

Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

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Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 1 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (37)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April		May		June	
1	09:00	09:54-10:24/30	08:21	09:33-10:01/28	07:13	07:41-07:46/5	06:48	07:14-07:29/15	05:28		04:27	05:04-05:26/22
	15:39		16:40	10:02-10:46/44	17:46		19:55		21:01		22:03	
2	09:00	09:55-10:26/31	08:19	09:34-10:00/26	07:11	07:38-07:46/8	06:45	07:11-07:29/18	05:25		04:26	05:04-05:26/22
	15:41		16:42	10:03-10:46/43	17:48		19:57		21:04		22:04	
3	09:00	09:42-09:45/3	08:17	09:36-09:59/23	07:08	07:35-07:46/11	06:42	07:08-07:28/20	05:23		04:24	05:04-05:26/22
	15:42	09:55-10:27/32	16:45	10:04-10:46/42	17:50		19:59		21:06		22:06	
4	08:59	09:41-09:47/6	08:15	09:37-09:56/19	07:05	07:33-07:47/14	06:39	07:07-07:28/21	05:20		04:23	05:05-05:27/22
	15:43	09:56-10:28/32	16:47	10:04-10:45/41	17:53		20:02		21:08		22:07	
5	08:59	09:40-09:48/8	08:13	10:05-10:45/40	07:03	07:30-07:46/16	06:37	07:07-07:26/19	05:18		04:22	05:05-05:27/22
	15:45	09:56-10:29/33	16:49		17:55		20:04		21:10		22:08	
6	08:58	09:39-09:50/11	08:10	10:06-10:45/39	07:00	07:30-07:45/15	06:34	07:08-07:24/16	05:16		04:21	05:05-05:27/22
	15:46	09:57-10:30/33	16:52		17:57		20:06		21:12		22:10	
7	08:57	09:38-09:51/13	08:08	10:07-10:44/37	06:57	07:31-07:44/13	06:31	07:08-07:20/12	05:13	05:44-05:46/2	04:20	05:05-05:27/22
	15:48	09:57-10:31/34	16:54		18:00		20:08		21:14		22:11	
8	08:57	09:37-09:52/15	08:06	10:08-10:43/35	06:55	07:32-07:42/10	06:28	07:11-07:17/6	05:11	05:42-05:47/5	04:19	05:06-05:28/22
	15:50	09:58-10:32/34	16:56		18:02	17:31-17:32/1	20:10		21:17		22:12	
9	08:56	09:36-09:53/17	08:04	10:09-10:42/33	06:52	17:29-17:34/5	06:26		05:09	05:40-05:48/8	04:19	05:06-05:28/22
	15:51	09:58-10:33/35	16:59		18:04		20:13		21:19		22:13	
10	08:55	09:35-09:55/20	08:01	10:11-10:41/30	06:49	07:16-07:17/1	06:23		05:06	05:37-05:47/10	04:18	05:06-05:28/22
	15:53	09:59-10:35/36	17:01	16:23-16:27/4	18:06	17:29-17:36/7	20:15		21:21		22:14	
11	08:54	09:34-09:56/22	07:59	10:12-10:38/26	06:46	07:13-07:18/5	06:20		05:04	05:36-05:48/12	04:17	05:06-05:28/22
	15:55	10:00-10:36/36	17:04	16:21-16:30/9	18:09	17:29-17:40/11	20:17		21:23		22:15	
12	08:53	09:32-09:56/24	07:57	10:14-10:36/22 16:18-16:32/14	06:44	07:10-07:18/8	06:17	19:46-19:49/3	05:02	05:34-05:48/14	04:17	05:07-05:28/21
	15:57	10:00-10:36/36	17:06	08:27-08:31/4	18:11	17:29-17:42/13	20:19		21:25		22:16	
13	08:52	09:31-09:58/27	07:54	10:18-10:33/15 16:18-16:35/17	06:41	07:07-07:18/11	06:15	19:44-19:51/7	05:00	05:32-05:48/16	04:16	05:07-05:28/21
	15:59	10:02-10:38/36	17:08	08:24-08:32/8	18:13	17:29-17:44/15	20:21		21:27		22:17	
14	08:51	09:29-09:58/29	07:52	08:21-08:32/11	06:38	07:04-07:17/13	06:12	19:42-19:52/10	04:58	05:31-05:48/17	04:16	05:07-05:28/21
	16:00	10:01-10:38/37	17:11	16:16-16:38/22	18:15	17:30-17:46/16	20:24		21:29		22:18	
15	08:50	09:28-10:00/32	07:49	08:19-08:34/15	06:35	07:02-07:18/16	06:09	19:42-19:55/13	04:56	05:31-05:47/16	04:15	05:08-05:28/20
	16:02	10:02-10:40/38	17:13	16:16-16:39/23	18:17	17:31-17:48/17	20:26		21:31		22:19	
16	08:48	09:26-10:00/34	07:47	08:16-08:34/18	06:32	06:59-07:16/17	06:06	06:33-06:37/4	04:54	05:31-05:47/16	04:15	05:08-05:29/21
	16:04	10:01-10:40/39	17:15	16:15-16:40/25	18:20	17:36-17:50/14	20:28	19:41-19:57/16	21:33		22:19	
17	08:47	09:24-10:00/36	07:44	08:14-08:33/19	06:30	06:56-07:14/18	06:04	06:31-06:39/8	04:52	05:32-05:46/14	04:15	05:08-05:29/21
	16:06	10:01-10:41/40	17:18	16:14-16:40/26	18:22	17:37-17:53/16	20:30	19:41-19:59/18	21:35		22:20	
18	08:46	09:23-10:42/79	07:42	08:15-08:34/19	06:27	06:53-07:11/18	06:01	06:28-06:39/11	04:50	05:33-05:46/13	04:15	05:09-05:29/20
	16:09		17:20	16:14-16:40/26	18:24	17:37-17:55/18	20:33	19:40-20:00/20	21:38		22:20	
19	08:44	09:23-10:43/80	07:39	08:14-08:33/19	06:24	06:54-07:07/13	05:58	06:26-06:40/14	04:48	05:34-05:45/11	04:15	05:09-05:29/20
	16:11		17:23	16:14-16:40/26	18:26	17:38-17:57/19	20:35	19:40-20:00/20	21:39		22:21	
20	08:43	09:24-10:43/79	07:37	08:15-08:32/17	06:21	06:55-07:05/10	05:56	06:23-06:39/16	04:46	05:35-05:43/8	04:15	05:09-05:29/20
	16:13		17:25	16:14-16:40/26	18:29	17:39-17:59/20	20:37	19:40-19:59/19	21:41		22:21	
21	08:41	09:24-10:44/80	07:34	08:16-08:32/16	06:18	06:58-07:02/4	05:53	06:21-06:40/19	04:44	05:18-05:20/2	04:15	05:09-05:29/20
	16:15		17:27	16:15-16:40/25	18:31	17:42-18:01/19	20:39	19:40-19:58/18	21:43	05:39-05:40/1	22:21	
22	08:39	09:24-10:44/80	07:32	08:17-08:30/13	06:16	17:46-18:03/17	05:51	06:18-06:39/21	04:42	05:16-05:21/5	04:15	05:09-05:29/20
	16:17		17:30	16:15-16:39/24	18:33		20:41	19:42-19:57/15	21:45		22:22	
23	08:38	09:25-10:45/80	07:29	08:19-08:28/9	06:13	17:50-18:06/16	05:48	06:17-06:39/22	04:40	05:15-05:23/8	04:15	05:10-05:30/20
	16:19		17:32	16:15-16:38/23	18:35		20:44	19:42-19:55/13	21:47		22:22	
24	08:36	09:26-10:45/79	07:27	16:15-16:37/22	06:10	17:50-18:08/18	05:45	06:17-06:37/20	04:39	05:13-05:23/10	04:16	05:10-05:30/20
	16:22		17:34		18:37		20:46	19:44-19:54/10	21:49		22:22	
25	08:34	09:27-10:46/79	07:24	16:17-16:36/19	06:07	17:52-18:09/17	05:43	06:17-06:37/20	04:37	05:12-05:24/12	04:16	05:09-05:30/21
	16:24		17:37		18:40		20:48		21:51		22:22	
26	08:33	09:28-10:46/78	07:21	16:19-16:34/15	06:04	17:54-18:08/14	05:40	06:17-06:35/18	04:35	05:10-05:24/14	04:16	05:10-05:31/21
	16:26		17:39		18:42		20:50		21:53		22:22	
27	08:31	09:29-10:47/78	07:19	16:21-16:31/10	06:02	17:58-18:05/7	05:38	06:18-06:33/15	04:34	05:09-05:25/16	04:17	05:10-05:31/21
	16:28		17:41		18:44		20:52		21:54		22:21	
28	08:29	09:30-10:47/77	07:16	07:44-07:46/2	05:59	06:25-06:27/2	05:35	06:20-06:32/12	04:32	05:08-05:25/17	04:18	05:10-05:31/21
	16:31		17:44		18:46		20:55		21:56		22:21	
29	08:27	09:29-10:46/77			06:56	07:22-07:28/6	05:33	06:21-06:29/8	04:31	05:07-05:26/19	04:18	05:11-05:32/21
	16:33				19:48		20:57		21:58		22:21	
30	08:25	09:30-10:47/77			06:53	07:19-07:29/10	05:30		04:29	05:06-05:26/20	04:19	05:10-05:31/21
	16:35				19:51		20:59		21:59		22:20	
31	08:23	09:32-10:02/30			06:50	07:17-07:30/13			04:28	05:04-05:26/22		
	16:38	10:03-10:47/44			19:53				22:01			
Potential sun hours	227		262		365		429		515		539	
Sum of minutes with flicker	1986		1069		537		517		308		633	

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
Vilandes 3-6  
LV-1010 Riga  
0037167242411  
Baiba / baiba.ozolina@environment.lv  
Calculated:  
15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 1 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (37)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 05:11-05:32/21 22:20	05:09 05:45-05:58/13 21:35	06:15 20:17	07:18 07:48-07:57/9 18:53 18:08-18:22/14	07:27 09:39-10:09/30 16:32 15:54-15:56/2	08:33 09:16-09:38/22 15:37 09:42-10:17/35
2	04:21 05:11-05:32/21 22:19	05:11 05:47-05:58/11 21:33	06:17 20:15	07:21 07:50-07:56/6 18:51 18:07-18:19/12	07:30 09:38-10:11/33 16:30	08:35 09:18-09:38/20 15:36 09:42-10:18/36
3	04:22 05:11-05:33/22 22:19	05:13 05:48-05:57/9 21:31	06:19 20:12	07:23 07:53-07:56/3 18:48 18:07-18:16/9	07:32 09:38-10:13/35 16:27	08:36 09:20-09:38/18 15:35 09:43-10:18/35
4	04:23 05:11-05:33/22 22:18	05:15 05:50-05:57/7 21:29	06:21 07:09-07:14/5 20:09	07:25 18:06-18:13/7 18:45	07:34 09:36-10:13/37 16:25	08:38 09:22-09:37/15 15:34 09:43-10:17/34
5	04:24 05:11-05:33/22 22:17	05:17 05:52-05:56/4 21:26	06:23 07:06-07:17/11 20:06	07:27 08:11-08:17/6 18:42 18:07-18:11/4	07:37 09:36-10:15/39 16:23	08:40 09:24-09:37/13 15:33 09:43-10:16/33
6	04:25 05:11-05:34/23 22:17	05:19 05:54-05:55/1 21:24	06:25 07:04-07:20/16 20:03	07:29 08:08-08:19/11 18:39	07:39 09:11-09:15/4 16:20 09:35-10:15/40	08:41 09:25-09:36/11 15:33 09:43-10:16/33
7	04:26 05:12-05:34/22 22:16	05:22 21:22	06:28 07:02-07:21/19 20:01	07:31 08:06-08:20/14 18:37	07:41 09:08-09:27/19 16:18 09:35-10:16/41	08:43 09:27-09:35/8 15:32 09:43-10:16/33
8	04:27 05:12-05:34/22 22:15	05:24 21:19	06:30 07:01-07:22/21 19:58	07:34 08:06-08:21/15 18:34	07:44 09:05-09:29/24 16:16 09:34-10:16/42	08:45 09:29-09:35/6 15:31 09:44-10:16/32
9	04:29 05:12-05:34/22 22:14	05:26 21:17	06:32 07:02-07:22/20 19:55	07:36 08:06-08:21/15 18:31	07:46 09:04-09:31/27 16:14 09:34-10:17/43	08:46 09:30-09:34/4 15:31 09:45-10:15/30
10	04:30 05:11-05:34/23 22:13	05:28 21:15	06:34 07:04-07:22/18 19:52	07:38 08:08-08:21/13 18:29	07:48 09:04-09:33/29 16:12 09:34-10:18/44	08:47 09:32-09:33/1 15:30 09:44-10:15/31
11	04:31 05:12-05:35/23 22:11	05:30 21:12	06:36 07:06-07:22/16 19:50	07:40 08:11-08:21/10 18:26	07:51 09:02-10:18/76 16:10	08:49 09:45-10:15/30 15:30
12	04:33 05:12-05:34/22 22:10	05:32 21:10	06:38 07:08-07:21/13 19:47	07:42 08:13-08:20/7 18:23	07:53 09:02-10:18/76 16:08	08:50 09:45-10:15/30 15:29
13	04:34 05:13-05:34/21 22:09	05:34 21:07	06:40 07:10-07:20/10 19:44	07:44 08:15-08:19/4 18:20	07:55 09:01-10:18/77 16:06	08:51 09:46-10:14/28 15:29
14	04:36 05:15-05:35/20 22:08	05:36 06:29-06:38/9 21:05	06:42 07:12-07:19/7 19:41	07:47 16:56-17:01/5 18:18	07:57 09:01-10:19/78 16:04	08:52 09:47-10:14/27 15:29
15	04:37 05:16-05:34/18 22:06	05:39 06:27-06:39/12 21:02	06:44 07:14-07:17/3 19:38	07:49 16:53-17:06/13 18:15	08:00 09:01-10:18/77 16:02	08:53 09:47-10:15/28 15:29
16	04:39 05:18-05:35/17 22:05	05:41 06:25-06:41/16 21:00	06:47 18:48-18:54/6 19:35	07:51 16:50-17:07/17 18:12	08:02 09:01-10:19/78 16:00	08:54 09:48-10:14/26 15:29
17	04:41 05:19-05:34/15 22:03	05:43 06:24-06:42/18 20:57	06:49 18:43-18:56/13 19:33	07:53 16:48-17:08/20 18:10	08:04 09:01-10:19/78 15:58	08:55 09:48-10:14/26 15:29
18	04:42 05:21-05:34/13 22:02	05:45 06:24-06:43/19 20:55 19:54-19:56/2	06:51 18:40-18:57/17 19:30	07:56 08:53-08:57/4 18:07 16:47-17:09/22	08:06 09:00-10:19/79 15:56	08:56 09:49-10:13/24 15:29
19	04:44 05:22-05:33/11 22:00	05:47 06:23-06:44/21 20:52 19:50-20:00/10	06:53 18:37-18:56/19 19:27	07:58 08:49-09:00/11 18:04 16:46-17:10/24	08:08 09:00-10:19/79 15:54	08:57 09:48-10:14/26 15:29
20	04:46 05:24-05:33/9 21:58	05:49 06:23-06:44/21 20:49 19:47-20:01/14	06:55 18:36-18:53/17 19:24	08:00 08:48-09:02/14 18:02 16:45-17:10/25	08:11 08:59-10:19/80 15:53	08:58 09:49-10:14/25 15:30
21	04:48 05:25-05:31/6 21:57	05:51 06:24-06:44/20 20:47 19:46-20:02/16	06:57 18:33-18:50/17 19:21	08:02 08:46-09:03/17 17:59 16:45-17:10/25	08:13 09:00-10:19/79 15:51	08:58 09:50-10:15/25 15:30
22	04:49 05:27-05:31/4 21:55	05:53 06:26-06:44/18 20:44 19:45-20:03/18	06:59 18:29-18:48/19 19:19	08:05 08:46-09:04/18 17:57 16:44-17:10/26	08:15 09:00-10:19/79 15:49	08:59 09:50-10:15/25 15:30
23	04:51 05:29-05:30/1 21:53 05:47-05:52/5	05:56 06:28-06:44/16 20:42 19:44-20:03/19	07:01 07:40-07:49/9 19:16 18:25-18:45/20	08:07 08:45-09:04/19 17:54 16:44-17:10/26	08:17 08:59-10:19/80 15:48	09:00 09:50-10:15/25 15:31
24	04:53 05:45-05:54/9 21:51	05:58 06:30-06:43/13 20:39 19:43-20:03/20	07:03 07:38-07:50/12 19:13 18:22-18:42/20	08:09 08:44-09:03/19 17:52 16:44-17:10/26	08:19 09:00-10:19/79 15:46	09:00 09:51-10:16/25 15:31
25	04:55 05:44-05:55/11 21:50	06:00 06:32-06:43/11 20:36 19:43-20:03/20	07:06 07:37-07:51/14 19:10 18:20-18:39/19	07:11 07:44-08:04/20 16:49 15:45-16:10/25	08:21 09:02-09:38/36 15:45 09:39-10:19/40	09:00 09:52-10:17/25 15:32
26	04:57 05:43-05:56/13 21:48	06:02 06:34-06:41/7 20:34 19:43-20:01/18	07:08 07:37-07:56/19 19:07 18:19-18:36/17	07:14 07:46-08:03/17 16:47 15:44-16:09/25	08:23 09:05-09:38/33 15:43 09:39-10:18/39	09:01 09:52-10:18/26 15:33
27	04:59 05:43-05:57/14 21:46	06:04 06:36-06:40/4 20:31 19:43-19:58/15	07:10 07:39-07:57/18 19:05 18:18-18:33/15	07:16 07:49-08:03/14 16:44 15:45-16:09/24	08:25 09:07-09:39/32 15:42 09:41-10:19/38	09:01 09:52-10:19/27 15:34
28	05:01 05:41-05:57/16 21:44	06:06 19:43-19:56/13 20:28	07:12 07:42-07:58/16 19:02 18:13-18:30/17	07:18 09:52-09:57/5 15:46-16:06/20 16:42 07:51-08:02/11	08:27 09:09-09:38/29 15:41 09:41-10:18/37	09:01 09:53-10:20/27 15:35
29	05:03 05:41-05:58/17 21:42	06:08 19:43-19:53/10 20:25	07:14 07:44-07:58/14 18:59 18:10-18:27/17	07:21 09:47-10:03/16 15:47-16:04/17 16:39 07:54-08:01/7	08:29 09:11-09:38/27 15:40 09:42-10:18/36	09:01 09:54-10:21/27 15:36
30	05:05 05:41-05:58/17 21:40	06:11 19:44-19:51/7 20:23	07:16 07:46-07:58/12 18:56 18:09-18:25/16	07:23 09:43-10:06/23 15:48-16:01/13 16:37 07:56-07:59/3	08:31 09:13-09:38/25 15:38 09:42-10:18/36	09:01 09:53-10:22/29 15:37
31	05:07 05:43-05:58/15 21:37	06:13 19:45-19:48/3 20:20		07:25 09:42-10:08/26 16:34 15:51-15:59/8		09:01 09:54-10:23/29 15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	517	435	522	764	1992	1010

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
 Vilandes 3-6  
 LV-1010 Riga  
 0037167242411  
 Baiba / baiba.ozolina@environment.lv  
 Calculated:  
 15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 2 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (36)  
 Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April		May		June	
1	09:00	12:40-13:06/26	08:21	08:53-09:08/15	07:13	16:29-16:53/24	06:48	18:14-19:25/71	05:28	19:57-20:22/25	04:27	20:55-21:08/13
	15:39		16:40	15:50-16:03/13	17:46	16:58-17:16/18	19:55		21:01		22:03	
2	09:00	12:42-13:07/25	08:19	08:51-09:09/18	07:11	16:31-16:52/21	06:45	18:13-19:28/75	05:25	19:57-20:22/25	04:26	20:55-21:07/12
	15:41		16:42	15:49-16:06/17	17:48	16:57-17:18/21	19:57		21:03		22:04	
3	09:00	12:42-13:06/24	08:17	08:50-09:10/20	07:08	16:33-16:49/16	06:42	18:12-19:27/75	05:23	19:58-20:22/24	04:24	21:23-21:24/1
	15:42		16:45	15:49-16:09/20	17:50	16:57-17:20/23	19:59		21:06		22:05	20:56-21:06/10
4	08:59	12:43-13:06/23	08:15	08:49-09:09/20	07:05	16:57-17:22/25	06:39	19:01-19:25/24	05:20	19:58-20:22/24	04:23	21:21-21:25/4
	15:43		16:47	15:48-16:11/23	17:53	16:57-16:46/9	20:02	18:12-18:59/47	21:08		22:07	20:57-21:06/9
5	08:59	12:44-13:06/22	08:12	08:50-09:10/20	07:03	16:57-17:25/28	06:36	19:03-19:11/8	05:18	19:59-20:21/22	04:22	21:21-21:27/6
	15:45		16:49	15:48-16:14/26	17:55		20:04	19:15-19:22/7	21:10		22:08	20:59-21:05/6
6	08:58	12:44-13:06/22	08:10	08:51-09:10/19	07:00	16:58-17:28/30	06:34	18:12-18:59/47	05:16	19:59-20:19/20	04:21	21:20-21:28/8
	15:46		16:52	15:47-16:16/29	17:57		20:06		21:12		22:10	21:01-21:03/2
7	08:57	12:46-13:06/20	08:08	08:51-09:09/18	06:57	16:59-17:30/31	06:31	18:11-18:58/47	05:13	20:01-20:18/17	04:20	21:19-21:29/10
	15:48		16:54	15:47-16:19/32	17:59		20:08		21:14		22:11	
8	08:57	12:47-13:05/18	08:06	08:52-09:09/17	06:54	17:01-17:32/31	06:28	18:11-18:57/46	05:11	20:03-20:17/14	04:19	21:18-21:29/11
	15:50		16:56	15:46-16:22/36	18:02		20:10		21:17		22:12	
9	08:56	12:48-13:05/17	08:03	08:52-09:08/16	06:52	17:03-17:34/31	06:25	18:12-18:58/46	05:09	20:06-20:15/9	04:19	21:19-21:31/12
	15:51		16:59	15:47-16:25/38	18:04		20:13		21:19		22:13	
10	08:55	12:50-13:05/15	08:01	08:54-09:08/14	06:49	17:06-17:36/30	06:23	19:43-19:44/1	05:06		04:18	21:18-21:31/13
	15:53		17:01	15:46-16:27/41	18:06		20:15	18:12-18:56/44	21:21		22:14	
11	08:54	12:51-13:03/12	07:59	08:55-09:05/10	06:46	17:10-17:40/30	06:20	19:41-19:46/5	05:04		04:17	21:18-21:33/15
	15:55		17:04	15:47-16:30/43	18:08		20:17	18:12-18:55/43	21:23		22:15	
12	08:53	12:55-13:01/6	07:56	15:47-16:32/45	06:43	17:12-17:42/30	06:17	19:40-19:49/9	05:02		04:17	21:19-21:34/15
	15:57		17:06		18:11		20:19	18:13-18:55/42	21:25		22:16	
13	08:52		07:54	15:48-16:35/47	06:41	17:15-17:44/29	06:15	19:39-19:51/12	05:00		04:16	21:18-21:34/16
	15:59		17:08		18:13		20:21	18:14-18:53/39	21:27		22:17	
14	08:51		07:52	15:48-16:38/50	06:38	17:18-17:46/28	06:12	19:38-19:52/14	04:58		04:16	21:18-21:35/17
	16:00		17:11		18:15		20:24	18:14-18:52/38	21:29		22:18	
15	08:49		07:49	15:48-16:40/52	06:35	17:21-17:48/27	06:09	19:38-19:55/17	04:56	20:54-20:55/1	04:15	21:18-21:36/18
	16:02		17:13		18:17		20:26	18:16-18:51/35	21:31		22:18	
16	08:48		07:47	15:50-16:43/53	06:32	17:24-17:50/26	06:06	19:37-19:57/20	04:54	20:53-20:57/4	04:15	21:19-21:36/17
	16:04		17:15		18:20		20:28	18:16-18:49/33	21:33		22:19	
17	08:47		07:44	15:51-16:45/54	06:30	17:26-17:53/27	06:04	19:38-19:57/19	04:52	20:52-20:58/6	04:15	21:19-21:37/18
	16:06		17:18		18:22		20:30	18:19-18:48/29	21:35		22:20	
18	08:45		07:42	15:54-16:48/54	06:27	17:27-17:55/28	06:01	19:38-19:56/18	04:50	20:51-21:00/9	04:15	21:19-21:37/18
	16:08		17:20		18:24		20:32	18:20-18:45/25	21:37		22:20	
19	08:44		07:39	15:56-16:51/55	06:24	17:29-17:57/28	05:58	19:38-19:54/16	04:48	20:51-21:02/11	04:15	21:19-21:38/19
	16:11		17:22		18:26		20:35	18:22-18:42/20	21:39		22:21	
20	08:43		07:37	16:00-16:53/53	06:21	17:33-17:59/26	05:56	19:39-19:53/14	04:46	20:51-21:03/12	04:15	21:19-21:38/19
	16:13		17:25		18:29		20:37	18:26-18:38/12	21:41		22:21	
21	08:41		07:34	16:04-16:55/51	06:18	17:33-18:01/28	05:53	20:05-20:07/2	04:44	20:50-21:05/15	04:15	21:19-21:38/19
	16:15		17:27		18:31		20:39	19:40-19:51/11	21:43		22:21	
22	08:39		07:32	16:09-16:56/47	06:16	17:29-18:03/34	05:50	20:03-20:09/6	04:42	20:51-21:07/16	04:15	21:19-21:38/19
	16:17		17:30		18:33		20:41	19:44-19:48/4	21:45		22:21	
23	08:38		07:29	16:13-16:56/43	06:13	17:26-18:06/40	05:48	20:01-20:11/10	04:40	20:50-21:08/18	04:15	21:19-21:38/19
	16:19		17:32		18:35		20:44		21:47		22:22	
24	08:36		07:27	16:14-16:56/42	06:10	17:24-18:08/44	05:45	20:00-20:13/13	04:39	20:51-21:10/19	04:16	21:20-21:39/19
	16:21		17:34		18:37		20:46		21:49		22:22	
25	08:34		07:24	16:15-16:56/41	06:07	17:22-18:10/48	05:43	20:00-20:16/16	04:37	20:52-21:10/18	04:16	21:20-21:38/18
	16:24		17:36	17:01-17:06/5	18:40		20:48		21:51		22:22	
26	08:32		07:21	16:16-16:56/40	06:04	17:20-18:12/52	05:40	19:58-20:17/19	04:35	20:51-21:09/18	04:16	21:21-21:39/18
	16:26		17:39	17:00-17:08/8	18:42		20:50		21:53		22:21	
27	08:31		07:19	16:18-16:55/37	06:02	17:18-18:14/56	05:38	19:58-20:20/22	04:34	20:52-21:09/17	04:17	21:20-21:38/18
	16:28		17:41	16:58-17:10/12	18:44		20:52		21:54		22:21	
28	08:29	09:03-09:04/1	07:16	16:20-16:54/34	05:59	17:17-18:17/60	05:35	19:57-20:21/24	04:32	20:53-21:09/16	04:18	21:21-21:38/17
	16:31		17:43	16:57-17:13/16	18:46		20:55		21:56		22:21	
29	08:27	09:00-09:05/5			06:56	18:16-19:19/63	05:33	19:57-20:23/26	04:31	20:52-21:08/16	04:18	21:21-21:37/16
	16:33	15:53-15:55/2			19:48		20:57		21:58		22:21	
30	08:25	08:58-09:06/8			06:53	18:15-19:21/66	05:30	19:57-20:23/26	04:29	20:53-21:08/15	04:19	21:22-21:37/15
	16:35	15:52-15:58/6			19:51		20:59		21:59		22:20	
31	08:23	08:56-09:08/12			06:50	18:14-19:23/69			04:28	20:54-21:08/14		
	16:38	15:51-16:01/10			19:53				22:01			
Potential sun hours	227		262		365		429		515		539	
Sum of minutes with flicker	274		1344		1177		1225		405		467	

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 2 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (36)  
 Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
 0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 21:22-21:37/15	05:09	06:15 19:40-19:45/5	07:18 17:53-18:22/29	07:27 08:22-08:36/14	08:33 12:34-12:45/11
	22:20	21:35	20:17 18:11-18:54/43	18:53	16:32 15:16-15:56/40	15:37
2	04:21 21:23-21:37/14	05:11	06:17 19:41-19:42/1	07:20 17:49-18:19/30	07:30 08:22-08:38/16	08:35 12:32-12:47/15
	22:19	21:33	20:14 18:10-18:54/44	18:50	16:30 15:16-15:54/38	15:36
3	04:22 21:24-21:37/13	05:13 20:20-20:22/2	06:19 18:10-18:56/46	07:23 17:46-18:16/30	07:32 08:21-08:39/18	08:36 12:32-12:48/16
	22:19	21:31	20:12	18:48	16:27 15:16-15:51/35	15:35
4	04:23 21:25-21:36/11	05:15 20:15-20:26/11	06:21 18:09-18:56/47	07:25 17:43-18:13/30	07:34 08:20-08:39/19	08:38 12:31-12:49/18
	22:18	21:29	20:09	18:45	16:25 15:16-15:49/33	15:34
5	04:24 21:25-21:35/10	05:17 20:12-20:28/16	06:23 18:08-18:55/47	07:27 17:39-18:11/32	07:37 08:20-08:40/20	08:40 12:31-12:51/20
	22:17	21:26	20:06	18:42	16:23 15:16-15:46/30	15:33
6	04:25 21:26-21:35/9	05:19 20:11-20:29/18	06:25 18:08-18:55/47	07:29 17:37-18:07/30	07:39 08:20-08:40/20	08:41 12:31-12:52/21
	22:16	21:24	20:03	18:39	16:20 15:17-15:44/27	15:33
7	04:26 21:27-21:34/7	05:21 20:09-20:30/21	06:27 18:59-19:07/8 18:07-18:55/48	07:31 17:34-18:04/30	07:41 08:20-08:40/20	08:43 12:31-12:53/22
	22:16	21:22	20:01 19:11-19:18/7	18:37	16:18 15:18-15:42/24	15:32
8	04:27 21:28-21:33/5	05:24 20:08-20:31/23	06:30 18:56-19:20/24	07:33 17:33-18:01/28	07:44 08:20-08:39/19	08:44 12:31-12:54/23
	22:15	21:19	19:58 18:07-18:55/48	18:34	16:16 15:19-15:39/20	15:31
9	04:29 21:30-21:32/2	05:26 20:08-20:31/23	06:32 18:07-19:21/74	07:36 17:32-17:59/27	07:46 08:22-08:40/18	08:46 12:30-12:54/24
	22:14	21:17	19:55	18:31	16:14 15:20-15:37/17	15:31
10	04:30 21:03-21:14/11	05:28 20:07-20:32/25	06:34 18:06-19:21/75	07:38 17:10-17:22/12	07:48 08:25-08:40/15	08:47 12:31-12:56/25
	22:13	21:15	19:52	18:28	16:12 15:21-15:34/13	15:30
11	04:31 21:02-21:15/13	05:30 20:06-20:32/26	06:36 18:06-19:19/73	07:40 17:06-17:24/18	07:50 08:27-08:39/12	08:49 12:30-12:56/26
	22:11	21:12	19:49	18:26	16:10 15:22-15:32/10	15:30
12	04:33 21:03-21:16/13	05:32 20:05-20:31/26	06:38 18:06-19:16/70	07:42 17:04-17:25/21	07:53 08:30-08:38/8	08:50 12:31-12:57/26
	22:10	21:10	19:47	18:23	16:08 15:24-15:30/6	15:29
13	04:34 21:02-21:17/15	05:34 20:05-20:31/26	06:40 18:06-19:13/67	07:44 16:57-17:27/30	07:55 08:32-08:37/5	08:51 12:31-12:57/26
	22:09	21:07	19:44	18:20	16:06 15:25-15:27/2	15:29
14	04:36 21:01-21:17/16	05:36 20:05-20:30/25	06:42 18:06-19:10/64	07:47 16:52-17:27/35	07:57 08:35-08:36/1	08:52 12:31-12:58/27
	22:08	21:05	19:41	18:18	16:04	15:29
15	04:37 21:01-21:18/17	05:38 20:05-20:28/23	06:44 18:07-19:07/60	07:49 16:50-17:27/37	07:59	08:53 12:31-12:58/27
	22:06	21:02	19:38	18:15	16:02	15:29
16	04:39 21:01-21:18/17	05:41 20:05-20:26/21	06:46 18:07-19:04/57	07:51 16:48-17:28/40	08:02	08:54 12:33-13:00/27
	22:05	21:00	19:35	18:12	16:00	15:29
17	04:41 21:01-21:19/18	05:43 20:05-20:23/18	06:49 18:08-19:01/53	07:53 16:46-17:27/41	08:04	08:55 12:32-12:59/27
	22:03	20:57	19:33	18:10	15:58	15:29
18	04:42 21:00-21:19/19	05:45 20:05-20:21/16	06:51 18:09-18:58/49	07:56 16:46-17:28/42	08:06	08:56 12:32-13:00/28
	22:02	20:55	19:30	18:07	15:56	15:29
19	04:44 21:01-21:19/18	05:47 20:06-20:19/13	06:53 18:10-18:56/46	07:58 16:43-17:27/44	08:08	08:57 12:33-13:01/28
	22:00	20:52	19:27	18:04	15:54	15:29
20	04:46 21:00-21:19/19	05:49 20:07-20:16/9	06:55 18:11-18:53/42	08:00 16:38-17:26/48	08:11	08:58 12:34-13:02/28
	21:58	20:49	19:24	18:02	15:53	15:30
21	04:48 21:01-21:18/17	05:51 20:08-20:14/6	06:57 18:13-18:50/37	08:02 16:34-17:26/52	08:13	08:58 12:34-13:02/28
	21:57	20:47 19:48-19:54/6	19:21	17:59	15:51	15:30
22	04:49 21:01-21:16/15	05:53 19:45-19:56/11	06:59 18:17-18:47/30	08:05 16:29-17:22/53	08:15	08:59 12:35-13:03/28
	21:55	20:44	19:19	17:57	15:49	15:30
23	04:51 21:01-21:14/13	05:56 19:43-19:57/14	07:01 18:19-18:45/26	08:07 16:25-17:20/55	08:17	08:59 12:35-13:03/28
	21:53	20:42 18:29-18:43/14	19:16	17:54	15:48	15:31
24	04:53 21:01-21:13/12	05:58 19:42-19:58/16	07:03 18:14-18:42/28	08:09 16:22-17:17/55	08:19	09:00 12:36-13:04/28
	21:51	20:39 18:25-18:46/21	19:13	17:52	15:46	15:31
25	04:55 21:02-21:12/10	06:00 19:41-19:58/17	07:05 18:10-18:39/29	07:11 15:21-16:15/54	08:21	09:00 12:36-13:04/28
	21:49	20:36 18:22-18:48/26	19:10	16:49	15:45	15:32
26	04:57 21:02-21:10/8	06:02 19:40-19:59/19	07:08 18:08-18:36/28	07:14 15:19-16:12/53	08:23	09:00 12:37-13:04/27
	21:47	20:34 18:20-18:50/30	19:07	16:46	15:43	15:33
27	04:59 21:02-21:08/6	06:04 19:39-19:58/19	07:10 18:06-18:33/27	07:16 15:19-16:10/51	08:25	09:01 12:37-13:05/28
	21:46	20:31 18:18-18:51/33	19:04	16:44	15:42	15:34
28	05:01 21:03-21:06/3	06:06 19:39-19:56/17	07:12 18:04-18:30/26	07:18 15:17-16:06/49	08:27	09:01 12:38-13:05/27
	21:44	20:28 18:16-18:52/36	19:02	16:42	15:41	15:35
29	05:03	06:08 19:39-19:53/14	07:14 17:59-18:27/28	07:20 15:17-16:04/47	08:29	09:01 12:39-13:06/27
	21:41	20:25 18:15-18:53/38	18:59	16:39	15:39	15:36
30	05:05	06:10 19:39-19:50/11	07:16 17:57-18:25/28	07:23 08:27-08:32/5	08:31 12:36-12:42/6	09:01 12:39-13:05/26
	21:39	20:23 18:13-18:53/40	18:56	16:37 15:16-16:01/45	15:38	15:37
31	05:07	06:13 19:39-19:48/9		07:25 08:24-08:35/11		09:01 12:40-13:06/26
	21:37	20:20 18:12-18:54/42		16:34 15:16-15:59/43		15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	369	781	1432	1330	506	766

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 3 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (33)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June
1	09:00 09:44-10:09/25 14:25-14:47/22 15:39 10:11-10:35/24	08:21 16:40	07:13 16:55-17:05/10 17:46	06:48 19:55	05:28 20:10-20:28/18 21:01	04:27 22:03
2	09:00 09:45-10:09/24 14:26-14:49/23 15:41 10:12-10:36/24	08:19 16:42	07:11 17:48	06:45 19:57	05:25 20:09-20:28/19 21:03	04:26 22:04
3	09:00 09:45-10:10/25 14:26-14:49/23 15:42 10:12-10:36/24	08:17 16:45	07:08 17:50	06:42 19:59	05:23 20:10-20:28/18 21:06	04:24 22:05
4	08:59 09:45-10:10/25 14:26-14:49/23 15:43 10:13-10:36/23	08:15 16:47	07:05 17:53	06:39 20:02	05:20 20:10-20:27/17 21:08	04:23 22:07
5	08:59 09:46-10:10/24 14:27-14:49/22 15:45 10:13-10:36/23	08:12 16:49	07:03 17:55	06:37 19:30-19:33/3 20:04	05:18 20:11-20:27/16 21:10	04:22 22:08
6	08:58 09:46-10:10/24 14:27-14:50/23 15:46 10:14-10:36/22	08:10 16:52	07:00 17:57	06:34 19:30-19:36/6 20:06	05:16 20:11-20:25/14 21:12	04:21 22:10
7	08:57 09:47-10:10/23 14:27-14:50/23 15:48 10:14-10:37/23	08:08 16:54	06:57 17:59	06:31 06:57-07:01/4 20:08 19:29-19:38/9	05:13 20:13-20:23/10 21:14	04:20 22:11
8	08:57 09:48-10:10/22 14:28-14:51/23 15:50 10:15-10:37/22	08:06 16:56	06:54 18:02	06:28 06:55-07:02/7 20:10 19:28-19:40/12	05:11 20:15-20:21/6 21:17	04:19 22:12
9	08:56 09:48-10:11/23 14:29-14:51/22 15:51 10:16-10:37/21	08:04 16:59	06:52 18:04	06:26 06:52-07:02/10 20:13 19:29-19:43/14	05:09 21:19	04:19 22:13
10	08:55 09:49-10:11/22 14:29-14:52/23 15:53 10:17-10:37/20	08:01 16:24-16:27/3 17:01	06:49 17:30-17:36/6 18:06	06:23 06:49-07:02/13 20:15 19:29-19:44/15	05:06 21:21	04:18 22:14
11	08:54 09:51-10:11/20 14:29-14:51/22 15:55 10:19-10:37/18	07:59 16:24-16:30/6 17:04	06:46 17:28-17:40/12 18:09	06:20 06:47-07:02/15 20:17 19:29-19:45/16	05:04 21:23	04:17 22:15
12	08:53 09:51-10:10/19 14:30-14:52/22 15:57 10:19-10:37/18	07:57 16:23-16:32/9 17:06	06:43 17:27-17:42/15 18:11	06:17 06:44-07:01/17 20:19 19:31-19:44/13	05:02 21:25	04:17 22:16
13	08:52 09:52-10:10/18 14:31-14:53/22 15:59 10:21-10:37/16	07:54 16:24-16:35/11 17:08	06:41 17:25-17:44/19 18:13	06:15 06:41-07:00/19 20:21 19:34-19:42/8	05:00 21:27	04:16 22:17
14	08:51 09:53-10:08/15 14:31-14:52/21 16:01 10:21-10:35/14	07:52 16:23-16:38/15 17:11	06:38 17:24-17:46/22 18:15	06:12 06:40-07:01/21 20:24	04:58 21:29	04:16 22:18
15	08:49 09:55-10:07/12 14:32-14:52/20 16:02 10:24-10:35/11	07:49 16:24-16:40/16 17:13	06:35 17:23-17:47/24 18:17	06:09 06:39-07:00/21 20:26	04:56 21:31	04:15 22:18
16	08:48 09:58-10:01/3 14:33-14:52/19 16:04 10:25-10:33/8	07:47 16:25-16:43/18 17:15	06:32 17:23-17:47/24 18:20	06:06 06:38-06:59/21 20:28	04:54 21:33	04:15 22:19
17	08:47 14:34-14:52/18 16:06	07:44 16:26-16:45/19 17:18	06:30 17:23-17:47/24 18:22	06:04 06:39-06:59/20 20:30	04:52 21:35	04:15 22:20
18	08:45 14:35-14:51/16 16:09	07:42 16:27-16:48/21 17:20	06:27 06:53-06:54/1 18:24 17:23-17:46/23	06:01 06:39-06:58/19 20:32	04:50 21:37	04:15 22:20
19	08:44 14:37-14:51/14 16:11	07:39 16:28-16:51/23 17:23	06:24 06:50-06:55/5 18:26 17:23-17:45/22	05:58 06:40-06:57/17 20:35	04:48 21:39	04:15 22:21
20	08:43 14:38-14:50/12 16:13	07:37 16:29-16:53/24 17:25	06:21 06:47-06:55/8 18:29 17:23-17:44/21	05:56 06:41-06:55/14 20:37	04:46 21:41	04:15 22:21
21	08:41 14:41-14:48/7 16:15	07:34 16:32-16:55/23 17:27	06:18 06:45-06:56/11 18:31 17:24-17:43/19	05:53 06:43-06:53/10 20:39	04:44 21:43	04:15 22:21
22	08:39 16:17	07:32 16:36-16:58/22 17:30	06:16 06:42-06:56/14 18:33 17:26-17:42/16	05:51 20:41	04:42 21:45	04:15 22:21
23	08:38 16:19	07:29 16:40-17:01/21 17:32	06:13 06:39-06:55/16 18:35 17:27-17:39/12	05:48 20:44	04:40 21:47	04:15 22:22
24	08:36 16:22	07:27 16:43-17:03/20 17:34	06:10 06:37-06:54/17 18:37	05:45 20:46	04:39 21:49	04:16 22:22
25	08:34 16:24	07:24 16:44-17:06/22 17:37	06:07 06:37-06:53/16 18:40	05:43 20:15-20:16/1 20:48	04:37 21:51	04:16 22:22
26	08:33 16:26	07:21 16:46-17:08/22 17:39	06:04 06:38-06:52/14 18:42	05:40 20:12-20:17/5 20:50	04:35 21:53	04:17 22:22
27	08:31 16:28	07:19 16:48-17:07/19 17:41	06:02 06:39-06:49/10 18:44	05:38 20:12-20:20/8 20:52	04:34 21:54	04:17 22:21
28	08:29 16:31	07:16 16:52-17:06/14 17:43	05:59 06:42-06:45/3 18:46	05:35 20:10-20:21/11 20:55	04:32 21:56	04:18 22:21
29	08:27 16:33		06:56 19:48	05:33 20:10-20:24/14 20:57	04:31 21:58	04:18 22:21
30	08:25 16:35		06:53 19:51	05:30 20:10-20:26/16 20:59	04:29 21:59	04:19 22:20
31	08:23 16:38		06:50 19:53		04:28 22:01	
Potential sun hours	227	262	365	429	515	539
Sum of minutes with flicker	1055	328	384	379	118	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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
 Vilandes 3-6  
 LV-1010 Riga  
 0037167242411  
 Baiba / baiba.ozolina@environment.lv  
 Calculated:  
 15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 3 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (33)  
 Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
 0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 21:35	06:15 06:46-07:01/15 20:17 19:28-19:44/16	07:18 18:05-18:22/17 18:53	07:27 15:53-15:56/3 16:32	08:33 09:33-09:53/20 14:11-14:33/22 15:37 10:00-10:18/18
2	04:21 22:19	05:11 21:33	06:17 06:48-07:01/13 20:15 19:27-19:42/15	07:21 18:06-18:19/13 18:51	07:30 16:30	08:35 09:33-09:54/21 14:11-14:34/23 15:36 10:00-10:20/20
3	04:22 22:19	05:13 21:31	06:19 06:50-07:00/10 20:12 19:26-19:40/14	07:23 18:07-18:16/9 18:48	07:32 16:27	08:36 09:33-09:55/22 14:12-14:34/22 15:35 10:00-10:21/21
4	04:23 22:18	05:15 21:29	06:21 06:52-06:59/7 20:09 19:26-19:37/11	07:25 18:09-18:13/4 18:45	07:34 16:25	08:38 09:33-09:56/23 14:12-14:35/23 15:34 10:00-10:22/22
5	04:24 22:17	05:17 20:24-20:32/8 21:26	06:23 06:54-06:58/4 20:06 19:26-19:35/9	07:27 18:42	07:37 16:23	08:40 09:33-09:56/23 14:12-14:35/23 15:33 10:00-10:22/22
6	04:25 22:17	05:19 20:23-20:34/11 21:24	06:25 06:56-06:57/1 20:03 19:26-19:32/6	07:29 18:39	07:39 16:20	08:41 09:32-09:56/24 14:13-14:36/23 15:33 10:00-10:22/22
7	04:26 22:16	05:22 20:21-20:35/14 21:22	06:28 19:26-19:30/4 20:01	07:31 18:37	07:41 16:18	08:43 09:33-09:57/24 14:14-14:36/22 15:32 10:00-10:23/23
8	04:27 22:15	05:24 20:20-20:36/16 21:19	06:30 19:58	07:33 18:34	07:44 16:16	08:45 09:34-09:58/24 14:14-14:37/23 15:31 10:01-10:24/23
9	04:29 22:14	05:26 20:20-20:37/17 21:17	06:32 19:55	07:36 18:31	07:46 16:14	08:46 09:33-09:58/25 14:14-14:37/23 15:31 10:01-10:24/23
10	04:30 22:13	05:28 20:19-20:37/18 21:15	06:34 19:52	07:38 18:29	07:48 16:12	08:47 09:34-09:59/25 14:15-14:38/23 15:30 10:01-10:25/24
11	04:31 22:11	05:30 20:19-20:37/18 21:12	06:36 19:50	07:40 18:26	07:50 16:10	08:49 09:35-10:00/25 14:15-14:38/23 15:30 10:01-10:25/24
12	04:33 22:10	05:32 20:19-20:36/17 21:10	06:38 19:47	07:42 17:30-17:35/5 18:23	07:53 16:08	08:50 09:35-10:00/25 14:16-14:38/22 15:29 10:02-10:26/24
13	04:34 22:09	05:34 20:18-20:33/15 21:07	06:40 19:44	07:44 17:27-17:39/12 18:20	07:55 16:06	08:51 09:36-10:00/24 14:17-14:39/22 15:29 10:02-10:26/24
14	04:36 22:08	05:36 20:18-20:30/12 21:05	06:42 19:41	07:47 17:24-17:39/15 18:18	07:57 16:04	08:52 09:38-10:00/22 14:17-14:39/22 15:29 10:02-10:27/25
15	04:37 22:06	05:39 20:18-20:28/10 21:02	06:44 19:38	07:49 17:20-17:40/20 18:15	08:00 16:02	08:53 09:39-10:01/22 14:17-14:39/22 15:29 10:04-10:28/24
16	04:39 22:05	05:41 20:18-20:26/8 21:00	06:47 07:28-07:37/9 19:35	07:51 17:17-17:39/22 18:12	08:02 16:00	08:54 09:40-10:02/22 14:19-14:40/21 15:29 10:04-10:28/24
17	04:41 22:03	05:43 20:19-20:23/4 20:57	06:49 07:26-07:39/13 19:33	07:53 17:15-17:36/21 18:10	08:04 15:58	08:55 09:41-10:02/21 14:18-14:40/22 15:29 10:04-10:29/25
18	04:42 22:02	05:45 20:55	06:51 07:24-07:40/16 19:30	07:56 17:14-17:34/20 18:07	08:06 15:56	08:56 09:42-10:03/21 14:19-14:40/21 15:29 10:04-10:28/24
19	04:44 22:00	05:47 20:52	06:53 07:24-07:42/18 19:27	07:58 17:09-17:31/22 18:04	08:08 15:54	08:57 09:42-10:03/21 14:20-14:41/21 15:29 10:05-10:29/24
20	04:46 21:58	05:49 20:49	06:55 07:25-07:42/17 19:24 18:14-18:24/10	08:00 17:05-17:28/23 18:02	08:11 15:53	08:58 09:43-10:03/20 14:20-14:42/22 15:30 10:05-10:30/25
21	04:48 21:57	05:51 06:51-06:55/4 20:47	06:57 07:27-07:42/15 19:21 18:11-18:26/15	08:02 17:02-17:26/24 17:59	08:13 14:16-14:23/7 15:51	08:58 09:44-10:04/20 14:20-14:41/21 15:30 10:06-10:31/25
22	04:50 21:55	05:53 06:47-06:58/11 20:44	06:59 07:29-07:41/12 19:19 18:10-18:28/18	08:05 16:59-17:22/23 17:57	08:15 14:14-14:26/12 15:49	08:59 09:44-10:04/20 14:21-14:42/21 15:30 10:06-10:31/25
23	04:51 21:53	05:56 06:45-07:00/15 20:42	07:01 07:31-07:40/9 19:16 18:08-18:29/21	08:07 16:58-17:20/22 17:54	08:17 14:13-14:27/14 15:48	08:59 09:44-10:04/20 14:21-14:42/21 15:31 10:06-10:31/25
24	04:53 21:51	05:58 06:44-07:01/17 20:39	07:03 07:33-07:39/6 19:13 18:07-18:29/22	08:09 16:56-17:17/21 17:52	08:19 14:13-14:29/16 15:46	09:00 09:45-10:05/20 14:23-14:44/21 15:32 10:08-10:32/24
25	04:55 21:49	06:00 06:43-07:02/19 20:36	07:06 07:35-07:37/2 19:10 18:06-18:29/23	07:11 15:56-16:15/19 16:49	08:21 14:12-14:30/18 15:45	09:00 09:45-10:06/21 14:23-14:44/21 15:32 10:08-10:32/24
26	04:57 21:48	06:02 06:42-07:02/20 20:34	07:08 18:05-18:29/24 19:07	07:14 15:54-16:12/18 16:47	08:23 09:36-09:39/3 14:11-14:30/19 15:43 10:04-10:11/7	09:00 09:45-10:06/21 14:23-14:44/21 15:33 10:08-10:33/25
27	04:59 21:46	06:04 06:41-07:02/21 20:31	07:10 18:04-18:28/24 19:05	07:16 15:54-16:10/16 16:44	08:25 09:35-09:46/11 14:12-14:32/20 15:42 10:03-10:14/11	09:01 09:45-10:07/22 14:24-14:45/21 15:34 10:09-10:33/24
28	05:01 21:44	06:06 06:41-07:02/21 20:28	07:12 18:04-18:28/24 19:02	07:18 15:53-16:06/13 16:42	08:27 09:33-09:48/15 14:12-14:32/20 15:41 10:02-10:16/14	09:01 09:45-10:07/22 14:24-14:46/22 15:35 10:09-10:34/25
29	05:03 21:42	06:08 06:40-07:01/21 20:25	07:14 18:04-18:27/23 18:59	07:21 15:53-16:04/11 16:39	08:29 09:33-09:50/17 14:11-14:33/22 15:40 10:01-10:17/16	09:01 09:45-10:08/23 14:25-14:46/21 15:36 10:10-10:34/24
30	05:05 21:39	06:11 06:42-07:01/19 20:23 19:34-19:42/8	07:16 18:05-18:25/20 18:56	07:23 15:53-16:01/8 16:37	08:31 09:32-09:51/19 14:11-14:33/22 15:38 10:00-10:18/18	09:01 09:44-10:08/24 14:24-14:46/22 15:37 10:10-10:34/24
31	05:07 21:37	06:13 06:44-07:01/17 20:20 19:30-19:43/13		07:25 15:53-15:59/6 16:34		09:01 09:44-10:08/24 14:25-14:47/22 15:38 10:11-10:35/24
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	374	466	384	304	2100

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 4 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (41)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April		May		June	
1	09:00	14:10-14:53/43	08:21	15:42-16:03/21	07:13	16:46-17:15/29	06:48	18:36-19:06/30	05:28	19:48-20:18/30	04:27	19:53-20:14/21
	15:39		16:40	14:35-15:18/43	17:46		19:55		21:01		22:02	
2	09:00	14:10-14:54/44	08:19	15:42-16:06/24	07:11	16:46-17:18/32	06:45	18:38-19:06/28	05:25	19:46-20:18/32	04:26	19:54-20:13/19
	15:41		16:42	14:36-15:18/42	17:48		19:57		21:03		22:04	
3	09:00	14:12-14:56/44	08:17	15:42-16:08/26	07:08	16:47-17:20/33	06:42	18:39-19:05/26	05:23	19:46-20:19/33	04:24	19:55-20:12/17
	15:42		16:45	14:36-15:19/43	17:50		19:59		21:06		22:05	
4	08:59	14:12-14:58/46	08:15	15:43-16:11/28	07:05	16:47-17:22/35	06:39	18:41-19:03/22	05:20	19:45-20:20/35	04:23	19:56-20:11/15
	15:43		16:47	14:36-15:18/42	17:53		20:02		21:08		22:07	
5	08:59	14:13-14:59/46	08:12	15:44-16:14/30	07:03	16:48-17:25/37	06:36	18:44-19:00/16	05:18	19:44-20:20/36	04:22	19:59-20:10/11
	15:45		16:49	14:37-15:19/42	17:55		20:04		21:10		22:08	
6	08:58	14:13-15:01/48	08:10	15:45-16:16/31	07:00	16:51-17:02/11	06:34	18:47-18:58/11	05:16	19:43-20:20/37	04:21	20:01-20:08/7
	15:46		16:52	14:37-15:18/41	17:57	17:03-17:28/25	20:06		21:12		22:09	
7	08:57	14:14-15:03/49	08:08	15:46-16:19/33	06:57	16:55-16:57/2	06:31		05:13	19:43-20:20/37	04:20	
	15:48		16:54	14:38-15:18/40	17:59	17:05-17:30/25	20:08		21:14		22:11	
8	08:57	14:15-15:05/50	08:06	15:48-16:22/34	06:54	17:08-17:32/24	06:28		05:11	19:42-20:21/39	04:19	
	15:50		16:56	14:38-15:17/39	18:02		20:10		21:16		22:12	
9	08:56	14:16-15:07/51	08:03	15:51-16:25/34	06:52	17:10-17:34/24	06:25		05:09	19:42-20:21/39	04:19	
	15:51		16:59	14:39-15:17/38	18:04		20:13		21:19		22:13	
10	08:55	14:17-15:09/52	08:01	15:54-16:27/33	06:49	17:12-17:34/22	06:23		05:06	19:42-20:21/39	04:18	
	15:53		17:01	14:39-15:16/37	18:06		20:15		21:21		22:14	
11	08:54	14:17-15:11/54	07:59	15:57-16:30/33	06:46	17:17-17:33/16	06:20		05:04	19:42-20:21/39	04:17	
	15:55		17:04	14:41-15:16/35	18:08		20:17		21:23		22:15	
12	08:53	14:18-15:13/55	07:56	16:00-16:32/32	06:43	17:19-17:32/13	06:17		05:02	19:42-20:21/39	04:17	
	15:57		17:06	14:41-15:14/33	18:11		20:19		21:25		22:16	
13	08:52	14:19-15:15/56	07:54	16:03-16:35/32	06:41	17:21-17:29/8	06:15		05:00	19:42-20:21/39	04:16	
	15:59		17:08	14:43-15:14/31	18:13	17:43-17:44/1	20:21		21:27		22:17	
14	08:51	14:21-15:18/57	07:52	16:06-16:38/32	06:38	17:40-17:46/6	06:12		04:58	19:42-20:21/39	04:16	
	16:00		17:11	14:45-15:12/27	18:15		20:24		21:29		22:18	
15	08:49	14:22-15:20/58	07:49	16:09-16:40/31	06:35	17:38-17:48/10	06:09		04:56	19:43-20:21/38	04:15	
	16:02		17:13	14:46-15:10/24	18:17		20:26		21:31		22:18	
16	08:48	14:25-15:21/56	07:47	16:12-16:43/31	06:32	17:36-17:50/14	06:06		04:54	19:43-20:21/38	04:15	
	16:04		17:15	14:50-15:08/18	18:20		20:28		21:33		22:19	
17	08:47	14:29-15:21/52	07:44	16:15-16:45/30	06:30	17:36-17:53/17	06:04		04:52	19:43-20:21/38	04:15	
	16:06		17:18	14:53-15:03/10	18:22		20:30		21:35		22:20	
18	08:45	14:32-15:21/49	07:42	16:16-16:48/32	06:27	17:35-17:55/20	06:01		04:50	19:43-20:20/37	04:15	
	16:09		17:20		18:24		20:32		21:37		22:20	
19	08:44	14:36-15:21/45	07:39	16:18-16:51/33	06:24	17:34-17:57/23	05:58		04:48	19:44-20:20/36	04:15	
	16:11		17:22		18:26		20:35		21:39		22:20	
20	08:42	14:38-15:22/44	07:37	16:22-16:53/31	06:21	17:34-17:59/25	05:56	20:00-20:05/5	04:46	19:44-20:20/36	04:15	
	16:13		17:25		18:29		20:37		21:41		22:21	
21	08:41	14:38-15:23/45	07:34	16:25-16:55/30	06:18	17:33-18:01/28	05:53	19:57-20:07/10	04:44	19:44-20:19/35	04:15	
	16:15		17:27		18:31		20:39		21:43		22:21	
22	08:39	14:37-15:23/46	07:32	16:29-16:58/29	06:16	17:33-18:03/30	05:50	19:56-20:09/13	04:42	19:45-20:19/34	04:15	
	16:17		17:30		18:33		20:41		21:45		22:21	
23	08:38	14:37-15:23/46	07:29	16:32-17:01/29	06:13	17:35-18:06/31	05:48	19:55-20:11/16	04:40	19:45-20:18/33	04:15	
	16:19		17:32		18:35		20:43		21:47		22:21	
24	08:36	14:36-15:22/46	07:27	16:36-17:03/27	06:10	17:35-18:08/33	05:45	19:54-20:13/19	04:39	19:46-20:18/32	04:16	
	16:21		17:34		18:37		20:46		21:49		22:22	
25	08:34	14:36-15:22/46	07:24	16:40-17:06/26	06:07	17:36-18:09/33	05:43	19:54-20:16/22	04:37	19:47-20:18/31	04:16	
	16:24		17:36		18:40		20:48		21:51		22:22	
26	08:32	14:36-15:22/46	07:21	16:43-17:08/25	06:04	17:36-18:09/33	05:40	19:53-20:16/23	04:35	19:47-20:17/30	04:16	
	16:26	15:44-15:48/4	17:39		18:42		20:50		21:53		22:21	
27	08:31	14:35-15:20/45	07:19	16:44-17:11/27	06:02	17:35-18:09/34	05:38	19:53-20:16/23	04:34	19:48-20:17/29	04:17	
	16:28	15:42-15:50/8	17:41		18:44		20:52		21:54		22:21	
28	08:29	14:35-15:19/44	07:16	16:45-17:13/28	05:59	17:36-18:10/34	05:35	19:52-20:16/24	04:32	19:49-20:17/28	04:18	
	16:31	15:42-15:52/10	17:43		18:46		20:55		21:56		22:21	
29	08:27	14:35-15:18/43			06:56	18:36-19:09/33	05:33	19:51-20:16/25	04:31	19:49-20:15/26	04:18	
	16:33	15:42-15:55/13			19:48		20:57		21:58		22:21	
30	08:25	14:36-15:18/42			06:53	18:36-19:08/32	05:30	19:49-20:16/27	04:29	19:51-20:15/24	04:19	
	16:35	15:42-15:58/16			19:51		20:59		21:59		22:20	
31	08:23	15:42-16:01/19			06:50	18:36-19:07/31			04:28	19:52-20:14/22		
	16:38	14:36-15:18/42			19:53				22:01			
Potential sun hours	227		262		365		429		515		539	
Sum of minutes with flicker	1560		1417		804		340		1060		90	

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 4 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (41)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 19:52-20:31/39 21:35	06:15 20:17	07:18 17:59-18:10/11 18:53	07:27 15:23-15:56/33 16:32 14:09-14:46/37	08:33 13:59-14:53/54 15:37
2	04:21 22:19	05:11 19:52-20:31/39 21:33	06:17 20:14	07:20 17:57-18:11/14 18:50	07:30 15:20-15:54/34 16:30 14:08-14:47/39	08:35 13:59-14:52/53 15:36
3	04:22 22:19	05:13 19:52-20:31/39 21:31	06:19 20:12	07:23 17:52-18:12/20 18:48	07:32 15:17-15:51/34 16:27 14:07-14:47/40	08:36 13:59-14:50/51 15:35
4	04:23 22:18	05:15 19:52-20:31/39 21:28	06:21 20:09	07:25 17:49-18:12/23 18:45	07:34 15:16-15:49/33 16:25 14:07-14:48/41	08:38 13:59-14:49/50 15:34
5	04:24 22:17	05:17 19:53-20:31/38 21:26	06:23 20:06	07:27 17:46-18:11/25 18:42	07:37 15:14-15:46/32 16:23 14:06-14:48/42	08:40 13:59-14:48/49 15:33
6	04:25 20:08-20:14/6 22:16	05:19 19:53-20:30/37 21:24	06:25 18:44-18:54/10 20:03	07:29 17:43-18:07/24 18:39	07:39 15:14-15:44/30 16:20 14:07-14:48/41	08:41 13:59-14:47/48 15:33
7	04:26 20:06-20:16/10 22:16	05:21 19:53-20:30/37 21:22	06:27 18:40-18:56/16 20:01	07:31 17:28-17:36/8 18:37 17:39-18:04/25	07:41 15:14-15:42/28 16:18 14:07-14:49/42	08:43 14:00-14:47/47 15:32
8	04:27 20:04-20:17/13 22:15	05:24 19:54-20:29/35 21:19	06:30 18:36-18:58/22 19:58	07:33 17:24-18:01/37 18:34	07:44 15:13-15:39/26 16:16 14:06-14:49/43	08:44 14:00-14:46/46 15:31
9	04:29 20:03-20:19/16 22:14	05:26 19:55-20:29/34 21:17	06:32 18:33-18:59/26 19:55	07:36 17:23-17:59/36 18:31	07:46 15:13-15:37/24 16:14 14:07-14:49/42	08:46 14:00-14:44/44 15:31
10	04:30 20:02-20:20/18 22:12	05:28 19:55-20:28/33 21:14	06:34 18:31-18:59/28 19:52	07:38 17:22-17:56/34 18:28	07:48 15:13-15:34/21 16:12 14:06-14:49/43	08:47 14:01-14:44/43 15:30
11	04:31 20:01-20:21/20 22:11	05:30 19:56-20:27/31 21:12	06:36 18:30-19:00/30 19:49	07:40 17:20-17:53/33 18:26	07:50 15:13-15:32/19 16:10 14:07-14:49/42	08:49 14:00-14:43/43 15:30
12	04:33 20:01-20:22/21 22:10	05:32 19:57-20:26/29 21:10	06:38 18:28-19:00/32 19:47	07:42 17:19-17:50/31 18:23	07:53 14:07-14:48/41 16:08 15:13-15:29/16	08:50 14:01-14:43/42 15:29
13	04:34 20:00-20:23/23 22:09	05:34 19:57-20:23/26 21:07	06:40 18:27-19:00/33 19:44	07:44 17:19-17:48/29 18:20	07:55 14:07-14:50/43 16:06 15:14-15:27/13	08:51 14:01-14:42/41 15:29
14	04:36 19:58-20:24/26 22:07	05:36 19:58-20:23/25 21:05	06:42 18:26-18:59/33 19:41	07:47 17:17-17:45/28 18:18	07:57 14:08-14:52/44 16:04 15:15-15:25/10	08:52 14:02-14:42/40 15:29
15	04:37 19:58-20:25/27 22:06	05:38 19:59-20:23/24 21:02	06:44 18:25-18:59/34 19:38	07:49 17:16-17:41/25 18:15	07:59 14:08-14:53/45 16:02 15:15-15:22/7	08:53 14:02-14:41/39 15:29
16	04:39 19:57-20:25/28 22:05	05:41 19:59-20:23/24 21:00	06:46 18:25-18:58/33 19:35	07:51 17:14-17:39/25 18:12	08:02 14:09-14:55/46 16:00 15:17-15:21/4	08:54 14:02-14:41/39 15:29
17	04:41 19:57-20:27/30 22:03	05:43 19:59-20:22/23 20:57	06:49 18:24-18:58/34 19:33	07:53 17:10-17:36/26 18:10	08:04 14:09-14:55/46 15:58	08:55 14:03-14:41/38 15:29
18	04:42 19:56-20:27/31 22:02	05:45 19:59-20:21/22 20:55	06:51 18:24-18:57/33 19:30	07:55 17:08-17:34/26 18:07	08:06 14:10-14:56/46 15:56	08:56 14:03-14:41/38 15:29
19	04:44 19:56-20:28/32 22:00	05:47 20:00-20:19/19 20:52	06:53 18:22-18:56/34 19:27	07:58 17:01-17:31/30 18:04	08:08 14:11-14:57/46 15:54	08:57 14:04-14:42/38 15:29
20	04:46 19:56-20:29/33 21:58	05:49 20:00-20:16/16 20:49	06:55 18:20-18:53/33 19:24	08:00 16:58-17:28/30 18:02	08:10 14:12-14:58/46 15:53	08:58 14:05-14:42/37 15:30
21	04:48 19:55-20:29/34 21:57	05:51 20:01-20:14/13 20:47	06:57 18:19-18:50/31 19:21	08:02 16:55-17:26/31 17:59	08:13 14:13-14:58/45 15:51	08:58 14:05-14:42/37 15:30
22	04:49 19:55-20:30/35 21:55	05:53 20:02-20:11/9 20:44	06:59 18:18-18:47/29 19:18	08:04 16:50-17:22/32 17:57	08:15 14:14-14:59/45 15:49	08:59 14:06-14:43/37 15:30
23	04:51 19:54-20:30/36 21:53	05:56 20:04-20:09/5 20:41	07:01 18:18-18:45/27 19:16	08:07 16:48-17:20/32 17:54	08:17 14:13-14:58/45 15:48	08:59 14:06-14:43/37 15:31
24	04:53 19:54-20:30/36 21:51	05:58 20:39	07:03 18:18-18:42/24 19:13	08:09 16:46-17:17/31 17:52	08:19 14:10-14:58/48 15:46	09:00 14:06-14:44/38 15:31
25	04:55 19:54-20:31/37 21:49	06:00 20:36	07:05 18:17-18:39/22 19:10	07:11 15:45-16:15/30 16:49 14:22-14:35/13	08:21 14:07-14:59/52 15:45	09:00 14:07-14:45/38 15:32
26	04:57 19:54-20:31/37 21:47	06:02 20:33	07:08 18:17-18:36/19 19:07	07:14 15:41-16:12/31 16:46 14:18-14:38/20	08:23 14:04-14:59/55 15:43	09:00 14:08-14:46/38 15:33
27	04:59 19:53-20:31/38 21:45	06:04 20:31	07:10 18:18-18:33/15 19:04	07:16 15:38-16:10/32 16:44 14:16-14:40/24	08:25 14:01-14:59/58 15:42	09:01 14:08-14:47/39 15:34
28	05:01 19:53-20:31/38 21:43	06:06 20:28	07:12 18:18-18:30/12 19:02	07:18 15:35-16:06/31 16:42 14:14-14:42/28	08:27 14:01-14:58/57 15:41	09:01 14:09-14:48/39 15:35
29	05:03 19:53-20:32/39 21:41	06:08 20:25	07:14 18:19-18:27/8 18:59	07:20 15:32-16:04/32 16:39 14:13-14:43/30	08:29 14:00-14:56/56 15:39	09:01 14:08-14:48/40 15:36
30	05:05 19:53-20:32/39 21:39	06:10 20:23	07:16 18:02-18:08/6 18:56 18:22-18:25/3	07:23 15:28-16:01/33 16:37 14:11-14:44/33	08:31 14:00-14:55/55 15:38	09:01 14:09-14:50/41 15:37
31	05:07 19:53-20:32/39 21:37	06:13 20:20		07:25 15:26-15:59/33 16:34 14:10-14:45/35		09:00 14:10-14:51/41 15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	742	636	627	1071	1735	1305

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 5 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (31)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June
1	09:00 11:12-11:50/38 10:37-10:42/5 15:39 12:42-13:23/41 10:43-10:46/3	08:21 09:18-09:40/22 16:40	07:13 07:41-07:58/17 17:46	06:48 07:29-07:56/27 19:55	05:28 06:19-06:46/27 21:01	04:27 05:08-05:40/32 22:03
2	09:00 11:13-11:51/38 15:41 12:43-13:24/41	08:19 09:19-09:39/20 16:42	07:11 07:38-07:58/20 17:48	06:45 07:29-07:54/25 19:57	05:25 06:20-06:45/25 21:04	04:26 05:09-05:39/30 22:04
3	09:00 11:14-11:50/36 15:42 12:43-13:25/42	08:17 09:20-09:39/19 16:45	07:08 07:35-07:58/23 17:50	06:42 07:30-07:51/21 19:59	05:23 06:20-06:42/22 21:06	04:24 05:10-05:40/30 22:06
4	08:59 11:14-11:50/36 15:43 12:43-13:25/42	08:15 09:21-09:37/16 16:47	07:05 07:33-07:58/25 17:53	06:39 07:32-07:46/14 20:02	05:20 06:21-06:41/20 21:08	04:23 05:10-05:40/30 22:07
5	08:59 11:15-11:50/35 15:45 12:43-13:25/42	08:13 09:23-09:36/13 16:49	07:03 07:30-07:58/28 17:55	06:37 07:34-07:43/9 20:04	05:18 06:22-06:40/18 21:10	04:22 05:10-05:40/30 22:08
6	08:58 11:16-11:50/34 15:46 12:44-13:25/41	08:10 09:26-09:33/7 16:52	07:00 07:27-07:56/29 17:57	06:34 07:00-07:12/12 20:06	05:16 06:24-06:39/15 21:12	04:21 05:10-05:40/30 22:10
7	08:57 11:17-11:49/32 15:48 12:44-13:26/42	08:08 16:54	06:57 07:24-07:55/31 18:00	06:31 06:57-07:12/15 20:08	05:13 06:27-06:36/9 21:14	04:20 05:10-05:39/29 22:11
8	08:57 11:19-11:49/30 15:50 12:45-13:26/41	08:06 16:57	06:55 07:21-07:53/32 18:02	06:28 06:56-07:12/16 20:10	05:11 21:17	04:20 05:11-05:40/29 22:12
9	08:56 11:21-11:32/11 12:46-13:27/41 15:51 11:35-11:48/13	08:04 16:59	06:52 07:20-07:50/30 18:04	06:26 06:56-07:11/15 20:13	05:09 21:19	04:19 05:11-05:39/28 22:13
10	08:55 11:23-11:31/8 12:46-13:27/41 15:53 11:38-11:47/9	08:01 17:01	06:49 07:20-07:45/25 18:06	06:23 06:56-07:09/13 20:15	05:07 21:21	04:18 05:12-05:40/28 22:14
11	08:54 12:47-13:28/41 15:55	07:59 17:04	06:46 07:20-07:43/23 18:09	06:20 06:58-07:08/10 20:17	05:04 21:23	04:17 05:11-05:39/28 22:15
12	08:53 12:47-13:27/40 15:57	07:57 08:27-08:32/5 17:06	06:44 07:20-07:41/21 18:11	06:17 07:00-07:05/5 20:19	05:02 21:25	04:17 05:12-05:40/28 22:16
13	08:52 12:48-13:28/40 15:59	07:54 08:24-08:33/9 17:08	06:41 07:21-07:38/17 18:13	06:15 20:22	05:00 21:27	04:16 05:13-05:39/26 22:17
14	08:51 12:48-13:28/40 16:01	07:52 08:21-08:34/13 17:11	06:38 07:23-07:32/9 18:15	06:12 20:24	04:58 21:29	04:16 05:12-05:39/27 22:18
15	08:50 12:50-13:28/38 16:03	07:49 08:19-08:35/16 17:13	06:35 07:02-07:07/5 18:18	06:09 06:36-06:46/10 20:26	04:56 05:28-05:33/5 21:31	04:16 05:13-05:39/26 22:19
16	08:48 12:50-13:28/38 16:04 09:26-09:30/4	07:47 08:16-08:35/19 17:16 16:39-16:43/4	06:32 06:59-07:07/8 18:20	06:07 06:33-06:47/14 20:28	04:54 05:26-05:34/8 21:33	04:15 05:13-05:39/26 22:19
17	08:47 12:51-13:28/37 16:07 09:24-09:32/8	07:44 08:14-08:35/21 17:18 16:37-16:45/8	06:30 06:56-07:07/11 18:22	06:04 06:31-06:49/18 20:30	04:52 05:24-05:35/11 21:36	04:15 05:14-05:40/26 22:20
18	08:46 12:52-13:28/36 16:09 09:23-09:34/11	07:42 08:14-08:35/21 17:20 16:37-16:48/11	06:27 06:53-07:07/14 18:24	06:01 06:28-06:50/22 20:33	04:50 05:23-05:37/14 21:38	04:15 05:14-05:40/26 22:20
19	08:44 12:53-13:28/35 16:11 09:21-09:35/14	07:39 08:14-08:35/21 17:23 16:36-16:51/15	06:24 06:50-07:06/16 18:26	05:58 06:26-06:51/25 20:35	04:48 05:21-05:37/16 21:40	04:15 05:14-05:40/26 22:21
20	08:43 12:54-13:27/33 16:13 09:19-09:36/17	07:37 08:14-08:34/20 17:25 16:36-16:53/17	06:21 06:47-07:04/17 18:29	05:56 06:23-06:51/28 20:37	04:46 05:19-05:37/18 21:41	04:15 05:14-05:40/26 22:21
21	08:41 12:55-13:27/32 16:15 09:17-09:37/20	07:34 08:15-08:34/19 17:27 16:36-16:55/19	06:19 06:45-07:04/19 18:31	05:53 06:22-06:52/30 20:39	04:44 05:18-05:38/20 21:43	04:15 05:14-05:40/26 22:21
22	08:39 12:56-13:26/30 16:17 09:16-09:37/21	07:32 08:16-08:33/17 17:30 16:36-16:54/18	06:16 06:42-07:01/19 18:33	05:51 06:20-06:51/31 20:41	04:42 05:16-05:38/22 21:45	04:15 05:14-05:40/26 22:22
23	08:38 12:57-13:25/28 16:19 09:15-09:38/23	07:29 08:17-08:31/14 17:32 16:37-16:53/16	06:13 06:39-07:00/21 18:35	05:48 06:20-06:52/32 20:44	04:40 05:15-05:39/24 21:47	04:15 05:15-05:41/26 22:22
24	08:36 12:59-13:24/25 16:22 09:15-09:39/24	07:27 08:19-08:30/11 17:34 16:37-16:52/15	06:10 06:36-07:00/24 18:37	05:45 06:19-06:51/32 20:46	04:39 05:13-05:39/26 21:49	04:16 05:15-05:41/26 22:22
25	08:34 13:00-13:23/23 16:24 09:15-09:39/24	07:24 07:52-07:54/2 17:37 16:39-16:51/12	06:07 06:33-07:00/27 18:40	05:43 06:19-06:51/32 20:48	04:37 05:12-05:40/28 21:51	04:16 05:15-05:41/26 22:22
26	08:33 13:03-13:22/19 16:26 09:16-09:40/24	07:21 07:49-07:56/7 17:39 16:41-16:48/7	06:05 06:31-07:01/30 18:42	05:40 06:18-06:50/32 20:50	04:35 05:11-05:39/28 21:53	04:17 05:16-05:42/26 22:22
27	08:31 13:06-13:20/14 16:28 09:16-09:40/24	07:19 07:46-07:57/11 17:41	06:02 06:30-07:00/30 18:44	05:38 06:18-06:50/32 20:53	04:34 05:09-05:40/31 21:54	04:17 05:15-05:41/26 22:21
28	08:29 13:12-13:14/2 16:31 09:16-09:41/25	07:16 07:44-07:58/14 17:44	05:59 06:29-07:00/31 18:46	05:35 06:19-06:50/31 20:55	04:32 05:09-05:40/31 21:56	04:18 05:16-05:42/26 22:21
29	08:27 09:16-09:40/24 16:33		06:56 07:28-07:59/31 19:48	05:33 06:18-06:48/30 20:57	04:31 05:09-05:40/31 21:58	04:18 05:16-05:43/27 22:21
30	08:25 09:17-09:40/23 16:35		06:53 07:28-07:58/30 19:51	05:30 06:19-06:47/28 20:59	04:29 05:09-05:40/31 21:59	04:19 05:15-05:43/28 22:20
31	08:23 09:17-09:40/23 16:38		06:51 07:29-07:57/28 19:53		04:28 05:08-05:39/31 22:01	
Potential sun hours	227	262	365	429	515	539
Sum of minutes with flicker	1602	479	692	627	511	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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
Vilandes 3-6  
LV-1010 Riga  
0037167242411  
Baiba / baiba.ozolina@environment.lv  
Calculated:  
15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 5 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (31)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 05:16-05:43/27 22:20	05:09 21:35	06:15 06:57-07:07/10 20:17	07:18 08:00-08:19/19 18:53	07:28 16:32	08:33 12:28-13:09/41 15:37
2	04:21 05:16-05:44/28 22:19	05:11 21:33	06:17 06:55-07:08/13 20:15	07:21 07:58-08:21/23 18:51	07:30 16:30	08:35 11:07-11:14/7 12:30-13:10/40 15:36 11:21-11:30/9
3	04:22 05:16-05:45/29 22:19	05:13 21:31	06:19 06:54-07:09/15 20:12	07:23 07:58-08:23/25 18:48	07:32 16:27	08:36 11:05-11:16/11 12:30-13:11/41 15:35 11:19-11:32/13
4	04:23 05:16-05:45/29 22:18	05:15 21:29	06:21 06:53-07:09/16 20:09	07:25 07:57-08:23/26 18:45	07:34 16:25	08:38 11:04-11:18/14 12:30-13:11/41 15:34 11:19-11:34/15
5	04:24 05:16-05:46/30 22:17	05:17 06:39-06:42/3 21:26	06:23 06:54-07:09/15 20:06	07:27 07:57-08:29/32 18:42	07:37 08:55-09:04/9 16:23	08:40 11:04-11:35/31 15:33 12:30-13:11/41
6	04:25 05:16-05:46/30 22:17	05:19 06:35-06:46/11 21:24	06:25 06:56-07:08/12 20:04	07:29 07:59-08:30/31 18:40	07:39 08:52-09:06/14 16:20	08:42 11:02-11:36/34 15:33 12:30-13:12/42
7	04:26 05:16-05:46/30 22:16	05:22 06:33-06:48/15 21:22	06:28 07:29-07:38/9 20:01 06:58-07:08/10	07:31 08:01-08:31/30 18:37	07:41 08:51-09:08/17 16:18	08:43 11:02-11:37/35 15:32 12:31-13:12/41
8	04:27 05:16-05:47/31 22:15	05:24 06:31-06:50/19 21:19	06:30 07:26-07:40/14 19:58 07:00-07:07/7	07:34 08:04-08:33/29 18:34	07:44 08:51-09:09/18 16:16	08:45 11:02-11:38/36 15:31 12:31-13:13/42
9	04:29 05:16-05:47/31 22:14	05:26 06:30-06:51/21 21:17	06:32 07:24-07:45/21 19:55 07:02-07:05/3	07:36 08:06-08:33/27 18:31	07:46 08:49-09:10/21 16:14	08:46 11:02-11:39/37 15:31 12:31-13:13/42
10	04:30 05:16-05:47/31 22:13	05:28 06:29-06:52/23 21:15	06:34 07:22-07:47/25 19:52	07:38 08:08-08:32/24 18:29	07:48 08:49-09:11/22 16:12	08:47 11:02-11:40/38 15:30 12:32-13:14/42
11	04:31 05:17-05:48/31 22:12	05:30 06:28-06:54/26 21:12	06:36 07:21-07:48/27 19:50	07:40 08:11-08:33/22 18:26	07:51 08:48-09:11/23 16:10	08:49 11:03-11:41/38 10:28-10:33/5 15:30 12:32-13:14/42 10:34-10:37/3
12	04:33 05:17-05:48/31 22:10	05:32 06:28-06:55/27 21:10	06:38 07:20-07:49/29 19:47	07:42 08:13-08:32/19 18:23	07:53 08:48-09:12/24 16:08	08:50 11:02-11:41/39 10:27-10:39/12 15:30 12:33-13:15/42
13	04:34 05:17-05:48/31 22:09	05:34 06:27-06:56/29 21:07	06:40 07:19-07:49/30 19:44	07:45 08:15-08:31/16 18:20	07:55 08:48-09:12/24 16:06	08:51 11:02-11:42/40 10:26-10:40/14 15:29 12:33-13:15/42
14	04:36 05:18-05:49/31 22:08	05:36 06:26-06:57/31 21:05	06:42 07:19-07:49/30 19:41	07:47 08:17-08:30/13 18:18	07:57 12:43-12:47/4 16:04 08:48-09:13/25	08:52 11:03-11:42/39 10:27-10:42/15 15:29 12:33-13:15/42
15	04:37 05:17-05:49/32 22:06	05:39 06:26-06:57/31 21:02	06:44 07:18-07:49/31 19:38	07:49 08:20-08:29/9 18:15	08:00 12:38-12:52/14 16:02 08:49-09:13/24	08:54 11:03-11:44/41 10:27-10:43/16 15:29 12:35-13:16/41
16	04:39 05:18-05:49/31 22:05	05:41 06:26-06:57/31 21:00	06:47 07:18-07:49/31 19:36	07:51 08:22-08:27/5 18:12 17:12-17:21/9	08:02 12:36-12:55/19 16:00 08:49-09:13/24	08:55 11:04-11:44/40 10:27-10:43/16 15:29 12:35-13:17/42
17	04:41 05:19-05:49/30 22:03	05:43 06:26-06:58/32 20:57	06:49 07:18-07:48/30 19:33	07:53 08:53-08:59/6 18:10 17:10-17:23/13	08:04 12:33-12:56/23 15:58 08:49-09:13/24	08:55 11:04-11:45/41 10:27-10:44/17 15:29 12:35-13:17/42
18	04:42 05:21-05:49/28 22:02	05:45 06:26-06:58/32 20:55	06:51 07:20-07:48/28 19:30	07:56 08:49-09:02/13 18:07 17:09-17:24/15	08:06 12:33-12:58/25 15:56 08:49-09:13/24	08:56 11:05-11:46/41 10:27-10:45/18 15:29 12:35-13:17/42
19	04:44 05:22-05:49/27 22:00	05:47 06:26-06:57/31 20:52	06:53 07:23-07:48/25 19:27	07:58 08:47-09:03/16 18:04 17:07-17:24/17	08:08 12:31-12:59/28 15:54 08:50-09:13/23	08:57 11:04-11:45/41 10:27-10:45/18 15:29 12:36-13:17/41
20	04:46 05:24-05:49/25 21:59	05:49 06:26-06:57/31 20:50	06:55 07:25-07:47/22 19:24	08:00 08:46-09:04/18 18:02 17:06-17:24/18	08:11 12:31-13:01/30 15:53 08:51-09:12/21	08:58 11:05-11:46/41 10:28-10:46/18 15:30 12:37-13:18/41 13:57-14:00/3
21	04:48 05:25-05:48/23 21:57	05:51 06:26-06:57/31 20:47	06:57 07:27-07:45/18 19:21	08:02 08:45-09:05/20 17:59 17:07-17:25/18	08:13 12:30-13:02/32 15:51 08:53-09:13/20	08:58 11:06-11:47/41 10:28-10:47/19 15:30 12:37-13:19/42 13:58-14:01/3
22	04:50 05:27-05:48/21 21:55	05:54 06:27-06:56/29 20:44	06:59 07:29-07:48/19 19:19	08:05 08:45-09:05/20 17:57 17:06-17:22/16	08:15 12:30-13:03/33 15:49 08:55-09:12/17	08:59 11:06-11:47/41 10:28-10:47/19 15:30 12:37-13:19/42 13:58-14:01/3
23	04:51 05:29-05:48/19 21:53	05:56 06:28-06:55/27 20:42	07:01 07:31-07:49/18 19:16	08:07 08:44-09:05/21 17:54 17:07-17:20/13	08:17 12:29-13:04/35 15:48 08:57-09:11/14	09:00 11:06-11:47/41 10:30-10:48/18 15:31 12:37-13:19/42 13:58-14:01/3
24	04:53 05:30-05:47/17 21:51	05:58 06:30-06:54/24 20:39	07:03 07:33-07:49/16 19:13	08:09 08:43-09:05/22 17:52 17:07-17:17/10	08:19 12:29-13:05/36 15:46 09:00-09:11/11	09:00 11:07-11:48/41 10:30-10:48/18 15:32 12:39-13:20/41 14:00-14:01/1
25	04:55 05:32-05:47/15 21:50	06:00 06:32-06:53/21 20:36	07:06 07:35-07:49/14 19:10	07:11 07:44-08:05/21 16:49 16:08-16:15/7	08:21 12:29-13:06/37 15:45 09:02-09:10/8	09:00 11:07-11:49/42 10:30-10:48/18 15:32 12:39-13:20/41
26	04:57 05:34-05:46/12 21:48	06:02 06:34-06:52/18 20:34	07:08 07:37-07:49/12 19:07	07:14 07:46-08:04/18 16:47 16:09-16:12/3	08:23 12:28-13:06/38 15:43 09:05-09:09/4	09:01 11:08-11:49/41 10:31-10:48/17 15:33 12:39-13:21/42
27	04:59 05:36-05:46/10 21:46	06:04 06:36-06:50/14 20:31	07:10 07:40-07:49/9 19:05	07:16 07:49-08:04/15 16:44	08:25 12:29-13:07/38 15:42	09:01 11:08-11:49/41 10:32-10:48/16 15:34 12:40-13:21/41
28	05:01 05:37-05:44/7 21:44	06:06 06:38-06:47/9 20:28	07:12 07:42-07:48/6 19:02	07:18 07:51-08:03/12 16:42	08:27 12:29-13:08/39 15:41	09:01 11:09-11:50/41 10:32-10:49/17 15:35 12:40-13:22/42
29	05:03 05:39-05:42/3 21:42	06:08 20:26	07:14 08:05-08:12/7 18:59 07:44-07:47/3	07:21 07:54-08:02/8 16:39	08:29 12:28-13:08/40 15:40	09:01 11:10-11:50/40 10:33-10:49/16 15:36 12:41-13:23/42
30	05:05 21:40	06:11 20:23	07:16 08:02-08:16/14 18:56	07:23 07:56-08:00/4 16:37	08:31 12:28-13:09/41 15:38	09:01 11:10-11:50/40 10:34-10:48/14 15:37 12:41-13:22/41
31	05:07 21:37	06:13 07:00-07:05/5 20:20		07:25 16:34		09:01 11:11-11:50/39 10:35-10:48/13 15:38 12:42-13:23/41
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	720	571	589	703	923	2766

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
 Vilandes 3-6  
 LV-1010 Riga  
 0037167242411  
 Baiba / baiba.ozolina@environment.lv  
 Calculated:  
 15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 6 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (29)  
 Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
 0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June
1	09:00 13:46-14:09/23 15:40 10:44-10:53/9	08:21 08:54-09:23/29 16:40	07:14 07:49-08:45/56 17:46	06:48 07:59-08:38/39 19:55	05:28 06:07-06:31/24 21:01	04:27 05:46-06:30/44 22:03
2	09:00 09:43-09:45/2 10:46-10:53/7 15:41 13:47-14:10/23	08:19 08:51-09:23/32 16:42	07:11 07:49-08:06/17 17:48 08:09-08:43/34	06:45 08:00-08:37/37 19:57	05:25 06:06-06:33/27 21:04	04:26 05:46-06:30/44 22:04
3	09:00 09:42-09:46/4 10:48-10:52/4 15:42 13:47-14:10/23	08:17 08:49-09:23/34 16:45	07:08 07:50-08:02/12 17:50 08:09-08:41/32	06:42 08:00-08:36/36 19:59	05:23 06:04-06:33/29 21:06	04:25 05:48-06:30/42 22:06
4	08:59 09:41-09:47/6 15:44 13:48-14:10/22	08:15 08:46-09:22/36 16:47	07:05 07:54-08:00/6 17:53 08:11-08:38/27	06:39 08:01-08:35/34 20:02	05:20 06:03-06:34/31 21:08	04:23 05:48-06:29/41 22:07
5	08:59 09:40-09:47/7 15:45 13:48-14:10/22	08:13 08:44-09:23/39 16:49	07:03 08:12-08:32/20 17:55	06:37 08:02-08:33/31 20:04	05:18 05:56-06:35/39 21:10	04:22 05:48-06:28/40 22:08
6	08:58 09:40-09:49/9 15:47 13:49-14:10/21	08:10 08:42-09:23/41 16:52	07:00 08:13-08:29/16 17:57	06:34 08:03-08:31/28 20:06	05:16 05:53-06:36/43 21:12	04:21 05:49-06:27/38 22:10
7	08:57 09:39-09:50/11 15:48 13:50-14:10/20	08:08 08:39-09:21/42 16:54	06:57 08:16-08:25/9 18:00	06:31 08:04-08:28/24 20:08	05:13 05:51-06:36/45 21:14	04:20 05:49-06:26/37 22:11
8	08:57 09:37-09:50/13 15:50 13:51-14:10/19	08:06 08:38-09:21/43 16:57	06:55 18:02	06:28 06:55-06:57/2 20:11 08:07-08:26/19	05:11 05:50-06:37/47 21:17	04:20 05:50-06:25/35 22:12
9	08:56 09:36-09:51/15 15:51 13:52-14:11/19	08:04 08:38-09:19/41 16:59	06:52 18:04	06:26 06:52-06:58/6 20:13 08:10-08:21/11	05:09 05:48-06:37/49 21:19	04:19 06:16-06:24/8 22:13
10	08:55 09:35-09:52/17 15:53 13:53-14:11/18	08:01 08:38-09:17/39 17:01	06:49 18:06	06:23 06:49-06:59/10 20:15	05:07 05:46-06:36/50 21:21	04:18 06:20-06:22/2 22:14
11	08:54 09:34-09:53/19 15:55 13:55-14:11/16	07:59 08:38-09:10/32 17:04	06:46 18:09	06:20 06:47-07:00/13 20:17	05:04 05:47-06:37/50 21:23	04:17 05:51-06:15/24 22:15
12	08:53 09:33-09:53/20 15:57 13:56-14:09/13	07:57 08:31-09:10/39 17:06	06:44 07:25-07:31/6 18:11	06:17 06:44-06:59/15 20:19	05:02 05:46-06:37/51 21:25	04:17 05:52-06:15/23 22:16
13	08:52 09:33-09:54/21 15:59 13:58-14:09/11	07:54 08:28-09:08/40 17:08	06:41 07:19-07:36/17 18:13	06:15 06:43-06:59/16 20:22	05:00 05:45-06:37/52 21:27	04:16 05:53-06:15/22 22:17
14	08:51 09:33-09:54/21 16:01 13:59-14:07/8	07:52 08:25-09:05/40 17:11	06:38 07:04-07:11/7 18:15 07:16-07:38/22	06:12 06:43-06:59/16 20:24	04:58 05:45-06:37/52 21:29	04:16 05:52-06:15/23 22:18
15	08:50 09:34-09:55/21 16:03	07:49 08:24-09:03/39 17:13	06:35 07:02-07:13/11 18:18 07:14-07:41/27	06:09 06:43-06:58/15 20:26	04:56 05:44-06:37/53 21:31	04:16 05:53-06:15/22 22:19
16	08:48 09:34-09:56/22 16:05	07:47 08:19-08:56/37 17:16	06:33 06:59-07:42/43 18:20	06:07 06:44-06:57/13 20:28	04:54 05:43-06:37/54 21:33	04:15 05:54-06:15/21 22:19
17	08:47 09:34-09:56/22 16:07	07:44 08:16-08:53/37 17:18	06:30 06:56-07:43/47 18:22	06:04 06:45-06:55/10 20:30	04:52 05:43-06:36/53 21:36	04:15 05:54-06:15/21 22:20
18	08:46 09:35-09:57/22 16:09	07:42 08:14-08:49/35 17:20	06:27 06:53-07:43/50 18:24	06:01 06:48-06:51/3 20:33	04:50 05:44-06:37/53 21:38	04:15 05:54-06:15/21 22:20
19	08:44 09:35-09:57/22 16:11	07:39 08:12-08:50/38 17:23	06:24 06:52-07:44/52 18:26	05:59 20:35	04:48 05:43-06:36/53 21:40	04:15 05:55-06:15/20 22:21
20	08:43 09:35-09:57/22 16:13	07:37 08:11-08:50/39 17:25 08:06-08:10/4	06:21 06:53-07:44/51 18:29	05:56 20:37	04:46 05:43-06:36/53 21:41	04:15 05:55-06:15/20 22:21
21	08:41 09:36-09:57/21 16:15	07:34 08:03-08:50/47 17:27	06:19 06:53-07:45/52 18:31	05:53 20:39	04:44 05:43-06:36/53 21:43	04:15 05:55-06:15/20 22:21
22	08:39 09:36-09:56/20 16:17	07:32 08:00-08:50/50 17:30	06:16 06:53-07:45/52 18:33	05:51 20:41	04:42 05:43-06:35/52 21:45	04:15 05:55-06:15/20 22:22
23	08:38 09:37-09:56/19 16:19	07:29 07:57-08:50/53 17:32	06:13 06:54-07:45/51 18:35	05:48 20:44	04:41 05:44-06:35/51 21:47	04:15 05:56-06:16/20 22:22
24	08:36 09:38-09:56/18 16:22 09:11-09:15/4	07:27 07:55-08:50/55 17:34	06:10 06:55-07:44/49 18:37	05:45 20:46	04:39 05:43-06:35/52 21:49	04:16 05:56-06:16/20 22:22
25	08:34 09:39-09:55/16 16:24 09:09-09:17/8	07:24 07:52-08:49/57 17:37	06:07 06:57-07:44/47 18:40	05:43 20:48	04:37 05:44-06:35/51 21:51	04:16 05:55-06:16/21 22:22
26	08:33 09:41-09:54/13 16:26 09:07-09:18/11	07:21 07:49-08:49/60 17:39	06:05 07:00-07:44/44 18:42	05:40 20:50	04:36 05:44-06:33/49 21:53	04:17 05:56-06:17/21 22:22
27	08:31 09:43-09:53/10 16:28 09:05-09:20/15	07:19 07:48-08:47/59 17:41	06:02 07:00-07:43/43 18:44	05:38 20:53	04:34 05:44-06:33/49 21:54	04:17 05:55-06:17/22 22:21
28	08:29 09:47-09:50/3 16:31 09:03-09:21/18	07:16 07:49-08:47/58 17:44	05:59 06:59-07:42/43 18:46	05:35 06:15-06:24/9 20:55	04:32 05:45-06:33/48 21:56	04:18 05:56-06:18/22 22:21
29	08:27 09:00-09:21/21 16:33		06:56 07:59-08:41/42 19:48	05:33 06:11-06:27/16 20:57	04:31 05:45-06:33/48 21:58	04:18 05:56-06:19/23 22:21
30	08:25 08:58-09:22/24 16:35		06:53 07:59-08:40/41 19:51	05:30 06:09-06:29/20 20:59	04:30 05:46-06:32/46 21:59	04:19 05:55-06:18/23 22:20
31	08:23 08:56-09:22/26 16:38		06:51 08:00-08:40/40 19:53		04:28 05:45-06:31/46 22:01	
Potential sun hours	227	262	365	429	515	539
Sum of minutes with flicker	821	1195	1066	423	1453	810

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 6 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (29)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 05:55-06:19/24 22:20	05:09 05:56-06:48/52 21:35	06:15 06:46-06:59/13 20:17	07:18 08:01-08:13/12 18:53	07:28 08:08-08:47/39 16:32	08:33 09:16-09:35/19 15:37 13:36-13:52/16
2	04:21 05:55-06:20/25 22:19	05:11 05:57-06:48/51 21:33	06:17 06:48-06:58/10 20:15	07:21 07:32 18:51	07:30 08:07-08:49/42 16:30	08:35 09:18-09:35/17 15:36 13:36-13:54/18
3	04:22 06:22-06:28/6 22:19 05:55-06:20/25	05:13 05:57-06:46/49 21:31	06:19 06:50-06:56/6 20:12 08:08-08:19/11	07:23 07:25 18:48	07:32 08:08-08:51/43 16:27	08:36 09:20-09:35/15 15:35 13:36-13:55/19
4	04:23 05:55-06:30/35 22:18	05:15 05:58-06:46/48 21:29	06:21 06:52-06:54/2 20:09 08:04-08:23/19	07:25 18:45 07:27	07:34 08:09-08:51/42 16:25	08:38 09:22-09:35/13 15:34 13:36-13:56/20
5	04:24 05:55-06:32/37 22:17	05:17 05:59-06:46/47 21:26	06:23 08:01-08:25/24 20:06	07:27 18:42 07:29	07:37 08:12-08:52/40 16:23	08:40 09:24-09:35/11 15:34 13:35-13:56/21
6	04:25 05:55-06:33/38 22:17	05:20 06:01-06:45/44 21:24	06:26 07:59-08:27/28 20:04	07:29 18:40 07:31 08:50-09:03/13	07:39 08:14-08:52/38 16:21	08:42 09:25-09:34/9 15:33 13:35-13:56/21
7	04:26 05:55-06:34/39 22:16	05:22 06:03-06:45/42 21:22	06:28 07:57-08:28/31 20:01	07:31 08:50-09:03/13 18:37	07:41 08:17-08:53/36 16:18	08:43 09:27-09:35/8 15:32 13:36-13:57/21
8	04:27 05:55-06:35/40 22:15	05:24 06:07-06:44/37 21:19	06:30 07:56-08:29/33 19:58	07:34 08:48-09:06/18 18:34	07:44 08:20-08:54/34 16:16	08:45 09:29-09:35/6 15:31 13:36-13:58/22
9	04:29 05:54-06:36/42 22:14	05:26 06:13-06:43/30 21:17	06:32 07:54-08:30/36 19:55	07:36 08:46-09:07/21 18:31	07:46 08:22-08:53/31 16:14	08:46 09:31-09:35/4 10:37-10:40/3 15:31 13:36-13:58/22
10	04:30 05:54-06:37/43 22:13	05:28 06:13-06:42/29 21:15	06:34 07:53-08:30/37 19:52	07:38 08:26-08:35/9 18:29 08:44-09:14/30	07:48 08:25-08:54/29 16:12	08:47 09:32-09:34/2 10:35-10:42/7 15:30 13:36-13:59/23
11	04:31 05:54-06:39/45 22:11	05:30 06:15-06:41/26 21:12	06:36 07:52-08:31/39 19:50	07:40 08:24-08:39/15 18:26 08:43-09:16/33	07:51 08:27-08:53/26 16:10	08:49 13:36-13:59/23 15:30 10:35-10:44/9
12	04:33 05:54-06:39/45 22:10	05:32 06:16-06:39/23 21:10	06:38 07:51-08:31/40 19:47	07:42 08:23-08:41/18 18:23 08:42-09:18/36	07:53 08:30-08:53/23 16:08	08:50 13:37-14:01/24 15:30 10:35-10:45/10
13	04:34 05:53-06:40/47 22:09	05:34 06:18-06:37/19 21:07	06:40 07:50-08:31/41 19:44	07:45 08:21-09:19/58 18:20	07:55 08:32-08:53/21 16:06	08:51 13:37-14:01/24 15:29 10:34-10:46/12
14	04:36 05:54-06:41/47 22:08	05:36 06:20-06:35/15 21:05	06:42 07:49-08:32/43 19:41	07:47 08:21-09:19/58 18:18	07:57 09:19-09:22/3 16:04 08:35-08:53/18	08:52 13:37-14:01/24 15:29 10:35-10:47/12
15	04:38 05:53-06:41/48 22:06	05:39 06:24-06:30/6 21:02	06:44 07:49-08:32/43 19:38	07:49 08:21-09:21/60 18:15	08:00 09:16-09:26/10 16:02 08:38-08:53/15	08:54 13:38-14:03/25 15:29 10:35-10:48/13
16	04:39 05:54-06:43/49 22:05	05:41 06:21-06:30/5 21:00	06:47 07:48-08:32/44 19:36	07:51 08:22-09:21/59 18:12	08:02 09:14-09:27/13 16:00 08:40-08:51/11	08:55 13:39-14:03/24 15:29 10:35-10:49/14
17	04:41 05:53-06:43/50 22:03	05:43 06:20-06:30/5 20:57	06:49 07:48-08:32/44 19:33	07:53 08:25-09:22/57 18:10	08:04 09:13-09:29/16 15:58 08:43-08:51/8	08:55 13:39-14:04/25 15:29 10:35-10:49/14
18	04:42 05:54-06:44/50 22:02	05:45 06:20-06:30/5 20:55	06:51 07:46-08:31/45 19:30	07:56 08:27-09:21/54 18:07	08:06 09:12-09:30/18 15:56 08:45-08:49/4	08:56 13:39-14:03/24 15:29 10:36-10:50/14
19	04:44 05:53-06:44/51 22:00	05:47 06:20-06:30/5 20:52	06:53 07:43-08:32/49 19:27	07:58 08:29-09:21/52 18:05	08:08 09:12-09:31/19 15:54	08:57 13:39-14:04/25 15:29 10:35-10:50/15
20	04:46 05:53-06:45/52 21:59	05:49 06:20-06:30/5 20:50	06:55 07:41-08:31/50 19:24	08:00 08:32-09:21/49 18:02	08:11 09:11-09:31/20 15:53	08:58 13:40-14:05/25 15:30 10:36-10:51/15
21	04:48 05:53-06:45/52 21:57	05:51 06:20-06:30/5 20:47	06:57 07:39-08:31/52 19:21	08:02 08:34-09:21/47 17:59	08:13 09:12-09:33/21 15:51	08:58 13:41-14:06/25 15:30 10:37-10:52/15
22	04:50 05:53-06:46/53 21:55	05:54 06:20-06:30/5 20:44	06:59 07:38-08:30/52 19:19	08:05 08:42-09:21/39 17:57 08:37-08:40/3	08:15 09:11-09:33/22 15:49	08:59 13:41-14:06/25 15:30 10:37-10:52/15
23	04:51 05:54-06:46/52 21:53	05:56 06:20-06:30/5 20:42	07:01 07:36-08:29/53 19:16	08:07 08:43-09:20/37 17:54	08:17 09:11-09:33/22 15:48	09:00 13:41-14:06/25 15:31 10:38-10:53/15
24	04:53 05:53-06:46/53 21:51	05:58 06:20-06:30/5 20:39	07:04 07:36-08:28/52 19:13	08:09 08:44-09:22/38 17:52	08:19 09:12-09:34/22 15:46	09:00 13:42-14:07/25 15:32 10:38-10:53/15
25	04:55 05:53-06:47/54 21:50	06:00 06:51-06:55/4 20:36	07:06 07:35-08:27/52 19:10	07:11 07:47-08:24/37 16:49	08:21 09:12-09:34/22 15:45	09:00 13:42-14:07/25 15:32 10:38-10:53/15
26	04:57 05:54-06:47/53 21:48	06:02 06:48-06:58/10 20:34	07:08 07:37-08:25/48 19:07	07:14 07:50-08:29/39 16:47	08:23 09:13-09:35/22 15:44	09:01 13:43-14:07/24 15:33 10:39-10:53/14
27	04:59 05:54-06:48/54 21:46	06:04 06:46-06:59/13 20:31	07:10 07:39-08:23/44 19:05	07:16 07:54-08:33/39 16:44	08:25 09:13-09:35/22 15:42	09:01 13:43-14:08/25 15:34 10:40-10:53/13
28	05:01 05:54-06:47/53 21:44	06:06 06:45-07:00/15 20:28	07:12 07:42-08:22/40 19:02	07:18 07:55-08:35/40 16:42	08:27 09:13-09:34/21 15:41 13:40-13:47/7	09:01 13:44-14:08/24 15:35 10:40-10:54/14
29	05:03 05:54-06:47/53 21:42	06:09 06:44-07:00/16 20:26	07:14 07:44-07:52/8 18:59 07:56-08:20/24	07:21 07:58-08:38/40 16:39	08:29 09:13-09:34/21 15:40 13:38-13:49/11	09:01 13:45-14:09/24 15:36 10:41-10:54/13
30	05:05 05:55-06:48/53 21:40	06:11 06:44-07:00/16 20:23	07:16 07:58-08:17/19 18:56 07:46-07:49/3	07:23 08:01-08:39/38 16:37	08:31 09:14-09:34/20 15:38 13:37-13:50/13	09:01 13:45-14:09/24 15:37 10:42-10:53/11
31	05:07 05:56-06:48/52 21:37	06:13 06:44-06:59/15 20:20		07:25 08:07-08:40/33 16:34		09:01 13:45-14:09/24 15:38 10:43-10:54/11
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	1420	607	1135	1082	845	1109

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
Vilandes 3-6  
LV-1010 Riga  
0037167242411  
Baiba / baiba.ozolina@environment.lv  
Calculated:  
15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 7 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (40)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June
1	09:00 09:43-10:15/32 15:40	08:21 08:54-09:13/19 16:40 09:24-10:03/39	07:14 08:00-08:09/9 17:46 09:36-11:07/91	06:48 10:38-11:37/59 19:55 07:52-09:00/68	05:28 21:01	04:27 22:03
2	09:00 09:43-10:16/33 15:41	08:19 08:51-09:13/22 16:42 09:24-10:04/40	07:11 09:35-11:07/92 17:48	06:45 10:39-11:34/55 19:57 07:52-08:56/64	05:25 21:04	04:26 22:04
3	09:00 09:42-10:16/34 15:42	08:17 08:50-09:13/23 16:45 09:25-10:04/39	07:08 09:34-11:07/93 17:51	06:42 10:41-11:30/49 07:51-08:35/44 19:59 08:39-08:52/13	05:23 21:06	04:25 22:06
4	08:59 09:41-10:16/35 15:44	08:15 08:50-09:13/23 16:47 09:24-10:04/40	07:05 09:33-11:07/94 17:53	06:39 10:44-11:27/43 20:02 07:52-08:35/43	05:21 21:08	04:23 22:07
5	08:59 09:40-10:16/36 15:45	08:13 08:50-09:11/21 16:49 09:25-10:04/39	07:03 09:33-11:08/95 17:55	06:37 10:47-11:21/34 20:04 07:52-08:34/42	05:18 21:10	04:22 22:08
6	08:58 09:39-10:17/38 15:47	08:10 08:51-09:11/20 16:52 09:26-10:05/39	07:00 09:33-11:07/94 17:57 07:48-08:02/14	06:34 10:51-11:15/24 20:06 07:52-08:33/41	05:16 21:12	04:21 22:10
7	08:57 09:38-10:16/38 15:48	08:08 10:14-10:29/15 09:25-10:04/39 16:54 08:51-09:08/17	06:57 09:32-11:07/95 18:00 07:44-08:05/21	06:31 07:52-08:31/39 20:08	05:13 21:14	04:21 22:11
8	08:57 09:37-10:16/39 15:50	08:06 10:09-10:36/27 09:26-10:04/38 16:57 08:53-09:06/13	06:55 09:31-11:07/96 18:02 07:41-08:08/27	06:28 07:53-08:31/38 20:11	05:11 21:17	04:20 22:12
9	08:56 09:37-10:17/40 15:52	08:04 10:05-10:39/34 08:55-09:02/7 16:59 09:26-10:03/37	06:52 09:31-11:07/96 18:04 07:38-08:09/31	06:26 07:54-08:29/35 20:13	05:09 21:19	04:19 22:13
10	08:55 09:38-10:17/39 15:53	08:01 09:28-10:43/75 17:01	06:49 09:31-11:07/96 18:06 07:37-08:11/34	06:23 06:49-06:51/2 20:15 07:54-08:27/33	05:07 21:21	04:18 22:14
11	08:54 09:38-10:17/39 15:55	07:59 09:28-10:45/77 17:04	06:46 09:31-11:07/96 18:09 07:36-08:12/36	06:20 06:47-06:53/6 20:17 07:56-08:26/30	05:04 21:23	04:18 22:15
12	08:53 09:38-10:16/38 15:57	07:57 09:29-10:47/78 17:06	06:44 09:30-11:06/96 18:11 07:34-08:13/39	06:17 06:44-06:53/9 20:19 07:57-08:23/26	05:02 21:25	04:17 22:16
13	08:52 09:38-10:16/38 15:59	07:54 09:30-10:50/80 17:08	06:41 09:30-11:06/96 18:13 07:33-08:13/40	06:15 06:41-06:53/12 20:22 07:58-08:20/22	05:00 21:27	04:16 22:17
14	08:51 09:38-10:14/36 16:01	07:52 09:32-10:51/79 17:11 08:21-08:24/3	06:38 09:29-11:05/96 18:15 07:31-08:14/43	06:12 06:39-06:54/15 20:24 08:02-08:18/16	04:58 21:29	04:16 22:18
15	08:50 09:38-10:15/37 16:03	07:49 09:34-10:54/80 17:13 08:19-08:27/8	06:35 09:30-11:05/95 18:18 07:31-08:15/44	06:09 06:36-06:54/18 20:26 08:07-08:11/4	04:56 21:31	04:16 22:18
16	08:48 09:38-10:15/37 16:05	07:47 09:37-10:55/78 17:16 08:16-08:29/13	06:33 09:30-11:04/94 18:20 07:30-08:15/45	06:07 06:36-06:54/18 20:28	04:54 21:33	04:15 22:19
17	08:47 09:38-10:15/37 16:07	07:44 09:40-10:56/76 17:18 08:13-08:29/16	06:30 09:30-11:03/93 18:22 07:29-08:15/46	06:04 06:36-06:53/17 20:30	04:52 21:36	04:15 22:20
18	08:46 09:35-10:16/41 16:09	07:42 09:47-10:58/71 17:20 08:11-08:30/19	06:27 09:29-11:02/93 07:29-08:15/46 18:24 06:53-06:59/6 07:13-07:25/12	06:01 06:36-06:51/15 20:33	04:50 21:38	04:15 22:20
19	08:44 09:32-10:16/44 16:11	07:39 08:08-08:31/23 17:23 09:45-10:59/74	06:24 09:29-11:01/92 07:08-08:14/66 18:26 06:50-07:00/10	05:59 06:37-06:51/14 20:35	04:48 21:40	04:15 22:21
20	08:43 09:31-10:16/45 16:13	07:37 08:06-08:30/24 17:25 09:44-11:00/76	06:21 09:29-11:00/91 07:05-08:14/69 18:29 06:48-07:02/14	05:56 06:38-06:49/11 20:37	04:46 21:41	04:15 22:21
21	08:41 09:29-10:16/47 16:15	07:34 08:03-08:31/28 17:27 09:43-11:01/78	06:19 09:30-10:59/89 07:03-08:14/71 18:31 06:45-07:02/17	05:53 06:41-06:46/5 20:39	04:44 21:43	04:15 22:21
22	08:39 09:28-10:16/48 16:17	07:32 08:00-08:30/30 17:30 09:42-11:02/80	06:16 09:30-10:58/88 18:33 06:44-08:14/90	05:51 20:41	04:42 21:45	04:15 22:21
23	08:38 09:27-10:15/48 16:19	07:29 07:57-08:30/33 17:32 09:40-11:03/83	06:13 09:30-10:56/86 18:35 06:44-08:13/89	05:48 20:44	04:41 21:47	04:15 22:22
24	08:36 09:27-10:15/48 16:22	07:27 07:57-08:29/32 17:34 09:40-11:04/84	06:10 09:31-10:55/84 18:38 06:43-08:12/89	05:45 20:46	04:39 21:49	04:16 22:22
25	08:34 09:26-10:14/48 16:24	07:24 07:57-08:28/31 17:37 09:39-11:04/85	06:07 09:31-10:53/82 18:40 06:43-08:11/88	05:43 20:48	04:37 21:51	04:16 22:22
26	08:33 09:26-10:14/48 16:26 09:07-09:09/2	07:21 07:57-08:26/29 17:39 09:38-11:05/87	06:05 09:31-10:51/80 18:42 06:45-08:10/85	05:40 20:50	04:36 21:53	04:17 22:22
27	08:31 09:26-10:13/47 16:28 09:05-09:10/5	07:19 07:57-08:12/15 08:16-08:23/7 17:41 09:37-11:05/88	06:02 09:33-10:50/77 18:44 06:46-08:09/83	05:38 20:53	04:34 21:54	04:17 22:21
28	08:29 09:03-09:11/8 16:31 09:25-10:11/46	07:16 07:59-08:11/12 17:44 09:37-11:06/89	05:59 09:33-10:48/75 06:54-08:07/73 18:46 06:49-06:53/4	05:35 20:55	04:32 21:56	04:18 22:21
29	08:27 09:00-09:11/11 16:33 09:24-10:07/43		06:56 10:34-11:45/71 19:49 07:53-09:06/73	05:33 20:57	04:31 21:58	04:18 22:21
30	08:25 08:58-09:12/14 16:35 09:24-10:02/38		06:53 10:35-11:42/67 19:51 07:52-09:04/72	05:30 20:59	04:30 21:59	04:19 22:20
31	08:23 08:56-09:13/17 16:38 09:25-10:03/38		06:51 10:37-11:41/64 19:53 07:53-09:02/69		04:28 22:01	
Potential sun hours	227	262	365	429	515	539
Sum of minutes with flicker	1312	2432	4302	964	0	0

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

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

Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 7 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (40  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20	05:09	06:15	07:18	08:56	09:20
2	22:20	21:35	20:17	18:53	16:32	15:37
3	04:21	05:11	06:17	07:21	09:35	08:35
4	22:19	21:33	20:15	18:51	16:30	15:36
5	04:22	05:13	06:19	07:23	09:39	08:36
6	22:19	21:31	20:12	18:48	16:27	15:35
7	04:23	05:15	06:21	07:25	09:45	08:38
8	22:18	21:29	20:09	18:45	16:25	15:34
9	04:24	05:17	06:23	07:27	09:48	08:40
10	22:17	21:26	20:06	18:42	16:23	15:34
11	04:25	05:20	06:26	07:29	09:50	08:41
12	22:17	21:24	20:04	18:40	16:21	15:33
13	04:26	05:22	06:28	07:31	09:51	08:43
14	22:16	21:22	20:01	18:37	16:18	15:32
15	04:27	05:24	06:30	07:34	09:52	08:45
16	22:15	21:19	19:58	18:34	16:16	15:31
17	04:29	05:26	06:32	07:36	09:54	08:46
18	22:14	21:17	19:55	18:31	16:14	15:31
19	04:30	05:28	06:34	07:38	09:56	08:47
20	22:13	21:15	19:52	18:29	16:12	15:30
21	04:32	05:30	06:36	07:40	09:58	08:49
22	22:11	21:12	19:50	18:26	16:10	15:30
23	04:33	05:32	06:38	07:42	09:59	08:50
24	22:10	21:10	19:47	18:23	16:08	15:30
25	04:34	05:34	06:40	07:45	10:00	08:51
26	22:09	21:07	19:44	18:20	16:06	15:29
27	04:36	05:37	06:42	07:47	10:01	08:52
28	22:08	21:05	19:41	18:19	16:04	15:29
29	04:38	05:39	06:45	07:49	10:02	08:53
30	22:06	21:02	19:38	18:15	16:02	15:29
31	04:39	05:41	06:47	07:51	10:03	08:54
32	22:05	21:00	19:36	18:12	16:00	15:29
33	04:41	05:43	06:49	07:53	10:04	08:55
34	22:03	20:57	19:33	18:10	15:58	15:29
35	04:43	05:45	06:51	07:56	10:05	08:56
36	22:02	20:55	19:30	18:07	15:56	15:29
37	04:44	05:47	06:53	07:58	10:06	08:57
38	22:00	20:52	19:27	18:05	15:55	15:29
39	04:46	05:49	06:55	08:00	10:07	08:58
40	21:58	20:50	19:24	18:02	15:53	15:30
41	04:48	05:51	06:57	08:02	10:08	08:58
42	21:57	20:47	19:21	17:59	15:51	15:30
43	04:50	05:54	06:59	08:05	10:09	08:59
44	21:55	20:44	19:19	17:57	15:50	15:31
45	04:52	05:56	07:01	08:07	10:10	09:00
46	21:53	20:42	19:16	17:54	15:48	15:31
47	04:53	05:58	07:04	08:09	10:11	09:00
48	21:51	20:39	19:13	17:52	15:46	15:32
49	04:55	06:00	07:06	08:11	10:12	09:00
50	21:50	20:36	19:10	17:49	15:45	15:32
51	04:57	06:02	07:08	08:14	10:13	09:01
52	21:48	20:34	19:07	17:47	15:44	15:33
53	04:59	06:04	07:10	08:16	10:14	09:01
54	21:46	20:31	19:05	17:44	15:42	15:34
55	05:01	06:06	07:12	08:18	10:15	09:01
56	21:44	20:28	19:02	17:42	15:41	15:35
57	05:03	06:09	07:14	08:21	10:16	09:01
58	21:42	20:26	18:59	17:39	15:40	15:36
59	05:05	06:11	07:16	08:23	10:17	09:01
60	21:40	20:23	18:56	17:37	15:38	15:37
61	05:07	06:13	07:18	08:25	10:18	09:01
62	21:37	20:20	18:53	17:34	15:36	15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	207	3714	3228	1571	967

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

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

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 8 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (38)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June
1	09:00 10:17-10:26/9 15:40	08:21 08:54-09:15/21 16:40	07:13 07:43-08:06/23 17:46	06:48 07:16-07:32/16 19:55	05:28 07:11-07:44/33 21:01	04:27 22:03
2	09:00 10:18-10:27/9 15:41	08:19 08:51-09:15/24 16:42	07:11 07:42-08:06/24 17:48	06:45 07:34-07:36/2 19:57	05:25 07:12-07:41/29 21:04	04:26 22:04
3	09:00 10:19-10:26/7 15:42	08:17 08:49-09:15/26 16:45	07:08 07:40-08:07/27 17:50	06:42 07:11-07:43/32 19:59	05:23 07:14-07:39/25 21:06	04:25 22:06
4	08:59 10:21-10:24/3 15:44	08:15 08:46-09:13/27 16:47	07:05 07:39-08:07/28 17:53	06:39 07:11-07:47/36 20:02	05:20 07:16-07:37/21 21:08	04:23 22:07
5	08:59 15:45	08:13 08:44-09:13/29 16:49	07:03 07:39-08:08/29 17:55	06:37 07:09-07:49/40 20:04	05:18 07:19-07:35/16 21:10	04:22 22:08
6	08:58 15:47	08:10 08:42-09:12/30 16:52	07:00 07:38-08:07/29 17:57	06:34 07:02-07:50/48 20:06	05:16 07:23-07:30/7 21:12	04:21 22:10
7	08:57 15:48	08:08 08:39-09:05/26 16:54	06:57 07:38-08:07/29 18:00	06:31 06:58-07:51/53 20:08	05:13 21:14	04:20 22:11
8	08:57 15:50	08:06 08:37-09:05/28 16:57	06:55 07:37-08:06/29 18:02	06:28 06:56-07:53/57 20:10	05:11 21:17	04:20 22:12
9	08:56 15:51	08:04 08:34-09:03/29 16:59	06:52 07:37-08:06/29 18:04	06:26 06:54-07:53/59 20:13	05:09 21:19	04:19 22:13
10	08:55 09:35-09:36/1 15:53	08:01 08:32-09:01/29 17:01	06:49 07:38-08:05/27 18:06	06:23 06:52-07:53/61 20:15	05:07 21:21	04:18 22:14
11	08:54 09:34-09:37/3 15:55	07:59 08:29-08:58/29 17:04	06:46 07:38-08:04/26 18:09	06:20 06:52-07:54/62 20:17	05:04 21:23	04:17 22:15
12	08:53 09:32-09:38/6 15:57	07:57 08:27-08:54/27 17:06	06:44 07:38-08:03/25 18:11	06:17 06:51-07:54/63 20:19	05:02 21:25	04:17 22:16
13	08:52 09:31-09:39/8 15:59	07:54 08:24-08:50/26 17:08	06:41 07:39-08:01/22 18:13	06:15 06:50-07:54/64 20:22	05:00 21:27	04:16 22:17
14	08:51 09:29-09:39/10 16:01	07:52 08:21-08:49/28 17:11	06:38 07:40-08:00/20 18:15	06:12 06:50-07:55/65 20:24	04:58 21:29	04:16 22:18
15	08:50 09:28-09:40/12 16:03	07:49 08:20-08:50/30 17:13	06:35 07:42-07:58/16 18:18	06:09 06:49-07:55/66 20:26	04:56 21:31	04:16 22:18
16	08:48 09:26-09:40/14 16:05	07:47 08:19-08:49/30 17:16	06:32 07:45-07:54/9 18:20	06:07 06:48-07:54/66 20:28	04:54 21:33	04:15 22:19
17	08:47 09:24-09:40/16 16:07	07:44 08:18-08:49/31 17:18	06:30 18:22	06:04 06:49-07:55/66 20:30	04:52 21:35	04:15 22:20
18	08:46 09:24-09:42/18 16:09	07:42 08:19-08:49/30 17:20	06:27 18:24	06:01 06:49-07:54/65 20:33	04:50 21:37	04:15 22:20
19	08:44 09:24-09:42/18 16:11	07:39 08:18-08:48/30 17:23	06:24 18:26	05:59 06:50-07:54/64 20:35	04:48 21:39	04:15 22:21
20	08:43 09:25-09:42/17 16:13	07:37 08:18-08:46/28 17:25	06:21 18:29	05:56 06:50-07:53/63 20:37	04:46 21:41	04:15 22:21
21	08:41 09:25-09:41/16 16:15	07:34 08:20-08:45/25 17:27	06:19 18:31	05:53 06:51-07:53/62 20:39	04:44 21:43	04:15 22:21
22	08:39 09:26-09:41/15 16:17	07:32 08:20-08:43/23 17:30	06:16 18:33	05:51 06:52-07:52/60 20:41	04:42 21:45	04:15 22:21
23	08:38 09:27-09:41/14 16:19	07:29 08:21-08:37/16 17:32	06:13 18:35	05:48 06:54-07:52/58 20:44	04:41 21:47	04:15 22:22
24	08:36 09:28-09:40/12 16:22	07:27 08:23-08:36/13 17:34	06:10 18:37	05:45 07:06-07:51/45 20:46	04:39 21:49	04:16 22:22
25	08:34 09:29-09:40/11 16:24	07:24 08:26-08:32/6 17:37	06:07 18:40	05:43 07:07-07:51/44 20:48	04:37 21:51	04:16 22:22
26	08:33 09:31-09:38/7 16:26	07:21 07:50-08:00/10 17:39	06:05 18:42	05:40 07:07-07:49/42 20:50	04:36 21:53	04:17 22:22
27	08:31 09:05-09:13/8 16:28	07:19 07:47-08:02/15 17:41	06:02 18:44	05:38 07:08-07:48/40 20:52	04:34 21:54	04:17 22:21
28	08:29 09:03-09:14/11 16:31	07:16 07:45-08:05/20 17:44	05:59 18:46	05:35 07:09-07:48/39 20:55	04:32 21:56	04:18 22:21
29	08:27 09:00-09:14/14 16:33		06:56 19:48	05:33 07:09-07:46/37 20:57	04:31 21:58	04:18 22:21
30	08:25 08:58-09:14/16 16:35		06:53 19:51	05:30 07:10-07:45/35 20:59	04:30 21:59	04:19 22:20
31	08:23 08:56-09:15/19 16:38		06:51 07:19-07:30/11 19:53		04:28 22:01	
Potential sun hours	227	262	365	429	515	539
Sum of minutes with flicker	301	687	514	1538	131	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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

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Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 8 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (38)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 21:35	06:15 20:17	07:18 18:53	08:02 16:32	09:16 15:37
2	04:21 22:19	05:11 21:33	06:17 20:15	07:21 18:51	08:04 16:30	09:18 15:36
3	04:22 22:19	05:13 21:31	06:19 20:12	07:23 18:48	08:07 16:27	09:35 15:35
4	04:23 22:18	05:15 21:29	06:21 20:09	07:25 18:45	08:09 16:25	09:38 15:34
5	04:24 22:17	05:17 21:26	06:23 20:06	07:27 18:42	08:12 16:23	09:40 15:34
6	04:25 22:17	05:20 21:24	06:25 20:04	07:29 18:40	08:14 16:21	09:43 15:33
7	04:26 22:16	05:22 21:22	06:28 20:01	07:31 18:37	08:17 16:18	09:44 15:32
8	04:27 22:15	05:24 21:19	06:30 19:58	07:34 18:34	08:14 16:16	09:45 15:31
9	04:29 22:14	05:26 21:17	06:32 19:55	07:36 18:31	08:22 16:14	09:46 15:31
10	04:30 22:13	05:28 21:15	06:34 19:52	07:38 18:29	08:25 16:12	09:47 15:30
11	04:31 22:11	05:30 21:12	06:36 19:50	07:40 18:26	08:27 16:10	09:48 15:30
12	04:33 22:10	05:32 21:10	06:38 19:47	07:42 18:23	08:30 16:08	09:49 15:30
13	04:34 22:09	05:34 21:07	06:40 19:44	07:45 18:20	08:32 16:06	09:51 15:29
14	04:36 22:08	05:36 21:05	06:42 19:41	07:47 18:18	08:35 16:04	09:52 15:29
15	04:38 22:06	05:39 21:02	06:44 19:38	07:49 18:15	08:38 16:02	09:53 15:29
16	04:39 22:05	05:41 21:00	06:47 19:36	07:51 18:12	08:40 16:00	09:54 15:29
17	04:41 22:03	05:43 20:57	06:49 19:33	07:53 18:10	08:43 15:58	09:55 15:29
18	04:42 22:02	05:45 20:55	06:51 19:30	07:56 18:07	08:46 15:56	09:56 15:29
19	04:44 22:00	05:47 20:52	06:53 19:27	07:58 18:05	08:49 15:54	09:57 15:29
20	04:46 21:58	05:49 20:49	06:55 19:24	08:00 18:02	08:51 15:53	09:58 15:30
21	04:48 21:57	05:51 20:47	06:57 19:21	08:02 17:59	08:54 15:51	09:59 15:30
22	04:50 21:55	05:54 20:44	06:59 19:19	08:05 17:57	08:57 15:49	10:00 15:30
23	04:51 21:53	05:56 20:42	07:01 19:16	08:07 17:54	08:59 15:48	10:01 15:31
24	04:53 21:51	05:58 20:39	07:03 19:13	08:09 17:52	09:01 15:46	10:02 15:32
25	04:55 21:50	06:00 20:36	07:06 19:10	08:11 17:49	09:02 15:45	10:03 15:32
26	04:57 21:48	06:02 20:34	07:08 19:07	08:14 17:47	09:05 15:44	10:04 15:33
27	04:59 21:46	06:04 20:31	07:10 19:05	08:16 17:44	09:07 15:42	10:05 15:34
28	05:01 21:44	06:06 20:28	07:12 19:02	08:18 17:42	09:09 15:41	10:06 15:35
29	05:03 21:42	06:08 20:26	07:14 18:59	08:21 17:39	09:11 15:40	10:07 15:36
30	05:05 21:40	06:11 20:23	07:16 18:56	08:23 17:37	09:13 15:38	10:08 15:37
31	05:07 21:37	06:13 20:20	07:18 18:54	08:25 17:35	09:15 15:36	10:09 15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	1205	576	859	541	287

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 9 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (30)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April		May		June	
1	09:00	11:56-12:16/20	08:21	15:52-16:03/11	07:13	07:47-08:04/17	06:48	07:18-07:45/27	05:28	05:59-06:30/31	04:27	05:52-06:10/18
	15:39		16:40		17:46		19:55		21:01		22:03	
2	09:00	11:57-12:17/20	08:19	15:52-16:06/14	07:11	07:48-08:00/12	06:45	07:18-07:44/26	05:25	05:55-06:30/35	04:26	05:53-06:10/17
	15:41		16:42		17:48		19:57		21:04		22:04	
3	09:00	11:58-12:16/18	08:17	15:52-16:09/17	07:08	07:51-07:56/5	06:42	07:17-07:43/26	05:23	05:52-06:28/36	04:24	05:54-06:09/15
	15:42		16:45		17:50		19:59		21:06		22:06	
4	08:59	11:59-12:16/17	08:15	15:52-16:10/18	07:05	07:33-07:34/1	06:39	07:18-07:43/25	05:20	05:51-06:27/36	04:23	05:56-06:09/13
	15:43		16:47		17:53		20:02		21:08		22:07	
5	08:59	12:00-12:15/15	08:13	08:44-08:48/4	07:03	07:30-07:36/6	06:37	07:18-07:41/23	05:18	05:50-06:25/35	04:22	05:57-06:08/11
	15:45		16:49	15:52-16:11/19	17:55		20:04		21:10		22:08	
6	08:58	12:01-12:15/14	08:10	08:42-08:49/7	07:00	07:27-07:37/10	06:34	07:18-07:39/21	05:16	05:48-06:23/35	04:21	05:58-06:06/8
	15:46		16:52	15:52-16:10/18	17:57		20:06		21:12		22:10	
7	08:57	12:03-12:14/11	08:08	08:39-08:49/10	06:57	07:24-07:38/14	06:31	07:19-07:37/18	05:13	05:48-06:17/29	04:20	
	15:48		16:54	15:53-16:10/17	18:00		20:08		21:14		22:11	
8	08:57	12:05-12:13/8	08:06	08:37-08:50/13	06:55	07:21-07:38/17	06:28	07:21-07:36/15	05:11	05:47-06:16/29	04:20	
	15:50		16:57	15:53-16:09/16	18:02		20:10		21:17		22:12	
9	08:56		08:04	08:34-08:50/16	06:52	07:18-07:38/20	06:26	07:23-07:33/10	05:09	05:45-06:15/30	04:19	
	15:51		16:59	15:55-16:09/14	18:04		20:13		21:19		22:13	
10	08:55		08:01	08:33-08:50/17	06:49	07:16-07:39/23	06:23		05:07	05:45-06:15/30	04:18	
	15:53		17:01	15:56-16:07/11	18:06		20:15		21:21		22:14	
11	08:54	09:34-09:35/1	07:59	08:33-08:50/17	06:46	07:13-07:38/25	06:20		05:04	05:44-06:16/32	04:17	
	15:55		17:04	16:00-16:05/5	18:09		20:17		21:23		22:15	
12	08:53	09:32-09:36/4	07:57	08:34-08:50/16	06:44	07:11-07:38/27	06:17		05:02	05:45-06:17/32	04:17	
	15:57		17:06		18:11		20:19		21:25		22:16	
13	08:52	09:31-09:37/6	07:54	08:34-08:48/14	06:41	07:11-07:37/26	06:15		05:00	05:45-06:17/32	04:16	
	15:59		17:08		18:13		20:21		21:27		22:17	
14	08:51	09:29-09:38/9	07:52	08:35-08:46/11	06:38	07:10-07:35/25	06:12		04:58	05:44-06:17/33	04:16	
	16:01		17:11		18:15		20:24		21:29		22:18	
15	08:50	09:28-09:39/11	07:49	08:39-08:44/5	06:35	07:12-07:35/23	06:09		04:56	05:44-06:17/33	04:16	
	16:03		17:13		18:18		20:26		21:31		22:18	
16	08:48	09:26-09:39/13	07:47	08:16-08:18/2	06:32	07:12-07:32/20	06:06		04:54	05:44-06:17/33	04:15	
	16:05		17:16		18:20		20:28		21:33		22:19	
17	08:47	09:24-09:40/16	07:44	08:13-08:18/5	06:30	07:13-07:27/14	06:04		04:52	05:44-06:16/32	04:15	
	16:07		17:18		18:22		20:30		21:35		22:20	
18	08:46	09:23-09:41/18	07:42	08:11-08:20/9	06:27	07:15-07:24/9	06:01		04:50	05:45-06:17/32	04:15	
	16:09		17:20		18:24		20:33		21:38		22:20	
19	08:44	09:22-09:41/19	07:39	08:08-08:20/12	06:24		05:58		04:48	05:45-06:16/31	04:15	
	16:11		17:23		18:26		20:35		21:39		22:21	
20	08:43	09:22-09:41/19	07:37	08:05-08:20/15	06:21	17:58-17:59/1	05:56	06:23-06:26/3	04:46	05:44-06:16/32	04:15	
	16:13		17:25		18:29		20:37		21:41		22:21	
21	08:41	09:22-09:42/20	07:34	08:03-08:20/17	06:18	17:56-18:01/5	05:53	06:21-06:29/8	04:44	05:45-06:16/31	04:15	
	16:15		17:27		18:31		20:39		21:43		22:21	
22	08:39	09:23-09:42/19	07:32	08:00-08:19/19	06:16	17:56-18:04/8	05:51	06:18-06:30/12	04:42	05:45-06:15/30	04:15	
	16:17		17:30		18:33		20:41		21:45		22:21	
23	08:38	09:23-09:42/19	07:29	07:57-08:18/21	06:13	17:55-18:06/11	05:48	06:16-06:31/15	04:40	05:46-06:16/30	04:15	
	16:19		17:32		18:35		20:44		21:47		22:22	
24	08:36	09:24-09:42/18	07:27	07:55-08:18/23	06:10	06:36-06:39/3	05:45	06:13-06:31/18	04:39	05:46-06:15/29	04:16	
	16:22		17:34		18:37	17:54-18:08/14	20:46		21:49		22:22	
25	08:34	09:25-09:42/17	07:24	07:52-08:16/24	06:07	06:33-06:42/9	05:43	06:11-06:32/21	04:37	05:47-06:15/28	04:16	
	16:24		17:37		18:40	17:54-18:10/16	20:48		21:51		22:22	
26	08:33	09:26-09:41/15	07:21	07:49-08:12/23	06:05	06:31-06:44/13	05:40	06:08-06:31/23	04:35	05:47-06:14/27	04:17	
	16:26		17:39		18:42	17:54-18:10/16	20:50		21:53		22:22	
27	08:31	09:27-09:41/14	07:19	07:46-08:08/22	06:02	06:28-06:45/17	05:38	06:06-06:31/25	04:34	05:48-06:14/26	04:17	
	16:28		17:41		18:44	17:55-18:08/13	20:52		21:54		22:21	
28	08:29	09:29-09:40/11	07:16	07:47-08:07/20	05:59	06:25-06:45/20	05:35	06:04-06:32/28	04:32	05:49-06:13/24	04:18	
	16:31		17:44		18:46	17:56-18:07/11	20:55		21:56		22:21	
29	08:27	09:30-09:37/7			06:56	07:22-07:45/23	05:33	06:01-06:31/30	04:31	05:50-06:13/23	04:18	
	16:33	15:54-15:55/1			19:48	18:59-19:04/5	20:57		21:58		22:21	
30	08:25	15:54-15:58/4			06:53	07:19-07:45/26	05:30	05:59-06:31/32	04:30	05:51-06:13/22	04:19	
	16:35				19:51		20:59		21:59		22:20	
31	08:23	15:53-16:01/8			06:51	07:19-07:46/27			04:28	05:51-06:11/20		
	16:38				19:53				22:01			
Potential sun hours	227		262		365		429		515		539	
Sum of minutes with flicker	392		502		532		406		938		82	

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

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

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

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0037167242411

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Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 9 - Siemens Gamesa SG 7.0-170 7000 170.0 !OI hub: 165.0 m (TOT: 250.0 m) (30)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20	05:09 05:55-06:27/32	06:15	07:18 07:50-08:17/27	07:28 08:02-08:20/18	08:33 09:16-09:17/1
2	22:20	21:35	20:17	18:53	16:32 15:25-15:37/12	15:37
3	04:21	05:11 05:56-06:27/31	06:17	07:21 07:50-08:16/26	07:30 08:04-08:19/15	08:35
4	22:19	21:33	20:15	18:51	16:30 15:24-15:39/15	15:36
5	04:22	05:13 05:55-06:25/30	06:19 07:21-07:31/10	07:23 07:52-08:16/24	07:32 08:07-08:20/13	08:36
6	22:19	21:31	20:12	18:48	16:27 15:23-15:39/16	15:35
7	04:23	05:15 05:56-06:25/29	06:21 07:18-07:33/15	07:25 07:55-08:16/21	07:34 08:09-08:19/10	08:38 11:51-11:57/6
8	22:18	21:29	20:09	18:45	16:25 15:23-15:40/17	15:34
9	04:24	05:17 05:56-06:26/30	06:23 07:16-07:34/18	07:27 07:57-08:16/19	07:37 08:12-08:19/7	08:40 11:48-11:59/11
10	22:17	21:26	20:06	18:42	16:23 15:23-15:41/18	15:33
11	04:25 06:06-06:11/5	05:19 05:57-06:27/30	06:25 07:15-07:35/20	07:29 07:59-08:14/15	07:39 08:14-08:18/4	08:41 11:47-12:01/14
12	22:17	21:24	20:04	18:40	16:20 15:22-15:41/19	15:33
13	04:26 06:04-06:13/9	05:22 05:58-06:33/35	06:28 07:13-07:36/23	07:31 08:01-08:13/12	07:41 15:22-15:41/19	08:43 11:47-12:03/16
14	22:16	21:22	20:01	18:37	16:18	15:32
15	04:27 06:03-06:15/12	05:24 05:59-06:35/36	06:30 07:12-07:37/25	07:34 08:04-08:12/8	07:44 15:22-15:38/16	08:45 11:47-12:04/17
16	22:15	21:19	19:58	18:34	16:16	15:31
17	04:29 06:02-06:16/14	05:26 06:01-06:37/36	06:32 07:12-07:37/25	07:36 08:06-08:10/4	07:46 15:23-15:37/14	08:46 11:46-12:04/18
18	22:14	21:17	19:55	18:31	16:14	15:31
19	04:30 06:01-06:17/16	05:28 06:02-06:38/36	06:34 07:11-07:37/26	07:38	07:48 15:23-15:34/11	08:47 11:46-12:06/20
20	22:13	21:15	19:52	18:29	16:12	15:30
21	04:31 06:01-06:19/18	05:30 06:05-06:38/33	06:36 07:11-07:37/26	07:40 08:24-08:32/8	07:51 15:24-15:32/8	08:49 11:46-12:06/20
22	22:11	21:12	19:50	18:26	16:10	15:30
23	04:33 06:00-06:19/19	05:32 06:07-06:39/32	06:38 07:10-07:37/27	07:42 08:22-08:36/14	07:53 15:25-15:30/5	08:50 11:46-12:08/22
24	22:10	21:10	19:47	18:23	16:08	15:30
25	04:34 05:59-06:20/21	05:34 06:08-06:39/31	06:40 07:10-07:36/26	07:45 08:20-08:39/19	07:55 09:02-09:09/7	08:51 11:46-12:08/22
26	22:09	21:07	19:44	18:20	16:06 15:26-15:27/1	15:29
27	04:36 05:59-06:21/22	05:36 06:10-06:39/29	06:42 07:12-07:36/24	07:47 08:19-08:40/21	07:57 09:00-09:12/12	08:52 11:46-12:09/23
28	22:08	21:05	19:41 18:50-18:53/3	18:18	16:04	15:29
29	04:37 05:58-06:22/24	05:39 06:12-06:39/27	06:44 07:14-07:35/21	07:49 08:20-08:41/21	08:00 09:00-09:14/14	08:53 11:47-12:10/23
30	22:06	21:02	19:38 18:46-18:56/10	18:15	16:02	15:29
31	04:39 05:58-06:23/25	05:41 06:14-06:39/25	06:47 07:16-07:33/17	07:51 08:22-08:46/24	08:02 08:58-09:14/16	08:54 10:51-10:55/4
32	22:05	21:00	19:36 18:44-18:58/14	18:12	16:00	15:29 11:47-12:11/24
33	04:41 05:57-06:23/26	05:43 06:16-06:39/23	06:49 07:18-07:32/14	07:53 08:25-08:49/24	08:04 08:58-09:16/18	08:55 10:51-10:57/6
34	22:03	20:57	19:33 18:43-18:58/15	18:10	15:58	15:29 11:48-12:11/23
35	04:42 05:57-06:24/27	05:45 06:18-06:38/20	06:51 07:20-07:30/10	07:56 08:27-08:50/23	08:06 08:58-09:16/18	08:56 10:51-10:58/7
36	22:02	20:55	19:30 18:42-18:58/16	18:07	15:56	15:29 11:47-12:11/24
37	04:44 05:56-06:24/28	05:47 06:20-06:37/17	06:53 07:23-07:28/5	07:58 08:29-08:50/21	08:08 08:58-09:17/19	08:57 10:50-10:58/8 11:48-12:12/24
38	22:00	20:52	19:27 18:41-18:56/15	18:04	15:54	15:29 11:03-11:06/3
39	04:46 05:56-06:25/29	05:49 06:22-06:36/14	06:55 18:41-18:53/12	08:00 08:32-08:51/19	08:11 08:58-09:17/19	08:58 10:51-10:59/8 11:49-12:13/24
40	21:58	20:49	19:24	18:02	15:53	15:30 11:03-11:07/4
41	04:48 05:55-06:25/30	05:51 06:24-06:35/11	06:57 18:40-18:50/10	08:02 08:34-08:50/16	08:13 08:58-09:18/20	08:58 10:52-11:00/8 11:49-12:14/25
42	21:57	20:47	19:21	17:59	15:51	15:30 11:04-11:09/5
43	04:50 05:55-06:26/31	05:54 06:26-06:33/7	06:59 18:42-18:48/6	08:05 08:37-08:51/14	08:15 08:58-09:18/20	08:59 10:51-11:00/9 11:49-12:14/25
44	21:55	20:44	19:19	17:57	15:49	15:30 11:04-11:09/5
45	04:51 05:56-06:27/31	05:56 06:28-06:30/2	07:01 18:42-18:45/3	08:07 08:39-08:50/11	08:17 08:58-09:17/19	08:59 10:52-11:00/8 11:49-12:14/25
46	21:53	20:42	19:16	17:54	15:48	15:31 11:04-11:08/4
47	04:53 05:55-06:26/31	05:58	07:03	08:09 08:41-08:49/8	08:19 09:00-09:18/18	09:00 10:53-11:01/8 11:51-12:15/24
48	21:51	20:39	19:13	17:52	15:46	15:32 11:06-11:09/3
49	04:55 05:55-06:27/32	06:00	07:06 07:58-08:06/8	07:11 07:44-07:48/4	08:21 09:02-09:18/16	09:00 10:54-11:01/7 11:51-12:15/24
50	21:50	20:36	19:10	16:49	15:45	15:32 11:07-11:09/2
51	04:57 05:55-06:27/32	06:02	07:08 07:55-08:08/13	07:14 07:46-07:47/1	08:23 09:05-09:18/13	09:01 10:54-11:01/7
52	21:48	20:34	19:07	16:47	15:43	15:33 11:52-12:15/23
53	04:59 05:55-06:27/32	06:04	07:10 07:53-08:12/19	07:16 08:07-08:15/8	08:25 09:07-09:18/11	09:01 10:55-11:01/6
54	21:46	20:31	19:05	16:44	15:42	15:34 11:52-12:16/24
55	05:01 05:54-06:27/33	06:06	07:12 07:53-08:15/22	07:18 08:05-08:16/11	08:27 09:09-09:18/9	09:01 10:57-11:00/3
56	21:44	20:28	19:02	16:42	15:41	15:35 11:53-12:16/23
57	05:03 05:54-06:27/33	06:08	07:14 07:52-08:16/24	07:21 08:04-08:18/14	08:29 09:11-09:17/6	09:01 11:54-12:17/23
58	21:42	20:26	18:59	16:39	15:40	15:36
59	05:05 05:55-06:27/32	06:11	07:16 07:51-08:16/25	07:23 08:02-08:18/16	08:31 09:13-09:17/4	09:01 11:54-12:16/22
60	21:40	20:23	18:56	16:37	15:38	15:37
61	05:07 05:55-06:27/32	06:13		07:25 08:02-08:19/17		09:01 11:55-12:17/22
62	21:37	20:20		16:34 15:28-15:35/7		15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	644	596	547	477	497	707

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 10 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (32)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:00 15:39 09:00 15:41	08:21 16:40 08:19 16:42	07:13 07:43-08:02/19 17:46 07:11 07:43-08:01/18 17:48	06:48 19:20-19:26/6 19:55 06:45 19:18-19:28/10 19:57	05:28 21:01 05:25 21:03	04:27 22:03 04:26 22:04	04:20 22:20 04:21 22:19	05:09 21:35 05:11 21:33	06:15 20:17 06:17 20:15	07:18 07:48-08:00/12 18:53 07:21 07:50-07:57/7 18:51	07:27 16:32 07:30 16:30	08:33 15:37 08:35 15:36
3	09:00 15:42	08:17 16:45	07:08 07:43-08:00/17 17:50	06:42 19:17-19:30/13 19:59	05:23 21:06	04:24 22:05	04:22 22:19	05:13 21:31	06:19 19:19-19:24/5 20:12	07:23 18:48	07:32 16:27	08:36 15:35
4	08:59 15:44	08:15 16:47	07:05 07:44-07:58/14 17:53	06:39 19:17-19:32/15 20:02	05:20 21:08	04:23 22:07	04:23 22:18	05:15 21:29	06:21 19:17-19:27/10 20:09	07:25 18:45	07:34 16:25	08:38 15:34
5	08:59 15:45	08:12 16:49	07:03 07:46-07:57/11 17:55	06:37 19:17-19:34/17 20:04	05:18 21:10	04:22 22:17	04:24 22:16	05:17 21:26	06:23 19:15-19:28/13 20:06	07:27 18:42	07:37 16:23	08:40 15:33
6	08:58 15:47	08:10 16:52	07:00 07:49-07:53/4 17:57	06:34 19:17-19:33/16 20:06	05:16 21:12	04:21 22:10	04:25 22:16	05:19 21:24	06:25 19:14-19:29/15 20:03	07:29 18:39	07:39 16:20	08:41 15:33
7	08:57 15:48	08:08 16:54	06:57 18:00	06:31 19:18-19:31/13 20:08	05:13 21:14	04:20 22:11	04:26 22:12	05:22 21:22	06:28 19:13-19:29/16 20:01	07:31 18:37	07:41 16:18	08:43 15:32
8	08:57 15:50	08:06 16:57	06:55 18:02	06:28 19:19-19:29/10 20:10	05:11 21:17	04:20 22:12	04:27 22:15	05:24 21:19	06:30 19:12-19:27/15 19:58	07:34 08:22-08:31/9 18:34	07:44 16:16	08:44 15:31
9	08:56 15:51	08:04 16:59	06:52 18:04	06:26 19:22-19:27/5 20:13	05:09 21:19	04:19 22:13	04:29 22:14	05:26 21:17	06:32 19:12-19:24/12 19:55	07:36 08:20-08:33/13 18:31	07:46 16:14	08:46 15:31
10	08:55 15:53	08:01 17:01	06:49 18:06	06:23 20:15	05:07 21:21	04:18 22:14	04:30 22:13	05:28 21:15	06:34 19:12-19:21/9 19:52	07:38 08:18-08:33/15 18:29	07:48 16:12	08:47 15:30
11	08:54 15:55	07:59 17:04	06:46 07:13-07:16/3 18:09	06:20 20:17	05:04 21:23	04:17 22:15	04:31 22:11	05:30 21:12	06:36 19:12-19:19/7 19:50	07:40 08:17-08:34/17 18:26	07:50 16:10	08:49 15:30
12	08:53 15:57	07:57 17:06	06:44 07:10-07:20/10 18:11	06:17 20:19	05:02 21:25	04:17 22:16	04:33 22:10	05:32 21:10	06:38 07:29-07:32/3 19:47	07:42 08:17-08:35/18 18:23	07:53 16:08	08:50 15:30
13	08:52 15:59	07:54 17:08	06:41 07:07-07:21/14 18:13	06:15 20:21	05:00 21:27	04:16 22:17	04:34 22:09	05:34 21:07	06:40 07:25-07:36/11 19:44	07:44 08:16-08:35/19 18:20	07:55 16:06	08:51 15:29
14	08:51 16:01	07:52 17:11	06:38 07:04-07:22/18 18:15	06:12 20:24	04:59 21:28	04:16 22:18	04:36 22:08	05:36 21:05	06:42 07:23-07:37/14 19:41	07:47 08:17-08:34/17 18:18	07:57 16:04	08:52 15:29
15	08:49 16:03	07:49 17:13	06:35 07:02-07:24/22 18:18	06:09 20:26	04:56 21:31	04:16 22:18	04:37 22:06	05:39 21:02	06:44 07:22-07:38/16 19:38	07:49 08:20-08:35/15 18:15	08:00 16:02	08:53 15:29
16	08:48 16:05	07:47 17:16	06:32 06:59-07:24/25 18:20	06:06 20:28	04:54 21:33	04:15 22:19	04:39 22:05	05:41 21:00	06:47 07:21-07:38/17 19:35	07:51 08:22-08:34/12 18:12	08:02 16:00	08:54 15:29
17	08:47 16:07	07:44 16:44-16:45/1 17:18	06:30 06:56-07:24/28 18:22	06:04 20:30	04:52 21:35	04:15 22:20	04:41 22:03	05:43 20:57	06:49 07:53-08:01/8 19:33	07:53 08:24-08:32/8 18:10	08:04 15:58	08:55 15:29
18	08:45 16:09	07:42 16:44-16:49/5 17:20	06:27 06:53-07:24/31 18:24	06:01 20:33	04:50 21:37	04:15 22:20	04:42 22:02	05:45 20:55	06:51 07:49-08:04/15 19:30	07:56 08:27-08:32/5 18:07	08:06 15:56	08:56 15:29
19	08:44 16:11	07:39 16:42-16:51/9 17:23	06:24 06:50-07:24/34 18:26	05:58 20:35	04:48 21:39	04:15 22:21	04:44 22:00	05:47 20:52	06:53 07:23-08:05/42 19:27	07:58 17:12-17:30/18 18:04	08:08 15:54	08:57 15:29
20	08:43 16:13	07:37 16:41-16:53/12 17:25	06:21 06:47-07:23/36 18:29	05:56 20:37	04:46 21:41	04:15 22:21	04:46 21:58	05:49 20:49	06:55 07:25-08:07/42 19:24	08:00 17:11-17:28/17 18:02	08:11 15:53	08:58 15:30
21	08:41 16:15	07:34 16:40-16:55/15 17:27	06:18 06:45-07:23/38 18:31	05:53 20:39	04:44 21:43	04:15 22:21	04:48 21:57	05:51 20:47	06:57 07:27-08:07/40 19:21	08:02 17:12-17:26/14 17:59	08:13 15:51	08:58 15:30
22	08:39 16:17	07:32 16:41-16:58/17 17:30	06:16 06:42-07:22/40 18:33	05:51 20:41	04:42 21:45	04:15 22:21	04:50 21:55	05:54 20:44	06:59 07:29-08:08/39 19:19	08:05 17:12-17:22/10 17:57	08:15 15:49	08:59 15:30
23	08:38 16:19	07:29 07:57-07:59/2 17:32	06:13 06:39-07:21/42 18:35	05:48 20:44	04:41 21:47	04:15 22:22	04:51 21:53	05:56 20:42	07:01 07:31-08:08/37 19:16	08:07 17:13-17:20/7 17:54	08:17 15:48	08:59 15:31
24	08:36 16:22	07:27 07:55-08:01/6 17:34	06:10 06:36-07:19/43 18:37	05:45 20:46	04:39 21:49	04:16 22:22	04:53 21:51	05:58 20:39	07:03 07:33-08:07/34 19:13	08:09 17:13-17:17/4 17:52	08:19 15:46	09:00 15:32
25	08:34 16:24	07:24 07:52-08:02/10 17:37	06:07 07:01-07:17/16 18:40	05:43 20:48	04:37 21:51	04:16 22:22	04:55 21:49	06:00 20:36	07:06 07:35-08:07/32 19:10	07:11 16:49	08:21 15:45	09:00 15:32
26	08:33 16:26	07:21 07:49-08:02/13 17:39	06:04 07:03-07:14/11 18:42	05:40 20:50	04:35 21:53	04:17 22:21	04:57 21:48	06:02 20:34	07:08 07:37-08:06/29 19:07	07:14 16:47	08:23 15:43	09:00 15:33
27	08:31 16:28	07:19 07:46-08:02/16 17:41	06:02 06:32-06:49/17 18:44	05:38 20:52	04:34 21:54	04:17 22:21	04:59 21:46	06:04 20:31	07:10 07:39-08:05/26 19:05	07:16 16:44	08:25 15:42	09:01 15:34
28	08:29 16:31	07:16 07:44-08:02/18 17:44	05:59 06:32-06:48/16 18:46	05:35 20:55	04:32 21:56	04:18 22:21	05:01 21:44	06:06 20:28	07:12 07:43-08:05/22 19:02	07:18 16:42	08:27 15:41	09:01 15:35
29	08:27 16:33		06:56 07:33-07:47/14 19:48	05:33 20:57	04:31 21:58	04:18 22:21	05:03 21:42	06:08 20:25	07:14 07:44-08:04/20 18:59	07:21 16:39	08:29 15:40	09:01 15:36
30	08:25 16:35		06:53 07:34-07:45/11 19:51	05:30 20:59	04:30 21:59	04:19 22:20	05:05 21:39	06:11 20:23	07:16 07:46-08:02/16 18:56	07:23 16:37	08:31 15:38	09:01 15:37
31	08:23 16:38		06:50 07:37-07:42/5 19:53	05:28 20:59	04:28 22:01		05:07 21:37	06:13 20:20		07:25 16:34		09:01 15:38
Potential sun hours	227	262	365	429	515	539	538	474	386	321	241	207
Sum of minutes with flicker	0	206	613	105	0	0	0	0	621	307	0	0

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

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

Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 11 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (39)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April	May	June
1	09:00	13:18-13:29/11	08:21	15:32-16:03/31	07:13	16:16-16:56/40	06:48	05:28	04:27
	15:39		16:40		17:46		19:55	21:01	22:02
2	09:00	13:20-13:28/8	08:19	15:33-16:06/33	07:11	16:15-16:56/41	06:45	05:25	04:26
	15:41		16:42		17:48		19:57	21:03	22:04
3	08:59	13:22-13:28/6	08:17	15:35-15:42/7	07:08	16:15-16:56/41	06:42	05:23	04:24
	15:42		16:45	15:45-16:08/23	17:50		19:59	21:06	22:05
4	08:59		08:15	15:48-16:11/23	07:05	16:14-16:56/42	06:39	05:20	04:23
	15:43		16:47		17:53		20:02	21:08	22:07
5	08:58		08:12	15:52-16:14/22	07:03	16:14-16:55/41	06:36	05:18	04:22
	15:45		16:49		17:55		20:04	21:10	22:08
6	08:58		08:10	15:54-16:16/22	07:00	16:14-16:56/42	06:34	05:16	04:21
	15:46		16:52		17:57		20:06	21:12	22:09
7	08:57	15:01-15:03/2	08:08	15:57-16:20/23	06:57	16:14-16:56/42	06:31	05:13	04:20
	15:48		16:54		17:59		20:08	21:14	22:11
8	08:56	15:01-15:05/4	08:06	15:56-16:22/26	06:54	16:14-16:55/41	06:28	05:11	04:20
	15:50		16:56		18:02		20:10	21:16	22:12
9	08:56	15:02-15:07/5	08:03	15:56-16:25/29	06:52	16:14-16:54/40	06:25	05:09	04:19
	15:51		16:59		18:04		20:13	21:19	22:13
10	08:55	15:02-15:09/7	08:01	15:55-16:27/32	06:49	16:14-16:53/39	06:23	05:06	04:18
	15:53		17:01		18:06		20:15	21:21	22:14
11	08:54	15:02-15:11/9	07:59	15:56-16:30/34	06:46	16:15-16:53/38	06:20	05:04	04:17
	15:55		17:04		18:08		20:17	21:23	22:15
12	08:53	15:02-15:13/11	07:56	15:55-16:32/37	06:43	16:16-16:52/36	06:17	05:02	04:17
	15:57		17:06		18:11	17:35-17:42/7	20:19	21:25	22:16
13	08:52	15:02-15:15/13	07:54	15:56-16:36/40	06:41	16:16-16:50/34	06:15	05:00	04:16
	15:59		17:08		18:13	17:32-17:44/12	20:21	21:27	22:17
14	08:51	15:03-15:18/15	07:52	15:56-16:37/41	06:38	16:17-16:49/32	06:12	04:58	04:16
	16:01		17:11		18:15	17:30-17:46/16	20:24	21:29	22:18
15	08:49	15:03-15:20/17	07:49	15:56-16:37/41	06:35	16:18-16:47/29	06:09	04:56	04:16
	16:02		17:13		18:17	17:28-17:48/20	20:26	21:31	22:18
16	08:48	15:04-15:23/19	07:47	15:58-16:37/39	06:32	16:20-16:44/24	06:06	04:54	04:15
	16:04		17:15		18:20	17:27-17:50/23	20:28	21:33	22:19
17	08:47	15:05-15:25/20	07:44	15:58-16:36/38	06:30	16:23-16:42/19	06:04	04:52	04:15
	16:06		17:18		18:22	17:27-17:52/25	20:30	21:35	22:19
18	08:45	15:05-15:27/22	07:42	15:59-16:35/36	06:27	16:27-16:38/11	06:01	04:50	04:15
	16:09		17:20		18:24	17:26-17:52/26	20:32	21:37	22:20
19	08:44	15:06-15:29/23	07:39	16:02-16:34/32	06:24	17:25-17:52/27	05:58	04:48	04:15
	16:11		17:22		18:26		20:35	21:39	22:20
20	08:42	15:07-15:33/26	07:37	16:04-16:42/38	06:21	17:25-17:51/26	05:56	04:46	04:15
	16:13		17:25		18:28		20:37	21:41	22:21
21	08:41	15:09-15:35/26	07:34	16:23-16:46/23	06:18	17:25-17:51/26	05:53	04:44	04:15
	16:15		17:27	16:07-16:22/15	18:31		20:39	21:43	22:21
22	08:39	15:10-15:37/27	07:32	16:25-16:49/24	06:16	17:25-17:50/25	05:50	04:42	04:15
	16:17		17:30	16:11-16:20/9	18:33		20:41	21:45	22:21
23	08:38	15:13-15:40/27	07:29	16:23-16:50/27	06:13	17:26-17:49/23	05:48	04:40	04:15
	16:19		17:32		18:35		20:43	21:47	22:21
24	08:36	15:17-15:43/26	07:26	16:21-16:51/30	06:10	17:26-17:48/22	05:45	04:39	04:16
	16:22		17:34		18:37		20:46	21:49	22:21
25	08:34	15:20-15:45/25	07:24	16:20-16:53/33	06:07	17:27-17:46/19	05:43	04:37	04:16
	16:24		17:36		18:40		20:48	21:51	22:21
26	08:32	15:23-15:48/25	07:21	16:19-16:54/35	06:04	17:28-17:44/16	05:40	04:35	04:17
	16:26		17:39		18:42		20:50	21:52	22:21
27	08:31	15:28-15:50/22	07:19	16:17-16:54/37	06:02	17:30-17:41/11	05:38	04:34	04:17
	16:28		17:41		18:44		20:52	21:54	22:21
28	08:29	15:28-15:52/24	07:16	16:16-16:55/39	05:59		05:35	04:32	04:18
	16:31		17:43		18:46		20:55	21:56	22:21
29	08:27	15:29-15:55/26			06:56		05:33	04:31	04:18
	16:33				19:48		20:57	21:58	22:21
30	08:25	15:30-15:58/28			06:53		05:30	04:29	04:19
	16:35				19:51		20:59	21:59	22:20
31	08:23	15:30-16:00/30			06:50			04:28	
	16:38				19:53			22:01	
Potential sun hours	227		262		365		429	515	539
Sum of minutes with flicker	504		919		956		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



Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 11 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (39)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 21:35	06:15 20:17	07:18 18:53	15:25-15:56/31 16:32	08:33 15:37
2	04:21 22:19	05:11 21:33	06:17 20:14	07:20 18:50	15:26-15:54/28 16:30	08:34 15:36
3	04:22 22:19	05:13 21:31	06:19 20:12	07:23 18:48	15:25-15:51/26 16:27	08:36 15:35
4	04:23 22:18	05:15 21:28	06:21 20:09	07:25 18:45	15:26-15:49/23 16:25	08:38 15:34
5	04:24 22:17	05:17 21:26	06:23 20:06	07:27 18:42	15:23-15:46/23 16:23	08:40 15:33
6	04:25 22:16	05:19 21:24	06:25 20:03	07:29 18:39	15:21-15:44/23 16:20	08:41 15:33
7	04:26 22:15	05:21 21:22	06:27 20:01	07:31 18:37	15:19-15:42/23 16:18	08:43 15:32
8	04:27 22:14	05:24 21:19	06:30 19:58	07:33 18:34	15:06-15:13/7 16:16	08:44 15:31
9	04:29 22:13	05:26 21:17	06:32 19:55	07:36 18:31	15:04-15:37/33 16:14	08:46 15:31
10	04:30 22:12	05:28 21:14	06:34 19:52	07:38 18:28	15:02-15:34/32 16:12	08:47 15:30
11	04:31 22:11	05:30 21:12	06:36 19:49	07:40 18:26	15:02-15:32/30 16:10	08:49 15:30
12	04:33 22:10	05:32 21:10	06:38 19:47	07:42 18:23	15:01-15:29/28 16:08	08:50 15:29
13	04:34 22:09	05:34 21:07	06:40 19:44	07:44 18:20	15:01-15:27/26 16:06	08:51 15:29
14	04:36 22:07	05:36 21:05	06:42 19:41	07:47 18:18	15:01-15:25/24 16:04	08:52 15:29
15	04:37 22:06	05:38 21:02	06:44 19:38	07:49 18:15	15:01-15:23/22 16:02	08:53 15:29
16	04:39 22:05	05:41 21:00	06:46 19:35	07:51 18:12	14:56-15:21/25 16:00	08:54 15:29
17	04:41 22:03	05:43 20:57	06:49 19:33	07:53 18:10	14:53-15:18/25 15:58	08:55 15:29
18	04:42 22:02	05:45 20:54	06:51 19:30	07:55 18:07	14:51-15:17/26 15:56	08:56 15:29
19	04:44 22:00	05:47 20:52	06:53 19:27	07:58 18:04	14:47-15:14/27 15:54	08:57 15:29
20	04:46 21:58	05:49 20:49	06:55 19:24	08:00 18:02	14:45-15:12/27 15:53	08:58 15:30
21	04:48 21:57	05:51 20:47	06:57 19:21	08:02 17:59	14:44-15:10/26 15:51	08:58 15:30
22	04:50 21:55	05:53 20:44	06:59 19:18	08:04 17:57	14:44-15:09/25 15:49	08:59 15:30
23	04:51 21:53	05:56 20:41	07:01 19:16	08:07 17:54	14:43-15:06/23 15:48	08:59 15:31
24	04:53 21:51	05:58 20:39	07:03 19:13	08:09 17:52	14:42-15:04/22 15:46	09:00 15:32
25	04:55 21:49	06:00 20:36	07:05 19:10	08:11 16:49	14:43-15:03/20 15:45	09:00 15:32
26	04:57 21:47	06:02 20:33	07:08 19:07	08:14 16:46	14:42-15:01/19 15:43	09:00 15:33
27	04:59 21:45	06:04 20:31	07:10 19:04	08:16 16:44	14:42-14:59/17 15:42	09:00 15:34
28	05:01 21:43	06:06 20:28	07:12 19:02	08:18 16:42	14:43-14:58/15 15:41	09:01 15:35
29	05:03 21:41	06:08 20:25	07:14 18:59	08:20 16:39	14:43-14:56/13 15:40	09:01 15:36
30	05:05 21:39	06:10 20:23	07:16 18:56	08:23 16:37	14:43-14:55/12 15:38	09:01 15:37
31	05:07 21:37	06:13 20:20		08:25 16:34	15:25-15:59/34	09:00 15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	0	457	1179	725	357

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

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

Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 12 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (42)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April		May		June	
1	09:00	14:21-14:53/32	08:21		07:13	16:58-17:16/18	06:48	18:33-18:58/25	05:28		04:27	
	15:39		16:40		17:46		19:55	19:03-19:24/21	21:01		22:02	
2	09:00	14:22-14:54/32	08:19		07:11	16:57-17:18/21	06:45	18:33-18:57/24	05:25		04:26	
	15:41		16:42		17:48		19:57	19:04-19:24/20	21:03		22:04	
3	09:00	14:24-14:56/32	08:17		07:08	16:57-17:20/23	06:42	18:34-18:55/21	05:23		04:24	
	15:42		16:45		17:50		19:59	19:04-19:23/19	21:06		22:05	
4	08:59	14:25-14:58/33	08:15		07:05	16:57-17:23/26	06:39	18:36-18:52/16	05:20		04:23	
	15:43		16:47		17:53		20:02	19:04-19:22/18	21:08		22:07	
5	08:59	14:27-14:59/32	08:12		07:03	16:57-17:23/26	06:37	18:39-18:49/10	05:18		04:22	
	15:45		16:49		17:55		20:04	19:05-19:20/15	21:10		22:08	
6	08:58	14:29-15:01/32	08:10		07:00	16:58-17:24/26	06:34	19:07-19:19/12	05:16		04:21	
	15:46		16:52		17:57		20:06		21:12		22:09	
7	08:57	14:32-15:03/31	08:08		06:57	16:58-17:23/25	06:31	19:11-19:14/3	05:13		04:20	
	15:48		16:54		17:59		20:08		21:14		22:11	
8	08:56	14:34-15:05/31	08:06		06:54	16:59-17:22/23	06:28		05:11		04:20	
	15:50		16:56		18:02		20:10		21:16		22:12	
9	08:56	14:35-15:07/32	08:03	16:24-16:25/1	06:52	17:01-17:20/19	06:25		05:09		04:19	
	15:51		16:59		18:04		20:13		21:19		22:13	
10	08:55	14:36-15:09/33	08:01	16:23-16:27/4	06:49	17:04-17:18/14	06:23		05:06		04:18	
	15:53		17:01		18:06		20:15		21:21		22:14	
11	08:54	14:35-15:11/36	07:59	16:23-16:30/7	06:46	17:07-17:16/9	06:20		05:04		04:17	
	15:55		17:04		18:08		20:17		21:23		22:15	
12	08:53	14:36-15:11/35	07:56	16:22-16:32/10	06:43		06:17		05:02		04:17	
	15:57		17:06		18:11		20:19		21:25		22:16	
13	08:52	14:36-15:11/35	07:54	16:22-16:35/13	06:41		06:15		05:00		04:16	
	15:59		17:08		18:13		20:21		21:27		22:17	
14	08:51	14:37-15:11/34	07:52	16:22-16:38/16	06:38		06:12		04:58		04:16	
	16:01		17:11		18:15		20:24		21:29		22:18	
15	08:49	14:36-15:11/35	07:49	16:22-16:39/17	06:35		06:09		04:56		04:16	
	16:02		17:13		18:17		20:26		21:31		22:18	
16	08:48	14:37-15:11/34	07:47	16:23-16:39/16	06:32		06:06		04:54		04:15	
	16:04		17:15		18:20		20:28		21:33		22:19	
17	08:47	14:38-15:11/33	07:44	16:23-16:38/15	06:30		06:04		04:52		04:15	
	16:07		17:18		18:22		20:30		21:35		22:20	
18	08:45	14:38-15:10/32	07:42	16:24-16:36/12	06:27	17:43-17:55/12	06:01		04:50		04:15	
	16:09		17:20		18:24		20:32		21:37		22:20	
19	08:44	14:38-15:08/30	07:39	16:27-16:35/8	06:24	17:40-17:57/17	05:58		04:48		04:15	
	16:11		17:23		18:26		20:35		21:39		22:20	
20	08:42	14:39-15:06/27	07:37		06:21	17:38-17:59/21	05:56		04:46		04:15	
	16:13		17:25		18:29		20:37		21:41		22:21	
21	08:41	14:40-15:06/26	07:34		06:18	17:36-18:00/24	05:53		04:44		04:15	
	16:15		17:27		18:31		20:39		21:43		22:21	
22	08:39	14:41-15:05/24	07:32		06:16	17:34-18:01/27	05:51		04:42		04:15	
	16:17		17:30		18:33		20:41		21:45		22:21	
23	08:38	14:41-15:05/24	07:29		06:13	17:34-18:02/28	05:48		04:40		04:15	
	16:19		17:32		18:35		20:43		21:47		22:21	
24	08:36	14:42-15:05/23	07:27		06:10	17:33-18:02/29	05:45		04:39		04:16	
	16:22		17:34		18:37		20:46		21:49		22:21	
25	08:34	14:43-15:04/21	07:24	17:03-17:06/3	06:07	17:32-18:02/30	05:43		04:37		04:16	
	16:24		17:37		18:40		20:48		21:51		22:21	
26	08:32	14:45-15:04/19	07:21	17:01-17:08/7	06:04	17:31-18:02/31	05:40		04:35		04:17	
	16:26		17:39		18:42	18:10-18:12/2	20:50		21:52		22:21	
27	08:31	14:46-15:02/16	07:19	16:59-17:11/12	06:02	17:31-18:01/30	05:38		04:34		04:17	
	16:28		17:41		18:44	18:08-18:14/6	20:52		21:54		22:21	
28	08:29	14:48-15:01/13	07:16	16:58-17:13/15	05:59	17:31-18:02/31	05:35		04:32		04:18	
	16:31		17:43		18:46	18:07-18:17/10	20:55		21:56		22:21	
29	08:27	14:51-14:58/7			06:56	18:31-19:01/30	05:33		04:31		04:18	
	16:33				19:48	19:06-19:19/13	20:57		21:58		22:21	
30	08:25				06:53	18:31-19:00/29	05:30		04:29		04:19	
	16:35				19:51	19:05-19:21/16	20:59		21:59		22:20	
31	08:23				06:50	18:31-18:59/28			04:28			
	16:38				19:53	19:04-19:23/19			22:01			
Potential sun hours	227		262		365		429		515		539	
Sum of minutes with flicker	824		156		663		204		0		0	

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

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

Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 12 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (42)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 21:35	06:15 20:17	07:18 18:53	07:27 15:52-15:56/4 16:32	08:33 14:18-14:53/35 15:37
2	04:21 22:19	05:11 21:33	06:17 20:14	07:20 17:47-17:52/5 18:51	07:30 16:30	08:35 14:18-14:52/34 15:36
3	04:22 22:19	05:13 21:31	06:19 20:12	07:23 17:43-17:55/12 18:48	07:32 16:27	08:36 14:19-14:50/31 15:35
4	04:23 22:18	05:15 21:28	06:21 20:09	07:25 17:39-17:57/18 18:45	07:34 16:25	08:38 14:18-14:49/31 15:34
5	04:24 22:17	05:17 21:26	06:23 19:08-19:11/3 20:06	07:27 17:37-17:58/21 18:42	07:37 16:23	08:40 14:17-14:48/31 15:33
6	04:25 22:16	05:19 21:24	06:25 19:04-19:15/11 20:03	07:29 17:35-17:59/24 18:39	07:39 16:20	08:41 14:15-14:47/32 15:33
7	04:26 22:16	05:22 21:22	06:27 18:35-18:44/9 20:01 19:01-19:16/15	07:31 17:33-17:59/26 18:37	07:41 16:18	08:43 14:14-14:47/33 15:32
8	04:27 22:15	05:24 21:19	06:30 18:31-18:47/16 19:58 19:00-19:17/17	07:33 17:32-17:58/26 18:34	07:44 16:16	08:44 14:13-14:46/33 15:31
9	04:29 22:14	05:26 21:17	06:32 18:29-18:49/20 19:55 18:58-19:17/19	07:36 17:32-17:59/27 18:31	07:46 16:14	08:46 14:12-14:45/33 15:31
10	04:30 22:12	05:28 21:14	06:34 18:27-18:50/23 19:52 18:57-19:17/20	07:38 17:31-17:56/25 18:28	07:48 16:12	08:47 14:12-14:44/32 15:30
11	04:31 22:11	05:30 21:12	06:36 18:25-18:50/25 19:49 18:57-19:17/20	07:40 17:31-17:53/22 18:26	07:50 16:10	08:49 14:11-14:43/32 15:30
12	04:33 22:10	05:32 21:10	06:38 18:24-18:51/27 19:47 18:56-19:16/20	07:42 17:30-17:50/20 18:23	07:53 16:08	08:50 14:12-14:43/31 15:29
13	04:34 22:09	05:34 21:07	06:40 18:23-18:51/28 19:44 18:56-19:13/17	07:44 17:31-17:48/17 18:20	07:55 14:23-14:30/7 16:06	08:51 14:12-14:43/31 15:29
14	04:36 22:07	05:36 21:05	06:42 18:22-18:51/29 19:41 18:56-19:10/14	07:47 17:31-17:45/14 18:18	07:57 14:21-14:34/13 16:04	08:52 14:12-14:42/30 15:29
15	04:37 22:06	05:38 21:02	06:44 18:21-18:51/30 19:38 18:56-19:07/11	07:49 17:32-17:42/10 18:15	07:59 14:18-14:35/17 16:02	08:53 14:12-14:42/30 15:29
16	04:39 22:05	05:41 21:00	06:46 18:20-18:51/31 19:35 18:57-19:04/7	07:51 17:33-17:39/6 18:12	08:02 14:18-14:37/19 16:00	08:54 14:12-14:41/29 15:29
17	04:41 22:03	05:43 20:57	06:49 18:20-18:50/30 19:33 18:58-19:01/3	07:53 17:35-17:36/1 18:10	08:04 14:16-14:37/21 15:58	08:55 14:12-14:41/29 15:29
18	04:42 22:02	05:45 20:55	06:51 18:19-18:50/31 19:30	07:55 18:07	08:06 14:16-14:39/23 15:56	08:56 14:13-14:41/28 15:29
19	04:44 22:00	05:47 20:52	06:53 18:19-18:49/30 19:27	07:58 18:04	08:08 14:15-14:39/24 15:54	08:57 14:13-14:42/29 15:29
20	04:46 21:58	05:49 20:49	06:55 18:19-18:48/29 19:24	08:00 18:02	08:10 14:16-14:40/24 15:53	08:58 14:14-14:42/28 15:30
21	04:48 21:57	05:51 20:47	06:57 18:20-18:47/27 19:21	08:02 17:59	08:13 14:15-14:41/26 15:51	08:58 14:14-14:42/28 15:30
22	04:50 21:55	05:53 20:44	06:59 18:21-18:46/25 19:19	08:04 17:57	08:15 14:15-14:42/27 15:49	08:59 14:15-14:43/28 15:30
23	04:51 21:53	05:56 20:41	07:01 18:22-18:45/23 19:16	08:07 16:57-17:06/9 17:54	08:17 14:15-14:45/30 15:48	08:59 14:15-14:43/28 15:31
24	04:53 21:51	05:58 20:39	07:03 18:23-18:42/19 19:13	08:09 16:54-17:07/13 17:52	08:19 14:15-14:47/32 15:46	09:00 14:15-14:44/29 15:32
25	04:55 21:49	06:00 20:36	07:05 18:25-18:39/14 19:10	07:11 15:53-16:08/15 16:49	08:21 14:16-14:49/33 15:45	09:00 14:16-14:45/29 15:32
26	04:57 21:47	06:02 20:33	07:08 18:28-18:35/7 19:07	07:14 15:52-16:09/17 16:47	08:23 14:16-14:49/33 15:43	09:00 14:17-14:46/29 15:33
27	04:59 21:45	06:04 20:31	07:10 19:04	07:16 15:52-16:09/17 16:44	08:25 14:16-14:50/34 15:42	09:01 14:18-14:47/29 15:34
28	05:01 21:43	06:06 20:28	07:12 19:02	07:18 15:51-16:06/15 16:42	08:27 14:17-14:52/35 15:41	09:01 14:18-14:48/30 15:35
29	05:03 21:41	06:08 20:25	07:14 18:59	07:20 15:52-16:04/12 16:39	08:29 14:17-14:52/35 15:40	09:01 14:18-14:48/30 15:36
30	05:05 21:39	06:11 20:23	07:16 18:56	07:23 15:51-16:01/10 16:37	08:31 14:17-14:52/35 15:38	09:01 14:19-14:50/31 15:37
31	05:07 21:37	06:13 20:20		07:25 15:52-15:59/7 16:34		09:00 14:20-14:52/32 15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	0	650	389	472	945

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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

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Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 13 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (34)  
 Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January	February	March	April	May	June
1	09:00 15:39	08:21 15:34-15:55/21 16:40	07:13 17:46	06:48 19:07-19:17/10 19:55	05:28 21:01	04:27 22:02
2	09:00 15:41	08:19 15:35-15:56/21 16:42	07:11 07:38-07:39/1 17:48 17:17-17:18/1	06:45 19:10-19:15/5 19:57	05:25 21:03	04:26 22:04
3	09:00 15:42	08:17 15:36-15:56/20 16:45	07:08 07:35-07:40/5 17:50 17:15-17:20/5	06:42 19:59	05:23 21:06	04:24 22:05
4	08:59 15:44	08:15 15:36-15:55/19 16:47	07:05 07:32-07:41/9 17:53 17:14-17:23/9	06:39 20:02	05:20 21:08	04:23 22:07
5	08:59 15:45	08:12 15:37-15:54/17 16:49	07:03 07:30-07:42/12 17:55 17:14-17:25/11	06:37 20:04	05:18 21:10	04:22 22:08
6	08:58 15:46	08:10 15:38-15:53/15 16:52	07:00 07:27-07:42/15 17:57 17:14-17:28/14	06:34 20:06	05:16 21:12	04:21 22:09
7	08:57 15:48	08:08 15:40-15:52/12 16:54	06:57 07:24-07:41/17 17:59 17:14-17:30/16	06:31 20:08	05:13 21:14	04:20 22:11
8	08:57 15:50	08:06 15:43-15:48/5 16:56	06:54 07:23-07:41/18 18:02 17:14-17:32/18	06:28 20:10	05:11 21:16	04:20 22:12
9	08:56 15:51	08:03 16:59	06:52 07:23-07:40/17 18:04 17:15-17:33/18	06:26 20:13	05:09 21:19	04:19 22:13
10	08:55 15:53	08:01 17:01	06:49 07:25-07:40/15 18:06 17:16-17:32/16	06:23 20:15	05:07 21:21	04:18 22:14
11	08:54 15:55	07:59 17:04	06:46 07:26-07:38/12 18:09 17:19-17:31/12	06:20 20:17	05:04 21:23	04:17 22:15
12	08:53 15:57	07:56 17:06	06:43 07:28-07:35/7 18:11 17:22-17:28/6	06:17 20:19	05:02 21:25	04:17 22:16
13	08:52 15:59	07:54 17:08	06:41 18:13	06:15 20:21	05:00 21:27	04:16 22:17
14	08:51 16:01	07:52 17:11	06:38 18:15	06:12 20:24	04:58 21:29	04:16 22:18
15	08:49 16:03	07:49 17:13	06:35 18:17	06:09 20:26	04:56 21:31	04:16 22:18
16	08:48 16:05	07:47 17:15	06:32 18:20	06:06 20:28	04:54 21:33	04:15 22:19
17	08:47 16:07	07:44 17:18	06:30 18:22	06:04 20:30	04:52 21:35	04:15 22:20
18	08:45 16:09	07:42 17:20	06:27 17:49-17:55/6 18:24	06:01 20:32	04:50 21:37	04:15 22:20
19	08:44 16:11	07:39 17:23	06:24 17:47-17:57/10 18:26	05:58 20:35	04:48 21:39	04:15 22:20
20	08:42 16:13	07:37 17:25	06:21 17:45-17:59/14 18:29	05:56 20:37	04:46 21:41	04:15 22:21
21	08:41 16:15	07:34 17:27	06:18 17:44-18:01/17 18:31	05:53 20:39	04:44 21:43	04:15 22:21
22	08:39 16:17	07:32 17:30	06:16 17:43-18:03/20 18:33	05:51 20:41	04:42 21:45	04:15 22:21
23	08:38 15:36-15:40/4 16:19	07:29 17:32	06:13 17:43-18:05/22 18:35	05:48 20:44	04:40 21:47	04:15 22:21
24	08:36 15:35-15:43/8 16:22	07:27 17:34	06:10 17:43-18:05/22 18:37	05:45 20:46	04:39 21:49	04:16 22:22
25	08:34 15:35-15:45/10 16:24	07:24 17:37	06:07 17:42-18:04/22 18:40 18:08-18:10/2	05:43 20:48	04:37 21:51	04:16 22:22
26	08:32 15:34-15:48/14 16:26	07:21 17:39	06:04 17:42-18:03/21 18:42 18:07-18:12/5	05:40 20:50	04:35 21:53	04:17 22:21
27	08:31 15:33-15:50/17 16:28	07:19 17:41	06:02 17:43-18:02/19 18:44 18:06-18:14/8	05:38 20:52	04:34 21:54	04:17 22:21
28	08:29 15:33-15:52/19 16:31	07:16 17:43	05:59 17:44-18:01/17 18:46 18:06-18:17/11	05:35 20:55	04:32 21:56	04:18 22:21
29	08:27 15:33-15:55/22 16:33		06:56 18:45-18:59/14 19:48 19:06-19:19/13	05:33 20:57	04:31 21:58	04:18 22:21
30	08:25 15:34-15:56/22 16:35		06:53 18:47-18:56/9 19:51 19:06-19:21/15	05:30 20:59	04:30 21:59	04:19 22:20
31	08:23 15:34-15:56/22 16:38		06:50 19:06-19:19/13 19:53		04:28 22:01	
Potential sun hours	227	262	365	429	515	539
Sum of minutes with flicker	138	130	534	15	0	0

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

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

Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 13 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (34)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 21:35	06:15 20:17	07:18 18:53	08:09-08:11/2 18:03-18:04/1	07:27 16:32
2	04:21 22:19	05:11 21:33	06:17 20:14	07:20 18:51	08:05-08:15/10 17:58-18:08/10	07:30 16:30
3	04:22 22:19	05:13 21:31	06:19 20:12	07:23 18:48	08:02-08:16/14 17:55-18:09/14	07:32 16:27
4	04:23 22:18	05:15 21:29	06:21 20:09	07:25 18:45	08:02-08:18/16 17:52-18:10/18	07:34 16:25
5	04:24 22:17	05:17 21:26	06:23 20:06	07:27 18:42	08:01-08:18/17 17:52-18:11/19	07:37 16:23
6	04:25 22:16	05:19 21:24	06:25 20:03	07:29 18:39	08:00-08:18/18 17:50-18:07/17	07:39 16:20
7	04:26 22:16	05:22 21:22	06:28 20:01	07:31 18:37	08:01-08:17/16 17:49-18:04/15	07:41 16:18
8	04:27 22:15	05:24 21:19	06:30 19:58	07:33 18:34	08:04-08:17/13 17:49-18:01/12	07:44 16:16
9	04:29 22:14	05:26 21:17	06:32 19:55	07:36 18:31	08:06-08:16/10 17:49-17:59/10	07:46 16:14
10	04:30 22:12	05:28 21:15	06:34 19:52	07:38 18:29	08:08-08:15/7 17:49-17:56/7	07:48 16:12
11	04:31 22:11	05:30 21:12	06:36 19:49	07:40 18:26	08:10-08:13/3 17:50-17:53/3	07:50 16:10
12	04:33 22:10	05:32 21:10	06:38 19:47	07:42 18:23	15:05-15:26/21	07:53 16:08
13	04:34 22:09	05:34 21:07	06:40 19:44	07:44 18:20	15:05-15:27/22	07:55 16:06
14	04:36 22:07	05:36 21:05	06:42 19:41	07:47 18:18	15:06-15:25/19	07:57 16:04
15	04:37 22:06	05:39 21:02	06:44 19:38	07:49 18:15	15:06-15:23/17	07:59 16:02
16	04:39 22:05	05:41 21:00	06:46 19:35	07:51 18:12	15:07-15:21/14	08:02 16:00
17	04:41 22:03	05:43 20:57	06:49 19:33	07:53 18:10	15:08-15:18/10	08:04 15:58
18	04:42 22:02	05:45 20:55	06:51 19:30	07:56 18:07	15:09-15:17/8	08:06 15:56
19	04:44 22:00	05:47 20:52	06:53 19:27	07:58 18:04	15:10-15:14/4	08:08 15:54
20	04:46 21:58	05:49 20:49	06:55 19:24	08:00 18:02		08:11 15:53
21	04:48 21:57	05:51 20:47	06:57 19:21	08:02 17:59		08:13 15:51
22	04:50 21:55	05:53 20:44	06:59 19:19	08:05 17:57		08:15 15:49
23	04:51 21:53	05:56 20:42	07:01 19:16	08:07 17:54		08:17 15:48
24	04:53 21:51	05:58 20:39	07:03 19:13	08:09 17:52		08:19 15:46
25	04:55 21:49	06:00 20:36	07:06 19:10	08:11 16:49		08:21 15:45
26	04:57 21:47	06:02 20:34	07:08 19:07	08:14 16:47		08:23 15:43
27	04:59 21:45	06:04 20:31	07:10 19:05	08:16 16:44		08:25 15:42
28	05:01 21:43	06:06 20:28	07:12 19:02	08:18 16:42		08:27 15:41
29	05:03 21:41	06:08 20:25	07:14 18:59	08:20 16:39		08:29 15:40
30	05:05 21:39	06:11 20:23	07:16 18:56	08:23 16:37		08:31 15:38
31	05:07 21:37	06:13 20:20		08:25 16:34		
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	0	304	252	271	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:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Baiba / baiba.ozolina@environment.lv

Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 14 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (35)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
0.80 1.82 4.75 6.09 9.67 10.05 8.16 7.72 5.94 2.93 0.63 0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	January		February		March		April		May		June	
1	09:00	10:01-10:16/15	08:21	15:37-16:03/26	07:13	17:10-17:16/6	06:48		05:28		04:27	
	15:39		16:40		17:46		19:55		21:01		22:02	
2	09:00	10:02-10:17/15	08:19	15:41-16:06/25	07:11	17:09-17:18/9	06:45		05:25		04:26	
	15:41		16:42		17:48		19:57		21:03		22:04	
3	09:00	10:02-10:17/15	08:17	15:42-16:09/27	07:08	17:09-17:20/11	06:42		05:23		04:24	
	15:42		16:45		17:50		19:59		21:06		22:05	
4	08:59	10:03-10:16/13	08:15	15:43-16:11/28	07:05	17:09-17:22/13	06:39		05:20		04:23	
	15:43		16:47		17:53		20:02		21:08		22:07	
5	08:59	10:04-10:16/12	08:12	15:46-16:11/25	07:03	17:09-17:24/15	06:37		05:18		04:22	
	15:45		16:49		17:55		20:04		21:10		22:08	
6	08:58	10:05-10:16/11	08:10	15:51-16:09/18	07:00	17:10-17:24/14	06:34		05:16		04:21	
	15:46		16:52	16:12-16:16/4	17:57		20:06		21:12		22:09	
7	08:57	10:06-10:16/10	08:08	15:54-16:09/15	06:57	17:11-17:22/11	06:31		05:13		04:20	
	15:48		16:54	16:10-16:19/9	17:59		20:08		21:14		22:11	
8	08:57	10:07-10:15/8	08:06	15:56-16:07/11	06:54	17:14-17:19/5	06:28	19:39-19:40/1	05:11		04:20	
	15:50		16:56	16:08-16:22/14	18:02		20:10		21:16		22:12	
9	08:56	10:09-10:14/5	08:03	16:01-16:03/2	06:52		06:25	19:36-19:43/7	05:09		04:19	
	15:51		16:59	16:07-16:25/18	18:04		20:13		21:19		22:13	
10	08:55		08:01	16:06-16:27/21	06:49		06:23	19:33-19:44/11	05:06		04:18	
	15:53		17:01		18:06		20:15		21:21		22:14	
11	08:54		07:59	16:06-16:30/24	06:46		06:20	19:31-19:46/15	05:04		04:17	
	15:55		17:04		18:09		20:17		21:23		22:15	
12	08:53		07:56	16:05-16:30/25	06:43		06:17	19:31-19:49/18	05:02		04:17	
	15:57		17:06		18:11		20:19		21:25		22:16	
13	08:52		07:54	16:05-16:31/26	06:41		06:15	19:29-19:51/22	05:00		04:16	
	15:59		17:08		18:13		20:21		21:27		22:17	
14	08:51		07:52	16:04-16:31/27	06:38		06:12	19:28-19:52/24	04:58		04:16	
	16:01		17:11		18:15		20:24		21:29		22:18	
15	08:49	15:18-15:20/2	07:49	16:04-16:31/27	06:35	17:45-17:48/3	06:09	19:28-19:55/27	04:56		04:16	
	16:02		17:13		18:17		20:26		21:31		22:18	
16	08:48	15:19-15:23/4	07:47	16:04-16:32/28	06:32	17:44-17:50/6	06:06	19:28-19:56/28	04:54		04:15	
	16:04		17:15		18:20		20:28		21:33		22:19	
17	08:47	15:18-15:25/7	07:44	16:04-16:31/27	06:30	17:44-17:53/9	06:04	19:28-19:56/28	04:52		04:15	
	16:06		17:18		18:22		20:30		21:35		22:20	
18	08:45	15:18-15:27/9	07:42	16:05-16:31/26	06:27	17:44-17:55/11	06:01	19:28-19:54/26	04:50		04:15	
	16:09		17:20		18:24		20:32		21:37		22:20	
19	08:44	15:19-15:30/11	07:39	16:05-16:30/25	06:24	06:50-06:51/1	05:58	19:27-19:52/25	04:48		04:15	
	16:11		17:23		18:26	17:44-17:57/13	20:35		21:39		22:21	
20	08:42	15:19-15:32/13	07:37	16:05-16:29/24	06:21	06:47-06:52/5	05:56	19:28-19:50/22	04:46		04:15	
	16:13		17:25		18:29	17:44-17:59/15	20:37		21:41		22:21	
21	08:41	15:19-15:35/16	07:34	16:06-16:28/22	06:18	06:45-06:54/9	05:53	19:29-19:48/19	04:44		04:15	
	16:15		17:27		18:31	17:44-18:01/17	20:39		21:43		22:21	
22	08:39	15:20-15:37/17	07:32	16:08-16:28/20	06:16	06:42-06:54/12	05:51	19:30-19:47/17	04:42		04:15	
	16:17		17:30		18:33	17:46-18:03/17	20:41		21:45		22:21	
23	08:38	15:20-15:40/20	07:29	16:09-16:26/17	06:13	06:39-06:53/14	05:48	19:31-19:45/14	04:40		04:15	
	16:19		17:32		18:35	17:47-18:06/19	20:44		21:47		22:21	
24	08:36	15:21-15:42/21	07:27	16:11-16:23/12	06:10	06:36-06:53/17	05:45	19:34-19:42/8	04:39		04:16	
	16:22		17:34		18:37	17:47-18:08/21	20:46		21:49		22:22	
25	08:34	15:21-15:45/24	07:24		06:07	06:35-06:52/17	05:43		04:37		04:16	
	16:24		17:37		18:40	17:47-18:09/22	20:48		21:51		22:22	
26	08:32	15:22-15:48/26	07:21		06:04	06:36-06:51/15	05:40		04:35		04:17	
	16:26		17:39		18:42	17:48-18:08/20	20:50		21:53		22:21	
27	08:31	15:23-15:50/27	07:19		06:02	06:37-06:50/13	05:38		04:34		04:17	
	16:28		17:41		18:44	17:49-18:06/17	20:52		21:54		22:21	
28	08:29	15:24-15:52/28	07:16	17:10-17:13/3	05:59	06:38-06:48/10	05:35		04:32		04:18	
	16:31		17:43		18:46	17:52-18:05/13	20:55		21:56		22:21	
29	08:27	15:27-15:55/28			06:56	18:55-19:02/7	05:33		04:31		04:18	
	16:33				19:48		20:57		21:58		22:21	
30	08:25	15:30-15:58/28			06:53		05:30		04:29		04:19	
	16:35				19:51		20:59		21:59		22:20	
31	08:23	15:34-16:01/27			06:50				04:28			
	16:38				19:53				22:01			
Potential sun hours		227	262		365		429		515		539	
Sum of minutes with flicker		412	576		407		312		0		0	

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

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



Project:

Flickering\_Valka\_Siemens\_Gamesa

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

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Calculated:

15/01/2026 18:42/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Valka\_Siemens\_Gamesa WTG: 14 - Siemens Gamesa SG 7.0-170 7000 170.0 !O! hub: 165.0 m (TOT: 250.0 m) (35)  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.80	1.82	4.75	6.09	9.67	10.05	8.16	7.72	5.94	2.93	0.63	0.41

No operational time reduction. It is assumed the WTGs are always running with worst case wind direction.

	July	August	September	October	November	December
1	04:20 22:20	05:09 21:35	06:15 20:17	19:30-19:45/15 18:53	07:18 16:32	15:36-15:56/20 15:37
2	04:21 22:19	05:11 21:33	06:17 20:14	19:31-19:42/11 18:51	07:20 16:30	15:29-15:34/5 15:37
3	04:22 22:19	05:13 21:31	06:19 20:12	19:33-19:40/7 18:48	07:23 16:27	15:25-15:37/12 15:35
4	04:23 22:18	05:15 21:29	06:21 20:09	19:37-19:38/1 18:45	07:25 16:25	15:23-15:39/16 15:40-15:49/9
5	04:24 22:17	05:17 21:26	06:23 20:06	07:27 18:42	07:37 16:23	15:20-15:39/19 15:42-15:46/4
6	04:25 22:16	05:19 21:24	06:25 20:03	07:29 18:39	17:48-17:57/9 16:20	15:16-15:40/24 15:33
7	04:26 22:16	05:22 21:22	06:28 20:01	07:31 18:37	17:46-17:58/12 16:18	15:14-15:41/27 15:32
8	04:27 22:15	05:24 21:19	06:30 19:58	07:33 18:34	17:44-17:59/15 16:16	15:12-15:39/27 15:31
9	04:29 22:14	05:26 21:17	06:32 19:55	07:36 18:31	17:44-17:59/15 16:14	15:11-15:37/26 15:31
10	04:30 22:12	05:28 21:15	06:34 19:52	07:38 18:28	17:43-17:56/13 16:12	15:07-15:34/27 15:30
11	04:31 22:11	05:30 21:12	06:36 19:49	07:40 18:26	17:43-17:53/10 16:10	15:05-15:32/27 15:30
12	04:33 22:10	05:32 21:10	06:38 19:47	07:42 18:23	17:42-17:50/8 16:08	15:02-15:29/27 15:29
13	04:34 22:09	05:34 21:07	06:40 19:44	07:44 18:20	17:43-17:48/5 16:06	14:58-15:27/29 15:29
14	04:36 22:08	05:36 21:05	06:42 19:41	18:46-18:52/6 18:18	07:47 16:04	17:44-17:45/1 15:29
15	04:37 22:06	05:39 21:02	06:44 19:38	07:28-07:36/8 18:15	07:49 16:02	14:56-15:22/26 15:29
16	04:39 22:05	05:41 21:00	06:46 19:35	07:26-07:38/12 18:12	07:51 16:00	14:55-15:21/26 15:29
17	04:41 22:03	05:43 20:57	06:49 19:33	07:24-07:39/15 18:10	07:53 15:58	16:45-16:52/7 15:29
18	04:42 22:02	05:45 20:55	06:51 19:30	07:23-07:39/16 18:07	07:56 15:56	16:42-16:56/14 15:29
19	04:44 22:00	05:47 20:52	06:53 19:27	07:22-07:39/17 18:04	07:58 15:54	16:39-16:57/18 15:29
20	04:46 21:58	05:49 20:49	06:55 19:24	07:25-07:40/15 18:02	08:00 15:53	16:37-16:58/21 15:30
21	04:48 21:57	05:51 20:47	06:57 19:21	07:27-07:39/12 18:32-18:50/18	08:02 17:59	16:37-17:00/23 15:51
22	04:50 21:55	05:53 20:44	06:59 19:19	07:29-07:38/9 18:30-18:47/17	08:05 17:57	16:35-17:00/25 15:49
23	04:51 21:53	05:56 20:42	07:01 19:16	07:31-07:37/6 18:29-18:45/16	08:07 17:54	16:35-17:01/26 15:48
24	04:53 21:51	05:58 20:39	07:03 19:13	07:33-07:35/2 18:27-18:42/15	08:09 17:52	16:34-17:01/27 15:46
25	04:55 21:49	06:00 20:36	07:06 19:10	07:30-07:39/12 18:27-18:39/12	07:11 16:49	15:34-16:01/27 15:45
26	04:57 21:47	06:02 20:34	07:08 19:07	18:26-18:36/10 19:07	07:14 16:47	15:33-16:01/28 15:43
27	04:59 21:46	06:04 20:31	07:10 19:04	18:26-18:33/7 19:04	07:16 16:44	15:34-16:01/27 15:42
28	05:01 21:44	06:06 20:28	07:12 19:02	18:26-18:30/4 19:02	07:18 16:42	15:34-16:01/27 15:41
29	05:03 21:41	06:08 20:25	07:14 18:59	18:26-18:27/1 18:59	07:20 16:39	15:34-16:01/27 15:40
30	05:05 21:39	06:11 20:23	07:16 18:56	19:29-19:50/21 18:56	07:23 16:37	15:34-16:00/26 15:38
31	05:07 21:37	06:13 20:20	19:30-19:48/18 16:34	07:25 16:34	15:35-15:59/24 16:34	09:00-10:00-10:16/16 15:38
Potential sun hours	538	474	386	321	241	207
Sum of minutes with flicker	0	282	361	435	554	439

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

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