

SHADOW - Main Result

Calculation: Shadow_Vestas

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

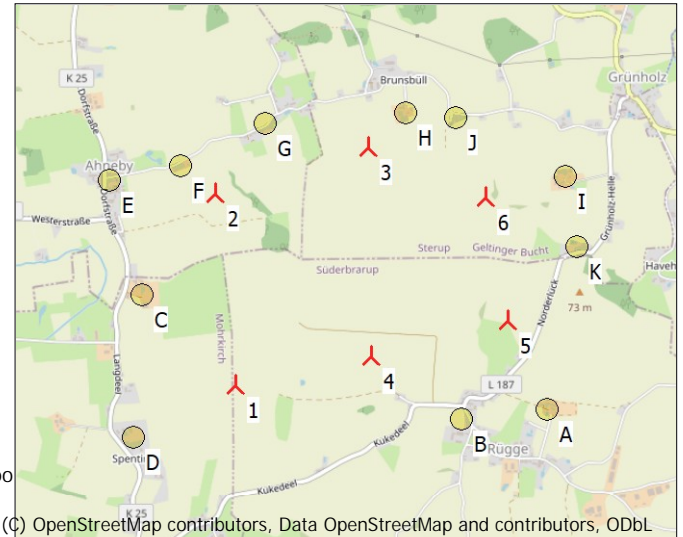
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo

Receptor grid resolution: 1.0 m

All coordinates are in

UTM (north)-ETRS89 Zone: 32



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

Scale 1:40,000

New WTG

Shadow receptor

WTGs

	Easting	Northing	Z	Row data/Description	WTG type				Rotor diameter	Hub height	Shadow data	
					Valid	Manufact.	Type-generator	Power, rated			Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	547,816	6,060,703	60.0	01_VESTAS V150-4.5 4500 150.0 !O! ...Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	2,500	-	
2	547,696	6,061,714	60.0	02_VESTAS V150-4.5 4500 150.0 !O! ...Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	2,500	-	
3	548,500	6,061,972	60.0	03_VESTAS V150-4.5 4500 150.0 !O! ...Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	2,500	-	
4	548,532	6,060,864	60.0	04_VESTAS V150-4.5 4500 150.0 !O! ...Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	2,500	-	
5	549,254	6,061,058	60.0	05_VESTAS V150-4.5 4500 150.0 !O! ...Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	2,500	-	
6	549,128	6,061,708	60.0	06_VESTAS V150-4.5 4500 150.0 !O! ...Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	2,500	-	

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
A	549,469	6,060,595	53.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
B	549,017	6,060,537	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
C	547,316	6,061,178	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
D	547,272	6,060,421	70.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
E	547,133	6,061,778	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
F	547,514	6,061,857	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
G	547,961	6,062,088	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
H	548,697	6,062,153	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
I	549,550	6,061,824	51.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
J	548,966	6,062,130	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
K	549,616	6,061,454	60.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

Calculation Results

Shadow receptor

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A	45:49	145	0:37
B	33:46	79	0:38
C	97:41	226	0:52
D	96:47	126	1:13
E	105:50	178	1:22
F	332:29	226	2:37

To be continued on next page...

SHADOW - Main Result

Calculation: Shadow_Vestas

...continued from previous page

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
G	201:34	213	1:33
H	321:26	235	2:38
I	188:51	213	1:39
J	243:42	226	1:29
K	177:23	218	1:35

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

No.	Name	Worst case [h/year]
1	01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)	197:06
2	02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)	509:52
3	03_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (8)	454:26
4	04_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (9)	125:30
5	05_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (10)	163:06
6	06_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (11)	407:48

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.

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: A - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (1)

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	08:45 16:05	08:13 16:58	07:13 17:56		06:56 19:56	19:21 (1) 19:29 (1)	05:45 20:54	19:37 (4) 20:13 (4)	04:53 21:46	20:53 (2) 21:10 (2)
2	08:45 16:06	08:11 17:00	07:11 17:58		06:53 19:58	19:20 (1) 19:31 (1)	05:42 20:56	19:37 (4) 20:13 (4)	04:52 21:47	20:54 (2) 21:10 (2)
3	08:44 16:07	08:09 17:02	07:08 18:00		06:51 20:00	19:18 (1) 19:33 (1)	05:40 20:58	19:36 (4) 20:13 (4)	04:51 21:49	20:54 (2) 21:09 (2)
4	08:44 16:09	08:07 17:04	07:06 18:02		06:48 20:02	19:18 (1) 19:35 (1)	05:38 21:00	19:36 (4) 20:13 (4)	04:50 21:50	20:54 (2) 21:09 (2)
5	08:44 16:10	08:05 17:06	07:04 18:04		06:46 20:04	19:17 (1) 19:36 (1)	05:36 21:02	19:36 (4) 20:12 (4)	04:49 21:51	20:55 (2) 21:10 (2)
6	08:43 16:11	08:04 17:08	07:01 18:06		06:43 20:06	19:17 (1) 19:38 (1)	05:34 21:03	19:36 (4) 20:12 (4)	04:48 21:52	20:55 (2) 21:09 (2)
7	08:43 16:13	08:02 17:10	06:59 18:08		06:41 20:08	19:17 (1) 19:37 (1)	05:32 21:05	19:36 (4) 20:12 (4)	04:48 21:53	20:56 (2) 21:08 (2)
8	08:42 16:14	08:00 17:13	06:56 18:10		06:38 20:10	19:17 (1) 19:36 (1)	05:30 21:07	19:36 (4) 20:11 (4)	04:47 21:54	20:57 (2) 21:09 (2)
9	08:41 16:16	07:58 17:15	06:54 18:12		06:36 20:12	19:17 (1) 19:35 (1)	05:28 21:09	19:37 (4) 20:11 (4)	04:46 21:55	20:57 (2) 21:08 (2)
10	08:41 16:17	07:56 17:17	06:51 18:14		06:34 20:14	19:18 (1) 19:34 (1)	05:26 21:11	19:38 (4) 20:11 (4)	04:46 21:56	20:58 (2) 21:08 (2)
11	08:40 16:19	07:54 17:19	06:49 18:16		06:31 20:16	19:19 (1) 19:31 (1)	05:24 21:13	19:38 (4) 20:10 (4)	04:45 21:57	20:59 (2) 21:08 (2)
12	08:39 16:20	07:51 17:21	06:46 18:18		06:29 20:18	19:23 (1) 19:28 (1)	05:22 21:14	19:38 (4) 20:09 (4)	04:45 21:58	20:59 (2) 21:07 (2)
13	08:38 16:22	07:49 17:23	06:44 18:20		06:26 20:20		05:21 21:16	19:40 (4) 20:09 (4)	04:45 21:58	21:00 (2) 21:07 (2)
14	08:38 16:24	07:47 17:25	06:41 18:22		06:24 20:21		05:19 21:18	19:40 (4) 20:08 (4)	04:44 21:59	21:01 (2) 21:07 (2)
15	08:37 16:25	07:45 17:27	06:39 18:24		06:21 20:23		05:17 21:20	19:42 (4) 20:07 (4)	04:44 22:00	21:02 (2) 21:07 (2)
16	08:36 16:27	07:43 17:29	06:36 18:26		06:19 20:25		05:15 21:22	19:42 (4) 20:06 (4)	04:44 22:00	21:03 (2) 21:06 (2)
17	08:34 16:29	07:41 17:31	06:34 18:28		06:17 20:27		05:14 21:23	19:43 (4) 20:04 (4)	04:44 22:01	21:04 (2) 21:05 (2)
18	08:33 16:31	07:39 17:33	06:31 18:29		06:14 20:29		05:12 21:25	19:45 (4) 20:03 (4)	04:44 22:01	
19	08:32 16:32	07:36 17:35	06:29 18:31		06:12 20:31		05:10 21:27	19:47 (4) 20:02 (4)	04:44 22:02	
20	08:31 16:34	07:34 17:37	06:26 18:33		06:09 20:33	19:52 (4) 20:01 (4)	05:09 21:28	19:49 (4) 20:55 (2)	04:44 22:02	
21	08:30 16:36	07:32 17:40	06:24 18:35		06:07 20:35	19:48 (4) 20:04 (4)	05:07 21:30	20:53 (2) 20:56 (2)	04:44 22:02	
22	08:28 16:38	07:30 17:42	06:21 18:37		06:05 20:37	19:46 (4) 20:07 (4)	05:06 21:32	20:52 (2) 20:57 (2)	04:44 22:02	
23	08:27 16:40	07:27 17:44	06:19 18:39		06:02 20:39	19:44 (4) 20:08 (4)	05:04 21:33	20:52 (2) 20:59 (2)	04:44 22:03	
24	08:26 16:42	07:25 17:46	06:16 18:41		06:00 20:41	19:43 (4) 20:10 (4)	05:03 21:35	20:52 (2) 21:01 (2)	04:45 22:03	
25	08:24 16:44	07:23 17:48	06:14 18:43		05:58 20:43	19:41 (4) 20:10 (4)	05:01 21:36	20:52 (2) 21:02 (2)	04:45 22:03	
26	08:23 16:46	07:20 17:50	06:11 18:45		05:56 20:45	19:40 (4) 20:11 (4)	05:00 21:38	20:52 (2) 21:04 (2)	04:45 22:03	21:05 (2) 21:08 (2)
27	08:21 16:48	07:18 17:52	06:09 18:47		05:53 20:46	19:39 (4) 20:11 (4)	04:59 21:39	20:51 (2) 21:04 (2)	04:46 22:02	21:04 (2) 21:08 (2)
28	08:19 16:50	07:16 17:54	06:06 18:49		05:51 20:48	19:38 (4) 20:12 (4)	04:57 21:41	20:52 (2) 21:05 (2)	04:46 22:02	21:04 (2) 21:10 (2)
29	08:18 16:52		07:03 19:51		05:49 20:50	19:38 (4) 20:12 (4)	04:56 21:42	20:52 (2) 21:07 (2)	04:47 22:02	21:03 (2) 21:10 (2)
30	08:16 16:54		07:01 19:53		05:47 20:52	19:37 (4) 20:13 (4)	04:55 21:44	20:52 (2) 21:08 (2)	04:48 22:02	21:03 (2) 21:11 (2)
31	08:14 16:56		06:58 19:55	19:23 (1) 19:28 (1)	20:52		04:54 21:45	20:52 (2) 21:09 (2)		
Potential sun hours	245	271	366	5	422		498	711	516	
Total, worst case				5	474				204	

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

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

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: A - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (1)

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	04:48 22:01	21:03 (2) 21:12 (2)	05:30 21:24	19:48 (4) 20:20 (4)	06:27 20:16	19:19 (1) 19:31 (1)	07:22 19:00	07:22 16:47	08:19 16:01
2	04:49 22:01	21:03 (2) 21:13 (2)	05:32 21:23	19:48 (4) 20:20 (4)	06:28 20:13	19:16 (1) 19:32 (1)	07:24 18:57	07:24 16:45	08:21 16:00
3	04:50 22:01	21:02 (2) 21:13 (2)	05:33 21:21	19:48 (4) 20:21 (4)	06:30 20:11	19:15 (1) 19:33 (1)	07:26 18:55	07:26 16:43	08:23 15:59
4	04:51 22:00	21:02 (2) 21:14 (2)	05:35 21:19	19:47 (4) 20:21 (4)	06:32 20:08	19:14 (1) 19:33 (1)	07:28 18:52	07:28 16:41	08:24 15:58
5	04:52 21:59	21:02 (2) 21:14 (2)	05:37 21:17	19:46 (4) 20:22 (4)	06:34 20:06	19:14 (1) 19:34 (1)	07:29 18:50	07:30 16:39	08:25 15:58
6	04:53 21:59	21:02 (2) 21:15 (2)	05:39 21:15	19:46 (4) 20:22 (4)	06:36 20:03	19:12 (1) 19:33 (1)	07:31 18:47	07:32 16:37	08:27 15:57
7	04:54 21:58	21:02 (2) 21:16 (2)	05:41 21:13	19:45 (4) 20:22 (4)	06:38 20:01	19:12 (1) 19:32 (1)	07:33 18:45	07:34 16:35	08:28 15:57
8	04:55 21:57	21:02 (2) 21:16 (2)	05:42 21:11	19:45 (4) 20:22 (4)	06:39 19:58	19:12 (1) 19:29 (1)	07:35 18:42	07:36 16:33	08:30 15:56
9	04:56 21:57	21:01 (2) 21:17 (2)	05:44 21:09	19:46 (4) 20:22 (4)	06:41 19:56	19:12 (1) 19:27 (1)	07:37 18:40	07:38 16:31	08:31 15:56
10	04:57 21:56	21:01 (2) 21:17 (2)	05:46 21:07	19:45 (4) 20:21 (4)	06:43 19:53	19:12 (1) 19:24 (1)	07:39 18:37	07:40 16:29	08:32 15:55
11	04:58 21:55	21:01 (2) 21:17 (2)	05:48 21:04	19:45 (4) 20:21 (4)	06:45 19:51	19:13 (1) 19:22 (1)	07:41 18:35	07:42 16:28	08:33 15:55
12	04:59 21:54	21:01 (2) 21:18 (2)	05:50 21:02	19:45 (4) 20:21 (4)	06:47 19:48	19:14 (1) 19:19 (1)	07:43 18:33	07:44 16:26	08:34 15:55
13	05:01 21:53	21:01 (2) 21:17 (2)	05:52 21:00	19:46 (4) 20:21 (4)	06:49 19:46	19:16 (1) 19:17 (1)	07:45 18:30	07:46 16:24	08:36 15:55
14	05:02 21:52	21:00 (2) 21:16 (2)	05:53 20:58	19:45 (4) 20:20 (4)	06:50 19:43		07:47 18:28	07:48 16:23	08:37 15:55
15	05:03 21:51	21:01 (2) 21:15 (2)	05:55 20:56	19:46 (4) 20:19 (4)	06:52 19:40		07:49 18:25	07:50 16:21	08:38 15:55
16	05:05 21:49	21:01 (2) 21:14 (2)	05:57 20:53	19:47 (4) 20:19 (4)	06:54 19:38		07:51 18:23	07:52 16:19	08:38 15:55
17	05:06 21:48	21:01 (2) 21:13 (2)	05:59 20:51	19:46 (4) 20:17 (4)	06:56 19:35		07:53 18:21	07:54 16:18	08:39 15:55
18	05:07 21:47	21:02 (2) 21:12 (2)	06:01 20:49	19:47 (4) 20:16 (4)	06:58 19:33		07:54 18:18	07:56 16:16	08:40 15:55
19	05:09 21:45	21:02 (2) 21:11 (2)	06:03 20:47	19:49 (4) 20:15 (4)	07:00 19:30		07:56 18:16	07:58 16:15	08:41 15:55
20	05:10 21:44	21:02 (2) 21:09 (2)	06:04 20:44	19:50 (4) 20:14 (4)	07:01 19:28		07:58 18:13	08:00 16:13	08:42 15:56
21	05:12 21:43	21:03 (2) 21:09 (2)	06:06 20:42	19:51 (4) 20:11 (4)	07:03 19:25		08:00 18:11	08:02 16:12	08:42 15:56
22	05:13 21:41	21:03 (2) 21:07 (2)	06:08 20:40	19:53 (4) 20:09 (4)	07:05 19:23		08:02 18:09	08:04 16:11	08:43 15:57
23	05:15 21:40	20:02 (4) 21:06 (2)	06:10 20:37	19:57 (4) 20:04 (4)	07:07 19:20		08:04 18:07	08:06 16:09	08:43 15:57
24	05:17 21:38	19:58 (4) 20:11 (4)	06:12 20:35		07:09 19:18		08:06 18:04	08:07 16:08	08:44 15:58
25	05:18 21:37	19:57 (4) 20:13 (4)	06:14 20:33		07:11 19:15		07:08 17:02	08:09 16:07	08:44 15:58
26	05:20 21:35	19:55 (4) 20:14 (4)	06:15 20:30		07:13 19:12		07:10 17:00	08:11 16:06	08:44 15:59
27	05:21 21:33	19:54 (4) 20:16 (4)	06:17 20:28		07:14 19:10		07:12 16:58	08:13 16:05	08:45 16:00
28	05:23 21:32	19:52 (4) 20:17 (4)	06:19 20:25		07:16 19:07		07:14 16:56	08:14 16:03	08:45 16:01
29	05:25 21:30	19:51 (4) 20:18 (4)	06:21 20:23		07:18 19:05		07:16 16:53	08:16 16:02	08:45 16:02
30	05:27 21:28	19:50 (4) 20:18 (4)	06:23 20:21		07:20 19:02		07:18 16:51	08:18 16:02	08:45 16:03
31	05:28 21:26	19:50 (4) 20:20 (4)	06:25 20:18	19:22 (1) 19:28 (1)			07:20 16:49		08:45 16:04
Potential sun hours	517	463	383	185	327	255	228		
Total, worst case	455	715	185						

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: B - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (2)
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	08:45 16:05	08:13 16:58	07:13 17:56	06:56 19:57	05:45 20:54	04:53 21:46	04:48 22:01	20:38 (4) 21:11 (4)	05:30 21:24	06:27 20:16	19:22 (1) 19:47 (1)	07:22 19:00	07:22 16:47	08:19 16:01	
2	08:45 16:06	08:11 17:00	07:11 17:58	06:53 19:58	05:42 20:56	04:52 21:47	20:43 (4) 20:53 (4)	04:49 22:01	20:39 (4) 21:11 (4)	05:32 21:23	06:28 19:22 (1)	07:24 18:57	07:24 16:45	08:21 16:00	
3	08:44 16:07	08:09 17:02	07:08 18:00	06:51 20:00	05:40 20:58	04:51 21:49	20:41 (4) 20:56 (4)	04:50 22:01	20:39 (4) 21:09 (4)	05:34 21:21	06:30 19:23 (1)	07:26 18:55	07:26 16:43	08:23 15:59	
4	08:44 16:09	08:07 17:04	07:06 18:02	06:48 20:02	05:38 21:00	04:50 21:50	20:39 (4) 20:58 (4)	04:51 22:00	20:40 (4) 21:09 (4)	05:35 21:19	06:32 20:08	19:24 (1) 19:39 (1)	07:28 16:41	08:24 15:58	
5	08:44 16:10	08:05 17:06	07:04 18:04	06:46 20:04	05:36 21:02	04:49 21:51	20:38 (4) 21:00 (4)	04:52 22:00	20:41 (4) 21:09 (4)	05:37 21:17	06:34 20:06	19:25 (1) 19:37 (1)	07:29 18:50	08:26 16:39	
6	08:43 16:11	08:04 17:08	07:01 18:06	06:43 20:06	7 19:32 (1) 19:39 (1)	05:34 21:03	04:49 21:52	20:42 (4) 21:01 (4)	05:39 21:59	06:39 21:08 (4)	12 19:37 (1) 19:34 (1)	07:30 18:41	07:32 16:37	08:28 15:57	
7	08:43 16:13	08:02 17:10	06:59 18:08	06:41 20:08	12 19:40 (1) 19:27 (1)	05:32 21:05	04:48 21:53	20:45 (4) 21:02 (4)	05:41 21:58	05:41 21:13	06:38 20:01	19:33 18:45	07:34 16:35	08:28 15:57	
8	08:42 16:14	08:00 17:13	06:56 18:10	06:38 20:10	15 19:42 (1) 19:25 (1)	05:30 21:07	04:47 21:54	20:45 (4) 21:04 (4)	05:42 21:57	05:42 21:11	06:39 19:58	19:36 18:42	07:36 16:33	08:30 15:56	
9	08:42 16:16	07:58 17:15	06:54 18:12	06:36 20:12	19 19:44 (1) 19:24 (1)	05:28 21:09	04:47 21:55	20:47 (4) 21:05 (4)	05:44 21:57	05:44 21:09	06:41 19:56	19:37 18:40	07:38 16:31	08:31 15:56	
10	08:41 16:17	07:56 17:17	06:51 18:14	06:34 20:14	22 19:46 (1) 19:22 (1)	05:26 21:11	04:46 21:56	20:49 (4) 21:05 (4)	05:46 21:56	05:46 21:07	06:43 19:53	19:39 18:37	07:40 16:30	08:32 15:55	
11	08:40 16:19	07:54 17:19	06:49 18:16	06:31 20:16	25 19:47 (1) 19:22 (1)	05:24 21:13	04:46 21:57	20:54 (4) 21:06 (4)	05:48 21:55	05:48 21:04	06:45 19:51	19:41 18:35	07:42 16:28	08:33 15:55	
12	08:39 16:20	07:52 17:21	06:46 18:18	06:29 20:18	27 19:49 (1) 19:22 (1)	05:22 21:14	04:45 21:58	20:59 (4) 21:06 (4)	05:49 21:54	05:50 21:02	06:47 19:48	19:43 18:33	07:44 16:26	08:34 15:55	
13	08:38 16:22	07:49 17:23	06:44 18:20	06:26 20:20	28 19:49 (1) 19:50 (1)	05:21 21:16	04:45 21:58	21:09 (4) 21:07 (4)	05:51 21:53	05:52 21:00	06:49 19:46	19:44 18:30	07:46 16:24	08:36 15:55	
14	08:38 16:24	07:47 17:25	06:41 18:22	06:24 20:21	29 19:49 (1) 19:51 (1)	05:19 21:18	04:44 21:59	21:08 (4) 20:33 (4)	05:02 05:03	05:53 05:55	06:50 06:52	19:43 19:49	07:48 07:50	08:37 08:38	
15	08:37 16:25	07:45 17:27	06:39 18:24	06:21 20:23	28 19:49 (1) 19:21 (1)	05:17 21:20	04:44 22:00	21:09 (4) 20:33 (4)	05:51 05:05	05:56 05:57	06:52 06:54	19:40 07:51	16:21 16:52	15:55 08:38	
16	08:36 16:27	07:43 17:29	06:36 18:26	06:19 20:25	28 19:49 (1) 19:20 (1)	05:15 21:22	04:44 22:00	21:09 (4) 20:33 (4)	05:49 05:06	05:53 05:59	06:54 06:56	19:38 19:35	16:19 16:18	15:55 08:39	
17	08:34 16:29	07:41 17:31	06:34 18:28	06:17 20:27	28 19:48 (1) 19:21 (1)	05:14 21:23	04:44 22:01	21:10 (4) 20:33 (4)	05:48 05:07	05:51 06:01	06:56 06:58	19:35 19:33	16:18 16:16	15:55 08:40	
18	08:33 16:31	07:39 17:33	06:31 18:29	06:14 20:29	27 19:48 (1) 19:21 (1)	05:12 21:25	04:44 22:01	21:10 (4) 20:33 (4)	05:07 05:09	06:01 06:03	06:58 06:53	19:33 (1) 19:33 (1)	07:54 07:56	08:40 15:55	
19	08:32 16:33	07:36 17:35	06:29 18:31	06:12 20:31	26 19:47 (1) 19:21 (1)	05:10 21:27	04:44 22:02	21:10 (4) 20:33 (4)	05:09 05:10	06:03 06:04	06:58 06:59	19:33 (1) 19:30 (1)	07:56 07:58	08:41 15:55	
20	08:31 16:34	07:34 17:37	06:26 18:33	06:09 20:33	25 19:46 (1) 19:22 (1)	05:09 21:30	04:44 22:02	21:10 (4) 20:33 (4)	05:10 05:12	06:04 06:06	06:59 06:59	19:30 (1) 19:28 (1)	07:58 18:14	08:42 16:13	
21	08:30 16:36	07:32 17:40	06:24 18:35	06:07 20:35	23 19:45 (1) 19:23 (1)	05:07 21:30	04:44 22:02	21:10 (4) 20:33 (4)	05:12 05:13	06:06 06:08	06:59 06:59	19:28 (1) 19:27 (1)	07:03 07:05	08:42 08:43	
22	08:28 16:38	07:30 17:42	06:21 18:37	06:05 20:37	20 19:43 (1) 19:25 (1)	05:06 21:32	04:44 22:02	21:11 (4) 20:34 (4)	05:13 05:15	06:08 06:10	06:59 06:59	19:27 (1) 19:26 (1)	07:05 07:04	08:43 08:43	
23	08:27 16:40	07:27 17:44	06:19 18:39	06:02 20:39	17 19:42 (1) 19:27 (1)	05:04 21:33	04:44 22:03	21:11 (4) 20:34 (4)	05:15 05:17	06:10 06:12	06:59 06:59	19:26 (1) 19:25 (1)	07:04 07:09	08:43 08:44	
24	08:26 16:42	07:25 17:46	06:16 18:41	06:00 20:41	12 19:39 (1) 19:21 (1)	05:03 21:35	04:45 22:03	21:11 (4) 20:34 (4)	05:17 05:18	06:12 06:14	06:59 06:59	19:25 (1) 19:23 (1)	07:09 07:11	08:44 15:58	
25	08:24 16:44	07:23 17:48	06:14 18:43	05:58 20:43	05:01 21:36	04:45 22:03	04:45 22:03	21:11 (4) 20:35 (4)	05:18 05:20	06:14 06:15	06:59 06:59	19:23 (1) 19:21 (1)	07:11 07:13	08:44 15:58	
26	08:23 16:46	07:20 17:50	06:11 18:45	05:56 20:45	05:00 21:38	04:45 22:03	04:45 22:03	21:11 (4) 20:35 (4)	05:20 05:21	06:15 06:17	06:59 06:59	19:23 (1) 19:23 (1)	07:13 07:14	08:44 15:59	
27	08:21 16:48	07:18 17:52	06:09 18:47	05:53 20:46	04:59 21:39	05:46 22:03	04:46 22:03	20:35 (4) 21:11 (4)	05:21 05:23	06:17 06:19	06:59 06:59	19:23 (1) 19:22 (1)	07:14 07:16	08:45 16:00	
28	08:19 16:50	07:16 17:54	06:06 18:49	05:51 20:48	04:57 21:41	04:46 22:02	05:23 22:02	20:36 (4) 21:11 (4)	05:23 05:25	06:19 06:21	06:59 06:59	19:22 (1) 19:21 (1)	07:16 07:18	08:45 16:04	
29	08:18 16:52	07:04 17:51	05:49 18:51	05:49 20:50	04:56 21:42	04:47 22:02	05:25 22:02	20:36 (4) 21:11 (4)	05:25 05:27	06:21 06:23	06:59 06:59	19:21 (1) 19:20 (1)	07:18 07:20	08:45 16:02	
30	08:16 16:54	07:01 17:53	05:47 18:53	05:47 20:52	04:55 21:44	04:48 22:02	05:27 22:02	20:37 (4) 21:11 (4)	05:27 05:28	06:23 06:25	06:59 06:59	19:21 (1) 19:20 (1)	07:20 07:21	08:45 16:04	
31	08:14 16:56	06:58 17:55	05:43 18:55	05:28 19:55	04:54 21:45	04:47 22:02	05:28 22:02	20:38 (4) 21:11 (4)	05:28 05:29	06:25 06:26	06:59 06:59	19:22 (1) 19:49 (1)	07:21 07:22	08:45 16:04	
Potential sun hours	245	271	366	422	418	498	516	517	463	327	383	100	327	255	228
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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: C - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (3)

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	08:45 16:05	08:13 16:58	09:03 (1) 09:50 (1)	07:13 17:56	06:56 19:57	04:53 21:46
2	08:45 16:06	08:11 17:00	09:03 (1) 09:51 (1)	07:11 17:58	06:54 19:59	04:52 21:48
3	08:44 16:07	08:09 17:02	09:02 (1) 09:51 (1)	07:09 18:00	06:51 20:00	04:51 21:49
4	08:44 16:09	08:07 17:04	09:02 (1) 09:52 (1)	07:06 18:02	06:49 20:02	04:50 21:50
5	08:44 16:10	08:06 17:06	09:02 (1) 09:52 (1)	07:04 18:04	06:46 20:04	04:49 21:51
6	08:43 16:11	08:04 17:08	09:02 (1) 09:53 (1)	07:01 18:06	06:44 20:06	04:49 21:52
7	08:43 16:13	08:02 17:11	09:01 (1) 09:52 (1)	06:59 18:08	06:41 20:08	04:48 21:53
8	08:42 16:14	08:00 17:13	09:01 (1) 09:52 (1)	06:56 18:10	06:39 20:10	04:47 21:54
9	08:42 16:16	07:58 17:15	09:01 (1) 09:53 (1)	06:54 18:12	06:36 20:12	04:47 21:55
10	08:41 16:17	07:56 17:17	09:02 (1) 09:53 (1)	06:51 18:14	06:34 20:14	04:46 21:56
11	08:40 16:19	07:54 17:19	09:02 (1) 09:53 (1)	06:49 18:16	06:31 20:16	04:46 21:57
12	08:39 16:20	07:52 17:21	09:02 (1) 09:53 (1)	06:46 18:18	06:29 20:18	04:45 21:58
13	08:39 16:22	07:50 17:23	09:02 (1) 09:52 (1)	06:44 18:20	06:26 20:20	04:45 21:59
14	08:38 16:24	07:47 17:25	09:03 (1) 09:52 (1)	06:41 18:22	06:24 20:22	04:44 21:59
15	08:37 16:25	07:45 17:27	09:03 (1) 09:51 (1)	06:39 18:24	06:21 20:24	04:44 22:00
16	08:36 16:27	07:43 17:29	09:04 (1) 09:51 (1)	06:36 18:26	06:19 20:25	04:44 22:00
17	08:35 16:29	07:41 09:19 (1) 17:31	09:04 (1) 09:50 (1)	06:34 18:28	06:17 20:27	04:44 22:01
18	08:33 16:31	07:39 09:15 (1) 17:33	09:05 (1) 09:49 (1)	06:31 18:30	06:14 20:29	04:44 22:01
19	08:32 16:33	07:37 09:13 (1) 17:36	09:06 (1) 09:48 (1)	06:29 18:32	06:12 20:31	04:44 22:02
20	08:31 16:34	07:34 09:11 (1) 17:38	09:07 (1) 09:46 (1)	06:26 18:33	06:10 20:33	04:44 22:02
21	08:30 16:36	07:32 09:10 (1) 17:40	09:08 (1) 09:45 (1)	06:24 18:35	06:07 20:35	04:44 22:02
22	08:28 16:38	07:30 09:09 (1) 17:42	09:09 (1) 09:43 (1)	06:21 18:37	06:05 20:37	04:44 22:03
23	08:27 16:40	07:27 09:08 (1) 17:44	09:11 (1) 09:41 (1)	06:19 18:39	06:03 20:39	04:44 22:03
24	08:26 16:42	07:25 09:07 (1) 17:46	09:13 (1) 09:39 (1)	06:16 18:41	06:00 20:41	04:45 22:03
25	08:24 16:44	07:23 09:06 (1) 17:48	09:15 (1) 09:35 (1)	06:14 18:43	05:58 20:43	04:45 22:03
26	08:23 16:46	07:20 09:06 (1) 17:50	09:20 (1) 09:31 (1)	06:11 18:45	05:56 20:45	04:46 22:03
27	08:21 16:48	07:18 09:05 (1) 17:52	06:09 18:47	05:53 20:47	05:53 20:47	04:46 22:03
28	08:20 16:50	07:16 09:04 (1) 17:54	06:06 18:49	05:51 20:48	05:51 20:48	04:47 22:02
29	08:18 16:52	07:14 09:04 (1) 17:54	06:04 18:49	05:49 20:48	05:49 20:48	04:47 22:02
30	08:16 16:54	07:12 09:03 (1) 17:54	06:02 18:47	05:47 20:46	05:47 20:46	04:48 22:02
31	08:15 16:56	07:10 09:04 (1) 17:54	06:01 18:46	05:46 20:45	05:46 20:45	04:48 22:02
Potential sun hours	245	271	366	422	498	516
Total, worst case	484	1125	459	142	172	776

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: C - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (3)

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	04:48		05:29 (3)	05:30		06:27		07:22	07:59 (4)	07:23		08:31 (1)	08:20				
	22:02	27	05:56 (3)	21:25		20:16		19:00	27	08:26 (4)	16:47	51	09:22 (1)	16:01			
2	04:49		05:30 (3)	05:32		06:29		07:24		07:58 (4)	07:25		08:31 (1)	08:21			
	22:01	26	05:56 (3)	21:23		20:13		18:57	28	08:26 (4)	16:45	51	09:22 (1)	16:00			
3	04:50		05:29 (3)	05:34		06:30		07:26		07:58 (4)	07:27		08:31 (1)	08:23			
	22:01	26	05:55 (3)	21:21		20:11		18:55	28	08:26 (4)	16:43	51	09:22 (1)	15:59			
4	04:51		05:30 (3)	05:35		06:32		07:28		07:58 (4)	07:29		08:31 (1)	08:24			
	22:00	26	05:56 (3)	21:19		20:08		18:52	27	08:25 (4)	16:41	51	09:22 (1)	15:58			
5	04:52		05:30 (3)	05:37		06:34		07:30		07:58 (4)	07:31		08:32 (1)	08:26			
	22:00	26	05:56 (3)	21:17		20:06		18:50	27	08:25 (4)	16:39	50	09:22 (1)	15:58			
6	04:53		05:30 (3)	05:39		06:36		07:31		07:59 (4)	07:33		08:32 (1)	08:27			
	21:59	26	05:56 (3)	21:15		20:03		18:47	25	08:24 (4)	16:37	50	09:22 (1)	15:57			
7	04:54		05:30 (3)	05:41		06:38		07:33		08:01 (4)	07:35		08:32 (1)	08:28			
	21:58	27	05:57 (3)	21:13		20:01		18:45	22	08:23 (4)	16:35	50	09:22 (1)	15:57			
8	04:55		05:31 (3)	05:43		06:40		07:35		08:03 (4)	07:37		08:32 (1)	08:30			
	21:58	26	05:57 (3)	21:11		19:58		18:42	19	08:22 (4)	16:33	49	09:21 (1)	15:56			
9	04:56		05:31 (3)	05:44		06:41		07:37		08:05 (4)	07:39		08:33 (1)	08:31			
	21:57	26	05:57 (3)	21:09		19:56		18:40	16	08:21 (4)	16:31	48	09:21 (1)	15:56			
10	04:57		05:31 (3)	05:46		06:43		07:39		08:07 (4)	07:41		08:34 (1)	08:32			
	21:56	26	05:57 (3)	21:07		19:53		18:38	12	08:19 (4)	16:30	47	09:21 (1)	15:56			
11	04:58		05:32 (3)	05:48		06:45		07:41		08:09 (4)	07:43		08:34 (1)	08:34			
	21:55	25	05:57 (3)	21:05		19:51		18:35	7	08:16 (4)	16:28	46	09:20 (1)	15:55			
12	04:59		05:33 (3)	05:50		06:47		07:43		08:11 (4)	07:45		08:35 (1)	08:35			
	21:54	24	05:57 (3)	21:02		19:48		18:33	1	08:12 (4)	16:26	45	09:20 (1)	15:55			
13	05:01		05:34 (3)	05:52		06:49		07:45			07:47		08:36 (1)	08:36			
	21:53	23	05:57 (3)	21:00		19:46		18:30			16:24	43	09:19 (1)	15:55			
14	05:02		05:36 (3)	05:53		06:51		07:47			07:49		08:36 (1)	08:37			
	21:52	21	05:57 (3)	20:58	2	06:43 (6)	19:43	18:28			16:23	42	09:18 (1)	15:55			
15	05:03		05:37 (3)	05:55		06:52		07:49			07:51		08:38 (1)	08:38			
	21:51	20	05:57 (3)	20:56	10	06:47 (6)	19:41	18:25			16:21	41	09:19 (1)	15:55			
16	05:05		05:38 (3)	05:57		06:54		07:51		09:50 (1)	07:52		08:39 (1)	08:39			
	21:50	18	05:56 (3)	20:54	13	06:49 (6)	19:38	6	07:40 (5)	18:23	15	10:05 (1)	16:19	39	09:18 (1)	15:55	
17	05:06		05:39 (3)	05:59		06:56		07:53		09:46 (1)	07:54		08:40 (1)	08:39			
	21:48	17	05:56 (3)	20:51	15	06:50 (6)	19:35	12	07:43 (5)	18:21	23	10:09 (1)	16:18	37	09:17 (1)	15:55	
18	05:08		05:41 (3)	06:01		06:58		07:55		09:44 (1)	07:56		08:41 (1)	08:40			
	21:47	15	05:56 (3)	20:49	17	06:50 (6)	19:33	14	07:44 (5)	18:18	27	10:11 (1)	16:16	35	09:16 (1)	15:55	
19	05:09		05:42 (3)	06:03		07:00		07:57		09:41 (1)	07:58		08:42 (1)	08:41			
	21:46	13	05:55 (3)	20:47	17	06:50 (6)	19:30	17	07:45 (5)	18:16	32	10:13 (1)	16:15	33	09:15 (1)	15:56	
20	05:10		05:43 (3)	06:05		07:02		07:59		09:40 (1)	08:00		08:44 (1)	08:42			
	21:44	11	05:54 (3)	20:45	17	06:51 (6)	19:28	16	07:45 (5)	18:14	35	10:15 (1)	16:13	30	09:14 (1)	15:56	
21	05:12		05:45 (3)	06:06		07:03		08:01		09:38 (1)	08:02		08:45 (1)	08:42			
	21:43	9	05:54 (3)	20:42	15	06:50 (6)	19:25	14	07:44 (5)	18:11	38	10:16 (1)	16:12	27	09:12 (1)	15:56	
22	05:14		05:46 (3)	06:08		07:05		08:02		09:37 (1)	08:04		08:47 (1)	08:43			
	21:41	7	05:53 (3)	20:40	13	06:50 (6)	19:23	12	07:44 (5)	18:09	40	10:17 (1)	16:11	24	09:11 (1)	15:57	
23	05:15		05:48 (3)	06:10		07:07		08:04		09:35 (1)	08:06		08:49 (1)	08:43			
	21:40	4	05:52 (3)	20:37	11	06:50 (6)	19:20	9	07:43 (5)	18:07	43	10:18 (1)	16:09	20	09:09 (1)	15:57	
24	05:17		05:49 (3)	06:12		07:09		08:06		09:34 (1)	08:08		08:52 (1)	08:44			
	21:38	1	05:50 (3)	20:35	8	06:49 (6)	19:18	6	07:42 (5)	18:04	45	10:19 (1)	16:08	15	09:07 (1)	15:58	
25	05:18			06:14		07:11		07:08		08:34 (1)	08:09		08:56 (1)	08:44			
	21:37			20:33	5	06:47 (6)	19:15	14	08:20 (4)	17:02	46	09:20 (1)	16:07	8	09:04 (1)	15:58	
26	05:20			06:16		07:13		08:06 (4)		07:10		08:33 (1)	08:11			08:44	
	21:35			20:30	2	06:46 (6)	19:13	16	08:22 (4)	17:00	48	09:21 (1)	16:06			15:59	
27	05:22			06:17		07:15		08:04 (4)		07:12		08:33 (1)	08:13			08:45	
	21:33			20:28		19:10		08:24 (4)	16:58	48	09:21 (1)	16:05				16:00	
28	05:23			06:19		07:16		08:02 (4)	17:14		08:32 (1)	08:15				08:45	
	21:32			20:26		19:08		08:24 (4)	16:56	49	09:21 (1)	16:04				16:01	
29	05:25			06:21		07:18		08:01 (4)	17:16		08:31 (1)	08:16				08:45	
	21:30			20:23		19:05		08:25 (4)	16:53	50	09:21 (1)	16:03				16:02	
30	05:27			06:23		07:20		08:00 (4)	17:18		08:31 (1)	08:18				08:45	
	21:28			20:21		19:02		08:25 (4)	16:51	50	09:21 (1)	16:02				16:03	
31	05:28			06:25							08:32 (1)					08:45	
	21:26			20:18							16:49	50	09:22 (1)			16:04	
Potential sun hours	517			463		383		327			255		983			228	
Total, worst case		470			145		227		878			983					

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: D - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (4)
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	08:45 16:05	08:13 16:58	07:13 17:56	06:56 19:57	05:45 20:54	27	06:13 (4) 06:40 (4)	04:53 21:46	69	05:25 (6) 06:42 (1)	02:42 21:25	67	05:31 (6) 06:49 (1)	05:30 21:25	32	06:06 (1) 06:38 (1)	06:27 20:16	07:22 19:00	07:22 16:47	08:19 16:01
2	08:45 16:06	08:11 17:00	07:11 17:58	06:54 19:59	05:43 20:56	27	06:13 (4) 06:40 (4)	04:52 21:48	70	05:24 (6) 06:42 (1)	04:49 22:01	68	05:31 (6) 06:49 (1)	05:32 21:23	33	06:07 (1) 06:40 (4)	06:29 20:13	07:24 18:57	07:25 16:45	08:20 16:00
3	08:44 16:07	08:09 17:02	07:09 18:00	06:51 20:00	05:40 20:58	25	06:14 (4) 06:39 (4)	04:51 21:49	72	05:23 (6) 06:42 (1)	04:50 22:01	70	05:29 (6) 06:49 (1)	05:34 21:21	33	06:10 (1) 06:43 (4)	06:30 20:11	07:26 18:55	07:27 16:43	08:23 15:59
4	08:44 16:09	08:07 17:04	07:06 18:02	06:49 20:02	05:38 21:00	25	06:14 (4) 06:39 (4)	04:50 21:50	72	05:22 (6) 06:42 (1)	04:51 22:00	71	05:29 (6) 06:49 (1)	05:35 21:19	32	06:13 (1) 06:45 (4)	06:32 20:08	07:28 18:52	07:29 16:41	08:24 15:59
5	08:44 16:10	08:06 17:06	07:04 18:04	06:46 20:04	05:36 21:02	24	06:14 (4) 06:39 (4)	04:49 21:51	72	05:23 (6) 06:43 (1)	04:50 22:00	71	05:29 (6) 06:49 (1)	05:37 21:17	26	06:18 (1) 06:45 (4)	06:34 20:06	07:30 18:50	07:31 16:39	08:26 15:58
6	08:43 16:11	08:04 17:09	07:01 18:06	06:44 20:06	05:34 21:04	22	06:15 (4) 06:37 (4)	04:49 21:52	71	05:23 (6) 06:43 (1)	04:53 21:59	72	05:29 (6) 06:50 (1)	05:32 21:15	22	06:25 (4) 06:47 (4)	06:08 20:03	07:32 18:47	07:33 16:37	08:27 15:57
7	08:43 16:13	08:02 17:11	06:59 18:08	06:41 20:08	05:32 21:05	21	06:15 (4) 06:36 (4)	04:48 21:53	71	05:24 (6) 06:44 (1)	04:54 21:58	73	05:24 (6) 06:50 (1)	05:41 21:13	23	06:25 (4) 06:48 (4)	06:09 20:01	07:33 18:45	07:35 16:35	08:28 15:57
8	08:42 16:14	08:00 17:13	06:56 18:10	06:39 20:10	05:30 21:07	30	06:06 (1) 06:36 (4)	04:47 21:54	72	05:24 (6) 06:44 (1)	04:55 21:58	73	05:29 (6) 06:50 (1)	05:43 21:11	24	06:23 (4) 06:47 (4)	06:40 19:58	07:35 18:42	07:37 16:33	08:30 15:56
9	08:42 16:16	07:58 17:15	06:54 18:12	06:36 20:12	05:28 21:09	32	06:02 (1) 06:34 (4)	04:47 21:55	71	05:25 (6) 06:45 (1)	04:56 21:57	72	05:30 (6) 06:50 (1)	05:44 21:09	25	06:23 (4) 06:48 (4)	06:41 19:56	07:37 18:40	07:39 16:31	08:31 15:56
10	08:41 16:17	07:56 17:17	06:51 18:14	06:34 20:14	05:26 21:11	33	05:59 (1) 06:32 (4)	04:46 21:56	71	05:25 (6) 06:44 (1)	04:57 21:56	71	05:31 (6) 06:50 (1)	05:46 21:07	26	06:23 (4) 06:49 (4)	06:43 19:53	07:39 18:38	07:41 16:30	08:32 15:56
11	08:40 16:19	07:54 17:19	06:48 18:16	06:31 20:16	05:24 21:13	33	05:56 (1) 06:29 (4)	04:46 21:57	69	05:26 (6) 06:45 (1)	04:58 21:55	71	05:32 (6) 06:50 (1)	05:48 21:05	26	06:22 (4) 06:48 (4)	06:45 19:51	07:41 18:35	07:43 16:28	08:33 15:55
12	08:39 16:20	07:52 17:21	06:46 18:18	06:29 20:18	05:23 21:15	34	05:55 (1) 06:29 (4)	04:45 21:58	68	05:27 (6) 06:45 (1)	04:59 21:54	70	05:33 (6) 06:50 (1)	05:50 21:02	26	06:22 (4) 06:48 (4)	06:47 19:48	07:43 18:33	07:45 16:26	08:35 15:55
13	08:39 16:22	07:50 17:23	06:44 18:20	06:26 20:20	05:21 21:16	37	05:53 (1) 06:30 (1)	04:45 21:58	67	05:27 (6) 06:45 (1)	05:01 21:53	67	05:34 (6) 06:49 (1)	05:52 21:00	27	06:22 (4) 06:49 (4)	06:49 19:46	07:45 18:30	07:47 16:24	08:36 15:55
14	08:38 16:24	07:47 17:25	06:41 18:20	06:24 20:22	05:19 21:18	39	05:52 (1) 06:31 (1)	04:45 21:59	67	05:28 (6) 06:45 (1)	05:02 21:59	66	05:36 (6) 06:50 (1)	05:53 21:04	25	06:23 (4) 06:48 (4)	06:51 19:43	07:47 18:29	07:49 16:23	08:37 15:55
15	08:37 16:25	07:45 17:27	06:39 18:24	06:21 20:24	05:17 21:20	42	05:51 (1) 06:33 (1)	04:44 22:00	65	05:30 (6) 06:46 (1)	05:03 21:51	65	05:37 (6) 06:50 (1)	05:55 20:56	23	06:25 (4) 06:48 (4)	06:52 19:41	07:49 18:25	07:50 16:21	08:38 15:55
16	08:36 16:27	07:43 17:29	06:36 18:26	06:19 20:25	05:15 21:22	43	05:50 (1) 06:33 (1)	04:44 22:00	63	05:45 (1) 06:46 (1)	05:05 21:49	63	05:38 (6) 06:49 (1)	05:57 20:54	20	06:27 (4) 06:49 (4)	06:54 19:38	07:51 18:23	07:52 16:19	08:39 15:55
17	08:35 16:29	07:41 17:31	06:34 18:28	06:17 20:27	05:14 21:23	46	05:49 (1) 06:35 (1)	04:44 22:01	61	05:46 (1) 06:46 (1)	05:06 21:48	62	05:39 (6) 06:49 (1)	05:59 20:51	18	06:29 (5) 06:47 (4)	06:56 19:35	07:53 18:21	07:54 16:18	08:39 15:55
18	08:33 16:31	07:39 17:33	06:31 18:30	06:14 20:29	05:12 21:25	47	05:48 (1) 06:35 (1)	04:44 22:01	60	05:46 (1) 06:46 (1)	05:08 21:47	59	05:41 (6) 06:49 (1)	06:01 20:49	15	06:30 (5) 06:45 (4)	06:58 19:33	07:55 18:18	07:56 16:16	08:40 15:55
19	08:32 16:33	07:36 17:36	06:29 18:32	06:12 20:31	05:10 21:27	48	05:48 (1) 06:36 (1)	04:44 22:02	60	05:46 (1) 06:46 (1)	05:09 21:46	58	05:42 (6) 06:49 (1)	06:03 20:47	12	06:32 (5) 06:44 (4)	07:00 19:30	07:57 18:16	07:58 16:15	08:41 15:56
20	08:31 16:34	07:34 17:38	06:26 18:33	06:10 20:33	05:09 21:28	49	05:47 (1) 06:36 (1)	04:44 22:02	61	05:46 (1) 06:47 (1)	05:10 21:44	54	05:43 (6) 06:49 (1)	06:05 20:44	10	06:34 (5) 06:46 (4)	07:02 19:28	07:59 18:14	08:00 16:13	08:42 15:56
21	08:30 16:36	07:32 17:40	06:24 18:35	06:07 20:35	05:07 21:30	51	05:46 (1) 06:37 (1)	04:44 22:02	61	05:46 (1) 06:47 (1)	05:12 21:43	52	05:43 (6) 06:49 (1)	06:06 20:42	7	06:35 (5) 06:48 (4)	07:03 19:25	08:00 18:11	08:02 16:12	08:42 15:56
22	08:28 16:38	07:30 17:42	06:21 18:37	06:05 20:37	05:06 21:32	52	05:46 (1) 06:38 (1)	04:44 22:02	61	05:47 (1) 06:48 (1)	05:14 21:41	51	05:44 (6) 06:49 (1)	06:08 20:40	5	06:37 (5) 06:49 (4)	07:05 19:23	08:02 18:09	08:04 16:11	08:43 15:57
23	08:27 16:40	07:27 17:44	06:19 18:39	06:03 20:39	05:04 21:33	53	05:45 (1) 06:38 (1)	04:44 22:03	61	05:47 (1) 06:47 (1)	05:15 21:40	50	05:57 (6) 06:47 (1)	06:10 20:37	3	06:42 (5) 06:49 (4)	07:07 19:20	08:04 18:07	08:06 16:09	08:43 15:57
24	08:26 16:42	07:25 17:46	06:16 18:41	06:00 20:41	05:03 21:35	56	05:46 (1) 06:39 (1)	04:45 22:03	60	05:47 (1) 06:48 (1)	05:17 21:38	49	05:57 (6) 06:46 (1)	06:12 20:35		07:09 19:18	08:06 18:04	08:08 16:08	08:44 15:58	
25	08:24 16:44	07:23 17:48	06:14 18:43	05:58 20:43	05:01 21:36	58	05:47 (1) 06:40 (4)	04:45 21:36	60	05:48 (1) 06:48 (1)	05:18 21:37	48	05:58 (1) 06:46 (1)	06:14 20:33		07:11 19:15	08:08 17:02	08:09 16:07	08:44 15:59	
26	08:23 16:46	07:20 17:50	06:11 18:45	05:56 20:45	05:00 21:38	60	05:21 (5) 06:39 (4)	04:46 21:38	61	05:31 (6) 06:40 (1)	04:46 22:03	46	05:59 (1) 06:45 (1)	06:16 20:30		07:13 19:13	07:10 17:00	08:11 16:06	08:44 15:59	
27	08:21 16:48	07:18 17:52	06:09 18:47	05:53 20:47	04:59 21:39	62	06:19 (4) 06:40 (4)	04:46 21:39	61	05:30 (6) 06:41 (1)	04:46 22:03	45	05:47 (1) 06:45 (1)	06:17 20:28		07:15 19:10	07:12 16:58	08:13 16:05	08:45 16:00	
28	08:20 16:50	07:16 17:54	06:06 18:49	05:51 20:48	04:58 21:41	65	05:17 (4) 06:40 (4)	04:47 21:41	63	05:29 (6) 06:41 (1)	04:47 22:02	43	05:32 (6) 06:48 (1)	06:19 20:26		07:16 19:08	07:14 16:56	08:15 16:04	08:45 16:01	
29	08:18 16:52	07:04 17:51	05:49 18:37	05:48 20:50	04:56 21:42	66	06:15 (4) 06:13 (4)	04:46 21:42	65	05:28 (6) 05:27 (6)	04:47 21:48	40	05:32 (6) 06:51 (6)	06:21 20:23		07:17 19:05	07:16 16:53	08:16 16:03	08:45 16:02	
30	08:16 16:54	07:01 17:53	05:47 18:39	05:47 20:52	04:55 21:44	68	06:16 (4) 06:14 (4)	04:48 21:44	66	05:29 (6) 06:42 (1)	04:48 22:02	38	05:31 (6) 06:48 (1)	06:23 20:21		07:20 19:02	07:18 16:51	08:18 16:03	08:45 16:04	
31	08:15 16:56	06:59 17:55	05:45 18:35	05:45 19:55	04:54 21:45	69	06:15 (4) 06:12 (4)	04:48 21:45		05:26 (6) 06:42 (1)	04:48 22:02	36	05:31 (6) 06:49 (1)	06:24 20:18		07:21 19:03	07:19 16:52	08:19 16:04	08:45 16:04	
Potential sun hours	245	271	366	422	498	516	517	463	383	327	255	228								
Total worst case				170	1344	1959	1841	493	282	327	255	228								

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: E - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (5)

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	08:45		09:50 (1)	08:13	08:42 (4)	07:13	07:38 (5)	06:56	07:47 (2)	05:45	04:53
	16:05	27	10:17 (1)	16:58	08:44 (4)	17:56	07:51 (5)	19:57	08:45 (2)	20:54	21:46
2	08:45		09:50 (1)	08:11	08:40 (4)	07:11	07:38 (5)	06:54	07:47 (2)	05:43	04:52
	16:06	27	10:17 (1)	17:00	08:45 (4)	17:58	07:50 (5)	19:59	08:46 (2)	20:56	21:48
3	08:44		09:51 (1)	08:09	08:38 (4)	07:09	07:40 (5)	06:51	07:46 (2)	05:40	04:51
	16:07	27	10:18 (1)	17:02	08:47 (4)	18:00	07:49 (5)	20:00	08:45 (2)	20:58	21:49
4	08:44		09:51 (1)	08:07	08:36 (4)	07:06		06:49	07:13 (3)	05:38	04:50
	16:09	26	10:17 (1)	17:04	08:47 (4)	18:02		20:02	08:45 (2)	21:00	21:50
5	08:44		09:52 (1)	08:06	08:34 (4)	07:04		06:46	07:10 (3)	05:36	04:49
	16:10	26	10:18 (1)	17:06	08:48 (4)	18:04		20:04	08:45 (2)	21:02	21:51
6	08:43		09:52 (1)	08:04	08:32 (4)	07:01		06:44	07:08 (3)	05:34	04:49
	16:11	26	10:18 (1)	17:08	08:49 (4)	18:06		20:06	08:45 (2)	21:04	21:52
7	08:43		09:53 (1)	08:02	08:29 (4)	06:59		06:41	07:05 (3)	05:32	04:48
	16:13	25	10:18 (1)	17:11	08:48 (4)	18:08		20:08	08:44 (2)	21:06	21:53
8	08:42		09:53 (1)	08:00	08:27 (4)	06:56		06:39	07:03 (3)	05:30	04:47
	16:14	24	10:17 (1)	17:13	08:48 (4)	18:10		20:10	08:43 (2)	21:07	21:54
9	08:42		09:55 (1)	07:58	08:27 (4)	06:54		06:36	07:00 (3)	05:28	04:47
	16:16	23	10:18 (1)	17:15	08:48 (4)	18:12		20:12	08:42 (2)	21:09	21:55
10	08:41		09:56 (1)	07:56	08:28 (4)	06:51		06:34	06:58 (3)	05:26	04:46
	16:17	22	10:18 (1)	17:17	08:48 (4)	18:14		20:14	08:42 (2)	21:11	21:56
11	08:40		09:57 (1)	07:54	08:28 (4)	06:49		06:31	06:57 (3)	05:24	04:46
	16:19	21	10:18 (1)	17:19	08:48 (4)	18:16		20:16	08:41 (2)	21:13	21:57
12	08:39		09:58 (1)	07:52	08:29 (4)	06:46		06:29	06:56 (3)	05:22	04:45
	16:20	19	10:17 (1)	17:21	08:48 (4)	18:18		20:18	08:40 (2)	21:15	21:58
13	08:39		10:00 (1)	07:50	08:30 (4)	06:44		06:26	06:57 (3)	05:21	04:45
	16:22	17	10:17 (1)	17:23	08:46 (4)	18:20		20:20	08:39 (2)	21:16	21:59
14	08:38		10:00 (1)	07:47	08:31 (4)	06:41		06:24	06:56 (3)	05:19	04:44
	16:24	15	10:15 (1)	17:25	08:44 (4)	18:22		20:22	08:37 (2)	21:18	21:59
15	08:37		10:02 (1)	07:45	08:34 (4)	06:39		06:21	06:57 (3)	05:17	04:44
	16:25	12	10:14 (1)	17:27	08:42 (4)	18:24		20:24	08:37 (2)	21:20	22:00
16	08:36		10:05 (1)	07:43		06:36		06:19	06:57 (3)	05:15	04:44
	16:27	7	10:12 (1)	17:29		18:26		20:25	08:36 (2)	21:22	22:00
17	08:35			07:41		06:34		07:16 (2)	06:17	06:58 (3)	05:14
	16:29			17:31		18:28	10	07:26 (2)	20:27	08:33 (2)	21:23
18	08:34			07:39		06:31		07:10 (2)	06:14	06:59 (3)	05:12
	16:31			17:33		18:30	22	07:32 (2)	20:29	08:32 (2)	21:25
19	08:32			07:37		06:29		07:06 (2)	06:12	07:01 (3)	05:10
	16:33			17:36		18:32	29	07:35 (2)	20:31	08:31 (2)	21:27
20	08:31			07:34		06:26		06:51 (6)	06:10	07:04 (3)	05:09
	16:34			17:38		18:33	34	07:37 (2)	20:33	08:29 (2)	21:29
21	08:30			07:32		06:24		06:48 (6)	06:07	07:51 (2)	05:07
	16:36			17:40		18:35	42	07:39 (2)	20:35	08:26 (2)	21:30
22	08:28			07:30		06:21		06:45 (6)	06:05	07:53 (2)	05:06
	16:38			17:42		18:37	49	07:40 (2)	20:37	08:24 (2)	21:32
23	08:27			07:27		06:19		06:43 (6)	06:03	07:56 (2)	05:04
	16:40			17:44		18:39	55	07:42 (2)	20:39	08:22 (2)	21:33
24	08:26			07:25		07:51 (5)	06:16	06:40 (6)	06:00	07:59 (2)	05:03
	16:42			17:46	1	07:52 (5)	18:41	07:42 (2)	20:41	08:18 (2)	21:35
25	08:24			07:23		07:48 (5)	06:14	06:38 (6)	05:58	08:04 (2)	05:01
	16:44			17:48	4	07:52 (5)	18:43	07:43 (2)	20:43	08:13 (2)	21:37
26	08:23			07:20		07:46 (5)	06:11	06:35 (6)	05:56		05:00
	16:46			17:50	7	07:53 (5)	18:45	07:44 (2)	20:45		21:38
27	08:21			07:18		07:43 (5)	06:09	06:36 (6)	05:53		04:59
	16:48			17:52	9	07:52 (5)	18:47	07:45 (2)	20:47		21:40
28	08:20			07:16		07:41 (5)	06:06	06:37 (6)	05:51		04:57
	16:50			17:54	11	07:52 (5)	18:49	07:45 (2)	20:49		21:41
29	08:18					07:04		07:39 (6)	05:49		04:56
	16:52					19:51	64	08:46 (2)	20:50		21:42
30	08:16					07:01		07:48 (2)	05:47		04:55
	16:54					19:53	57	08:45 (2)	20:52		21:44
31	08:15					06:59		07:48 (2)			04:54
	16:56					19:55	58	08:46 (2)			21:45
Potential sun hours	245			271		366		422		498	516
Total, worst case	344			247		781		1501			

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: E - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (5)

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	04:48 22:02	05:30 21:25			06:27 20:16	06:56 (3) 08:40 (2)	07:22 19:00		07:23 16:47	07:57 (4) 21 08:18 (4)	08:20 16:01	09:39 (1) 21 10:00 (1)		
2	04:49 22:01	05:32 21:23			06:29 20:13	06:56 (3) 08:40 (2)	07:24 18:57		07:25 16:45	07:57 (4) 21 08:18 (4)	08:21 16:00	09:38 (1) 22 10:00 (1)		
3	04:50 22:01	05:34 21:21			06:30 20:11	06:58 (3) 08:40 (2)	07:26 18:55		07:27 16:43	07:57 (4) 21 08:18 (4)	08:23 15:59	09:38 (1) 23 10:01 (1)		
4	04:51 22:00	05:35 21:19			06:32 20:08	07:00 (3) 08:40 (2)	07:28 18:52		07:29 16:41	07:59 (4) 19 08:18 (4)	08:24 15:58	09:39 (1) 24 10:03 (1)		
5	04:52 22:00	05:37 21:17			06:34 20:06	07:02 (3) 08:41 (2)	07:30 18:50		07:31 16:39	08:02 (4) 16 08:18 (4)	08:26 15:58	09:38 (1) 25 10:03 (1)		
6	04:53 21:59	05:39 21:15			06:36 20:03	07:04 (3) 08:41 (2)	07:31 18:47		07:33 16:37	08:04 (4) 14 08:18 (4)	08:27 15:57	09:39 (1) 25 10:04 (1)		
7	04:54 21:58	05:41 21:13			06:38 20:01	07:05 (3) 08:40 (2)	07:33 18:45		07:35 16:35	08:06 (4) 11 08:17 (4)	08:28 15:57	09:38 (1) 26 10:04 (1)		
8	04:55 21:58	05:43 21:11			06:40 19:58	07:07 (3) 08:40 (2)	07:35 18:42		07:37 16:33	08:08 (4) 8 08:16 (4)	08:30 15:56	09:39 (1) 26 10:05 (1)		
9	04:56 21:57	05:44 21:09			06:41 19:56	07:40 (2) 08:39 (2)	07:37 18:40		07:39 16:31	08:11 (4) 5 08:16 (4)	08:31 15:56	09:39 (1) 27 10:06 (1)		
10	04:57 21:56	05:46 21:07			06:43 19:53	07:40 (2) 08:39 (2)	07:39 18:38	08:16 (5) 6 08:22 (5)	07:41 16:30	08:13 (4) 2 08:15 (4)	08:32 15:56	09:40 (1) 27 10:07 (1)		
11	04:58 21:55	05:48 21:05			06:45 19:51	07:39 (2) 08:38 (2)	07:41 18:35	08:13 (5) 11 08:24 (5)	07:43 16:28	08:15 (4) 15:55	08:34 15:55	09:40 (1) 27 10:07 (1)		
12	04:59 21:54	05:50 21:02			06:47 19:48	07:39 (2) 08:37 (2)	07:43 18:33	08:12 (5) 13 08:25 (5)	07:45 16:26	08:12 (5) 15:55	08:35 15:55	09:40 (1) 28 10:08 (1)		
13	05:01 21:53	05:52 21:00			06:49 19:46	07:39 (2) 08:37 (2)	07:45 18:30	08:13 (5) 12 08:25 (5)	07:47 16:24	08:13 (5) 15:55	08:36 15:55	09:40 (1) 28 10:08 (1)		
14	05:02 21:52	05:53 20:58			06:51 19:43	07:30 (6) 08:36 (2)	07:47 18:28	08:15 (5) 11 08:26 (5)	07:49 16:23	08:15 (5) 15:55	08:37 15:55	09:40 (1) 29 10:09 (1)		
15	05:03 21:51	05:55 20:56			06:52 19:41	07:27 (6) 08:35 (2)	07:49 18:25	08:17 (5) 8 08:25 (5)	07:51 16:21	08:17 (5) 15:55	08:38 15:55	09:41 (1) 28 10:09 (1)		
16	05:05 21:50	05:57 20:54			06:54 19:38	07:25 (6) 08:33 (2)	07:51 18:23	08:19 (5) 6 08:25 (5)	07:52 16:19	08:19 (5) 15:55	08:39 15:55	09:41 (1) 29 10:10 (1)		
17	05:06 21:48	05:59 20:51			06:56 19:36	07:24 (6) 08:32 (2)	07:53 18:21	08:21 (5) 3 08:24 (5)	07:54 16:18	08:21 (5) 15:55	08:40 15:55	09:42 (1) 28 10:10 (1)		
18	05:07 21:47	06:01 20:49	08:08 (2) 12 08:20 (2)		06:58 19:33	07:25 (6) 08:31 (2)	07:55 18:18		07:56 16:16	08:24 (5) 15:55	08:40 15:55	09:42 (1) 29 10:11 (1)		
19	05:09 21:46	06:03 20:47	08:04 (2) 21 08:25 (2)		07:00 19:30	07:27 (6) 08:30 (2)	07:57 18:16		07:58 16:15	08:04 (2) 15:55	08:41 15:55	09:42 (1) 29 10:11 (1)		
20	05:10 21:44	06:04 20:45	08:01 (2) 27 08:28 (2)		07:02 19:28	07:29 (6) 08:28 (2)	07:59 18:14		08:00 16:13	08:01 (4) 15:56	08:42 15:56	09:43 (1) 29 10:12 (1)		
21	05:12 21:43	06:06 20:42	07:58 (2) 31 08:29 (2)		07:03 19:25	07:30 (6) 08:26 (2)	08:01 18:11		08:02 16:12	08:02 (4) 15:56	08:42 15:56	09:44 (1) 29 10:13 (1)		
22	05:13 21:41	06:08 20:40	07:56 (2) 35 08:31 (2)		07:05 19:23	07:32 (6) 08:24 (2)	08:03 18:09		08:04 16:11	08:04 (4) 15:57	08:43 15:57	09:44 (1) 29 10:13 (1)		
23	05:15 21:40	06:10 20:38	07:07 (3) 47 08:33 (2)		07:07 19:20	07:34 (6) 08:22 (2)	08:04 18:07		08:06 16:09	08:06 (4) 15:57	08:43 15:57	09:44 (1) 29 10:13 (1)		
24	05:17 21:38	06:12 20:35	07:04 (3) 56 08:35 (2)		07:09 19:18	07:49 (2) 08:19 (2)	08:06 18:04		08:08 16:08	08:08 (4) 15:58	08:44 15:58	09:45 (1) 29 10:14 (1)		
25	05:18 21:37	06:14 20:33	07:02 (3) 61 08:35 (2)		07:11 19:15	07:52 (2) 08:16 (2)	07:08 17:02		08:09 16:07	08:09 (4) 15:58	08:44 15:58	09:45 (1) 29 10:14 (1)		
26	05:20 21:35	06:16 20:30	07:00 (3) 66 08:36 (2)		07:13 19:13	07:56 (2) 08:11 (2)	07:10 17:00		08:11 16:06	08:11 (4) 6 09:50 (1)	08:45 15:59	09:46 (1) 28 10:14 (1)		
27	05:22 21:34	06:17 20:28	06:59 (3) 71 08:38 (2)		07:15 19:10	07:12 16:58	07:12 16:58	08:03 (4) 9 08:12 (4)	08:13 16:05	08:13 (4) 11 09:53 (1)	08:45 16:00	09:46 (1) 29 10:15 (1)		
28	05:23 21:32	06:19 20:26	06:58 (3) 75 08:39 (2)		07:16 19:08	07:14 16:56	07:14 16:56	08:01 (4) 13 08:14 (4)	08:15 16:04	08:15 (4) 15 09:55 (1)	08:45 16:01	09:46 (1) 29 10:15 (1)		
29	05:25 21:30	06:21 20:23	06:57 (3) 76 08:38 (2)		07:18 19:05	07:16 16:53	07:16 16:53	07:59 (4) 16 08:15 (4)	08:16 16:03	09:40 (1) 17 09:57 (1)	08:45 16:02	09:47 (1) 28 10:15 (1)		
30	05:27 21:28	06:23 20:21	06:56 (3) 79 08:39 (2)		07:20 19:02	07:19 16:51	07:19 16:51	07:58 (4) 18 08:16 (4)	08:18 16:02	09:39 (1) 19 09:58 (1)	08:45 16:03	09:48 (1) 28 10:16 (1)		
31	05:28 21:26	06:25 20:18	06:56 (3) 81 08:40 (2)			07:21 16:49	07:21 16:49	07:58 (4) 20 08:18 (4)		09:58 (1) 16:02	08:45 16:04	09:49 (1) 27 10:16 (1)		
Potential sun hours	518	463			383			327		255		228		
Total, worst case			738		1543			146		206		844		

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: F - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (6)

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	08:45 16:05	08:13 16:58	09:13 (4) 17:56	07:13 17:56	08:51 (2) 19:57	09:24 (2) 20:54
2	08:45 16:06	08:11 17:00	09:15 (4) 17:58	07:11 18:00	08:50 (2) 19:59	09:24 (2) 20:56
3	08:44 16:07	08:09 17:02	09:25 (4) 18:00	07:09 18:00	08:48 (2) 19:59	09:24 (2) 20:56
4	08:44 16:09	08:07 17:04	07:06 18:02	06:49 18:02	08:47 (2) 19:59	09:24 (2) 20:56
5	08:44 16:10	08:06 17:06	07:04 18:04	06:46 18:04	08:46 (2) 19:59	09:24 (2) 20:56
6	08:43 16:11	08:04 17:08	07:01 18:06	06:44 18:06	08:44 (2) 19:59	09:24 (2) 20:56
7	08:43 16:13	08:02 17:11	06:59 18:08	06:41 18:08	08:42 (2) 19:59	09:24 (2) 20:56
8	08:42 16:14	08:00 17:13	06:56 18:10	06:39 18:10	08:42 (2) 19:59	09:24 (2) 20:56
9	08:42 16:16	07:58 17:15	06:54 18:12	06:36 18:12	08:40 (2) 19:59	09:24 (2) 20:56
10	08:41 16:17	07:56 17:17	06:51 18:14	06:34 18:14	08:39 (2) 19:59	09:24 (2) 20:56
11	08:40 16:19	07:54 17:19	06:49 18:16	06:31 18:16	08:38 (2) 19:59	09:24 (2) 20:56
12	08:39 16:20	07:52 17:21	06:46 18:18	06:29 18:18	08:37 (2) 19:59	09:24 (2) 20:56
13	08:39 16:22	07:50 17:23	06:44 18:20	06:26 18:20	08:36 (2) 19:59	09:24 (2) 20:56
14	08:38 16:24	07:47 17:25	06:41 18:22	06:24 18:22	08:36 (2) 19:59	09:24 (2) 20:56
15	08:37 16:25	07:45 17:27	06:39 18:24	06:21 18:24	07:03 (6) 19:59	09:24 (2) 20:56
16	08:36 16:27	07:43 17:29	06:36 18:26	06:19 18:26	07:01 (6) 19:59	09:24 (2) 20:56
17	08:35 16:29	07:41 17:31	06:34 18:28	06:17 18:28	06:58 (6) 19:59	09:24 (2) 20:56
18	08:33 16:31	07:39 17:33	06:31 18:30	06:14 18:30	06:56 (6) 19:59	09:24 (2) 20:56
19	08:32 16:33	07:37 17:35	06:29 18:32	06:12 18:32	06:53 (6) 19:59	09:24 (2) 20:56
20	08:31 16:34	07:34 17:38	06:26 18:33	06:09 18:33	06:50 (6) 19:59	09:24 (2) 20:56
21	08:30 16:36	07:32 17:40	06:24 18:35	06:07 18:35	06:48 (6) 19:59	09:24 (2) 20:56
22	08:28 16:38	07:30 17:42	06:21 18:37	06:05 18:37	06:46 (6) 19:59	09:24 (2) 20:56
23	08:27 16:40	07:27 17:44	06:19 18:39	06:03 18:39	06:47 (6) 19:59	09:24 (2) 20:56
24	08:26 16:42	07:25 17:46	06:16 18:41	06:00 18:41	06:47 (6) 19:59	09:24 (2) 20:56
25	08:24 16:44	07:23 17:48	06:14 18:43	05:58 18:43	06:48 (6) 19:59	09:24 (2) 20:56
26	08:23 16:46	07:20 17:50	06:11 18:45	05:56 18:45	06:49 (6) 19:59	09:24 (2) 20:56
27	08:21 16:48	07:18 17:52	06:09 18:47	05:53 18:47	06:51 (6) 19:59	09:24 (2) 20:56
28	08:20 16:50	07:16 17:54	06:06 18:49	05:51 18:49	08:26 (2) 19:59	09:24 (2) 20:56
29	08:18 16:52	07:14 17:56	06:04 18:51	05:49 18:51	09:26 (2) 19:59	09:24 (2) 20:56
30	08:16 16:54	07:12 17:58	06:02 18:53	05:47 18:53	09:25 (2) 19:59	09:24 (2) 20:56
31	08:15 16:56	07:11 17:59	06:01 18:54	05:46 18:54	09:25 (2) 19:59	09:24 (2) 20:56
Potential sun hours	245	271	366	422	498	516
Total, worst case	451	994	3929	3979	553	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: F - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (6)

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	04:48	05:30	10:08 (2)	06:27	07:01 (3)	07:22	09:16 (2)	07:23				08:20	08:56 (4)
	22:02	21:25	10	10:18 (2)	20:16	157	11:25 (2)	19:00	120	11:16 (2)	16:47	16:01	9 09:05 (4)
2	04:49	05:32		10:01 (2)	06:28		07:00 (3)	07:24		09:17 (2)	07:25	08:21	08:57 (4)
	22:01	21:23	24	10:25 (2)	20:13	157	11:24 (2)	18:57	118	11:15 (2)	16:45	16:00	7 09:04 (4)
3	04:50	05:34		09:58 (2)	06:30		07:01 (3)	07:26		09:17 (2)	07:27	08:23	08:59 (4)
	22:01	21:21	32	10:30 (2)	20:11	156	11:25 (2)	18:55	117	11:14 (2)	16:43	15:59	5 09:04 (4)
4	04:51	05:35		09:55 (2)	06:32		07:01 (3)	07:28		09:18 (2)	07:29	08:24	09:01 (4)
	22:00	21:19	38	10:33 (2)	20:08	157	11:26 (2)	18:52	115	11:13 (2)	16:41	15:58	3 09:04 (4)
5	04:52	05:37		09:53 (2)	06:34		07:02 (3)	07:30		09:18 (2)	07:31	08:26	
	22:00	21:17	44	10:37 (2)	20:06	156	11:27 (2)	18:50	114	11:12 (2)	16:39	15:58	
6	04:53	05:39		09:51 (2)	06:36		07:04 (3)	07:31		09:19 (2)	07:33	08:27	
	21:59	21:15	49	10:40 (2)	20:03	153	11:27 (2)	18:47	112	11:11 (2)	16:37	15:57	
7	04:54	05:41		09:48 (2)	06:38		07:05 (3)	07:33		09:20 (2)	07:35	08:28	
	21:58	21:13	54	10:42 (2)	20:01	151	11:27 (2)	18:45	109	11:09 (2)	16:35	15:57	
8	04:55	05:42		09:47 (2)	06:40		07:07 (3)	07:35		09:21 (2)	07:37	08:30	
	21:58	21:11	58	10:45 (2)	19:58	147	11:27 (2)	18:42	107	11:08 (2)	16:33	15:56	
9	04:56	05:44		09:46 (2)	06:41		07:09 (3)	07:37		09:22 (2)	07:39	08:45 (4)	08:31
	21:57	21:09	62	10:48 (2)	19:56	144	11:28 (2)	18:40	104	11:06 (2)	16:31	10 08:55 (4)	15:56
10	04:57	05:46		09:44 (2)	06:43		07:13 (3)	07:39		09:22 (2)	07:41	08:43 (4)	08:32
	21:56	21:07	67	10:51 (2)	19:53	134	11:28 (2)	18:38	103	11:05 (2)	16:30	15 08:58 (4)	15:55
11	04:58	05:48		09:42 (2)	06:45		09:16 (2)	07:41		09:23 (2)	07:43	08:42 (4)	08:34
	21:55	21:05	70	10:52 (2)	19:51	131	11:27 (2)	18:35	100	11:03 (2)	16:28	17 08:59 (4)	15:55
12	04:59	05:50		09:41 (2)	06:47		09:16 (2)	07:43		09:25 (2)	07:45	08:41 (4)	08:35
	21:54	21:02	74	10:55 (2)	19:48	132	11:28 (2)	18:33	97	11:02 (2)	16:26	19 09:00 (4)	15:55
13	05:01	05:52		09:40 (2)	06:49		09:16 (2)	07:45		09:26 (2)	07:47	08:40 (4)	08:36
	21:53	21:00	77	10:57 (2)	19:46	132	11:28 (2)	18:30	94	11:00 (2)	16:24	21 09:01 (4)	15:55
14	05:02	05:53		09:38 (2)	06:51		09:16 (2)	07:47		09:27 (2)	07:49	08:39 (4)	08:37
	21:52	20:58	81	10:59 (2)	19:43	132	11:28 (2)	18:28	91	10:58 (2)	16:23	23 09:02 (4)	15:55
15	05:03	05:55		09:37 (2)	06:52		09:16 (2)	07:49		09:28 (2)	07:51	08:40 (4)	08:38
	21:51	20:56	84	11:01 (2)	19:41	132	11:28 (2)	18:25	88	10:56 (2)	16:21	23 09:03 (4)	15:55
16	05:05	05:57		09:36 (2)	06:54		07:41 (6)	07:51		09:30 (2)	07:52	08:39 (4)	08:39
	21:50	20:54	87	11:03 (2)	19:38	139	11:27 (2)	18:23	84	10:54 (2)	16:19	25 09:04 (4)	15:55
17	05:06	05:59		07:18 (3)	06:56		07:38 (6)	07:53		08:33 (5)	07:54	08:39 (4)	08:40
	21:48	20:51	97	11:05 (2)	19:35	144	11:26 (2)	18:21	91	10:52 (2)	16:18	25 09:04 (4)	15:55
18	05:07	06:01		07:13 (3)	06:58		07:36 (6)	07:55		08:31 (5)	07:56	08:39 (4)	08:40
	21:47	20:49	108	11:06 (2)	19:33	147	11:26 (2)	18:18	90	10:49 (2)	16:16	25 09:04 (4)	15:55
19	05:09	06:03		07:11 (3)	07:00		07:35 (6)	07:57		08:30 (5)	07:58	08:39 (4)	08:41
	21:46	20:47	115	11:08 (2)	19:30	149	11:26 (2)	18:16	88	10:47 (2)	16:15	26 09:05 (4)	15:55
20	05:10	06:04		07:10 (3)	07:02		07:34 (6)	07:59		08:29 (5)	08:00	08:39 (4)	08:42
	21:44	20:45	121	11:10 (2)	19:28	151	11:26 (2)	18:14	84	10:44 (2)	16:13	26 09:05 (4)	15:56
21	05:12	06:06		07:07 (3)	07:03		07:32 (6)	08:01		08:29 (5)	08:02	08:39 (4)	08:42
	21:43	20:42	127	11:11 (2)	19:25	151	11:24 (2)	18:11	79	10:41 (2)	16:12	26 09:05 (4)	15:56
22	05:13	06:08		07:06 (3)	07:05		07:32 (6)	08:02		08:31 (5)	08:04	08:40 (4)	08:43
	21:41	20:40	131	11:13 (2)	19:23	151	11:24 (2)	18:09	71	10:38 (2)	16:11	25 09:05 (4)	15:57
23	05:15	06:10		07:05 (3)	07:07		07:34 (6)	08:04		08:33 (5)	08:06	08:40 (4)	08:43
	21:40	20:37	136	11:15 (2)	19:20	148	11:23 (2)	18:07	63	10:35 (2)	16:09	25 09:05 (4)	15:57
24	05:17	06:12		07:05 (3)	07:09		07:36 (6)	08:06		08:35 (5)	08:08	08:42 (4)	08:44
	21:38	20:35	139	11:16 (2)	19:18	144	11:23 (2)	18:04	53	10:31 (2)	16:08	23 09:05 (4)	15:58
25	05:18	06:14		07:03 (3)	07:11		07:38 (6)	07:08		07:38 (5)	08:09	08:44 (4)	08:44
	21:37	20:33	143	11:17 (2)	19:15	141	11:22 (2)	17:02	41	09:27 (2)	16:07	21 09:05 (4)	15:58
26	05:20	06:16		07:03 (3)	07:13		07:40 (6)	07:10		07:40 (5)	08:11	08:46 (4)	08:44
	21:35	20:30	145	11:18 (2)	19:13	137	11:21 (2)	17:00	24	09:19 (2)	16:06	19 09:05 (4)	15:59
27	05:22	06:17		07:02 (3)	07:15		07:42 (6)	07:12		07:42 (5)	08:13	08:48 (4)	08:45
	21:33	20:28	149	11:20 (2)	19:10	133	11:21 (2)	16:58	1	07:43 (5)	16:05	17 09:05 (4)	16:00
28	05:23	06:19		07:02 (3)	07:16		07:43 (6)	07:14			08:15	08:50 (4)	08:45
	21:32	20:26	151	11:21 (2)	19:07	127	11:19 (2)	16:56		16:04	15 09:05 (4)	16:01	
29	05:25	06:21		07:01 (3)	07:18		09:15 (2)	07:16		08:16		08:52 (4)	08:45
	21:30	20:23	152	11:21 (2)	19:05	123	11:18 (2)	16:53		16:03	13 09:05 (4)	16:02	
30	05:27	06:23		07:01 (3)	07:20		09:16 (2)	07:18		08:18		08:54 (4)	08:45
	21:28	20:21	154	11:22 (2)	19:02	121	11:17 (2)	16:51		16:02	11 09:05 (4)	16:03	
31	05:28	06:25		07:01 (3)			07:21					08:45	
	21:26	20:18	155	11:23 (2)			16:49					16:04	
Potential sun hours	518	463			383			327		255		228	
Total, worst case			2934		4277			2358		450		24	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: G - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (7)

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	08:45			08:13			08:46 (5)	07:13		07:38 (6)	06:56		08:05 (3)	05:45		04:53		
	16:05			16:58	93		15:32 (2)	17:56	73	15:23 (2)	19:57	60	09:05 (3)	20:54		21:46		
2	08:45		14:43 (2)	08:11			08:47 (5)	07:11		07:36 (6)	06:54		08:06 (3)	05:42		04:52		
	16:06	7	14:50 (2)	17:00	93		15:33 (2)	17:58	72	15:21 (2)	19:59	59	09:05 (3)	20:56		21:48		
3	08:44		14:41 (2)	08:09			08:47 (5)	07:09		07:33 (6)	06:51		08:05 (3)	05:40		04:51		
	16:07	13	14:54 (2)	17:02	92		15:33 (2)	18:00	71	15:19 (2)	20:00	58	09:03 (3)	20:58		21:49		
4	08:44		14:39 (2)	08:07			08:48 (5)	07:06		07:33 (6)	06:48		08:06 (3)	05:38		04:50		
	16:09	17	14:56 (2)	17:04	92		15:34 (2)	18:02	66	15:17 (2)	20:02	57	09:03 (3)	21:00		21:50		
5	08:44		14:38 (2)	08:06			08:49 (5)	07:04		07:32 (6)	06:46		08:06 (3)	05:36		04:49		
	16:10	21	14:59 (2)	17:06	90		15:34 (2)	18:04	60	15:13 (2)	20:04	55	09:01 (3)	21:02		21:51		
6	08:43		14:36 (2)	08:04			08:50 (5)	07:01		07:33 (6)	06:43		08:07 (3)	05:34		04:48		
	16:11	24	15:00 (2)	17:08	88		15:34 (2)	18:06	50	15:09 (2)	20:06	54	09:01 (3)	21:04		21:52		
7	08:43		14:35 (2)	08:02			08:52 (5)	06:59		07:32 (6)	06:41		08:06 (3)	05:32		04:48		
	16:13	27	15:02 (2)	17:10	84		15:34 (2)	18:08	31	14:59 (2)	20:08	53	08:59 (3)	21:05		21:53		
8	08:42		14:34 (2)	08:00			14:20 (2)	06:56		07:33 (6)	06:39		08:08 (3)	05:30		04:47		
	16:14	30	15:04 (2)	17:13	75		15:35 (2)	18:10	27	08:00 (6)	20:10	50	08:58 (3)	21:07		21:54		
9	08:42		14:34 (2)	07:58			14:20 (2)	06:54		07:33 (6)	06:36		08:08 (3)	05:28		04:47		
	16:16	32	15:06 (2)	17:15	75		15:35 (2)	18:12	26	07:59 (6)	20:12	48	08:56 (3)	21:09		21:55		
10	08:41		14:33 (2)	07:56			14:20 (2)	06:51		07:32 (3)	06:34		08:09 (3)	05:26		04:46		
	16:17	35	15:08 (2)	17:17	75		15:35 (2)	18:14	26	07:58 (6)	20:14	45	08:54 (3)	21:11		21:56		
11	08:40		14:32 (2)	07:54			14:20 (2)	06:49		07:27 (3)	06:31		08:10 (3)	05:24		04:45		
	16:19	37	15:09 (2)	17:19	75		15:35 (2)	18:16	29	07:56 (3)	20:16	43	08:53 (3)	21:13		21:57		
12	08:39		14:31 (2)	07:52			14:20 (2)	06:46		07:25 (3)	06:29		08:11 (3)	05:22		04:45		
	16:20	40	15:11 (2)	17:21	76		15:36 (2)	18:18	34	07:59 (3)	20:18	39	08:50 (3)	21:15		21:58		
13	08:39		14:31 (2)	07:50			14:20 (2)	06:44		07:22 (3)	06:26		08:13 (3)	05:21		04:45		
	16:22	42	15:13 (2)	17:23	75		15:35 (2)	18:20	38	08:00 (3)	20:20	36	08:49 (3)	21:16		21:59		
14	08:38		14:29 (2)	07:47			14:20 (2)	06:41		07:20 (3)	06:24		08:14 (3)	05:19		04:44		
	16:24	44	15:13 (2)	17:25	75		15:35 (2)	18:22	42	08:02 (3)	20:22	31	08:45 (3)	21:18		21:59		
15	08:37		14:29 (2)	07:45			14:21 (2)	06:39		07:18 (3)	06:21		08:16 (3)	05:17		04:44		
	16:25	46	15:15 (2)	17:27	74		15:35 (2)	18:24	45	08:03 (3)	20:24	27	08:43 (3)	21:20		22:00		
16	08:36		14:28 (2)	07:43			14:21 (2)	06:36		07:17 (3)	06:19		08:20 (3)	05:15		04:44		
	16:27	48	15:16 (2)	17:29	74		15:35 (2)	18:26	48	08:05 (3)	20:25	19	08:39 (3)	21:22		22:00		
17	08:35		14:28 (2)	07:41			14:21 (2)	06:34		07:15 (3)	06:17		08:25 (3)	05:14		04:44		
	16:29	50	15:18 (2)	17:31	73		15:34 (2)	18:28	50	08:05 (3)	20:27	7	08:32 (3)	21:23		22:01		
18	08:33		14:27 (2)	07:39			14:22 (2)	06:31		07:14 (3)	06:14			05:12		04:44		
	16:31	52	15:19 (2)	17:33	72		15:34 (2)	18:30	52	08:06 (3)	20:29			21:25		22:01		
19	08:32		14:27 (2)	07:36			14:23 (2)	06:29		07:13 (3)	06:12			05:10		04:44		
	16:32	53	15:20 (2)	17:35	71		15:34 (2)	18:32	54	08:07 (3)	20:31			21:27		22:02		
20	08:31		14:25 (2)	07:34			14:22 (2)	06:26		07:11 (3)	06:09			05:09		04:44		
	16:34	56	15:21 (2)	17:38	71		15:33 (2)	18:33	56	08:07 (3)	20:33			21:29		22:02		
21	08:30		14:25 (2)	07:32			14:23 (2)	06:24		07:11 (3)	06:07			05:07		04:44		
	16:36	58	15:23 (2)	17:40	69		15:32 (2)	18:35	57	08:08 (3)	20:35			21:30		22:02		
22	08:28		08:59 (5)	07:30			14:24 (2)	06:21		07:09 (3)	06:05			05:06		04:44		
	16:38	61	15:23 (2)	17:42	67		15:31 (2)	18:37	58	08:07 (3)	20:37			21:32		22:03		
23	08:27		08:58 (5)	07:27			14:25 (2)	06:19		07:09 (3)	06:02			05:04		04:44		
	16:40	65	15:25 (2)	17:44	66		15:31 (2)	18:39	59	08:08 (3)	20:39			21:33		22:03		
24	08:26		08:56 (5)	07:25			14:26 (2)	06:16		07:08 (3)	06:00			05:03		04:45		
	16:42	69	15:25 (2)	17:46	64		15:30 (2)	18:41	60	08:08 (3)	20:41			21:35		22:03		
25	08:24		08:54 (5)	07:23			07:48 (6)	06:14		07:08 (3)	05:58			05:01		04:45		
	16:44	73	15:26 (2)	17:48	68		15:29 (2)	18:43	60	08:08 (3)	20:43			21:36		22:03		
26	08:23		08:53 (5)	07:20			07:46 (6)	06:11		07:07 (3)	05:56			05:00		04:45		
	16:46	78	15:28 (2)	17:50	71		15:28 (2)	18:45	61	08:08 (3)	20:45			21:38		22:03		
27	08:21		08:51 (5)	07:18			07:43 (6)	06:09		07:07 (3)	05:53			04:59		04:46		
	16:48	80	15:28 (2)	17:52	72		15:26 (2)	18:47	61	08:08 (3)	20:47			21:39		22:03		
28	08:20		08:49 (5)	07:16			07:41 (6)	06:06		07:06 (3)	05:51			04:57		04:46		
	16:50	85	15:29 (2)	17:54	72		15:25 (2)	18:49	61	08:07 (3)	20:48			21:41		22:03		
29	08:18		08:47 (5)				07:04			08:06 (3)	05:49			04:56		04:47		
	16:52	88	15:30 (2)				19:51			09:07 (3)	20:50			21:42		22:02		
30	08:16		08:45 (5)				07:01			08:05 (3)	05:47			04:55		04:48		
	16:54	91	15:30 (2)				19:53			09:06 (3)	20:52			21:44		22:02		
31	08:15		08:46 (5)				06:59			08:06 (3)				04:54				
	16:56	92	15:32 (2)				19:55			09:06 (3)				21:45				
Potential sun hours	245			271			366			422			498			516		
Total, worst case	1514			2142			1609			741								

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: G - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (7)

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	04:48	05:30	06:27	08:09 (3)	07:22	08:03 (3)	07:22	13:49 (2)	08:20	14:14 (2)
	22:02	21:25	20:16	43 08:52 (3)	19:00	36 08:39 (3)	16:47	76 15:05 (2)	16:01	38 14:52 (2)
2	04:49	05:32	06:28	08:07 (3)	07:24	08:05 (3)	07:25	13:49 (2)	08:21	14:15 (2)
	22:01	21:23	20:13	45 08:52 (3)	18:57	31 08:36 (3)	16:45	75 15:04 (2)	16:00	35 14:50 (2)
3	04:50	05:34	06:30	08:06 (3)	07:26	08:08 (3)	07:27	08:25 (5)	08:23	14:17 (2)
	22:01	21:21	20:11	48 08:54 (3)	18:55	28 08:36 (6)	16:43	78 15:04 (2)	15:59	32 14:49 (2)
4	04:51	05:35	06:32	08:05 (3)	07:28	08:11 (6)	07:29	08:21 (5)	08:24	14:19 (2)
	22:00	21:19	20:08	50 08:55 (3)	18:52	25 08:36 (6)	16:41	86 15:04 (2)	15:58	30 14:49 (2)
5	04:52	05:37	06:34	08:04 (3)	07:30	08:10 (6)	07:31	08:20 (5)	08:26	14:20 (2)
	22:00	21:17	20:06	52 08:56 (3)	18:50	27 08:37 (6)	16:39	89 15:04 (2)	15:58	27 14:47 (2)
6	04:53	05:39	06:36	08:02 (3)	07:31	08:09 (6)	07:33	08:19 (5)	08:27	14:22 (2)
	21:59	21:15	20:03	54 08:56 (3)	18:47	28 08:37 (6)	16:37	91 15:04 (2)	15:57	25 14:47 (2)
7	04:54	05:41	06:38	08:01 (3)	07:33	08:09 (6)	07:35	08:18 (5)	08:28	14:24 (2)
	21:58	21:13	20:01	55 08:56 (3)	18:45	44 15:42 (2)	16:35	93 15:04 (2)	15:57	21 14:45 (2)
8	04:55	05:42	06:39	08:00 (3)	07:35	08:09 (6)	07:37	08:17 (5)	08:30	14:26 (2)
	21:58	21:11	19:58	57 08:57 (3)	18:42	55 15:47 (2)	16:33	92 15:03 (2)	15:56	18 14:44 (2)
9	04:56	05:44	06:41	08:00 (3)	07:37	08:08 (6)	07:39	08:17 (5)	08:31	14:29 (2)
	21:57	21:09	19:56	57 08:57 (3)	18:40	63 15:50 (2)	16:31	92 15:03 (2)	15:56	13 14:42 (2)
10	04:57	05:46	06:43	07:59 (3)	07:39	08:08 (6)	07:41	08:17 (5)	08:32	14:31 (2)
	21:56	21:07	19:53	59 08:58 (3)	18:37	68 15:53 (2)	16:30	93 15:03 (2)	15:55	9 14:40 (2)
11	04:58	05:48	06:45	07:57 (3)	07:41	08:09 (6)	07:43	08:17 (5)	08:34	
	21:55	21:05	19:51	60 08:57 (3)	18:35	71 15:55 (2)	16:28	92 15:03 (2)	15:55	
12	04:59	05:50	06:47	07:57 (3)	07:43	08:11 (6)	07:45	08:17 (5)	08:35	
	21:54	21:02	19:48	60 08:57 (3)	18:33	72 15:56 (2)	16:26	91 15:02 (2)	15:55	
13	05:01	05:52	06:49	07:57 (3)	07:45	08:13 (6)	07:47	08:19 (5)	08:36	
	21:53	21:00	19:46	60 08:57 (3)	18:30	73 15:58 (2)	16:24	88 15:01 (2)	15:55	
14	05:02	05:53	06:51	07:56 (3)	07:47	08:15 (6)	07:49	08:21 (5)	08:37	
	21:52	20:58	19:43	62 08:58 (3)	18:28	73 15:59 (2)	16:23	84 15:01 (2)	15:55	
15	05:03	05:55	06:52	07:56 (3)	07:49	08:17 (6)	07:51	08:24 (5)	08:38	
	21:51	20:56	19:41	61 08:57 (3)	18:25	72 16:00 (2)	16:21	80 15:01 (2)	15:55	
16	05:05	05:57	06:54	07:55 (3)	07:51	08:19 (6)	07:52	08:26 (5)	08:39	
	21:50	20:54	19:38	61 08:56 (3)	18:23	69 16:00 (2)	16:19	78 15:01 (2)	15:55	
17	05:06	05:59	06:56	07:55 (3)	07:53	08:21 (6)	07:54	08:28 (5)	08:40	
	21:48	20:51	19:35	61 08:56 (3)	18:21	66 16:01 (2)	16:18	73 15:00 (2)	15:55	
18	05:07	06:01	06:58	07:55 (3)	07:55	14:57 (2)	07:56	08:30 (5)	08:40	
	21:47	20:49	19:33	61 08:56 (3)	18:18	65 16:02 (2)	16:16	69 14:59 (2)	15:55	
19	05:09	06:03	07:00	07:55 (3)	07:57	14:56 (2)	07:58	08:32 (5)	08:41	
	21:46	20:47	19:30	60 08:55 (3)	18:16	66 16:02 (2)	16:15	65 14:59 (2)	15:55	
20	05:10	06:04	07:02	07:55 (3)	07:59	14:55 (2)	08:00	08:34 (5)	08:42	
	21:44	20:44	19:28	60 08:55 (3)	18:14	68 16:03 (2)	16:13	61 14:58 (2)	15:56	
21	05:12	06:06	07:03	07:55 (3)	08:00	14:53 (2)	08:02	14:00 (2)	08:42	
	21:43	20:42	19:25	58 08:53 (3)	18:11	70 16:03 (2)	16:12	58 14:58 (2)	15:56	
22	05:13	06:08	07:05	07:55 (3)	08:02	14:53 (2)	08:04	14:01 (2)	08:43	
	21:41	20:40	19:23	57 08:52 (3)	18:09	70 16:03 (2)	16:11	56 14:57 (2)	15:57	
23	05:15	06:10	07:07	07:55 (3)	08:04	14:52 (2)	08:06	14:03 (2)	08:43	
	21:40	20:37	19:20	57 08:52 (3)	18:07	71 16:03 (2)	16:09	53 14:56 (2)	15:57	
24	05:17	06:12	07:09	07:56 (3)	08:06	14:51 (2)	08:08	14:04 (2)	08:44	
	21:38	20:35	19:18	55 08:51 (3)	18:04	73 16:04 (2)	16:08	52 14:56 (2)	15:58	
25	05:18	06:14	07:11	07:57 (3)	07:08	13:51 (2)	08:09	14:05 (2)	08:44	
	21:37	20:33	19:15	53 08:50 (3)	17:02	74 15:05 (2)	16:07	50 14:55 (2)	15:58	
26	05:20	06:16	08:27 (3)	07:13	07:57 (3)	13:51 (2)	08:11	14:06 (2)	08:44	
	21:35	20:30	9 08:36 (3)	19:13	51 08:48 (3)	17:00	74 15:05 (2)	16:06	49 14:55 (2)	15:59
27	05:21	06:17	08:21 (3)	07:15	07:57 (3)	17:12	13:50 (2)	08:13	14:08 (2)	08:45
	21:33	20:28	20 08:41 (3)	19:10	49 08:46 (3)	16:58	75 15:05 (2)	16:05	46 14:54 (2)	16:00
28	05:23	06:19	08:18 (3)	07:16	07:58 (3)	17:14	13:50 (2)	08:15	14:09 (2)	08:45
	21:32	20:26	27 08:45 (3)	19:07	46 08:44 (3)	16:56	75 15:05 (2)	16:04	44 14:53 (2)	16:01
29	05:25	06:21	08:15 (3)	07:18	08:00 (3)	17:16	13:49 (2)	08:16	14:11 (2)	08:45
	21:30	20:23	31 08:46 (3)	19:05	43 08:43 (3)	16:53	75 15:04 (2)	16:03	42 14:53 (2)	16:02
30	05:27	06:23	08:13 (3)	07:20	08:01 (3)	17:18	13:49 (2)	08:18	14:12 (2)	08:45
	21:28	20:21	36 08:49 (3)	19:02	40 08:41 (3)	16:51	75 15:04 (2)	16:02	40 14:52 (2)	16:03
31	05:28	06:25	08:11 (3)		07:20	13:50 (2)			08:45	
	21:26	20:18	39 08:50 (3)		16:49	75 15:05 (2)			16:04	
Potential sun hours	518	463		383		327		255		228
Total, worst case		162		1635	1907		2136		248	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: H - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (8)
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	08:45		10:17 (5)	08:13	09:11 (6)	07:13	14:31 (3)	06:56	15:25 (3)	05:45	04:53
	16:05	25	14:50 (1)	16:58	10:04 (6)	17:56	17:18 (2)	19:57	17:10 (3)	20:54	21:46
2	08:45		10:17 (5)	08:11	09:11 (6)	07:11	14:30 (3)	06:53	15:26 (3)	05:42	04:52
	16:06	19	10:36 (5)	17:00	10:04 (6)	17:58	17:18 (2)	19:58	17:10 (3)	20:56	21:48
3	08:44		10:18 (5)	08:09	09:10 (6)	07:08	14:29 (3)	06:51	15:26 (3)	05:40	04:51
	16:07	18	10:36 (5)	17:02	10:05 (6)	18:00	17:17 (2)	20:00	17:08 (3)	20:58	21:49
4	08:44		10:19 (5)	08:07	09:10 (6)	07:06	14:28 (3)	06:48	15:28 (3)	05:38	04:50
	16:09	16	10:35 (5)	17:04	10:05 (6)	18:02	17:17 (2)	20:02	17:08 (3)	21:00	21:50
5	08:44		10:21 (5)	08:06	09:10 (6)	07:04	14:27 (3)	06:46	15:29 (3)	05:36	04:49
	16:10	14	10:35 (5)	17:06	10:06 (6)	18:04	17:16 (2)	20:04	17:06 (3)	21:02	21:51
6	08:43		10:22 (5)	08:04	09:09 (6)	07:01	14:27 (3)	06:43	15:30 (3)	05:34	04:48
	16:11	12	10:34 (5)	17:08	10:05 (6)	18:06	17:15 (2)	20:06	17:06 (3)	21:04	21:52
7	08:43		10:24 (5)	08:02	09:09 (6)	06:59	14:25 (3)	06:41	15:31 (3)	05:32	04:48
	16:13	9	10:33 (5)	17:10	10:06 (6)	18:08	17:14 (2)	20:08	17:04 (3)	21:05	21:53
8	08:42		10:26 (5)	08:00	09:09 (6)	06:56	14:25 (3)	06:38	15:33 (3)	05:30	04:47
	16:14	4	10:30 (5)	17:13	15:33 (3)	18:10	17:13 (2)	20:10	17:03 (3)	21:07	21:54
9	08:42			07:58	09:09 (6)	06:54	14:24 (3)	06:36	15:34 (3)	05:28	04:46
	16:16			17:15	15:39 (3)	18:12	17:10 (2)	20:12	17:02 (3)	21:09	21:55
10	08:41			07:56	09:10 (6)	06:51	14:24 (3)	06:34	15:36 (3)	05:26	04:46
	16:17			17:17	15:44 (3)	18:14	17:08 (2)	20:14	17:01 (3)	21:11	21:56
11	08:40			07:54	09:10 (6)	06:49	14:23 (3)	06:31	15:38 (3)	05:24	04:45
	16:19			17:19	15:47 (3)	18:16	16:18 (3)	20:16	16:59 (3)	21:13	21:57
12	08:39			07:52	09:10 (6)	06:46	14:23 (3)	06:29	15:40 (3)	05:22	04:45
	16:20			17:21	15:50 (3)	18:18	16:18 (3)	20:18	16:58 (3)	21:15	21:58
13	08:39			07:49	09:10 (6)	06:44	14:22 (3)	06:26	15:42 (3)	05:21	04:45
	16:22			17:23	15:52 (3)	18:20	16:18 (3)	20:20	16:57 (3)	21:16	21:58
14	08:38		09:26 (6)	07:47	09:10 (6)	06:41	14:22 (3)	06:24	15:44 (3)	05:19	04:44
	16:24	11	09:37 (6)	17:25	15:55 (3)	18:22	16:18 (3)	20:22	16:54 (3)	21:18	21:59
15	08:37		09:24 (6)	07:45	09:11 (6)	06:39	14:21 (3)	06:21	15:47 (3)	05:17	04:44
	16:25	17	09:41 (6)	17:27	15:57 (3)	18:24	16:18 (3)	20:23	16:53 (3)	21:20	22:00
16	08:36		09:22 (6)	07:43	09:11 (6)	06:36	14:21 (3)	06:19	15:50 (3)	05:15	04:44
	16:27	22	09:44 (6)	17:29	15:59 (3)	18:26	16:18 (3)	20:25	16:51 (3)	21:22	22:00
17	08:35		09:21 (6)	07:41	09:12 (6)	06:34	14:21 (3)	06:17	15:52 (3)	05:13	04:44
	16:29	25	09:46 (6)	17:31	16:01 (3)	18:28	16:18 (3)	20:27	16:49 (3)	21:23	22:01
18	08:33		09:19 (6)	07:39	09:13 (6)	06:31	14:21 (3)	06:14	15:55 (3)	05:12	04:44
	16:31	28	09:47 (6)	17:33	16:03 (3)	18:30	16:18 (3)	20:29	16:46 (3)	21:25	22:01
19	08:32		09:18 (6)	07:36	09:14 (6)	06:29	14:20 (3)	06:12	15:59 (3)	05:10	04:44
	16:32	32	09:50 (6)	17:35	17:07 (2)	18:31	16:17 (3)	20:31	16:44 (3)	21:27	22:02
20	08:31		09:17 (6)	07:34	09:14 (6)	06:26	14:20 (3)	06:09	16:02 (3)	05:09	04:44
	16:34	34	09:51 (6)	17:37	17:08 (2)	18:33	16:17 (3)	20:33	16:40 (3)	21:28	22:02
21	08:30		09:16 (6)	07:32	09:15 (6)	06:24	14:20 (3)	06:07	16:07 (3)	05:07	04:44
	16:36	37	09:53 (6)	17:40	17:11 (2)	18:35	16:17 (3)	20:35	16:37 (3)	21:30	22:02
22	08:28		09:15 (6)	07:30	09:15 (6)	06:21	14:20 (3)	06:05	16:14 (3)	05:06	04:44
	16:38	39	09:54 (6)	17:42	17:12 (2)	18:37	16:16 (3)	20:37	16:31 (3)	21:32	22:02
23	08:27		09:15 (6)	07:27	09:17 (6)	06:19	14:21 (3)	06:02		05:04	04:44
	16:40	41	09:56 (6)	17:44	17:15 (2)	18:39	16:16 (3)	20:39		21:33	22:03
24	08:26		09:14 (6)	07:25	09:19 (6)	06:16	14:20 (3)	06:00		05:03	04:45
	16:42	42	09:56 (6)	17:46	17:18 (2)	18:41	16:15 (3)	20:41		21:35	22:03
25	08:24		09:13 (6)	07:23	09:20 (6)	06:14	14:21 (3)	05:58		05:01	04:45
	16:44	44	09:57 (6)	17:48	17:18 (2)	18:43	16:15 (3)	20:43		21:36	22:03
26	08:23		09:13 (6)	07:20	09:23 (6)	06:11	14:21 (3)	05:56		05:00	04:45
	16:46	46	09:59 (6)	17:50	17:19 (2)	18:45	16:14 (3)	20:45		21:38	22:03
27	08:21		09:12 (6)	07:18	09:26 (6)	06:09	14:22 (3)	05:53		04:59	04:46
	16:48	48	10:00 (6)	17:52	17:18 (2)	18:47	16:14 (3)	20:47		21:39	22:03
28	08:20		09:12 (6)	07:16	09:33 (6)	06:06	14:22 (3)	05:51		04:57	04:46
	16:50	48	10:00 (6)	17:54	17:19 (2)	18:49	16:13 (3)	20:48		21:41	22:02
29	08:18		09:11 (6)			07:04	15:23 (3)	05:49		04:56	04:47
	16:52	50	10:01 (6)			19:51	17:13 (3)	20:50		21:42	22:02
30	08:16		09:11 (6)			07:01	15:23 (3)	05:47		04:55	04:48
	16:54	51	10:02 (6)			19:53	17:12 (3)	20:52		21:44	22:02
31	08:15		09:10 (6)			06:58	15:24 (3)			04:54	
	16:56	52	10:02 (6)			19:55	17:12 (3)			21:45	
Potential sun hours	245			271		366		422		498	516
Total, worst case	784			3068		3758		1629			

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)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: H - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (8)

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	04:48	05:30	06:27	15:37 (3)	07:22	15:02 (3)	07:22	08:39 (6)	08:19
	22:02	21:25	20:16	82 16:59 (3)	19:00	115 16:57 (3)	16:47	93 15:12 (3)	16:01
2	04:49	05:32	06:28	15:34 (3)	07:24	15:02 (3)	07:24	08:39 (6)	08:21
	22:01	21:23	20:13	85 16:59 (3)	18:57	115 16:57 (3)	16:45	85 15:08 (3)	16:00
3	04:50	05:33	06:30	15:32 (3)	07:26	15:02 (3)	07:26	08:39 (6)	08:23
	22:01	21:21	20:11	88 17:00 (3)	18:55	124 17:44 (2)	16:43	71 15:01 (3)	15:59
4	04:51	05:35	06:32	15:30 (3)	07:28	15:02 (3)	07:29	08:39 (6)	08:24
	22:00	21:19	20:08	90 17:00 (3)	18:52	130 17:47 (2)	16:41	56 09:35 (6)	15:58
5	04:52	05:37	06:34	15:28 (3)	07:30	15:02 (3)	07:31	08:40 (6)	08:26
	22:00	21:17	20:06	93 17:01 (3)	18:50	134 17:49 (2)	16:39	56 09:36 (6)	15:58
6	04:53	05:39	06:36	15:26 (3)	07:31	15:02 (3)	07:33	08:40 (6)	08:27
	21:59	21:15	20:03	95 17:01 (3)	18:47	136 17:50 (2)	16:37	56 09:36 (6)	15:57
7	04:54	05:41	06:38	15:24 (3)	07:33	15:02 (3)	07:35	08:40 (6)	08:28
	21:58	21:13	20:01	98 17:02 (3)	18:45	137 17:51 (2)	16:35	55 09:35 (6)	15:57
8	04:55	05:42	06:39	15:22 (3)	07:35	15:03 (3)	07:37	08:40 (6)	08:30
	21:58	21:11	19:58	100 17:02 (3)	18:42	138 17:52 (2)	16:33	55 09:35 (6)	15:56
9	04:56	05:44	06:41	15:21 (3)	07:37	15:03 (3)	07:39	08:40 (6)	08:31
	21:57	21:09	19:56	102 17:03 (3)	18:40	138 17:52 (2)	16:31	54 09:34 (6)	15:56
10	04:57	05:46	06:43	15:19 (3)	07:39	15:02 (3)	07:41	08:42 (6)	08:32
	21:56	21:07	19:53	104 17:03 (3)	18:37	138 17:51 (2)	16:29	53 09:35 (6)	15:55
11	04:58	05:48	06:45	15:17 (3)	07:41	15:03 (3)	07:43	08:42 (6)	08:33
	21:55	21:05	19:51	105 17:02 (3)	18:35	137 17:51 (2)	16:28	52 09:34 (6)	15:55
12	04:59	05:50	06:47	15:16 (3)	07:43	15:04 (3)	07:45	08:43 (6)	08:35
	21:54	21:02	19:48	107 17:03 (3)	18:33	136 17:52 (2)	16:26	51 09:34 (6)	15:55
13	05:01	05:52	06:49	15:15 (3)	07:45	15:05 (3)	07:47	08:43 (6)	08:36
	21:53	21:00	19:46	108 17:03 (3)	18:30	135 17:52 (2)	16:24	50 09:33 (6)	15:55
14	05:02	05:53	06:50	15:13 (3)	07:47	10:02 (6)	07:49	08:44 (6)	08:37
	21:52	20:58	19:43	110 17:03 (3)	18:28	146 17:52 (2)	16:23	48 09:32 (6)	15:55
15	05:03	05:55	06:52	15:11 (3)	07:49	09:57 (6)	07:50	08:45 (6)	08:38
	21:51	20:56	19:41	111 17:02 (3)	18:25	153 17:51 (2)	16:21	48 09:33 (6)	15:55
16	05:05	05:57	06:54	15:10 (3)	07:51	09:54 (6)	07:52	08:46 (6)	08:39
	21:49	20:54	19:38	113 17:03 (3)	18:23	157 17:51 (2)	16:19	46 09:32 (6)	15:55
17	05:06	05:59	06:56	15:10 (3)	07:53	09:52 (6)	07:54	08:47 (6)	08:39
	21:48	20:51	19:35	113 17:03 (3)	18:21	157 17:50 (2)	16:18	44 09:31 (6)	15:55
18	05:07	06:01	06:58	15:09 (3)	07:55	09:50 (6)	07:56	08:48 (6)	08:40
	21:47	20:49	19:33	114 17:03 (3)	18:18	157 17:48 (2)	16:16	42 09:30 (6)	15:55
19	05:09	06:03	07:00	15:08 (3)	07:56	09:48 (6)	07:58	08:49 (6)	08:41
	21:46	20:47	19:30	115 17:03 (3)	18:16	153 17:45 (2)	16:15	41 09:30 (6)	15:55
20	05:10	06:04	07:02	15:07 (3)	07:58	09:46 (6)	08:00	08:50 (6)	08:42
	21:44	20:44	19:28	116 17:03 (3)	18:14	151 17:43 (2)	16:13	39 09:29 (6)	15:56
21	05:12	06:06	07:03	15:06 (3)	08:00	09:45 (6)	08:02	08:51 (6)	08:42
	21:43	20:42	20 16:17 (3)	19:25	116 17:02 (3)	18:11	146 17:40 (2)	16:12	37 09:28 (6)
22	05:13	06:08	16:11 (3)	07:05	15:05 (3)	08:02	09:44 (6)	08:04	08:53 (6)
	21:41	20:40	31 16:42 (3)	19:23	117 17:02 (3)	18:09	141 17:38 (2)	16:11	34 09:27 (6)
23	05:15	06:10	16:06 (3)	07:07	15:05 (3)	08:04	09:43 (6)	08:06	08:54 (6)
	21:40	20:37	39 16:45 (3)	19:20	116 17:01 (3)	18:07	135 17:35 (2)	16:09	32 09:26 (6)
24	05:17	06:12	16:02 (3)	07:09	15:04 (3)	08:06	09:42 (6)	08:07	08:56 (6)
	21:38	20:35	46 16:48 (3)	19:18	117 17:01 (3)	18:04	127 16:32 (3)	16:08	29 09:25 (6)
25	05:18	06:14	15:57 (3)	07:11	15:04 (3)	07:08	08:42 (6)	08:09	08:58 (6)
	21:37	20:33	53 16:50 (3)	19:15	117 17:01 (3)	17:02	125 15:31 (3)	16:07	25 09:23 (6)
26	05:20	06:15	15:54 (3)	07:13	15:03 (3)	07:10	08:41 (6)	08:11	09:00 (6)
	21:35	20:30	58 16:52 (3)	19:12	118 17:01 (3)	17:00	122 15:29 (3)	16:06	22 09:22 (6)
27	05:21	06:17	15:51 (3)	07:14	15:02 (3)	07:12	08:40 (6)	08:13	09:03 (6)
	21:33	20:28	62 16:53 (3)	19:10	117 16:59 (3)	16:58	119 15:26 (3)	16:04	17 09:20 (6)
28	05:23	06:19	15:48 (3)	07:16	15:02 (3)	07:14	08:40 (6)	08:15	09:06 (6)
	21:32	20:25	67 16:55 (3)	19:07	117 16:59 (3)	16:56	115 15:24 (3)	16:03	12 09:18 (6)
29	05:25	06:21	15:45 (3)	07:18	15:02 (3)	07:16	08:39 (6)	08:16	
	21:30	20:23	70 16:55 (3)	19:05	116 16:58 (3)	16:53	111 15:21 (3)	16:02	
30	05:27	06:23	15:42 (3)	07:20	15:02 (3)	07:18	08:39 (6)	08:18	
	21:28	20:21	75 16:57 (3)	19:02	116 16:58 (3)	16:51	106 15:18 (3)	16:02	
31	05:28	06:25	15:40 (3)			07:20	08:39 (6)		
	21:26	20:18	78 16:58 (3)			16:49	101 15:16 (3)		
Potential sun hours	518	463		383		327		255	
Total, worst case		599		3216		4135		1303	794

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: I - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (9)
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	08:45		13:34 (5)	08:13		15:43 (4)	07:13			06:56		17:21 (6)	05:45		04:53			
	16:05	46	14:20 (5)	16:58	24	16:07 (4)	17:56			19:56	75	18:36 (6)	20:54		21:46			
2	08:45		13:35 (5)	08:11		15:44 (4)	07:11			06:53		17:21 (6)	05:42		04:52			
	16:06	45	14:20 (5)	17:00	23	16:07 (4)	17:58			19:58	76	18:37 (6)	20:56		21:48			
3	08:44		13:36 (5)	08:09		15:45 (4)	07:08			06:51		17:21 (6)	05:40		04:51			
	16:07	45	14:21 (5)	17:02	22	16:07 (4)	18:00			20:00	75	18:36 (6)	20:58		21:49			
4	08:44		13:36 (5)	08:07		15:47 (4)	07:06			06:48		17:21 (6)	05:38		04:50			
	16:09	45	14:21 (5)	17:04	21	16:33 (1)	18:02			20:02	75	18:36 (6)	21:00		21:50			
5	08:44		13:37 (5)	08:05		15:47 (4)	07:04			06:46		17:20 (6)	05:36		04:49			
	16:10	45	14:22 (5)	17:06	21	16:34 (1)	18:04			20:04	75	18:35 (6)	21:02		21:51			
6	08:43		13:38 (5)	08:04		15:49 (4)	07:01			06:43		17:21 (6)	05:34		04:48			
	16:11	44	14:22 (5)	17:08	20	16:36 (1)	18:06			20:06	74	18:35 (6)	21:03		21:52			
7	08:43		13:38 (5)	08:02		15:52 (4)	06:59			06:41		17:20 (6)	05:32		04:48			
	16:13	44	14:22 (5)	17:10	18	16:39 (1)	18:08			20:08	81	19:38 (3)	21:05		21:53			
8	08:42		13:38 (5)	08:00		16:29 (1)	06:56			06:38		17:21 (6)	05:30		04:47			
	16:14	44	14:22 (5)	17:12	12	16:41 (1)	18:10			20:10	88	19:42 (3)	21:07		21:54			
9	08:42		13:39 (5)	07:58		16:29 (1)	06:54			06:36		17:20 (6)	05:28		04:46			
	16:16	43	14:22 (5)	17:15	15	16:44 (1)	18:12			20:12	93	19:44 (3)	21:09		21:55			
10	08:41		13:40 (5)	07:56		16:29 (1)	06:51			06:33		17:21 (6)	05:26		04:46			
	16:17	43	14:23 (5)	17:17	17	16:46 (1)	18:14			20:14	96	19:46 (3)	21:11		21:56			
11	08:40		13:41 (5)	07:54		16:30 (1)	06:49		16:57 (6)	06:31		17:21 (6)	05:24		04:45			
	16:19	42	14:23 (5)	17:19	16	16:46 (1)	18:16	16	17:13 (6)	20:16	97	19:46 (3)	21:13		21:57			
12	08:39		13:42 (5)	07:52		16:30 (1)	06:46		16:52 (6)	06:29		17:22 (6)	05:22		04:45			
	16:20	42	14:24 (5)	17:21	15	16:45 (1)	18:18	26	17:18 (6)	20:18	97	19:47 (3)	21:15		21:58			
13	08:38		13:41 (5)	07:49		16:31 (1)	06:44		16:47 (6)	06:26		17:22 (6)	05:20		04:45			
	16:22	42	14:23 (5)	17:23	13	16:44 (1)	18:20	34	17:21 (6)	20:20	99	19:48 (3)	21:16		21:58			
14	08:38		13:42 (5)	07:47		16:33 (1)	06:41		16:45 (6)	06:24		17:22 (6)	05:19		04:44			
	16:24	41	14:23 (5)	17:25	9	16:42 (1)	18:22	39	17:24 (6)	20:21	98	19:48 (3)	21:18		21:59			
15	08:37		13:43 (5)	07:45			06:39		16:41 (6)	06:21		17:23 (6)	05:17		04:44			
	16:25	42	15:48 (4)	17:27			18:24	45	17:26 (6)	20:23	98	19:48 (3)	21:20		22:00			
16	08:36		13:45 (5)	07:43			06:36		16:40 (6)	06:19		17:25 (6)	05:15		04:44			
	16:27	44	15:51 (4)	17:29			18:26	48	17:28 (6)	20:25	96	19:49 (3)	21:22		22:00			
17	08:34		13:46 (5)	07:41			06:34		16:37 (6)	06:16		17:25 (6)	05:13		04:44			
	16:29	46	15:53 (4)	17:31			18:28	52	17:29 (6)	20:27	94	19:48 (3)	21:23		22:01			
18	08:33		13:46 (5)	07:39			06:31		16:35 (6)	06:14		17:26 (6)	05:12		04:44			
	16:31	47	15:54 (4)	17:33			18:29	55	17:30 (6)	20:29	93	19:48 (3)	21:25		22:01			
19	08:32		13:48 (5)	07:36			06:29		16:34 (6)	06:12		17:27 (6)	05:10		04:44			
	16:32	48	15:57 (4)	17:35			18:31	58	17:32 (6)	20:31	91	19:48 (3)	21:27		22:02			
20	08:31		13:48 (5)	07:34			06:26		16:32 (6)	06:09		17:28 (6)	05:09		04:44			
	16:34	49	15:58 (4)	17:37			18:33	62	18:06 (2)	20:33	88	19:47 (3)	21:28		22:02			
21	08:30		13:50 (5)	07:32			06:24		16:31 (6)	06:07		17:29 (6)	05:07		04:44			
	16:36	50	16:01 (4)	17:39			18:35	68	18:08 (2)	20:35	85	19:47 (3)	21:30		22:02			
22	08:28		13:51 (5)	07:30			06:21		16:29 (6)	06:05		17:31 (6)	05:05		04:44			
	16:38	51	16:03 (4)	17:42			18:37	74	18:10 (2)	20:37	80	19:46 (3)	21:32		22:02			
23	08:27		13:53 (5)	07:27			06:19		16:28 (6)	06:02		17:33 (6)	05:04		04:44			
	16:40	50	16:05 (4)	17:44			18:39	78	18:12 (2)	20:39	76	19:46 (3)	21:33		22:03			
24	08:26		13:55 (5)	07:25			06:16		16:27 (6)	06:00		17:35 (6)	05:03		04:45			
	16:42	48	16:06 (4)	17:46			18:41	82	18:14 (2)	20:41	70	19:45 (3)	21:35		22:03			
25	08:24		13:57 (5)	07:23			06:14		16:26 (6)	05:58		17:36 (6)	05:01		04:45			
	16:44	44	16:06 (4)	17:48			18:43	86	18:16 (2)	20:43	64	19:43 (3)	21:36		22:03			
26	08:23		14:01 (5)	07:20			06:11		16:25 (6)	05:56		17:39 (6)	05:00		04:45			
	16:46	38	16:07 (4)	17:50			18:45	89	18:17 (2)	20:45	57	19:42 (3)	21:38		22:03			
27	08:21		15:41 (4)	07:18			06:09		16:25 (6)	05:53		17:42 (6)	04:59		04:46			
	16:48	26	16:07 (4)	17:52			18:47	89	18:17 (2)	20:46	49	19:41 (3)	21:39		22:03			
28	08:19		15:41 (4)	07:16			06:06		16:23 (6)	05:51		17:45 (6)	04:57		04:46			
	16:50	26	16:07 (4)	17:54			18:49	88	18:15 (2)	20:48	39	19:39 (3)	21:41		22:02			
29	08:18		15:42 (4)				07:03		17:23 (6)	05:49		17:52 (6)	04:56		04:47			
	16:52	25	16:07 (4)				19:51	87	19:14 (2)	20:50	21	19:36 (3)	21:42		22:02			
30	08:16		15:42 (4)				07:01		17:22 (6)	05:47		19:27 (3)	04:55		04:48			
	16:54	25	16:07 (4)				19:53	85	19:12 (2)	20:52	5	19:32 (3)	21:44		22:02			
31	08:14		15:42 (4)				06:58		17:22 (6)				04:54					
	16:56	25	16:07 (4)				19:55	75	18:37 (6)				21:45					
Potential sun hours	245			271			366			422			498		516			
Total, worst case	1295			246			1336			2305								

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: I - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (9)

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	04:48	05:30	06:27	17:21 (6)	07:22	17:29 (6)	07:22	15:59 (1)	08:19	13:23 (5)						
2	22:02	21:24	20:16	97	19:46 (3)	19:00	30	17:59 (6)	16:47	16	16:15 (1)	16:01	42	14:05 (5)		
2	04:49	05:32	06:28		17:19 (6)	07:24		17:33 (6)	07:24		15:59 (1)	08:21		13:22 (5)		
3	22:01	21:23	20:13	95	19:43 (3)	18:57	21	17:54 (6)	16:45	14	16:13 (1)	16:00	43	14:05 (5)		
3	04:50	05:33	06:30		17:18 (6)	07:26			07:26		15:59 (1)	08:23		13:23 (5)		
4	22:01	21:21	20:11	93	19:42 (3)	18:55			16:43	11	16:10 (1)	15:59	43	14:06 (5)		
4	04:51	05:35	06:32		17:18 (6)	07:28			07:28		15:21 (4)	08:24		13:23 (5)		
5	22:00	21:19	20:08	88	19:39 (3)	18:52			16:41	18	16:08 (1)	15:58	44	14:07 (5)		
5	04:52	05:37	06:34		17:17 (6)	07:29			07:30		15:19 (4)	08:26		13:23 (5)		
6	22:00	21:17	20:06	82	19:35 (3)	18:50			16:39	21	16:07 (1)	15:58	44	14:07 (5)		
6	04:53	05:39	06:36		17:16 (6)	07:31			07:32		15:18 (4)	08:27		13:24 (5)		
7	21:59	21:15	20:03	75	18:31 (6)	18:47			16:37	21	16:04 (1)	15:57	44	14:08 (5)		
7	04:54	05:41	06:38		17:15 (6)	07:33			07:34		15:16 (4)	08:28		13:24 (5)		
8	21:58	21:13	20:01	76	18:31 (6)	18:45			16:35	21	16:02 (1)	15:57	44	14:08 (5)		
8	04:55	05:42	06:39		17:15 (6)	07:35			07:36		15:15 (4)	08:30		13:24 (5)		
9	21:57	21:11	19:58	75	18:30 (6)	18:42			16:33	22	15:37 (4)	15:56	45	14:09 (5)		
9	04:56	05:44	06:41		17:15 (6)	07:37			07:39		15:14 (4)	08:31		13:24 (5)		
10	21:57	21:09	19:56	75	18:30 (6)	18:40			16:31	23	15:37 (4)	15:56	45	14:09 (5)		
10	04:57	05:46	06:43		17:14 (6)	07:39			07:41		15:15 (4)	08:32		13:24 (5)		
11	21:56	21:07	19:53	75	18:29 (6)	18:37			16:29	24	15:39 (4)	15:55	45	14:09 (5)		
11	04:58	05:48	06:45		17:13 (6)	07:41			07:42		15:14 (4)	08:33		13:26 (5)		
12	21:55	21:04	19:51	76	18:29 (6)	18:35			16:28	25	15:39 (4)	15:55	45	14:11 (5)		
12	04:59	05:50	06:47		17:13 (6)	07:43			07:44		15:14 (4)	08:35		13:26 (5)		
13	21:54	21:02	19:48	75	18:28 (6)	18:33			16:26	25	15:39 (4)	15:55	45	14:11 (5)		
13	05:01	05:51	19:34 (3)	06:49	17:13 (6)	07:45			07:46		15:13 (4)	08:36		13:26 (5)		
14	21:53	21:00	8	19:42 (3)	19:46	84	19:03 (2)	18:30	16:24	26	15:39 (4)	15:55	45	14:11 (5)		
14	05:02	05:53	17:57 (6)	06:50	17:14 (6)	07:47			07:48		15:13 (4)	08:37		13:26 (5)		
15	21:52	20:58	27	19:45 (3)	19:43	86	19:05 (2)	18:28	16:22	26	15:39 (4)	15:55	46	14:12 (5)		
15	05:03	05:55	17:52 (6)	06:52	17:13 (6)	07:49			07:50		15:13 (4)	08:38		13:27 (5)		
16	21:51	20:56	41	19:47 (3)	19:40	89	19:05 (2)	18:25	16:21	26	15:39 (4)	15:55	45	14:12 (5)		
16	05:05	05:57	17:49 (6)	06:54	17:13 (6)	07:51			07:52		13:34 (5)	08:39		13:27 (5)		
17	21:49	20:53	51	19:48 (3)	19:38	89	19:05 (2)	18:23	16:19	38	15:40 (4)	15:55	46	14:13 (5)		
17	05:06	05:59	17:45 (6)	06:56	17:13 (6)	07:53			07:54		13:31 (5)	08:39		13:28 (5)		
18	21:48	20:51	59	19:49 (3)	19:35	90	19:06 (2)	18:21	16:18	44	15:40 (4)	15:55	45	14:13 (5)		
18	05:07	06:01	17:42 (6)	06:58	17:14 (6)	07:54			07:56		13:29 (5)	08:40		13:29 (5)		
19	21:47	20:49	66	19:50 (3)	19:33	87	19:04 (2)	18:18	16:16	48	15:40 (4)	15:55	45	14:14 (5)		
19	05:09	06:02	17:40 (6)	07:00	17:14 (6)	07:56			07:58		13:27 (5)	08:41		13:28 (5)		
20	21:46	20:47	72	19:51 (3)	19:30	84	19:02 (2)	18:16	16:15	50	15:39 (4)	15:55	46	14:14 (5)		
20	05:10	06:04	17:38 (6)	07:01	17:14 (6)	07:58			08:00		13:26 (5)	08:42		13:29 (5)		
21	21:44	20:44	77	19:51 (3)	19:28	80	18:59 (2)	18:13	16:13	51	15:38 (4)	15:56	46	14:15 (5)		
21	05:12	06:06	17:36 (6)	07:03	17:14 (6)	08:00			08:02		13:25 (5)	08:42		13:29 (5)		
22	21:43	20:42	80	19:51 (3)	19:25	75	18:56 (2)	18:11	16:12	50	15:36 (4)	15:56	46	14:15 (5)		
22	05:13	06:08	17:34 (6)	07:05	17:15 (6)	08:02			08:04		13:24 (5)	08:43		13:30 (5)		
23	21:41	20:40	84	19:51 (3)	19:23	71	18:54 (2)	18:09	16:10	49	15:34 (4)	15:57	46	14:16 (5)		
23	05:15	06:10	17:32 (6)	07:07	17:16 (6)	08:04			08:06		13:24 (5)	08:43		13:30 (5)		
24	21:40	20:37	89	19:52 (3)	19:20	63	18:51 (2)	18:07	16:09	48	15:33 (4)	15:57	46	14:16 (5)		
24	05:16	06:12	17:31 (6)	07:09	17:17 (6)	08:06			08:07		13:23 (5)	08:44		13:31 (5)		
25	21:38	20:35	91	19:52 (3)	19:18	59	18:16 (6)	18:04	16:08	48	15:32 (4)	15:58	46	14:17 (5)		
25	05:18	06:14	17:29 (6)	07:11	17:18 (6)	07:08			08:09		13:23 (5)	08:44		13:32 (5)		
26	21:37	20:33	93	19:51 (3)	19:15	56	18:14 (6)	17:02	16:07	46	15:30 (4)	15:58	45	14:17 (5)		
26	05:20	06:15	17:27 (6)	07:13	17:19 (6)	07:10			08:11		13:23 (5)	08:44		13:32 (5)		
27	21:35	20:30	95	19:51 (3)	19:12	54	18:13 (6)	17:00	16:06	44	15:29 (4)	15:59	45	14:17 (5)		
27	05:21	06:17	17:26 (6)	07:14	17:20 (6)	07:12		16:06 (1)	08:13		13:22 (5)	08:45		13:32 (5)		
28	21:33	20:28	97	19:51 (3)	19:10	50	18:10 (6)	16:58	4	16:10 (1)	16:04	43	15:28 (4)	16:00	46	14:18 (5)
28	05:23	06:19	17:25 (6)	07:16	17:22 (6)	07:14		16:02 (1)	08:14		13:22 (5)	08:45		13:33 (5)		
29	21:32	20:25	98	19:50 (3)	19:07	45	18:07 (6)	16:55	10	16:12 (1)	16:03	41	14:03 (5)	16:01	45	14:18 (5)
29	05:25	06:21	17:23 (6)	07:18	17:24 (6)	07:16		16:01 (1)	08:16		13:23 (5)	08:45		13:33 (5)		
30	21:30	20:23	98	19:49 (3)	19:05	41	18:05 (6)	16:53	13	16:14 (1)	16:02	41	14:04 (5)	16:02	46	14:19 (5)
30	05:26	06:23	17:22 (6)	07:20	17:26 (6)	07:18		15:59 (1)	08:18		13:23 (5)	08:45		13:34 (5)		
31	21:28	20:21	99	19:48 (3)	19:02	36	18:02 (6)	16:51	15	16:14 (1)	16:01	42	14:05 (5)	16:02	45	14:19 (5)
31	05:28	06:25	17:21 (6)		07:20			16:00 (1)				08:45		13:35 (5)		
	21:26	20:18	98	19:47 (3)				16:49	16	16:16 (1)		16:04	45	14:20 (5)		
Potential sun hours	518	463		383		327			255			228				
Total, worst case			1423		2221		109		1002			1394				

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: J - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (10)
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	08:45		10:27 (6)	08:13		10:33 (6)	07:13		17:13 (2)	06:56		17:23 (3)	05:45		04:53			
	16:05	84	15:25 (1)	16:58	77	11:50 (6)	17:56	15	17:28 (2)	19:57	63	18:26 (3)	20:54		21:46			
2	08:45		10:28 (6)	08:11		10:33 (6)	07:11		17:12 (2)	06:53		17:24 (3)	05:42		04:52			
	16:06	85	15:27 (1)	17:00	77	11:50 (6)	17:58	18	17:30 (2)	19:58	61	18:25 (3)	20:56		21:48			
3	08:44		10:29 (6)	08:09		10:33 (6)	07:08		16:52 (3)	06:51		17:25 (3)	05:40		04:51			
	16:07	87	15:29 (1)	17:02	77	11:50 (6)	18:00	40	17:32 (2)	20:00	58	18:23 (3)	20:58		21:49			
4	08:44		10:28 (6)	08:07		10:34 (6)	07:06		16:48 (3)	06:48		17:26 (3)	05:38		04:50			
	16:09	88	15:29 (1)	17:04	76	11:50 (6)	18:02	46	17:34 (2)	20:02	57	18:23 (3)	21:00		21:50			
5	08:44		10:29 (6)	08:05		10:34 (6)	07:04		16:44 (3)	06:46		17:26 (3)	05:36		04:49			
	16:10	88	15:30 (1)	17:06	76	11:50 (6)	18:04	51	17:35 (2)	20:04	55	18:21 (3)	21:02		21:51			
6	08:43		10:29 (6)	08:04		10:34 (6)	07:01		16:42 (3)	06:43		17:28 (3)	05:34		04:48			
	16:11	88	15:30 (1)	17:08	75	11:49 (6)	18:06	54	17:36 (2)	20:06	52	18:20 (3)	21:04		21:52			
7	08:43		10:29 (6)	08:02		10:34 (6)	06:59		16:39 (3)	06:41		17:28 (3)	05:32		04:48			
	16:13	89	15:30 (1)	17:10	74	11:48 (6)	18:08	56	17:35 (2)	20:08	50	18:18 (3)	21:05		21:53			
8	08:42		10:29 (6)	08:00		10:35 (6)	06:56		16:38 (3)	06:38		17:30 (3)	05:30		04:47			
	16:14	89	15:30 (1)	17:13	73	11:48 (6)	18:10	57	17:35 (2)	20:10	47	18:17 (3)	21:07		21:54			
9	08:42		10:30 (6)	07:58		10:36 (6)	06:54		16:35 (3)	06:36		17:31 (3)	05:28		04:46			
	16:16	89	15:31 (1)	17:15	72	11:48 (6)	18:12	59	17:34 (2)	20:12	44	18:15 (3)	21:09		21:55			
10	08:41		10:30 (6)	07:56		10:36 (6)	06:51		16:34 (3)	06:34		17:33 (3)	05:26		04:46			
	16:17	89	15:31 (1)	17:17	71	11:47 (6)	18:14	59	17:33 (2)	20:14	40	18:13 (3)	21:11		21:56			
11	08:40		10:30 (6)	07:54		10:37 (6)	06:49		16:32 (3)	06:31		17:35 (3)	05:24		04:45			
	16:19	89	15:31 (1)	17:19	70	11:47 (6)	18:16	60	17:32 (2)	20:16	35	18:10 (3)	21:13		21:57			
12	08:39		10:30 (6)	07:52		10:37 (6)	06:46		16:31 (3)	06:29		17:38 (3)	05:22		04:45			
	16:20	89	15:31 (1)	17:21	68	11:45 (6)	18:18	60	17:31 (2)	20:18	30	18:08 (3)	21:15		21:58			
13	08:39		10:30 (6)	07:49		10:38 (6)	06:44		16:30 (3)	06:26		17:41 (3)	05:21		04:45			
	16:22	89	15:31 (1)	17:23	66	11:44 (6)	18:20	59	17:29 (3)	20:20	24	18:05 (3)	21:16		21:58			
14	08:38		10:29 (6)	07:47		10:39 (6)	06:41		16:29 (3)	06:24		17:45 (3)	05:19		04:44			
	16:24	89	15:30 (1)	17:25	65	11:44 (6)	18:22	61	17:30 (3)	20:22	14	17:59 (3)	21:18		21:59			
15	08:37		10:30 (6)	07:45		10:41 (6)	06:39		16:28 (3)	06:21			05:17		04:44			
	16:25	86	15:30 (1)	17:27	62	11:43 (6)	18:24	62	17:30 (3)	20:23			21:20		22:00			
16	08:36		10:30 (6)	07:43		10:41 (6)	06:36		16:27 (3)	06:19			05:15		04:44			
	16:27	84	15:29 (1)	17:29	60	11:41 (6)	18:26	64	17:31 (3)	20:25			21:22		22:00			
17	08:35		10:30 (6)	07:41		10:43 (6)	06:34		16:26 (3)	06:17			05:13		04:44			
	16:29	82	15:28 (1)	17:31	56	11:39 (6)	18:28	65	17:31 (3)	20:27			21:23		22:01			
18	08:33		10:30 (6)	07:39		10:44 (6)	06:31		16:26 (3)	06:14			05:12		04:44			
	16:31	75	11:45 (6)	17:33	54	11:38 (6)	18:29	65	17:31 (3)	20:29			21:25		22:01			
19	08:32		10:30 (6)	07:36		10:45 (6)	06:29		16:25 (3)	06:12			05:10		04:44			
	16:32	76	11:46 (6)	17:35	50	11:35 (6)	18:31	66	17:31 (3)	20:31			21:27		22:02			
20	08:31		10:30 (6)	07:34		10:48 (6)	06:26		16:24 (3)	06:09			05:09		04:44			
	16:34	76	11:46 (6)	17:37	45	11:33 (6)	18:33	67	17:31 (3)	20:33			21:28		22:02			
21	08:30		10:30 (6)	07:32		10:50 (6)	06:24		16:24 (3)	06:07			05:07		04:44			
	16:36	77	11:47 (6)	17:40	41	11:31 (6)	18:35	67	17:31 (3)	20:35			21:30		22:02			
22	08:28		10:30 (6)	07:30		10:52 (6)	06:21		16:23 (3)	06:05			05:05		04:44			
	16:38	77	11:47 (6)	17:42	35	11:27 (6)	18:37	68	17:31 (3)	20:37			21:32		22:02			
23	08:27		10:31 (6)	07:27		10:56 (6)	06:19		16:23 (3)	06:02			05:04		04:44			
	16:40	77	11:48 (6)	17:44	27	11:23 (6)	18:39	68	17:31 (3)	20:39			21:33		22:03			
24	08:26		10:31 (6)	07:25		11:03 (6)	06:16		16:22 (3)	06:00			05:03		04:45			
	16:42	77	11:48 (6)	17:46	14	11:17 (6)	18:41	68	17:30 (3)	20:41			21:35		22:03			
25	08:24		10:30 (6)	07:23			06:14		16:23 (3)	05:58			05:01		04:45			
	16:44	78	11:48 (6)	17:48			18:43	67	17:30 (3)	20:43			21:36		22:03			
26	08:23		10:31 (6)	07:20		17:21 (2)	06:11		16:22 (3)	05:56			05:00		04:45			
	16:46	78	11:49 (6)	17:50	1	17:22 (2)	18:45	67	17:29 (3)	20:45			21:38		22:03			
27	08:21		10:31 (6)	07:18		17:17 (2)	06:09		16:23 (3)	05:53			04:59		04:46			
	16:48	78	11:49 (6)	17:52	6	17:23 (2)	18:47	67	17:30 (3)	20:46			21:39		22:03			
28	08:20		10:31 (6)	07:16		17:15 (2)	06:06		16:22 (3)	05:51			04:57		04:46			
	16:50	78	11:49 (6)	17:54	11	17:26 (2)	18:49	66	17:28 (3)	20:48			21:41		22:02			
29	08:18		10:31 (6)				07:04		17:23 (3)	05:49			04:56		04:47			
	16:52	78	11:49 (6)				19:51	65	18:28 (3)	20:50			21:42		22:02			
30	08:16		10:31 (6)				07:01		17:23 (3)	05:47			04:55		04:48			
	16:54	78	11:49 (6)				19:53	64	18:27 (3)	20:52			21:44		22:02			
31	08:15		10:32 (6)				06:58		17:23 (3)				04:54					
	16:56	77	11:49 (6)				19:55	64	18:27 (3)				21:45					
Potential sun hours	245			271			366	1815		422	630		498		516			
Total, worst case		2564		1479														

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: J - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (10)
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	04:48 22:02	05:30 21:25	06:27 20:16	17:35 (3) 18:10 (3)	07:22 18:09 (2)	17:10 (3) 16:47	10:06 (6) 11:17 (6)	08:19 16:01	10:12 (6) 15:13 (1)
2	04:49 22:01	05:32 21:23	06:28 20:13	17:31 (3) 18:11 (3)	07:24 18:10 (2)	17:11 (3) 16:45	10:05 (6) 11:17 (6)	08:21 16:00	10:12 (6) 15:13 (1)
3	04:50 22:01	05:33 21:21	06:30 20:11	17:29 (3) 18:13 (3)	07:26 18:11 (2)	17:12 (3) 16:43	10:05 (6) 11:18 (6)	08:23 15:59	10:13 (6) 15:14 (1)
4	04:51 22:00	05:35 21:19	06:32 20:08	17:27 (3) 18:14 (3)	07:28 18:15 (3)	17:13 (3) 18:52	10:04 (6) 11:19 (6)	08:24 15:58	10:14 (6) 15:15 (1)
5	04:52 22:00	05:37 21:17	06:34 20:06	17:25 (3) 18:15 (3)	07:29 18:12 (2)	17:14 (3) 16:39	10:04 (6) 11:19 (6)	08:26 15:58	10:14 (6) 15:15 (1)
6	04:53 21:59	05:39 21:15	06:36 20:03	17:23 (3) 18:15 (3)	07:31 18:12 (2)	17:15 (3) 16:37	10:04 (6) 11:20 (6)	08:27 15:57	10:15 (6) 15:16 (1)
7	04:54 21:58	05:41 21:13	06:38 20:01	17:21 (3) 18:16 (3)	07:33 18:12 (2)	17:17 (3) 16:35	10:04 (6) 11:20 (6)	08:28 15:57	10:15 (6) 15:16 (1)
8	04:55 21:58	05:42 21:11	06:39 19:58	17:20 (3) 18:17 (3)	07:35 18:12 (2)	17:19 (3) 16:33	10:03 (6) 11:20 (6)	08:30 15:56	10:16 (6) 15:17 (1)
9	04:56 21:57	05:44 21:09	06:41 19:56	17:19 (3) 18:18 (3)	07:37 18:10 (2)	17:20 (3) 16:31	10:03 (6) 11:20 (6)	08:31 15:56	10:17 (6) 15:17 (1)
10	04:57 21:56	05:46 21:07	06:43 19:53	17:18 (3) 18:18 (3)	07:39 18:07 (2)	17:24 (3) 16:29	10:04 (6) 11:21 (6)	08:32 15:55	10:17 (6) 15:16 (1)
11	04:58 21:55	05:48 21:04	06:45 19:51	17:16 (3) 18:18 (3)	07:41 18:05 (2)	17:29 (3) 16:28	10:03 (6) 11:21 (6)	08:33 15:55	10:18 (6) 15:16 (1)
12	04:59 21:54	05:50 21:02	06:47 19:48	17:15 (3) 18:18 (3)	07:43 18:02 (2)	17:46 (2) 16:26	10:03 (6) 11:21 (6)	08:35 15:55	10:19 (6) 15:16 (1)
13	05:01 21:53	05:51 21:00	06:49 19:46	17:14 (3) 18:18 (3)	07:45 18:01 (2)	17:48 (2) 16:24	10:03 (6) 11:21 (6)	08:36 15:55	10:19 (6) 15:16 (1)
14	05:02 21:52	05:53 20:58	06:50 19:43	17:13 (3) 18:19 (3)	07:47 17:58 (2)	17:49 (2) 16:22	10:03 (6) 11:21 (6)	08:37 15:55	10:20 (6) 15:15 (1)
15	05:03 21:51	05:55 20:56	06:52 19:40	17:12 (3) 18:18 (3)	07:49 18:18 (3)	17:51 (2) 16:21	10:04 (6) 11:22 (6)	08:38 15:55	10:21 (6) 15:15 (1)
16	05:05 21:49	05:57 20:54	06:54 19:38	17:11 (3) 18:18 (3)	07:51 18:23	17:52 16:19	10:04 (6) 11:22 (6)	08:39 15:55	10:21 (6) 15:15 (1)
17	05:06 21:48	05:59 20:51	06:56 19:35	17:11 (3) 18:18 (3)	07:53 18:21	17:54 16:18	10:04 (6) 11:22 (6)	08:39 15:55	10:22 (6) 15:16 (1)
18	05:07 21:47	06:01 20:49	06:58 19:33	17:10 (3) 18:18 (3)	07:55 18:18	11:31 (6) 16:16	10:05 (6) 11:22 (6)	08:40 15:55	10:23 (6) 15:16 (1)
19	05:09 21:46	06:03 20:47	07:00 19:30	17:10 (3) 18:18 (3)	07:56 18:16	11:26 (6) 16:15	10:05 (6) 11:22 (6)	08:41 15:55	10:23 (6) 15:15 (1)
20	05:10 21:44	06:04 20:44	07:01 19:28	17:09 (3) 18:16 (3)	07:58 18:13	11:23 (6) 16:13	10:05 (6) 11:22 (6)	08:42 15:56	10:24 (6) 15:16 (1)
21	05:12 21:43	06:06 20:42	07:03 19:25	17:08 (3) 18:16 (3)	08:00 18:11	11:20 (6) 16:12	10:06 (6) 11:22 (6)	08:42 15:56	10:24 (6) 15:16 (1)
22	05:13 21:41	06:08 20:40	07:05 19:23	17:08 (3) 18:16 (3)	08:02 18:09	11:17 (6) 16:10	10:06 (6) 11:22 (6)	08:43 15:57	10:24 (6) 15:17 (1)
23	05:15 21:40	06:10 20:37	07:07 19:20	17:08 (3) 18:15 (3)	08:04 18:07	11:15 (6) 16:09	10:06 (6) 11:22 (6)	08:43 15:57	10:25 (6) 15:17 (1)
24	05:17 21:38	06:12 20:35	07:09 19:18	17:08 (3) 18:15 (3)	08:06 18:04	11:13 (6) 16:08	10:07 (6) 11:22 (6)	08:44 15:58	10:26 (6) 15:18 (1)
25	05:18 21:37	06:14 20:33	07:11 19:15	17:08 (3) 18:14 (3)	07:08 17:02	10:13 (6) 16:07	10:07 (6) 15:05 (1)	08:44 15:58	10:26 (6) 15:19 (1)
26	05:20 21:35	06:15 20:30	07:13 19:12	17:09 (3) 18:14 (3)	07:10 17:00	10:11 (6) 16:06	10:08 (6) 15:07 (1)	08:44 15:59	10:26 (6) 15:19 (1)
27	05:21 21:33	06:17 20:28	07:14 19:10	17:08 (3) 18:12 (3)	07:12 16:58	10:10 (6) 16:04	10:09 (6) 15:09 (1)	08:45 16:00	10:26 (6) 15:20 (1)
28	05:23 21:32	06:19 20:25	07:16 19:07	17:08 (3) 18:11 (3)	07:14 16:56	10:09 (6) 16:03	10:09 (6) 15:10 (1)	08:45 16:01	10:27 (6) 15:21 (1)
29	05:25 21:30	06:21 20:23	17:46 (3) 19:05	07:18 18:10 (3)	07:16 16:53	10:08 (6) 16:02	10:10 (6) 15:11 (1)	08:45 16:02	10:27 (6) 15:22 (1)
30	05:26 21:28	06:23 20:21	17:41 (3) 18:05 (3)	07:20 19:02	07:18 16:51	10:07 (6) 16:02	10:11 (6) 15:12 (1)	08:45 16:03	10:27 (6) 15:23 (1)
31	05:28 21:26	06:25 20:18	17:37 (3) 18:08 (3)	07:20 16:49	07:20 16:49	10:07 (6) 16:02	10:11 (6) 15:12 (1)	08:45 16:04	10:28 (6) 15:24 (1)
Potential sun hours	518	463	383	327	255	228			
Total, worst case		69	1806	1355	2346	2558			

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: K - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (11)

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	08:45			08:13	14:57 (5)	07:13	15:05 (5)	06:56		05:45			04:53	19:55 (6)				
	16:05			16:58	57 15:54 (5)	17:56	63 17:17 (1)	19:56		20:54			21:46	56 20:51 (6)				
2	08:45			08:11	14:57 (5)	07:11	15:08 (5)	06:53		05:42			04:52	19:55 (6)				
	16:06			17:00	58 15:55 (5)	17:58	39 15:47 (5)	19:58		20:56			21:47	56 20:51 (6)				
3	08:44			08:09	14:57 (5)	07:08	15:10 (5)	06:51		05:40			04:51	19:54 (6)				
	16:07			17:02	59 15:56 (5)	18:00	34 15:44 (5)	20:00		20:58			21:49	57 20:51 (6)				
4	08:44			08:07	14:56 (5)	07:06	15:13 (5)	06:48		05:38		20:24 (3)	04:50	19:54 (6)				
	16:09			17:04	60 15:56 (5)	18:02	28 15:41 (5)	20:02		21:00	5	20:29 (3)	21:50	57 20:51 (6)				
5	08:44			08:05	14:56 (5)	07:04	15:16 (5)	06:46		05:36		20:21 (3)	04:49	19:54 (6)				
	16:10			17:06	61 15:57 (5)	18:04	21 15:37 (5)	20:04		21:02	9	20:30 (3)	21:51	59 20:53 (6)				
6	08:43			08:04	14:55 (5)	07:01	15:25 (5)	06:43		19:35 (2)	05:34	20:19 (3)	04:48	19:54 (6)				
	16:11			17:08	62 15:57 (5)	18:06	4 15:29 (5)	20:06	4	19:39 (2)	21:03	13 20:32 (3)	21:52	59 20:53 (6)				
7	08:43			08:02	14:55 (5)	06:59		06:41		19:34 (2)	05:32	20:18 (3)	04:48	19:53 (6)				
	16:13			17:10	63 15:58 (5)	18:08		20:08	6	19:40 (2)	21:05	16 20:34 (3)	21:53	60 20:53 (6)				
8	08:42			08:00	14:55 (5)	06:56		06:38		19:33 (2)	05:30	20:17 (3)	04:47	19:54 (6)				
	16:14			17:13	63 15:58 (5)	18:10		20:10	9	19:42 (2)	21:07	18 20:35 (3)	21:54	60 20:54 (6)				
9	08:42			07:58	14:55 (5)	06:54		06:36		19:32 (2)	05:28	20:17 (3)	04:46	19:53 (6)				
	16:16			17:15	64 15:59 (5)	18:12		20:12	12	19:44 (2)	21:09	21 20:38 (3)	21:55	60 20:53 (6)				
10	08:41			07:56	14:55 (5)	06:51		06:33		19:32 (2)	05:26	20:16 (3)	04:46	19:54 (6)				
	16:17			17:17	64 15:59 (5)	18:14		20:14	14	19:46 (2)	21:11	23 20:39 (3)	21:56	60 20:54 (6)				
11	08:40			07:54	14:55 (5)	06:49		06:31		19:31 (2)	05:24	20:15 (3)	04:45	19:54 (6)				
	16:19			17:19	70 16:48 (4)	18:16		20:16	16	19:47 (2)	21:13	25 20:40 (3)	21:57	61 20:55 (6)				
12	08:39			07:52	14:54 (5)	06:46		06:29		19:32 (2)	05:22	20:14 (3)	04:45	19:53 (6)				
	16:20			17:21	75 16:50 (4)	18:18		20:18	17	19:49 (2)	21:15	28 20:42 (3)	21:58	62 20:55 (6)				
13	08:38			07:49	14:55 (5)	06:44		06:26		19:33 (2)	05:20	20:14 (3)	04:45	19:54 (6)				
	16:22			17:23	77 16:52 (4)	18:20		20:20	15	19:48 (2)	21:16	29 20:43 (3)	21:58	61 20:55 (6)				
14	08:38			07:47	14:55 (5)	06:41		06:24		19:33 (2)	05:19	20:14 (3)	04:44	19:54 (6)				
	16:24			17:25	82 16:55 (4)	18:22		20:21	13	19:46 (2)	21:18	29 20:43 (3)	21:59	62 20:56 (6)				
15	08:37			07:45	14:55 (5)	06:39		06:21		19:35 (2)	05:17	20:13 (3)	04:44	19:54 (6)				
	16:25			17:27	86 16:58 (4)	18:24		20:23	9	19:44 (2)	21:20	30 20:43 (3)	22:00	62 20:56 (6)				
16	08:36		15:16 (5)	07:43	14:55 (5)	06:36		06:19		05:15		20:11 (6)	04:44	19:54 (6)				
	16:27	12	15:28 (5)	17:29	87 16:59 (4)	18:26		20:25		21:22	32 20:43 (3)	22:00	63 20:57 (6)					
17	08:34		15:13 (5)	07:41	14:55 (5)	06:34		06:16		05:13		20:08 (6)	04:44	19:55 (6)				
	16:29	18	15:31 (5)	17:31	91 17:02 (4)	18:28		20:27		21:23	35 20:43 (3)	22:01	62 20:57 (6)					
18	08:33		15:11 (5)	07:39	14:56 (5)	06:31		06:14		05:12		20:06 (6)	04:44	19:55 (6)				
	16:31	23	15:34 (5)	17:33	91 17:03 (4)	18:29		20:29		21:25	37 20:43 (3)	22:01	62 20:57 (6)					
19	08:32		15:09 (5)	07:36	14:56 (5)	06:29		06:12		05:10		20:04 (6)	04:44	19:55 (6)				
	16:32	28	15:37 (5)	17:35	90 17:02 (4)	18:31		20:31		21:27	39 20:43 (3)	22:02	62 20:57 (6)					
20	08:31		15:07 (5)	07:34	14:57 (5)	06:26		06:09		05:09		20:03 (6)	04:44	19:55 (6)				
	16:34	31	15:38 (5)	17:37	92 17:08 (1)	18:33		20:33		21:28	40 20:43 (3)	22:02	62 20:57 (6)					
21	08:30		15:07 (5)	07:32	14:57 (5)	06:24		06:07		05:07		20:02 (6)	04:44	19:55 (6)				
	16:36	34	15:41 (5)	17:39	94 17:11 (1)	18:35		20:35		21:30	41 20:43 (3)	22:02	62 20:57 (6)					
22	08:28		15:05 (5)	07:30	14:57 (5)	06:21		06:05		05:05		20:00 (6)	04:44	19:55 (6)				
	16:38	37	15:42 (5)	17:42	95 17:12 (1)	18:37		20:37		21:32	42 20:42 (3)	22:02	62 20:57 (6)					
23	08:27		15:05 (5)	07:27	14:59 (5)	06:19		06:02		05:04		19:59 (6)	04:44	19:56 (6)				
	16:40	39	15:44 (5)	17:44	95 17:15 (1)	18:39		20:39		21:33	44 20:43 (6)	22:03	62 20:58 (6)					
24	08:26		15:03 (5)	07:25	15:00 (5)	06:16		06:00		05:03		19:59 (6)	04:45	19:56 (6)				
	16:42	43	15:46 (5)	17:46	95 17:18 (1)	18:41		20:41		21:35	45 20:44 (6)	22:03	62 20:58 (6)					
25	08:24		15:02 (5)	07:23	15:00 (5)	06:14		05:58		05:01		19:58 (6)	04:45	19:56 (6)				
	16:44	45	15:47 (5)	17:48	93 17:19 (1)	18:43		20:43		21:36	47 20:45 (6)	22:03	62 20:58 (6)					
26	08:23		15:02 (5)	07:20	15:02 (5)	06:11		05:56		05:00		19:58 (6)	04:45	19:56 (6)				
	16:46	47	15:49 (5)	17:50	90 17:21 (1)	18:45		20:45		21:38	49 20:47 (6)	22:03	63 20:59 (6)					
27	08:21		15:01 (5)	07:18	15:02 (5)	06:09		05:53		04:59		19:56 (6)	04:46	19:56 (6)				
	16:48	49	15:50 (5)	17:52	84 17:20 (1)	18:47		20:46		21:39	50 20:46 (6)	22:03	62 20:58 (6)					
28	08:19		15:00 (5)	07:16	15:04 (5)	06:06		05:51		04:57		19:56 (6)	04:46	19:57 (6)				
	16:50	51	15:51 (5)	17:54	75 17:19 (1)	18:49		20:48		21:41	51 20:47 (6)	22:02	62 20:59 (6)					
29	08:18		14:59 (5)		07:03			05:49		04:56		19:55 (6)	04:47	19:57 (6)				
	16:52	52	15:51 (5)		19:51			20:50		21:42	53 20:48 (6)	22:02	61 20:58 (6)					
30	08:16		14:59 (5)		07:01			05:47		04:55		19:55 (6)	04:48	19:57 (6)				
	16:54	53	15:52 (5)		19:53			20:52		21:44	54 20:49 (6)	22:02	62 20:59 (6)					
31	08:14		14:58 (5)		06:58					04:54		19:54 (6)						
	16:56	55	15:53 (5)		19:55					21:45	55 20:49 (6)							
Potential sun hours	245			271		366		422		498		516	1823					
Total, worst case	617			2173		189		115		960								

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Shadow_Vestas Shadow receptor: K - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (11)

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

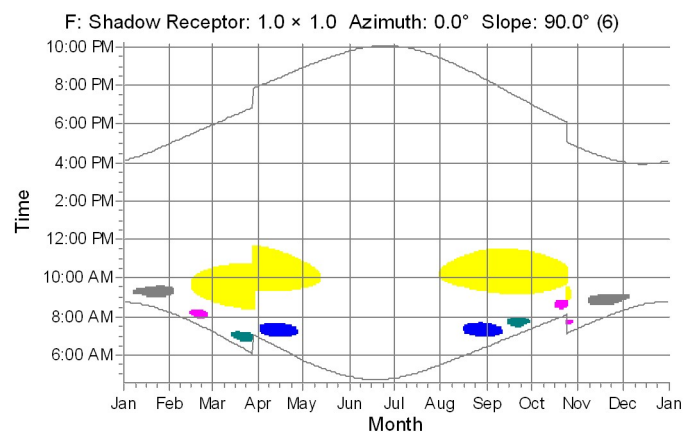
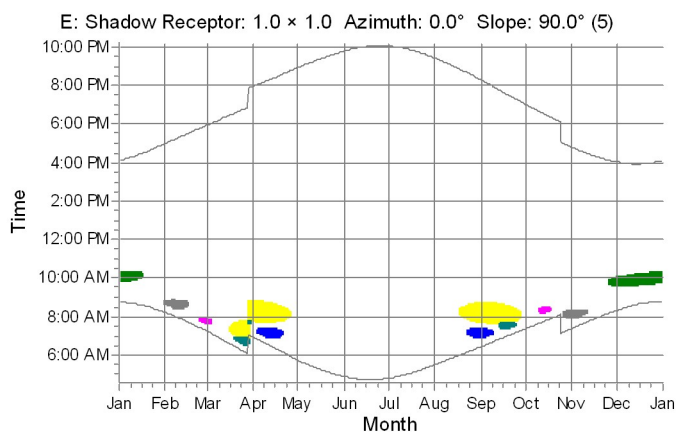
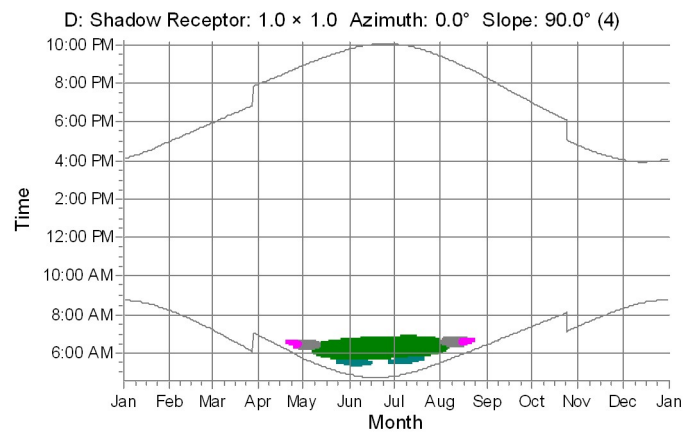
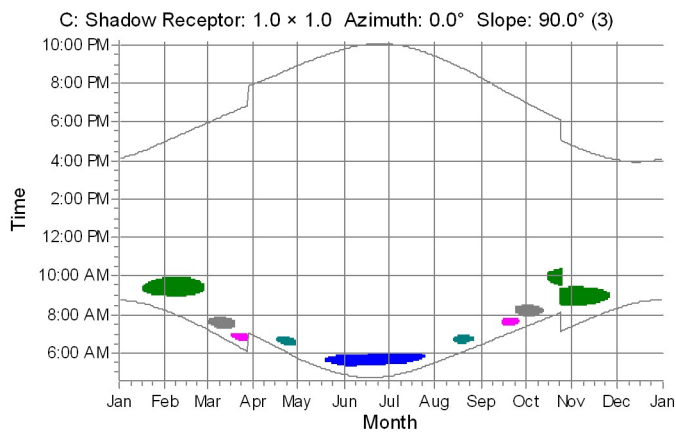
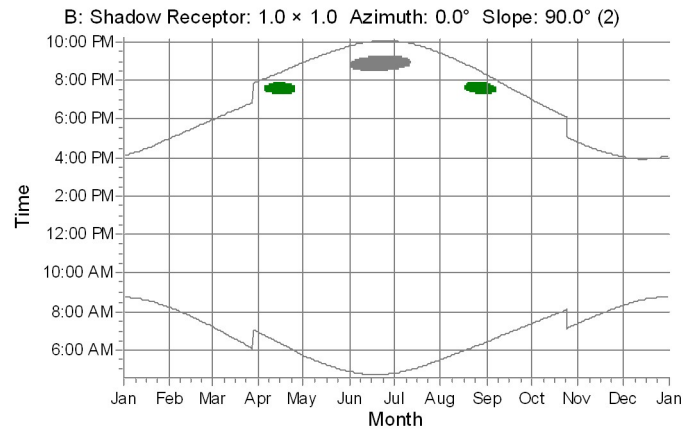
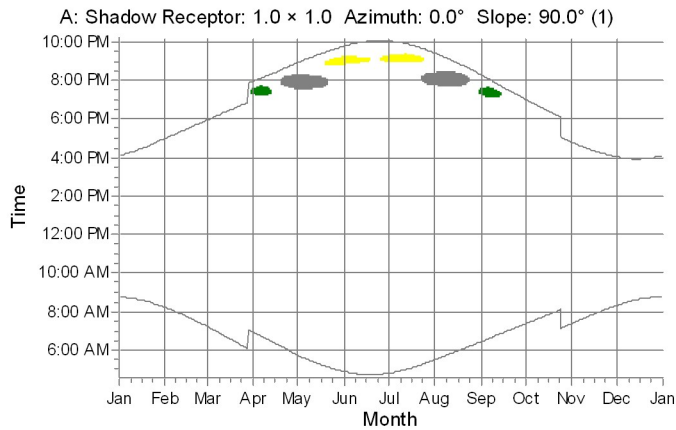
	July			August			September			October			November			December	
1	04:48		19:58 (6)	05:30		20:25 (3)	06:27		19:31 (2)	07:22		07:22		14:25 (5)	08:19		
2	22:02	61	20:59 (6)	21:24	26	20:51 (3)	20:16	16	19:47 (2)	19:00		16:47	64	15:29 (5)	16:01		
	04:49		19:58 (6)	05:32		20:25 (3)	06:28		19:30 (2)	07:24		07:24		14:25 (5)	08:21		
3	22:01	61	20:59 (6)	21:23	25	20:50 (3)	20:13	14	19:44 (2)	18:57		16:45	64	15:29 (5)	16:00		
	04:50		19:58 (6)	05:33		20:26 (3)	06:30		19:30 (2)	07:26		07:26		14:25 (5)	08:23		
4	22:01	61	20:59 (6)	21:21	23	20:49 (3)	20:11	12	19:42 (2)	18:55		16:43	63	15:28 (5)	15:59		
	04:51		19:59 (6)	05:35		20:26 (3)	06:32		19:30 (2)	07:28		07:28		14:25 (5)	08:24		
5	22:00	60	20:59 (6)	21:19	20	20:46 (3)	20:08	9	19:39 (2)	18:52		16:41	63	15:28 (5)	15:58		
	04:52		19:59 (6)	05:37		20:27 (3)	06:34		19:31 (2)	07:29		07:30		14:26 (5)	08:26		
6	22:00	60	20:59 (6)	21:17	18	20:45 (3)	20:06	6	19:37 (2)	18:50		16:39	62	15:28 (5)	15:58		
	04:53		20:00 (6)	05:39		20:29 (3)	06:36		19:30 (2)	07:31		07:32		14:26 (5)	08:27		
7	21:59	59	20:59 (6)	21:15	14	20:43 (3)	20:03	4	19:34 (2)	18:47		16:37	61	15:27 (5)	15:57		
	04:54		20:00 (6)	05:41		20:29 (3)	06:38			07:33		07:34		14:27 (5)	08:28		
8	21:58	59	20:59 (6)	21:13	12	20:41 (3)	20:01			18:45		16:35	60	15:27 (5)	15:57		
	04:55		20:01 (6)	05:42		20:31 (3)	06:39			07:35	15:55 (5)	07:36		14:27 (5)	08:30		
9	21:57	58	20:59 (6)	21:11	8	20:39 (3)	19:58			18:42	14	16:09 (5)	59	15:26 (5)	15:56		
	04:56		20:01 (6)	05:44		20:34 (3)	06:41			07:37		15:49 (5)	07:38	14:28 (5)	08:31		
10	21:57	58	20:59 (6)	21:09	4	20:38 (3)	19:56			18:40	25	16:14 (5)	57	15:25 (5)	15:56		
	04:57		20:02 (6)	05:46			06:43			07:39		15:45 (5)	07:40	14:29 (5)	08:32		
11	21:56	57	20:59 (6)	21:07			19:53			18:37	32	16:17 (5)	57	15:26 (5)	15:55		
	04:58		20:02 (6)	05:48			06:45			07:41		15:42 (5)	07:42	14:30 (5)	08:33		
12	21:55	56	20:58 (6)	21:04			19:51			18:35	37	16:19 (5)	55	15:25 (5)	15:55		
	04:59		20:03 (6)	05:50			06:47			07:43		15:40 (5)	07:44	14:30 (5)	08:35		
13	21:54	55	20:58 (6)	21:02			19:48			18:33	49	17:48 (1)	54	15:24 (5)	15:55		
	05:01		20:03 (6)	05:51			06:49			07:45		15:38 (5)	07:46	14:31 (5)	08:36		
14	21:53	54	20:57 (6)	21:00			19:46			18:30	69	17:51 (1)	52	15:23 (5)	15:55		
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15	21:52	53	20:57 (6)	20:58			19:43			18:28	79	17:52 (1)	50	15:22 (5)	15:55		
	05:03		20:05 (6)	05:55			06:52			07:49		15:35 (5)	07:50	14:33 (5)	08:38		
16	21:51	52	20:57 (6)	20:56			19:40			18:25	87	17:53 (1)	49	15:22 (5)	15:55		
	05:05		20:05 (6)	05:57			06:54			07:51		15:33 (5)	07:52	14:35 (5)	08:39		
17	21:49	51	20:56 (6)	20:53			19:38			18:23	92	17:53 (1)	47	15:22 (5)	15:55		
	05:06		20:06 (6)	05:59			06:56			07:53		15:32 (5)	07:54	14:36 (5)	08:39		
18	21:48	49	20:55 (6)	20:51			19:35			18:21	94	17:51 (1)	45	15:21 (5)	15:55		
	05:07		20:07 (6)	06:01			06:58			07:54		15:31 (5)	07:56	14:37 (5)	08:40		
19	21:47	49	20:56 (6)	20:49			19:33			18:18	94	17:48 (1)	42	15:19 (5)	15:55		
	05:09		20:08 (6)	06:03			07:00			07:56		15:30 (5)	07:58	14:39 (5)	08:41		
20	21:46	46	20:54 (6)	20:47			19:30			18:16	93	17:45 (1)	39	15:18 (5)	15:55		
	05:10		20:09 (6)	06:04			07:01			07:58		15:29 (5)	08:00	14:40 (5)	08:42		
21	21:44	44	20:53 (6)	20:44			19:28			18:13	94	17:43 (1)	37	15:17 (5)	15:56		
	05:12		20:10 (6)	06:06			07:03			08:00		15:28 (5)	08:02	14:42 (5)	08:42		
22	21:43	43	20:53 (3)	20:42			19:25			18:11	92	17:40 (1)	34	15:16 (5)	15:56		
	05:13		20:11 (6)	06:08			07:05			08:02		15:27 (5)	08:04	14:43 (5)	08:43		
23	21:41	42	20:53 (3)	20:40			19:23			18:09	90	17:38 (1)	31	15:14 (5)	15:57		
	05:15		20:13 (6)	06:10			07:07			08:04		15:26 (5)	08:06	14:45 (5)	08:43		
24	21:40	41	20:54 (3)	20:37			19:20			18:07	90	17:33 (4)	28	15:13 (5)	15:57		
	05:17		20:14 (6)	06:12			07:09			08:06		15:25 (5)	08:07	14:48 (5)	08:44		
25	21:38	40	20:54 (3)	20:35			19:18			18:04	90	17:32 (4)	23	15:11 (5)	15:58		
	05:18		20:16 (6)	06:14			07:11			07:08		14:25 (5)	08:09	14:51 (5)	08:44		
26	21:37	38	20:54 (3)	20:33			19:15			17:02	88	16:30 (4)	18	15:09 (5)	15:58		
	05:20		20:17 (6)	06:15			07:13			07:10		14:25 (5)	08:11	14:54 (5)	08:44		
27	21:35	37	20:54 (3)	20:30			19:12			17:00	87	16:29 (4)	12	15:06 (5)	15:59		
	05:21		20:20 (6)	06:17			07:14			07:12		14:25 (5)	08:13		08:45		
28	21:33	34	20:54 (3)	20:28			19:10			16:58	83	16:26 (4)		16:04	16:00		
	05:23		20:22 (6)	06:19		19:37 (2)	07:16			07:14		14:24 (5)	08:14		08:45		
29	21:32	32	20:54 (3)	20:25	9	19:46 (2)	19:07			16:55	81	16:24 (4)		16:03	16:01		
	05:25		20:25 (3)	06:21		19:34 (2)	07:18			07:16		14:24 (5)	08:16		08:45		
30	21:30	29	20:54 (3)	20:23	13	19:47 (2)	19:05			16:53	77	16:21 (4)		16:02	16:02		
	05:26		20:24 (3)	06:23		19:33 (2)	07:20			07:18		14:24 (5)	08:18		08:45		
31	21:28	29	20:53 (3)	20:21	15	19:48 (2)	19:02			16:51	74	16:19 (4)		16:02	16:03		
	05:28		20:25 (3)	06:25		19:32 (2)				07:20		14:24 (5)			08:45		
	21:26	28	20:53 (3)	20:18	17	19:49 (2)				16:49	68	16:17 (4)			16:04		
Potential sun hours	517			463			383			327			255		228		
Total, worst case		1496			204			61		1779			1226				

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar, graphical

Calculation: Shadow_Vestas

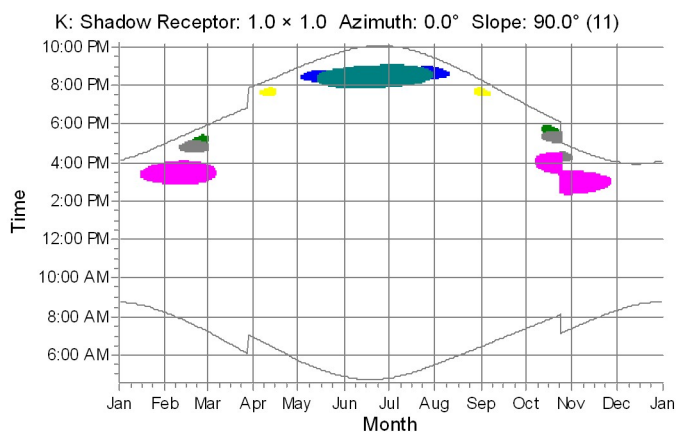
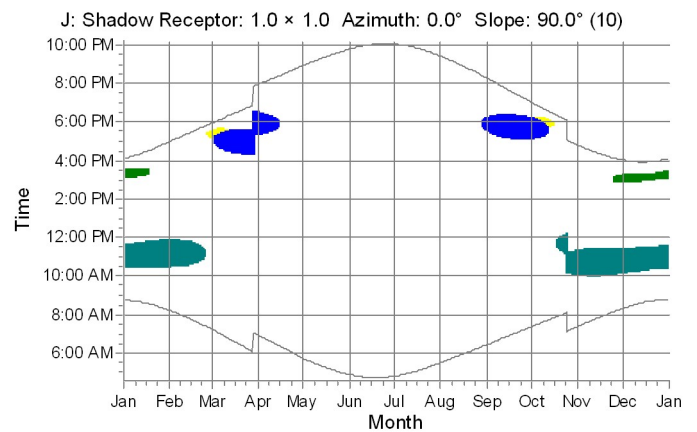
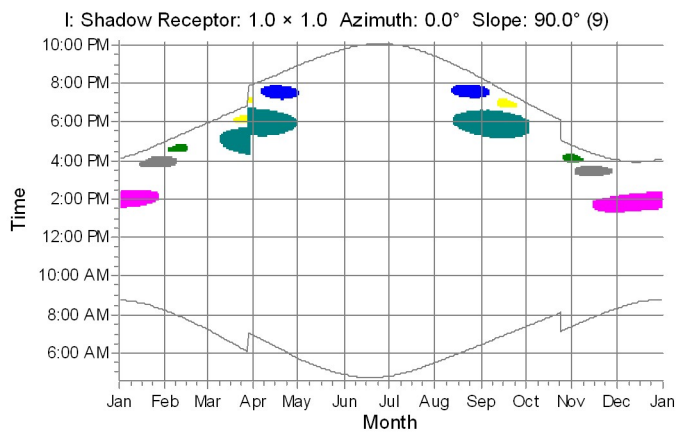
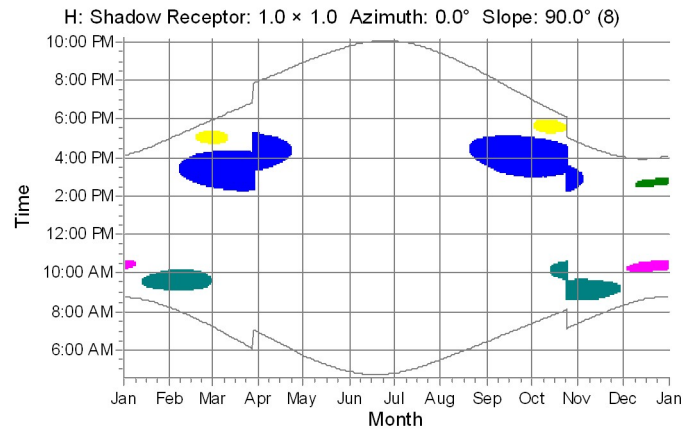
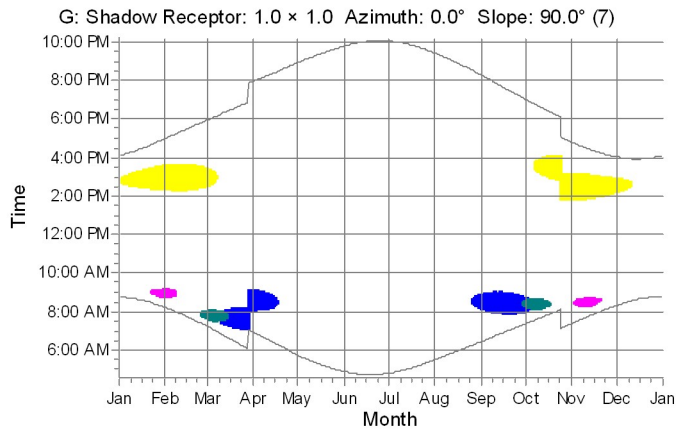


WTGs

- 1: 01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)
- 2: 02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)
- 3: 03_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (8)
- 4: 04_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (9)
- 5: 05_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (10)
- 6: 06_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (11)

SHADOW - Calendar, graphical

Calculation: Shadow_Vestas



WTGs

- 1: 01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)
- 2: 02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)
- 3: 03_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (8)
- 4: 04_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (9)
- 5: 05_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (10)
- 6: 06_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (11)

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar per WTG

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

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	08:45 15:07-15:25/18 09:50-10:17/27	08:13 09:03-09:50/47	07:13 17:07-17:17/10	06:56 19:21-19:29/8	05:45	04:53 05:44-06:42/58
	16:05 14:44-14:50/6	16:58	17:56	19:57	20:54	21:46
2	08:45 15:08-15:27/19	08:11 09:03-09:51/48	07:11	06:54 19:20-19:31/11	05:43	04:52 05:44-06:42/58
	16:06 09:50-10:17/27	17:00	17:58	19:59	20:56	21:48
3	08:44 15:09-15:29/20	08:09 09:02-09:51/49	07:08	06:51 19:18-19:33/15	05:40	04:51 05:43-06:42/59
	16:07 09:51-10:18/27	17:02	18:00	20:00	20:58	21:49
4	08:44 15:09-15:29/20	08:07 16:31-16:33/2	07:06	06:49 19:18-19:35/17	05:38	04:50 05:43-06:42/59
	16:09 09:51-10:17/26	17:04 09:02-09:52/50	18:02	20:02	21:00	21:50
5	08:44 15:10-15:30/20	08:06 16:30-16:34/4	07:04	06:46 19:17-19:36/19	05:36	04:49 05:44-06:43/59
	16:10 09:52-10:18/26	17:06 09:02-09:52/50	18:04	20:04	21:02	21:51
6	08:43 15:10-15:30/20	08:04 16:29-16:36/7	07:01	06:44 19:17-19:39/22	05:34	04:49 05:44-06:43/59
	16:11 09:52-10:18/26	17:08 09:02-09:53/51	18:06	20:06	21:04	21:52
7	08:43 15:10-15:30/20	08:02 16:29-16:39/10	06:59	06:41 19:17-19:40/23	05:32	04:48 05:44-06:44/60
	16:13 09:53-10:18/25	17:11 09:01-09:52/51	18:08	20:08	21:05	21:53
8	08:42 15:10-15:30/20	08:00 16:29-16:41/12	06:56	06:39 19:17-19:42/25	05:30 06:06-06:18/12	04:47 05:44-06:44/60
	16:14 09:53-10:17/24	17:13 09:01-09:52/51	18:10	20:10	21:07	21:54
9	08:42 15:12-15:31/19	07:58 16:29-16:44/15	06:54	06:36 19:17-19:44/27	05:28 06:02-06:22/20	04:47 05:44-06:45/61
	16:16 09:55-10:18/23	17:15 09:01-09:53/52	18:12	20:12	21:09	21:55
10	08:41 15:13-15:31/18	07:56 16:29-16:46/17	06:51	06:34 19:18-19:46/28	05:26 05:59-06:25/26	04:46 05:44-06:44/60
	16:17 09:56-10:18/22	17:17 09:02-09:53/51	18:14	20:14	21:11	21:56
11	08:40 15:13-15:31/18	07:54 16:30-16:46/16	06:49	06:31 19:19-19:47/28	05:24 05:56-06:26/30	04:46 05:45-06:45/60
	16:19 09:57-10:18/21	17:19 09:02-09:53/51	18:16	20:16	21:13	21:57
12	08:39 15:14-15:31/17	07:52 16:30-16:45/15	06:46	06:29 19:22-19:49/27	05:22 05:55-06:29/34	04:45 05:45-06:45/60
	16:20 09:58-10:17/19	17:21 09:02-09:53/51	18:18	20:18	21:15	21:58
13	08:39 15:15-15:31/16	07:50 16:31-16:44/13	06:44	06:26 19:22-19:50/28	05:21 05:53-06:30/37	04:45 05:44-06:45/61
	16:22 10:00-10:17/17	17:23 09:02-09:52/50	18:20	20:20	21:16	21:58
14	08:38 15:15-15:30/15	07:47 16:33-16:42/9	06:41	06:24 19:20-19:49/29	05:19 05:52-06:31/39	04:44 05:45-06:45/60
	16:24 10:00-10:15/15	17:25 09:03-09:52/49	18:22	20:22	21:18	21:59
15	08:37 15:17-15:30/13	07:45 09:03-09:51/48	06:39	06:21 19:21-19:49/28	05:17 05:51-06:33/42	04:44 05:45-06:46/61
	16:25 10:02-10:14/12	17:27	18:24	20:23	21:20	22:00
16	08:36 15:19-15:29/10	07:43 09:04-09:51/47	06:36	06:19 19:21-19:49/28	05:15 05:50-06:33/43	04:44 05:45-06:46/61
	16:27 10:05-10:12/7	17:29	18:26	20:25	21:22	22:00
17	08:35 15:21-15:28/7	07:41 09:04-09:50/46	06:34	06:17 19:20-19:48/28	05:14 05:49-06:35/46	04:44 05:46-06:46/60
	16:29 09:19-09:26/7	17:31	18:28	20:27	21:23	22:01
18	08:33 09:15-09:30/15	07:39 09:05-09:49/44	06:31	06:14 19:21-19:48/27	05:12 05:48-06:35/47	04:44 05:46-06:46/60
	16:31	17:33	18:30	20:29	21:25	22:01
19	08:32 09:13-09:33/20	07:36 09:06-09:48/42	06:29	06:12 19:21-19:47/26	05:10 05:48-06:36/48	04:44 05:46-06:46/60
	16:33	17:35	18:32	20:31	21:27	22:02
20	08:31 09:11-09:35/24	07:34 17:06-17:08/2	06:26	06:10 19:21-19:46/25	05:09 05:47-06:36/49	04:44 05:46-06:47/61
	16:34	17:38 09:07-09:46/39	18:33	20:33	21:28	22:02
21	08:30 09:10-09:37/27	07:32 17:06-17:11/5	06:24	06:07 19:22-19:45/23	05:07 05:46-06:37/51	04:44 05:46-06:47/61
	16:36	17:40 09:08-09:45/37	18:35	20:35	21:30	22:02
22	08:28 09:09-09:39/30	07:30 17:04-17:12/8	06:21	06:05 19:23-19:43/20	05:06 05:46-06:38/52	04:44 05:47-06:48/61
	16:38	17:42 09:09-09:43/34	18:37	20:37	21:32	22:02
23	08:27 09:08-09:41/33	07:27 17:04-17:15/11	06:19	06:03 19:25-19:42/17	05:04 05:45-06:38/53	04:44 05:47-06:47/60
	16:40	17:44 09:11-09:41/30	18:39	20:39	21:33	22:03
24	08:26 09:07-09:42/35	07:25 17:04-17:18/14	06:16	06:00 19:27-19:39/12	05:03 05:45-06:39/54	04:45 05:47-06:47/60
	16:42	17:46 09:13-09:39/26	18:41	20:41	21:35	22:03
25	08:24 09:06-09:43/37	07:23 17:04-17:19/15	06:14	05:58	05:01 05:45-06:39/54	04:45 05:48-06:48/60
	16:44	17:48 09:15-09:35/20	18:43	20:43	21:36	22:03
26	08:23 09:06-09:45/39	07:20 17:05-17:21/16	06:11	05:56	05:00 05:45-06:40/55	04:46 05:47-06:48/61
	16:46	17:50 09:20-09:31/11	18:45	20:45	21:38	22:03
27	08:21 09:05-09:46/41	07:18 17:05-17:20/15	06:09	05:53	04:59 05:45-06:41/56	04:46 05:47-06:48/61
	16:48	17:52	18:47	20:47	21:39	22:03
28	08:20 09:04-09:46/42	07:16 17:06-17:19/13	06:06	05:51	04:57 05:44-06:41/57	04:47 05:48-06:48/60
	16:50	17:54	18:49	20:48	21:41	22:02
29	08:18 09:04-09:47/43		07:04	05:49	04:56 05:44-06:41/57	04:47 05:49-06:49/60
	16:52		19:51	20:50	21:42	22:02
30	08:16 09:03-09:48/45		07:01	05:47	04:55 05:44-06:42/58	04:48 05:48-06:48/60
	16:54		19:53	20:52	21:44	22:02
31	08:15 09:04-09:50/46		06:59 19:23-19:28/5		04:54 05:44-06:42/58	
	16:56		19:55		21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	1124	1344	15	541	1078	1801

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

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	04:48 05:49-06:49/60	05:30 06:06-06:38/32	06:27 19:19-19:47/28	07:22	07:22 15:59-16:15/16	08:19 14:55-15:13/18
	22:02	21:25	20:16	19:00	16:47 08:31-09:22/51	16:01 09:39-10:00/21
2	04:49 05:49-06:49/60	05:32 06:07-06:36/29	06:28 19:16-19:44/28	07:24	07:24 15:59-16:13/14	08:21 14:55-15:13/18
	22:01	21:23	20:13	18:57	16:45 08:31-09:22/51	16:00 09:38-10:00/22
3	04:50 05:49-06:49/60	05:34 06:10-06:34/24	06:30 19:15-19:42/27	07:26	07:27 15:59-16:10/11	08:23 14:55-15:14/19
	22:01	21:21	20:11	18:55	16:43 08:31-09:22/51	15:59 09:38-10:01/23
4	04:51 05:49-06:49/60	05:35 06:13-06:31/18	06:32 19:14-19:39/25	07:28	07:29 15:59-16:08/9	08:24 14:56-15:15/19
	22:00	21:19	20:08	18:52	16:41 08:31-09:22/51	15:58 09:39-10:03/24
5	04:52 05:50-06:49/59	05:37 06:18-06:25/7	06:34 19:14-19:37/23	07:30	07:31 16:00-16:07/7	08:26 14:55-15:15/20
	22:00	21:17	20:06	18:50	16:39 08:32-09:22/50	15:58 09:38-10:03/25
6	04:53 05:50-06:50/60	05:39	06:36 19:12-19:34/22	07:31	07:33 16:00-16:04/4	08:27 14:56-15:16/20
	21:59	21:15	20:03	18:47	16:37 08:32-09:22/50	15:57 09:39-10:04/25
7	04:54 05:50-06:50/60	05:41	06:38 19:12-19:32/20	07:33	07:35 16:01-16:02/1	08:28 14:56-15:16/20
	21:58	21:13	20:01	18:45	16:35 08:32-09:22/50	15:57 09:38-10:04/26
8	04:55 05:51-06:50/59	05:43	06:40 19:12-19:29/17	07:35	07:37 08:32-09:21/49	08:30 14:57-15:17/20
	21:57	21:11	19:58	18:42	16:33	15:56 09:39-10:05/26
9	04:56 05:51-06:50/59	05:44	06:41 19:12-19:27/15	07:37	07:39 08:33-09:21/48	08:31 14:57-15:17/20
	21:57	21:09	19:56	18:40	16:31	15:56 09:39-10:06/27
10	04:57 05:51-06:50/59	05:46	06:43 19:12-19:24/12	07:39	07:41 08:34-09:21/47	08:32 14:57-15:16/19
	21:56	21:07	19:53	18:38	16:30	15:56 09:40-10:07/27
11	04:58 05:51-06:50/59	05:48	06:45 19:13-19:22/9	07:41	07:43 08:34-09:20/46	08:33 14:58-15:16/18 09:40-10:07/27
	21:55	21:05	19:51	18:35	16:28	15:55 14:34-14:39/5
12	04:59 05:51-06:50/59	05:50	06:47 19:14-19:19/5	07:43 17:42-17:48/6	07:45 08:35-09:20/45	08:35 14:58-15:16/18 09:40-10:08/28
	21:54	21:02	19:48	18:33	16:26	15:55 14:34-14:41/7
13	05:01 05:52-06:49/57	05:52	06:49 19:16-19:17/1	07:45 17:39-17:51/12	07:47 08:36-09:19/43	08:36 14:59-15:16/17 09:40-10:08/28
	21:53	21:00	19:46	18:30	16:24	15:55 14:33-14:42/9
14	05:02 05:53-06:50/57	05:53	06:51	07:47 17:38-17:52/14	07:49 08:36-09:18/42	08:37 14:59-15:15/16 09:40-10:09/29
	21:52	20:58	19:43	18:28	16:23	15:55 14:33-14:43/10
15	05:03 05:53-06:50/57	05:55	06:52	07:49 17:37-17:53/16	07:50 08:38-09:19/41	08:38 14:59-15:15/16 09:41-10:09/28
	21:51	20:56	19:41	18:25	16:21	15:55 14:33-14:44/11
16	05:05 05:53-06:49/56	05:57	06:54	07:51 17:37-17:53/16	07:52 08:39-09:18/39	08:39 15:00-15:15/15 09:41-10:10/29
	21:49	20:54	19:38	18:23 09:50-10:05/15	16:19	15:55 14:33-14:45/12
17	05:06 05:53-06:49/56	05:59	06:56	07:53 17:36-17:51/15	07:54 08:40-09:17/37	08:39 15:01-15:16/15 09:42-10:10/28
	21:48	20:51	19:35	18:21 09:46-10:09/23	16:18	15:55 14:33-14:46/13
18	05:08 05:54-06:49/55	06:01 19:36-19:42/6	06:58	07:55 17:36-17:48/12	07:56 08:41-09:16/35	08:40 15:01-15:16/15 09:42-10:11/29
	21:47	20:49	19:33	18:18 09:44-10:11/27	16:16	15:55 14:34-14:47/13
19	05:09 05:54-06:49/55	06:03 19:33-19:46/13	07:00	07:57 17:36-17:45/9	07:58 08:42-09:15/33	08:41 15:01-15:15/14 09:42-10:11/29
	21:46	20:47	19:30	18:16 09:41-10:13/32	16:15	15:56 14:33-14:46/13
20	05:10 05:55-06:48/53	06:04 19:30-19:48/18	07:02	07:58 17:36-17:43/7	08:00 08:44-09:14/30	08:42 15:02-15:16/14 09:43-10:12/29
	21:44	20:44	19:28	18:14 09:40-10:15/35	16:13	15:56 14:34-14:47/13
21	05:12 05:56-06:48/52	06:06 19:28-19:48/20	07:03	08:00 17:36-17:40/4	08:02 08:45-09:12/27	08:42 15:02-15:16/14 09:44-10:13/29
	21:43	20:42	19:25	18:11 09:38-10:16/38	16:12	15:56 14:35-14:48/13
22	05:14 05:56-06:47/51	06:08 19:27-19:49/22	07:05	08:02 17:37-17:38/1	08:04 08:47-09:11/24	08:43 15:03-15:17/14 09:44-10:13/29
	21:41	20:40	19:23	18:09 09:37-10:17/40	16:11	15:57 14:35-14:48/13
23	05:15 05:57-06:47/50	06:10 19:26-19:50/24	07:07	08:04 09:35-10:18/43	08:06 08:49-09:09/20	08:43 15:03-15:17/14 09:44-10:13/29
	21:40	20:37	19:20	18:07	16:09	15:57 14:35-14:48/13
24	05:17 05:57-06:46/49	06:12 19:25-19:51/26	07:09	08:06 09:34-10:19/45	08:07 08:52-09:07/15	08:44 15:04-15:18/14 09:45-10:14/29
	21:38	20:35	19:18	18:04	16:08	15:58 14:36-14:49/13
25	05:18 05:58-06:46/48	06:14 19:23-19:51/28	07:11	07:08 08:34-09:20/46	08:09 14:58-15:05/7	08:44 15:04-15:19/15 09:45-10:14/29
	21:37	20:33	19:15	17:02	16:07 08:56-09:04/8	15:58 14:37-14:49/12
26	05:20 05:59-06:45/46	06:16 19:23-19:51/28	07:13	07:10 08:33-09:21/48	08:11 14:57-15:07/10	08:44 15:04-15:19/15 09:46-10:14/28
	21:35	20:30	19:13	17:00	16:06 09:44-09:50/6	15:59 14:37-14:50/13
27	05:22 06:00-06:45/45	06:17 19:23-19:51/28	07:15	07:12 16:06-16:10/4	08:13 14:56-15:09/13	08:45 15:05-15:20/15 09:46-10:15/29
	21:33	20:28	19:10	16:58 08:33-09:21/48	16:05 09:42-09:53/11	16:00 14:38-14:50/12
28	05:23 06:00-06:43/43	06:19 19:22-19:51/29	07:16	07:14 16:02-16:12/10	08:15 14:56-15:10/14	08:45 15:05-15:21/16 09:46-10:15/29
	21:32	20:25	19:07	16:56 08:32-09:21/49	16:04 09:40-09:55/15	16:01 14:38-14:50/12
29	05:25 06:02-06:42/40	06:21 19:21-19:50/29	07:18	07:16 16:01-16:14/13	08:16 14:55-15:11/16	08:45 15:06-15:22/16 09:47-10:15/28
	21:30	20:23	19:05	16:53 08:31-09:21/50	16:03 09:40-09:57/17	16:02 14:39-14:50/11
30	05:27 06:03-06:41/38	06:23 19:21-19:50/29	07:20	07:18 15:59-16:14/15	08:18 14:55-15:12/17	08:45 15:06-15:23/17 09:48-10:16/28
	21:28	20:21	19:02	16:51 08:31-09:21/50	16:02 09:39-09:58/19	16:03 14:41-14:50/9
31	05:28 06:04-06:40/36	06:25 19:22-19:49/27		07:20 16:00-16:16/16		08:45 15:07-15:24/17 09:49-10:16/27
	21:26	20:18		16:49 08:32-09:22/50		16:04 14:42-14:50/8
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	1658	437	232	809	1190	1597

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

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

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_Vestas WTG: 2 - 02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)

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	08:45 16:05	08:13 14:21-15:32/71 16:58	07:13 16:46-17:28/42 08:51-10:26/95 17:56 14:32-15:23/51	06:56 09:24-11:35/131 19:57 07:47-08:45/58	05:45 09:33-10:46/73 20:54	04:53 20:53-21:10/17 21:46
2	08:45 14:43-14:50/7 16:06	08:11 14:21-15:33/72 17:00	07:11 16:47-17:30/43 08:50-10:28/98 17:58 14:34-15:21/47	06:54 09:24-11:35/131 19:59 07:47-08:46/59	05:42 09:34-10:43/69 20:56	04:52 20:54-21:10/16 21:48
3	08:44 14:41-14:54/13 16:07	08:09 14:21-15:33/72 17:02	07:09 16:46-17:32/46 08:48-10:29/101 18:00 14:36-15:19/43	06:51 09:24-11:34/130 20:00 07:46-08:45/59	05:40 09:35-10:41/66 20:58	04:51 20:54-21:09/15 21:49
4	08:44 14:39-14:56/17 16:09	08:07 14:21-15:34/73 17:04	07:06 16:47-17:34/47 08:47-10:31/104 18:02 14:39-15:17/38	06:49 09:24-11:33/129 20:02 07:46-08:45/59	05:38 09:37-10:38/61 21:00	04:50 20:54-21:09/15 21:50
5	08:44 14:38-14:59/21 16:10	08:06 14:21-15:34/73 17:06	07:04 16:47-17:35/48 08:46-10:32/106 18:04 14:42-15:13/31	06:46 09:23-11:32/129 20:04 07:45-08:45/60	05:36 09:38-10:35/57 21:02	04:49 20:55-21:10/15 21:51
6	08:43 14:36-15:00/24 16:11	08:04 14:20-15:34/74 17:08	07:01 16:48-17:36/48 08:44-10:33/109 18:06 14:47-15:09/22	06:44 19:35-19:39/4 07:45-08:45/60 20:06 09:23-11:31/128	05:34 09:39-10:32/53 21:04	04:49 20:55-21:09/14 21:52
7	08:43 14:35-15:02/27 16:13	08:02 14:20-15:34/74 17:11	06:59 16:49-17:35/46 08:42-10:33/111 18:08 14:56-14:59/3	06:41 19:34-19:40/6 07:44-08:44/60 20:08 09:23-11:30/127	05:32 09:41-10:29/48 21:05	04:48 20:56-21:08/12 21:53
8	08:42 14:34-15:04/30 16:14	08:00 14:20-15:35/75 17:13	06:56 16:50-17:35/45 18:10 08:42-10:34/112	06:39 19:33-19:42/9 07:45-08:43/58 20:10 09:23-11:29/126	05:30 09:44-10:26/42 21:07	04:47 20:57-21:09/12 21:54
9	08:42 14:34-15:06/32 16:16	07:58 14:20-15:35/75 17:15	06:54 16:51-17:34/43 18:12 08:40-10:35/115	06:36 19:32-19:44/12 07:44-08:42/58 20:12 09:23-11:27/124	05:28 09:46-10:22/36 21:09	04:47 20:57-21:08/11 21:55
10	08:41 14:33-15:08/35 16:17	07:56 14:20-15:35/75 17:17	06:51 17:11-17:33/22 08:39-10:36/117 18:14 16:54-17:08/14	06:34 19:32-19:46/14 07:44-08:42/58 20:14 09:23-11:26/123	05:26 09:49-10:18/29 21:11	04:46 20:58-21:08/10 21:56
11	08:40 14:32-15:09/37 16:19	07:54 14:20-15:35/75 17:19	06:49 17:11-17:32/21 18:16 08:38-10:36/118	06:31 19:31-19:47/16 07:45-08:41/56 20:16 09:23-11:26/123	05:24 09:53-10:12/19 21:13	04:46 20:59-21:08/9 21:57
12	08:39 14:31-15:11/40 16:20	07:52 14:20-15:36/76 17:21	06:46 17:13-17:31/18 18:18 08:37-10:37/120	06:29 19:32-19:49/17 07:45-08:40/55 20:18 09:23-11:24/121	05:22 09:53-10:12/19 21:15	04:45 20:59-21:07/8 21:58
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15	08:37 14:29-15:15/46 16:25	07:45 14:21-15:35/74 17:27	06:39 08:34-10:38/124 18:24	06:21 19:35-19:44/9 07:46-08:37/51 20:24 09:23-11:19/116	05:17 09:56-10:15/22 21:20	04:44 21:02-21:07/5 22:00
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21	08:30 14:25-15:23/58 16:36	07:32 16:53-17:11/18 09:08-10:12/64 17:40	06:24 18:03-18:08/5 07:01-07:39/38 18:35 08:30-10:39/129	06:07 09:25-11:08/103 20:35 07:51-08:26/35	05:07 20:53-20:56/3 21:30	04:44 21:08-21:09/5 22:05
22	08:28 14:24-15:23/59 16:38	07:30 16:51-17:12/21 09:05-10:14/69 17:42	06:21 18:01-18:10/9 06:58-07:40/42 18:37 08:29-10:39/130	06:05 09:26-11:06/100 20:37 07:53-08:24/31	05:06 20:52-20:57/5 21:32	04:44 21:09-21:10/6 22:06
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24	08:26 14:24-15:25/61 16:42	07:25 16:50-17:18/28 09:01-10:19/78 17:46	06:16 18:00-18:14/14 06:55-07:42/47 18:41 08:27-10:38/131	06:00 09:27-11:02/95 20:41 07:59-08:18/19	05:03 20:52-21:01/9 21:35	04:45 21:11-21:12/8 22:08
25	08:24 14:23-15:26/63 16:44	07:23 16:48-17:18/30 08:59-10:20/81 17:48	06:14 18:00-18:16/16 06:54-07:43/49 18:43 08:27-10:39/132	05:58 09:28-11:00/92 20:43 08:04-08:13/9	05:01 20:52-21:02/10 21:36	04:45 21:12-21:13/9 22:09
26	08:23 14:23-15:28/65 16:46	07:20 17:21-17:22/1 14:28-15:28/60 17:50	06:11 17:59-18:17/18 06:52-07:44/52 18:45 08:26-10:38/132	05:56 09:28-10:57/89 20:45	05:00 20:52-21:04/12 21:38	04:45 21:05-21:08/3 22:10
27	08:21 14:23-15:28/65 16:48	07:18 16:47-17:23/36 08:55-10:24/89 17:52	06:09 18:00-18:17/17 06:51-07:45/54 18:47 08:26-10:38/132	05:53 09:29-10:55/86 20:47	04:59 20:51-21:04/13 21:39	04:46 21:04-21:08/4 22:11
28	08:20 14:22-15:29/67 16:50	07:16 16:47-17:26/39 08:53-10:26/93 17:54	06:06 18:00-18:15/15 06:50-07:45/55 18:49 08:26-10:37/131	05:51 09:30-10:53/83 20:48	04:57 20:52-21:05/13 21:41	04:46 21:04-21:10/6 22:12
29	08:18 14:22-15:30/68 16:52		07:04 19:01-19:14/13 07:49-08:46/57 19:51 09:26-11:37/131	05:49 09:31-10:51/80 20:50	04:56 20:52-21:07/15 21:42	04:47 21:03-21:10/7 22:13
30	08:16 14:21-15:30/69 16:54		07:01 19:02-19:12/10 07:48-08:45/57 19:53 09:25-11:36/131	05:47 09:32-10:48/76 20:52	04:55 20:52-21:08/16 21:44	04:48 21:03-21:11/8 22:14
31	08:15 14:22-15:32/70 16:56		06:59 09:25-11:36/131 19:55 07:48-08:46/58		04:54 20:52-21:09/17 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	1379	3064	5264	4634	675	204

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

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

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_Vestas WTG: 2 - 02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)

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	04:48 21:03-21:12/9 22:02	05:30 10:08-10:18/10 21:25	06:27 19:31-19:47/16 07:44-08:40/56 20:16 09:22-11:25/123	07:22 17:52-18:09/17 19:00 09:16-11:16/120	07:23 13:49-15:05/76 16:47	08:20 14:14-14:52/38 16:01
2	04:49 21:03-21:13/10 22:01	05:32 10:01-10:25/24 21:23	06:28 19:30-19:44/14 07:42-08:40/58 20:13 09:21-11:24/123	07:24 17:50-18:10/20 18:57 09:17-11:15/118	07:25 13:49-15:04/75 16:45	08:21 14:15-14:50/35 16:00
3	04:50 21:02-21:13/11 22:01	05:34 09:58-10:30/32 21:21	06:30 19:30-19:42/12 07:42-08:40/58 20:11 09:21-11:25/124	07:26 17:49-18:11/22 09:17-11:14/117 18:55 17:34-17:44/10	07:27 13:49-15:04/75 16:43	08:23 14:17-14:49/32 15:59
4	04:51 21:02-21:14/12 22:00	05:35 09:55-10:33/38 21:19	06:32 19:30-19:39/9 07:42-08:40/58 20:08 09:20-11:26/126	07:28 17:48-18:12/24 09:18-11:13/115 18:52 17:31-17:47/16	07:29 13:49-15:04/75 16:41	08:24 14:19-14:49/30 15:58
5	04:52 21:02-21:14/12 22:00	05:37 09:53-10:37/44 21:17	06:34 19:31-19:37/6 07:41-08:41/60 20:06 09:20-11:27/127	07:30 17:28-18:12/44 18:50 09:18-11:12/114	07:31 13:50-15:04/74 16:39	08:26 14:20-14:47/27 15:58
6	04:53 21:02-21:15/13 21:59	05:39 09:51-10:40/49 21:15	06:36 19:30-19:34/4 07:41-08:41/60 20:03 09:20-11:27/127	07:31 17:26-18:12/46 18:47 09:19-11:11/112	07:33 13:50-15:04/74 16:37	08:27 14:22-14:47/25 15:57
7	04:54 21:02-21:16/14 21:58	05:41 09:48-10:42/54 21:13	06:38 09:18-11:27/129 20:01 07:40-08:40/60	07:33 17:25-18:12/47 09:20-11:09/109 18:45 15:26-15:42/16	07:35 13:50-15:04/74 16:35	08:28 14:24-14:45/21 15:57
8	04:55 21:02-21:16/14 21:58	05:42 09:47-10:45/58 21:11	06:40 09:18-11:27/129 19:58 07:40-08:40/60	07:35 17:24-18:12/48 09:21-11:08/107 18:42 15:20-15:47/27	07:37 13:51-15:03/72 16:33	08:30 14:26-14:44/18 15:56
9	04:56 21:01-21:17/16 21:57	05:44 09:46-10:48/62 21:09	06:41 09:18-11:28/130 19:56 07:40-08:39/59	07:37 17:23-18:10/47 09:22-11:06/104 18:40 15:16-15:50/34	07:39 13:51-15:03/72 16:31	08:31 14:29-14:42/13 15:56
10	04:57 21:01-21:17/16 21:56	05:46 09:44-10:51/67 21:07	06:43 09:18-11:28/130 19:53 07:40-08:39/59	07:39 17:21-18:07/46 09:22-11:05/103 18:38 15:13-15:53/40	07:41 13:52-15:03/71 16:30	08:32 14:31-14:40/9 15:55
11	04:58 21:01-21:17/16 21:55	05:48 09:42-10:52/70 21:05	06:45 09:16-11:27/131 19:51 07:39-08:38/59	07:41 17:20-18:05/45 09:23-11:03/100 18:35 15:10-15:55/45	07:43 13:53-15:03/70 16:28	08:34 15:55 15:55
12	04:59 21:01-21:18/17 21:54	05:50 09:41-10:55/74 21:02	06:47 09:16-11:28/132 19:48 07:39-08:37/58	07:43 17:21-18:02/41 09:25-11:02/97 18:33 15:07-15:56/49	07:45 13:53-15:02/69 16:26	08:35 15:55 15:55
13	05:01 21:01-21:17/16 21:53	05:52 09:40-10:57/77 21:00	06:49 18:54-19:03/9 07:39-08:37/58 19:46 09:16-11:28/132	07:45 17:20-18:01/41 09:26-11:00/94 18:30 15:05-15:58/53	07:47 13:53-15:01/68 16:24	08:36 15:55 15:55
14	05:02 21:00-21:16/16 21:52	05:53 09:38-10:59/81 20:58	06:51 18:52-19:05/13 07:40-08:36/56 19:43 09:16-11:28/132	07:47 17:20-17:58/38 09:27-10:58/91 18:28 15:03-15:59/56	07:49 13:54-15:01/67 16:23	08:37 15:55 15:55
15	05:03 21:01-21:15/14 21:51	05:55 09:37-11:01/84 20:56	06:52 18:49-19:05/16 07:40-08:35/55 19:41 09:16-11:28/132	07:49 17:20-17:56/36 09:28-10:56/88 18:25 15:01-16:00/59	07:51 13:56-15:01/65 16:21	08:38 15:55 15:55
16	05:05 21:01-21:14/13 21:50	05:57 09:36-11:03/87 20:54	06:54 18:48-19:05/17 07:40-08:33/53 19:38 09:15-11:27/132	07:51 17:20-17:51/31 09:30-10:54/84 18:23 15:00-16:00/60	07:52 13:56-15:01/65 16:19	08:39 15:55 15:55
17	05:06 21:01-21:13/12 21:48	05:59 09:36-11:05/89 20:51	06:56 18:48-19:06/18 07:40-08:32/52 19:35 09:15-11:26/131	07:53 17:21-17:50/29 09:31-10:52/81 18:21 14:58-16:01/63	07:54 13:57-15:00/63 16:18	08:40 15:55 15:55
18	05:07 21:02-21:12/10 21:47	06:01 09:34-11:06/92 20:49 08:08-08:20/12	06:58 18:47-19:04/17 07:41-08:31/50 19:33 09:15-11:26/131	07:55 17:21-17:48/27 09:33-10:49/76 18:18 14:57-16:02/65	07:56 13:58-14:59/61 16:16	08:41 15:55 15:55
19	05:09 21:02-21:11/9 21:46	06:03 09:33-11:08/95 20:47 08:04-08:25/21	07:00 18:47-19:02/15 07:42-08:30/48 19:30 09:15-11:26/131	07:57 17:22-17:45/23 09:35-10:47/72 18:16 14:56-16:02/66	07:58 13:59-14:59/60 16:15	08:41 15:55 15:55
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21	05:12 21:03-21:09/6 21:43	06:06 09:30-11:11/101 20:42 07:58-08:29/31	07:03 18:47-18:56/9 07:43-08:26/43 19:25 09:14-11:24/130	08:00 17:24-17:40/16 09:39-10:41/62 18:11 14:53-16:03/70	08:02 14:00-14:58/58 16:12	08:42 15:56 15:56
22	05:13 21:03-21:07/4 21:41	06:08 09:30-11:13/103 20:40 07:56-08:31/35	07:05 18:47-18:54/7 07:45-08:24/39 19:23 09:14-11:24/130	08:02 17:26-17:38/12 09:42-10:38/56 18:09 14:53-16:03/70	08:04 14:01-14:57/56 16:11	08:43 15:57 15:57
23	05:15 21:04-21:06/2 21:40	06:10 09:29-11:15/106 20:37 07:54-08:33/39	07:07 18:49-18:51/2 07:47-08:22/35 19:20 09:14-11:23/129	08:04 17:29-17:35/6 09:45-10:35/50 18:07 14:52-16:03/71	08:06 14:03-14:56/53 16:09	08:43 15:57 15:57
24	05:17 21:38	06:12 09:28-11:16/108 20:35 07:53-08:35/42	07:09 09:15-11:23/128 19:18 07:49-08:19/30	08:06 14:51-16:04/73 18:04 09:48-10:31/43	08:08 14:04-14:56/52 16:08	08:44 15:58 15:58
25	05:18 21:37	06:14 09:27-11:17/110 20:33 07:51-08:35/44	07:11 09:15-11:22/127 19:15 07:52-08:16/24	07:08 13:51-15:05/74 17:02 08:54-09:27/33	08:09 14:05-14:55/50 16:07	08:44 15:58 15:58
26	05:20 21:35	06:16 09:26-11:18/112 20:30 07:50-08:36/46	07:13 09:15-11:21/126 19:13 07:56-08:11/15	07:10 13:51-15:05/74 17:00 09:00-09:19/19	08:11 14:06-14:55/49 16:06	08:44 15:59 15:59
27	05:22 21:33	06:17 09:26-11:20/114 20:28 07:49-08:38/49	07:15 09:15-11:21/126 19:10	07:12 13:50-15:05/75 16:58	08:13 14:08-14:54/46 16:05	08:45 16:00 16:00
28	05:23 21:32	06:19 19:37-19:46/9 07:48-08:39/51 20:26 09:25-11:21/116	07:16 09:15-11:19/124 19:07	07:14 13:50-15:05/75 16:56	08:15 14:09-14:53/44 16:04	08:45 16:01 16:01
29	05:25 21:30	06:21 19:34-19:47/13 07:46-08:38/52 20:23 09:24-11:21/117	07:18 09:15-11:18/123 19:05	07:16 13:49-15:04/75 16:53	08:16 14:11-14:53/42 16:03	08:45 16:02 16:02
30	05:27 21:28	06:23 19:33-19:48/15 07:45-08:39/54 20:21 09:23-11:22/119	07:20 17:55-18:07/12 19:02 09:16-11:17/121	07:18 13:49-15:04/75 16:51	08:18 14:12-14:52/40 16:02	08:45 16:03 16:03
31	05:28 21:26	06:25 19:32-19:49/17 07:44-08:40/56 20:18 09:23-11:23/120	07:20 17:55-18:07/12 19:02 09:16-11:17/121	07:20 13:50-15:05/75 16:49	08:18 14:12-14:52/40 16:02	08:45 16:04 16:04
Potential sun hours	517	463	383	327	255	248
Sum of minutes with flicker	269	3124	5364	4492	1875	248

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

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

Project:

Exam_16.01

Licensed user:

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

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_Vestas WTG: 3 - 03_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (8)

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	08:45 16:05 08:45 16:06 08:44 17:00 16:07 17:02 08:44 17:02 16:09 17:04 08:44 17:04 16:10 17:06 08:43 17:08 16:13 17:10 08:42 17:13 16:14 17:15 08:41 17:16 16:17 17:17 08:39 17:19 16:20 17:21 08:39 17:23 16:22 17:23 08:38 17:25 16:24 17:25 08:37 17:27 16:25 17:27 08:36 17:29 16:27 17:29 08:35 17:31 16:29 17:31 08:33 17:33 16:31 17:33 08:32 17:35 16:32 17:35 08:31 17:37 16:34 17:37 08:30 17:40 16:36 17:40 08:28 17:42 16:38 17:42 08:27 17:44 16:40 17:44 08:26 17:46 16:42 17:46 08:24 17:48 16:44 17:48 08:23 17:50 16:46 17:50 08:21 17:52 16:48 17:52 08:20 17:54 16:50 17:54 08:18 17:55 16:52 17:55 08:16 17:56 16:54 17:56 08:15 17:57 16:56 17:57	08:13 16:58 08:11 17:00 17:02 08:07 17:04 08:06 17:06 08:04 17:08 08:02 17:10 08:00 15:16-15:33/17 07:58 15:09-15:39/30 17:15 07:56 15:05-15:44/39 17:17 07:54 15:02-15:47/45 17:19 07:52 14:59-15:50/51 17:21 07:49 14:56-15:52/56 17:23 07:47 14:54-15:55/61 17:25 07:45 14:52-15:57/65 07:43 14:49-15:59/70 17:29 07:41 14:47-16:01/74 17:31 07:39 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Project:

Exam_16.01

Licensed user:

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

- -

student / weti-lab-vt10@hs-flensburg.de

Calculated:

2/5/2025 10:56 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_Vestas WTG: 3 - 03_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (8)

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	04:48 05:29-05:56/27 22:02	05:30 20:25-20:51/26 21:25	06:27 17:35-18:10/35 15:37-16:59/82 06:56-07:35/39	07:22 17:10-18:08/58 08:03-08:39/36	07:22 14:36-15:12/36	08:19
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19	05:09 20:26-20:52/26 21:46 05:42-05:55/13	06:03 19:22-19:51/29 20:47 07:11-07:31/20	07:00 17:10-18:18/68 07:55-08:55/60	07:57 15:10-16:40/90	07:58	08:41
20	05:10 20:25-20:52/27 21:44 05:43-05:54/11	06:04 19:21-19:51/30 20:44 07:10-07:33/23	07:02 17:09-18:16/67 07:55-08:55/60	07:58 15:11-16:39/88	08:00	08:42
21	05:12 20:25-20:53/28 21:43 05:45-05:54/9	06:06 19:20-19:51/31 07:07-07:33/26 20:42 16:17-16:37/20	07:03 17:08-18:16/68 07:55-08:53/58	08:00 15:12-16:37/85	08:02	08:42
22	05:13 20:25-20:53/28 21:41 05:46-05:53/7	06:08 19:19-19:51/32 07:06-07:34/28 20:40 16:11-16:42/31	07:05 17:08-18:16/68 07:55-08:52/57	08:02 15:13-16:35/82	08:04	08:43
23	05:15 20:25-20:54/29 21:40 05:48-05:52/4	06:10 19:19-19:52/33 07:05-07:35/30 20:37 16:06-16:45/39	07:07 17:08-18:15/67 07:55-08:52/57	08:04 15:14-16:34/80	08:06	08:43
24	05:17 20:24-20:54/30 21:38 05:49-05:50/1	06:12 19:19-19:52/33 07:04-07:36/32 20:35 16:02-16:48/46	07:09 17:08-18:15/67 07:56-08:51/55	08:06 15:16-16:32/76	08:08	08:44
25	05:18 20:25-20:54/29 21:37	06:14 19:18-19:51/33 07:02-07:36/34 20:33 15:57-16:50/53	07:11 17:08-18:14/66 07:57-08:50/53	08:08 14:18-15:31/73	08:09	08:44
26	05:20 20:24-20:54/30 21:35	06:15 19:18-19:51/33 08:27-08:36/9 20:30 15:54-16:52/58 07:00-07:36/36	07:13 17:09-18:14/65 07:57-08:48/51	07:10 14:20-15:29/69	08:11	08:44
27	05:21 20:25-20:54/29 21:33	06:17 19:18-19:51/33 08:21-08:41/20 20:28 15:51-16:53/62 06:59-07:37/38	07:14 17:08-18:12/64 07:57-08:46/49	07:12 14:22-15:26/64	08:13	08:45
28	05:23 20:24-20:54/30 21:32	06:19 19:18-19:50/32 08:18-08:45/27 20:25 15:48-16:55/67 06:58-07:37/39	07:16 17:08-18:11/63 07:58-08:44/46	07:14 14:24-15:24/60	08:15	08:45
29	05:25 20:25-20:54/29 21:30	06:21 17:46-18:00/14 15:45-16:55/70 06:57-07:36/39 20:23 19:18-19:49/31 08:15-08:46/31	07:17 17:09-18:10/61 08:00-08:43/43	07:16 14:26-15:21/55	08:16	08:45
30	05:27 20:24-20:53/29 21:28	06:23 17:41-18:05/24 15:42-16:57/75 06:56-07:36/40 20:21 19:18-19:48/30 08:13-08:49/36	07:20 17:09-18:09/60 08:01-08:41/40	07:18 14:28-15:18/50	08:18	08:45
31	05:28 20:25-20:53/28 21:26	06:25 17:37-18:08/31 15:40-16:58/78 06:56-07:36/40 20:18 19:19-19:47/28 08:11-08:50/39	07:22 15:02-16:58/116	07:20 14:32-15:16/44	08:20	08:45
Potential sun hours	518	463	383	327	255	228
Sum of minutes with flicker	1057	1953	7005	3399	78	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: Shadow_Vestas WTG: 4 - 04_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (9)

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	08:45 16:05	08:13 15:43-16:07/24 08:42-08:44/2 16:58 09:13-09:27/14	07:13 16:42-16:52/10 17:56	06:56 19:57	05:45 06:13-06:40/27 20:54 19:37-20:13/36	04:53 21:46
2	08:45 16:06	08:11 15:44-16:07/23 08:40-08:45/5 17:00 09:15-09:25/10	07:11 07:36-07:40/4 17:58	06:53 19:58	05:42 06:13-06:40/27 20:56 19:37-20:13/36	04:52 20:43-20:53/10 21:48
3	08:44 16:07	08:09 15:45-16:07/22 17:02 08:38-08:47/9	07:08 07:34-07:44/10 18:00	06:51 20:00	05:40 06:14-06:39/25 20:58 19:36-20:13/37	04:51 20:41-20:56/15 21:49
4	08:44 16:09	08:07 15:47-16:06/19 17:04 08:36-08:47/11	07:06 07:31-07:45/14 18:02	06:48 20:02	05:38 06:14-06:39/25 21:00 19:36-20:13/37	04:50 20:39-20:58/19 21:50
5	08:44 16:10	08:05 15:47-16:04/17 17:06 08:34-08:48/14	07:04 07:29-07:46/17 18:04	06:46 20:04	05:36 06:14-06:38/24 21:02 19:36-20:12/36	04:49 20:38-21:00/22 21:51
6	08:43 16:11	08:04 15:49-16:02/13 17:08 08:32-08:49/17	07:01 07:26-07:47/21 18:06	06:43 20:06	05:34 06:15-06:37/22 21:04 19:36-20:12/36	04:49 20:36-21:01/25 21:52
7	08:43 16:13	08:02 15:52-16:00/8 17:11 08:29-08:48/19	06:59 07:23-07:47/24 18:08	06:41 20:08	05:32 06:15-06:36/21 21:05 19:36-20:12/36	04:48 20:35-21:02/27 21:53
8	08:42 09:16-09:18/2 16:14	08:00 08:27-08:48/21 17:13	06:56 07:21-07:48/27 18:10	06:39 20:10	05:30 06:17-06:36/19 21:07 19:36-20:11/35	04:47 20:35-21:04/29 21:54
9	08:42 09:16-09:21/5 16:16	07:58 08:27-08:48/21 17:15	06:54 07:20-07:47/27 18:12	06:36 20:12	05:28 06:18-06:34/16 21:09 19:37-20:11/34	04:47 20:35-21:05/30 21:55
10	08:41 09:15-09:22/7 16:17	07:56 08:28-08:48/20 17:17	06:51 07:20-07:48/28 18:14	06:34 20:14	05:26 06:20-06:32/12 21:11 19:38-20:11/33	04:46 20:34-21:05/31 21:56
11	08:40 09:14-09:23/9 16:19	07:54 16:43-16:48/5 17:19 08:28-08:48/20	06:49 07:19-07:47/28 18:16	06:31 20:16	05:24 06:22-06:29/7 21:13 19:38-20:10/32	04:46 20:34-21:06/32 21:57
12	08:39 09:13-09:24/11 16:20	07:52 16:40-16:50/10 17:21 08:29-08:48/19	06:46 07:20-07:47/27 18:18	06:29 20:18	05:22 19:38-20:09/31 21:15	04:45 20:33-21:06/33 21:58
13	08:38 09:12-09:25/13 16:22	07:49 16:39-16:52/13 17:23 08:30-08:46/16	06:44 07:20-07:46/26 18:20	06:26 20:20	05:21 19:40-20:09/29 21:16	04:45 20:33-21:07/34 21:58
14	08:38 09:10-09:25/15 16:24	07:47 16:38-16:55/17 17:25 08:31-08:44/13	06:41 07:20-07:45/25 18:22	06:24 20:22	05:19 19:40-20:08/28 21:18	04:44 20:33-21:08/35 21:59
15	08:37 15:46-15:48/2 16:25 09:09-09:26/17	07:45 16:37-16:58/21 17:27 08:34-08:42/8	06:39 07:21-07:44/23 18:24	06:21 20:23	05:17 19:42-20:07/25 21:20	04:44 20:33-21:09/36 22:00
16	08:36 15:45-15:51/6 16:27 09:08-09:27/19	07:43 16:36-16:59/23 17:29	06:36 07:22-07:43/21 18:26	06:19 20:25	05:15 19:42-20:06/24 21:22	04:44 20:33-21:09/36 22:00
17	08:35 15:44-15:53/9 16:29 09:07-09:28/21	07:41 16:35-17:02/27 17:31	06:34 07:23-07:40/17 18:28	06:17 20:27	05:14 19:43-20:04/21 21:23	04:44 20:33-21:10/37 22:01
18	08:33 15:43-15:54/11 16:31 09:05-09:28/23	07:39 16:35-17:03/28 17:33	06:31 07:25-07:38/13 18:30	06:14 20:29	05:12 19:45-20:03/18 21:25	04:44 20:33-21:10/37 22:01
19	08:32 15:43-15:57/14 16:33 09:04-09:29/25	07:36 16:34-17:02/28 17:35	06:29 18:31	06:12 20:31	05:10 19:47-20:02/15 21:27	04:44 20:33-21:10/37 22:02
20	08:31 15:42-15:58/16 16:34 09:04-09:29/25	07:34 16:34-17:03/29 17:38	06:26 18:33	06:09 19:52-20:01/9 20:33	05:09 19:49-19:59/10 21:28	04:44 20:33-21:10/37 22:02
21	08:30 15:42-16:01/19 16:36 09:04-09:30/26	07:32 16:35-17:03/28 17:40	06:24 18:35	06:07 06:32-06:34/2 20:35 19:48-20:04/16	05:07 21:30	04:44 20:33-21:11/38 22:02
22	08:28 15:41-16:03/22 16:38 09:04-09:30/26	07:30 16:34-17:02/28 17:42	06:21 18:37	06:05 06:30-06:36/6 20:37 19:46-20:07/21	05:06 21:32	04:44 20:33-21:11/38 22:02
23	08:27 15:42-16:05/23 16:40 09:05-09:31/26	07:27 16:35-17:02/27 17:44	06:19 18:39	06:02 06:28-06:38/10 20:39 19:44-20:08/24	05:04 21:33	04:44 20:34-21:11/37 22:03
24	08:26 15:41-16:06/25 16:42 09:05-09:31/26	07:25 16:36-17:02/26 17:46	06:16 18:41	06:00 06:26-06:39/13 20:41 19:43-20:10/27	05:03 21:35	04:45 20:34-21:11/37 22:03
25	08:24 15:41-16:06/25 16:44 09:05-09:30/25	07:23 16:36-17:00/24 17:48	06:14 18:43	05:58 06:24-06:40/16 20:43 19:41-20:10/29	05:01 21:36	04:45 20:34-21:11/37 22:03
26	08:23 15:42-16:07/25 16:46 09:06-09:31/25	07:20 16:37-17:00/23 17:50	06:11 18:45	05:56 06:21-06:39/18 20:45 19:40-20:11/31	05:00 21:38	04:45 20:35-21:11/36 22:03
27	08:21 15:41-16:07/26 16:48 09:07-09:31/24	07:18 16:38-16:58/20 17:52	06:09 18:47	05:53 06:19-06:40/21 20:46 19:39-20:11/32	04:59 21:39	04:46 20:35-21:11/36 22:03
28	08:19 15:41-16:07/26 16:50 09:07-09:30/23	07:16 16:40-16:56/16 17:54	06:06 18:49	05:51 06:17-06:40/23 20:48 19:38-20:12/34	04:57 21:41	04:46 20:36-21:11/35 22:02
29	08:18 15:42-16:07/25 16:52 09:08-09:29/21		07:04 19:51	05:49 06:15-06:40/25 20:50 19:38-20:12/34	04:56 21:42	04:47 20:36-21:11/35 22:02
30	08:16 15:42-16:07/25 16:54 09:09-09:29/20		07:01 19:53	05:47 06:13-06:40/27 20:52 19:37-20:13/36	04:55 21:44	04:48 20:37-21:11/34 22:02
31	08:14 15:42-16:07/25 16:56 09:11-09:28/17		06:59 19:55		04:54 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	775	758	362	454	814	925

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: Shadow_Vestas WTG: 4 - 04_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (9)

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	04:48 20:38-21:11/33	05:30 19:48-20:20/32	06:27	07:22 07:59-08:26/27	07:22 07:57-08:18/21	08:19 08:56-09:05/9
	22:02	21:25	20:16	19:00	16:47	16:01
2	04:49 20:39-21:11/32	05:32 06:31-06:40/9	06:28	07:24 07:58-08:26/28	07:24 07:57-08:18/21	08:21 08:57-09:04/7
	22:01	21:23 19:48-20:20/32	20:13	18:57	16:45	16:00
3	04:50 20:39-21:09/30	05:34 06:29-06:43/14	06:30	07:26 07:58-08:26/28	07:26 07:57-08:18/21	08:23 08:59-09:04/5
	22:01	21:21 19:48-20:21/33	20:11	18:55	16:43	15:59
4	04:51 20:40-21:09/29	05:35 06:28-06:45/17	06:32	07:28 07:58-08:25/27	07:28 15:21-15:30/9	08:24 09:01-09:04/3
	22:00	21:19 19:47-20:21/34	20:08	18:52	16:41 07:59-08:18/19	15:58
5	04:52 20:41-21:09/28	05:37 06:26-06:45/19	06:34	07:30 07:58-08:25/27	07:30 15:19-15:33/14	08:26
	22:00	21:17 19:46-20:22/36	20:06	18:50	16:39 08:02-08:18/16	15:58
6	04:53 20:42-21:08/26	05:39 06:25-06:47/22	06:36	07:31 07:59-08:24/25	07:33 15:18-15:35/17	08:27
	21:59	21:15 19:46-20:22/36	20:03	18:47	16:37 08:04-08:18/14	15:57
7	04:54 20:44-21:07/23	05:41 06:25-06:48/23	06:38	07:33 08:01-08:23/22	07:35 15:16-15:36/20	08:28
	21:58	21:13 19:45-20:22/37	20:01	18:45	16:35 08:06-08:17/11	15:57
8	04:55 20:45-21:06/21	05:42 06:23-06:47/24	06:39	07:35 08:03-08:22/19	07:37 15:15-15:37/22	08:30
	21:57	21:11 19:45-20:22/37	19:58	18:42	16:33 08:08-08:16/8	15:56
9	04:56 20:47-21:04/17	05:44 06:23-06:48/25	06:41	07:37 08:05-08:21/16	07:39 15:14-15:37/23 08:11-08:16/5	08:31
	21:57	21:09 19:46-20:22/36	19:56	18:40	16:31 08:45-08:55/10	15:56
10	04:57 20:49-21:02/13	05:46 06:23-06:49/26	06:43	07:39 08:07-08:19/12	07:41 15:15-15:39/24 08:13-08:15/2	08:32
	21:56	21:07 19:45-20:21/36	19:53	18:37	16:30 08:43-08:58/15	15:55
11	04:58 20:54-20:58/4	05:48 06:22-06:48/26	06:45	07:41 08:09-08:16/7	07:43 15:14-15:39/25	08:33
	21:55	21:04 19:45-20:21/36	19:51	18:35	16:28 08:42-08:59/17	15:55
12	04:59	05:50 06:22-06:48/26	06:47	07:43 17:19-17:22/3	07:45 15:14-15:39/25	08:35
	21:54	21:02 19:45-20:21/36	19:48	18:33 08:11-08:12/1	16:26 08:41-09:00/19	15:55
13	05:01	05:52 06:22-06:49/27	06:49	07:45 17:14-17:27/13	07:46 15:13-15:39/26	08:36
	21:53	21:00 19:46-20:21/35	19:46	18:30	16:24 08:40-09:01/21	15:55
14	05:02	05:53 06:23-06:48/25	06:50	07:47 17:11-17:29/18	07:48 15:13-15:39/26	08:37
	21:52	20:58 19:45-20:20/35	19:43	18:28	16:23 08:39-09:02/23	15:55
15	05:03	05:55 06:25-06:48/23	06:52	07:49 17:10-17:31/21	07:50 15:13-15:39/26	08:38
	21:51	20:56 19:46-20:19/33	19:41	18:25	16:21 08:40-09:03/23	15:55
16	05:05	05:57 06:27-06:47/20	06:54	07:51 17:09-17:32/23	07:52 15:15-15:40/25	08:39
	21:49	20:54 19:47-20:19/32	19:38	18:23	16:19 08:39-09:04/25	15:55
17	05:06	05:59 06:29-06:47/18	06:56	07:53 17:08-17:33/25	07:54 15:15-15:40/25	08:39
	21:48	20:51 19:46-20:17/31	19:35	18:21	16:18 08:39-09:04/25	15:55
18	05:07	06:01 06:30-06:45/15	06:58	07:55 17:07-17:33/26	07:56 15:15-15:40/25	08:40
	21:47	20:49 19:47-20:16/29	19:33	18:18	16:16 08:39-09:04/25	15:55
19	05:09	06:03 06:32-06:44/12	07:00	07:56 17:06-17:33/27	07:58 15:16-15:39/23	08:41
	21:46	20:47 19:49-20:15/26	19:30	18:16	16:15 08:39-09:05/26	15:55
20	05:10	06:04 06:34-06:43/9	07:02	07:58 17:05-17:33/28	08:00 15:16-15:38/22	08:42
	21:44	20:44 19:50-20:14/24	19:28	18:14	16:13 08:39-09:05/26	15:56
21	05:12	06:06 06:35-06:41/6	07:03	08:00 17:05-17:33/28	08:02 15:17-15:36/19	08:42
	21:43	20:42 19:51-20:11/20	19:25	18:11	16:12 08:39-09:05/26	15:56
22	05:13	06:08 06:37-06:38/1	07:05	08:02 17:05-17:33/28	08:04 15:18-15:34/16	08:43
	21:41	20:40 19:53-20:09/16	19:23	18:09	16:11 08:40-09:05/25	15:57
23	05:15 20:02-20:08/6	06:10 19:57-20:04/7	07:07	08:04 17:05-17:33/28	08:06 15:19-15:33/14	08:43
	21:40	20:37	19:20	18:07	16:09 08:40-09:05/25	15:57
24	05:17 19:58-20:11/13	06:12	07:09	08:06 17:05-17:32/27	08:07 15:20-15:32/12	08:44
	21:38	20:35	19:18	18:04	16:08 08:42-09:05/23	15:58
25	05:18 19:57-20:13/16	06:14	07:11 08:09-08:20/11	07:08 16:05-16:30/25	08:09 15:21-15:30/9	08:44
	21:37	20:33	19:15	17:02	16:07 08:44-09:05/21	15:58
26	05:20 19:55-20:14/19	06:16	07:13 08:06-08:22/16	07:10 16:06-16:29/23	08:11 15:23-15:29/6	08:44
	21:35	20:30	19:13	17:00	16:06 08:46-09:05/19	15:59
27	05:22 19:54-20:16/22	06:17	07:14 08:04-08:24/20	07:12 16:07-16:26/19	08:13 15:25-15:28/3	08:45
	21:33	20:28	19:10	16:58 08:03-08:12/9	16:05 08:48-09:05/17	16:00
28	05:23 19:52-20:17/25	06:19	07:16 08:02-08:24/22	07:14 16:08-16:24/16	08:14 08:50-09:05/15	08:45
	21:32	20:25	19:07	16:56 08:01-08:14/13	16:04	16:01
29	05:25 19:51-20:18/27	06:21	07:18 08:01-08:25/24	07:16 16:09-16:21/12	08:16 08:52-09:05/13	08:45
	21:30	20:23	19:05	16:53 07:59-08:15/16	16:03	16:02
30	05:27 19:50-20:18/28	06:23	07:20 08:00-08:25/25	07:18 16:10-16:19/9	08:18 08:54-09:05/11	08:45
	21:28	20:21	19:02	16:51 07:58-08:16/18	16:02	16:03
31	05:28 19:50-20:20/30	06:25		07:20 16:13-16:17/4		08:45
	21:26	20:18		16:49 07:58-08:18/20		16:04
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	442	1096	118	718	1044	24

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: Shadow_Vestas WTG: 5 - 05_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (10)

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	08:45 13:34-14:20/46 16:05 10:17-10:36/19	08:13 14:57-15:54/57 16:58 08:46-09:08/22	07:13 15:05-15:48/43 17:56 07:38-07:51/13	06:56 19:56	05:45 20:54	04:53 21:46
2	08:45 13:35-14:20/45 16:06 10:17-10:36/19	08:11 14:57-15:55/58 17:00 08:47-09:08/21	07:11 15:08-15:47/39 17:58 07:38-07:50/12	06:53 19:58	05:42 20:56	04:52 21:47
3	08:44 13:36-14:21/45 16:07 10:18-10:36/18	08:09 14:57-15:56/59 17:02 08:47-09:07/20	07:08 15:10-15:44/34 18:00 07:40-07:49/9	06:51 20:00	05:40 20:58	04:51 21:49
4	08:44 13:36-14:21/45 16:09 10:19-10:35/16	08:07 14:56-15:56/60 17:04 08:48-09:07/19	07:06 15:13-15:41/28 18:02	06:48 20:02	05:38 21:00	04:50 21:50
5	08:44 13:37-14:22/45 16:10 10:21-10:35/14	08:05 14:56-15:57/61 17:06 08:49-09:06/17	07:04 15:16-15:37/21 18:04	06:46 20:04	05:36 21:02	04:49 21:51
6	08:43 13:38-14:22/44 16:11 10:22-10:34/12	08:04 14:55-15:57/62 17:08 08:50-09:04/14	07:01 15:25-15:29/4 18:06	06:43 20:06	05:34 21:03	04:48 21:52
7	08:43 13:38-14:22/44 16:13 10:24-10:33/9	08:02 14:55-15:58/63 17:10 08:52-09:02/10	06:59 18:08	06:41 20:08	05:32 21:05	04:48 21:53
8	08:42 13:38-14:22/44 16:14 10:26-10:30/4	08:00 14:55-15:58/63 17:13	06:56 18:10	06:38 20:10	05:30 21:07	04:47 21:54
9	08:42 13:39-14:22/43 16:16	07:58 14:55-15:59/64 17:15	06:54 18:12	06:36 20:12	05:28 21:09	04:46 21:55
10	08:41 13:40-14:23/43 16:17	07:56 14:55-15:59/64 17:17	06:51 18:14	06:34 20:14	05:26 21:11	04:46 21:56
11	08:40 13:41-14:23/42 16:19	07:54 14:55-16:00/65 17:19	06:49 18:16	06:31 20:16	05:24 21:13	04:45 21:57
12	08:39 13:42-14:24/42 16:20	07:52 14:54-15:59/65 17:21	06:46 18:18	06:29 20:18	05:22 21:15	04:45 21:58
13	08:38 13:41-14:23/42 16:22	07:49 14:55-15:59/64 17:23	06:44 18:20	06:26 20:20	05:21 21:16	04:45 21:58
14	08:38 13:42-14:23/41 16:24	07:47 14:55-16:00/65 17:25	06:41 18:22	06:24 20:21	05:19 21:18	04:44 21:59
15	08:37 13:43-14:23/40 16:25	07:45 14:55-16:00/65 17:27 08:12-08:14/2	06:39 18:24	06:21 20:23	05:17 21:20	04:44 22:00
16	08:36 15:16-15:28/12 16:27 13:45-14:23/38	07:43 14:55-15:59/64 17:29 08:10-08:15/5	06:36 18:26	06:19 20:25	05:15 21:22	04:44 22:00
17	08:34 15:13-15:31/18 16:29 13:46-14:23/37	07:41 14:55-15:59/64 17:31 08:07-08:15/8	06:34 18:28	06:17 20:27	05:13 21:23	04:44 22:01
18	08:33 15:11-15:34/23 16:31 13:46-14:22/36	07:39 14:56-15:59/63 17:33 08:05-08:16/11	06:31 06:56-06:58/2 18:29	06:14 20:29	05:12 21:25	04:44 22:01
19	08:32 15:09-15:37/28 16:32 13:48-14:22/34	07:36 14:56-15:58/62 17:35 08:03-08:17/14	06:29 06:53-06:58/5 18:31	06:12 20:31	05:10 21:27	04:44 22:02
20	08:31 15:07-15:38/31 16:34 13:48-14:21/33	07:34 14:57-15:58/61 17:37 08:00-08:16/16	06:26 06:51-06:59/8 18:33	06:09 06:35-06:38/3 20:33	05:09 21:28	04:44 22:02
21	08:30 15:07-15:41/34 16:36 13:50-14:21/31	07:32 14:57-15:58/61 17:40 07:58-08:16/18	06:24 06:48-06:59/11 18:35	06:07 06:32-06:38/6 20:35	05:07 21:30	04:44 22:02
22	08:28 15:05-15:42/37 08:59-09:01/2 16:38 13:51-14:20/29	07:30 14:57-15:56/59 17:42 07:58-08:15/17	06:21 06:45-06:58/13 18:37	06:05 06:30-06:38/8 20:37	05:06 21:32	04:44 22:02
23	08:27 15:05-15:44/39 08:58-09:03/5 16:40 13:53-14:20/27	07:27 14:59-15:56/57 17:44 07:59-08:14/15	06:19 06:43-06:59/16 18:39	06:02 06:28-06:38/10 20:39	05:04 21:33	04:44 22:03
24	08:26 15:03-15:46/43 08:56-09:04/8 16:42 13:55-14:18/23	07:25 15:00-15:55/55 07:51-07:52/1 17:46 08:01-08:13/12	06:16 06:41-06:57/16 18:41	06:00 06:26-06:38/12 20:41	05:03 21:35	04:45 22:03
25	08:24 15:02-15:47/45 08:54-09:04/10 16:44 13:57-14:16/19	07:23 15:00-15:54/54 07:48-07:52/4 17:48 08:02-08:10/8	06:14 06:42-06:57/15 18:43	05:58 06:24-06:37/13 20:43	05:01 21:36	04:45 22:03
26	08:23 15:02-15:49/47 08:53-09:06/13 16:46 14:01-14:14/13	07:20 15:02-15:53/51 17:50 07:46-07:53/7	06:11 06:42-06:55/13 18:45	05:56 06:21-06:36/15 20:45	05:00 21:38	04:45 22:03
27	08:21 15:01-15:50/49 16:48 08:51-09:06/15	07:18 15:02-15:51/49 17:52 07:43-07:52/9	06:09 06:45-06:53/8 18:47	05:53 06:22-06:35/13 20:46	04:59 21:39	04:46 22:03
28	08:19 15:00-15:51/51 16:50 08:49-09:07/18	07:16 15:04-15:50/46 17:54 07:41-07:52/11	06:06 18:49	05:51 06:23-06:33/10 20:48	04:57 21:41	04:46 22:02
29	08:18 14:59-15:51/52 16:52 08:47-09:07/20		07:04 19:51	05:49 06:26-06:30/4 20:50	04:56 21:42	04:47 22:02
30	08:16 14:59-15:52/53 16:54 08:45-09:07/22		07:01 19:53	05:47 20:52	04:55 21:44	04:48 22:02
31	08:14 14:58-15:53/55 16:56 08:46-09:08/22		06:58 19:55		04:54 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	1834	1962	310	94	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: Shadow_Vestas WTG: 5 - 05_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (10)

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	04:48	05:30	06:27	07:22	07:22 14:25-15:29/64	08:19 13:23-14:05/42
	22:02	21:24	20:16	19:00	16:47	16:01
2	04:49	05:32	06:28	07:24	07:24 14:25-15:29/64	08:21 13:22-14:05/43
	22:01	21:23	20:13	18:57	16:45	16:00
3	04:50	05:33	06:30	07:26	07:26 14:25-15:28/63	08:23 13:23-14:06/43
	22:01	21:21	20:11	18:55	16:43 08:25-08:28/3	15:59
4	04:51	05:35	06:32	07:28	07:28 14:25-15:28/63	08:24 13:23-14:07/44
	22:00	21:19	20:08	18:52	16:41 08:21-08:32/11	15:58 10:12-10:15/3
5	04:52	05:37	06:34	07:29	07:30 14:26-15:28/62	08:26 13:23-14:07/44
	22:00	21:17	20:06	18:50	16:39 08:20-08:35/15	15:58 10:09-10:18/9
6	04:53	05:39	06:36	07:31	07:32 14:26-15:27/61	08:27 13:24-14:08/44
	21:59	21:15	20:03	18:47	16:37 08:19-08:36/17	15:57 10:08-10:20/12
7	04:54	05:41	06:38	07:33	07:34 14:27-15:27/60	08:28 13:24-14:08/44
	21:58	21:13	20:01	18:45	16:35 08:18-08:37/19	15:57 10:07-10:21/14
8	04:55	05:42	06:39	07:35 15:55-16:09/14	07:36 14:27-15:26/59	08:30 13:24-14:09/45
	21:57	21:11	19:58	18:42	16:33 08:17-08:37/20	15:56 10:07-10:23/16
9	04:56	05:44	06:41	07:37 15:49-16:14/25	07:38 14:28-15:25/57	08:31 13:24-14:09/45
	21:57	21:09	19:56	18:40	16:31 08:17-08:37/20	15:56 10:06-10:24/18
10	04:57	05:46	06:43	07:39 15:45-16:17/32	07:40 14:29-15:26/57	08:32 13:24-14:09/45
	21:56	21:07	19:53	18:37 08:16-08:22/6	16:29 08:17-08:39/22	15:55 10:06-10:25/19
11	04:58	05:48	06:45	07:41 15:42-16:19/37	07:42 14:30-15:25/55	08:33 13:26-14:11/45
	21:55	21:04	19:51	18:35 08:13-08:24/11	16:28 08:17-08:39/22	15:55 10:07-10:26/19
12	04:59	05:50	06:47	07:43 15:40-16:20/40	07:44 14:30-15:24/54	08:35 13:26-14:11/45
	21:54	21:02	19:48	18:33 08:12-08:25/13	16:26 08:17-08:39/22	15:55 10:07-10:27/20
13	05:01	05:52	06:49	07:45 15:38-16:22/44	07:46 14:31-15:23/52	08:36 13:26-14:11/45
	21:53	21:00	19:46	18:30 08:13-08:25/12	16:24 08:19-08:39/20	15:55 10:06-10:28/22
14	05:02	05:53 06:33-06:39/6	06:50	07:47 15:36-16:23/47	07:48 14:32-15:22/50	08:37 13:26-14:12/46
	21:52	20:58	19:43	18:28 08:15-08:26/11	16:23 08:21-08:38/17	15:55 10:07-10:28/21
15	05:03	05:55 06:30-06:41/11	06:52	07:49 15:35-16:25/50	07:50 14:33-15:22/49	08:38 13:27-14:12/45
	21:51	20:56	19:40	18:25 08:17-08:25/8	16:21 08:24-08:39/15	15:55 10:07-10:29/22
16	05:05	05:57 06:29-06:42/13	06:54 07:34-07:40/6	07:51 15:33-16:26/53	07:52 14:35-15:22/47 08:26-08:39/13	08:39 13:27-14:13/46
	21:49	20:53	19:38	18:23 08:19-08:25/6	16:19 13:34-13:47/13	15:55 10:07-10:30/23
17	05:06	05:59 06:29-06:43/14	06:56 07:31-07:43/12	07:53 15:32-16:26/54 08:21-08:24/3	07:54 14:36-15:21/45 08:28-08:38/10	08:39 13:28-14:13/45
	21:48	20:51	19:35	18:21 08:33-08:43/10	16:18 13:31-13:50/19	15:55 10:08-10:30/22
18	05:07	06:01 06:30-06:43/13	06:58 07:30-07:44/14	07:54 15:31-16:27/56	07:56 14:37-15:19/42 08:30-08:38/8	08:40 13:29-14:14/45
	21:47	20:49	19:33	18:18 08:31-08:45/14	16:16 13:29-13:52/23	15:55 10:08-10:31/23
19	05:09	06:03 06:32-06:43/11	07:00 07:28-07:45/17	07:56 15:30-16:27/57	07:58 14:39-15:18/39 08:32-08:37/5	08:41 13:28-14:14/46
	21:46	20:47	19:30	18:16 08:30-08:46/16	16:15 13:27-13:54/27	15:55 10:08-10:31/23
20	05:10	06:04 06:34-06:44/10	07:01 07:29-07:45/16	07:58 15:29-16:28/59	08:00 14:40-15:17/37 08:34-08:36/2	08:42 13:29-14:15/46
	21:44	20:44	19:28	18:14 08:29-08:46/17	16:13 13:26-13:55/29	15:56 10:09-10:32/23
21	05:12	06:06 06:35-06:42/7	07:03 07:30-07:44/14	08:00 15:28-16:28/60	08:02 14:42-15:16/34	08:42 13:29-14:15/46
	21:43	20:42	19:25	18:11 08:29-08:46/17	16:12 13:25-13:56/31	15:56 10:09-10:33/24
22	05:13	06:08 06:37-06:42/5	07:05 07:32-07:44/12	08:02 15:27-16:28/61	08:04 14:43-15:14/31	08:43 13:30-14:16/46
	21:41	20:40	19:23	18:09 08:31-08:46/15	16:11 13:24-13:57/33	15:57 10:09-10:33/24
23	05:15	06:10 06:39-06:42/3	07:07 07:34-07:43/9	08:04 15:26-16:28/62	08:06 14:45-15:13/28	08:43 13:30-14:16/46
	21:40	20:37	19:20	18:07 08:33-08:46/13	16:09 13:24-13:58/34	15:57 10:09-10:33/24
24	05:17	06:12	07:09 07:36-07:42/6	08:06 15:25-16:28/63	08:07 14:48-15:11/23	08:44 13:31-14:17/46
	21:38	20:35	19:18	18:04 08:35-08:45/10	16:08 13:23-13:59/36	15:58 10:11-10:34/23
25	05:18	06:14	07:11 07:38-07:41/3	07:08 14:25-15:28/63	08:09 14:51-15:09/18	08:44 13:32-14:17/45
	21:37	20:33	19:15	17:02 07:38-07:46/8	16:07 13:23-14:00/37	15:58 10:11-10:34/23
26	05:20	06:15	07:13	07:10 14:25-15:29/64	08:11 14:54-15:06/12	08:44 13:32-14:17/45
	21:35	20:30	19:12	17:00 07:40-07:45/5	16:06 13:23-14:01/38	15:59 10:11-10:34/23
27	05:21	06:17	07:14	07:12 14:25-15:29/64	08:13 13:22-14:02/40	08:45 13:32-14:18/46
	21:33	20:28	19:10	16:58 07:42-07:43/1	16:05	16:00 10:12-10:35/23
28	05:23	06:19	07:16	07:14 14:24-15:29/65	08:14 13:22-14:03/41	08:45 13:33-14:18/45
	21:32	20:25	19:07	16:56	16:03	16:01 10:13-10:35/22
29	05:25	06:21	07:18	07:16 14:24-15:29/65	08:16 13:23-14:04/41	08:45 13:33-14:19/46
	21:30	20:23	19:05	16:53	16:02	16:02 10:13-10:35/22
30	05:27	06:23	07:20	07:18 14:24-15:29/65	08:18 13:23-14:05/42	08:45 13:34-14:19/45
	21:28	20:21	19:02	16:51	16:02	16:03 10:14-10:35/21
31	05:28	06:25		07:20 14:24-15:28/64		08:45 13:35-14:20/45
	21:26	20:18		16:49		16:04 10:15-10:36/21
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	0	93	109	1460	1971	1953

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: Shadow_Vestas WTG: 6 - 06_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (11)

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	08:45 10:27-11:33/66 16:05	08:13 10:33-11:50/77 16:58 09:11-10:04/53	07:13 07:38-08:00/22 17:56	06:56 17:21-18:36/75 19:57	05:45 20:54	04:53 19:55-20:51/56 21:46 05:25-05:36/11
2	08:45 10:28-11:34/66 16:06	08:11 10:33-11:50/77 17:00 09:11-10:04/53	07:11 07:36-08:01/25 17:58	06:53 17:21-18:37/76 19:58	05:42 20:56	04:52 19:55-20:51/56 21:48 05:24-05:36/12
3	08:44 10:29-11:36/67 16:07	08:09 10:33-11:50/77 17:02 09:10-10:05/55	07:08 07:33-08:01/28 18:00	06:51 17:21-18:36/75 20:00	05:40 20:58	04:51 19:54-20:51/57 21:49 05:23-05:36/13
4	08:44 10:28-11:36/68 16:09	08:07 10:34-11:50/76 17:04 09:10-10:05/55	07:06 07:33-08:01/28 18:02	06:48 17:21-18:36/75 20:02	05:38 21:00	04:50 19:54-20:51/57 21:50 05:22-05:35/13
5	08:44 10:29-11:37/68 16:10	08:05 10:34-11:50/76 17:06 09:10-10:06/56	07:04 07:32-08:01/29 18:04	06:46 17:20-18:35/75 20:04	05:36 21:02	04:49 19:54-20:53/59 21:51 05:23-05:36/13
6	08:43 10:29-11:37/68 16:11	08:04 10:34-11:49/75 17:08 09:09-10:05/56	07:01 07:33-08:01/28 18:06	06:43 17:21-18:35/74 20:06	05:34 21:04	04:48 19:54-20:53/59 21:52 05:23-05:35/12
7	08:43 10:29-11:38/69 16:13	08:02 10:34-11:48/74 17:10 09:09-10:06/57	06:59 07:32-08:00/28 18:08	06:41 17:20-18:34/74 20:08	05:32 21:05	04:48 19:53-20:53/60 21:53 05:24-05:36/12
8	08:42 10:29-11:38/69 16:14	08:00 10:35-11:48/73 17:13 09:09-10:06/57	06:56 07:33-08:00/27 18:10	06:38 17:21-18:34/73 20:10	05:30 21:07	04:47 19:54-20:54/60 21:54 05:24-05:35/11
9	08:42 10:30-11:40/70 16:16	07:58 10:36-11:48/72 17:15 09:09-10:06/57	06:54 07:33-07:59/26 18:12	06:36 17:20-18:33/73 20:12	05:28 21:09	04:46 19:53-20:53/60 21:55 05:25-05:35/10
10	08:41 10:30-11:41/71 16:17	07:56 10:36-11:47/71 17:17 09:10-10:06/56	06:51 07:34-07:58/24 18:14	06:34 17:21-18:33/72 20:14	05:26 21:11	04:46 19:54-20:54/60 21:56 05:25-05:34/9
11	08:40 10:30-11:41/71 16:19	07:54 10:37-11:47/70 17:19 09:10-10:06/56	06:49 16:57-17:13/16 18:16 07:34-07:56/22	06:31 17:21-18:32/71 20:16	05:24 21:13	04:45 19:54-20:55/61 21:57 05:26-05:34/8
12	08:39 10:30-11:42/72 16:20	07:52 10:37-11:45/68 17:21 09:10-10:06/56	06:46 16:52-17:18/26 18:18 07:36-07:55/19	06:29 17:22-18:31/69 20:18	05:22 21:15	04:45 19:53-20:55/62 21:58 05:27-05:34/7
13	08:38 10:30-11:43/73 16:22	07:49 10:38-11:44/66 17:23 09:10-10:05/55	06:44 16:47-17:21/34 18:20 07:37-07:52/15	06:26 17:22-18:31/69 20:20	05:21 21:16	04:45 19:54-20:55/61 21:58 05:27-05:33/6
14	08:38 10:29-11:43/74 16:24	07:47 10:39-11:44/65 17:25 09:10-10:05/55	06:41 16:45-17:24/39 18:22 07:40-07:49/9	06:24 17:22-18:29/67 20:22	05:19 21:18	04:44 19:54-20:56/62 21:59 05:28-05:33/5
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16	08:36 10:30-11:44/74 16:27	07:43 10:41-11:41/60 17:29 09:11-10:04/53	06:36 16:40-17:28/48 18:26 07:01-07:07/6	06:19 17:25-18:28/63 20:25	05:15 20:11-20:31/20 21:22	04:44 19:54-20:57/63 22:00
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19	08:32 10:30-11:46/76 16:32	07:36 10:45-11:35/50 17:35 09:14-10:02/48	06:29 16:34-17:32/58 18:31 06:53-07:08/15	06:12 17:27-18:25/58 20:31	05:10 20:04-20:37/33 21:27	04:44 19:55-20:57/62 22:02
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24	08:26 10:31-11:48/77 16:42	07:25 11:03-11:17/14 17:46 09:19-09:55/36	06:16 16:27-17:35/68 18:41 06:40-07:06/26	06:00 17:35-18:17/42 20:41	05:03 19:59-20:44/45 21:35	04:45 19:56-20:58/62 22:03
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26	08:23 10:31-11:49/78 16:46	07:20 09:23-09:49/26 17:50 07:46-07:57/11	06:11 16:25-17:36/71 18:45 06:35-07:03/28	05:56 17:39-18:12/33 20:45	05:00 19:58-20:47/49 21:38	04:45 19:56-20:59/63 22:03
27	08:21 10:31-11:49/78 16:48	07:18 09:26-09:45/19 17:52 07:43-07:58/15	06:09 16:25-17:37/72 18:47 06:36-07:00/24	05:53 17:42-18:09/27 20:46	04:59 19:56-20:46/50 21:39	04:46 19:56-20:58/62 22:03
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29	08:18 10:31-11:49/78 16:52	07:15 09:33-09:39/6 17:54 07:41-07:59/18	06:05 16:23-17:36/73 18:48 06:37-06:49/12	05:50 17:45-18:06/21 20:47	04:56 19:55-20:48/53 21:42	04:47 19:57-20:58/61 22:02
30	08:16 10:31-11:49/78 16:54	07:14 09:33-09:39/6 17:54 07:41-07:59/18	06:04 16:23-17:36/73 18:47 06:37-06:49/12	05:49 17:45-18:06/21 20:46	04:55 19:55-20:49/54 21:44	04:48 19:57-20:59/62 22:02
31	08:14 10:32-11:49/77 16:56	07:13 09:33-09:39/6 17:54 07:41-07:59/18	06:03 16:23-17:36/73 18:46 06:37-06:49/12	05:48 17:45-18:06/21 20:45	04:54 19:54-20:49/55 21:45	04:49 19:57-20:59/62 22:02
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	2941	2837	1788	1840	742	1981

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: Shadow_Vestas WTG: 6 - 06_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (11)

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

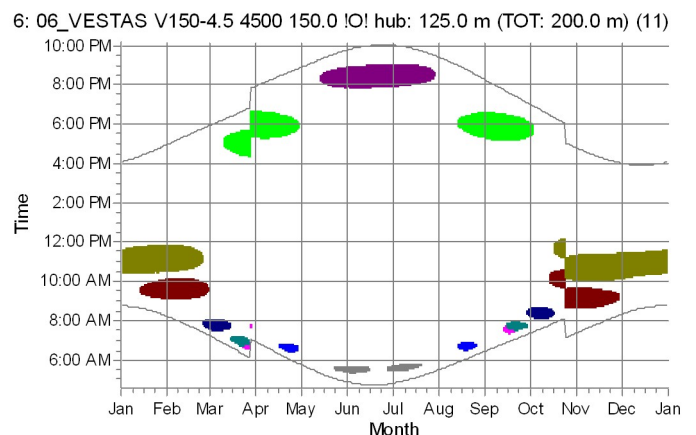
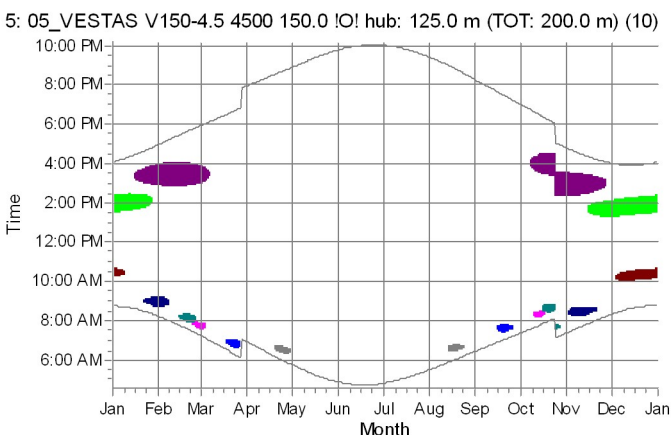
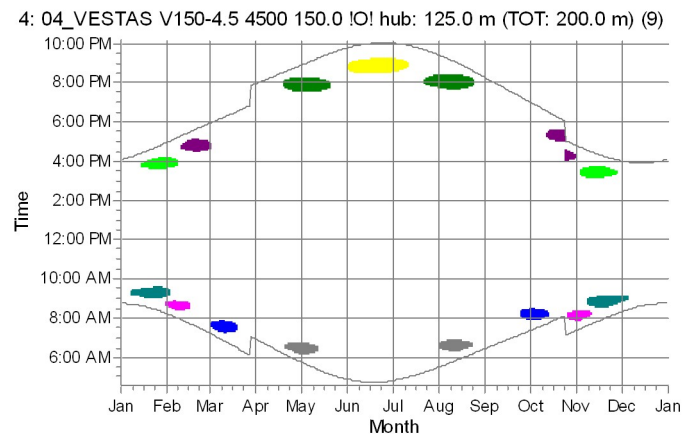
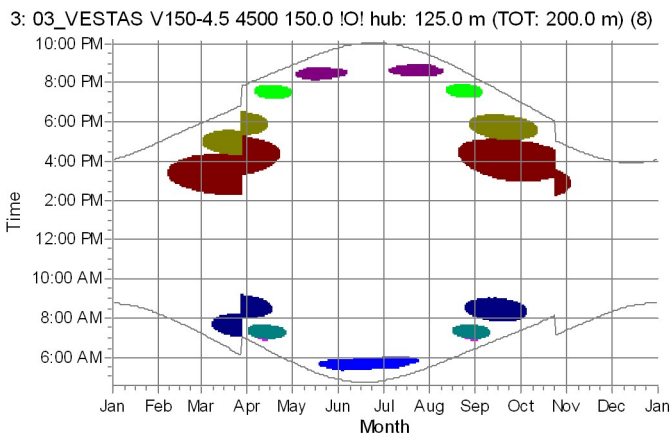
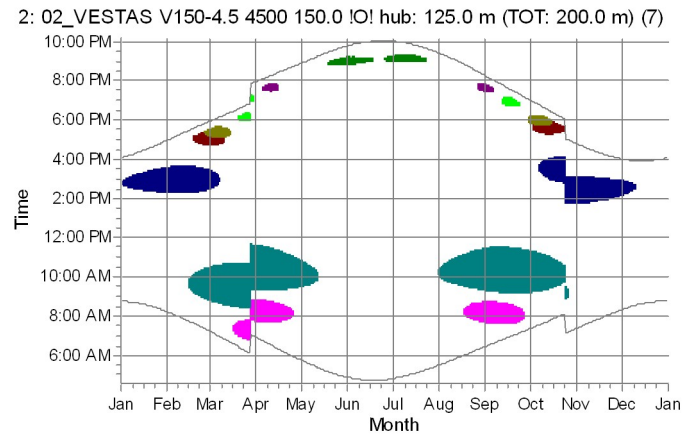
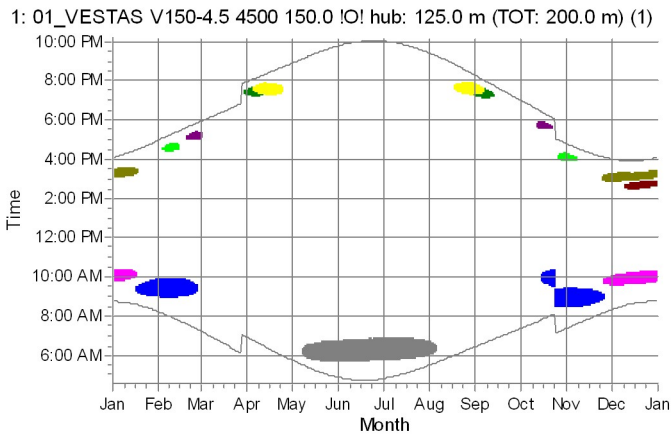
	July	August	September	October	November	December
1	04:48 19:58-20:59/61 22:02 05:31-05:38/7	05:30 21:25	06:27 17:21-18:32/71 20:16	07:22 17:29-17:59/30 19:00 08:15-08:33/18	07:22 10:06-11:17/71 16:47 08:39-09:36/57	08:19 10:12-11:23/71 16:01
2	04:49 19:58-20:59/61 22:01 05:31-05:39/8	05:32 21:23	06:28 17:19-18:31/72 20:13	07:24 17:33-17:54/21 18:57 08:14-08:35/21	07:24 10:05-11:17/72 16:45 08:39-09:36/57	08:21 10:12-11:23/71 16:00
3	04:50 19:58-20:59/61 22:01 05:29-05:39/10	05:33 21:21	06:30 17:18-18:31/73 20:11	07:26 08:12-08:36/24 18:55	07:26 10:05-11:18/73 16:43 08:39-09:36/57	08:23 10:13-11:23/70 15:59
4	04:51 19:59-20:59/60 22:00 05:29-05:40/11	05:35 21:19	06:32 17:18-18:31/73 20:08	07:28 08:11-08:36/25 18:52	07:28 10:04-11:18/74 16:41 08:39-09:35/56	08:24 10:14-11:24/70 15:58
5	04:52 19:59-20:59/60 22:00 05:29-05:41/12	05:37 21:17	06:34 17:17-18:32/75 20:06	07:29 08:10-08:37/27 18:50	07:30 10:04-11:19/75 16:39 08:40-09:36/56	08:26 10:14-11:23/69 15:58
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7	04:54 20:00-20:59/59 21:58 05:29-05:42/13	05:41 21:13	06:38 17:15-18:31/76 20:01	07:33 08:09-08:37/28 18:45	07:35 10:04-11:20/76 16:35 08:40-09:35/55	08:28 10:15-11:23/68 15:57
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9	04:56 20:01-20:59/58 21:57 05:30-05:43/13	05:44 21:09	06:41 17:15-18:30/75 19:56	07:37 08:08-08:37/29 18:40	07:39 10:03-11:20/77 16:31 08:40-09:34/54	08:31 10:17-11:24/67 15:56
10	04:57 20:02-20:59/57 21:56 05:31-05:43/12	05:46 21:07	06:43 17:14-18:29/75 19:53	07:39 08:08-08:36/28 18:37	07:41 10:04-11:21/77 16:29 08:42-09:35/53	08:32 10:17-11:24/67 15:55
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15	05:03 20:05-20:57/52 21:51 05:37-05:45/8	05:55 17:52-18:14/22 20:56 06:37-06:47/10	06:52 17:13-18:26/73 19:40 07:27-07:39/12	07:49 09:57-10:20/23 18:25 08:17-08:30/13	07:50 10:04-11:22/78 16:21 08:45-09:33/48	08:38 10:21-11:25/64 15:55
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29	05:25 20:28-20:36/8 21:30	06:21 17:23-18:30/67 20:23	07:18 17:24-18:05/41 19:05 08:23-08:27/4	07:16 10:08-11:14/66 16:53 08:39-09:35/56	08:16 10:10-11:23/73 16:02	08:45 10:27-11:32/65 16:02
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31	05:28 21:26	06:25 17:21-18:31/70 20:18		07:20 10:07-11:16/69 16:49 08:39-09:36/57		08:45 10:28-11:33/65 16:04
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	1553	1044	2269	1939	3494	2040

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

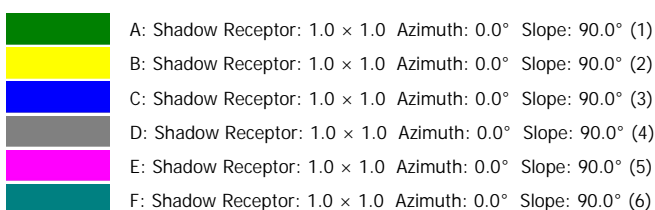
Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG, graphical

Calculation: Shadow_Vestas

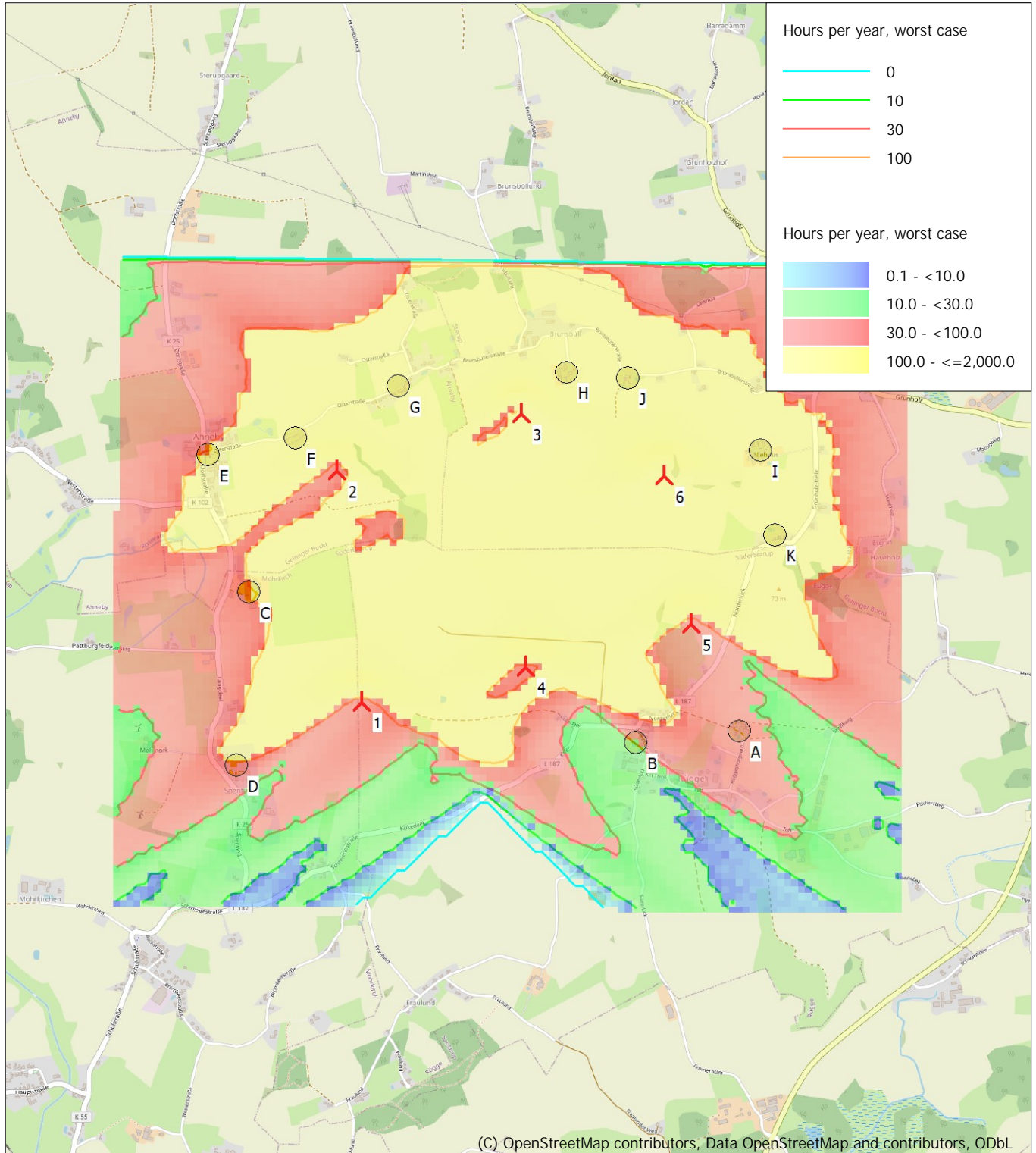


Shadow receptors



SHADOW - Map

Calculation: Shadow_Vestas



0 250 500 750 1000m

Map: EMD OpenStreetMap, Print scale 1:25,000, Map center UTM (north)-ETRS89 Zone: 32 East: 548,460 North: 6,061,230
 New WTG Shadow receptor
 Flicker map level: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo (1)
 Time step: 4 minutes, Day step: 14 days, Map resolution: 30 m, Visibility resolution: 15 m, Eye height: 1.5 m