

Project:

flickering\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 1 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (18)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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	08:57 15:53	08:21 16:50	07:17 17:53	06:54 19:59	05:38 21:02	04:41 21:59	04:35 22:16	05:21 21:34	06:23 20:20	07:23 18:59	07:29 16:41	08:31 15:50
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	04:40 22:00	04:36 22:15	05:23 21:32	06:25 20:17	07:25 18:57	07:31 16:39	08:32 15:49
3	08:57 15:56	08:17 16:55	07:12 17:57	06:49 20:03	05:33 21:06	04:39 22:02	04:37 22:15	05:25 21:30	06:27 20:15	07:27 18:54	07:33 16:37	08:34 15:48
4	08:56 15:58	08:15 16:59	07:09 18:02	06:46 20:07	05:31 21:10	04:38 22:04	04:38 22:13	05:27 21:26	06:29 20:09	07:29 18:49	07:35 16:33	08:36 15:47
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 20:07	05:29 21:10	04:37 22:04	04:39 22:13	05:29 21:26	06:31 20:09	07:31 18:49	07:37 16:33	08:37 15:47
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 20:09	05:26 21:12	04:36 22:06	04:40 22:13	05:31 21:24	06:33 20:07	07:33 18:46	07:40 16:30	08:39 15:46
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 20:11	05:24 21:14	04:35 22:07	04:41 22:12	05:33 21:21	06:35 20:04	07:35 18:43	07:42 16:28	08:40 15:45
8	08:54 16:03	08:07 17:06	06:59 18:08	06:36 20:13	05:22 21:16	04:34 22:08	04:42 22:11	05:35 21:19	06:37 20:01	07:37 18:41	07:44 16:26	08:42 15:45
9	08:53 16:04	08:04 17:08	06:56 18:10	06:33 20:16	05:20 21:18	04:33 22:09	04:43 22:10	05:36 21:17	06:39 19:59	07:40 18:38	07:46 16:24	08:43 15:44
10	08:52 16:06	08:02 17:11	06:53 18:13	06:30 20:18	05:18 21:20	04:33 22:10	04:44 22:09	05:38 21:15	06:41 19:56	07:42 18:35	07:48 16:22	08:44 15:44
11	08:52 16:08	08:00 17:13	06:51 18:15	06:28 20:20	05:16 21:22	04:32 22:11	04:46 22:08	05:40 21:12	06:43 19:53	07:44 18:33	07:50 16:20	08:46 15:43
12	08:51 16:10	07:58 17:15	06:48 18:17	06:25 20:22	05:14 21:24	04:32 22:12	04:47 22:07	05:42 21:10	06:45 19:51	07:46 18:30	07:53 16:18	08:47 15:43
13	08:50 16:11	07:56 17:18	06:45 18:19	06:23 20:24	05:12 21:26	04:31 22:12	04:48 22:06	05:44 21:08	06:47 19:48	07:48 18:28	07:55 16:16	08:48 15:43
14	08:49 16:13	07:53 17:20	06:43 18:21	06:20 20:26	05:10 21:28	04:31 22:13	04:50 22:04	05:46 21:05	06:49 19:45	07:50 18:25	07:57 16:15	08:49 15:43
15	08:48 16:15	07:51 17:22	06:40 18:23	06:17 20:28	05:08 21:30	04:31 22:14	04:51 22:03	05:49 21:03	06:51 19:42	07:52 18:22	07:59 16:13	08:50 15:43
16	08:46 16:17	07:49 17:24	06:37 18:25	06:15 20:30	05:06 21:32	04:30 22:15	04:53 22:02	05:51 21:01	06:53 19:40	07:54 18:20	08:01 16:11	08:51 15:43
17	08:45 16:19	07:46 17:27	06:35 18:27	06:12 20:32	05:04 21:34	04:30 22:15	04:54 22:00	05:53 20:58	06:55 19:37	07:56 18:17	08:03 16:09	08:52 15:43
18	08:44 16:21	07:44 17:29	06:32 18:30	06:10 20:34	05:02 21:36	04:30 22:16	04:56 21:59	05:55 20:56	06:57 19:34	07:58 18:15	08:05 16:08	08:53 15:43
19	08:43 16:23	07:42 17:31	06:29 18:32	06:07 20:37	05:00 21:37	04:30 22:16	04:57 21:57	05:57 20:53	06:59 19:32	08:01 18:12	08:07 16:06	08:54 15:43
20	08:41 16:25	07:39 17:33	06:27 18:34	06:05 20:39	04:58 21:39	04:30 22:16	04:59 21:56	05:59 20:51	07:01 19:29	08:03 18:10	08:10 16:04	08:54 15:44
21	08:40 16:27	07:37 17:35	06:24 18:36	06:02 20:41	04:57 21:41	04:30 22:17	05:01 21:54	06:01 20:48	07:03 19:26	08:05 18:07	08:12 16:03	08:55 15:44
22	08:38 16:29	07:34 17:38	06:21 18:38	06:00 20:43	04:55 21:43	04:30 22:17	05:03 21:53	06:03 20:46	07:05 19:24	08:07 18:05	08:14 16:01	08:56 15:44
23	08:37 16:31	07:32 17:40	06:19 18:40	05:57 20:45	04:53 21:45	04:31 22:17	05:04 21:51	06:05 20:43	07:07 19:21	08:09 18:02	08:16 16:00	08:56 15:45
24	08:35 16:33	07:29 17:42	06:16 18:42	05:55 20:47	04:52 21:46	04:31 22:17	05:06 21:49	06:07 20:41	07:09 19:18	08:11 18:00	08:18 15:58	08:56 15:46
25	08:33 16:35	07:27 17:44	06:13 18:44	05:52 20:49	04:50 21:48	04:31 22:17	05:08 21:48	06:09 20:38	07:11 19:15	08:13 16:58	08:20 15:57	08:57 15:46
26	08:32 16:37	07:24 17:47	06:10 18:46	05:50 20:51	04:49 21:50	04:32 22:17	05:10 21:46	06:11 20:36	07:13 19:13	08:15 16:55	08:21 15:56	08:57 15:47
27	08:30 16:40	07:22 17:49	06:08 18:48	05:47 20:53	04:47 21:51	04:32 22:17	05:11 21:44	06:13 20:33	07:15 19:10	07:18 16:53	08:23 15:54	08:57 15:48
28	08:28 16:42	07:19 17:51	06:05 18:51	05:45 20:55	04:46 21:53	04:33 22:17	05:13 21:42	06:15 20:30	07:17 19:07	07:20 16:51	08:25 15:53	08:57 15:49
29	08:27 16:44	07:17 19:53	06:02 19:53	05:43 20:57	04:45 21:55	04:33 22:16	05:15 21:40	06:17 20:28	07:19 19:05	07:22 16:48	08:27 15:52	08:57 15:50
30	08:25 16:46	07:15 19:55	07:00 19:55	05:40 21:00	04:43 21:56	04:34 22:16	05:17 21:38	06:19 20:25	07:21 19:02	07:24 16:46	08:29 15:51	08:57 15:51
31	08:23 16:48	07:13 19:57	06:57 19:57	05:37 21:58	04:42 21:58	04:32 21:36	05:19 21:36	06:21 20:23	07:23 16:44	07:26 16:44	08:31 15:52	08:57 15:52
Potential sun hours	235	266	366	426	508	529	530	470	385	323	247	216
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

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flickering\_Nordex\_N163\_Stelpe1

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SIA Estonian, Latvian &amp; Lithuanian environment

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Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 2 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (16)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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	08:57 15:53	08:21 16:50	07:17 17:53	06:54 19:59	05:38 21:02	04:41 21:59	04:35 22:16	05:21 21:34	06:23 20:20	07:23 18:59	07:29 16:41	08:31 15:50
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	04:40 22:00	04:36 22:15	05:23 21:32	06:25 20:17	07:25 18:57	07:31 16:39	08:32 15:49
3	08:57 15:56	08:17 16:55	07:12 17:57	06:49 20:03	05:33 21:06	04:39 22:02	04:37 22:15	05:25 21:30	06:27 20:15	07:27 18:54	07:33 16:37	08:34 15:48
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11	08:52 16:08	08:00 17:13	06:51 18:15	06:28 20:20	05:16 21:22	04:32 22:11	04:46 22:08	05:40 21:12	06:43 19:53	07:44 18:33	07:51 16:20	08:46 15:43
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15	08:48 16:15	07:51 17:22	06:40 18:23	06:17 20:28	05:08 21:30	04:30 22:14	04:51 22:03	05:48 21:03	06:51 19:42	07:52 18:22	07:59 16:13	08:50 15:43
16	08:46 16:17	07:49 17:24	06:37 18:25	06:15 20:30	05:06 21:32	04:30 22:15	04:53 22:02	05:50 21:01	06:53 19:40	07:54 18:20	08:01 16:11	08:51 15:43
17	08:45 16:19	07:46 17:26	06:35 18:27	06:12 20:32	05:04 21:34	04:30 22:15	04:54 22:00	05:53 20:58	06:55 19:37	07:56 18:17	08:03 16:09	08:52 15:43
18	08:44 16:21	07:44 17:29	06:32 18:30	06:10 20:34	05:02 21:36	04:30 22:16	04:56 21:59	05:55 20:56	06:57 19:34	07:58 18:15	08:05 16:08	08:53 15:43
19	08:43 16:23	07:42 17:31	06:29 18:32	06:07 20:37	05:00 21:38	04:30 22:16	04:57 21:57	05:57 20:53	06:59 19:32	08:01 18:12	08:07 16:06	08:54 15:43
20	08:41 16:25	07:39 17:33	06:27 18:34	06:05 20:39	04:58 21:39	04:30 22:16	04:59 21:56	05:59 20:51	07:01 19:29	08:03 18:10	08:10 16:04	08:54 15:44
21	08:40 16:27	07:37 17:35	06:24 18:36	06:02 20:41	04:57 21:41	04:30 22:17	05:01 21:54	06:01 20:48	07:03 19:26	08:05 18:07	08:12 16:03	08:55 15:44
22	08:38 16:29	07:34 17:38	06:21 18:38	06:00 20:43	04:55 21:43	04:30 22:17	05:02 21:53	06:03 20:46	07:05 19:24	08:07 18:05	08:14 16:01	08:56 15:44
23	08:37 16:31	07:32 17:40	06:19 18:40	05:57 20:45	04:53 21:45	04:31 22:17	05:04 21:51	06:05 20:43	07:07 19:21	08:09 18:02	08:16 16:00	08:56 15:45
24	08:35 16:33	07:29 17:42	06:16 18:42	05:55 20:47	04:52 21:46	04:31 22:17	05:06 21:49	06:07 20:41	07:09 19:18	08:11 18:00	08:18 15:58	08:56 15:45
25	08:33 16:35	07:27 17:44	06:13 18:44	05:52 20:49	04:50 21:48	04:31 22:17	05:08 21:48	06:09 20:38	07:11 19:15	08:13 16:58	08:20 15:57	08:57 15:46
26	08:32 16:37	07:24 17:46	06:10 18:46	05:50 20:51	04:49 21:50	04:32 22:17	05:10 21:46	06:11 20:36	07:13 19:13	08:15 16:55	08:21 15:56	08:57 15:47
27	08:30 16:39	07:22 17:49	06:08 18:48	05:47 20:53	04:47 21:51	04:32 22:17	05:11 21:44	06:13 20:33	07:15 19:10	07:18 16:53	08:23 15:54	08:57 15:48
28	08:28 16:42	07:19 17:51	06:05 18:51	05:45 20:55	04:46 21:53	04:33 22:17	05:13 21:42	06:15 20:30	07:17 19:07	07:20 16:50	08:25 15:53	08:57 15:49
29	08:27 16:44	07:17 19:53	06:02 19:53	05:42 20:57	04:44 21:55	04:33 22:16	05:15 21:40	06:17 20:28	07:19 19:05	07:22 16:48	08:27 15:52	08:58 15:50
30	08:25 16:46	07:15 19:55	07:00 19:55	05:40 21:00	04:43 21:56	04:34 22:16	05:17 21:38	06:19 20:25	07:21 19:02	07:24 16:46	08:29 15:51	08:57 15:51
31	08:23 16:48	07:13 19:57	06:57 19:57	06:42 21:58	04:42 21:58	04:32 21:36	05:19 21:36	06:21 20:23	07:23 16:44	07:26 16:44	08:31 15:52	08:57 15:52
Potential sun hours	235	266	366	426	508	529	530	470	385	323	247	215
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Project:

flickering\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 3 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (20)  
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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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

	January	February	March	April	May	June	
1	08:57 15:53	08:21 16:50	07:17 17:53	06:54 19:59	05:38 21:02	19:07-20:10/63 06:31-06:50/19	04:41 21:59
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	19:23-20:08/45 19:10-19:20/10	04:40 22:00
3	08:57 15:56	08:17 16:55	07:11 17:57	06:49 20:03	05:33 21:06	19:26-20:07/41 06:33-06:47/14	04:39 22:02
4	08:56 15:57	08:15 16:57	07:09 18:00	06:46 20:05	05:31 21:08	19:54-20:05/11 20:31-20:35/4 19:27-19:52/25	04:38 22:03
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 20:07	05:29 21:10	19:58-20:02/4 19:28-19:51/23 20:28-20:37/9	04:37 22:04
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 20:09	05:26 21:12	19:30-19:40/10 19:29-19:50/21 20:27-20:39/12	04:36 22:05
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 20:11	05:24 21:14	20:26-20:40/14 19:31-19:48/17 20:25-20:42/17 05:51-06:04/13	04:35 22:07
8	08:54 16:03	08:07 17:06	07:25-07:43/18 18:08	06:36 20:13	05:22 21:16	19:07-19:44/37 07:03-07:21/18 19:33-19:46/13	04:34 22:08
9	08:53 16:04	08:04 17:08	07:24-07:45/21 18:10	06:33 20:16	05:20 21:18	19:04-19:45/41 07:02-07:23/21 19:38-19:41/3	04:33 22:09
10	08:52 16:06	08:02 17:11	07:23-07:45/22 18:13	06:30 20:18	05:18 21:20	19:04-19:47/43 07:01-07:23/22 05:47-06:06/19	04:33 22:10
11	08:51 16:08	08:00 17:13	07:22-07:45/23 18:15	06:28 20:20	05:16 21:22	19:02-19:46/44 06:59-07:23/24 05:46-06:06/20	04:32 22:11
12	08:51 16:10	07:58 17:15	07:22-07:45/23 18:17	06:25 20:22	05:14 21:24	19:01-19:47/46 06:59-07:24/25 20:22-20:45/23 05:47-06:08/21	04:32 22:12
13	08:50 16:11	07:55 17:17	07:22-07:45/23 18:19	06:23 20:24	05:12 21:26	19:00-19:46/46 06:58-07:23/25 20:23-20:46/23 05:46-06:08/22	04:31 22:12
14	08:49 16:13	07:53 17:20	07:21-07:44/23 18:21	06:20 20:26	05:10 21:28	19:00-19:57/57 06:58-07:24/26 20:23-20:45/22 05:45-06:08/23	04:31 22:13
15	08:47 16:15	07:51 17:22	07:21-07:43/22 18:23	06:17 20:28	05:08 21:30	18:59-19:58/59 06:57-07:23/26 20:22-20:45/23 05:38-06:08/30	04:31 22:14
16	08:46 16:17	07:49 17:24	07:22-07:43/21 18:25	06:15 20:30	05:06 21:32	18:59-20:00/61 06:58-07:23/25 20:22-20:45/23 05:37-06:09/32	04:30 22:14
17	08:45 16:19	07:46 17:26	07:23-07:41/18 18:27	06:12 20:32	05:04 21:34	18:58-20:02/64 06:39-06:46/7 06:58-07:21/23 05:35-06:09/34	04:30 22:15
18	08:44 16:21	07:44 17:29	07:23-07:39/16 18:29	06:10 20:34	05:02 21:36	18:58-20:04/66 06:37-06:50/13 06:58-07:21/23 05:33-06:08/35	04:30 22:15
19	08:42 16:23	07:41 17:31	07:26-07:37/11 18:32	06:07 20:36	05:00 21:37	18:57-20:06/69 06:34-06:51/17 06:58-07:19/21 18:58-20:08/70 06:33-06:52/19	04:30 22:16
20	08:41 16:25	07:39 17:33	17:41-18:03/22 18:34	06:05 20:39	04:58 21:39	20:08/70 07:00-07:18/18 20:24-20:44/20 05:31-06:08/37	04:30 22:16
21	08:40 16:27	07:37 17:35	17:40-18:04/24 18:36	06:02 20:41	04:57 21:41	18:57-20:09/72 06:32-06:53/21 07:01-07:17/16 05:31-06:09/38	04:30 22:16
22	08:38 16:29	07:34 17:38	17:40-18:03/23 18:38	06:00 20:43	04:55 21:43	18:58-20:12/74 06:31-06:53/22 07:03-07:14/11 05:30-06:08/38	04:30 22:17
23	08:37 16:31	07:32 17:40	17:40-18:03/23 18:40	05:57 20:45	04:53 21:45	18:58-20:13/75 06:30-06:54/24 20:27-20:42/15 05:30-06:08/38	04:31 22:17
24	08:35 16:33	07:29 17:42	17:40-18:02/22 18:42	05:55 20:47	04:52 21:46	18:58-20:13/75 06:30-06:54/24 20:28-20:40/12 05:31-06:07/36	04:31 22:17
25	08:33 16:35	07:27 17:44	17:40-18:01/21 18:44	05:52 20:49	04:50 21:48	18:59-20:13/74 06:29-06:53/24 20:29-20:40/11 05:30-06:07/37	04:31 22:17
26	08:32 16:37	07:24 17:46	17:41-17:59/18 18:46	05:50 20:51	04:49 21:50	19:00-20:13/73 06:29-06:53/24 20:32-20:38/6 05:30-06:07/37	04:32 22:17
27	08:30 16:39	07:22 17:49	06:08 18:48	05:47 20:53	04:47 21:51	17:43-17:58/15 06:30-06:53/23 05:30-06:07/37 05:31-06:07/36	04:32 22:17
28	08:28 16:42	07:19 17:51	17:45-17:55/10 18:50	05:45 20:55	04:46 21:53	19:02-20:12/70 06:29-06:52/23 19:03-20:12/69 06:29-06:52/23	04:33 22:16
29	08:26 16:44		07:02 19:53	05:42 20:57	04:45 21:54	06:29-06:52/23 19:05-20:11/66 06:30-06:51/21	04:33 22:16
30	08:25 16:46		07:00 19:55	05:40 20:59	04:43 21:56	05:30-06:07/37 05:31-06:07/36	04:34 22:16
31	08:23 16:48		06:57 19:57		04:42 21:58		
Potential sun hours	235	266	366	426	508	529	1104
Sum of minutes with flicker	0	0	521	2130	1486		

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
Vilandes 3-6  
LV-1010 Riga  
0037167242411  
Laura Kurzemniece / laura.kurzemniece@environment.lv  
Calculated:  
03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 3 - NORDEX N163/6.X 7000 163.0 !O! hub: 169,0 m (TOT: 250,5 m) (20)  
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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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

	July	August	September	October	November	December
1	04:35 05:37-06:14/37 22:15	05:21 20:34-20:56/22 21:34 05:57-06:18/21	06:23 19:01-19:45/44 20:20 06:59-07:23/24	07:23 08:01-08:24/23 18:59	07:29 08:30 16:41	08:30 15:50
2	04:36 05:36-06:13/37 22:15	05:23 20:33-20:55/22 21:32 05:58-06:17/19	06:25 19:02-19:44/42 20:17 06:59-07:21/22	07:25 08:01-08:24/23 18:57	07:31 08:31 16:39	08:32 15:49
3	04:37 05:37-06:14/37 22:14	05:25 20:34-20:54/20 21:30 05:58-06:16/18	06:27 19:02-19:44/42 20:15 06:59-07:20/21	07:27 08:01-08:23/22 18:54	07:33 08:34 16:37	08:34 15:48
4	04:38 05:37-06:14/37 22:14	05:27 20:34-20:54/20 06:00-06:15/15 21:28 19:46-19:54/8	06:29 19:04-19:41/37 20:12 07:00-07:18/18	07:29 08:01-08:22/21 18:51	07:35 08:36 16:35	08:36 15:47
5	04:39 05:37-06:14/37 22:13	05:29 20:35-20:52/17 06:02-06:14/12 21:26 19:43-19:57/14	06:31 19:05-19:39/34 20:09 07:02-07:16/14	07:31 08:01-08:21/20 18:49	07:37 08:37 16:33	08:37 15:47
6	04:40 05:38-06:15/37 22:12	05:31 20:35-20:49/14 06:04-06:11/7 21:23 19:41-19:59/18	06:33 19:07-19:36/29 20:07 07:05-07:13/8	07:33 08:02-08:19/17 18:46	07:40 08:39 16:30	08:39 15:46
7	04:41 05:38-06:15/37 22:12	05:33 20:37-20:47/10 21:21 19:38-20:00/22	06:35 19:29-19:34/5 20:04 19:11-19:22/11	07:35 08:04-08:17/13 18:45	07:42 08:40 16:28	08:40 15:45
8	04:42 05:38-06:15/37 22:11	05:34 20:06-20:13/7 06:46-06:52/6 21:19 20:38-20:45/7 19:37-20:01/24	06:37 07:37 20:01	08:07-08:13/6 18:41	07:44 08:42 16:26	08:42 15:45
9	04:43 05:38-06:15/37 22:10	05:36 20:03-20:15/12 19:36-20:02/26 21:17 06:43-06:55/12	06:39 07:39 19:59	07:39 18:38	07:46 08:43 16:24	08:43 15:44
10	04:44 05:39-06:15/36 22:09	05:38 19:35-20:17/42 21:15 06:41-06:57/16	06:41 07:42 19:56	07:42 08:35 18:35	07:48 08:44 16:22	08:44 15:44
11	04:46 05:39-06:16/37 22:08	05:40 19:18-20:18/60 21:12 06:40-06:58/18	06:43 07:44 19:53	07:44 08:33 18:33	07:50 08:46 16:20	08:46 15:43
12	04:47 05:39-06:16/37 22:07	05:42 19:15-20:19/64 21:10 06:39-06:59/20	06:45 07:46 19:51	07:46 08:30 18:30	07:53 08:47 16:18	08:47 15:43
13	04:48 05:39-06:16/37 22:05	05:44 19:12-20:19/67 21:08 06:38-07:00/22	06:47 07:48 19:48	07:48 08:28 18:28	07:55 08:48 16:16	08:48 15:43
14	04:50 05:39-06:16/37 22:04	05:46 19:10-20:19/69 21:05 06:37-06:59/22	06:49 07:50 19:45	07:50 08:25 18:25	07:57 08:49 16:15	08:49 15:43
15	04:51 05:39-06:16/37 22:03	05:48 19:09-20:20/71 21:03 06:36-07:00/24	06:51 18:35-18:43/8 19:42	07:52 08:22 18:22	07:59 08:50 16:13	08:50 15:43
16	04:53 05:39-06:16/37 22:02	05:50 19:08-20:20/72 21:00 06:36-07:00/24	06:53 18:32-18:46/14 19:40	07:54 08:20 18:20	08:01 08:51 16:11	08:51 15:43
17	04:54 20:42-20:45/3 22:00 05:40-06:16/36	05:53 19:06-20:20/74 20:58 06:36-07:00/24	06:55 18:30-18:47/17 19:37	07:56 08:17 18:17	08:03 08:52 16:09	08:52 15:43
18	04:56 20:40-20:48/8 21:59 05:39-06:16/37	05:55 19:05-20:20/75 20:56 06:36-07:00/24	06:57 18:28-18:48/20 19:34	07:58 08:15 18:15	08:05 08:53 16:08	08:53 15:43
19	04:57 20:38-20:50/12 21:57 05:40-06:16/36	05:57 19:05-20:19/74 20:53 06:36-07:00/24	06:59 18:27-18:48/21 19:32	08:00 08:12 18:12	08:07 08:54 16:06	08:54 15:43
20	04:59 20:37-20:51/14 21:56 05:40-06:17/37	05:59 19:04-20:19/75 06:36-06:59/23 20:51 07:12-07:17/5	07:01 18:26-18:49/23 19:29	08:03 08:10 18:10	08:09 08:54 16:04	08:54 15:44
21	05:01 20:36-20:52/16 21:54 05:41-06:18/37	06:01 19:02-20:16/74 06:36-06:59/23 20:48 07:08-07:20/12	07:03 18:25-18:48/23 19:26	08:05 08:07 18:07	08:11 08:55 16:03	08:55 15:44
22	05:03 20:36-20:53/17 21:53 05:41-06:18/37	06:03 19:02-20:14/72 06:37-06:58/21 20:46 07:06-07:22/16	07:05 18:25-18:48/23 19:23	08:07 08:05 18:05	08:13 08:55 16:01	08:55 15:44
23	05:04 20:34-20:53/19 21:51 05:41-06:19/38	06:05 19:01-20:12/71 06:37-06:56/19 20:43 07:03-07:22/19	07:07 18:24-18:48/24 19:21	08:09 08:02 18:02	08:15 08:56 16:00	08:56 15:45
24	05:06 20:34-20:54/20 21:49 05:41-06:19/38	06:07 19:01-20:09/68 06:38-06:54/16 20:41 07:02-07:23/21	07:09 08:10-08:19/9 19:18 18:24-18:47/23	08:11 08:11 18:00	08:17 08:56 15:58	08:56 15:46
25	05:08 20:34-20:55/21 21:47 05:43-06:19/36	06:09 19:01-20:07/66 06:40-06:52/12 20:38 07:01-07:24/23	07:11 08:07-08:21/14 19:15 18:25-18:45/20	07:13 07:13 16:58	08:19 08:57 15:57	08:57 15:46
26	05:10 20:33-20:55/22 21:46 05:45-06:20/35	06:11 19:00-20:04/64 06:43-06:49/6 20:35 07:00-07:24/24	07:13 08:05-08:22/17 19:13 18:25-18:42/17	07:16 07:16 16:55	08:21 08:57 15:56	08:57 15:47
27	05:11 20:33-20:55/22 21:44 05:46-06:19/33	06:13 19:00-20:02/62 20:33 07:00-07:25/25	07:15 08:03-08:23/20 19:10 18:26-18:39/13	07:18 07:18 16:53	08:23 08:57 15:54	08:57 15:48
28	05:13 20:33-20:56/23 21:42 05:48-06:19/31	06:15 19:00-20:00/60 20:30 06:59-07:25/26	07:17 08:02-08:24/22 19:07 18:27-18:36/9	07:20 07:20 16:50	08:25 08:57 15:53	08:57 15:49
29	05:15 20:33-20:55/22 05:56-06:19/23 21:40 05:50-05:55/5	06:17 19:01-19:57/56 20:28 06:59-07:24/25	07:19 08:02-08:25/23 19:05 18:30-18:34/4	07:22 07:22 16:48	08:27 08:57 15:52	08:57 15:50
30	05:17 20:33-20:56/23 21:38 05:56-06:18/22	06:19 19:01-19:47/46 20:25 06:59-07:24/25	07:21 08:02-08:25/23 19:02	07:24 07:24 16:46	08:29 08:57 15:51	08:57 15:51
31	05:19 20:33-20:56/23 21:36 05:56-06:18/22	06:21 19:00-19:46/46 20:22 06:59-07:24/25		07:26 07:26 16:44		08:57 15:52
Potential sun hours	530	470	385	323	247	216
Sum of minutes with flicker	1359	2385	738	145	0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
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## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 4 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (19)  
 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 6,63 9,63 10,06 8,16 7,72 5,94 2,93 0,63 0,52

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

	January	February	March	April	May	June
1	08:57 15:53	08:21 16:50	07:17 17:53	06:54 19:59	05:38 19:49-19:56/7 21:02	04:41 20:36-21:16/40 21:59
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	04:40 20:36-21:17/41 22:00
3	08:57 15:56	08:17 16:55	07:11 17:57	06:49 07:14-07:21/7 20:03	05:33 21:06	04:39 20:37-21:17/40 22:02
4	08:56 15:57	08:15 16:57	07:09 18:00	06:46 07:12-07:24/12 20:05	05:31 21:08	04:38 20:39-21:19/40 22:03
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 07:09-07:25/16 20:07	05:29 05:57-06:02/5 21:10	04:37 20:39-21:20/41 22:04
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 07:07-07:26/19 20:09	05:26 05:55-06:05/10 21:12	04:36 20:40-21:22/42 22:06
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 07:06-07:27/21 20:11	05:24 05:53-06:06/13 21:14	04:35 20:41-20:49/8 22:07 20:51-21:24/33
8	08:54 16:03	08:07 17:06	06:58 18:08	06:36 07:05-07:27/22 20:13	05:22 05:51-06:07/16 21:16	04:34 20:43-20:49/6 22:08 20:52-21:26/34
9	08:53 16:04	08:04 17:08	06:56 17:34-17:41/7 18:10	06:33 07:05-07:28/23 20:16	05:20 20:39-20:44/5 21:18 05:49-06:08/19	04:33 20:52-21:26/34 22:09
10	08:52 16:06	08:02 17:11	06:53 17:33-17:44/11 18:13	06:30 07:04-07:27/23 20:18	05:18 20:37-20:46/9 21:20 05:49-06:09/20	04:33 20:53-21:28/35 22:10
11	08:51 16:08	08:00 17:13	06:51 17:31-17:46/15 18:15	06:28 07:04-07:26/22 20:20	05:16 20:35-20:47/12 21:22 05:48-06:09/21	04:32 20:52-21:28/36 22:11
12	08:51 16:10	07:58 17:15	06:48 17:29-17:48/19 18:17	06:25 07:04-07:26/22 20:22	05:14 20:34-20:49/15 21:24 05:48-06:10/22	04:32 20:53-21:29/36 22:12
13	08:50 16:11	07:55 17:17	06:45 17:29-17:50/21 18:19	06:23 07:04-07:25/21 20:24	05:12 20:34-20:52/18 21:26 05:48-06:10/22	04:31 20:54-21:30/36 22:12
14	08:49 16:13	07:53 17:20	06:43 17:28-17:50/22 18:21	06:20 07:05-07:25/20 20:26 19:51-19:57/6	05:10 20:33-20:53/20 21:28 05:47-06:10/23	04:31 20:54-21:31/37 22:13
15	08:47 16:15	07:51 17:22	06:40 17:27-17:50/23 18:23	06:17 07:05-07:23/18 20:28 19:48-19:58/10	05:08 20:32-20:54/22 21:30 05:47-06:10/23	04:31 20:54-21:30/36 22:14
16	08:46 16:17	07:49 17:24	06:37 17:26-17:49/23 18:25	06:15 07:06-07:22/16 20:30 19:46-20:00/14	05:06 20:31-20:54/23 21:32 05:48-06:11/23	04:30 20:54-21:31/37 22:14
17	08:45 16:19	07:46 17:26	06:35 17:27-17:50/23 18:27 17:57-17:59/2	06:12 07:08-07:19/11 20:32 19:44-20:02/18	05:04 20:31-20:55/24 20:57-20:58/1 21:34 05:48-06:10/22	04:30 20:55-21:31/36 22:15
18	08:44 16:21	07:44 17:29	06:32 17:27-17:49/22 18:29 17:53-18:01/8	06:10 07:12-07:15/3 20:34 19:44-20:04/20	05:02 20:31-21:00/29 21:36 05:48-06:10/22	04:30 20:55-21:32/37 22:15
19	08:42 16:23	07:41 17:31	06:29 17:27-17:47/20 18:32 17:51-18:03/12	06:07 19:42-20:05/23 20:36	05:00 20:31-21:02/31 21:37 05:48-06:10/22	04:30 20:55-21:32/37 22:16
20	08:41 16:25	07:39 17:33	06:27 17:29-17:47/18 18:34 17:50-18:06/16	06:05 19:42-20:06/24 20:39	04:58 20:31-21:03/32 21:39 05:48-06:09/21	04:30 20:55-21:32/37 22:16
21	08:40 16:27	07:37 17:35	06:24 17:30-17:44/14 18:36 17:48-18:08/20	06:02 19:41-20:05/24 20:41	04:57 20:30-21:05/35 21:41 05:49-06:09/20	04:30 20:56-21:33/37 22:17
22	08:38 16:29	07:34 17:38	06:21 17:32-17:41/9 18:38 17:47-18:09/22	06:00 19:41-20:06/25 20:43	04:55 20:31-21:06/35 21:43 05:49-06:08/19	04:30 20:56-21:33/37 22:17
23	08:37 16:31	07:32 17:40	06:18 17:47-18:10/23 18:40	05:57 19:41-20:06/25 20:45	04:53 20:32-21:08/36 21:45 05:50-06:08/18	04:31 20:56-21:33/37 22:17
24	08:35 16:33	07:29 17:42	06:16 17:47-18:10/23 18:42	05:55 19:41-20:05/24 20:47	04:52 20:31-21:09/38 21:46 05:51-06:07/16	04:31 20:56-21:33/37 22:17
25	08:33 16:35	07:27 17:44	06:13 17:46-18:09/23 18:44	05:52 19:41-20:04/23 20:49	04:50 20:32-21:11/39 21:48 05:52-06:06/14	04:31 20:57-21:34/37 22:17
26	08:32 16:37	07:24 17:46	06:10 17:46-18:08/22 18:46	05:50 19:42-20:04/22 20:51	04:49 20:33-21:12/39 21:50 05:53-06:06/13	04:32 20:56-21:33/37 22:17
27	08:30 16:39	07:22 17:49	06:08 17:47-18:08/21 18:48	05:47 19:42-20:02/20 20:53	04:47 20:32-21:12/40 21:51 05:55-06:05/10	04:32 20:57-21:34/37 22:17
28	08:28 16:42	07:19 17:51	06:05 17:47-18:07/20 18:50	05:45 19:43-20:02/19 20:55	04:46 20:33-21:12/39 21:53 05:56-06:02/6	04:33 20:57-21:33/36 22:17
29	08:26 16:44		07:02 18:47-19:05/18 19:53	05:42 19:44-20:00/16 20:57	04:44 20:34-21:13/39 21:55	04:33 20:57-21:33/36 22:16
30	08:25 16:46		07:00 18:50-19:04/14 19:55	05:40 19:46-19:59/13 20:59	04:43 20:34-21:13/39 21:56	04:34 20:57-21:33/36 22:16
31	08:23 16:48		06:57 18:52-19:00/8 19:57		04:42 20:35-21:14/39 21:58	
Potential sun hours	235	266	366	426	508	529
Sum of minutes with flicker	0	0	499	602	1086	1126

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
 Vilandes 3-6  
 LV-1010 Riga  
 0037167242411  
 Laura Kurzemniece / laura.kurzemniece@environment.lv  
 Calculated:  
 03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 4 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (19)  
 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 6,63 9,63 10,06 8,16 7,72 5,94 2,93 0,63 0,52

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

	July	August	September	October	November	December
1	04:35 20:57-21:32/35 22:15	05:21 20:45-21:00/15 21:34 05:59-06:20/21	06:23 07:03-07:26/23 20:20	07:23 18:08-18:28/20 18:59	07:29 16:41	08:31 15:50
2	04:36 20:57-21:32/35 22:15	05:23 20:46-20:57/11 21:32 05:59-06:20/21	06:25 07:02-07:25/23 20:17	07:25 18:09-18:26/17 18:57	07:31 16:39	08:32 15:49
3	04:37 20:57-21:32/35 22:14	05:25 20:48-20:55/7 21:30 05:59-06:19/20	06:27 07:02-07:25/23 20:15	07:27 18:10-18:23/13 18:54	07:33 16:37	08:34 15:48
4	04:37 20:49-20:53/4 22:14 20:57-21:31/34	05:27 20:51-20:54/3 21:28 06:00-06:18/18	06:29 07:02-07:24/22 20:12	07:29 18:11-18:21/10 18:51	07:35 16:35	08:36 15:47
5	04:38 20:48-20:55/7 22:13 20:57-21:31/34	05:29 06:02-06:17/15 21:26	06:31 07:02-07:23/21 20:09	07:31 18:14-18:18/4 18:49	07:37 16:33	08:37 15:47
6	04:40 20:47-20:56/9 22:12 20:58-21:29/31	05:30 06:04-06:16/12 21:24	06:33 07:03-07:22/19 20:07	07:33 18:46	07:40 16:30	08:39 15:46
7	04:41 20:46-21:26/40 22:12	05:32 06:05-06:13/8 21:21	06:35 07:04-07:21/17 20:04	07:35 18:43	07:42 16:28	08:40 15:45
8	04:42 20:45-21:26/41 22:11	05:34 21:19	06:37 07:06-07:19/13 20:01	07:37 18:41	07:44 16:26	08:42 15:45
9	04:43 20:45-21:25/40 22:10	05:36 21:17	06:39 07:08-07:15/7 19:59	07:39 18:38	07:46 16:24	08:43 15:44
10	04:44 20:44-21:25/41 22:09	05:38 21:15	06:41 19:56	07:42 18:35	07:48 16:22	08:44 15:44
11	04:46 20:43-21:24/41 22:08	05:40 21:12	06:43 19:53	07:44 18:33	07:50 16:20	08:46 15:43
12	04:47 20:44-21:24/40 22:07	05:42 19:56-20:04/8 21:10	06:45 18:45-18:52/7 19:51	07:46 18:30	07:53 16:18	08:47 15:43
13	04:48 20:43-21:22/39 22:05	05:44 19:53-20:07/14 21:08	06:47 18:40-18:54/14 19:48	07:48 18:28	07:55 16:16	08:48 15:43
14	04:50 20:42-21:21/39 22:04	05:46 19:51-20:08/17 21:05	06:49 18:38-18:55/17 19:45	07:50 18:25	07:57 16:15	08:49 15:43
15	04:51 20:43-21:22/39 22:03 06:07-06:10/3	05:48 19:50-20:09/19 21:03	06:51 18:36-18:56/20 19:42	07:52 18:22	07:59 16:13	08:50 15:43
16	04:53 20:42-21:21/39 22:02 06:04-06:12/8	05:50 19:49-20:10/21 21:00	06:53 18:35-18:56/21 19:40	07:54 18:20	08:01 16:11	08:51 15:43
17	04:54 20:41-21:21/40 22:00 06:03-06:15/12	05:52 19:48-20:11/23 20:58	06:55 18:34-18:57/23 19:37	07:56 18:17	08:03 16:09	08:52 15:43
18	04:56 20:42-21:21/39 21:59 06:02-06:16/14	05:55 19:48-20:11/23 20:56	06:57 18:34-18:57/23 19:34	07:58 18:15	08:05 16:08	08:53 15:43
19	04:57 20:41-21:20/39 21:57 06:01-06:16/15	05:57 19:47-20:11/24 20:53	06:59 18:33-18:57/24 19:32	08:00 18:12	08:07 16:06	08:54 15:43
20	04:59 20:41-21:19/38 21:56 06:01-06:17/16	05:59 19:47-20:11/24 20:51	07:01 18:33-18:56/23 19:29	08:03 18:10	08:09 16:04	08:54 15:44
21	05:01 20:41-21:17/36 21:54 05:59-06:18/19	06:01 19:46-20:10/24 20:48	07:03 18:18-18:26/8 19:26 18:33-18:56/23	08:05 18:07	08:11 16:03	08:55 15:44
22	05:02 20:41-21:16/35 21:53 05:59-06:19/20	06:03 19:46-20:10/24 20:46	07:05 18:15-18:29/14 19:23 18:33-18:53/20	08:07 18:05	08:14 16:01	08:55 15:44
23	05:04 20:41-21:14/33 21:51 05:59-06:20/21	06:05 19:46-20:10/24 20:43	07:07 18:13-18:30/17 19:21 18:33-18:50/17	08:09 18:02	08:16 16:00	08:56 15:45
24	05:06 20:41-21:13/32 21:49 05:58-06:20/22	06:07 19:46-20:09/23 20:41	07:09 18:11-18:31/20 19:18 18:34-18:47/13	08:11 18:00	08:17 15:58	08:56 15:45
25	05:08 20:42-21:11/29 21:47 05:59-06:20/21	06:09 07:14-07:19/5 20:38 19:46-20:07/21	07:11 18:10-18:31/21 19:15 18:35-18:45/10	07:13 16:58	08:19 15:57	08:57 15:46
26	05:10 20:41-21:05/24 21:06-21:09/3 21:46 05:58-06:20/22	06:11 07:10-07:22/12 20:35 19:47-20:04/17	07:13 18:09-18:31/22 19:13 18:37-18:42/5	07:16 16:55	08:21 15:56	08:57 15:47
27	05:11 20:42-21:05/23 21:44 05:58-06:21/23	06:13 07:08-07:24/16 20:33 19:48-20:02/14	07:15 18:08-18:31/23 19:10	07:18 16:53	08:23 15:54	08:57 15:48
28	05:13 20:43-21:05/22 21:42 05:58-06:21/23	06:15 07:07-07:25/18 20:30 19:50-20:00/10	07:17 18:08-18:31/23 19:07	07:20 16:50	08:25 15:53	08:57 15:49
29	05:15 20:42-21:04/22 21:40 05:58-06:21/23	06:17 07:05-07:26/21 20:28 19:52-19:57/5	07:19 18:08-18:30/22 19:05	07:22 16:48	08:27 15:52	08:57 15:50
30	05:17 20:43-21:03/20 21:38 05:58-06:20/22	06:19 07:05-07:26/21 20:25	07:21 18:08-18:30/22 19:02	07:24 16:46	08:29 15:51	08:57 15:51
31	05:19 20:44-21:01/17 21:36 05:58-06:20/22	06:21 07:04-07:26/22 20:22		07:26 16:44		08:57 15:52
Potential sun hours	530	470	385	323	247	216
Sum of minutes with flicker	1381	601	620	64	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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian & Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 5 - NORDEX N163/6.X 7000 163.0 !O! hub: 169,0 m (TOT: 250,5 m) (17)

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 6,63 9,63 10,06 8,16 7,72 5,94 2,93 0,63 0,52

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	08:57 15:53	08:21 16:50	07:17 17:53	06:54 19:59	05:38 21:02	04:41 21:59	05:29-05:51/22 22:16	04:35 22:16	05:37-05:55/18 21:34	06:23 20:20	07:23 18:59	07:29 16:41
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	04:40 22:00	05:29-05:51/22 22:15	04:36 22:15	05:37-05:55/18 21:32	06:25 20:17	07:25 18:57	07:31 16:39
3	08:57 15:56	08:17 16:55	07:11 17:57	06:49 20:03	05:33 21:06	04:39 22:02	05:29-05:51/22 22:15	04:36 22:15	05:37-05:56/19 21:30	06:27 20:15	07:27 18:54	07:33 16:37
4	08:56 15:57	08:15 16:57	07:09 18:00	06:46 20:05	05:31 21:08	04:37 22:03	05:30-05:51/21 22:14	04:37 22:14	05:37-05:56/19 21:28	06:29 20:12	07:29 18:51	07:35 16:35
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 20:07	05:29 21:10	04:37 22:04	05:30-05:51/21 22:13	04:38 22:13	05:37-05:57/20 21:26	06:31 20:09	07:31 18:49	07:37 16:32
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 20:09	05:26 21:12	04:36 22:06	05:30-05:51/21 22:12	04:39 22:12	05:37-05:57/20 21:24	06:33 20:07	07:33 18:46	07:40 16:30
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 20:11	05:24 21:14	04:35 22:07	05:31-05:51/20 22:12	04:41 22:12	05:37-05:57/20 21:21	06:35 20:04	07:35 18:43	07:42 16:28
8	08:54 16:03	08:07 17:06	06:58 18:08	06:36 20:13	05:22 21:16	04:34 22:08	05:31-05:51/20 22:11	04:42 22:11	05:37-05:58/21 21:19	06:37 20:01	07:37 18:41	07:44 16:26
9	08:53 16:04	08:04 17:08	06:56 18:10	06:33 20:16	05:20 21:18	04:33 22:09	05:31-05:50/19 22:10	04:43 22:10	05:37-05:58/21 21:17	06:39 19:59	07:39 18:38	07:46 16:24
10	08:52 16:06	08:02 17:11	06:53 18:13	06:30 20:18	05:18 21:20	04:33 22:10	05:32-05:51/19 22:09	04:44 22:09	05:36-05:58/22 21:15	06:41 19:56	07:42 18:35	07:48 16:22
11	08:52 16:08	08:00 17:13	06:51 18:15	06:28 20:20	05:16 21:22	04:32 22:11	05:33-05:51/18 22:08	04:46 22:08	05:37-05:59/22 21:12	06:43 19:53	07:44 18:33	07:50 16:20
12	08:51 16:09	07:58 17:15	06:48 18:17	06:25 20:22	05:14 21:24	04:32 22:12	05:33-05:51/18 22:07	04:47 22:07	05:37-05:59/22 21:10	06:45 19:51	07:46 18:30	07:53 16:18
13	08:50 16:11	07:56 17:17	06:45 18:19	06:23 20:24	05:12 21:26	04:31 22:12	05:34-05:51/17 22:06	04:48 22:06	05:37-05:59/22 21:08	06:47 19:48	07:48 18:28	07:55 16:16
14	08:49 16:13	07:53 17:20	06:43 18:21	06:20 20:26	05:10 21:28	04:31 22:13	05:34-05:51/17 22:04	04:50 22:04	05:37-05:59/22 21:05	06:49 19:45	07:50 18:25	07:57 16:15
15	08:47 16:15	07:51 17:22	06:40 18:23	06:17 20:28	05:08 21:30	04:30 22:14	05:35-05:51/16 22:03	04:51 22:03	05:37-06:00/23 21:03	06:51 19:42	07:52 18:22	07:59 16:13
16	08:46 16:17	07:49 17:24	06:37 18:25	06:15 20:30	05:06 21:32	04:30 22:15	05:34-05:50/16 22:15	04:53 22:15	05:37-06:00/23 21:05	06:53 19:40	07:54 18:20	08:01 16:11
17	08:45 16:19	07:46 17:26	06:35 18:27	06:12 20:32	05:04 21:34	04:30 22:15	05:35-05:51/16 22:00	04:54 22:00	05:38-06:00/22 20:58	06:55 19:37	07:56 18:17	08:03 16:09
18	08:44 16:21	07:44 17:29	06:32 18:30	06:10 20:34	05:02 21:36	04:30 22:16	05:35-05:51/16 22:16	04:56 22:16	05:38-06:00/22 20:56	06:57 19:34	07:58 18:15	08:05 16:08
19	08:42 16:23	07:41 17:31	06:29 18:32	06:07 20:36	05:00 21:37	04:30 22:16	05:35-05:51/16 22:16	04:57 22:16	05:37-05:59/22 20:53	06:59 19:32	08:00 18:12	08:07 16:06
20	08:41 16:25	07:39 17:33	06:27 18:34	06:05 20:39	05:05 21:39	04:30 22:16	05:36-05:52/16 22:16	04:59 22:16	05:38-06:00/22 20:51	06:59 19:29	08:01 18:10	08:09 16:04
21	08:40 16:27	07:37 17:35	06:24 18:36	06:02 20:41	05:07 21:41	04:30 22:17	05:36-05:52/16 22:17	05:01 22:17	05:38-05:59/21 20:48	06:01 19:26	08:03 18:07	08:12 16:03
22	08:38 16:29	07:34 17:38	06:21 18:38	06:00 20:43	05:05 21:43	04:30 22:17	05:36-05:52/16 22:17	05:02 22:17	05:39-05:59/20 20:46	06:03 19:23	08:07 18:05	08:14 16:01
23	08:37 16:31	07:32 17:40	06:18 18:40	05:57 20:45	05:03 21:45	04:30 22:17	05:36-05:52/16 22:17	05:04 22:17	05:40-05:59/19 20:43	06:05 19:21	08:09 18:02	08:16 16:00
24	08:35 16:33	07:29 17:42	06:16 18:42	05:55 20:47	05:02 21:46	04:31 22:17	05:37-05:53/16 22:17	05:06 22:17	05:41-05:58/17 20:41	06:07 19:18	08:11 18:00	08:18 15:58
25	08:33 16:35	07:27 17:44	06:13 18:44	05:52 20:49	05:00 21:48	04:31 22:17	05:37-05:53/16 22:17	05:08 22:17	05:43-05:57/14 20:38	06:09 19:15	08:13 17:58	08:19 15:57
26	08:32 16:37	07:24 17:46	06:10 18:46	05:50 20:51	04:49 21:50	04:32 22:17	05:36-05:53/17 22:17	05:10 22:17	05:44-05:56/12 20:36	06:11 19:13	08:15 17:56	08:21 15:56
27	08:30 16:39	07:22 17:49	06:08 18:48	05:47 20:53	04:47 21:51	04:32 22:17	05:37-05:53/16 22:17	05:11 22:17	05:46-05:54/8 20:33	06:13 19:10	08:16 17:53	08:23 15:54
28	08:28 16:42	07:19 17:51	06:05 18:50	05:45 20:55	04:46 21:53	04:33 22:17	05:37-05:54/17 22:17	05:13 22:17	05:48-05:52/4 20:30	06:15 19:07	08:17 17:50	08:25 15:53
29	08:27 16:44	07:19 17:53	06:02 19:53	05:42 20:57	04:44 21:55	04:33 22:16	05:37-05:54/17 22:16	05:15 22:16	05:47-05:54/17 20:28	06:17 19:05	08:19 17:48	08:27 15:52
30	08:25 16:46	07:17 17:55	06:00 19:55	05:40 20:59	04:43 21:56	04:34 22:16	05:37-05:55/18 22:16	05:17 22:16	05:47-05:55/18 20:25	06:19 19:02	08:21 17:46	08:29 15:51
31	08:23 16:48	07:15 17:57	06:07 19:57	05:41 20:58	04:42 21:58	04:34 22:16	05:37-05:55/18 22:16	05:19 22:16	05:47-05:55/18 20:23	06:21 19:02	08:23 17:46	08:37 15:52
Potential sun hours	235	266	366	426	508	529	538	535	470	385	323	247
Sum of minutes with flicker	0	0	0	245	301	529	538	535	246	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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 6 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (14)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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

	January	February	March	April	May	June
1	08:57 15:53	08:21 16:51	07:17 17:53	06:54 19:59	07:40-08:04/24 21:02	05:38 19:54-20:11/17 21:59
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	07:37-08:05/28 21:04	05:35 19:54-20:09/15 22:00
3	08:57 15:56	08:17 16:55	07:12 17:57	06:49 20:03	07:35-08:06/31 21:06	05:33 19:55-20:07/12 22:02
4	08:56 15:57	08:15 16:57	07:09 18:00	06:46 20:05	07:34-08:08/34 21:08	05:31 19:58-20:04/6 22:03
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 20:07	07:32-08:08/36 21:10	05:29 22:04
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 20:09	07:30-08:09/39 21:12	05:26 22:06
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 20:11	07:30-08:10/40 21:14	05:24 22:07
8	08:54 16:03	08:07 17:06	06:59 18:08	06:36 20:13	07:28-08:10/42 21:16	05:22 22:08
9	08:53 16:05	08:04 17:08	06:56 18:10	06:33 20:16	07:28-08:10/42 21:18	05:20 22:09
10	08:52 16:06	08:02 17:11	06:53 18:13	06:30 20:18	07:27-08:10/43 21:20	05:18 22:10
11	08:52 16:08	08:00 17:13	06:51 18:15	06:28 20:20	07:26-08:10/44 21:22	05:16 22:11
12	08:51 16:10	07:58 17:15	06:48 18:17	06:25 20:22	07:26-08:10/44 21:24	05:14 22:12
13	08:50 16:11	07:56 17:18	06:45 18:19	06:23 20:24	07:25-08:09/44 21:26	05:12 22:12
14	08:49 16:13	07:53 17:20	06:43 18:21	06:20 20:26	07:25-08:10/45 21:28	05:10 22:13
15	08:47 16:15	07:51 17:22	06:40 18:23	06:17 20:28	07:25-08:09/44 21:30	05:08 22:14
16	08:46 16:17	07:49 17:24	06:37 18:25	06:15 20:30	07:25-08:09/44 21:32	05:06 22:14
17	08:45 16:19	07:46 17:27	06:35 18:27	06:12 20:32	07:25-08:07/42 21:34	05:04 22:15
18	08:44 16:21	07:44 17:29	06:32 18:30	06:10 20:34	20:01-20:04/3 21:36	05:02 22:16
19	08:42 16:23	07:41 17:31	06:29 18:32	06:07 20:36	19:58-20:06/8 21:37	05:00 22:16
20	08:41 16:25	07:39 17:33	06:27 18:34	06:05 20:39	19:56-20:08/12 21:39	04:58 22:16
21	08:40 16:27	07:37 17:35	06:24 18:36	06:02 20:41	19:54-20:09/15 21:41	04:57 22:17
22	08:38 16:29	07:34 17:38	06:21 18:38	06:00 20:43	19:53-20:12/19 21:43	04:55 22:17
23	08:37 16:31	07:32 17:40	06:19 18:40	05:57 20:45	19:53-20:14/21 21:45	04:53 22:17
24	08:35 16:33	07:29 17:42	06:16 18:42	05:55 20:47	19:52-20:13/21 21:46	04:52 22:17
25	08:33 16:35	07:27 17:44	06:13 18:44	05:52 20:49	19:52-20:14/22 21:48	04:50 22:17
26	08:32 16:37	07:24 17:47	06:10 18:46	05:50 20:51	19:52-20:14/22 21:50	04:49 22:17
27	08:30 16:40	07:22 17:49	06:08 18:48	05:47 20:53	19:51-20:13/22 21:51	04:47 22:17
28	08:28 16:42	07:19 17:51	06:05 18:50	05:45 20:55	19:51-20:13/22 21:53	04:46 22:17
29	08:27 16:44		07:02 19:53	05:43 20:57	19:52-20:12/20 21:55	04:45 22:16
30	08:25 16:46		07:00 19:55	05:40 20:59	19:53-20:12/19 21:56	04:43 22:16
31	08:23 16:48		06:57 19:57		07:40-07:46/6 21:58	04:42 22:16
Potential sun hours	235	266	366	426	508	529
Sum of minutes with flicker	0	0	23	1252	50	80

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 6 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (14)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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

	July	August	September	October	November	December
1	04:35 22:16	05:21 21:34	06:23 07:26-08:10/44 20:20	07:23 18:59	07:29 16:41	08:31 15:50
2	04:36 22:15	05:23 21:32	06:25 07:25-08:08/43 20:17	07:25 18:57	07:31 16:39	08:32 15:49
3	04:37 22:15	05:25 21:30	06:27 07:25-08:07/42 20:15	07:27 18:54	07:33 16:37	08:34 15:48
4	04:38 22:14	05:27 21:28	06:29 07:25-08:07/42 20:12	07:29 18:51	07:35 16:35	08:36 15:47
5	04:39 22:13	05:29 21:26	06:31 07:26-08:06/40 20:09	07:31 18:49	07:37 16:33	08:37 15:47
6	04:40 22:12	05:31 21:24	06:33 07:26-08:05/39 20:07	07:33 18:46	07:40 16:30	08:39 15:46
7	04:41 22:12	05:33 21:21	06:35 07:27-08:04/37 20:04	07:35 18:43	07:42 16:28	08:40 15:45
8	04:42 22:11	05:35 21:19	06:37 07:28-08:02/34 20:01	07:37 18:41	07:44 16:26	08:42 15:45
9	04:43 22:10	05:36 20:07-20:15/8 21:17	06:39 07:29-08:00/31 19:59	07:39 18:38	07:46 16:24	08:43 15:44
10	04:44 22:09	05:38 20:04-20:17/13 21:15	06:41 07:30-07:58/28 19:56	07:42 18:35	07:48 16:22	08:44 15:44
11	04:46 22:08	05:40 20:03-20:18/15 21:12	06:43 07:32-07:56/24 19:53	07:44 18:33	07:50 16:20	08:46 15:43
12	04:47 22:07	05:42 20:02-20:20/18 21:10	06:45 07:35-07:53/18 19:51	07:46 18:30	07:53 16:18	08:47 15:43
13	04:48 22:06	05:44 20:00-20:19/19 21:08	06:47 07:39-07:48/9 19:48	07:48 18:28	07:55 16:16	08:48 15:43
14	04:50 22:04	05:47 19:59-20:20/21 21:05	06:49 07:46-07:55/9 19:45	07:50 18:25	07:57 16:15	08:49 15:43
15	04:51 22:03	05:49 19:59-20:20/21 21:03	06:51 07:42-07:59/17 19:42	07:52 18:22	07:59 16:13	08:50 15:43
16	04:53 22:02	05:51 19:58-20:20/22 21:00	06:53 07:39-08:02/23 19:40	07:54 18:20	08:01 16:11	08:51 15:43
17	04:54 22:00	05:53 19:58-20:20/22 20:58	06:55 07:37-08:04/27 19:37	07:56 18:17	08:03 16:09	08:52 15:43
18	04:56 21:59	05:55 19:58-20:20/22 20:56	06:57 07:36-08:05/29 19:34	07:58 18:15	08:05 16:08	08:53 15:43
19	04:58 21:57	05:57 19:58-20:20/22 20:53	06:59 07:34-08:07/33 19:32	08:01 18:12	08:07 16:06	08:54 15:43
20	04:59 21:56	05:59 19:59-20:19/20 20:51	07:01 07:33-08:08/35 19:29	08:03 18:10	08:09 16:04	08:54 15:44
21	05:01 21:54	06:01 19:58-20:16/18 20:48	07:03 07:32-08:09/37 19:26	08:05 18:07	08:12 16:03	08:55 15:44
22	05:03 21:53	06:03 19:59-20:14/15 20:46	07:05 07:30-08:09/39 19:24	08:07 18:05	08:14 16:01	08:56 15:44
23	05:04 21:51	06:05 20:00-20:12/12 20:43	07:07 07:29-08:09/40 19:21	08:09 18:02	08:16 16:00	08:56 15:45
24	05:06 21:49	06:07 20:02-20:09/7 20:41	07:09 07:29-08:10/41 19:18	08:11 18:00	08:18 15:58	08:56 15:46
25	05:08 21:47	06:09 20:05-20:07/2 20:38	07:11 07:28-08:10/42 19:15	08:13 16:58	08:19 15:57	08:57 15:46
26	05:10 21:46	06:11 07:27-08:10/43 20:36	07:13 07:27-08:10/43 19:13	08:15 16:55	08:21 15:56	08:57 15:47
27	05:11 21:44	06:13 07:27-08:10/43 20:33	07:15 07:27-08:10/43 19:10	08:17 16:53	08:23 15:55	08:57 15:48
28	05:13 21:42	06:15 07:27-08:11/44 20:30	07:17 07:27-08:11/44 19:07	08:19 16:51	08:25 15:53	08:57 15:49
29	05:15 21:40	06:17 07:26-08:10/44 20:28	07:19 07:26-08:10/44 19:05	08:21 16:48	08:27 15:52	08:57 15:50
30	05:17 21:38	06:19 07:26-08:10/44 20:25	07:21 07:26-08:10/44 19:02	08:23 16:46	08:29 15:51	08:57 15:51
31	05:19 21:36	06:21 07:26-08:10/44 20:23		08:25 16:44		08:57 15:52
Potential sun hours	530	470	385	323	247	216
Sum of minutes with flicker	0	911	431	0	0	0

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 7 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (15

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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	08:57 15:53	08:21 16:51	07:17 17:53	06:54 19:59	05:38 21:02	04:41 21:59	04:35 22:16	05:21 21:34	06:23 20:20	07:23 18:59	07:29 16:41	08:31 15:50
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	04:40 22:01	04:36 22:15	05:23 21:32	06:25 20:17	07:25 18:57	07:31 16:39	08:32 15:49
3	08:57 15:56	08:17 16:55	07:12 17:57	06:49 20:03	05:33 21:06	04:39 22:02	04:37 22:15	05:25 21:30	06:27 20:15	07:27 18:54	07:33 16:37	08:34 15:48
4	08:56 15:58	08:15 16:59	07:09 18:02	06:46 20:07	05:31 21:10	04:38 22:04	04:38 22:13	05:27 21:26	06:29 20:09	07:29 18:49	07:35 16:33	08:36 15:47
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 20:07	05:29 21:10	04:37 22:04	04:39 22:13	05:29 21:26	06:31 20:09	07:31 18:49	07:37 16:33	08:37 15:47
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 20:09	05:26 21:12	04:36 22:06	04:40 22:13	05:31 21:24	06:33 20:07	07:33 18:46	07:40 16:30	08:39 15:46
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 20:11	05:24 21:14	04:35 22:07	04:41 22:12	05:33 21:21	06:35 20:04	07:35 18:43	07:42 16:28	08:40 15:45
8	08:54 16:03	08:07 17:06	06:59 18:08	06:36 20:14	05:22 21:16	04:34 22:08	04:42 22:11	05:35 21:19	06:37 20:01	07:37 18:41	07:44 16:26	08:42 15:45
9	08:53 16:04	08:05 17:08	06:56 18:10	06:33 20:16	05:20 21:18	04:33 22:09	04:43 22:10	05:37 21:17	06:39 19:59	07:40 18:38	07:46 16:24	08:43 15:44
10	08:52 16:06	08:02 17:11	06:53 18:13	06:30 20:18	05:18 21:20	04:33 22:10	04:44 22:09	05:38 21:15	06:41 19:56	07:42 18:35	07:48 16:22	08:44 15:44
11	08:52 16:08	08:00 17:13	06:51 18:15	06:28 20:20	05:16 21:22	04:32 22:11	04:46 22:08	05:40 21:12	06:43 19:53	07:44 18:33	07:51 16:20	08:46 15:43
12	08:51 16:10	07:58 17:15	06:48 18:17	06:25 20:22	05:14 21:24	04:32 22:12	04:47 22:07	05:43 21:10	06:45 19:51	07:46 18:30	07:53 16:18	08:47 15:43
13	08:50 16:11	07:56 17:18	06:45 18:19	06:23 20:24	05:12 21:26	04:31 22:13	04:48 22:06	05:45 21:08	06:47 19:48	07:48 18:28	07:55 16:16	08:48 15:43
14	08:49 16:13	07:53 17:20	06:43 18:21	06:20 20:26	05:10 21:28	04:31 22:13	04:50 22:04	05:47 21:05	06:49 19:45	07:50 18:25	07:57 16:15	08:49 15:43
15	08:48 16:15	07:51 17:22	06:40 18:23	06:17 20:28	05:08 21:30	04:31 22:14	04:51 22:03	05:49 21:03	06:51 19:43	07:52 18:23	07:59 16:13	08:50 15:43
16	08:46 16:17	07:49 17:24	06:37 18:25	06:15 20:30	05:06 21:32	04:30 22:15	04:53 22:02	05:51 21:01	06:53 19:40	07:54 18:20	08:01 16:11	08:51 15:43
17	08:45 16:19	07:46 17:27	06:35 18:27	06:12 20:32	05:04 21:34	04:30 22:15	04:54 22:00	05:53 20:58	06:55 19:37	07:56 18:17	08:03 16:09	08:52 15:43
18	08:44 16:21	07:44 17:29	06:32 18:30	06:10 20:34	05:02 21:36	04:30 22:16	04:56 21:59	05:55 20:56	06:57 19:34	07:58 18:15	08:05 16:08	08:53 15:43
19	08:43 16:23	07:42 17:31	06:29 18:32	06:07 20:37	05:00 21:38	04:30 22:16	04:57 21:57	05:57 20:53	06:59 19:32	08:01 18:12	08:08 16:06	08:54 15:43
20	08:41 16:25	07:39 17:33	06:27 18:34	06:05 20:39	04:58 21:39	04:30 22:16	04:59 21:56	05:59 20:51	07:01 19:29	08:03 18:10	08:10 16:04	08:54 15:44
21	08:40 16:27	07:37 17:35	06:24 18:36	06:02 20:41	04:57 21:41	04:30 22:17	05:01 21:54	06:01 20:48	07:03 19:26	08:05 18:07	08:12 16:03	08:55 15:44
22	08:38 16:29	07:34 17:38	06:21 18:38	06:00 20:43	04:55 21:43	04:30 22:17	05:03 21:53	06:03 20:46	07:05 19:24	08:07 18:05	08:14 16:01	08:56 15:44
23	08:37 16:31	07:32 17:40	06:19 18:40	05:57 20:45	04:53 21:45	04:31 22:17	05:04 21:51	06:05 20:43	07:07 19:21	08:09 18:02	08:16 16:00	08:56 15:45
24	08:35 16:33	07:29 17:42	06:16 18:42	05:55 20:47	04:52 21:46	04:31 22:17	05:06 21:49	06:07 20:41	07:09 19:18	08:11 18:00	08:18 15:58	08:57 15:46
25	08:34 16:35	07:27 17:44	06:13 18:44	05:52 20:49	04:50 21:48	04:31 22:17	05:08 21:48	06:09 20:38	07:11 19:15	07:13 16:58	08:20 15:57	08:57 15:46
26	08:32 16:37	07:24 17:47	06:10 18:46	05:50 20:51	04:49 21:50	04:32 22:17	05:10 21:46	06:11 20:36	07:13 19:13	07:16 16:55	08:22 15:56	08:57 15:47
27	08:30 16:40	07:22 17:49	06:08 18:48	05:47 20:53	04:47 21:51	04:32 22:17	05:11 21:44	06:13 20:33	07:15 19:10	07:18 16:53	08:23 15:55	08:57 15:48
28	08:28 16:42	07:19 17:51	06:05 18:51	05:45 20:55	04:46 21:53	04:33 22:17	05:13 21:42	06:15 20:30	07:17 19:07	07:20 16:51	08:25 15:53	08:57 15:49
29	08:27 16:44	07:17 19:53	06:02 19:53	05:43 20:57	04:45 21:55	04:33 22:16	05:15 21:40	06:17 20:28	07:19 19:05	07:22 16:48	08:27 15:52	08:58 15:50
30	08:25 16:46	07:15 19:55	07:00 19:55	05:40 21:00	04:43 21:56	04:34 22:16	05:17 21:38	06:19 20:25	07:21 19:02	07:24 16:46	08:29 15:51	08:58 15:51
31	08:23 16:48	07:13 19:57	06:57 19:57	06:42 21:58	04:42 21:58	04:32 21:36	05:19 21:36	06:21 20:23	07:21 16:44	07:27 16:44	08:31 15:52	08:57 15:52
Potential sun hours	235	266	366	426	508	529	530	470	385	323	247	215
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Project:

flickering\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 8 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (21)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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	08:57	11:51-12:36/45	08:21	07:17	06:54	05:38	04:41	04:35	05:21	06:23	07:23	07:29	08:31	11:38-12:22/44
	15:53		16:50	17:53	19:59	21:02	21:59	22:16	21:34	20:20	18:59	16:41	15:50	
2	08:57	11:52-12:37/45	08:19	07:14	06:52	05:35	04:40	04:36	05:23	06:25	07:25	07:31	08:32	11:39-12:23/44
	15:54		16:53	17:55	20:01	21:04	22:01	22:15	21:32	20:17	18:57	16:39	15:49	
3	08:57	11:52-12:37/45	08:17	07:12	06:49	05:33	04:38	04:36	05:25	06:27	07:27	07:33	08:34	11:38-12:23/45
	15:56		16:55	17:57	20:03	21:06	22:02	22:15	21:30	20:15	18:54	16:37	15:48	
4	08:56	11:52-12:37/45	08:15	07:09	06:46	05:31	04:37	04:37	05:27	06:29	07:29	07:35	08:36	11:39-12:23/44
	15:57		16:57	18:00	20:05	21:08	22:03	22:14	21:28	20:12	18:51	16:35	15:47	
5	08:56	11:53-12:38/45	08:13	07:06	06:44	05:29	04:36	04:38	05:28	06:31	07:31	07:38	08:37	11:39-12:24/45
	15:58		16:59	18:02	20:07	21:10	22:05	22:13	21:26	20:09	18:49	16:32	15:47	
6	08:55	11:54-12:39/45	08:11	07:04	06:41	05:26	04:36	04:39	05:30	06:33	07:33	07:40	08:39	11:40-12:25/45
	16:00		17:02	18:04	20:09	21:12	22:06	22:13	21:24	20:07	18:46	16:30	15:46	
7	08:55	11:54-12:39/45	08:09	07:01	06:38	05:24	04:35	04:41	05:32	06:35	07:35	07:42	08:40	11:39-12:24/45
	16:01		17:04	18:06	20:11	21:14	22:07	22:12	21:22	20:04	18:43	16:28	15:45	
8	08:54	11:54-12:39/45	08:07	06:59	06:36	05:22	04:34	04:42	05:34	06:37	07:37	07:44	08:42	11:40-12:25/45
	16:03		17:06	18:08	20:14	21:16	22:08	22:11	21:19	20:01	18:41	16:26	15:45	
9	08:53	11:55-12:39/44	08:05	06:56	06:33	05:20	04:33	04:43	05:36	06:39	07:40	07:46	08:43	11:40-12:25/45
	16:04		17:08	18:10	20:16	21:18	22:09	22:10	21:17	19:59	18:38	16:24	15:44	
10	08:53	11:56-12:40/44	08:02	06:53	06:30	05:18	04:33	04:44	05:38	06:41	07:42	07:48	08:45	11:41-12:26/45
	16:06		17:11	18:13	20:18	21:20	22:10	22:09	21:15	19:56	18:35	16:22	15:44	
11	08:52	11:56-12:40/44	08:00	06:51	06:28	05:16	04:32	04:45	05:40	06:43	07:44	07:51	08:46	11:41-12:26/45
	16:08		17:13	18:15	20:20	21:22	22:11	22:08	21:12	19:53	18:33	16:20	15:43	
12	08:51	11:56-12:40/44	07:58	06:48	06:25	05:14	04:32	04:47	05:42	06:45	07:46	07:53	08:47	11:42-12:27/45
	16:09		17:15	18:17	20:22	21:24	22:12	22:07	21:10	19:51	18:30	16:18	15:43	
13	08:50	11:57-12:40/43	07:56	06:45	06:23	05:12	04:31	04:48	05:44	06:47	07:48	07:55	08:48	11:42-12:28/46
	16:11		17:17	18:19	20:24	21:26	22:13	22:06	21:08	19:48	18:28	16:16	15:43	
14	08:49	11:58-12:41/43	07:53	06:43	06:20	05:10	04:31	04:50	05:46	06:49	07:50	07:57	08:49	11:43-12:28/45
	16:13		17:20	18:21	20:26	21:28	22:13	22:05	21:05	19:45	18:25	16:15	15:43	
15	08:48	11:58-12:40/42	07:51	06:40	06:17	05:08	04:30	04:51	05:48	06:51	07:52	07:59	08:50	11:43-12:28/45
	16:15		17:22	18:23	20:28	21:30	22:14	22:03	21:03	19:43	18:22	16:13	15:43	
16	08:46	11:59-12:41/42	07:49	06:37	06:15	05:06	04:30	04:53	05:50	06:53	07:54	08:01	08:51	11:44-12:29/45
	16:17		17:24	18:25	20:30	21:32	22:15	22:02	21:01	19:40	18:20	16:11	15:43	
17	08:45	11:59-12:40/41	07:46	06:35	06:12	05:04	04:30	04:54	05:52	06:55	07:56	08:03	08:52	11:44-12:29/45
	16:19		17:26	18:27	20:32	21:34	22:15	22:01	20:58	19:37	18:17	16:09	15:43	
18	08:44	12:01-12:41/40	07:44	06:32	06:10	05:02	04:30	04:56	05:54	06:57	07:58	08:06	08:53	11:45-12:30/45
	16:21		17:29	18:30	20:35	21:36	22:16	21:59	20:56	19:34	18:15	16:07	15:43	
19	08:43	12:01-12:40/39	07:42	06:29	06:07	05:00	04:30	04:57	05:57	06:59	08:01	08:08	08:54	11:46-12:30/44
	16:23		17:31	18:32	20:37	21:38	22:16	21:58	20:53	19:32	18:12	16:06	15:43	
20	08:41	12:02-12:40/38	07:39	06:27	06:05	04:58	04:30	04:59	05:59	07:01	08:03	08:10	08:55	11:45-12:30/45
	16:25		17:33	18:34	20:39	21:39	22:17	21:56	20:51	19:29	18:10	16:04	15:43	
21	08:40	12:03-12:40/37	07:37	06:24	06:02	04:57	04:30	05:01	06:01	07:03	08:05	08:12	08:55	11:46-12:31/45
	16:27		17:35	18:36	20:41	21:41	22:17	21:54	20:48	19:26	18:07	16:03	15:44	
22	08:38	12:04-12:39/35	07:34	06:21	06:00	04:55	04:30	05:02	06:03	07:05	08:07	08:14	08:56	11:46-12:31/45
	16:29		17:38	18:38	20:43	21:43	22:17	21:53	20:46	19:24	18:05	16:01	15:44	
23	08:37	12:05-12:38/33	07:32	06:19	05:57	04:53	04:30	05:04	06:05	07:07	08:09	08:16	08:56	11:47-12:32/45
	16:31		17:40	18:40	20:45	21:45	22:17	21:51	20:43	19:21	18:02	16:00	15:45	
24	08:35	12:06-12:38/32	07:29	06:16	05:55	04:52	04:31	05:06	06:07	07:09	08:11	08:18	08:57	11:47-12:32/45
	16:33		17:42	18:42	20:47	21:47	22:17	21:49	20:41	19:18	18:00	15:58	15:45	
25	08:34	12:08-12:37/29	07:27	06:13	05:52	04:50	04:31	05:08	06:09	07:11	07:13	08:20	08:57	11:48-12:33/45
	16:35		17:44	18:44	20:49	21:48	22:17	21:48	20:38	19:15	16:58	15:57	15:46	
26	08:32	12:09-12:35/26	07:24	06:10	05:50	04:49	04:32	05:09	06:11	07:13	07:16	08:22	08:57	11:48-12:33/45
	16:37		17:46	18:46	20:51	21:50	22:17	21:46	20:36	19:13	16:55	15:56	15:47	
27	08:30	12:11-12:34/23	07:22	06:08	05:47	04:47	04:32	05:11	06:13	07:15	07:18	08:23	08:57	11:48-12:33/45
	16:39		17:49	18:48	20:53	21:52	22:17	21:44	20:33	19:10	16:53	15:54	15:48	
28	08:28	12:14-12:32/18	07:19	06:05	05:45	04:46	04:33	05:13	06:15	07:17	07:20	08:25	08:58	11:49-12:34/45
	16:42		17:51	18:51	20:55	21:53	22:17	21:42	20:30	19:07	16:50	15:53	15:48	
29	08:27	12:18-12:28/10		07:02	05:42	04:44	04:33	05:15	06:17	07:19	07:22	08:27	08:58	11:50-12:35/45
	16:44			19:53	20:58	21:55	22:17	21:40	20:28	19:05	16:48	15:52	15:49	
30	08:25			07:00	05:40	04:43	04:34	05:17	06:19	07:21	07:24	08:29	08:58	11:50-12:35/45
	16:46			19:55	21:00	21:56	22:16	21:38	20:25	19:02	16:46	15:51	15:50	
31	08:23			06:57		04:42		05:19	06:21		07:27		08:58	11:51-12:36/45
	16:48			19:57		21:58		21:36	20:23		16:44		15:52	
Potential sun hours	235		266	366	426	508	530	530	470	385	323	247	215	1392
Sum of minutes with flicker	1107		0	0	0	0	0	0	0	0	0	615	215	

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 9 - NORDEX N163/6.X 7000 163.0 IO! hub: 169,0 m (TOT: 250,5 m) (22)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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	08:57 09:48-10:12/24 15:53	08:21 07:17 16:50 17:53	06:54 05:38 19:59 21:02	04:41 04:35 22:16 21:34	05:21 06:23 20:20 18:59	07:29 08:31 16:41 15:50						
2	08:57 09:49-10:13/24 15:54	08:19 07:14 16:53 17:55	06:52 05:35 20:01 21:04	04:39 04:36 22:01 22:15	05:23 06:25 20:17 18:57	07:31 07:40 16:39 15:49						
3	08:57 09:49-10:13/24 15:55	08:17 07:12 16:55 17:57	06:49 05:33 20:03 21:06	04:38 04:36 22:02 22:15	05:25 06:27 20:15 18:54	07:27 07:33 16:37 15:48						
4	08:56 09:49-10:13/24 15:57	08:15 07:09 16:57 18:00	06:46 05:31 20:05 21:08	04:37 04:37 22:14 21:28	05:26 06:29 20:12 18:51	07:29 07:35 16:35 15:47						
5	08:56 09:50-10:15/25 15:58	08:13 07:06 16:59 18:02	06:44 05:29 20:07 21:10	04:36 04:38 22:05 22:13	05:28 06:31 20:09 18:49	07:31 07:37 16:32 15:46						
6	08:55 09:50-10:15/25 16:00	08:11 07:04 17:02 18:04	06:41 05:26 20:09 21:12	04:36 04:39 22:06 22:13	05:30 06:33 21:24 20:07	07:33 07:40 16:46 16:30						
7	08:55 09:50-10:16/26 16:01	08:09 07:01 17:04 18:06	06:38 05:24 20:11 21:14	04:35 04:40 22:07 22:12	05:32 06:35 21:21 20:04	07:35 07:42 16:28 15:45						
8	08:54 09:50-10:17/27 16:03	08:07 06:59 17:06 18:08	06:36 05:22 20:14 21:16	04:34 04:42 22:08 22:11	05:34 06:37 21:19 20:01	07:37 07:44 16:26 15:45						
9	08:53 09:50-10:17/27 16:04	08:05 06:56 17:08 18:10	06:33 05:20 20:16 21:18	04:33 04:43 22:09 22:10	05:36 06:39 21:17 19:59	07:40 07:46 16:24 15:44						
10	08:53 09:50-10:18/28 16:06	08:02 06:53 17:11 18:13	06:30 05:18 20:18 21:20	04:33 04:44 22:10 22:09	05:38 06:41 21:15 19:56	07:42 07:48 16:22 15:44						
11	08:52 09:51-10:19/28 16:08	08:00 06:51 17:13 18:15	06:28 05:16 20:20 21:22	04:32 04:45 22:11 22:08	05:40 06:43 21:12 19:53	07:44 07:51 16:20 15:43						
12	08:51 09:50-10:18/28 16:09	07:58 06:48 17:15 18:17	06:25 05:14 20:22 21:24	04:31 04:47 22:12 22:07	05:42 06:45 21:10 19:51	07:46 07:53 16:18 15:43						
13	08:50 09:51-10:19/28 16:11	07:56 06:45 17:17 18:19	06:22 05:11 20:24 21:26	04:31 04:48 22:13 22:06	05:44 06:47 21:08 19:48	07:48 07:55 16:16 15:43						
14	08:49 09:51-10:20/29 16:13	07:53 06:43 17:20 18:21	06:20 05:09 20:26 21:28	04:31 04:50 22:13 22:04	05:46 06:49 21:05 19:45	07:50 07:57 16:14 15:43						
15	08:48 09:51-10:20/29 16:15	07:51 06:40 17:22 18:23	06:17 05:08 20:28 21:30	04:30 04:51 22:14 22:03	05:48 06:51 21:03 19:42	07:52 07:59 16:13 15:43						
16	08:46 09:52-10:21/29 16:17	07:49 06:37 17:24 18:25	06:15 05:06 20:30 21:32	04:30 04:53 22:15 22:02	05:50 06:53 21:01 19:40	07:54 08:01 16:11 15:43						
17	08:45 09:52-10:21/29 16:19	07:46 06:35 17:26 18:27	06:12 05:04 20:32 21:34	04:30 04:54 22:15 22:00	05:52 06:55 20:58 19:37	07:56 08:03 16:09 15:43						
18	08:44 09:53-10:21/28 16:21	07:44 06:32 17:29 18:30	06:10 05:02 20:34 21:36	04:30 04:56 22:16 21:59	05:54 06:57 20:56 19:34	07:58 08:05 16:07 15:43						
19	08:43 09:53-10:21/28 16:23	07:42 06:29 17:31 18:32	06:07 05:00 20:37 21:38	04:30 04:57 22:16 21:58	05:56 06:59 20:53 19:32	07:59 08:01 16:06 15:43						
20	08:41 09:53-10:21/28 16:25	07:39 06:27 17:33 18:34	06:05 05:00 20:39 21:39	04:30 04:59 22:16 21:56	05:58 07:01 20:51 19:29	08:03 08:10 16:04 15:43						
21	08:40 09:55-10:22/27 16:27	07:37 06:24 17:35 18:36	06:02 05:00 20:41 21:41	04:30 05:01 22:17 21:54	06:01 07:03 20:48 19:26	08:05 08:12 16:03 15:44						
22	08:38 09:55-10:21/26 16:29	07:34 06:21 17:38 18:38	05:59 05:00 20:43 21:43	04:30 05:02 22:17 21:53	06:03 07:05 20:46 19:24	08:07 08:14 16:01 15:44						
23	08:37 09:56-10:21/25 16:31	07:32 06:18 17:40 18:40	05:57 05:00 20:45 21:45	04:30 05:04 22:17 21:51	06:05 07:07 20:43 19:21	08:09 08:16 16:00 15:45						
24	08:35 09:56-10:20/24 16:33	07:29 06:16 17:42 18:42	05:55 05:00 20:47 21:47	04:31 05:06 22:17 21:49	06:07 07:09 20:41 19:18	08:11 08:18 16:00 15:45						
25	08:34 09:57-10:20/23 16:35	07:27 06:13 17:44 18:44	05:52 05:00 20:49 21:48	04:31 05:08 22:17 21:48	06:09 07:11 20:38 19:15	08:13 08:20 16:00 15:46						
26	08:32 09:58-10:19/21 16:37	07:24 06:10 17:46 18:46	05:50 05:00 20:51 21:50	04:31 05:09 22:17 21:46	06:11 07:13 20:36 19:13	08:16 08:22 16:00 15:47						
27	08:30 10:00-10:18/18 16:39	07:22 06:08 17:49 18:48	05:47 05:00 20:53 21:52	04:32 05:11 22:17 21:44	06:13 07:15 20:33 19:10	08:18 08:23 16:00 15:48						
28	08:28 10:02-10:17/15 16:42	07:19 06:05 17:51 18:50	05:45 05:00 20:55 21:53	04:33 05:13 22:17 21:42	06:15 07:17 20:30 19:07	08:20 08:25 16:00 15:48						
29	08:27 10:04-10:15/11 16:44	07:17 06:02 19:53 20:57	05:42 05:00 20:57 21:55	04:33 05:15 22:16 21:40	06:17 07:19 20:28 19:05	08:22 08:27 16:00 15:49						
30	08:25 16:46 16:48	07:00 19:55 06:57 19:57	05:40 21:00 05:42 21:58	04:34 22:16 05:17 21:38	06:19 20:25 06:21 20:23	07:21 19:02 07:27 16:44						
31	08:23 16:48	06:57 19:57	05:42 21:58	04:34 22:16	05:19 20:23	06:21 20:23						
Potential sun hours	235	266	366	426	508	530	530	470	385	323	247	215
Sum of minutes with flicker	728	0	0	0	0	0	0	0	0	0	447	700

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian & Lithuanian environment  
Vilandes 3-6  
LV-1010 Riga  
0037167242411  
Laura Kurzemniece / laura.kurzemniece@environment.lv  
Calculated:  
03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 10 - NORDEX N163/6.X 7000 163.0 !O! hub: 169,0 m (TOT: 250,5 m) (23)  
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 6,63 9,63 10,06 8,16 7,72 5,94 2,93 0,63 0,52

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	08:57 15:53 08:19	08:21 16:50 08:19	07:17 08:58-09:28/30 17:53 07:14 08:59-09:26/27 17:55	06:54 19:59 06:52	05:38 21:02 05:35	04:41 21:59 04:39	04:35 22:16 04:35	05:21 21:34 05:23	06:23 20:20 06:25	07:23 18:59 07:25	07:29 08:27-09:01/34 16:41 07:31 08:29-09:00/31 16:39	08:31 15:50 08:32 15:49
2	08:57 15:54 08:17	08:21 16:53 08:17	07:12 09:01-09:24/23 17:57	06:49 20:03 06:49	05:33 21:04 05:33	04:38 22:01 04:38	04:36 22:15 04:36	05:25 21:32 05:25	06:27 20:17 06:27	07:27 18:57 07:27	07:33 08:30-08:59/29 16:37 07:35 08:31-08:57/26 16:35	08:34 15:48 08:36 15:47
3	08:56 15:57 08:15	08:15 09:09-09:19/10 16:57 08:13 09:06-09:23/17 16:59	07:09 09:04-09:20/16 18:00 07:06 09:09-09:14/5 18:02	06:46 20:05 06:44	05:31 21:08 05:29	04:37 22:03 04:36	04:37 22:14 04:38	05:26 21:28 05:28	06:29 20:12 06:31	07:29 18:51 07:31	07:35 08:31-08:57/26 16:35 07:37 08:33-08:55/22 16:32	08:36 15:47 08:37 15:46
4	08:55 16:00 08:11	08:11 09:04-09:26/22 17:02 08:09 09:01-09:27/26 16:01	07:04 18:04 07:01 18:06	06:41 20:09 06:38	05:26 21:12 05:24	04:36 22:06 04:35	04:39 22:13 04:40	05:30 21:24 05:32	06:33 20:07 06:35	07:33 18:46 07:35	07:40 08:36-08:53/17 16:30 07:42 08:40-08:49/9 16:28	08:39 15:46 08:40 15:45
5	08:54 16:03 08:07	08:07 09:00-09:29/29 17:06 08:05 08:59-09:31/32 17:08	06:59 18:08 06:56 18:10	06:36 20:14 06:33	05:22 21:16 05:20	04:34 22:08 04:33	04:42 22:11 04:43	05:34 21:19 05:36	06:37 20:01 06:39	07:37 18:41 07:40 09:41-09:53/12 18:38	07:44 16:26 07:46	08:42 15:45 08:43 15:44
6	08:53 16:04 08:02	08:02 08:57-09:32/35 17:11 08:00 08:57-09:33/36 17:13	06:56 18:13 06:51 18:15	06:30 20:18 06:28	05:18 21:20 05:16	04:33 22:10 04:32	04:44 22:09 04:45	05:38 21:15 05:40	06:41 19:56 06:43	07:42 09:37-09:57/20 18:35 07:44 09:34-09:59/25 18:33	07:48 16:22 07:51	08:45 15:44 08:46 15:43
7	08:52 16:08 07:58	08:00 08:57-09:33/36 17:13 07:58 08:57-09:34/37 17:15	06:51 18:15 06:48 18:17	06:28 20:20 06:25	05:16 21:22 05:13	04:32 22:11 04:31	04:45 22:08 04:47	05:40 21:12 05:42	06:43 19:53 06:45	07:44 09:34-09:59/25 18:33 07:46 09:32-10:01/29 18:30	07:53 16:20 07:58	08:47 15:43 08:48 15:43
8	08:50 16:11 07:56	07:56 08:55-09:34/39 17:17 07:53 08:55-09:35/40 17:20	06:45 18:19 06:43 18:21	06:22 20:24 06:20	05:11 21:26 05:09	04:31 22:13 04:31	04:48 22:06 04:50	05:44 21:08 05:46	06:47 19:48 06:49	07:48 09:30-10:02/32 18:28 07:50 09:29-10:04/35 18:25	07:55 16:16 07:57	08:48 10:44-10:46/2 15:43 08:49 10:43-10:48/5 15:43
9	08:48 16:15 07:51	07:51 08:54-09:35/41 17:22 07:49 08:54-09:36/42 17:24	06:40 18:23 06:37 18:25	06:17 20:28 06:15	05:08 21:30 05:06	04:30 22:14 04:30	04:51 22:03 04:53	05:48 21:03 05:50	06:51 19:42 06:53	07:51 09:28-10:04/36 18:22 07:54 09:27-10:05/38 18:20	07:59 16:13 08:01	08:50 10:42-10:50/8 15:43 08:51 10:42-10:51/9 15:43
10	08:46 16:17 07:49	07:49 08:54-09:36/42 17:24 07:46 08:53-09:36/43 17:26	06:37 18:25 06:35 18:27	06:15 20:30 06:12	05:06 21:32 05:04	04:30 22:15 04:30	04:54 22:02 04:54	05:52 21:01 05:52	06:55 19:40 06:55	07:56 09:26-10:05/39 18:20 07:56 09:25-10:05/40 18:17	08:03 16:11 08:08	08:52 10:42-10:52/10 15:43 08:53 10:42-10:53/11 15:43
11	08:44 16:19 07:44	07:44 08:54-09:36/42 17:26 07:42 08:54-09:36/43 17:29	06:32 18:30 06:29 18:30	06:10 20:32 06:07	05:02 21:34 05:00	04:30 22:15 04:30	04:56 22:00 04:57	05:54 20:58 05:56	06:57 19:37 06:59	07:58 09:25-10:05/40 18:17 07:58 09:24-10:06/41 18:15	08:05 16:09 08:08	08:53 10:42-10:53/11 15:43 08:54 10:43-10:54/11 15:43
12	08:41 16:23 07:39	07:39 08:54-09:36/42 17:31 07:37 08:53-09:36/43 17:33	06:27 18:32 06:24 18:34	06:05 20:37 06:02	04:58 21:38 04:57	04:30 22:16 04:30	04:59 21:58 04:57	05:58 20:53 05:58	07:01 19:32 07:03	08:03 09:24-10:06/42 18:12 08:05 09:23-10:06/43 18:10	08:10 16:06 08:12	08:55 10:43-10:54/11 15:43 08:56 10:43-10:54/11 15:44
13	08:40 16:25 07:37	07:37 08:53-09:36/43 17:35 07:34 08:53-09:35/42 17:38	06:24 18:36 06:21 18:38	06:02 20:41 05:59	04:57 21:41 04:55	04:30 22:17 04:30	05:01 21:54 05:02	06:01 20:48 06:03	07:03 19:26 07:05	08:05 09:23-10:06/43 18:07 08:07 09:24-10:07/43 18:05	08:12 16:03 08:14	08:55 10:43-10:54/11 15:43 08:56 10:43-10:54/11 15:44
14	08:38 16:29 07:34	07:34 08:53-09:35/42 17:38 07:32 08:54-09:35/41 17:40	06:21 18:38 06:18 18:40	06:01 20:43 05:57	04:55 21:43 04:53	04:30 22:17 04:30	05:02 21:53 05:04	06:03 20:46 06:05	07:05 19:24 07:07	08:07 09:24-10:07/43 18:05 08:09 09:23-10:06/43 18:02	08:16 16:01 08:18	08:56 10:45-10:55/10 15:44 08:57 10:45-10:56/11 15:45
15	08:35 16:33 07:29	07:29 08:54-09:34/40 17:42 07:27 08:55-09:34/39 17:44	06:16 18:42 06:13 18:44	05:55 20:47 05:52	04:52 21:47 04:50	04:31 22:17 04:31	05:06 21:49 05:08	06:07 20:41 06:09	07:09 19:18 07:11	08:11 09:23-10:06/43 18:00 07:13 08:24-09:06/42 16:58	08:18 15:58 08:20	08:57 10:45-10:56/11 15:45 08:57 10:46-10:56/10 15:46
16	08:32 16:37 07:24	07:24 08:55-09:32/37 17:46 07:22 08:55-09:31/36 17:49	06:10 18:46 06:08 18:51	05:50 20:51 05:47	04:49 21:50 04:47	04:31 22:17 04:32	05:09 21:46 05:11	06:11 20:36 06:13	07:13 19:13 07:15	07:16 08:24-09:05/41 16:55 07:18 08:24-09:05/41 16:53	08:22 15:56 08:23	08:57 10:46-10:56/10 15:47 08:57 10:47-10:56/9 15:48
17	08:30 16:39 07:22	07:22 08:55-09:31/36 17:49 07:19 08:57-09:30/33 17:51	06:08 18:48 06:05 18:51	05:47 20:53 05:45	04:47 21:52 04:46	04:33 22:17 04:33	05:11 21:44 05:13	06:15 20:33 06:15	07:17 08:25-09:05/40 16:50 07:22 08:25-09:05/40 16:50	08:25 10:43-10:54/11 15:50 08:25 09:04/39 16:48	08:26 15:53 08:27	08:48 10:48-10:56/8 15:49 08:49 10:49-10:55/6 15:49
18	08:28 16:42 07:19	07:19 08:57-09:30/33 17:51 07:17 08:25-09:03/38 17:46	06:05 18:51 06:02 18:55	05:42 20:58 05:40	04:44 21:55 04:43	04:33 22:17 04:34	05:15 21:40 05:17	06:17 20:28 06:19	07:19 19:05 07:21	08:25 09:04/39 16:48 08:25-09:03/38 16:46	08:27 15:52 08:29	08:58 10:51-10:55/4 15:49 08:58 10:51-10:55/4 15:50
19	08:23 16:48 07:13	07:13 08:27-09:02/35 17:57 07:13 08:27-09:02/35 17:57	06:02 18:57 06:01 18:57	05:37 21:03 05:36	04:42 21:58 04:42	04:33 22:16 04:33	05:19 21:36 05:19	06:21 20:23 06:21	07:23 08:27-09:02/35 16:43 07:23 08:27-09:02/35 16:43	08:27-09:02/35 16:43 08:27-09:02/35 16:43	08:28 15:51 08:29	08:58 10:51-10:55/4 15:51 08:58 10:51-10:55/4 15:51
Potential sun hours	235	266	366	426	508	530	530	470	385	323	247	158
Sum of minutes with flicker	0	887	101	0	0	0	0	0	0	837	168	158

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\_Nordex\_N163\_Stelpe1

Licensed user:

SIA Estonian, Latvian &amp; Lithuanian environment

Vilandes 3-6

LV-1010 Riga

0037167242411

Laura Kurzemniece / laura.kurzemniece@environment.lv

Calculated:

03.04.2025 11:19/4.1.254

## SHADOW - Calendar per WTG

Calculation: Flickering\_Nordex\_N163 WTG: 13 - NORDEX N163/6.X 7000 163.0 !O! hub: 169,0 m (TOT: 250,5 m) (24)

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	6,63	9,63	10,06	8,16	7,72	5,94	2,93	0,63	0,52

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	08:57 15:53	08:21 16:50	07:17 17:53	06:54 19:59	05:38 21:02	04:41 21:59	04:35 22:16	05:21 21:34	06:23 20:20	07:23 18:59	07:29 16:41	08:31 15:50
2	08:57 15:54	08:19 16:53	07:14 17:55	06:52 20:01	05:35 21:04	04:40 22:01	04:36 22:15	05:23 21:32	06:25 20:17	07:25 18:57	07:31 16:39	08:32 15:49
3	08:57 15:56	08:17 16:55	07:12 17:57	06:49 20:03	05:33 21:06	04:38 22:02	04:36 22:15	05:25 21:30	06:27 20:15	07:27 18:54	07:33 16:37	08:34 15:48
4	08:56 15:58	08:15 16:59	07:09 18:02	06:46 20:07	05:31 21:10	04:37 22:04	04:37 22:13	05:27 21:26	06:29 20:09	07:29 18:49	07:35 16:32	08:36 15:47
5	08:56 15:58	08:13 16:59	07:06 18:02	06:44 20:07	05:29 21:10	04:36 22:04	04:38 22:13	05:28 21:26	06:31 20:09	07:31 18:49	07:37 16:32	08:37 15:47
6	08:55 16:00	08:11 17:02	07:04 18:04	06:41 20:09	05:26 21:12	04:36 22:06	04:39 22:13	05:30 21:24	06:33 20:07	07:33 18:46	07:40 16:30	08:39 15:46
7	08:55 16:01	08:09 17:04	07:01 18:06	06:38 20:11	05:24 21:14	04:35 22:07	04:41 22:12	05:32 21:21	06:35 20:04	07:35 18:43	07:42 16:28	08:40 15:45
8	08:54 16:03	08:07 17:06	06:59 18:08	06:36 20:13	05:22 21:16	04:34 22:08	04:42 22:11	05:34 21:19	06:37 20:01	07:37 18:41	07:44 16:26	08:42 15:45
9	08:53 16:04	08:05 17:08	06:56 18:10	06:33 20:16	05:20 21:18	04:33 22:09	04:43 22:10	05:36 21:17	06:39 19:59	07:39 18:38	07:46 16:24	08:43 15:44
10	08:52 16:06	08:02 17:11	06:53 18:13	06:30 20:18	05:18 21:20	04:33 22:10	04:44 22:09	05:38 21:15	06:41 19:56	07:42 18:35	07:48 16:22	08:44 15:44
11	08:52 16:08	08:00 17:13	06:51 18:15	06:28 20:20	05:16 21:22	04:32 22:11	04:45 22:08	05:40 21:12	06:43 19:53	07:44 18:33	07:51 16:20	08:46 15:43
12	08:51 16:09	07:58 17:15	06:48 18:17	06:25 20:22	05:14 21:24	04:32 22:12	04:47 22:07	05:42 21:10	06:45 19:51	07:46 18:30	07:53 16:18	08:47 15:43
13	08:50 16:11	07:56 17:17	06:45 18:19	06:23 20:24	05:12 21:26	04:31 22:13	04:48 22:06	05:44 21:08	06:47 19:48	07:48 18:28	07:55 16:16	08:48 15:43
14	08:49 16:13	07:53 17:20	06:43 18:21	06:20 20:26	05:10 21:28	04:31 22:13	04:50 22:04	05:46 21:05	06:49 19:45	07:50 18:25	07:57 16:15	08:49 15:43
15	08:48 16:15	07:51 17:22	06:40 18:23	06:17 20:28	05:08 21:30	04:30 22:14	04:51 22:03	05:48 21:03	06:51 19:42	07:52 18:22	07:59 16:13	08:50 15:43
16	08:46 16:17	07:49 17:24	06:37 18:25	06:15 20:30	05:06 21:32	04:30 22:15	04:53 22:02	05:50 21:01	06:53 19:40	07:54 18:20	08:01 16:11	08:51 15:43
17	08:45 16:19	07:46 17:26	06:35 18:27	06:12 20:32	05:04 21:34	04:30 22:15	04:54 22:00	05:52 20:58	06:55 19:37	07:56 18:17	08:03 16:09	08:52 15:43
18	08:44 16:21	07:44 17:29	06:32 18:30	06:10 20:34	05:02 21:36	04:30 22:16	04:56 21:59	05:54 20:56	06:57 19:34	07:58 18:15	08:05 16:07	08:53 15:43
19	08:43 16:23	07:42 17:31	06:29 18:32	06:07 20:37	05:00 21:38	04:30 22:16	04:57 21:57	05:56 20:53	06:59 19:32	08:01 18:12	08:08 16:06	08:54 15:43
20	08:41 16:25	07:39 17:33	06:27 18:34	06:05 20:39	04:58 21:39	04:30 22:16	04:59 21:56	05:59 20:51	07:01 19:29	08:03 18:10	08:10 16:04	08:54 15:43
21	08:40 16:27	07:37 17:35	06:24 18:36	06:02 20:41	04:57 21:41	04:30 22:17	05:01 21:54	06:01 20:48	07:03 19:26	08:05 18:07	08:12 16:03	08:55 15:44
22	08:38 16:29	07:34 17:38	06:21 18:38	06:00 20:43	04:55 21:43	04:30 22:17	05:02 21:53	06:03 20:46	07:05 19:24	08:07 18:05	08:14 16:01	08:56 15:44
23	08:37 16:31	07:32 17:40	06:18 18:40	05:57 20:45	04:53 21:45	04:30 22:17	05:04 21:51	06:05 20:43	07:07 19:21	08:09 18:02	08:16 16:00	08:56 15:45
24	08:35 16:33	07:29 17:42	06:16 18:42	05:55 20:47	04:52 21:46	04:31 22:17	05:06 21:49	06:07 20:41	07:09 19:18	08:11 18:00	08:18 15:58	08:57 15:45
25	08:34 16:35	07:27 17:44	06:13 18:44	05:52 20:49	04:50 21:48	04:31 22:17	05:08 21:48	06:09 20:38	07:11 19:15	07:13 16:58	08:20 15:57	08:57 15:46
26	08:32 16:37	07:24 17:46	06:10 18:46	05:50 20:51	04:49 21:50	04:32 22:17	05:09 21:46	06:11 20:36	07:13 19:13	07:16 16:55	08:22 15:56	08:57 15:47
27	08:30 16:39	07:22 17:49	06:08 18:48	05:47 20:53	04:47 21:52	04:32 22:17	05:11 21:44	06:13 20:33	07:15 19:10	07:18 16:53	08:23 15:54	08:57 15:48
28	08:28 16:42	07:19 17:51	06:05 18:50	05:45 20:55	04:46 21:53	04:33 22:17	05:13 21:42	06:15 20:30	07:17 19:07	07:20 16:50	08:25 15:53	08:57 15:48
29	08:27 16:44	07:17 19:53	07:02 19:53	05:42 20:57	04:44 21:55	04:33 22:16	05:15 21:40	06:17 20:28	07:19 19:05	07:22 16:48	08:27 15:52	08:58 15:49
30	08:25 16:46	07:15 19:55	07:00 19:55	05:40 21:00	04:43 21:56	04:34 22:16	05:17 21:38	06:19 20:25	07:21 19:02	07:24 16:46	08:29 15:51	08:58 15:50
31	08:23 16:48	07:13 19:57	06:57 19:57	05:37 21:58	04:42 21:58	04:33 21:36	05:19 21:36	06:21 20:23	07:21 16:44	07:27 16:44	08:31 15:52	08:57 15:52
Potential sun hours	235	266	366	426	508	530	530	470	385	323	247	215
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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