

SHADOW - Main Result

Calculation: Shadow_enercon

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

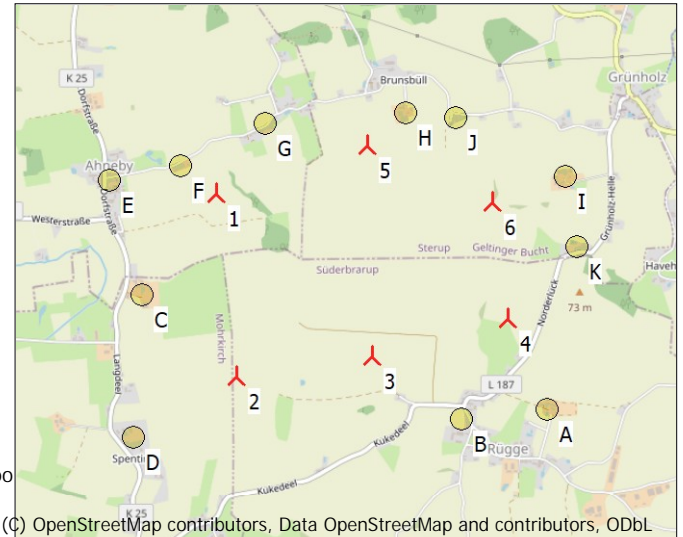
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo

Receptor grid resolution: 1.0 m

All coordinates are in

UTM (north)-ETRS89 Zone: 32



Scale 1:40,000
New WTG
Shadow receptor

WTGs

	Easting	Northing	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
1	547,702	6,061,711	60.0	01_ENERCON E-147 EP5 E2 500...	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	1,955	15.5
2	547,819	6,060,747	60.0	02_ENERCON E-147 EP5 E2 500...	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	1,955	15.5
3	548,537	6,060,868	60.0	03_ENERCON E-147 EP5 E2 500...	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	1,955	15.5
4	549,253	6,061,072	60.0	E04_NERCON E-147 EP5 E2 500...	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	1,955	15.5
5	548,497	6,061,973	60.0	05_ENERCON E-147 EP5 E2 500...	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	1,955	15.5
6	549,164	6,061,683	60.0	06_ENERCON E-147 EP5 E2 500...	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	1,955	15.5

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	35:26	89	0:36
B	26:09	71	0:29
C	93:23	214	0:52
D	68:30	114	0:55
E	99:53	165	1:19
F	306:01	218	2:29

To be continued on next page...

SHADOW - Main Result

Calculation: Shadow_enercon

...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	195:35	212	1:32
H	303:28	235	2:21
I	190:19	208	1:36
J	220:34	220	1:25
K	176:45	213	1:33

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

No.	Name	Worst case [h/year]
1	01_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (12)	466:57
2	02_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (13)	176:31
3	03_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (14)	115:26
4	E04_NERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (15)	156:27
5	05_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (16)	434:18
6	06_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (17)	373:11

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

SHADOW - Calendar

Calculation: Shadow_enercon 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	July	August	September	October	November	December			
1	08:45 16:05	08:13 16:58	07:13 17:56	06:56 19:56	05:45 20:54	19:38 (3) 20:13 (3)	04:53 21:46	04:48 22:01	05:30 21:24	19:49 (3) 20:20 (3)	06:27 20:16	19:21 (2) 19:39 (2)	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	19:28 (2) 3	05:42 20:56	19:38 (3) 20:13 (3)	04:49 22:01	05:32 21:23	19:49 (3) 20:21 (3)	06:28 20:13	19:19 (2) 20:19 (2)	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	19:26 (2) 7	05:40 20:58	19:37 (3) 20:13 (3)	04:50 22:01	05:33 21:21	19:48 (3) 20:22 (3)	06:30 20:11	19:19 (2) 19:39 (2)	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	19:24 (2) 11	05:38 21:00	19:37 (3) 20:13 (3)	04:51 22:00	05:35 21:19	19:47 (3) 20:22 (3)	06:32 20:08	19:18 (2) 19:39 (2)	07:28 18:52	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	19:23 (2) 13	05:36 21:02	19:37 (3) 20:13 (3)	04:49 21:59	05:37 21:17	19:47 (3) 20:22 (3)	06:34 20:06	19:18 (2) 19:37 (2)	07:29 18:50	07:30 16:39	08:25 15:58
6	08:43 16:11	08:04 17:08	07:01 18:06	06:43 20:06	19:22 (2) 17	05:34 21:03	19:37 (3) 20:13 (3)	04:48 21:59	05:39 21:15	19:47 (3) 20:23 (3)	06:36 20:03	19:17 (2) 19:34 (2)	07:31 18:47	07:32 16:37	08:27 15:57
7	08:43 16:13	08:02 17:10	06:59 18:08	06:41 20:08	19:21 (2) 19	05:32 21:05	19:37 (3) 20:12 (3)	04:48 21:53	05:41 21:13	19:46 (3) 20:22 (3)	06:38 20:01	19:18 (2) 19:32 (2)	07:33 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	19:21 (2) 21	05:30 21:07	19:37 (3) 20:12 (3)	04:47 21:57	05:42 21:11	19:46 (3) 20:22 (3)	06:39 19:58	19:19 (2) 19:29 (2)	07:35 18:42	07:36 16:33	08:30 15:56
9	08:41 16:16	07:58 17:15	06:54 18:12	06:36 20:12	19:21 (2) 20	05:28 21:09	19:38 (3) 20:12 (3)	04:46 21:55	05:44 21:09	19:47 (3) 20:23 (3)	06:41 19:56	19:20 (2) 19:27 (2)	07:37 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	19:21 (2) 20	05:26 21:11	19:38 (3) 20:12 (3)	04:46 21:56	05:46 21:07	19:46 (3) 20:22 (3)	06:43 19:53	19:20 (2) 19:24 (2)	07:39 18:37	07:40 16:29	08:32 15:55
11	08:40 16:19	07:54 17:19	06:49 18:16	06:31 20:16	19:21 (2) 18	05:24 21:13	19:38 (3) 20:11 (3)	04:45 21:55	05:48 21:04	19:46 (3) 20:22 (3)	06:45 19:51	19:24 (2) 19:51	07:41 18:35	07:42 16:28	08:33 15:55
12	08:39 16:20	07:51 17:21	06:46 18:18	06:29 20:18	19:22 (2) 16	05:22 21:14	19:39 (3) 20:10 (3)	04:45 21:54	05:50 21:02	19:47 (3) 20:22 (3)	06:47 19:48	19:24 (2) 19:51	07:43 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	19:24 (2) 13	05:21 21:16	19:40 (3) 20:10 (3)	04:45 21:53	05:52 21:00	19:47 (3) 20:21 (3)	06:49 19:46	19:24 (2) 19:50	07:45 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	19:25 (2) 9	05:19 21:18	19:40 (3) 20:09 (3)	04:44 21:59	05:02 20:58	19:47 (3) 20:20 (3)	06:50 19:43	19:24 (2) 19:51	07:47 18:28	07:48 16:23	08:37 15:55
15	08:37 16:25	07:45 17:27	06:39 18:24	06:21 20:23	19:24 (2) 27	05:17 21:20	19:42 (3) 20:09 (3)	04:44 22:00	05:03 21:51	19:47 (3) 20:19 (3)	06:52 19:40	19:24 (2) 19:50	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	19:23 (2) 25	05:15 21:22	19:42 (3) 20:07 (3)	04:44 22:00	05:05 21:49	19:48 (3) 20:19 (3)	06:54 19:38	19:24 (2) 19:50	07:51 18:23	07:52 16:19	08:38 15:55
17	08:34 16:29	07:41 17:31	06:34 18:28	06:17 20:27	19:22 (2) 23	05:14 21:23	19:43 (3) 20:06 (3)	04:44 22:01	05:06 21:48	19:48 (3) 20:17 (3)	06:56 19:35	19:24 (2) 19:51	07:53 18:21	07:54 16:18	08:39 15:55
18	08:33 16:31	07:39 17:33	06:31 18:29	06:14 20:29	19:21 (2) 20	05:12 21:25	19:45 (3) 20:05 (3)	04:44 22:01	05:07 21:47	19:49 (3) 20:16 (3)	06:58 19:33	19:24 (2) 19:51	07:54 18:18	07:56 16:16	08:40 15:55
19	08:32 16:32	07:36 17:35	06:29 18:31	06:12 20:31	19:20 (2) 17	05:10 21:27	19:47 (3) 20:04 (3)	04:44 22:02	05:09 21:45	19:51 (3) 20:15 (3)	07:00 19:30	19:24 (2) 19:51	07:56 18:16	07:58 16:15	08:41 15:55
20	08:31 16:34	07:34 17:37	06:26 18:33	06:09 20:33	19:19 (2) 14	05:09 21:28	19:48 (3) 20:02 (3)	04:44 22:02	05:10 21:44	19:52 (3) 20:13 (3)	07:01 19:28	19:24 (2) 19:51	07:58 18:13	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	19:18 (2) 10	05:07 21:30	19:51 (3) 20:00 (3)	04:44 22:02	05:12 21:43	19:54 (3) 20:10 (3)	07:03 19:25	19:24 (2) 19:51	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	19:17 (2) 16	05:06 21:32	19:52 (3) 20:05 (3)	04:44 22:02	05:13 21:41	19:57 (3) 20:06 (3)	07:05 19:23	19:24 (2) 19:51	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	06:02 20:39	19:16 (2) 22	05:04 21:33	19:53 (3) 20:08 (3)	04:44 22:03	05:15 21:40	19:58 (3) 20:11 (3)	07:07 20:37	19:24 (2) 19:51	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	19:15 (2) 24	05:03 21:35	19:54 (3) 20:09 (3)	04:45 22:03	05:17 21:38	19:58 (3) 20:13 (3)	06:12 20:35	19:24 (2) 19:51	08:06 18:04	08:07 16:08	08:44 15:58
25	08:24 16:44	07:23 17:48	06:14 18:43	05:58 20:43	19:14 (2) 28	05:01 21:36	19:55 (3) 20:10 (3)	04:45 22:03	05:18 21:37	19:56 (3) 20:15 (3)	06:14 20:33	19:24 (2) 19:51	08:08 17:02	08:09 16:07	08:44 15:58
26	08:23 16:46	07:20 17:50	06:11 18:45	05:56 20:45	19:13 (2) 30	05:00 21:38	19:56 (3) 20:11 (3)	04:45 22:03	05:20 21:35	19:55 (3) 20:16 (3)	06:15 20:30	19:24 (2) 19:51	08:10 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 20:46	19:12 (2) 31	05:00 21:39	19:57 (3) 20:12 (3)	04:46 22:02	05:21 21:33	19:54 (3) 20:17 (3)	06:17 20:28	19:24 (2) 19:51	08:12 16:58	08:13 16:05	08:45 16:00
28	08:19 16:50	07:16 17:54	06:06 18:49	05:51 20:48	19:11 (2) 32	05:00 21:41	19:58 (3) 20:13 (3)	04:46 22:02	05:23 21:32	19:52 (3) 20:18 (3)	06:19 20:25	19:24 (2) 19:51	08:14 16:56	08:14 16:03	08:45 16:01
29	08:18 16:52		07:03 19:51	05:49 20:50	19:10 (2) 34	05:00 21:42	19:59 (3) 20:14 (3)	04:47 22:02	05:25 21:30	19:52 (3) 20:19 (3)	06:21 20:23	19:24 (2) 19:51	08:16 16:53	08:16 16:02	08:45 16:02
30	08:16 16:54		07:01 19:53	05:47 20:52	19:09 (2) 35	05:00 21:44	19:59 (3) 20:15 (3)	04:48 22:02	05:27 21:28	19:50 (3) 20:19 (3)	06:23 20:21	19:24 (2) 19:51	08:18 16:51	08:18 16:02	08:45 16:03
31	08:14 16:56		06:58 19:55		19:08 (2) 35	05:00 21:45	19:59 (3) 20:16 (3)	05:28 21:26	05:28 21:26	19:50 (3) 20:21 (3)	06:25 20:18	19:24 (2) 19:51	08:20 16:49	08:20 16:04	08:45 16:04
Potential sun hours	245	271	366	422	449	498	516	517	205	712	383	150	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 11:02 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_enercon 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	20:44 (3) 21:08 (3)	05:30 21:24	06:27 20:16	19:33 (2) 19:47 (2)	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	04:49 22:01	20:46 (3) 21:07 (3)	05:32 21:23	06:28 20:13	19:34 (2) 19:44 (2)	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	04:50 22:01	20:46 (3) 21:06 (3)	05:34 21:21	06:30 20:11	19:36 (2) 19:42 (2)	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	04:51 22:00	20:48 (3) 21:05 (3)	05:35 21:19	06:32 20:08		07:28 18:52	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	04:52 22:00	20:50 (3) 21:03 (3)	05:37 21:17	06:34 20:06		07:29 18:50	07:30 16:39	08:26 15:58
6	08:43 16:11	08:04 17:08	07:01 18:06	06:43 20:06	05:34 21:03	04:49 21:52	04:53 21:59	20:52 (3) 21:01 (3)	05:39 21:15	06:36 20:03		07:31 18:47	07:32 16:37	08:27 15:57
7	08:43 16:13	08:02 17:10	06:59 18:08	06:41 20:08	05:32 21:05	04:48 21:53	04:54 21:58	20:44 (3) 20:56 (3)	05:41 21:13	06:38 20:01		07:33 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	05:30 21:07	04:47 21:54	04:55 21:57	20:43 (3) 20:59 (3)	05:42 21:11	06:39 19:58		07:35 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	19:38 (2) 19:44 (2)	05:28 21:09	04:47 21:55	20:42 (3) 21:01 (3)	04:56 21:57	05:44 21:09		07:37 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	19:36 (2) 19:46 (2)	05:26 21:11	04:46 21:56	20:41 (3) 21:02 (3)	04:57 21:56	05:46 21:07		07:39 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	19:33 (2) 19:47 (2)	05:24 21:13	04:46 21:57	20:41 (3) 21:03 (3)	04:58 21:55	05:48 21:04		07:41 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	19:31 (2) 19:49 (2)	05:22 21:14	04:45 21:58	20:39 (3) 21:03 (3)	04:59 21:54	05:50 21:02		06:47 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	19:30 (2) 19:52 (2)	05:21 21:16	04:45 21:58	20:39 (3) 21:04 (3)	05:01 21:53	05:52 21:00		06:49 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	19:29 (2) 19:53 (2)	05:19 21:18	04:44 21:59	20:39 (3) 21:05 (3)	05:02 21:52	05:53 20:58		06:50 18:28	07:48 16:23	08:37 15:55
15	08:37 16:25	07:45 17:27	06:39 18:24	06:21 20:23	19:28 (2) 19:55 (2)	05:17 21:20	04:44 22:00	20:39 (3) 21:06 (3)	05:03 21:51	05:55 20:56	19:41 (2) 19:52 (2)	06:52 19:40	07:50 18:25	08:38 16:21
16	08:36 16:27	07:43 17:29	06:36 18:26	06:19 20:25	19:28 (2) 19:56 (2)	05:15 21:22	04:44 22:00	20:39 (3) 21:07 (3)	05:05 21:49	05:57 20:53	19:39 (2) 19:54 (2)	06:54 19:38	07:51 18:23	08:38 16:19
17	08:34 16:29	07:41 17:31	06:34 18:28	06:17 20:27	19:27 (2) 19:55 (2)	05:14 21:23	04:44 22:01	20:39 (3) 21:07 (3)	05:06 21:48	05:59 20:51	19:36 (2) 19:55 (2)	06:56 19:35	07:53 18:21	08:39 16:18
18	08:33 16:31	07:39 17:33	06:31 18:29	06:14 20:29	19:27 (2) 19:55 (2)	05:12 21:25	04:44 22:01	20:39 (3) 21:08 (3)	05:07 21:47	06:01 20:49	19:35 (2) 19:56 (2)	06:58 19:33	07:54 18:18	08:40 16:16
19	08:32 16:33	07:36 17:35	06:29 18:31	06:12 20:31	19:27 (2) 19:55 (2)	05:10 21:27	04:44 22:02	20:39 (3) 21:08 (3)	05:09 21:46	06:03 20:47	19:34 (2) 19:57 (2)	07:00 19:30	07:56 18:16	08:41 16:15
20	08:31 16:34	07:34 17:37	06:26 18:33	06:09 20:33	19:26 (2) 19:54 (2)	05:09 21:28	04:44 22:02	20:39 (3) 21:08 (3)	05:10 21:44	06:04 20:44	19:33 (2) 19:58 (2)	07:01 19:28	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	19:26 (2) 19:54 (2)	05:07 21:30	04:44 22:02	20:39 (3) 21:08 (3)	05:12 21:43	06:06 20:42	19:32 (2) 19:58 (2)	07:03 19:25	08:00 18:11	08:42 16:12
22	08:28 16:38	07:30 17:42	06:21 18:37	06:05 20:37	19:27 (2) 19:53 (2)	05:06 21:32	04:44 22:02	20:39 (3) 21:08 (3)	05:13 21:41	06:08 20:40	19:31 (2) 19:58 (2)	07:05 19:23	08:02 18:09	08:44 16:11
23	08:27 16:40	07:27 17:44	06:19 18:39	06:02 20:39	19:28 (2) 19:52 (2)	05:04 21:33	04:44 22:03	20:40 (3) 21:09 (3)	05:15 21:40	06:10 20:37	19:31 (2) 19:59 (2)	07:07 19:20	08:04 18:07	08:43 15:57
24	08:26 16:42	07:25 17:46	06:16 18:41	06:00 20:41	19:29 (2) 19:52 (2)	05:03 21:35	04:45 22:03	20:40 (3) 21:09 (3)	05:17 21:38	06:12 20:35	19:31 (2) 19:59 (2)	07:09 19:18	08:06 18:04	08:44 16:08
25	08:24 16:44	07:23 17:48	06:14 18:43	05:58 20:43	19:29 (2) 19:49 (2)	05:01 21:36	04:45 22:03	20:40 (3) 21:08 (3)	05:18 21:37	06:14 20:33	19:29 (2) 19:58 (2)	07:11 19:15	07:08 17:02	08:09 16:07
26	08:23 16:46	07:20 17:50	06:11 18:45	05:56 20:45	19:30 (2) 19:48 (2)	05:00 21:38	04:45 22:03	20:41 (3) 21:09 (3)	05:20 21:35	06:15 20:30	19:30 (2) 19:58 (2)	07:13 19:12	07:10 17:00	08:11 16:06
27	08:21 16:48	07:18 17:52	06:09 18:47	05:53 20:46	19:32 (2) 19:46 (2)	04:59 21:39	04:46 22:03	20:41 (3) 21:08 (3)	05:21 21:33	06:17 20:28	19:30 (2) 19:57 (2)	07:14 19:10	07:12 16:58	08:13 16:05
28	08:19 16:50	07:16 17:54	06:06 18:49	05:51 20:48	19:35 (2) 19:43 (2)	04:57 21:41	04:46 22:02	20:42 (3) 21:09 (3)	05:23 21:32	06:19 20:25	19:30 (2) 19:57 (2)	07:16 19:07	07:14 16:56	08:14 16:04
29	08:18 16:52		07:04 19:51	05:49 20:50		04:54 21:42	04:47 22:02	20:42 (3) 21:08 (3)	05:25 21:30	06:21 20:23	19:30 (2) 19:53 (2)	07:18 19:05	07:16 16:53	08:16 16:03
30	08:16 16:54		07:01 19:53	05:47 20:52		04:48 21:44	04:48 22:02	20:43 (3) 21:08 (3)	05:27 21:28	06:23 20:21	19:30 (2) 19:51 (2)	07:20 19:02	07:18 16:51	08:18 16:02
31	08:14 16:56					04:54 21:45		04:54 21:26	05:28 21:26	06:25 20:18	19:31 (2) 19:49 (2)		07:20 16:49	08:45 16:04
Potential sun hours	245	271	366	422	498	516	517	463	396	383	30	327	255	228
Total, worst case				422		617	104							

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 11:02 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_enercon 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	08:13	08:57 (2)	07:13	09:02 (2)	06:56
	16:05	16:58	39 09:36 (2)	17:56	25 09:27 (2)	19:57
2	08:45	08:11	08:56 (2)	07:11	09:06 (2)	06:54
	16:06	17:00	41 09:37 (2)	17:58	18 09:24 (2)	19:59
3	08:44	08:09	08:56 (2)	07:09	07:34 (3)	06:51
	16:07	17:02	42 09:38 (2)	18:00	13 09:18 (2)	20:00
4	08:44	08:07	08:55 (2)	07:06	07:31 (3)	06:49
	16:09	17:04	44 09:39 (2)	18:02	12 07:43 (3)	20:02
5	08:44	08:06	08:55 (2)	07:04	07:29 (3)	06:46
	16:10	17:06	45 09:40 (2)	18:04	16 07:45 (3)	20:04
6	08:43	08:04	08:54 (2)	07:01	07:26 (3)	06:44
	16:11	17:08	47 09:41 (2)	18:06	19 07:45 (3)	20:06
7	08:43	08:02	08:53 (2)	06:59	07:23 (3)	06:41
	16:13	17:11	48 09:41 (2)	18:08	23 07:46 (3)	20:08
8	08:42	08:00	08:52 (2)	06:56	07:21 (3)	06:39
	16:14	17:13	49 09:41 (2)	18:10	25 07:46 (3)	20:10
9	08:42	07:58	08:52 (2)	06:54	07:20 (3)	06:36
	16:16	17:15	50 09:42 (2)	18:12	26 07:46 (3)	20:12
10	08:41	07:56	08:52 (2)	06:51	07:20 (3)	06:34
	16:17	17:17	51 09:43 (2)	18:14	27 07:47 (3)	20:14
11	08:40	07:54	08:52 (2)	06:49	07:19 (3)	06:31
	16:19	17:19	51 09:43 (2)	18:16	27 07:46 (3)	20:16
12	08:39	07:52	08:52 (2)	06:46	07:19 (3)	06:29
	16:20	17:21	52 09:44 (2)	18:18	27 07:46 (3)	20:18
13	08:39	07:50	08:51 (2)	06:44	07:19 (3)	06:26
	16:22	17:23	52 09:43 (2)	18:20	26 07:45 (3)	20:20
14	08:38	07:47	08:52 (2)	06:41	07:20 (3)	06:24
	16:24	17:25	51 09:43 (2)	18:22	25 07:45 (3)	20:22
15	08:37	07:45	08:52 (2)	06:39	07:20 (3)	06:21
	16:25	17:27	51 09:43 (2)	18:24	23 07:43 (3)	20:24
16	08:36	07:43	08:52 (2)	06:36	07:21 (3)	06:19
	16:27	17:29	51 09:43 (2)	18:26	21 07:42 (3)	20:25
17	08:35	07:41	08:52 (2)	06:34	07:22 (3)	06:17
	16:29	17:31	51 09:43 (2)	18:28	18 07:40 (3)	20:27
18	08:33	07:39	08:52 (2)	06:31	07:24 (3)	06:14
	16:31	17:33	50 09:42 (2)	18:30	14 07:38 (3)	20:29
19	08:32	07:37	08:53 (2)	06:29	06:53 (4)	06:12
	16:33	17:36	49 09:42 (2)	18:32	8 07:33 (3)	20:31
20	08:31	07:34	08:53 (2)	06:26	06:51 (4)	06:10
	16:34	17:38	48 09:41 (2)	18:33	7 06:58 (4)	20:33
21	08:30	07:32	08:53 (2)	06:24	06:48 (4)	06:07
	16:36	17:40	48 09:41 (2)	18:35	9 06:57 (4)	20:35
22	08:28	07:30	08:53 (2)	06:21	06:45 (4)	06:05
	16:38	17:42	46 09:39 (2)	18:37	12 06:57 (4)	20:37
23	08:27	07:27	08:54 (2)	06:19	06:43 (4)	06:03
	16:40	17:44	45 09:39 (2)	18:39	14 06:57 (4)	20:39
24	08:26	07:25	08:56 (2)	06:16	06:40 (4)	06:00
	16:42	17:46	42 09:38 (2)	18:41	16 06:56 (4)	20:41
25	08:24	09:07 (2)	07:23	06:14	06:40 (4)	05:58
	16:44	09:22 (2)	17:48	18:43	16 06:56 (4)	20:43
26	08:23	09:05 (2)	07:20	06:11	06:40 (4)	05:56
	16:46	09:26 (2)	17:50	18:45	14 06:54 (4)	20:45
27	08:21	09:03 (2)	07:18	06:09	06:42 (4)	05:53
	16:48	09:28 (2)	17:52	18:47	11 06:53 (4)	20:47
28	08:20	09:01 (2)	07:16	06:06	06:45 (4)	05:51
	16:50	09:30 (2)	17:54	18:49	4 06:49 (4)	20:48
29	08:18	09:00 (2)		07:04		05:49
	16:52	09:31 (2)		19:51		20:50
30	08:16	08:58 (2)		07:01		05:47
	16:54	09:33 (2)		19:53		20:52
31	08:15	08:58 (2)		06:59		
	16:56	09:35 (2)		19:55		
Potential sun hours	245	271	366	422	498	516
Total, worst case	193	1284	496	129	160	761

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_enercon 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 (5)	05:30		06:27		07:22	07:59 (3)	07:23	08:22 (2)	08:20			
	22:02	26	05:55 (5)	21:25		20:16		19:00	26	08:25 (3)	16:47	50	09:12 (2)	16:01	
2	04:49		05:30 (5)	05:32		06:29		07:24		07:58 (3)	07:25		08:22 (2)	08:21	
	22:01	26	05:56 (5)	21:23		20:13		18:57	27	08:25 (3)	16:45	50	09:12 (2)	16:00	
3	04:50		05:29 (5)	05:34		06:30		07:26		07:58 (3)	07:27		08:22 (2)	08:23	
	22:01	26	05:55 (5)	21:21		20:11		18:55	27	08:25 (3)	16:43	49	09:11 (2)	15:59	
4	04:51		05:30 (5)	05:35		06:32		07:28		07:58 (3)	07:29		08:22 (2)	08:24	
	22:00	25	05:55 (5)	21:19		20:08		18:52	26	08:24 (3)	16:41	48	09:10 (2)	15:58	
5	04:52		05:30 (5)	05:37		06:34		07:30		07:58 (3)	07:31		08:24 (2)	08:26	
	22:00	26	05:56 (5)	21:17		20:06		18:50	26	08:24 (3)	16:39	47	09:11 (2)	15:58	
6	04:53		05:30 (5)	05:39		06:36		07:31		07:59 (3)	07:33		08:24 (2)	08:27	
	21:59	26	05:56 (5)	21:15		20:03		18:47	24	08:23 (3)	16:37	46	09:10 (2)	15:57	
7	04:54		05:30 (5)	05:41		06:38		07:33		08:01 (3)	07:35		08:25 (2)	08:28	
	21:58	26	05:56 (5)	21:13		20:01		18:45	21	08:22 (3)	16:35	44	09:09 (2)	15:57	
8	04:55		05:31 (5)	05:43		06:40		07:35		08:03 (3)	07:37		08:26 (2)	08:30	
	21:58	25	05:56 (5)	21:11		19:58		18:42	18	08:21 (3)	16:33	42	09:08 (2)	15:56	
9	04:56		05:31 (5)	05:44		06:41		07:37		08:05 (3)	07:39		08:26 (2)	08:31	
	21:57	25	05:56 (5)	21:09		19:56		18:40	14	08:19 (3)	16:31	41	09:07 (2)	15:56	
10	04:57		05:31 (5)	05:46		06:43		07:39		08:07 (3)	07:41		08:28 (2)	08:32	
	21:56	25	05:56 (5)	21:07		19:53		18:38	10	08:17 (3)	16:30	39	09:07 (2)	15:56	
11	04:58		05:32 (5)	05:48		06:45		07:41		08:09 (3)	07:43		08:29 (2)	08:34	
	21:55	24	05:56 (5)	21:05		19:51		18:35	18	09:56 (2)	16:28	37	09:06 (2)	15:55	
12	04:59		05:33 (5)	05:50		06:47		07:43		09:38 (2)	07:45		08:30 (2)	08:35	
	21:54	23	05:56 (5)	21:02		19:48		18:33	22	10:00 (2)	16:26	35	09:05 (2)	15:55	
13	05:01		05:34 (5)	05:52		06:49		07:45		09:35 (2)	07:47		08:32 (2)	08:36	
	21:53	22	05:56 (5)	21:00		19:46		18:30	27	10:02 (2)	16:24	31	09:03 (2)	15:55	
14	05:02		05:36 (5)	05:53		06:51		07:47		09:33 (2)	07:49		08:33 (2)	08:37	
	21:52	21	05:57 (5)	20:58		19:43		18:28	32	10:05 (2)	16:23	29	09:02 (2)	15:55	
15	05:03		05:37 (5)	05:55		06:52		07:49		09:31 (2)	07:51		08:36 (2)	08:38	
	21:51	19	05:56 (5)	20:56		19:41		18:25	35	10:06 (2)	16:21	25	09:01 (2)	15:55	
16	05:05		05:38 (5)	05:57		06:54		07:51		09:29 (2)	07:52		08:38 (2)	08:39	
	21:50	18	05:56 (5)	20:54		19:38	10	07:41 (4)	18:23	38	10:07 (2)	16:19	21	08:59 (2)	15:55
17	05:06		05:39 (5)	05:59		06:56		07:29 (4)	07:53		09:28 (2)	07:54		08:41 (2)	08:39
	21:48	16	05:55 (5)	20:51	8	06:50 (6)	13	07:42 (4)	18:21	41	10:09 (2)	16:18	15	08:56 (2)	15:55
18	05:08		05:41 (5)	06:01		06:39 (6)		07:28 (4)	07:55		09:27 (2)	07:56			08:40
	21:47	14	05:55 (5)	20:49	12	06:51 (6)	15	07:43 (4)	18:18	42	10:09 (2)	16:16			15:55
19	05:09		05:42 (5)	06:03		06:38 (6)		07:27 (4)	07:57		09:25 (2)	07:58			08:41
	21:46	13	05:55 (5)	20:47	14	06:52 (6)	17	07:44 (4)	18:16	45	10:10 (2)	16:15			15:56
20	05:10		05:43 (5)	06:05		06:37 (6)		07:29 (4)	07:59		09:24 (2)	08:00			08:42
	21:44	10	05:53 (5)	20:45	16	06:53 (6)	15	07:44 (4)	18:14	47	10:11 (2)	16:13			15:56
21	05:12		05:45 (5)	06:06		06:35 (6)		07:30 (4)	08:01		09:24 (2)	08:02			08:42
	21:43	8	05:53 (5)	20:42	18	06:53 (6)	13	07:43 (4)	18:11	47	10:11 (2)	16:12			15:56
22	05:14		05:46 (5)	06:08		06:37 (6)		07:32 (4)	08:02		09:23 (2)	08:04			08:43
	21:41	6	05:52 (5)	20:40	16	06:53 (6)	10	07:42 (4)	18:09	49	10:12 (2)	16:11			15:57
23	05:15		05:48 (5)	06:10		06:39 (6)		07:34 (4)	08:04		09:22 (2)	08:06			08:43
	21:40	3	05:51 (5)	20:37	14	06:53 (6)	7	07:41 (4)	18:07	50	10:12 (2)	16:09			15:57
24	05:17			06:12		06:41 (6)		07:36 (4)	08:06		09:21 (2)	08:08			08:44
	21:38			20:35	12	06:53 (6)	4	07:40 (4)	18:04	51	10:12 (2)	16:08			15:58
25	05:18			06:14		06:42 (6)		07:38 (4)	07:08		08:22 (2)	08:09			08:44
	21:37			20:33	10	06:52 (6)	13	08:20 (3)	17:02	51	09:13 (2)	16:07			15:58
26	05:20			06:16		06:44 (6)		08:05 (3)	07:10		08:22 (2)	08:11			08:44
	21:35			20:30	7	06:51 (6)	17	08:22 (3)	17:00	51	09:13 (2)	16:06			15:59
27	05:22			06:17		06:46 (6)		08:04 (3)	07:12		08:21 (2)	08:13			08:45
	21:33			20:28	4	06:50 (6)	19	08:23 (3)	16:58	52	09:13 (2)	16:05			16:00
28	05:23			06:19				08:01 (3)	07:14		08:21 (2)	08:15			08:45
	21:32			20:26			22	08:23 (3)	16:56	52	09:13 (2)	16:04			16:01
29	05:25			06:21				08:00 (3)	07:16		08:21 (2)	08:16			08:45
	21:30			20:23			24	08:24 (3)	16:53	51	09:12 (2)	16:03			16:02
30	05:27			06:23				07:59 (3)	07:18		08:21 (2)	08:18			08:45
	21:28			20:21			26	08:25 (3)	16:51	51	09:12 (2)	16:02			16:03
31	05:28			06:25					07:20		08:22 (2)				08:45
	21:26			20:18				16:49	51	09:13 (2)					16:04
Potential sun hours	517			463		383		327			255		649		228
Total, worst case		453			131		225		1122						

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)

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 11:02 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_enercon 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	06:13 (3) 21:46	04:53 21:46	05:36 (2) 22:02	05:39 (2) 21:25	05:30 21:25	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	06:13 (3) 21:48	04:52 21:48	05:35 (2) 22:01	05:40 (2) 21:23	05:32 21:23	06:31 (3) 20:13	06:29 18:57	07:24 16:45	08:20 16:01
3	08:44 16:07	08:09 17:02	07:09 18:00	06:51 20:00	05:40 20:58	06:14 (3) 21:49	04:51 21:49	05:35 (2) 22:01	05:39 (2) 21:21	05:34 21:21	06:29 (3) 20:11	06:30 18:55	07:26 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	06:14 (3) 21:50	04:50 21:50	05:35 (2) 22:00	05:40 (2) 21:19	05:35 21:19	06:28 (3) 20:08	06:32 18:52	07:28 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	06:14 (3) 21:51	04:49 21:51	05:35 (2) 22:00	05:40 (2) 21:17	05:37 21:17	06:26 (3) 20:06	06:34 18:50	07:30 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	06:15 (3) 21:52	04:49 21:52	05:35 (2) 21:59	05:41 (2) 21:15	05:39 21:15	06:25 (3) 20:03	06:36 18:47	07:31 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	06:15 (3) 21:53	04:48 21:53	05:35 (2) 21:58	05:41 (2) 21:13	05:41 21:13	06:25 (3) 20:01	06:38 18:45	07:33 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	06:17 (3) 21:54	04:47 21:54	05:35 (2) 21:58	05:42 (2) 21:11	05:43 21:11	06:23 (3) 19:58	06:40 18:42	07:35 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	06:18 (3) 21:55	04:47 21:55	05:35 (2) 21:57	05:42 (2) 21:09	05:44 21:09	06:23 (3) 19:56	06:41 18:40	07:37 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	06:20 (3) 21:56	04:46 21:56	05:35 (2) 21:56	05:43 (2) 21:07	05:46 21:07	06:23 (3) 19:53	06:43 18:38	07:39 16:30	08:32 15:56
11	08:40 16:19	07:54 17:19	06:49 18:16	06:31 20:16	05:24 21:13	06:22 (3) 21:57	04:46 21:57	05:35 (2) 21:55	05:43 (2) 21:05	05:48 21:05	06:22 (3) 19:51	06:45 18:35	07:41 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	06:28 (3) 21:58	04:45 21:58	05:35 (2) 21:54	05:43 (2) 21:02	05:50 21:02	06:22 (3) 19:48	06:47 18:33	07:43 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	06:28 (3) 21:59	04:45 21:59	05:35 (2) 21:52	05:44 (2) 21:00	05:52 21:00	06:22 (3) 19:46	06:49 18:30	07:45 16:24	08:36 15:55
14	08:38 16:24	07:47 17:25	06:41 18:22	06:24 20:22	05:19 21:18	06:29 (3) 21:57	04:44 21:57	05:35 (2) 21:52	05:45 (2) 21:00	05:53 21:00	06:23 (3) 19:43	06:51 18:28	07:47 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	06:30 (3) 22:00	04:44 22:00	05:35 (2) 21:51	05:46 (2) 21:00	05:55 21:00	06:24 (3) 19:41	06:52 18:25	07:49 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	05:52 (2) 22:00	04:44 22:00	05:36 (2) 21:49	05:46 (2) 20:54	05:57 20:54	06:25 (3) 19:38	06:54 18:23	07:51 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	05:49 (2) 22:01	04:44 22:01	05:36 (2) 21:48	05:46 (2) 20:51	05:59 20:51	06:26 (3) 19:35	06:56 18:21	07:53 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	06:09 (2) 22:01	04:44 22:01	05:36 (2) 21:47	05:48 (2) 20:49	06:01 20:49	06:30 (3) 19:33	06:58 18:18	07:55 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	05:45 (2) 22:02	04:44 22:02	05:36 (2) 21:46	05:49 (2) 20:47	06:03 20:47	06:32 (3) 19:30	07:00 18:16	07:57 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	05:43 (2) 22:02	04:44 22:02	05:36 (2) 21:44	05:49 (2) 20:44	06:05 20:44	06:34 (3) 19:28	07:02 18:14	07:59 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	05:42 (2) 22:02	04:44 22:02	05:36 (2) 21:43	05:51 (2) 20:42	06:06 20:42	06:35 (3) 19:25	07:03 18:11	08:00 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	05:41 (2) 22:02	04:44 22:02	05:37 (2) 21:41	05:51 (2) 20:40	06:08 20:40	06:39 (3) 19:23	07:05 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	05:40 (2) 22:03	04:44 22:03	05:37 (2) 21:40	05:53 (2) 20:37	06:10 20:37	07:07 19:20	08:04 18:07	08:06 16:09	08:44 15:57
24	08:26 16:42	07:25 17:46	06:16 18:41	06:00 20:41	05:03 21:35	05:39 (2) 22:03	04:45 22:03	05:37 (2) 21:38	05:54 (2) 20:35	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	05:39 (2) 22:03	04:45 22:03	05:38 (2) 21:37	05:56 (2) 20:33	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	06:21 (3) 22:03	04:46 22:03	05:38 (2) 21:35	05:58 (2) 20:30	06:16 20:30	07:13 19:13	08:11 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	05:03 21:39	06:19 (3) 22:03	04:46 22:03	05:37 (2) 21:33	06:01 (2) 20:28	06:17 20:28	07:15 19:10	08:12 17:14	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	05:04 21:41	06:17 (3) 22:02	04:47 22:02	05:38 (2) 21:32	06:04 (2) 20:21	06:19 20:21	07:16 19:08	07:14 16:56	08:15 16:04	08:45 16:01
29	08:18 16:52	07:14 17:51	06:04 18:50	05:49 20:50	05:05 21:42	06:18 (3) 22:02	04:47 22:02	05:39 (2) 21:30	06:02 (2) 20:23	06:21 20:23	07:18 19:05	07:16 16:53	08:16 16:03	08:45 16:02
30	08:16 16:54	07:11 17:53	06:01 18:53	05:47 20:52	05:06 21:44	06:19 (3) 22:02	04:48 22:02	05:39 (2) 21:28	06:03 (2) 20:21	06:23 20:21	07:20 19:02	07:18 16:51	08:18 16:02	08:45 16:03
31	08:15 16:56	07:09 17:55	06:59 18:55	05:45 20:52	05:04 21:45	06:24 (2) 22:02	04:48 22:02	05:39 (2) 21:26	06:05 20:25	06:25 20:25	07:20 16:49	07:20 16:49	08:45 16:04	08:45 16:04
Potential sun hours	245	271	366	422	498	516	517	463	373	383	327	255	228	
Total, worst case				153	795	1607	1182							

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_enercon 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		09:44 (2)	08:13		07:13	06:56		07:48 (1)	05:45	04:53
	16:05	29	10:13 (2)	16:58		17:56	19:57	57	08:45 (1)	20:54	21:46
2	08:45		09:44 (2)	08:11	08:40 (3)	07:11	06:54		07:48 (1)	05:43	04:52
	16:06	29	10:13 (2)	17:00	4	17:58	19:59	58	08:46 (1)	20:56	21:48
3	08:44		09:45 (2)	08:09		07:09	06:51		07:47 (1)	05:40	04:51
	16:07	29	10:14 (2)	17:02	7	18:00	20:00	58	08:45 (1)	20:58	21:49
4	08:44		09:45 (2)	08:07		07:06	06:49		07:13 (5)	05:38	04:50
	16:09	29	10:14 (2)	17:04	10	18:02	20:02	61	08:45 (1)	21:00	21:50
5	08:44		09:46 (2)	08:06		07:04	06:46		07:10 (5)	05:36	04:49
	16:10	29	10:15 (2)	17:06	13	18:04	20:04	66	08:44 (1)	21:02	21:51
6	08:43		09:46 (2)	08:04		07:01	06:44		07:08 (5)	05:34	04:49
	16:11	28	10:14 (2)	17:08	16	18:06	20:06	69	08:44 (1)	21:04	21:52
7	08:43		09:47 (2)	08:02		06:59	06:41		07:05 (5)	05:32	04:48
	16:13	27	10:14 (2)	17:11	18	18:08	20:08	72	08:43 (1)	21:06	21:53
8	08:42		09:47 (2)	08:00		06:56	06:39		07:03 (5)	05:30	04:47
	16:14	27	10:14 (2)	17:13	20	18:10	20:10	75	08:43 (1)	21:07	21:54
9	08:42		09:49 (2)	07:58		06:54	06:36		07:00 (5)	05:28	04:47
	16:16	26	10:15 (2)	17:15	21	18:12	20:12	77	08:42 (1)	21:09	21:55
10	08:41		09:49 (2)	07:56		06:51	06:34		06:58 (5)	05:26	04:46
	16:17	26	10:15 (2)	17:17	21	18:14	20:14	79	08:41 (1)	21:11	21:56
11	08:40		09:50 (2)	07:54		06:49	06:31		06:57 (5)	05:24	04:46
	16:19	25	10:15 (2)	17:19	19	18:16	20:16	79	08:41 (1)	21:13	21:57
12	08:39		09:51 (2)	07:52		06:46	06:29		06:56 (5)	05:22	04:45
	16:20	24	10:15 (2)	17:21	18	18:18	20:18	78	08:39 (1)	21:15	21:58
13	08:39		09:52 (2)	07:50		06:44	06:26		06:57 (5)	05:21	04:45
	16:22	23	10:15 (2)	17:23	16	18:20	20:20	76	08:39 (1)	21:16	21:59
14	08:38		09:52 (2)	07:47		06:41	06:24		06:56 (5)	05:19	04:44
	16:24	22	10:14 (2)	17:25	13	18:22	20:22	74	08:37 (1)	21:18	21:59
15	08:37		09:54 (2)	07:45		06:39	06:21		06:57 (5)	05:17	04:44
	16:25	20	10:14 (2)	17:27	9	18:24	20:24	70	08:36 (1)	21:20	22:00
16	08:36		09:55 (2)	07:43		06:36	06:19		06:57 (5)	05:15	04:44
	16:27	18	10:13 (2)	17:29		18:26	20:25	68	08:35 (1)	21:22	22:00
17	08:35		09:57 (2)	07:41		06:34	07:19 (1)	06:17	06:57 (5)	05:14	04:44
	16:29	16	10:13 (2)	17:31		18:28	5	07:24 (1)	06:14	08:33 (1)	21:23
18	08:34		09:58 (2)	07:39		06:31	07:12 (1)	06:14	06:59 (5)	05:12	04:44
	16:31	13	10:11 (2)	17:33		18:30	20	07:32 (1)	06:12	08:31 (1)	21:25
19	08:32		10:01 (2)	07:37		06:29	07:08 (1)	06:12	07:01 (5)	05:10	04:44
	16:33	8	10:09 (2)	17:36		18:32	27	07:35 (1)	06:10	08:30 (1)	21:27
20	08:31			07:34		06:26	07:05 (1)	06:10	07:04 (5)	05:09	04:44
	16:34			17:38		18:33	32	07:37 (1)	06:07	08:28 (1)	21:29
21	08:30			07:32		06:24	07:02 (1)	06:07	07:55 (1)	05:07	04:44
	16:36			17:40		18:35	37	07:39 (1)	06:05	08:25 (1)	21:30
22	08:28			07:30		06:21	07:00 (1)	06:05	07:57 (1)	05:06	04:44
	16:38			17:42		18:37	40	07:40 (1)	06:03	08:22 (1)	21:32
23	08:27			07:27		06:19	06:58 (1)	06:03	08:00 (1)	05:04	04:44
	16:40			17:44		18:39	44	07:42 (1)	06:00	08:19 (1)	21:33
24	08:26			07:25		06:16	06:56 (1)	06:00	08:06 (1)	05:03	04:45
	16:42			17:46		18:41	46	07:42 (1)	06:00	08:13 (1)	21:35
25	08:24			07:23		06:14	06:55 (1)	05:58		05:01	04:45
	16:44			17:48		18:43	49	07:44 (1)	06:00	21:37	22:03
26	08:23			07:20		06:11	06:54 (1)	05:56		05:00	04:46
	16:46			17:50		18:45	50	07:44 (1)	06:00	21:38	22:03
27	08:21			07:18		06:09	06:53 (1)	05:53		04:59	04:46
	16:48			17:52		18:47	52	07:45 (1)	06:00	21:40	22:03
28	08:20			07:16		06:06	06:51 (1)	05:51		04:57	04:47
	16:50			17:54		18:49	54	07:45 (1)	06:00	21:41	22:03
29	08:18					07:04	07:51 (1)	05:49		04:56	04:47
	16:52					19:51	55	08:46 (1)	06:00	21:42	22:02
30	08:16					07:01	07:50 (1)	05:47		04:55	04:48
	16:54					19:53	55	08:45 (1)	06:00	21:44	22:02
31	08:15					06:59	07:49 (1)			04:54	
	16:56					19:55	57	08:46 (1)		21:45	
Potential sun hours	245		271		366		422		498		516
Total, worst case	448		205		623		1410				

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_enercon 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 (5) 08:40 (1)	07:22 19:00		07:23 16:47		07:57 (3) 08:17 (3)	08:20 16:01		09:32 (2) 09:57 (2)
2	04:49 22:01	05:32 21:23			06:29 20:13	79	06:56 (5) 08:39 (1)	07:24 18:57		07:25 16:45	20	07:56 (3) 08:17 (3)	08:21 16:00	25	09:32 (2) 09:57 (2)
3	04:50 22:01	05:34 21:21			06:30 20:11	77	06:58 (5) 08:40 (1)	07:26 18:55		07:27 16:43	21	07:57 (3) 08:17 (3)	08:23 15:59	26	09:32 (2) 09:58 (2)
4	04:51 22:00	05:35 21:19			06:32 20:08	75	07:00 (5) 08:40 (1)	07:28 18:52		07:29 16:41	20	07:59 (3) 08:17 (3)	08:24 15:58	27	09:32 (2) 09:59 (2)
5	04:52 22:00	05:37 21:17			06:34 20:06	72	07:02 (5) 08:40 (1)	07:30 18:50		07:31 16:39	15	08:02 (3) 08:17 (3)	08:26 15:58	27	09:32 (2) 09:59 (2)
6	04:53 21:59	05:39 21:15			06:36 20:03	69	07:04 (5) 08:40 (1)	07:31 18:47		07:33 16:37	13	08:04 (3) 08:17 (3)	08:27 15:57	28	09:33 (2) 10:01 (2)
7	04:54 21:58	05:41 21:13			06:38 20:01	66	07:05 (5) 08:39 (1)	07:33 18:45		07:35 16:35	10	08:06 (3) 08:16 (3)	08:28 15:57	29	09:32 (2) 10:01 (2)
8	04:55 21:58	05:43 21:11			06:40 19:58	61	07:07 (5) 08:39 (1)	07:35 18:42		07:37 16:33	7	08:08 (3) 08:15 (3)	08:30 15:56	29	09:33 (2) 10:02 (2)
9	04:56 21:57	05:44 21:09			06:41 19:56	58	07:41 (1) 08:39 (1)	07:37 18:40		07:39 16:31	4	08:11 (3) 08:15 (3)	08:31 15:56	29	09:33 (2) 10:02 (2)
10	04:57 21:56	05:46 21:07			06:43 19:53	58	07:41 (1) 08:39 (1)	07:39 18:38		07:41 16:30			08:32 15:56	29	09:34 (2) 10:03 (2)
11	04:58 21:55	05:48 21:05			06:45 19:51	58	07:40 (1) 08:38 (1)	07:41 18:35		07:43 16:28			08:34 15:55	29	09:34 (2) 10:03 (2)
12	04:59 21:54	05:50 21:02			06:47 19:48	56	07:41 (1) 08:37 (1)	07:43 18:33		07:45 16:26			08:35 15:55	30	09:34 (2) 10:04 (2)
13	05:01 21:53	05:52 21:00			06:49 19:46	56	07:41 (1) 08:37 (1)	07:45 18:30		07:47 16:24			08:36 15:55	29	09:35 (2) 10:04 (2)
14	05:02 21:52	05:53 20:58			06:51 19:43	55	07:41 (1) 08:36 (1)	07:47 18:28		07:49 16:23			08:37 15:55	30	09:35 (2) 10:05 (2)
15	05:03 21:51	05:55 20:56			06:52 19:41	53	07:42 (1) 08:35 (1)	07:49 18:25		07:51 16:21			08:38 15:55	30	09:35 (2) 10:05 (2)
16	05:05 21:50	05:57 20:54			06:54 19:38	52	07:41 (1) 08:33 (1)	07:51 18:23		07:52 16:19			08:39 15:55	30	09:36 (2) 10:06 (2)
17	05:06 21:48	05:59 20:51			06:56 19:36	50	07:42 (1) 08:32 (1)	07:53 18:21		07:54 16:18			08:40 15:55	30	09:36 (2) 10:06 (2)
18	05:07 21:47	06:01 20:49			06:58 19:33	48	07:43 (1) 08:31 (1)	07:55 18:18		07:56 16:16			08:40 15:55	30	09:37 (2) 10:07 (2)
19	05:09 21:46	06:03 20:47			07:00 19:30	47	07:43 (1) 08:30 (1)	07:57 18:16		07:58 16:15			08:41 15:55	30	09:37 (2) 10:07 (2)
20	05:10 21:44	06:04 20:45	10	08:10 (1) 08:20 (1)	07:02 19:28	44	07:45 (1) 08:29 (1)	07:59 18:14		08:00 16:13			08:42 15:56	29	09:38 (2) 10:07 (2)
21	05:12 21:43	06:06 20:42	20	08:05 (1) 08:25 (1)	07:03 19:25	41	07:45 (1) 08:26 (1)	08:01 18:11		08:02 16:12			08:42 15:56	29	09:39 (2) 10:08 (2)
22	05:13 21:41	06:08 20:40	26	08:01 (1) 08:27 (1)	07:05 19:05	38	07:46 (1) 08:24 (1)	08:03 18:09		08:04 16:11			08:43 15:57	29	09:39 (2) 10:08 (2)
23	05:15 21:40	06:10 20:38	31	08:30 (1) 07:07 (5)	07:07 19:20	34	08:00 (3) 08:22 (1)	08:09 18:07		08:06 16:09		09:38 (2) 09:45 (2)	08:43 15:57	29	10:08 (2) 10:08 (2)
24	05:17 21:38	06:12 20:35	43	08:32 (1) 07:04 (5)	07:09 19:18	29	08:08 (3) 08:19 (1)	08:14 18:04		08:08 16:08	7	09:35 (2) 09:48 (2)	08:44 15:58	30	09:40 (2) 10:10 (2)
25	05:18 21:37	06:14 20:33	51	08:33 (1) 07:01 (5)	07:11 19:15	23	08:00 (3) 07:53 (1)	08:15 17:02		08:09 16:07	13	09:34 (2) 09:50 (2)	08:44 15:58	30	09:40 (2) 10:10 (2)
26	05:20 21:35	06:16 20:30	58	08:34 (1) 07:00 (5)	07:13 19:13	13	08:16 (1) 07:58 (1)	08:11 17:00		08:11 16:06	16	09:33 (2) 09:51 (2)	08:45 15:59	30	10:10 (2) 10:10 (2)
27	05:22 21:34	06:17 20:28	63	08:35 (1) 06:59 (5)	07:15 19:10		08:11 (1) 07:14	17:00 16:58	1	08:08 (3) 08:12 (3)	18	09:51 (2) 09:33 (2)	15:59 16:00	30	10:11 (2) 10:10 (2)
28	05:23 21:32	06:19 20:26	68	08:37 (1) 06:58 (5)	07:16 19:08		07:15 07:14	16:58 16:56	10	08:15 (3) 08:14 (3)	20	09:53 (2) 09:54 (2)	16:00 16:01	29	10:11 (2) 10:11 (2)
29	05:25 21:30	06:21 20:23	71	08:38 (1) 06:57 (5)	07:18 19:05		07:16 16:53	17:02 16:03	14	07:58 (3) 08:15 (3)	22	09:32 (2) 09:55 (2)	08:45 16:02	29	09:42 (2) 10:11 (2)
30	05:27 21:28	06:23 20:21	74	08:38 (1) 06:57 (5)	07:20 19:02		07:19 16:51	17:03 16:02	17	07:57 (3) 08:16 (3)	23	09:32 (2) 09:56 (2)	08:45 16:03	30	09:42 (2) 10:12 (2)
31	05:28 21:26	06:25 20:18	76	08:39 (1) 06:56 (5)			07:21 16:49	07:57 (3) 16:20	19	07:57 (3) 08:17 (3)	24		08:45 16:04	30	09:43 (2) 10:12 (2)
Potential sun hours	518	463			383			327		255			228		
Total, worst case		669			1391			81		271			895		

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_enercon 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	09:12 (3) 17:56	07:13 17:56	08:52 (1) 19:57	09:25 (1) 20:54
2	08:45 16:06	08:11 17:00	09:14 (3) 17:58	07:11 17:58	08:51 (1) 19:59	09:26 (1) 20:56
3	08:44 16:07	08:09 17:02	09:18 (3) 18:00	07:09 18:00	08:49 (1) 19:59	09:26 (1) 20:58
4	08:44 16:09	08:07 17:04	09:20 (3) 18:06	07:06 18:02	08:48 (1) 19:59	09:26 (1) 20:58
5	08:44 16:10	08:06 17:06	09:21 (3) 18:04	07:04 18:04	08:47 (1) 19:59	09:26 (1) 20:58
6	08:43 16:11	08:04 17:08	09:22 (3) 18:06	07:01 18:06	08:45 (1) 19:59	09:26 (1) 20:58
7	08:43 16:13	08:02 17:11	09:23 (3) 18:08	06:59 18:08	08:44 (1) 19:59	09:26 (1) 20:58
8	08:42 16:14	08:00 17:13	09:24 (3) 18:10	06:56 18:10	08:43 (1) 19:59	09:26 (1) 20:58
9	08:42 16:16	09:16 (3) 17:15	09:25 (3) 18:12	06:54 18:12	08:41 (1) 19:59	09:26 (1) 20:58
10	08:41 16:17	09:15 (3) 17:17	09:26 (3) 18:14	06:51 18:14	08:40 (1) 19:59	09:26 (1) 20:58
11	08:40 16:19	09:14 (3) 17:19	09:27 (3) 18:16	06:49 18:16	08:39 (1) 19:59	09:26 (1) 20:58
12	08:39 16:20	09:13 (3) 17:21	09:28 (3) 18:18	06:46 18:18	08:38 (1) 19:59	09:26 (1) 20:58
13	08:39 16:22	09:12 (3) 17:23	09:29 (3) 18:20	06:44 18:20	08:37 (1) 19:59	09:26 (1) 20:58
14	08:38 16:24	09:10 (3) 17:25	09:30 (3) 18:22	06:41 18:22	08:36 (1) 19:59	09:26 (1) 20:58
15	08:37 16:25	09:09 (3) 17:27	09:31 (3) 18:24	06:39 18:24	08:35 (1) 19:59	09:26 (1) 20:58
16	08:36 16:27	09:08 (3) 17:29	09:32 (3) 18:26	06:36 18:26	08:34 (1) 19:59	09:26 (1) 20:58
17	08:35 16:29	09:07 (3) 17:31	09:33 (3) 18:28	06:34 18:28	08:33 (1) 19:59	09:26 (1) 20:58
18	08:33 16:31	09:05 (3) 17:33	09:34 (3) 18:30	06:31 18:30	08:32 (1) 19:59	09:26 (1) 20:58
19	08:32 16:33	09:04 (3) 17:35	09:35 (3) 18:32	06:29 18:32	08:31 (1) 19:59	09:26 (1) 20:58
20	08:31 16:34	09:03 (3) 17:38	09:36 (3) 18:34	06:26 18:34	08:30 (1) 19:59	09:26 (1) 20:58
21	08:30 16:36	09:02 (3) 17:40	09:37 (3) 18:36	06:24 18:36	08:29 (1) 19:59	09:26 (1) 20:58
22	08:28 16:38	09:01 (3) 17:42	09:38 (3) 18:38	06:21 18:38	08:28 (1) 19:59	09:26 (1) 20:58
23	08:27 16:40	09:00 (3) 17:44	09:39 (3) 18:40	06:19 18:40	08:27 (1) 19:59	09:26 (1) 20:58
24	08:26 16:42	08:59 (3) 17:46	09:40 (3) 18:42	06:16 18:42	08:26 (1) 19:59	09:26 (1) 20:58
25	08:24 16:44	08:58 (3) 17:48	09:41 (3) 18:44	06:14 18:44	08:25 (1) 19:59	09:26 (1) 20:58
26	08:23 16:46	08:57 (3) 17:50	09:42 (3) 18:46	06:11 18:46	08:24 (1) 19:59	09:26 (1) 20:58
27	08:21 16:48	08:56 (3) 17:52	09:43 (3) 18:48	06:09 18:48	08:23 (1) 19:59	09:26 (1) 20:58
28	08:20 16:50	08:55 (3) 17:54	09:44 (3) 18:50	06:06 18:50	08:22 (1) 19:59	09:26 (1) 20:58
29	08:18 16:52	08:54 (3) 17:56	09:45 (3) 18:52	06:04 18:52	08:21 (1) 19:59	09:26 (1) 20:58
30	08:16 16:54	08:53 (3) 17:58	09:46 (3) 18:54	06:01 18:54	08:20 (1) 19:59	09:26 (1) 20:58
31	08:15 16:56	08:52 (3) 18:00	09:47 (3) 18:56	05:59 18:56	08:19 (1) 19:59	09:26 (1) 20:58
Potential sun hours	245	271	366	422	498	516
Total, worst case	429	872	3748	3730	340	

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_enercon 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	06:27	07:01 (5)	07:22	09:17 (1)	07:23	08:20	08:56 (3)
	22:02	21:25	20:16	11:19 (1)	19:00	11:12 (1)	16:47	16:01	7 09:03 (3)
2	04:49	05:32	06:28	07:01 (5)	07:24	09:18 (1)	07:25	08:21	08:57 (3)
	22:01	21:23	20:13	11:19 (1)	18:57	11:11 (1)	16:45	16:00	5 09:02 (3)
3	04:50	05:34	06:30	07:01 (5)	07:26	09:18 (1)	07:27	08:23	08:59 (3)
	22:01	21:21	20:11	11:20 (1)	18:55	11:10 (1)	16:43	15:59	2 09:01 (3)
4	04:51	05:35	10:11 (1)	06:32	07:02 (5)	07:28	09:19 (1)	07:29	08:24
	22:00	21:19	10:13 (1)	20:08	11:21 (1)	18:52	11:09 (1)	16:41	15:58
5	04:52	05:37	10:02 (1)	06:34	07:03 (5)	07:30	09:19 (1)	07:31	08:26
	22:00	21:17	10:24 (1)	20:06	11:22 (1)	18:50	11:08 (1)	16:39	15:58
6	04:53	05:39	09:59 (1)	06:36	07:04 (5)	07:31	09:20 (1)	07:33	08:27
	21:59	21:15	10:29 (1)	20:03	11:22 (1)	18:47	11:06 (1)	16:37	15:57
7	04:54	05:41	09:55 (1)	06:38	07:05 (5)	07:33	09:21 (1)	07:35	08:28
	21:58	21:13	10:32 (1)	20:01	11:22 (1)	18:45	11:05 (1)	16:35	15:57
8	04:55	05:42	09:53 (1)	06:40	07:07 (5)	07:35	09:22 (1)	07:37	08:30
	21:58	21:11	10:36 (1)	19:58	11:23 (1)	18:42	11:04 (1)	16:33	4 08:51 (3)
9	04:56	05:44	09:51 (1)	06:41	07:10 (5)	07:37	09:23 (1)	07:39	08:43 (3)
	21:57	21:09	10:40 (1)	19:56	11:23 (1)	18:40	11:02 (1)	16:31	12 08:55 (3)
10	04:57	05:46	09:49 (1)	06:43	09:19 (1)	07:39	09:24 (1)	07:41	08:42 (3)
	21:56	21:07	10:43 (1)	19:53	11:23 (1)	18:38	11:01 (1)	16:30	16 08:58 (3)
11	04:58	05:48	09:46 (1)	06:45	09:18 (1)	07:41	09:25 (1)	07:43	08:41 (3)
	21:55	21:05	10:45 (1)	19:51	11:23 (1)	18:35	10:59 (1)	16:28	18 08:59 (3)
12	04:59	05:50	09:45 (1)	06:47	09:17 (1)	07:43	09:26 (1)	07:45	08:40 (3)
	21:54	21:02	10:47 (1)	19:48	11:23 (1)	18:33	10:57 (1)	16:26	20 09:00 (3)
13	05:01	05:52	09:44 (1)	06:49	09:17 (1)	07:45	09:27 (1)	07:47	08:39 (3)
	21:53	21:00	10:50 (1)	19:46	11:23 (1)	18:30	10:55 (1)	16:24	22 09:01 (3)
14	05:02	05:53	09:42 (1)	06:51	09:17 (1)	07:47	09:28 (1)	07:49	08:38 (3)
	21:52	20:58	10:52 (1)	19:43	11:23 (1)	18:28	10:54 (1)	16:23	23 09:01 (3)
15	05:03	05:55	09:41 (1)	06:52	09:17 (1)	07:49	09:30 (1)	07:51	08:39 (3)
	21:51	20:56	10:54 (1)	19:41	11:23 (1)	18:25	10:51 (1)	16:21	24 09:03 (3)
16	05:05	05:57	09:39 (1)	06:54	09:16 (1)	07:51	08:34 (4)	07:52	08:39 (3)
	21:50	20:54	10:57 (1)	19:38	11:22 (1)	18:23	10:49 (1)	16:19	24 09:03 (3)
17	05:06	05:59	07:17 (5)	06:56	09:16 (1)	07:53	08:31 (4)	07:54	08:38 (3)
	21:48	20:51	10:59 (1)	19:35	11:22 (1)	18:21	10:47 (1)	16:18	25 09:03 (3)
18	05:07	06:01	07:13 (5)	06:58	07:41 (6)	07:55	08:30 (4)	07:56	08:38 (3)
	21:47	20:49	11:00 (1)	19:33	11:22 (1)	18:18	10:45 (1)	16:16	25 09:03 (3)
19	05:09	06:03	07:11 (5)	07:00	07:39 (6)	07:57	08:28 (4)	07:58	08:38 (3)
	21:46	20:47	11:02 (1)	19:30	11:22 (1)	18:16	10:42 (1)	16:15	26 09:04 (3)
20	05:10	06:04	07:09 (5)	07:02	07:38 (6)	07:59	08:28 (4)	08:00	08:39 (3)
	21:44	20:45	11:04 (1)	19:28	11:21 (1)	18:14	10:39 (1)	16:13	25 09:04 (3)
21	05:12	06:06	07:07 (5)	07:03	07:36 (6)	08:01	08:29 (4)	08:02	08:39 (3)
	21:43	20:42	11:05 (1)	19:25	11:20 (1)	18:11	10:36 (1)	16:12	25 09:04 (3)
22	05:13	06:08	07:06 (5)	07:05	07:35 (6)	08:02	08:31 (4)	08:04	08:39 (3)
	21:41	20:40	11:07 (1)	19:23	11:20 (1)	18:09	10:32 (1)	16:11	25 09:04 (3)
23	05:15	06:10	07:05 (5)	07:07	07:34 (6)	08:04	08:33 (4)	08:06	08:40 (3)
	21:40	20:37	11:09 (1)	19:20	11:19 (1)	18:07	10:28 (1)	16:09	24 09:04 (3)
24	05:17	06:12	07:05 (5)	07:09	07:36 (6)	08:06	08:35 (4)	08:08	08:42 (3)
	21:38	20:35	11:11 (1)	19:18	11:19 (1)	18:04	10:23 (1)	16:08	22 09:04 (3)
25	05:18	06:14	07:03 (5)	07:11	07:38 (6)	07:08	07:38 (4)	08:09	08:44 (3)
	21:37	20:33	11:11 (1)	19:15	11:18 (1)	17:02	09:16 (1)	16:07	20 09:04 (3)
26	05:20	06:16	07:03 (5)	07:13	07:40 (6)	07:10	07:40 (4)	08:11	08:46 (3)
	21:35	20:30	11:13 (1)	19:13	11:17 (1)	17:00	07:43 (4)	16:06	18 09:04 (3)
27	05:22	06:17	07:02 (5)	07:15	07:42 (6)	07:12		08:13	08:48 (3)
	21:33	20:28	11:14 (1)	19:10	11:17 (1)	16:58		16:05	16 09:04 (3)
28	05:23	06:19	07:02 (5)	07:16	07:43 (6)	07:14		08:15	08:50 (3)
	21:32	20:26	11:16 (1)	19:07	11:15 (1)	16:56		16:04	14 09:04 (3)
29	05:25	06:21	07:01 (5)	07:18	07:45 (6)	07:16		08:16	08:52 (3)
	21:30	20:23	11:16 (1)	19:05	11:14 (1)	16:53		16:03	11 09:03 (3)
30	05:27	06:23	07:01 (5)	07:20	09:17 (1)	07:18		08:18	08:54 (3)
	21:28	20:21	11:17 (1)	19:02	11:13 (1)	16:51		16:02	9 09:03 (3)
31	05:28	06:25	07:01 (5)			07:21			08:45
	21:26	20:18	11:18 (1)			16:49			16:04
Potential sun hours	518	463	383	327	255	228			
Total, worst case		2548	4068	2164	448	14			

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_enercon 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		08:45 (4)	07:13	07:38 (6)	06:56	08:06 (5)	05:45	04:53
	16:05		16:58	92	15:29 (1)	17:56	15:18 (1)	19:57	09:05 (5)	20:54	21:46
2	08:45		08:11		08:46 (4)	07:11	07:36 (6)	06:54	08:06 (5)	05:42	04:52
	16:06		17:00	90	15:29 (1)	17:58	15:17 (1)	19:59	09:05 (5)	20:56	21:48
3	08:44	14:39 (1)	08:09		08:46 (4)	07:09	07:35 (6)	06:51	08:06 (5)	05:40	04:51
	16:07	10	14:49 (1)	92	15:30 (1)	18:00	15:14 (1)	20:00	09:03 (5)	20:58	21:49
4	08:44	14:37 (1)	08:07		08:47 (4)	07:06	07:36 (6)	06:48	08:06 (5)	05:38	04:50
	16:09	15	14:52 (1)	91	15:30 (1)	18:02	15:11 (1)	20:02	09:03 (5)	21:00	21:50
5	08:44	14:36 (1)	08:06		08:48 (4)	07:04	07:35 (6)	06:46	08:06 (5)	05:36	04:49
	16:10	19	14:55 (1)	90	15:31 (1)	18:04	15:07 (1)	20:04	09:01 (5)	21:02	21:51
6	08:43	14:34 (1)	08:04		08:48 (4)	07:01	07:35 (6)	06:43	08:07 (5)	05:34	04:48
	16:11	23	14:57 (1)	88	15:30 (1)	18:06	15:01 (1)	20:06	09:01 (5)	21:04	21:52
7	08:43	14:33 (1)	08:02		08:50 (4)	06:59	07:35 (6)	06:41	08:07 (5)	05:32	04:48
	16:13	25	14:58 (1)	85	15:30 (1)	18:08	08:01 (6)	20:08	08:07 (5)	21:05	21:53
8	08:42	14:31 (1)	08:00		08:52 (4)	06:56	07:36 (6)	06:39	08:08 (5)	05:30	04:47
	16:14	29	15:00 (1)	82	15:31 (1)	18:10	08:00 (6)	20:10	08:58 (5)	21:07	21:54
9	08:42	14:31 (1)	07:58		14:17 (1)	06:54	07:36 (6)	06:36	08:08 (5)	05:28	04:47
	16:16	31	15:02 (1)	74	15:31 (1)	18:12	07:59 (6)	20:12	08:56 (5)	21:09	21:55
10	08:41	14:30 (1)	07:56		14:17 (1)	06:51	07:36 (5)	06:34	08:09 (5)	05:26	04:46
	16:17	34	15:04 (1)	74	15:31 (1)	18:14	07:58 (6)	20:14	08:55 (5)	21:11	21:56
11	08:40	14:29 (1)	07:54		14:18 (1)	06:49	07:30 (5)	06:31	08:11 (5)	05:24	04:45
	16:19	37	15:06 (1)	74	15:32 (1)	18:16	07:55 (6)	20:16	08:53 (5)	21:13	21:57
12	08:39	14:29 (1)	07:52		14:18 (1)	06:46	07:27 (5)	06:29	08:11 (5)	05:22	04:45
	16:20	38	15:07 (1)	74	15:32 (1)	18:18	07:57 (5)	20:18	08:51 (5)	21:15	21:58
13	08:39	14:28 (1)	07:50		14:17 (1)	06:44	07:24 (5)	06:26	08:13 (5)	05:21	04:45
	16:22	41	15:09 (1)	74	15:31 (1)	18:20	07:59 (5)	20:20	08:49 (5)	21:16	21:59
14	08:38	14:27 (1)	07:47		14:18 (1)	06:41	07:22 (5)	06:24	08:14 (5)	05:19	04:44
	16:24	43	15:10 (1)	73	15:31 (1)	18:22	08:01 (5)	20:22	08:46 (5)	21:18	21:59
15	08:37	14:26 (1)	07:45		14:18 (1)	06:39	07:20 (5)	06:21	08:16 (5)	05:17	04:44
	16:25	45	15:11 (1)	73	15:31 (1)	18:24	08:02 (5)	20:24	08:43 (5)	21:20	22:00
16	08:36	14:26 (1)	07:43		14:19 (1)	06:36	07:18 (5)	06:19	08:20 (5)	05:15	04:44
	16:27	47	15:13 (1)	72	15:31 (1)	18:26	08:04 (5)	20:25	08:40 (5)	21:22	22:00
17	08:35	14:25 (1)	07:41		14:19 (1)	06:34	07:16 (5)	06:17	08:24 (5)	05:14	04:44
	16:29	49	15:14 (1)	71	15:30 (1)	18:28	08:04 (5)	20:27	08:33 (5)	21:23	22:01
18	08:33	14:24 (1)	07:39		14:20 (1)	06:31	07:15 (5)	06:14		05:12	04:44
	16:31	51	15:15 (1)	70	15:30 (1)	18:30	08:06 (5)	20:29		21:25	22:01
19	08:32	14:24 (1)	07:36		14:20 (1)	06:29	07:14 (5)	06:12		05:10	04:44
	16:32	53	15:17 (1)	70	15:30 (1)	18:32	08:06 (5)	20:31		21:27	22:02
20	08:31	14:23 (1)	07:34		14:20 (1)	06:26	07:12 (5)	06:09		05:09	04:44
	16:34	54	15:17 (1)	69	15:29 (1)	18:33	08:06 (5)	20:33		21:29	22:02
21	08:30	14:23 (1)	07:32		14:21 (1)	06:24	07:12 (5)	06:07		05:07	04:44
	16:36	56	15:19 (1)	67	15:28 (1)	18:35	08:07 (5)	20:35		21:30	22:02
22	08:28	14:22 (1)	07:30		14:22 (1)	06:21	07:10 (5)	06:05		05:06	04:44
	16:38	58	15:20 (1)	65	15:27 (1)	18:37	08:07 (5)	20:37		21:32	22:03
23	08:27	08:58 (4)	07:27		14:23 (1)	06:19	07:10 (5)	06:02		05:04	04:44
	16:40	61	15:21 (1)	64	15:27 (1)	18:39	08:08 (5)	20:39		21:33	22:03
24	08:26	08:56 (4)	07:25		07:51 (6)	06:16	07:09 (5)	06:00		05:03	04:45
	16:42	66	15:22 (1)	66	15:26 (1)	18:41	08:07 (5)	20:41		21:35	22:03
25	08:24	08:54 (4)	07:23		07:48 (6)	06:14	07:08 (5)	05:58		05:01	04:45
	16:44	71	15:23 (1)	68	15:24 (1)	18:43	08:08 (5)	20:43		21:36	22:03
26	08:23	08:53 (4)	07:20		07:46 (6)	06:11	07:07 (5)	05:56		05:00	04:45
	16:46	74	15:24 (1)	71	15:24 (1)	18:45	08:07 (5)	20:45		21:38	22:03
27	08:21	08:51 (4)	07:18		07:43 (6)	06:09	07:07 (5)	05:53		04:59	04:46
	16:48	78	15:25 (1)	72	15:22 (1)	18:47	08:08 (5)	20:47		21:39	22:03
28	08:20	08:49 (4)	07:16		07:41 (6)	06:06	07:07 (5)	05:51		04:57	04:46
	16:50	81	15:25 (1)	72	15:21 (1)	18:49	08:07 (5)	20:48		21:41	22:03
29	08:18	08:47 (4)			07:04		08:07 (5)	05:49		04:56	04:47
	16:52	85	15:26 (1)		19:51	60	09:07 (5)	20:50		21:42	22:02
30	08:16	08:45 (4)			07:01		08:06 (5)	05:47		04:55	04:48
	16:54	88	15:27 (1)		19:53	60	09:06 (5)	20:52		21:44	22:02
31	08:15	08:45 (4)			06:59		08:06 (5)			04:54	
	16:56	91	15:28 (1)		19:55	60	09:06 (5)			21:45	
Potential sun hours	245		271		366		422		498		516
Total, worst case	1453		2123		1520		743				

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_enercon 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 (5)	07:22	08:05 (5)	07:22	13:47 (1)	08:20	14:11 (1)				
	22:02	21:25	20:16	43	08:52 (5)	19:00	32	08:37 (5)	16:47	74	15:01 (1)	16:01	37	14:48 (1)
2	04:49	05:32	06:28	08:07 (5)	07:24	08:08 (5)	07:25	13:47 (1)	08:21	14:12 (1)				
	22:01	21:23	20:13	46	08:53 (5)	18:57	26	08:34 (5)	16:45	74	15:01 (1)	16:00	34	14:46 (1)
3	04:50	05:34	06:30	08:06 (5)	07:26	08:11 (5)	07:27	08:21 (4)	08:23	14:14 (1)				
	22:01	21:21	20:11	48	08:54 (5)	18:55	24	08:35 (6)	16:43	82	15:00 (1)	15:59	32	14:46 (1)
4	04:51	05:35	06:32	08:05 (5)	07:28	08:15 (6)	07:29	08:19 (4)	08:24	14:16 (1)				
	22:00	21:19	20:08	50	08:55 (5)	18:52	21	08:36 (6)	16:41	86	15:00 (1)	15:58	29	14:45 (1)
5	04:52	05:37	06:34	08:04 (5)	07:30	08:13 (6)	07:31	08:18 (4)	08:26	14:18 (1)				
	22:00	21:17	20:06	52	08:56 (5)	18:50	24	08:37 (6)	16:39	89	15:01 (1)	15:58	25	14:43 (1)
6	04:53	05:39	06:36	08:02 (5)	07:31	08:12 (6)	07:33	08:17 (4)	08:27	14:20 (1)				
	21:59	21:15	20:03	54	08:56 (5)	18:47	25	08:37 (6)	16:37	90	15:00 (1)	15:57	23	14:43 (1)
7	04:54	05:41	06:38	08:01 (5)	07:33	08:12 (6)	07:35	08:16 (4)	08:28	14:22 (1)				
	21:58	21:13	20:01	55	08:56 (5)	18:45	26	08:38 (6)	16:35	92	15:00 (1)	15:57	19	14:41 (1)
8	04:55	05:42	06:39	08:01 (5)	07:35	08:11 (6)	07:37	08:16 (4)	08:30	14:24 (1)				
	21:58	21:11	19:58	56	08:57 (5)	18:42	46	15:40 (1)	16:33	91	14:59 (1)	15:56	16	14:40 (1)
9	04:56	05:44	06:41	08:00 (5)	07:37	08:11 (6)	07:39	08:15 (4)	08:31	14:27 (1)				
	21:57	21:09	19:56	57	08:57 (5)	18:40	56	15:45 (1)	16:31	92	14:59 (1)	15:56	11	14:38 (1)
10	04:57	05:46	06:43	07:59 (5)	07:39	08:11 (6)	07:41	08:16 (4)	08:32	14:32 (1)				
	21:56	21:07	19:53	59	08:58 (5)	18:37	61	15:47 (1)	16:30	90	14:59 (1)	15:55	1	14:33 (1)
11	04:58	05:48	06:45	07:58 (5)	07:41	08:11 (6)	07:43	08:16 (4)	08:34	14:34 (1)				
	21:55	21:05	19:51	59	08:57 (5)	18:35	67	15:50 (1)	16:28	90	14:59 (1)	15:55		
12	04:59	05:50	06:47	07:58 (5)	07:43	08:11 (6)	07:45	08:17 (4)	08:35	14:35 (1)				
	21:54	21:02	19:48	59	08:57 (5)	18:33	70	15:51 (1)	16:26	88	14:58 (1)	15:55		
13	05:01	05:52	06:49	07:57 (5)	07:45	08:13 (6)	07:47	08:19 (4)	08:36	14:36 (1)				
	21:53	21:00	19:46	60	08:57 (5)	18:30	71	15:53 (1)	16:24	85	14:58 (1)	15:55		
14	05:02	05:53	06:51	07:57 (5)	07:47	08:15 (6)	07:49	08:21 (4)	08:37	14:37 (1)				
	21:52	20:58	19:43	60	08:57 (5)	18:28	71	15:54 (1)	16:23	82	14:57 (1)	15:55		
15	05:03	05:55	06:52	07:57 (5)	07:49	08:17 (6)	07:51	08:24 (4)	08:38	14:38 (1)				
	21:51	20:56	19:41	60	08:57 (5)	18:25	71	15:55 (1)	16:21	78	14:58 (1)	15:55		
16	05:05	05:57	06:54	07:56 (5)	07:51	08:19 (6)	07:52	08:26 (4)	08:39	14:39 (1)				
	21:50	20:54	19:38	60	08:56 (5)	18:23	70	15:56 (1)	16:19	74	14:57 (1)	15:55		
17	05:06	05:59	06:56	07:56 (5)	07:53	08:21 (6)	07:54	08:28 (4)	08:40	14:40 (1)				
	21:48	20:51	19:35	60	08:56 (5)	18:21	68	15:57 (1)	16:18	70	14:56 (1)	15:55		
18	05:07	06:01	06:58	07:56 (5)	07:55	08:23 (6)	07:56	08:30 (4)	08:40	14:41 (1)				
	21:47	20:49	19:33	59	08:55 (5)	18:18	64	15:58 (1)	16:16	66	14:56 (1)	15:55		
19	05:09	06:03	07:00	07:56 (5)	07:57	14:54 (1)	07:58	08:32 (4)	08:41	14:42 (1)				
	21:46	20:47	19:30	59	08:55 (5)	18:16	64	15:58 (1)	16:15	61	14:55 (1)	15:55		
20	05:10	06:04	07:02	07:56 (5)	07:59	14:53 (1)	08:00	13:57 (1)	08:42	14:43 (1)				
	21:44	20:44	19:28	58	08:54 (5)	18:14	66	15:59 (1)	16:13	58	14:55 (1)	15:56		
21	05:12	06:06	07:03	07:56 (5)	08:00	14:51 (1)	08:02	13:58 (1)	08:42	14:44 (1)				
	21:43	20:42	19:25	57	08:53 (5)	18:11	68	15:59 (1)	16:12	56	14:54 (1)	15:56		
22	05:13	06:08	07:05	07:56 (5)	08:02	14:50 (1)	08:04	13:59 (1)	08:43	14:45 (1)				
	21:41	20:40	19:23	56	08:52 (5)	18:09	69	15:59 (1)	16:11	54	14:53 (1)	15:57		
23	05:15	06:10	07:07	07:56 (5)	08:04	14:50 (1)	08:06	14:00 (1)	08:43	14:46 (1)				
	21:40	20:37	19:20	55	08:51 (5)	18:07	69	15:59 (1)	16:09	53	14:53 (1)	15:57		
24	05:17	06:12	07:09	07:57 (5)	08:06	14:49 (1)	08:08	14:01 (1)	08:44	14:47 (1)				
	21:38	20:35	19:18	53	08:50 (5)	18:04	71	16:00 (1)	16:08	51	14:52 (1)	15:58		
25	05:18	06:14	07:11	07:58 (5)	07:08	13:49 (1)	08:09	14:02 (1)	08:44	14:48 (1)				
	21:37	20:33	19:15	51	08:49 (5)	17:02	72	15:01 (1)	16:07	50	14:52 (1)	15:58		
26	05:20	06:16	08:26 (5)	07:13	07:59 (5)	07:10	13:48 (1)	08:11	14:04 (1)	08:44	14:51 (1)	15:59		
	21:35	20:30	11	08:37 (5)	19:13	48	08:47 (5)	17:00	73	15:01 (1)	16:06	47	14:51 (1)	15:59
27	05:21	06:17	08:21 (5)	07:15	07:59 (5)	07:12	13:48 (1)	08:13	14:05 (1)	08:45	14:50 (1)	16:00		
	21:33	20:28	21	08:42 (5)	19:10	46	08:45 (5)	16:58	73	15:01 (1)	16:05	45	14:50 (1)	16:00
28	05:23	06:19	08:18 (5)	07:16	08:00 (5)	07:14	13:47 (1)	08:15	14:07 (1)	08:45	14:51 (1)	16:01		
	21:32	20:26	27	08:45 (5)	19:07	43	08:43 (5)	16:56	74	15:01 (1)	16:04	43	14:50 (1)	16:01
29	05:25	06:21	08:15 (5)	07:18	08:01 (5)	07:16	13:47 (1)	08:16	14:08 (1)	08:45	14:51 (1)	16:02		
	21:30	20:23	32	08:47 (5)	19:05	40	08:41 (5)	16:53	74	15:01 (1)	16:03	41	14:49 (1)	16:02
30	05:27	06:23	08:13 (5)	07:20	08:03 (5)	07:18	13:47 (1)	08:18	14:10 (1)	08:45	14:48 (1)	16:03		
	21:28	20:21	36	08:49 (5)	19:02	36	08:39 (5)	16:51	73	15:00 (1)	16:02	38	14:48 (1)	16:03
31	05:28	06:25	08:11 (5)	07:21	07:20	13:47 (1)	08:19	14:11 (1)	08:45	14:49 (1)				
	21:26	20:18	40	08:51 (5)	16:49	74	15:01 (1)	16:04	16:04	228				
Potential sun hours	518	463	383	1599	327	1813	255	2090	227					
Total, worst case		167												

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_enercon 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		10:15 (4)	08:13	09:09 (6)	07:13	14:35 (5)	06:56	15:27 (5)	05:45	04:53
	16:05	34	14:56 (2)	16:58	09:58 (6)	17:56	17:17 (1)	19:57	17:11 (5)	20:54	21:46
2	08:45		10:15 (4)	08:11	09:09 (6)	07:11	14:34 (5)	06:53	15:28 (5)	05:42	04:52
	16:06	31	14:55 (2)	17:00	09:59 (6)	17:58	17:17 (1)	19:58	17:10 (5)	20:56	21:48
3	08:44		10:17 (4)	08:09	09:09 (6)	07:08	14:32 (5)	06:51	15:29 (5)	05:40	04:51
	16:07	29	14:55 (2)	17:02	09:59 (6)	18:00	17:16 (1)	20:00	17:09 (5)	20:58	21:49
4	08:44		10:17 (4)	08:07	09:09 (6)	07:06	14:32 (5)	06:48	15:30 (5)	05:38	04:50
	16:09	26	14:54 (2)	17:04	10:00 (6)	18:02	17:16 (1)	20:02	17:09 (5)	21:00	21:50
5	08:44		10:19 (4)	08:06	09:08 (6)	07:04	14:31 (5)	06:46	15:31 (5)	05:36	04:49
	16:10	20	14:53 (2)	17:06	10:00 (6)	18:04	17:14 (1)	20:04	17:07 (5)	21:02	21:51
6	08:43		10:20 (4)	08:04	09:08 (6)	07:01	14:30 (5)	06:43	15:33 (5)	05:34	04:48
	16:11	14	10:34 (4)	17:08	09:59 (6)	18:06	17:14 (1)	20:06	17:06 (5)	21:04	21:52
7	08:43		10:21 (4)	08:02	09:08 (6)	06:59	14:29 (5)	06:41	15:33 (5)	05:32	04:48
	16:13	13	10:34 (4)	17:10	10:00 (6)	18:08	17:12 (1)	20:08	15:36 (5)	21:05	21:53
8	08:42		10:23 (4)	08:00	09:08 (6)	06:56	14:29 (5)	06:38	15:35 (5)	05:30	04:47
	16:14	9	10:32 (4)	17:13	10:00 (6)	18:10	17:11 (1)	20:10	17:04 (5)	21:07	21:54
9	08:42		10:27 (4)	07:58	09:08 (6)	06:54	14:27 (5)	06:36	15:36 (5)	05:28	04:46
	16:16	4	10:31 (4)	17:15	10:00 (6)	18:12	17:08 (1)	20:12	17:02 (5)	21:09	21:55
10	08:41			07:56	09:08 (6)	06:51	14:27 (5)	06:34	15:38 (5)	05:26	04:46
	16:17			17:17	15:33 (5)	18:14	17:05 (1)	20:14	17:01 (5)	21:11	21:56
11	08:40			07:54	09:09 (6)	06:49	14:26 (5)	06:31	15:39 (5)	05:24	04:45
	16:19			17:19	15:40 (5)	18:16	16:18 (5)	20:16	17:00 (5)	21:13	21:57
12	08:39			07:52	09:09 (6)	06:46	14:26 (5)	06:29	15:42 (5)	05:22	04:45
	16:20			17:21	15:45 (5)	18:18	16:18 (5)	20:18	16:58 (5)	21:15	21:58
13	08:39			07:49	09:09 (6)	06:44	14:25 (5)	06:26	15:44 (5)	05:21	04:45
	16:22			17:23	15:48 (5)	18:20	16:18 (5)	20:20	16:57 (5)	21:16	21:58
14	08:38			07:47	09:09 (6)	06:41	14:25 (5)	06:24	15:46 (5)	05:19	04:44
	16:24			17:25	15:51 (5)	18:22	16:18 (5)	20:22	16:55 (5)	21:18	21:59
15	08:37		09:26 (6)	07:45	09:10 (6)	06:39	14:24 (5)	06:21	15:48 (5)	05:17	04:44
	16:25	6	09:32 (6)	17:27	15:54 (5)	18:24	16:18 (5)	20:23	16:54 (5)	21:20	22:00
16	08:36		09:22 (6)	07:43	09:10 (6)	06:36	14:24 (5)	06:19	15:51 (5)	05:15	04:44
	16:27	14	09:36 (6)	17:29	15:56 (5)	18:26	16:18 (5)	20:25	16:52 (5)	21:22	22:00
17	08:35		09:20 (6)	07:41	09:11 (6)	06:34	14:24 (5)	06:17	15:53 (5)	05:13	04:44
	16:29	19	09:39 (6)	17:31	15:58 (5)	18:28	16:18 (5)	20:27	16:49 (5)	21:23	22:01
18	08:33		09:18 (6)	07:39	09:12 (6)	06:31	14:24 (5)	06:14	15:57 (5)	05:12	04:44
	16:31	23	09:41 (6)	17:33	16:00 (5)	18:30	16:18 (5)	20:29	16:47 (5)	21:25	22:01
19	08:32		09:17 (6)	07:36	09:13 (6)	06:29	14:23 (5)	06:12	16:00 (5)	05:10	04:44
	16:32	26	09:43 (6)	17:35	17:07 (1)	18:31	16:18 (5)	20:31	16:45 (5)	21:27	22:02
20	08:31		09:16 (6)	07:34	09:14 (6)	06:26	14:23 (5)	06:09	16:03 (5)	05:09	04:44
	16:34	29	09:45 (6)	17:37	17:08 (1)	18:33	16:17 (5)	20:33	16:41 (5)	21:28	22:02
21	08:30		09:15 (6)	07:32	09:15 (6)	06:24	14:23 (5)	06:07	16:08 (5)	05:07	04:44
	16:36	32	09:47 (6)	17:40	17:11 (1)	18:35	16:17 (5)	20:35	16:38 (5)	21:30	22:02
22	08:28		09:14 (6)	07:30	09:16 (6)	06:21	14:23 (5)	06:05	16:15 (5)	05:06	04:44
	16:38	34	09:48 (6)	17:42	17:12 (1)	18:37	16:16 (5)	20:37	16:32 (5)	21:32	22:02
23	08:27		09:13 (6)	07:27	09:18 (6)	06:19	14:23 (5)	06:02		05:04	04:44
	16:40	37	09:50 (6)	17:44	17:15 (1)	18:39	16:16 (5)	20:39		21:33	22:03
24	08:26		09:12 (6)	07:25	09:21 (6)	06:16	14:23 (5)	06:00		05:03	04:45
	16:42	39	09:51 (6)	17:46	17:17 (1)	18:41	16:16 (5)	20:41		21:35	22:03
25	08:24		09:11 (6)	07:23	09:24 (6)	06:14	14:24 (5)	05:58		05:01	04:45
	16:44	40	09:51 (6)	17:48	17:17 (1)	18:43	16:16 (5)	20:43		21:36	22:03
26	08:23		09:12 (6)	07:20	14:39 (5)	06:11	14:24 (5)	05:56		05:00	04:45
	16:46	41	09:53 (6)	17:50	17:17 (1)	18:45	16:15 (5)	20:45		21:38	22:03
27	08:21		09:11 (6)	07:18	14:37 (5)	06:09	14:24 (5)	05:53		04:59	04:46
	16:48	43	09:54 (6)	17:52	17:17 (1)	18:47	16:15 (5)	20:47		21:39	22:03
28	08:20		09:10 (6)	07:16	14:36 (5)	06:06	14:24 (5)	05:51		04:57	04:46
	16:50	45	09:55 (6)	17:54	17:18 (1)	18:49	16:14 (5)	20:48		21:41	22:02
29	08:18		09:09 (6)		07:04		15:25 (5)	05:49		04:56	04:47
	16:52	46	09:55 (6)		19:51		17:13 (5)	20:50		21:42	22:02
30	08:16		09:09 (6)		07:01		15:26 (5)	05:47		04:55	04:48
	16:54	47	09:56 (6)		19:53		17:12 (5)	20:52		21:44	22:02
31	08:15		09:09 (6)		06:58		15:27 (5)			04:54	
	16:56	48	09:57 (6)		19:55		17:12 (5)			21:45	
Potential sun hours	245			271		366		422		498	516
Total, worst case	749			2644		3652		1606			

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_enercon 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	15:39 (5)	07:22	15:05 (5)	07:22	08:38 (6)	08:19					
	22:02	21:25	20:16	80	16:59 (5)	19:00	112	16:57 (5)	16:47	62	15:01 (5)	16:01		
2	04:49	05:32	06:28	83	15:36 (5)	07:24	112	15:05 (5)	07:24	52	08:38 (6)	08:21		
	22:01	21:23	20:13	83	16:59 (5)	18:57	112	16:57 (5)	16:45	52	09:30 (6)	16:00		
3	04:50	05:33	06:30	86	15:34 (5)	07:26	117	15:05 (5)	07:26	53	08:37 (6)	08:23	10:10 (4)	
	22:01	21:21	20:11	86	17:00 (5)	18:55	117	17:41 (1)	16:43	53	09:30 (6)	15:59	3	10:13 (4)
4	04:51	05:35	06:32	89	15:32 (5)	07:28	124	15:05 (5)	07:29	52	08:37 (6)	08:24	10:08 (4)	
	22:00	21:19	20:08	89	17:01 (5)	18:52	124	17:45 (1)	16:41	52	09:29 (6)	15:58	9	10:17 (4)
5	04:52	05:37	06:34	92	15:30 (5)	07:30	129	15:05 (5)	07:31	52	08:38 (6)	08:26	12	10:06 (4)
	22:00	21:17	20:06	92	17:02 (5)	18:50	129	17:47 (1)	16:39	52	09:30 (6)	15:58	12	10:18 (4)
6	04:53	05:39	06:36	93	15:28 (5)	07:31	131	15:06 (5)	07:33	52	08:38 (6)	08:27	15	10:06 (4)
	21:59	21:15	20:03	93	17:01 (5)	18:47	131	17:49 (1)	16:37	52	09:30 (6)	15:57	15	10:21 (4)
7	04:54	05:41	06:38	96	15:26 (5)	07:33	132	15:06 (5)	07:35	51	08:38 (6)	08:28	20	10:05 (4)
	21:58	21:13	20:01	96	17:02 (5)	18:45	132	17:49 (1)	16:35	51	09:29 (6)	15:57	20	14:39 (2)
8	04:55	05:42	06:39	98	15:25 (5)	07:35	133	15:06 (5)	07:37	51	08:38 (6)	08:30	25	10:05 (4)
	21:58	21:11	19:58	98	17:03 (5)	18:42	133	17:50 (1)	16:33	51	09:29 (6)	15:56	25	14:42 (2)
9	04:56	05:44	06:41	100	15:23 (5)	07:37	133	15:07 (5)	07:39	50	08:39 (6)	08:31	29	10:05 (4)
	21:57	21:09	19:56	100	17:03 (5)	18:40	133	17:51 (1)	16:31	50	09:29 (6)	15:56	29	14:43 (2)
10	04:57	05:46	06:43	102	15:22 (5)	07:39	133	15:06 (5)	07:41	49	08:40 (6)	08:32	31	10:04 (4)
	21:56	21:07	19:53	102	17:04 (5)	18:37	133	17:50 (1)	16:29	49	09:29 (6)	15:55	31	14:44 (2)
11	04:58	05:48	06:45	104	15:19 (5)	07:41	132	15:07 (5)	07:43	48	08:40 (6)	08:33	34	10:05 (4)
	21:55	21:05	19:51	104	17:03 (5)	18:35	132	17:50 (1)	16:28	48	09:28 (6)	15:55	34	14:46 (2)
12	04:59	05:50	06:47	105	15:18 (5)	07:43	131	15:08 (5)	07:45	47	08:41 (6)	08:35	35	10:05 (4)
	21:54	21:02	19:48	105	17:03 (5)	18:33	131	17:51 (1)	16:26	47	09:28 (6)	15:55	35	14:46 (2)
13	05:01	05:52	06:49	106	15:17 (5)	07:45	129	15:09 (5)	07:47	46	08:41 (6)	08:36	36	10:05 (4)
	21:53	21:00	19:46	106	17:03 (5)	18:30	129	17:51 (1)	16:24	46	09:27 (6)	15:55	36	14:47 (2)
14	05:02	05:53	06:50	108	15:16 (5)	07:47	128	15:10 (5)	07:49	45	08:42 (6)	08:37	38	10:05 (4)
	21:52	20:58	19:43	108	17:04 (5)	18:28	128	17:51 (1)	16:23	45	09:27 (6)	15:55	38	14:48 (2)
15	05:03	05:55	06:52	109	15:14 (5)	07:49	124	15:11 (5)	07:50	43	08:44 (6)	08:38	40	10:05 (4)
	21:51	20:56	19:41	109	17:03 (5)	18:25	124	17:50 (1)	16:21	43	09:27 (6)	15:55	40	14:49 (2)
16	05:05	05:57	06:54	110	15:13 (5)	07:51	131	10:00 (6)	07:52	41	08:45 (6)	08:39	38	10:06 (4)
	21:49	20:54	19:38	110	17:03 (5)	18:23	131	17:49 (1)	16:19	41	09:26 (6)	15:55	38	14:49 (2)
17	05:06	05:59	06:56	111	15:12 (5)	07:53	138	09:55 (6)	07:54	40	08:45 (6)	08:39	40	10:06 (4)
	21:48	20:51	19:35	111	17:03 (5)	18:21	138	17:49 (1)	16:18	40	09:25 (6)	15:55	40	14:50 (2)
18	05:07	06:01	06:58	112	15:11 (5)	07:55	141	09:51 (6)	07:56	39	08:46 (6)	08:40	41	10:07 (4)
	21:47	20:49	19:33	112	17:03 (5)	18:18	141	17:48 (1)	16:16	39	09:25 (6)	15:55	41	14:51 (2)
19	05:09	06:03	07:00	112	15:11 (5)	07:56	140	09:49 (6)	07:58	37	08:47 (6)	08:41	42	10:06 (4)
	21:46	20:47	19:30	112	17:03 (5)	18:16	140	17:45 (1)	16:15	37	09:24 (6)	15:55	42	14:51 (2)
20	05:10	06:04	07:02	113	15:10 (5)	07:58	136	09:47 (6)	08:00	34	08:49 (6)	08:42	42	10:07 (4)
	21:44	20:44	19:28	113	17:03 (5)	18:14	136	17:43 (1)	16:13	34	09:23 (6)	15:56	42	14:52 (2)
21	05:12	06:06	07:03	114	15:08 (5)	08:00	133	09:45 (6)	08:02	32	08:50 (6)	08:42	41	10:08 (4)
	21:43	20:42	19:25	114	17:02 (5)	18:11	133	17:40 (1)	16:12	32	09:22 (6)	15:56	41	14:53 (2)
22	05:13	06:08	07:05	114	16:12 (5)	08:02	128	09:44 (6)	08:04	29	08:52 (6)	08:43	41	10:08 (4)
	21:41	20:40	19:23	114	16:43 (5)	18:09	128	17:38 (1)	16:11	29	09:21 (6)	15:57	41	14:53 (2)
23	05:15	06:10	07:07	115	16:07 (5)	08:04	122	09:42 (6)	08:06	27	08:53 (6)	08:43	42	10:08 (4)
	21:40	20:37	19:20	115	17:02 (5)	18:07	122	17:35 (1)	16:09	27	09:20 (6)	15:57	42	14:53 (2)
24	05:17	06:12	07:09	114	16:04 (5)	08:06	113	09:41 (6)	08:07	23	08:55 (6)	08:44	42	10:09 (4)
	21:38	20:35	19:18	114	16:49 (5)	18:04	113	16:29 (5)	16:08	23	09:18 (6)	15:58	42	14:54 (2)
25	05:18	06:14	07:11	114	15:59 (5)	07:11	110	08:41 (6)	08:09	20	08:57 (6)	08:44	41	10:10 (4)
	21:37	20:33	19:15	114	16:50 (5)	17:02	110	15:28 (5)	16:07	20	09:17 (6)	15:58	41	14:54 (2)
26	05:20	06:15	07:13	115	15:56 (5)	07:10	108	08:40 (6)	08:11	14	09:00 (6)	08:44	40	10:10 (4)
	21:35	20:30	19:12	115	16:52 (5)	17:01	108	15:26 (5)	16:06	14	09:14 (6)	15:59	40	14:54 (2)
27	05:21	06:17	07:14	114	15:53 (5)	07:12	103	08:40 (6)	08:13	7	09:04 (6)	08:45	40	10:10 (4)
	21:33	20:28	19:10	114	16:54 (5)	16:58	103	15:23 (5)	16:04	7	09:11 (6)	16:00	40	14:54 (2)
28	05:23	06:19	07:16	114	15:50 (5)	07:14	98	08:39 (6)	08:15			08:45	39	10:11 (4)
	21:32	20:25	19:07	114	16:56 (5)	16:56	98	15:20 (5)	16:03			16:01	39	14:55 (2)
29	05:25	06:21	07:18	113	15:46 (5)	07:16	94	08:38 (6)	08:16			08:45	38	10:12 (4)
	21:30	20:23	19:05	113	16:56 (5)	16:53	94	15:17 (5)	16:02			16:02	38	14:55 (2)
30	05:27	06:23	07:20	113	15:44 (5)	07:18	87	08:38 (6)	08:18			08:45	36	10:13 (4)
	21:28	20:21	19:02	113	16:57 (5)	16:51	87	15:13 (5)	16:02			16:03	36	14:55 (2)
31	05:28	06:25	07:20		15:42 (5)	07:20		08:38 (6)				08:45	34	10:14 (4)
	21:26	20:18	16:49		16:58 (5)	16:49	78	15:09 (5)				16:04	34	14:55 (2)
Potential sun hours	518	463	383	3149	327	3760	255	1096	964					
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		

SHADOW - Calendar

Calculation: Shadow_enercon 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		13:36 (4)	08:13		15:43 (3)	07:13			06:56		17:02 (6)	05:45		04:53			
	16:05	45	14:21 (4)	16:58	23	16:06 (3)	17:56			19:56	78	18:20 (6)	20:54		21:46			
2	08:45		13:37 (4)	08:11		15:44 (3)	07:11			06:53		17:03 (6)	05:42		04:52			
	16:06	45	14:22 (4)	17:00	23	16:07 (3)	17:58			19:58	77	18:20 (6)	20:56		21:48			
3	08:44		13:38 (4)	08:09		15:45 (3)	07:08			06:51		17:02 (6)	05:40		04:51			
	16:07	45	14:23 (4)	17:02	21	16:06 (3)	18:00			20:00	77	18:19 (6)	20:58		21:49			
4	08:44		13:38 (4)	08:07		15:46 (3)	07:06			06:48		17:03 (6)	05:38		04:50			
	16:09	45	14:23 (4)	17:04	20	16:06 (3)	18:02			20:02	76	18:19 (6)	21:00		21:50			
5	08:44		13:39 (4)	08:05		15:47 (3)	07:04			06:46		17:03 (6)	05:36		04:49			
	16:10	45	14:24 (4)	17:06	17	16:04 (3)	18:04			20:04	75	18:18 (6)	21:02		21:51			
6	08:43		13:39 (4)	08:04		15:49 (3)	07:01		16:41 (6)	06:43		17:03 (6)	05:34		04:48			
	16:11	45	14:24 (4)	17:08	13	16:02 (3)	18:06	15	16:56 (6)	20:06	75	18:18 (6)	21:03		21:52			
7	08:43		13:39 (4)	08:02		15:52 (3)	06:59		16:34 (6)	06:41		17:03 (6)	05:32		04:48			
	16:13	45	14:24 (4)	17:10	7	15:59 (3)	18:08	27	17:01 (6)	20:08	74	18:17 (6)	21:05		21:53			
8	08:42		13:40 (4)	08:00			06:56		16:31 (6)	06:38		17:04 (6)	05:30		04:47			
	16:14	44	14:24 (4)	17:12			18:10	34	17:05 (6)	20:10	85	19:41 (5)	21:07		21:54			
9	08:42		13:40 (4)	07:58			06:54		16:27 (6)	06:36		17:04 (6)	05:28		04:46			
	16:16	44	14:24 (4)	17:15			18:12	40	17:07 (6)	20:12	89	19:43 (5)	21:09		21:55			
10	08:41		13:42 (4)	07:56			06:51		16:25 (6)	06:33		17:05 (6)	05:26		04:46			
	16:17	43	14:25 (4)	17:17			18:14	45	17:10 (6)	20:14	91	19:45 (5)	21:11		21:56			
11	08:40		13:42 (4)	07:54			06:49		16:22 (6)	06:31		17:05 (6)	05:24		04:45			
	16:19	43	14:25 (4)	17:19			18:16	49	17:11 (6)	20:16	92	19:45 (5)	21:13		21:57			
12	08:39		13:43 (4)	07:52			06:46		16:21 (6)	06:29		17:07 (6)	05:22		04:45			
	16:20	42	14:25 (4)	17:21			18:18	52	17:13 (6)	20:18	92	19:47 (5)	21:15		21:58			
13	08:38		13:43 (4)	07:49			06:44		16:18 (6)	06:26		17:08 (6)	05:20		04:45			
	16:22	42	14:25 (4)	17:23			18:20	56	17:14 (6)	20:20	92	19:48 (5)	21:16		21:58			
14	08:38		13:43 (4)	07:47			06:41		16:17 (6)	06:24		17:08 (6)	05:19		04:44			
	16:24	42	14:25 (4)	17:25			18:22	59	17:16 (6)	20:21	92	19:47 (5)	21:18		21:59			
15	08:37		13:44 (4)	07:45			06:39		16:15 (6)	06:21		17:10 (6)	05:17		04:44			
	16:25	42	15:48 (3)	17:27			18:24	62	17:17 (6)	20:23	90	19:48 (5)	21:20		22:00			
16	08:36		13:45 (4)	07:43			06:36		16:14 (6)	06:19		17:11 (6)	05:15		04:44			
	16:27	46	15:51 (3)	17:29			18:26	64	17:18 (6)	20:25	88	19:48 (5)	21:22		22:00			
17	08:34		13:47 (4)	07:41			06:34		16:12 (6)	06:16		17:12 (6)	05:13		04:44			
	16:29	46	15:53 (3)	17:31			18:28	66	17:18 (6)	20:27	86	19:48 (5)	21:23		22:01			
18	08:33		13:47 (4)	07:39			06:31		16:11 (6)	06:14		17:14 (6)	05:12		04:44			
	16:31	49	15:54 (3)	17:33			18:29	68	17:19 (6)	20:29	82	19:48 (5)	21:25		22:01			
19	08:32		13:48 (4)	07:36			06:29		16:10 (6)	06:12		17:16 (6)	05:10		04:44			
	16:32	51	15:57 (3)	17:35			18:31	70	17:20 (6)	20:31	79	19:48 (5)	21:27		22:02			
20	08:31		13:49 (4)	07:34			06:26		16:08 (6)	06:09		17:17 (6)	05:09		04:44			
	16:34	51	15:58 (3)	17:37			18:33	74	18:06 (1)	20:33	75	19:47 (5)	21:28		22:02			
21	08:30		13:50 (4)	07:32			06:24		16:08 (6)	06:07		17:19 (6)	05:07		04:44			
	16:36	53	16:01 (3)	17:39			18:35	78	18:08 (1)	20:35	70	19:46 (5)	21:30		22:02			
22	08:28		13:51 (4)	07:30			06:21		16:07 (6)	06:05		17:22 (6)	05:05		04:44			
	16:38	54	16:03 (3)	17:42			18:37	83	18:10 (1)	20:37	64	19:46 (5)	21:32		22:02			
23	08:27		13:53 (4)	07:27			06:19		16:06 (6)	06:02		17:25 (6)	05:04		04:44			
	16:40	53	16:05 (3)	17:44			18:39	87	18:12 (1)	20:39	57	19:45 (5)	21:33		22:03			
24	08:26		13:55 (4)	07:25			06:16		16:05 (6)	06:00		17:30 (6)	05:03		04:45			
	16:42	50	16:05 (3)	17:46			18:41	91	18:14 (1)	20:41	48	19:45 (5)	21:35		22:03			
25	08:24		13:56 (4)	07:23			06:14		16:05 (6)	05:58		17:38 (6)	05:01		04:45			
	16:44	49	16:06 (3)	17:48			18:43	94	18:16 (1)	20:43	28	19:43 (5)	21:36		22:03			
26	08:23		13:59 (4)	07:20			06:11		16:04 (6)	05:56		19:18 (5)	05:00		04:45			
	16:46	45	16:07 (3)	17:50			18:45	95	18:17 (1)	20:45	24	19:42 (5)	21:38		22:03			
27	08:21		14:02 (4)	07:18			06:09		16:04 (6)	05:53		19:19 (5)	04:59		04:46			
	16:48	39	16:07 (3)	17:52			18:47	94	18:16 (1)	20:46	21	19:40 (5)	21:39		22:03			
28	08:19		15:41 (3)	07:16			06:06		16:03 (6)	05:51		19:21 (5)	04:57		04:46			
	16:50	26	16:07 (3)	17:54			18:49	93	18:15 (1)	20:48	18	19:39 (5)	21:41		22:02			
29	08:18		15:42 (3)				07:03		17:03 (6)	05:49		19:24 (5)	04:56		04:47			
	16:52	25	16:07 (3)				19:51	91	19:14 (1)	20:50	12	19:36 (5)	21:42		22:02			
30	08:16		15:42 (3)				07:01		17:03 (6)	05:47		19:29 (5)	04:55		04:48			
	16:54	25	16:07 (3)				19:53	86	19:11 (1)	20:52	2	19:31 (5)	21:44		22:02			
31	08:14		15:42 (3)				06:58		17:03 (6)				04:54					
	16:56	25	16:07 (3)				19:55	78	18:21 (6)				21:45					
Potential sun hours	245			271			366			422			498			516		
Total, worst case	1344			124			1751			2009								

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_enercon 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	17:05 (6)	07:22	16:59 (6)	07:22	08:19	13:24 (4)		
	22:02	21:24	20:16	92 19:45 (5)	19:00	54 17:53 (6)	16:47	16:01	43 14:07 (4)		
2	04:49	05:32	06:28	17:03 (6)	07:24	17:00 (6)	07:24	08:21	13:24 (4)		
	22:01	21:23	20:13	91 19:43 (5)	18:57	51 17:51 (6)	16:45	16:00	43 14:07 (4)		
3	04:50	05:33	06:30	17:02 (6)	07:26	17:02 (6)	07:26	08:23	13:24 (4)		
	22:01	21:21	20:11	89 19:41 (5)	18:55	47 17:49 (6)	16:43	15:59	44 14:08 (4)		
4	04:51	05:35	06:32	17:01 (6)	07:28	17:04 (6)	07:28	15:21 (3)	08:24	13:25 (4)	
	22:00	21:19	20:08	85 19:38 (5)	18:52	42 17:46 (6)	16:41	9 15:30 (3)	15:58	44 14:09 (4)	
5	04:52	05:37	06:34	17:00 (6)	07:29	17:07 (6)	07:30	15:19 (3)	08:26	13:24 (4)	
	22:00	21:17	20:06	74 18:14 (6)	18:50	36 17:43 (6)	16:39	14 15:33 (3)	15:58	45 14:09 (4)	
6	04:53	05:39	06:36	16:59 (6)	07:31	17:10 (6)	07:32	15:17 (3)	08:27	13:25 (4)	
	21:59	21:15	20:03	74 18:13 (6)	18:47	30 17:40 (6)	16:37	17 15:34 (3)	15:57	45 14:10 (4)	
7	04:54	05:41	06:38	16:58 (6)	07:33	17:14 (6)	07:34	15:16 (3)	08:28	13:25 (4)	
	21:58	21:13	20:01	75 18:13 (6)	18:45	21 17:35 (6)	16:35	20 15:36 (3)	15:57	45 14:10 (4)	
8	04:55	05:42	06:39	16:57 (6)	07:35		07:36	15:15 (3)	08:30	13:26 (4)	
	21:57	21:11	19:58	76 18:13 (6)	18:42		16:33	21 15:36 (3)	15:56	45 14:11 (4)	
9	04:56	05:44	06:41	16:57 (6)	07:37		07:39	15:14 (3)	08:31	13:26 (4)	
	21:57	21:09	19:56	76 18:13 (6)	18:40		16:31	23 15:37 (3)	15:56	45 14:11 (4)	
10	04:57	05:46	06:43	16:55 (6)	07:39		07:41	15:14 (3)	08:32	13:26 (4)	
	21:56	21:07	19:53	77 18:12 (6)	18:37		16:29	24 15:38 (3)	15:55	45 14:11 (4)	
11	04:58	05:48	06:45	16:55 (6)	07:41		07:42	15:14 (3)	08:33	13:27 (4)	
	21:55	21:04	19:51	77 18:12 (6)	18:35		16:28	25 15:39 (3)	15:55	45 14:12 (4)	
12	04:59	05:50	06:47	16:54 (6)	07:43		07:44	15:14 (3)	08:35	13:27 (4)	
	21:54	21:02	19:48	78 18:12 (6)	18:33		16:26	25 15:39 (3)	15:55	45 14:12 (4)	
13	05:01	05:51	19:35 (5)	06:49	16:54 (6)	07:45	07:46	15:13 (3)	08:36	13:28 (4)	
	21:53	21:00	7 19:42 (5)	19:46	86 19:02 (1)	18:30	16:24	26 15:39 (3)	15:55	45 14:13 (4)	
14	05:02	05:53	19:30 (5)	06:50	16:54 (6)	07:47	07:48	15:13 (3)	08:37	13:28 (4)	
	21:52	20:58	14 19:44 (5)	19:43	90 19:04 (1)	18:28	16:22	26 15:39 (3)	15:55	45 14:13 (4)	
15	05:03	05:55	19:28 (5)	06:52	16:53 (6)	07:49	07:50	13:34 (4)	08:38	13:28 (4)	
	21:51	20:56	19 19:47 (5)	19:40	93 19:04 (1)	18:25	16:21	40 15:39 (3)	15:55	46 14:14 (4)	
16	05:05	05:57	19:27 (5)	06:54	16:53 (6)	07:51	07:52	13:32 (4)	08:39	13:29 (4)	
	21:49	20:53	21 19:48 (5)	19:38	94 19:05 (1)	18:23	16:19	45 15:40 (3)	15:55	45 14:14 (4)	
17	05:06	05:59	19:24 (5)	06:56	16:52 (6)	07:53	07:54	13:30 (4)	08:39	13:30 (4)	
	21:48	20:51	25 19:49 (5)	19:35	96 19:05 (1)	18:21	16:18	49 15:40 (3)	15:55	45 14:15 (4)	
18	05:07	06:01	17:41 (6)	06:58	16:53 (6)	07:54	07:56	13:29 (4)	08:40	13:30 (4)	
	21:47	20:49	36 19:50 (5)	19:33	93 19:04 (1)	18:18	16:16	50 15:39 (3)	15:55	45 14:15 (4)	
19	05:09	06:02	17:34 (6)	07:00	16:53 (6)	07:56	07:58	13:27 (4)	08:41	13:30 (4)	
	21:46	20:47	49 19:50 (5)	19:30	91 19:02 (1)	18:16	16:15	53 15:39 (3)	15:55	45 14:15 (4)	
20	05:10	06:04	17:30 (6)	07:01	16:52 (6)	07:58	08:00	13:26 (4)	08:42	13:31 (4)	
	21:44	20:44	58 19:51 (5)	19:28	88 18:59 (1)	18:13	16:13	54 15:38 (3)	15:56	45 14:16 (4)	
21	05:12	06:06	17:26 (6)	07:03	16:52 (6)	08:00	08:02	13:25 (4)	08:42	13:31 (4)	
	21:43	20:42	66 19:51 (5)	19:25	84 18:56 (1)	18:11	16:12	53 15:36 (3)	15:56	45 14:16 (4)	
22	05:13	06:08	17:24 (6)	07:05	16:52 (6)	08:02	08:04	13:25 (4)	08:43	13:32 (4)	
	21:41	20:40	70 19:51 (5)	19:23	81 18:54 (1)	18:09	16:10	51 15:34 (3)	15:57	45 14:17 (4)	
23	05:15	06:10	17:21 (6)	07:07	16:53 (6)	08:04	08:06	13:24 (4)	08:43	13:32 (4)	
	21:40	20:37	75 19:51 (5)	19:20	75 18:51 (1)	18:07	16:09	51 15:33 (3)	15:57	45 14:17 (4)	
24	05:16	06:12	17:19 (6)	07:09	16:53 (6)	08:06	08:07	13:24 (4)	08:44	13:33 (4)	
	21:38	20:35	81 19:52 (5)	19:18	71 18:04 (6)	18:04	16:08	50 15:32 (3)	15:58	45 14:18 (4)	
25	05:18	06:14	17:16 (6)	07:11	16:54 (6)	07:08	08:09	13:24 (4)	08:44	13:33 (4)	
	21:37	20:33	84 19:51 (5)	19:15	69 18:03 (6)	17:02	16:07	47 15:30 (3)	15:58	45 14:18 (4)	
26	05:20	06:15	17:15 (6)	07:13	16:55 (6)	07:10	08:11	13:24 (4)	08:44	13:33 (4)	
	21:35	20:30	86 19:50 (5)	19:12	67 18:02 (6)	17:00	16:06	45 15:29 (3)	15:59	46 14:19 (4)	
27	05:21	06:17	17:13 (6)	07:14	16:54 (6)	07:12	08:13	13:24 (4)	08:45	13:34 (4)	
	21:33	20:28	88 19:50 (5)	19:10	65 17:59 (6)	16:58	16:04	42 15:28 (3)	16:00	45 14:19 (4)	
28	05:23	06:19	17:11 (6)	07:16	16:55 (6)	07:14	08:14	13:24 (4)	08:45	13:34 (4)	
	21:32	20:25	91 19:50 (5)	19:07	63 17:58 (6)	16:55	16:03	41 14:05 (4)	16:01	45 14:19 (4)	
29	05:25	06:21	17:09 (6)	07:18	16:56 (6)	07:16	08:16	13:24 (4)	08:45	13:35 (4)	
	21:30	20:23	92 19:48 (5)	19:05	60 17:56 (6)	16:53	16:02	42 14:06 (4)	16:02	45 14:20 (4)	
30	05:26	06:23	17:08 (6)	07:20	16:57 (6)	07:18	08:18	13:24 (4)	08:45	13:35 (4)	
	21:28	20:21	91 19:47 (5)	19:02	58 17:55 (6)	16:51	16:01	42 14:06 (4)	16:02	46 14:21 (4)	
31	05:28	06:25	17:06 (6)		07:20				08:45	13:36 (4)	
	21:26	20:18	92 19:46 (5)		16:49				16:04	45 14:21 (4)	
Potential sun hours	518	463		383		327		255		228	
Total, worst case			1145		2388		281		985		1392

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_enercon 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		10:18 (6)	08:13		10:24 (6)	07:13		17:12 (1)	06:56		17:25 (5)	05:45		04:53			
	16:05	75	15:25 (2)	16:58	70	11:34 (6)	17:56	16	17:28 (1)	19:57	60	18:25 (5)	20:54		21:46			
2	08:45		10:19 (6)	08:11		10:24 (6)	07:11		17:12 (1)	06:53		17:26 (5)	05:42		04:52			
	16:06	76	15:27 (2)	17:00	70	11:34 (6)	17:58	18	17:30 (1)	19:58	59	18:25 (5)	20:56		21:48			
3	08:44		10:20 (6)	08:09		10:25 (6)	07:08		17:10 (1)	06:51		17:26 (5)	05:40		04:51			
	16:07	77	15:29 (2)	17:02	69	11:34 (6)	18:00	22	17:32 (1)	20:00	58	18:24 (5)	20:58		21:49			
4	08:44		10:19 (6)	08:07		10:25 (6)	07:06		16:53 (5)	06:48		17:27 (5)	05:38		04:50			
	16:09	79	15:30 (2)	17:04	69	11:34 (6)	18:02	41	17:34 (1)	20:02	56	18:23 (5)	21:00		21:50			
5	08:44		10:20 (6)	08:05		10:26 (6)	07:04		16:48 (5)	06:46		17:27 (5)	05:36		04:49			
	16:10	80	15:32 (2)	17:06	67	11:33 (6)	18:04	46	17:34 (1)	20:04	54	18:21 (5)	21:02		21:51			
6	08:43		10:20 (6)	08:04		10:25 (6)	07:01		16:45 (5)	06:43		17:29 (5)	05:34		04:48			
	16:11	82	15:33 (2)	17:08	67	11:32 (6)	18:06	50	17:35 (1)	20:06	51	18:20 (5)	21:04		21:52			
7	08:43		10:20 (6)	08:02		10:26 (6)	06:59		16:42 (5)	06:41		17:29 (5)	05:32		04:48			
	16:13	82	15:33 (2)	17:10	66	11:32 (6)	18:08	52	17:34 (1)	20:08	49	18:18 (5)	21:05		21:53			
8	08:42		10:20 (6)	08:00		10:27 (6)	06:56		16:40 (5)	06:38		17:31 (5)	05:30		04:47			
	16:14	83	15:33 (2)	17:13	64	11:31 (6)	18:10	54	17:34 (1)	20:10	46	18:17 (5)	21:07		21:54			
9	08:42		10:20 (6)	07:58		10:28 (6)	06:54		16:38 (5)	06:36		17:32 (5)	05:28		04:46			
	16:16	84	15:34 (2)	17:15	63	11:31 (6)	18:12	55	17:33 (1)	20:12	43	18:15 (5)	21:09		21:55			
10	08:41		10:20 (6)	07:56		10:29 (6)	06:51		16:36 (5)	06:34		17:34 (5)	05:26		04:46			
	16:17	85	15:35 (2)	17:17	61	11:30 (6)	18:14	56	17:32 (1)	20:14	39	18:13 (5)	21:11		21:56			
11	08:40		10:21 (6)	07:54		10:30 (6)	06:49		16:34 (5)	06:31		17:36 (5)	05:24		04:45			
	16:19	85	15:35 (2)	17:19	59	11:29 (6)	18:16	57	17:31 (1)	20:16	34	18:10 (5)	21:13		21:57			
12	08:39		10:21 (6)	07:52		10:30 (6)	06:46		16:33 (5)	06:29		17:38 (5)	05:22		04:45			
	16:20	84	15:35 (2)	17:21	58	11:28 (6)	18:18	56	17:29 (1)	20:18	30	18:08 (5)	21:15		21:58			
13	08:39		10:21 (6)	07:49		10:31 (6)	06:44		16:32 (5)	06:26		17:42 (5)	05:21		04:45			
	16:22	84	15:35 (2)	17:23	56	11:27 (6)	18:20	56	17:28 (5)	20:20	23	18:05 (5)	21:16		21:58			
14	08:38		10:20 (6)	07:47		10:33 (6)	06:41		16:31 (5)	06:24		17:46 (5)	05:19		04:44			
	16:24	84	15:34 (2)	17:25	53	11:26 (6)	18:22	58	17:29 (5)	20:22	13	17:59 (5)	21:18		21:59			
15	08:37		10:20 (6)	07:45		10:34 (6)	06:39		16:29 (5)	06:21			05:17		04:44			
	16:25	84	15:34 (2)	17:27	50	11:24 (6)	18:24	60	17:29 (5)	20:23			21:20		22:00			
16	08:36		10:21 (6)	07:43		10:35 (6)	06:36		16:29 (5)	06:19			05:15		04:44			
	16:27	83	15:34 (2)	17:29	47	11:22 (6)	18:26	61	17:30 (5)	20:25			21:22		22:00			
17	08:35		10:21 (6)	07:41		10:37 (6)	06:34		16:28 (5)	06:17			05:13		04:44			
	16:29	82	15:34 (2)	17:31	43	11:20 (6)	18:28	62	17:30 (5)	20:27			21:23		22:01			
18	08:33		10:21 (6)	07:39		10:39 (6)	06:31		16:27 (5)	06:14			05:12		04:44			
	16:31	78	15:32 (2)	17:33	39	11:18 (6)	18:29	64	17:31 (5)	20:29			21:25		22:01			
19	08:32		10:21 (6)	07:36		10:41 (6)	06:29		16:26 (5)	06:12			05:10		04:44			
	16:32	76	15:31 (2)	17:35	33	11:14 (6)	18:31	65	17:31 (5)	20:31			21:27		22:02			
20	08:31		10:21 (6)	07:34		10:45 (6)	06:26		16:25 (5)	06:09			05:09		04:44			
	16:34	69	11:30 (6)	17:37	26	11:11 (6)	18:33	65	17:30 (5)	20:33			21:28		22:02			
21	08:30		10:21 (6)	07:32		10:50 (6)	06:24		16:25 (5)	06:07			05:07		04:44			
	16:36	70	11:31 (6)	17:40	15	11:05 (6)	18:35	66	17:31 (5)	20:35			21:30		22:02			
22	08:28		10:21 (6)	07:30			06:21		16:24 (5)	06:05			05:05		04:44			
	16:38	70	11:31 (6)	17:42			18:37	66	17:30 (5)	20:37			21:32		22:02			
23	08:27		10:22 (6)	07:27			06:19		16:24 (5)	06:02			05:04		04:44			
	16:40	70	11:32 (6)	17:44			18:39	67	17:31 (5)	20:39			21:33		22:03			
24	08:26		10:22 (6)	07:25			06:16		16:24 (5)	06:00			05:03		04:45			
	16:42	70	11:32 (6)	17:46			18:41	66	17:30 (5)	20:41			21:35		22:03			
25	08:24		10:21 (6)	07:23			06:14		16:24 (5)	05:58			05:01		04:45			
	16:44	71	11:32 (6)	17:48			18:43	66	17:30 (5)	20:43			21:36		22:03			
26	08:23		10:22 (6)	07:20		17:20 (1)	06:11		16:23 (5)	05:56			05:00		04:45			
	16:46	71	11:33 (6)	17:50	2	17:22 (1)	18:45	66	17:29 (5)	20:45			21:38		22:03			
27	08:21		10:22 (6)	07:18		17:16 (1)	06:09		16:24 (5)	05:53			04:59		04:46			
	16:48	71	11:33 (6)	17:52	7	17:23 (1)	18:47	65	17:29 (5)	20:46			21:39		22:03			
28	08:20		10:22 (6)	07:16		17:15 (1)	06:06		16:23 (5)	05:51			04:57		04:46			
	16:50	71	11:33 (6)	17:54	11	17:26 (1)	18:49	65	17:28 (5)	20:48			21:41		22:02			
29	08:18		10:22 (6)				07:04		17:24 (5)	05:49			04:56		04:47			
	16:52	71	11:33 (6)				19:51	64	18:28 (5)	20:50			21:42		22:02			
30	08:16		10:23 (6)				07:01		17:24 (5)	05:47			04:55		04:48			
	16:54	70	11:33 (6)				19:53	63	18:27 (5)	20:52			21:44		22:02			
31	08:15		10:23 (6)				06:58		17:25 (5)				04:54					
	16:56	70	11:33 (6)				19:55	62	18:27 (5)				21:45					
Potential sun hours	245			271			366		422			498		516				
Total, worst case	2387			1165			1730		615									

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_enercon 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 (5) 18:10 (5)	07:22 19:00	17:12 (5) 18:08 (1)	07:22 16:47	09:58 (6) 11:00 (6)	08:19 16:01	10:03 (6) 15:17 (2)
2	04:49 22:01	05:32 21:23	06:28 20:13	17:32 (5) 18:11 (5)	07:24 18:57	17:13 (5) 18:09 (1)	07:24 16:45	09:57 (6) 11:00 (6)	08:21 16:00	10:03 (6) 15:17 (2)
3	04:50 22:01	05:33 21:21	06:30 20:11	17:30 (5) 18:13 (5)	07:26 18:55	17:14 (5) 18:10 (1)	07:26 16:43	09:56 (6) 11:01 (6)	08:23 15:59	10:04 (6) 15:18 (2)
4	04:51 22:00	05:35 21:19	06:32 20:08	17:28 (5) 18:14 (5)	07:28 18:52	17:15 (5) 18:11 (1)	07:28 16:41	09:56 (6) 11:01 (6)	08:24 15:58	10:05 (6) 15:18 (2)
5	04:52 22:00	05:37 21:17	06:34 20:06	17:26 (5) 18:15 (5)	07:29 18:50	17:16 (5) 18:11 (1)	07:31 16:39	09:56 (6) 11:03 (6)	08:26 15:58	10:05 (6) 15:18 (2)
6	04:53 21:59	05:39 21:15	06:36 20:03	17:24 (5) 18:15 (5)	07:31 18:47	17:18 (5) 18:11 (1)	07:33 16:37	09:56 (6) 11:03 (6)	08:27 15:57	10:06 (6) 15:19 (2)
7	04:54 21:58	05:41 21:13	06:38 20:01	17:22 (5) 18:16 (5)	07:33 18:45	17:20 (5) 18:11 (1)	07:35 16:35	09:55 (6) 11:03 (6)	08:28 15:57	10:06 (6) 15:18 (2)
8	04:55 21:58	05:42 21:11	06:39 19:58	17:21 (5) 18:17 (5)	07:35 18:42	17:22 (5) 18:11 (1)	07:37 16:33	09:55 (6) 11:04 (6)	08:30 15:56	10:07 (6) 15:18 (2)
9	04:56 21:57	05:44 21:09	06:41 19:56	17:20 (5) 18:18 (5)	07:37 18:40	17:25 (5) 18:09 (1)	07:39 16:31	09:54 (6) 11:04 (6)	08:31 15:56	10:08 (6) 15:17 (2)
10	04:57 21:56	05:46 21:07	06:43 19:53	17:19 (5) 18:18 (5)	07:39 18:37	17:30 (5) 18:07 (1)	07:41 16:29	09:55 (6) 11:05 (6)	08:32 15:55	10:08 (6) 15:16 (2)
11	04:58 21:55	05:48 21:04	06:45 19:51	17:17 (5) 18:18 (5)	07:41 18:35	17:45 (1) 18:05 (1)	07:43 16:28	09:55 (6) 11:05 (6)	08:33 15:55	10:09 (6) 15:16 (2)
12	04:59 21:54	05:50 21:02	06:47 19:48	17:16 (5) 18:18 (5)	07:43 18:33	17:45 (1) 18:02 (1)	07:45 16:26	09:55 (6) 11:05 (6)	08:35 15:55	10:10 (6) 15:16 (2)
13	05:01 21:53	05:51 21:00	06:49 19:46	17:15 (5) 18:18 (5)	07:45 18:30	17:47 (1) 18:01 (1)	07:47 16:24	09:54 (6) 11:05 (6)	08:36 15:55	10:10 (6) 15:16 (2)
14	05:02 21:52	05:53 20:58	06:50 19:43	17:15 (5) 18:19 (5)	07:47 18:28	17:48 (1) 17:58 (1)	07:48 16:22	09:54 (6) 11:05 (6)	08:37 15:55	10:11 (6) 15:15 (2)
15	05:03 21:51	05:55 20:56	06:52 19:40	17:13 (5) 18:18 (5)	07:49 18:25	17:50 (1) 17:56 (1)	07:50 16:21	09:55 (6) 11:06 (6)	08:38 15:55	10:12 (6) 15:15 (2)
16	05:05 21:49	05:57 20:54	06:54 19:38	17:12 (5) 18:18 (5)	07:51 18:23	07:52 16:19	07:52 16:19	09:55 (6) 11:06 (6)	08:39 15:55	10:12 (6) 15:15 (2)
17	05:06 21:48	05:59 20:51	06:56 19:35	17:12 (5) 18:18 (5)	07:53 18:21	07:54 16:18	07:54 16:18	09:55 (6) 11:06 (6)	08:39 15:55	10:13 (6) 15:16 (2)
18	05:07 21:47	06:01 20:49	06:58 19:33	17:11 (5) 18:18 (5)	07:55 18:18	07:56 16:16	07:56 16:16	09:56 (6) 11:06 (6)	08:40 15:55	10:14 (6) 15:16 (2)
19	05:09 21:46	06:03 20:47	07:00 19:30	17:11 (5) 18:17 (5)	07:56 18:16	07:58 16:15	07:58 16:15	09:56 (6) 11:06 (6)	08:41 15:55	10:14 (6) 15:15 (2)
20	05:10 21:44	06:04 20:44	07:01 19:28	17:10 (5) 18:16 (5)	07:58 18:13	08:00 16:13	08:00 16:13	09:56 (6) 11:06 (6)	08:42 15:56	10:14 (6) 15:16 (2)
21	05:12 21:43	06:06 20:42	07:03 19:25	17:10 (5) 18:16 (5)	08:00 18:11	11:19 (6) 11:38 (6)	08:02 16:12	09:56 (6) 11:06 (6)	08:42 15:56	10:14 (6) 15:16 (2)
22	05:13 21:41	06:08 20:40	07:05 19:23	17:10 (5) 18:16 (5)	08:02 18:09	11:14 (6) 11:42 (6)	08:04 16:10	09:57 (6) 11:06 (6)	08:43 15:57	10:15 (6) 15:17 (2)
23	05:15 21:40	06:10 20:37	07:07 19:20	17:10 (5) 18:15 (5)	08:04 18:07	11:11 (6) 11:45 (6)	08:06 16:09	09:57 (6) 15:07 (2)	08:43 15:57	10:15 (6) 15:17 (2)
24	05:17 21:38	06:12 20:35	07:09 19:18	17:10 (5) 18:14 (5)	08:06 18:04	11:08 (6) 11:48 (6)	08:07 16:08	09:58 (6) 15:09 (2)	08:44 15:58	10:17 (6) 15:18 (2)
25	05:18 21:37	06:14 20:33	07:11 19:15	17:10 (5) 18:14 (5)	07:08 17:02	10:07 (6) 10:51 (6)	08:09 16:07	09:58 (6) 15:11 (2)	08:44 15:58	10:17 (6) 15:19 (2)
26	05:20 21:35	06:15 20:30	07:13 19:12	17:10 (5) 18:13 (5)	07:10 17:00	10:05 (6) 10:53 (6)	08:11 16:06	09:59 (6) 15:12 (2)	08:44 15:59	10:17 (6) 15:19 (2)
27	05:21 21:33	06:17 20:28	07:14 19:10	17:10 (5) 18:11 (5)	07:12 16:58	10:03 (6) 10:54 (6)	08:13 16:04	10:00 (6) 15:13 (2)	08:45 16:00	10:17 (6) 15:20 (2)
28	05:23 21:32	06:19 20:25	07:16 19:07	17:10 (5) 18:10 (5)	07:14 16:56	10:02 (6) 10:55 (6)	08:15 16:03	10:00 (6) 15:14 (2)	08:45 16:01	10:17 (6) 15:21 (2)
29	05:25 21:30	06:21 20:23	17:47 (5) 18:00 (5)	07:18 19:05	07:16 16:53	10:00 (6) 10:56 (6)	08:16 16:02	10:01 (6) 15:15 (2)	08:45 16:02	10:18 (6) 15:22 (2)
30	05:26 21:28	06:23 20:21	17:42 (5) 18:05 (5)	07:20 19:02	07:18 16:51	09:59 (6) 10:57 (6)	08:18 16:02	10:02 (6) 15:16 (2)	08:45 16:03	10:18 (6) 15:23 (2)
31	05:28 21:26	06:25 20:18	17:38 (5) 18:08 (5)	07:20 16:49	07:20 16:49	09:59 (6) 10:59 (6)	08:45 16:04	08:45 16:04	10:19 (6) 15:24 (2)	
Potential sun hours	518	463	383	327	255	228				
Total, worst case		66	1760	1070	2164	2277				

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 11:02 AM/4.0.547

SHADOW - Calendar

Calculation: Shadow_enercon 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	15:03 (4)	07:13	15:06 (4)	06:56	05:45	04:53	19:49 (6)			
2	16:05	16:58	52 15:55 (4)	17:56	74 17:23 (2)	19:56	20:54	21:46	57 20:46 (6)			
	08:45	08:11	15:02 (4)	07:11	15:08 (4)	06:53	05:42	04:52	19:48 (6)			
	16:06	17:00	54 15:56 (4)	17:58	57 17:22 (2)	19:58	20:56	21:47	58 20:46 (6)			
3	08:44	08:09	15:03 (4)	07:08	15:09 (4)	06:51	05:40	04:51	19:48 (6)			
	16:07	17:02	55 15:58 (4)	18:00	50 17:19 (2)	20:00	20:58	21:49	59 20:47 (6)			
4	08:44	08:07	15:01 (4)	07:06	15:11 (4)	06:48	05:38	20:25 (5)	04:50	19:47 (6)		
	16:09	17:04	57 15:58 (4)	18:02	38 15:49 (4)	20:02	21:00	20:29 (5)	21:50	60 20:47 (6)		
5	08:44	08:05	15:01 (4)	07:04	15:13 (4)	06:46	05:36	20:22 (5)	04:49	19:48 (6)		
	16:10	17:06	58 15:59 (4)	18:04	33 15:46 (4)	20:04	21:02	8 20:30 (5)	21:51	60 20:48 (6)		
6	08:43	08:04	15:00 (4)	07:01	15:17 (4)	06:43	19:35 (1)	05:34	20:20 (5)	04:48	19:47 (6)	
	16:11	17:08	59 15:59 (4)	18:06	27 15:44 (4)	20:06	4 19:39 (1)	21:03	12 20:32 (5)	21:52	61 20:48 (6)	
7	08:43	08:02	15:00 (4)	06:59	15:21 (4)	06:41	19:33 (1)	05:32	20:18 (5)	04:48	19:47 (6)	
	16:13	17:10	60 16:00 (4)	18:08	18 15:39 (4)	20:08	7 19:40 (1)	21:05	16 20:34 (5)	21:53	61 20:48 (6)	
8	08:42	08:00	15:00 (4)	06:56		06:38	19:33 (1)	05:30	20:17 (5)	04:47	19:47 (6)	
	16:14	17:13	61 16:01 (4)	18:10		20:10	9 19:42 (1)	21:07	18 20:35 (5)	21:54	62 20:49 (6)	
9	08:42	07:58	14:59 (4)	06:54		06:36	19:32 (1)	05:28	20:17 (5)	04:46	19:47 (6)	
	16:16	17:15	62 16:01 (4)	18:12		20:12	12 19:44 (1)	21:09	21 20:38 (5)	21:55	62 20:49 (6)	
10	08:41	07:56	14:59 (4)	06:51		06:33	19:32 (1)	05:26	20:16 (5)	04:46	19:47 (6)	
	16:17	17:17	63 16:02 (4)	18:14		20:14	14 19:46 (1)	21:11	23 20:39 (5)	21:56	63 20:50 (6)	
11	08:40	07:54	14:59 (4)	06:49		06:31	19:31 (1)	05:24	20:15 (5)	04:45	19:47 (6)	
	16:19	17:19	67 16:48 (3)	18:16		20:16	16 19:47 (1)	21:13	25 20:40 (5)	21:57	64 20:51 (6)	
12	08:39	07:52	14:58 (4)	06:46		06:29	19:32 (1)	05:22	20:14 (5)	04:45	19:47 (6)	
	16:20	17:21	73 16:50 (3)	18:18		20:18	16 19:48 (1)	21:15	28 20:42 (5)	21:58	63 20:50 (6)	
13	08:38	07:49	14:58 (4)	06:44		06:26	19:33 (1)	05:20	20:15 (5)	04:45	19:47 (6)	
	16:22	17:23	77 16:52 (3)	18:20		20:20	14 19:47 (1)	21:16	28 20:43 (5)	21:58	64 20:51 (6)	
14	08:38	07:47	14:59 (4)	06:41		06:24	19:33 (1)	05:19	20:14 (5)	04:44	19:47 (6)	
	16:24	17:25	81 16:55 (3)	18:22		20:21	12 19:45 (1)	21:18	29 20:43 (5)	21:59	64 20:51 (6)	
15	08:37	07:45	14:59 (4)	06:39		06:21	19:35 (1)	05:17	20:12 (6)	04:44	19:47 (6)	
	16:25	17:27	84 16:58 (3)	18:24		20:23	8 19:43 (1)	21:20	30 20:42 (5)	22:00	65 20:52 (6)	
16	08:36	07:43	14:58 (4)	06:36		06:19		05:15	20:07 (6)	04:44	19:48 (6)	
	16:27	17:29	87 16:59 (3)	18:26		20:25		21:22	36 20:43 (5)	22:00	64 20:52 (6)	
17	08:34	07:41	14:59 (4)	06:34		06:16		05:13	20:03 (6)	04:44	19:48 (6)	
	16:29	17:31	90 17:02 (3)	18:28		20:27		21:23	40 20:43 (5)	22:01	65 20:53 (6)	
18	08:33	07:39	14:59 (4)	06:31		06:14		05:12	20:01 (6)	04:44	19:48 (6)	
	16:31	17:33	92 17:03 (3)	18:29		20:29		21:25	42 20:43 (5)	22:01	65 20:53 (6)	
19	08:32	07:36	14:59 (4)	06:29		06:12		05:10	19:59 (6)	04:44	19:48 (6)	
	16:32	17:35	91 17:02 (3)	18:31		20:31		21:27	43 20:42 (5)	22:02	65 20:53 (6)	
20	08:31	15:20 (4)	07:34	14:59 (4)	06:26	06:09		05:09	19:57 (6)	04:44	19:48 (6)	
	16:34	13 15:33 (4)	17:37	91 17:03 (3)	18:33	20:33		21:28	46 20:43 (5)	22:02	65 20:53 (6)	
21	08:30	15:17 (4)	07:32	15:00 (4)	06:24	06:07		05:07	19:56 (6)	04:44	19:48 (6)	
	16:36	20 15:37 (4)	17:39	90 17:03 (3)	18:35	20:35		21:30	47 20:43 (5)	22:02	65 20:53 (6)	
22	08:28	15:14 (4)	07:30	15:00 (4)	06:21	06:05		05:05	19:54 (6)	04:44	19:48 (6)	
	16:38	26 15:40 (4)	17:42	91 17:12 (2)	18:37	20:37		21:32	48 20:42 (5)	22:02	65 20:53 (6)	
23	08:27	15:13 (4)	07:27	15:01 (4)	06:19	06:02		05:04	19:54 (6)	04:44	19:49 (6)	
	16:40	30 15:43 (4)	17:44	92 17:15 (2)	18:39	20:39		21:33	48 20:42 (5)	22:03	65 20:54 (6)	
24	08:26	15:11 (4)	07:25	15:02 (4)	06:16	06:00		05:03	19:53 (6)	04:45	19:49 (6)	
	16:42	33 15:44 (4)	17:46	93 17:18 (2)	18:41	20:41		21:35	49 20:42 (5)	22:03	65 20:54 (6)	
25	08:24	15:10 (4)	07:23	15:02 (4)	06:14	05:58		05:01	19:52 (6)	04:45	19:49 (6)	
	16:44	36 15:46 (4)	17:48	92 17:19 (2)	18:43	20:43		21:36	50 20:42 (5)	22:03	65 20:54 (6)	
26	08:23	15:09 (4)	07:20	15:03 (4)	06:11	05:56		05:00	19:52 (6)	04:45	19:50 (6)	
	16:46	39 15:48 (4)	17:50	92 17:22 (2)	18:45	20:45		21:38	50 20:42 (5)	22:03	64 20:54 (6)	
27	08:21	15:08 (4)	07:18	15:04 (4)	06:09	05:53		04:59	19:50 (6)	04:46	19:50 (6)	
	16:48	42 15:50 (4)	17:52	89 17:23 (2)	18:47	20:46		21:39	51 20:41 (6)	22:03	64 20:54 (6)	
28	08:19	15:07 (4)	07:16	15:05 (4)	06:06	05:51		04:57	19:50 (6)	04:46	19:50 (6)	
	16:50	44 15:51 (4)	17:54	84 17:25 (2)	18:49	20:48		21:41	52 20:42 (6)	22:02	65 20:55 (6)	
29	08:18	15:06 (4)		07:03		05:49		04:56	19:49 (6)	04:47	19:50 (6)	
	16:52	46 15:52 (4)		19:51		20:50		21:42	54 20:43 (6)	22:02	64 20:54 (6)	
30	08:16	15:05 (4)		07:01		05:47		04:55	19:49 (6)	04:48	19:51 (6)	
	16:54	48 15:53 (4)		19:53		20:52		21:44	55 20:44 (6)	22:02	63 20:54 (6)	
31	08:14	15:04 (4)		06:58				04:54	19:48 (6)			
	16:56	50 15:54 (4)		19:55				21:45	56 20:44 (6)			
Potential sun hours	245		271		366		422		498		516	1892
Total, worst case	427		2137		297		112		1009			

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_enercon 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

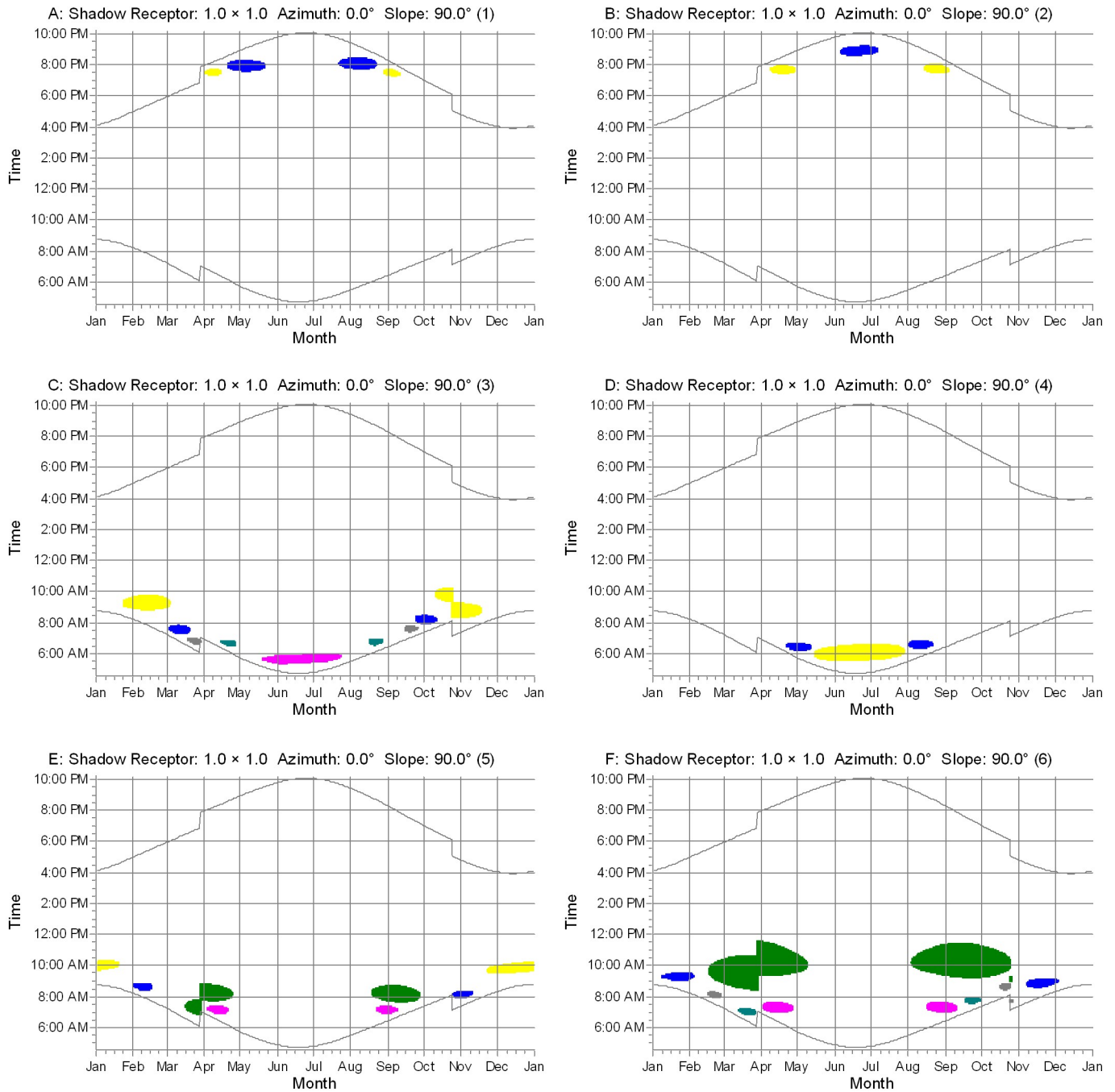
	July			August			September			October			November			December	
1	04:48		19:51 (6)	05:30		20:25 (5)	06:27		19:31 (1)	07:22		07:22		14:29 (4)	08:19		
2	22:02	64	20:55 (6)	21:24	26	20:51 (5)	20:16	16	19:47 (1)	19:00		16:47	63	15:32 (4)	16:01		
	04:49		19:51 (6)	05:32		20:26 (5)	06:28		19:30 (1)	07:24		07:24		14:29 (4)	08:21		
3	22:01	63	20:54 (6)	21:23	24	20:50 (5)	20:13	14	19:44 (1)	18:57		16:45	62	15:31 (4)	16:00		
	04:50		19:52 (6)	05:33		20:27 (5)	06:30		19:30 (1)	07:26		07:26		14:29 (4)	08:23		
4	22:01	62	20:54 (6)	21:21	22	20:49 (5)	20:11	12	19:42 (1)	18:55		16:43	61	15:30 (4)	15:59		
	04:51		19:52 (6)	05:35		20:27 (5)	06:32		19:30 (1)	07:28		07:28		14:30 (4)	08:24		
5	22:00	63	20:55 (6)	21:19	19	20:46 (5)	20:08	9	19:39 (1)	18:52		16:41	60	15:30 (4)	15:58		
	04:52		19:53 (6)	05:37		20:28 (5)	06:34		19:31 (1)	07:29		07:30		14:31 (4)	08:26		
6	22:00	62	20:55 (6)	21:17	17	20:45 (5)	20:06	6	19:37 (1)	18:50		16:39	59	15:30 (4)	15:58		
	04:53		19:53 (6)	05:39		20:29 (5)	06:36		19:30 (1)	07:31	16:01 (4)	07:32		14:31 (4)	08:27		
7	21:59	62	20:55 (6)	21:15	14	20:43 (5)	20:03	4	19:34 (1)	18:47	12	16:13 (4)	58	15:29 (4)	15:57		
	04:54		19:54 (6)	05:41		20:30 (5)	06:38		18:47	07:33		15:55 (4)	07:34		14:32 (4)	08:28	
8	21:58	61	20:55 (6)	21:13	11	20:41 (5)	20:01			18:45	23	16:18 (4)	57	15:29 (4)	15:57		
	04:55		19:54 (6)	05:42		20:32 (5)	06:39			07:35		15:50 (4)	07:36		14:32 (4)	08:30	
9	21:57	60	20:54 (6)	21:11	7	20:39 (5)	19:58			18:42	30	16:20 (4)	56	15:28 (4)	15:56		
	04:56		19:55 (6)	05:44		20:36 (5)	06:41			07:37		15:47 (4)	07:38		14:33 (4)	08:31	
10	21:57	59	20:54 (6)	21:09	2	20:38 (5)	19:56			18:40	35	16:22 (4)	54	15:27 (4)	15:56		
	04:57		19:55 (6)	05:46			06:43			07:39		15:44 (4)	07:40		14:35 (4)	08:32	
11	21:56	59	20:54 (6)	21:07			19:53			18:37	43	17:51 (2)	52	15:27 (4)	15:55		
	04:58		19:56 (6)	05:48			06:45			07:41		15:42 (4)	07:42		14:36 (4)	08:33	
12	21:55	58	20:54 (6)	21:04			19:51			18:35	54	17:54 (2)	50	15:26 (4)	15:55		
	04:59		19:56 (6)	05:50			06:47			07:43		15:40 (4)	07:44		14:37 (4)	08:35	
13	21:54	57	20:53 (6)	21:02			19:48			18:33	66	17:56 (2)	48	15:25 (4)	15:55		
	05:01		19:57 (6)	05:51			06:49			07:45		15:38 (4)	07:46		14:38 (4)	08:36	
14	21:53	56	20:53 (6)	21:00			19:46			18:30	79	17:57 (2)	46	15:24 (4)	15:55		
	05:02		19:57 (6)	05:53			06:50			07:47		15:37 (4)	07:48		14:39 (4)	08:37	
15	21:52	55	20:52 (6)	20:58			19:43			18:28	87	17:57 (2)	44	15:23 (4)	15:55		
	05:03		19:59 (6)	05:55			06:52			07:49		15:36 (4)	07:50		14:40 (4)	08:38	
16	21:51	53	20:52 (6)	20:56			19:40			18:25	91	17:56 (2)	42	15:22 (4)	15:55		
	05:05		19:59 (6)	05:57			06:54			07:51		15:35 (4)	07:52		14:42 (4)	08:39	
17	21:49	52	20:51 (6)	20:53			19:38			18:23	92	17:53 (2)	39	15:21 (4)	15:55		
	05:06		20:00 (6)	05:59			06:56			07:53		15:34 (4)	07:54		14:44 (4)	08:39	
18	21:48	50	20:50 (5)	20:51			19:35			18:21	93	17:51 (2)	36	15:20 (4)	15:55		
	05:07		20:01 (6)	06:01			06:58			07:54		15:33 (4)	07:56		14:45 (4)	08:40	
19	21:47	50	20:51 (5)	20:49			19:33			18:18	93	17:48 (2)	33	15:18 (4)	15:55		
	05:09		20:02 (6)	06:03			07:00			07:56		15:32 (4)	07:58		14:47 (4)	08:41	
20	21:46	50	20:52 (5)	20:47			19:30			18:16	91	17:45 (2)	30	15:17 (4)	15:55		
	05:10		20:03 (6)	06:04			07:01			07:58		15:31 (4)	08:00		14:49 (4)	08:42	
21	21:44	49	20:52 (5)	20:44			19:28			18:13	90	17:43 (2)	26	15:15 (4)	15:56		
	05:12		20:04 (6)	06:06			07:03			08:00		15:30 (4)	08:02		14:52 (4)	08:42	
22	21:43	49	20:53 (5)	20:42			19:25			18:11	90	17:33 (3)	20	15:12 (4)	15:56		
	05:13		20:05 (6)	06:08			07:05			08:02		15:29 (4)	08:04		14:56 (4)	08:43	
23	21:41	48	20:53 (5)	20:40			19:23			18:09	91	17:33 (3)	13	15:09 (4)	15:57		
	05:15		20:07 (6)	06:10			07:07			08:04		15:29 (4)	08:06			08:43	
24	21:40	46	20:53 (5)	20:37			19:20			18:07	90	17:32 (3)		16:09		15:57	
	05:17		20:08 (6)	06:12			07:09			08:06		15:28 (4)	08:07			08:44	
25	21:38	45	20:53 (5)	20:35			19:18			18:04	91	17:32 (3)		16:08		15:58	
	05:18		20:11 (6)	06:14			07:11			07:08		14:28 (4)	08:09			08:44	
26	21:37	43	20:54 (5)	20:33			19:15			17:02	89	16:30 (3)		16:07		15:58	
	05:20		20:12 (6)	06:15			07:13			07:10		14:29 (4)	08:11			08:44	
27	21:35	41	20:53 (5)	20:30			19:12			17:00	86	16:29 (3)		16:06		15:59	
	05:21		20:15 (6)	06:17			07:14			07:12		14:28 (4)	08:13			08:45	
28	21:33	39	20:54 (5)	20:28			19:10			16:58	84	16:26 (3)		16:04		16:00	
	05:23		20:19 (6)	06:19		19:37 (1)	07:16			07:14		14:28 (4)	08:14			08:45	
29	21:32	34	20:53 (5)	20:25	8	19:45 (1)	19:07			16:55	80	16:24 (3)		16:03		16:01	
	05:25		20:25 (5)	06:21		19:34 (1)	07:18			07:16		14:28 (4)	08:16			08:45	
30	21:30	29	20:54 (5)	20:23	12	19:46 (1)	19:05			16:53	76	16:21 (3)		16:02		16:02	
	05:26		20:25 (5)	06:23		19:33 (1)	07:20			07:18		14:28 (4)	08:18			08:45	
31	21:28	28	20:53 (5)	20:21	14	19:47 (1)	19:02			16:51	72	16:19 (3)		16:02		16:03	
	05:28		20:25 (5)	06:25		19:32 (1)				07:20		14:28 (4)				08:45	
Potential sun hours	21:26	28	20:53 (5)	20:18	16	19:48 (1)				16:49	66	16:17 (3)				16:04	
Total, worst case	517	1575		463	192		383	61		327	1894		255	1009		228	

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, graphical

Calculation: Shadow_enercon

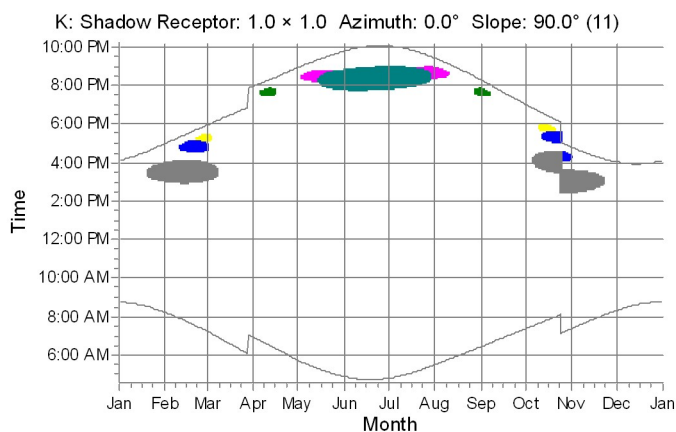
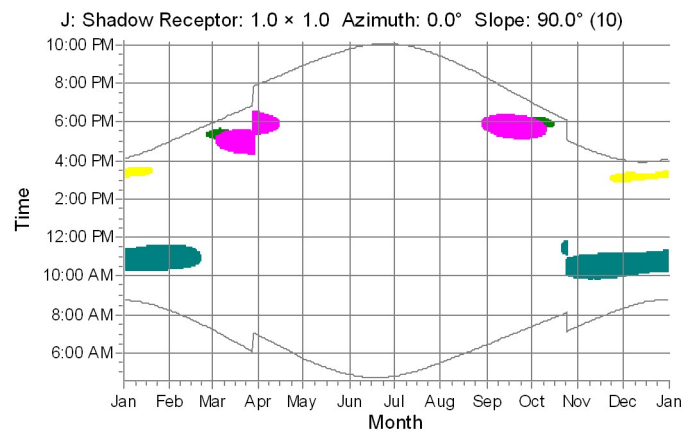
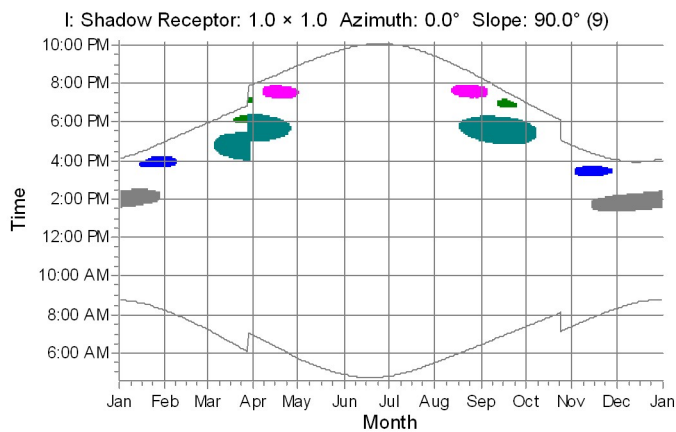
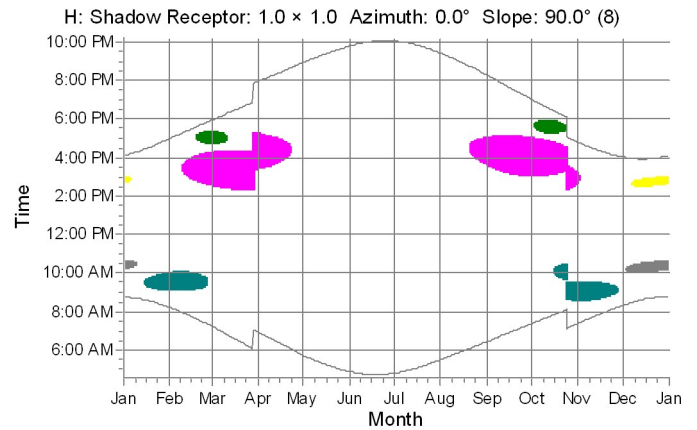
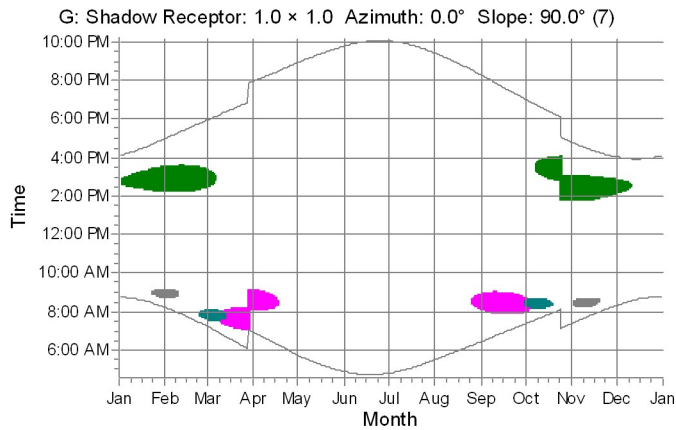


WTGs

1: 01_ENERCON E-147 EP5 E2 5000 147.0 !OI hub: 126.0 m (TOT: 199.5 m) (12)
2: 02_ENERCON E-147 EP5 E2 5000 147.0 !OI hub: 126.0 m (TOT: 199.5 m) (13)
3: 03_ENERCON E-147 EP5 E2 5000 147.0 !OI hub: 126.0 m (TOT: 199.5 m) (14)
4: E04_NERCON E-147 EP5 E2 5000 147.0 !OI hub: 126.0 m (TOT: 199.5 m) (15)
5: 05_ENERCON E-147 EP5 E2 5000 147.0 !OI hub: 126.0 m (TOT: 199.5 m) (16)
6: 06_ENERCON E-147 EP5 E2 5000 147.0 !OI hub: 126.0 m (TOT: 199.5 m) (17)

SHADOW - Calendar, graphical

Calculation: Shadow_enercon



WTGs

- 1: 01_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (12)
- 2: 02_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (13)
- 3: 03_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (14)
- 4: E04_NERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (15)
- 5: 05_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (16)
- 6: 06_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (17)

SHADOW - Calendar per WTG

Calculation: Shadow_enercon WTG: 1 - 01_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (12)

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 14:19-15:29/70 16:58	07:13 16:46-17:28/42 08:52-10:22/90 17:56 14:31-15:18/47	06:56 09:25-11:31/126 19:57 07:48-08:45/57	05:45 09:37-10:38/61 20:54	04:53 21:46
2	08:45 16:06	08:11 14:19-15:29/70 17:00	07:11 16:46-17:30/44 08:51-10:24/93 17:58 14:33-15:17/44	06:54 09:26-11:30/124 19:59 07:48-08:46/58	05:42 09:38-10:35/57 20:56	04:52 21:48
3	08:44 14:39-14:49/10 16:07	08:09 14:18-15:30/72 17:02	07:09 16:46-17:32/46 08:49-10:25/96 18:00 14:35-15:14/39	06:51 09:25-11:29/124 20:00 07:47-08:45/58	05:40 09:40-10:32/52 20:58	04:51 21:49
4	08:44 14:37-14:52/15 16:09	08:07 14:18-15:30/72 17:04	07:06 16:46-17:34/48 08:48-10:26/98 18:02 14:39-15:11/32	06:49 09:25-11:28/123 20:02 07:47-08:45/58	05:38 09:42-10:29/47 21:00	04:50 21:50
5	08:44 14:36-14:55/19 16:10	08:06 14:18-15:31/73 17:06	07:04 16:46-17:34/48 08:47-10:28/101 18:04 14:42-15:07/25	06:46 09:25-11:27/122 20:04 07:46-08:44/58	05:36 09:44-10:26/42 21:02	04:49 21:51
6	08:43 14:34-14:57/23 16:11	08:04 14:17-15:30/73 17:08	07:01 16:48-17:35/47 08:45-10:28/103 18:06 14:50-15:01/11	06:44 19:35-19:39/4 07:47-08:44/57 20:06 09:25-11:26/121	05:34 09:46-10:22/36 21:04	04:49 21:52
7	08:43 14:33-14:58/25 16:13	08:02 14:17-15:30/73 17:11	06:59 16:48-17:34/46 18:08 08:44-10:29/105	06:41 19:33-19:40/7 07:46-08:43/57 20:08 09:24-11:25/121	05:32 09:49-10:17/28 21:05	04:48 21:53
8	08:42 14:31-15:00/29 16:14	08:00 14:17-15:31/74 17:13	06:56 16:50-17:34/44 18:10 08:43-10:30/107	06:39 19:33-19:42/9 07:46-08:43/57 20:10 09:25-11:24/119	05:30 09:55-10:12/17 21:07	04:47 21:54
9	08:42 14:31-15:02/31 16:16	07:58 14:17-15:31/74 17:15	06:54 17:09-17:33/24 08:41-10:30/109 18:12 16:51-17:08/17	06:36 19:32-19:44/12 07:46-08:42/56 20:12 09:24-11:22/118	05:28 21:09	04:47 21:55
10	08:41 14:30-15:04/34 16:17	07:56 14:17-15:31/74 17:17	06:51 17:10-17:32/22 08:41-10:32/111 18:14 16:55-17:05/10	06:34 19:32-19:46/14 07:46-08:41/55 20:14 09:25-11:21/116	05:26 21:11	04:46 21:56
11	08:40 14:29-15:06/37 16:19	07:54 14:18-15:32/74 17:19	06:49 17:11-17:31/20 18:16 08:39-10:32/113	06:31 19:31-19:47/16 07:47-08:41/54 20:16 09:25-11:20/115	05:24 21:13	04:46 21:57
12	08:39 14:29-15:07/38 16:20	07:52 14:18-15:32/74 17:21	06:46 17:12-17:29/17 18:18 08:38-10:33/115	06:29 19:32-19:48/16 07:46-08:39/53 20:18 09:25-11:18/113	05:22 21:15	04:45 21:58
13	08:39 14:28-15:09/41 16:22	07:50 14:17-15:31/74 17:23	06:44 17:14-17:26/12 18:20 08:37-10:33/116	06:26 19:33-19:47/14 07:47-08:39/52 20:20 09:25-11:17/112	05:21 21:16	04:45 21:59
14	08:38 14:27-15:10/43 16:24	07:47 14:18-15:31/73 17:25	06:41 17:19-17:22/3 18:22 08:37-10:34/117	06:24 19:33-19:45/12 07:47-08:37/50 20:22 09:25-11:15/110	05:19 21:18	04:44 21:59
15	08:37 14:26-15:11/45 16:25	07:45 14:18-15:31/73 17:27	06:39 08:35-10:34/119 18:24	06:21 19:35-19:43/8 07:48-08:36/48 20:24 09:25-11:14/109	05:17 21:20	04:44 22:00
16	08:36 14:26-15:13/47 16:27	07:43 14:19-15:31/72 17:29	06:36 08:35-10:35/120 18:26	06:19 09:26-11:12/106 20:25 07:49-08:35/46	05:15 21:22	04:44 22:00
17	08:35 14:25-15:14/49 16:29	07:41 14:19-15:30/71 17:31	06:34 08:34-10:34/120 18:28 07:19-07:24/5	06:17 09:26-11:10/104 20:27 07:49-08:33/44	05:14 21:23	04:44 22:01
18	08:33 14:24-15:15/51 16:31	07:39 14:20-15:30/70 17:33	06:31 08:33-10:35/122 18:30 07:12-07:32/20	06:14 09:26-11:08/102 20:29 07:51-08:31/40	05:12 21:25	04:44 22:01
19	08:32 14:24-15:17/53 16:33	07:36 16:57-17:07/10 09:18-10:00/42 17:35	06:29 08:32-10:35/123 18:32 07:08-07:35/27	06:12 09:27-11:07/100 20:31 07:52-08:30/38	05:10 21:27	04:44 22:02
20	08:31 14:23-15:17/54 16:34	07:34 16:54-17:08/14 09:14-10:03/49 17:38	06:26 18:04-18:06/2 07:05-07:37/32 18:33 08:31-10:34/123	06:09 09:28-11:05/97 20:33 07:54-08:28/34	05:09 21:29	04:44 22:02
21	08:30 14:23-15:19/56 16:36	07:32 16:52-17:11/19 09:11-10:07/56 17:40	06:24 18:03-18:08/5 07:02-07:39/37 18:35 08:31-10:35/124	06:07 09:28-11:02/94 20:35 07:55-08:25/30	05:07 21:30	04:44 22:02
22	08:28 14:22-15:20/58 16:38	07:30 16:50-17:12/22 09:07-10:09/62 17:42	06:21 18:01-18:10/9 07:00-07:40/40 18:37 08:30-10:34/124	06:05 09:28-11:00/92 20:37 07:57-08:22/25	05:06 21:32	04:44 22:03
23	08:27 14:22-15:21/59 16:40	07:27 16:49-17:15/26 09:05-10:12/67 17:44	06:19 18:00-18:12/12 06:58-07:42/44 18:39 08:30-10:35/125	06:02 09:29-10:58/89 20:39 08:00-08:19/19	05:04 21:33	04:44 22:03
24	08:26 14:21-15:22/61 16:42	07:25 16:49-17:17/28 09:03-10:14/71 17:46	06:16 17:59-18:14/15 06:56-07:42/46 18:41 08:29-10:34/125	06:00 09:30-10:56/86 20:41 08:06-08:13/7	05:03 21:35	04:45 22:03
25	08:24 14:20-15:23/63 16:44	07:23 16:47-17:17/30 09:00-10:16/76 17:48	06:14 17:59-18:16/17 06:55-07:44/49 18:43 08:29-10:34/125	05:58 09:31-10:54/83 20:43	05:01 21:36	04:45 22:03
26	08:23 14:21-15:24/63 16:46	07:20 17:20-17:22/2 14:26-15:24/58 17:50	06:11 17:59-18:17/18 06:54-07:44/50 18:45 08:28-10:34/126	05:56 09:31-10:51/80 20:45	05:00 21:38	04:45 22:03
27	08:21 14:20-15:25/65 16:48	07:18 16:46-17:23/37 08:56-10:19/83 17:52	06:09 18:00-18:16/16 06:53-07:45/52 18:47 08:28-10:34/126	05:53 09:32-10:48/76 20:47	04:59 21:39	04:46 22:03
28	08:20 14:20-15:25/65 16:50	07:16 16:46-17:26/40 08:55-10:21/86 17:54	06:06 18:00-18:15/15 06:51-07:45/54 18:49 08:27-10:33/126	05:51 09:33-10:46/73 20:48	04:57 21:41	04:46 22:02
29	08:18 14:19-15:26/67 16:52	07:14 14:19-15:26/67 17:56	07:04 19:01-19:14/13 07:51-08:46/55 19:51 09:27-11:33/126	05:49 09:34-10:44/70 20:50	04:56 21:42	04:47 22:02
30	08:16 14:19-15:27/68 16:54	07:12 14:19-15:27/68 17:58	07:01 19:03-19:11/8 07:50-08:45/55 19:53 09:26-11:32/126	05:47 09:36-10:41/65 20:52	04:55 21:44	04:48 22:02
31	08:15 14:19-15:28/69 16:56	07:10 14:19-15:28/69 17:59	06:59 09:26-11:32/126 19:55 07:49-08:46/57		04:54 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	1338	2908	5021	4313	340	0

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

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

Project:

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 11:02 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_enercon WTG: 1 - 01_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (12)
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 19:31-19:47/16 07:46-08:40/54 20:16 09:24-11:19/115	07:22 17:52-18:08/16 19:00 09:17-11:12/115	07:23 13:47-15:01/74 16:47	08:20 14:11-14:48/37 16:01
2	04:49 22:01	05:32 21:23	06:28 19:30-19:44/14 07:44-08:39/55 20:13 09:23-11:19/116	07:24 17:50-18:09/19 18:57 09:18-11:11/113	07:25 13:47-15:01/74 16:45	08:21 14:12-14:46/34 16:00
3	04:50 22:01	05:34 21:21	06:30 19:30-19:42/12 07:44-08:40/56 20:11 09:22-11:20/118	07:26 17:49-18:10/21 09:18-11:10/112 18:55 17:35-17:41/6	07:27 13:47-15:00/73 16:43	08:23 14:14-14:46/32 15:59
4	04:51 22:00	05:35 10:11-10:13/2 21:19	06:32 19:30-19:39/9 07:43-08:40/57 20:08 09:22-11:21/119	07:28 17:48-18:11/23 09:19-11:09/110 18:52 17:31-17:45/14	07:29 13:47-15:00/73 16:41	08:24 14:16-14:45/29 15:58
5	04:52 22:00	05:37 10:02-10:24/22 21:17	06:34 19:31-19:37/6 07:43-08:40/57 20:06 09:21-11:22/121	07:30 17:28-18:11/43 18:50 09:19-11:08/109	07:31 13:48-15:01/73 16:39	08:26 14:18-14:43/25 15:58
6	04:53 21:59	05:39 09:59-10:29/30 21:15	06:36 19:30-19:34/4 07:43-08:40/57 20:03 09:21-11:22/121	07:31 17:26-18:11/45 18:47 09:20-11:06/106	07:33 13:48-15:00/72 16:37	08:27 14:20-14:43/23 15:57
7	04:54 21:58	05:41 09:55-10:32/37 21:13	06:38 19:30-11:22/122 20:01 07:41-08:39/58	07:33 17:24-18:11/47 18:45 09:21-11:05/104	07:35 13:48-15:00/72 16:35	08:28 14:22-14:41/19 15:57
8	04:55 21:58	05:42 09:53-10:36/43 21:11	06:40 09:19-11:23/124 19:58 07:41-08:39/58	07:37 17:22-18:09/47 09:23-11:02/99 18:42 15:21-15:40/19	07:39 13:48-14:59/71 16:33	08:30 14:24-14:40/16 15:56
9	04:56 21:57	05:44 09:51-10:40/49 21:09	06:41 09:19-11:23/124 19:56 07:41-08:39/58	07:37 17:22-18:07/47 09:24-11:01/97 18:40 15:16-15:45/29	07:41 13:50-14:59/69 16:31	08:31 14:27-14:38/11 15:56
10	04:57 21:56	05:46 09:49-10:43/54 21:07	06:43 09:19-11:23/124 19:53 07:41-08:39/58	07:39 17:20-18:07/47 09:24-11:01/97 18:38 15:12-15:47/35	07:43 13:50-14:59/69 16:30	08:32 14:32-14:33/1 15:55
11	04:58 21:55	05:48 09:46-10:45/59 21:05	06:45 09:18-11:23/125 19:51 07:40-08:38/58	07:41 17:19-18:05/46 09:25-10:59/94 18:35 15:09-15:50/41	07:43 13:50-14:59/69 16:28	08:34 15:55
12	04:59 21:54	05:50 09:45-10:47/62 21:02	06:47 09:17-11:23/126 19:48 07:41-08:37/56	07:43 17:20-18:02/42 09:26-10:57/91 18:33 15:06-15:51/45	07:45 13:50-14:58/68 16:26	08:35 15:55
13	05:01 21:53	05:52 09:44-10:50/66 21:00	06:49 18:54-19:02/8 07:41-08:37/56 19:46 09:17-11:23/126	07:45 17:20-18:01/41 09:27-10:55/88 18:30 15:04-15:53/49	07:47 13:51-14:58/67 16:24	08:36 15:55
14	05:02 21:52	05:53 09:42-10:52/70 20:58	06:51 18:52-19:04/12 07:41-08:36/55 19:43 09:17-11:23/126	07:47 17:19-17:58/39 09:28-10:54/86 18:28 15:02-15:54/52	07:49 13:51-14:57/66 16:23	08:37 15:55
15	05:03 21:51	05:55 09:41-10:54/73 20:56	06:52 18:49-19:04/15 07:42-08:35/53 19:41 09:17-11:23/126	07:49 17:19-17:56/37 09:30-10:51/81 18:25 15:00-15:55/55	07:51 13:53-14:58/65 16:21	08:38 15:55
16	05:05 21:50	05:57 09:39-10:57/78 20:54	06:54 18:48-19:05/17 07:41-08:33/52 19:38 09:16-11:22/126	07:51 17:19-17:49/30 09:31-10:49/78 18:23 14:58-15:56/58	07:52 13:54-14:57/63 16:19	08:39 15:55
17	05:06 21:48	05:59 09:38-10:59/81 20:51	06:56 18:47-19:05/18 07:42-08:32/50 19:35 09:16-11:22/126	07:53 17:20-17:49/29 09:33-10:47/74 18:21 14:56-15:57/61	07:54 13:54-14:56/62 16:18	08:40 15:55
18	05:07 21:47	06:01 09:37-11:00/83 20:49	06:58 18:47-19:04/17 07:43-08:31/48 19:33 09:16-11:22/126	07:55 17:20-17:48/28 09:35-10:45/70 18:18 14:55-15:58/63	07:56 13:55-14:56/61 16:16	08:40 15:55
19	05:09 21:46	06:03 09:36-11:02/86 20:47	07:00 18:47-19:02/15 07:43-08:30/47 19:30 09:16-11:22/126	07:57 17:21-17:45/24 09:37-10:42/65 18:16 14:54-15:58/64	07:58 13:56-14:55/59 16:15	08:41 15:55
20	05:10 21:44	06:04 09:35-11:04/89 20:44	07:02 18:46-18:59/13 07:45-08:29/44 19:28 09:16-11:21/125	07:59 17:22-17:43/21 09:39-10:39/60 18:14 14:53-15:59/66	08:00 13:57-14:55/58 16:13	08:42 15:56
21	05:12 21:43	06:06 09:33-11:05/92 20:42	07:03 18:46-18:56/10 07:45-08:26/41 19:25 09:15-11:20/125	08:00 17:23-17:40/17 09:42-10:36/54 18:11 14:51-15:59/68	08:02 13:58-14:54/56 16:12	08:42 15:56
22	05:13 21:41	06:08 09:32-11:07/95 20:40	07:05 18:47-18:54/7 07:46-08:24/38 19:23 09:15-11:20/125	08:02 17:25-17:38/13 09:45-10:32/47 18:09 14:50-15:59/69	08:04 13:59-14:53/54 16:11	08:43 15:57
23	05:15 21:40	06:10 09:31-11:09/98 20:37	07:07 18:48-18:51/3 07:48-08:22/34 19:20 09:15-11:19/124	08:04 17:27-17:35/8 09:49-10:28/39 18:07 14:50-15:59/69	08:06 14:00-14:53/53 16:09	08:43 15:57
24	05:17 21:38	06:12 09:31-11:11/100 20:35	07:09 09:16-11:19/123 19:18 07:50-08:19/29	08:06 14:49-16:00/71 18:04 09:53-10:23/30	08:08 14:01-14:52/51 16:08	08:44 15:58
25	05:18 21:37	06:14 09:29-11:11/102 20:33	07:11 09:16-11:18/122 19:15 07:53-08:16/23	07:08 13:49-15:01/72 17:02 09:02-09:16/14	08:09 14:02-14:52/50 16:07	08:44 15:58
26	05:20 21:35	06:16 09:28-11:13/105 20:30	07:13 09:16-11:17/121 19:13 07:58-08:11/13	07:10 13:48-15:01/73 17:00	08:11 14:04-14:51/47 16:06	08:44 15:59
27	05:22 21:33	06:17 09:28-11:14/106 20:28	07:15 09:16-11:17/121 19:10	07:12 13:48-15:01/73 16:58	08:13 14:05-14:50/45 16:05	08:45 16:00
28	05:23 21:32	06:19 19:37-19:45/8 07:50-08:38/48 20:26	07:16 09:16-11:15/119 19:07	07:14 13:47-15:01/74 16:56	08:15 14:07-14:50/43 16:04	08:45 16:01
29	05:25 21:30	06:21 19:34-19:46/12 07:48-08:38/50 20:23	07:18 09:16-11:14/118 19:05	07:16 13:47-15:01/74 16:53	08:16 14:08-14:49/41 16:03	08:45 16:02
30	05:27 21:28	06:23 19:33-19:47/14 07:47-08:39/52 20:21	07:20 17:55-18:05/10 19:02	07:18 13:47-15:00/73 16:51	08:18 14:10-14:48/38 16:02	08:45 16:03
31	05:28 21:26	06:25 19:32-19:48/16 07:46-08:39/53 20:18	07:22 17:56-18:06/11 19:03	07:20 13:47-15:01/74 16:49	 16:02	08:45 16:04
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	0	2669	5147	4216	1838	227

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_enercon WTG: 2 - 02_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (13)
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 15:10-15:25/15 09:44-10:13/29 16:05 14:43-14:56/13	08:13 08:57-09:36/39 16:58	07:13 17:08-17:23/15 17:56 09:02-09:27/25	06:56 19:57	05:45 20:54	04:53 05:36-06:25/49 21:46
2	08:45 15:11-15:27/16 09:44-10:13/29 16:06 14:44-14:55/11	08:11 08:56-09:37/41 17:00	07:11 17:10-17:22/12 17:58 09:06-09:24/18	06:54 19:28-19:31/3 19:59	05:43 20:56	04:52 05:35-06:25/50 21:48
3	08:44 15:12-15:29/17 09:45-10:14/29 16:07 14:45-14:55/10	08:09 08:56-09:38/42 17:02	07:08 17:11-17:19/8 18:00 09:12-09:18/6	06:51 19:26-19:33/7 20:00	05:40 20:58	04:51 05:35-06:25/50 21:49
4	08:44 15:12-15:30/18 09:45-10:14/29 16:09 14:46-14:54/8	08:07 08:55-09:39/44 17:04	07:06 18:02	06:49 19:24-19:35/11 20:02	05:38 21:00	04:50 05:35-06:26/51 21:50
5	08:44 15:13-15:32/19 09:46-10:15/29 16:10 14:49-14:53/4	08:06 08:55-09:40/45 17:06	07:04 18:04	06:46 19:23-19:36/13 20:04	05:36 21:02	04:49 05:35-06:27/52 21:51
6	08:43 15:13-15:33/20 16:11 09:46-10:14/28	08:04 08:54-09:41/47 17:08	07:01 18:06	06:44 19:22-19:39/17 20:06	05:34 21:04	04:49 05:35-06:27/52 21:52
7	08:43 15:13-15:33/20 16:13 09:47-10:14/27	08:02 08:53-09:41/48 17:11	06:59 18:08	06:41 19:21-19:40/19 20:08	05:32 21:05	04:48 05:35-06:28/53 21:53
8	08:42 15:13-15:33/20 16:14 09:47-10:14/27	08:00 08:52-09:41/49 17:13	06:56 18:10	06:39 19:21-19:42/21 20:10	05:30 21:07	04:47 05:35-06:27/52 21:54
9	08:42 15:14-15:34/20 16:16 09:49-10:15/26	07:58 08:52-09:42/50 17:15	06:54 18:12	06:36 19:21-19:44/23 20:12	05:28 21:09	04:47 05:35-06:28/53 21:55
10	08:41 15:15-15:35/20 16:17 09:49-10:15/26	07:56 08:52-09:43/51 17:17	06:51 18:14	06:34 19:21-19:46/25 20:14	05:26 21:11	04:46 05:35-06:28/53 21:56
11	08:40 15:15-15:35/20 16:19 09:50-10:15/25	07:54 08:52-09:43/51 17:19	06:49 18:16	06:31 19:21-19:47/26 20:16	05:24 21:13	04:46 05:35-06:29/54 21:57
12	08:39 15:16-15:35/19 16:20 09:51-10:15/24	07:52 08:52-09:44/52 17:21	06:46 18:18	06:29 19:22-19:49/27 20:18	05:22 21:15	04:45 05:35-06:29/54 21:58
13	08:39 15:17-15:35/18 16:22 09:52-10:15/23	07:50 08:51-09:43/52 17:23	06:44 18:20	06:26 19:24-19:52/28 20:20	05:21 21:16	04:45 05:35-06:29/54 21:58
14	08:38 15:17-15:34/17 16:24 09:52-10:14/22	07:47 08:52-09:43/51 17:25	06:41 18:22	06:24 19:25-19:53/28 20:22	05:19 21:18	04:44 05:35-06:29/54 21:59
15	08:37 15:18-15:34/16 16:25 09:54-10:14/20	07:45 08:52-09:43/51 17:27	06:39 18:24	06:21 19:28-19:55/27 20:23	05:17 21:20	04:44 05:35-06:30/55 22:00
16	08:36 15:19-15:34/15 16:27 09:55-10:13/18	07:43 08:52-09:43/51 17:29	06:36 18:26	06:19 19:28-19:56/28 20:25	05:15 05:52-06:05/13 21:22	04:44 05:36-06:30/54 22:00
17	08:35 15:21-15:34/13 16:29 09:57-10:13/16	07:41 08:52-09:43/51 17:31	06:34 18:28	06:17 19:27-19:55/28 20:27	05:14 05:49-06:09/20 21:23	04:44 05:36-06:31/55 22:01
18	08:33 15:22-15:32/10 16:31 09:58-10:11/13	07:39 08:52-09:42/50 17:33	06:31 18:30	06:14 19:27-19:55/28 20:29	05:12 05:47-06:11/24 21:25	04:44 05:36-06:31/55 22:01
19	08:32 15:24-15:31/7 16:33 10:01-10:09/8	07:36 08:53-09:42/49 17:35	06:29 18:32	06:12 19:27-19:55/28 20:31	05:10 05:45-06:13/28 21:27	04:44 05:36-06:31/55 22:02
20	08:31 16:34	07:34 08:53-09:41/48 17:38	06:26 18:33	06:10 19:26-19:54/28 20:33	05:09 05:43-06:14/31 21:28	04:44 05:36-06:31/55 22:02
21	08:30 16:36	07:32 08:53-09:41/48 17:40	06:24 18:35	06:07 19:26-19:54/28 20:35	05:07 05:42-06:16/34 21:30	04:44 05:36-06:31/55 22:02
22	08:28 16:38	07:30 17:10-17:12/2 17:42 08:53-09:39/46	06:21 18:37	06:05 19:27-19:53/26 20:37	05:06 05:41-06:17/36 21:32	04:44 05:37-06:32/55 22:02
23	08:27 16:40	07:27 17:09-17:15/6 17:44 08:54-09:39/45	06:19 18:39	06:03 19:28-19:52/24 20:39	05:04 05:40-06:18/38 21:33	04:44 05:37-06:32/55 22:03
24	08:26 16:42	07:25 17:09-17:18/9 17:46 08:56-09:38/42	06:16 18:41	06:00 19:29-19:52/23 20:41	05:03 05:39-06:19/40 21:35	04:45 05:37-06:32/55 22:03
25	08:24 09:07-09:22/15 16:44	07:23 17:08-17:19/11 17:48 08:56-09:36/40	06:14 18:43	05:58 19:29-19:49/20 20:43	05:01 05:39-06:20/41 21:36	04:45 05:38-06:33/55 22:03
26	08:23 09:05-09:26/21 16:46	07:20 17:08-17:22/14 17:50 08:58-09:35/37	06:11 18:45	05:56 19:30-19:48/18 20:45	05:00 05:38-06:21/43 21:38	04:46 05:38-06:32/54 22:03
27	08:21 09:03-09:28/25 16:48	07:18 17:07-17:23/16 17:52 08:58-09:32/34	06:09 18:47	05:53 19:32-19:46/14 20:47	04:59 05:38-06:22/44 21:39	04:46 05:37-06:32/55 22:03
28	08:20 09:01-09:30/29 16:50	07:16 17:08-17:25/17 17:54 09:01-09:31/30	06:06 18:49	05:51 19:35-19:43/8 20:48	04:57 05:37-06:23/46 21:41	04:47 05:38-06:33/55 22:02
29	08:18 09:00-09:31/31 16:52		07:04 19:51	05:49 20:50	04:56 05:37-06:23/46 21:42	04:47 05:39-06:33/54 22:02
30	08:16 08:58-09:33/35 16:54		07:01 19:53	05:47 20:52	04:55 05:37-06:24/47 21:44	04:48 05:39-06:33/54 22:02
31	08:15 08:58-09:35/37 16:56		06:59 19:55		04:54 05:36-06:24/48 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	1007	1359	84	576	579	1607

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_enercon WTG: 2 - 02_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (13)
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 05:39-06:33/54 22:02	05:30 21:25	06:27 19:21-19:47/26 20:16	07:22 19:00	07:22 08:22-09:12/50 16:47	08:19 14:58-15:17/19 16:01 09:32-09:57/25
2	04:49 05:40-06:33/53 22:01	05:32 21:23	06:28 19:19-19:44/25 20:13	07:24 18:57	07:24 08:22-09:12/50 16:45	08:21 14:57-15:17/20 16:00 09:32-09:57/25
3	04:50 05:39-06:33/54 22:01	05:34 21:21	06:30 19:19-19:42/23 20:11	07:26 18:55	07:27 08:22-09:11/49 16:43	08:23 14:58-15:18/20 15:59 09:32-09:58/26
4	04:51 05:40-06:33/53 22:00	05:35 21:19	06:32 19:18-19:39/21 20:08	07:28 18:52	07:29 08:22-09:10/48 16:41	08:24 14:58-15:18/20 15:58 09:32-09:59/27
5	04:52 05:40-06:33/53 22:00	05:37 21:17	06:34 19:18-19:37/19 20:06	07:30 18:50	07:31 08:24-09:11/47 16:39	08:26 14:58-15:18/20 15:58 09:32-09:59/27
6	04:53 05:41-06:33/52 21:59	05:39 21:15	06:36 19:17-19:34/17 20:03	07:31 18:47	07:33 08:24-09:10/46 16:37	08:27 14:59-15:19/20 15:57 09:33-10:01/28
7	04:54 05:41-06:33/52 21:58	05:41 21:13	06:38 19:18-19:32/14 20:01	07:33 18:45	07:35 08:25-09:09/44 16:35	08:28 14:59-15:18/19 09:32-10:01/29 15:57 14:35-14:39/4
8	04:55 05:42-06:33/51 21:57	05:43 21:11	06:40 19:19-19:29/10 19:58	07:35 18:42	07:37 08:26-09:08/42 16:33	08:30 15:00-15:18/18 09:33-10:02/29 15:56 14:35-14:42/7
9	04:56 05:42-06:33/51 21:57	05:44 21:09	06:41 19:20-19:27/7 19:56	07:37 18:40	07:39 08:26-09:07/41 16:31	08:31 15:00-15:17/17 09:33-10:02/29 15:56 14:33-14:43/10
10	04:57 05:43-06:33/50 21:56	05:46 21:07	06:43 19:20-19:24/4 19:53	07:39 17:48-17:51/3 18:38	07:41 08:28-09:07/39 16:30	08:32 15:00-15:16/16 09:34-10:03/29 15:56 14:33-14:44/11
11	04:58 05:43-06:32/49 21:55	05:48 21:05	06:45 19:51	07:41 17:44-17:54/10 18:35 09:43-09:56/13	07:43 08:29-09:06/37 16:28	08:33 15:01-15:16/15 09:34-10:03/29 15:55 14:33-14:46/13
12	04:59 05:43-06:32/49 21:54	05:50 21:02	06:47 19:48	07:43 17:42-17:56/14 18:33 09:38-10:00/22	07:45 08:30-09:05/35 16:26	08:35 15:01-15:16/15 09:34-10:04/30 15:55 14:33-14:46/13
13	05:01 05:44-06:32/48 21:53	05:52 21:00	06:49 19:46	07:45 17:41-17:57/16 18:30 09:35-10:02/27	07:47 08:32-09:03/31 16:24	08:36 15:02-15:16/14 09:35-10:04/29 15:55 14:33-14:47/14
14	05:02 05:45-06:32/47 21:52	05:53 20:58	06:51 19:43	07:47 17:40-17:57/17 18:28 09:33-10:05/32	07:49 08:33-09:02/29 16:23	08:37 15:02-15:15/13 09:35-10:05/30 15:55 14:33-14:48/15
15	05:03 05:46-06:31/45 21:51	05:55 19:41-19:52/11 20:56	06:52 19:41	07:49 17:40-17:56/16 18:25 09:31-10:06/35	07:50 08:36-09:01/25 16:21	08:38 15:03-15:15/12 09:35-10:05/30 15:55 14:33-14:49/16
16	05:05 05:46-06:31/45 21:49	05:57 19:39-19:54/15 20:54	06:54 19:38	07:51 17:40-17:53/13 18:23 09:29-10:07/38	07:52 08:38-08:59/21 16:19	08:39 15:03-15:15/12 09:36-10:06/30 15:55 14:34-14:49/15
17	05:06 05:46-06:30/44 21:48	05:59 19:36-19:55/19 20:51	06:56 19:35	07:53 17:40-17:51/11 18:21 09:28-10:09/41	07:54 08:41-08:56/15 16:18	08:39 15:04-15:16/12 09:36-10:06/30 15:55 14:34-14:50/16
18	05:08 05:48-06:30/42 21:47	06:01 19:35-19:56/21 20:49	06:58 19:33	07:55 17:40-17:48/8 18:18 09:27-10:09/42	07:56 16:16	08:40 15:05-15:16/11 09:37-10:07/30 15:55 14:34-14:51/17
19	05:09 05:48-06:29/41 21:46	06:03 19:34-19:57/23 20:47	07:00 19:30	07:57 17:41-17:45/4 18:16 09:25-10:10/45	07:58 16:15	08:41 15:05-15:15/10 09:37-10:07/30 15:56 14:34-14:51/17
20	05:10 05:49-06:28/39 21:44	06:04 19:33-19:58/25 20:44	07:02 19:28	07:58 17:41-17:43/2 18:14 09:24-10:11/47	08:00 16:13	08:42 15:05-15:16/11 09:38-10:07/29 15:56 14:35-14:52/17
21	05:12 05:51-06:28/37 21:43	06:06 19:32-19:58/26 20:42	07:03 19:25	08:00 09:24-10:11/47 18:11	08:02 16:12	08:42 15:05-15:16/11 09:39-10:08/29 15:56 14:36-14:53/17
22	05:14 05:51-06:26/35 21:41	06:08 19:31-19:58/27 20:40	07:05 19:23	08:02 09:23-10:12/49 18:09	08:04 16:11	08:43 15:06-15:17/11 09:39-10:08/29 15:57 14:36-14:53/17
23	05:15 05:53-06:26/33 21:40	06:10 19:31-19:59/28 20:37	07:07 19:20	08:04 09:22-10:12/50 18:07	08:06 15:01-15:07/6 16:09 09:38-09:45/7	08:43 15:06-15:17/11 09:39-10:08/29 15:57 14:36-14:53/17
24	05:17 05:54-06:24/30 21:38	06:12 19:31-19:59/28 20:35	07:09 19:18	08:06 09:21-10:12/51 18:04	08:07 14:59-15:09/10 16:08 09:35-09:48/13	08:44 15:08-15:18/10 09:40-10:10/30 15:58 14:37-14:54/17
25	05:18 05:56-06:23/27 21:37	06:14 19:29-19:58/29 20:33	07:11 19:15	08:08 08:22-09:13/51 17:02	08:09 14:58-15:11/13 16:07 09:34-09:50/16	08:44 15:08-15:19/11 09:40-10:10/30 15:58 14:37-14:54/17
26	05:20 05:58-06:20/22 21:35	06:16 19:30-19:58/28 20:30	07:13 19:13	08:10 08:22-09:13/51 17:00	08:11 14:57-15:12/15 16:06 09:33-09:51/18	08:44 15:08-15:19/11 09:40-10:10/30 15:59 14:38-14:54/16
27	05:22 06:01-06:18/17 21:33	06:17 19:30-19:57/27 20:28	07:15 19:10	08:12 08:21-09:13/52 16:58	08:13 14:57-15:13/16 16:05 09:33-09:53/20	08:45 15:08-15:20/12 09:41-10:10/29 16:00 14:38-14:54/16
28	05:23 06:04-06:13/9 21:32	06:19 19:30-19:57/27 20:25	07:16 19:07	08:14 08:21-09:13/52 16:56	08:15 14:57-15:14/17 16:04 09:32-09:54/22	08:45 15:09-15:21/12 09:41-10:11/30 16:01 14:39-14:55/16
29	05:25 21:30	06:21 19:26-19:53/27 20:23	07:18 19:05	08:16 08:21-09:12/51 16:53	08:16 14:57-15:15/18 16:03 09:32-09:55/23	08:45 15:09-15:22/13 09:42-10:11/29 16:02 14:40-14:55/15
30	05:27 21:28	06:23 19:24-19:51/27 20:21	07:20 19:02	08:18 08:21-09:12/51 16:51	08:18 14:57-15:16/19 16:02 09:32-09:56/24	08:45 15:10-15:23/13 09:42-10:12/30 16:03 14:41-14:55/14
31	05:28 21:26	06:25 19:22-19:49/27 20:18		07:20 08:22-09:13/51 16:49		08:45 15:10-15:24/14 09:43-10:12/29 16:04 14:42-14:55/13
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	1182	415	166	1012	906	1698

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_enercon WTG: 3 - 03_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (14)
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 15:43-16:06/23 16:58 09:12-09:27/15	07:13 16:42-16:53/11 17:56	06:56 19:57	05:45 06:13-06:39/26 20:54 19:38-20:13/35	04:53 21:46
2	08:45 16:06	08:11 15:44-16:07/23 08:40-08:44/4 17:00 09:14-09:25/11	07:11 17:58	06:53 19:58	05:42 06:13-06:39/26 20:56 19:38-20:13/35	04:52 21:48
3	08:44 16:07	08:09 15:45-16:06/21 08:38-08:45/7 17:02 09:18-09:20/2	07:08 07:34-07:41/7 18:00	06:51 20:00	05:40 06:14-06:39/25 20:58 19:37-20:13/36	04:51 21:49
4	08:44 16:09	08:07 15:46-16:06/20 17:04 08:36-08:46/10	07:06 07:31-07:43/12 18:02	06:48 20:02	05:38 06:14-06:38/24 21:00 19:37-20:13/36	04:50 21:50
5	08:44 16:10	08:05 15:47-16:04/17 17:06 08:34-08:47/13	07:04 07:29-07:45/16 18:04	06:46 20:04	05:36 06:14-06:37/23 21:02 19:37-20:13/36	04:49 21:51
6	08:43 16:11	08:04 15:49-16:02/13 17:08 08:32-08:48/16	07:01 07:26-07:45/19 18:06	06:43 20:06	05:34 06:15-06:37/22 21:04 19:37-20:13/36	04:49 20:48-20:53/5 21:52
7	08:43 16:13	08:02 15:52-15:59/7 17:11 08:29-08:47/18	06:59 07:23-07:46/23 18:08	06:41 20:08	05:32 06:15-06:35/20 21:05 19:37-20:12/35	04:48 20:44-20:56/12 21:53
8	08:42 16:14	08:00 08:27-08:47/20 17:13	06:56 07:21-07:46/25 18:10	06:39 20:10	05:30 06:17-06:35/18 21:07 19:37-20:12/35	04:47 20:43-20:59/16 21:54
9	08:42 09:16-09:18/2 16:16	07:58 08:27-08:48/21 17:15	06:54 07:20-07:46/26 18:12	06:36 20:12	05:28 06:18-06:33/15 21:09 19:38-20:12/34	04:47 20:42-21:01/19 21:55
10	08:41 09:15-09:20/5 16:17	07:56 08:27-08:48/21 17:17	06:51 07:20-07:47/27 18:14	06:34 20:14	05:26 06:20-06:31/11 21:11 19:38-20:12/34	04:46 20:41-21:02/21 21:56
11	08:40 09:14-09:21/7 16:19	07:54 16:45-16:48/3 17:19 08:28-08:47/19	06:49 07:19-07:46/27 18:16	06:31 20:16	05:24 06:22-06:28/6 21:13 19:38-20:11/33	04:46 20:41-21:03/22 21:57
12	08:39 09:13-09:22/9 16:20	07:52 16:41-16:50/9 17:21 08:29-08:47/18	06:46 07:19-07:46/27 18:18	06:29 20:18	05:22 19:39-20:10/31 21:15	04:45 20:39-21:03/24 21:58
13	08:38 09:12-09:23/11 16:22	07:49 16:39-16:52/13 17:23 08:29-08:45/16	06:44 07:19-07:45/26 18:20	06:26 20:20	05:21 19:40-20:10/30 21:16	04:45 20:39-21:04/25 21:58
14	08:38 09:10-09:23/13 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 19:40-20:09/29 21:18	04:44 20:39-21:05/26 21:59
15	08:37 15:47-15:48/1 16:25 09:09-09:25/16	07:45 16:38-16:58/20 17:27 08:33-08:42/9	06:39 07:20-07:43/23 18:24	06:21 20:23	05:17 19:42-20:09/27 21:20	04:44 20:39-21:06/27 22:00
16	08:36 15:45-15:51/6 16:27 09:08-09:26/18	07:43 16:36-16:59/23 17:29	06:36 07:21-07:42/21 18:26	06:19 20:25	05:15 19:42-20:07/25 21:22	04:44 20:39-21:07/28 22:00
17	08:35 15:45-15:53/8 16:29 09:07-09:27/20	07:41 16:36-17:02/26 17:31	06:34 07:22-07:40/18 18:28	06:17 20:27	05:14 19:43-20:06/23 21:23	04:44 20:39-21:07/28 22:01
18	08:33 15:43-15:54/11 16:31 09:05-09:27/22	07:39 16:35-17:03/28 17:33	06:31 07:24-07:38/14 18:30	06:14 20:29	05:12 19:45-20:05/20 21:25	04:44 20:39-21:08/29 22:01
19	08:32 15:43-15:57/14 16:33 09:04-09:28/24	07:36 16:34-17:02/28 17:35	06:29 07:28-07:33/5 18:31	06:12 20:31	05:10 19:47-20:04/17 21:27	04:44 20:39-21:08/29 22:02
20	08:31 15:42-15:58/16 16:34 09:03-09:28/25	07:34 16:35-17:03/28 17:38	06:26 18:33	06:09 20:33	05:09 19:48-20:02/14 21:28	04:44 20:39-21:08/29 22:02
21	08:30 15:42-16:01/19 16:36 09:04-09:29/25	07:32 16:35-17:03/28 17:40	06:24 18:35	06:07 19:52-20:02/10 20:35	05:07 19:51-20:00/9 21:30	04:44 20:39-21:08/29 22:02
22	08:28 15:41-16:03/22 16:38 09:04-09:29/25	07:30 16:34-17:02/28 17:42	06:21 18:37	06:05 06:30-06:35/5 20:37 19:49-20:05/16	05:06 21:32	04:44 20:39-21:08/29 22:02
23	08:27 15:42-16:05/23 16:40 09:04-09:30/26	07:27 16:35-17:02/27 17:44	06:19 18:39	06:02 06:28-06:37/9 20:39 19:46-20:08/22	05:04 21:33	04:44 20:40-21:09/29 22:03
24	08:26 15:41-16:05/24 16:42 09:04-09:29/25	07:25 16:36-17:02/26 17:46	06:16 18:41	06:00 06:26-06:38/12 20:41 19:45-20:09/24	05:03 21:35	04:45 20:40-21:09/29 22:03
25	08:24 15:41-16:06/25 16:44 09:04-09:29/25	07:23 16:36-17:00/24 17:48	06:14 18:43	05:58 06:24-06:39/15 20:43 19:42-20:10/28	05:01 21:36	04:45 20:40-21:08/28 22:03
26	08:23 15:42-16:07/25 16:46 09:06-09:30/24	07:20 16:37-17:00/23 17:50	06:11 18:45	05:56 06:21-06:39/18 20:45 19:41-20:11/30	05:00 21:38	04:45 20:41-21:09/28 22:03
27	08:21 15:42-16:07/25 16:48 09:06-09:30/24	07:18 16:38-16:58/20 17:52	06:09 18:47	05:53 06:19-06:39/20 20:46 19:40-20:11/31	04:59 21:39	04:46 20:41-21:08/27 22:03
28	08:19 15:41-16:07/26 16:50 09:06-09:29/23	07:16 16:40-16:56/16 17:54	06:06 18:49	05:51 06:17-06:39/22 20:48 19:40-20:12/32	04:57 21:41	04:46 20:42-21:09/27 22:02
29	08:18 15:42-16:07/25 16:52 09:07-09:29/22		07:04 19:51	05:49 06:15-06:40/25 20:50 19:39-20:13/34	04:56 21:42	04:47 20:42-21:08/26 22:02
30	08:16 15:42-16:07/25 16:54 09:08-09:28/20		07:01 19:53	05:47 06:13-06:40/27 20:52 19:38-20:13/35	04:55 21:44	04:48 20:43-21:08/25 22:02
31	08:14 15:42-16:07/25 16:56 09:10-09:28/18		06:59 19:55		04:54 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	749	744	352	415	826	617

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_enercon WTG: 3 - 03_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (14)
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 20:44-21:08/24	05:30 19:49-20:20/31	06:27	07:22 07:59-08:25/26	07:22 07:57-08:17/20	08:19 08:56-09:03/7
	22:02	21:25	20:16	19:00	16:47	16:01
2	04:49 20:46-21:07/21	05:32 06:31-06:40/9	06:28	07:24 07:58-08:25/27	07:24 07:56-08:17/21	08:21 08:57-09:02/5
	22:01	21:23 19:49-20:21/32	20:13	18:57	16:45	16:00
3	04:50 20:46-21:06/20	05:34 06:29-06:43/14	06:30	07:26 07:58-08:25/27	07:26 07:57-08:17/20	08:23 08:59-09:01/2
	22:01	21:21 19:48-20:22/34	20:11	18:55	16:43	15:59
4	04:51 20:48-21:05/17	05:35 06:28-06:44/16	06:32	07:28 07:58-08:24/26	07:28 15:21-15:30/9	08:24
	22:00	21:19 19:47-20:22/35	20:08	18:52	16:41 07:59-08:17/18	15:58
5	04:52 20:50-21:03/13	05:37 06:26-06:45/19	06:34	07:30 07:58-08:24/26	07:30 15:19-15:33/14	08:26
	22:00	21:17 19:47-20:22/35	20:06	18:50	16:39 08:02-08:17/15	15:58
6	04:53 20:52-21:01/9	05:39 06:25-06:46/21	06:36	07:31 07:59-08:23/24	07:33 15:17-15:34/17	08:27
	21:59	21:15 19:47-20:23/36	20:03	18:47	16:37 08:04-08:17/13	15:57
7	04:54	05:41 06:25-06:47/22	06:38	07:33 08:01-08:22/21	07:35 15:16-15:36/20	08:28
	21:58	21:13 19:46-20:22/36	20:01	18:45	16:35 08:06-08:16/10	15:57
8	04:55	05:42 06:23-06:47/24	06:39	07:35 08:03-08:21/18	07:37 15:15-15:36/21 08:08-08:15/7	08:30
	21:57	21:11 19:46-20:22/36	19:58	18:42	16:33 08:47-08:51/4	15:56
9	04:56	05:44 06:23-06:48/25	06:41	07:37 08:05-08:19/14	07:39 15:14-15:37/23 08:11-08:15/4	08:31
	21:57	21:09 19:47-20:23/36	19:56	18:40	16:31 08:43-08:55/12	15:56
10	04:57	05:46 06:23-06:48/25	06:43	07:39 08:07-08:17/10	07:41 15:14-15:38/24	08:32
	21:56	21:07 19:46-20:22/36	19:53	18:37	16:30 08:42-08:58/16	15:55
11	04:58	05:48 06:22-06:48/26	06:45	07:41 08:09-08:14/5	07:43 15:14-15:39/25	08:33
	21:55	21:04 19:46-20:22/36	19:51	18:35	16:28 08:41-08:59/18	15:55
12	04:59	05:50 06:22-06:48/26	06:47	07:43 17:18-17:23/5	07:45 15:14-15:39/25	08:35
	21:54	21:02 19:47-20:22/35	19:48	18:33	16:26 08:40-09:00/20	15:55
13	05:01	05:52 06:22-06:48/26	06:49	07:45 17:14-17:27/13	07:46 15:13-15:39/26	08:36
	21:53	21:00 19:47-20:21/34	19:46	18:30	16:24 08:39-09:01/22	15:55
14	05:02	05:53 06:23-06:47/24	06:50	07:47 17:11-17:29/18	07:48 15:13-15:39/26	08:37
	21:52	20:58 19:47-20:20/33	19:43	18:28	16:23 08:38-09:01/23	15:55
15	05:03	05:55 06:25-06:47/22	06:52	07:49 17:10-17:31/21	07:50 15:13-15:39/26	08:38
	21:51	20:56 19:47-20:19/32	19:41	18:25	16:21 08:39-09:03/24	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 19:48-20:19/31	19:38	18:23	16:19 08:39-09:03/24	15:55
17	05:06	05:59 06:29-06:46/17	06:56	07:53 17:08-17:33/25	07:54 15:15-15:40/25	08:39
	21:48	20:51 19:48-20:17/29	19:35	18:21	16:18 08:38-09:03/25	15:55
18	05:07	06:01 06:30-06:44/14	06:58	07:55 17:07-17:33/26	07:56 15:15-15:39/24	08:40
	21:47	20:49 19:49-20:16/27	19:33	18:18	16:16 08:38-09:03/25	15:55
19	05:09	06:03 06:32-06:43/11	07:00	07:56 17:06-17:33/27	07:58 15:16-15:39/23	08:41
	21:46	20:47 19:51-20:15/24	19:30	18:16	16:15 08:38-09:04/26	15:55
20	05:10	06:04 06:34-06:42/8	07:02	07:58 17:06-17:33/27	08:00 15:16-15:38/22	08:42
	21:44	20:44 19:52-20:13/21	19:28	18:14	16:13 08:39-09:04/25	15:56
21	05:12	06:06 06:35-06:39/4	07:03	08:00 17:05-17:33/28	08:02 15:17-15:36/19	08:42
	21:43	20:42 19:54-20:10/16	19:25	18:11	16:12 08:39-09:04/25	15:56
22	05:13 20:04-20:06/2	06:08 19:57-20:06/9	07:05	08:02 17:05-17:33/28	08:04 15:18-15:34/16	08:43
	21:41	20:40	19:23	18:09	16:11 08:39-09:04/25	15:57
23	05:15 20:00-20:11/11	06:10	07:07	08:04 17:05-17:32/27	08:06 15:19-15:33/14	08:43
	21:40	20:37	19:20	18:07	16:09 08:40-09:04/24	15:57
24	05:17 19:58-20:13/15	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 08:42-09:04/22	15:58
25	05:18 19:56-20:15/19	06:14	07:11 08:08-08:20/12	07:08 16:05-16:30/25	08:09 15:22-15:30/8	08:44
	21:37	20:33	19:15	17:02	16:07 08:44-09:04/20	15:58
26	05:20 19:55-20:16/21	06:16	07:13 08:05-08:22/17	07:10 16:07-16:29/22	08:11 15:23-15:29/6	08:44
	21:35	20:30	19:13	17:00 08:07-08:08/1	16:06 08:46-09:04/18	15:59
27	05:22 19:54-20:18/24	06:17	07:14 08:04-08:23/19	07:12 16:07-16:26/19	08:13 15:26-15:28/2	08:45
	21:33	20:28	19:10	16:58 08:02-08:12/10	16:05 08:48-09:04/16	16:00
28	05:23 19:52-20:18/26	06:19	07:16 08:01-08:23/22	07:14 16:08-16:24/16	08:14 08:50-09:04/14	08:45
	21:32	20:25	19:07	16:56 08:00-08:14/14	16:04	16:01
29	05:25 19:52-20:19/27	06:21	07:18 08:00-08:24/24	07:16 16:09-16:21/12	08:16 08:52-09:03/11	08:45
	21:30	20:23	19:05	16:53 07:58-08:15/17	16:03	16:02
30	05:27 19:50-20:19/29	06:23	07:20 07:59-08:25/26	07:18 16:11-16:19/8	08:18 08:54-09:03/9	08:45
	21:28	20:21	19:02	16:51 07:57-08:16/19	16:02	16:03
31	05:28 19:50-20:21/31	06:25		07:20 16:14-16:17/3		08:45
	21:26	20:18		16:49 07:57-08:17/20		16:04
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	309	1047	120	705	1028	14

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_enercon WTG: 4 - E04_NERCON E-147 EP5 E2 5000 147.0 IO! hub: 126.0 m (TOT: 199.5 m) (15)

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 13:36-14:21/45 16:05 10:15-10:36/21	08:13 15:03-15:55/52 16:58 08:45-09:07/22	07:13 15:06-15:54/48 17:56	06:56 19:56	05:45 20:54	04:53 21:46
2	08:45 13:37-14:22/45 16:06 10:15-10:35/20	08:11 15:02-15:56/54 17:00 08:46-09:06/20	07:11 15:08-15:53/45 17:58	06:53 19:58	05:42 20:56	04:52 21:47
3	08:44 13:38-14:23/45 16:07 10:17-10:36/19	08:09 15:03-15:58/55 17:02 08:46-09:06/20	07:08 15:09-15:51/42 18:00	06:51 20:00	05:40 20:58	04:51 21:49
4	08:44 13:38-14:23/45 16:09 10:17-10:35/18	08:07 15:01-15:58/57 17:04 08:47-09:06/19	07:06 15:11-15:49/38 18:02	06:48 20:02	05:38 21:00	04:50 21:50
5	08:43 13:39-14:24/45 16:10 10:19-10:35/16	08:05 15:01-15:59/58 17:06 08:48-09:05/17	07:04 15:13-15:46/33 18:04	06:46 20:04	05:36 21:02	04:49 21:51
6	08:43 13:39-14:24/45 16:11 10:20-10:34/14	08:04 15:00-15:59/59 17:08 08:48-09:03/15	07:01 15:17-15:44/27 18:06	06:43 20:06	05:34 21:03	04:48 21:52
7	08:43 13:39-14:24/45 16:13 10:21-10:34/13	08:02 15:00-16:00/60 17:10 08:50-09:02/12	06:59 15:21-15:39/18 18:08	06:41 20:08	05:32 21:05	04:48 21:53
8	08:42 13:40-14:24/44 16:14 10:23-10:32/9	08:00 15:00-16:01/61 17:13 08:52-09:00/8	06:56 18:10	06:38 20:10	05:30 21:07	04:47 21:54
9	08:42 13:40-14:24/44 16:16 10:27-10:31/4	07:58 14:59-16:01/62 17:15	06:54 18:12	06:36 20:12	05:28 21:09	04:46 21:55
10	08:41 13:42-14:25/43 16:17	07:56 14:59-16:02/63 17:17	06:51 18:14	06:34 20:14	05:26 21:11	04:46 21:56
11	08:40 13:42-14:25/43 16:19	07:54 14:59-16:03/64 17:19	06:49 18:16	06:31 20:16	05:24 21:13	04:45 21:57
12	08:39 13:43-14:25/42 16:20	07:52 14:58-16:02/64 17:21	06:46 18:18	06:29 20:18	05:22 21:15	04:45 21:58
13	08:38 13:43-14:25/42 16:22	07:49 14:58-16:02/64 17:23	06:44 18:20	06:26 20:20	05:21 21:16	04:45 21:58
14	08:38 13:43-14:25/42 16:24	07:47 14:59-16:03/64 17:25	06:41 18:22	06:24 20:21	05:19 21:18	04:44 21:59
15	08:37 13:44-14:25/41 16:25	07:45 14:59-16:03/64 17:27	06:39 18:24	06:21 20:23	05:17 21:20	04:44 22:00
16	08:36 13:45-14:25/40 16:27	07:43 14:58-16:02/64 17:29 08:10-08:13/3	06:36 18:26	06:19 20:25	05:15 21:22	04:44 22:00
17	08:34 13:47-14:25/38 16:29	07:41 14:59-16:03/64 17:31 08:07-08:14/7	06:34 18:28	06:17 20:27	05:13 21:23	04:44 22:01
18	08:33 13:47-14:25/38 16:31	07:39 14:59-16:03/64 17:33 08:05-08:15/10	06:31 18:29	06:14 20:29	05:12 21:25	04:44 22:01
19	08:32 13:48-14:25/37 16:32	07:36 14:59-16:02/63 17:35 08:03-08:15/12	06:29 06:53-06:56/3 18:31	06:12 20:31	05:10 21:27	04:44 22:02
20	08:31 15:20-15:33/13 16:34 13:49-14:24/35	07:34 14:59-16:02/63 17:37 08:00-08:15/15	06:26 06:51-06:58/7 18:33	06:09 20:33	05:09 21:28	04:44 22:02
21	08:30 15:17-15:37/20 16:36 13:50-14:24/34	07:32 15:00-16:02/62 17:40 07:58-08:15/17	06:24 06:48-06:57/9 18:35	06:07 20:35	05:07 21:30	04:44 22:02
22	08:28 15:14-15:40/26 16:38 13:51-14:23/32	07:30 15:00-16:01/61 17:42 07:57-08:14/17	06:21 06:45-06:57/12 18:37	06:05 20:37	05:06 21:32	04:44 22:02
23	08:27 15:13-15:43/30 08:58-09:00/2 16:40 13:53-14:23/30	07:27 15:01-16:00/59 17:44 07:58-08:13/15	06:19 06:43-06:57/14 18:39	06:02 20:39	05:04 21:33	04:44 22:03
24	08:26 15:11-15:44/33 08:56-09:01/5 16:42 13:55-14:21/26	07:25 15:02-16:00/58 17:46 07:59-08:12/13	06:16 06:40-06:56/16 18:41	06:00 20:41	05:03 21:35	04:45 22:03
25	08:24 15:10-15:46/36 08:54-09:02/8 16:44 13:56-14:20/24	07:23 15:02-15:59/57 17:48 08:00-08:10/10	06:14 06:40-06:56/16 18:43	05:58 20:43	05:01 21:36	04:45 22:03
26	08:23 15:09-15:48/39 08:53-09:04/11 16:46 13:59-14:19/20	07:20 15:03-15:58/55 17:50 08:04-08:06/2	06:11 06:40-06:54/14 18:45	05:56 20:45	05:00 21:38	04:45 22:03
27	08:21 15:08-15:50/42 08:51-09:04/13 16:48 14:02-14:16/14	07:18 15:04-15:57/53 17:52	06:09 06:42-06:53/11 18:47	05:53 20:46	04:59 21:39	04:46 22:03
28	08:19 15:07-15:51/44 16:50 08:49-09:05/16	07:16 15:05-15:56/51 17:54	06:06 06:45-06:49/4 18:49	05:51 20:48	04:57 21:41	04:46 22:02
29	08:18 15:06-15:52/46 16:52 08:47-09:05/18		07:04 19:51	05:49 20:50	04:56 21:42	04:47 22:02
30	08:16 15:05-15:53/48 16:54 08:45-09:05/20		07:01 19:53	05:47 20:52	04:55 21:44	04:48 22:02
31	08:14 15:04-15:54/50 16:56 08:45-09:07/22		06:58 19:55		04:54 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	1700	1929	357	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_enercon WTG: 4 - E04_NERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (15)

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 21:24	06:27 20:16	07:22 19:00	07:22 14:29-15:32/63 16:47	08:19 13:24-14:07/43 16:01
2	04:49 22:01	05:32 21:23	06:28 20:13	07:24 18:57	07:24 14:29-15:31/62 16:45	08:21 13:24-14:07/43 16:00
3	04:50 22:01	05:33 21:21	06:30 20:11	07:26 18:55	07:26 14:29-15:30/61 16:43 08:21-08:30/9	08:23 13:24-14:08/44 15:59 10:10-10:13/3
4	04:51 22:00	05:35 21:19	06:32 20:08	07:28 18:52	07:28 14:30-15:30/60 16:41 08:19-08:32/13	08:24 13:25-14:09/44 15:58 10:08-10:17/9
5	04:52 22:00	05:37 21:17	06:34 20:06	07:29 18:50	07:30 14:31-15:30/59 16:39 08:18-08:34/16	08:26 13:24-14:09/45 15:56 10:06-10:18/12
6	04:53 21:59	05:39 21:15	06:36 20:03	07:31 16:01-16:13/12 18:47	07:32 14:31-15:29/58 16:37 08:17-08:35/18	08:27 13:25-14:10/45 15:57 10:06-10:21/15
7	04:54 21:58	05:41 21:13	06:38 20:01	07:33 15:55-16:18/23 18:45	07:34 14:32-15:29/57 16:35 08:16-08:36/20	08:28 13:25-14:10/45 15:57 10:05-10:21/16
8	04:55 21:57	05:42 21:11	06:39 19:58	07:35 15:50-16:20/30 18:42	07:36 14:32-15:28/56 16:33 08:16-08:36/20	08:30 13:26-14:11/45 15:56 10:05-10:23/18
9	04:56 21:57	05:44 21:09	06:41 19:56	07:37 15:47-16:22/35 18:40	07:38 14:33-15:27/54 16:31 08:15-08:36/21	08:31 13:26-14:11/45 15:56 10:05-10:24/19
10	04:57 21:56	05:46 21:07	06:43 19:53	07:39 15:44-16:24/40 18:37	07:40 14:35-15:27/52 16:29 08:16-08:37/21	08:32 13:26-14:11/45 15:55 10:04-10:24/20
11	04:58 21:55	05:48 21:04	06:45 19:51	07:41 15:42-16:26/44 18:35	07:42 14:36-15:26/50 16:28 08:16-08:37/21	08:33 13:27-14:12/45 15:55 10:05-10:26/21
12	04:59 21:54	05:50 21:02	06:47 19:48	07:43 15:40-16:27/47 18:33	07:44 14:37-15:25/48 16:26 08:17-08:37/20	08:35 13:27-14:12/45 15:55 10:05-10:27/22
13	05:01 21:53	05:52 21:00	06:49 19:46	07:45 15:38-16:28/50 18:30	07:46 14:38-15:24/46 16:24 08:19-08:37/18	08:36 13:28-14:13/45 15:55 10:05-10:27/22
14	05:02 21:52	05:53 20:58	06:50 19:43	07:47 15:37-16:29/52 18:28	07:48 14:39-15:23/44 16:23 08:21-08:37/16	08:37 13:28-14:13/45 15:55 10:05-10:28/23
15	05:03 21:51	05:55 20:56	06:52 19:40	07:49 15:36-16:30/54 18:25	07:50 14:40-15:22/42 08:24-08:37/13 16:21 13:34-13:48/14	08:38 13:28-14:14/46 15:55 10:05-10:29/24
16	05:05 21:49	05:57 20:53	06:54 07:31-07:41/10 19:38	07:51 15:35-16:31/56 18:23 08:34-08:41/7	07:52 14:42-15:21/39 08:26-08:37/11 16:19 13:32-13:52/20	08:39 13:29-14:14/45 15:55 10:06-10:29/23
17	05:06 21:48	05:59 20:51	06:56 07:29-07:42/13 19:35	07:53 15:34-16:31/57 18:21 08:31-08:43/12	07:54 14:44-15:20/36 08:28-08:36/8 16:18 13:30-13:54/24	08:39 13:30-14:15/45 15:55 10:06-10:30/24
18	05:07 21:47	06:01 20:49	06:58 07:28-07:43/15 19:33	07:54 15:33-16:32/59 18:18 08:30-08:44/14	07:56 14:45-15:18/33 08:30-08:35/5 16:16 13:29-13:55/26	08:40 13:30-14:15/45 15:55 10:07-10:31/24
19	05:09 21:46	06:03 20:47	07:00 07:27-07:44/17 19:30	07:56 15:32-16:32/60 18:16 08:28-08:45/17	07:58 14:47-15:17/30 08:32-08:34/2 16:15 13:27-13:57/30	08:41 13:30-14:15/45 15:55 10:06-10:31/25
20	05:10 21:44	06:04 20:44	07:01 07:29-07:44/15 19:28	07:58 15:31-16:32/61 18:13 08:28-08:45/17	08:00 14:49-15:15/26 16:13 13:26-13:58/32	08:42 13:31-14:16/45 15:56 10:07-10:32/25
21	05:12 21:43	06:06 20:42	07:03 07:30-07:43/13 19:25	08:00 15:30-16:32/62 18:11 08:29-08:45/16	08:02 14:52-15:12/20 16:12 13:25-13:59/34	08:42 13:31-14:16/45 15:56 10:08-10:32/24
22	05:13 21:41	06:08 20:40	07:05 07:32-07:42/10 19:23	08:02 15:29-16:32/63 18:09 08:31-08:45/14	08:04 14:56-15:09/13 16:11 13:25-14:00/35	08:43 13:32-14:17/45 15:57 10:08-10:32/24
23	05:15 21:40	06:10 20:37	07:07 07:34-07:41/7 19:20	08:04 15:29-16:32/63 18:07 08:33-08:44/11	08:06 13:24-14:01/37 16:09	08:43 13:32-14:17/45 15:57 10:08-10:33/25
24	05:17 21:38	06:12 20:35	07:09 07:36-07:40/4 19:18	08:06 15:28-16:32/64 18:04 08:35-08:44/9	08:07 13:24-14:02/38 16:08	08:44 13:33-14:18/45 15:58 10:10-10:34/24
25	05:18 21:37	06:14 20:33	07:11 07:38-07:39/1 19:15	07:08 14:28-15:32/64 17:02 07:38-07:44/6	08:09 13:24-14:03/39 16:07	08:44 13:33-14:18/45 15:58 10:10-10:34/24
26	05:20 21:35	06:15 20:30	07:13 19:12	07:10 14:29-15:33/64 17:00 07:40-07:43/3	08:11 13:24-14:03/39 16:06	08:44 13:33-14:19/46 15:59 10:10-10:34/24
27	05:21 21:33	06:17 20:28	07:14 19:10	07:12 14:28-15:33/65 16:58	08:13 13:24-14:04/40 16:05	08:45 13:34-14:19/45 16:00 10:10-10:34/24
28	05:23 21:32	06:19 20:25	07:16 19:07	07:14 14:28-15:32/64 16:56	08:14 13:24-14:05/41 16:03	08:45 13:34-14:19/45 16:01 10:11-10:34/23
29	05:25 21:30	06:21 20:23	07:18 19:05	07:16 14:28-15:32/64 16:53	08:16 13:24-14:06/42 16:02	08:45 13:35-14:20/45 16:02 10:12-10:35/23
30	05:27 21:28	06:23 20:21	07:20 19:02	07:18 14:28-15:32/64 16:51	08:18 13:24-14:06/42 16:02	08:45 13:35-14:21/46 16:03 10:13-10:35/22
31	05:28 21:26	06:25 20:18		07:20 14:28-15:31/63 16:49		08:45 13:36-14:21/45 16:04 10:14-10:35/21
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	0	0	105	1506	1794	1996

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 11:02 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_enercon WTG: 5 - 05_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (16)
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 14:35-16:13/98 17:56	06:56 17:25-18:25/60 08:06-09:05/59 19:57 15:27-17:11/104	05:45 20:54	04:53 20:22-20:39/17 21:46 05:25-05:49/24
2	08:45 16:06	08:11 17:00	07:11 14:34-16:14/100 17:58	06:53 17:26-18:25/59 08:06-09:05/59 19:58 15:28-17:10/102	05:42 20:56	04:52 20:23-20:38/15 21:48 05:24-05:49/25
3	08:44 16:07	08:09 17:02	07:08 14:32-16:15/103 18:00	06:51 17:26-18:24/58 08:06-09:03/57 20:00 15:29-17:09/100 07:16-07:26/10	05:40 20:58	04:51 20:24-20:37/13 21:49 05:24-05:49/25
4	08:44 16:09	08:07 17:04	07:06 16:53-17:12/19 18:02 14:32-16:16/104	06:48 17:27-18:23/56 08:06-09:03/57 20:02 15:30-17:09/99 07:13-07:30/17	05:38 20:25-20:29/4 21:00	04:50 20:25-20:35/10 21:50 05:23-05:49/26
5	08:44 16:10	08:06 17:06	07:04 16:48-17:15/27 18:04 14:31-16:16/105	06:46 17:27-18:21/54 08:06-09:01/55 20:04 15:31-17:07/96 07:10-07:31/21	05:36 20:22-20:30/8 21:02	04:49 20:27-20:35/8 21:51 05:24-05:50/26
6	08:43 16:11	08:04 17:08	07:01 16:45-17:18/33 18:06 14:30-16:17/107	06:43 17:29-18:20/51 08:07-09:01/54 20:06 15:33-17:06/93 07:08-07:33/25	05:34 20:20-20:32/12 21:04	04:48 05:24-05:50/26 21:52
7	08:43 16:13	08:02 17:10	06:59 16:42-17:20/38 18:08 14:29-16:16/107	06:41 17:29-18:18/49 08:07-08:59/52 20:08 15:33-17:05/92 07:05-07:33/28	05:32 20:18-20:34/16 21:05	04:46 05:25-05:50/25 21:53
8	08:42 16:14	08:00 17:13	06:56 16:40-17:23/43 18:10 14:29-16:17/108	06:38 17:31-18:17/46 15:35-17:04/89 07:03-07:34/31 20:10 19:28-19:41/13 08:08-08:58/50	05:30 20:17-20:35/18 21:07	04:47 05:24-05:50/26 21:54
9	08:42 16:16	07:58 17:15	06:54 16:38-17:24/46 18:12 14:27-16:17/110	06:36 17:32-18:15/43 15:36-17:02/86 07:00-07:34/34 20:12 19:25-19:43/18 08:08-08:56/48	05:28 20:17-20:38/21 21:09	04:46 05:25-05:51/26 21:55
10	08:41 16:17	07:56 15:19-15:33/14 17:17	06:51 16:36-17:25/49 07:36-07:49/13 18:14 14:27-16:18/111	06:34 17:34-18:13/39 15:38-17:01/83 06:58-07:35/37 20:14 19:23-19:45/22 08:09-08:55/46	05:26 20:16-20:39/23 21:11	04:45 05:25-05:50/25 21:56
11	08:40 16:19	07:54 15:12-15:40/28 17:19	06:49 16:34-17:26/52 07:30-07:53/23 18:16 14:26-16:18/112	06:31 17:36-18:10/34 15:39-17:00/81 06:57-07:36/39 20:16 19:21-19:45/24 08:11-08:53/42	05:24 20:15-20:40/25 21:13	04:45 05:25-05:51/26 21:57
12	08:39 16:20	07:52 15:08-15:45/37 17:21	06:46 16:33-17:28/55 07:27-07:57/30 18:18 14:26-16:18/112	06:29 17:38-18:08/30 15:42-16:58/76 06:56-07:35/39 20:18 19:20-19:47/27 08:11-08:51/40	05:22 20:14-20:42/28 21:15	04:45 05:26-05:51/25 21:58
13	08:39 16:22	07:49 15:04-15:48/44 17:23	06:44 16:32-17:28/56 07:24-07:59/35 18:20 14:25-16:18/113	06:26 17:42-18:05/23 15:44-16:57/73 06:57-07:35/38 20:20 19:19-19:48/29 08:13-08:49/36	05:21 20:15-20:43/28 21:16	04:45 05:25-05:51/26 21:58
14	08:38 16:24	07:47 15:01-15:51/50 17:25	06:41 16:31-17:29/58 07:22-08:01/39 18:22 14:25-16:18/113	06:24 17:46-17:59/13 15:46-16:55/69 06:56-07:35/39 20:22 19:17-19:47/30 08:14-08:46/32	05:19 20:14-20:43/29 21:18	04:44 05:26-05:51/25 21:59
15	08:37 16:25	07:45 14:58-15:54/56 17:27	06:39 16:29-17:29/60 07:20-08:02/42 18:24 14:24-16:18/114	06:21 19:17-19:48/31 08:16-08:43/27 20:23 15:48-16:54/66 06:57-07:35/38	05:17 20:14-20:42/28 21:20	04:44 05:26-05:51/25 22:00
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19	08:32 16:32	07:36 14:50-16:03/73 17:35	06:29 16:26-17:31/65 07:14-08:06/52 18:31 14:23-16:18/115	06:12 19:16-19:48/32 07:01-07:32/31 20:31 16:00-16:45/45	05:10 20:14-20:42/28 21:27	04:44 05:27-05:52/25 22:02
20	08:31 16:34	07:34 14:47-16:04/77 17:37	06:26 16:25-17:30/65 07:12-08:06/54 18:33 14:23-16:17/114	06:09 19:15-19:47/32 07:02-07:31/29 20:33 16:03-16:41/38	05:09 20:14-20:43/29 21:28	04:44 05:27-05:52/25 22:02
21	08:30 16:36	07:32 14:46-16:05/79 17:40	06:24 16:25-17:31/66 07:12-08:07/55 18:35 14:23-16:17/114	06:07 19:15-19:46/31 07:02-07:29/27 20:35 16:08-16:38/30	05:07 20:15-20:43/28 21:30	04:44 05:27-05:52/25 22:02
22	08:28 16:38	07:30 14:44-16:06/82 17:42	06:21 16:24-17:30/66 07:10-08:07/57 18:37 14:23-16:16/113	06:05 19:16-19:46/30 07:03-07:28/25 20:37 16:15-16:32/17	05:06 20:15-20:42/27 21:32	04:44 05:27-05:52/25 22:03
23	08:27 16:40	07:27 14:43-16:08/85 17:44	06:19 16:24-17:31/67 07:10-08:08/58 18:39 14:23-16:16/113	06:02 19:16-19:45/29 20:39 07:04-07:27/23	05:04 20:15-20:42/27 21:33	04:44 05:28-05:53/25 22:03
24	08:26 16:42	07:25 14:42-16:09/87 17:46	06:16 16:24-17:30/66 07:09-08:07/58 18:41 14:23-16:16/113	06:00 19:17-19:45/28 20:41 07:06-07:25/19	05:03 20:16-20:42/26 21:35	04:45 05:28-05:53/25 22:03
25	08:24 16:44	07:23 14:40-16:10/90 17:48	06:14 16:24-17:30/66 07:08-08:08/60 18:43 14:24-16:16/112	05:58 19:17-19:43/26 20:43 07:08-07:23/15	05:01 20:17-20:42/25 21:36	04:45 05:28-05:53/25 22:03
26	08:23 16:46	07:20 14:39-16:11/92 17:50	06:11 16:23-17:29/66 07:07-08:07/60 18:45 14:24-16:15/111	05:56 19:18-19:42/24 20:45 07:11-07:18/7	05:00 20:17-20:42/25 21:38	04:45 05:28-05:54/26 22:03
27	08:21 16:48	07:18 14:37-16:12/95 17:52	06:09 16:24-17:29/65 07:07-08:08/61 18:47 14:24-16:15/111	05:53 19:19-19:40/21 20:47	04:59 20:17-20:40/23 21:39	04:46 05:28-05:54/26 22:03
28	08:20 16:50	07:16 14:36-16:13/97 17:54	06:06 16:23-17:28/65 07:07-08:07/60 18:49 14:24-16:14/110	05:51 19:21-19:39/18 20:48	04:57 20:18-20:40/22 21:41	04:46 05:29-05:54/25 22:02
29	08:18 16:52		07:04 17:24-18:28/64 08:07-09:07/60 19:51 15:25-17:13/108	05:49 19:24-19:36/12 20:50	04:56 20:19-20:40/21 21:42	04:47 05:29-05:55/26 22:02
30	08:16 16:54		07:01 17:24-18:27/63 08:06-09:06/60 19:53 15:26-17:12/106	05:47 19:29-19:31/2 20:52	04:55 20:20-20:39/19 21:44	04:48 05:29-05:55/26 22:02
31	08:15 16:56		06:59 17:25-18:27/62 08:06-09:06/60 19:55 15:27-17:12/105		04:54 20:20-20:38/18 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	0	1281	6055	4217	805	824

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 11:02 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_enercon WTG: 5 - 05_ENERCON E-147 EP5 E2 5000 147.0 !OI! hub: 126.0 m (TOT: 199.5 m) (16)
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 05:29-05:55/26 22:02	05:30 20:25-20:51/26 21:25	06:27 17:35-18:10/35 15:39-16:59/80 06:56-07:35/39 20:16 19:21-19:45/24 08:09-08:52/43	07:22 17:12-18:07/55 08:05-08:37/32 19:00 15:05-16:57/112	07:22 14:51-15:01/10 16:47	08:19 16:01
2	04:49 05:30-05:56/26 22:01	05:30 20:26-20:50/24 21:23	06:28 17:32-18:11/39 15:36-16:59/83 06:56-07:33/37 20:13 19:21-19:43/22 08:07-08:53/46	07:24 17:13-18:06/53 08:08-08:34/26 18:57 15:05-16:57/112	07:24 16:45	08:21 16:00
3	04:50 05:29-05:55/26 22:01	05:33 20:27-20:49/22 21:21	06:30 17:30-18:13/43 15:34-17:00/86 06:58-07:32/34 20:11 19:23-19:41/18 08:06-08:54/48	07:26 17:14-18:04/50 08:11-08:30/19 18:55 15:05-16:56/111	07:26 16:43	08:23 15:59
4	04:51 05:30-05:55/25 22:00	05:35 20:27-20:46/19 21:19	06:32 17:28-18:14/46 15:32-17:01/89 07:00-07:31/31 20:08 19:25-19:38/13 08:05-08:55/50	07:28 17:15-18:02/47 18:52 15:05-16:55/110	07:28 16:41	08:24 15:58
5	04:52 05:30-05:56/26 22:00	05:37 20:28-20:45/17 21:17	06:34 17:26-18:15/49 08:04-08:56/52 20:06 15:30-17:02/92 07:02-07:30/26	07:30 17:16-18:00/44 18:50 15:05-16:55/110	07:31 16:39	08:26 15:58
6	04:53 05:30-05:56/26 21:59	05:39 20:29-20:43/14 21:15	06:36 17:24-18:15/51 08:02-08:56/54 20:03 15:28-17:01/93 07:04-07:29/25	07:31 17:18-17:58/40 18:47 15:06-16:54/108	07:33 16:37	08:27 15:57
7	04:54 20:35-20:40/5 21:58 05:30-05:56/26	05:41 20:30-20:41/11 21:13	06:38 17:22-18:16/54 08:01-08:56/55 20:01 15:26-17:02/96 07:05-07:26/21	07:33 17:20-17:56/36 18:45 15:06-16:53/107	07:35 16:35	08:28 15:57
8	04:55 20:33-20:42/9 21:58 05:31-05:56/25	05:42 20:32-20:39/7 21:11	06:39 17:21-18:17/56 08:01-08:57/56 19:58 15:25-17:03/98 07:07-07:24/17	07:35 17:22-17:53/31 18:42 15:06-16:52/106	07:37 16:33	08:30 15:56
9	04:56 20:32-20:44/12 21:57 05:31-05:56/25	05:44 20:36-20:38/2 21:09	06:41 17:20-18:18/58 08:00-08:57/57 19:56 15:23-17:03/100 07:10-07:20/10	07:37 17:25-17:48/23 18:40 15:07-16:51/104	07:39 16:31	08:31 15:56
10	04:57 20:31-20:45/14 21:56 05:31-05:56/25	05:46 21:07	06:43 17:19-18:18/59 07:59-08:58/59 19:53 15:22-17:04/102	07:39 17:30-17:43/13 18:37 15:06-16:49/103	07:41 16:29	08:32 15:55
11	04:58 20:30-20:46/16 21:55 05:32-05:56/24	05:48 21:05	06:45 17:17-18:18/61 07:58-08:57/59 19:51 15:19-17:03/104	07:41 15:07-16:48/101 18:35	07:43 16:28	08:33 15:55
12	04:59 20:29-20:47/18 21:54 05:33-05:56/23	05:50 21:02	06:47 17:16-18:18/62 07:58-08:57/59 19:48 15:18-17:03/105	07:43 15:08-16:48/100 18:33	07:45 16:26	08:35 15:55
13	05:01 20:28-20:47/19 21:53 05:34-05:56/22	05:52 19:35-19:42/7 21:00	06:49 17:15-18:18/63 07:57-08:57/60 19:46 15:17-17:03/106	07:45 15:09-16:47/98 18:30	07:47 16:24	08:36 15:55
14	05:02 20:28-20:48/20 21:52 05:36-05:57/21	05:53 19:30-19:44/14 20:58	06:50 17:15-18:19/64 07:57-08:57/60 19:43 15:16-17:04/108	07:47 15:10-16:46/96 18:28	07:49 16:23	08:37 15:55
15	05:03 20:28-20:49/21 21:51 05:37-05:56/19	05:55 19:28-19:47/19 20:56	06:52 17:13-18:18/65 07:57-08:57/60 19:41 15:14-17:03/109	07:49 15:11-16:44/93 18:25	07:50 16:21	08:38 15:55
16	05:05 20:27-20:50/23 21:49 05:38-05:56/18	05:57 19:27-19:48/21 20:54	06:54 17:12-18:18/66 07:56-08:56/60 19:38 15:13-17:03/110	07:51 15:11-16:43/92 18:23	07:52 16:19	08:39 15:55
17	05:06 20:26-20:50/24 21:48 05:39-05:55/16	05:59 19:24-19:49/25 20:51 07:17-07:27/10	06:56 17:12-18:18/66 07:56-08:56/60 19:35 15:12-17:03/111	07:53 15:12-16:42/90 18:21	07:54 16:18	08:39 15:55
18	05:07 20:27-20:51/24 21:47 05:41-05:55/14	06:01 19:23-19:50/27 20:49 07:13-07:29/16	06:58 17:11-18:18/67 07:56-08:55/59 19:33 15:11-17:03/112	07:55 15:13-16:40/87 18:18	07:56 16:16	08:40 15:55
19	05:09 20:26-20:52/26 21:46 05:42-05:55/13	06:03 19:23-19:50/27 20:47 07:11-07:31/20	07:00 17:11-18:17/66 07:56-08:55/59 19:30 15:11-17:03/112	07:57 15:14-16:39/85 18:16	07:58 16:15	08:41 15:55
20	05:10 20:25-20:52/27 21:44 05:43-05:53/10	06:04 19:22-19:51/29 20:44 07:09-07:33/24	07:02 17:10-18:16/66 07:56-08:54/58 19:28 15:10-17:03/113	07:58 15:16-16:37/81 18:14	08:00 16:13	08:42 15:56
21	05:12 20:26-20:53/27 21:43 05:45-05:53/8	06:06 19:20-19:51/31 07:07-07:33/26 20:42 16:18-16:38/20	07:03 17:10-18:16/66 07:56-08:53/57 19:25 15:08-17:02/114	08:00 15:17-16:35/78 18:11	08:02 16:12	08:42 15:56
22	05:13 20:25-20:53/28 21:41 05:46-05:52/6	06:08 19:20-19:51/31 07:06-07:34/28 20:40 16:12-16:43/31	07:05 17:10-18:16/66 07:56-08:52/56 19:23 15:08-17:02/114	08:02 15:18-16:33/75 18:09	08:04 16:11	08:43 15:57
23	05:15 20:25-20:53/28 21:40 05:48-05:51/3	06:10 19:20-19:51/31 07:05-07:35/30 20:37 16:07-16:46/39	07:07 17:10-18:15/65 07:56-08:51/55 19:20 15:07-17:02/115	08:04 15:20-16:31/71 18:07	08:06 16:09	08:43 15:57
24	05:17 20:25-20:53/28 21:38	06:12 19:19-19:52/33 07:04-07:36/32 20:35 16:04-16:49/45	07:09 17:10-18:14/64 07:57-08:50/53 19:18 15:07-17:01/114	08:06 15:21-16:29/68 18:04	08:08 16:08	08:44 15:58
25	05:18 20:25-20:54/29 21:37	06:14 19:18-19:51/33 07:01-07:36/35 20:33 15:59-16:50/51	07:11 17:10-18:14/64 07:58-08:49/51 19:15 15:07-17:01/114	08:08 14:24-15:28/64 17:02	08:09 16:07	08:44 15:58
26	05:20 20:24-20:53/29 21:35	06:15 19:18-19:50/32 08:26-08:37/11 20:30 15:56-16:52/56 07:00-07:36/36	07:13 17:10-18:13/63 07:59-08:47/48 19:13 15:06-17:01/115	07:10 14:26-15:26/60 17:00	08:11 16:06	08:44 15:59
27	05:21 20:25-20:54/29 21:33	06:17 19:19-19:50/31 08:21-08:42/21 20:28 15:53-16:54/61 06:59-07:36/37	07:14 17:10-18:11/61 07:59-08:45/46 19:10 15:05-16:59/114	07:12 14:28-15:23/55 16:58	08:13 16:05	08:45 16:00
28	05:23 20:24-20:53/29 21:32	06:19 19:19-19:50/31 08:18-08:45/27 20:25 15:50-16:56/66 06:58-07:36/38	07:16 17:10-18:10/60 08:00-08:43/43 19:07 15:05-16:59/114	07:14 14:31-15:20/49 16:56	08:15 16:03	08:45 16:01
29	05:25 20:25-20:54/29 21:30	06:21 17:47-18:00/13 15:46-16:56/70 06:57-07:35/38 20:23 19:18-19:48/30 08:15-08:47/32	07:18 17:11-18:09/58 08:01-08:41/40 19:05 15:05-16:58/113	07:16 14:34-15:17/43 16:53	08:16 16:02	08:45 16:02
30	05:27 20:25-20:53/28 21:28	06:23 17:42-18:05/23 15:44-16:57/73 06:57-07:35/38 20:21 19:19-19:47/28 08:13-08:49/36	07:20 17:11-18:08/57 08:03-08:39/36 19:02 15:05-16:58/113	07:18 14:37-15:13/36 16:51	08:18 16:02	08:45 16:03
31	05:28 20:25-20:53/28 21:26	06:25 17:38-18:08/30 15:42-16:58/76 06:56-07:35/39 20:18 19:20-19:46/26 08:11-08:51/40	 	07:20 14:43-15:09/26 16:49	 	08:45 16:04
Potential sun hours	518	463	383	327	255	228
Sum of minutes with flicker	1023	1916	6827	3100	10	0

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

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

Project:

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 11:02 AM/4.0.547

SHADOW - Calendar per WTG

Calculation: Shadow_enercon WTG: 6 - 06_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (17)
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 10:18-11:18/60 16:05	08:13 10:24-11:34/70 16:58 09:09-09:58/49	07:13 07:38-08:01/23 17:56	06:56 17:02-18:20/78 19:57	05:45 20:54	04:53 19:49-20:46/57 21:46
2	08:45 10:19-11:19/60 16:06	08:11 10:24-11:34/70 17:00 09:09-09:59/50	07:11 07:36-08:02/26 17:58	06:53 17:03-18:20/77 19:58	05:42 20:56	04:52 19:48-20:46/58 21:48
3	08:44 10:20-11:20/60 16:07	08:09 10:25-11:34/69 17:02 09:09-09:59/50	07:08 07:35-08:02/27 18:00	06:51 17:02-18:19/77 20:00	05:40 20:58	04:51 19:48-20:47/59 21:49
4	08:44 10:19-11:20/61 16:09	08:07 10:25-11:34/69 17:04 09:09-10:00/51	07:06 07:36-08:02/26 18:02	06:48 17:03-18:19/76 20:02	05:38 21:00	04:50 19:47-20:47/60 21:50
5	08:44 10:20-11:21/61 16:10	08:05 10:26-11:33/67 17:06 09:08-10:00/52	07:04 07:35-08:02/27 18:04	06:46 17:03-18:18/75 20:04	05:36 21:02	04:49 19:48-20:48/60 21:51
6	08:43 10:20-11:22/62 16:11	08:04 10:25-11:32/67 17:08 09:08-09:59/51	07:01 16:41-16:56/15 18:06 07:35-08:02/27	06:43 17:03-18:18/75 20:06	05:34 21:04	04:48 19:47-20:48/61 21:52
7	08:43 10:20-11:22/62 16:13	08:02 10:26-11:32/66 17:10 09:08-10:00/52	06:59 16:34-17:01/27 18:08 07:35-08:01/26	06:41 17:03-18:17/74 20:08	05:32 21:05	04:48 19:47-20:48/61 21:53
8	08:42 10:20-11:23/63 16:14	08:00 10:27-11:31/64 17:13 09:08-10:00/52	06:56 16:31-17:05/34 18:10 07:36-08:00/24	06:38 17:04-18:16/72 20:10	05:30 21:07	04:47 19:47-20:49/62 21:54
9	08:42 10:20-11:24/64 16:16	07:58 10:28-11:31/63 17:15 09:08-10:00/52	06:54 16:27-17:07/40 18:12 07:36-07:59/23	06:36 17:04-18:15/71 20:12	05:28 21:09	04:46 19:47-20:49/62 21:55
10	08:41 10:20-11:25/65 16:17	07:56 10:29-11:30/61 17:17 09:08-10:00/52	06:51 16:25-17:10/45 18:14 07:38-07:58/20	06:34 17:05-18:14/69 20:14	05:26 21:11	04:46 19:47-20:50/63 21:56
11	08:40 10:21-11:26/65 16:19	07:54 10:30-11:29/59 17:19 09:09-10:00/51	06:49 16:22-17:11/49 18:16 07:39-07:55/16	06:31 17:05-18:13/68 20:16	05:24 21:13	04:45 19:47-20:51/64 21:57
12	08:39 10:21-11:26/65 16:20	07:52 10:30-11:28/58 17:21 09:09-10:00/51	06:46 16:21-17:13/52 18:18 07:41-07:53/12	06:29 17:07-18:12/65 20:18	05:22 21:15	04:45 19:47-20:50/63 21:58
13	08:38 10:21-11:27/66 16:22	07:49 10:31-11:27/56 17:23 09:09-09:59/50	06:44 16:18-17:14/56 18:20	06:26 17:08-18:11/63 20:20	05:21 21:16	04:45 19:47-20:51/64 21:58
14	08:38 10:20-11:27/67 16:24	07:47 10:33-11:26/53 17:25 09:09-09:59/50	06:41 16:17-17:16/59 18:22 07:06-07:07/1	06:24 17:08-18:10/62 20:22	05:19 21:18	04:44 19:47-20:51/64 21:59
15	08:37 10:20-11:28/68 16:25	07:45 10:34-11:24/50 17:27 09:10-09:59/49	06:39 16:15-17:17/62 18:24 07:03-07:09/6	06:21 17:10-18:09/59 20:23 06:46-06:47/1	05:17 20:12-20:18/6 21:20	04:44 19:47-20:52/65 22:00
16	08:36 10:21-11:29/68 16:27	07:43 10:35-11:22/47 17:29 09:10-09:57/47	06:36 16:14-17:18/64 18:26 07:01-07:10/9	06:19 17:11-18:08/57 20:25 06:44-06:48/4	05:15 20:07-20:25/18 21:22	04:44 19:48-20:52/64 22:00
17	08:35 10:21-11:30/69 16:29	07:41 10:37-11:20/43 17:31 09:11-09:57/46	06:34 16:12-17:18/66 18:28 06:58-07:10/12	06:17 17:12-18:06/54 20:27 06:41-06:48/7	05:13 20:03-20:27/24 21:23	04:44 19:48-20:53/65 22:01
18	08:33 10:21-11:29/68 16:31	07:39 10:39-11:18/39 17:33 09:12-09:56/44	06:31 16:11-17:19/68 18:29 06:56-07:11/15	06:14 17:14-18:04/50 20:29 06:39-06:49/10	05:12 20:01-20:30/29 21:25	04:44 19:48-20:53/65 22:01
19	08:32 10:21-11:30/69 16:32	07:36 10:41-11:14/33 17:35 09:13-09:55/42	06:29 16:10-17:20/70 18:31 06:53-07:11/18	06:12 17:16-18:03/47 20:31 06:37-06:49/12	05:10 19:59-20:32/33 21:27	04:44 19:48-20:53/65 22:02
20	08:31 10:21-11:30/69 16:34	07:34 10:45-11:11/26 17:37 09:14-09:53/39	06:26 16:08-17:20/72 18:33 06:50-07:10/20	06:09 17:17-18:00/43 20:33 06:35-06:49/14	05:09 19:57-20:34/37 21:28	04:44 19:48-20:53/65 22:02
21	08:30 10:21-11:31/70 16:36	07:32 10:50-11:05/15 17:40 09:15-09:52/37	06:24 16:08-17:21/73 18:35 06:50-07:10/20	06:07 17:19-17:58/39 20:35 06:32-06:48/16	05:07 19:56-20:36/40 21:30	04:44 19:48-20:53/65 22:02
22	08:28 10:21-11:31/70 16:38	07:30 09:16-09:49/33 17:42	06:21 16:07-17:21/74 18:37 06:50-07:09/19	06:05 17:22-17:56/34 20:37 06:31-06:48/17	05:05 19:54-20:36/42 21:32	04:44 19:48-20:53/65 22:02
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24	08:26 10:22-11:32/70 16:42	07:25 09:21-09:45/24 17:46 07:51-07:55/4	06:16 16:05-17:21/76 18:41 06:51-07:06/15	06:00 17:30-17:50/20 20:41 06:32-06:46/14	05:03 19:53-20:39/46 21:35	04:45 19:49-20:54/65 22:03
25	08:24 10:21-11:32/71 16:44	07:23 09:24-09:41/17 17:48 09:11-09:51/40	06:14 16:05-17:22/77 18:43 06:53-07:05/12	05:58 17:38-17:40/2 20:43 06:34-06:45/11	05:01 19:52-20:40/48 21:36	04:45 19:49-20:54/65 22:03
26	08:23 10:22-11:33/71 16:46	07:20 07:46-07:59/13 17:50	06:11 16:04-17:21/77 18:45 06:56-07:00/4	05:56 06:35-06:42/7 20:45	05:00 19:52-20:41/49 21:38	04:45 19:50-20:54/64 22:03
27	08:21 10:22-11:33/71 16:48	07:18 07:43-08:00/17 17:52	06:09 16:04-17:22/78 18:47	05:53 20:46	04:59 19:50-20:41/51 21:39	04:46 19:50-20:54/64 22:03
28	08:19 10:22-11:33/71 16:50	07:16 07:41-08:01/20 17:54	06:06 16:03-17:21/78 18:49	05:51 20:48	04:57 19:50-20:42/52 21:41	04:46 19:50-20:55/65 22:02
29	08:18 10:22-11:33/71 16:52	09:09-09:55/46	07:04 17:03-18:21/78 19:51	05:49 20:50	04:56 19:49-20:43/54 21:42	04:47 19:50-20:54/64 22:02
30	08:16 10:23-11:33/70 16:54	09:09-09:56/47	07:01 17:03-18:21/78 19:53	05:47 20:52	04:55 19:49-20:44/55 21:44	04:48 19:51-20:54/63 22:02
31	08:14 10:23-11:33/70 16:56	09:09-09:57/48	06:58 17:03-18:21/78 19:55		04:54 19:48-20:44/56 21:45	
Potential sun hours	245	271	366	422	498	516
Sum of minutes with flicker	2636	2329	2066	1564	684	1892

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_enercon WTG: 6 - 06_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (17)
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

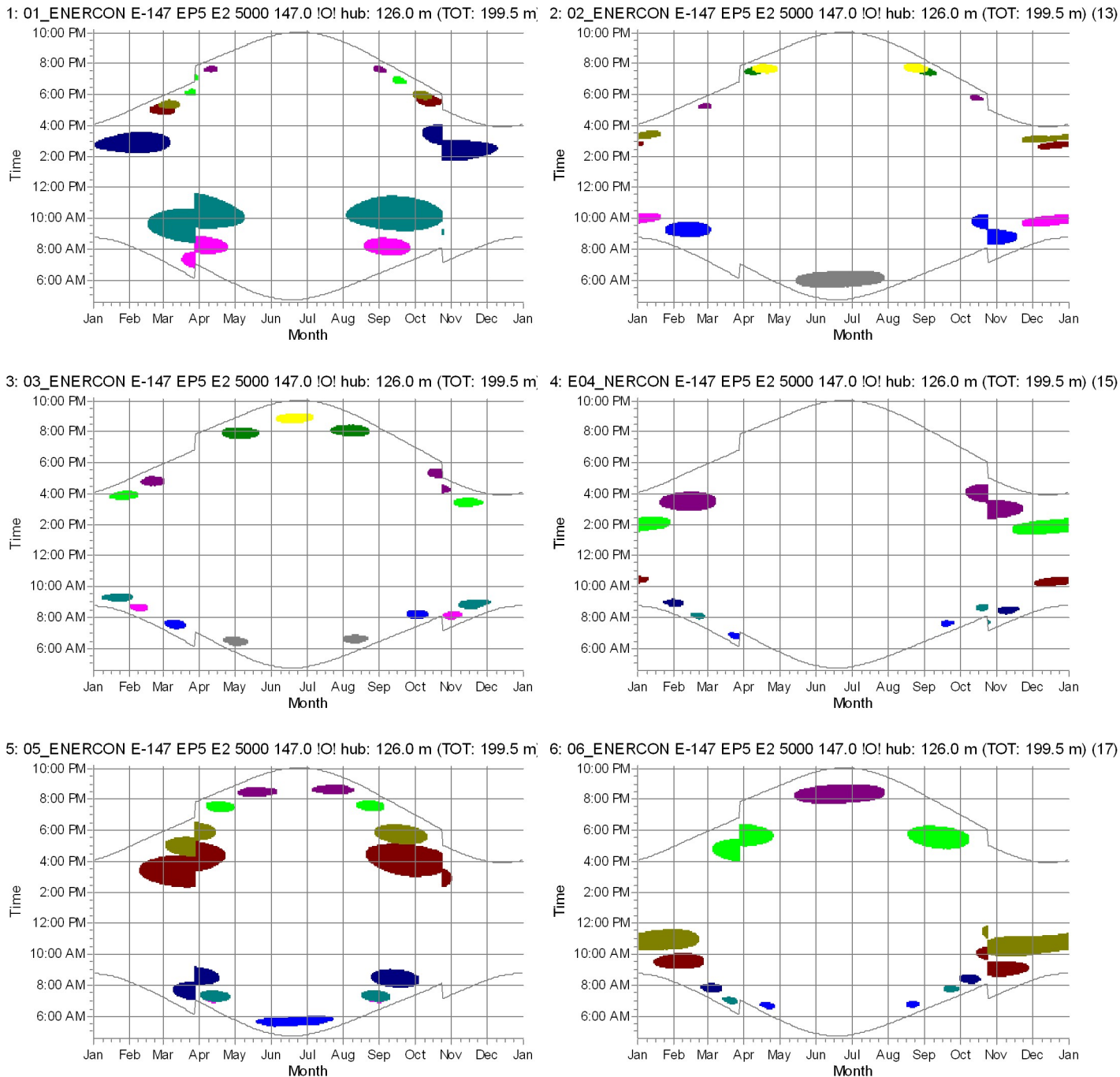
	July	August	September	October	November	December
1	04:48 19:51-20:55/64 22:02	05:30 21:25	06:27 17:05-18:13/68 20:16	07:22 16:59-17:53/54 19:00 08:22-08:30/8	07:22 09:58-11:00/62 16:47 08:38-09:30/52	08:19 10:03-11:08/65 16:01
2	04:49 19:51-20:54/63 22:01	05:32 21:23	06:28 17:03-18:12/69 20:13	07:24 17:00-17:51/51 18:57 08:18-08:33/15	07:24 09:57-11:00/63 16:45 08:38-09:30/52	08:21 10:03-11:07/64 16:00
3	04:50 19:52-20:54/62 22:01	05:33 21:21	06:30 17:02-18:13/71 20:11	07:26 17:02-17:49/47 18:55 08:16-08:35/19	07:26 09:56-11:01/65 16:43 08:37-09:30/53	08:23 10:04-11:07/63 15:59
4	04:51 19:52-20:55/63 22:00	05:35 21:19	06:32 17:01-18:13/72 20:08	07:28 17:04-17:46/42 18:52 08:15-08:36/21	07:28 09:56-11:01/65 16:41 08:37-09:29/52	08:24 10:05-11:08/63 15:58
5	04:52 19:53-20:55/62 22:00	05:37 21:17	06:34 17:00-18:14/74 20:06	07:29 17:07-17:43/36 18:50 08:13-08:37/24	07:30 09:56-11:03/67 16:39 08:38-09:30/52	08:26 10:05-11:07/62 15:58
6	04:53 19:53-20:55/62 21:59	05:39 21:15	06:36 16:59-18:13/74 20:03	07:31 17:10-17:40/30 18:47 08:12-08:37/25	07:32 09:56-11:03/67 16:37 08:38-09:30/52	08:27 10:06-11:08/62 15:57
7	04:54 19:54-20:55/61 21:58	05:41 21:13	06:38 16:58-18:13/75 20:01	07:33 17:14-17:35/21 18:45 08:12-08:38/26	07:35 09:55-11:03/68 16:35 08:38-09:29/51	08:28 10:06-11:08/62 15:57
8	04:55 19:54-20:54/60 21:57	05:42 21:11	06:39 16:57-18:13/76 19:58	07:35 08:11-08:38/27 18:42	07:37 09:55-11:04/69 16:33 08:38-09:29/51	08:30 10:07-11:08/61 15:56
9	04:56 19:55-20:54/59 21:57	05:44 21:09	06:41 16:57-18:13/76 19:56	07:37 08:11-08:38/27 18:40	07:39 09:54-11:04/70 16:31 08:39-09:29/50	08:31 10:08-11:08/60 15:56
10	04:57 19:55-20:54/59 21:56	05:46 21:07	06:43 16:55-18:12/77 19:53	07:39 08:11-08:37/26 18:37	07:41 09:55-11:05/70 16:29 08:40-09:29/49	08:32 10:08-11:08/60 15:55
11	04:58 19:56-20:54/58 21:55	05:48 21:04	06:45 16:55-18:12/77 19:51	07:41 08:11-08:37/26 18:35	07:43 09:55-11:05/70 16:28 08:40-09:28/48	08:33 10:09-11:09/60 15:55
12	04:59 19:56-20:53/57 21:54	05:50 21:02	06:47 16:54-18:12/78 19:48	07:43 08:11-08:36/25 18:33	07:45 09:55-11:05/70 16:26 08:41-09:28/47	08:35 10:10-11:09/59 15:55
13	05:01 19:57-20:53/56 21:53	05:51 21:00	06:49 16:54-18:12/78 19:46	07:45 08:13-08:35/22 18:30	07:46 09:54-11:05/71 16:24 08:41-09:27/46	08:36 10:10-11:09/59 15:55
14	05:02 19:57-20:52/55 21:52	05:53 20:58	06:50 16:54-18:12/78 19:43	07:47 08:15-08:34/19 18:28	07:48 09:54-11:05/71 16:23 08:42-09:27/45	08:37 10:11-11:09/58 15:55
15	05:03 19:59-20:52/53 21:51	05:55 20:56	06:52 16:53-18:11/78 19:40	07:49 08:17-08:33/16 18:25	07:50 09:55-11:06/71 16:21 08:44-09:27/43	08:38 10:12-11:09/57 15:55
16	05:05 19:59-20:51/52 21:49	05:57 20:54	06:54 16:53-18:10/77 19:38	07:51 10:00-10:09/9 18:23 08:19-08:31/12	07:52 09:55-11:06/71 16:19 08:45-09:26/41	08:39 10:12-11:10/58 15:55
17	05:06 20:00-20:50/50 21:48	05:59 06:42-06:50/8 20:51	06:56 16:52-18:10/78 19:35	07:53 09:55-10:14/19 18:21 08:21-08:28/7	07:54 09:55-11:06/71 16:18 08:45-09:25/40	08:39 10:13-11:10/57 15:55
18	05:07 20:01-20:50/49 21:47	06:01 17:41-17:50/9 20:49 06:39-06:51/12	06:58 16:53-18:09/76 19:33 07:41-07:51/10	07:54 09:51-10:17/26 18:18 08:23-08:24/1	07:56 09:56-11:06/70 16:16 08:46-09:25/39	08:40 10:14-11:11/57 15:55
19	05:09 20:02-20:49/47 21:46	06:03 17:34-17:56/22 20:47 06:38-06:52/14	07:00 16:53-18:09/76 19:30 07:39-07:53/14	07:56 09:49-10:20/31 18:16	07:58 09:56-11:06/70 16:15 08:47-09:24/37	08:41 10:14-11:11/57 15:55
20	05:10 20:03-20:48/45 21:44	06:04 17:30-17:59/29 20:44 06:37-06:53/16	07:01 16:52-18:07/75 19:28 07:38-07:54/16	07:58 09:47-10:21/34 18:13	08:00 09:56-11:06/70 16:13 08:49-09:23/34	08:42 10:14-11:11/57 15:56
21	05:12 20:04-20:48/44 21:43	06:06 17:26-18:01/35 20:42 06:35-06:53/18	07:03 16:52-18:06/74 19:25 07:36-07:54/18	08:00 11:19-11:38/19 18:11 09:45-10:23/38	08:02 09:56-11:06/70 16:12 08:50-09:22/32	08:42 10:14-11:11/57 15:56
22	05:13 20:05-20:46/41 21:41	06:08 17:24-18:03/39 20:40 06:37-06:53/16	07:05 16:52-18:06/74 19:23 07:35-07:55/20	08:02 11:14-11:42/28 18:09 09:44-10:24/40	08:04 09:57-11:06/69 16:10 08:52-09:21/29	08:43 10:15-11:12/57 15:57
23	05:15 20:07-20:45/38 21:40	06:10 17:21-18:05/44 20:37 06:39-06:53/14	07:07 16:53-18:05/72 19:20 07:34-07:55/21	08:04 11:11-11:45/34 18:07 09:42-10:25/43	08:06 09:57-11:06/69 16:09 08:53-09:20/27	08:43 10:15-11:12/57 15:57
24	05:17 20:08-20:43/35 21:38	06:12 17:19-18:07/48 20:35 06:41-06:53/12	07:09 16:53-18:04/71 19:18 07:36-07:54/18	08:06 11:08-11:48/40 18:04 09:41-10:26/45	08:07 09:58-11:07/69 16:08 08:55-09:18/23	08:44 10:17-11:13/56 15:58
25	05:18 20:11-20:42/31 21:37	06:14 17:16-18:07/51 20:33 06:42-06:52/10	07:11 16:54-18:03/69 19:15 07:38-07:54/16	07:08 10:07-10:51/44 17:02 08:41-09:27/46	08:09 09:58-11:07/69 16:07 08:57-09:17/20	08:44 10:17-11:14/57 15:58
26	05:20 20:12-20:40/28 21:35	06:15 17:15-18:09/54 20:30 06:44-06:51/7	07:13 16:55-18:02/67 19:12 07:40-07:53/13	07:10 10:05-10:53/48 17:00 08:40-09:28/48	08:11 09:59-11:07/68 16:06 09:00-09:14/14	08:44 10:17-11:14/57 15:59
27	05:21 20:15-20:37/22 21:33	06:17 17:13-18:10/57 20:28 06:46-06:50/4	07:14 16:54-17:59/65 19:10 07:42-07:52/10	07:12 10:03-10:54/51 16:58 08:40-09:28/48	08:13 10:00-11:07/67 16:04 09:04-09:11/7	08:45 10:17-11:15/58 16:00
28	05:23 20:19-20:33/14 21:32	06:19 17:11-18:11/60 20:25	07:16 16:55-17:58/63 19:07 07:43-07:50/7	07:14 10:02-10:55/53 16:56 08:39-09:28/49	08:14 10:00-11:07/67 16:03	08:45 10:17-11:15/58 16:01
29	05:25 21:30 21:30	06:21 17:09-18:11/62 20:23	07:18 16:56-17:56/60 19:05 07:45-07:48/3	07:16 10:00-10:56/56 16:53 08:38-09:29/51	08:16 10:01-11:07/66 16:02	08:45 10:18-11:16/58 16:02
30	05:26 21:28 21:28	06:23 17:08-18:11/63 20:21	07:20 16:57-17:55/58 19:02	07:18 09:59-10:57/58 16:51 08:38-09:29/51	08:18 10:02-11:07/65 16:02	08:45 10:18-11:17/59 16:03
31	05:28 21:26 21:26	06:25 17:06-18:12/66 20:18		07:20 09:59-10:59/60 16:49 08:38-09:30/52		08:45 10:19-11:18/59 16:04
Potential sun hours	517	463	383	327	255	228
Sum of minutes with flicker	1390	770	2342	1748	3136	1834

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_enercon

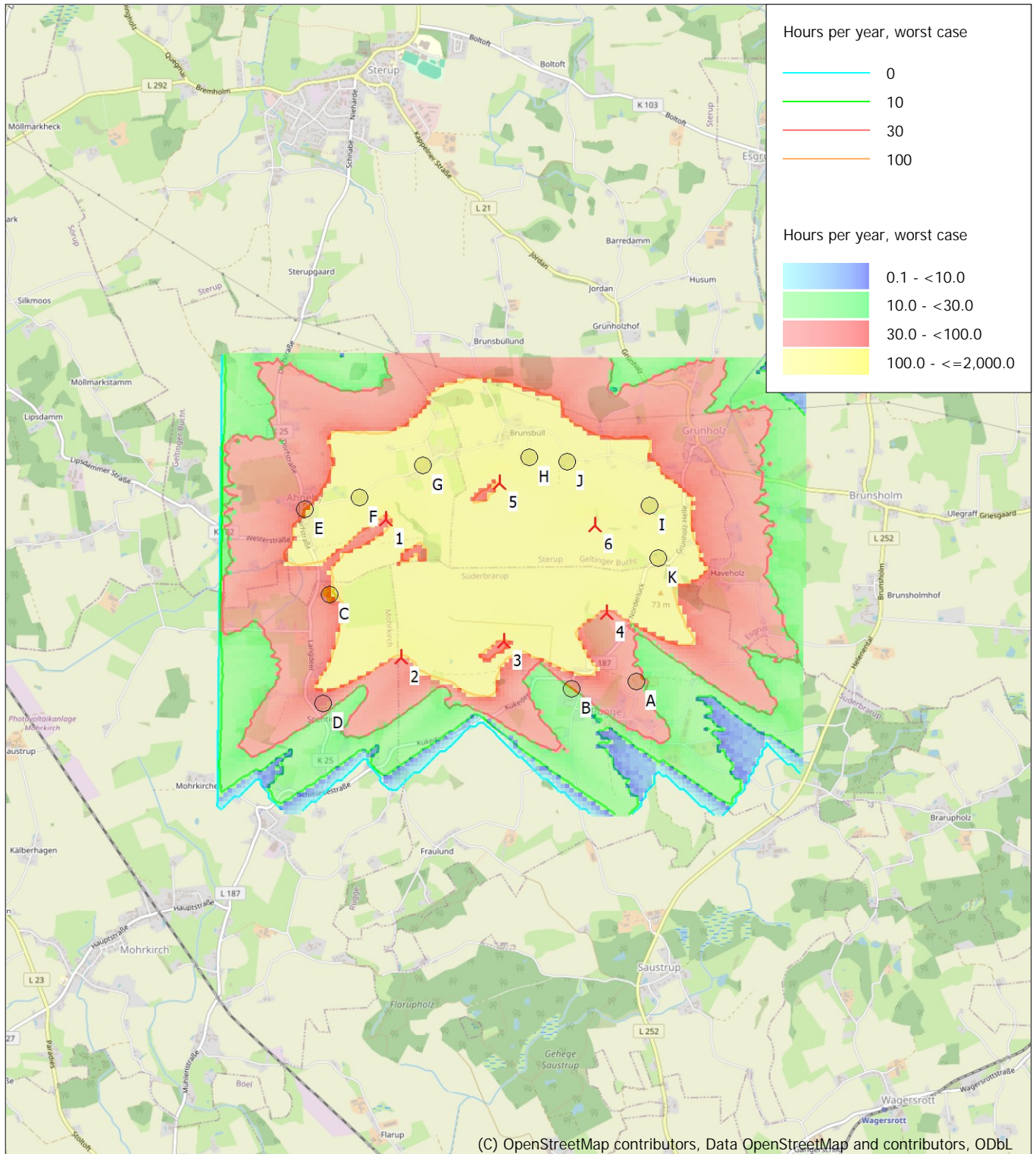


Shadow receptors

	A: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (1)		G: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (7)
	B: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (2)		H: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (8)
	C: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (3)		I: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (9)
	D: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (4)		J: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (10)
	E: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (5)		K: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (11)
	F: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 90.0° (6)		

SHADOW - Map

Calculation: Shadow_enercon



Map: EMD OpenStreetMap, Print scale 1:40,000, Map center UTM (north)-ETRS89 Zone: 32 East: 548,580 North: 6,061,260
 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