

SHADOW - Main Result

Calculation: varjutus_põhja_real case

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) []
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,06 2,24 4,50 6,38 8,59 8,43 8,90 7,50 5,07 2,54 1,01 0,68

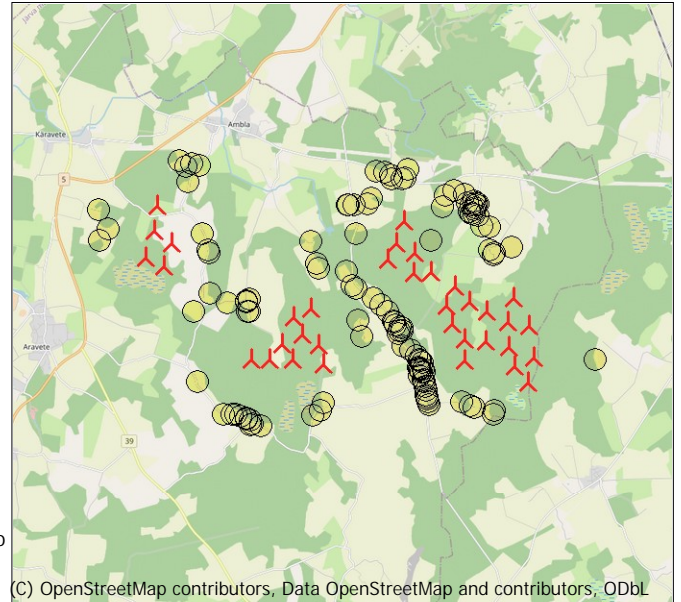
Operational time
N NE E SE S SW W NW Sum
710 631 631 946 1 498 1 498 1 104 867 7 885

Monthly aggregation of real case reduction
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_ONLINEDATA_4.wpo
Receptor grid resolution: 1,0 m

All coordinates are in
Estonian Lambert L-EST97-EST97 (EE)

WTGs

	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
1	611 416	6 557 563	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
2	611 154	6 558 946	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
3	611 984	6 558 311	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
4	612 708	6 558 702	116,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
5	612 567	6 558 056	112,3	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
6	613 121	6 557 971	116,8	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
7	613 285	6 557 133	114,1	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
8	610 928	6 556 437	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
9	611 524	6 558 566	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
10	611 070	6 557 948	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
11	612 785	6 556 895	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
12	613 138	6 556 463	110,7	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
14	612 598	6 557 410	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
15	611 994	6 557 526	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
16	610 035	6 559 804	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
17	609 742	6 560 627	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
18	610 490	6 559 330	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
19	609 343	6 559 611	109,3	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
20	609 546	6 560 069	108,9	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
22	607 553	6 557 291	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
23	607 122	6 557 557	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
24	607 335	6 558 258	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
25	606 595	6 557 297	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
26	606 278	6 556 890	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
27	605 774	6 556 848	107,6	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
28	606 887	6 556 886	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
29	606 868	6 558 000	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
30	607 683	6 556 797	110,0	TU11	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
31	603 400	6 559 258	100,0	TU13	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
32	602 904	6 559 490	100,0	TU13	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
33	603 109	6 560 194	100,0	TU13	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
34	603 176	6 560 874	100,0	TU13	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
35	603 565	6 559 899	100,0	TU13	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
13 (reserv)	611 435	6 557 004	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-
21 (reserv)	610 011	6 559 294	110,0	TU10	Yes	Teoreetiline	-7 000	7 000	180,0	180,0	1 783	-



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:200 000
New WTG Shadow receptor

SHADOW - Main Result

Calculation: varjutus_põhja_real case

Shadow receptor-Input

No.	Name	East	North	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
				[m]	[m]	[m]	a.g.l.	window		(ZVI) a.g.l.
							[m]	[°]		[m]
A	Viljaku	605 537	6 555 357	105,9	3,0	2,0	0,0	90,0	"Green house mode"	2,0
B	Rava mõis	605 872	6 555 175	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
C	Kirjapi	611 515	6 560 900	113,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
D	Vankri	605 615	6 558 384	104,1	3,0	2,0	0,0	90,0	"Green house mode"	2,0
E	Mõisa	612 286	6 555 711	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
F	Mäe tn 2	610 313	6 556 660	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
G	Liivaku	611 400	6 555 904	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
H	Undiaugu	610 754	6 561 053	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
I	Õunila	601 663	6 559 905	99,2	3,0	2,0	0,0	90,0	"Green house mode"	2,0
J	Ande	612 264	6 555 609	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
K	Saare	605 409	6 555 411	103,9	3,0	2,0	0,0	90,0	"Green house mode"	2,0
L	Pärtli	610 320	6 556 922	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
M	Rehepapi	611 462	6 560 968	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
N	Antsu	607 645	6 555 552	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
O	Veskimäe	608 838	6 561 245	109,9	3,0	2,0	0,0	90,0	"Green house mode"	2,0
P	Männi	609 770	6 557 804	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
Q	Jäära	610 505	6 555 871	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
R	Maarja	612 612	6 560 042	120,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
S	Karjala	604 584	6 559 659	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
T	Kannikese	603 980	6 561 528	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
U	Kährikutoa	611 388	6 561 181	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
V	Lageda	609 733	6 561 784	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
W	Ilumäe	610 264	6 556 551	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
X	Niidu	610 284	6 556 966	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
Y	Männimäe	609 727	6 557 839	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
Z	Lillelehe	604 064	6 562 018	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AA	Endla	604 205	6 558 083	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AB	Karukaevu	608 584	6 557 989	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AC	Männaru	609 683	6 557 734	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AD	Pödra	611 727	6 555 767	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AE	Kääno	611 025	6 561 498	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AF	Sepa/1	608 222	6 561 034	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AG	Vana-Prediku	610 253	6 556 768	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AH	Pärja	609 769	6 557 761	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AI	Kalda	609 359	6 558 222	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AJ	Topsu	608 479	6 560 291	102,1	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AK	Lindala	609 384	6 561 735	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AL	Alt-Sepa	609 793	6 562 030	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AM	Kindela	608 750	6 561 087	108,7	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AN	Jaama	612 014	6 559 932	114,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AO	Kallaste	604 387	6 560 168	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AP	Sireli	609 323	6 561 856	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AQ	Tammiku	605 809	6 555 258	109,9	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AR	Lüsingu	608 524	6 558 832	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AS	Sinimäe	611 631	6 555 806	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AT	Uueni	607 455	6 555 424	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AU	Lille	610 009	6 557 245	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AV	Uustalu	610 378	6 556 660	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AW	Aleksandri	610 442	6 556 173	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AX	Tooma	610 519	6 555 790	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AY	Nõmme	608 702	6 557 544	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
AZ	Kübarsespa	610 372	6 556 459	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BA	Õobiku	605 645	6 558 149	102,3	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BB	Vana-Prediku/1	610 225	6 556 777	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BC	Sanglepa	614 912	6 557 119	120,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BD	Koopa	607 502	6 559 342	108,5	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BE	Kopliotsa	609 786	6 557 332	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BF	Uuetoa	610 265	6 556 989	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BG	Siili	612 119	6 559 816	115,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BH	Kaevandi	609 584	6 557 876	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BI	Lõugu	605 688	6 558 139	102,9	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BJ	Kure	603 732	6 562 075	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BK	Kasemetsa	601 904	6 560 221	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BL	Tuuleveski	612 001	6 560 554	118,7	3,0	2,0	0,0	90,0	"Green house mode"	2,0

To be continued on next page...

SHADOW - Main Result

Calculation: varjutus_põhja_real case

...continued from previous page

No.	Name	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]
BM	Mäe tn 3	610 273	6 556 739	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BN	Treieri	604 256	6 561 980	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BO	Voki	610 827	6 561 357	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BP	Hirve	601 610	6 560 727	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BQ	Langu	608 950	6 561 955	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BR	Männiku	608 241	6 559 275	108,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BS	Lahe	611 588	6 560 865	117,8	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BT	Adra	610 487	6 555 939	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BU	Uuetoa	604 373	6 556 245	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BV	Kivila	605 078	6 555 379	101,7	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BW	Suitsuri	606 083	6 555 109	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BX	Pärna	605 305	6 555 405	102,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BY	Niidu	605 810	6 555 130	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
BZ	Mäe tn 5	610 335	6 556 739	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CA	Tiigira	611 517	6 561 123	111,8	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CB	Lalli	610 424	6 556 278	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CC	Sepa	608 240	6 561 016	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CD	Männituka	605 688	6 558 456	105,5	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CE	Vile	604 629	6 558 596	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CF	Hansurahva	610 444	6 556 064	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CG	Põllu	611 662	6 561 162	116,4	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CH	Mardi-Hansu	611 308	6 561 405	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CI	Kalviku	608 971	6 558 579	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CJ	Jõulu	604 541	6 559 742	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CK	Kooli	609 203	6 558 414	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CL	Sirtsu	609 519	6 558 003	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CM	Mäe tn 1	610 291	6 556 700	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CN	Kungla	609 175	6 561 938	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CO	Kitse	610 401	6 556 406	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CP	Eliase	607 432	6 559 462	107,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CQ	Kubja	611 702	6 560 852	119,1	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CR	Terase	607 273	6 560 036	101,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CS	Rohila	611 805	6 560 577	116,1	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CT	Jürirahva (kokkuleppega)	610 452	6 560 152	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CU	Prillupi	605 696	6 555 284	108,3	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CV	Laastu	608 401	6 558 900	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CW	Aedniku	608 392	6 561 030	102,4	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CX	Hansurahva/1	610 488	6 556 003	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CY	Ridala	610 185	6 557 088	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
CZ	Raamatukogu	611 635	6 561 177	115,2	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DA	Järve	605 708	6 555 313	108,3	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DB	Tammekännu	609 561	6 557 964	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DC	Nurme	609 655	6 561 780	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DD	Koigi park	612 152	6 559 858	116,4	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DE	Pajuste	611 594	6 561 230	113,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DF	Harri	605 600	6 558 423	104,3	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DG	Laasi	603 920	6 561 927	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DH	Tammiku	609 671	6 557 674	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DI	Kilgi	605 100	6 558 353	100,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DJ	Piirsoo	607 731	6 555 763	110,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DK	Madise	611 630	6 561 141	115,6	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DL	Antsura	611 610	6 561 055	116,2	3,0	2,0	0,0	90,0	"Green house mode"	2,0
DM	Pere	611 604	6 560 996	119,0	3,0	2,0	0,0	90,0	"Green house mode"	2,0

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		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]	
A	Viljaku	0:00	0	0:00	0:00	
B	Rava mõis	0:00	0	0:00	0:00	
C	Kirjapi	0:00	0	0:00	0:00	

To be continued on next page...

SHADOW - Main Result

Calculation: varjutus_põhja_real case

...continued from previous page

No.	Name	Shadow, worst case			Shadow, expected values	
		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]	
D	Vankri	106:35	204	0:55	12:35	
E	Mõisa	8:18	29	0:22	2:12	
F	Mäe tn 2	50:56	114	0:37	13:31	
G	Liivaku	28:44	74	0:27	7:46	
H	Undiaugu	78:34	180	0:38	9:31	
I	Õunila	32:15	83	0:32	7:01	
J	Ande	0:00	0	0:00	0:00	
K	Saare	0:00	0	0:00	0:00	
L	Pärtli	81:59	164	0:45	21:08	
M	Rehepapi	9:24	31	0:24	2:01	
N	Antsu	0:00	0	0:00	0:00	
O	Veskimäe	76:27	144	0:47	7:58	
P	Männi	71:05	169	0:34	17:53	
Q	Jäära	0:00	0	0:00	0:00	
R	Maarja	31:20	64	0:34	2:23	
S	Karjala	82:46	133	1:05	20:08	
T	Kannikese	70:25	148	0:41	7:35	
U	Kährikutoa	9:35	31	0:24	1:46	
V	Lageda	59:26	79	1:00	4:33	
W	Ilumäe	44:00	109	0:35	11:37	
X	Niidu	66:42	145	0:36	16:58	
Y	Männimäe	58:28	150	0:33	14:32	
Z	Lillelehe	19:50	50	0:31	1:58	
AA	Endla	0:00	0	0:00	0:00	
AB	Karukaevu	84:40	212	0:34	15:37	
AC	Männaru	61:43	166	0:31	15:38	
AD	Pödra	19:45	55	0:28	5:09	
AE	Kääno	13:17	38	0:27	1:51	
AF	Sepa/1	24:22	71	0:27	4:00	
AG	Vana-Prediku	59:23	127	0:35	15:41	
AH	Pärja	71:07	167	0:34	18:02	
AI	Kalda	26:52	90	0:27	6:24	
AJ	Topsu	81:02	165	0:38	16:16	
AK	Lindala	63:14	88	0:58	4:51	
AL	Alt-Sepa	28:52	62	0:33	2:11	
AM	Kindela	78:11	159	0:40	8:54	
AN	Jaama	116:30	153	1:14	10:40	
AO	Kallaste	123:18	237	1:00	26:59	
AP	Sireli	40:19	80	0:35	3:04	
AQ	Tammiku	0:00	0	0:00	0:00	
AR	Lüsingu	32:01	83	0:32	6:38	
AS	Sinimäe	24:43	79	0:27	6:26	
AT	Uueni	0:00	0	0:00	0:00	
AU	Lille	69:48	156	0:36	17:42	
AV	Uustalu	49:26	110	0:39	13:07	
AW	Aleksandri	18:40	47	0:30	5:00	
AX	Tooma	0:00	0	0:00	0:00	
AY	Nõmme	84:25	201	0:49	19:00	
AZ	Kübarsepa	49:07	97	0:37	12:39	
BA	Õobiku	142:08	221	1:04	17:43	
BB	Vana-Prediku/1	59:09	129	0:35	15:35	
BC	Sanglepa	11:26	34	0:26	2:41	
BD	Koopa	85:08	88	1:11	6:36	
BE	Kopliotsa	52:53	156	0:31	13:05	
BF	Uuetoa	59:36	140	0:36	15:03	
BG	Siili	128:46	166	1:22	12:14	
BH	Kaevandi	34:23	91	0:30	8:35	
BI	Lõugu	148:19	223	1:05	18:36	
BJ	Kure	37:51	90	0:34	2:57	
BK	Kasemetsa	84:46	190	0:46	17:54	
BL	Tuuleveski	0:00	0	0:00	0:00	
BM	Mäe tn 3	57:34	123	0:36	15:16	
BN	Treieri	15:42	42	0:28	1:51	

To be continued on next page...

SHADOW - Main Result

Calculation: varjutus_põhja_real case

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		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]
BO	Voki	44:23	119	0:33	4:38
BP	Hirve	24:03	69	0:27	4:58
BQ	Langu	28:52	84	0:29	2:15
BR	Männiku	93:22	206	0:50	21:23
BS	Lahe	0:00	0	0:00	0:00
BT	Adra	0:00	0	0:00	0:00
BU	Uuetoa	19:15	52	0:29	4:59
BV	Kivila	0:00	0	0:00	0:00
BW	Suitsuri	0:00	0	0:00	0:00
BX	Pärna	0:00	0	0:00	0:00
BY	Niidu	0:00	0	0:00	0:00
BZ	Mäe tn 5	57:16	120	0:38	15:12
CA	Tiigira	0:00	0	0:00	0:00
CB	Lalli	33:51	66	0:37	9:04
CC	Sepa	25:01	73	0:27	4:09
CD	Männituka	103:46	200	0:54	12:11
CE	Vile	39:12	85	0:32	10:42
CF	Hansurahva	4:46	23	0:16	1:16
CG	Põllu	0:00	0	0:00	0:00
CH	Mardi-Hansu	9:46	32	0:24	1:28
CI	Kalviku	64:06	138	0:38	16:28
CJ	Jõulu	97:32	174	1:12	23:46
CK	Kooli	41:03	105	0:29	10:38
CL	Sirtsu	29:20	80	0:29	7:08
CM	Mäe tn 1	54:30	118	0:36	14:28
CN	Kungla	35:34	78	0:32	2:38
CO	Kitse	48:04	87	0:38	12:36
CP	Eliase	73:21	77	1:06	5:31
CQ	Kubja	0:00	0	0:00	0:00
CR	Terase	12:22	40	0:23	0:53
CS	Rohila	24:20	64	0:26	1:43
CT	Jürirahva (kokkuleppega)	336:50	292	2:05	50:34
CU	Prillupi	0:00	0	0:00	0:00
CV	Laastu	63:55	142	0:43	14:27
CW	Aedniku	49:52	138	0:30	6:27
CX	Hansurahva/1	0:00	0	0:00	0:00
CY	Ridala	43:25	100	0:33	10:39
CZ	Raamatukogu	0:00	0	0:00	0:00
DA	Järve	0:00	0	0:00	0:00
DB	Tammekännu	31:52	84	0:30	7:49
DC	Nurme	59:45	80	1:02	4:35
DD	Koigi park	124:37	162	1:22	11:31
DE	Pajuste	0:00	0	0:00	0:00
DF	Harri	101:31	201	0:53	11:50
DG	Laasi	25:12	58	0:34	2:30
DH	Tammiku	62:15	159	0:31	15:55
DI	Kilgi	28:17	70	0:28	2:03
DJ	Piirsoo	0:00	0	0:00	0:00
DK	Madise	0:00	0	0:00	0:00
DL	Antsura	0:00	0	0:00	0:00
DM	Pere	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]
1	TU10	168:07	43:35
2	TU10	97:36	9:22
3	TU10	36:33	2:40
4	TU10	93:40	7:13
5	TU10	0:00	0:00
6	TU10	0:00	0:00
7	TU10	11:26	2:41

To be continued on next page...

SHADOW - Main Result

Calculation: varjutus_põhja_real case

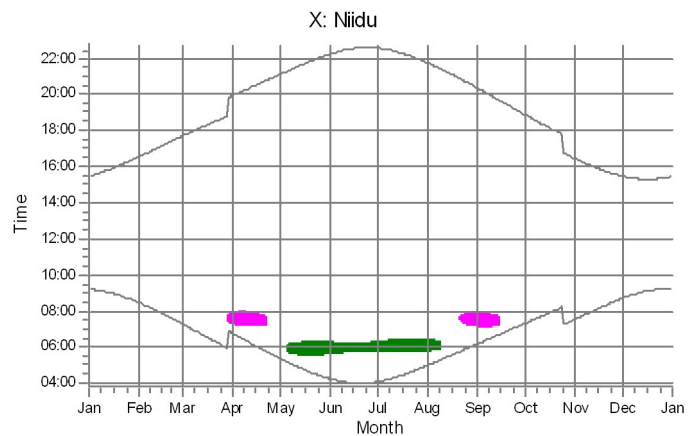
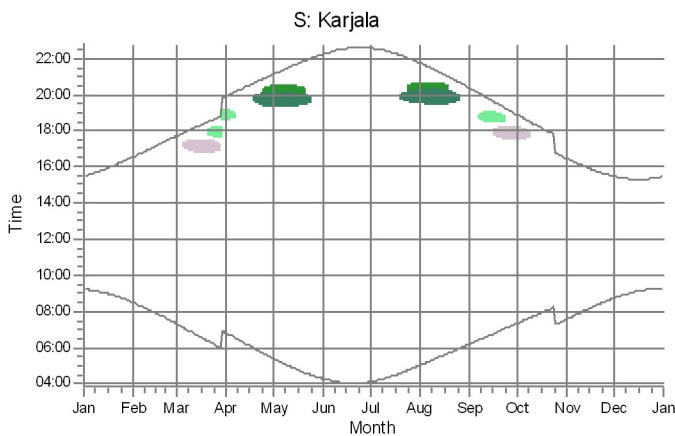
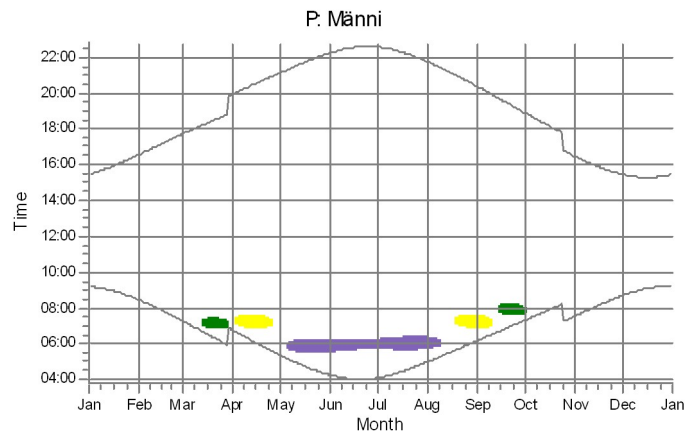
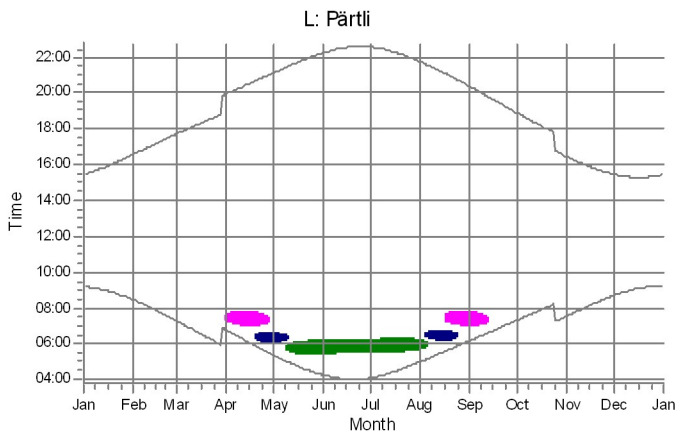
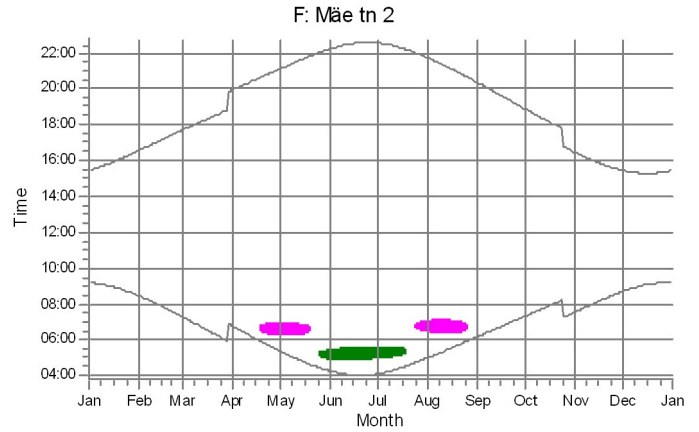
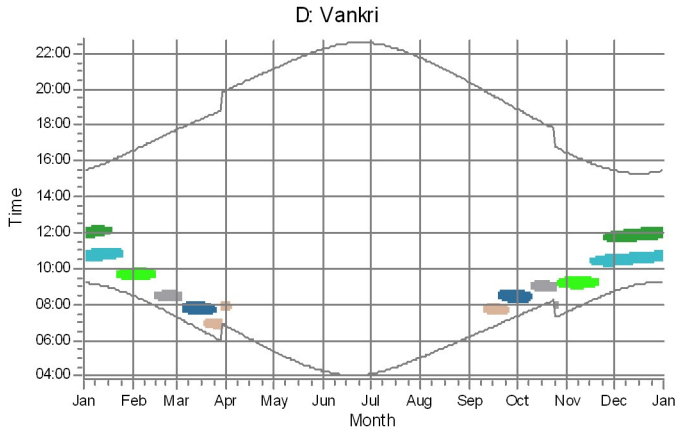
...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
8	TU10	138:44	32:53
9	TU10	68:21	5:07
10	TU10	124:04	31:09
11	TU10	37:31	10:07
12	TU10	35:29	9:14
14	TU10	0:00	0:00
15	TU10	11:52	3:00
16	TU10	140:15	22:42
17	TU10	353:03	47:57
18	TU10	167:03	25:51
19	TU10	168:18	27:39
20	TU10	224:03	35:55
22	TU11	40:35	7:28
23	TU11	55:51	10:06
24	TU11	228:19	37:10
25	TU11	54:05	6:08
26	TU11	62:09	4:37
27	TU11	92:48	10:33
28	TU11	15:39	1:36
29	TU11	123:09	17:33
30	TU11	39:02	4:42
31	TU13	98:40	20:16
32	TU13	65:39	11:32
33	TU13	112:09	23:45
34	TU13	201:52	35:53
35	TU13	126:14	26:46
13 (reserv)	TU10	219:20	55:32
21 (reserv)	TU10	114:23	22:28
















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.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

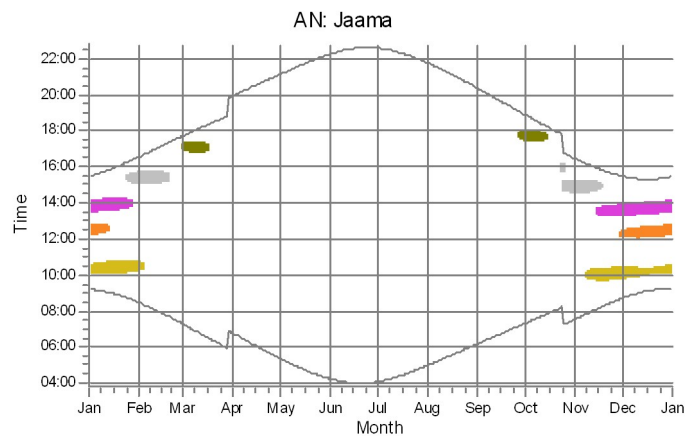
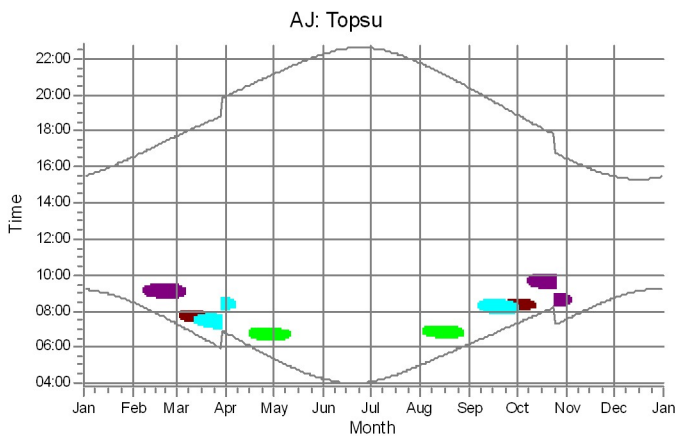
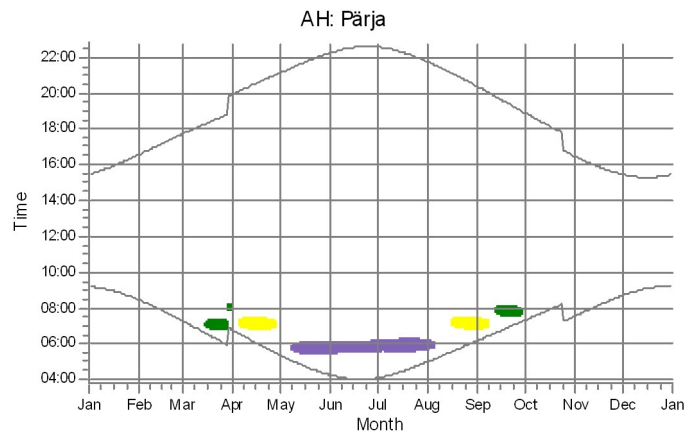
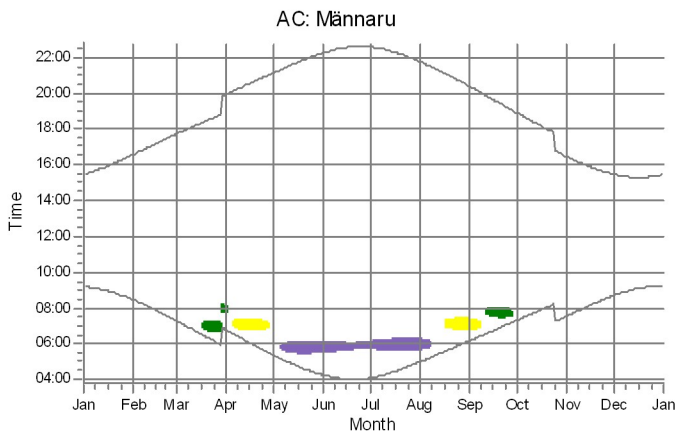
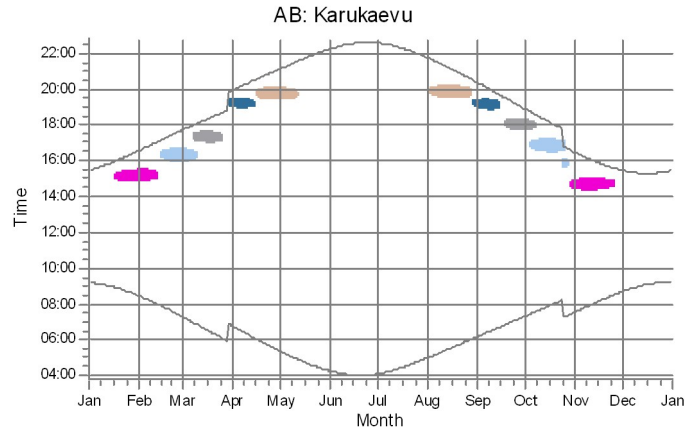
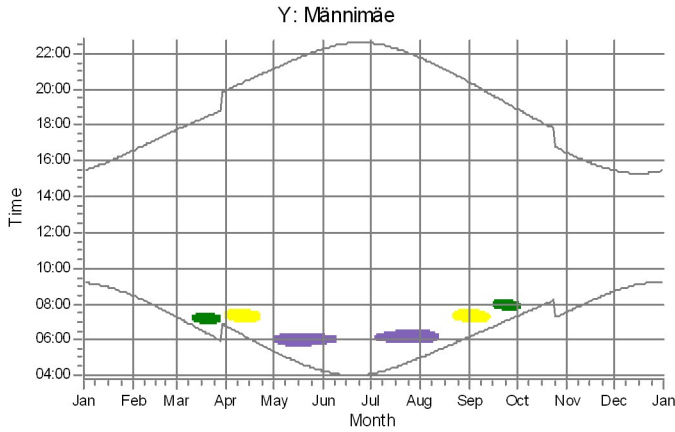
SHADOW - Calendar, graphical
Calculation: varjutus_põhja_real case



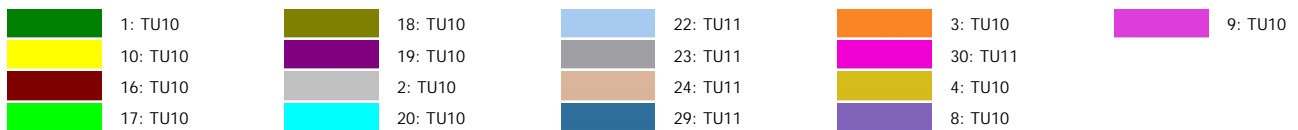
WTGs

 1: TU10	 15: TU10	 25: TU11	 29: TU11	 33: TU13
 10: TU10	 23: TU11	 26: TU11	 31: TU13	 35: TU13
 13 (reserv): TU10	 24: TU11	 27: TU11	 32: TU13	 8: TU10

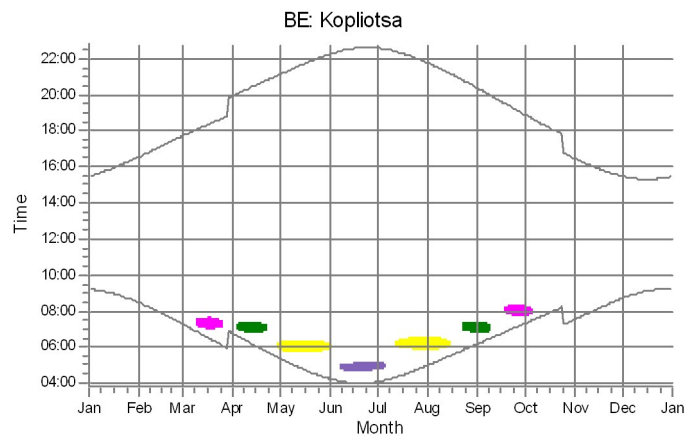
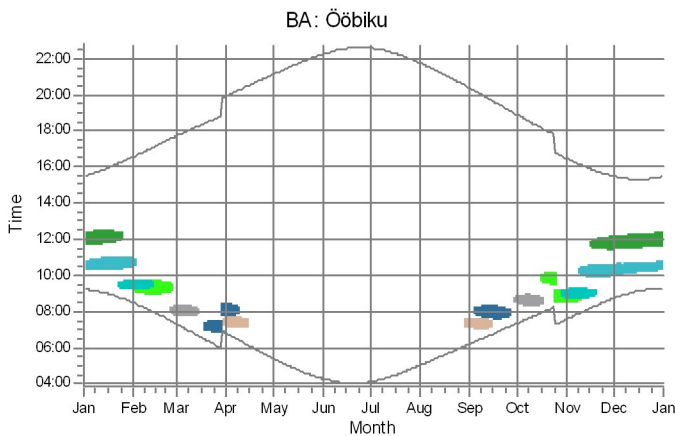
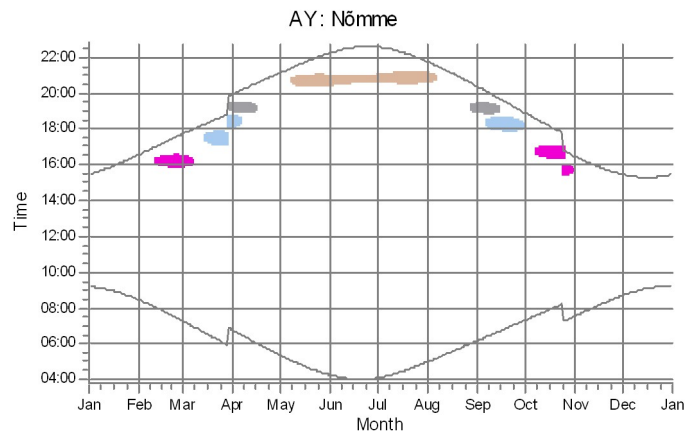
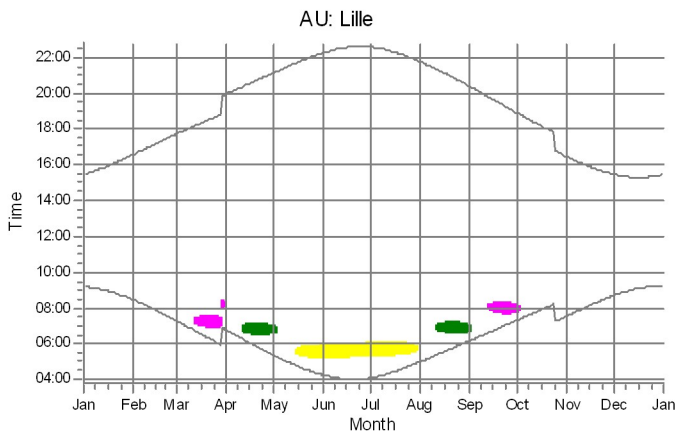
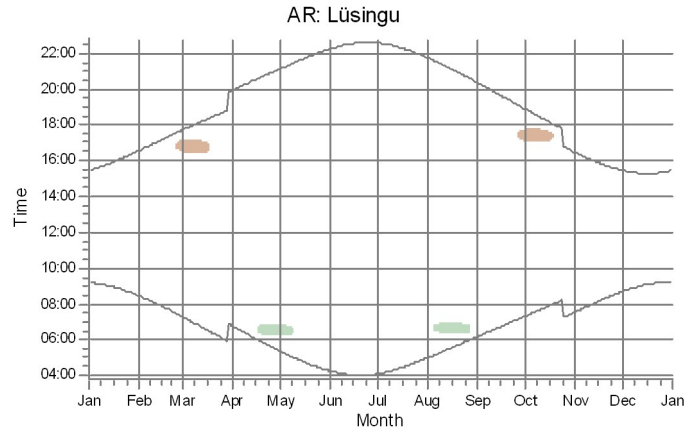
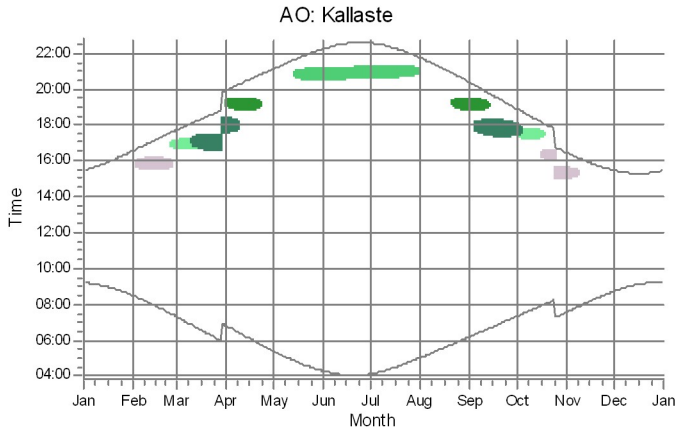
SHADOW - Calendar, graphical
Calculation: varjutus_põhja_real case






















WTGs



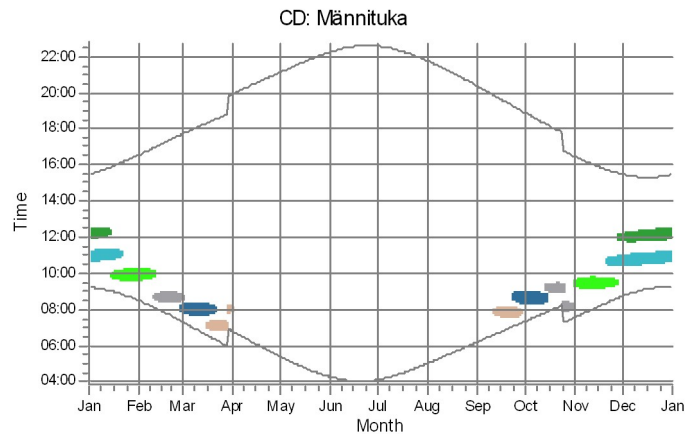
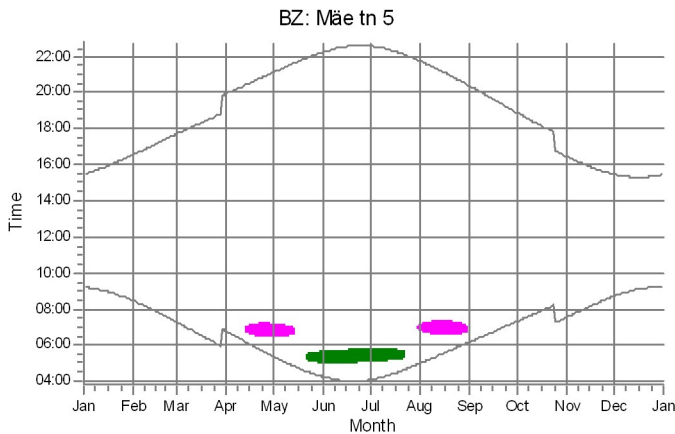
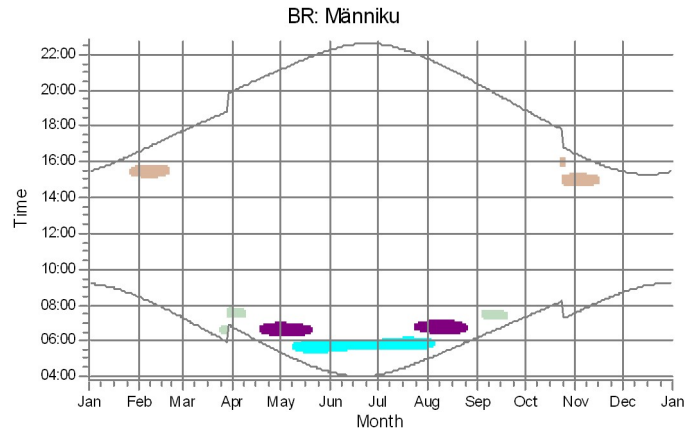
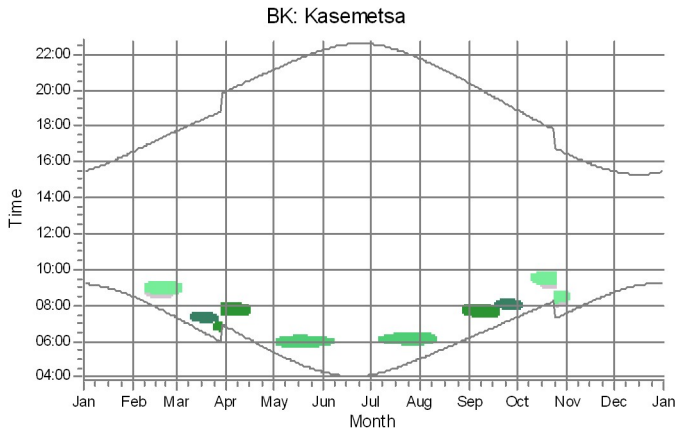
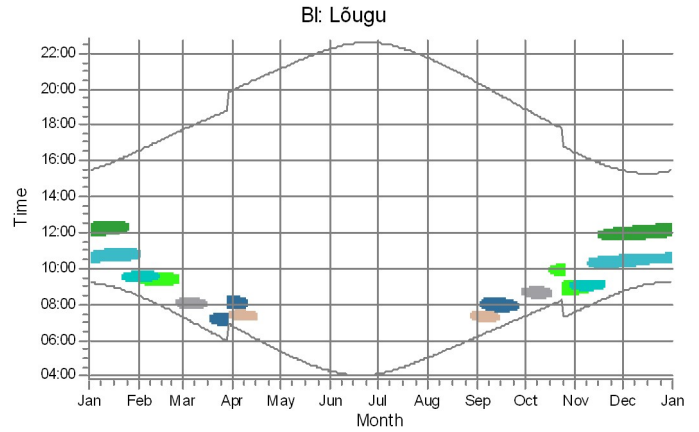
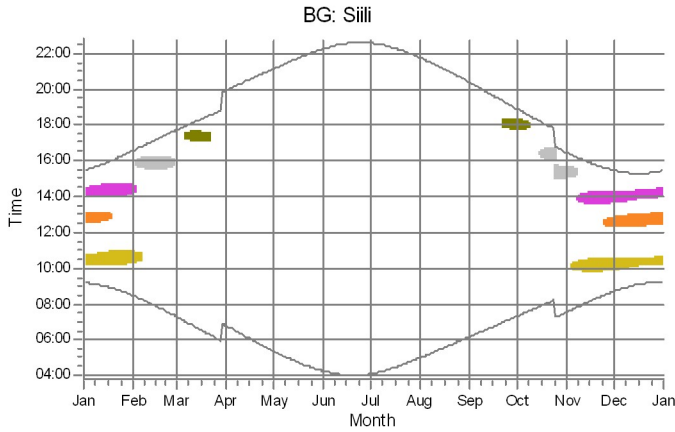
SHADOW - Calendar, graphical
Calculation: varjutus_põhja_real case











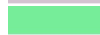













WTGs

	1: TU10		22: TU11		26: TU11		30: TU11		34: TU13
	10: TU10		23: TU11		27: TU11		31: TU13		35: TU13
	13 (reserv): TU10		24: TU11		28: TU11		32: TU13		8: TU10
	21 (reserv): TU10		25: TU11		29: TU11		33: TU13		

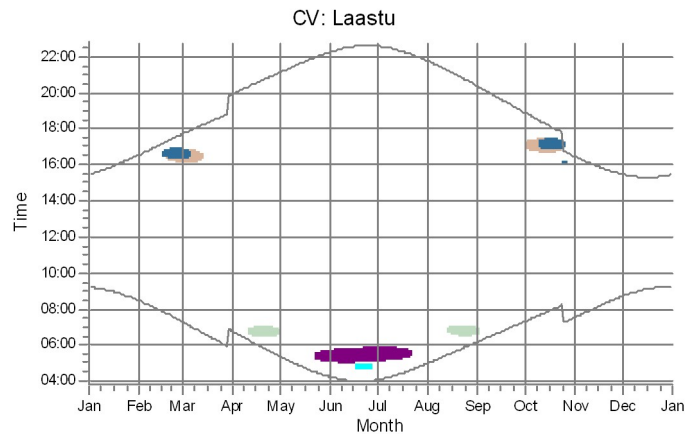
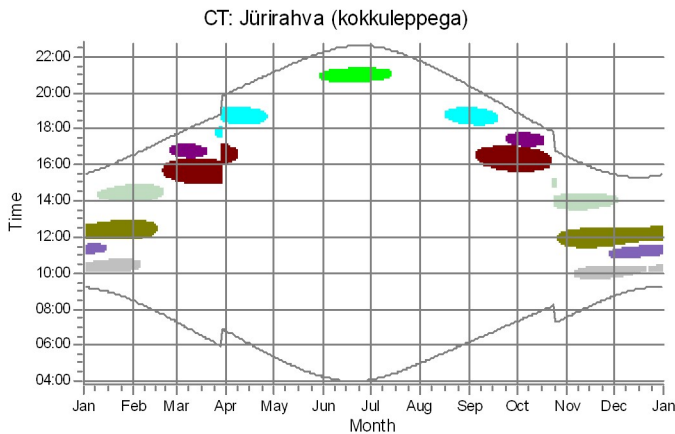
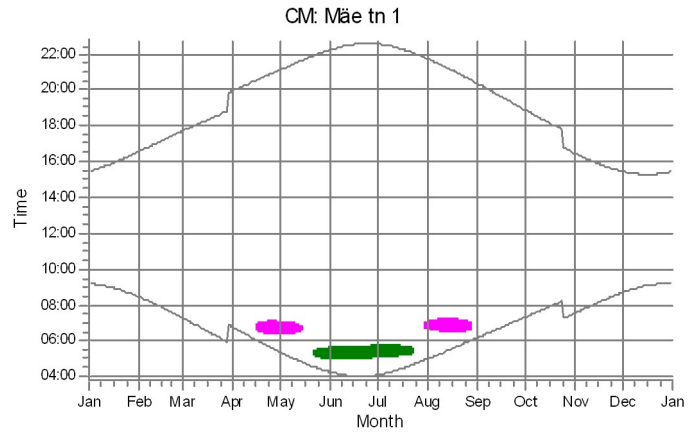
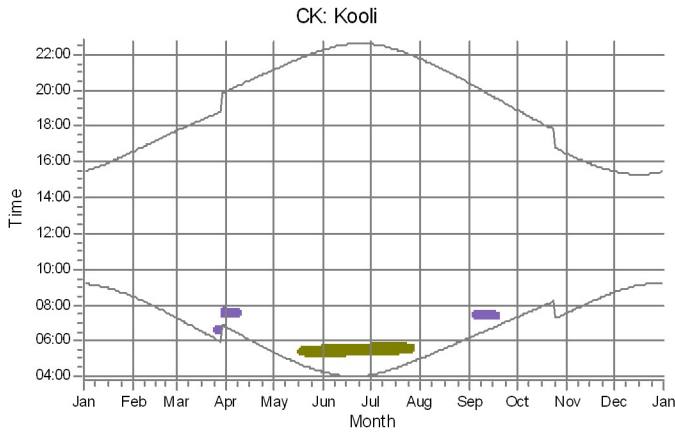
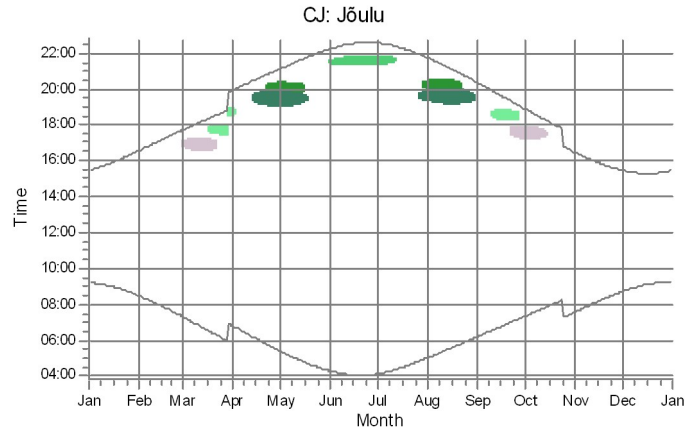
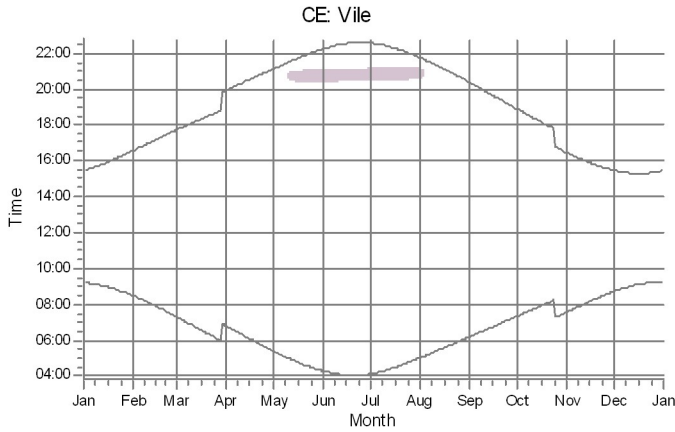
SHADOW - Calendar, graphical
Calculation: varjutus_põhja_real case



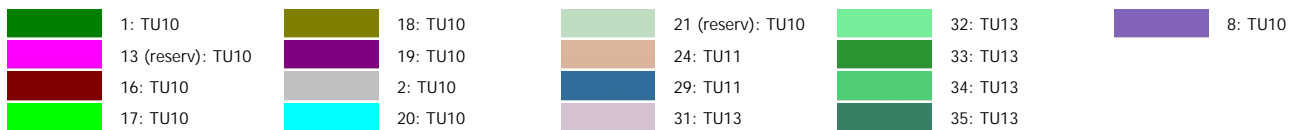
WTGs

 1: TU10	 20: TU10	 26: TU11	 31: TU13	 4: TU10
 13 (reserv): TU10	 21 (reserv): TU10	 27: TU11	 32: TU13	 9: TU10
 18: TU10	 23: TU11	 28: TU11	 33: TU13	
 19: TU10	 24: TU11	 29: TU11	 34: TU13	
 2: TU10	 25: TU11	 3: TU10	 35: TU13	

SHADOW - Calendar, graphical
Calculation: varjutus_põhja_real case

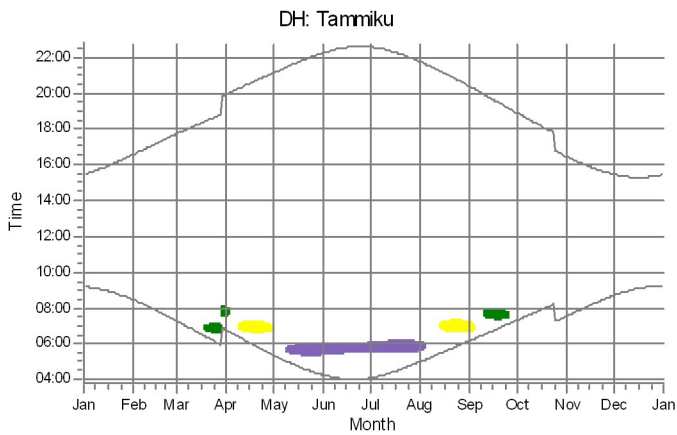
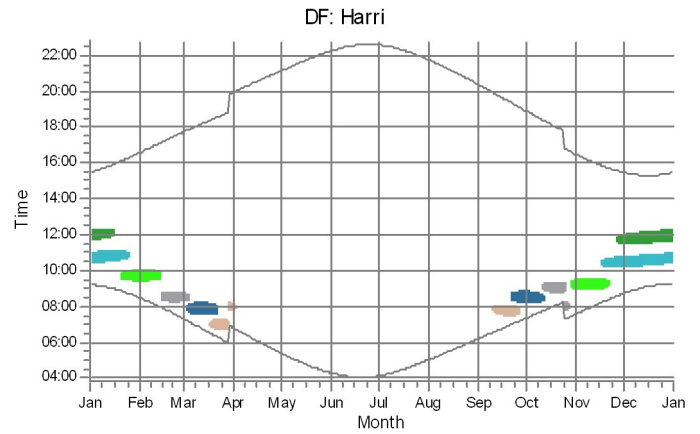
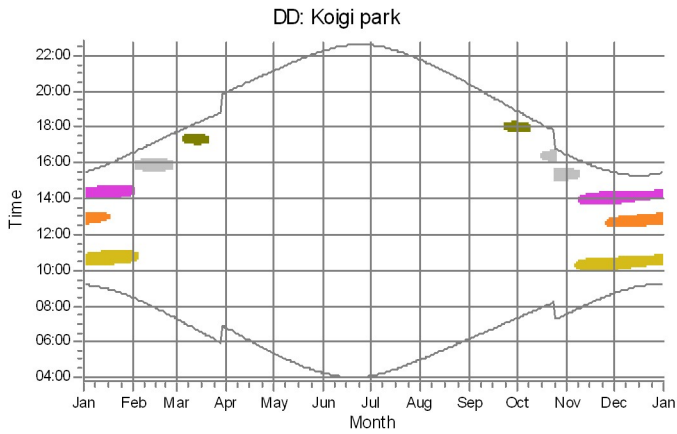


WTGs

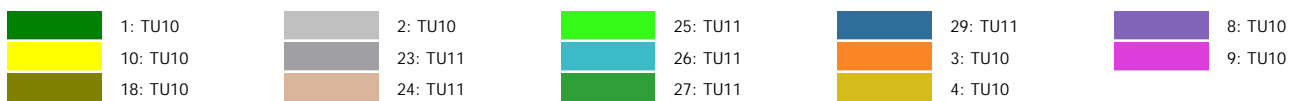


SHADOW - Calendar, graphical

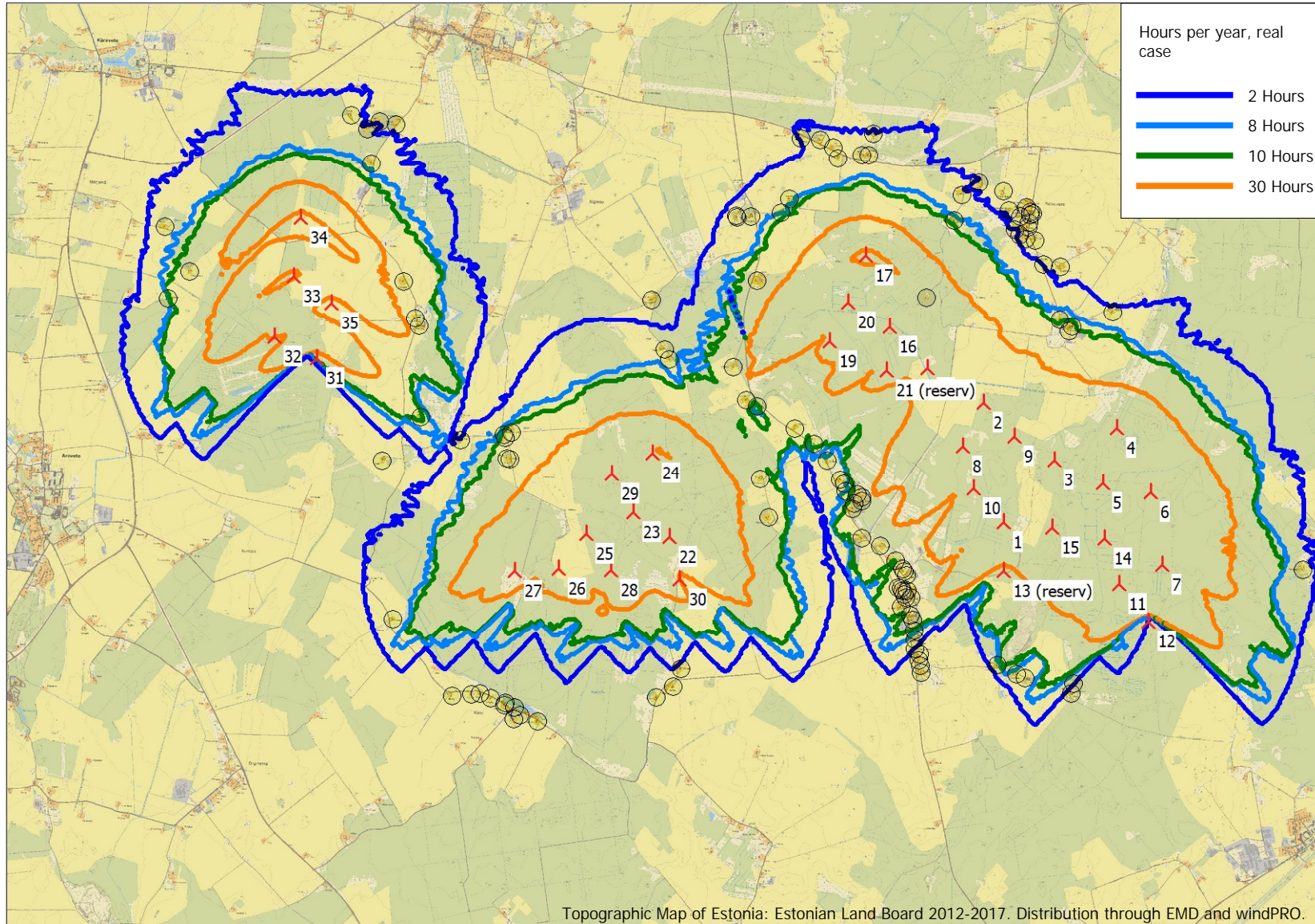
Calculation: varjutus_põhja_real case



WTGs



Hours per year, real case



Topographic Map of Estonia: Estonian Land Board 2012-2017. Distribution through EMD and windPRO.



Map: Estonian Topographic Map, Print scale 1:70 000, Map center Estonian Lambert L-EST97-EST97 (EE) East: 607 560 North: 6 558 270

🚧 New WTG

🟡 Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_ONLINEDATA_4.wpo (12)

Time step: 4 minutes, Day step: 14 days, Map resolution: 30 m, Visibility resolution: 15 m, Eye height: 1,5 m

SHADOW -
Map
Calculation:
varjutus_põhja_real case

Licensed user:
Lemma OÜ
Värvi 5 - A308
EE-10621 Tallinn
+3725059914
Piret Toonpere / piret@lemma.ee
Calculated:
01.09.2024 16:08/4.0.547