	24,15	68,5	0,11	5,40	8,40
WTG 15			32	21,69	74,0	0,17	5,20	10,80
WTG 15			40	19,48	77,5	0,28	5,00	11,40
WTG 15			50	18,17	82,6	0,39	4,70	13,00
WTG 15			63	11,24	83,9	0,61	4,30	16,60
WTG 15			80	6,36	86,7	0,89	3,70	19,70
WTG 15			100	4,96	91,4	1,40	3,00	21,20
WTG 15			125	-0,47	89,9	2,12	1,80	20,20
WTG 15			160	-5,73	91,2	3,18	0,00	21,20
WTG 15			200	-11,82	92,8	4,58	0,00	25,00
WTG 16	6.155	6.160						
WTG 16			20	27,21	64,5	0,00	5,60	6,60
WTG 16			25	23,28	68,5	0,12	5,40	8,40
WTG 16			32	20,82	74,0	0,18	5,20	10,80
WTG 16			40	18,60	77,5	0,31	5,00	11,40
WTG 16			50	17,28	82,6	0,43	4,70	13,00
WTG 16			63	10,33	83,9	0,68	4,30	16,60
WTG 16			80	5,42	86,7	0,99	3,70	19,70
WTG 16			100	3,97	91,4	1,54	3,00	21,20
WTG 16			125	-1,53	89,9	2,34	1,80	20,20
WTG 16			160	-6,90	91,2	3,51	0,00	21,20
WTG 16			200	-13,14	92,8	5,05	0,00	25,00
WTG 17	4.659	4.667						
WTG 17			20	29,62	64,5	0,00	5,60	6,60
WTG 17			25	25,73	68,5	0,09	5,40	8,40
WTG 17			32	23,28	74,0	0,14	5,20	10,80
WTG 17			40	21,09	77,5	0,23	5,00	11,40
WTG 17			50	19,79	82,6	0,33	4,70	13,00
WTG 17			63	12,91	83,9	0,51	4,30	16,60
WTG 17			80	8,07	86,7	0,75	3,70	19,70
WTG 17			100	6,75	91,4	1,17	3,00	21,20
WTG 17			125	1,45	89,9	1,77	1,80	20,20
WTG 17			160	-3,64	91,2	2,66	0,00	21,20
WTG 17			200	-9,51	92,8	3,83	0,00	25,00
WTG 18	6.101	6.107						
WTG 18			20	27,28	64,5	0,00	5,60	6,60
WTG 18			25	23,36	68,5	0,12	5,40	8,40
WTG 18			32	20,90	74,0	0,18	5,20	10,80
WTG 18			40	18,68	77,5	0,31	5,00	11,40
WTG 18			50	17,36	82,6	0,43	4,70	13,00
WTG 18			63	10,41	83,9	0,67	4,30	16,60
WTG 18			80	5,51	86,7	0,98	3,70	19,70
WTG 18			100	4,06	91,4	1,53	3,00	21,20
WTG 18			125	-1,44	89,9	2,32	1,80	20,20
WTG 18			160	-6,80	91,2	3,48	0,00	21,20
WTG 18			200	-13,02	92,8	5,01	0,00	25,00
WTG 19	5.047	5.054						
WTG 19			20	28,93	64,5	0,00	5,60	6,60
WTG 19			25	25,03	68,5	0,10	5,40	8,40
WTG 19			32	22,58	74,0	0,15	5,20	10,80
WTG 19			40	20,37	77,5	0,25	5,00	11,40
WTG 19			50	19,07	82,6	0,35	4,70	13,00
WTG 19			63	12,17	83,9	0,56	4,30	16,60
WTG 19			80	7,32	86,7	0,81	3,70	19,70
WTG 19			100	5,96	91,4	1,26	3,00	21,20
WTG 19			125	0,61	89,9	1,92	1,80	20,20
WTG 19			160	-4,55	91,2	2,88	0,00	21,20
WTG 19			200	-10,52	92,8	4,14	0,00	25,00
Sum								
Sum			20	41,06				
Sum			25	37,16				

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
Sum			32	34,71				
Sum			40	32,50				
Sum			50	31,20				
Sum			63	24,30				
Sum			80	19,44				
Sum			100	18,08				
Sum			125	12,72				
Sum			160	7,55				
Sum			200	1,58				

Noise sensitive area: Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.223	5.233						
WTG 03			20	28,63	64,5	0,00	5,60	6,60
WTG 03			25	24,72	68,5	0,10	5,40	8,40
WTG 03			32	22,27	74,0	0,16	5,20	10,80
WTG 03			40	20,06	77,5	0,26	5,00	11,40
WTG 03			50	18,76	82,6	0,37	4,70	13,00
WTG 03			63	11,85	83,9	0,58	4,30	16,60
WTG 03			80	6,99	86,7	0,84	3,70	19,70
WTG 03			100	5,62	91,4	1,31	3,00	21,20
WTG 03			125	0,24	89,9	1,99	1,80	20,20
WTG 03			160	-4,96	91,2	2,98	0,00	21,20
WTG 03			200	-10,97	92,8	4,29	0,00	25,00
WTG 04	5.861	5.870						
WTG 04			20	27,63	64,5	0,00	5,60	6,60
WTG 04			25	23,71	68,5	0,12	5,40	8,40
WTG 04			32	21,25	74,0	0,18	5,20	10,80
WTG 04			40	19,03	77,5	0,29	5,00	11,40
WTG 04			50	17,72	82,6	0,41	4,70	13,00
WTG 04			63	10,78	83,9	0,65	4,30	16,60
WTG 04			80	5,89	86,7	0,94	3,70	19,70
WTG 04			100	4,46	91,4	1,47	3,00	21,20
WTG 04			125	-1,00	89,9	2,23	1,80	20,20
WTG 04			160	-6,32	91,2	3,35	0,00	21,20
WTG 04			200	-12,49	92,8	4,81	0,00	25,00
WTG 05	5.205	5.216						
WTG 05			20	28,65	64,5	0,00	5,60	6,60
WTG 05			25	24,75	68,5	0,10	5,40	8,40
WTG 05			32	22,30	74,0	0,16	5,20	10,80
WTG 05			40	20,09	77,5	0,26	5,00	11,40
WTG 05			50	18,79	82,6	0,37	4,70	13,00
WTG 05			63	11,88	83,9	0,57	4,30	16,60
WTG 05			80	7,02	86,7	0,83	3,70	19,70
WTG 05			100	5,65	91,4	1,30	3,00	21,20
WTG 05			125	0,27	89,9	1,98	1,80	20,20
WTG 05			160	-4,92	91,2	2,97	0,00	21,20
WTG 05			200	-10,92	92,8	4,28	0,00	25,00
WTG 06	5.769	5.778						
WTG 06			20	27,76	64,5	0,00	5,60	6,60
WTG 06			25	23,85	68,5	0,12	5,40	8,40
WTG 06			32	21,39	74,0	0,17	5,20	10,80
WTG 06			40	19,18	77,5	0,29	5,00	11,40
WTG 06			50	17,86	82,6	0,40	4,70	13,00
WTG 06			63	10,93	83,9	0,64	4,30	16,60
WTG 06			80	6,04	86,7	0,92	3,70	19,70
WTG 06			100	4,62	91,4	1,44	3,00	21,20
WTG 06			125	-0,83	89,9	2,20	1,80	20,20
WTG 06			160	-6,13	91,2	3,29	0,00	21,20
WTG 06			200	-12,27	92,8	4,74	0,00	25,00
WTG 07	4.749	4.759						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 07			20	29,45	64,5	0,00	5,60	6,60
WTG 07			25	25,55	68,5	0,10	5,40	8,40
WTG 07			32	23,11	74,0	0,14	5,20	10,80
WTG 07			40	20,91	77,5	0,24	5,00	11,40
WTG 07			50	19,62	82,6	0,33	4,70	13,00
WTG 07			63	12,73	83,9	0,52	4,30	16,60
WTG 07			80	7,89	86,7	0,76	3,70	19,70
WTG 07			100	6,56	91,4	1,19	3,00	21,20
WTG 07			125	1,24	89,9	1,81	1,80	20,20
WTG 07			160	-3,86	91,2	2,71	0,00	21,20
WTG 07			200	-9,75	92,8	3,90	0,00	25,00
WTG 08	5.557	5.567						
WTG 08			20	28,09	64,5	0,00	5,60	6,60
WTG 08			25	24,18	68,5	0,11	5,40	8,40
WTG 08			32	21,72	74,0	0,17	5,20	10,80
WTG 08			40	19,51	77,5	0,28	5,00	11,40
WTG 08			50	18,20	82,6	0,39	4,70	13,00
WTG 08			63	11,27	83,9	0,61	4,30	16,60
WTG 08			80	6,40	86,7	0,89	3,70	19,70
WTG 08			100	5,00	91,4	1,39	3,00	21,20
WTG 08			125	-0,43	89,9	2,12	1,80	20,20
WTG 08			160	-5,69	91,2	3,17	0,00	21,20
WTG 08			200	-11,78	92,8	4,57	0,00	25,00
WTG 09	4.406	4.415						
WTG 09			20	30,10	64,5	0,00	5,60	6,60
WTG 09			25	26,21	68,5	0,09	5,40	8,40
WTG 09			32	23,77	74,0	0,13	5,20	10,80
WTG 09			40	21,58	77,5	0,22	5,00	11,40
WTG 09			50	20,29	82,6	0,31	4,70	13,00
WTG 09			63	13,42	83,9	0,49	4,30	16,60
WTG 09			80	8,59	86,7	0,71	3,70	19,70
WTG 09			100	7,30	91,4	1,10	3,00	21,20
WTG 09			125	2,02	89,9	1,68	1,80	20,20
WTG 09			160	-3,02	91,2	2,52	0,00	21,20
WTG 09			200	-8,82	92,8	3,62	0,00	25,00
WTG 10	4.888	4.897						
WTG 10			20	29,20	64,5	0,00	5,60	6,60
WTG 10			25	25,30	68,5	0,10	5,40	8,40
WTG 10			32	22,85	74,0	0,15	5,20	10,80
WTG 10			40	20,66	77,5	0,24	5,00	11,40
WTG 10			50	19,36	82,6	0,34	4,70	13,00
WTG 10			63	12,46	83,9	0,54	4,30	16,60
WTG 10			80	7,62	86,7	0,78	3,70	19,70
WTG 10			100	6,28	91,4	1,22	3,00	21,20
WTG 10			125	0,94	89,9	1,86	1,80	20,20
WTG 10			160	-4,19	91,2	2,79	0,00	21,20
WTG 10			200	-10,11	92,8	4,02	0,00	25,00
WTG 11	5.542	5.552						
WTG 11			20	28,11	64,5	0,00	5,60	6,60
WTG 11			25	24,20	68,5	0,11	5,40	8,40
WTG 11			32	21,74	74,0	0,17	5,20	10,80
WTG 11			40	19,53	77,5	0,28	5,00	11,40
WTG 11			50	18,22	82,6	0,39	4,70	13,00
WTG 11			63	11,30	83,9	0,61	4,30	16,60
WTG 11			80	6,42	86,7	0,89	3,70	19,70
WTG 11			100	5,02	91,4	1,39	3,00	21,20
WTG 11			125	-0,40	89,9	2,11	1,80	20,20
WTG 11			160	-5,65	91,2	3,16	0,00	21,20
WTG 11			200	-11,74	92,8	4,55	0,00	25,00
WTG 12	4.337	4.347						
WTG 12			20	30,24	64,5	0,00	5,60	6,60
WTG 12			25	26,35	68,5	0,09	5,40	8,40
WTG 12			32	23,91	74,0	0,13	5,20	10,80
WTG 12			40	21,72	77,5	0,22	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 12			50	20,43	82,6	0,30	4,70	13,00
WTG 12			63	13,56	83,9	0,48	4,30	16,60
WTG 12			80	8,74	86,7	0,70	3,70	19,70
WTG 12			100	7,45	91,4	1,09	3,00	21,20
WTG 12			125	2,18	89,9	1,65	1,80	20,20
WTG 12			160	-2,84	91,2	2,48	0,00	21,20
WTG 12			200	-8,63	92,8	3,56	0,00	25,00
WTG 13	5.734	5.741						
WTG 13			20	27,82	64,5	0,00	5,60	6,60
WTG 13			25	23,91	68,5	0,11	5,40	8,40
WTG 13			32	21,45	74,0	0,17	5,20	10,80
WTG 13			40	19,23	77,5	0,29	5,00	11,40
WTG 13			50	17,92	82,6	0,40	4,70	13,00
WTG 13			63	10,99	83,9	0,63	4,30	16,60
WTG 13			80	6,10	86,7	0,92	3,70	19,70
WTG 13			100	4,69	91,4	1,44	3,00	21,20
WTG 13			125	-0,76	89,9	2,18	1,80	20,20
WTG 13			160	-6,05	91,2	3,27	0,00	21,20
WTG 13			200	-12,19	92,8	4,71	0,00	25,00
WTG 14	4.607	4.615						
WTG 14			20	29,72	64,5	0,00	5,60	6,60
WTG 14			25	25,82	68,5	0,09	5,40	8,40
WTG 14			32	23,38	74,0	0,14	5,20	10,80
WTG 14			40	21,19	77,5	0,23	5,00	11,40
WTG 14			50	19,89	82,6	0,32	4,70	13,00
WTG 14			63	13,01	83,9	0,51	4,30	16,60
WTG 14			80	8,18	86,7	0,74	3,70	19,70
WTG 14			100	6,86	91,4	1,15	3,00	21,20
WTG 14			125	1,56	89,9	1,75	1,80	20,20
WTG 14			160	-3,51	91,2	2,63	0,00	21,20
WTG 14			200	-9,37	92,8	3,78	0,00	25,00
WTG 15	5.593	5.601						
WTG 15			20	28,03	64,5	0,00	5,60	6,60
WTG 15			25	24,12	68,5	0,11	5,40	8,40
WTG 15			32	21,67	74,0	0,17	5,20	10,80
WTG 15			40	19,45	77,5	0,28	5,00	11,40
WTG 15			50	18,14	82,6	0,39	4,70	13,00
WTG 15			63	11,22	83,9	0,62	4,30	16,60
WTG 15			80	6,34	86,7	0,90	3,70	19,70
WTG 15			100	4,93	91,4	1,40	3,00	21,20
WTG 15			125	-0,49	89,9	2,13	1,80	20,20
WTG 15			160	-5,76	91,2	3,19	0,00	21,20
WTG 15			200	-11,86	92,8	4,59	0,00	25,00
WTG 16	6.174	6.180						
WTG 16			20	27,18	64,5	0,00	5,60	6,60
WTG 16			25	23,26	68,5	0,12	5,40	8,40
WTG 16			32	20,79	74,0	0,19	5,20	10,80
WTG 16			40	18,57	77,5	0,31	5,00	11,40
WTG 16			50	17,25	82,6	0,43	4,70	13,00
WTG 16			63	10,30	83,9	0,68	4,30	16,60
WTG 16			80	5,39	86,7	0,99	3,70	19,70
WTG 16			100	3,94	91,4	1,55	3,00	21,20
WTG 16			125	-1,57	89,9	2,35	1,80	20,20
WTG 16			160	-6,94	91,2	3,52	0,00	21,20
WTG 16			200	-13,19	92,8	5,07	0,00	25,00
WTG 17	4.668	4.676						
WTG 17			20	29,60	64,5	0,00	5,60	6,60
WTG 17			25	25,71	68,5	0,09	5,40	8,40
WTG 17			32	23,26	74,0	0,14	5,20	10,80
WTG 17			40	21,07	77,5	0,23	5,00	11,40
WTG 17			50	19,77	82,6	0,33	4,70	13,00
WTG 17			63	12,89	83,9	0,51	4,30	16,60
WTG 17			80	8,05	86,7	0,75	3,70	19,70
WTG 17			100	6,73	91,4	1,17	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 17			125	1,43	89,9	1,78	1,80	20,20
WTG 17			160	-3,66	91,2	2,67	0,00	21,20
WTG 17			200	-9,53	92,8	3,83	0,00	25,00
WTG 18	6.114	6.120						
WTG 18			20	27,26	64,5	0,00	5,60	6,60
WTG 18			25	23,34	68,5	0,12	5,40	8,40
WTG 18			32	20,88	74,0	0,18	5,20	10,80
WTG 18			40	18,66	77,5	0,31	5,00	11,40
WTG 18			50	17,34	82,6	0,43	4,70	13,00
WTG 18			63	10,39	83,9	0,67	4,30	16,60
WTG 18			80	5,49	86,7	0,98	3,70	19,70
WTG 18			100	4,03	91,4	1,53	3,00	21,20
WTG 18			125	-1,46	89,9	2,33	1,80	20,20
WTG 18			160	-6,82	91,2	3,49	0,00	21,20
WTG 18			200	-13,05	92,8	5,02	0,00	25,00
WTG 19	5.054	5.061						
WTG 19			20	28,92	64,5	0,00	5,60	6,60
WTG 19			25	25,01	68,5	0,10	5,40	8,40
WTG 19			32	22,56	74,0	0,15	5,20	10,80
WTG 19			40	20,36	77,5	0,25	5,00	11,40
WTG 19			50	19,06	82,6	0,35	4,70	13,00
WTG 19			63	12,16	83,9	0,56	4,30	16,60
WTG 19			80	7,31	86,7	0,81	3,70	19,70
WTG 19			100	5,95	91,4	1,27	3,00	21,20
WTG 19			125	0,59	89,9	1,92	1,80	20,20
WTG 19			160	-4,57	91,2	2,88	0,00	21,20
WTG 19			200	-10,53	92,8	4,15	0,00	25,00
Sum								
Sum			20	41,02				
Sum			25	37,12				
Sum			32	34,67				
Sum			40	32,46				
Sum			50	31,16				
Sum			63	24,25				
Sum			80	19,40				
Sum			100	18,04				
Sum			125	12,67				
Sum			160	7,50				
Sum			200	1,52				

Noise sensitive area: Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.720	5.727						
WTG 03			20	27,84	64,5	0,00	5,60	6,60
WTG 03			25	23,93	68,5	0,11	5,40	8,40
WTG 03			32	21,47	74,0	0,17	5,20	10,80
WTG 03			40	19,25	77,5	0,29	5,00	11,40
WTG 03			50	17,94	82,6	0,40	4,70	13,00
WTG 03			63	11,01	83,9	0,63	4,30	16,60
WTG 03			80	6,12	86,7	0,92	3,70	19,70
WTG 03			100	4,71	91,4	1,43	3,00	21,20
WTG 03			125	-0,74	89,9	2,18	1,80	20,20
WTG 03			160	-6,02	91,2	3,26	0,00	21,20
WTG 03			200	-12,16	92,8	4,70	0,00	25,00
WTG 04	6.393	6.400						
WTG 04			20	26,88	64,5	0,00	5,60	6,60
WTG 04			25	22,95	68,5	0,13	5,40	8,40
WTG 04			32	20,48	74,0	0,19	5,20	10,80
WTG 04			40	18,26	77,5	0,32	5,00	11,40
WTG 04			50	16,93	82,6	0,45	4,70	13,00
WTG 04			63	9,97	83,9	0,70	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 04			80	5,05	86,7	1,02	3,70	19,70
WTG 04			100	3,58	91,4	1,60	3,00	21,20
WTG 04			125	-1,96	89,9	2,43	1,80	20,20
WTG 04			160	-7,37	91,2	3,65	0,00	21,20
WTG 04			200	-13,67	92,8	5,25	0,00	25,00
WTG 05	5.538	5.547						
WTG 05			20	28,12	64,5	0,00	5,60	6,60
WTG 05			25	24,21	68,5	0,11	5,40	8,40
WTG 05			32	21,75	74,0	0,17	5,20	10,80
WTG 05			40	19,54	77,5	0,28	5,00	11,40
WTG 05			50	18,23	82,6	0,39	4,70	13,00
WTG 05			63	11,31	83,9	0,61	4,30	16,60
WTG 05			80	6,43	86,7	0,89	3,70	19,70
WTG 05			100	5,03	91,4	1,39	3,00	21,20
WTG 05			125	-0,39	89,9	2,11	1,80	20,20
WTG 05			160	-5,64	91,2	3,16	0,00	21,20
WTG 05			200	-11,73	92,8	4,55	0,00	25,00
WTG 06	6.111	6.118						
WTG 06			20	27,27	64,5	0,00	5,60	6,60
WTG 06			25	23,35	68,5	0,12	5,40	8,40
WTG 06			32	20,88	74,0	0,18	5,20	10,80
WTG 06			40	18,66	77,5	0,31	5,00	11,40
WTG 06			50	17,34	82,6	0,43	4,70	13,00
WTG 06			63	10,39	83,9	0,67	4,30	16,60
WTG 06			80	5,49	86,7	0,98	3,70	19,70
WTG 06			100	4,04	91,4	1,53	3,00	21,20
WTG 06			125	-1,46	89,9	2,32	1,80	20,20
WTG 06			160	-6,82	91,2	3,49	0,00	21,20
WTG 06			200	-13,05	92,8	5,02	0,00	25,00
WTG 07	4.993	5.001						
WTG 07			20	29,02	64,5	0,00	5,60	6,60
WTG 07			25	25,12	68,5	0,10	5,40	8,40
WTG 07			32	22,67	74,0	0,15	5,20	10,80
WTG 07			40	20,47	77,5	0,25	5,00	11,40
WTG 07			50	19,17	82,6	0,35	4,70	13,00
WTG 07			63	12,27	83,9	0,55	4,30	16,60
WTG 07			80	7,42	86,7	0,80	3,70	19,70
WTG 07			100	6,07	91,4	1,25	3,00	21,20
WTG 07			125	0,72	89,9	1,90	1,80	20,20
WTG 07			160	-4,43	91,2	2,85	0,00	21,20
WTG 07			200	-10,38	92,8	4,10	0,00	25,00
WTG 08	5.724	5.733						
WTG 08			20	27,83	64,5	0,00	5,60	6,60
WTG 08			25	23,92	68,5	0,11	5,40	8,40
WTG 08			32	21,46	74,0	0,17	5,20	10,80
WTG 08			40	19,25	77,5	0,29	5,00	11,40
WTG 08			50	17,93	82,6	0,40	4,70	13,00
WTG 08			63	11,00	83,9	0,63	4,30	16,60
WTG 08			80	6,12	86,7	0,92	3,70	19,70
WTG 08			100	4,70	91,4	1,43	3,00	21,20
WTG 08			125	-0,75	89,9	2,18	1,80	20,20
WTG 08			160	-6,03	91,2	3,27	0,00	21,20
WTG 08			200	-12,17	92,8	4,70	0,00	25,00
WTG 09	4.491	4.498						
WTG 09			20	29,94	64,5	0,00	5,60	6,60
WTG 09			25	26,05	68,5	0,09	5,40	8,40
WTG 09			32	23,60	74,0	0,13	5,20	10,80
WTG 09			40	21,41	77,5	0,22	5,00	11,40
WTG 09			50	20,12	82,6	0,31	4,70	13,00
WTG 09			63	13,24	83,9	0,49	4,30	16,60
WTG 09			80	8,42	86,7	0,72	3,70	19,70
WTG 09			100	7,11	91,4	1,12	3,00	21,20
WTG 09			125	1,83	89,9	1,71	1,80	20,20
WTG 09			160	-3,23	91,2	2,56	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 09			200	-9,05	92,8	3,69	0,00	25,00
WTG 10	4.890	4.897						
WTG 10			20	29,20	64,5	0,00	5,60	6,60
WTG 10			25	25,30	68,5	0,10	5,40	8,40
WTG 10			32	22,85	74,0	0,15	5,20	10,80
WTG 10			40	20,66	77,5	0,24	5,00	11,40
WTG 10			50	19,36	82,6	0,34	4,70	13,00
WTG 10			63	12,46	83,9	0,54	4,30	16,60
WTG 10			80	7,62	86,7	0,78	3,70	19,70
WTG 10			100	6,28	91,4	1,22	3,00	21,20
WTG 10			125	0,94	89,9	1,86	1,80	20,20
WTG 10			160	-4,19	91,2	2,79	0,00	21,20
WTG 10			200	-10,11	92,8	4,02	0,00	25,00
WTG 11	5.525	5.534						
WTG 11			20	28,14	64,5	0,00	5,60	6,60
WTG 11			25	24,23	68,5	0,11	5,40	8,40
WTG 11			32	21,77	74,0	0,17	5,20	10,80
WTG 11			40	19,56	77,5	0,28	5,00	11,40
WTG 11			50	18,25	82,6	0,39	4,70	13,00
WTG 11			63	11,33	83,9	0,61	4,30	16,60
WTG 11			80	6,45	86,7	0,89	3,70	19,70
WTG 11			100	5,06	91,4	1,38	3,00	21,20
WTG 11			125	-0,36	89,9	2,10	1,80	20,20
WTG 11			160	-5,61	91,2	3,15	0,00	21,20
WTG 11			200	-11,70	92,8	4,54	0,00	25,00
WTG 12	4.207	4.216						
WTG 12			20	30,50	64,5	0,00	5,60	6,60
WTG 12			25	26,62	68,5	0,08	5,40	8,40
WTG 12			32	24,18	74,0	0,13	5,20	10,80
WTG 12			40	21,99	77,5	0,21	5,00	11,40
WTG 12			50	20,71	82,6	0,30	4,70	13,00
WTG 12			63	13,84	83,9	0,46	4,30	16,60
WTG 12			80	9,03	86,7	0,67	3,70	19,70
WTG 12			100	7,75	91,4	1,05	3,00	21,20
WTG 12			125	2,50	89,9	1,60	1,80	20,20
WTG 12			160	-2,50	91,2	2,40	0,00	21,20
WTG 12			200	-8,25	92,8	3,46	0,00	25,00
WTG 13	5.447	5.453						
WTG 13			20	28,27	64,5	0,00	5,60	6,60
WTG 13			25	24,36	68,5	0,11	5,40	8,40
WTG 13			32	21,90	74,0	0,16	5,20	10,80
WTG 13			40	19,69	77,5	0,27	5,00	11,40
WTG 13			50	18,39	82,6	0,38	4,70	13,00
WTG 13			63	11,47	83,9	0,60	4,30	16,60
WTG 13			80	6,59	86,7	0,87	3,70	19,70
WTG 13			100	5,20	91,4	1,36	3,00	21,20
WTG 13			125	-0,20	89,9	2,07	1,80	20,20
WTG 13			160	-5,44	91,2	3,11	0,00	21,20
WTG 13			200	-11,50	92,8	4,47	0,00	25,00
WTG 14	4.090	4.098						
WTG 14			20	30,75	64,5	0,00	5,60	6,60
WTG 14			25	26,87	68,5	0,08	5,40	8,40
WTG 14			32	24,43	74,0	0,12	5,20	10,80
WTG 14			40	22,24	77,5	0,20	5,00	11,40
WTG 14			50	20,96	82,6	0,29	4,70	13,00
WTG 14			63	14,10	83,9	0,45	4,30	16,60
WTG 14			80	9,29	86,7	0,66	3,70	19,70
WTG 14			100	8,02	91,4	1,02	3,00	21,20
WTG 14			125	2,79	89,9	1,56	1,80	20,20
WTG 14			160	-2,19	91,2	2,34	0,00	21,20
WTG 14			200	-7,91	92,8	3,36	0,00	25,00
WTG 15	4.955	4.963						
WTG 15			20	29,09	64,5	0,00	5,60	6,60
WTG 15			25	25,19	68,5	0,10	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 15			32	22,74	74,0	0,15	5,20	10,80
WTG 15			40	20,54	77,5	0,25	5,00	11,40
WTG 15			50	19,24	82,6	0,35	4,70	13,00
WTG 15			63	12,34	83,9	0,55	4,30	16,60
WTG 15			80	7,49	86,7	0,79	3,70	19,70
WTG 15			100	6,15	91,4	1,24	3,00	21,20
WTG 15			125	0,80	89,9	1,89	1,80	20,20
WTG 15			160	-4,34	91,2	2,83	0,00	21,20
WTG 15			200	-10,28	92,8	4,07	0,00	25,00
WTG 16	5.728	5.734						
WTG 16			20	27,83	64,5	0,00	5,60	6,60
WTG 16			25	23,92	68,5	0,11	5,40	8,40
WTG 16			32	21,46	74,0	0,17	5,20	10,80
WTG 16			40	19,24	77,5	0,29	5,00	11,40
WTG 16			50	17,93	82,6	0,40	4,70	13,00
WTG 16			63	11,00	83,9	0,63	4,30	16,60
WTG 16			80	6,11	86,7	0,92	3,70	19,70
WTG 16			100	4,70	91,4	1,43	3,00	21,20
WTG 16			125	-0,75	89,9	2,18	1,80	20,20
WTG 16			160	-6,04	91,2	3,27	0,00	21,20
WTG 16			200	-12,17	92,8	4,70	0,00	25,00
WTG 17	3.837	3.845						
WTG 17			20	31,30	64,5	0,00	5,60	6,60
WTG 17			25	27,42	68,5	0,08	5,40	8,40
WTG 17			32	24,99	74,0	0,12	5,20	10,80
WTG 17			40	22,81	77,5	0,19	5,00	11,40
WTG 17			50	21,53	82,6	0,27	4,70	13,00
WTG 17			63	14,68	83,9	0,42	4,30	16,60
WTG 17			80	9,89	86,7	0,62	3,70	19,70
WTG 17			100	8,64	91,4	0,96	3,00	21,20
WTG 17			125	3,44	89,9	1,46	1,80	20,20
WTG 17			160	-1,49	91,2	2,19	0,00	21,20
WTG 17			200	-7,15	92,8	3,15	0,00	25,00
WTG 18	5.373	5.379						
WTG 18			20	28,39	64,5	0,00	5,60	6,60
WTG 18			25	24,48	68,5	0,11	5,40	8,40
WTG 18			32	22,02	74,0	0,16	5,20	10,80
WTG 18			40	19,82	77,5	0,27	5,00	11,40
WTG 18			50	18,51	82,6	0,38	4,70	13,00
WTG 18			63	11,59	83,9	0,59	4,30	16,60
WTG 18			80	6,73	86,7	0,86	3,70	19,70
WTG 18			100	5,34	91,4	1,34	3,00	21,20
WTG 18			125	-0,06	89,9	2,04	1,80	20,20
WTG 18			160	-5,28	91,2	3,07	0,00	21,20
WTG 18			200	-11,32	92,8	4,41	0,00	25,00
WTG 19	4.089	4.097						
WTG 19			20	30,75	64,5	0,00	5,60	6,60
WTG 19			25	26,87	68,5	0,08	5,40	8,40
WTG 19			32	24,43	74,0	0,12	5,20	10,80
WTG 19			40	22,25	77,5	0,20	5,00	11,40
WTG 19			50	20,96	82,6	0,29	4,70	13,00
WTG 19			63	14,10	83,9	0,45	4,30	16,60
WTG 19			80	9,30	86,7	0,66	3,70	19,70
WTG 19			100	8,03	91,4	1,02	3,00	21,20
WTG 19			125	2,79	89,9	1,56	1,80	20,20
WTG 19			160	-2,18	91,2	2,34	0,00	21,20
WTG 19			200	-7,91	92,8	3,36	0,00	25,00
Sum								
Sum			20	41,39				
Sum			25	37,49				
Sum			32	35,04				
Sum			40	32,85				
Sum			50	31,55				
Sum			63	24,65				

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17.09.2021 08:24/3.4.415

DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
Sum			80	19,81				
Sum			100	18,47				
Sum			125	13,14				
Sum			160	8,02				
Sum			200	2,11				

Noise sensitive area: Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	2.256	2.265						
WTG 03			20	35,90	64,5	0,00	5,60	6,60
WTG 03			25	32,05	68,5	0,05	5,40	8,40
WTG 03			32	29,63	74,0	0,07	5,20	10,80
WTG 03			40	27,49	77,5	0,11	5,00	11,40
WTG 03			50	26,24	82,6	0,16	4,70	13,00
WTG 03			63	19,45	83,9	0,25	4,30	16,60
WTG 03			80	14,74	86,7	0,36	3,70	19,70
WTG 03			100	13,63	91,4	0,57	3,00	21,20
WTG 03			125	8,64	89,9	0,86	1,80	20,20
WTG 03			160	4,01	91,2	1,29	0,00	21,20
WTG 03			200	-1,26	92,8	1,86	0,00	25,00
WTG 04	1.776	1.788						
WTG 04			20	37,95	64,5	0,00	5,60	6,60
WTG 04			25	34,12	68,5	0,04	5,40	8,40
WTG 04			32	31,70	74,0	0,05	5,20	10,80
WTG 04			40	29,56	77,5	0,09	5,00	11,40
WTG 04			50	28,33	82,6	0,13	4,70	13,00
WTG 04			63	21,56	83,9	0,20	4,30	16,60
WTG 04			80	16,87	86,7	0,29	3,70	19,70
WTG 04			100	15,81	91,4	0,45	3,00	21,20
WTG 04			125	10,87	89,9	0,68	1,80	20,20
WTG 04			160	6,33	91,2	1,02	0,00	21,20
WTG 04			200	1,19	92,8	1,47	0,00	25,00
WTG 05	2.676	2.685						
WTG 05			20	34,42	64,5	0,00	5,60	6,60
WTG 05			25	30,57	68,5	0,05	5,40	8,40
WTG 05			32	28,14	74,0	0,08	5,20	10,80
WTG 05			40	25,99	77,5	0,13	5,00	11,40
WTG 05			50	24,73	82,6	0,19	4,70	13,00
WTG 05			63	17,93	83,9	0,30	4,30	16,60
WTG 05			80	13,19	86,7	0,43	3,70	19,70
WTG 05			100	12,05	91,4	0,67	3,00	21,20
WTG 05			125	7,00	89,9	1,02	1,80	20,20
WTG 05			160	2,29	91,2	1,53	0,00	21,20
WTG 05			200	-3,08	92,8	2,20	0,00	25,00
WTG 06	2.386	2.395						
WTG 06			20	35,42	64,5	0,00	5,60	6,60
WTG 06			25	31,57	68,5	0,05	5,40	8,40
WTG 06			32	29,14	74,0	0,07	5,20	10,80
WTG 06			40	27,00	77,5	0,12	5,00	11,40
WTG 06			50	25,75	82,6	0,17	4,70	13,00
WTG 06			63	18,95	83,9	0,26	4,30	16,60
WTG 06			80	14,23	86,7	0,38	3,70	19,70
WTG 06			100	13,12	91,4	0,60	3,00	21,20
WTG 06			125	8,11	89,9	0,91	1,80	20,20
WTG 06			160	3,45	91,2	1,36	0,00	21,20
WTG 06			200	-1,85	92,8	1,96	0,00	25,00
WTG 07	3.156	3.161						
WTG 07			20	33,00	64,5	0,00	5,60	6,60
WTG 07			25	29,14	68,5	0,06	5,40	8,40
WTG 07			32	26,71	74,0	0,09	5,20	10,80
WTG 07			40	24,55	77,5	0,16	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 07			50	23,28	82,6	0,22	4,70	13,00
WTG 07			63	16,46	83,9	0,35	4,30	16,60
WTG 07			80	11,70	86,7	0,51	3,70	19,70
WTG 07			100	10,51	91,4	0,79	3,00	21,20
WTG 07			125	5,40	89,9	1,20	1,80	20,20
WTG 07			160	0,60	91,2	1,80	0,00	21,20
WTG 07			200	-4,89	92,8	2,59	0,00	25,00
WTG 08	2.971	2.979						
WTG 08			20	33,52	64,5	0,00	5,60	6,60
WTG 08			25	29,66	68,5	0,06	5,40	8,40
WTG 08			32	27,23	74,0	0,09	5,20	10,80
WTG 08			40	25,07	77,5	0,15	5,00	11,40
WTG 08			50	23,81	82,6	0,21	4,70	13,00
WTG 08			63	16,99	83,9	0,33	4,30	16,60
WTG 08			80	12,24	86,7	0,48	3,70	19,70
WTG 08			100	11,07	91,4	0,74	3,00	21,20
WTG 08			125	5,99	89,9	1,13	1,80	20,20
WTG 08			160	1,22	91,2	1,70	0,00	21,20
WTG 08			200	-4,22	92,8	2,44	0,00	25,00
WTG 09	3.709	3.713						
WTG 09			20	31,61	64,5	0,00	5,60	6,60
WTG 09			25	27,73	68,5	0,07	5,40	8,40
WTG 09			32	25,29	74,0	0,11	5,20	10,80
WTG 09			40	23,12	77,5	0,19	5,00	11,40
WTG 09			50	21,85	82,6	0,26	4,70	13,00
WTG 09			63	15,00	83,9	0,41	4,30	16,60
WTG 09			80	10,21	86,7	0,59	3,70	19,70
WTG 09			100	8,98	91,4	0,93	3,00	21,20
WTG 09			125	3,79	89,9	1,41	1,80	20,20
WTG 09			160	-1,11	91,2	2,12	0,00	21,20
WTG 09			200	-6,74	92,8	3,04	0,00	25,00
WTG 10	3.661	3.665						
WTG 10			20	31,72	64,5	0,00	5,60	6,60
WTG 10			25	27,85	68,5	0,07	5,40	8,40
WTG 10			32	25,41	74,0	0,11	5,20	10,80
WTG 10			40	23,24	77,5	0,18	5,00	11,40
WTG 10			50	21,96	82,6	0,26	4,70	13,00
WTG 10			63	15,12	83,9	0,40	4,30	16,60
WTG 10			80	10,33	86,7	0,59	3,70	19,70
WTG 10			100	9,10	91,4	0,92	3,00	21,20
WTG 10			125	3,93	89,9	1,39	1,80	20,20
WTG 10			160	-0,97	91,2	2,09	0,00	21,20
WTG 10			200	-6,59	92,8	3,01	0,00	25,00
WTG 11	3.495	3.501						
WTG 11			20	32,12	64,5	0,00	5,60	6,60
WTG 11			25	28,25	68,5	0,07	5,40	8,40
WTG 11			32	25,81	74,0	0,11	5,20	10,80
WTG 11			40	23,64	77,5	0,18	5,00	11,40
WTG 11			50	22,37	82,6	0,25	4,70	13,00
WTG 11			63	15,53	83,9	0,39	4,30	16,60
WTG 11			80	10,76	86,7	0,56	3,70	19,70
WTG 11			100	9,54	91,4	0,88	3,00	21,20
WTG 11			125	4,39	89,9	1,33	1,80	20,20
WTG 11			160	-0,48	91,2	2,00	0,00	21,20
WTG 11			200	-6,05	92,8	2,87	0,00	25,00
WTG 12	4.206	4.209						
WTG 12			20	30,52	64,5	0,00	5,60	6,60
WTG 12			25	26,63	68,5	0,08	5,40	8,40
WTG 12			32	24,19	74,0	0,13	5,20	10,80
WTG 12			40	22,01	77,5	0,21	5,00	11,40
WTG 12			50	20,72	82,6	0,29	4,70	13,00
WTG 12			63	13,85	83,9	0,46	4,30	16,60
WTG 12			80	9,04	86,7	0,67	3,70	19,70
WTG 12			100	7,76	91,4	1,05	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 12			125	2,52	89,9	1,60	1,80	20,20
WTG 12			160	-2,48	91,2	2,40	0,00	21,20
WTG 12			200	-8,24	92,8	3,45	0,00	25,00
WTG 13	4.233	4.237						
WTG 13			20	30,46	64,5	0,00	5,60	6,60
WTG 13			25	26,57	68,5	0,08	5,40	8,40
WTG 13			32	24,13	74,0	0,13	5,20	10,80
WTG 13			40	21,95	77,5	0,21	5,00	11,40
WTG 13			50	20,66	82,6	0,30	4,70	13,00
WTG 13			63	13,79	83,9	0,47	4,30	16,60
WTG 13			80	8,98	86,7	0,68	3,70	19,70
WTG 13			100	7,70	91,4	1,06	3,00	21,20
WTG 13			125	2,45	89,9	1,61	1,80	20,20
WTG 13			160	-2,56	91,2	2,41	0,00	21,20
WTG 13			200	-8,31	92,8	3,47	0,00	25,00
WTG 14	4.979	4.982						
WTG 14			20	29,05	64,5	0,00	5,60	6,60
WTG 14			25	25,15	68,5	0,10	5,40	8,40
WTG 14			32	22,70	74,0	0,15	5,20	10,80
WTG 14			40	20,50	77,5	0,25	5,00	11,40
WTG 14			50	19,20	82,6	0,35	4,70	13,00
WTG 14			63	12,30	83,9	0,55	4,30	16,60
WTG 14			80	7,46	86,7	0,80	3,70	19,70
WTG 14			100	6,11	91,4	1,25	3,00	21,20
WTG 14			125	0,76	89,9	1,89	1,80	20,20
WTG 14			160	-4,39	91,2	2,84	0,00	21,20
WTG 14			200	-10,33	92,8	4,08	0,00	25,00
WTG 15	5.214	5.217						
WTG 15			20	28,65	64,5	0,00	5,60	6,60
WTG 15			25	24,75	68,5	0,10	5,40	8,40
WTG 15			32	22,29	74,0	0,16	5,20	10,80
WTG 15			40	20,09	77,5	0,26	5,00	11,40
WTG 15			50	18,79	82,6	0,37	4,70	13,00
WTG 15			63	11,88	83,9	0,57	4,30	16,60
WTG 15			80	7,02	86,7	0,83	3,70	19,70
WTG 15			100	5,65	91,4	1,30	3,00	21,20
WTG 15			125	0,27	89,9	1,98	1,80	20,20
WTG 15			160	-4,92	91,2	2,97	0,00	21,20
WTG 15			200	-10,93	92,8	4,28	0,00	25,00
WTG 16	4.709	4.711						
WTG 16			20	29,54	64,5	0,00	5,60	6,60
WTG 16			25	25,64	68,5	0,09	5,40	8,40
WTG 16			32	23,20	74,0	0,14	5,20	10,80
WTG 16			40	21,00	77,5	0,24	5,00	11,40
WTG 16			50	19,71	82,6	0,33	4,70	13,00
WTG 16			63	12,82	83,9	0,52	4,30	16,60
WTG 16			80	7,98	86,7	0,75	3,70	19,70
WTG 16			100	6,66	91,4	1,18	3,00	21,20
WTG 16			125	1,35	89,9	1,79	1,80	20,20
WTG 16			160	-3,75	91,2	2,69	0,00	21,20
WTG 16			200	-9,63	92,8	3,86	0,00	25,00
WTG 17	5.701	5.703						
WTG 17			20	27,88	64,5	0,00	5,60	6,60
WTG 17			25	23,96	68,5	0,11	5,40	8,40
WTG 17			32	21,51	74,0	0,17	5,20	10,80
WTG 17			40	19,29	77,5	0,29	5,00	11,40
WTG 17			50	17,98	82,6	0,40	4,70	13,00
WTG 17			63	11,05	83,9	0,63	4,30	16,60
WTG 17			80	6,17	86,7	0,91	3,70	19,70
WTG 17			100	4,75	91,4	1,43	3,00	21,20
WTG 17			125	-0,69	89,9	2,17	1,80	20,20
WTG 17			160	-5,97	91,2	3,25	0,00	21,20
WTG 17			200	-12,10	92,8	4,68	0,00	25,00
WTG 18	5.572	5.575						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 18			20	28,08	64,5	0,00	5,60	6,60
WTG 18			25	24,16	68,5	0,11	5,40	8,40
WTG 18			32	21,71	74,0	0,17	5,20	10,80
WTG 18			40	19,50	77,5	0,28	5,00	11,40
WTG 18			50	18,19	82,6	0,39	4,70	13,00
WTG 18			63	11,26	83,9	0,61	4,30	16,60
WTG 18			80	6,38	86,7	0,89	3,70	19,70
WTG 18			100	4,98	91,4	1,39	3,00	21,20
WTG 18			125	-0,44	89,9	2,12	1,80	20,20
WTG 18			160	-5,70	91,2	3,18	0,00	21,20
WTG 18			200	-11,80	92,8	4,57	0,00	25,00
WTG 19	6.038	6.039						
WTG 19			20	27,38	64,5	0,00	5,60	6,60
WTG 19			25	23,46	68,5	0,12	5,40	8,40
WTG 19			32	21,00	74,0	0,18	5,20	10,80
WTG 19			40	18,78	77,5	0,30	5,00	11,40
WTG 19			50	17,46	82,6	0,42	4,70	13,00
WTG 19			63	10,52	83,9	0,66	4,30	16,60
WTG 19			80	5,61	86,7	0,97	3,70	19,70
WTG 19			100	4,17	91,4	1,51	3,00	21,20
WTG 19			125	-1,31	89,9	2,29	1,80	20,20
WTG 19			160	-6,66	91,2	3,44	0,00	21,20
WTG 19			200	-12,87	92,8	4,95	0,00	25,00
Sum								
Sum			20	45,01				
Sum			25	41,14				
Sum			32	38,71				
Sum			40	36,55				
Sum			50	35,29				
Sum			63	28,47				
Sum			80	23,72				
Sum			100	22,55				
Sum			125	17,46				
Sum			160	12,70				
Sum			200	7,28				

Noise sensitive area: Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.023	5.031						
WTG 03			20	28,97	64,5	0,00	5,60	6,60
WTG 03			25	25,07	68,5	0,10	5,40	8,40
WTG 03			32	22,62	74,0	0,15	5,20	10,80
WTG 03			40	20,42	77,5	0,25	5,00	11,40
WTG 03			50	19,11	82,6	0,35	4,70	13,00
WTG 03			63	12,21	83,9	0,55	4,30	16,60
WTG 03			80	7,36	86,7	0,80	3,70	19,70
WTG 03			100	6,01	91,4	1,26	3,00	21,20
WTG 03			125	0,65	89,9	1,91	1,80	20,20
WTG 03			160	-4,50	91,2	2,87	0,00	21,20
WTG 03			200	-10,46	92,8	4,13	0,00	25,00
WTG 04	4.871	4.879						
WTG 04			20	29,23	64,5	0,00	5,60	6,60
WTG 04			25	25,34	68,5	0,10	5,40	8,40
WTG 04			32	22,89	74,0	0,15	5,20	10,80
WTG 04			40	20,69	77,5	0,24	5,00	11,40
WTG 04			50	19,39	82,6	0,34	4,70	13,00
WTG 04			63	12,50	83,9	0,54	4,30	16,60
WTG 04			80	7,65	86,7	0,78	3,70	19,70
WTG 04			100	6,31	91,4	1,22	3,00	21,20
WTG 04			125	0,98	89,9	1,85	1,80	20,20
WTG 04			160	-4,15	91,2	2,78	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 04			200	-10,07	92,8	4,00	0,00	25,00
WTG 05	4.685	4.695						
WTG 05			20	29,57	64,5	0,00	5,60	6,60
WTG 05			25	25,67	68,5	0,09	5,40	8,40
WTG 05			32	23,23	74,0	0,14	5,20	10,80
WTG 05			40	21,03	77,5	0,23	5,00	11,40
WTG 05			50	19,74	82,6	0,33	4,70	13,00
WTG 05			63	12,85	83,9	0,52	4,30	16,60
WTG 05			80	8,02	86,7	0,75	3,70	19,70
WTG 05			100	6,69	91,4	1,17	3,00	21,20
WTG 05			125	1,38	89,9	1,78	1,80	20,20
WTG 05			160	-3,71	91,2	2,68	0,00	21,20
WTG 05			200	-9,58	92,8	3,85	0,00	25,00
WTG 06	4.405	4.414						
WTG 06			20	30,10	64,5	0,00	5,60	6,60
WTG 06			25	26,21	68,5	0,09	5,40	8,40
WTG 06			32	23,77	74,0	0,13	5,20	10,80
WTG 06			40	21,58	77,5	0,22	5,00	11,40
WTG 06			50	20,29	82,6	0,31	4,70	13,00
WTG 06			63	13,42	83,9	0,49	4,30	16,60
WTG 06			80	8,60	86,7	0,71	3,70	19,70
WTG 06			100	7,30	91,4	1,10	3,00	21,20
WTG 06			125	2,03	89,9	1,68	1,80	20,20
WTG 06			160	-3,01	91,2	2,52	0,00	21,20
WTG 06			200	-8,82	92,8	3,62	0,00	25,00
WTG 07	4.832	4.839						
WTG 07			20	29,31	64,5	0,00	5,60	6,60
WTG 07			25	25,41	68,5	0,10	5,40	8,40
WTG 07			32	22,96	74,0	0,15	5,20	10,80
WTG 07			40	20,76	77,5	0,24	5,00	11,40
WTG 07			50	19,47	82,6	0,34	4,70	13,00
WTG 07			63	12,57	83,9	0,53	4,30	16,60
WTG 07			80	7,73	86,7	0,77	3,70	19,70
WTG 07			100	6,40	91,4	1,21	3,00	21,20
WTG 07			125	1,07	89,9	1,84	1,80	20,20
WTG 07			160	-4,05	91,2	2,76	0,00	21,20
WTG 07			200	-9,96	92,8	3,97	0,00	25,00
WTG 08	4.153	4.164						
WTG 08			20	30,61	64,5	0,00	5,60	6,60
WTG 08			25	26,73	68,5	0,08	5,40	8,40
WTG 08			32	24,29	74,0	0,12	5,20	10,80
WTG 08			40	22,10	77,5	0,21	5,00	11,40
WTG 08			50	20,82	82,6	0,29	4,70	13,00
WTG 08			63	13,95	83,9	0,46	4,30	16,60
WTG 08			80	9,14	86,7	0,67	3,70	19,70
WTG 08			100	7,87	91,4	1,04	3,00	21,20
WTG 08			125	2,63	89,9	1,58	1,80	20,20
WTG 08			160	-2,36	91,2	2,37	0,00	21,20
WTG 08			200	-8,10	92,8	3,41	0,00	25,00
WTG 09	4.919	4.925						
WTG 09			20	29,15	64,5	0,00	5,60	6,60
WTG 09			25	25,25	68,5	0,10	5,40	8,40
WTG 09			32	22,80	74,0	0,15	5,20	10,80
WTG 09			40	20,60	77,5	0,25	5,00	11,40
WTG 09			50	19,31	82,6	0,34	4,70	13,00
WTG 09			63	12,41	83,9	0,54	4,30	16,60
WTG 09			80	7,56	86,7	0,79	3,70	19,70
WTG 09			100	6,22	91,4	1,23	3,00	21,20
WTG 09			125	0,88	89,9	1,87	1,80	20,20
WTG 09			160	-4,26	91,2	2,81	0,00	21,20
WTG 09			200	-10,19	92,8	4,04	0,00	25,00
WTG 10	4.437	4.444						
WTG 10			20	30,04	64,5	0,00	5,60	6,60
WTG 10			25	26,15	68,5	0,09	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 10			32	23,71	74,0	0,13	5,20	10,80
WTG 10			40	21,52	77,5	0,22	5,00	11,40
WTG 10			50	20,23	82,6	0,31	4,70	13,00
WTG 10			63	13,35	83,9	0,49	4,30	16,60
WTG 10			80	8,53	86,7	0,71	3,70	19,70
WTG 10			100	7,23	91,4	1,11	3,00	21,20
WTG 10			125	1,95	89,9	1,69	1,80	20,20
WTG 10			160	-3,09	91,2	2,53	0,00	21,20
WTG 10			200	-8,90	92,8	3,64	0,00	25,00
WTG 11	3.876	3.886						
WTG 11			20	31,21	64,5	0,00	5,60	6,60
WTG 11			25	27,33	68,5	0,08	5,40	8,40
WTG 11			32	24,89	74,0	0,12	5,20	10,80
WTG 11			40	22,72	77,5	0,19	5,00	11,40
WTG 11			50	21,44	82,6	0,27	4,70	13,00
WTG 11			63	14,58	83,9	0,43	4,30	16,60
WTG 11			80	9,79	86,7	0,62	3,70	19,70
WTG 11			100	8,54	91,4	0,97	3,00	21,20
WTG 11			125	3,33	89,9	1,48	1,80	20,20
WTG 11			160	-1,61	91,2	2,22	0,00	21,20
WTG 11			200	-7,28	92,8	3,19	0,00	25,00
WTG 12	4.850	4.856						
WTG 12			20	29,27	64,5	0,00	5,60	6,60
WTG 12			25	25,38	68,5	0,10	5,40	8,40
WTG 12			32	22,93	74,0	0,15	5,20	10,80
WTG 12			40	20,73	77,5	0,24	5,00	11,40
WTG 12			50	19,43	82,6	0,34	4,70	13,00
WTG 12			63	12,54	83,9	0,53	4,30	16,60
WTG 12			80	7,70	86,7	0,78	3,70	19,70
WTG 12			100	6,36	91,4	1,21	3,00	21,20
WTG 12			125	1,03	89,9	1,85	1,80	20,20
WTG 12			160	-4,09	91,2	2,77	0,00	21,20
WTG 12			200	-10,01	92,8	3,98	0,00	25,00
WTG 13	3.456	3.465						
WTG 13			20	32,21	64,5	0,00	5,60	6,60
WTG 13			25	28,34	68,5	0,07	5,40	8,40
WTG 13			32	25,90	74,0	0,10	5,20	10,80
WTG 13			40	23,73	77,5	0,17	5,00	11,40
WTG 13			50	22,46	82,6	0,24	4,70	13,00
WTG 13			63	15,62	83,9	0,38	4,30	16,60
WTG 13			80	10,85	86,7	0,55	3,70	19,70
WTG 13			100	9,64	91,4	0,87	3,00	21,20
WTG 13			125	4,49	89,9	1,32	1,80	20,20
WTG 13			160	-0,37	91,2	1,98	0,00	21,20
WTG 13			200	-5,94	92,8	2,84	0,00	25,00
WTG 14	4.588	4.594						
WTG 14			20	29,76	64,5	0,00	5,60	6,60
WTG 14			25	25,86	68,5	0,09	5,40	8,40
WTG 14			32	23,42	74,0	0,14	5,20	10,80
WTG 14			40	21,23	77,5	0,23	5,00	11,40
WTG 14			50	19,93	82,6	0,32	4,70	13,00
WTG 14			63	13,05	83,9	0,51	4,30	16,60
WTG 14			80	8,22	86,7	0,74	3,70	19,70
WTG 14			100	6,91	91,4	1,15	3,00	21,20
WTG 14			125	1,61	89,9	1,75	1,80	20,20
WTG 14			160	-3,46	91,2	2,62	0,00	21,20
WTG 14			200	-9,31	92,8	3,77	0,00	25,00
WTG 15	3.653	3.662						
WTG 15			20	31,73	64,5	0,00	5,60	6,60
WTG 15			25	27,85	68,5	0,07	5,40	8,40
WTG 15			32	25,42	74,0	0,11	5,20	10,80
WTG 15			40	23,24	77,5	0,18	5,00	11,40
WTG 15			50	21,97	82,6	0,26	4,70	13,00
WTG 15			63	15,12	83,9	0,40	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 15			80	10,34	86,7	0,59	3,70	19,70
WTG 15			100	9,11	91,4	0,92	3,00	21,20
WTG 15			125	3,94	89,9	1,39	1,80	20,20
WTG 15			160	-0,96	91,2	2,09	0,00	21,20
WTG 15			200	-6,58	92,8	3,00	0,00	25,00
WTG 16	2.981	2.990						
WTG 16			20	33,49	64,5	0,00	5,60	6,60
WTG 16			25	29,63	68,5	0,06	5,40	8,40
WTG 16			32	27,20	74,0	0,09	5,20	10,80
WTG 16			40	25,04	77,5	0,15	5,00	11,40
WTG 16			50	23,78	82,6	0,21	4,70	13,00
WTG 16			63	16,96	83,9	0,33	4,30	16,60
WTG 16			80	12,21	86,7	0,48	3,70	19,70
WTG 16			100	11,04	91,4	0,75	3,00	21,20
WTG 16			125	5,95	89,9	1,14	1,80	20,20
WTG 16			160	1,18	91,2	1,70	0,00	21,20
WTG 16			200	-4,26	92,8	2,45	0,00	25,00
WTG 17	4.768	4.774						
WTG 17			20	29,42	64,5	0,00	5,60	6,60
WTG 17			25	25,53	68,5	0,10	5,40	8,40
WTG 17			32	23,08	74,0	0,14	5,20	10,80
WTG 17			40	20,88	77,5	0,24	5,00	11,40
WTG 17			50	19,59	82,6	0,33	4,70	13,00
WTG 17			63	12,70	83,9	0,53	4,30	16,60
WTG 17			80	7,86	86,7	0,76	3,70	19,70
WTG 17			100	6,53	91,4	1,19	3,00	21,20
WTG 17			125	1,21	89,9	1,81	1,80	20,20
WTG 17			160	-3,90	91,2	2,72	0,00	21,20
WTG 17			200	-9,79	92,8	3,91	0,00	25,00
WTG 18	3.241	3.250						
WTG 18			20	32,76	64,5	0,00	5,60	6,60
WTG 18			25	28,90	68,5	0,06	5,40	8,40
WTG 18			32	26,47	74,0	0,10	5,20	10,80
WTG 18			40	24,30	77,5	0,16	5,00	11,40
WTG 18			50	23,04	82,6	0,23	4,70	13,00
WTG 18			63	16,21	83,9	0,36	4,30	16,60
WTG 18			80	11,44	86,7	0,52	3,70	19,70
WTG 18			100	10,25	91,4	0,81	3,00	21,20
WTG 18			125	5,13	89,9	1,23	1,80	20,20
WTG 18			160	0,31	91,2	1,85	0,00	21,20
WTG 18			200	-5,20	92,8	2,66	0,00	25,00
WTG 19	4.577	4.582						
WTG 19			20	29,78	64,5	0,00	5,60	6,60
WTG 19			25	25,89	68,5	0,09	5,40	8,40
WTG 19			32	23,44	74,0	0,14	5,20	10,80
WTG 19			40	21,25	77,5	0,23	5,00	11,40
WTG 19			50	19,96	82,6	0,32	4,70	13,00
WTG 19			63	13,07	83,9	0,50	4,30	16,60
WTG 19			80	8,24	86,7	0,73	3,70	19,70
WTG 19			100	6,93	91,4	1,15	3,00	21,20
WTG 19			125	1,64	89,9	1,74	1,80	20,20
WTG 19			160	-3,43	91,2	2,61	0,00	21,20
WTG 19			200	-9,28	92,8	3,76	0,00	25,00
Sum								
Sum			20	42,92				
Sum			25	39,04				
Sum			32	36,60				
Sum			40	34,42				
Sum			50	33,14				
Sum			63	26,27				
Sum			80	21,47				
Sum			100	20,20				
Sum			125	14,97				
Sum			160	10,00				
Sum			200	4,30				

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency
Noise sensitive area: Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)
Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.062	5.070						
WTG 03			20	28,90	64,5	0,00	5,60	6,60
WTG 03			25	25,00	68,5	0,10	5,40	8,40
WTG 03			32	22,55	74,0	0,15	5,20	10,80
WTG 03			40	20,35	77,5	0,25	5,00	11,40
WTG 03			50	19,05	82,6	0,35	4,70	13,00
WTG 03			63	12,14	83,9	0,56	4,30	16,60
WTG 03			80	7,29	86,7	0,81	3,70	19,70
WTG 03			100	5,93	91,4	1,27	3,00	21,20
WTG 03			125	0,57	89,9	1,93	1,80	20,20
WTG 03			160	-4,59	91,2	2,89	0,00	21,20
WTG 03			200	-10,56	92,8	4,16	0,00	25,00
WTG 04	4.924	4.932						
WTG 04			20	29,14	64,5	0,00	5,60	6,60
WTG 04			25	25,24	68,5	0,10	5,40	8,40
WTG 04			32	22,79	74,0	0,15	5,20	10,80
WTG 04			40	20,59	77,5	0,25	5,00	11,40
WTG 04			50	19,29	82,6	0,35	4,70	13,00
WTG 04			63	12,40	83,9	0,54	4,30	16,60
WTG 04			80	7,55	86,7	0,79	3,70	19,70
WTG 04			100	6,21	91,4	1,23	3,00	21,20
WTG 04			125	0,86	89,9	1,87	1,80	20,20
WTG 04			160	-4,27	91,2	2,81	0,00	21,20
WTG 04			200	-10,21	92,8	4,04	0,00	25,00
WTG 05	4.716	4.726						
WTG 05			20	29,51	64,5	0,00	5,60	6,60
WTG 05			25	25,62	68,5	0,09	5,40	8,40
WTG 05			32	23,17	74,0	0,14	5,20	10,80
WTG 05			40	20,97	77,5	0,24	5,00	11,40
WTG 05			50	19,68	82,6	0,33	4,70	13,00
WTG 05			63	12,79	83,9	0,52	4,30	16,60
WTG 05			80	7,95	86,7	0,76	3,70	19,70
WTG 05			100	6,63	91,4	1,18	3,00	21,20
WTG 05			125	1,32	89,9	1,80	1,80	20,20
WTG 05			160	-3,78	91,2	2,69	0,00	21,20
WTG 05			200	-9,66	92,8	3,87	0,00	25,00
WTG 06	4.449	4.458						
WTG 06			20	30,02	64,5	0,00	5,60	6,60
WTG 06			25	26,13	68,5	0,09	5,40	8,40
WTG 06			32	23,68	74,0	0,13	5,20	10,80
WTG 06			40	21,49	77,5	0,22	5,00	11,40
WTG 06			50	20,21	82,6	0,31	4,70	13,00
WTG 06			63	13,33	83,9	0,49	4,30	16,60
WTG 06			80	8,50	86,7	0,71	3,70	19,70
WTG 06			100	7,20	91,4	1,11	3,00	21,20
WTG 06			125	1,92	89,9	1,69	1,80	20,20
WTG 06			160	-3,12	91,2	2,54	0,00	21,20
WTG 06			200	-8,94	92,8	3,66	0,00	25,00
WTG 07	4.849	4.856						
WTG 07			20	29,27	64,5	0,00	5,60	6,60
WTG 07			25	25,38	68,5	0,10	5,40	8,40
WTG 07			32	22,93	74,0	0,15	5,20	10,80
WTG 07			40	20,73	77,5	0,24	5,00	11,40
WTG 07			50	19,43	82,6	0,34	4,70	13,00
WTG 07			63	12,54	83,9	0,53	4,30	16,60
WTG 07			80	7,70	86,7	0,78	3,70	19,70
WTG 07			100	6,36	91,4	1,21	3,00	21,20
WTG 07			125	1,03	89,9	1,85	1,80	20,20
WTG 07			160	-4,09	91,2	2,77	0,00	21,20
WTG 07			200	-10,01	92,8	3,98	0,00	25,00
WTG 08	4.183	4.193						
WTG 08			20	30,55	64,5	0,00	5,60	6,60
WTG 08			25	26,67	68,5	0,08	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 08			32	24,22	74,0	0,13	5,20	10,80
WTG 08			40	22,04	77,5	0,21	5,00	11,40
WTG 08			50	20,76	82,6	0,29	4,70	13,00
WTG 08			63	13,89	83,9	0,46	4,30	16,60
WTG 08			80	9,08	86,7	0,67	3,70	19,70
WTG 08			100	7,80	91,4	1,05	3,00	21,20
WTG 08			125	2,56	89,9	1,59	1,80	20,20
WTG 08			160	-2,44	91,2	2,39	0,00	21,20
WTG 08			200	-8,19	92,8	3,44	0,00	25,00
WTG 09	4.923	4.929						
WTG 09			20	29,15	64,5	0,00	5,60	6,60
WTG 09			25	25,25	68,5	0,10	5,40	8,40
WTG 09			32	22,80	74,0	0,15	5,20	10,80
WTG 09			40	20,60	77,5	0,25	5,00	11,40
WTG 09			50	19,30	82,6	0,35	4,70	13,00
WTG 09			63	12,40	83,9	0,54	4,30	16,60
WTG 09			80	7,56	86,7	0,79	3,70	19,70
WTG 09			100	6,21	91,4	1,23	3,00	21,20
WTG 09			125	0,87	89,9	1,87	1,80	20,20
WTG 09			160	-4,26	91,2	2,81	0,00	21,20
WTG 09			200	-10,20	92,8	4,04	0,00	25,00
WTG 10	4.443	4.450						
WTG 10			20	30,03	64,5	0,00	5,60	6,60
WTG 10			25	26,14	68,5	0,09	5,40	8,40
WTG 10			32	23,70	74,0	0,13	5,20	10,80
WTG 10			40	21,51	77,5	0,22	5,00	11,40
WTG 10			50	20,22	82,6	0,31	4,70	13,00
WTG 10			63	13,34	83,9	0,49	4,30	16,60
WTG 10			80	8,52	86,7	0,71	3,70	19,70
WTG 10			100	7,22	91,4	1,11	3,00	21,20
WTG 10			125	1,94	89,9	1,69	1,80	20,20
WTG 10			160	-3,10	91,2	2,54	0,00	21,20
WTG 10			200	-8,92	92,8	3,65	0,00	25,00
WTG 11	3.892	3.902						
WTG 11			20	31,17	64,5	0,00	5,60	6,60
WTG 11			25	27,30	68,5	0,08	5,40	8,40
WTG 11			32	24,86	74,0	0,12	5,20	10,80
WTG 11			40	22,68	77,5	0,20	5,00	11,40
WTG 11			50	21,40	82,6	0,27	4,70	13,00
WTG 11			63	14,54	83,9	0,43	4,30	16,60
WTG 11			80	9,75	86,7	0,62	3,70	19,70
WTG 11			100	8,50	91,4	0,98	3,00	21,20
WTG 11			125	3,29	89,9	1,48	1,80	20,20
WTG 11			160	-1,65	91,2	2,22	0,00	21,20
WTG 11			200	-7,33	92,8	3,20	0,00	25,00
WTG 12	4.841	4.847						
WTG 12			20	29,29	64,5	0,00	5,60	6,60
WTG 12			25	25,39	68,5	0,10	5,40	8,40
WTG 12			32	22,94	74,0	0,15	5,20	10,80
WTG 12			40	20,75	77,5	0,24	5,00	11,40
WTG 12			50	19,45	82,6	0,34	4,70	13,00
WTG 12			63	12,56	83,9	0,53	4,30	16,60
WTG 12			80	7,71	86,7	0,78	3,70	19,70
WTG 12			100	6,38	91,4	1,21	3,00	21,20
WTG 12			125	1,05	89,9	1,84	1,80	20,20
WTG 12			160	-4,07	91,2	2,76	0,00	21,20
WTG 12			200	-9,98	92,8	3,97	0,00	25,00
WTG 13	3.452	3.461						
WTG 13			20	32,22	64,5	0,00	5,60	6,60
WTG 13			25	28,35	68,5	0,07	5,40	8,40
WTG 13			32	25,91	74,0	0,10	5,20	10,80
WTG 13			40	23,74	77,5	0,17	5,00	11,40
WTG 13			50	22,47	82,6	0,24	4,70	13,00
WTG 13			63	15,64	83,9	0,38	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 13			80	10,86	86,7	0,55	3,70	19,70
WTG 13			100	9,65	91,4	0,87	3,00	21,20
WTG 13			125	4,50	89,9	1,32	1,80	20,20
WTG 13			160	-0,36	91,2	1,97	0,00	21,20
WTG 13			200	-5,92	92,8	2,84	0,00	25,00
WTG 14	4.558	4.565						
WTG 14			20	29,81	64,5	0,00	5,60	6,60
WTG 14			25	25,92	68,5	0,09	5,40	8,40
WTG 14			32	23,48	74,0	0,14	5,20	10,80
WTG 14			40	21,28	77,5	0,23	5,00	11,40
WTG 14			50	19,99	82,6	0,32	4,70	13,00
WTG 14			63	13,11	83,9	0,50	4,30	16,60
WTG 14			80	8,28	86,7	0,73	3,70	19,70
WTG 14			100	6,97	91,4	1,14	3,00	21,20
WTG 14			125	1,68	89,9	1,73	1,80	20,20
WTG 14			160	-3,39	91,2	2,60	0,00	21,20
WTG 14			200	-9,23	92,8	3,74	0,00	25,00
WTG 15	3.614	3.623						
WTG 15			20	31,82	64,5	0,00	5,60	6,60
WTG 15			25	27,95	68,5	0,07	5,40	8,40
WTG 15			32	25,51	74,0	0,11	5,20	10,80
WTG 15			40	23,34	77,5	0,18	5,00	11,40
WTG 15			50	22,07	82,6	0,25	4,70	13,00
WTG 15			63	15,22	83,9	0,40	4,30	16,60
WTG 15			80	10,44	86,7	0,58	3,70	19,70
WTG 15			100	9,21	91,4	0,91	3,00	21,20
WTG 15			125	4,04	89,9	1,38	1,80	20,20
WTG 15			160	-0,85	91,2	2,07	0,00	21,20
WTG 15			200	-6,45	92,8	2,97	0,00	25,00
WTG 16	2.963	2.972						
WTG 16			20	33,54	64,5	0,00	5,60	6,60
WTG 16			25	29,68	68,5	0,06	5,40	8,40
WTG 16			32	27,25	74,0	0,09	5,20	10,80
WTG 16			40	25,09	77,5	0,15	5,00	11,40
WTG 16			50	23,83	82,6	0,21	4,70	13,00
WTG 16			63	17,01	83,9	0,33	4,30	16,60
WTG 16			80	12,26	86,7	0,48	3,70	19,70
WTG 16			100	11,10	91,4	0,74	3,00	21,20
WTG 16			125	6,01	89,9	1,13	1,80	20,20
WTG 16			160	1,24	91,2	1,69	0,00	21,20
WTG 16			200	-4,20	92,8	2,44	0,00	25,00
WTG 17	4.721	4.727						
WTG 17			20	29,51	64,5	0,00	5,60	6,60
WTG 17			25	25,61	68,5	0,09	5,40	8,40
WTG 17			32	23,17	74,0	0,14	5,20	10,80
WTG 17			40	20,97	77,5	0,24	5,00	11,40
WTG 17			50	19,68	82,6	0,33	4,70	13,00
WTG 17			63	12,79	83,9	0,52	4,30	16,60
WTG 17			80	7,95	86,7	0,76	3,70	19,70
WTG 17			100	6,63	91,4	1,18	3,00	21,20
WTG 17			125	1,31	89,9	1,80	1,80	20,20
WTG 17			160	-3,79	91,2	2,69	0,00	21,20
WTG 17			200	-9,67	92,8	3,88	0,00	25,00
WTG 18	3.190	3.198						
WTG 18			20	32,90	64,5	0,00	5,60	6,60
WTG 18			25	29,04	68,5	0,06	5,40	8,40
WTG 18			32	26,61	74,0	0,10	5,20	10,80
WTG 18			40	24,44	77,5	0,16	5,00	11,40
WTG 18			50	23,18	82,6	0,22	4,70	13,00
WTG 18			63	16,35	83,9	0,35	4,30	16,60
WTG 18			80	11,59	86,7	0,51	3,70	19,70
WTG 18			100	10,40	91,4	0,80	3,00	21,20
WTG 18			125	5,29	89,9	1,22	1,80	20,20
WTG 18			160	0,48	91,2	1,82	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 18			200	-5,02	92,8	2,62	0,00	25,00
WTG 19	4.520	4.526						
WTG 19			20	29,89	64,5	0,00	5,60	6,60
WTG 19			25	26,00	68,5	0,09	5,40	8,40
WTG 19			32	23,55	74,0	0,14	5,20	10,80
WTG 19			40	21,36	77,5	0,23	5,00	11,40
WTG 19			50	20,07	82,6	0,32	4,70	13,00
WTG 19			63	13,19	83,9	0,50	4,30	16,60
WTG 19			80	8,36	86,7	0,72	3,70	19,70
WTG 19			100	7,06	91,4	1,13	3,00	21,20
WTG 19			125	1,77	89,9	1,72	1,80	20,20
WTG 19			160	-3,29	91,2	2,58	0,00	21,20
WTG 19			200	-9,12	92,8	3,71	0,00	25,00
Sum								
Sum			20	42,94				
Sum			25	39,06				
Sum			32	36,62				
Sum			40	34,44				
Sum			50	33,15				
Sum			63	26,29				
Sum			80	21,49				
Sum			100	20,22				
Sum			125	14,99				
Sum			160	10,03				
Sum			200	4,32				

Noise sensitive area: Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.348	5.355						
WTG 03			20	28,42	64,5	0,00	5,60	6,60
WTG 03			25	24,52	68,5	0,11	5,40	8,40
WTG 03			32	22,06	74,0	0,16	5,20	10,80
WTG 03			40	19,86	77,5	0,27	5,00	11,40
WTG 03			50	18,55	82,6	0,37	4,70	13,00
WTG 03			63	11,64	83,9	0,59	4,30	16,60
WTG 03			80	6,77	86,7	0,86	3,70	19,70
WTG 03			100	5,39	91,4	1,34	3,00	21,20
WTG 03			125	-0,01	89,9	2,03	1,80	20,20
WTG 03			160	-5,23	91,2	3,05	0,00	21,20
WTG 03			200	-11,27	92,8	4,39	0,00	25,00
WTG 04	5.244	5.251						
WTG 04			20	28,59	64,5	0,00	5,60	6,60
WTG 04			25	24,69	68,5	0,11	5,40	8,40
WTG 04			32	22,24	74,0	0,16	5,20	10,80
WTG 04			40	20,03	77,5	0,26	5,00	11,40
WTG 04			50	18,73	82,6	0,37	4,70	13,00
WTG 04			63	11,82	83,9	0,58	4,30	16,60
WTG 04			80	6,95	86,7	0,84	3,70	19,70
WTG 04			100	5,58	91,4	1,31	3,00	21,20
WTG 04			125	0,20	89,9	2,00	1,80	20,20
WTG 04			160	-5,00	91,2	2,99	0,00	21,20
WTG 04			200	-11,01	92,8	4,31	0,00	25,00
WTG 05	4.985	4.994						
WTG 05			20	29,03	64,5	0,00	5,60	6,60
WTG 05			25	25,13	68,5	0,10	5,40	8,40
WTG 05			32	22,68	74,0	0,15	5,20	10,80
WTG 05			40	20,48	77,5	0,25	5,00	11,40
WTG 05			50	19,18	82,6	0,35	4,70	13,00
WTG 05			63	12,28	83,9	0,55	4,30	16,60
WTG 05			80	7,43	86,7	0,80	3,70	19,70
WTG 05			100	6,08	91,4	1,25	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 05			125	0,73	89,9	1,90	1,80	20,20
WTG 05			160	-4,42	91,2	2,85	0,00	21,20
WTG 05			200	-10,36	92,8	4,10	0,00	25,00
WTG 06	4.749	4.757						
WTG 06			20	29,45	64,5	0,00	5,60	6,60
WTG 06			25	25,56	68,5	0,10	5,40	8,40
WTG 06			32	23,11	74,0	0,14	5,20	10,80
WTG 06			40	20,92	77,5	0,24	5,00	11,40
WTG 06			50	19,62	82,6	0,33	4,70	13,00
WTG 06			63	12,73	83,9	0,52	4,30	16,60
WTG 06			80	7,89	86,7	0,76	3,70	19,70
WTG 06			100	6,56	91,4	1,19	3,00	21,20
WTG 06			125	1,25	89,9	1,81	1,80	20,20
WTG 06			160	-3,86	91,2	2,71	0,00	21,20
WTG 06			200	-9,75	92,8	3,90	0,00	25,00
WTG 07	5.083	5.090						
WTG 07			20	28,87	64,5	0,00	5,60	6,60
WTG 07			25	24,96	68,5	0,10	5,40	8,40
WTG 07			32	22,51	74,0	0,15	5,20	10,80
WTG 07			40	20,31	77,5	0,25	5,00	11,40
WTG 07			50	19,01	82,6	0,36	4,70	13,00
WTG 07			63	12,11	83,9	0,56	4,30	16,60
WTG 07			80	7,25	86,7	0,81	3,70	19,70
WTG 07			100	5,89	91,4	1,27	3,00	21,20
WTG 07			125	0,53	89,9	1,93	1,80	20,20
WTG 07			160	-4,64	91,2	2,90	0,00	21,20
WTG 07			200	-10,61	92,8	4,17	0,00	25,00
WTG 08	4.449	4.459						
WTG 08			20	30,02	64,5	0,00	5,60	6,60
WTG 08			25	26,13	68,5	0,09	5,40	8,40
WTG 08			32	23,68	74,0	0,13	5,20	10,80
WTG 08			40	21,49	77,5	0,22	5,00	11,40
WTG 08			50	20,20	82,6	0,31	4,70	13,00
WTG 08			63	13,32	83,9	0,49	4,30	16,60
WTG 08			80	8,50	86,7	0,71	3,70	19,70
WTG 08			100	7,20	91,4	1,11	3,00	21,20
WTG 08			125	1,92	89,9	1,69	1,80	20,20
WTG 08			160	-3,13	91,2	2,54	0,00	21,20
WTG 08			200	-8,94	92,8	3,66	0,00	25,00
WTG 09	5.119	5.125						
WTG 09			20	28,81	64,5	0,00	5,60	6,60
WTG 09			25	24,90	68,5	0,10	5,40	8,40
WTG 09			32	22,45	74,0	0,15	5,20	10,80
WTG 09			40	20,25	77,5	0,26	5,00	11,40
WTG 09			50	18,95	82,6	0,36	4,70	13,00
WTG 09			63	12,04	83,9	0,56	4,30	16,60
WTG 09			80	7,19	86,7	0,82	3,70	19,70
WTG 09			100	5,83	91,4	1,28	3,00	21,20
WTG 09			125	0,46	89,9	1,95	1,80	20,20
WTG 09			160	-4,71	91,2	2,92	0,00	21,20
WTG 09			200	-10,70	92,8	4,20	0,00	25,00
WTG 10	4.648	4.655						
WTG 10			20	29,64	64,5	0,00	5,60	6,60
WTG 10			25	25,75	68,5	0,09	5,40	8,40
WTG 10			32	23,30	74,0	0,14	5,20	10,80
WTG 10			40	21,11	77,5	0,23	5,00	11,40
WTG 10			50	19,82	82,6	0,33	4,70	13,00
WTG 10			63	12,93	83,9	0,51	4,30	16,60
WTG 10			80	8,10	86,7	0,74	3,70	19,70
WTG 10			100	6,78	91,4	1,16	3,00	21,20
WTG 10			125	1,47	89,9	1,77	1,80	20,20
WTG 10			160	-3,61	91,2	2,65	0,00	21,20
WTG 10			200	-9,48	92,8	3,82	0,00	25,00
WTG 11	4.127	4.137						

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 11			20	30,67	64,5	0,00	5,60	6,60
WTG 11			25	26,78	68,5	0,08	5,40	8,40
WTG 11			32	24,34	74,0	0,12	5,20	10,80
WTG 11			40	22,16	77,5	0,21	5,00	11,40
WTG 11			50	20,88	82,6	0,29	4,70	13,00
WTG 11			63	14,01	83,9	0,46	4,30	16,60
WTG 11			80	9,21	86,7	0,66	3,70	19,70
WTG 11			100	7,93	91,4	1,03	3,00	21,20
WTG 11			125	2,70	89,9	1,57	1,80	20,20
WTG 11			160	-2,29	91,2	2,36	0,00	21,20
WTG 11			200	-8,02	92,8	3,39	0,00	25,00
WTG 12	5.001	5.008						
WTG 12			20	29,01	64,5	0,00	5,60	6,60
WTG 12			25	25,11	68,5	0,10	5,40	8,40
WTG 12			32	22,66	74,0	0,15	5,20	10,80
WTG 12			40	20,46	77,5	0,25	5,00	11,40
WTG 12			50	19,16	82,6	0,35	4,70	13,00
WTG 12			63	12,26	83,9	0,55	4,30	16,60
WTG 12			80	7,41	86,7	0,80	3,70	19,70
WTG 12			100	6,06	91,4	1,25	3,00	21,20
WTG 12			125	0,70	89,9	1,90	1,80	20,20
WTG 12			160	-4,45	91,2	2,85	0,00	21,20
WTG 12			200	-10,40	92,8	4,11	0,00	25,00
WTG 13	3.633	3.641						
WTG 13			20	31,77	64,5	0,00	5,60	6,60
WTG 13			25	27,90	68,5	0,07	5,40	8,40
WTG 13			32	25,47	74,0	0,11	5,20	10,80
WTG 13			40	23,29	77,5	0,18	5,00	11,40
WTG 13			50	22,02	82,6	0,25	4,70	13,00
WTG 13			63	15,17	83,9	0,40	4,30	16,60
WTG 13			80	10,39	86,7	0,58	3,70	19,70
WTG 13			100	9,16	91,4	0,91	3,00	21,20
WTG 13			125	3,99	89,9	1,38	1,80	20,20
WTG 13			160	-0,90	91,2	2,08	0,00	21,20
WTG 13			200	-6,51	92,8	2,99	0,00	25,00
WTG 14	4.656	4.663						
WTG 14			20	29,63	64,5	0,00	5,60	6,60
WTG 14			25	25,73	68,5	0,09	5,40	8,40
WTG 14			32	23,29	74,0	0,14	5,20	10,80
WTG 14			40	21,09	77,5	0,23	5,00	11,40
WTG 14			50	19,80	82,6	0,33	4,70	13,00
WTG 14			63	12,91	83,9	0,51	4,30	16,60
WTG 14			80	8,08	86,7	0,75	3,70	19,70
WTG 14			100	6,76	91,4	1,17	3,00	21,20
WTG 14			125	1,46	89,9	1,77	1,80	20,20
WTG 14			160	-3,63	91,2	2,66	0,00	21,20
WTG 14			200	-9,50	92,8	3,82	0,00	25,00
WTG 15	3.687	3.696						
WTG 15			20	31,64	64,5	0,00	5,60	6,60
WTG 15			25	27,77	68,5	0,07	5,40	8,40
WTG 15			32	25,33	74,0	0,11	5,20	10,80
WTG 15			40	23,16	77,5	0,18	5,00	11,40
WTG 15			50	21,89	82,6	0,26	4,70	13,00
WTG 15			63	15,04	83,9	0,41	4,30	16,60
WTG 15			80	10,25	86,7	0,59	3,70	19,70
WTG 15			100	9,02	91,4	0,92	3,00	21,20
WTG 15			125	3,84	89,9	1,40	1,80	20,20
WTG 15			160	-1,06	91,2	2,11	0,00	21,20
WTG 15			200	-6,69	92,8	3,03	0,00	25,00
WTG 16	3.110	3.119						
WTG 16			20	33,12	64,5	0,00	5,60	6,60
WTG 16			25	29,26	68,5	0,06	5,40	8,40
WTG 16			32	26,83	74,0	0,09	5,20	10,80
WTG 16			40	24,66	77,5	0,16	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 16			50	23,40	82,6	0,22	4,70	13,00
WTG 16			63	16,58	83,9	0,34	4,30	16,60
WTG 16			80	11,82	86,7	0,50	3,70	19,70
WTG 16			100	10,64	91,4	0,78	3,00	21,20
WTG 16			125	5,54	89,9	1,19	1,80	20,20
WTG 16			160	0,74	91,2	1,78	0,00	21,20
WTG 16			200	-4,74	92,8	2,56	0,00	25,00
WTG 17	4.760	4.765						
WTG 17			20	29,44	64,5	0,00	5,60	6,60
WTG 17			25	25,54	68,5	0,10	5,40	8,40
WTG 17			32	23,10	74,0	0,14	5,20	10,80
WTG 17			40	20,90	77,5	0,24	5,00	11,40
WTG 17			50	19,60	82,6	0,33	4,70	13,00
WTG 17			63	12,71	83,9	0,52	4,30	16,60
WTG 17			80	7,88	86,7	0,76	3,70	19,70
WTG 17			100	6,55	91,4	1,19	3,00	21,20
WTG 17			125	1,23	89,9	1,81	1,80	20,20
WTG 17			160	-3,88	91,2	2,72	0,00	21,20
WTG 17			200	-9,77	92,8	3,91	0,00	25,00
WTG 18	3.223	3.232						
WTG 18			20	32,81	64,5	0,00	5,60	6,60
WTG 18			25	28,95	68,5	0,06	5,40	8,40
WTG 18			32	26,51	74,0	0,10	5,20	10,80
WTG 18			40	24,35	77,5	0,16	5,00	11,40
WTG 18			50	23,08	82,6	0,23	4,70	13,00
WTG 18			63	16,26	83,9	0,36	4,30	16,60
WTG 18			80	11,49	86,7	0,52	3,70	19,70
WTG 18			100	10,30	91,4	0,81	3,00	21,20
WTG 18			125	5,18	89,9	1,23	1,80	20,20
WTG 18			160	0,37	91,2	1,84	0,00	21,20
WTG 18			200	-5,14	92,8	2,65	0,00	25,00
WTG 19	4.523	4.529						
WTG 19			20	29,88	64,5	0,00	5,60	6,60
WTG 19			25	25,99	68,5	0,09	5,40	8,40
WTG 19			32	23,54	74,0	0,14	5,20	10,80
WTG 19			40	21,35	77,5	0,23	5,00	11,40
WTG 19			50	20,06	82,6	0,32	4,70	13,00
WTG 19			63	13,18	83,9	0,50	4,30	16,60
WTG 19			80	8,36	86,7	0,72	3,70	19,70
WTG 19			100	7,05	91,4	1,13	3,00	21,20
WTG 19			125	1,76	89,9	1,72	1,80	20,20
WTG 19			160	-3,30	91,2	2,58	0,00	21,20
WTG 19			200	-9,13	92,8	3,71	0,00	25,00
Sum								
Sum			20	42,60				
Sum			25	38,72				
Sum			32	36,28				
Sum			40	34,09				
Sum			50	32,81				
Sum			63	25,94				
Sum			80	21,13				
Sum			100	19,85				
Sum			125	14,60				
Sum			160	9,60				
Sum			200	3,86				

Noise sensitive area: Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.349	5.358						
WTG 03			20	28,42	64,5	0,00	5,60	6,60
WTG 03			25	24,51	68,5	0,11	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03			32	22,06	74,0	0,16	5,20	10,80
WTG 03			40	19,85	77,5	0,27	5,00	11,40
WTG 03			50	18,54	82,6	0,38	4,70	13,00
WTG 03			63	11,63	83,9	0,59	4,30	16,60
WTG 03			80	6,76	86,7	0,86	3,70	19,70
WTG 03			100	5,38	91,4	1,34	3,00	21,20
WTG 03			125	-0,02	89,9	2,04	1,80	20,20
WTG 03			160	-5,23	91,2	3,05	0,00	21,20
WTG 03			200	-11,27	92,8	4,39	0,00	25,00
WTG 04	5.998	6.007						
WTG 04			20	27,43	64,5	0,00	5,60	6,60
WTG 04			25	23,51	68,5	0,12	5,40	8,40
WTG 04			32	21,05	74,0	0,18	5,20	10,80
WTG 04			40	18,83	77,5	0,30	5,00	11,40
WTG 04			50	17,51	82,6	0,42	4,70	13,00
WTG 04			63	10,57	83,9	0,66	4,30	16,60
WTG 04			80	5,67	86,7	0,96	3,70	19,70
WTG 04			100	4,23	91,4	1,50	3,00	21,20
WTG 04			125	-1,26	89,9	2,28	1,80	20,20
WTG 04			160	-6,60	91,2	3,42	0,00	21,20
WTG 04			200	-12,80	92,8	4,93	0,00	25,00
WTG 05	5.058	5.069						
WTG 05			20	28,90	64,5	0,00	5,60	6,60
WTG 05			25	25,00	68,5	0,10	5,40	8,40
WTG 05			32	22,55	74,0	0,15	5,20	10,80
WTG 05			40	20,35	77,5	0,25	5,00	11,40
WTG 05			50	19,05	82,6	0,35	4,70	13,00
WTG 05			63	12,14	83,9	0,56	4,30	16,60
WTG 05			80	7,29	86,7	0,81	3,70	19,70
WTG 05			100	5,93	91,4	1,27	3,00	21,20
WTG 05			125	0,58	89,9	1,93	1,80	20,20
WTG 05			160	-4,59	91,2	2,89	0,00	21,20
WTG 05			200	-10,56	92,8	4,16	0,00	25,00
WTG 06	5.591	5.600						
WTG 06			20	28,04	64,5	0,00	5,60	6,60
WTG 06			25	24,12	68,5	0,11	5,40	8,40
WTG 06			32	21,67	74,0	0,17	5,20	10,80
WTG 06			40	19,46	77,5	0,28	5,00	11,40
WTG 06			50	18,14	82,6	0,39	4,70	13,00
WTG 06			63	11,22	83,9	0,62	4,30	16,60
WTG 06			80	6,34	86,7	0,90	3,70	19,70
WTG 06			100	4,94	91,4	1,40	3,00	21,20
WTG 06			125	-0,49	89,9	2,13	1,80	20,20
WTG 06			160	-5,76	91,2	3,19	0,00	21,20
WTG 06			200	-11,86	92,8	4,59	0,00	25,00
WTG 07	4.500	4.510						
WTG 07			20	29,92	64,5	0,00	5,60	6,60
WTG 07			25	26,03	68,5	0,09	5,40	8,40
WTG 07			32	23,58	74,0	0,14	5,20	10,80
WTG 07			40	21,39	77,5	0,23	5,00	11,40
WTG 07			50	20,10	82,6	0,32	4,70	13,00
WTG 07			63	13,22	83,9	0,50	4,30	16,60
WTG 07			80	8,40	86,7	0,72	3,70	19,70
WTG 07			100	7,09	91,4	1,13	3,00	21,20
WTG 07			125	1,80	89,9	1,71	1,80	20,20
WTG 07			160	-3,25	91,2	2,57	0,00	21,20
WTG 07			200	-9,08	92,8	3,70	0,00	25,00
WTG 08	5.103	5.113						
WTG 08			20	28,83	64,5	0,00	5,60	6,60
WTG 08			25	24,92	68,5	0,10	5,40	8,40
WTG 08			32	22,47	74,0	0,15	5,20	10,80
WTG 08			40	20,27	77,5	0,26	5,00	11,40
WTG 08			50	18,97	82,6	0,36	4,70	13,00
WTG 08			63	12,06	83,9	0,56	4,30	16,60

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 08			80	7,21	86,7	0,82	3,70	19,70
WTG 08			100	5,85	91,4	1,28	3,00	21,20
WTG 08			125	0,48	89,9	1,94	1,80	20,20
WTG 08			160	-4,69	91,2	2,91	0,00	21,20
WTG 08			200	-10,67	92,8	4,19	0,00	25,00
WTG 09	3.937	3.947						
WTG 09			20	31,07	64,5	0,00	5,60	6,60
WTG 09			25	27,20	68,5	0,08	5,40	8,40
WTG 09			32	24,76	74,0	0,12	5,20	10,80
WTG 09			40	22,58	77,5	0,20	5,00	11,40
WTG 09			50	21,30	82,6	0,28	4,70	13,00
WTG 09			63	14,44	83,9	0,43	4,30	16,60
WTG 09			80	9,64	86,7	0,63	3,70	19,70
WTG 09			100	8,39	91,4	0,99	3,00	21,20
WTG 09			125	3,17	89,9	1,50	1,80	20,20
WTG 09			160	-1,78	91,2	2,25	0,00	21,20
WTG 09			200	-7,46	92,8	3,24	0,00	25,00
WTG 10	4.222	4.233						
WTG 10			20	30,47	64,5	0,00	5,60	6,60
WTG 10			25	26,58	68,5	0,08	5,40	8,40
WTG 10			32	24,14	74,0	0,13	5,20	10,80
WTG 10			40	21,96	77,5	0,21	5,00	11,40
WTG 10			50	20,67	82,6	0,30	4,70	13,00
WTG 10			63	13,80	83,9	0,47	4,30	16,60
WTG 10			80	8,99	86,7	0,68	3,70	19,70
WTG 10			100	7,71	91,4	1,06	3,00	21,20
WTG 10			125	2,46	89,9	1,61	1,80	20,20
WTG 10			160	-2,54	91,2	2,41	0,00	21,20
WTG 10			200	-8,30	92,8	3,47	0,00	25,00
WTG 11	4.784	4.794						
WTG 11			20	29,39	64,5	0,00	5,60	6,60
WTG 11			25	25,49	68,5	0,10	5,40	8,40
WTG 11			32	23,04	74,0	0,14	5,20	10,80
WTG 11			40	20,85	77,5	0,24	5,00	11,40
WTG 11			50	19,55	82,6	0,34	4,70	13,00
WTG 11			63	12,66	83,9	0,53	4,30	16,60
WTG 11			80	7,82	86,7	0,77	3,70	19,70
WTG 11			100	6,49	91,4	1,20	3,00	21,20
WTG 11			125	1,16	89,9	1,82	1,80	20,20
WTG 11			160	-3,95	91,2	2,73	0,00	21,20
WTG 11			200	-9,85	92,8	3,93	0,00	25,00
WTG 12	3.527	3.539						
WTG 12			20	32,02	64,5	0,00	5,60	6,60
WTG 12			25	28,15	68,5	0,07	5,40	8,40
WTG 12			32	25,72	74,0	0,11	5,20	10,80
WTG 12			40	23,55	77,5	0,18	5,00	11,40
WTG 12			50	22,28	82,6	0,25	4,70	13,00
WTG 12			63	15,43	83,9	0,39	4,30	16,60
WTG 12			80	10,66	86,7	0,57	3,70	19,70
WTG 12			100	9,44	91,4	0,88	3,00	21,20
WTG 12			125	4,28	89,9	1,34	1,80	20,20
WTG 12			160	-0,59	91,2	2,02	0,00	21,20
WTG 12			200	-6,18	92,8	2,90	0,00	25,00
WTG 13	4.515	4.524						
WTG 13			20	29,89	64,5	0,00	5,60	6,60
WTG 13			25	26,00	68,5	0,09	5,40	8,40
WTG 13			32	23,55	74,0	0,14	5,20	10,80
WTG 13			40	21,36	77,5	0,23	5,00	11,40
WTG 13			50	20,07	82,6	0,32	4,70	13,00
WTG 13			63	13,19	83,9	0,50	4,30	16,60
WTG 13			80	8,37	86,7	0,72	3,70	19,70
WTG 13			100	7,06	91,4	1,13	3,00	21,20
WTG 13			125	1,77	89,9	1,72	1,80	20,20
WTG 13			160	-3,29	91,2	2,58	0,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 13			200	-9,12	92,8	3,71	0,00	25,00
WTG 14	3.125	3.138						
WTG 14			20	33,07	64,5	0,00	5,60	6,60
WTG 14			25	29,20	68,5	0,06	5,40	8,40
WTG 14			32	26,77	74,0	0,09	5,20	10,80
WTG 14			40	24,61	77,5	0,16	5,00	11,40
WTG 14			50	23,35	82,6	0,22	4,70	13,00
WTG 14			63	16,52	83,9	0,35	4,30	16,60
WTG 14			80	11,77	86,7	0,50	3,70	19,70
WTG 14			100	10,58	91,4	0,78	3,00	21,20
WTG 14			125	5,48	89,9	1,19	1,80	20,20
WTG 14			160	0,68	91,2	1,79	0,00	21,20
WTG 14			200	-4,81	92,8	2,57	0,00	25,00
WTG 15	3.817	3.828						
WTG 15			20	31,34	64,5	0,00	5,60	6,60
WTG 15			25	27,46	68,5	0,08	5,40	8,40
WTG 15			32	25,03	74,0	0,11	5,20	10,80
WTG 15			40	22,85	77,5	0,19	5,00	11,40
WTG 15			50	21,57	82,6	0,27	4,70	13,00
WTG 15			63	14,72	83,9	0,42	4,30	16,60
WTG 15			80	9,93	86,7	0,61	3,70	19,70
WTG 15			100	8,68	91,4	0,96	3,00	21,20
WTG 15			125	3,49	89,9	1,45	1,80	20,20
WTG 15			160	-1,44	91,2	2,18	0,00	21,20
WTG 15			200	-7,10	92,8	3,14	0,00	25,00
WTG 16	4.668	4.676						
WTG 16			20	29,60	64,5	0,00	5,60	6,60
WTG 16			25	25,71	68,5	0,09	5,40	8,40
WTG 16			32	23,26	74,0	0,14	5,20	10,80
WTG 16			40	21,07	77,5	0,23	5,00	11,40
WTG 16			50	19,78	82,6	0,33	4,70	13,00
WTG 16			63	12,89	83,9	0,51	4,30	16,60
WTG 16			80	8,05	86,7	0,75	3,70	19,70
WTG 16			100	6,73	91,4	1,17	3,00	21,20
WTG 16			125	1,43	89,9	1,78	1,80	20,20
WTG 16			160	-3,66	91,2	2,67	0,00	21,20
WTG 16			200	-9,53	92,8	3,83	0,00	25,00
WTG 17	2.666	2.680						
WTG 17			20	34,44	64,5	0,00	5,60	6,60
WTG 17			25	30,58	68,5	0,05	5,40	8,40
WTG 17			32	28,16	74,0	0,08	5,20	10,80
WTG 17			40	26,00	77,5	0,13	5,00	11,40
WTG 17			50	24,75	82,6	0,19	4,70	13,00
WTG 17			63	17,94	83,9	0,29	4,30	16,60
WTG 17			80	13,21	86,7	0,43	3,70	19,70
WTG 17			100	12,07	91,4	0,67	3,00	21,20
WTG 17			125	7,02	89,9	1,02	1,80	20,20
WTG 17			160	2,31	91,2	1,53	0,00	21,20
WTG 17			200	-3,06	92,8	2,20	0,00	25,00
WTG 18	4.142	4.151						
WTG 18			20	30,64	64,5	0,00	5,60	6,60
WTG 18			25	26,75	68,5	0,08	5,40	8,40
WTG 18			32	24,31	74,0	0,12	5,20	10,80
WTG 18			40	22,13	77,5	0,21	5,00	11,40
WTG 18			50	20,85	82,6	0,29	4,70	13,00
WTG 18			63	13,98	83,9	0,46	4,30	16,60
WTG 18			80	9,17	86,7	0,66	3,70	19,70
WTG 18			100	7,90	91,4	1,04	3,00	21,20
WTG 18			125	2,66	89,9	1,58	1,80	20,20
WTG 18			160	-2,33	91,2	2,37	0,00	21,20
WTG 18			200	-8,07	92,8	3,40	0,00	25,00
WTG 19	2.799	2.811						
WTG 19			20	34,02	64,5	0,00	5,60	6,60
WTG 19			25	30,17	68,5	0,06	5,40	8,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 19			32	27,74	74,0	0,08	5,20	10,80
WTG 19			40	25,58	77,5	0,14	5,00	11,40
WTG 19			50	24,32	82,6	0,20	4,70	13,00
WTG 19			63	17,51	83,9	0,31	4,30	16,60
WTG 19			80	12,77	86,7	0,45	3,70	19,70
WTG 19			100	11,62	91,4	0,70	3,00	21,20
WTG 19			125	6,55	89,9	1,07	1,80	20,20
WTG 19			160	1,82	91,2	1,60	0,00	21,20
WTG 19			200	-3,58	92,8	2,31	0,00	25,00
Sum								
Sum			20	43,22				
Sum			25	39,34				
Sum			32	36,90				
Sum			40	34,73				
Sum			50	33,45				
Sum			63	26,59				
Sum			80	21,80				
Sum			100	20,55				
Sum			125	15,35				
Sum			160	10,43				
Sum			200	4,79				

Noise sensitive area: Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 03	5.343	5.352						
WTG 03			20	28,43	64,5	0,00	5,60	6,60
WTG 03			25	24,52	68,5	0,11	5,40	8,40
WTG 03			32	22,07	74,0	0,16	5,20	10,80
WTG 03			40	19,86	77,5	0,27	5,00	11,40
WTG 03			50	18,55	82,6	0,37	4,70	13,00
WTG 03			63	11,64	83,9	0,59	4,30	16,60
WTG 03			80	6,77	86,7	0,86	3,70	19,70
WTG 03			100	5,39	91,4	1,34	3,00	21,20
WTG 03			125	0,00	89,9	2,03	1,80	20,20
WTG 03			160	-5,22	91,2	3,05	0,00	21,20
WTG 03			200	-11,26	92,8	4,39	0,00	25,00
WTG 04	5.991	6.000						
WTG 04			20	27,44	64,5	0,00	5,60	6,60
WTG 04			25	23,52	68,5	0,12	5,40	8,40
WTG 04			32	21,06	74,0	0,18	5,20	10,80
WTG 04			40	18,84	77,5	0,30	5,00	11,40
WTG 04			50	17,52	82,6	0,42	4,70	13,00
WTG 04			63	10,58	83,9	0,66	4,30	16,60
WTG 04			80	5,68	86,7	0,96	3,70	19,70
WTG 04			100	4,24	91,4	1,50	3,00	21,20
WTG 04			125	-1,24	89,9	2,28	1,80	20,20
WTG 04			160	-6,58	91,2	3,42	0,00	21,20
WTG 04			200	-12,78	92,8	4,92	0,00	25,00
WTG 05	5.050	5.061						
WTG 05			20	28,92	64,5	0,00	5,60	6,60
WTG 05			25	25,01	68,5	0,10	5,40	8,40
WTG 05			32	22,56	74,0	0,15	5,20	10,80
WTG 05			40	20,36	77,5	0,25	5,00	11,40
WTG 05			50	19,06	82,6	0,35	4,70	13,00
WTG 05			63	12,16	83,9	0,56	4,30	16,60
WTG 05			80	7,31	86,7	0,81	3,70	19,70
WTG 05			100	5,95	91,4	1,27	3,00	21,20
WTG 05			125	0,59	89,9	1,92	1,80	20,20
WTG 05			160	-4,57	91,2	2,88	0,00	21,20
WTG 05			200	-10,53	92,8	4,15	0,00	25,00
WTG 06	5.581	5.590						

To be continued on next page...

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 06			20	28,05	64,5	0,00	5,60	6,60
WTG 06			25	24,14	68,5	0,11	5,40	8,40
WTG 06			32	21,68	74,0	0,17	5,20	10,80
WTG 06			40	19,47	77,5	0,28	5,00	11,40
WTG 06			50	18,16	82,6	0,39	4,70	13,00
WTG 06			63	11,24	83,9	0,61	4,30	16,60
WTG 06			80	6,36	86,7	0,89	3,70	19,70
WTG 06			100	4,95	91,4	1,40	3,00	21,20
WTG 06			125	-0,47	89,9	2,12	1,80	20,20
WTG 06			160	-5,73	91,2	3,19	0,00	21,20
WTG 06			200	-11,83	92,8	4,58	0,00	25,00
WTG 07	4.492	4.502						
WTG 07			20	29,93	64,5	0,00	5,60	6,60
WTG 07			25	26,04	68,5	0,09	5,40	8,40
WTG 07			32	23,60	74,0	0,14	5,20	10,80
WTG 07			40	21,41	77,5	0,23	5,00	11,40
WTG 07			50	20,12	82,6	0,32	4,70	13,00
WTG 07			63	13,24	83,9	0,50	4,30	16,60
WTG 07			80	8,41	86,7	0,72	3,70	19,70
WTG 07			100	7,11	91,4	1,13	3,00	21,20
WTG 07			125	1,82	89,9	1,71	1,80	20,20
WTG 07			160	-3,23	91,2	2,57	0,00	21,20
WTG 07			200	-9,06	92,8	3,69	0,00	25,00
WTG 08	5.090	5.101						
WTG 08			20	28,85	64,5	0,00	5,60	6,60
WTG 08			25	24,95	68,5	0,10	5,40	8,40
WTG 08			32	22,49	74,0	0,15	5,20	10,80
WTG 08			40	20,29	77,5	0,26	5,00	11,40
WTG 08			50	18,99	82,6	0,36	4,70	13,00
WTG 08			63	12,09	83,9	0,56	4,30	16,60
WTG 08			80	7,23	86,7	0,82	3,70	19,70
WTG 08			100	5,87	91,4	1,28	3,00	21,20
WTG 08			125	0,51	89,9	1,94	1,80	20,20
WTG 08			160	-4,66	91,2	2,91	0,00	21,20
WTG 08			200	-10,64	92,8	4,18	0,00	25,00
WTG 09	3.928	3.938						
WTG 09			20	31,09	64,5	0,00	5,60	6,60
WTG 09			25	27,22	68,5	0,08	5,40	8,40
WTG 09			32	24,78	74,0	0,12	5,20	10,80
WTG 09			40	22,60	77,5	0,20	5,00	11,40
WTG 09			50	21,32	82,6	0,28	4,70	13,00
WTG 09			63	14,46	83,9	0,43	4,30	16,60
WTG 09			80	9,66	86,7	0,63	3,70	19,70
WTG 09			100	8,41	91,4	0,98	3,00	21,20
WTG 09			125	3,20	89,9	1,50	1,80	20,20
WTG 09			160	-1,75	91,2	2,24	0,00	21,20
WTG 09			200	-7,43	92,8	3,23	0,00	25,00
WTG 10	4.210	4.220						
WTG 10			20	30,49	64,5	0,00	5,60	6,60
WTG 10			25	26,61	68,5	0,08	5,40	8,40
WTG 10			32	24,17	74,0	0,13	5,20	10,80
WTG 10			40	21,98	77,5	0,21	5,00	11,40
WTG 10			50	20,70	82,6	0,30	4,70	13,00
WTG 10			63	13,83	83,9	0,46	4,30	16,60
WTG 10			80	9,02	86,7	0,68	3,70	19,70
WTG 10			100	7,74	91,4	1,05	3,00	21,20
WTG 10			125	2,49	89,9	1,60	1,80	20,20
WTG 10			160	-2,51	91,2	2,41	0,00	21,20
WTG 10			200	-8,27	92,8	3,46	0,00	25,00
WTG 11	4.768	4.779						
WTG 11			20	29,41	64,5	0,00	5,60	6,60
WTG 11			25	25,52	68,5	0,10	5,40	8,40
WTG 11			32	23,07	74,0	0,14	5,20	10,80
WTG 11			40	20,87	77,5	0,24	5,00	11,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 11			50	19,58	82,6	0,33	4,70	13,00
WTG 11			63	12,69	83,9	0,53	4,30	16,60
WTG 11			80	7,85	86,7	0,76	3,70	19,70
WTG 11			100	6,52	91,4	1,19	3,00	21,20
WTG 11			125	1,20	89,9	1,82	1,80	20,20
WTG 11			160	-3,91	91,2	2,72	0,00	21,20
WTG 11			200	-9,80	92,8	3,92	0,00	25,00
WTG 12	3.515	3.527						
WTG 12			20	32,05	64,5	0,00	5,60	6,60
WTG 12			25	28,18	68,5	0,07	5,40	8,40
WTG 12			32	25,75	74,0	0,11	5,20	10,80
WTG 12			40	23,58	77,5	0,18	5,00	11,40
WTG 12			50	22,31	82,6	0,25	4,70	13,00
WTG 12			63	15,46	83,9	0,39	4,30	16,60
WTG 12			80	10,69	86,7	0,56	3,70	19,70
WTG 12			100	9,47	91,4	0,88	3,00	21,20
WTG 12			125	4,31	89,9	1,34	1,80	20,20
WTG 12			160	-0,56	91,2	2,01	0,00	21,20
WTG 12			200	-6,14	92,8	2,89	0,00	25,00
WTG 13	4.494	4.503						
WTG 13			20	29,93	64,5	0,00	5,60	6,60
WTG 13			25	26,04	68,5	0,09	5,40	8,40
WTG 13			32	23,59	74,0	0,14	5,20	10,80
WTG 13			40	21,40	77,5	0,23	5,00	11,40
WTG 13			50	20,11	82,6	0,32	4,70	13,00
WTG 13			63	13,23	83,9	0,50	4,30	16,60
WTG 13			80	8,41	86,7	0,72	3,70	19,70
WTG 13			100	7,10	91,4	1,13	3,00	21,20
WTG 13			125	1,82	89,9	1,71	1,80	20,20
WTG 13			160	-3,24	91,2	2,57	0,00	21,20
WTG 13			200	-9,06	92,8	3,69	0,00	25,00
WTG 14	3.105	3.118						
WTG 14			20	33,12	64,5	0,00	5,60	6,60
WTG 14			25	29,26	68,5	0,06	5,40	8,40
WTG 14			32	26,83	74,0	0,09	5,20	10,80
WTG 14			40	24,67	77,5	0,16	5,00	11,40
WTG 14			50	23,40	82,6	0,22	4,70	13,00
WTG 14			63	16,58	83,9	0,34	4,30	16,60
WTG 14			80	11,82	86,7	0,50	3,70	19,70
WTG 14			100	10,64	91,4	0,78	3,00	21,20
WTG 14			125	5,54	89,9	1,18	1,80	20,20
WTG 14			160	0,75	91,2	1,78	0,00	21,20
WTG 14			200	-4,73	92,8	2,56	0,00	25,00
WTG 15	3.790	3.801						
WTG 15			20	31,40	64,5	0,00	5,60	6,60
WTG 15			25	27,53	68,5	0,08	5,40	8,40
WTG 15			32	25,09	74,0	0,11	5,20	10,80
WTG 15			40	22,91	77,5	0,19	5,00	11,40
WTG 15			50	21,63	82,6	0,27	4,70	13,00
WTG 15			63	14,78	83,9	0,42	4,30	16,60
WTG 15			80	9,99	86,7	0,61	3,70	19,70
WTG 15			100	8,75	91,4	0,95	3,00	21,20
WTG 15			125	3,56	89,9	1,44	1,80	20,20
WTG 15			160	-1,37	91,2	2,17	0,00	21,20
WTG 15			200	-7,02	92,8	3,12	0,00	25,00
WTG 16	4.643	4.651						
WTG 16			20	29,65	64,5	0,00	5,60	6,60
WTG 16			25	25,76	68,5	0,09	5,40	8,40
WTG 16			32	23,31	74,0	0,14	5,20	10,80
WTG 16			40	21,12	77,5	0,23	5,00	11,40
WTG 16			50	19,82	82,6	0,33	4,70	13,00
WTG 16			63	12,94	83,9	0,51	4,30	16,60
WTG 16			80	8,11	86,7	0,74	3,70	19,70
WTG 16			100	6,79	91,4	1,16	3,00	21,20

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]	Lsigma [dB]
WTG 16			125	1,48	89,9	1,77	1,80	20,20
WTG 16			160	-3,60	91,2	2,65	0,00	21,20
WTG 16			200	-9,46	92,8	3,81	0,00	25,00
WTG 17	2.640	2.654						
WTG 17			20	34,52	64,5	0,00	5,60	6,60
WTG 17			25	30,67	68,5	0,05	5,40	8,40
WTG 17			32	28,24	74,0	0,08	5,20	10,80
WTG 17			40	26,09	77,5	0,13	5,00	11,40
WTG 17			50	24,84	82,6	0,19	4,70	13,00
WTG 17			63	18,03	83,9	0,29	4,30	16,60
WTG 17			80	13,30	86,7	0,42	3,70	19,70
WTG 17			100	12,16	91,4	0,66	3,00	21,20
WTG 17			125	7,11	89,9	1,01	1,80	20,20
WTG 17			160	2,41	91,2	1,51	0,00	21,20
WTG 17			200	-2,95	92,8	2,18	0,00	25,00
WTG 18	4.112	4.121						
WTG 18			20	30,70	64,5	0,00	5,60	6,60
WTG 18			25	26,82	68,5	0,08	5,40	8,40
WTG 18			32	24,38	74,0	0,12	5,20	10,80
WTG 18			40	22,19	77,5	0,21	5,00	11,40
WTG 18			50	20,91	82,6	0,29	4,70	13,00
WTG 18			63	14,05	83,9	0,45	4,30	16,60
WTG 18			80	9,24	86,7	0,66	3,70	19,70
WTG 18			100	7,97	91,4	1,03	3,00	21,20
WTG 18			125	2,73	89,9	1,57	1,80	20,20
WTG 18			160	-2,25	91,2	2,35	0,00	21,20
WTG 18			200	-7,98	92,8	3,38	0,00	25,00
WTG 19	2.768	2.781						
WTG 19			20	34,12	64,5	0,00	5,60	6,60
WTG 19			25	30,26	68,5	0,06	5,40	8,40
WTG 19			32	27,83	74,0	0,08	5,20	10,80
WTG 19			40	25,68	77,5	0,14	5,00	11,40
WTG 19			50	24,42	82,6	0,19	4,70	13,00
WTG 19			63	17,61	83,9	0,31	4,30	16,60
WTG 19			80	12,87	86,7	0,44	3,70	19,70
WTG 19			100	11,72	91,4	0,70	3,00	21,20
WTG 19			125	6,66	89,9	1,06	1,80	20,20
WTG 19			160	1,93	91,2	1,59	0,00	21,20
WTG 19			200	-3,46	92,8	2,28	0,00	25,00
Sum								
Sum			20	43,27				
Sum			25	39,39				
Sum			32	36,95				
Sum			40	34,78				
Sum			50	33,50				
Sum			63	26,64				
Sum			80	21,85				
Sum			100	20,61				
Sum			125	15,41				
Sum			160	10,49				
Sum			200	4,85				

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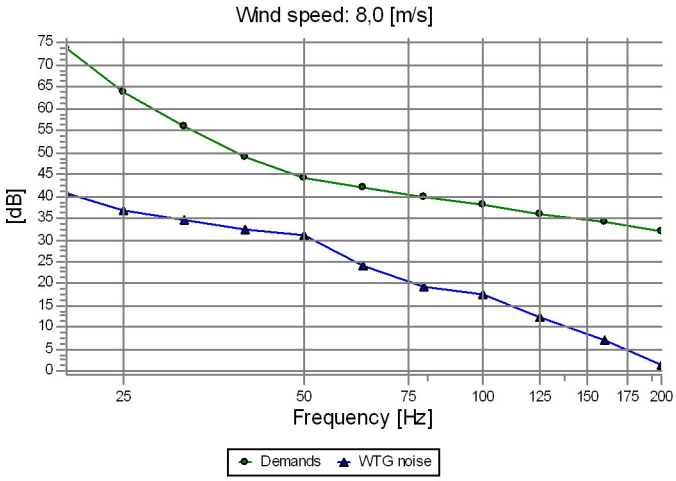
DECIBEL - Detailed results, graphic

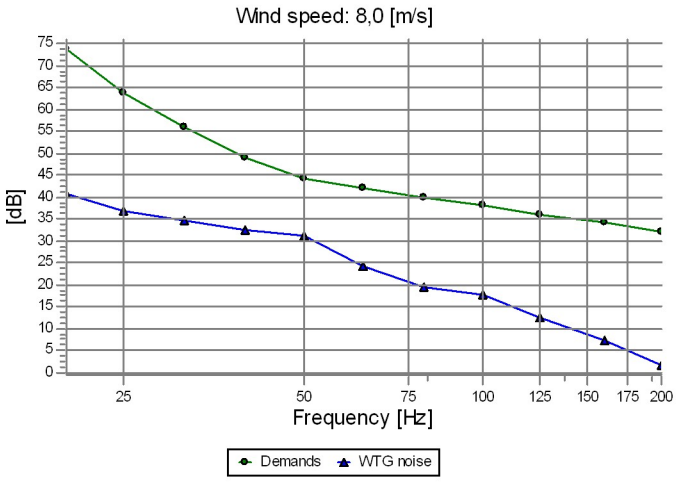
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)



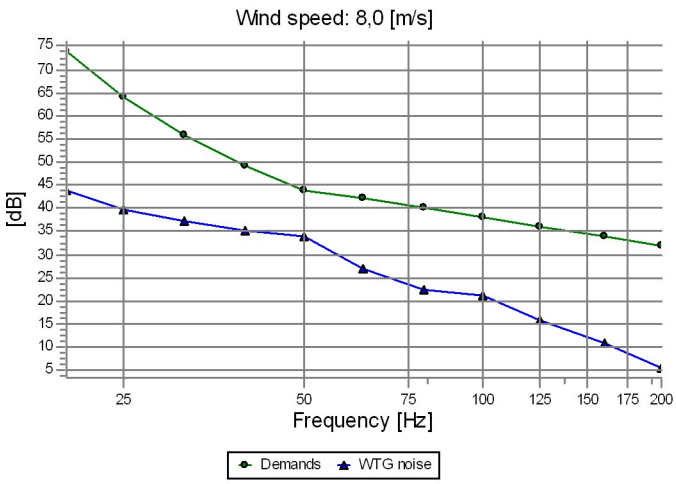
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	40,8	Yes
25,0	64,0	36,9	Yes
31,5	56,0	34,4	Yes
40,0	49,0	32,2	Yes
50,0	44,0	30,9	Yes
63,0	42,0	24,0	Yes
80,0	40,0	19,2	Yes
100,0	38,0	17,8	Yes
125,0	36,0	12,4	Yes
160,0	34,0	7,3	Yes
200,0	32,0	1,3	Yes

Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	40,8	Yes
25,0	64,0	36,9	Yes
31,5	56,0	34,5	Yes
40,0	49,0	32,3	Yes
50,0	44,0	31,0	Yes
63,0	42,0	24,1	Yes
80,0	40,0	19,2	Yes
100,0	38,0	17,8	Yes
125,0	36,0	12,5	Yes
160,0	34,0	7,3	Yes
200,0	32,0	1,3	Yes

Asuntola Noise sensitive point: Demands defined in calculation setup. (449)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	43,7	Yes
25,0	64,0	39,8	Yes
31,5	56,0	37,3	Yes
40,0	49,0	35,2	Yes
50,0	44,0	33,9	Yes
63,0	42,0	27,1	Yes
80,0	40,0	22,3	Yes
100,0	38,0	21,0	Yes
125,0	36,0	15,9	Yes
160,0	34,0	11,0	Yes
200,0	32,0	5,4	Yes

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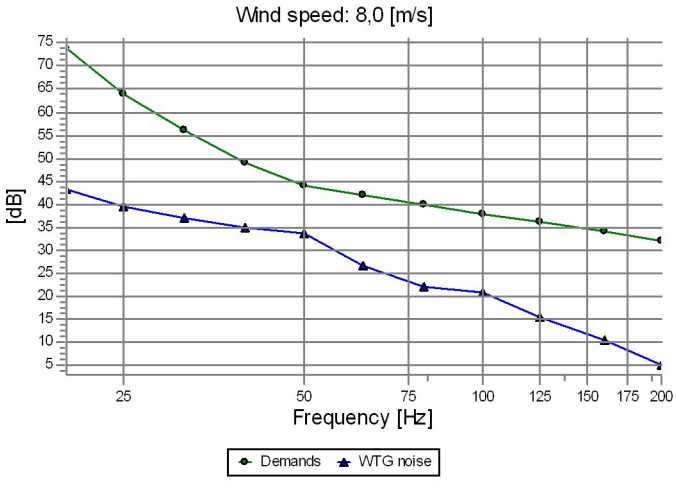
DECIBEL - Detailed results, graphic

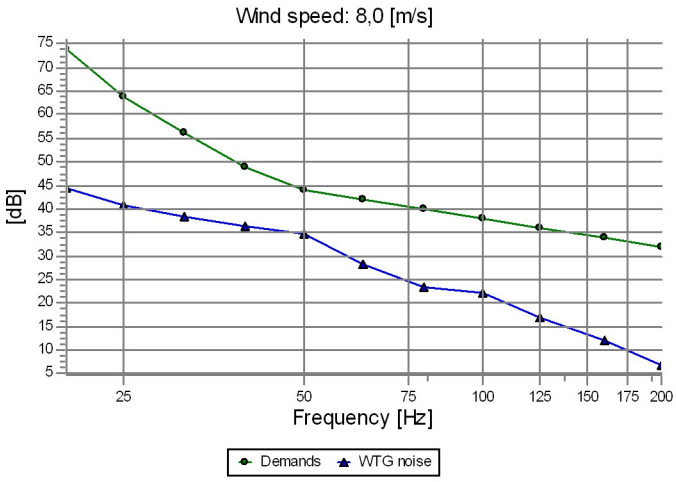
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)



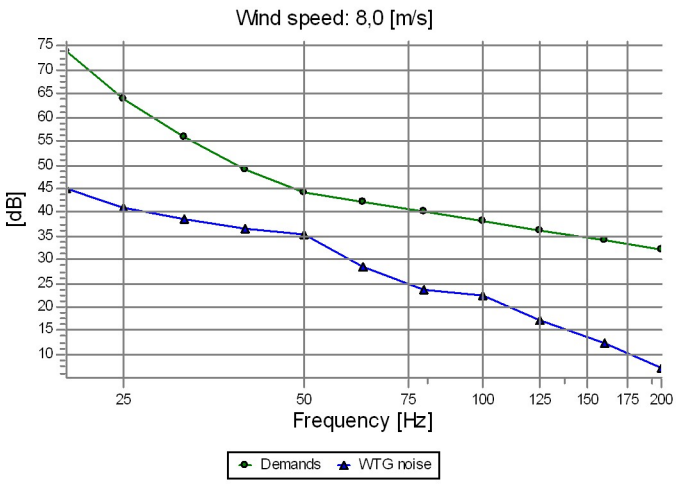
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	43,3	Yes
25,0	64,0	39,4	Yes
31,5	56,0	36,9	Yes
40,0	49,0	34,8	Yes
50,0	44,0	33,5	Yes
63,0	42,0	26,6	Yes
80,0	40,0	21,8	Yes
100,0	38,0	20,6	Yes
125,0	36,0	15,4	Yes
160,0	34,0	10,5	Yes
200,0	32,0	4,9	Yes

Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	44,6	Yes
25,0	64,0	40,7	Yes
31,5	56,0	38,3	Yes
40,0	49,0	36,1	Yes
50,0	44,0	34,9	Yes
63,0	42,0	28,0	Yes
80,0	40,0	23,3	Yes
100,0	38,0	22,1	Yes
125,0	36,0	17,0	Yes
160,0	34,0	12,2	Yes
200,0	32,0	6,7	Yes

Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	44,9	Yes
25,0	64,0	41,0	Yes
31,5	56,0	38,6	Yes
40,0	49,0	36,4	Yes
50,0	44,0	35,2	Yes
63,0	42,0	28,3	Yes
80,0	40,0	23,6	Yes
100,0	38,0	22,4	Yes
125,0	36,0	17,3	Yes
160,0	34,0	12,5	Yes
200,0	32,0	7,1	Yes

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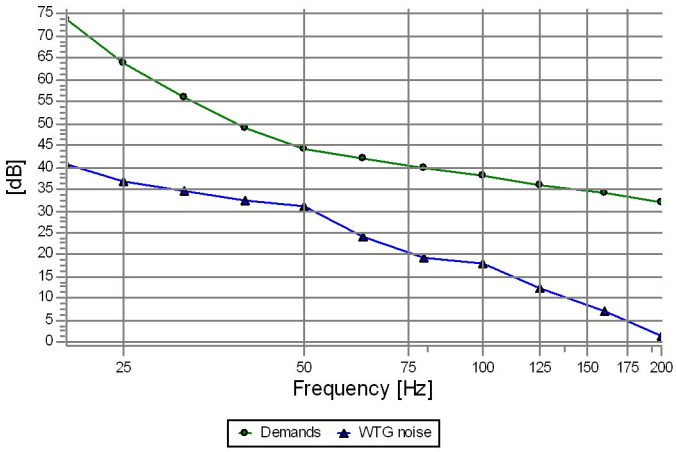
Calculated:
17.09.2021 08:24/3.4.415

DECIBEL - Detailed results, graphic

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)

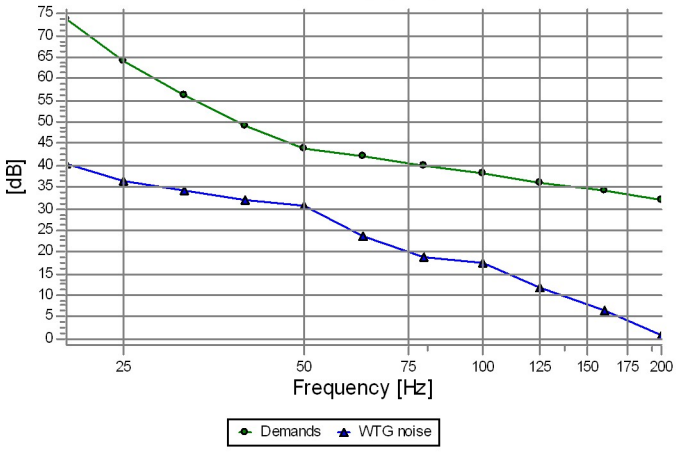
Wind speed: 8,0 [m/s]



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	40,9	Yes
25,0	64,0	36,9	Yes
31,5	56,0	34,5	Yes
40,0	49,0	32,3	Yes
50,0	44,0	31,0	Yes
63,0	42,0	24,1	Yes
80,0	40,0	19,2	Yes
100,0	38,0	17,8	Yes
125,0	36,0	12,5	Yes
160,0	34,0	7,3	Yes
200,0	32,0	1,3	Yes

Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)

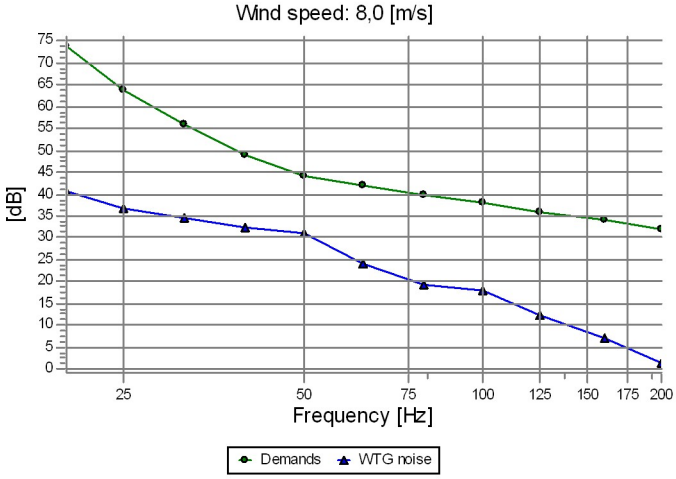
Wind speed: 8,0 [m/s]



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	40,4	Yes
25,0	64,0	36,5	Yes
31,5	56,0	34,0	Yes
40,0	49,0	31,8	Yes
50,0	44,0	30,5	Yes
63,0	42,0	23,6	Yes
80,0	40,0	18,7	Yes
100,0	38,0	17,3	Yes
125,0	36,0	11,9	Yes
160,0	34,0	6,6	Yes
200,0	32,0	0,5	Yes

Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)

Wind speed: 8,0 [m/s]



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	40,8	Yes
25,0	64,0	36,9	Yes
31,5	56,0	34,5	Yes
40,0	49,0	32,3	Yes
50,0	44,0	31,0	Yes
63,0	42,0	24,1	Yes
80,0	40,0	19,2	Yes
100,0	38,0	17,8	Yes
125,0	36,0	12,4	Yes
160,0	34,0	7,3	Yes
200,0	32,0	1,2	Yes

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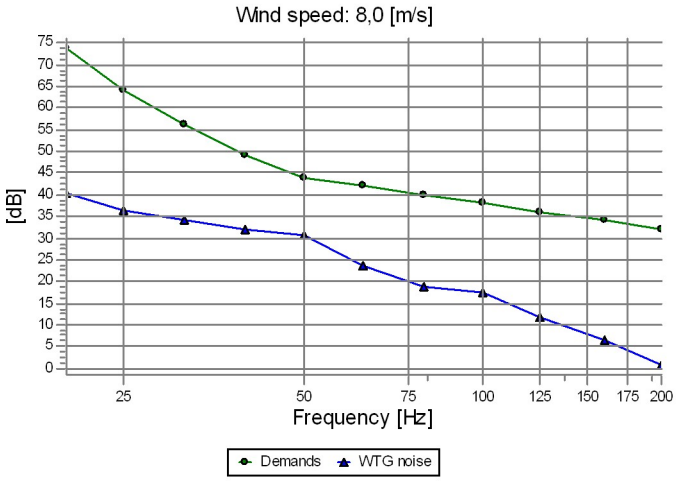
Calculated:
17.09.2021 08:24/3.4.415

DECIBEL - Detailed results, graphic

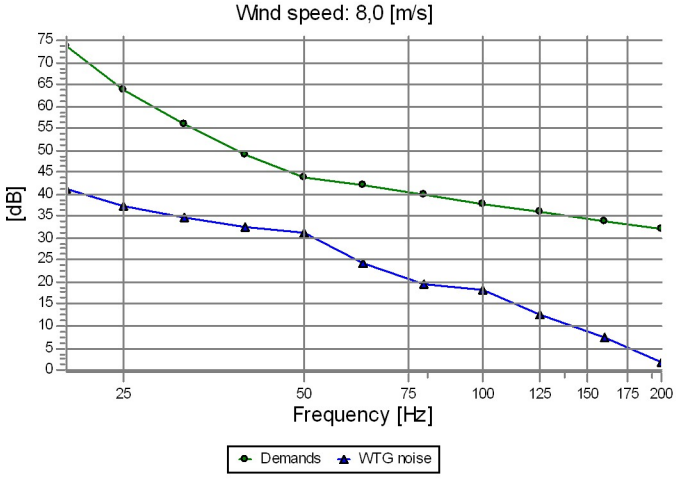
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)



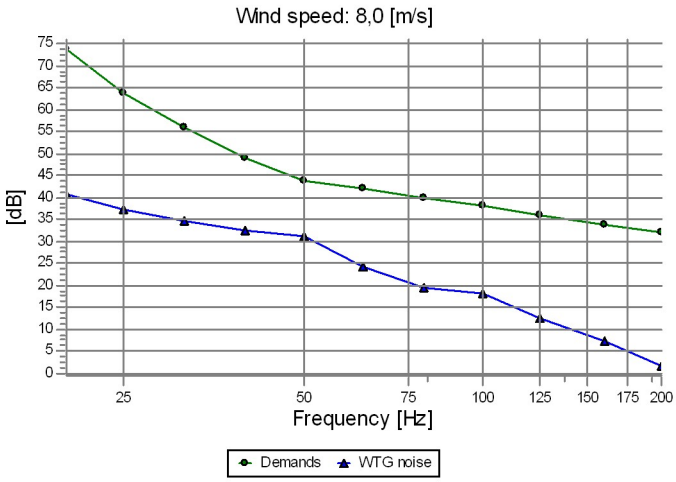
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	40,4	Yes
25,0	64,0	36,5	Yes
31,5	56,0	34,0	Yes
40,0	49,0	31,8	Yes
50,0	44,0	30,5	Yes
63,0	42,0	23,6	Yes
80,0	40,0	18,7	Yes
100,0	38,0	17,3	Yes
125,0	36,0	11,9	Yes
160,0	34,0	6,6	Yes
200,0	32,0	0,6	Yes

Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	41,1	Yes
25,0	64,0	37,2	Yes
31,5	56,0	34,7	Yes
40,0	49,0	32,5	Yes
50,0	44,0	31,2	Yes
63,0	42,0	24,3	Yes
80,0	40,0	19,4	Yes
100,0	38,0	18,1	Yes
125,0	36,0	12,7	Yes
160,0	34,0	7,6	Yes
200,0	32,0	1,6	Yes

Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	41,0	Yes
25,0	64,0	37,1	Yes
31,5	56,0	34,7	Yes
40,0	49,0	32,5	Yes
50,0	44,0	31,2	Yes
63,0	42,0	24,3	Yes
80,0	40,0	19,4	Yes
100,0	38,0	18,0	Yes
125,0	36,0	12,7	Yes
160,0	34,0	7,5	Yes
200,0	32,0	1,5	Yes

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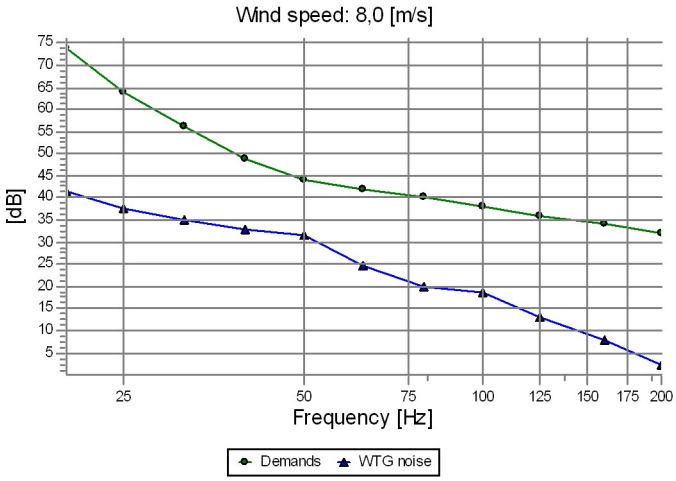
Calculated:
17.09.2021 08:24/3.4.415

DECIBEL - Detailed results, graphic

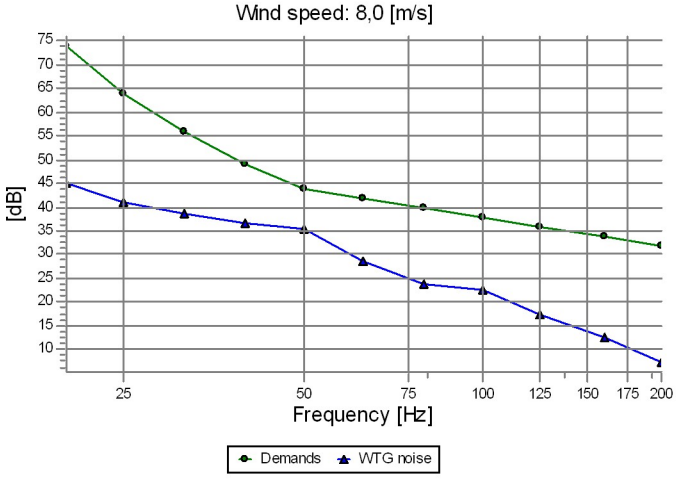
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)



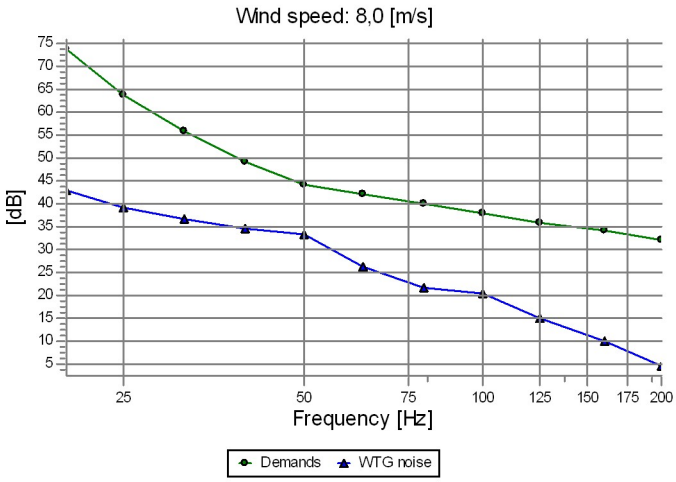
Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	41,4	Yes
25,0	64,0	37,5	Yes
31,5	56,0	35,0	Yes
40,0	49,0	32,8	Yes
50,0	44,0	31,5	Yes
63,0	42,0	24,7	Yes
80,0	40,0	19,8	Yes
100,0	38,0	18,5	Yes
125,0	36,0	13,1	Yes
160,0	34,0	8,0	Yes
200,0	32,0	2,1	Yes

Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)



Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	45,0	Yes
25,0	64,0	41,1	Yes
31,5	56,0	38,7	Yes
40,0	49,0	36,6	Yes
50,0	44,0	35,3	Yes
63,0	42,0	28,5	Yes
80,0	40,0	23,7	Yes
100,0	38,0	22,5	Yes
125,0	36,0	17,5	Yes
160,0	34,0	12,7	Yes
200,0	32,0	7,3	Yes

Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)



Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	42,9	Yes
25,0	64,0	39,0	Yes
31,5	56,0	36,6	Yes
40,0	49,0	34,4	Yes
50,0	44,0	33,1	Yes
63,0	42,0	26,3	Yes
80,0	40,0	21,5	Yes
100,0	38,0	20,2	Yes
125,0	36,0	15,0	Yes
160,0	34,0	10,0	Yes
200,0	32,0	4,3	Yes

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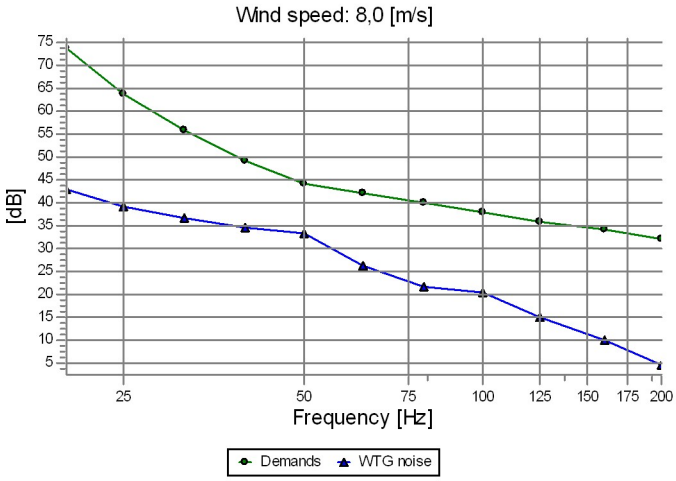
Calculated:
17.09.2021 08:24/3.4.415

DECIBEL - Detailed results, graphic

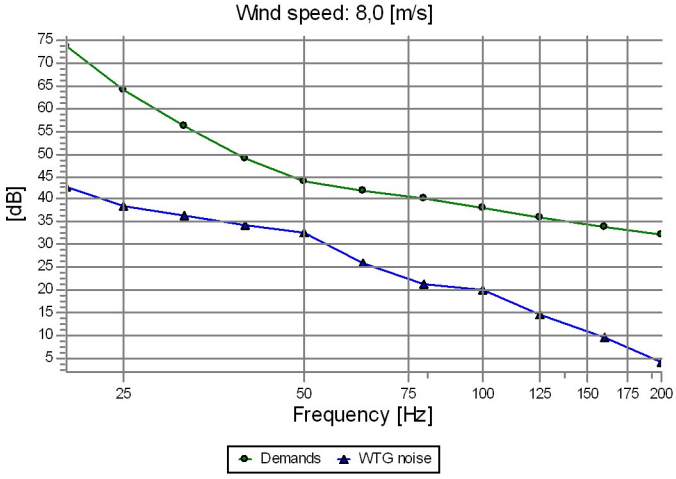
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)



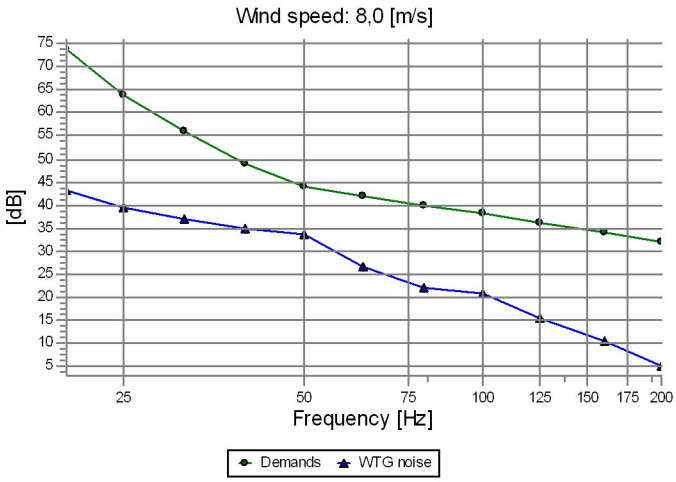
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	42,9	Yes
25,0	64,0	39,1	Yes
31,5	56,0	36,6	Yes
40,0	49,0	34,4	Yes
50,0	44,0	33,2	Yes
63,0	42,0	26,3	Yes
80,0	40,0	21,5	Yes
100,0	38,0	20,2	Yes
125,0	36,0	15,0	Yes
160,0	34,0	10,0	Yes
200,0	32,0	4,3	Yes

Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	42,6	Yes
25,0	64,0	38,7	Yes
31,5	56,0	36,3	Yes
40,0	49,0	34,1	Yes
50,0	44,0	32,8	Yes
63,0	42,0	25,9	Yes
80,0	40,0	21,1	Yes
100,0	38,0	19,8	Yes
125,0	36,0	14,6	Yes
160,0	34,0	9,6	Yes
200,0	32,0	3,9	Yes

Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	43,2	Yes
25,0	64,0	39,3	Yes
31,5	56,0	36,9	Yes
40,0	49,0	34,7	Yes
50,0	44,0	33,4	Yes
63,0	42,0	26,6	Yes
80,0	40,0	21,8	Yes
100,0	38,0	20,6	Yes
125,0	36,0	15,4	Yes
160,0	34,0	10,4	Yes
200,0	32,0	4,8	Yes

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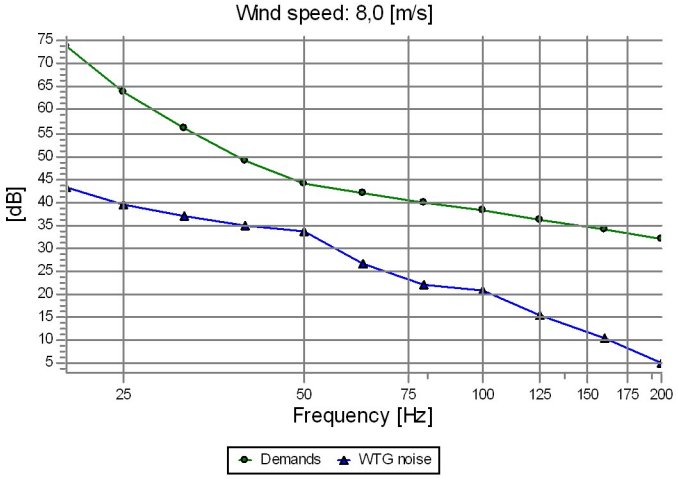
DECIBEL - Detailed results, graphic

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoorNoise calculation model: Finland Low frequency

Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)



Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	43,3	Yes
25,0	64,0	39,4	Yes
31,5	56,0	37,0	Yes
40,0	49,0	34,8	Yes
50,0	44,0	33,5	Yes
63,0	42,0	26,6	Yes
80,0	40,0	21,9	Yes
100,0	38,0	20,6	Yes
125,0	36,0	15,4	Yes
160,0	34,0	10,5	Yes
200,0	32,0	4,9	Yes

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

Noise calculation model:
Finland Low frequency
Wind speed (in 10 m height):
Highest noise value at receptor
Spectral distribution:
From 20,0 Hz to 200,0 Hz
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tone penalty is subtracted from demand
Model: 5,0 dB(A)
Height above ground level, when no value in NSA object:
4,0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
0,0 dB; Uncertainty margin in model has priority
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)
Low frequency calculation
dLsigma

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
6,6	8,4	10,8	11,4	13,0	16,6	19,7	21,2	20,2	21,2	25,0

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N163/6.X 6800 163.0 !O!
Noise: SPL wo/ STE M0

Source	Source/Date	Creator	Edited
F008_276_A17_EN Revision 00, 2019-05-21 (5.7 MW version octave data)	09.07.2019	USER	14.09.2021 20:53

Status	Hub height	Wind speed	LwA,ref	20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
	[m]	[m/s]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	168,0	8,0	98,2	64,5	68,5	74,0	77,5	82,6	83,9	86,7	91,4	89,9	91,2	92,8

Noise sensitive area: Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

Noise sensitive area: Asuntola Noise sensitive point: Demands defined in calculation setup. (449)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

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DECIBEL - Map

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF indoor

0 1 2 3 4 km

Map: Finnish Topographic Map , Print scale 1:75.000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 368.193 North: 7.381.274

New WTG Noise sensitive area

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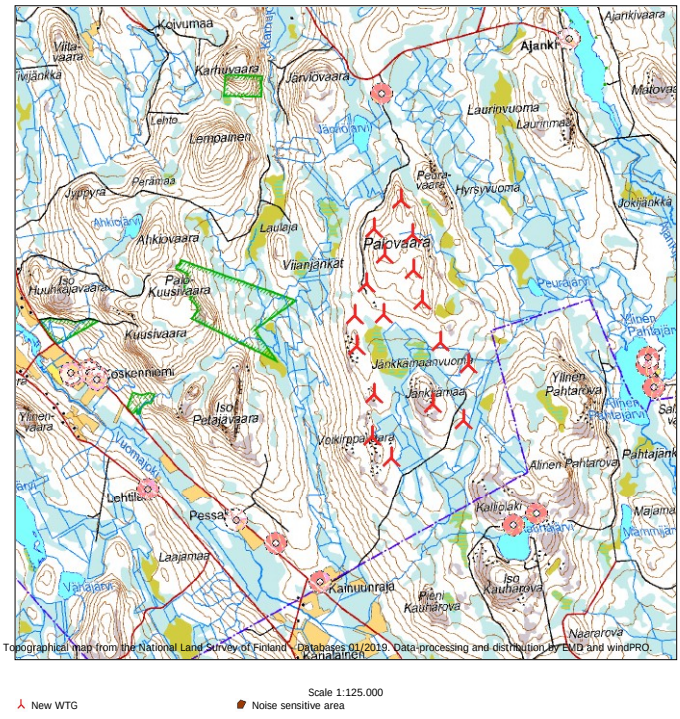
DECIBEL - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

Noise calculation model:
Finland Low frequency
Wind speed (in 10 m height):
Highest noise value at receptor
Spectral distribution:
From 20,0 Hz to 200,0 Hz
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tone penalty is subtracted from demand
Model: 5,0 dB(A)
Height above ground level, when no value in NSA object:
4,0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
0,0 dB; Uncertainty margin in model has priority
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTGs

	East	North	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Noise data Creator	Name	First wind speed	LwaRef	Last wind speed	LwaRef
			[m]					[kW]	[m]	[m]			[m/s]	[dB(A)]	[m/s]	[dB(A)]
WTG 03	368.490	7.382.686	224,8	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 04	368.962	7.383.166	231,2	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 05	368.656	7.382.253	240,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 06	369.135	7.382.575	229,4	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 07	368.329	7.381.799	208,6	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 08	369.118	7.381.981	239,3	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 09	368.107	7.381.273	191,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 10	368.598	7.381.270	198,9	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 11	369.227	7.381.467	229,2	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 12	368.108	7.380.770	199,4	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 13	369.508	7.380.765	193,7	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 14	368.369	7.379.963	190,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 15	369.338	7.379.748	201,8	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 16	369.959	7.380.380	174,8	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 17	368.303	7.379.244	180,0	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 18	369.824	7.379.462	179,3	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2
WTG 19	368.603	7.378.892	170,1	NORDEX N163/6.X 6800 1...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	USER	SPL wo/ STE M0	8,0	98,2	8,0	98,2

Calculation Results

Sound level

Noise sensitive area No.	Name	East	North	Z	Immission height	Most critical demand Frequency	Noise	Predicted sound level WTG noise
				[m]	[m]	[Hz]	[dB]	[dB]
Ajanki 1	Noise sensitive point: Demands defined in calculation setup. (444)	371.874	7.385.678	120,0	4,0	100,0	38,0	39,0
Ajanki 2	Noise sensitive point: Demands defined in calculation setup. (445)	371.842	7.385.676	120,1	4,0	100,0	38,0	39,0
Asuntola	Noise sensitive point: Demands defined in calculation setup. (449)	366.608	7.377.543	73,4	4,0	100,0	38,0	42,2
Kainuunraja	Noise sensitive point: Demands defined in calculation setup. (450)	367.325	7.376.870	72,9	4,0	100,0	38,0	41,8
Kauhajärvi 1	Noise sensitive point: Demands defined in calculation setup. (439)	370.975	7.377.840	184,2	4,0	100,0	38,0	43,3
Kauhajärvi 2	Noise sensitive point: Demands defined in calculation setup. (440)	370.574	7.377.669	180,5	4,0	100,0	38,0	43,6
Koskenniemi 1	Noise sensitive point: Demands defined in calculation setup. (451)	363.667	7.380.593	72,2	4,0	100,0	38,0	39,0
Koskenniemi 2	Noise sensitive point: Demands defined in calculation setup. (452)	363.362	7.380.565	66,0	4,0	100,0	38,0	38,5
Koskenniemi 3	Noise sensitive point: Demands defined in calculation setup. (453)	363.662	7.380.526	70,0	4,0	100,0	38,0	39,0
Koskenniemi 4	Noise sensitive point: Demands defined in calculation setup. (454)	363.375	7.380.502	65,3	4,0	100,0	38,0	38,5
Koskenniemi 5	Noise sensitive point: Demands defined in calculation setup. (455)	363.805	7.380.458	73,3	4,0	100,0	38,0	39,3
Koskenniemi 6	Noise sensitive point: Demands defined in calculation setup. (463)	363.785	7.380.418	70,7	4,0	100,0	38,0	39,2
Lehtilaki	Noise sensitive point: Demands defined in calculation setup. (446)	364.527	7.378.562	93,8	4,0	100,0	38,0	39,7
Metsästysmaja	Noise sensitive point: Demands defined in calculation setup. (438)	368.740	7.384.928	190,0	4,0	100,0	38,0	43,7

To be continued on next page...

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DECIBEL - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

...continued from previous page

Noise sensitive area No.	Name	East	North	Z	Immission height	Most critical demand Frequency	Noise	Predicted sound level WTG noise
				[m]	[m]	[Hz]	[dB]	[dB]
Pahtajärvi 1	Noise sensitive point: Demands defined in calculation setup. (441)	372.940	7.380.355	110,0	4,0	100,0	38,0	41,4
Pahtajärvi 2	Noise sensitive point: Demands defined in calculation setup. (442)	372.919	7.380.235	110,0	4,0	100,0	38,0	41,4
Pahtajärvi 3	Noise sensitive point: Demands defined in calculation setup. (443)	373.024	7.379.850	110,0	4,0	100,0	38,0	41,0
Pessala 1	Noise sensitive point: Demands defined in calculation setup. (447)	365.959	7.377.974	71,0	4,0	100,0	38,0	41,8
Pessala 2	Noise sensitive point: Demands defined in calculation setup. (448)	365.996	7.377.961	70,5	4,0	100,0	38,0	41,8

*)Spectral distribution, please see details in report "Detailed results"

Distances (m)

NSA	WTG WTG 03	WTG 04	WTG 05	WTG 06	WTG 07	WTG 08	WTG 09	WTG 10	WTG 11	WTG 12	WTG 13	WTG 14	WTG 15	WTG 16	WTG 17	WTG 18	WTG 19
Ajanki 1	4517	3846	4699	4139	5255	4611	5796	5492	4974	6186	5453	6704	6449	5633	7358	6545	7533
Ajanki 2	4492	3820	4676	4116	5232	4590	5774	5471	4955	6165	5437	6686	6435	5621	7341	6533	7517
Asuntola	5477	6096	5136	5631	4591	5099	4020	4225	4718	3559	4335	2993	3509	4391	2401	3745	2408
Kainuunraja	5932	6505	5545	5985	5030	5416	4472	4580	4975	3978	4465	3264	3512	4388	2568	3601	2392
Kauhajärvi 1	5446	5694	4985	5080	4762	4538	4473	4173	4026	4099	3272	3361	2514	2736	3018	1989	2595
Kauhajärvi 2	5433	5728	4969	5113	4701	4551	4367	4107	4030	3962	3274	3182	2419	2780	2764	1943	2319
Koskenniemi 1	5258	5887	5258	5816	4816	5625	4492	4977	5628	4445	5844	4744	5734	6296	4828	6260	5221
Koskenniemi 2	5549	6175	5557	6113	5118	5928	4798	5283	5934	4751	6149	5043	6032	6600	5115	6556	5502
Koskenniemi 3	5289	5921	5284	5844	4838	5647	4507	4992	5644	4453	5851	4741	5729	6299	4815	6253	5204
Koskenniemi 4	5562	6190	5564	6122	5121	5931	4795	5279	5931	4741	6139	5023	6011	6585	5086	6532	5470
Koskenniemi 5	5188	5825	5173	5735	4719	5527	4379	4861	5515	4314	5711	4591	5579	6155	4659	6101	5047
Koskenniemi 6	5223	5861	5205	5769	4749	5557	4406	4888	5542	4337	5734	4607	5593	6174	4668	6114	5054
Lehtilaki	5720	6393	5538	6111	4993	5724	4491	4890	5525	4207	5447	4090	4955	5728	3837	5373	4089
Metsästysmaja	2256	1776	2676	2386	3156	2971	3709	3661	3495	4206	4233	4979	5214	4709	5701	5572	6038
Pahtajärvi 1	5023	4871	4685	4405	4832	4153	4919	4437	3876	4850	3456	4588	3653	2981	4768	3241	4577
Pahtajärvi 2	5062	4924	4716	4449	4849	4183	4923	4443	3892	4841	3452	4558	3614	2963	4721	3190	4520
Pahtajärvi 3	5348	5244	4985	4749	5083	4449	5119	4648	4127	5001	3633	4656	3687	3110	4760	3223	4523
Pessala 1	5349	5998	5058	5591	4500	5103	3937	4222	4783	3527	4515	3125	3817	4668	2666	4142	2799
Pessala 2	5343	5991	5050	5581	4492	5090	3928	4210	4768	3514	4494	3105	3790	4643	2640	4112	2768

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Assumptions

Cmet: Meteorological correction

Calculation Results

Noise sensitive area: Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	4.517	4.525					
WTG 03			20	36,49	64,5	0,00	5,60
WTG 03			25	34,40	68,5	0,09	5,40
WTG 03			32	34,35	74,0	0,14	5,20
WTG 03			40	32,76	77,5	0,23	5,00
WTG 03			50	33,07	82,6	0,32	4,70
WTG 03			63	29,79	83,9	0,50	4,30
WTG 03			80	28,06	86,7	0,72	3,70
WTG 03			100	28,26	91,4	1,13	3,00
WTG 03			125	21,97	89,9	1,72	1,80
WTG 03			160	17,91	91,2	2,58	0,00
WTG 03			200	15,88	92,8	3,71	0,00
WTG 04	3.846	3.856					
WTG 04			20	37,88	64,5	0,00	5,60
WTG 04			25	35,80	68,5	0,08	5,40
WTG 04			32	35,76	74,0	0,12	5,20
WTG 04			40	34,19	77,5	0,19	5,00
WTG 04			50	34,51	82,6	0,27	4,70
WTG 04			63	31,25	83,9	0,42	4,30
WTG 04			80	29,56	86,7	0,62	3,70
WTG 04			100	29,81	91,4	0,96	3,00
WTG 04			125	23,61	89,9	1,47	1,80
WTG 04			160	19,68	91,2	2,20	0,00
WTG 04			200	17,82	92,8	3,16	0,00
WTG 05	4.699	4.708					
WTG 05			20	36,14	64,5	0,00	5,60
WTG 05			25	34,05	68,5	0,09	5,40
WTG 05			32	34,00	74,0	0,14	5,20
WTG 05			40	32,41	77,5	0,24	5,00
WTG 05			50	32,71	82,6	0,33	4,70
WTG 05			63	29,43	83,9	0,52	4,30
WTG 05			80	27,69	86,7	0,75	3,70
WTG 05			100	27,87	91,4	1,18	3,00
WTG 05			125	21,55	89,9	1,79	1,80
WTG 05			160	17,46	91,2	2,68	0,00
WTG 05			200	15,38	92,8	3,86	0,00
WTG 06	4.139	4.148					
WTG 06			20	37,24	64,5	0,00	5,60
WTG 06			25	35,16	68,5	0,08	5,40
WTG 06			32	35,12	74,0	0,12	5,20
WTG 06			40	33,54	77,5	0,21	5,00
WTG 06			50	33,85	82,6	0,29	4,70
WTG 06			63	30,59	83,9	0,46	4,30
WTG 06			80	28,88	86,7	0,66	3,70
WTG 06			100	29,11	91,4	1,04	3,00
WTG 06			125	22,87	89,9	1,58	1,80
WTG 06			160	18,88	91,2	2,36	0,00
WTG 06			200	16,94	92,8	3,40	0,00
WTG 07	5.255	5.261					
WTG 07			20	35,18	64,5	0,00	5,60
WTG 07			25	33,07	68,5	0,11	5,40
WTG 07			32	33,02	74,0	0,16	5,20
WTG 07			40	31,42	77,5	0,26	5,00
WTG 07			50	31,71	82,6	0,37	4,70
WTG 07			63	28,40	83,9	0,58	4,30
WTG 07			80	26,64	86,7	0,84	3,70
WTG 07			100	26,76	91,4	1,32	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 07			125	20,38	89,9	2,00	1,80
WTG 07			160	16,18	91,2	3,00	0,00
WTG 07			200	13,96	92,8	4,31	0,00
WTG 08	4.611	4.620					
WTG 08			20	36,31	64,5	0,00	5,60
WTG 08			25	34,22	68,5	0,09	5,40
WTG 08			32	34,17	74,0	0,14	5,20
WTG 08			40	32,58	77,5	0,23	5,00
WTG 08			50	32,88	82,6	0,32	4,70
WTG 08			63	29,60	83,9	0,51	4,30
WTG 08			80	27,87	86,7	0,74	3,70
WTG 08			100	28,05	91,4	1,15	3,00
WTG 08			125	21,75	89,9	1,76	1,80
WTG 08			160	17,67	91,2	2,63	0,00
WTG 08			200	15,62	92,8	3,79	0,00
WTG 09	5.796	5.801					
WTG 09			20	34,33	64,5	0,00	5,60
WTG 09			25	32,21	68,5	0,12	5,40
WTG 09			32	32,16	74,0	0,17	5,20
WTG 09			40	30,54	77,5	0,29	5,00
WTG 09			50	30,82	82,6	0,41	4,70
WTG 09			63	27,49	83,9	0,64	4,30
WTG 09			80	25,70	86,7	0,93	3,70
WTG 09			100	25,78	91,4	1,45	3,00
WTG 09			125	19,33	89,9	2,20	1,80
WTG 09			160	15,02	91,2	3,31	0,00
WTG 09			200	12,67	92,8	4,76	0,00
WTG 10	5.492	5.497					
WTG 10			20	34,80	64,5	0,00	5,60
WTG 10			25	32,69	68,5	0,11	5,40
WTG 10			32	32,63	74,0	0,16	5,20
WTG 10			40	31,02	77,5	0,27	5,00
WTG 10			50	31,31	82,6	0,38	4,70
WTG 10			63	27,99	83,9	0,60	4,30
WTG 10			80	26,22	86,7	0,88	3,70
WTG 10			100	26,32	91,4	1,37	3,00
WTG 10			125	19,91	89,9	2,09	1,80
WTG 10			160	15,66	91,2	3,13	0,00
WTG 10			200	13,39	92,8	4,51	0,00
WTG 11	4.974	4.981					
WTG 11			20	35,65	64,5	0,00	5,60
WTG 11			25	33,55	68,5	0,10	5,40
WTG 11			32	33,50	74,0	0,15	5,20
WTG 11			40	31,90	77,5	0,25	5,00
WTG 11			50	32,20	82,6	0,35	4,70
WTG 11			63	28,91	83,9	0,55	4,30
WTG 11			80	27,16	86,7	0,80	3,70
WTG 11			100	27,31	91,4	1,25	3,00
WTG 11			125	20,96	89,9	1,89	1,80
WTG 11			160	16,81	91,2	2,84	0,00
WTG 11			200	14,67	92,8	4,08	0,00
WTG 12	6.186	6.191					
WTG 12			20	33,76	64,5	0,00	5,60
WTG 12			25	31,64	68,5	0,12	5,40
WTG 12			32	31,58	74,0	0,19	5,20
WTG 12			40	29,96	77,5	0,31	5,00
WTG 12			50	30,23	82,6	0,43	4,70
WTG 12			63	26,88	83,9	0,68	4,30
WTG 12			80	25,07	86,7	0,99	3,70
WTG 12			100	25,12	91,4	1,55	3,00
WTG 12			125	18,61	89,9	2,35	1,80
WTG 12			160	14,24	91,2	3,53	0,00
WTG 12			200	11,79	92,8	5,08	0,00
WTG 13	5.453	5.458					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 13			20	34,86	64,5	0,00	5,60
WTG 13			25	32,75	68,5	0,11	5,40
WTG 13			32	32,70	74,0	0,16	5,20
WTG 13			40	31,09	77,5	0,27	5,00
WTG 13			50	31,38	82,6	0,38	4,70
WTG 13			63	28,06	83,9	0,60	4,30
WTG 13			80	26,29	86,7	0,87	3,70
WTG 13			100	26,39	91,4	1,36	3,00
WTG 13			125	19,98	89,9	2,07	1,80
WTG 13			160	15,75	91,2	3,11	0,00
WTG 13			200	13,48	92,8	4,48	0,00
WTG 14	6.704	6.708					
WTG 14			20	33,07	64,5	0,00	5,60
WTG 14			25	30,93	68,5	0,13	5,40
WTG 14			32	30,87	74,0	0,20	5,20
WTG 14			40	29,23	77,5	0,34	5,00
WTG 14			50	29,50	82,6	0,47	4,70
WTG 14			63	26,13	83,9	0,74	4,30
WTG 14			80	24,29	86,7	1,07	3,70
WTG 14			100	24,29	91,4	1,68	3,00
WTG 14			125	17,72	89,9	2,55	1,80
WTG 14			160	13,24	91,2	3,82	0,00
WTG 14			200	10,67	92,8	5,50	0,00
WTG 15	6.449	6.454					
WTG 15			20	33,40	64,5	0,00	5,60
WTG 15			25	31,27	68,5	0,13	5,40
WTG 15			32	31,21	74,0	0,19	5,20
WTG 15			40	29,58	77,5	0,32	5,00
WTG 15			50	29,85	82,6	0,45	4,70
WTG 15			63	26,49	83,9	0,71	4,30
WTG 15			80	24,67	86,7	1,03	3,70
WTG 15			100	24,69	91,4	1,61	3,00
WTG 15			125	18,15	89,9	2,45	1,80
WTG 15			160	13,72	91,2	3,68	0,00
WTG 15			200	11,21	92,8	5,29	0,00
WTG 16	5.633	5.638					
WTG 16			20	34,58	64,5	0,00	5,60
WTG 16			25	32,47	68,5	0,11	5,40
WTG 16			32	32,41	74,0	0,17	5,20
WTG 16			40	30,80	77,5	0,28	5,00
WTG 16			50	31,08	82,6	0,39	4,70
WTG 16			63	27,76	83,9	0,62	4,30
WTG 16			80	25,98	86,7	0,90	3,70
WTG 16			100	26,07	91,4	1,41	3,00
WTG 16			125	19,64	89,9	2,14	1,80
WTG 16			160	15,36	91,2	3,21	0,00
WTG 16			200	13,06	92,8	4,62	0,00
WTG 17	7.358	7.362					
WTG 17			20	32,26	64,5	0,00	5,60
WTG 17			25	30,11	68,5	0,15	5,40
WTG 17			32	30,04	74,0	0,22	5,20
WTG 17			40	28,39	77,5	0,37	5,00
WTG 17			50	28,64	82,6	0,52	4,70
WTG 17			63	25,25	83,9	0,81	4,30
WTG 17			80	23,38	86,7	1,18	3,70
WTG 17			100	23,32	91,4	1,84	3,00
WTG 17			125	16,66	89,9	2,80	1,80
WTG 17			160	12,06	91,2	4,20	0,00
WTG 17			200	9,32	92,8	6,04	0,00
WTG 18	6.545	6.549					
WTG 18			20	33,28	64,5	0,00	5,60
WTG 18			25	31,15	68,5	0,13	5,40
WTG 18			32	31,08	74,0	0,20	5,20
WTG 18			40	29,45	77,5	0,33	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 18			50	29,72	82,6	0,46	4,70
WTG 18			63	26,36	83,9	0,72	4,30
WTG 18			80	24,53	86,7	1,05	3,70
WTG 18			100	24,54	91,4	1,64	3,00
WTG 18			125	17,99	89,9	2,49	1,80
WTG 18			160	13,54	91,2	3,73	0,00
WTG 18			200	11,01	92,8	5,37	0,00
WTG 19	7.533	7.536					
WTG 19			20	32,06	64,5	0,00	5,60
WTG 19			25	29,91	68,5	0,15	5,40
WTG 19			32	29,83	74,0	0,23	5,20
WTG 19			40	28,18	77,5	0,38	5,00
WTG 19			50	28,43	82,6	0,53	4,70
WTG 19			63	25,03	83,9	0,83	4,30
WTG 19			80	23,15	86,7	1,21	3,70
WTG 19			100	23,07	91,4	1,88	3,00
WTG 19			125	16,39	89,9	2,86	1,80
WTG 19			160	11,76	91,2	4,30	0,00
WTG 19			200	8,98	92,8	6,18	0,00
Sum							
Sum			20	47,40			
Sum			25	45,29			
Sum			32	45,24			
Sum			40	43,64			
Sum			50	43,93			
Sum			63	40,62			
Sum			80	38,86			
Sum			100	39,00			
Sum			125	32,63			
Sum			160	28,46			
Sum			200	26,29			

Noise sensitive area: Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	4.492	4.500					
WTG 03			20	36,54	64,5	0,00	5,60
WTG 03			25	34,45	68,5	0,09	5,40
WTG 03			32	34,40	74,0	0,13	5,20
WTG 03			40	32,81	77,5	0,22	5,00
WTG 03			50	33,12	82,6	0,31	4,70
WTG 03			63	29,84	83,9	0,49	4,30
WTG 03			80	28,12	86,7	0,72	3,70
WTG 03			100	28,31	91,4	1,12	3,00
WTG 03			125	22,03	89,9	1,71	1,80
WTG 03			160	17,97	91,2	2,56	0,00
WTG 03			200	15,95	92,8	3,69	0,00
WTG 04	3.820	3.830					
WTG 04			20	37,94	64,5	0,00	5,60
WTG 04			25	35,86	68,5	0,08	5,40
WTG 04			32	35,82	74,0	0,11	5,20
WTG 04			40	34,24	77,5	0,19	5,00
WTG 04			50	34,57	82,6	0,27	4,70
WTG 04			63	31,31	83,9	0,42	4,30
WTG 04			80	29,62	86,7	0,61	3,70
WTG 04			100	29,88	91,4	0,96	3,00
WTG 04			125	23,68	89,9	1,46	1,80
WTG 04			160	19,75	91,2	2,18	0,00
WTG 04			200	17,90	92,8	3,14	0,00
WTG 05	4.676	4.685					
WTG 05			20	36,19	64,5	0,00	5,60
WTG 05			25	34,09	68,5	0,09	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 05			32	34,05	74,0	0,14	5,20
WTG 05			40	32,45	77,5	0,23	5,00
WTG 05			50	32,76	82,6	0,33	4,70
WTG 05			63	29,47	83,9	0,52	4,30
WTG 05			80	27,74	86,7	0,75	3,70
WTG 05			100	27,91	91,4	1,17	3,00
WTG 05			125	21,61	89,9	1,78	1,80
WTG 05			160	17,52	91,2	2,67	0,00
WTG 05			200	15,44	92,8	3,84	0,00
WTG 06	4.116	4.125					
WTG 06			20	37,29	64,5	0,00	5,60
WTG 06			25	35,21	68,5	0,08	5,40
WTG 06			32	35,17	74,0	0,12	5,20
WTG 06			40	33,58	77,5	0,21	5,00
WTG 06			50	33,90	82,6	0,29	4,70
WTG 06			63	30,64	83,9	0,45	4,30
WTG 06			80	28,93	86,7	0,66	3,70
WTG 06			100	29,16	91,4	1,03	3,00
WTG 06			125	22,92	89,9	1,57	1,80
WTG 06			160	18,94	91,2	2,35	0,00
WTG 06			200	17,01	92,8	3,38	0,00
WTG 07	5.232	5.238					
WTG 07			20	35,22	64,5	0,00	5,60
WTG 07			25	33,11	68,5	0,10	5,40
WTG 07			32	33,06	74,0	0,16	5,20
WTG 07			40	31,46	77,5	0,26	5,00
WTG 07			50	31,75	82,6	0,37	4,70
WTG 07			63	28,44	83,9	0,58	4,30
WTG 07			80	26,68	86,7	0,84	3,70
WTG 07			100	26,81	91,4	1,31	3,00
WTG 07			125	20,43	89,9	1,99	1,80
WTG 07			160	16,23	91,2	2,99	0,00
WTG 07			200	14,02	92,8	4,30	0,00
WTG 08	4.590	4.599					
WTG 08			20	36,35	64,5	0,00	5,60
WTG 08			25	34,25	68,5	0,09	5,40
WTG 08			32	34,21	74,0	0,14	5,20
WTG 08			40	32,62	77,5	0,23	5,00
WTG 08			50	32,92	82,6	0,32	4,70
WTG 08			63	29,64	83,9	0,51	4,30
WTG 08			80	27,91	86,7	0,74	3,70
WTG 08			100	28,10	91,4	1,15	3,00
WTG 08			125	21,80	89,9	1,75	1,80
WTG 08			160	17,72	91,2	2,62	0,00
WTG 08			200	15,67	92,8	3,77	0,00
WTG 09	5.774	5.778					
WTG 09			20	34,36	64,5	0,00	5,60
WTG 09			25	32,25	68,5	0,12	5,40
WTG 09			32	32,19	74,0	0,17	5,20
WTG 09			40	30,57	77,5	0,29	5,00
WTG 09			50	30,86	82,6	0,40	4,70
WTG 09			63	27,53	83,9	0,64	4,30
WTG 09			80	25,74	86,7	0,92	3,70
WTG 09			100	25,82	91,4	1,44	3,00
WTG 09			125	19,37	89,9	2,20	1,80
WTG 09			160	15,07	91,2	3,29	0,00
WTG 09			200	12,73	92,8	4,74	0,00
WTG 10	5.471	5.477					
WTG 10			20	34,83	64,5	0,00	5,60
WTG 10			25	32,72	68,5	0,11	5,40
WTG 10			32	32,67	74,0	0,16	5,20
WTG 10			40	31,06	77,5	0,27	5,00
WTG 10			50	31,35	82,6	0,38	4,70
WTG 10			63	28,03	83,9	0,60	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 10			80	26,25	86,7	0,88	3,70
WTG 10			100	26,36	91,4	1,37	3,00
WTG 10			125	19,95	89,9	2,08	1,80
WTG 10			160	15,71	91,2	3,12	0,00
WTG 10			200	13,44	92,8	4,49	0,00
WTG 11	4.955	4.963					
WTG 11			20	35,69	64,5	0,00	5,60
WTG 11			25	33,59	68,5	0,10	5,40
WTG 11			32	33,54	74,0	0,15	5,20
WTG 11			40	31,94	77,5	0,25	5,00
WTG 11			50	32,24	82,6	0,35	4,70
WTG 11			63	28,94	83,9	0,55	4,30
WTG 11			80	27,19	86,7	0,79	3,70
WTG 11			100	27,35	91,4	1,24	3,00
WTG 11			125	21,00	89,9	1,89	1,80
WTG 11			160	16,86	91,2	2,83	0,00
WTG 11			200	14,72	92,8	4,07	0,00
WTG 12	6.165	6.170					
WTG 12			20	33,79	64,5	0,00	5,60
WTG 12			25	31,67	68,5	0,12	5,40
WTG 12			32	31,61	74,0	0,19	5,20
WTG 12			40	29,99	77,5	0,31	5,00
WTG 12			50	30,26	82,6	0,43	4,70
WTG 12			63	26,92	83,9	0,68	4,30
WTG 12			80	25,11	86,7	0,99	3,70
WTG 12			100	25,15	91,4	1,54	3,00
WTG 12			125	18,65	89,9	2,34	1,80
WTG 12			160	14,28	91,2	3,52	0,00
WTG 12			200	11,83	92,8	5,06	0,00
WTG 13	5.437	5.443					
WTG 13			20	34,88	64,5	0,00	5,60
WTG 13			25	32,78	68,5	0,11	5,40
WTG 13			32	32,72	74,0	0,16	5,20
WTG 13			40	31,11	77,5	0,27	5,00
WTG 13			50	31,40	82,6	0,38	4,70
WTG 13			63	28,09	83,9	0,60	4,30
WTG 13			80	26,31	86,7	0,87	3,70
WTG 13			100	26,42	91,4	1,36	3,00
WTG 13			125	20,02	89,9	2,07	1,80
WTG 13			160	15,78	91,2	3,10	0,00
WTG 13			200	13,52	92,8	4,46	0,00
WTG 14	6.686	6.690					
WTG 14			20	33,09	64,5	0,00	5,60
WTG 14			25	30,96	68,5	0,13	5,40
WTG 14			32	30,89	74,0	0,20	5,20
WTG 14			40	29,26	77,5	0,33	5,00
WTG 14			50	29,52	82,6	0,47	4,70
WTG 14			63	26,16	83,9	0,74	4,30
WTG 14			80	24,32	86,7	1,07	3,70
WTG 14			100	24,32	91,4	1,67	3,00
WTG 14			125	17,75	89,9	2,54	1,80
WTG 14			160	13,28	91,2	3,81	0,00
WTG 14			200	10,71	92,8	5,49	0,00
WTG 15	6.435	6.440					
WTG 15			20	33,42	64,5	0,00	5,60
WTG 15			25	31,29	68,5	0,13	5,40
WTG 15			32	31,23	74,0	0,19	5,20
WTG 15			40	29,60	77,5	0,32	5,00
WTG 15			50	29,87	82,6	0,45	4,70
WTG 15			63	26,51	83,9	0,71	4,30
WTG 15			80	24,69	86,7	1,03	3,70
WTG 15			100	24,71	91,4	1,61	3,00
WTG 15			125	18,18	89,9	2,45	1,80
WTG 15			160	13,75	91,2	3,67	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 15			200	11,24	92,8	5,28	0,00
WTG 16	5.621	5.625					
WTG 16			20	34,60	64,5	0,00	5,60
WTG 16			25	32,49	68,5	0,11	5,40
WTG 16			32	32,43	74,0	0,17	5,20
WTG 16			40	30,82	77,5	0,28	5,00
WTG 16			50	31,10	82,6	0,39	4,70
WTG 16			63	27,78	83,9	0,62	4,30
WTG 16			80	26,00	86,7	0,90	3,70
WTG 16			100	26,09	91,4	1,41	3,00
WTG 16			125	19,66	89,9	2,14	1,80
WTG 16			160	15,39	91,2	3,21	0,00
WTG 16			200	13,09	92,8	4,61	0,00
WTG 17	7.341	7.345					
WTG 17			20	32,28	64,5	0,00	5,60
WTG 17			25	30,13	68,5	0,15	5,40
WTG 17			32	30,06	74,0	0,22	5,20
WTG 17			40	28,41	77,5	0,37	5,00
WTG 17			50	28,67	82,6	0,51	4,70
WTG 17			63	25,27	83,9	0,81	4,30
WTG 17			80	23,41	86,7	1,18	3,70
WTG 17			100	23,34	91,4	1,84	3,00
WTG 17			125	16,69	89,9	2,79	1,80
WTG 17			160	12,09	91,2	4,19	0,00
WTG 17			200	9,36	92,8	6,02	0,00
WTG 18	6.533	6.537					
WTG 18			20	33,29	64,5	0,00	5,60
WTG 18			25	31,16	68,5	0,13	5,40
WTG 18			32	31,10	74,0	0,20	5,20
WTG 18			40	29,47	77,5	0,33	5,00
WTG 18			50	29,73	82,6	0,46	4,70
WTG 18			63	26,37	83,9	0,72	4,30
WTG 18			80	24,55	86,7	1,05	3,70
WTG 18			100	24,56	91,4	1,63	3,00
WTG 18			125	18,01	89,9	2,48	1,80
WTG 18			160	13,57	91,2	3,73	0,00
WTG 18			200	11,03	92,8	5,36	0,00
WTG 19	7.517	7.521					
WTG 19			20	32,08	64,5	0,00	5,60
WTG 19			25	29,92	68,5	0,15	5,40
WTG 19			32	29,85	74,0	0,23	5,20
WTG 19			40	28,20	77,5	0,38	5,00
WTG 19			50	28,45	82,6	0,53	4,70
WTG 19			63	25,05	83,9	0,83	4,30
WTG 19			80	23,17	86,7	1,20	3,70
WTG 19			100	23,09	91,4	1,88	3,00
WTG 19			125	16,42	89,9	2,86	1,80
WTG 19			160	11,79	91,2	4,29	0,00
WTG 19			200	9,01	92,8	6,17	0,00
Sum							
Sum			20	47,43			
Sum			25	45,33			
Sum			32	45,28			
Sum			40	43,67			
Sum			50	43,97			
Sum			63	40,66			
Sum			80	38,90			
Sum			100	39,04			
Sum			125	32,68			
Sum			160	28,51			
Sum			200	26,35			

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency
Noise sensitive area: Asuntola Noise sensitive point: Demands defined in calculation setup. (449)
Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.477	5.486					
WTG 03			20	34,82	64,5	0,00	5,60
WTG 03			25	32,71	68,5	0,11	5,40
WTG 03			32	32,65	74,0	0,16	5,20
WTG 03			40	31,04	77,5	0,27	5,00
WTG 03			50	31,33	82,6	0,38	4,70
WTG 03			63	28,01	83,9	0,60	4,30
WTG 03			80	26,24	86,7	0,88	3,70
WTG 03			100	26,34	91,4	1,37	3,00
WTG 03			125	19,93	89,9	2,08	1,80
WTG 03			160	15,69	91,2	3,13	0,00
WTG 03			200	13,42	92,8	4,50	0,00
WTG 04	6.096	6.104					
WTG 04			20	33,89	64,5	0,00	5,60
WTG 04			25	31,77	68,5	0,12	5,40
WTG 04			32	31,70	74,0	0,18	5,20
WTG 04			40	30,08	77,5	0,31	5,00
WTG 04			50	30,36	82,6	0,43	4,70
WTG 04			63	27,02	83,9	0,67	4,30
WTG 04			80	25,21	86,7	0,98	3,70
WTG 04			100	25,26	91,4	1,53	3,00
WTG 04			125	18,77	89,9	2,32	1,80
WTG 04			160	14,41	91,2	3,48	0,00
WTG 04			200	11,98	92,8	5,01	0,00
WTG 05	5.136	5.147					
WTG 05			20	35,37	64,5	0,00	5,60
WTG 05			25	33,27	68,5	0,10	5,40
WTG 05			32	33,21	74,0	0,15	5,20
WTG 05			40	31,61	77,5	0,26	5,00
WTG 05			50	31,91	82,6	0,36	4,70
WTG 05			63	28,60	83,9	0,57	4,30
WTG 05			80	26,85	86,7	0,82	3,70
WTG 05			100	26,98	91,4	1,29	3,00
WTG 05			125	20,61	89,9	1,96	1,80
WTG 05			160	16,44	91,2	2,93	0,00
WTG 05			200	14,25	92,8	4,22	0,00
WTG 06	5.631	5.640					
WTG 06			20	34,57	64,5	0,00	5,60
WTG 06			25	32,46	68,5	0,11	5,40
WTG 06			32	32,41	74,0	0,17	5,20
WTG 06			40	30,79	77,5	0,28	5,00
WTG 06			50	31,08	82,6	0,39	4,70
WTG 06			63	27,75	83,9	0,62	4,30
WTG 06			80	25,97	86,7	0,90	3,70
WTG 06			100	26,06	91,4	1,41	3,00
WTG 06			125	19,63	89,9	2,14	1,80
WTG 06			160	15,36	91,2	3,21	0,00
WTG 06			200	13,05	92,8	4,62	0,00
WTG 07	4.591	4.601					
WTG 07			20	36,34	64,5	0,00	5,60
WTG 07			25	34,25	68,5	0,09	5,40
WTG 07			32	34,21	74,0	0,14	5,20
WTG 07			40	32,61	77,5	0,23	5,00
WTG 07			50	32,92	82,6	0,32	4,70
WTG 07			63	29,64	83,9	0,51	4,30
WTG 07			80	27,91	86,7	0,74	3,70
WTG 07			100	28,09	91,4	1,15	3,00
WTG 07			125	21,80	89,9	1,75	1,80
WTG 07			160	17,72	91,2	2,62	0,00
WTG 07			200	15,67	92,8	3,77	0,00
WTG 08	5.099	5.109					
WTG 08			20	35,43	64,5	0,00	5,60
WTG 08			25	33,33	68,5	0,10	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 08			32	33,28	74,0	0,15	5,20
WTG 08			40	31,68	77,5	0,26	5,00
WTG 08			50	31,97	82,6	0,36	4,70
WTG 08			63	28,67	83,9	0,56	4,30
WTG 08			80	26,92	86,7	0,82	3,70
WTG 08			100	27,06	91,4	1,28	3,00
WTG 08			125	20,69	89,9	1,94	1,80
WTG 08			160	16,52	91,2	2,91	0,00
WTG 08			200	14,34	92,8	4,19	0,00
WTG 09	4.020	4.030					
WTG 09			20	37,49	64,5	0,00	5,60
WTG 09			25	35,41	68,5	0,08	5,40
WTG 09			32	35,37	74,0	0,12	5,20
WTG 09			40	33,79	77,5	0,20	5,00
WTG 09			50	34,11	82,6	0,28	4,70
WTG 09			63	30,85	83,9	0,44	4,30
WTG 09			80	29,15	86,7	0,64	3,70
WTG 09			100	29,39	91,4	1,01	3,00
WTG 09			125	23,16	89,9	1,53	1,80
WTG 09			160	19,20	91,2	2,30	0,00
WTG 09			200	17,29	92,8	3,30	0,00
WTG 10	4.225	4.235					
WTG 10			20	37,06	64,5	0,00	5,60
WTG 10			25	34,98	68,5	0,08	5,40
WTG 10			32	34,94	74,0	0,13	5,20
WTG 10			40	33,35	77,5	0,21	5,00
WTG 10			50	33,67	82,6	0,30	4,70
WTG 10			63	30,40	83,9	0,47	4,30
WTG 10			80	28,69	86,7	0,68	3,70
WTG 10			100	28,90	91,4	1,06	3,00
WTG 10			125	22,65	89,9	1,61	1,80
WTG 10			160	18,65	91,2	2,41	0,00
WTG 10			200	16,69	92,8	3,47	0,00
WTG 11	4.718	4.729					
WTG 11			20	36,11	64,5	0,00	5,60
WTG 11			25	34,01	68,5	0,09	5,40
WTG 11			32	33,96	74,0	0,14	5,20
WTG 11			40	32,37	77,5	0,24	5,00
WTG 11			50	32,67	82,6	0,33	4,70
WTG 11			63	29,39	83,9	0,52	4,30
WTG 11			80	27,65	86,7	0,76	3,70
WTG 11			100	27,82	91,4	1,18	3,00
WTG 11			125	21,51	89,9	1,80	1,80
WTG 11			160	17,41	91,2	2,70	0,00
WTG 11			200	15,33	92,8	3,88	0,00
WTG 12	3.559	3.570					
WTG 12			20	38,55	64,5	0,00	5,60
WTG 12			25	36,47	68,5	0,07	5,40
WTG 12			32	36,44	74,0	0,11	5,20
WTG 12			40	34,87	77,5	0,18	5,00
WTG 12			50	35,20	82,6	0,25	4,70
WTG 12			63	31,95	83,9	0,39	4,30
WTG 12			80	30,27	86,7	0,57	3,70
WTG 12			100	30,55	91,4	0,89	3,00
WTG 12			125	24,39	89,9	1,36	1,80
WTG 12			160	20,51	91,2	2,04	0,00
WTG 12			200	18,72	92,8	2,93	0,00
WTG 13	4.335	4.344					
WTG 13			20	36,84	64,5	0,00	5,60
WTG 13			25	34,75	68,5	0,09	5,40
WTG 13			32	34,71	74,0	0,13	5,20
WTG 13			40	33,12	77,5	0,22	5,00
WTG 13			50	33,44	82,6	0,30	4,70
WTG 13			63	30,16	83,9	0,48	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 13			80	28,45	86,7	0,70	3,70
WTG 13			100	28,66	91,4	1,09	3,00
WTG 13			125	22,39	89,9	1,65	1,80
WTG 13			160	18,37	91,2	2,48	0,00
WTG 13			200	16,38	92,8	3,56	0,00
WTG 14	2.993	3.006					
WTG 14			20	40,04	64,5	0,00	5,60
WTG 14			25	37,98	68,5	0,06	5,40
WTG 14			32	37,95	74,0	0,09	5,20
WTG 14			40	36,39	77,5	0,15	5,00
WTG 14			50	36,73	82,6	0,21	4,70
WTG 14			63	33,51	83,9	0,33	4,30
WTG 14			80	31,86	86,7	0,48	3,70
WTG 14			100	32,19	91,4	0,75	3,00
WTG 14			125	26,10	89,9	1,14	1,80
WTG 14			160	22,33	91,2	1,71	0,00
WTG 14			200	20,67	92,8	2,47	0,00
WTG 15	3.509	3.522					
WTG 15			20	38,67	64,5	0,00	5,60
WTG 15			25	36,59	68,5	0,07	5,40
WTG 15			32	36,56	74,0	0,11	5,20
WTG 15			40	34,99	77,5	0,18	5,00
WTG 15			50	35,32	82,6	0,25	4,70
WTG 15			63	32,08	83,9	0,39	4,30
WTG 15			80	30,40	86,7	0,56	3,70
WTG 15			100	30,68	91,4	0,88	3,00
WTG 15			125	24,53	89,9	1,34	1,80
WTG 15			160	20,66	91,2	2,01	0,00
WTG 15			200	18,88	92,8	2,89	0,00
WTG 16	4.391	4.399					
WTG 16			20	36,73	64,5	0,00	5,60
WTG 16			25	34,65	68,5	0,09	5,40
WTG 16			32	34,60	74,0	0,13	5,20
WTG 16			40	33,01	77,5	0,22	5,00
WTG 16			50	33,33	82,6	0,31	4,70
WTG 16			63	30,05	83,9	0,48	4,30
WTG 16			80	28,33	86,7	0,70	3,70
WTG 16			100	28,53	91,4	1,10	3,00
WTG 16			125	22,26	89,9	1,67	1,80
WTG 16			160	18,23	91,2	2,51	0,00
WTG 16			200	16,23	92,8	3,61	0,00
WTG 17	2.401	2.417					
WTG 17			20	41,94	64,5	0,00	5,60
WTG 17			25	39,89	68,5	0,05	5,40
WTG 17			32	39,86	74,0	0,07	5,20
WTG 17			40	38,31	77,5	0,12	5,00
WTG 17			50	38,67	82,6	0,17	4,70
WTG 17			63	35,47	83,9	0,27	4,30
WTG 17			80	33,85	86,7	0,39	3,70
WTG 17			100	34,23	91,4	0,60	3,00
WTG 17			125	28,22	89,9	0,92	1,80
WTG 17			160	24,56	91,2	1,38	0,00
WTG 17			200	23,05	92,8	1,98	0,00
WTG 18	3.745	3.755					
WTG 18			20	38,11	64,5	0,00	5,60
WTG 18			25	36,03	68,5	0,08	5,40
WTG 18			32	36,00	74,0	0,11	5,20
WTG 18			40	34,42	77,5	0,19	5,00
WTG 18			50	34,75	82,6	0,26	4,70
WTG 18			63	31,49	83,9	0,41	4,30
WTG 18			80	29,81	86,7	0,60	3,70
WTG 18			100	30,07	91,4	0,94	3,00
WTG 18			125	23,88	89,9	1,43	1,80
WTG 18			160	19,97	91,2	2,14	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 18			200	18,13	92,8	3,08	0,00
WTG 19	2.408	2.423					
WTG 19			20	41,91	64,5	0,00	5,60
WTG 19			25	39,87	68,5	0,05	5,40
WTG 19			32	39,84	74,0	0,07	5,20
WTG 19			40	38,29	77,5	0,12	5,00
WTG 19			50	38,65	82,6	0,17	4,70
WTG 19			63	35,45	83,9	0,27	4,30
WTG 19			80	33,83	86,7	0,39	3,70
WTG 19			100	34,21	91,4	0,61	3,00
WTG 19			125	28,19	89,9	0,92	1,80
WTG 19			160	24,53	91,2	1,38	0,00
WTG 19			200	23,03	92,8	1,99	0,00
Sum							
Sum			20	50,26			
Sum			25	48,19			
Sum			32	48,15			
Sum			40	46,58			
Sum			50	46,90			
Sum			63	43,66			
Sum			80	41,97			
Sum			100	42,25			
Sum			125	36,08			
Sum			160	32,21			
Sum			200	30,43			

Noise sensitive area: Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.932	5.940					
WTG 03			20	34,12	64,5	0,00	5,60
WTG 03			25	32,01	68,5	0,12	5,40
WTG 03			32	31,95	74,0	0,18	5,20
WTG 03			40	30,33	77,5	0,30	5,00
WTG 03			50	30,61	82,6	0,42	4,70
WTG 03			63	27,27	83,9	0,65	4,30
WTG 03			80	25,47	86,7	0,95	3,70
WTG 03			100	25,54	91,4	1,49	3,00
WTG 03			125	19,07	89,9	2,26	1,80
WTG 03			160	14,74	91,2	3,39	0,00
WTG 03			200	12,35	92,8	4,87	0,00
WTG 04	6.505	6.513					
WTG 04			20	33,32	64,5	0,00	5,60
WTG 04			25	31,19	68,5	0,13	5,40
WTG 04			32	31,13	74,0	0,20	5,20
WTG 04			40	29,50	77,5	0,33	5,00
WTG 04			50	29,77	82,6	0,46	4,70
WTG 04			63	26,41	83,9	0,72	4,30
WTG 04			80	24,58	86,7	1,04	3,70
WTG 04			100	24,60	91,4	1,63	3,00
WTG 04			125	18,05	89,9	2,48	1,80
WTG 04			160	13,61	91,2	3,71	0,00
WTG 04			200	11,08	92,8	5,34	0,00
WTG 05	5.545	5.555					
WTG 05			20	34,71	64,5	0,00	5,60
WTG 05			25	32,60	68,5	0,11	5,40
WTG 05			32	32,54	74,0	0,17	5,20
WTG 05			40	30,93	77,5	0,28	5,00
WTG 05			50	31,22	82,6	0,39	4,70
WTG 05			63	27,90	83,9	0,61	4,30
WTG 05			80	26,12	86,7	0,89	3,70
WTG 05			100	26,22	91,4	1,39	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 05			125	19,80	89,9	2,11	1,80
WTG 05			160	15,54	91,2	3,17	0,00
WTG 05			200	13,25	92,8	4,56	0,00
WTG 06	5.985	5.994					
WTG 06			20	34,05	64,5	0,00	5,60
WTG 06			25	31,93	68,5	0,12	5,40
WTG 06			32	31,87	74,0	0,18	5,20
WTG 06			40	30,25	77,5	0,30	5,00
WTG 06			50	30,53	82,6	0,42	4,70
WTG 06			63	27,19	83,9	0,66	4,30
WTG 06			80	25,39	86,7	0,96	3,70
WTG 06			100	25,45	91,4	1,50	3,00
WTG 06			125	18,97	89,9	2,28	1,80
WTG 06			160	14,63	91,2	3,42	0,00
WTG 06			200	12,23	92,8	4,91	0,00
WTG 07	5.030	5.039					
WTG 07			20	35,55	64,5	0,00	5,60
WTG 07			25	33,45	68,5	0,10	5,40
WTG 07			32	33,40	74,0	0,15	5,20
WTG 07			40	31,80	77,5	0,25	5,00
WTG 07			50	32,10	82,6	0,35	4,70
WTG 07			63	28,80	83,9	0,55	4,30
WTG 07			80	27,05	86,7	0,81	3,70
WTG 07			100	27,19	91,4	1,26	3,00
WTG 07			125	20,84	89,9	1,91	1,80
WTG 07			160	16,68	91,2	2,87	0,00
WTG 07			200	14,52	92,8	4,13	0,00
WTG 08	5.416	5.427					
WTG 08			20	34,91	64,5	0,00	5,60
WTG 08			25	32,80	68,5	0,11	5,40
WTG 08			32	32,75	74,0	0,16	5,20
WTG 08			40	31,14	77,5	0,27	5,00
WTG 08			50	31,43	82,6	0,38	4,70
WTG 08			63	28,11	83,9	0,60	4,30
WTG 08			80	26,34	86,7	0,87	3,70
WTG 08			100	26,45	91,4	1,36	3,00
WTG 08			125	20,05	89,9	2,06	1,80
WTG 08			160	15,82	91,2	3,09	0,00
WTG 08			200	13,56	92,8	4,45	0,00
WTG 09	4.472	4.481					
WTG 09			20	36,57	64,5	0,00	5,60
WTG 09			25	34,48	68,5	0,09	5,40
WTG 09			32	34,44	74,0	0,13	5,20
WTG 09			40	32,85	77,5	0,22	5,00
WTG 09			50	33,16	82,6	0,31	4,70
WTG 09			63	29,88	83,9	0,49	4,30
WTG 09			80	28,16	86,7	0,72	3,70
WTG 09			100	28,35	91,4	1,12	3,00
WTG 09			125	22,07	89,9	1,70	1,80
WTG 09			160	18,02	91,2	2,55	0,00
WTG 09			200	16,00	92,8	3,67	0,00
WTG 10	4.580	4.590					
WTG 10			20	36,36	64,5	0,00	5,60
WTG 10			25	34,27	68,5	0,09	5,40
WTG 10			32	34,23	74,0	0,14	5,20
WTG 10			40	32,63	77,5	0,23	5,00
WTG 10			50	32,94	82,6	0,32	4,70
WTG 10			63	29,66	83,9	0,50	4,30
WTG 10			80	27,93	86,7	0,73	3,70
WTG 10			100	28,12	91,4	1,15	3,00
WTG 10			125	21,82	89,9	1,74	1,80
WTG 10			160	17,75	91,2	2,62	0,00
WTG 10			200	15,70	92,8	3,76	0,00
WTG 11	4.975	4.985					

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17.09.2021 08:24/3.4.415

DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 11			20	35,65	64,5	0,00	5,60
WTG 11			25	33,55	68,5	0,10	5,40
WTG 11			32	33,50	74,0	0,15	5,20
WTG 11			40	31,90	77,5	0,25	5,00
WTG 11			50	32,20	82,6	0,35	4,70
WTG 11			63	28,90	83,9	0,55	4,30
WTG 11			80	27,15	86,7	0,80	3,70
WTG 11			100	27,30	91,4	1,25	3,00
WTG 11			125	20,95	89,9	1,89	1,80
WTG 11			160	16,80	91,2	2,84	0,00
WTG 11			200	14,66	92,8	4,09	0,00
WTG 12	3.978	3.988					
WTG 12			20	37,58	64,5	0,00	5,60
WTG 12			25	35,50	68,5	0,08	5,40
WTG 12			32	35,46	74,0	0,12	5,20
WTG 12			40	33,88	77,5	0,20	5,00
WTG 12			50	34,20	82,6	0,28	4,70
WTG 12			63	30,95	83,9	0,44	4,30
WTG 12			80	29,25	86,7	0,64	3,70
WTG 12			100	29,49	91,4	1,00	3,00
WTG 12			125	23,27	89,9	1,52	1,80
WTG 12			160	19,31	91,2	2,27	0,00
WTG 12			200	17,41	92,8	3,27	0,00
WTG 13	4.465	4.474					
WTG 13			20	36,59	64,5	0,00	5,60
WTG 13			25	34,50	68,5	0,09	5,40
WTG 13			32	34,45	74,0	0,13	5,20
WTG 13			40	32,86	77,5	0,22	5,00
WTG 13			50	33,17	82,6	0,31	4,70
WTG 13			63	29,89	83,9	0,49	4,30
WTG 13			80	28,17	86,7	0,72	3,70
WTG 13			100	28,37	91,4	1,12	3,00
WTG 13			125	22,09	89,9	1,70	1,80
WTG 13			160	18,04	91,2	2,55	0,00
WTG 13			200	16,02	92,8	3,67	0,00
WTG 14	3.264	3.277					
WTG 14			20	39,29	64,5	0,00	5,60
WTG 14			25	37,23	68,5	0,07	5,40
WTG 14			32	37,19	74,0	0,10	5,20
WTG 14			40	35,63	77,5	0,16	5,00
WTG 14			50	35,96	82,6	0,23	4,70
WTG 14			63	32,73	83,9	0,36	4,30
WTG 14			80	31,07	86,7	0,52	3,70
WTG 14			100	31,37	91,4	0,82	3,00
WTG 14			125	25,25	89,9	1,25	1,80
WTG 14			160	21,42	91,2	1,87	0,00
WTG 14			200	19,70	92,8	2,69	0,00
WTG 15	3.512	3.524					
WTG 15			20	38,66	64,5	0,00	5,60
WTG 15			25	36,59	68,5	0,07	5,40
WTG 15			32	36,55	74,0	0,11	5,20
WTG 15			40	34,98	77,5	0,18	5,00
WTG 15			50	35,31	82,6	0,25	4,70
WTG 15			63	32,07	83,9	0,39	4,30
WTG 15			80	30,39	86,7	0,56	3,70
WTG 15			100	30,68	91,4	0,88	3,00
WTG 15			125	24,52	89,9	1,34	1,80
WTG 15			160	20,65	91,2	2,01	0,00
WTG 15			200	18,87	92,8	2,89	0,00
WTG 16	4.388	4.397					
WTG 16			20	36,74	64,5	0,00	5,60
WTG 16			25	34,65	68,5	0,09	5,40
WTG 16			32	34,61	74,0	0,13	5,20
WTG 16			40	33,02	77,5	0,22	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 16			50	33,33	82,6	0,31	4,70
WTG 16			63	30,05	83,9	0,48	4,30
WTG 16			80	28,33	86,7	0,70	3,70
WTG 16			100	28,54	91,4	1,10	3,00
WTG 16			125	22,27	89,9	1,67	1,80
WTG 16			160	18,23	91,2	2,51	0,00
WTG 16			200	16,23	92,8	3,61	0,00
WTG 17	2.568	2.582					
WTG 17			20	41,36	64,5	0,00	5,60
WTG 17			25	39,31	68,5	0,05	5,40
WTG 17			32	39,28	74,0	0,08	5,20
WTG 17			40	37,73	77,5	0,13	5,00
WTG 17			50	38,08	82,6	0,18	4,70
WTG 17			63	34,88	83,9	0,28	4,30
WTG 17			80	33,25	86,7	0,41	3,70
WTG 17			100	33,62	91,4	0,65	3,00
WTG 17			125	27,58	89,9	0,98	1,80
WTG 17			160	23,89	91,2	1,47	0,00
WTG 17			200	22,34	92,8	2,12	0,00
WTG 18	3.601	3.611					
WTG 18			20	38,45	64,5	0,00	5,60
WTG 18			25	36,38	68,5	0,07	5,40
WTG 18			32	36,34	74,0	0,11	5,20
WTG 18			40	34,77	77,5	0,18	5,00
WTG 18			50	35,10	82,6	0,25	4,70
WTG 18			63	31,85	83,9	0,40	4,30
WTG 18			80	30,17	86,7	0,58	3,70
WTG 18			100	30,45	91,4	0,90	3,00
WTG 18			125	24,28	89,9	1,37	1,80
WTG 18			160	20,39	91,2	2,06	0,00
WTG 18			200	18,59	92,8	2,96	0,00
WTG 19	2.392	2.406					
WTG 19			20	41,97	64,5	0,00	5,60
WTG 19			25	39,92	68,5	0,05	5,40
WTG 19			32	39,90	74,0	0,07	5,20
WTG 19			40	38,35	77,5	0,12	5,00
WTG 19			50	38,70	82,6	0,17	4,70
WTG 19			63	35,51	83,9	0,26	4,30
WTG 19			80	33,89	86,7	0,39	3,70
WTG 19			100	34,27	91,4	0,60	3,00
WTG 19			125	28,26	89,9	0,91	1,80
WTG 19			160	24,60	91,2	1,37	0,00
WTG 19			200	23,10	92,8	1,97	0,00
Sum							
Sum			20	49,86			
Sum			25	47,78			
Sum			32	47,74			
Sum			40	46,16			
Sum			50	46,49			
Sum			63	43,24			
Sum			80	41,55			
Sum			100	41,81			
Sum			125	35,62			
Sum			160	31,72			
Sum			200	29,91			

Noise sensitive area: Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.446	5.450					
WTG 03			20	34,87	64,5	0,00	5,60
WTG 03			25	32,76	68,5	0,11	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03			32	32,71	74,0	0,16	5,20
WTG 03			40	31,10	77,5	0,27	5,00
WTG 03			50	31,39	82,6	0,38	4,70
WTG 03			63	28,07	83,9	0,60	4,30
WTG 03			80	26,30	86,7	0,87	3,70
WTG 03			100	26,41	91,4	1,36	3,00
WTG 03			125	20,00	89,9	2,07	1,80
WTG 03			160	15,77	91,2	3,11	0,00
WTG 03			200	13,50	92,8	4,47	0,00
WTG 04	5.694	5.698					
WTG 04			20	34,49	64,5	0,00	5,60
WTG 04			25	32,37	68,5	0,11	5,40
WTG 04			32	32,32	74,0	0,17	5,20
WTG 04			40	30,70	77,5	0,28	5,00
WTG 04			50	30,99	82,6	0,40	4,70
WTG 04			63	27,66	83,9	0,63	4,30
WTG 04			80	25,87	86,7	0,91	3,70
WTG 04			100	25,96	91,4	1,42	3,00
WTG 04			125	19,52	89,9	2,17	1,80
WTG 04			160	15,24	91,2	3,25	0,00
WTG 04			200	12,91	92,8	4,67	0,00
WTG 05	4.985	4.990					
WTG 05			20	35,64	64,5	0,00	5,60
WTG 05			25	33,54	68,5	0,10	5,40
WTG 05			32	33,49	74,0	0,15	5,20
WTG 05			40	31,89	77,5	0,25	5,00
WTG 05			50	32,19	82,6	0,35	4,70
WTG 05			63	28,89	83,9	0,55	4,30
WTG 05			80	27,14	86,7	0,80	3,70
WTG 05			100	27,29	91,4	1,25	3,00
WTG 05			125	20,94	89,9	1,90	1,80
WTG 05			160	16,79	91,2	2,84	0,00
WTG 05			200	14,65	92,8	4,09	0,00
WTG 06	5.080	5.084					
WTG 06			20	35,48	64,5	0,00	5,60
WTG 06			25	33,37	68,5	0,10	5,40
WTG 06			32	33,32	74,0	0,15	5,20
WTG 06			40	31,72	77,5	0,25	5,00
WTG 06			50	32,02	82,6	0,36	4,70
WTG 06			63	28,72	83,9	0,56	4,30
WTG 06			80	26,96	86,7	0,81	3,70
WTG 06			100	27,10	91,4	1,27	3,00
WTG 06			125	20,74	89,9	1,93	1,80
WTG 06			160	16,58	91,2	2,90	0,00
WTG 06			200	14,41	92,8	4,17	0,00
WTG 07	4.762	4.766					
WTG 07			20	36,04	64,5	0,00	5,60
WTG 07			25	33,94	68,5	0,10	5,40
WTG 07			32	33,89	74,0	0,14	5,20
WTG 07			40	32,30	77,5	0,24	5,00
WTG 07			50	32,60	82,6	0,33	4,70
WTG 07			63	29,31	83,9	0,52	4,30
WTG 07			80	27,58	86,7	0,76	3,70
WTG 07			100	27,75	91,4	1,19	3,00
WTG 07			125	21,43	89,9	1,81	1,80
WTG 07			160	17,32	91,2	2,72	0,00
WTG 07			200	15,23	92,8	3,91	0,00
WTG 08	4.538	4.544					
WTG 08			20	36,45	64,5	0,00	5,60
WTG 08			25	34,36	68,5	0,09	5,40
WTG 08			32	34,32	74,0	0,14	5,20
WTG 08			40	32,72	77,5	0,23	5,00
WTG 08			50	33,03	82,6	0,32	4,70
WTG 08			63	29,75	83,9	0,50	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 08			80	28,03	86,7	0,73	3,70
WTG 08			100	28,22	91,4	1,14	3,00
WTG 08			125	21,93	89,9	1,73	1,80
WTG 08			160	17,86	91,2	2,59	0,00
WTG 08			200	15,83	92,8	3,73	0,00
WTG 09	4.473	4.477					
WTG 09			20	36,58	64,5	0,00	5,60
WTG 09			25	34,49	68,5	0,09	5,40
WTG 09			32	34,45	74,0	0,13	5,20
WTG 09			40	32,86	77,5	0,22	5,00
WTG 09			50	33,17	82,6	0,31	4,70
WTG 09			63	29,89	83,9	0,49	4,30
WTG 09			80	28,16	86,7	0,72	3,70
WTG 09			100	28,36	91,4	1,12	3,00
WTG 09			125	22,08	89,9	1,70	1,80
WTG 09			160	18,03	91,2	2,55	0,00
WTG 09			200	16,01	92,8	3,67	0,00
WTG 10	4.173	4.177					
WTG 10			20	37,18	64,5	0,00	5,60
WTG 10			25	35,10	68,5	0,08	5,40
WTG 10			32	35,06	74,0	0,13	5,20
WTG 10			40	33,47	77,5	0,21	5,00
WTG 10			50	33,79	82,6	0,29	4,70
WTG 10			63	30,52	83,9	0,46	4,30
WTG 10			80	28,81	86,7	0,67	3,70
WTG 10			100	29,04	91,4	1,04	3,00
WTG 10			125	22,80	89,9	1,59	1,80
WTG 10			160	18,80	91,2	2,38	0,00
WTG 10			200	16,86	92,8	3,43	0,00
WTG 11	4.026	4.032					
WTG 11			20	37,49	64,5	0,00	5,60
WTG 11			25	35,41	68,5	0,08	5,40
WTG 11			32	35,37	74,0	0,12	5,20
WTG 11			40	33,79	77,5	0,20	5,00
WTG 11			50	34,11	82,6	0,28	4,70
WTG 11			63	30,85	83,9	0,44	4,30
WTG 11			80	29,15	86,7	0,65	3,70
WTG 11			100	29,38	91,4	1,01	3,00
WTG 11			125	23,16	89,9	1,53	1,80
WTG 11			160	19,19	91,2	2,30	0,00
WTG 11			200	17,28	92,8	3,31	0,00
WTG 12	4.099	4.103					
WTG 12			20	37,34	64,5	0,00	5,60
WTG 12			25	35,26	68,5	0,08	5,40
WTG 12			32	35,21	74,0	0,12	5,20
WTG 12			40	33,63	77,5	0,21	5,00
WTG 12			50	33,95	82,6	0,29	4,70
WTG 12			63	30,69	83,9	0,45	4,30
WTG 12			80	28,98	86,7	0,66	3,70
WTG 12			100	29,21	91,4	1,03	3,00
WTG 12			125	22,98	89,9	1,56	1,80
WTG 12			160	19,00	91,2	2,34	0,00
WTG 12			200	17,07	92,8	3,36	0,00
WTG 13	3.272	3.277					
WTG 13			20	39,29	64,5	0,00	5,60
WTG 13			25	37,23	68,5	0,07	5,40
WTG 13			32	37,19	74,0	0,10	5,20
WTG 13			40	35,63	77,5	0,16	5,00
WTG 13			50	35,96	82,6	0,23	4,70
WTG 13			63	32,73	83,9	0,36	4,30
WTG 13			80	31,07	86,7	0,52	3,70
WTG 13			100	31,37	91,4	0,82	3,00
WTG 13			125	25,25	89,9	1,25	1,80
WTG 13			160	21,42	91,2	1,87	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 13			200	19,70	92,8	2,69	0,00
WTG 14	3.361	3.366					
WTG 14			20	39,06	64,5	0,00	5,60
WTG 14			25	36,99	68,5	0,07	5,40
WTG 14			32	36,96	74,0	0,10	5,20
WTG 14			40	35,39	77,5	0,17	5,00
WTG 14			50	35,72	82,6	0,24	4,70
WTG 14			63	32,49	83,9	0,37	4,30
WTG 14			80	30,82	86,7	0,54	3,70
WTG 14			100	31,12	91,4	0,84	3,00
WTG 14			125	24,98	89,9	1,28	1,80
WTG 14			160	21,14	91,2	1,92	0,00
WTG 14			200	19,40	92,8	2,76	0,00
WTG 15	2.514	2.521					
WTG 15			20	41,57	64,5	0,00	5,60
WTG 15			25	39,52	68,5	0,05	5,40
WTG 15			32	39,49	74,0	0,08	5,20
WTG 15			40	37,94	77,5	0,13	5,00
WTG 15			50	38,29	82,6	0,18	4,70
WTG 15			63	35,09	83,9	0,28	4,30
WTG 15			80	33,47	86,7	0,40	3,70
WTG 15			100	33,84	91,4	0,63	3,00
WTG 15			125	27,81	89,9	0,96	1,80
WTG 15			160	24,13	91,2	1,44	0,00
WTG 15			200	22,60	92,8	2,07	0,00
WTG 16	2.736	2.740					
WTG 16			20	40,84	64,5	0,00	5,60
WTG 16			25	38,79	68,5	0,05	5,40
WTG 16			32	38,76	74,0	0,08	5,20
WTG 16			40	37,21	77,5	0,14	5,00
WTG 16			50	37,55	82,6	0,19	4,70
WTG 16			63	34,34	83,9	0,30	4,30
WTG 16			80	32,71	86,7	0,44	3,70
WTG 16			100	33,06	91,4	0,69	3,00
WTG 16			125	27,00	89,9	1,04	1,80
WTG 16			160	23,28	91,2	1,56	0,00
WTG 16			200	21,70	92,8	2,25	0,00
WTG 17	3.018	3.023					
WTG 17			20	39,99	64,5	0,00	5,60
WTG 17			25	37,93	68,5	0,06	5,40
WTG 17			32	37,90	74,0	0,09	5,20
WTG 17			40	36,34	77,5	0,15	5,00
WTG 17			50	36,68	82,6	0,21	4,70
WTG 17			63	33,46	83,9	0,33	4,30
WTG 17			80	31,81	86,7	0,48	3,70
WTG 17			100	32,14	91,4	0,76	3,00
WTG 17			125	26,04	89,9	1,15	1,80
WTG 17			160	22,27	91,2	1,72	0,00
WTG 17			200	20,61	92,8	2,48	0,00
WTG 18	1.989	1.995					
WTG 18			20	43,60	64,5	0,00	5,60
WTG 18			25	41,56	68,5	0,04	5,40
WTG 18			32	41,54	74,0	0,06	5,20
WTG 18			40	40,00	77,5	0,10	5,00
WTG 18			50	40,36	82,6	0,14	4,70
WTG 18			63	37,18	83,9	0,22	4,30
WTG 18			80	35,58	86,7	0,32	3,70
WTG 18			100	36,00	91,4	0,50	3,00
WTG 18			125	30,04	89,9	0,76	1,80
WTG 18			160	26,46	91,2	1,14	0,00
WTG 18			200	25,06	92,8	1,64	0,00
WTG 19	2.595	2.599					
WTG 19			20	41,30	64,5	0,00	5,60
WTG 19			25	39,25	68,5	0,05	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 19			32	39,23	74,0	0,08	5,20
WTG 19			40	37,67	77,5	0,13	5,00
WTG 19			50	38,02	82,6	0,18	4,70
WTG 19			63	34,82	83,9	0,29	4,30
WTG 19			80	33,19	86,7	0,42	3,70
WTG 19			100	33,55	91,4	0,65	3,00
WTG 19			125	27,52	89,9	0,99	1,80
WTG 19			160	23,82	91,2	1,48	0,00
WTG 19			200	22,27	92,8	2,13	0,00
Sum							
Sum			20	51,20			
Sum			25	49,13			
Sum			32	49,10			
Sum			40	47,53			
Sum			50	47,87			
Sum			63	44,64			
Sum			80	42,98			
Sum			100	43,29			
Sum			125	37,17			
Sum			160	33,37			
Sum			200	31,70			

Noise sensitive area: Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.433	5.437					
WTG 03			20	34,89	64,5	0,00	5,60
WTG 03			25	32,78	68,5	0,11	5,40
WTG 03			32	32,73	74,0	0,16	5,20
WTG 03			40	31,12	77,5	0,27	5,00
WTG 03			50	31,41	82,6	0,38	4,70
WTG 03			63	28,10	83,9	0,60	4,30
WTG 03			80	26,32	86,7	0,87	3,70
WTG 03			100	26,43	91,4	1,36	3,00
WTG 03			125	20,03	89,9	2,07	1,80
WTG 03			160	15,79	91,2	3,10	0,00
WTG 03			200	13,54	92,8	4,46	0,00
WTG 04	5.728	5.732					
WTG 04			20	34,43	64,5	0,00	5,60
WTG 04			25	32,32	68,5	0,11	5,40
WTG 04			32	32,26	74,0	0,17	5,20
WTG 04			40	30,65	77,5	0,29	5,00
WTG 04			50	30,93	82,6	0,40	4,70
WTG 04			63	27,60	83,9	0,63	4,30
WTG 04			80	25,82	86,7	0,92	3,70
WTG 04			100	25,90	91,4	1,43	3,00
WTG 04			125	19,45	89,9	2,18	1,80
WTG 04			160	15,17	91,2	3,27	0,00
WTG 04			200	12,83	92,8	4,70	0,00
WTG 05	4.969	4.974					
WTG 05			20	35,67	64,5	0,00	5,60
WTG 05			25	33,57	68,5	0,10	5,40
WTG 05			32	33,52	74,0	0,15	5,20
WTG 05			40	31,92	77,5	0,25	5,00
WTG 05			50	32,22	82,6	0,35	4,70
WTG 05			63	28,92	83,9	0,55	4,30
WTG 05			80	27,17	86,7	0,80	3,70
WTG 05			100	27,32	91,4	1,24	3,00
WTG 05			125	20,98	89,9	1,89	1,80
WTG 05			160	16,83	91,2	2,84	0,00
WTG 05			200	14,69	92,8	4,08	0,00
WTG 06	5.113	5.117					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 06			20	35,42	64,5	0,00	5,60
WTG 06			25	33,32	68,5	0,10	5,40
WTG 06			32	33,27	74,0	0,15	5,20
WTG 06			40	31,66	77,5	0,26	5,00
WTG 06			50	31,96	82,6	0,36	4,70
WTG 06			63	28,66	83,9	0,56	4,30
WTG 06			80	26,90	86,7	0,82	3,70
WTG 06			100	27,04	91,4	1,28	3,00
WTG 06			125	20,68	89,9	1,94	1,80
WTG 06			160	16,50	91,2	2,92	0,00
WTG 06			200	14,32	92,8	4,20	0,00
WTG 07	4.701	4.705					
WTG 07			20	36,15	64,5	0,00	5,60
WTG 07			25	34,06	68,5	0,09	5,40
WTG 07			32	34,01	74,0	0,14	5,20
WTG 07			40	32,41	77,5	0,24	5,00
WTG 07			50	32,72	82,6	0,33	4,70
WTG 07			63	29,43	83,9	0,52	4,30
WTG 07			80	27,70	86,7	0,75	3,70
WTG 07			100	27,87	91,4	1,18	3,00
WTG 07			125	21,56	89,9	1,79	1,80
WTG 07			160	17,47	91,2	2,68	0,00
WTG 07			200	15,39	92,8	3,86	0,00
WTG 08	4.551	4.557					
WTG 08			20	36,43	64,5	0,00	5,60
WTG 08			25	34,34	68,5	0,09	5,40
WTG 08			32	34,29	74,0	0,14	5,20
WTG 08			40	32,70	77,5	0,23	5,00
WTG 08			50	33,01	82,6	0,32	4,70
WTG 08			63	29,73	83,9	0,50	4,30
WTG 08			80	28,00	86,7	0,73	3,70
WTG 08			100	28,19	91,4	1,14	3,00
WTG 08			125	21,90	89,9	1,73	1,80
WTG 08			160	17,83	91,2	2,60	0,00
WTG 08			200	15,79	92,8	3,74	0,00
WTG 09	4.367	4.371					
WTG 09			20	36,79	64,5	0,00	5,60
WTG 09			25	34,70	68,5	0,09	5,40
WTG 09			32	34,66	74,0	0,13	5,20
WTG 09			40	33,07	77,5	0,22	5,00
WTG 09			50	33,38	82,6	0,31	4,70
WTG 09			63	30,11	83,9	0,48	4,30
WTG 09			80	28,39	86,7	0,70	3,70
WTG 09			100	28,60	91,4	1,09	3,00
WTG 09			125	22,33	89,9	1,66	1,80
WTG 09			160	18,30	91,2	2,49	0,00
WTG 09			200	16,30	92,8	3,58	0,00
WTG 10	4.107	4.112					
WTG 10			20	37,32	64,5	0,00	5,60
WTG 10			25	35,24	68,5	0,08	5,40
WTG 10			32	35,20	74,0	0,12	5,20
WTG 10			40	33,61	77,5	0,21	5,00
WTG 10			50	33,93	82,6	0,29	4,70
WTG 10			63	30,67	83,9	0,45	4,30
WTG 10			80	28,96	86,7	0,66	3,70
WTG 10			100	29,19	91,4	1,03	3,00
WTG 10			125	22,96	89,9	1,56	1,80
WTG 10			160	18,98	91,2	2,34	0,00
WTG 10			200	17,05	92,8	3,37	0,00
WTG 11	4.030	4.035					
WTG 11			20	37,48	64,5	0,00	5,60
WTG 11			25	35,40	68,5	0,08	5,40
WTG 11			32	35,36	74,0	0,12	5,20
WTG 11			40	33,78	77,5	0,20	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 11			50	34,10	82,6	0,28	4,70
WTG 11			63	30,84	83,9	0,44	4,30
WTG 11			80	29,14	86,7	0,65	3,70
WTG 11			100	29,37	91,4	1,01	3,00
WTG 11			125	23,15	89,9	1,53	1,80
WTG 11			160	19,18	91,2	2,30	0,00
WTG 11			200	17,27	92,8	3,31	0,00
WTG 12	3.962	3.966					
WTG 12			20	37,63	64,5	0,00	5,60
WTG 12			25	35,55	68,5	0,08	5,40
WTG 12			32	35,51	74,0	0,12	5,20
WTG 12			40	33,93	77,5	0,20	5,00
WTG 12			50	34,25	82,6	0,28	4,70
WTG 12			63	31,00	83,9	0,44	4,30
WTG 12			80	29,30	86,7	0,63	3,70
WTG 12			100	29,54	91,4	0,99	3,00
WTG 12			125	23,33	89,9	1,51	1,80
WTG 12			160	19,37	91,2	2,26	0,00
WTG 12			200	17,48	92,8	3,25	0,00
WTG 13	3.274	3.279					
WTG 13			20	39,28	64,5	0,00	5,60
WTG 13			25	37,22	68,5	0,07	5,40
WTG 13			32	37,19	74,0	0,10	5,20
WTG 13			40	35,62	77,5	0,16	5,00
WTG 13			50	35,96	82,6	0,23	4,70
WTG 13			63	32,72	83,9	0,36	4,30
WTG 13			80	31,06	86,7	0,52	3,70
WTG 13			100	31,36	91,4	0,82	3,00
WTG 13			125	25,24	89,9	1,25	1,80
WTG 13			160	21,42	91,2	1,87	0,00
WTG 13			200	19,70	92,8	2,69	0,00
WTG 14	3.182	3.187					
WTG 14			20	39,53	64,5	0,00	5,60
WTG 14			25	37,47	68,5	0,06	5,40
WTG 14			32	37,44	74,0	0,10	5,20
WTG 14			40	35,87	77,5	0,16	5,00
WTG 14			50	36,21	82,6	0,22	4,70
WTG 14			63	32,98	83,9	0,35	4,30
WTG 14			80	31,32	86,7	0,51	3,70
WTG 14			100	31,64	91,4	0,80	3,00
WTG 14			125	25,52	89,9	1,21	1,80
WTG 14			160	21,72	91,2	1,82	0,00
WTG 14			200	20,02	92,8	2,61	0,00
WTG 15	2.419	2.426					
WTG 15			20	41,90	64,5	0,00	5,60
WTG 15			25	39,85	68,5	0,05	5,40
WTG 15			32	39,83	74,0	0,07	5,20
WTG 15			40	38,28	77,5	0,12	5,00
WTG 15			50	38,63	82,6	0,17	4,70
WTG 15			63	35,44	83,9	0,27	4,30
WTG 15			80	33,82	86,7	0,39	3,70
WTG 15			100	34,20	91,4	0,61	3,00
WTG 15			125	28,18	89,9	0,92	1,80
WTG 15			160	24,52	91,2	1,38	0,00
WTG 15			200	23,01	92,8	1,99	0,00
WTG 16	2.780	2.784					
WTG 16			20	40,71	64,5	0,00	5,60
WTG 16			25	38,65	68,5	0,06	5,40
WTG 16			32	38,62	74,0	0,08	5,20
WTG 16			40	37,07	77,5	0,14	5,00
WTG 16			50	37,41	82,6	0,19	4,70
WTG 16			63	34,20	83,9	0,31	4,30
WTG 16			80	32,56	86,7	0,45	3,70
WTG 16			100	32,91	91,4	0,70	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 16			125	26,85	89,9	1,06	1,80
WTG 16			160	23,12	91,2	1,59	0,00
WTG 16			200	21,52	92,8	2,28	0,00
WTG 17	2.764	2.768					
WTG 17			20	40,76	64,5	0,00	5,60
WTG 17			25	38,70	68,5	0,06	5,40
WTG 17			32	38,67	74,0	0,08	5,20
WTG 17			40	37,12	77,5	0,14	5,00
WTG 17			50	37,46	82,6	0,19	4,70
WTG 17			63	34,25	83,9	0,30	4,30
WTG 17			80	32,61	86,7	0,44	3,70
WTG 17			100	32,96	91,4	0,69	3,00
WTG 17			125	26,90	89,9	1,05	1,80
WTG 17			160	23,18	91,2	1,58	0,00
WTG 17			200	21,59	92,8	2,27	0,00
WTG 18	1.943	1.950					
WTG 18			20	43,80	64,5	0,00	5,60
WTG 18			25	41,76	68,5	0,04	5,40
WTG 18			32	41,74	74,0	0,06	5,20
WTG 18			40	40,20	77,5	0,10	5,00
WTG 18			50	40,56	82,6	0,14	4,70
WTG 18			63	37,38	83,9	0,21	4,30
WTG 18			80	35,79	86,7	0,31	3,70
WTG 18			100	36,21	91,4	0,49	3,00
WTG 18			125	30,26	89,9	0,74	1,80
WTG 18			160	26,69	91,2	1,11	0,00
WTG 18			200	25,30	92,8	1,60	0,00
WTG 19	2.319	2.325					
WTG 19			20	42,27	64,5	0,00	5,60
WTG 19			25	40,23	68,5	0,05	5,40
WTG 19			32	40,20	74,0	0,07	5,20
WTG 19			40	38,66	77,5	0,12	5,00
WTG 19			50	39,01	82,6	0,16	4,70
WTG 19			63	35,82	83,9	0,26	4,30
WTG 19			80	34,20	86,7	0,37	3,70
WTG 19			100	34,59	91,4	0,58	3,00
WTG 19			125	28,59	89,9	0,88	1,80
WTG 19			160	24,95	91,2	1,33	0,00
WTG 19			200	23,47	92,8	1,91	0,00
Sum							
Sum			20	51,48			
Sum			25	49,42			
Sum			32	49,39			
Sum			40	47,82			
Sum			50	48,16			
Sum			63	44,93			
Sum			80	43,28			
Sum			100	43,60			
Sum			125	37,50			
Sum			160	33,73			
Sum			200	32,08			

Noise sensitive area: Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.258	5.267					
WTG 03			20	35,17	64,5	0,00	5,60
WTG 03			25	33,06	68,5	0,11	5,40
WTG 03			32	33,01	74,0	0,16	5,20
WTG 03			40	31,40	77,5	0,26	5,00
WTG 03			50	31,70	82,6	0,37	4,70
WTG 03			63	28,39	83,9	0,58	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03			80	26,63	86,7	0,84	3,70
WTG 03			100	26,75	91,4	1,32	3,00
WTG 03			125	20,37	89,9	2,00	1,80
WTG 03			160	16,17	91,2	3,00	0,00
WTG 03			200	13,95	92,8	4,32	0,00
WTG 04	5.887	5.896					
WTG 04			20	34,19	64,5	0,00	5,60
WTG 04			25	32,07	68,5	0,12	5,40
WTG 04			32	32,01	74,0	0,18	5,20
WTG 04			40	30,39	77,5	0,29	5,00
WTG 04			50	30,68	82,6	0,41	4,70
WTG 04			63	27,34	83,9	0,65	4,30
WTG 04			80	25,55	86,7	0,94	3,70
WTG 04			100	25,61	91,4	1,47	3,00
WTG 04			125	19,15	89,9	2,24	1,80
WTG 04			160	14,83	91,2	3,36	0,00
WTG 04			200	12,45	92,8	4,83	0,00
WTG 05	5.258	5.269					
WTG 05			20	35,17	64,5	0,00	5,60
WTG 05			25	33,06	68,5	0,11	5,40
WTG 05			32	33,01	74,0	0,16	5,20
WTG 05			40	31,40	77,5	0,26	5,00
WTG 05			50	31,70	82,6	0,37	4,70
WTG 05			63	28,39	83,9	0,58	4,30
WTG 05			80	26,62	86,7	0,84	3,70
WTG 05			100	26,75	91,4	1,32	3,00
WTG 05			125	20,36	89,9	2,00	1,80
WTG 05			160	16,16	91,2	3,00	0,00
WTG 05			200	13,95	92,8	4,32	0,00
WTG 06	5.816	5.825					
WTG 06			20	34,29	64,5	0,00	5,60
WTG 06			25	32,18	68,5	0,12	5,40
WTG 06			32	32,12	74,0	0,17	5,20
WTG 06			40	30,50	77,5	0,29	5,00
WTG 06			50	30,79	82,6	0,41	4,70
WTG 06			63	27,45	83,9	0,64	4,30
WTG 06			80	25,66	86,7	0,93	3,70
WTG 06			100	25,74	91,4	1,46	3,00
WTG 06			125	19,28	89,9	2,21	1,80
WTG 06			160	14,97	91,2	3,32	0,00
WTG 06			200	12,62	92,8	4,78	0,00
WTG 07	4.816	4.825					
WTG 07			20	35,93	64,5	0,00	5,60
WTG 07			25	33,83	68,5	0,10	5,40
WTG 07			32	33,79	74,0	0,14	5,20
WTG 07			40	32,19	77,5	0,24	5,00
WTG 07			50	32,49	82,6	0,34	4,70
WTG 07			63	29,20	83,9	0,53	4,30
WTG 07			80	27,46	86,7	0,77	3,70
WTG 07			100	27,62	91,4	1,21	3,00
WTG 07			125	21,30	89,9	1,83	1,80
WTG 07			160	17,18	91,2	2,75	0,00
WTG 07			200	15,07	92,8	3,96	0,00
WTG 08	5.625	5.635					
WTG 08			20	34,58	64,5	0,00	5,60
WTG 08			25	32,47	68,5	0,11	5,40
WTG 08			32	32,41	74,0	0,17	5,20
WTG 08			40	30,80	77,5	0,28	5,00
WTG 08			50	31,09	82,6	0,39	4,70
WTG 08			63	27,76	83,9	0,62	4,30
WTG 08			80	25,98	86,7	0,90	3,70
WTG 08			100	26,07	91,4	1,41	3,00
WTG 08			125	19,64	89,9	2,14	1,80
WTG 08			160	15,37	91,2	3,21	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 08			200	13,06	92,8	4,62	0,00
WTG 09	4.492	4.501					
WTG 09			20	36,53	64,5	0,00	5,60
WTG 09			25	34,44	68,5	0,09	5,40
WTG 09			32	34,40	74,0	0,14	5,20
WTG 09			40	32,81	77,5	0,23	5,00
WTG 09			50	33,12	82,6	0,32	4,70
WTG 09			63	29,84	83,9	0,50	4,30
WTG 09			80	28,11	86,7	0,72	3,70
WTG 09			100	28,31	91,4	1,13	3,00
WTG 09			125	22,02	89,9	1,71	1,80
WTG 09			160	17,97	91,2	2,57	0,00
WTG 09			200	15,94	92,8	3,69	0,00
WTG 10	4.977	4.986					
WTG 10			20	35,65	64,5	0,00	5,60
WTG 10			25	33,55	68,5	0,10	5,40
WTG 10			32	33,50	74,0	0,15	5,20
WTG 10			40	31,90	77,5	0,25	5,00
WTG 10			50	32,20	82,6	0,35	4,70
WTG 10			63	28,90	83,9	0,55	4,30
WTG 10			80	27,15	86,7	0,80	3,70
WTG 10			100	27,30	91,4	1,25	3,00
WTG 10			125	20,95	89,9	1,89	1,80
WTG 10			160	16,80	91,2	2,84	0,00
WTG 10			200	14,66	92,8	4,09	0,00
WTG 11	5.628	5.638					
WTG 11			20	34,58	64,5	0,00	5,60
WTG 11			25	32,47	68,5	0,11	5,40
WTG 11			32	32,41	74,0	0,17	5,20
WTG 11			40	30,80	77,5	0,28	5,00
WTG 11			50	31,08	82,6	0,39	4,70
WTG 11			63	27,76	83,9	0,62	4,30
WTG 11			80	25,98	86,7	0,90	3,70
WTG 11			100	26,07	91,4	1,41	3,00
WTG 11			125	19,64	89,9	2,14	1,80
WTG 11			160	15,36	91,2	3,21	0,00
WTG 11			200	13,06	92,8	4,62	0,00
WTG 12	4.445	4.454					
WTG 12			20	36,62	64,5	0,00	5,60
WTG 12			25	34,54	68,5	0,09	5,40
WTG 12			32	34,49	74,0	0,13	5,20
WTG 12			40	32,90	77,5	0,22	5,00
WTG 12			50	33,21	82,6	0,31	4,70
WTG 12			63	29,93	83,9	0,49	4,30
WTG 12			80	28,21	86,7	0,71	3,70
WTG 12			100	28,41	91,4	1,11	3,00
WTG 12			125	22,13	89,9	1,69	1,80
WTG 12			160	18,09	91,2	2,54	0,00
WTG 12			200	16,07	92,8	3,65	0,00
WTG 13	5.844	5.851					
WTG 13			20	34,26	64,5	0,00	5,60
WTG 13			25	32,14	68,5	0,12	5,40
WTG 13			32	32,08	74,0	0,18	5,20
WTG 13			40	30,46	77,5	0,29	5,00
WTG 13			50	30,75	82,6	0,41	4,70
WTG 13			63	27,41	83,9	0,64	4,30
WTG 13			80	25,62	86,7	0,94	3,70
WTG 13			100	25,69	91,4	1,46	3,00
WTG 13			125	19,23	89,9	2,22	1,80
WTG 13			160	14,92	91,2	3,33	0,00
WTG 13			200	12,56	92,8	4,80	0,00
WTG 14	4.744	4.753					
WTG 14			20	36,06	64,5	0,00	5,60
WTG 14			25	33,97	68,5	0,10	5,40

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17.09.2021 08:24/3.4.415

DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 14			32	33,92	74,0	0,14	5,20
WTG 14			40	32,32	77,5	0,24	5,00
WTG 14			50	32,63	82,6	0,33	4,70
WTG 14			63	29,34	83,9	0,52	4,30
WTG 14			80	27,60	86,7	0,76	3,70
WTG 14			100	27,77	91,4	1,19	3,00
WTG 14			125	21,46	89,9	1,81	1,80
WTG 14			160	17,35	91,2	2,71	0,00
WTG 14			200	15,26	92,8	3,90	0,00
WTG 15	5.734	5.741					
WTG 15			20	34,42	64,5	0,00	5,60
WTG 15			25	32,30	68,5	0,11	5,40
WTG 15			32	32,25	74,0	0,17	5,20
WTG 15			40	30,63	77,5	0,29	5,00
WTG 15			50	30,92	82,6	0,40	4,70
WTG 15			63	27,59	83,9	0,63	4,30
WTG 15			80	25,80	86,7	0,92	3,70
WTG 15			100	25,88	91,4	1,44	3,00
WTG 15			125	19,44	89,9	2,18	1,80
WTG 15			160	15,15	91,2	3,27	0,00
WTG 15			200	12,81	92,8	4,71	0,00
WTG 16	6.296	6.301					
WTG 16			20	33,61	64,5	0,00	5,60
WTG 16			25	31,49	68,5	0,13	5,40
WTG 16			32	31,42	74,0	0,19	5,20
WTG 16			40	29,80	77,5	0,32	5,00
WTG 16			50	30,07	82,6	0,44	4,70
WTG 16			63	26,72	83,9	0,69	4,30
WTG 16			80	24,90	86,7	1,01	3,70
WTG 16			100	24,94	91,4	1,58	3,00
WTG 16			125	18,42	89,9	2,39	1,80
WTG 16			160	14,02	91,2	3,59	0,00
WTG 16			200	11,54	92,8	5,17	0,00
WTG 17	4.828	4.836					
WTG 17			20	35,91	64,5	0,00	5,60
WTG 17			25	33,81	68,5	0,10	5,40
WTG 17			32	33,77	74,0	0,15	5,20
WTG 17			40	32,17	77,5	0,24	5,00
WTG 17			50	32,47	82,6	0,34	4,70
WTG 17			63	29,18	83,9	0,53	4,30
WTG 17			80	27,44	86,7	0,77	3,70
WTG 17			100	27,60	91,4	1,21	3,00
WTG 17			125	21,27	89,9	1,84	1,80
WTG 17			160	17,15	91,2	2,76	0,00
WTG 17			200	15,04	92,8	3,97	0,00
WTG 18	6.260	6.266					
WTG 18			20	33,66	64,5	0,00	5,60
WTG 18			25	31,53	68,5	0,13	5,40
WTG 18			32	31,47	74,0	0,19	5,20
WTG 18			40	29,85	77,5	0,31	5,00
WTG 18			50	30,12	82,6	0,44	4,70
WTG 18			63	26,77	83,9	0,69	4,30
WTG 18			80	24,96	86,7	1,00	3,70
WTG 18			100	24,99	91,4	1,57	3,00
WTG 18			125	18,48	89,9	2,38	1,80
WTG 18			160	14,09	91,2	3,57	0,00
WTG 18			200	11,62	92,8	5,14	0,00
WTG 19	5.221	5.228					
WTG 19			20	35,23	64,5	0,00	5,60
WTG 19			25	33,13	68,5	0,10	5,40
WTG 19			32	33,08	74,0	0,16	5,20
WTG 19			40	31,47	77,5	0,26	5,00
WTG 19			50	31,77	82,6	0,37	4,70
WTG 19			63	28,46	83,9	0,58	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 19			80	26,70	86,7	0,84	3,70
WTG 19			100	26,83	91,4	1,31	3,00
WTG 19			125	20,45	89,9	1,99	1,80
WTG 19			160	16,25	91,2	2,98	0,00
WTG 19			200	14,05	92,8	4,29	0,00
Sum							
Sum			20	47,45			
Sum			25	45,35			
Sum			32	45,30			
Sum			40	43,69			
Sum			50	43,99			
Sum			63	40,68			
Sum			80	38,91			
Sum			100	39,04			
Sum			125	32,66			
Sum			160	28,47			
Sum			200	26,27			

Noise sensitive area: Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.549	5.559					
WTG 03			20	34,70	64,5	0,00	5,60
WTG 03			25	32,59	68,5	0,11	5,40
WTG 03			32	32,53	74,0	0,17	5,20
WTG 03			40	30,92	77,5	0,28	5,00
WTG 03			50	31,21	82,6	0,39	4,70
WTG 03			63	27,89	83,9	0,61	4,30
WTG 03			80	26,11	86,7	0,89	3,70
WTG 03			100	26,21	91,4	1,39	3,00
WTG 03			125	19,79	89,9	2,11	1,80
WTG 03			160	15,53	91,2	3,17	0,00
WTG 03			200	13,24	92,8	4,56	0,00
WTG 04	6.175	6.183					
WTG 04			20	33,78	64,5	0,00	5,60
WTG 04			25	31,65	68,5	0,12	5,40
WTG 04			32	31,59	74,0	0,19	5,20
WTG 04			40	29,97	77,5	0,31	5,00
WTG 04			50	30,24	82,6	0,43	4,70
WTG 04			63	26,90	83,9	0,68	4,30
WTG 04			80	25,09	86,7	0,99	3,70
WTG 04			100	25,13	91,4	1,55	3,00
WTG 04			125	18,63	89,9	2,35	1,80
WTG 04			160	14,25	91,2	3,52	0,00
WTG 04			200	11,80	92,8	5,07	0,00
WTG 05	5.557	5.567					
WTG 05			20	34,69	64,5	0,00	5,60
WTG 05			25	32,58	68,5	0,11	5,40
WTG 05			32	32,52	74,0	0,17	5,20
WTG 05			40	30,91	77,5	0,28	5,00
WTG 05			50	31,20	82,6	0,39	4,70
WTG 05			63	27,88	83,9	0,61	4,30
WTG 05			80	26,10	86,7	0,89	3,70
WTG 05			100	26,20	91,4	1,39	3,00
WTG 05			125	19,77	89,9	2,12	1,80
WTG 05			160	15,51	91,2	3,17	0,00
WTG 05			200	13,22	92,8	4,56	0,00
WTG 06	6.113	6.122					
WTG 06			20	33,86	64,5	0,00	5,60
WTG 06			25	31,74	68,5	0,12	5,40
WTG 06			32	31,68	74,0	0,18	5,20
WTG 06			40	30,06	77,5	0,31	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 06			50	30,33	82,6	0,43	4,70
WTG 06			63	26,99	83,9	0,67	4,30
WTG 06			80	25,18	86,7	0,98	3,70
WTG 06			100	25,23	91,4	1,53	3,00
WTG 06			125	18,74	89,9	2,33	1,80
WTG 06			160	14,37	91,2	3,49	0,00
WTG 06			200	11,94	92,8	5,02	0,00
WTG 07	5.118	5.127					
WTG 07			20	35,40	64,5	0,00	5,60
WTG 07			25	33,30	68,5	0,10	5,40
WTG 07			32	33,25	74,0	0,15	5,20
WTG 07			40	31,65	77,5	0,26	5,00
WTG 07			50	31,94	82,6	0,36	4,70
WTG 07			63	28,64	83,9	0,56	4,30
WTG 07			80	26,88	86,7	0,82	3,70
WTG 07			100	27,02	91,4	1,28	3,00
WTG 07			125	20,65	89,9	1,95	1,80
WTG 07			160	16,48	91,2	2,92	0,00
WTG 07			200	14,30	92,8	4,20	0,00
WTG 08	5.928	5.937					
WTG 08			20	34,13	64,5	0,00	5,60
WTG 08			25	32,01	68,5	0,12	5,40
WTG 08			32	31,95	74,0	0,18	5,20
WTG 08			40	30,33	77,5	0,30	5,00
WTG 08			50	30,61	82,6	0,42	4,70
WTG 08			63	27,28	83,9	0,65	4,30
WTG 08			80	25,48	86,7	0,95	3,70
WTG 08			100	25,54	91,4	1,48	3,00
WTG 08			125	19,07	89,9	2,26	1,80
WTG 08			160	14,74	91,2	3,38	0,00
WTG 08			200	12,36	92,8	4,87	0,00
WTG 09	4.798	4.806					
WTG 09			20	35,96	64,5	0,00	5,60
WTG 09			25	33,87	68,5	0,10	5,40
WTG 09			32	33,82	74,0	0,14	5,20
WTG 09			40	32,22	77,5	0,24	5,00
WTG 09			50	32,53	82,6	0,34	4,70
WTG 09			63	29,23	83,9	0,53	4,30
WTG 09			80	27,49	86,7	0,77	3,70
WTG 09			100	27,66	91,4	1,20	3,00
WTG 09			125	21,34	89,9	1,83	1,80
WTG 09			160	17,22	91,2	2,74	0,00
WTG 09			200	15,12	92,8	3,94	0,00
WTG 10	5.283	5.292					
WTG 10			20	35,13	64,5	0,00	5,60
WTG 10			25	33,02	68,5	0,11	5,40
WTG 10			32	32,97	74,0	0,16	5,20
WTG 10			40	31,36	77,5	0,26	5,00
WTG 10			50	31,66	82,6	0,37	4,70
WTG 10			63	28,35	83,9	0,58	4,30
WTG 10			80	26,58	86,7	0,85	3,70
WTG 10			100	26,71	91,4	1,32	3,00
WTG 10			125	20,32	89,9	2,01	1,80
WTG 10			160	16,11	91,2	3,02	0,00
WTG 10			200	13,89	92,8	4,34	0,00
WTG 11	5.934	5.943					
WTG 11			20	34,12	64,5	0,00	5,60
WTG 11			25	32,00	68,5	0,12	5,40
WTG 11			32	31,94	74,0	0,18	5,20
WTG 11			40	30,32	77,5	0,30	5,00
WTG 11			50	30,60	82,6	0,42	4,70
WTG 11			63	27,27	83,9	0,65	4,30
WTG 11			80	25,47	86,7	0,95	3,70
WTG 11			100	25,53	91,4	1,49	3,00

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17.09.2021 08:24/3.4.415

DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 11			125	19,06	89,9	2,26	1,80
WTG 11			160	14,73	91,2	3,39	0,00
WTG 11			200	12,35	92,8	4,87	0,00
WTG 12	4.751	4.760					
WTG 12			20	36,05	64,5	0,00	5,60
WTG 12			25	33,95	68,5	0,10	5,40
WTG 12			32	33,91	74,0	0,14	5,20
WTG 12			40	32,31	77,5	0,24	5,00
WTG 12			50	32,61	82,6	0,33	4,70
WTG 12			63	29,32	83,9	0,52	4,30
WTG 12			80	27,59	86,7	0,76	3,70
WTG 12			100	27,76	91,4	1,19	3,00
WTG 12			125	21,44	89,9	1,81	1,80
WTG 12			160	17,33	91,2	2,71	0,00
WTG 12			200	15,24	92,8	3,90	0,00
WTG 13	6.149	6.156					
WTG 13			20	33,81	64,5	0,00	5,60
WTG 13			25	31,69	68,5	0,12	5,40
WTG 13			32	31,63	74,0	0,18	5,20
WTG 13			40	30,01	77,5	0,31	5,00
WTG 13			50	30,28	82,6	0,43	4,70
WTG 13			63	26,94	83,9	0,68	4,30
WTG 13			80	25,13	86,7	0,99	3,70
WTG 13			100	25,17	91,4	1,54	3,00
WTG 13			125	18,67	89,9	2,34	1,80
WTG 13			160	14,30	91,2	3,51	0,00
WTG 13			200	11,87	92,8	5,05	0,00
WTG 14	5.043	5.051					
WTG 14			20	35,53	64,5	0,00	5,60
WTG 14			25	33,43	68,5	0,10	5,40
WTG 14			32	33,38	74,0	0,15	5,20
WTG 14			40	31,78	77,5	0,25	5,00
WTG 14			50	32,08	82,6	0,35	4,70
WTG 14			63	28,78	83,9	0,56	4,30
WTG 14			80	27,02	86,7	0,81	3,70
WTG 14			100	27,17	91,4	1,26	3,00
WTG 14			125	20,81	89,9	1,92	1,80
WTG 14			160	16,65	91,2	2,88	0,00
WTG 14			200	14,49	92,8	4,14	0,00
WTG 15	6.032	6.039					
WTG 15			20	33,98	64,5	0,00	5,60
WTG 15			25	31,86	68,5	0,12	5,40
WTG 15			32	31,80	74,0	0,18	5,20
WTG 15			40	30,18	77,5	0,30	5,00
WTG 15			50	30,46	82,6	0,42	4,70
WTG 15			63	27,12	83,9	0,66	4,30
WTG 15			80	25,31	86,7	0,97	3,70
WTG 15			100	25,37	91,4	1,51	3,00
WTG 15			125	18,89	89,9	2,29	1,80
WTG 15			160	14,54	91,2	3,44	0,00
WTG 15			200	12,13	92,8	4,95	0,00
WTG 16	6.600	6.605					
WTG 16			20	33,20	64,5	0,00	5,60
WTG 16			25	31,07	68,5	0,13	5,40
WTG 16			32	31,00	74,0	0,20	5,20
WTG 16			40	29,37	77,5	0,33	5,00
WTG 16			50	29,64	82,6	0,46	4,70
WTG 16			63	26,28	83,9	0,73	4,30
WTG 16			80	24,45	86,7	1,06	3,70
WTG 16			100	24,45	91,4	1,65	3,00
WTG 16			125	17,89	89,9	2,51	1,80
WTG 16			160	13,44	91,2	3,77	0,00
WTG 16			200	10,89	92,8	5,42	0,00
WTG 17	5.115	5.122					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 17			20	35,41	64,5	0,00	5,60
WTG 17			25	33,31	68,5	0,10	5,40
WTG 17			32	33,26	74,0	0,15	5,20
WTG 17			40	31,65	77,5	0,26	5,00
WTG 17			50	31,95	82,6	0,36	4,70
WTG 17			63	28,65	83,9	0,56	4,30
WTG 17			80	26,89	86,7	0,82	3,70
WTG 17			100	27,03	91,4	1,28	3,00
WTG 17			125	20,66	89,9	1,95	1,80
WTG 17			160	16,49	91,2	2,92	0,00
WTG 17			200	14,31	92,8	4,20	0,00
WTG 18	6.556	6.561					
WTG 18			20	33,26	64,5	0,00	5,60
WTG 18			25	31,13	68,5	0,13	5,40
WTG 18			32	31,06	74,0	0,20	5,20
WTG 18			40	29,43	77,5	0,33	5,00
WTG 18			50	29,70	82,6	0,46	4,70
WTG 18			63	26,34	83,9	0,72	4,30
WTG 18			80	24,51	86,7	1,05	3,70
WTG 18			100	24,52	91,4	1,64	3,00
WTG 18			125	17,97	89,9	2,49	1,80
WTG 18			160	13,52	91,2	3,74	0,00
WTG 18			200	10,98	92,8	5,38	0,00
WTG 19	5.502	5.508					
WTG 19			20	34,78	64,5	0,00	5,60
WTG 19			25	32,67	68,5	0,11	5,40
WTG 19			32	32,61	74,0	0,17	5,20
WTG 19			40	31,00	77,5	0,28	5,00
WTG 19			50	31,29	82,6	0,39	4,70
WTG 19			63	27,97	83,9	0,61	4,30
WTG 19			80	26,20	86,7	0,88	3,70
WTG 19			100	26,30	91,4	1,38	3,00
WTG 19			125	19,89	89,9	2,09	1,80
WTG 19			160	15,64	91,2	3,14	0,00
WTG 19			200	13,36	92,8	4,52	0,00
Sum							
Sum			20	46,97			
Sum			25	44,86			
Sum			32	44,80			
Sum			40	43,19			
Sum			50	43,48			
Sum			63	40,16			
Sum			80	38,38			
Sum			100	38,48			
Sum			125	32,06			
Sum			160	27,81			
Sum			200	25,54			

Noise sensitive area: Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.289	5.299					
WTG 03			20	35,12	64,5	0,00	5,60
WTG 03			25	33,01	68,5	0,11	5,40
WTG 03			32	32,96	74,0	0,16	5,20
WTG 03			40	31,35	77,5	0,26	5,00
WTG 03			50	31,65	82,6	0,37	4,70
WTG 03			63	28,33	83,9	0,58	4,30
WTG 03			80	26,57	86,7	0,85	3,70
WTG 03			100	26,69	91,4	1,32	3,00
WTG 03			125	20,30	89,9	2,01	1,80
WTG 03			160	16,10	91,2	3,02	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03			200	13,87	92,8	4,35	0,00
WTG 04	5.921	5.930					
WTG 04			20	34,14	64,5	0,00	5,60
WTG 04			25	32,02	68,5	0,12	5,40
WTG 04			32	31,96	74,0	0,18	5,20
WTG 04			40	30,34	77,5	0,30	5,00
WTG 04			50	30,62	82,6	0,42	4,70
WTG 04			63	27,29	83,9	0,65	4,30
WTG 04			80	25,49	86,7	0,95	3,70
WTG 04			100	25,56	91,4	1,48	3,00
WTG 04			125	19,09	89,9	2,25	1,80
WTG 04			160	14,76	91,2	3,38	0,00
WTG 04			200	12,38	92,8	4,86	0,00
WTG 05	5.284	5.295					
WTG 05			20	35,12	64,5	0,00	5,60
WTG 05			25	33,02	68,5	0,11	5,40
WTG 05			32	32,96	74,0	0,16	5,20
WTG 05			40	31,36	77,5	0,26	5,00
WTG 05			50	31,65	82,6	0,37	4,70
WTG 05			63	28,34	83,9	0,58	4,30
WTG 05			80	26,58	86,7	0,85	3,70
WTG 05			100	26,70	91,4	1,32	3,00
WTG 05			125	20,31	89,9	2,01	1,80
WTG 05			160	16,10	91,2	3,02	0,00
WTG 05			200	13,88	92,8	4,34	0,00
WTG 06	5.844	5.853					
WTG 06			20	34,25	64,5	0,00	5,60
WTG 06			25	32,14	68,5	0,12	5,40
WTG 06			32	32,08	74,0	0,18	5,20
WTG 06			40	30,46	77,5	0,29	5,00
WTG 06			50	30,74	82,6	0,41	4,70
WTG 06			63	27,41	83,9	0,64	4,30
WTG 06			80	25,62	86,7	0,94	3,70
WTG 06			100	25,69	91,4	1,46	3,00
WTG 06			125	19,23	89,9	2,22	1,80
WTG 06			160	14,92	91,2	3,34	0,00
WTG 06			200	12,55	92,8	4,80	0,00
WTG 07	4.838	4.847					
WTG 07			20	35,89	64,5	0,00	5,60
WTG 07			25	33,79	68,5	0,10	5,40
WTG 07			32	33,74	74,0	0,15	5,20
WTG 07			40	32,15	77,5	0,24	5,00
WTG 07			50	32,45	82,6	0,34	4,70
WTG 07			63	29,16	83,9	0,53	4,30
WTG 07			80	27,41	86,7	0,78	3,70
WTG 07			100	27,58	91,4	1,21	3,00
WTG 07			125	21,25	89,9	1,84	1,80
WTG 07			160	17,13	91,2	2,76	0,00
WTG 07			200	15,02	92,8	3,97	0,00
WTG 08	5.647	5.657					
WTG 08			20	34,55	64,5	0,00	5,60
WTG 08			25	32,44	68,5	0,11	5,40
WTG 08			32	32,38	74,0	0,17	5,20
WTG 08			40	30,77	77,5	0,28	5,00
WTG 08			50	31,05	82,6	0,40	4,70
WTG 08			63	27,73	83,9	0,62	4,30
WTG 08			80	25,94	86,7	0,91	3,70
WTG 08			100	26,03	91,4	1,41	3,00
WTG 08			125	19,60	89,9	2,15	1,80
WTG 08			160	15,32	91,2	3,22	0,00
WTG 08			200	13,01	92,8	4,64	0,00
WTG 09	4.507	4.517					
WTG 09			20	36,50	64,5	0,00	5,60
WTG 09			25	34,41	68,5	0,09	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 09			32	34,37	74,0	0,14	5,20
WTG 09			40	32,78	77,5	0,23	5,00
WTG 09			50	33,09	82,6	0,32	4,70
WTG 09			63	29,81	83,9	0,50	4,30
WTG 09			80	28,08	86,7	0,72	3,70
WTG 09			100	28,27	91,4	1,13	3,00
WTG 09			125	21,99	89,9	1,72	1,80
WTG 09			160	17,93	91,2	2,57	0,00
WTG 09			200	15,90	92,8	3,70	0,00
WTG 10	4.992	5.001					
WTG 10			20	35,62	64,5	0,00	5,60
WTG 10			25	33,52	68,5	0,10	5,40
WTG 10			32	33,47	74,0	0,15	5,20
WTG 10			40	31,87	77,5	0,25	5,00
WTG 10			50	32,17	82,6	0,35	4,70
WTG 10			63	28,87	83,9	0,55	4,30
WTG 10			80	27,12	86,7	0,80	3,70
WTG 10			100	27,27	91,4	1,25	3,00
WTG 10			125	20,92	89,9	1,90	1,80
WTG 10			160	16,77	91,2	2,85	0,00
WTG 10			200	14,62	92,8	4,10	0,00
WTG 11	5.644	5.653					
WTG 11			20	34,55	64,5	0,00	5,60
WTG 11			25	32,44	68,5	0,11	5,40
WTG 11			32	32,38	74,0	0,17	5,20
WTG 11			40	30,77	77,5	0,28	5,00
WTG 11			50	31,06	82,6	0,40	4,70
WTG 11			63	27,73	83,9	0,62	4,30
WTG 11			80	25,95	86,7	0,90	3,70
WTG 11			100	26,04	91,4	1,41	3,00
WTG 11			125	19,61	89,9	2,15	1,80
WTG 11			160	15,33	91,2	3,22	0,00
WTG 11			200	13,02	92,8	4,64	0,00
WTG 12	4.453	4.463					
WTG 12			20	36,61	64,5	0,00	5,60
WTG 12			25	34,52	68,5	0,09	5,40
WTG 12			32	34,47	74,0	0,13	5,20
WTG 12			40	32,89	77,5	0,22	5,00
WTG 12			50	33,20	82,6	0,31	4,70
WTG 12			63	29,92	83,9	0,49	4,30
WTG 12			80	28,19	86,7	0,71	3,70
WTG 12			100	28,39	91,4	1,12	3,00
WTG 12			125	22,11	89,9	1,70	1,80
WTG 12			160	18,06	91,2	2,54	0,00
WTG 12			200	16,05	92,8	3,66	0,00
WTG 13	5.851	5.858					
WTG 13			20	34,24	64,5	0,00	5,60
WTG 13			25	32,13	68,5	0,12	5,40
WTG 13			32	32,07	74,0	0,18	5,20
WTG 13			40	30,45	77,5	0,29	5,00
WTG 13			50	30,73	82,6	0,41	4,70
WTG 13			63	27,40	83,9	0,64	4,30
WTG 13			80	25,61	86,7	0,94	3,70
WTG 13			100	25,68	91,4	1,46	3,00
WTG 13			125	19,22	89,9	2,23	1,80
WTG 13			160	14,91	91,2	3,34	0,00
WTG 13			200	12,54	92,8	4,80	0,00
WTG 14	4.741	4.749					
WTG 14			20	36,07	64,5	0,00	5,60
WTG 14			25	33,97	68,5	0,09	5,40
WTG 14			32	33,93	74,0	0,14	5,20
WTG 14			40	32,33	77,5	0,24	5,00
WTG 14			50	32,64	82,6	0,33	4,70
WTG 14			63	29,35	83,9	0,52	4,30

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Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 14			80	27,61	86,7	0,76	3,70
WTG 14			100	27,78	91,4	1,19	3,00
WTG 14			125	21,46	89,9	1,80	1,80
WTG 14			160	17,36	91,2	2,71	0,00
WTG 14			200	15,27	92,8	3,89	0,00
WTG 15	5.729	5.737					
WTG 15			20	34,43	64,5	0,00	5,60
WTG 15			25	32,31	68,5	0,11	5,40
WTG 15			32	32,25	74,0	0,17	5,20
WTG 15			40	30,64	77,5	0,29	5,00
WTG 15			50	30,92	82,6	0,40	4,70
WTG 15			63	27,60	83,9	0,63	4,30
WTG 15			80	25,81	86,7	0,92	3,70
WTG 15			100	25,89	91,4	1,43	3,00
WTG 15			125	19,45	89,9	2,18	1,80
WTG 15			160	15,16	91,2	3,27	0,00
WTG 15			200	12,82	92,8	4,70	0,00
WTG 16	6.299	6.305					
WTG 16			20	33,61	64,5	0,00	5,60
WTG 16			25	31,48	68,5	0,13	5,40
WTG 16			32	31,42	74,0	0,19	5,20
WTG 16			40	29,79	77,5	0,32	5,00
WTG 16			50	30,07	82,6	0,44	4,70
WTG 16			63	26,71	83,9	0,69	4,30
WTG 16			80	24,90	86,7	1,01	3,70
WTG 16			100	24,93	91,4	1,58	3,00
WTG 16			125	18,41	89,9	2,40	1,80
WTG 16			160	14,01	91,2	3,59	0,00
WTG 16			200	11,54	92,8	5,17	0,00
WTG 17	4.815	4.823					
WTG 17			20	35,93	64,5	0,00	5,60
WTG 17			25	33,84	68,5	0,10	5,40
WTG 17			32	33,79	74,0	0,14	5,20
WTG 17			40	32,19	77,5	0,24	5,00
WTG 17			50	32,50	82,6	0,34	4,70
WTG 17			63	29,20	83,9	0,53	4,30
WTG 17			80	27,46	86,7	0,77	3,70
WTG 17			100	27,63	91,4	1,21	3,00
WTG 17			125	21,30	89,9	1,83	1,80
WTG 17			160	17,19	91,2	2,75	0,00
WTG 17			200	15,08	92,8	3,95	0,00
WTG 18	6.253	6.259					
WTG 18			20	33,67	64,5	0,00	5,60
WTG 18			25	31,54	68,5	0,13	5,40
WTG 18			32	31,48	74,0	0,19	5,20
WTG 18			40	29,86	77,5	0,31	5,00
WTG 18			50	30,13	82,6	0,44	4,70
WTG 18			63	26,78	83,9	0,69	4,30
WTG 18			80	24,97	86,7	1,00	3,70
WTG 18			100	25,00	91,4	1,56	3,00
WTG 18			125	18,49	89,9	2,38	1,80
WTG 18			160	14,10	91,2	3,57	0,00
WTG 18			200	11,64	92,8	5,13	0,00
WTG 19	5.204	5.211					
WTG 19			20	35,26	64,5	0,00	5,60
WTG 19			25	33,16	68,5	0,10	5,40
WTG 19			32	33,11	74,0	0,16	5,20
WTG 19			40	31,50	77,5	0,26	5,00
WTG 19			50	31,80	82,6	0,36	4,70
WTG 19			63	28,49	83,9	0,57	4,30
WTG 19			80	26,73	86,7	0,83	3,70
WTG 19			100	26,86	91,4	1,30	3,00
WTG 19			125	20,48	89,9	1,98	1,80
WTG 19			160	16,29	91,2	2,97	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 19			200	14,09	92,8	4,27	0,00
Sum							
Sum			20	47,44			
Sum			25	45,33			
Sum			32	45,28			
Sum			40	43,67			
Sum			50	43,97			
Sum			63	40,66			
Sum			80	38,90			
Sum			100	39,02			
Sum			125	32,64			
Sum			160	28,45			
Sum			200	26,25			

Noise sensitive area: Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.562	5.571					
WTG 03			20	34,68	64,5	0,00	5,60
WTG 03			25	32,57	68,5	0,11	5,40
WTG 03			32	32,51	74,0	0,17	5,20
WTG 03			40	30,90	77,5	0,28	5,00
WTG 03			50	31,19	82,6	0,39	4,70
WTG 03			63	27,87	83,9	0,61	4,30
WTG 03			80	26,09	86,7	0,89	3,70
WTG 03			100	26,19	91,4	1,39	3,00
WTG 03			125	19,76	89,9	2,12	1,80
WTG 03			160	15,51	91,2	3,18	0,00
WTG 03			200	13,21	92,8	4,57	0,00
WTG 04	6.190	6.199					
WTG 04			20	33,75	64,5	0,00	5,60
WTG 04			25	31,63	68,5	0,12	5,40
WTG 04			32	31,57	74,0	0,19	5,20
WTG 04			40	29,94	77,5	0,31	5,00
WTG 04			50	30,22	82,6	0,43	4,70
WTG 04			63	26,87	83,9	0,68	4,30
WTG 04			80	25,06	86,7	0,99	3,70
WTG 04			100	25,10	91,4	1,55	3,00
WTG 04			125	18,60	89,9	2,36	1,80
WTG 04			160	14,22	91,2	3,53	0,00
WTG 04			200	11,77	92,8	5,08	0,00
WTG 05	5.564	5.574					
WTG 05			20	34,68	64,5	0,00	5,60
WTG 05			25	32,56	68,5	0,11	5,40
WTG 05			32	32,51	74,0	0,17	5,20
WTG 05			40	30,90	77,5	0,28	5,00
WTG 05			50	31,19	82,6	0,39	4,70
WTG 05			63	27,86	83,9	0,61	4,30
WTG 05			80	26,08	86,7	0,89	3,70
WTG 05			100	26,18	91,4	1,39	3,00
WTG 05			125	19,76	89,9	2,12	1,80
WTG 05			160	15,50	91,2	3,18	0,00
WTG 05			200	13,21	92,8	4,57	0,00
WTG 06	6.122	6.131					
WTG 06			20	33,85	64,5	0,00	5,60
WTG 06			25	31,73	68,5	0,12	5,40
WTG 06			32	31,67	74,0	0,18	5,20
WTG 06			40	30,04	77,5	0,31	5,00
WTG 06			50	30,32	82,6	0,43	4,70
WTG 06			63	26,98	83,9	0,67	4,30
WTG 06			80	25,17	86,7	0,98	3,70
WTG 06			100	25,22	91,4	1,53	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 06			125	18,72	89,9	2,33	1,80
WTG 06			160	14,36	91,2	3,49	0,00
WTG 06			200	11,92	92,8	5,03	0,00
WTG 07	5.121	5.130					
WTG 07			20	35,40	64,5	0,00	5,60
WTG 07			25	33,29	68,5	0,10	5,40
WTG 07			32	33,24	74,0	0,15	5,20
WTG 07			40	31,64	77,5	0,26	5,00
WTG 07			50	31,94	82,6	0,36	4,70
WTG 07			63	28,63	83,9	0,56	4,30
WTG 07			80	26,88	86,7	0,82	3,70
WTG 07			100	27,01	91,4	1,28	3,00
WTG 07			125	20,65	89,9	1,95	1,80
WTG 07			160	16,47	91,2	2,92	0,00
WTG 07			200	14,29	92,8	4,21	0,00
WTG 08	5.931	5.940					
WTG 08			20	34,12	64,5	0,00	5,60
WTG 08			25	32,01	68,5	0,12	5,40
WTG 08			32	31,95	74,0	0,18	5,20
WTG 08			40	30,33	77,5	0,30	5,00
WTG 08			50	30,61	82,6	0,42	4,70
WTG 08			63	27,27	83,9	0,65	4,30
WTG 08			80	25,47	86,7	0,95	3,70
WTG 08			100	25,54	91,4	1,49	3,00
WTG 08			125	19,07	89,9	2,26	1,80
WTG 08			160	14,74	91,2	3,39	0,00
WTG 08			200	12,35	92,8	4,87	0,00
WTG 09	4.795	4.803					
WTG 09			20	35,97	64,5	0,00	5,60
WTG 09			25	33,87	68,5	0,10	5,40
WTG 09			32	33,83	74,0	0,14	5,20
WTG 09			40	32,23	77,5	0,24	5,00
WTG 09			50	32,53	82,6	0,34	4,70
WTG 09			63	29,24	83,9	0,53	4,30
WTG 09			80	27,50	86,7	0,77	3,70
WTG 09			100	27,67	91,4	1,20	3,00
WTG 09			125	21,34	89,9	1,83	1,80
WTG 09			160	17,23	91,2	2,74	0,00
WTG 09			200	15,13	92,8	3,94	0,00
WTG 10	5.279	5.288					
WTG 10			20	35,13	64,5	0,00	5,60
WTG 10			25	33,03	68,5	0,11	5,40
WTG 10			32	32,98	74,0	0,16	5,20
WTG 10			40	31,37	77,5	0,26	5,00
WTG 10			50	31,66	82,6	0,37	4,70
WTG 10			63	28,35	83,9	0,58	4,30
WTG 10			80	26,59	86,7	0,85	3,70
WTG 10			100	26,71	91,4	1,32	3,00
WTG 10			125	20,33	89,9	2,01	1,80
WTG 10			160	16,12	91,2	3,01	0,00
WTG 10			200	13,90	92,8	4,34	0,00
WTG 11	5.931	5.940					
WTG 11			20	34,12	64,5	0,00	5,60
WTG 11			25	32,01	68,5	0,12	5,40
WTG 11			32	31,95	74,0	0,18	5,20
WTG 11			40	30,33	77,5	0,30	5,00
WTG 11			50	30,61	82,6	0,42	4,70
WTG 11			63	27,27	83,9	0,65	4,30
WTG 11			80	25,47	86,7	0,95	3,70
WTG 11			100	25,54	91,4	1,49	3,00
WTG 11			125	19,07	89,9	2,26	1,80
WTG 11			160	14,74	91,2	3,39	0,00
WTG 11			200	12,35	92,8	4,87	0,00
WTG 12	4.741	4.750					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 12			20	36,07	64,5	0,00	5,60
WTG 12			25	33,97	68,5	0,10	5,40
WTG 12			32	33,92	74,0	0,14	5,20
WTG 12			40	32,33	77,5	0,24	5,00
WTG 12			50	32,63	82,6	0,33	4,70
WTG 12			63	29,34	83,9	0,52	4,30
WTG 12			80	27,61	86,7	0,76	3,70
WTG 12			100	27,78	91,4	1,19	3,00
WTG 12			125	21,46	89,9	1,81	1,80
WTG 12			160	17,36	91,2	2,71	0,00
WTG 12			200	15,27	92,8	3,90	0,00
WTG 13	6.139	6.146					
WTG 13			20	33,83	64,5	0,00	5,60
WTG 13			25	31,71	68,5	0,12	5,40
WTG 13			32	31,64	74,0	0,18	5,20
WTG 13			40	30,02	77,5	0,31	5,00
WTG 13			50	30,30	82,6	0,43	4,70
WTG 13			63	26,95	83,9	0,68	4,30
WTG 13			80	25,15	86,7	0,98	3,70
WTG 13			100	25,19	91,4	1,54	3,00
WTG 13			125	18,69	89,9	2,34	1,80
WTG 13			160	14,33	91,2	3,50	0,00
WTG 13			200	11,89	92,8	5,04	0,00
WTG 14	5.023	5.031					
WTG 14			20	35,57	64,5	0,00	5,60
WTG 14			25	33,47	68,5	0,10	5,40
WTG 14			32	33,42	74,0	0,15	5,20
WTG 14			40	31,81	77,5	0,25	5,00
WTG 14			50	32,11	82,6	0,35	4,70
WTG 14			63	28,81	83,9	0,55	4,30
WTG 14			80	27,06	86,7	0,81	3,70
WTG 14			100	27,21	91,4	1,26	3,00
WTG 14			125	20,85	89,9	1,91	1,80
WTG 14			160	16,70	91,2	2,87	0,00
WTG 14			200	14,54	92,8	4,13	0,00
WTG 15	6.011	6.018					
WTG 15			20	34,01	64,5	0,00	5,60
WTG 15			25	31,89	68,5	0,12	5,40
WTG 15			32	31,83	74,0	0,18	5,20
WTG 15			40	30,21	77,5	0,30	5,00
WTG 15			50	30,49	82,6	0,42	4,70
WTG 15			63	27,15	83,9	0,66	4,30
WTG 15			80	25,35	86,7	0,96	3,70
WTG 15			100	25,41	91,4	1,50	3,00
WTG 15			125	18,92	89,9	2,29	1,80
WTG 15			160	14,58	91,2	3,43	0,00
WTG 15			200	12,18	92,8	4,93	0,00
WTG 16	6.585	6.591					
WTG 16			20	33,22	64,5	0,00	5,60
WTG 16			25	31,09	68,5	0,13	5,40
WTG 16			32	31,02	74,0	0,20	5,20
WTG 16			40	29,39	77,5	0,33	5,00
WTG 16			50	29,66	82,6	0,46	4,70
WTG 16			63	26,30	83,9	0,73	4,30
WTG 16			80	24,47	86,7	1,05	3,70
WTG 16			100	24,47	91,4	1,65	3,00
WTG 16			125	17,92	89,9	2,50	1,80
WTG 16			160	13,46	91,2	3,76	0,00
WTG 16			200	10,92	92,8	5,40	0,00
WTG 17	5.086	5.094					
WTG 17			20	35,46	64,5	0,00	5,60
WTG 17			25	33,36	68,5	0,10	5,40
WTG 17			32	33,31	74,0	0,15	5,20
WTG 17			40	31,70	77,5	0,25	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 17			50	32,00	82,6	0,36	4,70
WTG 17			63	28,70	83,9	0,56	4,30
WTG 17			80	26,94	86,7	0,82	3,70
WTG 17			100	27,09	91,4	1,27	3,00
WTG 17			125	20,72	89,9	1,94	1,80
WTG 17			160	16,56	91,2	2,90	0,00
WTG 17			200	14,38	92,8	4,18	0,00
WTG 18	6.532	6.538					
WTG 18			20	33,29	64,5	0,00	5,60
WTG 18			25	31,16	68,5	0,13	5,40
WTG 18			32	31,09	74,0	0,20	5,20
WTG 18			40	29,46	77,5	0,33	5,00
WTG 18			50	29,73	82,6	0,46	4,70
WTG 18			63	26,37	83,9	0,72	4,30
WTG 18			80	24,54	86,7	1,05	3,70
WTG 18			100	24,56	91,4	1,63	3,00
WTG 18			125	18,01	89,9	2,48	1,80
WTG 18			160	13,56	91,2	3,73	0,00
WTG 18			200	11,03	92,8	5,36	0,00
WTG 19	5.470	5.477					
WTG 19			20	34,83	64,5	0,00	5,60
WTG 19			25	32,72	68,5	0,11	5,40
WTG 19			32	32,66	74,0	0,16	5,20
WTG 19			40	31,06	77,5	0,27	5,00
WTG 19			50	31,35	82,6	0,38	4,70
WTG 19			63	28,03	83,9	0,60	4,30
WTG 19			80	26,25	86,7	0,88	3,70
WTG 19			100	26,36	91,4	1,37	3,00
WTG 19			125	19,95	89,9	2,08	1,80
WTG 19			160	15,71	91,2	3,12	0,00
WTG 19			200	13,44	92,8	4,49	0,00
Sum							
Sum			20	46,98			
Sum			25	44,87			
Sum			32	44,81			
Sum			40	43,20			
Sum			50	43,49			
Sum			63	40,17			
Sum			80	38,39			
Sum			100	38,50			
Sum			125	32,08			
Sum			160	27,83			
Sum			200	25,56			

Noise sensitive area: Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.188	5.198					
WTG 03			20	35,28	64,5	0,00	5,60
WTG 03			25	33,18	68,5	0,10	5,40
WTG 03			32	33,13	74,0	0,16	5,20
WTG 03			40	31,52	77,5	0,26	5,00
WTG 03			50	31,82	82,6	0,36	4,70
WTG 03			63	28,51	83,9	0,57	4,30
WTG 03			80	26,75	86,7	0,83	3,70
WTG 03			100	26,88	91,4	1,30	3,00
WTG 03			125	20,51	89,9	1,98	1,80
WTG 03			160	16,32	91,2	2,96	0,00
WTG 03			200	14,12	92,8	4,26	0,00
WTG 04	5.825	5.834					
WTG 04			20	34,28	64,5	0,00	5,60
WTG 04			25	32,16	68,5	0,12	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 04			32	32,11	74,0	0,18	5,20
WTG 04			40	30,49	77,5	0,29	5,00
WTG 04			50	30,77	82,6	0,41	4,70
WTG 04			63	27,44	83,9	0,64	4,30
WTG 04			80	25,65	86,7	0,93	3,70
WTG 04			100	25,72	91,4	1,46	3,00
WTG 04			125	19,26	89,9	2,22	1,80
WTG 04			160	14,96	91,2	3,33	0,00
WTG 04			200	12,60	92,8	4,78	0,00
WTG 05	5.173	5.183					
WTG 05			20	35,31	64,5	0,00	5,60
WTG 05			25	33,20	68,5	0,10	5,40
WTG 05			32	33,15	74,0	0,16	5,20
WTG 05			40	31,55	77,5	0,26	5,00
WTG 05			50	31,85	82,6	0,36	4,70
WTG 05			63	28,54	83,9	0,57	4,30
WTG 05			80	26,78	86,7	0,83	3,70
WTG 05			100	26,91	91,4	1,30	3,00
WTG 05			125	20,54	89,9	1,97	1,80
WTG 05			160	16,35	91,2	2,95	0,00
WTG 05			200	14,16	92,8	4,25	0,00
WTG 06	5.735	5.744					
WTG 06			20	34,42	64,5	0,00	5,60
WTG 06			25	32,30	68,5	0,11	5,40
WTG 06			32	32,24	74,0	0,17	5,20
WTG 06			40	30,63	77,5	0,29	5,00
WTG 06			50	30,91	82,6	0,40	4,70
WTG 06			63	27,58	83,9	0,63	4,30
WTG 06			80	25,80	86,7	0,92	3,70
WTG 06			100	25,88	91,4	1,44	3,00
WTG 06			125	19,43	89,9	2,18	1,80
WTG 06			160	15,14	91,2	3,27	0,00
WTG 06			200	12,81	92,8	4,71	0,00
WTG 07	4.719	4.728					
WTG 07			20	36,11	64,5	0,00	5,60
WTG 07			25	34,01	68,5	0,09	5,40
WTG 07			32	33,96	74,0	0,14	5,20
WTG 07			40	32,37	77,5	0,24	5,00
WTG 07			50	32,68	82,6	0,33	4,70
WTG 07			63	29,39	83,9	0,52	4,30
WTG 07			80	27,65	86,7	0,76	3,70
WTG 07			100	27,82	91,4	1,18	3,00
WTG 07			125	21,51	89,9	1,80	1,80
WTG 07			160	17,41	91,2	2,70	0,00
WTG 07			200	15,33	92,8	3,88	0,00
WTG 08	5.527	5.537					
WTG 08			20	34,73	64,5	0,00	5,60
WTG 08			25	32,62	68,5	0,11	5,40
WTG 08			32	32,57	74,0	0,17	5,20
WTG 08			40	30,96	77,5	0,28	5,00
WTG 08			50	31,25	82,6	0,39	4,70
WTG 08			63	27,93	83,9	0,61	4,30
WTG 08			80	26,15	86,7	0,89	3,70
WTG 08			100	26,25	91,4	1,38	3,00
WTG 08			125	19,83	89,9	2,10	1,80
WTG 08			160	15,58	91,2	3,16	0,00
WTG 08			200	13,29	92,8	4,54	0,00
WTG 09	4.379	4.388					
WTG 09			20	36,76	64,5	0,00	5,60
WTG 09			25	34,67	68,5	0,09	5,40
WTG 09			32	34,62	74,0	0,13	5,20
WTG 09			40	33,04	77,5	0,22	5,00
WTG 09			50	33,35	82,6	0,31	4,70
WTG 09			63	30,07	83,9	0,48	4,30

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Calculated:
17.09.2021 08:24/3.4.415

DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 09			80	28,35	86,7	0,70	3,70
WTG 09			100	28,56	91,4	1,10	3,00
WTG 09			125	22,29	89,9	1,67	1,80
WTG 09			160	18,25	91,2	2,50	0,00
WTG 09			200	16,26	92,8	3,60	0,00
WTG 10	4.861	4.870					
WTG 10			20	35,85	64,5	0,00	5,60
WTG 10			25	33,75	68,5	0,10	5,40
WTG 10			32	33,70	74,0	0,15	5,20
WTG 10			40	32,11	77,5	0,24	5,00
WTG 10			50	32,41	82,6	0,34	4,70
WTG 10			63	29,11	83,9	0,54	4,30
WTG 10			80	27,37	86,7	0,78	3,70
WTG 10			100	27,53	91,4	1,22	3,00
WTG 10			125	21,20	89,9	1,85	1,80
WTG 10			160	17,07	91,2	2,78	0,00
WTG 10			200	14,96	92,8	3,99	0,00
WTG 11	5.515	5.525					
WTG 11			20	34,75	64,5	0,00	5,60
WTG 11			25	32,64	68,5	0,11	5,40
WTG 11			32	32,59	74,0	0,17	5,20
WTG 11			40	30,98	77,5	0,28	5,00
WTG 11			50	31,27	82,6	0,39	4,70
WTG 11			63	27,95	83,9	0,61	4,30
WTG 11			80	26,17	86,7	0,88	3,70
WTG 11			100	26,27	91,4	1,38	3,00
WTG 11			125	19,85	89,9	2,10	1,80
WTG 11			160	15,61	91,2	3,15	0,00
WTG 11			200	13,32	92,8	4,53	0,00
WTG 12	4.314	4.324					
WTG 12			20	36,88	64,5	0,00	5,60
WTG 12			25	34,80	68,5	0,09	5,40
WTG 12			32	34,75	74,0	0,13	5,20
WTG 12			40	33,17	77,5	0,22	5,00
WTG 12			50	33,48	82,6	0,30	4,70
WTG 12			63	30,21	83,9	0,48	4,30
WTG 12			80	28,49	86,7	0,69	3,70
WTG 12			100	28,70	91,4	1,08	3,00
WTG 12			125	22,44	89,9	1,64	1,80
WTG 12			160	18,42	91,2	2,46	0,00
WTG 12			200	16,44	92,8	3,55	0,00
WTG 13	5.711	5.718					
WTG 13			20	34,45	64,5	0,00	5,60
WTG 13			25	32,34	68,5	0,11	5,40
WTG 13			32	32,28	74,0	0,17	5,20
WTG 13			40	30,67	77,5	0,29	5,00
WTG 13			50	30,95	82,6	0,40	4,70
WTG 13			63	27,63	83,9	0,63	4,30
WTG 13			80	25,84	86,7	0,91	3,70
WTG 13			100	25,92	91,4	1,43	3,00
WTG 13			125	19,48	89,9	2,17	1,80
WTG 13			160	15,19	91,2	3,26	0,00
WTG 13			200	12,87	92,8	4,69	0,00
WTG 14	4.591	4.600					
WTG 14			20	36,35	64,5	0,00	5,60
WTG 14			25	34,25	68,5	0,09	5,40
WTG 14			32	34,21	74,0	0,14	5,20
WTG 14			40	32,62	77,5	0,23	5,00
WTG 14			50	32,92	82,6	0,32	4,70
WTG 14			63	29,64	83,9	0,51	4,30
WTG 14			80	27,91	86,7	0,74	3,70
WTG 14			100	28,10	91,4	1,15	3,00
WTG 14			125	21,80	89,9	1,75	1,80
WTG 14			160	17,72	91,2	2,62	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 14			200	15,67	92,8	3,77	0,00
WTG 15	5.579	5.586					
WTG 15			20	34,66	64,5	0,00	5,60
WTG 15			25	32,55	68,5	0,11	5,40
WTG 15			32	32,49	74,0	0,17	5,20
WTG 15			40	30,88	77,5	0,28	5,00
WTG 15			50	31,17	82,6	0,39	4,70
WTG 15			63	27,84	83,9	0,61	4,30
WTG 15			80	26,06	86,7	0,89	3,70
WTG 15			100	26,16	91,4	1,40	3,00
WTG 15			125	19,73	89,9	2,12	1,80
WTG 15			160	15,47	91,2	3,18	0,00
WTG 15			200	13,18	92,8	4,58	0,00
WTG 16	6.155	6.160					
WTG 16			20	33,81	64,5	0,00	5,60
WTG 16			25	31,68	68,5	0,12	5,40
WTG 16			32	31,62	74,0	0,18	5,20
WTG 16			40	30,00	77,5	0,31	5,00
WTG 16			50	30,28	82,6	0,43	4,70
WTG 16			63	26,93	83,9	0,68	4,30
WTG 16			80	25,12	86,7	0,99	3,70
WTG 16			100	25,17	91,4	1,54	3,00
WTG 16			125	18,67	89,9	2,34	1,80
WTG 16			160	14,30	91,2	3,51	0,00
WTG 16			200	11,86	92,8	5,05	0,00
WTG 17	4.659	4.667					
WTG 17			20	36,22	64,5	0,00	5,60
WTG 17			25	34,13	68,5	0,09	5,40
WTG 17			32	34,08	74,0	0,14	5,20
WTG 17			40	32,49	77,5	0,23	5,00
WTG 17			50	32,79	82,6	0,33	4,70
WTG 17			63	29,51	83,9	0,51	4,30
WTG 17			80	27,77	86,7	0,75	3,70
WTG 17			100	27,95	91,4	1,17	3,00
WTG 17			125	21,65	89,9	1,77	1,80
WTG 17			160	17,56	91,2	2,66	0,00
WTG 17			200	15,49	92,8	3,83	0,00
WTG 18	6.101	6.107					
WTG 18			20	33,88	64,5	0,00	5,60
WTG 18			25	31,76	68,5	0,12	5,40
WTG 18			32	31,70	74,0	0,18	5,20
WTG 18			40	30,08	77,5	0,31	5,00
WTG 18			50	30,36	82,6	0,43	4,70
WTG 18			63	27,01	83,9	0,67	4,30
WTG 18			80	25,21	86,7	0,98	3,70
WTG 18			100	25,26	91,4	1,53	3,00
WTG 18			125	18,76	89,9	2,32	1,80
WTG 18			160	14,40	91,2	3,48	0,00
WTG 18			200	11,98	92,8	5,01	0,00
WTG 19	5.047	5.054					
WTG 19			20	35,53	64,5	0,00	5,60
WTG 19			25	33,43	68,5	0,10	5,40
WTG 19			32	33,38	74,0	0,15	5,20
WTG 19			40	31,77	77,5	0,25	5,00
WTG 19			50	32,07	82,6	0,35	4,70
WTG 19			63	28,77	83,9	0,56	4,30
WTG 19			80	27,02	86,7	0,81	3,70
WTG 19			100	27,16	91,4	1,26	3,00
WTG 19			125	20,81	89,9	1,92	1,80
WTG 19			160	16,65	91,2	2,88	0,00
WTG 19			200	14,48	92,8	4,14	0,00
Sum							
Sum			20	47,66			
Sum			25	45,56			

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
Sum			32	45,51			
Sum			40	43,90			
Sum			50	44,20			
Sum			63	40,90			
Sum			80	39,14			
Sum			100	39,28			
Sum			125	32,92			
Sum			160	28,75			
Sum			200	26,58			

Noise sensitive area: Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.223	5.233					
WTG 03			20	35,23	64,5	0,00	5,60
WTG 03			25	33,12	68,5	0,10	5,40
WTG 03			32	33,07	74,0	0,16	5,20
WTG 03			40	31,46	77,5	0,26	5,00
WTG 03			50	31,76	82,6	0,37	4,70
WTG 03			63	28,45	83,9	0,58	4,30
WTG 03			80	26,69	86,7	0,84	3,70
WTG 03			100	26,82	91,4	1,31	3,00
WTG 03			125	20,44	89,9	1,99	1,80
WTG 03			160	16,24	91,2	2,98	0,00
WTG 03			200	14,03	92,8	4,29	0,00
WTG 04	5.861	5.870					
WTG 04			20	34,23	64,5	0,00	5,60
WTG 04			25	32,11	68,5	0,12	5,40
WTG 04			32	32,05	74,0	0,18	5,20
WTG 04			40	30,43	77,5	0,29	5,00
WTG 04			50	30,72	82,6	0,41	4,70
WTG 04			63	27,38	83,9	0,65	4,30
WTG 04			80	25,59	86,7	0,94	3,70
WTG 04			100	25,66	91,4	1,47	3,00
WTG 04			125	19,20	89,9	2,23	1,80
WTG 04			160	14,88	91,2	3,35	0,00
WTG 04			200	12,51	92,8	4,81	0,00
WTG 05	5.205	5.216					
WTG 05			20	35,25	64,5	0,00	5,60
WTG 05			25	33,15	68,5	0,10	5,40
WTG 05			32	33,10	74,0	0,16	5,20
WTG 05			40	31,49	77,5	0,26	5,00
WTG 05			50	31,79	82,6	0,37	4,70
WTG 05			63	28,48	83,9	0,57	4,30
WTG 05			80	26,72	86,7	0,83	3,70
WTG 05			100	26,85	91,4	1,30	3,00
WTG 05			125	20,47	89,9	1,98	1,80
WTG 05			160	16,28	91,2	2,97	0,00
WTG 05			200	14,08	92,8	4,28	0,00
WTG 06	5.769	5.778					
WTG 06			20	34,36	64,5	0,00	5,60
WTG 06			25	32,25	68,5	0,12	5,40
WTG 06			32	32,19	74,0	0,17	5,20
WTG 06			40	30,58	77,5	0,29	5,00
WTG 06			50	30,86	82,6	0,40	4,70
WTG 06			63	27,53	83,9	0,64	4,30
WTG 06			80	25,74	86,7	0,92	3,70
WTG 06			100	25,82	91,4	1,44	3,00
WTG 06			125	19,37	89,9	2,20	1,80
WTG 06			160	15,07	91,2	3,29	0,00
WTG 06			200	12,73	92,8	4,74	0,00
WTG 07	4.749	4.759					

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Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 07			20	36,05	64,5	0,00	5,60
WTG 07			25	33,95	68,5	0,10	5,40
WTG 07			32	33,91	74,0	0,14	5,20
WTG 07			40	32,31	77,5	0,24	5,00
WTG 07			50	32,62	82,6	0,33	4,70
WTG 07			63	29,33	83,9	0,52	4,30
WTG 07			80	27,59	86,7	0,76	3,70
WTG 07			100	27,76	91,4	1,19	3,00
WTG 07			125	21,44	89,9	1,81	1,80
WTG 07			160	17,34	91,2	2,71	0,00
WTG 07			200	15,25	92,8	3,90	0,00
WTG 08	5.557	5.567					
WTG 08			20	34,69	64,5	0,00	5,60
WTG 08			25	32,58	68,5	0,11	5,40
WTG 08			32	32,52	74,0	0,17	5,20
WTG 08			40	30,91	77,5	0,28	5,00
WTG 08			50	31,20	82,6	0,39	4,70
WTG 08			63	27,87	83,9	0,61	4,30
WTG 08			80	26,10	86,7	0,89	3,70
WTG 08			100	26,20	91,4	1,39	3,00
WTG 08			125	19,77	89,9	2,12	1,80
WTG 08			160	15,51	91,2	3,17	0,00
WTG 08			200	13,22	92,8	4,57	0,00
WTG 09	4.406	4.415					
WTG 09			20	36,70	64,5	0,00	5,60
WTG 09			25	34,61	68,5	0,09	5,40
WTG 09			32	34,57	74,0	0,13	5,20
WTG 09			40	32,98	77,5	0,22	5,00
WTG 09			50	33,29	82,6	0,31	4,70
WTG 09			63	30,02	83,9	0,49	4,30
WTG 09			80	28,29	86,7	0,71	3,70
WTG 09			100	28,50	91,4	1,10	3,00
WTG 09			125	22,22	89,9	1,68	1,80
WTG 09			160	18,18	91,2	2,52	0,00
WTG 09			200	16,18	92,8	3,62	0,00
WTG 10	4.888	4.897					
WTG 10			20	35,80	64,5	0,00	5,60
WTG 10			25	33,70	68,5	0,10	5,40
WTG 10			32	33,65	74,0	0,15	5,20
WTG 10			40	32,06	77,5	0,24	5,00
WTG 10			50	32,36	82,6	0,34	4,70
WTG 10			63	29,06	83,9	0,54	4,30
WTG 10			80	27,32	86,7	0,78	3,70
WTG 10			100	27,48	91,4	1,22	3,00
WTG 10			125	21,14	89,9	1,86	1,80
WTG 10			160	17,01	91,2	2,79	0,00
WTG 10			200	14,89	92,8	4,02	0,00
WTG 11	5.542	5.552					
WTG 11			20	34,71	64,5	0,00	5,60
WTG 11			25	32,60	68,5	0,11	5,40
WTG 11			32	32,54	74,0	0,17	5,20
WTG 11			40	30,93	77,5	0,28	5,00
WTG 11			50	31,22	82,6	0,39	4,70
WTG 11			63	27,90	83,9	0,61	4,30
WTG 11			80	26,12	86,7	0,89	3,70
WTG 11			100	26,22	91,4	1,39	3,00
WTG 11			125	19,80	89,9	2,11	1,80
WTG 11			160	15,55	91,2	3,16	0,00
WTG 11			200	13,26	92,8	4,55	0,00
WTG 12	4.337	4.347					
WTG 12			20	36,84	64,5	0,00	5,60
WTG 12			25	34,75	68,5	0,09	5,40
WTG 12			32	34,71	74,0	0,13	5,20
WTG 12			40	33,12	77,5	0,22	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 12			50	33,43	82,6	0,30	4,70
WTG 12			63	30,16	83,9	0,48	4,30
WTG 12			80	28,44	86,7	0,70	3,70
WTG 12			100	28,65	91,4	1,09	3,00
WTG 12			125	22,38	89,9	1,65	1,80
WTG 12			160	18,36	91,2	2,48	0,00
WTG 12			200	16,37	92,8	3,56	0,00
WTG 13	5.734	5.741					
WTG 13			20	34,42	64,5	0,00	5,60
WTG 13			25	32,31	68,5	0,11	5,40
WTG 13			32	32,25	74,0	0,17	5,20
WTG 13			40	30,63	77,5	0,29	5,00
WTG 13			50	30,92	82,6	0,40	4,70
WTG 13			63	27,59	83,9	0,63	4,30
WTG 13			80	25,80	86,7	0,92	3,70
WTG 13			100	25,89	91,4	1,44	3,00
WTG 13			125	19,44	89,9	2,18	1,80
WTG 13			160	15,15	91,2	3,27	0,00
WTG 13			200	12,81	92,8	4,71	0,00
WTG 14	4.607	4.615					
WTG 14			20	36,32	64,5	0,00	5,60
WTG 14			25	34,22	68,5	0,09	5,40
WTG 14			32	34,18	74,0	0,14	5,20
WTG 14			40	32,59	77,5	0,23	5,00
WTG 14			50	32,89	82,6	0,32	4,70
WTG 14			63	29,61	83,9	0,51	4,30
WTG 14			80	27,88	86,7	0,74	3,70
WTG 14			100	28,06	91,4	1,15	3,00
WTG 14			125	21,76	89,9	1,75	1,80
WTG 14			160	17,69	91,2	2,63	0,00
WTG 14			200	15,63	92,8	3,78	0,00
WTG 15	5.593	5.601					
WTG 15			20	34,63	64,5	0,00	5,60
WTG 15			25	32,52	68,5	0,11	5,40
WTG 15			32	32,47	74,0	0,17	5,20
WTG 15			40	30,85	77,5	0,28	5,00
WTG 15			50	31,14	82,6	0,39	4,70
WTG 15			63	27,82	83,9	0,62	4,30
WTG 15			80	26,04	86,7	0,90	3,70
WTG 15			100	26,13	91,4	1,40	3,00
WTG 15			125	19,71	89,9	2,13	1,80
WTG 15			160	15,44	91,2	3,19	0,00
WTG 15			200	13,14	92,8	4,59	0,00
WTG 16	6.174	6.180					
WTG 16			20	33,78	64,5	0,00	5,60
WTG 16			25	31,66	68,5	0,12	5,40
WTG 16			32	31,59	74,0	0,19	5,20
WTG 16			40	29,97	77,5	0,31	5,00
WTG 16			50	30,25	82,6	0,43	4,70
WTG 16			63	26,90	83,9	0,68	4,30
WTG 16			80	25,09	86,7	0,99	3,70
WTG 16			100	25,14	91,4	1,55	3,00
WTG 16			125	18,63	89,9	2,35	1,80
WTG 16			160	14,26	91,2	3,52	0,00
WTG 16			200	11,81	92,8	5,07	0,00
WTG 17	4.668	4.676					
WTG 17			20	36,20	64,5	0,00	5,60
WTG 17			25	34,11	68,5	0,09	5,40
WTG 17			32	34,06	74,0	0,14	5,20
WTG 17			40	32,47	77,5	0,23	5,00
WTG 17			50	32,77	82,6	0,33	4,70
WTG 17			63	29,49	83,9	0,51	4,30
WTG 17			80	27,75	86,7	0,75	3,70
WTG 17			100	27,93	91,4	1,17	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 17			125	21,63	89,9	1,78	1,80
WTG 17			160	17,54	91,2	2,67	0,00
WTG 17			200	15,47	92,8	3,83	0,00
WTG 18	6.114	6.120					
WTG 18			20	33,86	64,5	0,00	5,60
WTG 18			25	31,74	68,5	0,12	5,40
WTG 18			32	31,68	74,0	0,18	5,20
WTG 18			40	30,06	77,5	0,31	5,00
WTG 18			50	30,34	82,6	0,43	4,70
WTG 18			63	26,99	83,9	0,67	4,30
WTG 18			80	25,19	86,7	0,98	3,70
WTG 18			100	25,23	91,4	1,53	3,00
WTG 18			125	18,74	89,9	2,33	1,80
WTG 18			160	14,38	91,2	3,49	0,00
WTG 18			200	11,95	92,8	5,02	0,00
WTG 19	5.054	5.061					
WTG 19			20	35,52	64,5	0,00	5,60
WTG 19			25	33,41	68,5	0,10	5,40
WTG 19			32	33,36	74,0	0,15	5,20
WTG 19			40	31,76	77,5	0,25	5,00
WTG 19			50	32,06	82,6	0,35	4,70
WTG 19			63	28,76	83,9	0,56	4,30
WTG 19			80	27,01	86,7	0,81	3,70
WTG 19			100	27,15	91,4	1,27	3,00
WTG 19			125	20,79	89,9	1,92	1,80
WTG 19			160	16,63	91,2	2,88	0,00
WTG 19			200	14,47	92,8	4,15	0,00
Sum							
Sum			20	47,62			
Sum			25	45,52			
Sum			32	45,47			
Sum			40	43,86			
Sum			50	44,16			
Sum			63	40,85			
Sum			80	39,10			
Sum			100	39,24			
Sum			125	32,87			
Sum			160	28,70			
Sum			200	26,52			

Noise sensitive area: Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.720	5.727					
WTG 03			20	34,44	64,5	0,00	5,60
WTG 03			25	32,33	68,5	0,11	5,40
WTG 03			32	32,27	74,0	0,17	5,20
WTG 03			40	30,65	77,5	0,29	5,00
WTG 03			50	30,94	82,6	0,40	4,70
WTG 03			63	27,61	83,9	0,63	4,30
WTG 03			80	25,82	86,7	0,92	3,70
WTG 03			100	25,91	91,4	1,43	3,00
WTG 03			125	19,46	89,9	2,18	1,80
WTG 03			160	15,18	91,2	3,26	0,00
WTG 03			200	12,84	92,8	4,70	0,00
WTG 04	6.393	6.400					
WTG 04			20	33,48	64,5	0,00	5,60
WTG 04			25	31,35	68,5	0,13	5,40
WTG 04			32	31,28	74,0	0,19	5,20
WTG 04			40	29,66	77,5	0,32	5,00
WTG 04			50	29,93	82,6	0,45	4,70
WTG 04			63	26,57	83,9	0,70	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 04			80	24,75	86,7	1,02	3,70
WTG 04			100	24,78	91,4	1,60	3,00
WTG 04			125	18,24	89,9	2,43	1,80
WTG 04			160	13,83	91,2	3,65	0,00
WTG 04			200	11,33	92,8	5,25	0,00
WTG 05	5.538	5.547					
WTG 05			20	34,72	64,5	0,00	5,60
WTG 05			25	32,61	68,5	0,11	5,40
WTG 05			32	32,55	74,0	0,17	5,20
WTG 05			40	30,94	77,5	0,28	5,00
WTG 05			50	31,23	82,6	0,39	4,70
WTG 05			63	27,91	83,9	0,61	4,30
WTG 05			80	26,13	86,7	0,89	3,70
WTG 05			100	26,23	91,4	1,39	3,00
WTG 05			125	19,81	89,9	2,11	1,80
WTG 05			160	15,56	91,2	3,16	0,00
WTG 05			200	13,27	92,8	4,55	0,00
WTG 06	6.111	6.118					
WTG 06			20	33,87	64,5	0,00	5,60
WTG 06			25	31,75	68,5	0,12	5,40
WTG 06			32	31,68	74,0	0,18	5,20
WTG 06			40	30,06	77,5	0,31	5,00
WTG 06			50	30,34	82,6	0,43	4,70
WTG 06			63	26,99	83,9	0,67	4,30
WTG 06			80	25,19	86,7	0,98	3,70
WTG 06			100	25,24	91,4	1,53	3,00
WTG 06			125	18,74	89,9	2,32	1,80
WTG 06			160	14,38	91,2	3,49	0,00
WTG 06			200	11,95	92,8	5,02	0,00
WTG 07	4.993	5.001					
WTG 07			20	35,62	64,5	0,00	5,60
WTG 07			25	33,52	68,5	0,10	5,40
WTG 07			32	33,47	74,0	0,15	5,20
WTG 07			40	31,87	77,5	0,25	5,00
WTG 07			50	32,17	82,6	0,35	4,70
WTG 07			63	28,87	83,9	0,55	4,30
WTG 07			80	27,12	86,7	0,80	3,70
WTG 07			100	27,27	91,4	1,25	3,00
WTG 07			125	20,92	89,9	1,90	1,80
WTG 07			160	16,77	91,2	2,85	0,00
WTG 07			200	14,62	92,8	4,10	0,00
WTG 08	5.724	5.733					
WTG 08			20	34,43	64,5	0,00	5,60
WTG 08			25	32,32	68,5	0,11	5,40
WTG 08			32	32,26	74,0	0,17	5,20
WTG 08			40	30,65	77,5	0,29	5,00
WTG 08			50	30,93	82,6	0,40	4,70
WTG 08			63	27,60	83,9	0,63	4,30
WTG 08			80	25,82	86,7	0,92	3,70
WTG 08			100	25,90	91,4	1,43	3,00
WTG 08			125	19,45	89,9	2,18	1,80
WTG 08			160	15,17	91,2	3,27	0,00
WTG 08			200	12,83	92,8	4,70	0,00
WTG 09	4.491	4.498					
WTG 09			20	36,54	64,5	0,00	5,60
WTG 09			25	34,45	68,5	0,09	5,40
WTG 09			32	34,40	74,0	0,13	5,20
WTG 09			40	32,81	77,5	0,22	5,00
WTG 09			50	33,12	82,6	0,31	4,70
WTG 09			63	29,84	83,9	0,49	4,30
WTG 09			80	28,12	86,7	0,72	3,70
WTG 09			100	28,31	91,4	1,12	3,00
WTG 09			125	22,03	89,9	1,71	1,80
WTG 09			160	17,97	91,2	2,56	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 09			200	15,95	92,8	3,69	0,00
WTG 10	4.890	4.897					
WTG 10			20	35,80	64,5	0,00	5,60
WTG 10			25	33,70	68,5	0,10	5,40
WTG 10			32	33,65	74,0	0,15	5,20
WTG 10			40	32,06	77,5	0,24	5,00
WTG 10			50	32,36	82,6	0,34	4,70
WTG 10			63	29,06	83,9	0,54	4,30
WTG 10			80	27,32	86,7	0,78	3,70
WTG 10			100	27,48	91,4	1,22	3,00
WTG 10			125	21,14	89,9	1,86	1,80
WTG 10			160	17,01	91,2	2,79	0,00
WTG 10			200	14,89	92,8	4,02	0,00
WTG 11	5.525	5.534					
WTG 11			20	34,74	64,5	0,00	5,60
WTG 11			25	32,63	68,5	0,11	5,40
WTG 11			32	32,57	74,0	0,17	5,20
WTG 11			40	30,96	77,5	0,28	5,00
WTG 11			50	31,25	82,6	0,39	4,70
WTG 11			63	27,93	83,9	0,61	4,30
WTG 11			80	26,15	86,7	0,89	3,70
WTG 11			100	26,26	91,4	1,38	3,00
WTG 11			125	19,84	89,9	2,10	1,80
WTG 11			160	15,59	91,2	3,15	0,00
WTG 11			200	13,30	92,8	4,54	0,00
WTG 12	4.207	4.216					
WTG 12			20	37,10	64,5	0,00	5,60
WTG 12			25	35,02	68,5	0,08	5,40
WTG 12			32	34,98	74,0	0,13	5,20
WTG 12			40	33,39	77,5	0,21	5,00
WTG 12			50	33,71	82,6	0,30	4,70
WTG 12			63	30,44	83,9	0,46	4,30
WTG 12			80	28,73	86,7	0,67	3,70
WTG 12			100	28,95	91,4	1,05	3,00
WTG 12			125	22,70	89,9	1,60	1,80
WTG 12			160	18,70	91,2	2,40	0,00
WTG 12			200	16,75	92,8	3,46	0,00
WTG 13	5.447	5.453					
WTG 13			20	34,87	64,5	0,00	5,60
WTG 13			25	32,76	68,5	0,11	5,40
WTG 13			32	32,70	74,0	0,16	5,20
WTG 13			40	31,09	77,5	0,27	5,00
WTG 13			50	31,39	82,6	0,38	4,70
WTG 13			63	28,07	83,9	0,60	4,30
WTG 13			80	26,29	86,7	0,87	3,70
WTG 13			100	26,40	91,4	1,36	3,00
WTG 13			125	20,00	89,9	2,07	1,80
WTG 13			160	15,76	91,2	3,11	0,00
WTG 13			200	13,50	92,8	4,47	0,00
WTG 14	4.090	4.098					
WTG 14			20	37,35	64,5	0,00	5,60
WTG 14			25	35,27	68,5	0,08	5,40
WTG 14			32	35,23	74,0	0,12	5,20
WTG 14			40	33,64	77,5	0,20	5,00
WTG 14			50	33,96	82,6	0,29	4,70
WTG 14			63	30,70	83,9	0,45	4,30
WTG 14			80	28,99	86,7	0,66	3,70
WTG 14			100	29,22	91,4	1,02	3,00
WTG 14			125	22,99	89,9	1,56	1,80
WTG 14			160	19,01	91,2	2,34	0,00
WTG 14			200	17,09	92,8	3,36	0,00
WTG 15	4.955	4.963					
WTG 15			20	35,69	64,5	0,00	5,60
WTG 15			25	33,59	68,5	0,10	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 15			32	33,54	74,0	0,15	5,20
WTG 15			40	31,94	77,5	0,25	5,00
WTG 15			50	32,24	82,6	0,35	4,70
WTG 15			63	28,94	83,9	0,55	4,30
WTG 15			80	27,19	86,7	0,79	3,70
WTG 15			100	27,35	91,4	1,24	3,00
WTG 15			125	21,00	89,9	1,89	1,80
WTG 15			160	16,86	91,2	2,83	0,00
WTG 15			200	14,72	92,8	4,07	0,00
WTG 16	5.728	5.734					
WTG 16			20	34,43	64,5	0,00	5,60
WTG 16			25	32,32	68,5	0,11	5,40
WTG 16			32	32,26	74,0	0,17	5,20
WTG 16			40	30,64	77,5	0,29	5,00
WTG 16			50	30,93	82,6	0,40	4,70
WTG 16			63	27,60	83,9	0,63	4,30
WTG 16			80	25,81	86,7	0,92	3,70
WTG 16			100	25,90	91,4	1,43	3,00
WTG 16			125	19,45	89,9	2,18	1,80
WTG 16			160	15,16	91,2	3,27	0,00
WTG 16			200	12,83	92,8	4,70	0,00
WTG 17	3.837	3.845					
WTG 17			20	37,90	64,5	0,00	5,60
WTG 17			25	35,82	68,5	0,08	5,40
WTG 17			32	35,79	74,0	0,12	5,20
WTG 17			40	34,21	77,5	0,19	5,00
WTG 17			50	34,53	82,6	0,27	4,70
WTG 17			63	31,28	83,9	0,42	4,30
WTG 17			80	29,59	86,7	0,62	3,70
WTG 17			100	29,84	91,4	0,96	3,00
WTG 17			125	23,64	89,9	1,46	1,80
WTG 17			160	19,71	91,2	2,19	0,00
WTG 17			200	17,85	92,8	3,15	0,00
WTG 18	5.373	5.379					
WTG 18			20	34,99	64,5	0,00	5,60
WTG 18			25	32,88	68,5	0,11	5,40
WTG 18			32	32,82	74,0	0,16	5,20
WTG 18			40	31,22	77,5	0,27	5,00
WTG 18			50	31,51	82,6	0,38	4,70
WTG 18			63	28,19	83,9	0,59	4,30
WTG 18			80	26,43	86,7	0,86	3,70
WTG 18			100	26,54	91,4	1,34	3,00
WTG 18			125	20,14	89,9	2,04	1,80
WTG 18			160	15,92	91,2	3,07	0,00
WTG 18			200	13,68	92,8	4,41	0,00
WTG 19	4.089	4.097					
WTG 19			20	37,35	64,5	0,00	5,60
WTG 19			25	35,27	68,5	0,08	5,40
WTG 19			32	35,23	74,0	0,12	5,20
WTG 19			40	33,65	77,5	0,20	5,00
WTG 19			50	33,96	82,6	0,29	4,70
WTG 19			63	30,70	83,9	0,45	4,30
WTG 19			80	29,00	86,7	0,66	3,70
WTG 19			100	29,23	91,4	1,02	3,00
WTG 19			125	22,99	89,9	1,56	1,80
WTG 19			160	19,02	91,2	2,34	0,00
WTG 19			200	17,09	92,8	3,36	0,00
Sum							
Sum			20	47,99			
Sum			25	45,89			
Sum			32	45,84			
Sum			40	44,25			
Sum			50	44,55			
Sum			63	41,25			

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
Sum			80	39,51			
Sum			100	39,67			
Sum			125	33,34			
Sum			160	29,22			
Sum			200	27,11			

Noise sensitive area: Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	2.256	2.265					
WTG 03			20	42,50	64,5	0,00	5,60
WTG 03			25	40,45	68,5	0,05	5,40
WTG 03			32	40,43	74,0	0,07	5,20
WTG 03			40	38,89	77,5	0,11	5,00
WTG 03			50	39,24	82,6	0,16	4,70
WTG 03			63	36,05	83,9	0,25	4,30
WTG 03			80	34,44	86,7	0,36	3,70
WTG 03			100	34,83	91,4	0,57	3,00
WTG 03			125	28,84	89,9	0,86	1,80
WTG 03			160	25,21	91,2	1,29	0,00
WTG 03			200	23,74	92,8	1,86	0,00
WTG 04	1.776	1.788					
WTG 04			20	44,55	64,5	0,00	5,60
WTG 04			25	42,52	68,5	0,04	5,40
WTG 04			32	42,50	74,0	0,05	5,20
WTG 04			40	40,96	77,5	0,09	5,00
WTG 04			50	41,33	82,6	0,13	4,70
WTG 04			63	38,16	83,9	0,20	4,30
WTG 04			80	36,57	86,7	0,29	3,70
WTG 04			100	37,01	91,4	0,45	3,00
WTG 04			125	31,07	89,9	0,68	1,80
WTG 04			160	27,53	91,2	1,02	0,00
WTG 04			200	26,19	92,8	1,47	0,00
WTG 05	2.676	2.685					
WTG 05			20	41,02	64,5	0,00	5,60
WTG 05			25	38,97	68,5	0,05	5,40
WTG 05			32	38,94	74,0	0,08	5,20
WTG 05			40	37,39	77,5	0,13	5,00
WTG 05			50	37,73	82,6	0,19	4,70
WTG 05			63	34,53	83,9	0,30	4,30
WTG 05			80	32,89	86,7	0,43	3,70
WTG 05			100	33,25	91,4	0,67	3,00
WTG 05			125	27,20	89,9	1,02	1,80
WTG 05			160	23,49	91,2	1,53	0,00
WTG 05			200	21,92	92,8	2,20	0,00
WTG 06	2.386	2.395					
WTG 06			20	42,02	64,5	0,00	5,60
WTG 06			25	39,97	68,5	0,05	5,40
WTG 06			32	39,94	74,0	0,07	5,20
WTG 06			40	38,40	77,5	0,12	5,00
WTG 06			50	38,75	82,6	0,17	4,70
WTG 06			63	35,55	83,9	0,26	4,30
WTG 06			80	33,93	86,7	0,38	3,70
WTG 06			100	34,32	91,4	0,60	3,00
WTG 06			125	28,31	89,9	0,91	1,80
WTG 06			160	24,65	91,2	1,36	0,00
WTG 06			200	23,15	92,8	1,96	0,00
WTG 07	3.156	3.161					
WTG 07			20	39,60	64,5	0,00	5,60
WTG 07			25	37,54	68,5	0,06	5,40
WTG 07			32	37,51	74,0	0,09	5,20
WTG 07			40	35,95	77,5	0,16	5,00

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 07			50	36,28	82,6	0,22	4,70
WTG 07			63	33,06	83,9	0,35	4,30
WTG 07			80	31,40	86,7	0,51	3,70
WTG 07			100	31,71	91,4	0,79	3,00
WTG 07			125	25,60	89,9	1,20	1,80
WTG 07			160	21,80	91,2	1,80	0,00
WTG 07			200	20,11	92,8	2,59	0,00
WTG 08	2.971	2.979					
WTG 08			20	40,12	64,5	0,00	5,60
WTG 08			25	38,06	68,5	0,06	5,40
WTG 08			32	38,03	74,0	0,09	5,20
WTG 08			40	36,47	77,5	0,15	5,00
WTG 08			50	36,81	82,6	0,21	4,70
WTG 08			63	33,59	83,9	0,33	4,30
WTG 08			80	31,94	86,7	0,48	3,70
WTG 08			100	32,27	91,4	0,74	3,00
WTG 08			125	26,19	89,9	1,13	1,80
WTG 08			160	22,42	91,2	1,70	0,00
WTG 08			200	20,78	92,8	2,44	0,00
WTG 09	3.709	3.713					
WTG 09			20	38,21	64,5	0,00	5,60
WTG 09			25	36,13	68,5	0,07	5,40
WTG 09			32	36,09	74,0	0,11	5,20
WTG 09			40	34,52	77,5	0,19	5,00
WTG 09			50	34,85	82,6	0,26	4,70
WTG 09			63	31,60	83,9	0,41	4,30
WTG 09			80	29,91	86,7	0,59	3,70
WTG 09			100	30,18	91,4	0,93	3,00
WTG 09			125	23,99	89,9	1,41	1,80
WTG 09			160	20,09	91,2	2,12	0,00
WTG 09			200	18,26	92,8	3,04	0,00
WTG 10	3.661	3.665					
WTG 10			20	38,32	64,5	0,00	5,60
WTG 10			25	36,25	68,5	0,07	5,40
WTG 10			32	36,21	74,0	0,11	5,20
WTG 10			40	34,64	77,5	0,18	5,00
WTG 10			50	34,96	82,6	0,26	4,70
WTG 10			63	31,72	83,9	0,40	4,30
WTG 10			80	30,03	86,7	0,59	3,70
WTG 10			100	30,30	91,4	0,92	3,00
WTG 10			125	24,13	89,9	1,39	1,80
WTG 10			160	20,23	91,2	2,09	0,00
WTG 10			200	18,41	92,8	3,01	0,00
WTG 11	3.495	3.501					
WTG 11			20	38,72	64,5	0,00	5,60
WTG 11			25	36,65	68,5	0,07	5,40
WTG 11			32	36,61	74,0	0,11	5,20
WTG 11			40	35,04	77,5	0,18	5,00
WTG 11			50	35,37	82,6	0,25	4,70
WTG 11			63	32,13	83,9	0,39	4,30
WTG 11			80	30,46	86,7	0,56	3,70
WTG 11			100	30,74	91,4	0,88	3,00
WTG 11			125	24,59	89,9	1,33	1,80
WTG 11			160	20,72	91,2	2,00	0,00
WTG 11			200	18,95	92,8	2,87	0,00
WTG 12	4.206	4.209					
WTG 12			20	37,12	64,5	0,00	5,60
WTG 12			25	35,03	68,5	0,08	5,40
WTG 12			32	34,99	74,0	0,13	5,20
WTG 12			40	33,41	77,5	0,21	5,00
WTG 12			50	33,72	82,6	0,29	4,70
WTG 12			63	30,45	83,9	0,46	4,30
WTG 12			80	28,74	86,7	0,67	3,70
WTG 12			100	28,96	91,4	1,05	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 12			125	22,72	89,9	1,60	1,80
WTG 12			160	18,72	91,2	2,40	0,00
WTG 12			200	16,76	92,8	3,45	0,00
WTG 13	4.233	4.237					
WTG 13			20	37,06	64,5	0,00	5,60
WTG 13			25	34,97	68,5	0,08	5,40
WTG 13			32	34,93	74,0	0,13	5,20
WTG 13			40	33,35	77,5	0,21	5,00
WTG 13			50	33,66	82,6	0,30	4,70
WTG 13			63	30,39	83,9	0,47	4,30
WTG 13			80	28,68	86,7	0,68	3,70
WTG 13			100	28,90	91,4	1,06	3,00
WTG 13			125	22,65	89,9	1,61	1,80
WTG 13			160	18,64	91,2	2,41	0,00
WTG 13			200	16,69	92,8	3,47	0,00
WTG 14	4.979	4.982					
WTG 14			20	35,65	64,5	0,00	5,60
WTG 14			25	33,55	68,5	0,10	5,40
WTG 14			32	33,50	74,0	0,15	5,20
WTG 14			40	31,90	77,5	0,25	5,00
WTG 14			50	32,20	82,6	0,35	4,70
WTG 14			63	28,90	83,9	0,55	4,30
WTG 14			80	27,16	86,7	0,80	3,70
WTG 14			100	27,31	91,4	1,25	3,00
WTG 14			125	20,96	89,9	1,89	1,80
WTG 14			160	16,81	91,2	2,84	0,00
WTG 14			200	14,67	92,8	4,08	0,00
WTG 15	5.214	5.217					
WTG 15			20	35,25	64,5	0,00	5,60
WTG 15			25	33,15	68,5	0,10	5,40
WTG 15			32	33,09	74,0	0,16	5,20
WTG 15			40	31,49	77,5	0,26	5,00
WTG 15			50	31,79	82,6	0,37	4,70
WTG 15			63	28,48	83,9	0,57	4,30
WTG 15			80	26,72	86,7	0,83	3,70
WTG 15			100	26,85	91,4	1,30	3,00
WTG 15			125	20,47	89,9	1,98	1,80
WTG 15			160	16,28	91,2	2,97	0,00
WTG 15			200	14,07	92,8	4,28	0,00
WTG 16	4.709	4.711					
WTG 16			20	36,14	64,5	0,00	5,60
WTG 16			25	34,04	68,5	0,09	5,40
WTG 16			32	34,00	74,0	0,14	5,20
WTG 16			40	32,40	77,5	0,24	5,00
WTG 16			50	32,71	82,6	0,33	4,70
WTG 16			63	29,42	83,9	0,52	4,30
WTG 16			80	27,68	86,7	0,75	3,70
WTG 16			100	27,86	91,4	1,18	3,00
WTG 16			125	21,55	89,9	1,79	1,80
WTG 16			160	17,45	91,2	2,69	0,00
WTG 16			200	15,37	92,8	3,86	0,00
WTG 17	5.701	5.703					
WTG 17			20	34,48	64,5	0,00	5,60
WTG 17			25	32,36	68,5	0,11	5,40
WTG 17			32	32,31	74,0	0,17	5,20
WTG 17			40	30,69	77,5	0,29	5,00
WTG 17			50	30,98	82,6	0,40	4,70
WTG 17			63	27,65	83,9	0,63	4,30
WTG 17			80	25,87	86,7	0,91	3,70
WTG 17			100	25,95	91,4	1,43	3,00
WTG 17			125	19,51	89,9	2,17	1,80
WTG 17			160	15,23	91,2	3,25	0,00
WTG 17			200	12,90	92,8	4,68	0,00
WTG 18	5.572	5.575					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 18			20	34,68	64,5	0,00	5,60
WTG 18			25	32,56	68,5	0,11	5,40
WTG 18			32	32,51	74,0	0,17	5,20
WTG 18			40	30,90	77,5	0,28	5,00
WTG 18			50	31,19	82,6	0,39	4,70
WTG 18			63	27,86	83,9	0,61	4,30
WTG 18			80	26,08	86,7	0,89	3,70
WTG 18			100	26,18	91,4	1,39	3,00
WTG 18			125	19,76	89,9	2,12	1,80
WTG 18			160	15,50	91,2	3,18	0,00
WTG 18			200	13,20	92,8	4,57	0,00
WTG 19	6.038	6.039					
WTG 19			20	33,98	64,5	0,00	5,60
WTG 19			25	31,86	68,5	0,12	5,40
WTG 19			32	31,80	74,0	0,18	5,20
WTG 19			40	30,18	77,5	0,30	5,00
WTG 19			50	30,46	82,6	0,42	4,70
WTG 19			63	27,12	83,9	0,66	4,30
WTG 19			80	25,31	86,7	0,97	3,70
WTG 19			100	25,37	91,4	1,51	3,00
WTG 19			125	18,89	89,9	2,29	1,80
WTG 19			160	14,54	91,2	3,44	0,00
WTG 19			200	12,13	92,8	4,95	0,00
Sum							
Sum			20	51,61			
Sum			25	49,54			
Sum			32	49,51			
Sum			40	47,95			
Sum			50	48,29			
Sum			63	45,07			
Sum			80	43,42			
Sum			100	43,75			
Sum			125	37,66			
Sum			160	33,90			
Sum			200	32,28			

Noise sensitive area: Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.023	5.031					
WTG 03			20	35,57	64,5	0,00	5,60
WTG 03			25	33,47	68,5	0,10	5,40
WTG 03			32	33,42	74,0	0,15	5,20
WTG 03			40	31,82	77,5	0,25	5,00
WTG 03			50	32,11	82,6	0,35	4,70
WTG 03			63	28,81	83,9	0,55	4,30
WTG 03			80	27,06	86,7	0,80	3,70
WTG 03			100	27,21	91,4	1,26	3,00
WTG 03			125	20,85	89,9	1,91	1,80
WTG 03			160	16,70	91,2	2,87	0,00
WTG 03			200	14,54	92,8	4,13	0,00
WTG 04	4.871	4.879					
WTG 04			20	35,83	64,5	0,00	5,60
WTG 04			25	33,74	68,5	0,10	5,40
WTG 04			32	33,69	74,0	0,15	5,20
WTG 04			40	32,09	77,5	0,24	5,00
WTG 04			50	32,39	82,6	0,34	4,70
WTG 04			63	29,10	83,9	0,54	4,30
WTG 04			80	27,35	86,7	0,78	3,70
WTG 04			100	27,51	91,4	1,22	3,00
WTG 04			125	21,18	89,9	1,85	1,80
WTG 04			160	17,05	91,2	2,78	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 04			200	14,93	92,8	4,00	0,00
WTG 05	4.685	4.695					
WTG 05			20	36,17	64,5	0,00	5,60
WTG 05			25	34,07	68,5	0,09	5,40
WTG 05			32	34,03	74,0	0,14	5,20
WTG 05			40	32,43	77,5	0,23	5,00
WTG 05			50	32,74	82,6	0,33	4,70
WTG 05			63	29,45	83,9	0,52	4,30
WTG 05			80	27,72	86,7	0,75	3,70
WTG 05			100	27,89	91,4	1,17	3,00
WTG 05			125	21,58	89,9	1,78	1,80
WTG 05			160	17,49	91,2	2,68	0,00
WTG 05			200	15,42	92,8	3,85	0,00
WTG 06	4.405	4.414					
WTG 06			20	36,70	64,5	0,00	5,60
WTG 06			25	34,61	68,5	0,09	5,40
WTG 06			32	34,57	74,0	0,13	5,20
WTG 06			40	32,98	77,5	0,22	5,00
WTG 06			50	33,29	82,6	0,31	4,70
WTG 06			63	30,02	83,9	0,49	4,30
WTG 06			80	28,30	86,7	0,71	3,70
WTG 06			100	28,50	91,4	1,10	3,00
WTG 06			125	22,23	89,9	1,68	1,80
WTG 06			160	18,19	91,2	2,52	0,00
WTG 06			200	16,18	92,8	3,62	0,00
WTG 07	4.832	4.839					
WTG 07			20	35,91	64,5	0,00	5,60
WTG 07			25	33,81	68,5	0,10	5,40
WTG 07			32	33,76	74,0	0,15	5,20
WTG 07			40	32,16	77,5	0,24	5,00
WTG 07			50	32,47	82,6	0,34	4,70
WTG 07			63	29,17	83,9	0,53	4,30
WTG 07			80	27,43	86,7	0,77	3,70
WTG 07			100	27,60	91,4	1,21	3,00
WTG 07			125	21,27	89,9	1,84	1,80
WTG 07			160	17,15	91,2	2,76	0,00
WTG 07			200	15,04	92,8	3,97	0,00
WTG 08	4.153	4.164					
WTG 08			20	37,21	64,5	0,00	5,60
WTG 08			25	35,13	68,5	0,08	5,40
WTG 08			32	35,09	74,0	0,12	5,20
WTG 08			40	33,50	77,5	0,21	5,00
WTG 08			50	33,82	82,6	0,29	4,70
WTG 08			63	30,55	83,9	0,46	4,30
WTG 08			80	28,84	86,7	0,67	3,70
WTG 08			100	29,07	91,4	1,04	3,00
WTG 08			125	22,83	89,9	1,58	1,80
WTG 08			160	18,84	91,2	2,37	0,00
WTG 08			200	16,90	92,8	3,41	0,00
WTG 09	4.919	4.925					
WTG 09			20	35,75	64,5	0,00	5,60
WTG 09			25	33,65	68,5	0,10	5,40
WTG 09			32	33,60	74,0	0,15	5,20
WTG 09			40	32,00	77,5	0,25	5,00
WTG 09			50	32,31	82,6	0,34	4,70
WTG 09			63	29,01	83,9	0,54	4,30
WTG 09			80	27,26	86,7	0,79	3,70
WTG 09			100	27,42	91,4	1,23	3,00
WTG 09			125	21,08	89,9	1,87	1,80
WTG 09			160	16,94	91,2	2,81	0,00
WTG 09			200	14,81	92,8	4,04	0,00
WTG 10	4.437	4.444					
WTG 10			20	36,64	64,5	0,00	5,60
WTG 10			25	34,55	68,5	0,09	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 10			32	34,51	74,0	0,13	5,20
WTG 10			40	32,92	77,5	0,22	5,00
WTG 10			50	33,23	82,6	0,31	4,70
WTG 10			63	29,95	83,9	0,49	4,30
WTG 10			80	28,23	86,7	0,71	3,70
WTG 10			100	28,43	91,4	1,11	3,00
WTG 10			125	22,15	89,9	1,69	1,80
WTG 10			160	18,11	91,2	2,53	0,00
WTG 10			200	16,10	92,8	3,64	0,00
WTG 11	3.876	3.886					
WTG 11			20	37,81	64,5	0,00	5,60
WTG 11			25	35,73	68,5	0,08	5,40
WTG 11			32	35,69	74,0	0,12	5,20
WTG 11			40	34,12	77,5	0,19	5,00
WTG 11			50	34,44	82,6	0,27	4,70
WTG 11			63	31,18	83,9	0,43	4,30
WTG 11			80	29,49	86,7	0,62	3,70
WTG 11			100	29,74	91,4	0,97	3,00
WTG 11			125	23,53	89,9	1,48	1,80
WTG 11			160	19,59	91,2	2,22	0,00
WTG 11			200	17,72	92,8	3,19	0,00
WTG 12	4.850	4.856					
WTG 12			20	35,87	64,5	0,00	5,60
WTG 12			25	33,78	68,5	0,10	5,40
WTG 12			32	33,73	74,0	0,15	5,20
WTG 12			40	32,13	77,5	0,24	5,00
WTG 12			50	32,43	82,6	0,34	4,70
WTG 12			63	29,14	83,9	0,53	4,30
WTG 12			80	27,40	86,7	0,78	3,70
WTG 12			100	27,56	91,4	1,21	3,00
WTG 12			125	21,23	89,9	1,85	1,80
WTG 12			160	17,11	91,2	2,77	0,00
WTG 12			200	14,99	92,8	3,98	0,00
WTG 13	3.456	3.465					
WTG 13			20	38,81	64,5	0,00	5,60
WTG 13			25	36,74	68,5	0,07	5,40
WTG 13			32	36,70	74,0	0,10	5,20
WTG 13			40	35,13	77,5	0,17	5,00
WTG 13			50	35,46	82,6	0,24	4,70
WTG 13			63	32,22	83,9	0,38	4,30
WTG 13			80	30,55	86,7	0,55	3,70
WTG 13			100	30,84	91,4	0,87	3,00
WTG 13			125	24,69	89,9	1,32	1,80
WTG 13			160	20,83	91,2	1,98	0,00
WTG 13			200	19,06	92,8	2,84	0,00
WTG 14	4.588	4.594					
WTG 14			20	36,36	64,5	0,00	5,60
WTG 14			25	34,26	68,5	0,09	5,40
WTG 14			32	34,22	74,0	0,14	5,20
WTG 14			40	32,63	77,5	0,23	5,00
WTG 14			50	32,93	82,6	0,32	4,70
WTG 14			63	29,65	83,9	0,51	4,30
WTG 14			80	27,92	86,7	0,74	3,70
WTG 14			100	28,11	91,4	1,15	3,00
WTG 14			125	21,81	89,9	1,75	1,80
WTG 14			160	17,74	91,2	2,62	0,00
WTG 14			200	15,69	92,8	3,77	0,00
WTG 15	3.653	3.662					
WTG 15			20	38,33	64,5	0,00	5,60
WTG 15			25	36,25	68,5	0,07	5,40
WTG 15			32	36,22	74,0	0,11	5,20
WTG 15			40	34,64	77,5	0,18	5,00
WTG 15			50	34,97	82,6	0,26	4,70
WTG 15			63	31,72	83,9	0,40	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 15			80	30,04	86,7	0,59	3,70
WTG 15			100	30,31	91,4	0,92	3,00
WTG 15			125	24,14	89,9	1,39	1,80
WTG 15			160	20,24	91,2	2,09	0,00
WTG 15			200	18,42	92,8	3,00	0,00
WTG 16	2.981	2.990					
WTG 16			20	40,09	64,5	0,00	5,60
WTG 16			25	38,03	68,5	0,06	5,40
WTG 16			32	38,00	74,0	0,09	5,20
WTG 16			40	36,44	77,5	0,15	5,00
WTG 16			50	36,78	82,6	0,21	4,70
WTG 16			63	33,56	83,9	0,33	4,30
WTG 16			80	31,91	86,7	0,48	3,70
WTG 16			100	32,24	91,4	0,75	3,00
WTG 16			125	26,15	89,9	1,14	1,80
WTG 16			160	22,38	91,2	1,70	0,00
WTG 16			200	20,74	92,8	2,45	0,00
WTG 17	4.768	4.774					
WTG 17			20	36,02	64,5	0,00	5,60
WTG 17			25	33,93	68,5	0,10	5,40
WTG 17			32	33,88	74,0	0,14	5,20
WTG 17			40	32,28	77,5	0,24	5,00
WTG 17			50	32,59	82,6	0,33	4,70
WTG 17			63	29,30	83,9	0,53	4,30
WTG 17			80	27,56	86,7	0,76	3,70
WTG 17			100	27,73	91,4	1,19	3,00
WTG 17			125	21,41	89,9	1,81	1,80
WTG 17			160	17,30	91,2	2,72	0,00
WTG 17			200	15,21	92,8	3,91	0,00
WTG 18	3.241	3.250					
WTG 18			20	39,36	64,5	0,00	5,60
WTG 18			25	37,30	68,5	0,06	5,40
WTG 18			32	37,27	74,0	0,10	5,20
WTG 18			40	35,70	77,5	0,16	5,00
WTG 18			50	36,04	82,6	0,23	4,70
WTG 18			63	32,81	83,9	0,36	4,30
WTG 18			80	31,14	86,7	0,52	3,70
WTG 18			100	31,45	91,4	0,81	3,00
WTG 18			125	25,33	89,9	1,23	1,80
WTG 18			160	21,51	91,2	1,85	0,00
WTG 18			200	19,80	92,8	2,66	0,00
WTG 19	4.577	4.582					
WTG 19			20	36,38	64,5	0,00	5,60
WTG 19			25	34,29	68,5	0,09	5,40
WTG 19			32	34,24	74,0	0,14	5,20
WTG 19			40	32,65	77,5	0,23	5,00
WTG 19			50	32,96	82,6	0,32	4,70
WTG 19			63	29,67	83,9	0,50	4,30
WTG 19			80	27,94	86,7	0,73	3,70
WTG 19			100	28,13	91,4	1,15	3,00
WTG 19			125	21,84	89,9	1,74	1,80
WTG 19			160	17,77	91,2	2,61	0,00
WTG 19			200	15,72	92,8	3,76	0,00
Sum							
Sum			20	49,52			
Sum			25	47,44			
Sum			32	47,40			
Sum			40	45,82			
Sum			50	46,14			
Sum			63	42,87			
Sum			80	41,17			
Sum			100	41,40			
Sum			125	35,17			
Sum			160	31,20			
Sum			200	29,30			

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency
Noise sensitive area: Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)
Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.062	5.070					
WTG 03			20	35,50	64,5	0,00	5,60
WTG 03			25	33,40	68,5	0,10	5,40
WTG 03			32	33,35	74,0	0,15	5,20
WTG 03			40	31,75	77,5	0,25	5,00
WTG 03			50	32,05	82,6	0,35	4,70
WTG 03			63	28,74	83,9	0,56	4,30
WTG 03			80	26,99	86,7	0,81	3,70
WTG 03			100	27,13	91,4	1,27	3,00
WTG 03			125	20,77	89,9	1,93	1,80
WTG 03			160	16,61	91,2	2,89	0,00
WTG 03			200	14,44	92,8	4,16	0,00
WTG 04	4.924	4.932					
WTG 04			20	35,74	64,5	0,00	5,60
WTG 04			25	33,64	68,5	0,10	5,40
WTG 04			32	33,59	74,0	0,15	5,20
WTG 04			40	31,99	77,5	0,25	5,00
WTG 04			50	32,29	82,6	0,35	4,70
WTG 04			63	29,00	83,9	0,54	4,30
WTG 04			80	27,25	86,7	0,79	3,70
WTG 04			100	27,41	91,4	1,23	3,00
WTG 04			125	21,06	89,9	1,87	1,80
WTG 04			160	16,93	91,2	2,81	0,00
WTG 04			200	14,79	92,8	4,04	0,00
WTG 05	4.716	4.726					
WTG 05			20	36,11	64,5	0,00	5,60
WTG 05			25	34,02	68,5	0,09	5,40
WTG 05			32	33,97	74,0	0,14	5,20
WTG 05			40	32,37	77,5	0,24	5,00
WTG 05			50	32,68	82,6	0,33	4,70
WTG 05			63	29,39	83,9	0,52	4,30
WTG 05			80	27,65	86,7	0,76	3,70
WTG 05			100	27,83	91,4	1,18	3,00
WTG 05			125	21,52	89,9	1,80	1,80
WTG 05			160	17,42	91,2	2,69	0,00
WTG 05			200	15,34	92,8	3,87	0,00
WTG 06	4.449	4.458					
WTG 06			20	36,62	64,5	0,00	5,60
WTG 06			25	34,53	68,5	0,09	5,40
WTG 06			32	34,48	74,0	0,13	5,20
WTG 06			40	32,89	77,5	0,22	5,00
WTG 06			50	33,21	82,6	0,31	4,70
WTG 06			63	29,93	83,9	0,49	4,30
WTG 06			80	28,20	86,7	0,71	3,70
WTG 06			100	28,40	91,4	1,11	3,00
WTG 06			125	22,12	89,9	1,69	1,80
WTG 06			160	18,08	91,2	2,54	0,00
WTG 06			200	16,06	92,8	3,66	0,00
WTG 07	4.849	4.856					
WTG 07			20	35,87	64,5	0,00	5,60
WTG 07			25	33,78	68,5	0,10	5,40
WTG 07			32	33,73	74,0	0,15	5,20
WTG 07			40	32,13	77,5	0,24	5,00
WTG 07			50	32,43	82,6	0,34	4,70
WTG 07			63	29,14	83,9	0,53	4,30
WTG 07			80	27,40	86,7	0,78	3,70
WTG 07			100	27,56	91,4	1,21	3,00
WTG 07			125	21,23	89,9	1,85	1,80
WTG 07			160	17,11	91,2	2,77	0,00
WTG 07			200	14,99	92,8	3,98	0,00
WTG 08	4.183	4.193					
WTG 08			20	37,15	64,5	0,00	5,60
WTG 08			25	35,07	68,5	0,08	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 08			32	35,02	74,0	0,13	5,20
WTG 08			40	33,44	77,5	0,21	5,00
WTG 08			50	33,76	82,6	0,29	4,70
WTG 08			63	30,49	83,9	0,46	4,30
WTG 08			80	28,78	86,7	0,67	3,70
WTG 08			100	29,00	91,4	1,05	3,00
WTG 08			125	22,76	89,9	1,59	1,80
WTG 08			160	18,76	91,2	2,39	0,00
WTG 08			200	16,81	92,8	3,44	0,00
WTG 09	4.923	4.929					
WTG 09			20	35,75	64,5	0,00	5,60
WTG 09			25	33,65	68,5	0,10	5,40
WTG 09			32	33,60	74,0	0,15	5,20
WTG 09			40	32,00	77,5	0,25	5,00
WTG 09			50	32,30	82,6	0,35	4,70
WTG 09			63	29,00	83,9	0,54	4,30
WTG 09			80	27,26	86,7	0,79	3,70
WTG 09			100	27,41	91,4	1,23	3,00
WTG 09			125	21,07	89,9	1,87	1,80
WTG 09			160	16,94	91,2	2,81	0,00
WTG 09			200	14,80	92,8	4,04	0,00
WTG 10	4.443	4.450					
WTG 10			20	36,63	64,5	0,00	5,60
WTG 10			25	34,54	68,5	0,09	5,40
WTG 10			32	34,50	74,0	0,13	5,20
WTG 10			40	32,91	77,5	0,22	5,00
WTG 10			50	33,22	82,6	0,31	4,70
WTG 10			63	29,94	83,9	0,49	4,30
WTG 10			80	28,22	86,7	0,71	3,70
WTG 10			100	28,42	91,4	1,11	3,00
WTG 10			125	22,14	89,9	1,69	1,80
WTG 10			160	18,10	91,2	2,54	0,00
WTG 10			200	16,08	92,8	3,65	0,00
WTG 11	3.892	3.902					
WTG 11			20	37,77	64,5	0,00	5,60
WTG 11			25	35,70	68,5	0,08	5,40
WTG 11			32	35,66	74,0	0,12	5,20
WTG 11			40	34,08	77,5	0,20	5,00
WTG 11			50	34,40	82,6	0,27	4,70
WTG 11			63	31,14	83,9	0,43	4,30
WTG 11			80	29,45	86,7	0,62	3,70
WTG 11			100	29,70	91,4	0,98	3,00
WTG 11			125	23,49	89,9	1,48	1,80
WTG 11			160	19,55	91,2	2,22	0,00
WTG 11			200	17,67	92,8	3,20	0,00
WTG 12	4.841	4.847					
WTG 12			20	35,89	64,5	0,00	5,60
WTG 12			25	33,79	68,5	0,10	5,40
WTG 12			32	33,74	74,0	0,15	5,20
WTG 12			40	32,15	77,5	0,24	5,00
WTG 12			50	32,45	82,6	0,34	4,70
WTG 12			63	29,16	83,9	0,53	4,30
WTG 12			80	27,41	86,7	0,78	3,70
WTG 12			100	27,58	91,4	1,21	3,00
WTG 12			125	21,25	89,9	1,84	1,80
WTG 12			160	17,13	91,2	2,76	0,00
WTG 12			200	15,02	92,8	3,97	0,00
WTG 13	3.452	3.461					
WTG 13			20	38,82	64,5	0,00	5,60
WTG 13			25	36,75	68,5	0,07	5,40
WTG 13			32	36,71	74,0	0,10	5,20
WTG 13			40	35,14	77,5	0,17	5,00
WTG 13			50	35,47	82,6	0,24	4,70
WTG 13			63	32,24	83,9	0,38	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 13			80	30,56	86,7	0,55	3,70
WTG 13			100	30,85	91,4	0,87	3,00
WTG 13			125	24,70	89,9	1,32	1,80
WTG 13			160	20,84	91,2	1,97	0,00
WTG 13			200	19,08	92,8	2,84	0,00
WTG 14	4.558	4.565					
WTG 14			20	36,41	64,5	0,00	5,60
WTG 14			25	34,32	68,5	0,09	5,40
WTG 14			32	34,28	74,0	0,14	5,20
WTG 14			40	32,68	77,5	0,23	5,00
WTG 14			50	32,99	82,6	0,32	4,70
WTG 14			63	29,71	83,9	0,50	4,30
WTG 14			80	27,98	86,7	0,73	3,70
WTG 14			100	28,17	91,4	1,14	3,00
WTG 14			125	21,88	89,9	1,73	1,80
WTG 14			160	17,81	91,2	2,60	0,00
WTG 14			200	15,77	92,8	3,74	0,00
WTG 15	3.614	3.623					
WTG 15			20	38,42	64,5	0,00	5,60
WTG 15			25	36,35	68,5	0,07	5,40
WTG 15			32	36,31	74,0	0,11	5,20
WTG 15			40	34,74	77,5	0,18	5,00
WTG 15			50	35,07	82,6	0,25	4,70
WTG 15			63	31,82	83,9	0,40	4,30
WTG 15			80	30,14	86,7	0,58	3,70
WTG 15			100	30,41	91,4	0,91	3,00
WTG 15			125	24,24	89,9	1,38	1,80
WTG 15			160	20,35	91,2	2,07	0,00
WTG 15			200	18,55	92,8	2,97	0,00
WTG 16	2.963	2.972					
WTG 16			20	40,14	64,5	0,00	5,60
WTG 16			25	38,08	68,5	0,06	5,40
WTG 16			32	38,05	74,0	0,09	5,20
WTG 16			40	36,49	77,5	0,15	5,00
WTG 16			50	36,83	82,6	0,21	4,70
WTG 16			63	33,61	83,9	0,33	4,30
WTG 16			80	31,96	86,7	0,48	3,70
WTG 16			100	32,30	91,4	0,74	3,00
WTG 16			125	26,21	89,9	1,13	1,80
WTG 16			160	22,44	91,2	1,69	0,00
WTG 16			200	20,80	92,8	2,44	0,00
WTG 17	4.721	4.727					
WTG 17			20	36,11	64,5	0,00	5,60
WTG 17			25	34,01	68,5	0,09	5,40
WTG 17			32	33,97	74,0	0,14	5,20
WTG 17			40	32,37	77,5	0,24	5,00
WTG 17			50	32,68	82,6	0,33	4,70
WTG 17			63	29,39	83,9	0,52	4,30
WTG 17			80	27,65	86,7	0,76	3,70
WTG 17			100	27,83	91,4	1,18	3,00
WTG 17			125	21,51	89,9	1,80	1,80
WTG 17			160	17,41	91,2	2,69	0,00
WTG 17			200	15,33	92,8	3,88	0,00
WTG 18	3.190	3.198					
WTG 18			20	39,50	64,5	0,00	5,60
WTG 18			25	37,44	68,5	0,06	5,40
WTG 18			32	37,41	74,0	0,10	5,20
WTG 18			40	35,84	77,5	0,16	5,00
WTG 18			50	36,18	82,6	0,22	4,70
WTG 18			63	32,95	83,9	0,35	4,30
WTG 18			80	31,29	86,7	0,51	3,70
WTG 18			100	31,60	91,4	0,80	3,00
WTG 18			125	25,49	89,9	1,22	1,80
WTG 18			160	21,68	91,2	1,82	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 18			200	19,98	92,8	2,62	0,00
WTG 19	4.520	4.526					
WTG 19			20	36,49	64,5	0,00	5,60
WTG 19			25	34,40	68,5	0,09	5,40
WTG 19			32	34,35	74,0	0,14	5,20
WTG 19			40	32,76	77,5	0,23	5,00
WTG 19			50	33,07	82,6	0,32	4,70
WTG 19			63	29,79	83,9	0,50	4,30
WTG 19			80	28,06	86,7	0,72	3,70
WTG 19			100	28,26	91,4	1,13	3,00
WTG 19			125	21,97	89,9	1,72	1,80
WTG 19			160	17,91	91,2	2,58	0,00
WTG 19			200	15,88	92,8	3,71	0,00
Sum							
Sum			20	49,54			
Sum			25	47,46			
Sum			32	47,42			
Sum			40	45,84			
Sum			50	46,15			
Sum			63	42,89			
Sum			80	41,19			
Sum			100	41,42			
Sum			125	35,19			
Sum			160	31,23			
Sum			200	29,32			

Noise sensitive area: Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.348	5.355					
WTG 03			20	35,02	64,5	0,00	5,60
WTG 03			25	32,92	68,5	0,11	5,40
WTG 03			32	32,86	74,0	0,16	5,20
WTG 03			40	31,26	77,5	0,27	5,00
WTG 03			50	31,55	82,6	0,37	4,70
WTG 03			63	28,24	83,9	0,59	4,30
WTG 03			80	26,47	86,7	0,86	3,70
WTG 03			100	26,59	91,4	1,34	3,00
WTG 03			125	20,19	89,9	2,03	1,80
WTG 03			160	15,97	91,2	3,05	0,00
WTG 03			200	13,73	92,8	4,39	0,00
WTG 04	5.244	5.251					
WTG 04			20	35,19	64,5	0,00	5,60
WTG 04			25	33,09	68,5	0,11	5,40
WTG 04			32	33,04	74,0	0,16	5,20
WTG 04			40	31,43	77,5	0,26	5,00
WTG 04			50	31,73	82,6	0,37	4,70
WTG 04			63	28,42	83,9	0,58	4,30
WTG 04			80	26,65	86,7	0,84	3,70
WTG 04			100	26,78	91,4	1,31	3,00
WTG 04			125	20,40	89,9	2,00	1,80
WTG 04			160	16,20	91,2	2,99	0,00
WTG 04			200	13,99	92,8	4,31	0,00
WTG 05	4.985	4.994					
WTG 05			20	35,63	64,5	0,00	5,60
WTG 05			25	33,53	68,5	0,10	5,40
WTG 05			32	33,48	74,0	0,15	5,20
WTG 05			40	31,88	77,5	0,25	5,00
WTG 05			50	32,18	82,6	0,35	4,70
WTG 05			63	28,88	83,9	0,55	4,30
WTG 05			80	27,13	86,7	0,80	3,70
WTG 05			100	27,28	91,4	1,25	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 05			125	20,93	89,9	1,90	1,80
WTG 05			160	16,78	91,2	2,85	0,00
WTG 05			200	14,64	92,8	4,10	0,00
WTG 06	4.749	4.757					
WTG 06			20	36,05	64,5	0,00	5,60
WTG 06			25	33,96	68,5	0,10	5,40
WTG 06			32	33,91	74,0	0,14	5,20
WTG 06			40	32,32	77,5	0,24	5,00
WTG 06			50	32,62	82,6	0,33	4,70
WTG 06			63	29,33	83,9	0,52	4,30
WTG 06			80	27,59	86,7	0,76	3,70
WTG 06			100	27,76	91,4	1,19	3,00
WTG 06			125	21,45	89,9	1,81	1,80
WTG 06			160	17,34	91,2	2,71	0,00
WTG 06			200	15,25	92,8	3,90	0,00
WTG 07	5.083	5.090					
WTG 07			20	35,47	64,5	0,00	5,60
WTG 07			25	33,36	68,5	0,10	5,40
WTG 07			32	33,31	74,0	0,15	5,20
WTG 07			40	31,71	77,5	0,25	5,00
WTG 07			50	32,01	82,6	0,36	4,70
WTG 07			63	28,71	83,9	0,56	4,30
WTG 07			80	26,95	86,7	0,81	3,70
WTG 07			100	27,09	91,4	1,27	3,00
WTG 07			125	20,73	89,9	1,93	1,80
WTG 07			160	16,56	91,2	2,90	0,00
WTG 07			200	14,39	92,8	4,17	0,00
WTG 08	4.449	4.459					
WTG 08			20	36,62	64,5	0,00	5,60
WTG 08			25	34,53	68,5	0,09	5,40
WTG 08			32	34,48	74,0	0,13	5,20
WTG 08			40	32,89	77,5	0,22	5,00
WTG 08			50	33,20	82,6	0,31	4,70
WTG 08			63	29,92	83,9	0,49	4,30
WTG 08			80	28,20	86,7	0,71	3,70
WTG 08			100	28,40	91,4	1,11	3,00
WTG 08			125	22,12	89,9	1,69	1,80
WTG 08			160	18,07	91,2	2,54	0,00
WTG 08			200	16,06	92,8	3,66	0,00
WTG 09	5.119	5.125					
WTG 09			20	35,41	64,5	0,00	5,60
WTG 09			25	33,30	68,5	0,10	5,40
WTG 09			32	33,25	74,0	0,15	5,20
WTG 09			40	31,65	77,5	0,26	5,00
WTG 09			50	31,95	82,6	0,36	4,70
WTG 09			63	28,64	83,9	0,56	4,30
WTG 09			80	26,89	86,7	0,82	3,70
WTG 09			100	27,03	91,4	1,28	3,00
WTG 09			125	20,66	89,9	1,95	1,80
WTG 09			160	16,49	91,2	2,92	0,00
WTG 09			200	14,30	92,8	4,20	0,00
WTG 10	4.648	4.655					
WTG 10			20	36,24	64,5	0,00	5,60
WTG 10			25	34,15	68,5	0,09	5,40
WTG 10			32	34,10	74,0	0,14	5,20
WTG 10			40	32,51	77,5	0,23	5,00
WTG 10			50	32,82	82,6	0,33	4,70
WTG 10			63	29,53	83,9	0,51	4,30
WTG 10			80	27,80	86,7	0,74	3,70
WTG 10			100	27,98	91,4	1,16	3,00
WTG 10			125	21,67	89,9	1,77	1,80
WTG 10			160	17,59	91,2	2,65	0,00
WTG 10			200	15,52	92,8	3,82	0,00
WTG 11	4.127	4.137					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 11			20	37,27	64,5	0,00	5,60
WTG 11			25	35,18	68,5	0,08	5,40
WTG 11			32	35,14	74,0	0,12	5,20
WTG 11			40	33,56	77,5	0,21	5,00
WTG 11			50	33,88	82,6	0,29	4,70
WTG 11			63	30,61	83,9	0,46	4,30
WTG 11			80	28,91	86,7	0,66	3,70
WTG 11			100	29,13	91,4	1,03	3,00
WTG 11			125	22,90	89,9	1,57	1,80
WTG 11			160	18,91	91,2	2,36	0,00
WTG 11			200	16,98	92,8	3,39	0,00
WTG 12	5.001	5.008					
WTG 12			20	35,61	64,5	0,00	5,60
WTG 12			25	33,51	68,5	0,10	5,40
WTG 12			32	33,46	74,0	0,15	5,20
WTG 12			40	31,86	77,5	0,25	5,00
WTG 12			50	32,16	82,6	0,35	4,70
WTG 12			63	28,86	83,9	0,55	4,30
WTG 12			80	27,11	86,7	0,80	3,70
WTG 12			100	27,26	91,4	1,25	3,00
WTG 12			125	20,90	89,9	1,90	1,80
WTG 12			160	16,75	91,2	2,85	0,00
WTG 12			200	14,60	92,8	4,11	0,00
WTG 13	3.633	3.641					
WTG 13			20	38,37	64,5	0,00	5,60
WTG 13			25	36,30	68,5	0,07	5,40
WTG 13			32	36,27	74,0	0,11	5,20
WTG 13			40	34,69	77,5	0,18	5,00
WTG 13			50	35,02	82,6	0,25	4,70
WTG 13			63	31,77	83,9	0,40	4,30
WTG 13			80	30,09	86,7	0,58	3,70
WTG 13			100	30,36	91,4	0,91	3,00
WTG 13			125	24,19	89,9	1,38	1,80
WTG 13			160	20,30	91,2	2,08	0,00
WTG 13			200	18,49	92,8	2,99	0,00
WTG 14	4.656	4.663					
WTG 14			20	36,23	64,5	0,00	5,60
WTG 14			25	34,13	68,5	0,09	5,40
WTG 14			32	34,09	74,0	0,14	5,20
WTG 14			40	32,49	77,5	0,23	5,00
WTG 14			50	32,80	82,6	0,33	4,70
WTG 14			63	29,51	83,9	0,51	4,30
WTG 14			80	27,78	86,7	0,75	3,70
WTG 14			100	27,96	91,4	1,17	3,00
WTG 14			125	21,66	89,9	1,77	1,80
WTG 14			160	17,57	91,2	2,66	0,00
WTG 14			200	15,50	92,8	3,82	0,00
WTG 15	3.687	3.696					
WTG 15			20	38,24	64,5	0,00	5,60
WTG 15			25	36,17	68,5	0,07	5,40
WTG 15			32	36,13	74,0	0,11	5,20
WTG 15			40	34,56	77,5	0,18	5,00
WTG 15			50	34,89	82,6	0,26	4,70
WTG 15			63	31,64	83,9	0,41	4,30
WTG 15			80	29,95	86,7	0,59	3,70
WTG 15			100	30,22	91,4	0,92	3,00
WTG 15			125	24,04	89,9	1,40	1,80
WTG 15			160	20,14	91,2	2,11	0,00
WTG 15			200	18,31	92,8	3,03	0,00
WTG 16	3.110	3.119					
WTG 16			20	39,72	64,5	0,00	5,60
WTG 16			25	37,66	68,5	0,06	5,40
WTG 16			32	37,63	74,0	0,09	5,20
WTG 16			40	36,06	77,5	0,16	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 16			50	36,40	82,6	0,22	4,70
WTG 16			63	33,18	83,9	0,34	4,30
WTG 16			80	31,52	86,7	0,50	3,70
WTG 16			100	31,84	91,4	0,78	3,00
WTG 16			125	25,74	89,9	1,19	1,80
WTG 16			160	21,94	91,2	1,78	0,00
WTG 16			200	20,26	92,8	2,56	0,00
WTG 17	4.760	4.765					
WTG 17			20	36,04	64,5	0,00	5,60
WTG 17			25	33,94	68,5	0,10	5,40
WTG 17			32	33,90	74,0	0,14	5,20
WTG 17			40	32,30	77,5	0,24	5,00
WTG 17			50	32,60	82,6	0,33	4,70
WTG 17			63	29,31	83,9	0,52	4,30
WTG 17			80	27,58	86,7	0,76	3,70
WTG 17			100	27,75	91,4	1,19	3,00
WTG 17			125	21,43	89,9	1,81	1,80
WTG 17			160	17,32	91,2	2,72	0,00
WTG 17			200	15,23	92,8	3,91	0,00
WTG 18	3.223	3.232					
WTG 18			20	39,41	64,5	0,00	5,60
WTG 18			25	37,35	68,5	0,06	5,40
WTG 18			32	37,31	74,0	0,10	5,20
WTG 18			40	35,75	77,5	0,16	5,00
WTG 18			50	36,08	82,6	0,23	4,70
WTG 18			63	32,86	83,9	0,36	4,30
WTG 18			80	31,19	86,7	0,52	3,70
WTG 18			100	31,50	91,4	0,81	3,00
WTG 18			125	25,38	89,9	1,23	1,80
WTG 18			160	21,57	91,2	1,84	0,00
WTG 18			200	19,86	92,8	2,65	0,00
WTG 19	4.523	4.529					
WTG 19			20	36,48	64,5	0,00	5,60
WTG 19			25	34,39	68,5	0,09	5,40
WTG 19			32	34,34	74,0	0,14	5,20
WTG 19			40	32,75	77,5	0,23	5,00
WTG 19			50	33,06	82,6	0,32	4,70
WTG 19			63	29,78	83,9	0,50	4,30
WTG 19			80	28,06	86,7	0,72	3,70
WTG 19			100	28,25	91,4	1,13	3,00
WTG 19			125	21,96	89,9	1,72	1,80
WTG 19			160	17,90	91,2	2,58	0,00
WTG 19			200	15,87	92,8	3,71	0,00
Sum							
Sum			20	49,20			
Sum			25	47,12			
Sum			32	47,08			
Sum			40	45,49			
Sum			50	45,81			
Sum			63	42,54			
Sum			80	40,83			
Sum			100	41,05			
Sum			125	34,80			
Sum			160	30,80			
Sum			200	28,86			

Noise sensitive area: Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.349	5.358					
WTG 03			20	35,02	64,5	0,00	5,60
WTG 03			25	32,91	68,5	0,11	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03			32	32,86	74,0	0,16	5,20
WTG 03			40	31,25	77,5	0,27	5,00
WTG 03			50	31,54	82,6	0,38	4,70
WTG 03			63	28,23	83,9	0,59	4,30
WTG 03			80	26,46	86,7	0,86	3,70
WTG 03			100	26,58	91,4	1,34	3,00
WTG 03			125	20,18	89,9	2,04	1,80
WTG 03			160	15,97	91,2	3,05	0,00
WTG 03			200	13,73	92,8	4,39	0,00
WTG 04	5.998	6.007					
WTG 04			20	34,03	64,5	0,00	5,60
WTG 04			25	31,91	68,5	0,12	5,40
WTG 04			32	31,85	74,0	0,18	5,20
WTG 04			40	30,23	77,5	0,30	5,00
WTG 04			50	30,51	82,6	0,42	4,70
WTG 04			63	27,17	83,9	0,66	4,30
WTG 04			80	25,37	86,7	0,96	3,70
WTG 04			100	25,43	91,4	1,50	3,00
WTG 04			125	18,94	89,9	2,28	1,80
WTG 04			160	14,60	91,2	3,42	0,00
WTG 04			200	12,20	92,8	4,93	0,00
WTG 05	5.058	5.069					
WTG 05			20	35,50	64,5	0,00	5,60
WTG 05			25	33,40	68,5	0,10	5,40
WTG 05			32	33,35	74,0	0,15	5,20
WTG 05			40	31,75	77,5	0,25	5,00
WTG 05			50	32,05	82,6	0,35	4,70
WTG 05			63	28,74	83,9	0,56	4,30
WTG 05			80	26,99	86,7	0,81	3,70
WTG 05			100	27,13	91,4	1,27	3,00
WTG 05			125	20,78	89,9	1,93	1,80
WTG 05			160	16,61	91,2	2,89	0,00
WTG 05			200	14,44	92,8	4,16	0,00
WTG 06	5.591	5.600					
WTG 06			20	34,64	64,5	0,00	5,60
WTG 06			25	32,52	68,5	0,11	5,40
WTG 06			32	32,47	74,0	0,17	5,20
WTG 06			40	30,86	77,5	0,28	5,00
WTG 06			50	31,14	82,6	0,39	4,70
WTG 06			63	27,82	83,9	0,62	4,30
WTG 06			80	26,04	86,7	0,90	3,70
WTG 06			100	26,14	91,4	1,40	3,00
WTG 06			125	19,71	89,9	2,13	1,80
WTG 06			160	15,44	91,2	3,19	0,00
WTG 06			200	13,14	92,8	4,59	0,00
WTG 07	4.500	4.510					
WTG 07			20	36,52	64,5	0,00	5,60
WTG 07			25	34,43	68,5	0,09	5,40
WTG 07			32	34,38	74,0	0,14	5,20
WTG 07			40	32,79	77,5	0,23	5,00
WTG 07			50	33,10	82,6	0,32	4,70
WTG 07			63	29,82	83,9	0,50	4,30
WTG 07			80	28,10	86,7	0,72	3,70
WTG 07			100	28,29	91,4	1,13	3,00
WTG 07			125	22,00	89,9	1,71	1,80
WTG 07			160	17,95	91,2	2,57	0,00
WTG 07			200	15,92	92,8	3,70	0,00
WTG 08	5.103	5.113					
WTG 08			20	35,43	64,5	0,00	5,60
WTG 08			25	33,32	68,5	0,10	5,40
WTG 08			32	33,27	74,0	0,15	5,20
WTG 08			40	31,67	77,5	0,26	5,00
WTG 08			50	31,97	82,6	0,36	4,70
WTG 08			63	28,66	83,9	0,56	4,30

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 08			80	26,91	86,7	0,82	3,70
WTG 08			100	27,05	91,4	1,28	3,00
WTG 08			125	20,68	89,9	1,94	1,80
WTG 08			160	16,51	91,2	2,91	0,00
WTG 08			200	14,33	92,8	4,19	0,00
WTG 09	3.937	3.947					
WTG 09			20	37,67	64,5	0,00	5,60
WTG 09			25	35,60	68,5	0,08	5,40
WTG 09			32	35,56	74,0	0,12	5,20
WTG 09			40	33,98	77,5	0,20	5,00
WTG 09			50	34,30	82,6	0,28	4,70
WTG 09			63	31,04	83,9	0,43	4,30
WTG 09			80	29,34	86,7	0,63	3,70
WTG 09			100	29,59	91,4	0,99	3,00
WTG 09			125	23,37	89,9	1,50	1,80
WTG 09			160	19,42	91,2	2,25	0,00
WTG 09			200	17,54	92,8	3,24	0,00
WTG 10	4.222	4.233					
WTG 10			20	37,07	64,5	0,00	5,60
WTG 10			25	34,98	68,5	0,08	5,40
WTG 10			32	34,94	74,0	0,13	5,20
WTG 10			40	33,36	77,5	0,21	5,00
WTG 10			50	33,67	82,6	0,30	4,70
WTG 10			63	30,40	83,9	0,47	4,30
WTG 10			80	28,69	86,7	0,68	3,70
WTG 10			100	28,91	91,4	1,06	3,00
WTG 10			125	22,66	89,9	1,61	1,80
WTG 10			160	18,66	91,2	2,41	0,00
WTG 10			200	16,70	92,8	3,47	0,00
WTG 11	4.784	4.794					
WTG 11			20	35,99	64,5	0,00	5,60
WTG 11			25	33,89	68,5	0,10	5,40
WTG 11			32	33,84	74,0	0,14	5,20
WTG 11			40	32,25	77,5	0,24	5,00
WTG 11			50	32,55	82,6	0,34	4,70
WTG 11			63	29,26	83,9	0,53	4,30
WTG 11			80	27,52	86,7	0,77	3,70
WTG 11			100	27,69	91,4	1,20	3,00
WTG 11			125	21,36	89,9	1,82	1,80
WTG 11			160	17,25	91,2	2,73	0,00
WTG 11			200	15,15	92,8	3,93	0,00
WTG 12	3.527	3.539					
WTG 12			20	38,62	64,5	0,00	5,60
WTG 12			25	36,55	68,5	0,07	5,40
WTG 12			32	36,52	74,0	0,11	5,20
WTG 12			40	34,95	77,5	0,18	5,00
WTG 12			50	35,28	82,6	0,25	4,70
WTG 12			63	32,03	83,9	0,39	4,30
WTG 12			80	30,36	86,7	0,57	3,70
WTG 12			100	30,64	91,4	0,88	3,00
WTG 12			125	24,48	89,9	1,34	1,80
WTG 12			160	20,61	91,2	2,02	0,00
WTG 12			200	18,82	92,8	2,90	0,00
WTG 13	4.515	4.524					
WTG 13			20	36,49	64,5	0,00	5,60
WTG 13			25	34,40	68,5	0,09	5,40
WTG 13			32	34,35	74,0	0,14	5,20
WTG 13			40	32,76	77,5	0,23	5,00
WTG 13			50	33,07	82,6	0,32	4,70
WTG 13			63	29,79	83,9	0,50	4,30
WTG 13			80	28,07	86,7	0,72	3,70
WTG 13			100	28,26	91,4	1,13	3,00
WTG 13			125	21,97	89,9	1,72	1,80
WTG 13			160	17,91	91,2	2,58	0,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 13			200	15,88	92,8	3,71	0,00
WTG 14	3.125	3.138					
WTG 14			20	39,67	64,5	0,00	5,60
WTG 14			25	37,60	68,5	0,06	5,40
WTG 14			32	37,57	74,0	0,09	5,20
WTG 14			40	36,01	77,5	0,16	5,00
WTG 14			50	36,35	82,6	0,22	4,70
WTG 14			63	33,12	83,9	0,35	4,30
WTG 14			80	31,47	86,7	0,50	3,70
WTG 14			100	31,78	91,4	0,78	3,00
WTG 14			125	25,68	89,9	1,19	1,80
WTG 14			160	21,88	91,2	1,79	0,00
WTG 14			200	20,19	92,8	2,57	0,00
WTG 15	3.817	3.828					
WTG 15			20	37,94	64,5	0,00	5,60
WTG 15			25	35,86	68,5	0,08	5,40
WTG 15			32	35,83	74,0	0,11	5,20
WTG 15			40	34,25	77,5	0,19	5,00
WTG 15			50	34,57	82,6	0,27	4,70
WTG 15			63	31,32	83,9	0,42	4,30
WTG 15			80	29,63	86,7	0,61	3,70
WTG 15			100	29,88	91,4	0,96	3,00
WTG 15			125	23,69	89,9	1,45	1,80
WTG 15			160	19,76	91,2	2,18	0,00
WTG 15			200	17,90	92,8	3,14	0,00
WTG 16	4.668	4.676					
WTG 16			20	36,20	64,5	0,00	5,60
WTG 16			25	34,11	68,5	0,09	5,40
WTG 16			32	34,06	74,0	0,14	5,20
WTG 16			40	32,47	77,5	0,23	5,00
WTG 16			50	32,78	82,6	0,33	4,70
WTG 16			63	29,49	83,9	0,51	4,30
WTG 16			80	27,75	86,7	0,75	3,70
WTG 16			100	27,93	91,4	1,17	3,00
WTG 16			125	21,63	89,9	1,78	1,80
WTG 16			160	17,54	91,2	2,67	0,00
WTG 16			200	15,47	92,8	3,83	0,00
WTG 17	2.666	2.680					
WTG 17			20	41,04	64,5	0,00	5,60
WTG 17			25	38,98	68,5	0,05	5,40
WTG 17			32	38,96	74,0	0,08	5,20
WTG 17			40	37,40	77,5	0,13	5,00
WTG 17			50	37,75	82,6	0,19	4,70
WTG 17			63	34,54	83,9	0,29	4,30
WTG 17			80	32,91	86,7	0,43	3,70
WTG 17			100	33,27	91,4	0,67	3,00
WTG 17			125	27,22	89,9	1,02	1,80
WTG 17			160	23,51	91,2	1,53	0,00
WTG 17			200	21,94	92,8	2,20	0,00
WTG 18	4.142	4.151					
WTG 18			20	37,24	64,5	0,00	5,60
WTG 18			25	35,15	68,5	0,08	5,40
WTG 18			32	35,11	74,0	0,12	5,20
WTG 18			40	33,53	77,5	0,21	5,00
WTG 18			50	33,85	82,6	0,29	4,70
WTG 18			63	30,58	83,9	0,46	4,30
WTG 18			80	28,87	86,7	0,66	3,70
WTG 18			100	29,10	91,4	1,04	3,00
WTG 18			125	22,86	89,9	1,58	1,80
WTG 18			160	18,87	91,2	2,37	0,00
WTG 18			200	16,93	92,8	3,40	0,00
WTG 19	2.799	2.811					
WTG 19			20	40,62	64,5	0,00	5,60
WTG 19			25	38,57	68,5	0,06	5,40

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 19			32	38,54	74,0	0,08	5,20
WTG 19			40	36,98	77,5	0,14	5,00
WTG 19			50	37,32	82,6	0,20	4,70
WTG 19			63	34,11	83,9	0,31	4,30
WTG 19			80	32,47	86,7	0,45	3,70
WTG 19			100	32,82	91,4	0,70	3,00
WTG 19			125	26,75	89,9	1,07	1,80
WTG 19			160	23,02	91,2	1,60	0,00
WTG 19			200	21,42	92,8	2,31	0,00
Sum							
Sum			20	49,82			
Sum			25	47,74			
Sum			32	47,70			
Sum			40	46,13			
Sum			50	46,45			
Sum			63	43,19			
Sum			80	41,50			
Sum			100	41,75			
Sum			125	35,55			
Sum			160	31,63			
Sum			200	29,79			

Noise sensitive area: Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)

Highest noise value at receptor: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 03	5.343	5.352					
WTG 03			20	35,03	64,5	0,00	5,60
WTG 03			25	32,92	68,5	0,11	5,40
WTG 03			32	32,87	74,0	0,16	5,20
WTG 03			40	31,26	77,5	0,27	5,00
WTG 03			50	31,55	82,6	0,37	4,70
WTG 03			63	28,24	83,9	0,59	4,30
WTG 03			80	26,47	86,7	0,86	3,70
WTG 03			100	26,59	91,4	1,34	3,00
WTG 03			125	20,20	89,9	2,03	1,80
WTG 03			160	15,98	91,2	3,05	0,00
WTG 03			200	13,74	92,8	4,39	0,00
WTG 04	5.991	6.000					
WTG 04			20	34,04	64,5	0,00	5,60
WTG 04			25	31,92	68,5	0,12	5,40
WTG 04			32	31,86	74,0	0,18	5,20
WTG 04			40	30,24	77,5	0,30	5,00
WTG 04			50	30,52	82,6	0,42	4,70
WTG 04			63	27,18	83,9	0,66	4,30
WTG 04			80	25,38	86,7	0,96	3,70
WTG 04			100	25,44	91,4	1,50	3,00
WTG 04			125	18,96	89,9	2,28	1,80
WTG 04			160	14,62	91,2	3,42	0,00
WTG 04			200	12,22	92,8	4,92	0,00
WTG 05	5.050	5.061					
WTG 05			20	35,52	64,5	0,00	5,60
WTG 05			25	33,41	68,5	0,10	5,40
WTG 05			32	33,36	74,0	0,15	5,20
WTG 05			40	31,76	77,5	0,25	5,00
WTG 05			50	32,06	82,6	0,35	4,70
WTG 05			63	28,76	83,9	0,56	4,30
WTG 05			80	27,01	86,7	0,81	3,70
WTG 05			100	27,15	91,4	1,27	3,00
WTG 05			125	20,79	89,9	1,92	1,80
WTG 05			160	16,63	91,2	2,88	0,00
WTG 05			200	14,47	92,8	4,15	0,00
WTG 06	5.581	5.590					

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 06			20	34,65	64,5	0,00	5,60
WTG 06			25	32,54	68,5	0,11	5,40
WTG 06			32	32,48	74,0	0,17	5,20
WTG 06			40	30,87	77,5	0,28	5,00
WTG 06			50	31,16	82,6	0,39	4,70
WTG 06			63	27,84	83,9	0,61	4,30
WTG 06			80	26,06	86,7	0,89	3,70
WTG 06			100	26,15	91,4	1,40	3,00
WTG 06			125	19,73	89,9	2,12	1,80
WTG 06			160	15,47	91,2	3,19	0,00
WTG 06			200	13,17	92,8	4,58	0,00
WTG 07	4.492	4.502					
WTG 07			20	36,53	64,5	0,00	5,60
WTG 07			25	34,44	68,5	0,09	5,40
WTG 07			32	34,40	74,0	0,14	5,20
WTG 07			40	32,81	77,5	0,23	5,00
WTG 07			50	33,12	82,6	0,32	4,70
WTG 07			63	29,84	83,9	0,50	4,30
WTG 07			80	28,11	86,7	0,72	3,70
WTG 07			100	28,31	91,4	1,13	3,00
WTG 07			125	22,02	89,9	1,71	1,80
WTG 07			160	17,97	91,2	2,57	0,00
WTG 07			200	15,94	92,8	3,69	0,00
WTG 08	5.090	5.101					
WTG 08			20	35,45	64,5	0,00	5,60
WTG 08			25	33,35	68,5	0,10	5,40
WTG 08			32	33,29	74,0	0,15	5,20
WTG 08			40	31,69	77,5	0,26	5,00
WTG 08			50	31,99	82,6	0,36	4,70
WTG 08			63	28,69	83,9	0,56	4,30
WTG 08			80	26,93	86,7	0,82	3,70
WTG 08			100	27,07	91,4	1,28	3,00
WTG 08			125	20,71	89,9	1,94	1,80
WTG 08			160	16,54	91,2	2,91	0,00
WTG 08			200	14,36	92,8	4,18	0,00
WTG 09	3.928	3.938					
WTG 09			20	37,69	64,5	0,00	5,60
WTG 09			25	35,62	68,5	0,08	5,40
WTG 09			32	35,58	74,0	0,12	5,20
WTG 09			40	34,00	77,5	0,20	5,00
WTG 09			50	34,32	82,6	0,28	4,70
WTG 09			63	31,06	83,9	0,43	4,30
WTG 09			80	29,36	86,7	0,63	3,70
WTG 09			100	29,61	91,4	0,98	3,00
WTG 09			125	23,40	89,9	1,50	1,80
WTG 09			160	19,45	91,2	2,24	0,00
WTG 09			200	17,57	92,8	3,23	0,00
WTG 10	4.210	4.220					
WTG 10			20	37,09	64,5	0,00	5,60
WTG 10			25	35,01	68,5	0,08	5,40
WTG 10			32	34,97	74,0	0,13	5,20
WTG 10			40	33,38	77,5	0,21	5,00
WTG 10			50	33,70	82,6	0,30	4,70
WTG 10			63	30,43	83,9	0,46	4,30
WTG 10			80	28,72	86,7	0,68	3,70
WTG 10			100	28,94	91,4	1,05	3,00
WTG 10			125	22,69	89,9	1,60	1,80
WTG 10			160	18,69	91,2	2,41	0,00
WTG 10			200	16,73	92,8	3,46	0,00
WTG 11	4.768	4.779					
WTG 11			20	36,01	64,5	0,00	5,60
WTG 11			25	33,92	68,5	0,10	5,40
WTG 11			32	33,87	74,0	0,14	5,20
WTG 11			40	32,27	77,5	0,24	5,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

...continued from previous page

WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 11			50	32,58	82,6	0,33	4,70
WTG 11			63	29,29	83,9	0,53	4,30
WTG 11			80	27,55	86,7	0,76	3,70
WTG 11			100	27,72	91,4	1,19	3,00
WTG 11			125	21,40	89,9	1,82	1,80
WTG 11			160	17,29	91,2	2,72	0,00
WTG 11			200	15,20	92,8	3,92	0,00
WTG 12	3.515	3.527					
WTG 12			20	38,65	64,5	0,00	5,60
WTG 12			25	36,58	68,5	0,07	5,40
WTG 12			32	36,55	74,0	0,11	5,20
WTG 12			40	34,98	77,5	0,18	5,00
WTG 12			50	35,31	82,6	0,25	4,70
WTG 12			63	32,06	83,9	0,39	4,30
WTG 12			80	30,39	86,7	0,56	3,70
WTG 12			100	30,67	91,4	0,88	3,00
WTG 12			125	24,51	89,9	1,34	1,80
WTG 12			160	20,64	91,2	2,01	0,00
WTG 12			200	18,86	92,8	2,89	0,00
WTG 13	4.494	4.503					
WTG 13			20	36,53	64,5	0,00	5,60
WTG 13			25	34,44	68,5	0,09	5,40
WTG 13			32	34,39	74,0	0,14	5,20
WTG 13			40	32,80	77,5	0,23	5,00
WTG 13			50	33,11	82,6	0,32	4,70
WTG 13			63	29,83	83,9	0,50	4,30
WTG 13			80	28,11	86,7	0,72	3,70
WTG 13			100	28,30	91,4	1,13	3,00
WTG 13			125	22,02	89,9	1,71	1,80
WTG 13			160	17,96	91,2	2,57	0,00
WTG 13			200	15,94	92,8	3,69	0,00
WTG 14	3.105	3.118					
WTG 14			20	39,72	64,5	0,00	5,60
WTG 14			25	37,66	68,5	0,06	5,40
WTG 14			32	37,63	74,0	0,09	5,20
WTG 14			40	36,07	77,5	0,16	5,00
WTG 14			50	36,40	82,6	0,22	4,70
WTG 14			63	33,18	83,9	0,34	4,30
WTG 14			80	31,52	86,7	0,50	3,70
WTG 14			100	31,84	91,4	0,78	3,00
WTG 14			125	25,74	89,9	1,18	1,80
WTG 14			160	21,95	91,2	1,78	0,00
WTG 14			200	20,27	92,8	2,56	0,00
WTG 15	3.790	3.801					
WTG 15			20	38,00	64,5	0,00	5,60
WTG 15			25	35,93	68,5	0,08	5,40
WTG 15			32	35,89	74,0	0,11	5,20
WTG 15			40	34,31	77,5	0,19	5,00
WTG 15			50	34,63	82,6	0,27	4,70
WTG 15			63	31,38	83,9	0,42	4,30
WTG 15			80	29,69	86,7	0,61	3,70
WTG 15			100	29,95	91,4	0,95	3,00
WTG 15			125	23,76	89,9	1,44	1,80
WTG 15			160	19,83	91,2	2,17	0,00
WTG 15			200	17,98	92,8	3,12	0,00
WTG 16	4.643	4.651					
WTG 16			20	36,25	64,5	0,00	5,60
WTG 16			25	34,16	68,5	0,09	5,40
WTG 16			32	34,11	74,0	0,14	5,20
WTG 16			40	32,52	77,5	0,23	5,00
WTG 16			50	32,82	82,6	0,33	4,70
WTG 16			63	29,54	83,9	0,51	4,30
WTG 16			80	27,81	86,7	0,74	3,70
WTG 16			100	27,99	91,4	1,16	3,00

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DECIBEL - Detailed results

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

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WTG No.	Distance [m]	Sound distance [m]	Frequency [Hz]	Calculated [dB]	LwA,ref [dB(A)]	Aatm [dB]	Agr [dB]
WTG 16			125	21,68	89,9	1,77	1,80
WTG 16			160	17,60	91,2	2,65	0,00
WTG 16			200	15,54	92,8	3,81	0,00
WTG 17	2.640	2.654					
WTG 17			20	41,12	64,5	0,00	5,60
WTG 17			25	39,07	68,5	0,05	5,40
WTG 17			32	39,04	74,0	0,08	5,20
WTG 17			40	37,49	77,5	0,13	5,00
WTG 17			50	37,84	82,6	0,19	4,70
WTG 17			63	34,63	83,9	0,29	4,30
WTG 17			80	33,00	86,7	0,42	3,70
WTG 17			100	33,36	91,4	0,66	3,00
WTG 17			125	27,31	89,9	1,01	1,80
WTG 17			160	23,61	91,2	1,51	0,00
WTG 17			200	22,05	92,8	2,18	0,00
WTG 18	4.112	4.121					
WTG 18			20	37,30	64,5	0,00	5,60
WTG 18			25	35,22	68,5	0,08	5,40
WTG 18			32	35,18	74,0	0,12	5,20
WTG 18			40	33,59	77,5	0,21	5,00
WTG 18			50	33,91	82,6	0,29	4,70
WTG 18			63	30,65	83,9	0,45	4,30
WTG 18			80	28,94	86,7	0,66	3,70
WTG 18			100	29,17	91,4	1,03	3,00
WTG 18			125	22,93	89,9	1,57	1,80
WTG 18			160	18,95	91,2	2,35	0,00
WTG 18			200	17,02	92,8	3,38	0,00
WTG 19	2.768	2.781					
WTG 19			20	40,72	64,5	0,00	5,60
WTG 19			25	38,66	68,5	0,06	5,40
WTG 19			32	38,63	74,0	0,08	5,20
WTG 19			40	37,08	77,5	0,14	5,00
WTG 19			50	37,42	82,6	0,19	4,70
WTG 19			63	34,21	83,9	0,31	4,30
WTG 19			80	32,57	86,7	0,44	3,70
WTG 19			100	32,92	91,4	0,70	3,00
WTG 19			125	26,86	89,9	1,06	1,80
WTG 19			160	23,13	91,2	1,59	0,00
WTG 19			200	21,54	92,8	2,28	0,00
Sum							
Sum			20	49,87			
Sum			25	47,79			
Sum			32	47,75			
Sum			40	46,18			
Sum			50	46,50			
Sum			63	43,24			
Sum			80	41,55			
Sum			100	41,81			
Sum			125	35,61			
Sum			160	31,69			
Sum			200	29,85			

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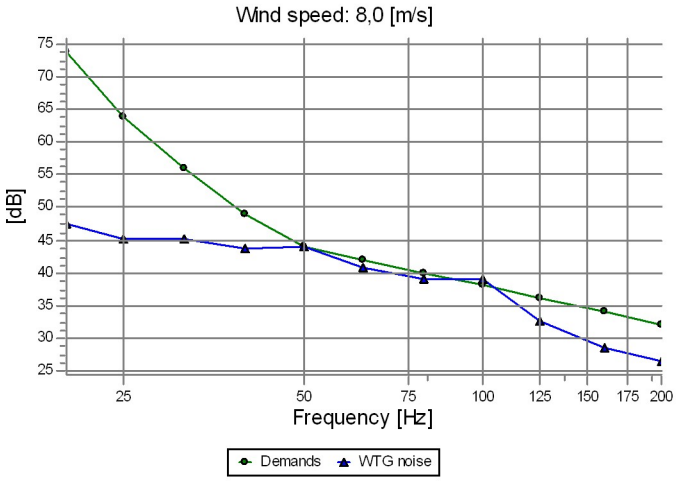
17.09.2021 08:24/3.4.415

DECIBEL - Detailed results, graphic

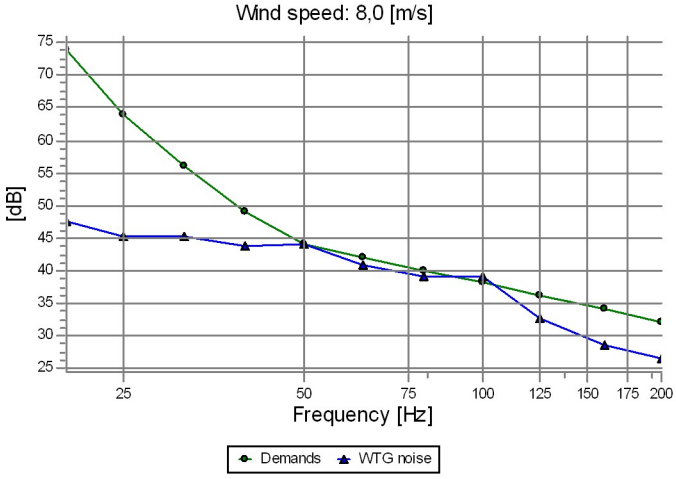
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)



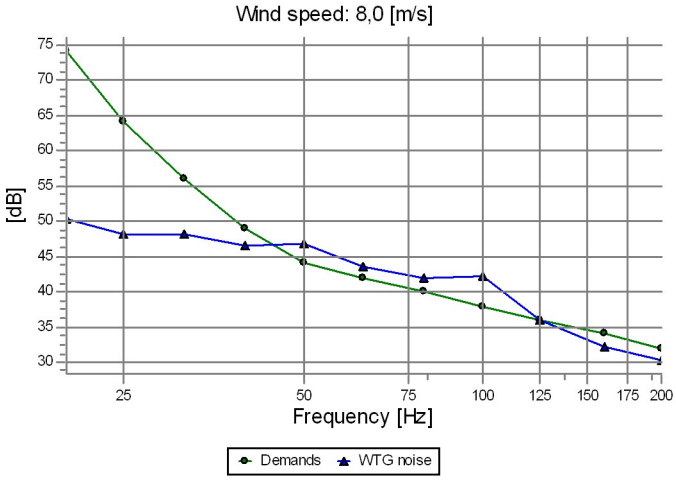
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,4	Yes
25,0	64,0	45,3	Yes
31,5	56,0	45,2	Yes
40,0	49,0	43,6	Yes
50,0	44,0	43,9	Yes
63,0	42,0	40,6	Yes
80,0	40,0	38,9	Yes
100,0	38,0	39,0	No
125,0	36,0	32,6	Yes
160,0	34,0	28,5	Yes
200,0	32,0	26,3	Yes

Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,4	Yes
25,0	64,0	45,3	Yes
31,5	56,0	45,3	Yes
40,0	49,0	43,7	Yes
50,0	44,0	44,0	Yes
63,0	42,0	40,7	Yes
80,0	40,0	38,9	Yes
100,0	38,0	39,0	No
125,0	36,0	32,7	Yes
160,0	34,0	28,5	Yes
200,0	32,0	26,3	Yes

Asuntola Noise sensitive point: Demands defined in calculation setup. (449)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	50,3	Yes
25,0	64,0	48,2	Yes
31,5	56,0	48,1	Yes
40,0	49,0	46,6	Yes
50,0	44,0	46,9	No
63,0	42,0	43,7	No
80,0	40,0	42,0	No
100,0	38,0	42,2	No
125,0	36,0	36,1	No
160,0	34,0	32,2	Yes
200,0	32,0	30,4	Yes

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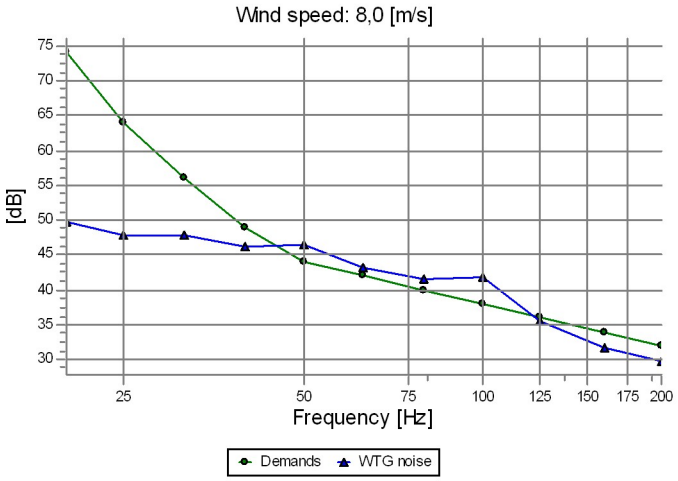
DECIBEL - Detailed results, graphic

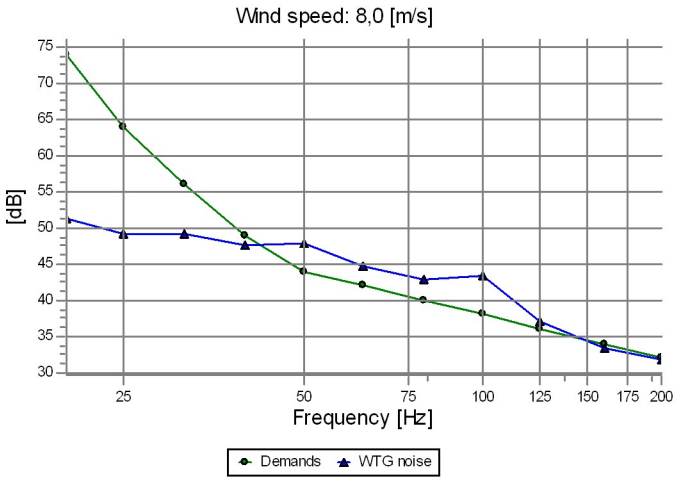
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)



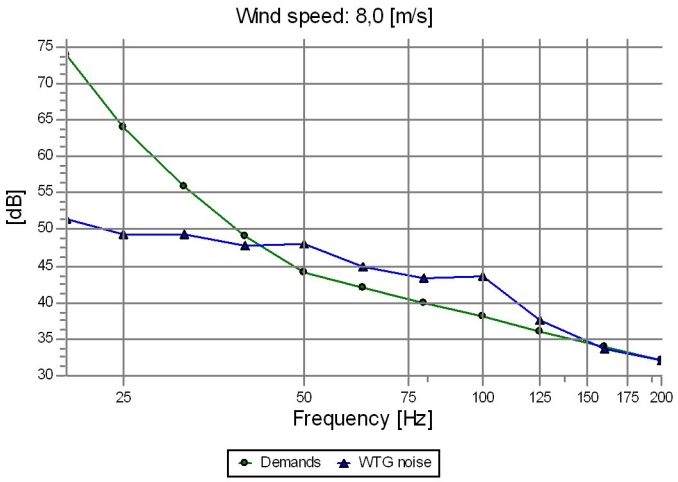
Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	49,9	Yes
25,0	64,0	47,8	Yes
31,5	56,0	47,7	Yes
40,0	49,0	46,2	Yes
50,0	44,0	46,5	No
63,0	42,0	43,2	No
80,0	40,0	41,5	No
100,0	38,0	41,8	No
125,0	36,0	35,6	Yes
160,0	34,0	31,7	Yes
200,0	32,0	29,9	Yes

Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)



Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	51,2	Yes
25,0	64,0	49,1	Yes
31,5	56,0	49,1	Yes
40,0	49,0	47,5	Yes
50,0	44,0	47,9	No
63,0	42,0	44,6	No
80,0	40,0	43,0	No
100,0	38,0	43,3	No
125,0	36,0	37,2	No
160,0	34,0	33,4	Yes
200,0	32,0	31,7	Yes

Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)



Frequency	Sound level Demands	WTG noise	Demands fulfilled ?
[Hz]	[dB]	[dB]	
20,0	74,0	51,5	Yes
25,0	64,0	49,4	Yes
31,5	56,0	49,4	Yes
40,0	49,0	47,8	Yes
50,0	44,0	48,2	No
63,0	42,0	44,9	No
80,0	40,0	43,3	No
100,0	38,0	43,6	No
125,0	36,0	37,5	No
160,0	34,0	33,7	Yes
200,0	32,0	32,1	No

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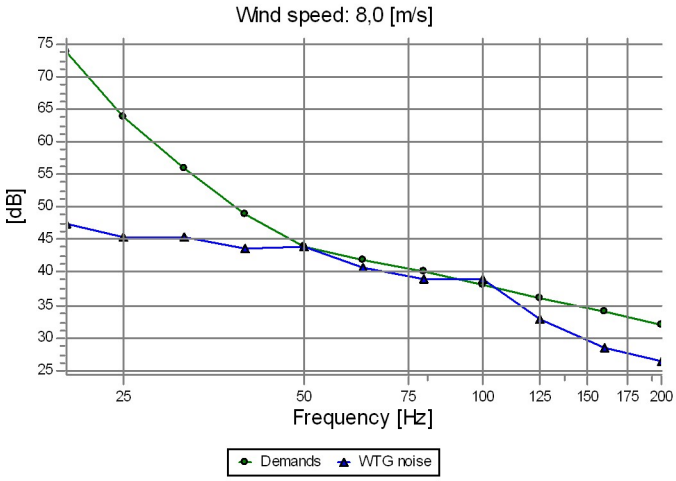
DECIBEL - Detailed results, graphic

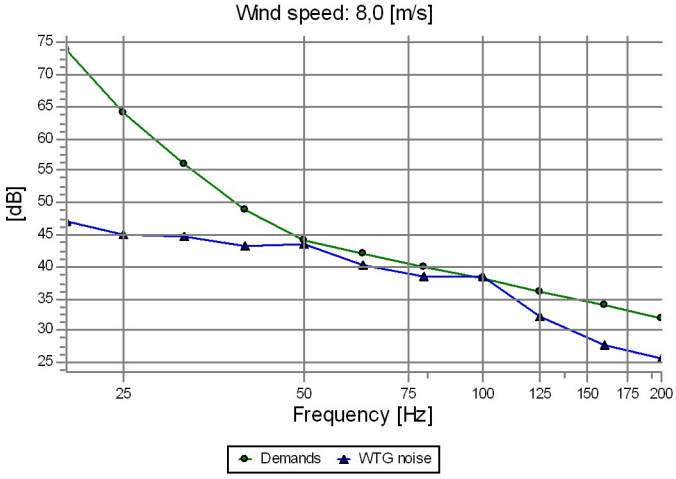
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)



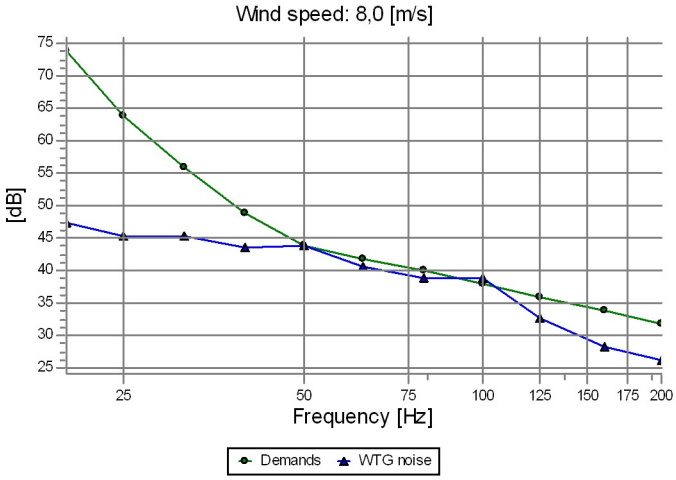
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,5	Yes
25,0	64,0	45,3	Yes
31,5	56,0	45,3	Yes
40,0	49,0	43,7	Yes
50,0	44,0	44,0	Yes
63,0	42,0	40,7	Yes
80,0	40,0	38,9	Yes
100,0	38,0	39,0	No
125,0	36,0	32,7	Yes
160,0	34,0	28,5	Yes
200,0	32,0	26,3	Yes

Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,0	Yes
25,0	64,0	44,9	Yes
31,5	56,0	44,8	Yes
40,0	49,0	43,2	Yes
50,0	44,0	43,5	Yes
63,0	42,0	40,2	Yes
80,0	40,0	38,4	Yes
100,0	38,0	38,5	No
125,0	36,0	32,1	Yes
160,0	34,0	27,8	Yes
200,0	32,0	25,5	Yes

Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,4	Yes
25,0	64,0	45,3	Yes
31,5	56,0	45,3	Yes
40,0	49,0	43,7	Yes
50,0	44,0	44,0	Yes
63,0	42,0	40,7	Yes
80,0	40,0	38,9	Yes
100,0	38,0	39,0	No
125,0	36,0	32,6	Yes
160,0	34,0	28,5	Yes
200,0	32,0	26,2	Yes

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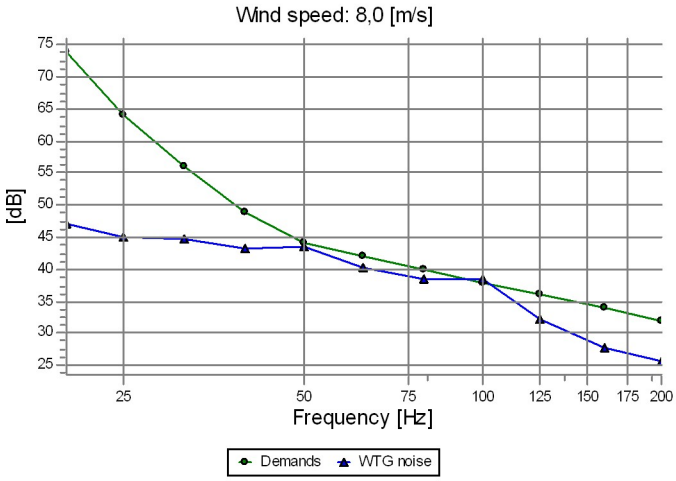
DECIBEL - Detailed results, graphic

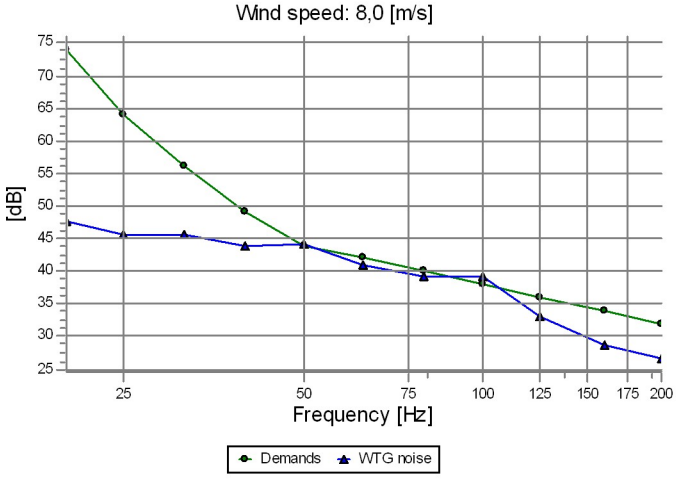
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)



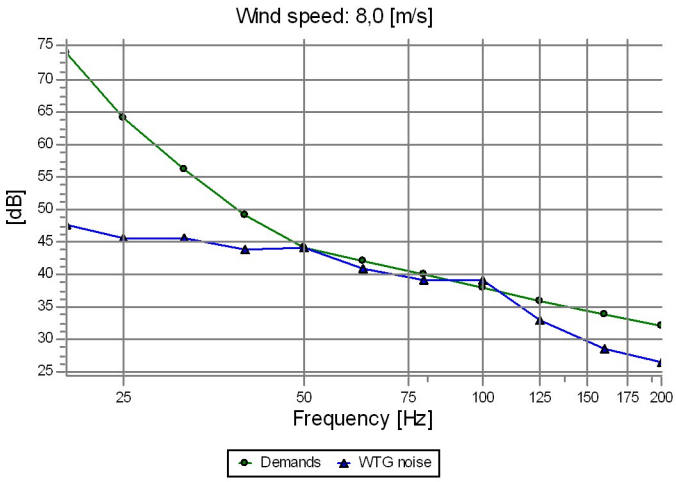
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,0	Yes
25,0	64,0	44,9	Yes
31,5	56,0	44,8	Yes
40,0	49,0	43,2	Yes
50,0	44,0	43,5	Yes
63,0	42,0	40,2	Yes
80,0	40,0	38,4	Yes
100,0	38,0	38,5	No
125,0	36,0	32,1	Yes
160,0	34,0	27,8	Yes
200,0	32,0	25,6	Yes

Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,7	Yes
25,0	64,0	45,6	Yes
31,5	56,0	45,5	Yes
40,0	49,0	43,9	Yes
50,0	44,0	44,2	No
63,0	42,0	40,9	Yes
80,0	40,0	39,1	Yes
100,0	38,0	39,3	No
125,0	36,0	32,9	Yes
160,0	34,0	28,8	Yes
200,0	32,0	26,6	Yes

Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	47,6	Yes
25,0	64,0	45,5	Yes
31,5	56,0	45,5	Yes
40,0	49,0	43,9	Yes
50,0	44,0	44,2	No
63,0	42,0	40,9	Yes
80,0	40,0	39,1	Yes
100,0	38,0	39,2	No
125,0	36,0	32,9	Yes
160,0	34,0	28,7	Yes
200,0	32,0	26,5	Yes

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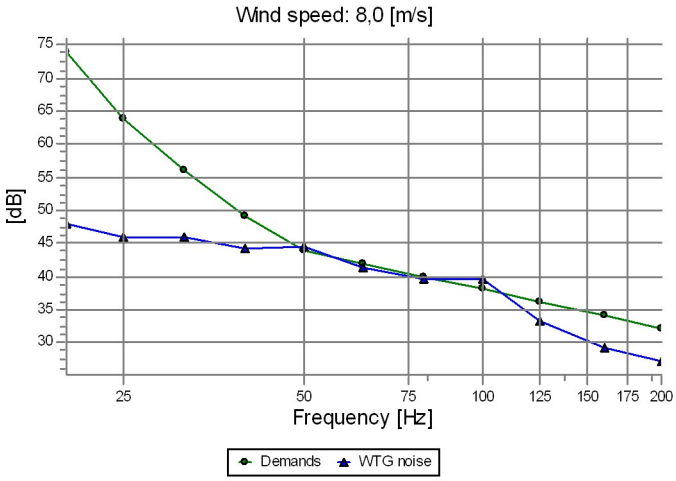
DECIBEL - Detailed results, graphic

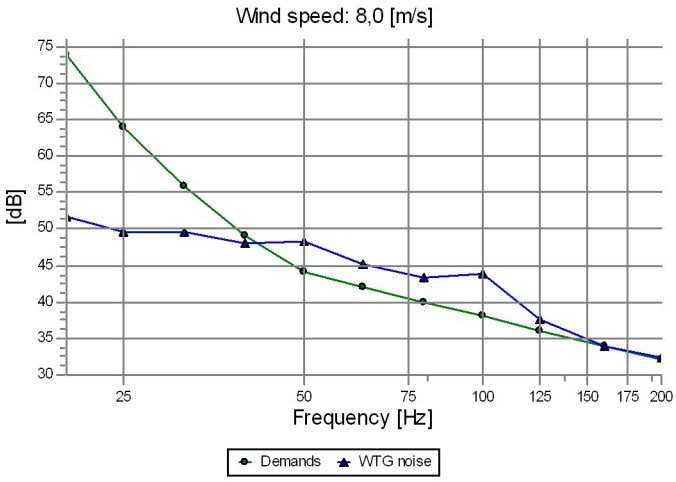
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)



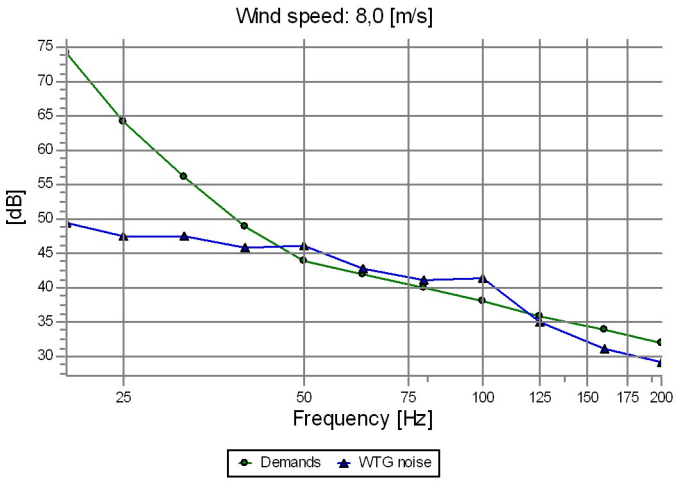
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	48,0	Yes
25,0	64,0	45,9	Yes
31,5	56,0	45,8	Yes
40,0	49,0	44,2	Yes
50,0	44,0	44,5	No
63,0	42,0	41,3	Yes
80,0	40,0	39,5	Yes
100,0	38,0	39,7	No
125,0	36,0	33,3	Yes
160,0	34,0	29,2	Yes
200,0	32,0	27,1	Yes

Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	51,6	Yes
25,0	64,0	49,5	Yes
31,5	56,0	49,5	Yes
40,0	49,0	48,0	Yes
50,0	44,0	48,3	No
63,0	42,0	45,1	No
80,0	40,0	43,4	No
100,0	38,0	43,7	No
125,0	36,0	37,7	No
160,0	34,0	33,9	Yes
200,0	32,0	32,3	No

Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	49,5	Yes
25,0	64,0	47,4	Yes
31,5	56,0	47,4	Yes
40,0	49,0	45,8	Yes
50,0	44,0	46,1	No
63,0	42,0	42,9	No
80,0	40,0	41,2	No
100,0	38,0	41,4	No
125,0	36,0	35,2	Yes
160,0	34,0	31,2	Yes
200,0	32,0	29,3	Yes

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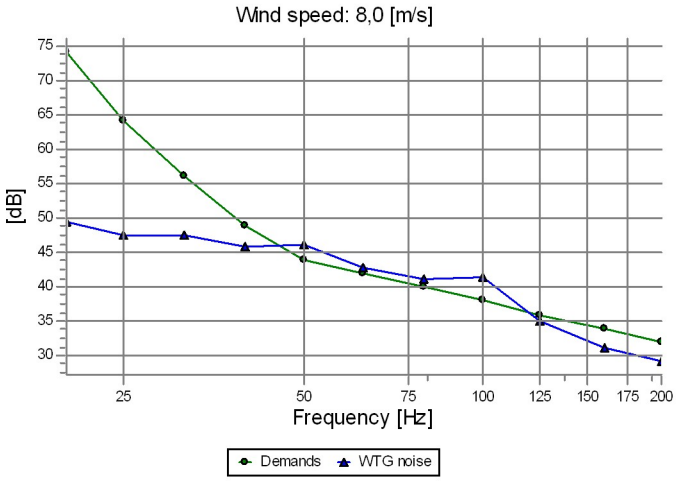
DECIBEL - Detailed results, graphic

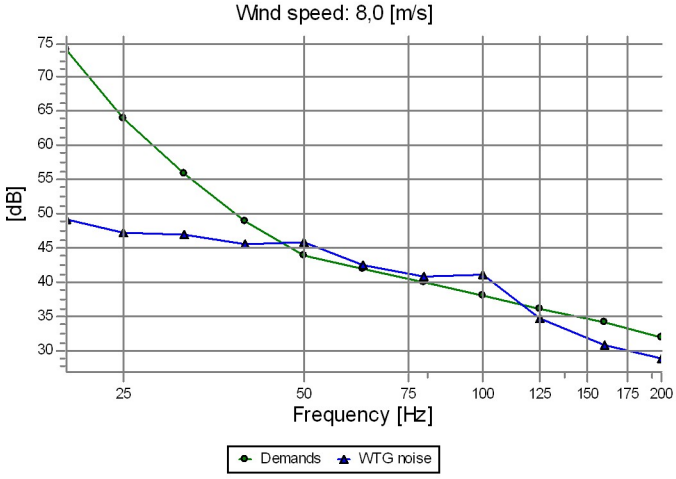
Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)



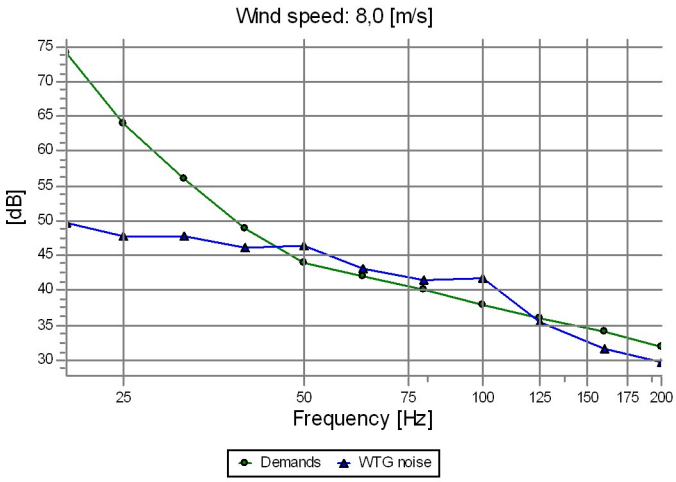
Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	49,5	Yes
25,0	64,0	47,5	Yes
31,5	56,0	47,4	Yes
40,0	49,0	45,8	Yes
50,0	44,0	46,2	No
63,0	42,0	42,9	No
80,0	40,0	41,2	No
100,0	38,0	41,4	No
125,0	36,0	35,2	Yes
160,0	34,0	31,2	Yes
200,0	32,0	29,3	Yes

Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	49,2	Yes
25,0	64,0	47,1	Yes
31,5	56,0	47,1	Yes
40,0	49,0	45,5	Yes
50,0	44,0	45,8	No
63,0	42,0	42,5	No
80,0	40,0	40,8	No
100,0	38,0	41,0	No
125,0	36,0	34,8	Yes
160,0	34,0	30,8	Yes
200,0	32,0	28,9	Yes

Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	49,8	Yes
25,0	64,0	47,7	Yes
31,5	56,0	47,7	Yes
40,0	49,0	46,1	Yes
50,0	44,0	46,4	No
63,0	42,0	43,2	No
80,0	40,0	41,5	No
100,0	38,0	41,8	No
125,0	36,0	35,6	Yes
160,0	34,0	31,6	Yes
200,0	32,0	29,8	Yes

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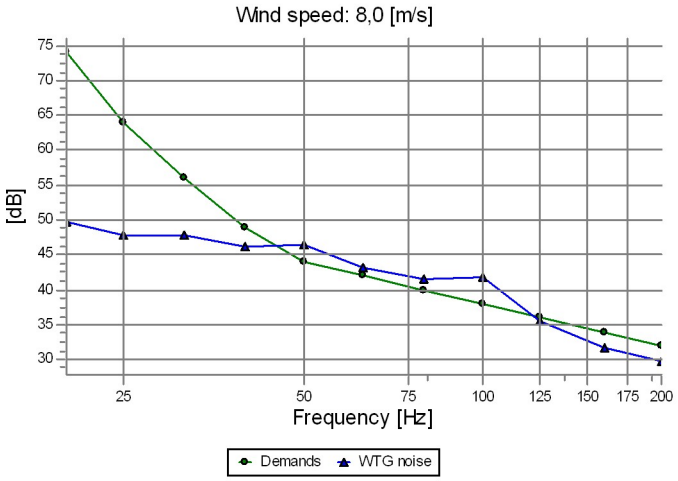
DECIBEL - Detailed results, graphic

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoorNoise calculation model: Finland Low frequency

Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)



Frequency [Hz]	Sound level Demands [dB]	WTG noise [dB]	Demands fulfilled ?
20,0	74,0	49,9	Yes
25,0	64,0	47,8	Yes
31,5	56,0	47,8	Yes
40,0	49,0	46,2	Yes
50,0	44,0	46,5	No
63,0	42,0	43,2	No
80,0	40,0	41,6	No
100,0	38,0	41,8	No
125,0	36,0	35,6	Yes
160,0	34,0	31,7	Yes
200,0	32,0	29,9	Yes

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

Noise calculation model:
Finland Low frequency
Wind speed (in 10 m height):
Highest noise value at receptor
Spectral distribution:
From 20,0 Hz to 200,0 Hz
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure tone penalty is subtracted from demand
Model: 5,0 dB(A)
Height above ground level, when no value in NSA object:
4,0 m; Don't allow override of model height with height from NSA object
Uncertainty margin:
0,0 dB; Uncertainty margin in model has priority
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)
Low frequency calculation
dLsigma

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N163/6.X 6800 163.0 !O!
Noise: SPL wo/ STE M0

Source	Source/Date	Creator	Edited
F008_276_A17_EN Revision 00, 2019-05-21 (5.7 MW version octave data)	09.07.2019	USER	14.09.2021 20:53

Status	Hub height	Wind speed	LwA,ref	20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
	[m]	[m/s]	[dB(A)]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	168,0	8,0	98,2	64,5	68,5	74,0	77,5	82,6	83,9	86,7	91,4	89,9	91,2	92,8

Noise sensitive area: Ajanki 1 Noise sensitive point: Demands defined in calculation setup. (444)
Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Ajanki 2 Noise sensitive point: Demands defined in calculation setup. (445)
Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

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Calculated:
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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

Noise sensitive area: Asuntola Noise sensitive point: Demands defined in calculation setup. (449)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Kainuunraja Noise sensitive point: Demands defined in calculation setup. (450)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Kauhajärvi 1 Noise sensitive point: Demands defined in calculation setup. (439)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Kauhajärvi 2 Noise sensitive point: Demands defined in calculation setup. (440)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 1 Noise sensitive point: Demands defined in calculation setup. (451)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 2 Noise sensitive point: Demands defined in calculation setup. (452)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

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DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 3 Noise sensitive point: Demands defined in calculation setup. (453)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 4 Noise sensitive point: Demands defined in calculation setup. (454)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 5 Noise sensitive point: Demands defined in calculation setup. (455)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Koskenniemi 6 Noise sensitive point: Demands defined in calculation setup. (463)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Lehtilaki Noise sensitive point: Demands defined in calculation setup. (446)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Metsästysmaja Noise sensitive point: Demands defined in calculation setup. (438)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

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Calculated:
17.09.2021 08:24/3.4.415

DECIBEL - Assumptions for noise calculation

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pahtajärvi 1 Noise sensitive point: Demands defined in calculation setup. (441)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pahtajärvi 2 Noise sensitive point: Demands defined in calculation setup. (442)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pahtajärvi 3 Noise sensitive point: Demands defined in calculation setup. (443)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pessala 1 Noise sensitive point: Demands defined in calculation setup. (447)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

Noise sensitive area: Pessala 2 Noise sensitive point: Demands defined in calculation setup. (448)

Predefined calculation standard: Residential health guide 2003, indoor - night
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model

Noise demand:

20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz	200,0 Hz
74,0 dB	64,0 dB	56,0 dB	49,0 dB	44,0 dB	42,0 dB	40,0 dB	38,0 dB	36,0 dB	34,0 dB	32,0 dB

No distance demand

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DECIBEL - Map

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, LF outdoor

0 1 2 3 4 km

Map: Finnish Topographic Map , Print scale 1:75.000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 368.193 North: 7.381.274

New WTG Noise sensitive area

Project:
Palovaara, Pello

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SHADOW - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

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 (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational hours are calculated from WTGs in calculation and wind distribution:
VTT Wind Atlas, 12 Sectors, 75 m - 200 m

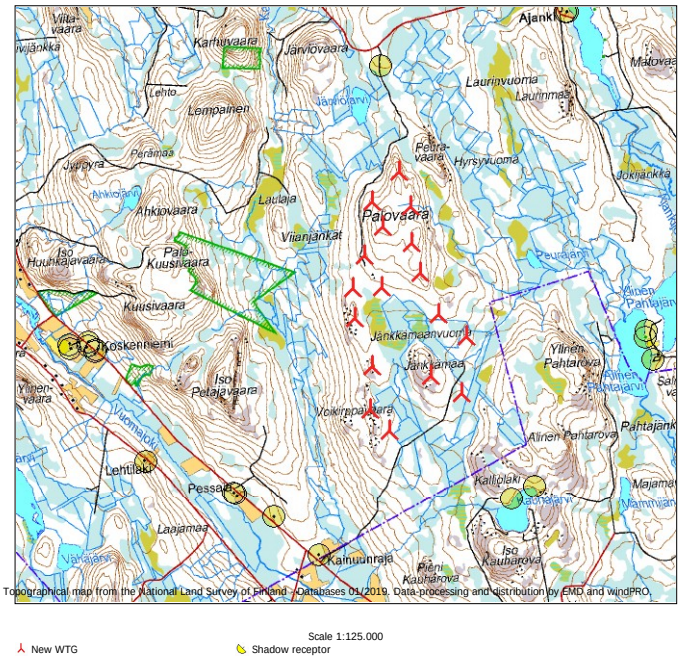
Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

Line-of-sight calculation has been deactivated. This means that sheltering from obstacles, areas or hills are not taken into account.

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



WTGs

	East	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]
WTG 03	368.490	7.382.686	224,8	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 04	368.962	7.383.166	231,2	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 05	368.656	7.382.253	240,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 06	369.135	7.382.575	229,4	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 07	368.329	7.381.799	208,6	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 08	369.118	7.381.981	239,3	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 09	368.107	7.381.273	191,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 10	368.598	7.381.270	198,9	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 11	369.227	7.381.467	229,2	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 12	368.108	7.380.770	199,4	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 13	369.508	7.380.765	193,7	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 14	368.369	7.379.963	190,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 15	369.338	7.379.748	201,8	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 16	369.959	7.380.380	174,8	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 17	368.303	7.379.244	180,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 18	369.824	7.379.462	179,3	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 19	368.603	7.378.892	170,1	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8

Shadow receptor-Input

No.	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
Ajanki 1	371.874	7.385.678	120,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Ajanki 2	371.842	7.385.676	120,1	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Asuntola	366.608	7.377.543	73,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Kainuunraja	367.325	7.376.870	72,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Kauhajärvi 1	370.975	7.377.840	184,2	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Kauhajärvi 2	370.574	7.377.669	180,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 1	363.667	7.380.593	72,2	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 2	363.362	7.380.565	66,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 3	363.662	7.380.526	70,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 4	363.375	7.380.502	65,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 5	363.805	7.380.458	73,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 6	363.785	7.380.418	70,7	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Lehtilaki	364.527	7.378.562	93,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0

To be continued on next page...

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17.09.2021 08:26/3.4.415

SHADOW - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

...continued from previous page

No.	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
Metsästysmaja	368.740	7.384.928	190,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pahtajärvi 1	372.940	7.380.355	110,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pahtajärvi 2	372.919	7.380.235	110,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pahtajärvi 3	373.024	7.379.850	110,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pessala 1	365.959	7.377.974	71,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pessala 2	365.996	7.377.961	70,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0

Calculation Results

Shadow receptor

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
Ajanki 1	0:00	0	0:00	0:00
Ajanki 2	0:00	0	0:00	0:00
Asuntola	0:00	0	0:00	0:00
Kainuunraja	0:00	0	0:00	0:00
Kauhajärvi 1	0:00	0	0:00	0:00
Kauhajärvi 2	0:00	0	0:00	0:00
Koskenniemi 1	0:00	0	0:00	0:00
Koskenniemi 2	0:00	0	0:00	0:00
Koskenniemi 3	0:00	0	0:00	0:00
Koskenniemi 4	0:00	0	0:00	0:00
Koskenniemi 5	0:00	0	0:00	0:00
Koskenniemi 6	0:00	0	0:00	0:00
Lehtilaki	0:00	0	0:00	0:00
Metsästysmaja	10:19	36	0:22	1:10
Pahtajärvi 1	0:00	0	0:00	0:00
Pahtajärvi 2	0:00	0	0:00	0:00
Pahtajärvi 3	0:00	0	0:00	0:00
Pessala 1	0:00	0	0:00	0:00
Pessala 2	0:00	0	0:00	0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
WTG 03	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (326)	0:00	0:00
WTG 04	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (327)	10:19	1:10
WTG 05	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (328)	0:00	0:00
WTG 06	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (329)	0:00	0:00
WTG 07	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (330)	0:00	0:00
WTG 08	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (331)	0:00	0:00
WTG 09	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (332)	0:00	0:00
WTG 10	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (333)	0:00	0:00
WTG 11	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (334)	0:00	0:00
WTG 12	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (335)	0:00	0:00
WTG 13	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (336)	0:00	0:00
WTG 14	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (337)	0:00	0:00
WTG 15	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (338)	0:00	0:00
WTG 16	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (339)	0:00	0:00
WTG 17	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (340)	0:00	0:00
WTG 18	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (341)	0:00	0:00
WTG 19	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (342)	0:00	0:00

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.

Project:
Palovaara, Pello

Licensed user:
wpd AG
Stephanitorsbollwerk 3 (Haus LUV)
DE-28211 Bremen
+49 7142 77810
Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Ajanki 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (696)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:09	09:29	07:42	06:41	04:40	02:15		03:58	05:53	07:32	08:20	10:19
	13:46	15:47	17:32	20:18	22:05	00:29		23:00	20:53	18:54	15:54	14:07
2	11:07	09:25	07:38	06:37	04:36	02:08		04:02	05:57	07:35	08:24	10:22
	13:49	15:51	17:36	20:21	22:09	00:35		22:55	20:49	18:50	15:51	14:03
3	11:05	09:22	07:35	06:33	04:32	02:01		04:06	06:00	07:39	08:27	10:26
	13:52	15:55	17:39	20:25	22:13	00:43		22:51	20:45	18:46	15:47	14:00
4	11:02	09:18	07:31	06:29	04:28	01:52		04:10	06:04	07:42	08:31	10:30
	13:56	15:59	17:43	20:28	22:17	00:52		22:47	20:41	18:43	15:43	13:57
5	11:00	09:14	07:27	06:25	04:24	01:41		04:14	06:07	07:45	08:35	10:34
	13:59	16:03	17:46	20:31	22:21	01:04		22:43	20:37	18:39	15:39	13:54
6	10:57	09:10	07:23	06:21	04:20	23:02		04:18	06:10	07:49	08:39	10:38
	14:03	16:07	17:50	20:35	22:25			22:39	20:33	18:35	15:35	13:51
7	10:54	09:07	07:19	06:17	04:15			04:22	06:14	07:52	08:43	10:41
	14:06	16:11	17:53	20:38	22:29			22:34	20:29	18:31	15:32	13:49
8	10:51	09:03	07:15	06:13	04:11			04:26	06:17	07:55	08:47	10:45
	14:10	16:15	17:57	20:42	22:33		01:05	22:30	20:25	18:27	15:28	13:46
9	10:48	08:59	07:11	06:09	04:07		02:03	04:30	06:20	07:59	08:50	10:48
	14:14	16:19	18:00	20:45	22:37		00:55	22:26	20:21	18:23	15:24	13:43
10	10:45	08:55	07:07	06:05	04:03		02:12	04:34	06:24	08:02	08:54	10:52
	14:18	16:23	18:04	20:49	22:41		00:48	22:22	20:17	18:19	15:21	13:41
11	10:42	08:52	07:03	06:01	03:59		02:19	04:38	06:27	08:05	08:58	10:55
	14:22	16:26	18:07	20:52	22:46		00:41	22:18	20:13	18:15	15:17	13:39
12	10:39	08:48	06:59	05:57	03:54		02:25	04:42	06:30	08:09	09:02	10:58
	14:26	16:30	18:10	20:56	22:50		00:34	22:14	20:09	18:11	15:13	13:36
13	10:36	08:44	06:56	05:53	03:50		02:32	04:46	06:33	08:12	09:06	11:01
	14:30	16:34	18:14	20:59	22:54		00:28	22:10	20:05	18:07	15:09	13:34
14	10:33	08:40	06:52	05:49	03:46		02:37	04:49	06:37	08:16	09:10	11:04
	14:34	16:38	18:17	21:03	22:58		00:23	22:06	20:01	18:04	15:06	13:33
15	10:29	08:36	06:48	05:45	03:42		02:43	04:53	06:40	08:19	09:14	11:06
	14:38	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:02	13:31
16	10:26	08:32	06:44	05:41	03:37		02:48	04:57	06:43	08:22	09:18	11:09
	14:42	16:45	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:58	13:30
17	10:23	08:29	06:40	05:37	03:33		02:54	05:01	06:46	08:26	09:22	11:11
	14:46	16:49	18:27	21:13	23:12		00:07	21:53	19:49	17:52	14:55	13:29
18	10:19	08:25	06:36	05:33	03:29		02:59	05:04	06:50	08:29	09:26	11:13
	14:50	16:53	18:31	21:17	23:16		00:02	21:49	19:45	17:48	14:51	13:28
19	10:16	08:21	06:32	05:29	03:24		03:04	05:08	06:53	08:33	09:30	11:14
	14:54	16:57	18:34	21:20	23:21		23:57	21:45	19:41	17:44	14:48	13:27
20	10:12	08:17	06:28	05:25	03:20		03:04	05:12	06:56	08:36	09:34	11:16
	14:58	17:00	18:37	21:24	23:25		23:53	21:41	19:37	17:40	14:44	13:27
21	10:09	08:13	06:24	05:21	03:15		03:09	05:15	06:59	08:40	09:38	11:17
	15:02	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:36	14:40	13:27
22	10:05	08:09	06:20	05:17	03:11		03:14	05:19	07:03	08:43	09:42	11:17
	15:06	17:07	18:44	21:31	23:35		23:43	21:33	19:30	17:33	14:37	13:27
23	10:02	08:06	06:16	05:13	03:06		03:18	05:22	07:06	08:47	09:46	11:18
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:33	13:28
24	09:58	08:02	06:12	05:09	03:02		03:23	05:26	07:09	08:51	09:50	11:18
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:30	13:28
25	09:55	07:58	06:08	05:05	02:52		03:27	05:29	07:12	07:54	09:55	11:18
	15:19	17:18	18:54	21:42	23:49		23:30	21:21	19:18	16:21	14:26	13:30
26	09:51	07:54	06:04	05:01	02:47		03:32	05:33	07:16	07:58	09:59	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:17	14:23	13:31
27	09:47	07:50	06:01	04:57	02:42		03:36	05:36	07:19	08:01	10:03	11:17
	15:27	17:25	19:01	21:50	00:00		23:21	21:13	19:10	16:13	14:20	13:33
28	09:44	07:46	05:57	04:52	02:37		03:41	05:40	07:22	08:05	10:07	11:16
	15:31	17:29	19:04	21:54	00:05		23:17	21:09	19:06	16:10	14:16	13:35
29	09:40		06:53	04:48	02:32		03:45	05:43	07:26	08:09	10:11	11:14
	15:35		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:13	13:37
30	09:36		06:49	04:44	02:26		03:49	05:47	07:29	08:12	10:15	11:13
	15:39		20:11	22:01	00:16		23:08	21:01	18:58	16:02	14:10	13:40
31	09:33		06:45		02:21		03:54	05:50		08:16		11:11
	15:43		20:14		00:22		23:04	20:57		15:58		13:42
Potential sun hours	133	225	362	463	607	694	670	528	397	296	172	82
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
Palovaara, Pello

Licensed user:
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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Ajanki 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (697)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:09	09:29	07:42	06:41	04:40	02:15		03:58	05:53	07:32	08:20	10:19
	13:46	15:47	17:32	20:18	22:05	00:29		23:00	20:53	18:54	15:54	14:07
2	11:07	09:25	07:38	06:37	04:36	02:08		04:02	05:57	07:35	08:24	10:22
	13:49	15:51	17:36	20:21	22:09	00:35		22:55	20:49	18:50	15:51	14:03
3	11:05	09:22	07:35	06:33	04:32	02:01		04:06	06:00	07:39	08:27	10:26
	13:52	15:55	17:39	20:25	22:13	00:43		22:51	20:45	18:46	15:47	14:00
4	11:02	09:18	07:31	06:29	04:28	01:52		04:10	06:04	07:42	08:31	10:30
	13:56	15:59	17:43	20:28	22:17	00:52		22:47	20:41	18:43	15:43	13:57
5	11:00	09:14	07:27	06:25	04:24	01:41		04:14	06:07	07:45	08:35	10:34
	13:59	16:03	17:46	20:31	22:21	01:04		22:43	20:37	18:39	15:39	13:54
6	10:57	09:10	07:23	06:21	04:20	22:56		04:18	06:10	07:49	08:39	10:38
	14:03	16:07	17:50	20:35	22:25			22:39	20:33	18:35	15:35	13:51
7	10:54	09:07	07:19	06:17	04:15			04:22	06:14	07:52	08:43	10:41
	14:06	16:11	17:53	20:38	22:29			22:34	20:29	18:31	15:32	13:49
8	10:51	09:03	07:15	06:13	04:11			04:26	06:17	07:55	08:47	10:45
	14:10	16:15	17:57	20:42	22:33		01:05	22:30	20:25	18:27	15:28	13:46
9	10:48	08:59	07:11	06:09	04:07		02:03	04:30	06:20	07:59	08:50	10:48
	14:14	16:19	18:00	20:45	22:37		00:55	22:26	20:21	18:23	15:24	13:43
10	10:45	08:55	07:07	06:05	04:03		02:12	04:34	06:24	08:02	08:54	10:52
	14:18	16:23	18:04	20:49	22:41		00:48	22:22	20:17	18:19	15:21	13:41
11	10:42	08:52	07:03	06:01	03:59		02:19	04:38	06:27	08:05	08:58	10:55
	14:22	16:26	18:07	20:52	22:46		00:41	22:18	20:13	18:15	15:17	13:39
12	10:39	08:48	06:59	05:57	03:54		02:25	04:42	06:30	08:09	09:02	10:58
	14:26	16:30	18:10	20:56	22:50		00:34	22:14	20:09	18:11	15:13	13:36
13	10:36	08:44	06:56	05:53	03:50		02:32	04:46	06:33	08:12	09:06	11:01
	14:30	16:34	18:14	20:59	22:54		00:28	22:10	20:05	18:07	15:09	13:34
14	10:33	08:40	06:52	05:49	03:46		02:37	04:49	06:37	08:16	09:10	11:04
	14:34	16:38	18:17	21:03	22:58		00:23	22:06	20:01	18:04	15:06	13:33
15	10:29	08:36	06:48	05:45	03:42		02:43	04:53	06:40	08:19	09:14	11:06
	14:38	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:02	13:31
16	10:26	08:32	06:44	05:41	03:37		02:48	04:57	06:43	08:22	09:18	11:09
	14:42	16:45	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:58	13:30
17	10:23	08:29	06:40	05:37	03:33		02:54	05:01	06:46	08:26	09:22	11:11
	14:46	16:49	18:27	21:13	23:12		00:07	21:53	19:49	17:52	14:55	13:29
18	10:19	08:25	06:36	05:33	03:29		02:59	05:04	06:50	08:29	09:26	11:13
	14:50	16:53	18:31	21:17	23:16		00:02	21:49	19:45	17:48	14:51	13:28
19	10:16	08:21	06:32	05:29	03:24		03:04	05:08	06:53	08:33	09:30	11:14
	14:54	16:57	18:34	21:20	23:21		23:57	21:45	19:41	17:44	14:48	13:27
20	10:12	08:17	06:28	05:25	03:20		03:04	05:12	06:56	08:36	09:34	11:16
	14:58	17:00	18:37	21:24	23:25		23:53	21:41	19:37	17:40	14:44	13:27
21	10:09	08:13	06:24	05:21	03:15		03:09	05:15	06:59	08:40	09:38	11:17
	15:02	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:36	14:40	13:27
22	10:05	08:09	06:20	05:17	03:11		03:14	05:19	07:03	08:43	09:42	11:17
	15:06	17:07	18:44	21:31	23:35		23:43	21:33	19:30	17:33	14:37	13:27
23	10:02	08:06	06:16	05:13	03:06		03:18	05:22	07:06	08:47	09:46	11:18
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:33	13:28
24	09:58	08:02	06:12	05:09	03:02		03:23	05:26	07:09	08:51	09:50	11:18
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:30	13:28
25	09:55	07:58	06:08	05:05	02:52		03:27	05:29	07:12	07:54	09:55	11:18
	15:19	17:18	18:54	21:42	23:49		23:30	21:21	19:18	16:21	14:26	13:30
26	09:51	07:54	06:04	05:01	02:47		03:32	05:33	07:16	07:58	09:59	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:17	14:23	13:31
27	09:47	07:50	06:01	04:57	02:42		03:36	05:36	07:19	08:01	10:03	11:17
	15:27	17:25	19:01	21:50	00:00		23:21	21:13	19:10	16:13	14:20	13:33
28	09:44	07:46	05:57	04:52	02:37		03:41	05:40	07:22	08:05	10:07	11:16
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31	09:33		06:45		02:21		03:54	05:50		08:16		11:11
	15:43		20:14		00:22		23:04	20:57		15:58		13:42
Potential sun hours	133	225	362	463	607	694	670	528	397	296	172	82
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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)

Licensed user:
wpd AG
Stephanitorsbollwerk 3 (Haus LUV)
DE-28211 Bremen
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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Asuntola - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (701)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:29	07:43	06:41	04:41	02:18		03:59	05:54	07:32	08:20	10:17
	13:49	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:04	05:58	07:36	08:23	10:21
	13:52	15:52	17:37	20:21	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:58		04:12	06:04	07:42	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:47		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:26	04:25	01:49		04:16	06:08	07:46	08:35	10:33
	14:02	16:04	17:47	20:32	22:21	00:56		22:42	20:37	18:39	15:40	13:56
6	10:55	09:10	07:23	06:22	04:21	01:36		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:50	20:35	22:25	01:10		22:38	20:33	18:35	15:37	13:54
7	10:53	09:06	07:19	06:18	04:17	02:27		04:24	06:14	07:52	08:42	10:40
	14:09	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:51
8	10:50	09:03	07:15	06:14	04:13			04:28	06:18	07:56	08:46	10:43
	14:12	16:16	17:57	20:42	22:33		00:59	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:12	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:51	22:26	20:21	18:24	15:25	13:46
10	10:44	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:24	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:22	13:43
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:27	08:06	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:37	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:41	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:36
15	10:29	08:36	06:48	05:46	03:43		02:46	04:54	06:41	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:15	22:01	19:58	18:00	15:03	13:34
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:24	21:10	23:06		00:10	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:30	11:12
	14:56	16:57	18:35	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:29	05:26	03:22		03:06	05:13	06:57	08:36	09:34	11:13
	15:00	17:01	18:38	21:24	23:24		23:51	21:41	19:38	17:41	14:45	13:30
21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:14
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:09	06:21	05:18	03:13		03:16	05:20	07:03	08:43	09:42	11:15
	15:08	17:08	18:45	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:14
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:06	16:11	14:18	13:38
29	09:40		06:53	04:49	02:35		03:47	05:44	07:26	08:09	10:10	11:12
	15:36		20:08	21:57	00:08		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:30		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:59	16:03	14:12	13:43
31	09:32		06:45		02:24		03:55	05:51		08:16		11:09
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	689	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Kainuunraja - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (702)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:29	07:42	06:41	04:41	02:19		03:59	05:54	07:32	08:20	10:17
	13:49	15:48	17:33	20:18	22:05	00:25		22:59	20:53	18:55	15:55	14:09
2	11:05	09:25	07:39	06:37	04:37	02:13		04:04	05:58	07:36	08:23	10:21
	13:52	15:52	17:37	20:21	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:50	20:45	18:47	15:48	14:02
4	11:00	09:18	07:31	06:29	04:29	01:59		04:12	06:04	07:42	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:46		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:50		04:16	06:08	07:46	08:35	10:32
	14:02	16:04	17:47	20:32	22:21	00:55		22:42	20:37	18:39	15:40	13:57
6	10:55	09:10	07:23	06:22	04:21	01:37		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:50	20:35	22:25	01:09		22:38	20:33	18:35	15:37	13:54
7	10:53	09:06	07:19	06:18	04:17	00:55		04:24	06:14	07:52	08:42	10:40
	14:09	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:51
8	10:50	09:03	07:15	06:14	04:13			04:28	06:18	07:55	08:46	10:43
	14:12	16:16	17:57	20:42	22:33		00:58	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:50	22:26	20:21	18:24	15:25	13:46
10	10:44	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:24	18:04	20:49	22:41		00:43	22:22	20:17	18:20	15:22	13:44
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:27	08:05	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:37	22:17	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:31	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:41	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:20	22:05	20:01	18:04	15:07	13:36
15	10:28	08:36	06:48	05:46	03:43		02:46	04:54	06:40	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:15	22:01	19:57	18:00	15:03	13:34
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:22	09:18	11:06
	14:44	16:46	18:24	21:10	23:06		00:10	21:57	19:53	17:56	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:21	11:08
	14:48	16:50	18:28	21:13	23:11		00:05	21:53	19:50	17:53	14:56	13:32
18	10:18	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:25	11:10
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:29	11:12
	14:56	16:57	18:34	21:20	23:19		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:28	05:26	03:22		03:06	05:12	06:57	08:36	09:33	11:13
	15:00	17:01	18:38	21:24	23:24		23:51	21:41	19:38	17:41	14:45	13:30
21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:14
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:09	06:21	05:18	03:13		03:16	05:20	07:03	08:43	09:42	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:06	08:47	09:46	11:15
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:50	09:50	11:15
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:15
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:50	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:52		23:24	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:14
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:53	02:40		03:43	05:41	07:23	08:05	10:06	11:13
	15:32	17:30	19:05	21:53	00:03		23:16	21:09	19:06	16:11	14:18	13:38
29	09:40		06:53	04:49	02:35		03:47	05:44	07:26	08:09	10:09	11:12
	15:36		20:08	21:57	00:08		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:30		03:51	05:47	07:29	08:12	10:13	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:59	16:03	14:12	13:43
31	09:32		06:45		02:24		03:55	05:51		08:16		11:09
	15:44		20:15		00:19		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	85
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Kauhajärvi 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (691)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:28	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:19	10:17
	13:48	15:48	17:33	20:18	22:05	00:25		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:12		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:32		22:54	20:49	18:50	15:51	14:05
3	11:03	09:21	07:34	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:24	22:12	00:39		22:50	20:45	18:47	15:47	14:02
4	11:00	09:17	07:31	06:29	04:29	01:58		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:16	00:47		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:24	01:49		04:15	06:07	07:45	08:34	10:32
	14:01	16:04	17:47	20:31	22:20	00:56		22:42	20:37	18:39	15:40	13:56
6	10:55	09:10	07:23	06:21	04:20	01:35		04:19	06:11	07:49	08:38	10:36
	14:05	16:08	17:50	20:35	22:24	01:10		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	02:00		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:43
	14:12	16:15	17:57	20:42	22:32		00:59	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:58	08:50	10:47
	14:16	16:19	18:00	20:45	22:36		00:51	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:48	22:41		00:44	22:21	20:17	18:19	15:21	13:43
11	10:41	08:51	07:03	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:37	22:17	20:13	18:15	15:18	13:41
12	10:38	08:47	06:59	05:57	03:55		02:29	04:43	06:30	08:09	09:02	10:56
	14:27	16:31	18:11	20:55	22:49		00:31	22:13	20:09	18:12	15:14	13:39
13	10:35	08:43	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:05	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:37
14	10:31	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:57		00:20	22:05	20:01	18:04	15:07	13:35
15	10:28	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:13	11:04
	14:39	16:42	18:21	21:06	23:02		00:15	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:51	04:58	06:43	08:22	09:17	11:06
	14:43	16:46	18:24	21:09	23:06		00:10	21:57	19:53	17:56	14:59	13:32
17	10:22	08:28	06:40	05:37	03:34		02:56	05:01	06:47	08:26	09:21	11:08
	14:47	16:50	18:27	21:13	23:10		00:05	21:53	19:49	17:52	14:56	13:31
18	10:18	08:24	06:36	05:33	03:30		03:01	05:05	06:50	08:29	09:25	11:10
	14:51	16:53	18:31	21:16	23:15		00:00	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:01	05:08	06:53	08:33	09:29	11:12
	14:55	16:57	18:34	21:20	23:19		23:56	21:45	19:41	17:45	14:49	13:30
20	10:11	08:17	06:28	05:25	03:21		03:06	05:12	06:56	08:36	09:33	11:13
	14:59	17:01	18:37	21:24	23:24		23:51	21:41	19:37	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:37	11:14
	15:03	17:04	18:41	21:27	23:28		23:47	21:37	19:34	17:37	14:41	13:29
22	10:04	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:41	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:05	06:16	05:13	03:08		03:20	05:23	07:06	08:47	09:45	11:15
	15:12	17:11	18:48	21:35	23:38		23:37	21:29	19:26	17:29	14:35	13:30
24	09:57	08:01	06:12	05:09	03:03		03:24	05:26	07:09	08:50	09:49	11:16
	15:16	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:53	11:15
	15:20	17:19	18:54	21:42	23:47		23:29	21:21	19:18	16:22	14:28	13:32
26	09:50	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:57	09:57	11:15
	15:24	17:22	18:58	21:46	23:52		23:24	21:17	19:14	16:18	14:24	13:34
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:01	11:14
	15:28	17:26	19:01	21:49	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:05	11:13
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:18	13:37
29	09:39		06:53	04:49	02:34		03:46	05:44	07:26	08:08	10:09	11:12
	15:36		20:08	21:57	00:08		23:11	21:05	19:02	16:06	14:14	13:40
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:13	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:24		03:55	05:50		08:16		11:09
	15:44		20:14		00:19		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Kauhajärvi 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (692)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:28	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:19	10:17
	13:48	15:48	17:33	20:18	22:05	00:25		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:12		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:32		22:54	20:49	18:50	15:51	14:05
3	11:03	09:21	07:34	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:24	22:12	00:39		22:50	20:45	18:47	15:47	14:02
4	11:00	09:17	07:31	06:29	04:29	01:58		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:16	00:47		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:49		04:15	06:07	07:45	08:34	10:32
	14:01	16:04	17:47	20:31	22:20	00:56		22:42	20:37	18:39	15:40	13:56
6	10:55	09:10	07:23	06:21	04:20	01:35		04:19	06:11	07:49	08:38	10:36
	14:05	16:08	17:50	20:35	22:24	01:10		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	01:52		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:28			22:34	20:29	18:31	15:32	13:51
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:43
	14:12	16:16	17:57	20:42	22:32		00:59	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:59	08:50	10:47
	14:16	16:19	18:00	20:45	22:36		00:51	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:23	18:04	20:48	22:41		00:44	22:21	20:17	18:19	15:21	13:43
11	10:41	08:51	07:03	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:37	22:17	20:13	18:15	15:18	13:41
12	10:38	08:47	06:59	05:57	03:55		02:29	04:43	06:30	08:09	09:02	10:56
	14:27	16:31	18:11	20:55	22:49		00:31	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:05	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:37
14	10:31	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:57		00:20	22:05	20:01	18:04	15:07	13:35
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	14:39	16:42	18:21	21:06	23:02		00:15	22:01	19:57	18:00	15:03	13:34
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17	10:22	08:28	06:40	05:37	03:34		02:56	05:01	06:47	08:26	09:21	11:08
	14:47	16:50	18:27	21:13	23:10		00:05	21:53	19:49	17:52	14:56	13:31
18	10:18	08:24	06:36	05:33	03:30		03:01	05:05	06:50	08:29	09:25	11:10
	14:51	16:53	18:31	21:17	23:15		00:00	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:26		03:01	05:09	06:53	08:33	09:29	11:12
	14:55	16:57	18:34	21:20	23:19		23:56	21:45	19:41	17:45	14:49	13:30
20	10:11	08:17	06:28	05:25	03:21		03:06	05:12	06:56	08:36	09:33	11:13
	14:59	17:01	18:38	21:24	23:24		23:51	21:41	19:37	17:41	14:45	13:30
21	10:08	08:13	06:24	05:21	03:17		03:11	05:16	07:00	08:40	09:37	11:14
	15:03	17:04	18:41	21:27	23:28		23:46	21:37	19:34	17:37	14:42	13:29
22	10:04	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:41	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:05	06:16	05:13	03:08		03:20	05:23	07:06	08:47	09:45	11:15
	15:12	17:11	18:48	21:35	23:38		23:37	21:29	19:26	17:29	14:35	13:30
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25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:53	11:15
	15:20	17:19	18:54	21:42	23:47		23:29	21:21	19:18	16:22	14:28	13:32
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	15:24	17:22	18:58	21:46	23:52		23:24	21:17	19:14	16:18	14:24	13:34
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29	09:39		06:53	04:49	02:34		03:46	05:44	07:26	08:08	10:09	11:12
	15:36		20:08	21:57	00:08		23:11	21:05	19:02	16:06	14:14	13:40
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31	09:32		06:45		02:24		03:55	05:51		08:16		11:09
	15:44		20:14		00:19		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Koskenniemi 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (703)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:04		04:08	06:01	07:39	08:28	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:32	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	02:00		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:29	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:01	22:30	20:26	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:08	04:32	06:21	07:59	08:51	10:48
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10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
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11	10:42	08:52	07:04	06:02	04:00		02:22	04:39	06:28	08:06	08:58	10:54
	14:24	16:28	18:08	20:53	22:46		00:39	22:18	20:14	18:16	15:18	13:41
12	10:39	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:10	18:12	15:14	13:39
13	10:36	08:44	06:56	05:54	03:52		02:34	04:47	06:34	08:13	09:06	11:00
	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:40	06:52	05:50	03:47		02:40	04:51	06:38	08:16	09:10	11:03
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17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:07	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:57	21:46	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:30		23:48	21:37	19:34	17:37	14:42	13:29
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	15:24	17:23	18:58	21:47	23:54		23:25	21:17	19:15	16:18	14:25	13:34
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Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Koskenniemi 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (704)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:32	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:36	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	02:12		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:30	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:01	22:30	20:26	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:08	04:32	06:21	07:59	08:51	10:48
	14:16	16:20	18:01	20:46	22:37		00:53	22:26	20:22	18:24	15:25	13:45
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	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:41	06:52	05:50	03:47		02:40	04:51	06:38	08:16	09:10	11:03
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18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
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	15:04	17:05	18:42	21:28	23:30		23:48	21:37	19:34	17:37	14:42	13:29
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	15:20	17:19	18:55	21:43	23:49		23:30	21:21	19:19	16:22	14:28	13:32
26	09:51	07:55	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:47	23:54		23:25	21:17	19:15	16:18	14:25	13:34
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Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Koskenniemi 3 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (705)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
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	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:31	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	02:24		04:24	06:15	07:53	08:43	10:41
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16	10:26	08:33	06:45	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
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17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
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18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
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20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
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21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:29		23:48	21:37	19:34	17:37	14:42	13:29
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Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Koskenniemi 4 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (706)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Idle start wind speed: Cut in wind speed from power curve

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	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:36	15:37	13:53
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	14:24	16:28	18:08	20:53	22:46		00:39	22:18	20:14	18:16	15:18	13:41
12	10:39	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:10	18:12	15:14	13:39
13	10:36	08:44	06:56	05:54	03:52		02:34	04:47	06:34	08:13	09:06	11:00
	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:41	06:52	05:50	03:47		02:40	04:51	06:38	08:16	09:10	11:03
	14:35	16:39	18:18	21:03	22:58		00:22	22:06	20:02	18:04	15:07	13:35
15	10:29	08:37	06:48	05:46	03:43		02:45	04:54	06:41	08:20	09:14	11:05
	14:39	16:43	18:21	21:07	23:03		00:17	22:02	19:58	18:01	15:03	13:34
16	10:26	08:33	06:45	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:10
	14:48	16:50	18:28	21:14	23:11		00:07	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:58	18:35	21:21	23:20		23:57	21:46	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:30		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:13		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
	15:20	17:19	18:55	21:43	23:49		23:30	21:21	19:19	16:22	14:28	13:32
26	09:51	07:55	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:47	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
	15:28	17:26	19:02	21:50	23:59		23:21	21:13	19:11	16:14	14:21	13:35
28	09:44	07:47	05:57	04:54	02:39		03:42	05:41	07:23	08:05	10:06	11:15
	15:32	17:30	19:05	21:54	00:04		23:17	21:09	19:07	16:11	14:18	13:37
29	09:40		06:53	04:50	02:34		03:47	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:37		06:49	04:45	02:29		03:51	05:48	07:30	08:13	10:14	11:12
	15:40		20:12	22:02	00:15		23:08	21:01	18:59	16:03	14:11	13:42
31	09:33		06:46		02:23		03:55	05:51		08:17		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:45
Potential sun hours	134	225	362	463	606	713	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
Palovaara, Pello

Licensed user:
wpd AG
Stephanitorsbollwerk 3 (Haus LUV)
DE-28211 Bremen
+49 7142 77810
Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Koskenniemi 5 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (707)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:31	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:23	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	04:31		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:29	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:01	22:30	20:26	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:08	04:32	06:21	07:59	08:51	10:48
	14:16	16:20	18:01	20:46	22:37		00:53	22:26	20:22	18:24	15:25	13:45
10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
	14:20	16:24	18:04	20:49	22:41		00:45	22:22	20:18	18:20	15:22	13:43
11	10:42	08:52	07:04	06:02	04:00		02:22	04:39	06:28	08:06	08:58	10:54
	14:24	16:28	18:08	20:53	22:46		00:39	22:18	20:14	18:16	15:18	13:41
12	10:39	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:10	18:12	15:14	13:39
13	10:36	08:44	06:56	05:54	03:52		02:34	04:47	06:34	08:13	09:06	11:00
	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:03
	14:35	16:39	18:18	21:03	22:58		00:22	22:06	20:02	18:04	15:07	13:35
15	10:29	08:37	06:48	05:46	03:43		02:45	04:54	06:41	08:19	09:14	11:05
	14:39	16:43	18:21	21:07	23:03		00:17	22:02	19:58	18:01	15:03	13:33
16	10:26	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:06	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:57	21:45	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:12		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
	15:20	17:19	18:55	21:43	23:49		23:30	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:46	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
	15:28	17:26	19:02	21:50	23:59		23:21	21:13	19:11	16:14	14:21	13:35
28	09:44	07:47	05:57	04:54	02:39		03:42	05:41	07:23	08:05	10:06	11:15
	15:32	17:30	19:05	21:54	00:04		23:17	21:09	19:07	16:11	14:18	13:37
29	09:40		06:53	04:49	02:34		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:37		06:49	04:45	02:29		03:51	05:48	07:29	08:13	10:14	11:12
	15:40		20:12	22:02	00:15		23:08	21:01	18:59	16:03	14:11	13:42
31	09:33		06:46		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:45
Potential sun hours	134	225	362	463	606	711	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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)

Licensed user:
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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Koskenniemi 6 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (708)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:31	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:23	06:22	04:21	01:31		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	16:58		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:29	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:01	22:30	20:26	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:08	04:32	06:21	07:59	08:51	10:48
	14:16	16:20	18:01	20:46	22:37		00:53	22:26	20:22	18:24	15:25	13:45
10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
	14:20	16:24	18:04	20:49	22:41		00:45	22:22	20:18	18:20	15:22	13:43
11	10:42	08:52	07:04	06:02	04:00		02:22	04:39	06:28	08:06	08:58	10:54
	14:24	16:28	18:08	20:53	22:46		00:39	22:18	20:14	18:16	15:18	13:41
12	10:39	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:10	18:12	15:14	13:39
13	10:36	08:44	06:56	05:54	03:52		02:34	04:47	06:34	08:13	09:06	11:00
	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:03
	14:35	16:39	18:18	21:03	22:58		00:22	22:06	20:02	18:04	15:07	13:35
15	10:29	08:37	06:48	05:46	03:43		02:45	04:54	06:41	08:19	09:14	11:05
	14:39	16:43	18:21	21:07	23:03		00:16	22:02	19:58	18:01	15:03	13:33
16	10:26	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:06	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:57	21:45	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:12		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
	15:20	17:19	18:55	21:43	23:49		23:30	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:46	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
	15:28	17:26	19:02	21:50	23:59		23:21	21:13	19:11	16:14	14:21	13:35
28	09:44	07:47	05:57	04:54	02:39		03:42	05:41	07:23	08:05	10:06	11:15
	15:32	17:30	19:05	21:54	00:04		23:17	21:09	19:07	16:11	14:18	13:37
29	09:40		06:53	04:50	02:34		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:37		06:49	04:45	02:29		03:51	05:48	07:29	08:13	10:14	11:12
	15:40		20:12	22:02	00:15		23:08	21:01	18:59	16:03	14:11	13:42
31	09:33		06:46		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:45
Potential sun hours	134	225	362	463	606	699	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
Palovaara, Pello

Licensed user:
wpd AG
Stephanitorsbollwerk 3 (Haus LUV)
DE-28211 Bremen
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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Lehtilaki - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (698)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:42	04:41	02:18		04:00	05:54	07:33	08:20	10:18
	13:49	15:49	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:56	14:08
2	11:05	09:25	07:39	06:38	04:37	02:12		04:04	05:58	07:36	08:24	10:22
	13:52	15:52	17:37	20:22	22:09	00:33		22:55	20:49	18:51	15:52	14:05
3	11:03	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:27	10:26
	13:55	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:30	04:29	01:58		04:12	06:05	07:43	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:48		22:47	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:26	04:25	01:49		04:16	06:08	07:46	08:35	10:33
	14:02	16:04	17:47	20:32	22:21	00:57		22:43	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:22	04:21	01:35		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:11		22:38	20:33	18:35	15:37	13:54
7	10:53	09:07	07:19	06:18	04:17	23:53		04:24	06:14	07:52	08:43	10:40
	14:09	16:12	17:54	20:39	22:29			22:34	20:29	18:32	15:33	13:51
8	10:50	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:00	22:30	20:25	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:46	22:37		00:52	22:26	20:21	18:24	15:26	13:46
10	10:45	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:51
	14:20	16:24	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:22	13:43
11	10:42	08:52	07:04	06:02	04:00		02:23	04:39	06:28	08:06	08:58	10:54
	14:24	16:28	18:08	20:52	22:45		00:38	22:18	20:14	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:57
	14:28	16:31	18:11	20:56	22:50		00:32	22:14	20:10	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:13	09:06	11:00
	14:32	16:35	18:15	20:59	22:54		00:26	22:10	20:06	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:21	22:06	20:02	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:46	04:54	06:41	08:19	09:14	11:05
	14:40	16:43	18:21	21:06	23:02		00:16	22:01	19:58	18:01	15:03	13:34
16	10:26	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:25	21:10	23:07		00:11	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:14	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:29	05:26	03:22		03:06	05:13	06:57	08:37	09:34	11:14
	15:00	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:46	13:30
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:15
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:10	06:21	05:18	03:13		03:16	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:39	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:51	09:50	11:16
	15:16	17:16	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:55	21:43	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:20	08:02	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:21	21:13	19:11	16:14	14:21	13:36
28	09:44	07:47	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:07	16:11	14:18	13:38
29	09:40		06:53	04:50	02:35		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:29		03:51	05:48	07:29	08:13	10:14	11:11
	15:41		20:12	22:01	00:14		23:08	21:01	18:59	16:03	14:12	13:43
31	09:33		06:45		02:24		03:55	05:51		08:16		11:10
	15:45		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	463	605	692	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
Palovaara, Pello

Licensed user:
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Stephanitorsbollwerk 3 (Haus LUV)
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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Metsästysmaja - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (690)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June
1	11:09			09:29		11:45 (WTG 04)	07:43	06:41	04:41	02:15
	13:47			15:48	21	12:06 (WTG 04)	17:33	20:18	22:05	00:28
2	11:07			09:26		11:45 (WTG 04)	07:39	06:37	04:36	02:09
	13:50			15:52	22	12:07 (WTG 04)	17:36	20:21	22:09	00:35
3	11:05			09:22		11:45 (WTG 04)	07:35	06:33	04:32	02:02
	13:53			15:56	22	12:07 (WTG 04)	17:40	20:25	22:13	00:43
4	11:02			09:18		11:45 (WTG 04)	07:31	06:29	04:28	01:53
	13:56			16:00	22	12:07 (WTG 04)	17:43	20:28	22:17	00:52
5	11:00			09:14		11:46 (WTG 04)	07:27	06:25	04:24	01:42
	14:00			16:03	21	12:07 (WTG 04)	17:47	20:32	22:21	01:03
6	10:57			09:11		11:46 (WTG 04)	07:23	06:21	04:20	01:59
	14:03			16:07	21	12:07 (WTG 04)	17:50	20:35	22:25	
7	10:54			09:07		11:46 (WTG 04)	07:19	06:17	04:16	
	14:07			16:11	20	12:06 (WTG 04)	17:54	20:39	22:29	
8	10:51			09:03		11:47 (WTG 04)	07:15	06:13	04:12	
	14:11			16:15	18	12:05 (WTG 04)	17:57	20:42	22:33	
9	10:49			08:59		11:48 (WTG 04)	07:11	06:09	04:07	
	14:14			16:19	16	12:04 (WTG 04)	18:01	20:45	22:37	
10	10:46			08:56		11:50 (WTG 04)	07:08	06:05	04:03	
	14:18			16:23	14	12:04 (WTG 04)	18:04	20:49	22:42	
11	10:42			08:52		11:52 (WTG 04)	07:04	06:01	03:59	
	14:22			16:27	9	12:01 (WTG 04)	18:07	20:52	22:46	
12	10:39			08:48			07:00	05:57	03:55	
	14:26			16:31			18:11	20:56	22:50	
13	10:36			08:44			06:56	05:53	03:51	
	14:30			16:34			18:14	20:59	22:54	
14	10:33			08:40			06:52	05:49	03:46	
	14:34			16:38			18:18	21:03	22:59	
15	10:30			08:37			06:48	05:45	03:42	
	14:38			16:42			18:21	21:06	23:03	
16	10:26			08:33			06:44	05:41	03:38	
	14:42			16:46			18:24	21:10	23:07	
17	10:23			08:29			06:40	05:37	03:33	
	14:46			16:49			18:28	21:14	23:12	
18	10:20			08:25			06:36	05:33	03:29	
	14:50			16:53			18:31	21:17	23:16	
19	10:16			08:21			06:32	05:29	03:25	
	14:55			16:57			18:34	21:21	23:21	
20	10:13			08:17			06:28	05:25	03:20	
	14:59			17:00			18:38	21:24	23:25	
21	10:09			08:14			06:24	05:21	03:16	
	15:03			17:04			18:41	21:28	23:30	
22	10:06			08:10			06:21	05:17	03:11	
	15:07			17:08			18:44	21:32	23:35	
23	10:02			08:06			06:17	05:13	03:07	
	15:11			17:11			18:48	21:35	23:39	
24	09:58			08:02			06:13	05:09	03:02	
	15:15			17:15			18:51	21:39	23:44	
25	09:55		11:52 (WTG 04)	07:58			06:09	05:05	02:53	
	15:19	5	11:57 (WTG 04)	17:19			18:55	21:43	23:49	
26	09:51		11:49 (WTG 04)	07:54			06:05	05:01	02:48	
	15:23	10	11:59 (WTG 04)	17:22			18:58	21:46	23:54	
27	09:48		11:48 (WTG 04)	07:50			06:01	04:57	02:43	
	15:27	14	12:02 (WTG 04)	17:26			19:01	21:50	00:00	
28	09:44		11:47 (WTG 04)	07:46			05:57	04:53	02:38	
	15:31	16	12:03 (WTG 04)	17:29			19:05	21:54	00:05	
29	09:40		11:46 (WTG 04)				06:53	04:49	02:32	
	15:35	18	12:04 (WTG 04)				20:08	21:58	00:10	
30	09:37		11:45 (WTG 04)				06:49	04:45	02:27	
	15:40	20	12:05 (WTG 04)				20:11	22:02	00:16	
31	09:33		11:46 (WTG 04)				06:45		02:21	
	15:44	20	12:06 (WTG 04)				20:15		00:22	
Potential sun hours	134			225			362	463	607	691
Total, worst case		103			206					
Sun reduction		0,08			0,25					
Oper. time red.		0,98			0,98					
Wind dir. red.		0,72			0,72					
Total reduction		0,06			0,17					
Total, real		6			36					

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Metsästysmaja - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (690)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October		November		December
1		03:58	05:54	07:32		08:20	11:19 (WTG 04)	10:19
		23:00	20:53	18:55		15:55	14 11:33 (WTG 04)	14:07
2		04:02	05:57	07:36		08:24	11:18 (WTG 04)	10:23
		22:56	20:49	18:51		15:51	17 11:35 (WTG 04)	14:04
3		04:07	06:01	07:39		08:28	11:16 (WTG 04)	10:26
		22:51	20:45	18:47		15:47	19 11:35 (WTG 04)	14:01
4		04:11	06:04	07:42		08:31	11:16 (WTG 04)	10:30
		22:47	20:41	18:43		15:43	20 11:36 (WTG 04)	13:58
5		04:15	06:07	07:46		08:35	11:15 (WTG 04)	10:34
		22:43	20:37	18:39		15:40	21 11:36 (WTG 04)	13:55
6		04:19	06:11	07:49		08:39	11:15 (WTG 04)	10:38
		22:39	20:33	18:35		15:36	22 11:37 (WTG 04)	13:52
7		04:23	06:14	07:52		08:43	11:15 (WTG 04)	10:41
		22:35	20:29	18:31		15:32	22 11:37 (WTG 04)	13:49
8		04:27	06:17	07:56		08:47	11:16 (WTG 04)	10:45
	01:05	22:30	20:25	18:27		15:28	21 11:37 (WTG 04)	13:46
9	02:04	04:31	06:21	07:59		08:51	11:15 (WTG 04)	10:48
	00:55	22:26	20:21	18:23		15:25	22 11:37 (WTG 04)	13:44
10	02:12	04:35	06:24	08:02		08:55	11:16 (WTG 04)	10:52
	00:47	22:22	20:17	18:19		15:21	21 11:37 (WTG 04)	13:41
11	02:20	04:38	06:27	08:06		08:58	11:16 (WTG 04)	10:55
	00:41	22:18	20:13	18:16		15:17	21 11:37 (WTG 04)	13:39
12	02:26	04:42	06:30	08:09		09:02	11:17 (WTG 04)	10:58
	00:34	22:14	20:09	18:12		15:13	19 11:36 (WTG 04)	13:37
13	02:32	04:46	06:34	08:12		09:06	11:18 (WTG 04)	11:01
	00:28	22:10	20:05	18:08		15:10	18 11:36 (WTG 04)	13:35
14	02:38	04:50	06:37	08:16		09:10	11:19 (WTG 04)	11:04
	00:23	22:06	20:01	18:04		15:06	16 11:35 (WTG 04)	13:33
15	02:44	04:54	06:40	08:19		09:14	11:21 (WTG 04)	11:06
	00:17	22:02	19:57	18:00		15:02	13 11:34 (WTG 04)	13:32
16	02:49	04:57	06:44	08:23		09:18	11:22 (WTG 04)	11:09
	00:12	21:58	19:54	17:56		14:59	10 11:32 (WTG 04)	13:30
17	02:54	05:01	06:47	08:26		09:22	11:25 (WTG 04)	11:11
	00:07	21:53	19:50	17:52		14:55	4 11:29 (WTG 04)	13:29
18	02:59	05:05	06:50	08:30		09:26		11:13
	00:02	21:49	19:46	17:48		14:52		13:28
19	03:04	05:08	06:53	08:33		09:30		11:14
	23:58	21:45	19:42	17:45		14:48		13:28
20	03:04	05:12	06:57	08:37		09:34		11:16
	23:53	21:41	19:38	17:41		14:44		13:27
21	03:09	05:15	07:00	08:40		09:38		11:17
	23:48	21:37	19:34	17:37		14:41		13:27
22	03:14	05:19	07:03	08:44		09:42		11:17
	23:44	21:33	19:30	17:33		14:37		13:28
23	03:19	05:23	07:06	08:47		09:47		11:18
	23:39	21:29	19:26	17:29		14:34		13:28
24	03:23	05:26	07:10	08:51		09:51		11:18
	23:34	21:25	19:22	17:25		14:30		13:29
25	03:28	05:30	07:13	07:54		09:55		11:18
	23:30	21:21	19:18	16:21		14:27		13:30
26	03:32	05:33	07:16	07:58		09:59		11:17
	23:26	21:17	19:14	16:18		14:23		13:32
27	03:37	05:37	07:19	08:02		10:03		11:17
	23:21	21:13	19:10	16:14		14:20		13:33
28	03:41	05:40	07:23	08:05		10:07		11:16
	23:17	21:09	19:06	16:10		14:17		13:36
29	03:46	05:44	07:26	08:09		10:11		11:14
	23:13	21:05	19:02	16:06		14:13		13:38
30	03:50	05:47	07:29	08:13		10:15		11:13
	23:08	21:01	18:58	16:02		14:10		13:40
31	03:54	05:50		08:16	11:21 (WTG 04)			11:11
	23:04	20:57		15:59	10 11:31 (WTG 04)			13:43
Potential sun hours	669	528	397	296		172		82
Total, worst case				10		300		
Sun reduction				0,21		0,13		
Oper. time red.				0,98		0,98		
Wind dir. red.				0,72		0,72		
Total reduction				0,15		0,09		
Total, real				1		27		

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Pahtajärvi 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (693)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:28	07:42	06:41	04:40	02:17		03:59	05:54	07:32	08:19	10:17
	13:47	15:48	17:32	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:07
2	11:05	09:25	07:38	06:37	04:36	02:10		04:03	05:57	07:35	08:23	10:21
	13:50	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:50	15:51	14:04
3	11:03	09:21	07:34	06:33	04:32	02:04		04:07	06:00	07:38	08:27	10:25
	13:54	15:56	17:39	20:24	22:12	00:40		22:50	20:45	18:46	15:47	14:01
4	11:01	09:17	07:30	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	15:59	17:43	20:28	22:16	00:48		22:46	20:41	18:42	15:43	13:58
5	10:58	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:34	10:33
	14:00	16:03	17:46	20:31	22:20	00:58		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:29		04:19	06:10	07:48	08:38	10:36
	14:04	16:07	17:50	20:35	22:24	01:16		22:38	20:33	18:35	15:36	13:52
7	10:53	09:06	07:19	06:17	04:16	23:36		04:23	06:14	07:52	08:42	10:40
	14:07	16:11	17:53	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:41	22:32		01:01	22:30	20:25	18:27	15:28	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:20	07:58	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:48	22:41		00:45	22:21	20:17	18:19	15:21	13:42
11	10:41	08:51	07:03	06:01	03:59		02:21	04:38	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:15	15:17	13:40
12	10:38	08:47	06:59	05:57	03:55		02:27	04:42	06:30	08:08	09:02	10:57
	14:27	16:31	18:10	20:55	22:49		00:32	22:13	20:09	18:11	15:13	13:38
13	10:35	08:43	06:55	05:53	03:51		02:33	04:46	06:33	08:12	09:06	10:59
	14:31	16:34	18:14	20:59	22:53		00:26	22:09	20:05	18:07	15:10	13:36
14	10:32	08:40	06:51	05:49	03:46		02:39	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:53	06:40	08:19	09:13	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:02	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:17	11:07
	14:43	16:46	18:24	21:09	23:06		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:46	08:26	09:21	11:09
	14:47	16:49	18:27	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:18	08:24	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:25	11:11
	14:51	16:53	18:31	21:16	23:15		00:01	21:49	19:45	17:48	14:52	13:29
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:32	09:29	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:41	17:44	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:33	11:14
	14:59	17:00	18:37	21:24	23:24		23:51	21:41	19:37	17:40	14:45	13:28
21	10:08	08:13	06:24	05:21	03:16		03:10	05:15	06:59	08:40	09:37	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:33	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:14	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:29	17:33	14:37	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:22	07:06	08:47	09:46	11:16
	15:11	17:11	18:47	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:01	06:12	05:09	03:02		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:08	05:05	02:53		03:28	05:29	07:12	07:54	09:54	11:16
	15:19	17:18	18:54	21:42	23:48		23:29	21:21	19:18	16:21	14:27	13:31
26	09:50	07:54	06:04	05:01	02:48		03:33	05:33	07:16	07:57	09:58	11:16
	15:23	17:22	18:57	21:46	23:53		23:25	21:17	19:14	16:17	14:24	13:33
27	09:47	07:50	06:00	04:57	02:43		03:37	05:36	07:19	08:01	10:02	11:15
	15:27	17:25	19:01	21:49	23:58		23:20	21:13	19:10	16:14	14:20	13:34
28	09:43	07:46	05:57	04:53	02:38		03:41	05:40	07:22	08:05	10:06	11:14
	15:31	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:36
29	09:39		06:53	04:49	02:33		03:46	05:43	07:25	08:08	10:10	11:13
	15:36		20:07	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:02	14:11	13:41
31	09:32		06:45		02:22		03:54	05:50		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:58		13:44
Potential sun hours	134	225	362	463	606	692	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Pahtajärvi 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (694)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:28	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:19	10:17
	13:47	15:48	17:32	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:07
2	11:05	09:25	07:38	06:37	04:36	02:10		04:03	05:57	07:35	08:23	10:21
	13:50	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:50	15:51	14:04
3	11:03	09:21	07:34	06:33	04:32	02:04		04:07	06:00	07:38	08:27	10:25
	13:54	15:56	17:39	20:24	22:12	00:40		22:50	20:45	18:46	15:47	14:01
4	11:01	09:17	07:30	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:16	00:48		22:46	20:41	18:42	15:43	13:58
5	10:58	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:34	10:33
	14:00	16:03	17:46	20:31	22:20	00:58		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:29		04:19	06:10	07:48	08:38	10:36
	14:04	16:07	17:50	20:35	22:24	01:16		22:38	20:33	18:35	15:36	13:52
7	10:53	09:06	07:19	06:17	04:16	02:00		04:23	06:14	07:52	08:42	10:40
	14:08	16:11	17:53	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:41	22:32		01:01	22:30	20:25	18:27	15:28	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:20	07:58	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:48	22:41		00:45	22:21	20:17	18:19	15:21	13:42
11	10:41	08:51	07:03	06:01	03:59		02:21	04:38	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:15	15:17	13:40
12	10:38	08:47	06:59	05:57	03:55		02:27	04:42	06:30	08:08	09:02	10:56
	14:27	16:31	18:10	20:55	22:49		00:32	22:13	20:09	18:11	15:13	13:38
13	10:35	08:43	06:55	05:53	03:51		02:33	04:46	06:33	08:12	09:06	10:59
	14:31	16:34	18:14	20:59	22:53		00:26	22:09	20:05	18:07	15:10	13:36
14	10:32	08:40	06:51	05:49	03:46		02:39	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:28	08:36	06:48	05:45	03:42		02:45	04:53	06:40	08:19	09:13	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:17	11:07
	14:43	16:46	18:24	21:09	23:06		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:46	08:26	09:21	11:09
	14:47	16:49	18:27	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:18	08:24	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:25	11:11
	14:51	16:53	18:31	21:16	23:15		00:01	21:49	19:45	17:48	14:52	13:29
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:32	09:29	11:12
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:41	17:44	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:33	11:14
	14:59	17:00	18:37	21:24	23:24		23:51	21:41	19:37	17:40	14:45	13:28
21	10:08	08:13	06:24	05:21	03:16		03:10	05:15	06:59	08:39	09:37	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:33	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:14	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:29	17:33	14:37	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:22	07:06	08:47	09:46	11:16
	15:11	17:11	18:47	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:01	06:12	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:08	05:05	02:53		03:28	05:30	07:12	07:54	09:54	11:16
	15:19	17:18	18:54	21:42	23:48		23:29	21:21	19:18	16:21	14:27	13:31
26	09:50	07:54	06:04	05:01	02:48		03:33	05:33	07:16	07:57	09:58	11:16
	15:23	17:22	18:57	21:46	23:53		23:25	21:17	19:14	16:17	14:24	13:33
27	09:47	07:50	06:00	04:57	02:44		03:37	05:36	07:19	08:01	10:02	11:15
	15:27	17:25	19:01	21:49	23:58		23:20	21:13	19:10	16:14	14:20	13:35
28	09:43	07:46	05:57	04:53	02:38		03:42	05:40	07:22	08:05	10:06	11:14
	15:31	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:37
29	09:39		06:53	04:49	02:33		03:46	05:43	07:25	08:08	10:10	11:13
	15:36		20:07	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:02	14:11	13:41
31	09:32		06:45		02:22		03:54	05:50		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:58		13:44
Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Pahtajärvi 3 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (695)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:28	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:19	10:17
	13:48	15:48	17:32	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:07
2	11:05	09:25	07:38	06:37	04:36	02:11		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:50	15:51	14:04
3	11:03	09:21	07:34	06:33	04:32	02:04		04:07	06:00	07:38	08:27	10:25
	13:54	15:56	17:39	20:24	22:12	00:40		22:50	20:45	18:46	15:47	14:01
4	11:01	09:17	07:30	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:16	00:48		22:46	20:41	18:42	15:43	13:58
5	10:58	09:14	07:27	06:25	04:24	01:47		04:15	06:07	07:45	08:34	10:33
	14:00	16:03	17:46	20:31	22:20	00:58		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:30		04:19	06:10	07:48	08:38	10:36
	14:04	16:07	17:50	20:35	22:24	01:15		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	00:38		04:23	06:14	07:52	08:42	10:40
	14:08	16:11	17:53	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:43
	14:11	16:15	17:57	20:41	22:32		01:00	22:30	20:25	18:27	15:28	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:20	07:58	08:50	10:47
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13	10:35	08:43	06:55	05:53	03:51		02:33	04:46	06:33	08:12	09:05	10:59
	14:31	16:34	18:14	20:59	22:53		00:26	22:09	20:05	18:07	15:10	13:36
14	10:32	08:40	06:51	05:49	03:47		02:39	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:57		00:21	22:05	20:01	18:04	15:06	13:34
15	10:28	08:36	06:48	05:45	03:42		02:45	04:53	06:40	08:19	09:13	11:05
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17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:46	08:26	09:21	11:09
	14:47	16:49	18:27	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:18	08:24	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:25	11:11
	14:51	16:53	18:31	21:16	23:15		00:01	21:49	19:45	17:48	14:52	13:29
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:32	09:29	11:12
	14:55	16:57	18:34	21:20	23:19		23:56	21:45	19:41	17:44	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:33	11:14
	14:59	17:00	18:37	21:24	23:24		23:51	21:41	19:37	17:40	14:45	13:29
21	10:08	08:13	06:24	05:21	03:16		03:10	05:15	06:59	08:39	09:37	11:15
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	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:29	17:33	14:38	13:29
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	15:44		20:14		00:20		23:03	20:56		15:58		13:44
Potential sun hours	134	225	362	463	606	691	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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17.09.2021 08:26/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Pessala 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (699)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Operational time

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Idle start wind speed: Cut in wind speed from power curve

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	13:49	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
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	13:52	15:52	17:37	20:22	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:51	20:45	18:47	15:48	14:02
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6	10:56	09:10	07:23	06:22	04:21	01:36		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:51	20:35	22:25	01:10		22:38	20:33	18:35	15:37	13:54
7	10:53	09:07	07:19	06:18	04:17	01:53		04:24	06:14	07:52	08:43	10:40
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14	10:32	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:02
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15	10:29	08:36	06:48	05:46	03:43		02:46	04:54	06:41	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:16	22:01	19:58	18:00	15:03	13:34
16	10:25	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:25	21:10	23:06		00:11	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:12
	14:56	16:57	18:35	21:21	23:20		23:56	21:45	19:42	17:45	14:49	13:30
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21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:15
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23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:16
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25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
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Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCShadow receptor: Pessala 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (700)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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	13:49	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:04	05:58	07:36	08:24	10:21
	13:52	15:52	17:37	20:22	22:09	00:32		22:55	20:49	18:51	15:52	14:05
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	13:58	16:00	17:44	20:28	22:17	00:47		22:47	20:41	18:43	15:44	13:59
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	14:20	16:24	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:22	13:43
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:28	08:06	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:32	22:14	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:54		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:21	22:05	20:02	18:04	15:07	13:35
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16	10:25	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:25	21:10	23:06		00:11	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:12
	14:56	16:57	18:35	21:21	23:20		23:56	21:45	19:42	17:45	14:49	13:30
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	15:08	17:08	18:45	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
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25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
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26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:07	16:11	14:18	13:38
29	09:40		06:53	04:49	02:35		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:29		03:51	05:48	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:59	16:03	14:12	13:43
31	09:33		06:45		02:24		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	84
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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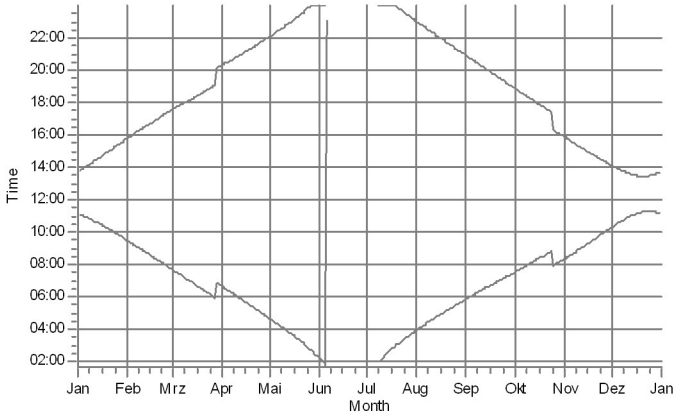
17.09.2021 08:26/3.4.415

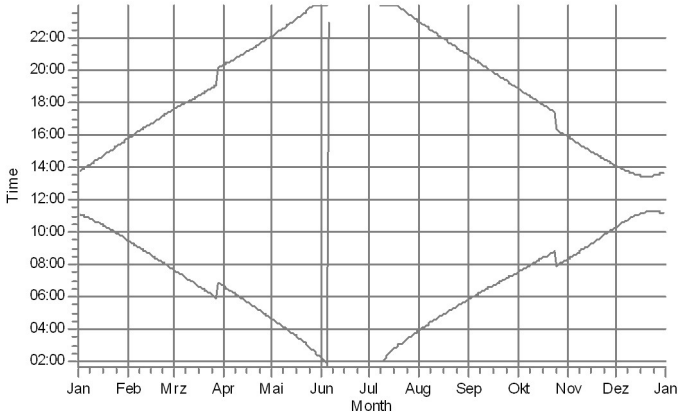
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

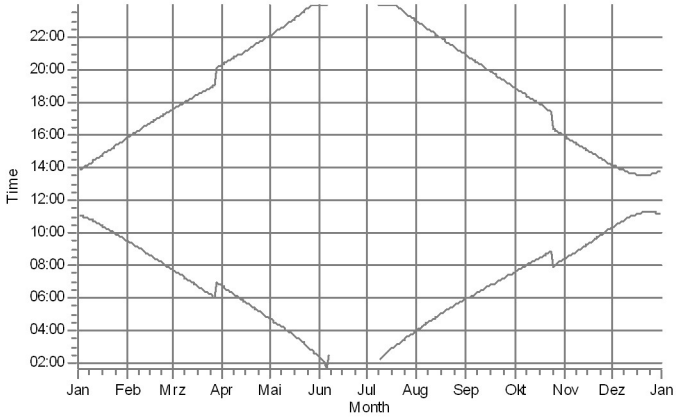
Ajanki 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (696)



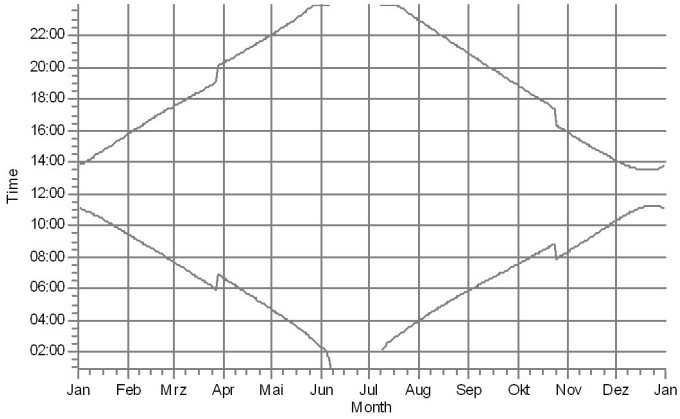
Ajanki 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (697)



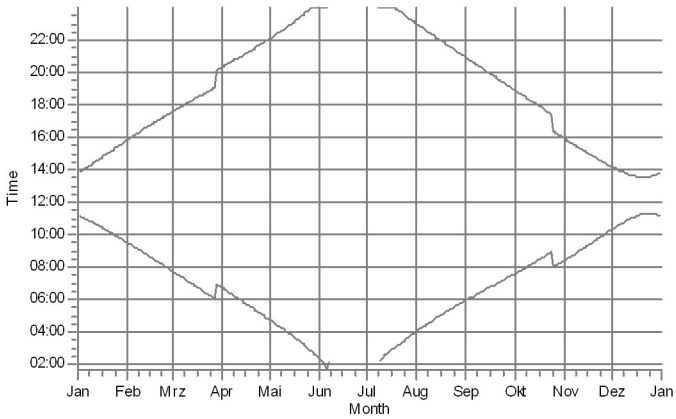
Asuntola: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (701)



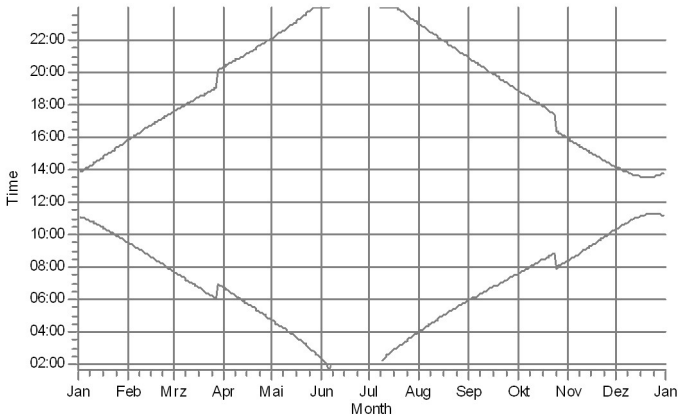
Kainuunraja: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (702)



Kauhajärvi 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (691



Kauhajärvi 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (692



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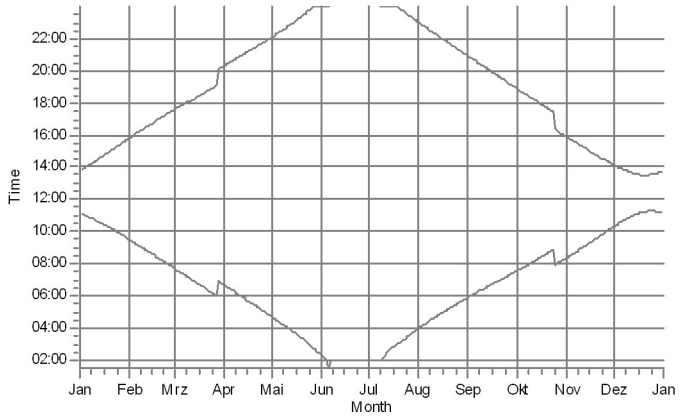
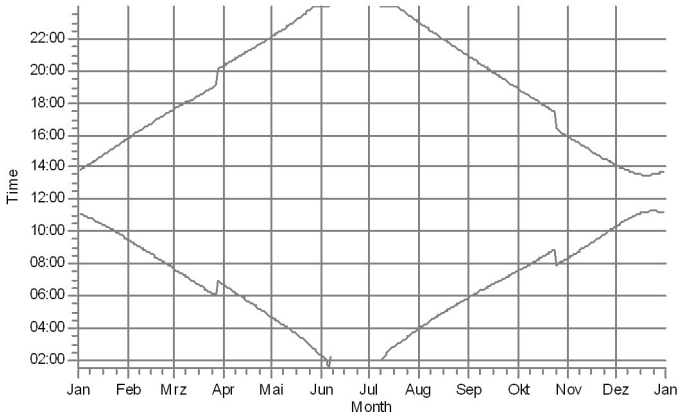
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

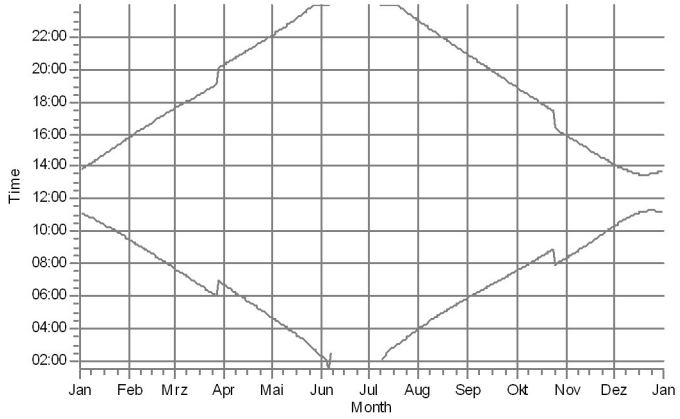
Koskenniemi 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



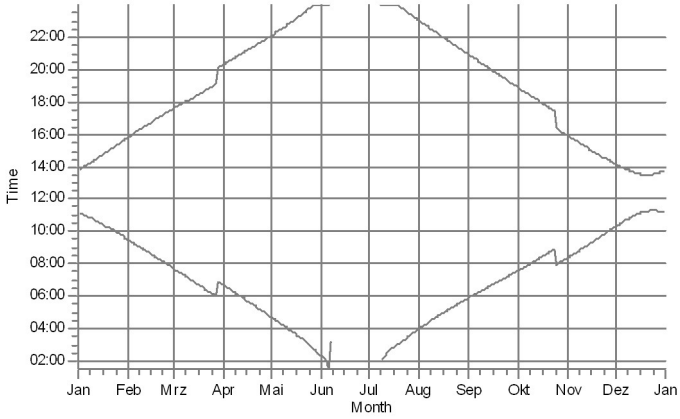
Koskenniemi 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



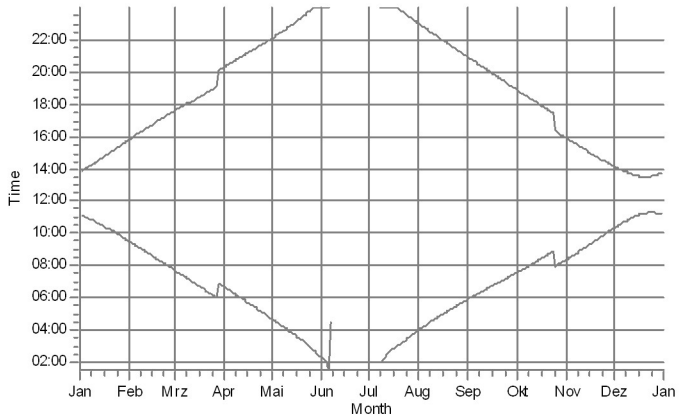
Koskenniemi 3: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



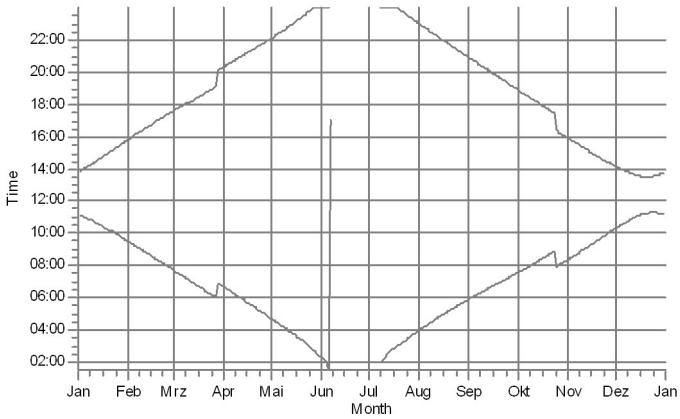
Koskenniemi 4: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



Koskenniemi 5: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



Koskenniemi 6: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



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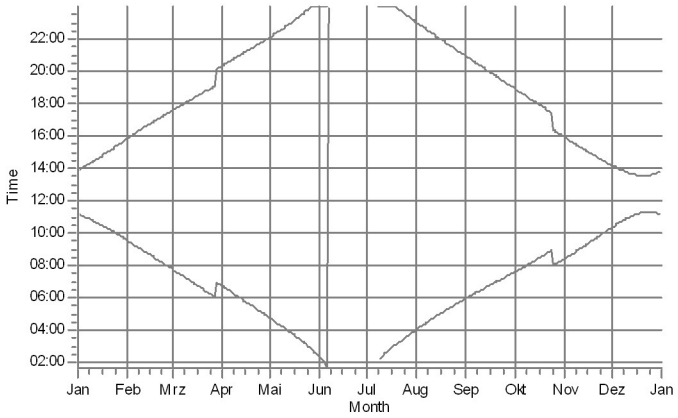
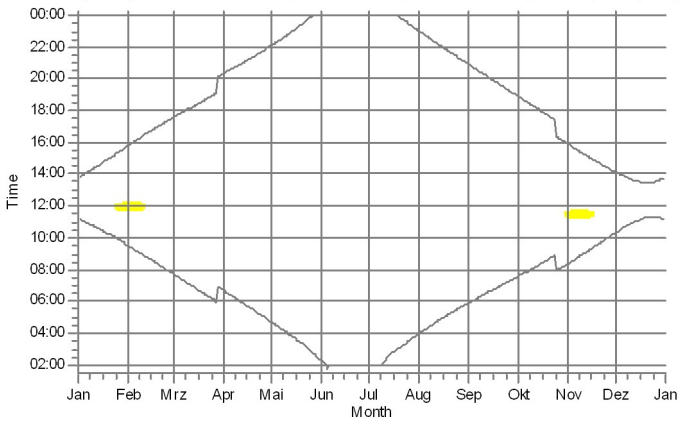
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

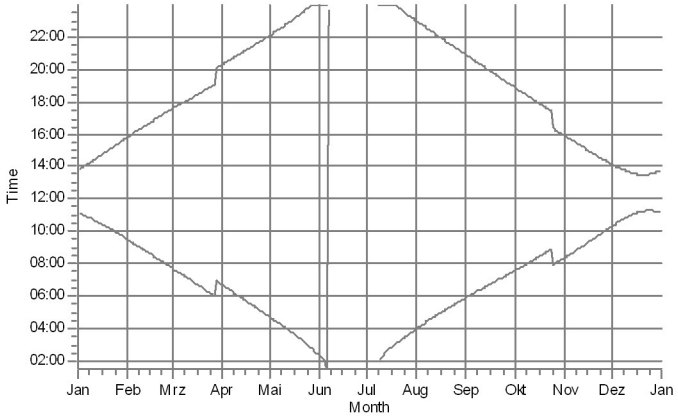
Lehtilaki: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (698)



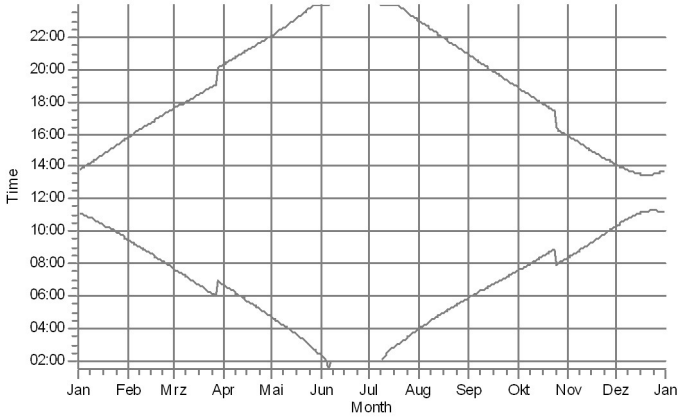
Metsästysmaja: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (6



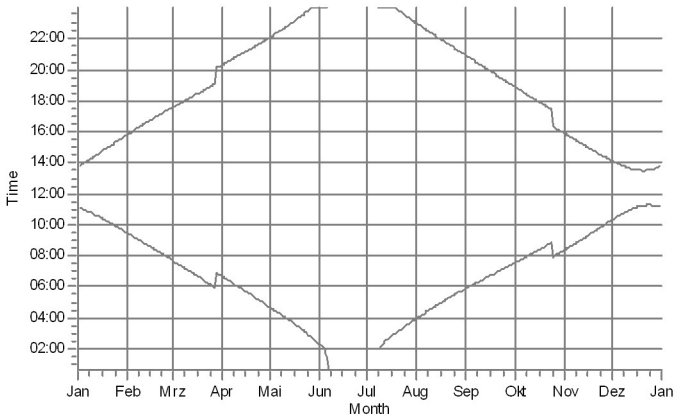
Pahtajärvi 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (693)



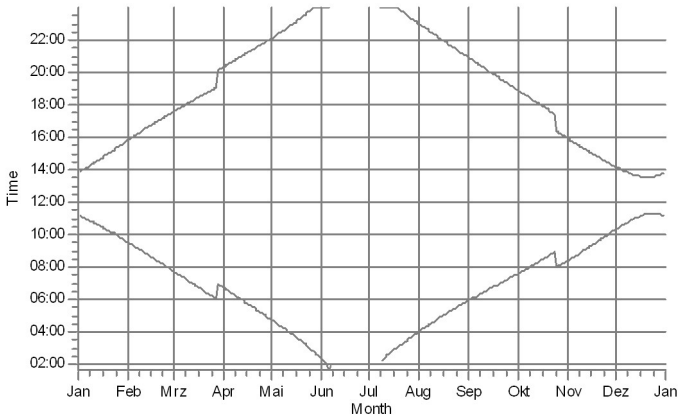
Pahtajärvi 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (694)



Pahtajärvi 3: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (695)



Pessala 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (699)



WTGs

WTG 04: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (327)

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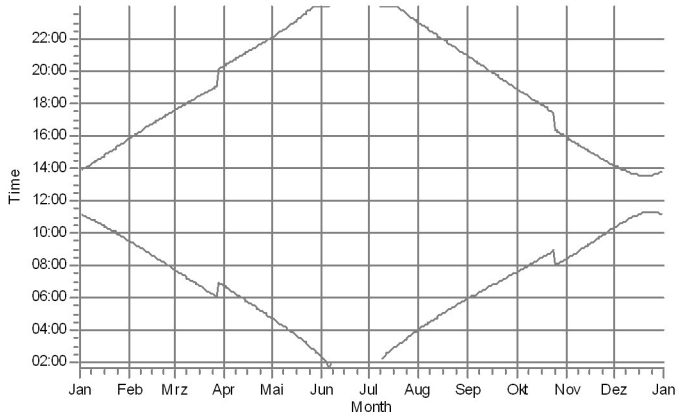
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

Pessala 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (700)



WTGs

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Calculated:
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SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 03 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (326)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:28		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:53	15:56	17:40	20:25	22:13	00:42		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:44		04:15	06:07	07:46	08:35	10:34
	14:00	16:04	17:47	20:32	22:21	01:01		22:43	20:37	18:39	15:40	13:55
6	10:57	09:10	07:23	06:21	04:20	00:40		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:39	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:07	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:03	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:54	22:26	20:21	18:23	15:25	13:44
10	10:45	08:55	07:08	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:46		00:40	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:31	08:09	09:02	10:58
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:28	22:10	20:05	18:08	15:10	13:36
14	10:33	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:06
	14:39	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:07	21:53	19:50	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:30	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:14
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:28
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:12		03:14	05:19	07:03	08:44	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:02		03:24	05:26	07:10	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:43	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:32
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:17	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:38
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:13	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:51		08:16		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	692	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 04 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (327)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29 11:45-12:06/21	07:43	06:41	04:41	02:16		03:59	05:54	07:32	08:20 11:19-11:33/14	10:18
	13:47	15:48	17:33	20:18	22:05	00:28		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25 11:45-12:07/22	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24 11:18-11:35/17	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22 11:45-12:07/22	07:35	06:33	04:32	02:03		04:07	06:01	07:39	08:27 11:16-11:35/19	10:26
	13:53	15:56	17:40	20:25	22:13	00:42		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18 11:45-12:07/22	07:31	06:29	04:28	01:54		04:11	06:04	07:42	08:31 11:16-11:36/20	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:43	13:58
5	10:59	09:14 11:46-12:07/21	07:27	06:25	04:24	01:44		04:15	06:07	07:45	08:35 11:15-11:36/21	10:34
	14:00	16:04	17:47	20:32	22:21	01:01		22:43	20:37	18:39	15:40	13:55
6	10:57	09:10 11:46-12:07/21	07:23	06:21	04:20	02:19		04:19	06:11	07:49	08:39 11:15-11:37/22	10:37
	14:04	16:08	17:50	20:35	22:25			22:39	20:33	18:35	15:36	13:52
7	10:54	09:07 11:46-12:06/20	07:19	06:17	04:16			04:23	06:14	07:52	08:43 11:15-11:37/22	10:41
	14:07	16:11	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:49
8	10:51	09:03 11:47-12:05/18	07:15	06:13	04:12			04:27	06:17	07:55	08:47 11:16-11:37/21	10:45
	14:11	16:15	17:57	20:42	22:33		01:03	22:30	20:25	18:27	15:28	13:47
9	10:48	08:59 11:48-12:04/16	07:11	06:09	04:08		02:05	04:31	06:21	07:59	08:50 11:15-11:37/22	10:48
	14:15	16:19	18:01	20:45	22:37		00:54	22:26	20:21	18:23	15:25	13:44
10	10:45	08:55 11:50-12:04/14	07:08	06:05	04:03		02:13	04:35	06:24	08:02	08:54 11:16-11:37/21	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52 11:52-12:01/9	07:04	06:01	03:59		02:20	04:39	06:27	08:06	08:58 11:16-11:37/21	10:55
	14:23	16:27	18:07	20:52	22:46		00:40	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02 11:17-11:36/19	10:58
	14:26	16:31	18:11	20:56	22:50		00:34	22:14	20:09	18:12	15:14	13:37
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06 11:18-11:36/18	11:01
	14:30	16:35	18:14	20:59	22:54		00:28	22:10	20:05	18:08	15:10	13:35
14	10:33	08:40	06:52	05:49	03:46		02:39	04:50	06:37	08:16	09:10 11:19-11:35/16	11:03
	14:34	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14 11:21-11:34/13	11:06
	14:38	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:49	04:57	06:44	08:23	09:18 11:22-11:32/10	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22 11:25-11:29/4	11:10
	14:47	16:49	18:28	21:13	23:11		00:07	21:53	19:50	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:14
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:28
20	10:12	08:17	06:28	05:25	03:20		03:05	05:12	06:56	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:11		03:14	05:19	07:03	08:44	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:37	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:02		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55 11:52-11:57/5	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:43	23:49		23:30	21:21	19:18	16:21	14:27	13:31
26	09:51 11:49-11:59/10	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:32
27	09:47 11:48-12:02/14	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:27	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44 11:47-12:03/16	07:46	05:57	04:53	02:38		03:41	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:17	21:09	19:06	16:10	14:17	13:36
29	09:40 11:46-12:04/18		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:38
30	09:36 11:45-12:05/20		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:16		23:08	21:01	18:58	16:02	14:10	13:41
31	09:33 11:46-12:06/20		06:45		02:22		03:54	05:50		08:16 11:21-11:31/10		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:43
Potential sun hours	134	225	362	463	606	690	669	528	397	296	172	83
Sum of minutes with flicker	103	206	0	0	0	0	0	0	0	10	300	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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 05 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (328)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:45		04:15	06:07	07:46	08:35	10:34
	14:00	16:04	17:47	20:32	22:21	01:00		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	17:08		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:07	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:06
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:07	21:53	19:50	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:44	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:51		08:16		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	699	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 06 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (329)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:42	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:28		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:32	02:03		04:07	06:01	07:39	08:27	10:26
	13:53	15:56	17:40	20:25	22:13	00:42		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:43	13:58
5	10:59	09:14	07:27	06:25	04:24	01:44		04:15	06:07	07:45	08:35	10:34
	14:00	16:04	17:47	20:32	22:21	01:01		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	00:50		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:07	16:11	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:03	22:30	20:25	18:27	15:28	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:00	20:45	22:37		00:54	22:26	20:21	18:23	15:25	13:44
10	10:45	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:20	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:28	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:06
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:43	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:07	21:53	19:49	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:14
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:28
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:20	05:17	03:12		03:14	05:19	07:03	08:43	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:02		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:32
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
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	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:50		08:16		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	692	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 07 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (330)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:29	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:45		04:15	06:07	07:46	08:35	10:33
	14:00	16:04	17:47	20:32	22:21	01:00		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	02:36		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
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17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:49	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:44	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:16
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Potential sun hours	134	225	362	463	606	690	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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
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SHADOW - Calendar per WTG

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Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:42	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:45		04:15	06:07	07:45	08:35	10:33
	14:00	16:04	17:47	20:32	22:21	01:00		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:31		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:22	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:32	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:22	08:05	10:06	11:15
	15:32	17:29	19:04	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:50		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 09 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (332)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:05
3	11:04	09:22	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:29	01:56		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:46	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:25		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:16	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:20	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:18	13:40
12	10:39	08:48	07:00	05:57	03:55		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:05	20:01	18:04	15:07	13:34
15	10:29	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:33	06:44	05:41	03:38		02:50	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:54	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:49	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:13	06:25	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:44	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:16	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:58	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:59	16:03	14:11	13:41
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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

Licensed user:
wpd AG
Stephanitorsbollwerk 3 (Haus LUV)
DE-28211 Bremen
+49 7142 77810
Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 10 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (333)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:29	01:56		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:59		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:25		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:41	03:38		02:50	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:01	21:49	19:46	17:49	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:16	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:03	14:11	13:41
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 11 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (334)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:54	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:21	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:00	16:04	17:47	20:32	22:21	00:59		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:00		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:33	22:14	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:22	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:01	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:15
	15:32	17:29	19:04	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:55	05:50		08:16		11:10
	15:44		20:15		00:21		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 12 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (335)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:43	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:04	09:22	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:02
4	11:01	09:18	07:31	06:29	04:29	01:56		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:25	04:25	01:46		04:15	06:07	07:46	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:59		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:28		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:01	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:20	15:21	13:43
11	10:42	08:51	07:04	06:01	04:00		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:18	13:40
12	10:39	08:48	07:00	05:57	03:55		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:50	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:05	20:01	18:04	15:07	13:34
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:42	03:38		02:50	04:58	06:44	08:23	09:18	11:07
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:38	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:31
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:16		00:01	21:49	19:46	17:49	14:52	13:30
19	10:16	08:21	06:32	05:29	03:25		03:00	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:13	06:25	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:20	05:23	07:06	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:59	16:03	14:11	13:42
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 13 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (336)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

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	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:54	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:04
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:59		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:28		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
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8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
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	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:42
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	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
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	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
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	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:06	13:34
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20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
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24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:17
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18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
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	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:08
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3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:25
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9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:01	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:43
11	10:41	08:51	07:04	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:40
12	10:38	08:48	07:00	05:57	03:55		02:28	04:43	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:53		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:31
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:42	21:33	19:30	17:33	14:38	13:29
23	10:01	08:06	06:17	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:44
Potential sun hours	135	225	362	463	606	692	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 16 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (339)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:54	15:55	14:08
2	11:06	09:25	07:38	06:37	04:37	02:11		04:03	05:57	07:35	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:58
5	10:58	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:58		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:29		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25	01:16		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	02:03		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:01	22:30	20:25	18:27	15:29	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:42
11	10:41	08:51	07:03	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:15	15:17	13:40
12	10:38	08:48	07:00	05:57	03:55		02:28	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:02
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:16
	15:11	17:11	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:32		06:45		02:23		03:55	05:50		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 17 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (340)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:29	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:48		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:57		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:33		04:19	06:11	07:49	08:39	10:37
	14:05	16:08	17:50	20:35	22:25	01:13		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	03:40		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:08	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:20	15:21	13:43
11	10:41	08:51	07:04	06:02	04:00		02:22	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:51		02:34	04:47	06:34	08:12	09:06	10:59
	14:31	16:35	18:14	20:59	22:54		00:26	22:09	20:05	18:08	15:10	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:38	03:34		02:56	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:31
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:52	13:30
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:28	05:26	03:21		03:06	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:22	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:04	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:08	17:08	18:44	21:31	23:34		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:35	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:34
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
	15:32	17:29	19:05	21:54	00:03		23:16	21:09	19:06	16:10	14:18	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	463	606	712	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 18 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (341)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:11		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:47	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:24	01:47		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:58		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:32		04:19	06:11	07:49	08:38	10:37
	14:04	16:08	17:50	20:35	22:25	01:13		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	02:51		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:15	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:43
11	10:41	08:51	07:03	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:16	15:18	13:40
12	10:38	08:47	07:00	05:57	03:55		02:28	04:43	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:58	06:43	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:31
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:12
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:29
23	10:01	08:05	06:16	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:11	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:16	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:08	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:59		13:44
Potential sun hours	135	225	362	463	606	689	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:26/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RCWTG: WTG 19 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (342)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [SODANKYLA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,34	2,00	3,92	6,70	7,94	9,26	8,84	6,04	3,51	1,99	0,75	0,02

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
797	454	463	456	529	613	1.497	1.176	637	555	601	769	8.547

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	11:07	09:29	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:03	05:57	07:36	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:48		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:57		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:21	01:33		04:19	06:11	07:49	08:39	10:36
	14:05	16:08	17:50	20:35	22:25	01:12		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	21:28		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:51	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:21	13:43
11	10:41	08:51	07:04	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:56
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:51		02:34	04:47	06:34	08:12	09:06	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:38	03:34		02:56	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:31
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:52	13:30
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:30	11:12
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:28	05:26	03:21		03:06	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:04	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:35	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:50	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:15
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:34
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
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28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:18	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:40
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	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	463	606	694	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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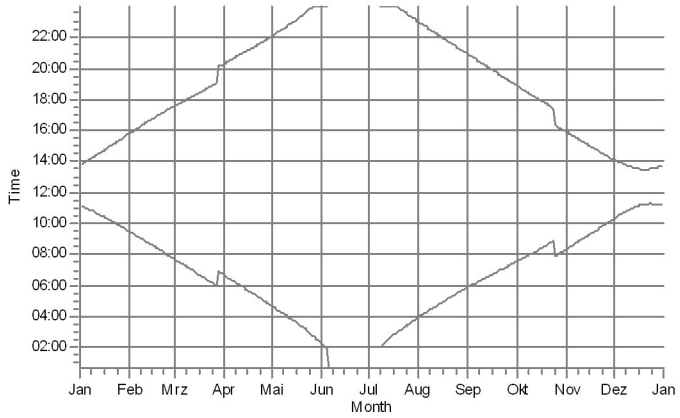
Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:26/3.4.415

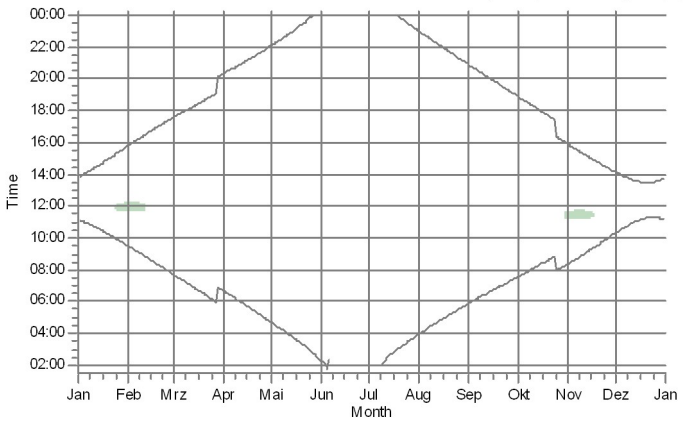
SHADOW - Calendar per WTG, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

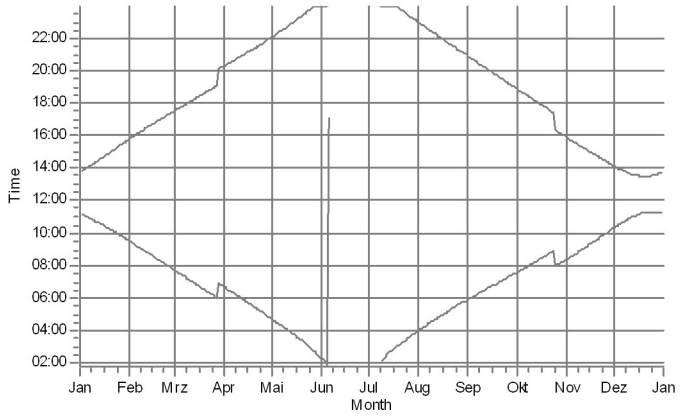
WTG 03: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



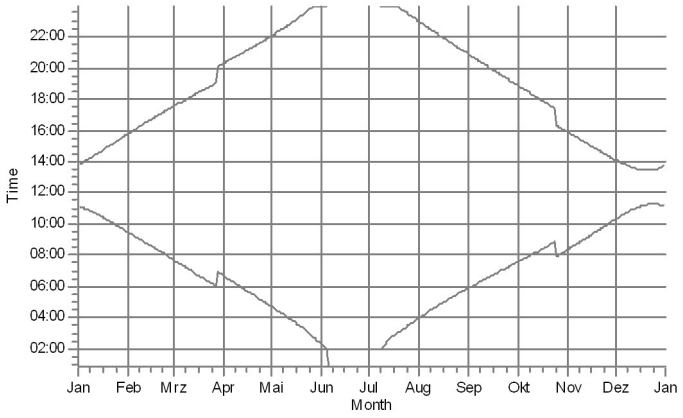
WTG 04: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



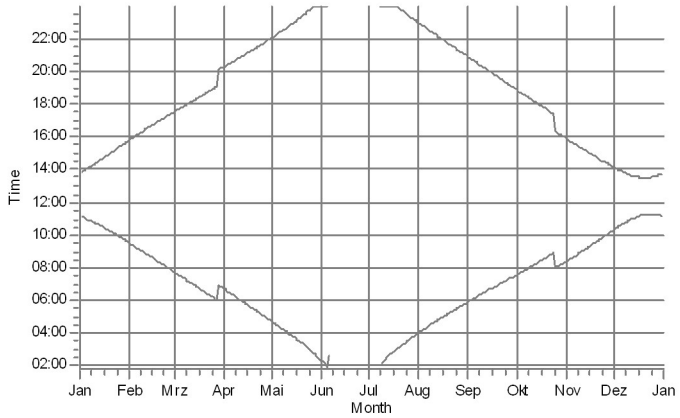
WTG 05: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



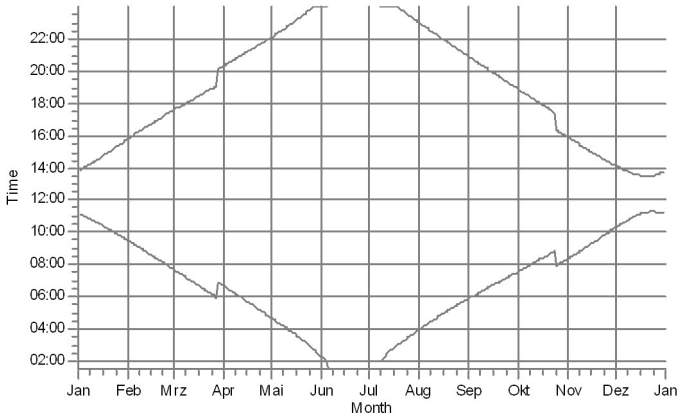
WTG 06: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 07: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 08: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



Shadow receptors

Metsästysmaja: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (690)

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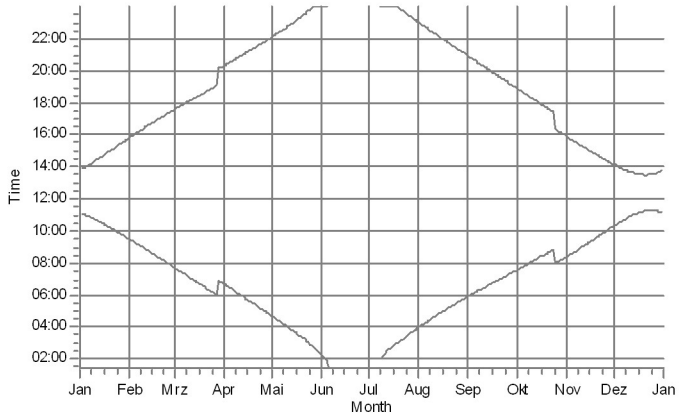
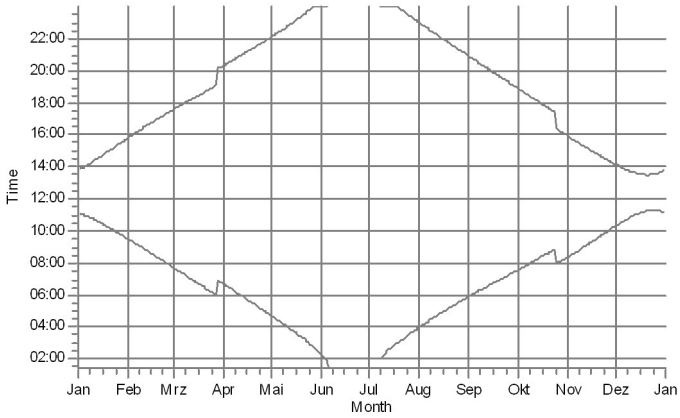
SHADOW - Calendar per WTG, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

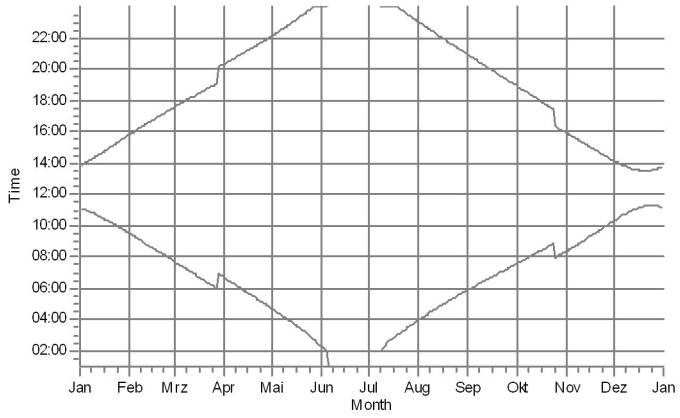
WTG 09: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



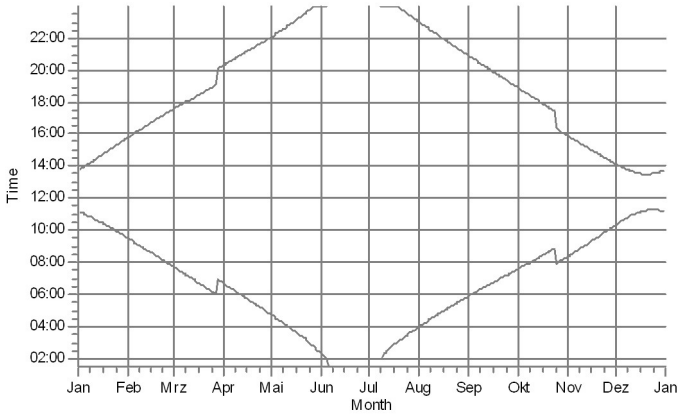
WTG 10: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



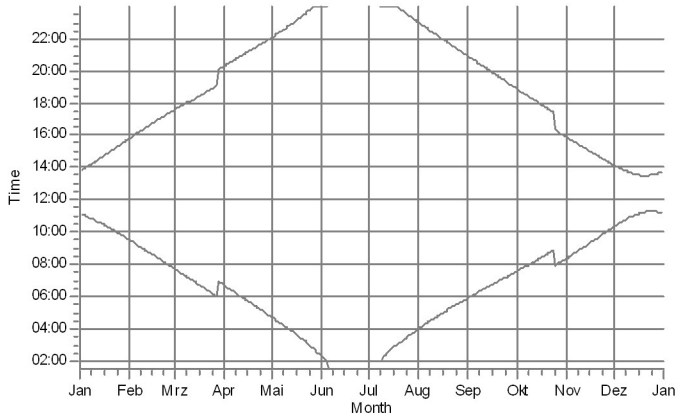
WTG 11: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



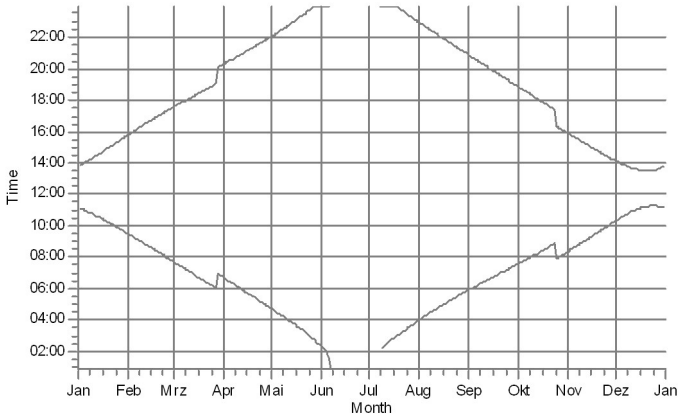
WTG 12: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 13: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 14: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



Shadow receptors

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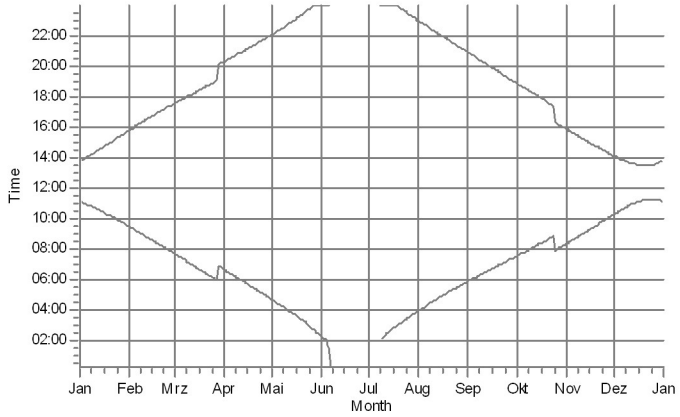
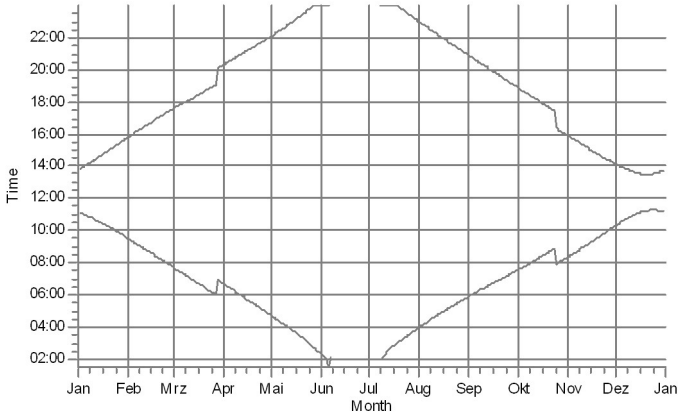
SHADOW - Calendar per WTG, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC

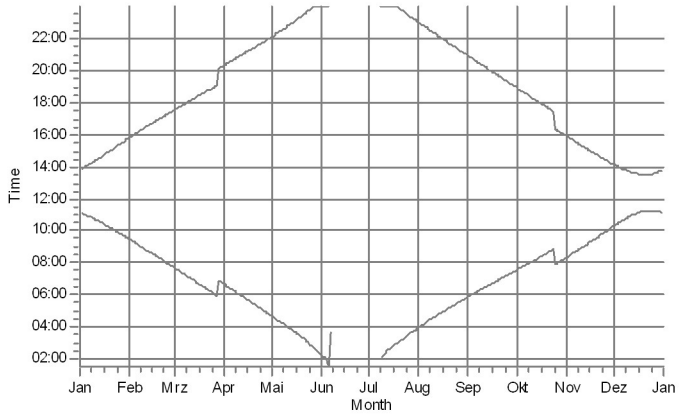
WTG 15: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



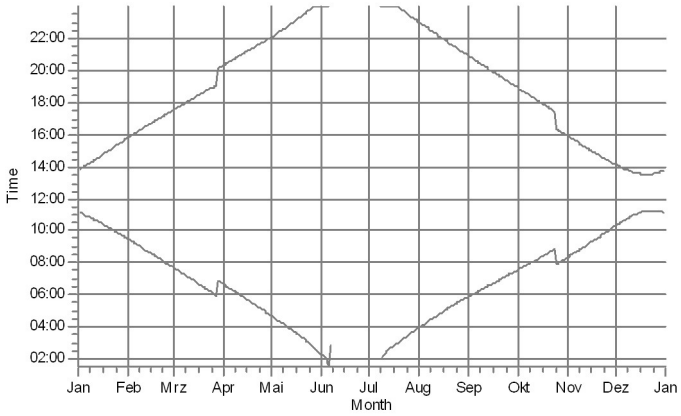
WTG 16: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



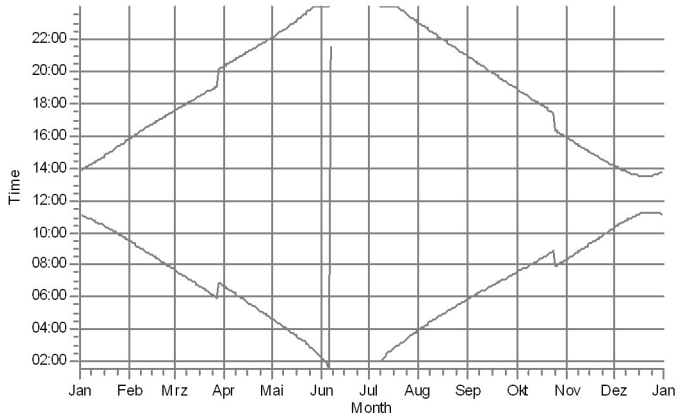
WTG 17: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 18: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 19: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



Shadow receptors

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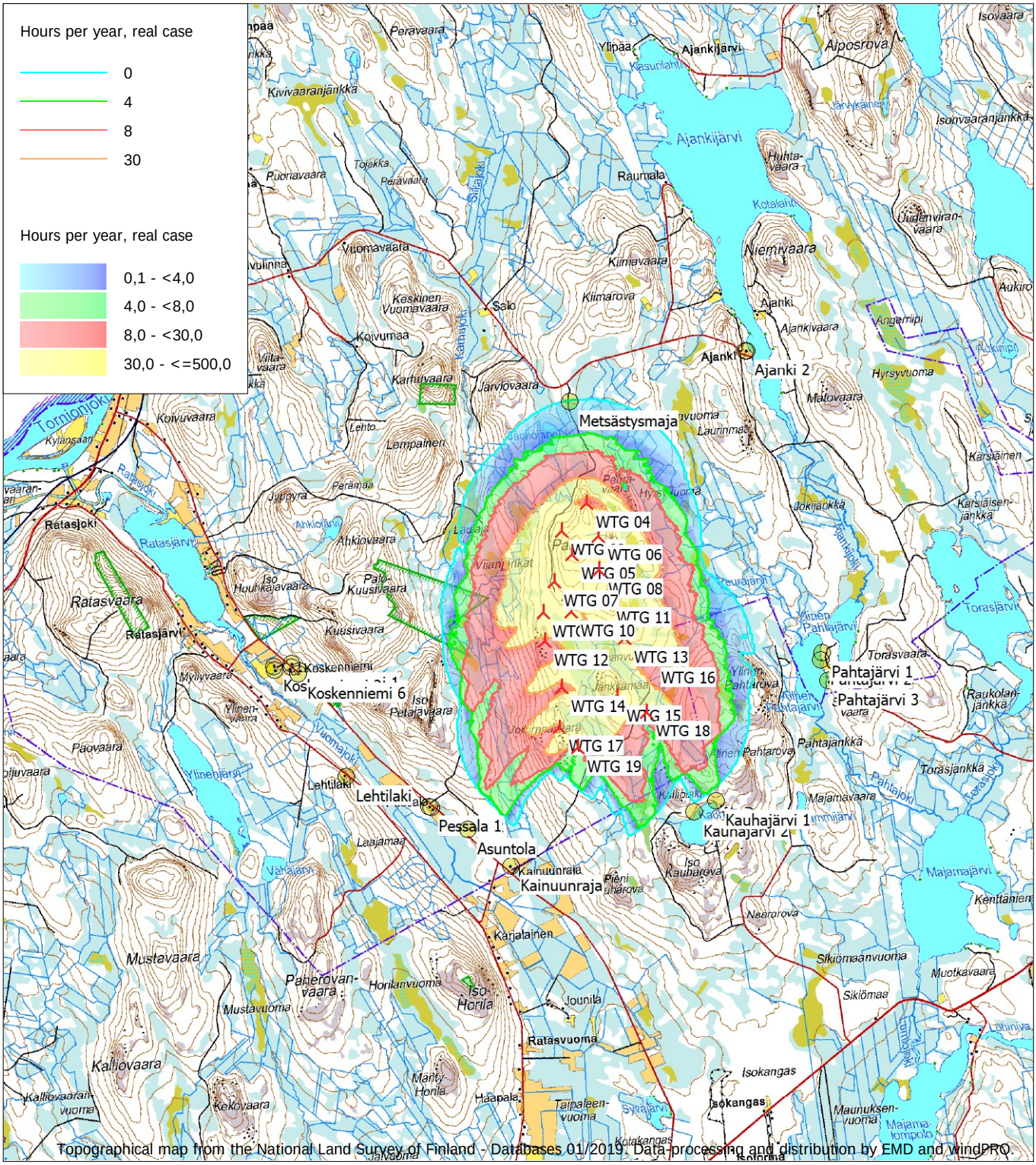
Calculated:
17.09.2021 08:26/3.4.415

SHADOW - Map

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, RC



0 1 2 3 4 km

Map: Finnish Topographic Map , Print scale 1:100.000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 368.160 North: 7.382.280

New WTG Shadow receptor

Flicker map level: DEM FI+SE

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Palovaara, Pello

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SHADOW - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

Assumptions for shadow calculations

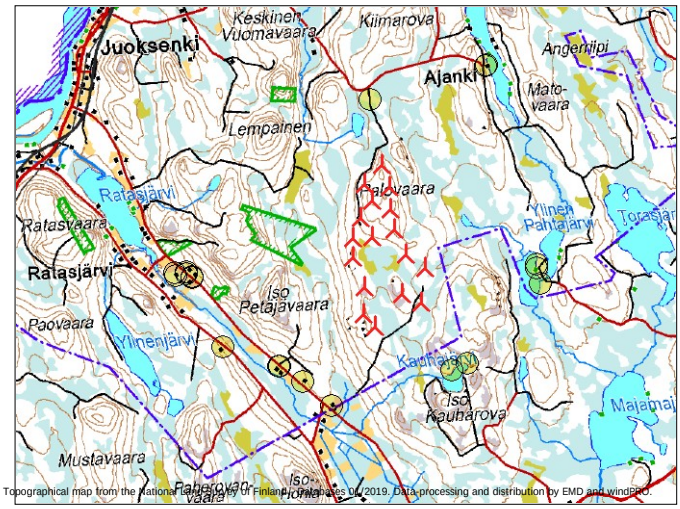
Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

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

Line-of-sight calculation has been deactivated. This means that sheltering from obstacles, areas or hills are not taken into account.

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



WTGs

	East	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]
WTG 03	368.490	7.382.686	224,8	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 04	368.962	7.383.166	231,2	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 05	368.656	7.382.253	240,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 06	369.135	7.382.575	229,4	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 07	368.329	7.381.799	208,6	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 08	369.118	7.381.981	239,3	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 09	368.107	7.381.273	191,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 10	368.598	7.381.270	198,9	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 11	369.227	7.381.467	229,2	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 12	368.108	7.380.770	199,4	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 13	369.508	7.380.765	193,7	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 14	368.369	7.379.963	190,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 15	369.338	7.379.748	201,8	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 16	369.959	7.380.380	174,8	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 17	368.303	7.379.244	180,0	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 18	369.824	7.379.462	179,3	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8
WTG 19	368.603	7.378.892	170,1	NORDEX N163/6.X 6800 163...	Yes	NORDEX	N163/6.X-6.800	6.800	163,0	168,5	1.784	11,8

Shadow receptor-Input

No.	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
Ajanki 1	371.874	7.385.678	120,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Ajanki 2	371.842	7.385.676	120,1	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Asuntola	366.608	7.377.543	73,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Kainuunraja	367.325	7.376.870	72,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Kauhajärvi 1	370.975	7.377.840	184,2	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Kauhajärvi 2	370.574	7.377.669	180,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 1	363.667	7.380.593	72,2	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 2	363.362	7.380.565	66,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 3	363.662	7.380.526	70,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 4	363.375	7.380.502	65,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 5	363.805	7.380.458	73,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Koskenniemi 6	363.785	7.380.418	70,7	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Lehtilaki	364.527	7.378.562	93,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Metsästysmaja	368.740	7.384.928	190,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pahtajärvi 1	372.940	7.380.355	110,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pahtajärvi 2	372.919	7.380.235	110,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pahtajärvi 3	373.024	7.379.850	110,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0

To be continued on next page...

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17.09.2021 08:27/3.4.415

SHADOW - Main Result

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

...continued from previous page

No.	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
Pessala 1	365.959	7.377.974	71,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Pessala 2	365.996	7.377.961	70,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
Ajanki 1	0:00	0	0:00
Ajanki 2	0:00	0	0:00
Asuntola	0:00	0	0:00
Kainuunraja	0:00	0	0:00
Kauhajärvi 1	0:00	0	0:00
Kauhajärvi 2	0:00	0	0:00
Koskenniemi 1	0:00	0	0:00
Koskenniemi 2	0:00	0	0:00
Koskenniemi 3	0:00	0	0:00
Koskenniemi 4	0:00	0	0:00
Koskenniemi 5	0:00	0	0:00
Koskenniemi 6	0:00	0	0:00
Lehtilaki	0:00	0	0:00
Metsästysmaja	10:19	36	0:22
Pahtajärvi 1	0:00	0	0:00
Pahtajärvi 2	0:00	0	0:00
Pahtajärvi 3	0:00	0	0:00
Pessala 1	0:00	0	0:00
Pessala 2	0:00	0	0:00

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

No.	Name	Worst case [h/year]
WTG 03	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (326)	0:00
WTG 04	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (327)	10:19
WTG 05	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (328)	0:00
WTG 06	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (329)	0:00
WTG 07	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (330)	0:00
WTG 08	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (331)	0:00
WTG 09	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (332)	0:00
WTG 10	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (333)	0:00
WTG 11	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (334)	0:00
WTG 12	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (335)	0:00
WTG 13	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (336)	0:00
WTG 14	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (337)	0:00
WTG 15	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (338)	0:00
WTG 16	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (339)	0:00
WTG 17	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (340)	0:00
WTG 18	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (341)	0:00
WTG 19	NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (342)	0:00

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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Ajanki 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (696)

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	11:09	09:29	07:42	06:41	04:40	02:15		03:58	05:53	07:32	08:20	10:19
	13:46	15:47	17:32	20:18	22:05	00:29		23:00	20:53	18:54	15:54	14:07
2	11:07	09:25	07:38	06:37	04:36	02:08		04:02	05:57	07:35	08:24	10:22
	13:49	15:51	17:36	20:21	22:09	00:35		22:55	20:49	18:50	15:51	14:03
3	11:05	09:22	07:35	06:33	04:32	02:01		04:06	06:00	07:39	08:27	10:26
	13:52	15:55	17:39	20:25	22:13	00:43		22:51	20:45	18:46	15:47	14:00
4	11:02	09:18	07:31	06:29	04:28	01:52		04:10	06:04	07:42	08:31	10:30
	13:56	15:59	17:43	20:28	22:17	00:52		22:47	20:41	18:43	15:43	13:57
5	11:00	09:14	07:27	06:25	04:24	01:41		04:14	06:07	07:45	08:35	10:34
	13:59	16:03	17:46	20:31	22:21	01:04		22:43	20:37	18:39	15:39	13:54
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7	10:54	09:07	07:19	06:17	04:15			04:22	06:14	07:52	08:43	10:41
	14:06	16:11	17:53	20:38	22:29			22:34	20:29	18:31	15:32	13:49
8	10:51	09:03	07:15	06:13	04:11			04:26	06:17	07:55	08:47	10:45
	14:10	16:15	17:57	20:42	22:33		01:05	22:30	20:25	18:27	15:28	13:46
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11	10:42	08:52	07:03	06:01	03:59		02:19	04:38	06:27	08:05	08:58	10:55
	14:22	16:26	18:07	20:52	22:46		00:41	22:18	20:13	18:15	15:17	13:39
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13	10:36	08:44	06:56	05:53	03:50		02:32	04:46	06:33	08:12	09:06	11:01
	14:30	16:34	18:14	20:59	22:54		00:28	22:10	20:05	18:07	15:09	13:34
14	10:33	08:40	06:52	05:49	03:46		02:37	04:49	06:37	08:16	09:10	11:04
	14:34	16:38	18:17	21:03	22:58		00:23	22:06	20:01	18:04	15:06	13:33
15	10:29	08:36	06:48	05:45	03:42		02:43	04:53	06:40	08:19	09:14	11:06
	14:38	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:02	13:31
16	10:26	08:32	06:44	05:41	03:37		02:48	04:57	06:43	08:22	09:18	11:09
	14:42	16:45	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:58	13:30
17	10:23	08:29	06:40	05:37	03:33		02:54	05:01	06:46	08:26	09:22	11:11
	14:46	16:49	18:27	21:13	23:12		00:07	21:53	19:49	17:52	14:55	13:29
18	10:19	08:25	06:36	05:33	03:29		02:59	05:04	06:50	08:29	09:26	11:13
	14:50	16:53	18:31	21:17	23:16		00:02	21:49	19:45	17:48	14:51	13:28
19	10:16	08:21	06:32	05:29	03:24		03:04	05:08	06:53	08:33	09:30	11:14
	14:54	16:57	18:34	21:20	23:21		23:57	21:45	19:41	17:44	14:48	13:27
20	10:12	08:17	06:28	05:25	03:20		03:04	05:12	06:56	08:36	09:34	11:16
	14:58	17:00	18:37	21:24	23:25		23:53	21:41	19:37	17:40	14:44	13:27
21	10:09	08:13	06:24	05:21	03:15		03:09	05:15	06:59	08:40	09:38	11:17
	15:02	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:36	14:40	13:27
22	10:05	08:09	06:20	05:17	03:11		03:14	05:19	07:03	08:43	09:42	11:17
	15:06	17:07	18:44	21:31	23:35		23:43	21:33	19:30	17:33	14:37	13:27
23	10:02	08:06	06:16	05:13	03:06		03:18	05:22	07:06	08:47	09:46	11:18
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:33	13:28
24	09:58	08:02	06:12	05:09	03:02		03:23	05:26	07:09	08:51	09:50	11:18
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:30	13:28
25	09:55	07:58	06:08	05:05	02:52		03:27	05:29	07:12	07:54	09:55	11:18
	15:19	17:18	18:54	21:42	23:49		23:30	21:21	19:18	16:21	14:26	13:30
26	09:51	07:54	06:04	05:01	02:47		03:32	05:33	07:16	07:58	09:59	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:17	14:23	13:31
27	09:47	07:50	06:01	04:57	02:42		03:36	05:36	07:19	08:01	10:03	11:17
	15:27	17:25	19:01	21:50	00:00		23:21	21:13	19:10	16:13	14:20	13:33
28	09:44	07:46	05:57	04:52	02:37		03:41	05:40	07:22	08:05	10:07	11:16
	15:31	17:29	19:04	21:54	00:05		23:17	21:09	19:06	16:10	14:16	13:35
29	09:40		06:53	04:48	02:32		03:45	05:43	07:26	08:09	10:11	11:14
	15:35		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:13	13:37
30	09:36		06:49	04:44	02:26		03:49	05:47	07:29	08:12	10:15	11:13
	15:39		20:11	22:01	00:16		23:08	21:01	18:58	16:02	14:10	13:40
31	09:33		06:45		02:21		03:54	05:50		08:16		11:11
	15:43		20:14		00:22		23:04	20:57		15:58		13:42
Potential sun hours Total, worst case	133	225	362	463	607	694	670	528	397	296	172	82

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Ajanki 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (697)

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	11:09	09:29	07:42	06:41	04:40	02:15		03:58	05:53	07:32	08:20	10:19
	13:46	15:47	17:32	20:18	22:05	00:29		23:00	20:53	18:54	15:54	14:07
2	11:07	09:25	07:38	06:37	04:36	02:08		04:02	05:57	07:35	08:24	10:22
	13:49	15:51	17:36	20:21	22:09	00:35		22:55	20:49	18:50	15:51	14:03
3	11:05	09:22	07:35	06:33	04:32	02:01		04:06	06:00	07:39	08:27	10:26
	13:52	15:55	17:39	20:25	22:13	00:43		22:51	20:45	18:46	15:47	14:00
4	11:02	09:18	07:31	06:29	04:28	01:52		04:10	06:04	07:42	08:31	10:30
	13:56	15:59	17:43	20:28	22:17	00:52		22:47	20:41	18:43	15:43	13:57
5	11:00	09:14	07:27	06:25	04:24	01:41		04:14	06:07	07:45	08:35	10:34
	13:59	16:03	17:46	20:31	22:21	01:04		22:43	20:37	18:39	15:39	13:54
6	10:57	09:10	07:23	06:21	04:20	22:56		04:18	06:10	07:49	08:39	10:38
	14:03	16:07	17:50	20:35	22:25			22:39	20:33	18:35	15:35	13:51
7	10:54	09:07	07:19	06:17	04:15			04:22	06:14	07:52	08:43	10:41
	14:06	16:11	17:53	20:38	22:29			22:34	20:29	18:31	15:32	13:49
8	10:51	09:03	07:15	06:13	04:11			04:26	06:17	07:55	08:47	10:45
	14:10	16:15	17:57	20:42	22:33		01:05	22:30	20:25	18:27	15:28	13:46
9	10:48	08:59	07:11	06:09	04:07		02:03	04:30	06:20	07:59	08:50	10:48
	14:14	16:19	18:00	20:45	22:37		00:55	22:26	20:21	18:23	15:24	13:43
10	10:45	08:55	07:07	06:05	04:03		02:12	04:34	06:24	08:02	08:54	10:52
	14:18	16:23	18:04	20:49	22:41		00:48	22:22	20:17	18:19	15:21	13:41
11	10:42	08:52	07:03	06:01	03:59		02:19	04:38	06:27	08:05	08:58	10:55
	14:22	16:26	18:07	20:52	22:46		00:41	22:18	20:13	18:15	15:17	13:39
12	10:39	08:48	06:59	05:57	03:54		02:25	04:42	06:30	08:09	09:02	10:58
	14:26	16:30	18:10	20:56	22:50		00:34	22:14	20:09	18:11	15:13	13:36
13	10:36	08:44	06:56	05:53	03:50		02:32	04:46	06:33	08:12	09:06	11:01
	14:30	16:34	18:14	20:59	22:54		00:28	22:10	20:05	18:07	15:09	13:34
14	10:33	08:40	06:52	05:49	03:46		02:37	04:49	06:37	08:16	09:10	11:04
	14:34	16:38	18:17	21:03	22:58		00:23	22:06	20:01	18:04	15:06	13:33
15	10:29	08:36	06:48	05:45	03:42		02:43	04:53	06:40	08:19	09:14	11:06
	14:38	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:02	13:31
16	10:26	08:32	06:44	05:41	03:37		02:48	04:57	06:43	08:22	09:18	11:09
	14:42	16:45	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:58	13:30
17	10:23	08:29	06:40	05:37	03:33		02:54	05:01	06:46	08:26	09:22	11:11
	14:46	16:49	18:27	21:13	23:12		00:07	21:53	19:49	17:52	14:55	13:29
18	10:19	08:25	06:36	05:33	03:29		02:59	05:04	06:50	08:29	09:26	11:13
	14:50	16:53	18:31	21:17	23:16		00:02	21:49	19:45	17:48	14:51	13:28
19	10:16	08:21	06:32	05:29	03:24		03:04	05:08	06:53	08:33	09:30	11:14
	14:54	16:57	18:34	21:20	23:21		23:57	21:45	19:41	17:44	14:48	13:27
20	10:12	08:17	06:28	05:25	03:20		03:04	05:12	06:56	08:36	09:34	11:16
	14:58	17:00	18:37	21:24	23:25		23:53	21:41	19:37	17:40	14:44	13:27
21	10:09	08:13	06:24	05:21	03:15		03:09	05:15	06:59	08:40	09:38	11:17
	15:02	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:36	14:40	13:27
22	10:05	08:09	06:20	05:17	03:11		03:14	05:19	07:03	08:43	09:42	11:17
	15:06	17:07	18:44	21:31	23:35		23:43	21:33	19:30	17:33	14:37	13:27
23	10:02	08:06	06:16	05:13	03:06		03:18	05:22	07:06	08:47	09:46	11:18
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:33	13:28
24	09:58	08:02	06:12	05:09	03:02		03:23	05:26	07:09	08:51	09:50	11:18
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:30	13:28
25	09:55	07:58	06:08	05:05	02:52		03:27	05:29	07:12	07:54	09:55	11:18
	15:19	17:18	18:54	21:42	23:49		23:30	21:21	19:18	16:21	14:26	13:30
26	09:51	07:54	06:04	05:01	02:47		03:32	05:33	07:16	07:58	09:59	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:17	14:23	13:31
27	09:47	07:50	06:01	04:57	02:42		03:36	05:36	07:19	08:01	10:03	11:17
	15:27	17:25	19:01	21:50	00:00		23:21	21:13	19:10	16:13	14:20	13:33
28	09:44	07:46	05:57	04:52	02:37		03:41	05:40	07:22	08:05	10:07	11:16
	15:31	17:29	19:04	21:54	00:05		23:17	21:09	19:06	16:10	14:16	13:35
29	09:40		06:53	04:48	02:32		03:45	05:43	07:26	08:09	10:11	11:14
	15:35		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:13	13:37
30	09:36		06:49	04:44	02:26		03:49	05:47	07:29	08:12	10:15	11:13
	15:39		20:11	22:01	00:16		23:08	21:01	18:58	16:02	14:10	13:40
31	09:33		06:45		02:21		03:54	05:50		08:16		11:11
	15:43		20:14		00:22		23:04	20:57		15:58		13:42
Potential sun hours	133	225	362	463	607	694	670	528	397	296	172	82
Total, worst case												

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Asuntola - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (701)

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	11:07	09:29	07:43	06:41	04:41	02:18		03:59	05:54	07:32	08:20	10:17
	13:49	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:04	05:58	07:36	08:23	10:21
	13:52	15:52	17:37	20:21	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:58		04:12	06:04	07:42	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:47		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:26	04:25	01:49		04:16	06:08	07:46	08:35	10:33
	14:02	16:04	17:47	20:32	22:21	00:56		22:42	20:37	18:39	15:40	13:56
6	10:55	09:10	07:23	06:22	04:21	01:36		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:50	20:35	22:25	01:10		22:38	20:33	18:35	15:37	13:54
7	10:53	09:06	07:19	06:18	04:17	02:27		04:24	06:14	07:52	08:42	10:40
	14:09	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:51
8	10:50	09:03	07:15	06:14	04:13			04:28	06:18	07:56	08:46	10:43
	14:12	16:16	17:57	20:42	22:33		00:59	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:12	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:51	22:26	20:21	18:24	15:25	13:46
10	10:44	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:24	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:22	13:43
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:27	08:06	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:37	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:41	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:36
15	10:29	08:36	06:48	05:46	03:43		02:46	04:54	06:41	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:15	22:01	19:58	18:00	15:03	13:34
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:24	21:10	23:06		00:10	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:30	11:12
	14:56	16:57	18:35	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:29	05:26	03:22		03:06	05:13	06:57	08:36	09:34	11:13
	15:00	17:01	18:38	21:24	23:24		23:51	21:41	19:38	17:41	14:45	13:30
21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:14
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:09	06:21	05:18	03:13		03:16	05:20	07:03	08:43	09:42	11:15
	15:08	17:08	18:45	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:14
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:06	16:11	14:18	13:38
29	09:40		06:53	04:49	02:35		03:47	05:44	07:26	08:09	10:10	11:12
	15:36		20:08	21:57	00:08		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:30		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:59	16:03	14:12	13:43
31	09:32		06:45		02:24		03:55	05:51		08:16		11:09
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours Total, worst case	135	225	362	462	605	689	668	527	397	296	173	84

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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Kainuunraja - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (702)

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	11:07	09:29	07:42	06:41	04:41	02:19		03:59	05:54	07:32	08:20	10:17
	13:49	15:48	17:33	20:18	22:05	00:25		22:59	20:53	18:55	15:55	14:09
2	11:05	09:25	07:39	06:37	04:37	02:13		04:04	05:58	07:36	08:23	10:21
	13:52	15:52	17:37	20:21	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:50	20:45	18:47	15:48	14:02
4	11:00	09:18	07:31	06:29	04:29	01:59		04:12	06:04	07:42	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:46		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:50		04:16	06:08	07:46	08:35	10:32
	14:02	16:04	17:47	20:32	22:21	00:55		22:42	20:37	18:39	15:40	13:57
6	10:55	09:10	07:23	06:22	04:21	01:37		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:50	20:35	22:25	01:09		22:38	20:33	18:35	15:37	13:54
7	10:53	09:06	07:19	06:18	04:17	00:55		04:24	06:14	07:52	08:42	10:40
	14:09	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:51
8	10:50	09:03	07:15	06:14	04:13			04:28	06:18	07:55	08:46	10:43
	14:12	16:16	17:57	20:42	22:33		00:58	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:50	22:26	20:21	18:24	15:25	13:46
10	10:44	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:24	18:04	20:49	22:41		00:43	22:22	20:17	18:20	15:22	13:44
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:27	08:05	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:37	22:17	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:31	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:41	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:20	22:05	20:01	18:04	15:07	13:36
15	10:28	08:36	06:48	05:46	03:43		02:46	04:54	06:40	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:15	22:01	19:57	18:00	15:03	13:34
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:22	09:18	11:06
	14:44	16:46	18:24	21:10	23:06		00:10	21:57	19:53	17:56	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:21	11:08
	14:48	16:50	18:28	21:13	23:11		00:05	21:53	19:50	17:53	14:56	13:32
18	10:18	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:25	11:10
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:29	11:12
	14:56	16:57	18:34	21:20	23:19		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:28	05:26	03:22		03:06	05:12	06:57	08:36	09:33	11:13
	15:00	17:01	18:38	21:24	23:24		23:51	21:41	19:38	17:41	14:45	13:30
21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:14
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:09	06:21	05:18	03:13		03:16	05:20	07:03	08:43	09:42	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:06	08:47	09:46	11:15
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:50	09:50	11:15
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:15
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:50	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:52		23:24	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:14
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28	09:43	07:46	05:57	04:53	02:40		03:43	05:41	07:23	08:05	10:06	11:13
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31	09:32		06:45		02:24		03:55	05:51		08:16		11:09
	15:44		20:15		00:19		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	85
Total, worst case												

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Kauhajärvi 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (691)

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	11:07	09:28	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:19	10:17
	13:48	15:48	17:33	20:18	22:05	00:25		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:12		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:32		22:54	20:49	18:50	15:51	14:05
3	11:03	09:21	07:34	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:24	22:12	00:39		22:50	20:45	18:47	15:47	14:02
4	11:00	09:17	07:31	06:29	04:29	01:58		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:16	00:47		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:24	01:49		04:15	06:07	07:45	08:34	10:32
	14:01	16:04	17:47	20:31	22:20	00:56		22:42	20:37	18:39	15:40	13:56
6	10:55	09:10	07:23	06:21	04:20	01:35		04:19	06:11	07:49	08:38	10:36
	14:05	16:08	17:50	20:35	22:24	01:10		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	02:00		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:43
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	14:16	16:19	18:00	20:45	22:36		00:51	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:16	04:35	06:24	08:02	08:54	10:50
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	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:37
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16	10:25	08:32	06:44	05:41	03:38		02:51	04:58	06:43	08:22	09:17	11:06
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18	10:18	08:24	06:36	05:33	03:30		03:01	05:05	06:50	08:29	09:25	11:10
	14:51	16:53	18:31	21:16	23:15		00:00	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:01	05:08	06:53	08:33	09:29	11:12
	14:55	16:57	18:34	21:20	23:19		23:56	21:45	19:41	17:45	14:49	13:30
20	10:11	08:17	06:28	05:25	03:21		03:06	05:12	06:56	08:36	09:33	11:13
	14:59	17:01	18:37	21:24	23:24		23:51	21:41	19:37	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:37	11:14
	15:03	17:04	18:41	21:27	23:28		23:47	21:37	19:34	17:37	14:41	13:29
22	10:04	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:41	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:05	06:16	05:13	03:08		03:20	05:23	07:06	08:47	09:45	11:15
	15:12	17:11	18:48	21:35	23:38		23:37	21:29	19:26	17:29	14:35	13:30
24	09:57	08:01	06:12	05:09	03:03		03:24	05:26	07:09	08:50	09:49	11:16
	15:16	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:53	11:15
	15:20	17:19	18:54	21:42	23:47		23:29	21:21	19:18	16:22	14:28	13:32
26	09:50	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:57	09:57	11:15
	15:24	17:22	18:58	21:46	23:52		23:24	21:17	19:14	16:18	14:24	13:34
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:01	11:14
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28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:05	11:13
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:18	13:37
29	09:39		06:53	04:49	02:34		03:46	05:44	07:26	08:08	10:09	11:12
	15:36		20:08	21:57	00:08		23:11	21:05	19:02	16:06	14:14	13:40
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:13	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:24		03:55	05:50		08:16		11:09
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Potential sun hours Total, worst case	135	225	362	462	605	690	668	527	397	296	173	84

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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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Kauhajärvi 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (692)

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	11:07	09:28	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:19	10:17
	13:48	15:48	17:33	20:18	22:05	00:25		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:12		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:32		22:54	20:49	18:50	15:51	14:05
3	11:03	09:21	07:34	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:24	22:12	00:39		22:50	20:45	18:47	15:47	14:02
4	11:00	09:17	07:31	06:29	04:29	01:58		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:16	00:47		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:49		04:15	06:07	07:45	08:34	10:32
	14:01	16:04	17:47	20:31	22:20	00:56		22:42	20:37	18:39	15:40	13:56
6	10:55	09:10	07:23	06:21	04:20	01:35		04:19	06:11	07:49	08:38	10:36
	14:05	16:08	17:50	20:35	22:24	01:10		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	01:52		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:28			22:34	20:29	18:31	15:32	13:51
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:43
	14:12	16:16	17:57	20:42	22:32		00:59	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:59	08:50	10:47
	14:16	16:19	18:00	20:45	22:36		00:51	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:23	18:04	20:48	22:41		00:44	22:21	20:17	18:19	15:21	13:43
11	10:41	08:51	07:03	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:37	22:17	20:13	18:15	15:18	13:41
12	10:38	08:47	06:59	05:57	03:55		02:29	04:43	06:30	08:09	09:02	10:56
	14:27	16:31	18:11	20:55	22:49		00:31	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:05	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:37
14	10:31	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:57		00:20	22:05	20:01	18:04	15:07	13:35
15	10:28	08:36	06:48	05:45	03:43		02:46	04:54	06:40	08:19	09:13	11:04
	14:39	16:42	18:21	21:06	23:02		00:15	22:01	19:57	18:00	15:03	13:34
16	10:25	08:32	06:44	05:41	03:39		02:51	04:58	06:43	08:22	09:17	11:06
	14:43	16:46	18:24	21:09	23:06		00:10	21:57	19:53	17:56	14:59	13:32
17	10:22	08:28	06:40	05:37	03:34		02:56	05:01	06:47	08:26	09:21	11:08
	14:47	16:50	18:27	21:13	23:10		00:05	21:53	19:49	17:52	14:56	13:31
18	10:18	08:24	06:36	05:33	03:30		03:01	05:05	06:50	08:29	09:25	11:10
	14:51	16:53	18:31	21:17	23:15		00:00	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:26		03:01	05:09	06:53	08:33	09:29	11:12
	14:55	16:57	18:34	21:20	23:19		23:56	21:45	19:41	17:45	14:49	13:30
20	10:11	08:17	06:28	05:25	03:21		03:06	05:12	06:56	08:36	09:33	11:13
	14:59	17:01	18:38	21:24	23:24		23:51	21:41	19:37	17:41	14:45	13:30
21	10:08	08:13	06:24	05:21	03:17		03:11	05:16	07:00	08:40	09:37	11:14
	15:03	17:04	18:41	21:27	23:28		23:46	21:37	19:34	17:37	14:42	13:29
22	10:04	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:41	11:15
	15:08	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:05	06:16	05:13	03:08		03:20	05:23	07:06	08:47	09:45	11:15
	15:12	17:11	18:48	21:35	23:38		23:37	21:29	19:26	17:29	14:35	13:30
24	09:57	08:01	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:49	11:15
	15:16	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:53	11:15
	15:20	17:19	18:54	21:42	23:47		23:29	21:21	19:18	16:22	14:28	13:32
26	09:50	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:57	09:57	11:15
	15:24	17:22	18:58	21:46	23:52		23:24	21:17	19:14	16:18	14:24	13:34
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:01	11:14
	15:28	17:26	19:01	21:49	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:05	11:13
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:18	13:38
29	09:39		06:53	04:49	02:34		03:46	05:44	07:26	08:08	10:09	11:12
	15:36		20:08	21:57	00:08		23:11	21:05	19:02	16:06	14:14	13:40
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:13	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:24		03:55	05:51		08:16		11:09
	15:44		20:14		00:19		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	462	605	690	668	527	397	296	173	84
Total, worst case												

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Koskenniemi 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (703)

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	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:04		04:08	06:01	07:39	08:28	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:32	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	02:00		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:29	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:01	22:30	20:26	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:08	04:32	06:21	07:59	08:51	10:48
	14:16	16:20	18:01	20:46	22:37		00:53	22:26	20:22	18:24	15:25	13:45
10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
	14:20	16:24	18:04	20:49	22:42		00:45	22:22	20:18	18:20	15:22	13:43
11	10:42	08:52	07:04	06:02	04:00		02:22	04:39	06:28	08:06	08:58	10:54
	14:24	16:28	18:08	20:53	22:46		00:39	22:18	20:14	18:16	15:18	13:41
12	10:39	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:10	18:12	15:14	13:39
13	10:36	08:44	06:56	05:54	03:52		02:34	04:47	06:34	08:13	09:06	11:00
	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:40	06:52	05:50	03:47		02:40	04:51	06:38	08:16	09:10	11:03
	14:35	16:39	18:18	21:03	22:58		00:22	22:06	20:02	18:04	15:07	13:35
15	10:29	08:37	06:48	05:46	03:43		02:45	04:54	06:41	08:20	09:14	11:05
	14:39	16:43	18:21	21:07	23:03		00:17	22:02	19:58	18:01	15:03	13:33
16	10:26	08:33	06:45	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:07	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:57	21:46	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:30		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:12		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
	15:20	17:19	18:55	21:43	23:49		23:30	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:47	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
	15:28	17:26	19:02	21:50	23:59		23:21	21:13	19:11	16:14	14:21	13:35
28	09:44	07:47	05:57	04:54	02:39		03:42	05:41	07:23	08:05	10:06	11:15
	15:32	17:30	19:05	21:54	00:04		23:17	21:09	19:07	16:11	14:18	13:37
29	09:40		06:53	04:49	02:34		03:47	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:37		06:49	04:45	02:29		03:51	05:48	07:29	08:13	10:14	11:12
	15:40		20:12	22:02	00:15		23:08	21:01	18:59	16:03	14:11	13:42
31	09:33		06:46		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:45
Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Total, worst case												

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Koskenniemi 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (704)

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	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:32	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:36	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	02:12		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:30	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
	14:12	16:16	17:58	20:42	22:33		01:01	22:30	20:26	18:28	15:29	13:48
9	10:48	08:59	07:12	06:10	04:08		02:08	04:32	06:21	07:59	08:51	10:48
	14:16	16:20	18:01	20:46	22:37		00:53	22:26	20:22	18:24	15:25	13:45
10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
	14:20	16:24	18:04	20:49	22:42		00:45	22:22	20:18	18:20	15:22	13:43
11	10:42	08:52	07:04	06:02	04:00		02:22	04:39	06:28	08:06	08:59	10:54
	14:24	16:28	18:08	20:53	22:46		00:39	22:18	20:14	18:16	15:18	13:41
12	10:39	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:10	18:12	15:14	13:39
13	10:36	08:44	06:56	05:54	03:52		02:34	04:47	06:34	08:13	09:06	11:00
	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
14	10:33	08:41	06:52	05:50	03:47		02:40	04:51	06:38	08:16	09:10	11:03
	14:35	16:39	18:18	21:03	22:58		00:22	22:06	20:02	18:04	15:07	13:35
15	10:29	08:37	06:48	05:46	03:43		02:45	04:54	06:41	08:20	09:14	11:05
	14:39	16:43	18:21	21:07	23:03		00:17	22:02	19:58	18:01	15:03	13:33
16	10:26	08:33	06:45	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:10
	14:48	16:50	18:28	21:14	23:11		00:07	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:58	18:35	21:21	23:20		23:57	21:46	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:30		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:12		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
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	15:24	17:23	18:58	21:47	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
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	15:32	17:30	19:05	21:54	00:04		23:17	21:09	19:07	16:11	14:18	13:37
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	15:36		20:08	21:58	00:10		23:12	21:05	19:03	16:07	14:15	13:40
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Potential sun hours Total, worst case	134	225	362	463	606	690	669	527	397	296	173	84

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Koskenniemi 3 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (705)

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	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:31	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	02:24		04:24	06:15	07:53	08:43	10:41
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10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
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17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:07	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:51	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
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	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:29		23:48	21:37	19:34	17:37	14:42	13:29
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	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
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26	09:51	07:54	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:47	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
	15:28	17:26	19:02	21:50	23:59		23:21	21:13	19:11	16:14	14:21	13:35
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	15:32	17:30	19:05	21:54	00:04		23:17	21:09	19:07	16:11	14:18	13:37
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	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
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Potential sun hours Total, worst case	134	225	362	463	606	690	669	527	397	296	173	84

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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Koskenniemi 4 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (706)

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	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:02	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:32	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:24	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:36	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	03:09		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:30	18:32	15:33	13:51
8	10:51	09:03	07:16	06:14	04:13			04:28	06:18	07:56	08:47	10:44
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	14:31	16:35	18:15	21:00	22:54		00:27	22:10	20:06	18:08	15:11	13:37
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	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:42	21:28	23:30		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:13		03:15	05:20	07:03	08:44	09:42	11:16
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Total, worst case												

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	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Koskenniemi 5 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (707)

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	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:48	15:48	17:33	20:18	22:06	00:27		23:00	20:53	18:55	15:55	14:08
2	11:06	09:26	07:39	06:38	04:37	02:11		04:04	05:58	07:36	08:24	10:22
	13:51	15:52	17:37	20:22	22:09	00:34		22:55	20:49	18:51	15:52	14:05
3	11:04	09:22	07:35	06:34	04:33	02:05		04:08	06:01	07:39	08:28	10:26
	13:55	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:30	04:29	01:57		04:12	06:05	07:43	08:31	10:30
	13:58	16:00	17:44	20:29	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:26	04:25	01:47		04:16	06:08	07:46	08:35	10:34
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:23	06:22	04:21	01:30		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
7	10:54	09:07	07:20	06:18	04:17	04:31		04:24	06:15	07:53	08:43	10:41
	14:08	16:12	17:54	20:39	22:29			22:35	20:29	18:32	15:33	13:51
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10	10:45	08:56	07:08	06:06	04:04		02:15	04:35	06:24	08:03	08:55	10:51
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15	10:29	08:37	06:48	05:46	03:43		02:45	04:54	06:41	08:19	09:14	11:05
	14:39	16:43	18:21	21:07	23:03		00:17	22:02	19:58	18:01	15:03	13:33
16	10:26	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:06	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
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	14:56	16:57	18:35	21:21	23:20		23:57	21:45	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:12		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
	15:20	17:19	18:55	21:43	23:49		23:30	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:02	02:49		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:46	23:54		23:25	21:17	19:15	16:18	14:25	13:34
27	09:48	07:51	06:01	04:58	02:44		03:38	05:37	07:20	08:02	10:02	11:16
	15:28	17:26	19:02	21:50	23:59		23:21	21:13	19:11	16:14	14:21	13:35
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	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
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	15:44		20:15		00:21		23:04	20:57		15:59		13:45
Potential sun hours Total, worst case	134	225	362	463	606	711	669	527	397	296	173	84

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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Koskenniemi 6 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (708)

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	11:08	09:29	07:43	06:42	04:41	02:18		03:59	05:54	07:33	08:20	10:18
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	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:11	07:23	06:22	04:21	01:31		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:16		22:39	20:33	18:35	15:37	13:53
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	14:43	16:46	18:25	21:10	23:07		00:11	21:58	19:54	17:57	15:00	13:32
17	10:23	08:29	06:41	05:38	03:34		02:56	05:02	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:14	23:11		00:06	21:54	19:50	17:53	14:56	13:31
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:12
	14:52	16:54	18:31	21:17	23:16		00:02	21:50	19:46	17:49	14:53	13:30
19	10:16	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:57	21:45	19:42	17:45	14:49	13:30
20	10:12	08:18	06:29	05:26	03:21		03:06	05:13	06:57	08:37	09:34	11:15
	15:00	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:16
	15:04	17:05	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:42	13:29
22	10:05	08:10	06:21	05:18	03:12		03:15	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:38	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:39	21:29	19:26	17:30	14:35	13:30
24	09:58	08:02	06:13	05:10	03:03		03:25	05:27	07:10	08:51	09:50	11:17
	15:16	17:16	18:52	21:39	23:44		23:34	21:25	19:22	17:26	14:31	13:31
25	09:55	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:55	09:54	11:17
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Potential sun hours	134	225	362	463	606	699	669	527	397	296	173	84
Total, worst case												

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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Paul Bade / p.bade@wpd.de

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Lehtilaki - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (698)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

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The WTG is always operating

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	13:49	15:49	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:56	14:08
2	11:05	09:25	07:39	06:38	04:37	02:12		04:04	05:58	07:36	08:24	10:22
	13:52	15:52	17:37	20:22	22:09	00:33		22:55	20:49	18:51	15:52	14:05
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	13:55	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
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6	10:56	09:10	07:23	06:22	04:21	01:35		04:20	06:11	07:49	08:39	10:37
	14:05	16:08	17:51	20:35	22:25	01:11		22:38	20:33	18:35	15:37	13:54
7	10:53	09:07	07:19	06:18	04:17	23:53		04:24	06:14	07:52	08:43	10:40
	14:09	16:12	17:54	20:39	22:29			22:34	20:29	18:32	15:33	13:51
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	14:40	16:43	18:21	21:06	23:02		00:16	22:01	19:58	18:01	15:03	13:34
16	10:26	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:25	21:10	23:07		00:11	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:14	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:37	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:13
	14:56	16:57	18:35	21:21	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:29	05:26	03:22		03:06	05:13	06:57	08:37	09:34	11:14
	15:00	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:46	13:30
21	10:09	08:14	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:15
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:10	06:21	05:18	03:13		03:16	05:20	07:03	08:44	09:42	11:16
	15:08	17:08	18:45	21:32	23:34		23:43	21:33	19:30	17:34	14:39	13:30
23	10:02	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:51	09:50	11:16
	15:16	17:16	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:55	21:43	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:16
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:20	08:02	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:21	21:13	19:11	16:14	14:21	13:36
28	09:44	07:47	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:07	16:11	14:18	13:38
29	09:40		06:53	04:50	02:35		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:58	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:29		03:51	05:48	07:29	08:13	10:14	11:11
	15:41		20:12	22:01	00:14		23:08	21:01	18:59	16:03	14:12	13:43
31	09:33		06:45		02:24		03:55	05:51		08:16		11:10
	15:45		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours Total, worst case	135	225	362	463	605	692	668	527	397	296	173	84

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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Metsästysmaja - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (690)

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	11:09			09:29		11:45 (WTG 04)	07:43	06:41	04:41	02:15
	13:47			15:48	21	12:06 (WTG 04)	17:33	20:18	22:05	00:28
2	11:07			09:26		11:45 (WTG 04)	07:39	06:37	04:36	02:09
	13:50			15:52	22	12:07 (WTG 04)	17:36	20:21	22:09	00:35
3	11:05			09:22		11:45 (WTG 04)	07:35	06:33	04:32	02:02
	13:53			15:56	22	12:07 (WTG 04)	17:40	20:25	22:13	00:43
4	11:02			09:18		11:45 (WTG 04)	07:31	06:29	04:28	01:53
	13:56			16:00	22	12:07 (WTG 04)	17:43	20:28	22:17	00:52
5	11:00			09:14		11:46 (WTG 04)	07:27	06:25	04:24	01:42
	14:00			16:03	21	12:07 (WTG 04)	17:47	20:32	22:21	01:03
6	10:57			09:11		11:46 (WTG 04)	07:23	06:21	04:20	01:59
	14:03			16:07	21	12:07 (WTG 04)	17:50	20:35	22:25	
7	10:54			09:07		11:46 (WTG 04)	07:19	06:17	04:16	
	14:07			16:11	20	12:06 (WTG 04)	17:54	20:39	22:29	
8	10:51			09:03		11:47 (WTG 04)	07:15	06:13	04:12	
	14:11			16:15	18	12:05 (WTG 04)	17:57	20:42	22:33	
9	10:49			08:59		11:48 (WTG 04)	07:11	06:09	04:07	
	14:14			16:19	16	12:04 (WTG 04)	18:01	20:45	22:37	
10	10:46			08:56		11:50 (WTG 04)	07:08	06:05	04:03	
	14:18			16:23	14	12:04 (WTG 04)	18:04	20:49	22:42	
11	10:42			08:52		11:52 (WTG 04)	07:04	06:01	03:59	
	14:22			16:27	9	12:01 (WTG 04)	18:07	20:52	22:46	
12	10:39			08:48			07:00	05:57	03:55	
	14:26			16:31			18:11	20:56	22:50	
13	10:36			08:44			06:56	05:53	03:51	
	14:30			16:34			18:14	20:59	22:54	
14	10:33			08:40			06:52	05:49	03:46	
	14:34			16:38			18:18	21:03	22:59	
15	10:30			08:37			06:48	05:45	03:42	
	14:38			16:42			18:21	21:06	23:03	
16	10:26			08:33			06:44	05:41	03:38	
	14:42			16:46			18:24	21:10	23:07	
17	10:23			08:29			06:40	05:37	03:33	
	14:46			16:49			18:28	21:14	23:12	
18	10:20			08:25			06:36	05:33	03:29	
	14:50			16:53			18:31	21:17	23:16	
19	10:16			08:21			06:32	05:29	03:25	
	14:55			16:57			18:34	21:21	23:21	
20	10:13			08:17			06:28	05:25	03:20	
	14:59			17:00			18:38	21:24	23:25	
21	10:09			08:14			06:24	05:21	03:16	
	15:03			17:04			18:41	21:28	23:30	
22	10:06			08:10			06:21	05:17	03:11	
	15:07			17:08			18:44	21:32	23:35	
23	10:02			08:06			06:17	05:13	03:07	
	15:11			17:11			18:48	21:35	23:39	
24	09:58			08:02			06:13	05:09	03:02	
	15:15			17:15			18:51	21:39	23:44	
25	09:55		11:52 (WTG 04)	07:58			06:09	05:05	02:53	
	15:19	5	11:57 (WTG 04)	17:19			18:55	21:43	23:49	
26	09:51		11:49 (WTG 04)	07:54			06:05	05:01	02:48	
	15:23	10	11:59 (WTG 04)	17:22			18:58	21:46	23:54	
27	09:48		11:48 (WTG 04)	07:50			06:01	04:57	02:43	
	15:27	14	12:02 (WTG 04)	17:26			19:01	21:50	00:00	
28	09:44		11:47 (WTG 04)	07:46			05:57	04:53	02:38	
	15:31	16	12:03 (WTG 04)	17:29			19:05	21:54	00:05	
29	09:40		11:46 (WTG 04)				06:53	04:49	02:32	
	15:35	18	12:04 (WTG 04)				20:08	21:58	00:10	
30	09:37		11:45 (WTG 04)				06:49	04:45	02:27	
	15:40	20	12:05 (WTG 04)				20:11	22:02	00:16	
31	09:33		11:46 (WTG 04)				06:45		02:21	
	15:44	20	12:06 (WTG 04)				20:15		00:22	
Potential sun hours	134			225			362	463	607	691
Total, worst case		103			206					

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Metsästysmaja - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (690)

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		03:58	05:54	07:32	08:20	10:19
		23:00	20:53	18:55	15:55	14 11:33 (WTG 04) 14:07
2		04:02	05:57	07:36	08:24	11:18 (WTG 04) 10:23
		22:56	20:49	18:51	15:51	17 11:35 (WTG 04) 14:04
3		04:07	06:01	07:39	08:28	11:16 (WTG 04) 10:26
		22:51	20:45	18:47	15:47	19 11:35 (WTG 04) 14:01
4		04:11	06:04	07:42	08:31	11:16 (WTG 04) 10:30
		22:47	20:41	18:43	15:43	20 11:36 (WTG 04) 13:58
5		04:15	06:07	07:46	08:35	11:15 (WTG 04) 10:34
		22:43	20:37	18:39	15:40	21 11:36 (WTG 04) 13:55
6		04:19	06:11	07:49	08:39	11:15 (WTG 04) 10:38
		22:39	20:33	18:35	15:36	22 11:37 (WTG 04) 13:52
7		04:23	06:14	07:52	08:43	11:15 (WTG 04) 10:41
		22:35	20:29	18:31	15:32	22 11:37 (WTG 04) 13:49
8		04:27	06:17	07:56	08:47	11:16 (WTG 04) 10:45
	01:05	22:30	20:25	18:27	15:28	21 11:37 (WTG 04) 13:46
9	02:04	04:31	06:21	07:59	08:51	11:15 (WTG 04) 10:48
	00:55	22:26	20:21	18:23	15:25	22 11:37 (WTG 04) 13:44
10	02:12	04:35	06:24	08:02	08:55	11:16 (WTG 04) 10:52
	00:47	22:22	20:17	18:19	15:21	21 11:37 (WTG 04) 13:41
11	02:20	04:38	06:27	08:06	08:58	11:16 (WTG 04) 10:55
	00:41	22:18	20:13	18:16	15:17	21 11:37 (WTG 04) 13:39
12	02:26	04:42	06:30	08:09	09:02	11:17 (WTG 04) 10:58
	00:34	22:14	20:09	18:12	15:13	19 11:36 (WTG 04) 13:37
13	02:32	04:46	06:34	08:12	09:06	11:18 (WTG 04) 11:01
	00:28	22:10	20:05	18:08	15:10	18 11:36 (WTG 04) 13:35
14	02:38	04:50	06:37	08:16	09:10	11:19 (WTG 04) 11:04
	00:23	22:06	20:01	18:04	15:06	16 11:35 (WTG 04) 13:33
15	02:44	04:54	06:40	08:19	09:14	11:21 (WTG 04) 11:06
	00:17	22:02	19:57	18:00	15:02	13 11:34 (WTG 04) 13:32
16	02:49	04:57	06:44	08:23	09:18	11:22 (WTG 04) 11:09
	00:12	21:58	19:54	17:56	14:59	10 11:32 (WTG 04) 13:30
17	02:54	05:01	06:47	08:26	09:22	11:25 (WTG 04) 11:11
	00:07	21:53	19:50	17:52	14:55	4 11:29 (WTG 04) 13:29
18	02:59	05:05	06:50	08:30	09:26	11:13
	00:02	21:49	19:46	17:48	14:52	13:28
19	03:04	05:08	06:53	08:33	09:30	11:14
	23:58	21:45	19:42	17:45	14:48	13:28
20	03:04	05:12	06:57	08:37	09:34	11:16
	23:53	21:41	19:38	17:41	14:44	13:27
21	03:09	05:15	07:00	08:40	09:38	11:17
	23:48	21:37	19:34	17:37	14:41	13:27
22	03:14	05:19	07:03	08:44	09:42	11:17
	23:44	21:33	19:30	17:33	14:37	13:28
23	03:19	05:23	07:06	08:47	09:47	11:18
	23:39	21:29	19:26	17:29	14:34	13:28
24	03:23	05:26	07:10	08:51	09:51	11:18
	23:34	21:25	19:22	17:25	14:30	13:29
25	03:28	05:30	07:13	07:54	09:55	11:18
	23:30	21:21	19:18	16:21	14:27	13:30
26	03:32	05:33	07:16	07:58	09:59	11:17
	23:26	21:17	19:14	16:18	14:23	13:32
27	03:37	05:37	07:19	08:02	10:03	11:17
	23:21	21:13	19:10	16:14	14:20	13:33
28	03:41	05:40	07:23	08:05	10:07	11:16
	23:17	21:09	19:06	16:10	14:17	13:36
29	03:46	05:44	07:26	08:09	10:11	11:14
	23:13	21:05	19:02	16:06	14:13	13:38
30	03:50	05:47	07:29	08:13	10:15	11:13
	23:08	21:01	18:58	16:02	14:10	13:40
31	03:54	05:50		08:16	11:21 (WTG 04)	11:11
	23:04	20:57		15:59	10 11:31 (WTG 04)	13:43
Potential sun hours	669	528	397	296	172	82
Total, worst case				10	300	

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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17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Pahtajärvi 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (693)

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	11:07	09:28	07:42	06:41	04:40	02:17		03:59	05:54	07:32	08:19	10:17
	13:47	15:48	17:32	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:07
2	11:05	09:25	07:38	06:37	04:36	02:10		04:03	05:57	07:35	08:23	10:21
	13:50	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:50	15:51	14:04
3	11:03	09:21	07:34	06:33	04:32	02:04		04:07	06:00	07:38	08:27	10:25
	13:54	15:56	17:39	20:24	22:12	00:40		22:50	20:45	18:46	15:47	14:01
4	11:01	09:17	07:30	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	15:59	17:43	20:28	22:16	00:48		22:46	20:41	18:42	15:43	13:58
5	10:58	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:34	10:33
	14:00	16:03	17:46	20:31	22:20	00:58		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:29		04:19	06:10	07:48	08:38	10:36
	14:04	16:07	17:50	20:35	22:24	01:16		22:38	20:33	18:35	15:36	13:52
7	10:53	09:06	07:19	06:17	04:16	23:36		04:23	06:14	07:52	08:42	10:40
	14:07	16:11	17:53	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:41	22:32		01:01	22:30	20:25	18:27	15:28	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:20	07:58	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:48	22:41		00:45	22:21	20:17	18:19	15:21	13:42
11	10:41	08:51	07:03	06:01	03:59		02:21	04:38	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:15	15:17	13:40
12	10:38	08:47	06:59	05:57	03:55		02:27	04:42	06:30	08:08	09:02	10:57
	14:27	16:31	18:10	20:55	22:49		00:32	22:13	20:09	18:11	15:13	13:38
13	10:35	08:43	06:55	05:53	03:51		02:33	04:46	06:33	08:12	09:06	10:59
	14:31	16:34	18:14	20:59	22:53		00:26	22:09	20:05	18:07	15:10	13:36
14	10:32	08:40	06:51	05:49	03:46		02:39	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:53	06:40	08:19	09:13	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:02	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:17	11:07
	14:43	16:46	18:24	21:09	23:06		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:46	08:26	09:21	11:09
	14:47	16:49	18:27	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:18	08:24	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:25	11:11
	14:51	16:53	18:31	21:16	23:15		00:01	21:49	19:45	17:48	14:52	13:29
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:32	09:29	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:41	17:44	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:33	11:14
	14:59	17:00	18:37	21:24	23:24		23:51	21:41	19:37	17:40	14:45	13:28
21	10:08	08:13	06:24	05:21	03:16		03:10	05:15	06:59	08:40	09:37	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:33	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:14	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:29	17:33	14:37	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:22	07:06	08:47	09:46	11:16
	15:11	17:11	18:47	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:01	06:12	05:09	03:02		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:08	05:05	02:53		03:28	05:29	07:12	07:54	09:54	11:16
	15:19	17:18	18:54	21:42	23:48		23:29	21:21	19:18	16:21	14:27	13:31
26	09:50	07:54	06:04	05:01	02:48		03:33	05:33	07:16	07:57	09:58	11:16
	15:23	17:22	18:57	21:46	23:53		23:25	21:17	19:14	16:17	14:24	13:33
27	09:47	07:50	06:00	04:57	02:43		03:37	05:36	07:19	08:01	10:02	11:15
	15:27	17:25	19:01	21:49	23:58		23:20	21:13	19:10	16:14	14:20	13:34
28	09:43	07:46	05:57	04:53	02:38		03:41	05:40	07:22	08:05	10:06	11:14
	15:31	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:36
29	09:39		06:53	04:49	02:33		03:46	05:43	07:25	08:08	10:10	11:13
	15:36		20:07	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:02	14:11	13:41
31	09:32		06:45		02:22		03:54	05:50		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:58		13:44
Potential sun hours Total, worst case	134	225	362	463	606	692	669	527	397	296	173	84

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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Pahtajärvi 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (694)

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	11:07	09:28	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:19	10:17
	13:47	15:48	17:32	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:07
2	11:05	09:25	07:38	06:37	04:36	02:10		04:03	05:57	07:35	08:23	10:21
	13:50	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:50	15:51	14:04
3	11:03	09:21	07:34	06:33	04:32	02:04		04:07	06:00	07:38	08:27	10:25
	13:54	15:56	17:39	20:24	22:12	00:40		22:50	20:45	18:46	15:47	14:01
4	11:01	09:17	07:30	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:16	00:48		22:46	20:41	18:42	15:43	13:58
5	10:58	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:34	10:33
	14:00	16:03	17:46	20:31	22:20	00:58		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:29		04:19	06:10	07:48	08:38	10:36
	14:04	16:07	17:50	20:35	22:24	01:16		22:38	20:33	18:35	15:36	13:52
7	10:53	09:06	07:19	06:17	04:16	02:00		04:23	06:14	07:52	08:42	10:40
	14:08	16:11	17:53	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:41	22:32		01:01	22:30	20:25	18:27	15:28	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:20	07:58	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:48	22:41		00:45	22:21	20:17	18:19	15:21	13:42
11	10:41	08:51	07:03	06:01	03:59		02:21	04:38	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:15	15:17	13:40
12	10:38	08:47	06:59	05:57	03:55		02:27	04:42	06:30	08:08	09:02	10:56
	14:27	16:31	18:10	20:55	22:49		00:32	22:13	20:09	18:11	15:13	13:38
13	10:35	08:43	06:55	05:53	03:51		02:33	04:46	06:33	08:12	09:06	10:59
	14:31	16:34	18:14	20:59	22:53		00:26	22:09	20:05	18:07	15:10	13:36
14	10:32	08:40	06:51	05:49	03:46		02:39	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:28	08:36	06:48	05:45	03:42		02:45	04:53	06:40	08:19	09:13	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:17	11:07
	14:43	16:46	18:24	21:09	23:06		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:46	08:26	09:21	11:09
	14:47	16:49	18:27	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:18	08:24	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:25	11:11
	14:51	16:53	18:31	21:16	23:15		00:01	21:49	19:45	17:48	14:52	13:29
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:32	09:29	11:12
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:41	17:44	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:33	11:14
	14:59	17:00	18:37	21:24	23:24		23:51	21:41	19:37	17:40	14:45	13:28
21	10:08	08:13	06:24	05:21	03:16		03:10	05:15	06:59	08:39	09:37	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:33	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:14	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:29	17:33	14:37	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:22	07:06	08:47	09:46	11:16
	15:11	17:11	18:47	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:01	06:12	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:08	05:05	02:53		03:28	05:30	07:12	07:54	09:54	11:16
	15:19	17:18	18:54	21:42	23:48		23:29	21:21	19:18	16:21	14:27	13:31
26	09:50	07:54	06:04	05:01	02:48		03:33	05:33	07:16	07:57	09:58	11:16
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27	09:47	07:50	06:00	04:57	02:44		03:37	05:36	07:19	08:01	10:02	11:15
	15:27	17:25	19:01	21:49	23:58		23:20	21:13	19:10	16:14	14:20	13:35
28	09:43	07:46	05:57	04:53	02:38		03:42	05:40	07:22	08:05	10:06	11:14
	15:31	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:37
29	09:39		06:53	04:49	02:33		03:46	05:43	07:25	08:08	10:10	11:13
	15:36		20:07	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:11
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31	09:32		06:45		02:22		03:54	05:50		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:58		13:44
Potential sun hours Total, worst case	134	225	362	463	606	690	669	527	397	296	173	84

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Pahtajärvi 3 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (695)

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	11:07	09:28	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:19	10:17
	13:48	15:48	17:32	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:07
2	11:05	09:25	07:38	06:37	04:36	02:11		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:50	15:51	14:04
3	11:03	09:21	07:34	06:33	04:32	02:04		04:07	06:00	07:38	08:27	10:25
	13:54	15:56	17:39	20:24	22:12	00:40		22:50	20:45	18:46	15:47	14:01
4	11:01	09:17	07:30	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:16	00:48		22:46	20:41	18:42	15:43	13:58
5	10:58	09:14	07:27	06:25	04:24	01:47		04:15	06:07	07:45	08:34	10:33
	14:00	16:03	17:46	20:31	22:20	00:58		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:30		04:19	06:10	07:48	08:38	10:36
	14:04	16:07	17:50	20:35	22:24	01:15		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	00:38		04:23	06:14	07:52	08:42	10:40
	14:08	16:11	17:53	20:38	22:28			22:34	20:29	18:31	15:32	13:50
8	10:50	09:02	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:43
	14:11	16:15	17:57	20:41	22:32		01:00	22:30	20:25	18:27	15:28	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:20	07:58	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:25	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:50
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11	10:41	08:51	07:03	06:01	03:59		02:21	04:38	06:27	08:05	08:58	10:53
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13	10:35	08:43	06:55	05:53	03:51		02:33	04:46	06:33	08:12	09:05	10:59
	14:31	16:34	18:14	20:59	22:53		00:26	22:09	20:05	18:07	15:10	13:36
14	10:32	08:40	06:51	05:49	03:47		02:39	04:50	06:37	08:15	09:09	11:02
	14:35	16:38	18:17	21:02	22:57		00:21	22:05	20:01	18:04	15:06	13:34
15	10:28	08:36	06:48	05:45	03:42		02:45	04:53	06:40	08:19	09:13	11:05
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16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:17	11:07
	14:43	16:46	18:24	21:09	23:06		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:46	08:26	09:21	11:09
	14:47	16:49	18:27	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:18	08:24	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:25	11:11
	14:51	16:53	18:31	21:16	23:15		00:01	21:49	19:45	17:48	14:52	13:29
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:32	09:29	11:12
	14:55	16:57	18:34	21:20	23:19		23:56	21:45	19:41	17:44	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:33	11:14
	14:59	17:00	18:37	21:24	23:24		23:51	21:41	19:37	17:40	14:45	13:29
21	10:08	08:13	06:24	05:21	03:16		03:10	05:15	06:59	08:39	09:37	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:33	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:41	11:15
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:29	17:33	14:38	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:22	07:06	08:47	09:45	11:16
	15:11	17:11	18:47	21:35	23:38		23:38	21:29	19:25	17:29	14:34	13:29
24	09:57	08:01	06:12	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:30
25	09:54	07:57	06:08	05:05	02:53		03:28	05:30	07:12	07:54	09:54	11:16
	15:19	17:18	18:54	21:42	23:48		23:29	21:20	19:18	16:21	14:27	13:31
26	09:50	07:54	06:04	05:01	02:48		03:33	05:33	07:16	07:57	09:58	11:15
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27	09:47	07:50	06:00	04:57	02:44		03:37	05:36	07:19	08:01	10:02	11:15
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	15:32	17:29	19:04	21:53	00:03		23:16	21:08	19:06	16:10	14:17	13:37
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	15:36		20:07	21:57	00:09		23:11	21:04	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:13	11:11
	15:40		20:11	22:01	00:14		23:07	21:00	18:58	16:02	14:11	13:41
31	09:32		06:45		02:23		03:54	05:50		08:16		11:10
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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: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Pessala 1 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (699)

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	11:07	09:29	07:43	06:41	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:49	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:04	05:58	07:36	08:24	10:21
	13:52	15:52	17:37	20:22	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:30	04:29	01:58		04:12	06:04	07:42	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:47		22:47	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:26	04:25	01:49		04:16	06:08	07:46	08:35	10:33
	14:02	16:04	17:47	20:32	22:21	00:56		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:22	04:21	01:36		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:51	20:35	22:25	01:10		22:38	20:33	18:35	15:37	13:54
7	10:53	09:07	07:19	06:18	04:17	01:53		04:24	06:14	07:52	08:43	10:40
	14:09	16:12	17:54	20:39	22:29			22:34	20:29	18:31	15:33	13:51
8	10:50	09:03	07:15	06:14	04:13			04:28	06:18	07:56	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		00:59	22:30	20:25	18:28	15:29	13:48
9	10:47	08:59	07:12	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:51	22:26	20:21	18:24	15:25	13:46
10	10:44	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:24	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:22	13:43
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:28	08:06	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:32	22:14	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:54		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:21	22:05	20:02	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:46	04:54	06:41	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:16	22:01	19:58	18:00	15:03	13:34
16	10:25	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:25	21:10	23:06		00:11	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:12
	14:56	16:57	18:35	21:21	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:29	05:26	03:22		03:06	05:13	06:57	08:36	09:34	11:14
	15:00	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:30
21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:15
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:10	06:21	05:18	03:13		03:16	05:20	07:03	08:44	09:42	11:15
	15:08	17:08	18:45	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:07	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:07	16:11	14:18	13:38
29	09:40		06:53	04:49	02:35		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:29		03:51	05:48	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:59	16:03	14:12	13:43
31	09:33		06:45		02:24		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours Total, worst case	135	225	362	462	605	690	668	527	397	296	173	84

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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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCShadow receptor: Pessala 2 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (700)

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	11:07	09:29	07:43	06:41	04:41	02:18		03:59	05:54	07:33	08:20	10:18
	13:49	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:04	05:58	07:36	08:24	10:21
	13:52	15:52	17:37	20:22	22:09	00:32		22:55	20:49	18:51	15:52	14:05
3	11:03	09:21	07:35	06:33	04:33	02:06		04:08	06:01	07:39	08:27	10:25
	13:55	15:56	17:40	20:25	22:13	00:39		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:30	04:29	01:58		04:12	06:04	07:42	08:31	10:29
	13:58	16:00	17:44	20:28	22:17	00:47		22:47	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:26	04:25	01:49		04:16	06:08	07:46	08:35	10:33
	14:02	16:04	17:47	20:32	22:21	00:56		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:22	04:21	01:36		04:20	06:11	07:49	08:39	10:36
	14:05	16:08	17:51	20:35	22:25	01:10		22:38	20:33	18:35	15:37	13:54
7	10:53	09:07	07:19	06:18	04:17	01:53		04:24	06:14	07:52	08:43	10:40
	14:09	16:12	17:54	20:39	22:29			22:34	20:29	18:31	15:33	13:51
8	10:50	09:03	07:15	06:14	04:13			04:28	06:18	07:56	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		00:59	22:30	20:25	18:28	15:29	13:48
9	10:47	08:59	07:12	06:10	04:08		02:09	04:32	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:51	22:26	20:21	18:24	15:25	13:46
10	10:44	08:55	07:08	06:06	04:04		02:16	04:35	06:24	08:02	08:54	10:50
	14:20	16:24	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:22	13:43
11	10:41	08:51	07:04	06:02	04:00		02:23	04:39	06:28	08:06	08:58	10:53
	14:24	16:27	18:08	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:29	04:43	06:31	08:09	09:02	10:56
	14:28	16:31	18:11	20:56	22:49		00:32	22:14	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:52		02:35	04:47	06:34	08:12	09:06	10:59
	14:32	16:35	18:14	20:59	22:54		00:26	22:09	20:05	18:08	15:11	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:51	06:37	08:16	09:10	11:02
	14:36	16:39	18:18	21:03	22:58		00:21	22:05	20:02	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:46	04:54	06:41	08:19	09:14	11:04
	14:40	16:43	18:21	21:06	23:02		00:16	22:01	19:58	18:00	15:03	13:34
16	10:25	08:33	06:44	05:42	03:39		02:51	04:58	06:44	08:23	09:18	11:07
	14:44	16:46	18:25	21:10	23:06		00:11	21:57	19:54	17:57	15:00	13:33
17	10:22	08:29	06:40	05:38	03:35		02:56	05:02	06:47	08:26	09:22	11:09
	14:48	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:53	14:56	13:32
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:30	09:26	11:11
	14:52	16:54	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:53	13:31
19	10:15	08:21	06:33	05:30	03:26		03:01	05:09	06:54	08:33	09:30	11:12
	14:56	16:57	18:35	21:21	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:29	05:26	03:22		03:06	05:13	06:57	08:36	09:34	11:14
	15:00	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:30
21	10:08	08:13	06:25	05:22	03:17		03:11	05:16	07:00	08:40	09:38	11:15
	15:04	17:05	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:30
22	10:05	08:10	06:21	05:18	03:13		03:16	05:20	07:03	08:44	09:42	11:15
	15:08	17:08	18:45	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:14	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:30	14:35	13:31
24	09:58	08:02	06:13	05:10	03:04		03:25	05:27	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:32	13:32
25	09:54	07:58	06:09	05:06	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:33
26	09:51	07:54	06:05	05:02	02:50		03:34	05:34	07:16	07:58	09:58	11:15
	15:24	17:23	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:25	13:34
27	09:47	07:50	06:01	04:58	02:45		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:36
28	09:43	07:46	05:57	04:54	02:40		03:43	05:41	07:23	08:05	10:06	11:14
	15:32	17:30	19:05	21:54	00:03		23:16	21:09	19:07	16:11	14:18	13:38
29	09:40		06:53	04:49	02:35		03:47	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:03	16:07	14:15	13:40
30	09:36		06:49	04:45	02:29		03:51	05:48	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:59	16:03	14:12	13:43
31	09:33		06:45		02:24		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours Total, worst case	135	225	362	462	605	690	668	527	397	296	173	84

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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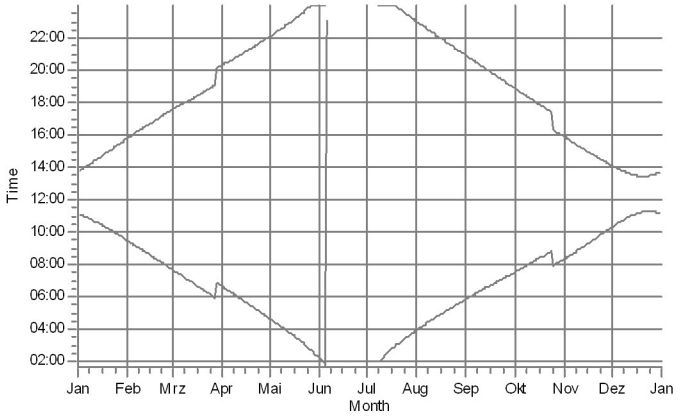
Calculated:
17.09.2021 08:27/3.4.415

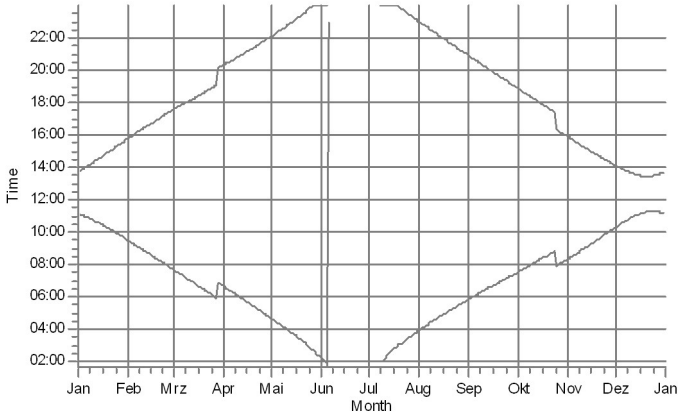
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

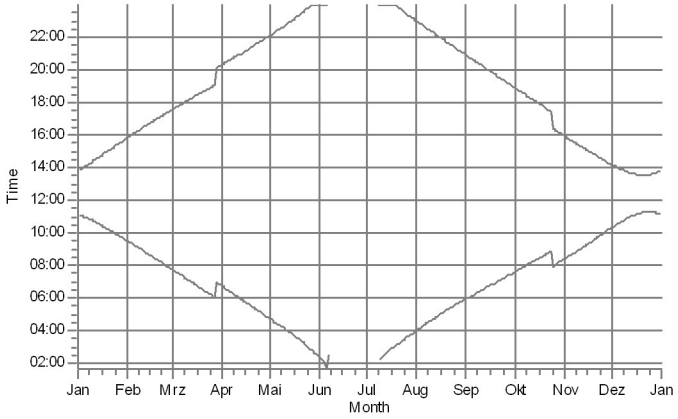
Ajanki 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (696)



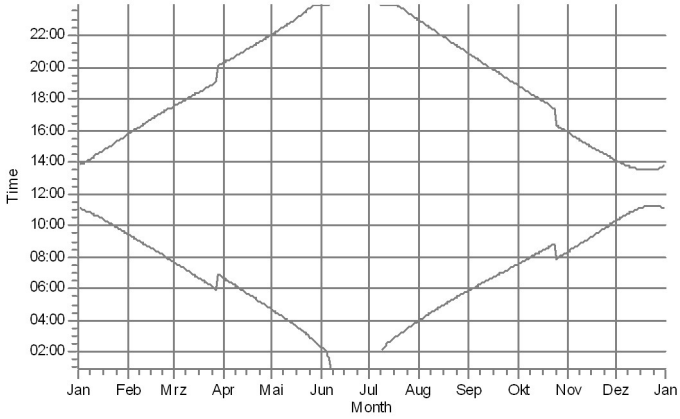
Ajanki 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (697)



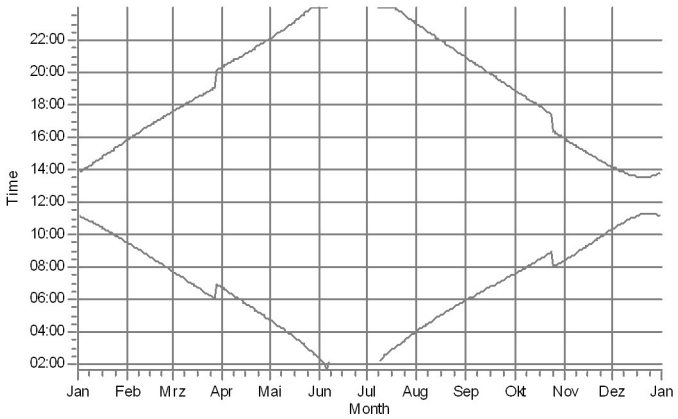
Asuntola: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (701)



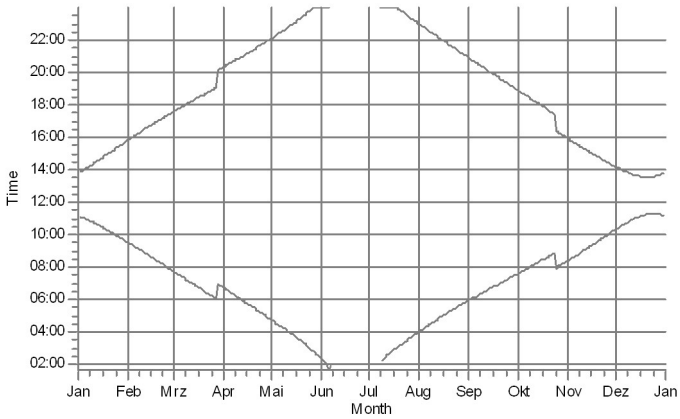
Kainuunraja: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (702)



Kauhajärvi 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (691



Kauhajärvi 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (692



WTGs

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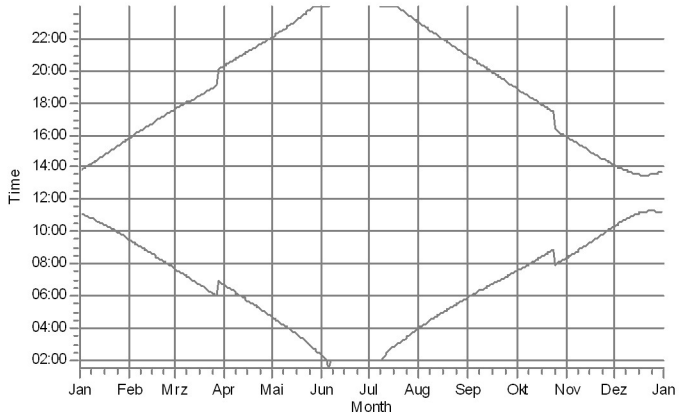
17.09.2021 08:27/3.4.415

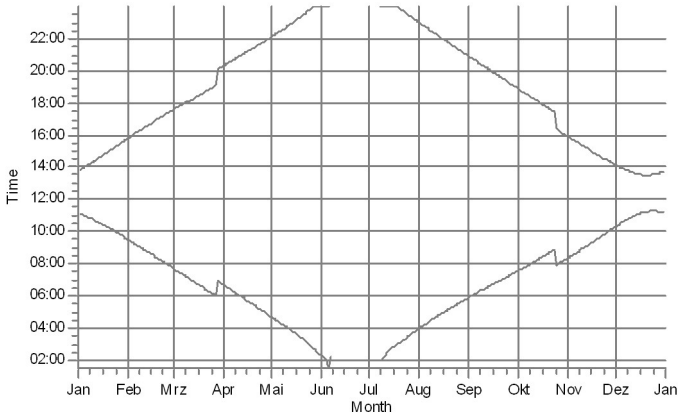
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

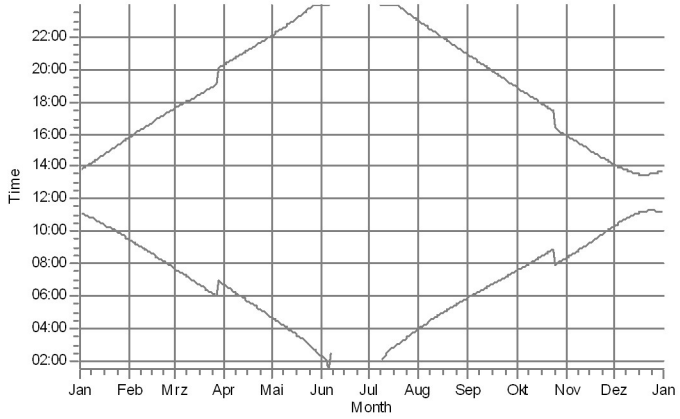
Koskenniemi 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



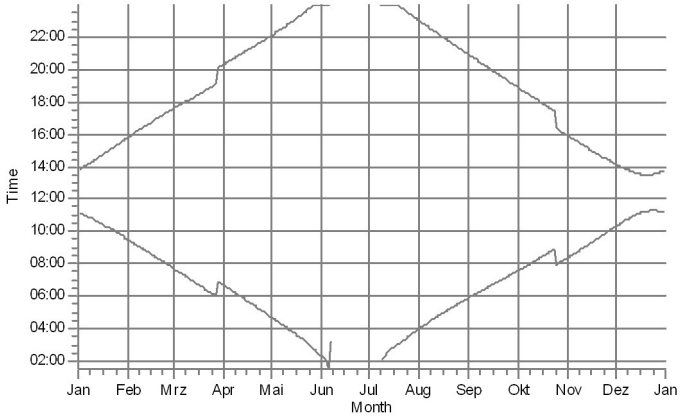
Koskenniemi 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



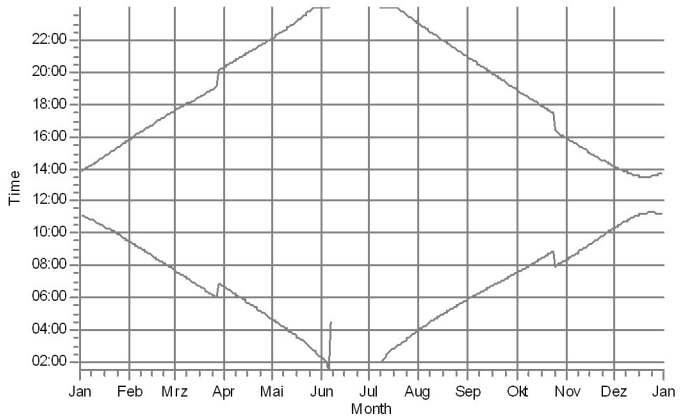
Koskenniemi 3: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



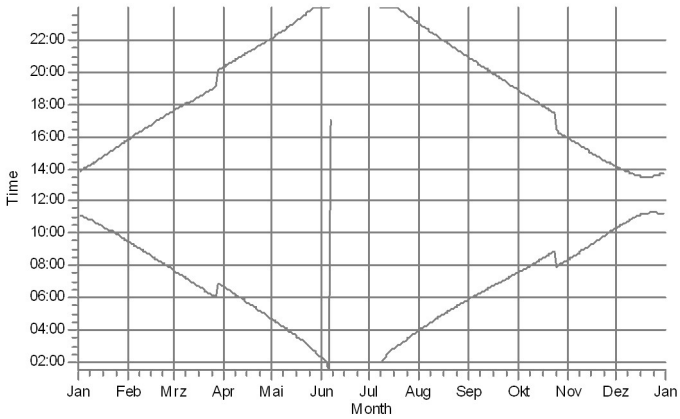
Koskenniemi 4: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



Koskenniemi 5: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



Koskenniemi 6: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7



WTGs

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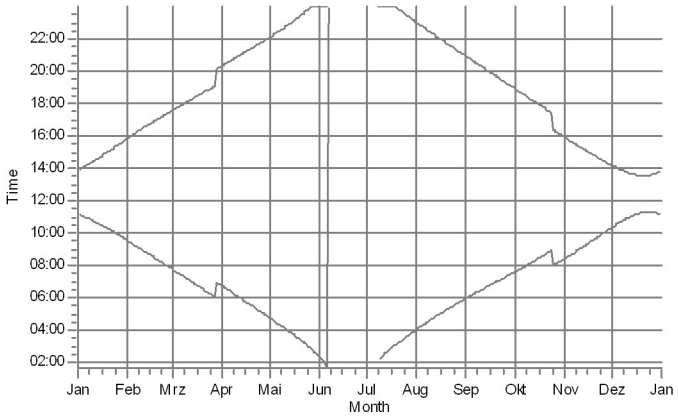
Calculated:
17.09.2021 08:27/3.4.415

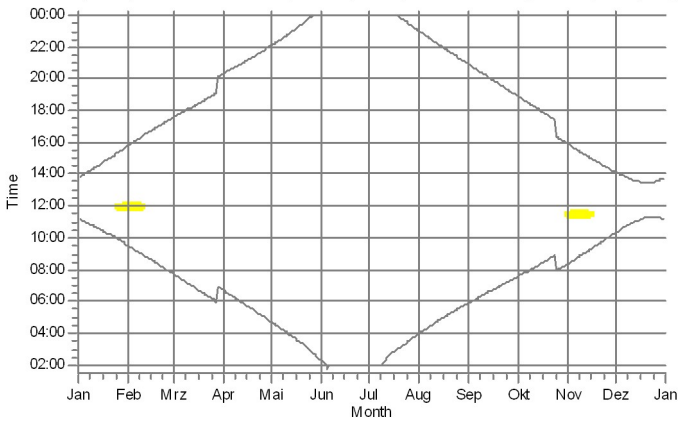
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

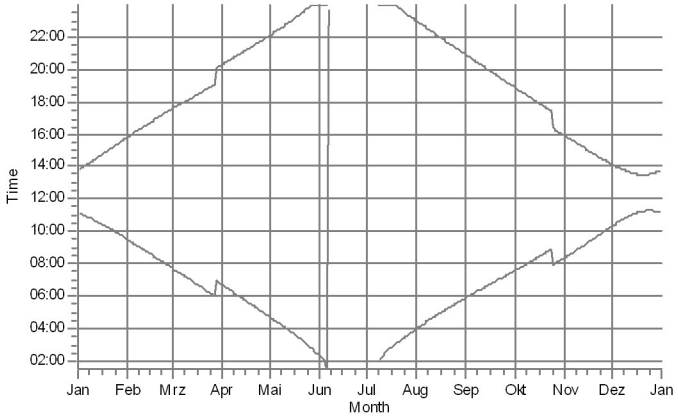
Lehtilaki: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (698)



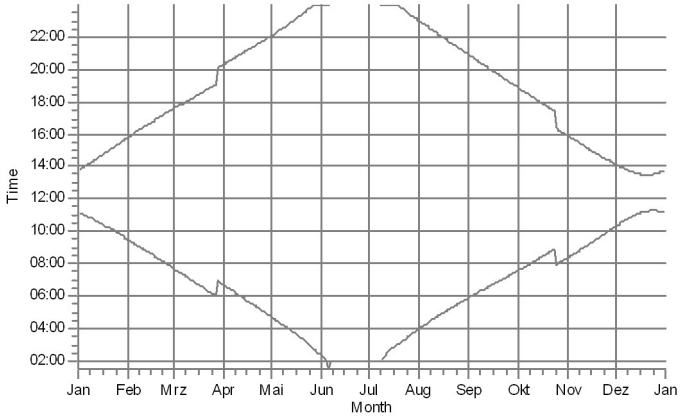
Metsästysmaja: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (6



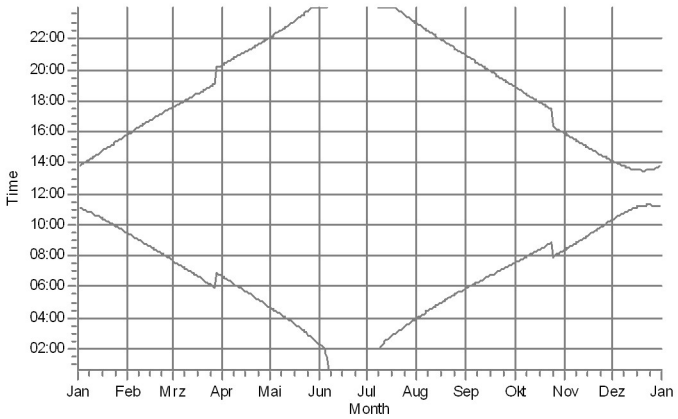
Pahtajärvi 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (693)



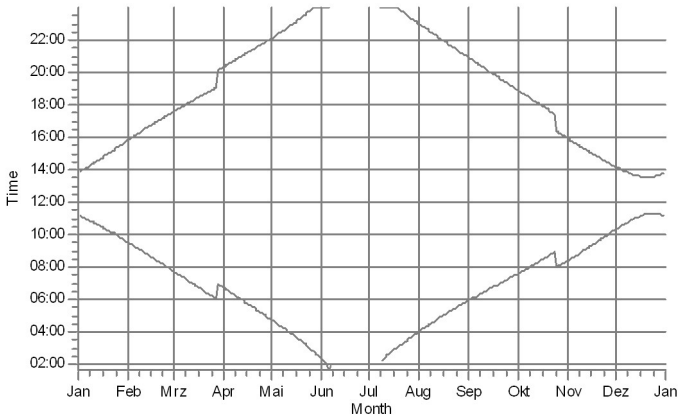
Pahtajärvi 2: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (694)



Pahtajärvi 3: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (695)



Pessala 1: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (699)



WTGs

WTG 04: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (327)

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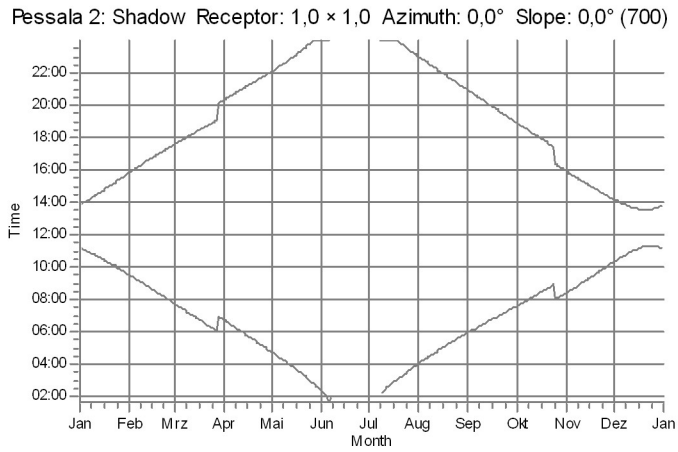
SHADOW - Calendar, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC



WTGs

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Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 03 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (326)

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	11:08	09:29	07:43	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:28		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:53	15:56	17:40	20:25	22:13	00:42		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:44		04:15	06:07	07:46	08:35	10:34
	14:00	16:04	17:47	20:32	22:21	01:01		22:43	20:37	18:39	15:40	13:55
6	10:57	09:10	07:23	06:21	04:20	00:40		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:39	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:07	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:03	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:54	22:26	20:21	18:23	15:25	13:44
10	10:45	08:55	07:08	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:46		00:40	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:31	08:09	09:02	10:58
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:28	22:10	20:05	18:08	15:10	13:36
14	10:33	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
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	14:39	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:07	21:53	19:50	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:30	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:14
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:28
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:12		03:14	05:19	07:03	08:44	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:02		03:24	05:26	07:10	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:43	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:32
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:17	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:38
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:13	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:51		08:16		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	692	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 04 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (327)

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	11:08	09:29 11:45-12:06/21	07:43	06:41	04:41	02:16		03:59	05:54	07:32	08:20 11:19-11:33/14	10:18
	13:47	15:48	17:33	20:18	22:05	00:28		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25 11:45-12:07/22	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24 11:18-11:35/17	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22 11:45-12:07/22	07:35	06:33	04:32	02:03		04:07	06:01	07:39	08:27 11:16-11:35/19	10:26
	13:53	15:56	17:40	20:25	22:13	00:42		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18 11:45-12:07/22	07:31	06:29	04:28	01:54		04:11	06:04	07:42	08:31 11:16-11:36/20	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:43	13:58
5	10:59	09:14 11:46-12:07/21	07:27	06:25	04:24	01:44		04:15	06:07	07:45	08:35 11:15-11:36/21	10:34
	14:00	16:04	17:47	20:32	22:21	01:01		22:43	20:37	18:39	15:40	13:55
6	10:57	09:10 11:46-12:07/21	07:23	06:21	04:20	02:19		04:19	06:11	07:49	08:39 11:15-11:37/22	10:37
	14:04	16:08	17:50	20:35	22:25			22:39	20:33	18:35	15:36	13:52
7	10:54	09:07 11:46-12:06/20	07:19	06:17	04:16			04:23	06:14	07:52	08:43 11:15-11:37/22	10:41
	14:07	16:11	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:49
8	10:51	09:03 11:47-12:05/18	07:15	06:13	04:12			04:27	06:17	07:55	08:47 11:16-11:37/21	10:45
	14:11	16:15	17:57	20:42	22:33		01:03	22:30	20:25	18:27	15:28	13:47
9	10:48	08:59 11:48-12:04/16	07:11	06:09	04:08		02:05	04:31	06:21	07:59	08:50 11:15-11:37/22	10:48
	14:15	16:19	18:01	20:45	22:37		00:54	22:26	20:21	18:23	15:25	13:44
10	10:45	08:55 11:50-12:04/14	07:08	06:05	04:03		02:13	04:35	06:24	08:02	08:54 11:16-11:37/21	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52 11:52-12:01/9	07:04	06:01	03:59		02:20	04:39	06:27	08:06	08:58 11:16-11:37/21	10:55
	14:23	16:27	18:07	20:52	22:46		00:40	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02 11:17-11:36/19	10:58
	14:26	16:31	18:11	20:56	22:50		00:34	22:14	20:09	18:12	15:14	13:37
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06 11:18-11:36/18	11:01
	14:30	16:35	18:14	20:59	22:54		00:28	22:10	20:05	18:08	15:10	13:35
14	10:33	08:40	06:52	05:49	03:46		02:39	04:50	06:37	08:16	09:10 11:19-11:35/16	11:03
	14:34	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14 11:21-11:34/13	11:06
	14:38	16:42	18:21	21:06	23:03		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:49	04:57	06:44	08:23	09:18 11:22-11:32/10	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22 11:25-11:29/4	11:10
	14:47	16:49	18:28	21:13	23:11		00:07	21:53	19:50	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:14
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:28
20	10:12	08:17	06:28	05:25	03:20		03:05	05:12	06:56	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:30		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:11		03:14	05:19	07:03	08:44	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:37	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:02		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55 11:52-11:57/5	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:43	23:49		23:30	21:21	19:18	16:21	14:27	13:31
26	09:51 11:49-11:59/10	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:32
27	09:47 11:48-12:02/14	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:27	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44 11:47-12:03/16	07:46	05:57	04:53	02:38		03:41	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:17	21:09	19:06	16:10	14:17	13:36
29	09:40 11:46-12:04/18		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:38
30	09:36 11:45-12:05/20		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:16		23:08	21:01	18:58	16:02	14:10	13:41
31	09:33 11:46-12:06/20		06:45		02:22		03:54	05:50		08:16 11:21-11:31/10		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:43
Potential sun hours	134	225	362	463	606	690	669	528	397	296	172	83
Sum of minutes with flicker	103	206	0	0	0	0	0	0	0	10	300	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 05 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (328)

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	11:08	09:29	07:43	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:45		04:15	06:07	07:46	08:35	10:34
	14:00	16:04	17:47	20:32	22:21	01:00		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	17:08		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:07	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:06
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:07	21:53	19:50	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:44	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:51		08:16		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	699	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 06 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (329)

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	11:08	09:29	07:42	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:28		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:32	02:03		04:07	06:01	07:39	08:27	10:26
	13:53	15:56	17:40	20:25	22:13	00:42		22:51	20:45	18:47	15:47	14:01
4	11:02	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:43	13:58
5	10:59	09:14	07:27	06:25	04:24	01:44		04:15	06:07	07:45	08:35	10:34
	14:00	16:04	17:47	20:32	22:21	01:01		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	00:50		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:07	16:11	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:03	22:30	20:25	18:27	15:28	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:00	20:45	22:37		00:54	22:26	20:21	18:23	15:25	13:44
10	10:45	08:55	07:07	06:05	04:03		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:20	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:28	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:06
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:43	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:12	21:57	19:53	17:56	14:59	13:31
17	10:23	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:07	21:53	19:49	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:14
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:28
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:20	05:17	03:12		03:14	05:19	07:03	08:43	09:42	11:17
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:28
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:39	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:02		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:17
	15:23	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:32
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:22	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:17	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:38
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:50		08:16		11:11
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	692	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 07 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (330)

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	11:08	09:29	07:43	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:29	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:45		04:15	06:07	07:46	08:35	10:33
	14:00	16:04	17:47	20:32	22:21	01:00		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	02:36		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:47	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:06	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:33
16	10:26	08:33	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:49	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:48	21:37	19:34	17:37	14:41	13:28
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:44	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:55	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:58	00:10		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:03	14:11	13:41
31	09:33		06:45		02:22		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	690	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 08 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (331)

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	11:08	09:29	07:42	06:41	04:41	02:16		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:07
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:50	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:50		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:45		04:15	06:07	07:45	08:35	10:33
	14:00	16:04	17:47	20:32	22:21	01:00		22:43	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:31		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:52
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:22	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:44	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:17	22:01	19:57	18:00	15:03	13:32
16	10:26	08:32	06:44	05:41	03:38		02:50	04:57	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:19	17:19	18:54	21:42	23:49		23:30	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:43		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:20	13:34
28	09:44	07:46	05:57	04:53	02:38		03:42	05:40	07:22	08:05	10:06	11:15
	15:32	17:29	19:04	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:36
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:14
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:54	05:50		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 09 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (332)

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	11:08	09:29	07:43	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:05
3	11:04	09:22	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:29	01:56		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:46	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:59		22:43	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:25		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:54	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:16	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:20	15:21	13:42
11	10:42	08:52	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:18	13:40
12	10:39	08:48	07:00	05:57	03:55		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:05	20:01	18:04	15:07	13:34
15	10:29	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:33	06:44	05:41	03:38		02:50	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:54	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:02	21:49	19:46	17:49	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:21	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:15
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:13	06:25	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:44	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:16	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:54		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:58	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:59	16:03	14:11	13:41
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 10 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (333)

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	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:22	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:29	01:56		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:59		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:25		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:36	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:41	03:38		02:50	04:58	06:44	08:23	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:01	21:49	19:46	17:49	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:16	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:15
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:03	14:11	13:41
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:04	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 11 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (334)

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	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:47	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:54	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:10		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:34		22:55	20:49	18:51	15:51	14:04
3	11:04	09:21	07:35	06:33	04:33	02:03		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:55		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:00	16:04	17:47	20:32	22:21	00:59		22:42	20:37	18:39	15:40	13:55
6	10:56	09:10	07:23	06:21	04:20	01:00		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:02	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:06	04:31	06:21	07:59	08:50	10:48
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:46	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:39	08:48	07:00	05:57	03:55		02:27	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:33	22:14	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:33	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:22	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:18	11:08
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:55	13:30
18	10:19	08:25	06:36	05:33	03:29		03:00	05:05	06:50	08:29	09:26	11:12
	14:51	16:53	18:31	21:17	23:16		00:01	21:49	19:46	17:48	14:52	13:29
19	10:16	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:28
21	10:09	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:16
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:28
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:17
	15:11	17:11	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:51	09:50	11:17
	15:15	17:15	18:51	21:39	23:44		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:28	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:31
26	09:51	07:54	06:05	05:01	02:48		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:16
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:15
	15:32	17:29	19:04	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:33		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:33		06:45		02:22		03:55	05:50		08:16		11:10
	15:44		20:15		00:21		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	83
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 12 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (335)

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	11:08	09:29	07:43	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:04	09:22	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:02
4	11:01	09:18	07:31	06:29	04:29	01:56		04:11	06:04	07:42	08:31	10:30
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:25	04:25	01:46		04:15	06:07	07:46	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:59		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:28		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:07	07:19	06:17	04:16			04:23	06:14	07:52	08:43	10:41
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:51	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:01	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:01	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:20	15:21	13:43
11	10:42	08:51	07:04	06:01	04:00		02:21	04:39	06:27	08:06	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:18	13:40
12	10:39	08:48	07:00	05:57	03:55		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:50		00:33	22:14	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:10	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:50	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:18	21:03	22:58		00:22	22:05	20:01	18:04	15:07	13:34
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:42	03:38		02:50	04:58	06:44	08:23	09:18	11:07
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:38	03:34		02:55	05:01	06:47	08:26	09:22	11:10
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:31
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:16		00:01	21:49	19:46	17:49	14:52	13:30
19	10:16	08:21	06:32	05:29	03:25		03:00	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:25		23:52	21:41	19:38	17:41	14:45	13:29
21	10:09	08:13	06:25	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:10	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:02	08:06	06:17	05:13	03:07		03:20	05:23	07:06	08:47	09:46	11:17
	15:12	17:12	18:48	21:35	23:39		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:17
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:17
	15:20	17:19	18:55	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:59		23:21	21:13	19:10	16:14	14:21	13:35
28	09:44	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:59	16:03	14:11	13:42
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:21		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 13 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (336)

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	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:54	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:04
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:41		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:49		22:47	20:41	18:43	15:44	13:58
5	10:59	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:59		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:28		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25			22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16			04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:01	22:30	20:25	18:27	15:29	13:47
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:53	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:14	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:42
11	10:42	08:51	07:04	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:39	22:18	20:13	18:16	15:17	13:40
12	10:38	08:48	07:00	05:57	03:55		02:28	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:33	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:03
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:31
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:57	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:01	08:06	06:17	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:16
	15:11	17:11	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:29
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:17
	15:15	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:21	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:54	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:32		06:45		02:23		03:55	05:50		08:16		11:10
	15:44		20:15		00:21		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	669	528	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 14 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (337)

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	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:55	15:55	14:08
2	11:06	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:24	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:26
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:48		22:47	20:41	18:43	15:44	13:59
5	10:59	09:14	07:27	06:25	04:25	01:47		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:58		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:31		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25	01:15		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	00:50		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:01	22:30	20:25	18:27	15:29	13:48
9	10:48	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:01	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:08	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:20	15:21	13:43
11	10:42	08:51	07:04	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:40
12	10:38	08:48	07:00	05:57	03:55		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:14	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:54	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:50	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:26	08:32	06:44	05:42	03:38		02:50	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:07		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:38	03:34		02:56	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:31
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:01	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:08	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:01	08:06	06:17	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
	15:32	17:29	19:05	21:54	00:04		23:16	21:09	19:06	16:10	14:18	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:03	14:11	13:42
31	09:33		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	691	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 15 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (338)

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	11:07	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:11		04:03	05:57	07:36	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:47	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:24	01:47		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:58		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:31		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25	01:14		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	00:15		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:01	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:43
11	10:41	08:51	07:04	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:40
12	10:38	08:48	07:00	05:57	03:55		02:28	04:43	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:53		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:31
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:42	21:33	19:30	17:33	14:38	13:29
23	10:01	08:06	06:17	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:44
Potential sun hours	135	225	362	463	606	692	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 16 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (339)

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	11:08	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:27		22:59	20:53	18:54	15:55	14:08
2	11:06	09:25	07:38	06:37	04:37	02:11		04:03	05:57	07:35	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:47	14:01
4	11:01	09:18	07:31	06:29	04:28	01:56		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:58
5	10:58	09:14	07:27	06:25	04:24	01:46		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:58		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:29		04:19	06:11	07:49	08:39	10:37
	14:04	16:08	17:50	20:35	22:25	01:16		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	02:03		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:11	16:15	17:57	20:42	22:33		01:01	22:30	20:25	18:27	15:29	13:47
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:45	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:51
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:42
11	10:41	08:51	07:03	06:01	03:59		02:21	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:15	15:17	13:40
12	10:38	08:48	07:00	05:57	03:55		02:28	04:42	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	11:00
	14:31	16:35	18:14	20:59	22:54		00:27	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:39	04:50	06:37	08:16	09:10	11:02
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:06	13:34
15	10:29	08:36	06:48	05:45	03:42		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:57	06:43	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:30
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:16		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:34		23:43	21:33	19:30	17:33	14:38	13:29
23	10:01	08:05	06:16	05:13	03:07		03:19	05:23	07:06	08:47	09:46	11:16
	15:11	17:11	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:15	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:25	14:31	13:30
25	09:54	07:58	06:09	05:05	02:53		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:27	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:37	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:04		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:28		03:50	05:47	07:29	08:12	10:14	11:12
	15:40		20:11	22:01	00:15		23:08	21:01	18:58	16:02	14:11	13:41
31	09:32		06:45		02:23		03:55	05:50		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:59		13:44
Potential sun hours	134	225	362	463	606	690	669	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 17 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (340)

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	11:07	09:29	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:11		04:03	05:57	07:36	08:23	10:22
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:48		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:32	22:21	00:57		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:33		04:19	06:11	07:49	08:39	10:37
	14:05	16:08	17:50	20:35	22:25	01:13		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	03:40		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:08	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:20	15:21	13:43
11	10:41	08:51	07:04	06:02	04:00		02:22	04:39	06:27	08:05	08:58	10:54
	14:23	16:27	18:07	20:52	22:45		00:38	22:18	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:51		02:34	04:47	06:34	08:12	09:06	10:59
	14:31	16:35	18:14	20:59	22:54		00:26	22:09	20:05	18:08	15:10	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
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16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:29	06:40	05:38	03:34		02:56	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:50	17:52	14:56	13:31
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:52	13:30
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:30	11:13
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:28	05:26	03:21		03:06	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:22	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:04	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:08	17:08	18:44	21:31	23:34		23:42	21:33	19:30	17:33	14:38	13:30
23	10:01	08:06	06:17	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:35	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:10	08:51	09:50	11:16
	15:16	17:15	18:51	21:39	23:43		23:34	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:34
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
	15:32	17:29	19:05	21:54	00:03		23:16	21:09	19:06	16:10	14:18	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:08	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	463	606	712	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 18 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (341)

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	11:07	09:29	07:42	06:41	04:41	02:17		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:54	15:55	14:08
2	11:05	09:25	07:38	06:37	04:37	02:11		04:03	05:57	07:35	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:04		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:47	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:57	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:24	01:47		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:58		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:20	01:32		04:19	06:11	07:49	08:38	10:37
	14:04	16:08	17:50	20:35	22:25	01:13		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	02:51		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:32	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:15	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:07	04:31	06:21	07:59	08:50	10:47
	14:15	16:19	18:00	20:45	22:37		00:52	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:45	22:22	20:17	18:19	15:21	13:43
11	10:41	08:51	07:03	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:16	15:18	13:40
12	10:38	08:47	07:00	05:57	03:55		02:28	04:43	06:30	08:09	09:02	10:57
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:38
13	10:35	08:44	06:56	05:53	03:51		02:34	04:46	06:34	08:12	09:06	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:36
14	10:32	08:40	06:52	05:49	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:38	18:17	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:45	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:41	03:38		02:50	04:58	06:43	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
17	10:22	08:28	06:40	05:37	03:34		02:55	05:01	06:47	08:26	09:22	11:09
	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:31
18	10:19	08:25	06:36	05:33	03:30		03:00	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:45	17:48	14:52	13:30
19	10:15	08:21	06:32	05:29	03:25		03:00	05:08	06:53	08:33	09:30	11:12
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:48	13:29
20	10:12	08:17	06:28	05:25	03:21		03:05	05:12	06:56	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:03	17:04	18:41	21:27	23:29		23:47	21:37	19:34	17:37	14:41	13:29
22	10:05	08:09	06:20	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:16
	15:07	17:08	18:44	21:31	23:33		23:42	21:33	19:30	17:33	14:38	13:29
23	10:01	08:05	06:16	05:13	03:08		03:20	05:23	07:06	08:47	09:46	11:16
	15:12	17:11	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:34	13:30
24	09:58	08:02	06:13	05:09	03:03		03:24	05:26	07:09	08:50	09:50	11:16
	15:16	17:15	18:51	21:38	23:43		23:33	21:25	19:22	17:25	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:16
	15:24	17:22	18:58	21:46	23:53		23:25	21:17	19:14	16:18	14:24	13:33
27	09:47	07:50	06:01	04:57	02:44		03:38	05:37	07:19	08:01	10:02	11:15
	15:28	17:26	19:01	21:50	23:58		23:20	21:13	19:10	16:14	14:21	13:35
28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:22	08:05	10:06	11:14
	15:32	17:29	19:04	21:53	00:03		23:16	21:09	19:06	16:10	14:17	13:37
29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:08	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:39
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:14		00:20		23:03	20:57		15:59		13:44
Potential sun hours	135	225	362	463	606	689	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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:
17.09.2021 08:27/3.4.415

SHADOW - Calendar per WTG

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WCWTG: WTG 19 - NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (342)

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	11:07	09:29	07:42	06:41	04:41	02:18		03:59	05:54	07:32	08:20	10:18
	13:48	15:48	17:33	20:18	22:05	00:26		22:59	20:53	18:55	15:55	14:08
2	11:05	09:25	07:39	06:37	04:37	02:12		04:03	05:57	07:36	08:23	10:21
	13:51	15:52	17:36	20:21	22:09	00:33		22:55	20:49	18:51	15:51	14:05
3	11:03	09:21	07:35	06:33	04:33	02:05		04:07	06:01	07:39	08:27	10:25
	13:54	15:56	17:40	20:25	22:13	00:40		22:51	20:45	18:47	15:48	14:02
4	11:01	09:18	07:31	06:29	04:29	01:57		04:11	06:04	07:42	08:31	10:29
	13:58	16:00	17:43	20:28	22:17	00:48		22:46	20:41	18:43	15:44	13:59
5	10:58	09:14	07:27	06:25	04:25	01:48		04:15	06:07	07:45	08:35	10:33
	14:01	16:04	17:47	20:31	22:21	00:57		22:42	20:37	18:39	15:40	13:56
6	10:56	09:10	07:23	06:21	04:21	01:33		04:19	06:11	07:49	08:39	10:36
	14:05	16:08	17:50	20:35	22:25	01:12		22:38	20:33	18:35	15:36	13:53
7	10:53	09:06	07:19	06:17	04:16	21:28		04:23	06:14	07:52	08:42	10:40
	14:08	16:12	17:54	20:38	22:29			22:34	20:29	18:31	15:33	13:50
8	10:50	09:03	07:15	06:13	04:12			04:27	06:17	07:55	08:46	10:44
	14:12	16:16	17:57	20:42	22:33		01:00	22:30	20:25	18:27	15:29	13:48
9	10:47	08:59	07:11	06:09	04:08		02:08	04:31	06:21	07:59	08:50	10:47
	14:16	16:20	18:01	20:45	22:37		00:51	22:26	20:21	18:23	15:25	13:45
10	10:44	08:55	07:07	06:05	04:04		02:15	04:35	06:24	08:02	08:54	10:50
	14:19	16:23	18:04	20:49	22:41		00:44	22:22	20:17	18:20	15:21	13:43
11	10:41	08:51	07:04	06:01	04:00		02:22	04:39	06:27	08:05	08:58	10:53
	14:23	16:27	18:07	20:52	22:45		00:38	22:17	20:13	18:16	15:18	13:41
12	10:38	08:48	07:00	05:58	03:56		02:28	04:43	06:31	08:09	09:02	10:56
	14:27	16:31	18:11	20:56	22:49		00:32	22:13	20:09	18:12	15:14	13:39
13	10:35	08:44	06:56	05:54	03:51		02:34	04:47	06:34	08:12	09:06	10:59
	14:31	16:35	18:14	20:59	22:53		00:26	22:09	20:05	18:08	15:10	13:37
14	10:32	08:40	06:52	05:50	03:47		02:40	04:50	06:37	08:16	09:10	11:02
	14:35	16:39	18:18	21:03	22:58		00:21	22:05	20:01	18:04	15:07	13:35
15	10:29	08:36	06:48	05:46	03:43		02:45	04:54	06:40	08:19	09:14	11:05
	14:39	16:42	18:21	21:06	23:02		00:16	22:01	19:57	18:00	15:03	13:33
16	10:25	08:32	06:44	05:42	03:39		02:51	04:58	06:44	08:22	09:18	11:07
	14:43	16:46	18:24	21:10	23:06		00:11	21:57	19:53	17:56	14:59	13:32
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	14:47	16:50	18:28	21:13	23:11		00:06	21:53	19:49	17:52	14:56	13:31
18	10:19	08:25	06:36	05:34	03:30		03:01	05:05	06:50	08:29	09:26	11:11
	14:51	16:53	18:31	21:17	23:15		00:01	21:49	19:46	17:49	14:52	13:30
19	10:15	08:21	06:32	05:30	03:26		03:01	05:09	06:53	08:33	09:30	11:12
	14:55	16:57	18:34	21:20	23:20		23:56	21:45	19:42	17:45	14:49	13:30
20	10:12	08:17	06:28	05:26	03:21		03:06	05:12	06:57	08:36	09:34	11:14
	14:59	17:01	18:38	21:24	23:24		23:52	21:41	19:38	17:41	14:45	13:29
21	10:08	08:13	06:24	05:21	03:17		03:10	05:16	07:00	08:40	09:38	11:15
	15:04	17:04	18:41	21:28	23:29		23:47	21:37	19:34	17:37	14:42	13:29
22	10:05	08:09	06:21	05:17	03:12		03:15	05:19	07:03	08:43	09:42	11:15
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	15:12	17:12	18:48	21:35	23:38		23:38	21:29	19:26	17:29	14:35	13:30
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	15:16	17:15	18:51	21:39	23:43		23:33	21:25	19:22	17:26	14:31	13:31
25	09:54	07:58	06:09	05:05	02:54		03:29	05:30	07:13	07:54	09:54	11:16
	15:20	17:19	18:54	21:42	23:48		23:29	21:21	19:18	16:22	14:28	13:32
26	09:51	07:54	06:05	05:01	02:49		03:33	05:33	07:16	07:58	09:58	11:15
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28	09:43	07:46	05:57	04:53	02:39		03:42	05:40	07:23	08:05	10:06	11:14
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29	09:40		06:53	04:49	02:34		03:46	05:44	07:26	08:09	10:10	11:13
	15:36		20:08	21:57	00:09		23:12	21:05	19:02	16:06	14:14	13:40
30	09:36		06:49	04:45	02:29		03:51	05:47	07:29	08:12	10:14	11:11
	15:40		20:11	22:01	00:14		23:07	21:01	18:58	16:03	14:11	13:42
31	09:32		06:45		02:23		03:55	05:51		08:16		11:10
	15:44		20:15		00:20		23:03	20:57		15:59		13:45
Potential sun hours	135	225	362	463	606	694	668	527	397	296	173	84
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	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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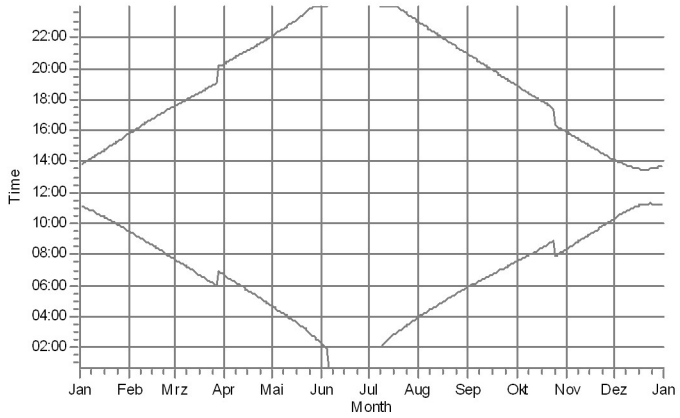
17.09.2021 08:27/3.4.415

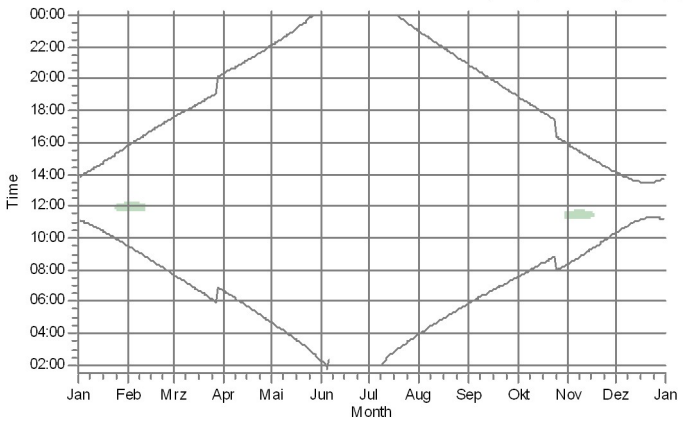
SHADOW - Calendar per WTG, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

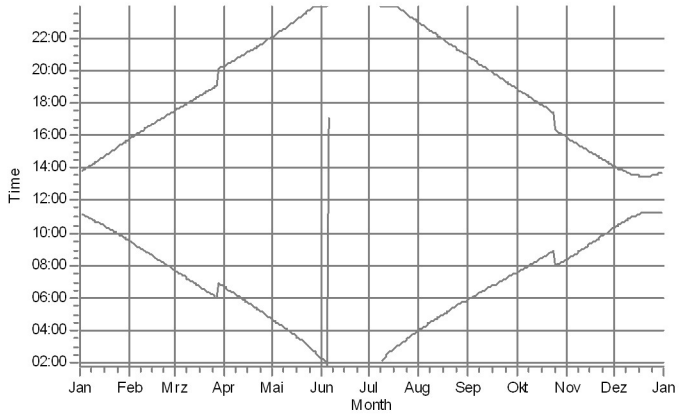
WTG 03: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



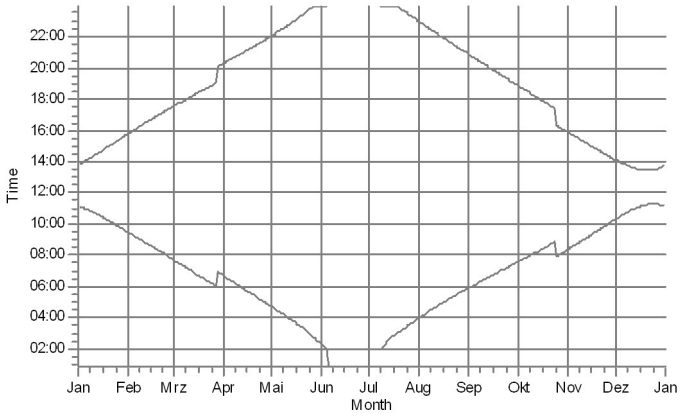
WTG 04: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



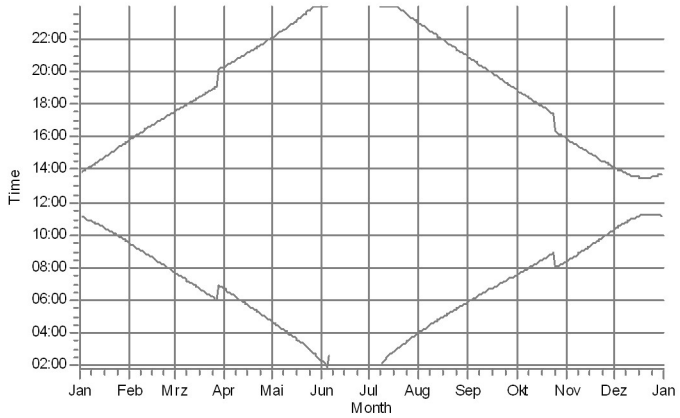
WTG 05: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



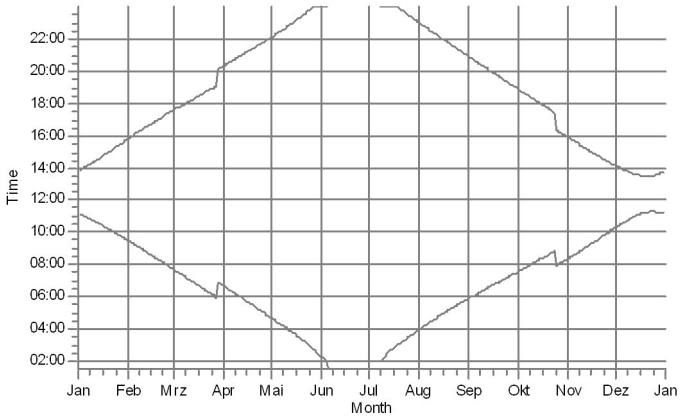
WTG 06: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 07: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 08: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



Shadow receptors

Metsästysmaja: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (690)

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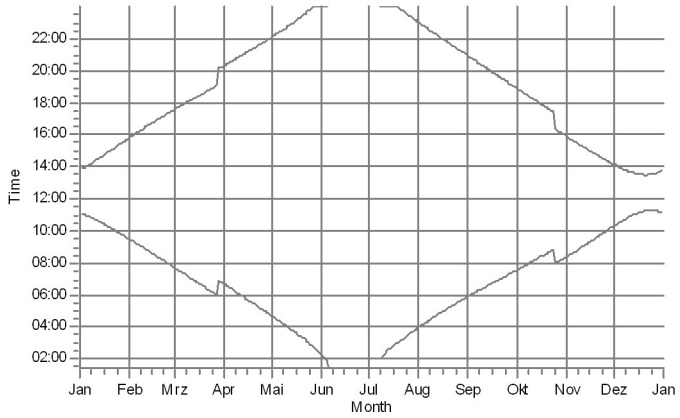
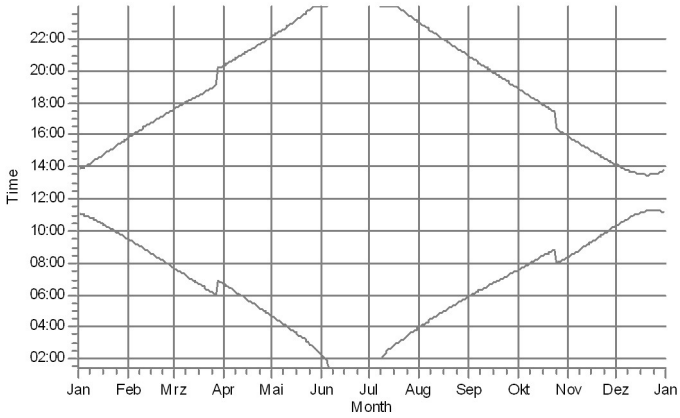
SHADOW - Calendar per WTG, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

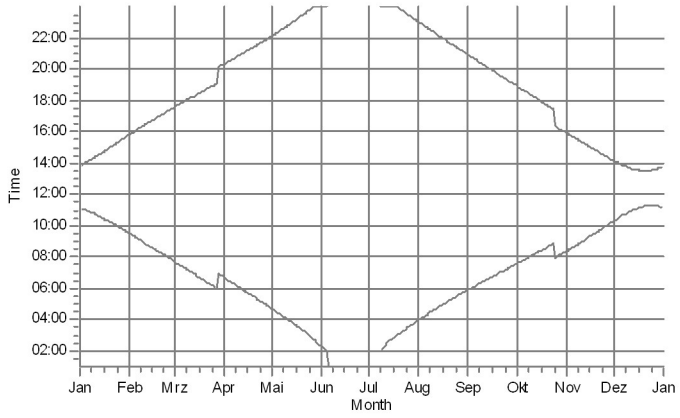
WTG 09: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



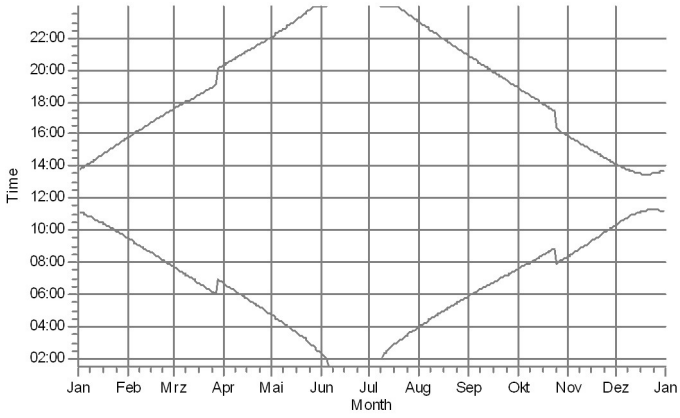
WTG 10: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



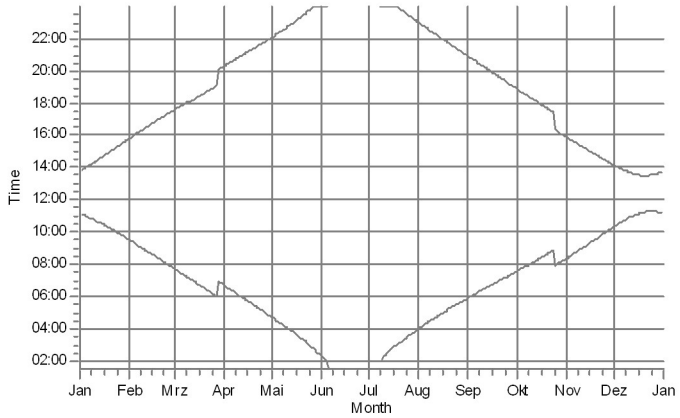
WTG 11: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



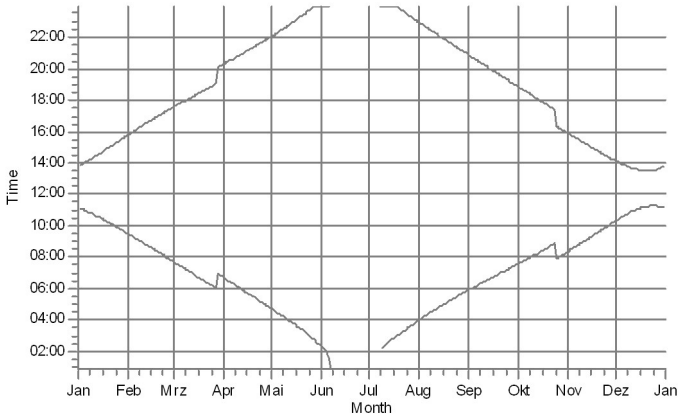
WTG 12: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 13: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 14: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



Shadow receptors

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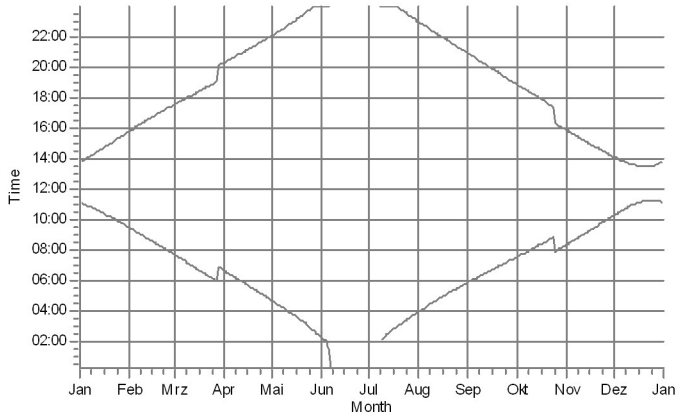
Calculated:
17.09.2021 08:27/3.4.415

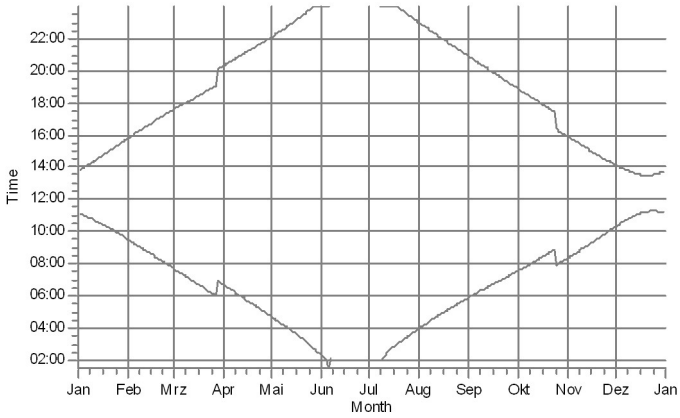
SHADOW - Calendar per WTG, graphical

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC

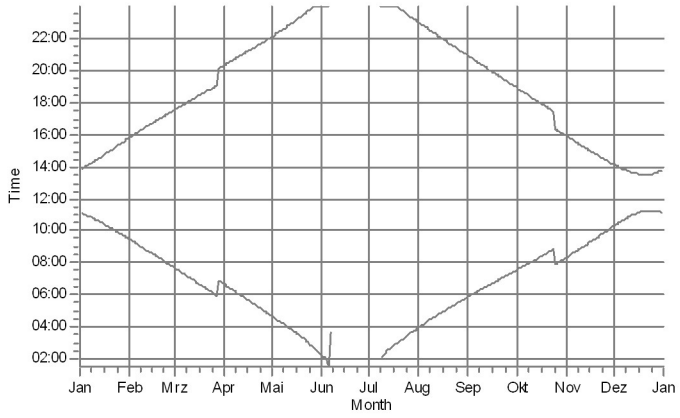
WTG 15: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



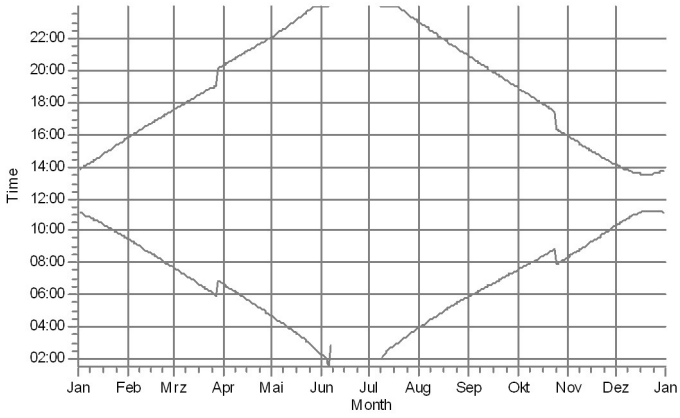
WTG 16: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



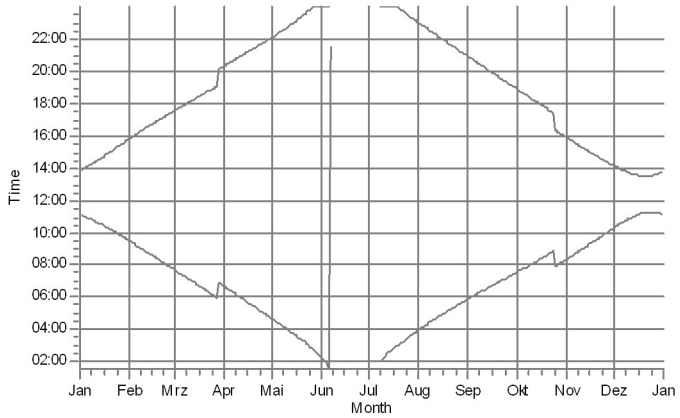
WTG 17: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 18: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



WTG 19: NORDEX N163/6.X 6800 163.0 !O! hub: 168,5 m (TOT: 250,0 m) (



Shadow receptors

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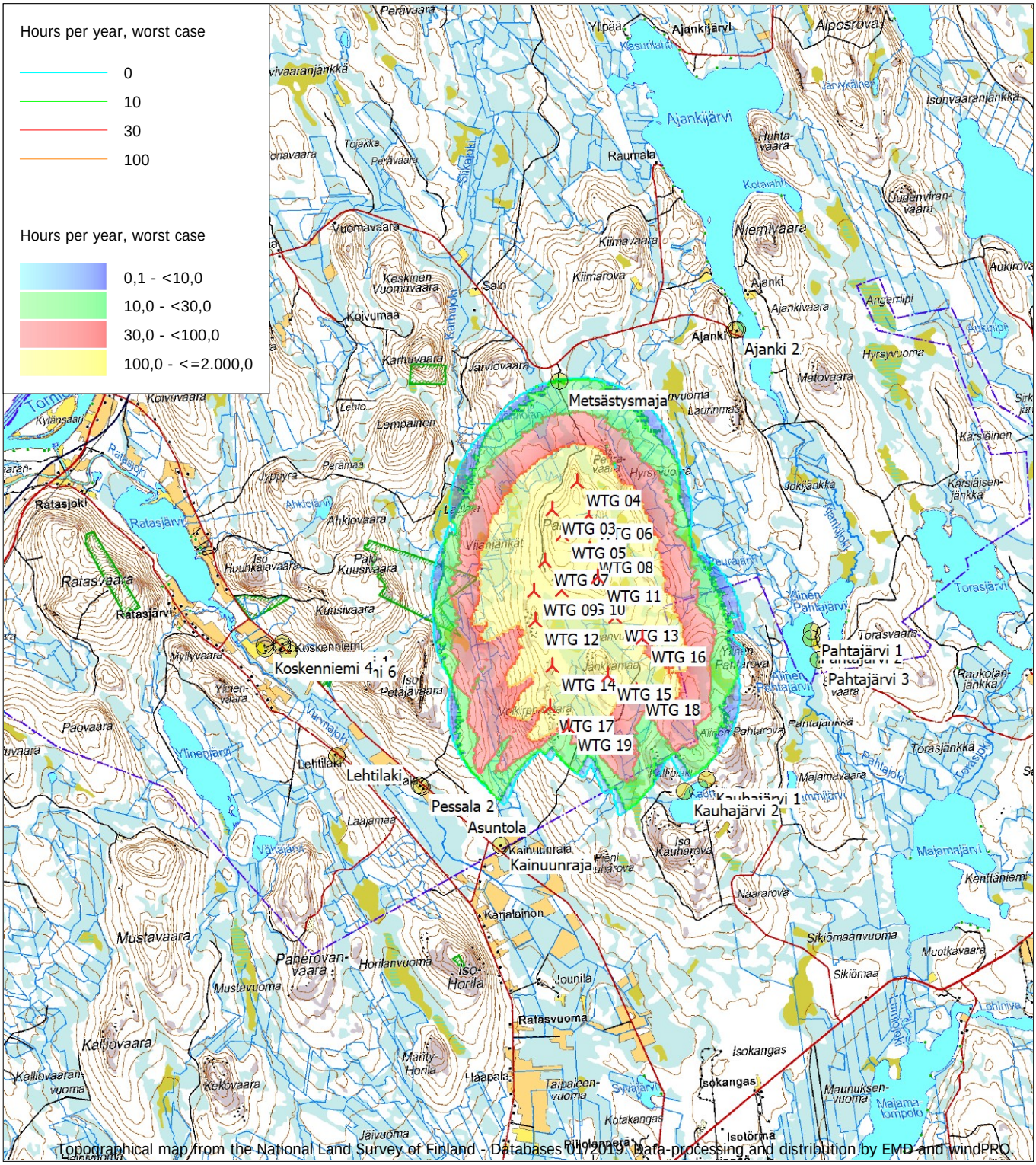
Paul Bade / p.bade@wpd.de
Calculated:
17.09.2021 08:27/3.4.415

SHADOW - Map

Calculation: BPA Layout 31.8.21, 17x N163 6.8 MW @168.5m, WC



Map: Finnish Topographic Map , Print scale 1:100.000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 368.310 North: 7.381.920

New WTG Shadow receptor

Flicker map level: DEM FI+SE