

## SHADOW - Calendar

**Shadow receptor:** A - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:41 15:46	08:22 (21) 08:34 (21)	07:17 16:31	06:26 17:20	06:19 19:11	05:17 19:59	04:34 20:42	04:32 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:30 16:17	07:18 15:39
2	07:41 15:47	08:22 (21) 08:34 (21)	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 20:43	04:32 20:55	05:07 20:25	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	08:23 (21) 08:35 (21)	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38
4	07:41 15:49	08:23 (21) 08:35 (21)	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:34 20:55	05:10 20:21	05:57 19:21	06:44 18:14	06:35 16:12	07:22 15:38
5	07:41 15:50	08:24 (21) 08:35 (21)	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:20	05:59 19:18	06:45 18:12	06:36 16:10	07:23 15:37
6	07:41 15:51	08:25 (21) 08:36 (21)	07:09 16:40	06:16 17:29	06:08 19:19	05:08 20:07	04:31 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	07:25 15:37
7	07:40 15:52	08:26 (21) 08:35 (21)	07:08 16:42	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48	04:36 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:36
8	07:40 15:54	08:27 (21) 08:35 (21)	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:30 20:49	04:37 20:53	05:16 20:15	06:03 19:12	06:50 18:05	06:42 16:05	07:27 15:36
9	07:40 15:55	08:28 (21) 08:35 (21)	07:04 16:45	06:09 17:34	06:01 19:24	05:03 20:11	04:29 20:50	04:38 20:52	05:18 20:13	06:05 19:10	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	08:29 (21) 08:33 (21)	07:03 16:47	06:07 17:35	05:59 19:26	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	07:39 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:15	04:28 20:51	04:40 20:51	05:21 20:09	06:08 19:05	06:55 17:59	06:47 16:01	07:30 15:36	08:12 (21) 08:24 (21)
12	07:38 15:59	06:59 16:50	06:03 17:39	05:55 19:29	04:58 20:16	04:28 20:52	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:36	08:12 (21) 08:25 (21)
13	07:37 16:00	06:57 16:52	06:01 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:24 20:06	06:11 19:01	06:58 17:54	06:50 15:58	07:32 15:36	08:12 (21) 08:25 (21)
14	07:37 16:02	06:56 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	04:43 20:48	05:25 20:04	06:13 18:58	07:00 17:52	06:52 15:57	07:33 15:36	08:13 (21) 08:26 (21)
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:34	04:53 20:20	04:27 20:54	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36	08:14 (21) 08:26 (21)
16	07:35 16:05	06:52 16:58	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:16 18:54	07:03 17:48	06:55 15:54	07:35 15:36	08:14 (21) 08:27 (21)
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	04:51 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	06:57 15:53	07:36 15:36	08:15 (21) 08:28 (21)
18	07:33 16:08	06:48 17:01	05:50 17:48	05:42 19:38	04:49 20:25	04:27 20:55	04:47 20:44	05:31 19:56	06:19 18:49	07:06 17:44	06:58 15:51	07:36 15:36	08:15 (21) 08:27 (21)
19	07:33 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:49 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50	07:37 15:37	08:15 (21) 08:28 (21)
20	07:32 16:11	06:44 17:05	05:45 17:52	05:38 19:42	04:47 20:27	04:27 20:56	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49	07:38 15:37	08:16 (21) 08:29 (21)
21	07:31 16:13	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:28 20:56	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48	07:38 15:37	08:16 (21) 08:29 (21)
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	04:44 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:05 15:47	07:39 15:38	08:17 (21) 08:30 (21)
23	07:28 16:16	06:38 17:10	05:38 17:57	05:32 19:46	04:43 20:31	04:28 20:56	04:54 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38	08:17 (21) 08:30 (21)
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45	07:40 15:39	08:17 (21) 08:30 (21)
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:50	04:41 20:34	04:29 20:56	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	07:09 15:44	07:40 15:39	08:19 (21) 08:31 (21)
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:40 20:35	04:29 20:56	04:57 20:35	05:43 19:40	06:31 18:32	06:19 16:28	07:11 15:43	07:40 15:40	08:19 (21) 08:31 (21)
27	07:24 16:22	06:30 17:17	05:30 18:03	05:24 19:53	04:38 20:37	04:29 20:56	04:59 20:33	05:45 19:38	06:33 18:29	06:21 16:26	07:12 15:42	07:41 15:41	08:19 (21) 08:32 (21)
28	07:22 16:24	06:28 17:18	05:27 18:05	05:22 19:54	04:37 20:38	04:30 20:56	05:00 20:32	05:47 19:36	06:34 18:27	06:23 16:24	07:14 15:41	07:41 15:42	08:19 (21) 08:32 (21)
29	07:21 16:26	06:25 19:06	05:20 19:56	05:20 20:39	04:37 20:39	04:30 20:56	05:02 20:31	05:48 19:33	06:36 18:25	06:24 16:23	07:15 15:41	07:41 15:42	08:20 (21) 08:32 (21)
30	07:20 16:28	06:23 19:08	05:18 19:57	05:18 20:40	04:36 20:40	04:31 20:56	05:03 20:29	05:50 19:31	06:37 18:23	06:26 16:21	07:17 15:40	07:41 15:43	08:20 (21) 08:33 (21)
31	07:18 16:29	06:21 19:09	05:19 20:41	05:19 20:41	04:35 20:41	04:30 20:56	05:04 20:28	05:51 19:29	06:28 16:19	06:28 15:44	07:18 15:44	07:41 15:44	08:21 (21) 08:33 (21)
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251	
Total, worst case	98												351
Sun reduction	0,26												0,19
Oper. time red.	0,86												0,86
Wind dir. red.	0,61												0,61
Total reduction	0,13												0,10
Total, real	13												35

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

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

## SHADOW - Calendar

**Shadow receptor:** B - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	04:31 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:30 16:17	07:18 15:39
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38
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9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:50	04:38 20:52	05:18 20:13	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
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11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:40 20:51	05:21 20:09	06:08 19:05	06:55 17:59	06:47 16:01	07:30 15:36
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	04:58 20:16	04:28 20:52	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:24 20:05	06:11 19:01	06:58 17:54	06:50 15:58	07:32 15:35
14	07:37 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	04:43 20:48	05:25 20:04	06:12 18:58	06:59 17:52	06:52 15:57	07:33 15:35
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:16 18:54	07:03 17:48	06:55 15:54	07:35 15:36
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	04:50 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	06:57 15:53	07:36 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:25	04:27 20:55	04:47 20:44	05:31 19:56	06:19 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50	07:37 15:36
20	07:31 16:11	06:44 17:04	05:45 17:52	05:38 19:41	04:46 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49	07:38 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:27 20:56	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	04:44 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:05 15:47	07:39 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45	07:40 15:39
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:41 20:34	04:29 20:56	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	07:09 15:44	07:40 15:39
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	07:11 15:43	07:40 15:40
27	07:24 16:22	06:30 17:17	05:29 18:03	05:24 19:53	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:38	06:32 18:29	06:21 16:26	07:12 15:42	07:41 15:41
28	07:22 16:24	06:28 17:18	05:27 18:05	05:22 19:54	04:37 20:38	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:14 15:41	07:41 15:42
29	07:21 16:26		06:25 19:06	05:20 19:56	04:36 20:39	04:30 20:56	05:02 20:31	05:48 19:33	06:36 18:25	06:24 16:23	07:15 15:41	07:41 15:42
30	07:20 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:56	05:03 20:29	05:50 19:31	06:37 18:23	06:26 16:21	07:17 15:40	07:41 15:43
31	07:18 16:29		06:21 19:09		04:35 20:41		05:04 20:28	05:51 19:29		06:28 16:19		07:41 15:44
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

**Shadow receptor:** C - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:41		08:25 (20)	07:17	06:26	06:18	05:17	04:34	04:31	05:06	05:53	06:39	06:30									07:18	08:11 (20)	
	15:45	20	08:45 (20)	16:31	17:20	19:11	19:59	20:42	20:56	20:26	19:27	18:20	16:17									15:39	22 08:35 (20)	
2	07:41		08:26 (20)	07:15	06:24	06:16	05:15	04:33	04:32	05:07	05:54	06:40	06:31									07:19	08:11 (20)	
	15:47	20	08:46 (20)	16:33	17:22	19:13	20:01	20:43	20:55	20:24	19:25	18:18	16:15									15:39	22 08:33 (20)	
3	07:41		08:26 (20)	07:14	06:22	06:14	05:13	04:32	04:33	05:09	05:56	06:42	06:33									07:21	08:11 (20)	
	15:48	21	08:47 (20)	16:35	17:23	19:14	20:02	20:44	20:55	20:23	19:23	18:16	16:14									15:38	22 08:33 (20)	
4	07:41		08:26 (20)	07:12	06:20	06:12	05:11	04:32	04:34	05:10	05:57	06:43	06:35									07:22	08:12 (20)	
	15:49	21	08:47 (20)	16:36	17:25	19:16	20:04	20:45	20:55	20:21	19:20	18:14	16:12									15:38	22 08:34 (20)	
5	07:41		08:26 (20)	07:11	06:18	06:10	05:09	04:31	04:34	05:12	05:59	06:45	06:36									07:23	08:12 (20)	
	15:50	22	08:48 (20)	16:38	17:27	19:17	20:05	20:46	20:54	20:20	19:18	18:12	16:10									15:37	22 08:34 (20)	
6	07:41		08:27 (20)	07:09	06:16	06:07	05:08	04:31	04:35	05:13	06:00	06:47	06:38									07:24	08:12 (20)	
	15:51	22	08:49 (20)	16:40	17:28	19:19	20:07	20:47	20:54	20:18	19:16	18:09	16:09									15:37	22 08:34 (20)	
7	07:40		08:27 (20)	07:08	06:13	06:05	05:06	04:30	04:36	05:15	06:02	06:48	06:40									07:26	08:13 (20)	
	15:52	22	08:49 (20)	16:42	17:30	19:21	20:08	20:48	20:53	20:16	19:14	18:07	16:07									15:36	22 08:35 (20)	
8	07:40		08:28 (20)	07:06	06:11	06:03	05:04	04:29	04:37	05:16	06:03	06:50	06:41									07:27	08:14 (20)	
	15:53	22	08:50 (20)	16:43	17:32	19:22	20:10	20:49	20:53	20:14	19:12	18:05	16:05									15:36	21 08:35 (20)	
9	07:39		08:27 (20)	07:04	06:09	06:01	05:03	04:29	04:38	05:18	06:05	06:51	06:43									07:28	08:14 (20)	
	15:55	23	08:50 (20)	16:45	17:33	19:24	20:11	20:50	20:52	20:13	19:09	18:03	16:04									15:36	21 08:35 (20)	
10	07:39		08:27 (20)	07:03	06:07	05:59	05:01	04:29	04:39	05:19	06:06	06:53	06:45									07:29	08:15 (20)	
	15:56	23	08:50 (20)	16:47	17:35	19:25	20:13	20:50	20:51	20:11	19:07	18:01	16:02									15:36	20 08:35 (20)	
11	07:38		08:29 (20)	07:01	06:05	05:57	04:59	04:28	04:40	05:21	06:08	06:55	06:47									07:30	08:15 (20)	
	15:57	22	08:51 (20)	16:49	17:37	19:27	20:14	20:51	20:51	20:09	19:05	17:59	16:01									15:36	21 08:36 (20)	
12	07:38		08:29 (20)	06:59	06:03	05:55	04:58	04:28	04:41	05:22	06:09	06:56	06:48									07:31	08:16 (20)	
	15:59	23	08:52 (20)	16:50	17:38	19:29	20:16	20:52	20:50	20:07	19:03	17:56	15:59									15:35	20 08:36 (20)	
13	07:37		08:29 (20)	06:57	06:00	05:52	04:56	04:28	04:42	05:24	06:11	06:58	06:50									07:32	08:16 (20)	
	16:00	23	08:52 (20)	16:52	17:40	19:30	20:17	20:52	20:49	20:05	19:01	17:54	15:58	3								07:42 (19)	15:35 20 08:36 (20)	
14	07:37		08:29 (20)	06:55	05:58	05:50	04:55	04:28	04:43	05:25	06:12	06:59	06:52									07:37 (19)	07:33 08:17 (20)	
	16:02	23	08:52 (20)	16:54	17:42	19:32	20:19	20:53	20:48	20:04	18:58	17:52	15:57	8								07:45 (19)	15:35 19 08:36 (20)	
15	07:36		08:30 (20)	06:54	05:56	05:48	04:53	04:27	04:44	05:27	06:14	07:01	06:53									07:36 (19)	07:34 08:18 (20)	
	16:03	22	08:52 (20)	16:56	17:43	19:33	20:20	20:53	20:47	20:02	18:56	17:50	15:55	10								07:46 (19)	15:36 19 08:37 (20)	
16	07:35		08:02 (19)	06:52	05:54	05:46	04:52	04:27	04:45	05:28	06:16	07:03	06:55									07:36 (19)	07:35 08:19 (20)	
	16:05	28	08:52 (20)	16:57	17:45	19:35	20:22	20:54	20:46	20:00	18:54	17:48	15:54	12								07:48 (19)	15:36 18 08:37 (20)	
17	07:34		08:01 (19)	06:50	05:52	05:44	04:51	04:27	04:46	05:30	06:17	07:04	06:57									07:36 (19)	07:36 08:19 (20)	
	16:06	30	08:52 (20)	16:59	17:47	19:37	20:23	20:54	20:45	19:58	18:52	17:46	15:53	13								07:49 (19)	15:36 19 08:38 (20)	
18	07:33		08:01 (19)	06:48	05:49	05:42	04:49	04:27	04:47	05:31	06:19	07:06	06:58									07:35 (19)	07:36 08:19 (20)	
	16:08	30	08:52 (20)	17:01	17:48	19:38	20:25	20:55	20:44	19:56	18:49	17:44	15:51	18								08:20 (20)	15:36 19 08:38 (20)	
19	07:32		08:00 (19)	06:46	05:47	05:40	04:48	04:27	04:48	05:33	06:20	07:08	07:00									07:35 (19)	07:37 08:20 (20)	
	16:09	31	08:52 (20)	17:03	17:50	19:40	20:26	20:55	20:43	19:54	18:47	17:42	15:50	24								08:23 (20)	15:36 18 08:38 (20)	
20	07:31		08:00 (19)	06:44	05:45	05:38	04:46	04:27	04:50	05:34	06:22	07:09	07:01									07:36 (19)	07:38 08:21 (20)	
	16:11	30	08:51 (20)	17:04	17:52	19:41	20:27	20:55	20:42	19:52	18:45	17:40	15:49	26								08:25 (20)	15:37 18 08:39 (20)	
21	07:30		08:00 (19)	06:42	05:43	05:36	04:45	04:27	04:51	05:36	06:23	07:11	07:03									07:36 (19)	07:38 08:21 (20)	
	16:12	30	08:51 (20)	17:06	17:53	19:43	20:29	20:56	20:41	19:50	18:43	17:38	15:48	30								08:27 (20)	15:37 18 08:39 (20)	
22	07:29		08:01 (19)	06:40	05:41	05:34	04:44	04:28	04:52	05:37	06:25	07:13	07:05									07:36 (19)	07:39 08:22 (20)	
	16:14	26	08:50 (20)	17:08	17:55	19:45	20:30	20:56	20:40	19:48	18:40	17:36	15:47	30								08:27 (20)	15:38 18 08:40 (20)	
23	07:28		08:01 (19)	06:38	05:38	05:32	04:43	04:28	04:53	05:39	06:26	07:14	07:06									07:37 (19)	07:39 08:22 (20)	
	16:16	24	08:49 (20)	17:10	17:56	19:46	20:31	20:56	20:39	19:46	18:38	17:34	15:46	31								08:29 (20)	15:38 18 08:40 (20)	
24	07:27		08:01 (19)	06:36	05:36	05:30	04:42	04:28	04:55	05:40	06:28	07:16	07:08									07:39 (19)	07:40 08:22 (20)	
	16:17	18	08:46 (20)	17:11	17:58	19:48	20:33	20:56	20:37	19:44	18:36	17:32	15:45	30								08:30 (20)	15:39 18 08:40 (20)	
25	07:26		08:02 (19)	06:34	05:34	05:28	04:41	04:29	04:56	05:42	06:29	06:18	07:09									07:39 (19)	07:40 08:23 (20)	
	16:19	13	08:15 (19)	17:13	18:00	19:49	20:34	20:56	20:36	19:42	18:34	16:30	15:44	30								08:30 (20)	15:39 19 08:42 (20)	
26	07:25		08:03 (19)	06:32	05:32	05:26	04:39	04:29	04:57	05:43	06:31	06:19	07:11									07:41 (19)	07:40 08:23 (20)	
	16:21	12	08:15 (19)	17:15	18:01	19:51	20:35	20:56	20:35	19:40	18:31	16:28	15:43	28								08:31 (20)	15:40 19 08:42 (20)	
27	07:24		08:03 (19)	06:30	05:30	05:24	04:38	04:29	04:59	05:45	06:32	06:21	07:12									08:10 (20)	07:41 08:23 (20)	
	16:22	10	08:13 (19)	17:17	18:03	19:53	20:36	20:56	20:33	19:38	18:29	16:26	15:42	22								08:32 (20)	15:41 19 08:42 (20)	
28	07:22		08:05 (19)	06:28	05:27	05:22	04:37	04:30	05:00	05:46	06:34	06:23	07:14									08:09 (20)	07:41 08:24 (20)	
	16:24	8	08:13 (19)	17:18	18:05	19:54	20:38	20:56	20:32	19:35	18:27	16:24	15:41	23								08:32 (20)	15:42 19 08:43 (20)	
29	07:21		08:08 (19)		06:25	05:20	04:37	04:30	05:02	05:48	06:36	06:24	07:15									08:10 (20)	07:41 08:24 (20)	
	16:26	2	08:10 (19)		19:06	19:56	20:39	20:56	20:31	19:33	18:25	16:23	15:41	23								08:33 (20)	15:42 19 08:43 (20)	
30	07:20				06:23	05:18	04:36	04:31	05:03	05:50	06:37	06:26	07:17									08:10 (20)	07:41 08:24 (20)	
	16:28				19:08		19:57	20:40	20:56		18:23	16:21	15:40	23								08:33 (20)	15:43 20 08:44 (20)	
31	07:18				06:21			04:35		05:04		06:28											07:41 08:25 (20)	
	16:29				19:09			20:41		20:28		19:29											15:44 20 08:45 (20)	

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

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

## SHADOW - Calendar

**Shadow receptor:** D - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:46 40	09:35 (21) 10:15 (21) 16:31	07:17 17:20 24	06:26 07:04 (20) 19:11	05:17 19:59	04:34 20:42
2	07:41 15:47 40	09:36 (21) 10:16 (21) 16:33	07:15 17:22 25	06:16 07:03 (20) 19:13	05:15 20:01	04:33 20:43
3	07:41 15:48 41	09:36 (21) 10:17 (21) 16:35	07:14 17:23 25	06:14 07:02 (20) 19:14	05:13 20:02	04:32 20:44
4	07:41 15:49 40	09:36 (21) 10:16 (21) 16:36	07:12 17:25 24	06:12 07:03 (20) 19:16	05:11 20:04	04:32 20:45
5	07:41 15:50 40	09:37 (21) 10:17 (21) 16:38	07:11 17:27 23	06:10 07:03 (20) 19:17	05:09 20:05	04:31 20:46
6	07:41 15:51 40	09:38 (21) 10:18 (21) 16:40	07:09 17:28 21	06:08 07:04 (20) 19:19	05:08 20:07	04:31 20:47
7	07:40 15:52 39	09:38 (21) 10:17 (21) 16:42	07:08 17:30 20	06:05 07:04 (20) 19:21	05:06 20:08	04:30 20:48
8	07:40 15:53 39	09:39 (21) 10:18 (21) 16:43	07:06 17:32 17	06:03 07:06 (20) 19:22	05:04 20:10	04:30 20:49
9	07:39 15:55 39	09:39 (21) 10:18 (21) 16:45	07:04 17:33 13	06:01 07:07 (20) 19:24	05:03 20:11	04:29 20:50
10	07:39 15:56 38	09:40 (21) 10:18 (21) 16:47	07:03 17:35 6	05:59 07:10 (20) 19:25	05:01 20:13	04:29 20:50
11	07:38 15:57 37	09:41 (21) 10:18 (21) 16:49	07:01 17:37	05:57 19:27	04:59 20:14	04:28 20:51
12	07:38 15:59 36	09:42 (21) 10:18 (21) 16:50	06:59 17:38	05:55 19:29	04:58 20:16	04:28 20:52
13	07:37 16:00 36	09:42 (21) 10:18 (21) 16:52	06:57 17:40	05:52 19:30	04:56 20:17	04:28 20:52
14	07:37 16:02 35	09:43 (21) 10:18 (21) 16:54	06:55 17:42	05:50 19:32	04:55 20:19	04:28 20:53
15	07:36 16:03 34	09:43 (21) 10:17 (21) 16:56	06:54 17:43	05:48 19:33	04:53 20:20	04:27 20:53
16	07:35 16:05 33	09:44 (21) 10:17 (21) 16:57	06:52 07:16 (19) 17:45	05:46 19:35	04:52 20:22	04:27 20:54
17	07:34 16:06 32	09:45 (21) 10:17 (21) 16:59	06:50 07:13 (19) 17:47	05:44 19:37	04:51 20:23	04:27 20:54
18	07:33 16:08 30	09:46 (21) 10:16 (21) 17:01	06:48 07:12 (19) 17:48	05:42 19:38	04:49 20:25	04:27 20:55
19	07:32 16:09 28	09:48 (21) 10:16 (21) 17:03	06:46 07:11 (19) 17:50	05:40 19:40	04:48 20:26	04:27 20:55
20	07:31 16:11 26	09:49 (21) 10:15 (21) 17:04	06:44 07:11 (19) 17:52	05:38 19:41	04:47 20:27	04:27 20:55
21	07:30 16:12 23	09:51 (21) 10:14 (21) 17:06	06:42 07:11 (19) 17:53	05:36 19:43	04:45 20:29	04:28 20:56
22	07:29 16:14 20	09:53 (21) 10:13 (21) 17:08	06:40 07:11 (19) 17:55	05:34 19:45	04:44 20:30	04:28 20:56
23	07:28 16:16 16	09:55 (21) 10:11 (21) 17:10	06:38 07:11 (20) 17:58	05:32 19:46	04:43 20:31	04:28 20:56
24	07:27 16:17 9	09:58 (21) 10:07 (21) 17:11	06:36 07:09 (20) 17:56	05:30 19:48	04:42 20:33	04:28 20:56
25	07:26 16:19	06:34 17:13 18	05:34 07:07 (20) 18:00	05:28 19:49	04:41 20:34	04:29 20:56
26	07:25 16:21	06:32 17:15 20	05:32 07:06 (20) 18:01	05:26 19:51	04:39 20:35	04:29 20:56
27	07:24 16:22	06:30 17:17 22	05:30 07:05 (20) 18:03	05:24 19:53	04:38 20:36	04:29 20:56
28	07:22 16:24	06:28 17:18 24	05:27 07:04 (20) 18:05	05:22 19:54	04:37 20:38	04:30 20:56
29	07:21 16:26		06:25 19:06	05:20 19:56	04:37 20:39	04:30 20:56
30	07:20 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:56
31	07:18 16:29		06:21 19:09		04:35 20:41	
Potential sun hours	265	280	367	413	479	491
Total, worst case	791	192	198			
Sun reduction	0,26	0,31	0,31			
Oper. time red.	0,86	0,86	0,86			
Wind dir. red.	0,52	0,63	0,63			
Total reduction	0,11	0,16	0,17			
Total, real	89	31	33			

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

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

## SHADOW - Calendar

**Shadow receptor:** D - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:30 16:17	07:18 15:39 38
2	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39 38
3	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38 38
4	04:34 20:55	05:10 20:21	05:57 19:20	06:43 18:14	07:46 (20) 06:35 07:57 (20) 16:12	07:22 15:38 39
5	04:34 20:54	05:12 20:20	05:59 19:18	06:45 18:12	07:43 (20) 06:36 07:59 (20) 16:10	07:23 15:37 39
6	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	07:41 (20) 06:38 08:00 (20) 16:09	07:24 15:37 40
7	04:36 20:53	05:15 20:16	06:02 19:14	06:48 18:07	07:40 (20) 06:40 08:01 (20) 16:07	07:26 15:36 40
8	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	07:38 (20) 06:41 08:01 (20) 16:05	07:27 15:36 40
9	04:38 20:52	05:18 20:13	06:05 19:09	06:51 18:03	07:38 (20) 06:43 08:01 (20) 16:04	07:28 15:36 41
10	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	07:38 (20) 06:45 08:02 (20) 16:02	07:29 15:36 40
11	04:40 20:51	05:21 20:09	06:08 19:05	06:55 17:59	07:36 (20) 06:47 08:01 (20) 16:01	07:30 15:36 41
12	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	07:37 (20) 06:48 08:01 (20) 15:59	07:31 15:36 41
13	04:42 20:49	05:24 20:05	06:11 19:01	06:58 17:54	07:37 (20) 06:50 08:01 (20) 15:58	07:32 15:35 41
14	04:43 20:48	05:25 20:04	06:12 18:58	06:59 17:52	07:37 (20) 06:52 08:00 (20) 15:57	07:33 15:36 41
15	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	07:37 (20) 06:53 07:59 (20) 15:55	07:34 15:36 41
16	04:45 20:46	05:28 20:00	06:16 18:54	07:03 17:48	07:38 (20) 06:55 07:58 (20) 15:54	07:35 15:36 41
17	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	07:40 (20) 06:57 07:57 (20) 15:53	07:36 15:36 41
18	04:47 20:44	05:31 19:56	06:19 18:49	07:06 17:44	07:41 (20) 06:58 07:54 (19) 15:51	07:36 15:36 41
19	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:43 (19) 07:00 07:55 (19) 15:50	09:32 (21) 07:36 09:41 (21) 15:36
20	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:42 (19) 07:01 07:56 (19) 15:49	09:29 (21) 07:37 09:45 (21) 15:37
21	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:42 (19) 07:03 07:56 (19) 15:48	15:37 41 09:28 (21) 07:38 09:48 (21) 15:37
22	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:41 (19) 07:05 07:55 (19) 15:47	15:37 41 09:25 (21) 07:39 09:51 (21) 15:38
23	04:54 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:42 (19) 07:06 07:55 (19) 15:46	15:38 40 09:25 (21) 07:39 09:53 (21) 15:38
24	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:43 (19) 07:08 07:54 (19) 15:45	15:40 41 09:24 (21) 07:40 09:54 (21) 15:39
25	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	07:09 06:44 (19) 15:44	15:41 41 09:23 (21) 07:40 09:55 (21) 15:39
26	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	07:11 06:46 (19) 15:43	15:42 41 09:23 (21) 07:40 09:56 (21) 15:40
27	04:59 20:33	05:45 19:38	06:32 18:29	06:21 16:26	07:12 15:42	15:43 41 09:24 (21) 07:41 09:57 (21) 15:41
28	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:14 15:41	15:44 41 09:23 (21) 07:41 09:58 (21) 15:42
29	05:02 20:31	05:48 19:33	06:36 18:25	06:24 16:23	07:15 15:41	15:45 41 09:23 (21) 07:41 09:59 (21) 15:42
30	05:03 20:29	05:50 19:31	06:37 18:23	06:26 16:21	07:17 15:40	15:46 40 09:23 (21) 07:41 09:59 (21) 15:43
31	05:04 20:28	05:51 19:29		06:28 16:19		15:47 41 07:41 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case				395	357	1252
Sun reduction				0,37	0,25	0,19
Oper. time red.				0,86	0,86	0,86
Wind dir. red.				0,63	0,52	0,52
Total reduction				0,19	0,11	0,08
Total, real				77	40	105

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

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



## SHADOW - Calendar

**Shadow receptor:** E - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	04:31 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17	07:18 15:39	
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39	
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38	
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:33 20:55	05:10 20:21	05:57 19:20	06:43 18:14	06:35 16:12	07:22 15:38	
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:20	05:59 19:18	06:45 18:11	06:36 16:10	07:23 15:37	
6	07:41 15:51	07:09 16:40	06:16 17:28	06:07 19:19	05:08 20:07	04:30 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	07:24 15:37	
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48	04:36 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:36	
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:49	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05	07:27 15:36	
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:50	04:38 20:52	05:18 20:13	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36	
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36	
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:40 20:51	05:21 20:09	06:08 19:05	06:55 17:59	06:46 16:01	07:30 15:36	
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	04:58 20:16	04:28 20:52	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35	6 08:41 (22) 14:17 (21)
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:24 20:05	06:11 19:01	06:58 17:54	06:50 15:58	07:32 15:35	12 08:40 (22) 14:19 (21)
14	07:37 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	04:43 20:48	05:25 20:04	06:12 18:58	06:59 17:52	06:52 15:57	07:33 15:35	14 08:40 (22) 14:20 (21)
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36	16 08:40 (22) 14:21 (21)
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	06:55 15:54	07:35 15:36	17 08:41 (22) 14:22 (21)
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	04:50 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	06:56 15:53	07:35 15:36	18 08:41 (22) 14:23 (21)
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:25	04:27 20:55	04:47 20:44	05:31 19:56	06:19 18:49	07:06 17:44	06:58 15:51	07:36 15:36	19 08:41 (22) 14:23 (21)
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50	07:37 15:36	20 08:41 (22) 14:24 (21)
20	07:31 16:11	06:44 17:04	05:45 17:52	05:38 19:41	04:46 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49	07:38 15:37	20 08:42 (22) 14:25 (21)
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:27 20:56	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48	07:38 15:37	21 08:42 (22) 14:25 (21)
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	04:44 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:05 15:47	07:39 15:38	21 08:43 (22) 14:26 (21)
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38	20 08:43 (22) 14:26 (21)
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45	07:40 15:39	20 08:43 (22) 14:26 (21)
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:40 20:34	04:28 20:56	04:56 20:36	05:42 19:42	06:29 18:34	07:18 16:30	07:09 15:44	07:40 15:39	20 08:44 (22) 14:27 (21)
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:35	05:43 19:40	06:31 18:31	07:19 16:28	07:11 15:43	07:40 15:40	18 08:45 (22) 14:27 (21)
27	07:24 16:22	06:30 17:17	05:29 18:03	05:24 19:53	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:38	06:32 18:29	07:21 16:26	07:12 15:42	07:41 15:41	18 08:45 (22) 14:27 (21)
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:38	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	07:23 16:24	07:14 15:41	07:41 15:42	16 08:46 (22) 14:27 (21)
29	07:21 16:26		06:25 19:06	05:20 19:56	04:36 20:39	04:30 20:56	05:02 20:30	05:48 19:33	06:36 18:25	07:24 16:22	07:15 15:41	07:41 15:42	14 08:47 (22) 14:27 (21)
30	07:20 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:56	05:03 20:29	05:49 19:31	06:37 18:23	07:17 16:21	07:17 15:40	07:41 15:43	12 08:48 (22) 14:27 (21)
31	07:18 16:29		06:21 19:09		04:35 20:41		05:04 20:28	05:51 19:29		06:28 16:19		07:41 15:44	9 08:49 (22) 14:26 (21)
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251	
Total, worst case													331
Sun reduction													0,19
Oper. time red.													0,86
Wind dir. red.													0,63
Total reduction													0,10
Total, real													34

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

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

## SHADOW - Calendar

**Shadow receptor:** F - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (6)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45 12	14:54 (21) 15:06 (21) 16:31	07:17 16:31 17:20	06:26 17:20 19:11	05:16 19:59 20:42	04:34 20:42 20:56	04:31 20:56 20:26	05:06 20:26 19:27	05:53 19:27 18:20	06:39 18:20 16:17	06:29 16:17 15:39	07:18 15:39 16
2	07:41 15:46 12	14:55 (21) 15:07 (21) 16:33	07:15 16:33 17:22	06:16 17:22 19:13	05:15 20:01 20:43	04:33 20:43 20:55	04:32 20:55 20:24	05:07 20:24 19:25	05:54 19:25 18:18	06:40 16:15 15:39	06:31 15:39 16	07:19 15:39 16
3	07:41 15:48 13	14:55 (21) 15:08 (21) 16:34	07:14 16:34 17:23	06:22 17:23 19:14	05:13 20:02 20:44	04:32 20:44 20:55	04:33 20:55 20:23	05:09 19:23 18:16	05:56 18:16 16:14	06:42 16:14 15:38	06:33 15:38 16	07:21 15:38 16
4	07:41 15:49 13	14:55 (21) 15:08 (21) 16:36	07:12 16:36 17:25	06:20 17:25 19:16	05:11 20:04 20:45	04:32 20:45 20:55	04:33 20:55 20:21	05:10 19:20 18:14	05:57 18:14 16:12	06:43 16:12 15:38	06:35 15:38 15	07:22 15:38 15
5	07:41 15:50 14	14:55 (21) 15:09 (21) 16:38	07:11 16:38 17:27	06:18 17:27 19:17	05:09 20:05 20:46	04:31 20:46 20:54	04:34 20:54 20:20	05:12 19:18 18:11	05:59 18:11 16:10	06:45 16:10 15:37	06:36 15:37 14	07:23 15:37 14
6	07:41 15:51 14	14:55 (21) 15:09 (21) 16:40	07:09 16:40 17:28	06:16 17:28 19:19	05:08 20:07 20:47	04:30 20:47 20:54	04:35 20:54 20:18	05:13 19:16 18:09	06:00 18:09 16:09	06:47 16:09 15:37	06:38 15:37 14	07:24 15:37 14
7	07:40 15:52 14	14:56 (21) 15:10 (21) 16:42	07:07 16:42 17:30	06:13 17:30 19:21	05:06 20:08 20:48	04:30 20:48 20:53	04:36 20:53 20:16	05:15 19:14 18:07	06:02 18:07 16:07	06:48 16:07 15:36	06:40 15:36 14	07:26 15:36 14
8	07:40 15:53 15	14:55 (21) 15:10 (21) 16:43	07:06 16:43 17:32	06:11 17:32 19:22	05:04 20:10 20:49	04:29 20:49 20:53	04:37 20:53 20:14	05:16 19:12 18:05	06:03 18:05 16:05	06:50 16:05 15:36	06:41 15:36 13	07:27 15:36 13
9	07:39 15:55 15	14:56 (21) 15:11 (21) 16:45	07:04 16:45 17:33	06:09 17:33 19:24	05:03 20:11 20:50	04:29 20:50 20:52	04:38 20:52 20:13	05:18 19:09 18:03	06:05 18:03 16:04	06:51 16:04 15:36	06:43 15:36 13	07:28 15:36 13
10	07:39 15:56 16	14:56 (21) 15:12 (21) 16:47	07:02 16:47 17:35	06:07 17:35 19:25	05:01 20:13 20:50	04:29 20:50 20:51	04:39 20:51 20:11	05:19 19:07 18:01	06:06 18:01 16:02	06:53 16:02 15:36	06:45 15:36 12	07:29 15:36 12
11	07:38 15:57 16	14:57 (21) 15:13 (21) 16:49	07:01 16:49 17:37	06:05 17:37 19:27	05:00 20:14 20:51	04:28 20:51 20:51	04:40 20:51 20:09	06:08 19:05 17:58	06:55 17:58 16:01	06:46 16:01 15:36	06:46 15:36 12	07:30 15:36 12
12	07:38 15:59 15	14:58 (21) 15:13 (21) 16:50	06:59 16:50 17:38	06:03 17:38 19:29	05:55 20:16 20:52	04:58 20:52 20:50	04:41 20:50 20:07	06:09 19:03 17:56	06:56 17:56 15:59	06:48 15:59 15:35	06:48 15:35 11	07:31 15:35 11
13	07:37 16:00 15	14:58 (21) 15:13 (21) 16:52	06:57 16:52 17:40	06:00 17:40 19:30	05:52 20:17 20:52	04:56 20:52 20:49	04:42 20:49 20:05	06:11 19:01 17:54	06:58 17:54 15:58	06:50 15:58 15:35	06:50 15:35 11	07:32 15:35 11
14	07:36 16:02 15	14:58 (21) 15:13 (21) 16:54	06:55 16:54 17:42	05:58 17:42 19:32	05:50 20:19 20:53	04:55 20:53 20:48	04:43 20:48 20:04	06:12 18:58 17:52	06:59 17:52 15:57	06:52 15:57 15:35	06:52 15:35 10	07:33 15:35 10
15	07:36 16:03 14	14:59 (21) 15:13 (21) 16:56	06:54 16:56 17:43	05:56 17:43 19:33	05:48 20:20 20:53	04:54 20:53 20:47	04:44 20:47 20:02	06:14 18:56 17:50	07:01 17:50 15:55	06:53 15:55 15:36	06:53 15:36 9	07:34 15:36 9
16	07:35 16:05 12	15:00 (21) 15:12 (21) 16:57	06:52 16:57 17:45	05:54 17:45 19:35	05:46 20:22 20:54	04:52 20:54 20:46	04:45 20:46 20:00	06:15 18:54 17:48	07:03 17:48 15:54	06:55 15:54 15:36	06:55 15:36 8	07:35 15:36 8
17	07:34 16:06 11	15:01 (21) 15:12 (21) 16:59	06:50 16:59 17:47	05:52 17:47 19:37	05:44 20:23 20:54	04:50 20:54 20:45	04:46 20:45 19:58	06:17 18:52 17:46	07:04 17:46 15:53	06:56 15:53 15:36	06:56 15:36 9	07:36 15:36 9
18	07:33 16:08 10	15:02 (21) 15:12 (21) 17:01	06:48 17:01 17:48	05:49 17:48 19:38	05:42 20:25 20:55	04:49 20:55 20:44	04:47 20:44 19:56	06:19 18:49 17:44	07:06 17:44 15:51	06:58 15:51 15:36	06:58 15:36 8	07:37 15:36 8
19	07:32 16:09 7	15:04 (21) 15:11 (21) 17:03	06:46 17:03 17:50	05:47 17:50 19:40	05:40 20:26 20:55	04:48 20:55 20:43	04:48 20:43 19:54	06:20 18:47 17:42	07:08 17:42 15:50	07:00 15:50 15:36	07:00 15:36 8	07:38 15:36 8
20	07:31 16:11 1	15:07 (21) 15:08 (21) 17:04	06:44 17:04 17:52	05:45 17:52 19:41	05:38 20:27 20:55	04:46 20:55 20:42	04:47 20:42 19:52	06:22 18:45 17:40	07:09 17:40 15:49	07:01 15:49 15:37	07:01 15:37 8	07:39 15:37 8
21	07:30 16:12 1	15:08 (21) 17:06 17:53	06:42 17:53 19:43	05:43 19:43 20:29	05:36 20:45 20:56	04:45 20:56 20:41	04:47 20:41 19:50	06:23 18:43 17:38	07:11 17:38 15:48	07:03 15:48 15:37	07:03 15:37 8	07:40 15:37 8
22	07:29 16:14 1	15:09 (21) 17:08 17:55	06:40 17:55 19:45	05:41 19:45 20:30	05:34 20:44 20:56	04:44 20:56 20:40	04:45 20:40 19:48	06:25 18:40 17:36	07:13 17:36 15:47	07:05 15:47 15:36	07:05 15:36 8	07:41 15:36 8
23	07:28 16:16 1	15:10 (21) 17:10 17:56	06:38 17:56 19:46	05:38 19:46 20:31	05:32 20:42 20:56	04:43 20:56 20:39	04:53 20:39 19:46	06:26 18:38 17:34	07:14 17:34 15:46	07:06 15:46 15:35	07:06 15:35 7	07:42 15:35 7
24	07:27 16:17 1	15:11 (21) 17:11 17:58	06:36 17:58 19:48	05:36 19:48 20:33	05:30 20:40 20:56	04:42 20:56 20:37	04:55 20:37 19:44	06:28 18:36 17:32	07:16 17:32 15:45	07:08 15:45 15:34	07:08 15:34 10	07:43 15:34 10
25	07:26 16:19 1	15:12 (21) 17:13 18:00	06:34 18:00 19:49	05:34 19:49 20:34	05:28 20:40 20:56	04:40 20:56 20:36	04:56 20:36 19:42	06:29 18:34 17:30	07:18 17:30 15:44	07:09 15:44 15:33	07:09 15:33 11	07:44 15:33 11
26	07:25 16:21 1	15:13 (21) 17:15 18:01	06:32 18:01 19:51	05:32 19:51 20:35	05:26 20:35 20:56	04:39 20:56 20:35	04:57 20:35 19:40	06:31 18:31 17:28	07:11 17:28 15:43	07:11 15:43 15:32	07:11 15:32 12	07:45 15:32 12
27	07:24 16:22 1	15:14 (21) 17:17 18:03	06:30 18:03 19:53	05:24 19:53 20:36	05:24 20:36 20:56	04:38 20:56 20:33	04:59 20:33 19:38	06:32 18:29 17:26	07:12 17:26 15:42	07:12 15:42 15:31	07:12 15:31 14	07:46 15:31 14
28	07:22 16:24 1	15:15 (21) 17:18 18:04	06:28 18:04 19:54	05:22 19:54 20:38	05:22 20:38 20:56	04:37 20:56 20:32	05:00 20:32 19:35	06:34 18:27 17:24	07:14 17:24 15:41	07:14 15:41 15:30	07:14 15:30 15	07:47 15:30 15
29	07:21 16:26 1	15:16 (21) 17:19 18:06	06:25 18:06 19:56	05:20 19:56 20:39	05:20 20:39 20:56	04:36 20:56 20:30	05:02 20:30 19:33	06:36 18:25 17:22	07:15 17:22 15:41	07:15 15:41 15:29	07:15 15:29 15	07:48 15:29 15
30	07:20 16:28 1	15:17 (21) 17:20 18:07	06:23 18:07 19:57	05:18 19:57 20:40	05:18 20:40 20:56	04:36 20:56 20:29	05:03 20:29 19:31	06:37 18:22 17:20	07:17 17:20 15:40	07:17 15:40 15:28	07:17 15:28 15	07:49 15:28 15
31	07:18 16:29 1	15:18 (21) 17:21 18:08	06:21 18:08 19:59	05:17 19:59 20:41	05:17 20:41 20:56	04:35 20:56 20:28	05:04 20:28 19:29	06:38 18:19 17:19	07:18 17:19 15:39	07:18 15:39 15:27	07:18 15:27 15	07:50 15:27 15
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case	254										100	335
Sun reduction	0,26										0,25	0,19
Oper. time red.	0,86										0,86	0,86
Wind dir. red.	0,69										0,69	0,69
Total reduction	0,15										0,15	0,11
Total, real	38										15	38

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

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

## SHADOW - Calendar

**Shadow receptor:** G - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	14:56 (20) 15:08 (20)	07:17 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:56	05:06 20:26	05:52 19:27	06:39 18:20	06:29 16:17
2	07:41 15:46	14:57 (20) 15:09 (20)	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15
3	07:41 15:47	14:57 (20) 15:10 (20)	07:14 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14
4	07:41 15:49	14:57 (20) 15:10 (20)	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:33 20:55	05:10 20:21	05:57 19:20	06:43 18:14	06:35 16:12
5	07:41 15:50	14:57 (20) 15:11 (20)	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:20	05:59 19:18	06:45 18:11	06:36 16:10
6	07:40 15:51	14:57 (20) 15:11 (20)	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:07	04:30 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09
7	07:40 15:52	14:58 (20) 15:12 (20)	07:07 16:41	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:40 16:07
8	07:40 15:53	14:58 (20) 15:12 (20)	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:49	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05
9	07:39 15:55	14:59 (20) 15:13 (20)	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:50	04:38 20:52	05:17 20:13	06:05 19:09	06:51 18:03	06:43 16:04
10	07:39 15:56	14:59 (20) 15:13 (20)	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02
11	07:38 15:57	15:00 (20) 15:14 (20)	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:40 20:51	05:20 20:09	06:08 19:05	06:55 17:58	06:46 16:01
12	07:38 15:59	15:00 (20) 15:14 (20)	06:59 16:50	06:03 17:38	05:54 19:29	04:58 20:16	04:28 20:52	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59
13	07:37 16:00	15:00 (20) 15:14 (20)	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58
14	07:36 16:02	15:01 (20) 15:14 (20)	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:27 20:53	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:57
15	07:36 16:03	15:02 (20) 15:14 (20)	06:54 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55
16	07:35 16:05	15:03 (20) 15:14 (20)	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	06:55 15:54
17	07:34 16:06	15:04 (20) 15:13 (20)	06:50 16:59	05:52 17:47	05:44 19:37	04:50 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	06:56 15:53
18	07:33 16:08	15:05 (20) 15:12 (20)	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:25	04:27 20:55	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51
19	07:32 16:09	15:06 (20) 17:03	06:46 17:50	05:47 19:40	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50
20	07:31 16:11	15:07 (20) 17:04	06:44 17:52	05:45 19:41	05:38 19:41	04:46 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49
21	07:30 16:12	15:08 (20) 17:06	06:42 17:53	05:43 19:43	05:36 19:43	04:45 20:29	04:27 20:56	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48
22	07:29 16:14	15:09 (20) 17:08	06:40 17:55	05:41 19:45	05:34 19:45	04:44 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:04 15:47
23	07:28 16:16	15:10 (20) 17:10	06:38 17:56	05:38 19:46	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46
24	07:27 16:17	15:11 (20) 17:11	06:36 17:58	05:36 19:48	05:30 19:48	04:42 20:33	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45
25	07:26 16:19	15:12 (20) 17:13	06:34 18:00	05:34 19:49	05:28 19:49	04:40 20:34	04:28 20:56	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	06:18 15:44
26	07:25 16:21	15:13 (20) 17:15	06:32 18:01	05:32 19:51	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	06:19 15:43
27	07:23 16:22	15:14 (20) 17:16	06:30 18:03	05:29 19:53	05:24 19:53	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:38	06:32 18:29	06:21 16:26	06:21 15:42
28	07:22 16:24	15:15 (20) 17:18	06:28 18:04	05:27 19:54	05:22 19:54	04:37 20:38	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	06:23 15:41
29	07:21 16:26	15:16 (20) 17:19	06:25 18:06	05:20 19:56	05:20 19:56	04:36 20:39	04:30 20:56	05:01 20:30	05:48 19:33	06:36 18:25	06:24 16:22	06:24 15:41
30	07:20 16:27	15:17 (20) 17:20	06:23 18:08	05:18 19:57	05:18 19:57	04:35 20:40	04:31 20:56	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	06:26 15:40
31	07:18 16:29	15:18 (20) 17:21	06:21 18:09	05:17 19:59	05:17 19:59	04:35 20:41	05:04 20:27	05:51 19:29	05:48 18:22	06:28 16:19	06:28 16:19	06:28 16:19
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case	228										79	331
Sun reduction	0,26										0,25	0,19
Oper. time red.	0,86										0,86	0,86
Wind dir. red.	0,69										0,69	0,69
Total reduction	0,15										0,15	0,11
Total, real	35										12	37

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

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



## SHADOW - Calendar

**Shadow receptor:** H - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:17 16:31	15:34 (20) 17:20	06:26 19:11	06:18 19:59	05:16 20:42	04:34 20:56	04:31 20:26	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17
2	07:41 15:46	07:15 16:33	15:34 (20) 17:22	06:16 19:13	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:07 19:25	05:54 18:18	06:40 16:15	06:31 15:39
3	07:41 15:47	07:14 16:34	15:35 (20) 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:09 19:23	05:56 18:16	06:42 16:14	06:33 15:38
4	07:41 15:49	07:12 16:36	15:36 (20) 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:33 20:55	05:10 20:21	05:10 19:20	05:57 18:14	06:43 16:12	06:35 15:38
5	07:41 15:50	07:11 16:38	15:37 (20) 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:20	05:09 19:18	05:59 18:11	06:45 16:10	06:36 15:37
6	07:40 15:51	07:09 16:40	15:40 (20) 17:28	06:07 19:19	05:08 20:07	04:30 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	06:47 15:37
7	07:40 15:52	07:07 16:42	15:45 (20) 17:30	06:05 19:21	05:06 20:08	04:30 20:48	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:40 16:07	06:40 15:36
8	07:40 15:53	07:06 16:43	15:45 (20) 17:32	06:03 19:22	05:04 20:10	04:29 20:49	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05	06:41 15:36
9	07:39 15:55	07:04 16:45	15:45 (20) 17:33	06:01 19:24	05:03 20:11	04:29 20:49	04:38 20:52	05:17 20:13	06:05 19:09	06:51 18:03	06:43 16:04	06:43 15:36
10	07:39 15:56	07:02 16:47	15:46 (20) 17:35	06:00 19:25	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	06:45 15:36
11	07:38 15:57	07:01 16:49	15:47 (20) 17:37	06:00 19:27	05:01 20:14	04:29 20:51	04:40 20:51	05:20 20:09	06:08 19:05	06:58 17:58	06:46 16:01	06:46 15:35
12	07:38 15:59	06:59 16:50	15:48 (20) 17:38	06:00 19:29	05:02 20:16	04:28 20:52	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	06:48 15:35
13	07:37 16:00	06:57 16:52	15:49 (20) 17:40	06:00 19:30	05:02 20:17	04:28 20:52	04:42 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	06:50 15:35
14	07:36 16:02	06:55 16:54	15:50 (20) 17:42	06:00 19:32	05:03 20:19	04:27 20:53	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:57	06:51 15:35
15	07:36 16:03	06:54 16:56	15:51 (20) 17:43	06:00 19:33	05:04 20:20	04:27 20:53	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55	06:53 15:35
16	07:35 16:05	06:52 16:57	15:52 (20) 17:45	06:00 19:35	05:05 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	06:55 15:54	06:55 15:36
17	07:34 16:06	06:50 16:59	15:53 (20) 17:47	06:00 19:37	05:06 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	06:56 15:53	06:56 15:36
18	07:33 16:08	06:48 17:01	15:54 (20) 17:48	06:00 19:38	05:07 20:25	04:27 20:55	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	06:58 15:36
19	07:32 16:09	06:46 17:03	15:55 (20) 17:50	06:00 19:40	05:08 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50	07:00 15:36
20	07:31 16:11	06:44 17:04	15:56 (20) 17:52	06:00 19:41	05:09 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49	07:01 15:37
21	07:30 16:12	06:42 17:06	15:57 (20) 17:53	06:00 19:43	05:10 20:29	04:27 20:56	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48	07:03 15:37
22	07:29 16:14	06:40 17:08	15:58 (20) 17:55	06:00 19:45	05:11 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:04 15:47	07:04 15:38
23	07:28 16:16	06:38 17:10	15:59 (20) 17:56	06:00 19:46	05:12 20:31	04:28 20:56	04:53 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:06 15:38
24	07:27 16:17	15:38 (20) 15:41 (20)	06:36 17:11	06:00 19:48	05:13 20:33	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45	07:08 15:39
25	07:26 16:19	15:36 (20) 15:44 (20)	06:34 17:13	06:00 19:49	05:14 20:34	04:28 20:56	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	07:09 15:44	07:09 15:39
26	07:25 16:21	15:35 (20) 15:46 (20)	06:32 17:15	06:00 19:51	05:15 20:35	04:29 20:56	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	07:11 15:43	07:11 15:40
27	07:23 16:22	15:34 (20) 15:47 (20)	06:30 17:16	06:00 19:53	05:16 20:36	04:29 20:56	04:59 20:33	05:45 19:38	06:32 18:29	06:21 16:26	07:12 15:42	07:12 15:41
28	07:22 16:24	15:33 (20) 15:48 (20)	06:28 17:18	06:00 19:54	05:17 20:38	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:14 15:41	07:14 15:42
29	07:21 16:26	15:32 (20) 15:48 (20)		06:00 19:56	05:18 20:39	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:25	06:24 16:22	07:15 15:41	07:15 15:42
30	07:20 16:27	15:31 (20) 15:49 (20)		06:00 19:58	05:19 20:40	04:31 20:56	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	07:16 15:40	07:16 15:43
31	07:18 16:29	15:30 (20) 15:49 (20)		06:00 19:59	05:20 20:41	04:32 20:57	05:04 20:27	05:51 19:29	06:38 16:19	06:28 15:40		07:17 15:44
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case	96	71									169	
Sun reduction	0,26	0,31									0,25	
Oper. time red.	0,86	0,86									0,86	
Wind dir. red.	0,70	0,70									0,70	
Total reduction	0,15	0,18									0,15	
Total, real	15	13									26	

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

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

## SHADOW - Calendar

**Shadow receptor:** I - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45 15	14:43 (19) 14:58 (19) 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42
2	07:41 15:46 15	14:44 (19) 14:59 (19) 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43
3	07:41 15:47 15	14:44 (19) 14:59 (19) 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44
4	07:41 15:49 15	14:44 (19) 14:59 (19) 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45
5	07:41 15:50 15	14:45 (19) 15:00 (19) 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46
6	07:40 15:51 15	14:45 (19) 15:00 (19) 16:40	06:15 17:28	06:07 19:19	05:08 20:07	04:30 20:47
7	07:40 15:52 14	14:46 (19) 15:00 (19) 16:41	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48
8	07:40 15:53 14	14:46 (19) 15:00 (19) 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:49
9	07:39 15:55 13	14:48 (19) 15:01 (19) 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49
10	07:39 15:56 12	14:48 (19) 15:00 (19) 16:47	06:07 16:18 (20) 17:35	05:59 19:25	05:01 20:13	04:29 20:50
11	07:38 15:57 11	14:50 (19) 15:01 (19) 16:49	06:05 16:17 (20) 17:37	05:57 19:27	04:59 20:14	04:28 20:51
12	07:38 15:59 9	14:51 (19) 15:00 (19) 16:50	06:03 16:16 (20) 17:38	05:54 19:29	04:58 20:16	04:28 20:52
13	07:37 16:00 7	14:52 (19) 14:59 (19) 16:52	06:00 16:15 (20) 17:40	05:52 19:30	04:56 20:17	04:28 20:52
14	07:36 16:02 2	14:55 (19) 14:57 (19) 16:54	05:58 16:14 (20) 17:42	05:50 19:32	04:55 20:19	04:27 20:53
15	07:36 16:03	06:54 16:56 12	05:56 16:14 (20) 17:43	05:48 19:33	04:53 20:20	04:27 20:53
16	07:35 16:05	06:52 16:57 11	05:54 16:15 (20) 17:45	05:46 19:35	04:52 20:22	04:27 20:54
17	07:34 16:06	06:50 16:59 9	05:52 16:16 (20) 17:47	05:44 19:37	04:50 20:23	04:27 20:54
18	07:33 16:08	06:48 17:01 5	05:49 16:18 (20) 17:48	05:42 19:38	04:49 20:25	04:27 20:55
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:27 20:56
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:45	04:44 20:30	04:28 20:56
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:28 20:56
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:40 20:34	04:28 20:56
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:29 20:56
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:53	04:38 20:36	04:29 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:38	04:30 20:56
29	07:21 16:26		06:25 19:06	05:20 19:56	04:36 20:39	04:30 20:56
30	07:19 16:27		06:23 19:08	05:18 19:57	04:35 20:40	04:31 20:56
31	07:18 16:29		06:21 19:09		04:35 20:41	
Potential sun hours	265	280	367	413	479	491
Total, worst case	172	71				
Sun reduction	0,26	0,31				
Oper. time red.	0,86	0,86				
Wind dir. red.	0,69	0,69				
Total reduction	0,15	0,18				
Total, real	26	13				

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

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

## SHADOW - Calendar

**Shadow receptor:** I - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:56	05:06 20:26	05:52 19:27	06:39 18:20	06:29 16:17	07:18 15:39 11
2	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39 12
3	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38 13
4	04:33 20:55	05:10 20:21	05:57 19:20	06:43 18:14	06:35 16:12	07:22 15:38 13
5	04:34 20:54	05:12 20:19	05:59 19:18	06:45 18:11	06:36 16:10	07:23 15:37 14
6	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	07:24 15:37 15
7	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:36 15
8	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05	07:27 15:36 15
9	04:38 20:52	05:17 20:13	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36 16
10	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36 15
11	04:39 20:51	05:20 20:09	06:08 19:05	06:55 17:58	06:46 16:01	07:30 15:35 15
12	04:40 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35 15
13	04:42 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35 15
14	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:57	07:33 15:35 15
15	04:44 20:47	05:26 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:35 15
16	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	06:55 15:54	07:35 15:36 15
17	04:46 20:45	05:30 19:58	06:17 18:52	07:04 17:46	06:56 15:53	07:35 15:36 14
18	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	07:36 15:36 15
19	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50	07:37 15:36 15
20	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49	07:37 15:37 15
21	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48	07:38 15:37 15
22	04:52 20:40	05:37 19:48	06:25 18:40	07:13 17:36	07:04 15:47	07:39 15:38 15
23	04:53 20:39	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38 15
24	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45	07:40 15:39 15
25	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	07:09 15:44	07:40 15:39 15
26	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	07:11 15:43	07:40 15:40 15
27	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	07:41 15:41 15
28	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:14 15:41	14:35 (19) 15:41 15
29	05:01 20:30	05:48 19:33	06:35 18:25	06:24 16:22	07:15 15:41	14:36 (19) 15:41 15
30	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	07:16 15:40	14:33 (19) 15:41 15
31	05:04 20:27	05:51 19:29		06:28 16:19	07:17 15:40	14:41 (19) 15:41 15
Potential sun hours	495	450	380	334	271	251
Total, worst case				71	17	453
Sun reduction				0,37	0,25	0,19
Oper. time red.				0,86	0,86	0,86
Wind dir. red.				0,69	0,69	0,69
Total reduction				0,22	0,15	0,11
Total, real				15	3	51

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

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

## SHADOW - Calendar

**Shadow receptor:** J - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:56	05:06 20:26	05:52 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:47	07:14 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:55 19:22	06:42 18:16	06:33 16:14	07:21 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:33 20:55	05:10 20:21	05:57 19:20	06:43 18:14	06:34 16:12	07:22 15:37
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:11 20:19	05:59 19:18	06:45 18:11	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:07	04:30 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:08	07:24 15:37
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:36
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:49	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05	07:27 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:02 20:11	04:29 20:49	04:38 20:52	05:17 20:13	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:28 20:50	04:38 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:39 20:50	05:20 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:35
12	07:38 15:59	15:26 (22) 06:59	06:02 17:38	05:54 19:29	04:58 20:16	04:28 20:52	04:40 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	07:37 16:00	15:25 (22) 06:57	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:41 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	07:36 16:02	15:24 (22) 06:55	06:55 17:42	05:58 19:32	04:55 20:19	04:27 20:53	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:56	07:33 15:34
15	07:36 16:03	15:24 (22) 06:53	06:53 17:43	05:56 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:26 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:35
16	07:35 16:04	15:23 (22) 06:52	06:52 17:45	05:54 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	06:55 15:54	07:35 15:36
17	07:34 16:06	15:23 (22) 06:50	05:52 17:47	05:44 19:37	04:50 20:23	04:27 20:54	04:46 20:45	05:29 19:58	06:17 18:51	07:04 17:46	06:56 15:53	15:02 (22) 07:35
18	07:33 16:08	15:23 (22) 06:48	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:55	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	15:01 (22) 07:36
19	07:32 16:09	15:24 (22) 06:46	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	07:00 15:50	15:01 (22) 07:37
20	07:31 16:11	15:24 (22) 06:44	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:21 18:45	07:09 17:40	07:01 15:49	15:11 (22) 07:37
21	07:30 16:12	15:25 (22) 06:42	05:43 17:53	05:36 19:43	04:45 20:29	04:27 20:56	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	07:03 15:48	15:12 (22) 07:38
22	07:29 16:14	15:26 (22) 06:40	05:40 17:55	05:34 19:45	04:44 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:12 17:36	07:04 15:47	15:12 (22) 07:39
23	07:28 16:16	15:27 (22) 06:38	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:38	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	15:01 (22) 07:39
24	07:27 16:17	15:27 (22) 06:36	05:36 17:58	05:30 19:48	04:41 20:33	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:08 15:45	15:01 (22) 07:40
25	07:26 16:19	15:29 (22) 06:34	05:34 17:13	05:28 18:00	04:40 19:49	04:28 20:34	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	07:09 15:44	15:01 (22) 07:40
26	07:25 16:21	15:35 (22) 06:32	05:32 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	07:11 15:43	15:02 (22) 07:40
27	07:23 16:22	17:15 06:30	05:29 18:03	05:24 19:53	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	15:12 (22) 07:41
28	07:22 16:24	17:16 06:28	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:14 15:41	15:04 (22) 07:41
29	07:21 16:26	17:18 06:25	05:20 19:06	05:14 19:56	04:36 20:39	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:25	06:24 16:22	07:15 15:40	15:05 (22) 07:41
30	07:19 16:27	19:08 06:23	05:18 19:08	05:18 19:57	04:35 20:40	04:31 20:56	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	07:16 15:40	15:07 (22) 07:41
31	07:18 16:29	19:09 06:21	05:19 19:09	05:19 19:57	04:35 20:41	04:31 20:56	05:04 20:27	05:51 19:29	06:28 16:19	06:28 16:19	07:16 15:40	15:08 (22) 07:41
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case	123										124	
Sun reduction	0,26										0,25	
Oper. time red.	0,86										0,86	
Wind dir. red.	0,70										0,70	
Total reduction	0,15										0,15	
Total, real	19										19	

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

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

## SHADOW - Calendar

**Shadow receptor:** K - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:41 15:45		07:17 16:31	15:23 (23) 15:55 (17)	06:26 17:20	7	16:47 (22) 16:54 (22)	06:18 19:11	05:16 19:59	04:34 20:42	
2	07:41 15:46		07:15 16:33	15:23 (23) 15:54 (17)	06:24 17:22	11	16:44 (22) 16:55 (22)	06:16 19:12	05:15 20:00	04:33 20:43	
3	07:41 15:47		07:14 16:34	15:23 (23) 15:53 (17)	06:22 17:23	13	16:43 (22) 16:56 (22)	06:14 19:14	05:13 20:02	04:32 20:44	
4	07:41 15:49		07:12 16:36	15:24 (23) 15:53 (17)	06:20 17:25	14	16:43 (22) 16:57 (22)	06:12 19:16	05:11 20:04	04:32 20:45	
5	07:41 15:50		07:11 16:38	15:24 (23) 15:50 (17)	06:18 17:27	18	16:42 (22) 17:02 (19)	06:10 19:17	05:09 20:05	04:31 20:46	
6	07:40 15:51		07:09 16:40	15:25 (23) 15:44 (23)	06:15 17:28	22	16:42 (22) 17:04 (19)	06:07 19:19	05:08 20:07	04:30 20:47	
7	07:40 15:52		07:07 16:41	15:26 (23) 15:44 (23)	06:13 17:30	22	16:43 (22) 17:05 (19)	06:05 19:20	05:06 20:08	04:30 20:48	
8	07:40 15:53		07:06 16:43	15:28 (23) 15:43 (23)	06:11 17:32	23	16:43 (22) 17:06 (19)	06:03 19:22	05:04 20:10	04:29 20:49	
9	07:39 15:55		07:04 16:45	15:29 (23) 15:41 (23)	06:09 17:33	20	16:44 (22) 17:06 (19)	06:01 19:24	05:03 20:11	04:29 20:49	
10	07:39 15:56		07:02 16:47	15:32 (23) 15:38 (23)	06:07 17:35	10	16:56 (19) 17:06 (19)	05:59 19:25	05:01 20:13	04:29 20:50	
11	07:38 15:57		07:01 16:49		06:05 17:37	7	16:57 (19) 17:04 (19)	05:57 19:27	04:59 20:14	04:28 20:51	
12	07:38 15:59		06:59 16:50		06:02 17:38			05:54 19:29	04:58 20:16	04:28 20:52	
13	07:37 16:00		06:57 16:52		06:00 17:40			05:52 19:30	04:56 20:17	04:28 20:52	
14	07:36 16:02		06:55 16:54		05:58 17:42			05:50 19:32	04:55 20:19	04:27 20:53	
15	07:36 16:03		06:53 16:56		05:56 17:43			05:48 19:33	04:53 20:20	04:27 20:53	
16	07:35 16:05		06:52 16:57		05:54 17:45			05:46 19:35	04:52 20:22	04:27 20:54	
17	07:34 16:06		06:50 16:59		05:52 17:47			05:44 19:37	04:50 20:23	04:27 20:54	
18	07:33 16:08		06:48 17:01		05:49 17:48			05:42 19:38	04:49 20:24	04:27 20:55	
19	07:32 16:09		06:46 17:03		05:47 17:50			05:40 19:40	04:48 20:26	04:27 20:55	
20	07:31 16:11		06:44 17:04		05:45 17:51			05:38 19:41	04:46 20:27	04:27 20:55	
21	07:30 16:12		06:42 17:06		05:43 17:53			05:36 19:43	04:45 20:29	04:27 20:56	
22	07:29 16:14		06:40 17:08		05:40 17:55			05:34 19:45	04:44 20:30	04:28 20:56	
23	07:28 16:16	6	15:29 (23) 15:35 (23)	06:38 17:10	05:38 17:56			05:32 19:46	04:43 20:31	04:28 20:56	
24	07:27 16:17	12	15:27 (23) 15:46 (17)	06:36 17:11	05:36 17:58			05:30 19:48	04:42 20:33	04:28 20:56	
25	07:26 16:19	21	15:26 (23) 15:49 (17)	06:34 17:13	05:34 18:00			05:28 19:49	04:40 20:34	04:28 20:56	
26	07:25 16:21	25	15:25 (23) 15:51 (17)	06:32 17:15	05:32 18:01			05:26 19:51	04:39 20:35	04:29 20:56	
27	07:23 16:22	28	15:24 (23) 15:52 (17)	06:30 17:16	05:29 18:03			05:24 19:52	04:38 20:36	04:29 20:56	
28	07:22 16:24	30	15:24 (23) 15:54 (17)	06:28 17:18	05:27 18:04			05:22 19:54	04:37 20:37	04:30 20:56	
29	07:21 16:26	31	15:23 (23) 15:54 (17)		06:25 19:06			05:20 19:56	04:36 20:39	04:30 20:56	
30	07:19 16:27	31	15:23 (23) 15:54 (17)		06:23 19:08			05:18 19:57	04:35 20:40	04:31 20:56	
31	07:18 16:29	31	15:23 (23) 15:54 (17)		06:21 19:09				04:35 20:41		
Potential sun hours		265		280	367		413	479		491	
Total, worst case		215		217	167						
Sun reduction		0,26		0,31	0,31						
Oper. time red.		0,86		0,86	0,86						
Wind dir. red.		0,70		0,70	0,70						
Total reduction		0,15		0,18	0,19						
Total, real		33		40	31						

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

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



## SHADOW - Calendar

**Shadow receptor:** K - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 20:26	05:52 19:27	06:39 18:20	06:29 16:17	15:01 (23) 15:08 (23)
2	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	17:37 (19) 16:15	14:58 (23) 15:11 (23)
3	04:33 20:55	05:09 20:23	05:56 19:22	06:42 18:16	17:34 (19) 16:14	14:57 (23) 15:13 (23)
4	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:14	17:23 (22) 16:12	14:56 (23) 15:14 (23)
5	04:34 20:54	05:11 20:19	05:59 19:18	06:45 18:11	17:20 (22) 16:10	14:55 (23) 15:15 (23)
6	04:35 20:54	05:13 20:18	06:00 19:16	06:46 18:09	17:19 (22) 16:09	14:54 (23) 15:20 (17)
7	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	17:18 (22) 16:07	14:54 (23) 15:22 (17)
8	04:37 20:52	05:16 20:14	06:03 19:12	06:50 18:05	17:17 (22) 16:05	14:54 (23) 15:24 (17)
9	04:38 20:52	05:17 20:13	06:05 19:09	06:51 18:03	17:17 (22) 16:04	14:54 (23) 15:25 (17)
10	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	17:18 (22) 16:02	14:54 (23) 15:26 (17)
11	04:39 20:50	05:20 20:09	06:08 19:05	06:54 17:58	17:18 (22) 16:01	14:55 (23) 15:26 (17)
12	04:40 20:50	05:22 20:07	06:09 19:03	06:56 17:56	17:19 (22) 15:59	14:54 (23) 15:25 (17)
13	04:42 20:49	05:23 20:05	06:11 19:00	06:58 17:54	17:22 (22) 15:58	14:55 (23) 15:25 (17)
14	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	17:26 (22) 15:56	15:25 (17) 14:56 (23)
15	04:44 20:47	05:26 20:02	06:14 18:56	07:01 17:50	15:55 15:55	14:57 (23) 15:25 (17)
16	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	15:54 15:54	14:58 (23) 15:24 (17)
17	04:46 20:45	05:30 19:58	06:17 18:51	07:04 17:46	15:53 15:53	14:59 (23) 15:22 (17)
18	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	15:51 15:51	15:01 (23) 15:20 (17)
19	04:48 20:43	05:33 19:54	06:20 18:47	07:08 17:42	15:50 15:50	15:04 (23) 15:10 (23)
20	04:50 20:42	05:34 19:52	06:21 18:45	07:09 17:40	15:49 15:49	15:07 (23) 15:37
21	04:51 20:41	05:36 19:50	06:23 18:43	07:11 17:38	15:48 15:48	15:38 15:37
22	04:52 20:40	05:37 19:48	06:25 18:40	07:12 17:36	15:47 15:47	15:39 15:38
23	04:53 20:38	05:39 19:46	06:26 18:38	07:14 17:34	15:46 15:46	15:39 15:38
24	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	15:45 15:45	15:40 15:39
25	04:56 20:36	05:42 19:42	06:29 18:34	06:18 16:30	15:44 15:44	15:40 15:39
26	04:57 20:35	05:43 19:40	06:31 18:31	06:19 16:28	15:43 15:43	15:40 15:40
27	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	15:42 15:42	15:41 15:41
28	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	15:41 15:41	15:41 15:41
29	05:01 20:30	05:48 19:33	06:35 18:25	06:24 16:22	15:41 15:41	15:41 15:42
30	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	15:40 15:40	15:41 15:43
31	05:04 20:27	05:51 19:29	06:39 16:19	06:28 16:19	15:40 15:40	15:41 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case				175	434	
Sun reduction				0,37	0,25	
Oper. time red.				0,86	0,86	
Wind dir. red.				0,70	0,70	
Total reduction				0,22	0,15	
Total, real				39	66	

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

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

## SHADOW - Calendar

**Shadow receptor:** L - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (12)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43
3	07:41 15:47	07:14 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:07	04:30 20:47
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:49
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:02 20:11	04:29 20:49
10	07:39 15:56	07:02 16:47	06:07 16:16 (17) 17:35	05:59 17:05 (22) 19:25	05:01 17:03 (22) 20:13	04:29 17:03 (22) 20:50
11	07:38 15:57	07:01 16:49	06:05 16:15 (17) 17:37	05:57 17:03 (22) 19:27	04:59 17:12 (22) 20:14	04:28 17:12 (22) 20:51
12	07:38 15:59	06:59 16:50	06:02 16:14 (17) 17:38	05:54 17:03 (22) 19:28	04:58 17:14 (22) 20:16	04:28 17:14 (22) 20:52
13	07:37 16:00	06:57 16:52	06:00 16:14 (17) 17:40	05:52 17:02 (22) 19:30	04:56 17:13 (22) 20:17	04:28 17:13 (22) 20:52
14	07:36 16:02	06:55 16:54	05:58 16:14 (17) 17:42	05:50 17:03 (22) 19:32	04:55 17:03 (22) 20:19	04:27 17:03 (22) 20:53
15	07:36 16:03	06:53 16:56	05:56 16:14 (17) 17:43	05:48 17:03 (22) 19:33	04:53 17:12 (22) 20:20	04:27 17:12 (22) 20:53
16	07:35 16:05	06:52 16:57	05:54 16:14 (17) 17:45	05:46 17:04 (22) 19:35	04:52 17:11 (22) 20:22	04:27 17:11 (22) 20:54
17	07:34 16:06	06:50 16:59	05:51 16:16 (17) 17:47	05:44 17:04 (22) 19:37	04:50 17:12 (22) 20:23	04:27 17:12 (22) 20:54
18	07:33 16:08	06:48 17:01	05:49 16:15 (23) 17:48	05:42 17:04 (22) 19:38	04:49 17:13 (22) 20:24	04:27 17:13 (22) 20:55
19	07:32 16:09	06:46 17:03	05:47 16:15 (23) 17:50	05:40 17:04 (22) 19:40	04:48 17:14 (22) 20:26	04:27 17:14 (22) 20:55
20	07:31 16:11	06:44 17:04	05:45 16:14 (23) 17:51	05:38 17:04 (22) 19:41	04:46 17:15 (22) 20:27	04:27 17:15 (22) 20:55
21	07:30 16:12	06:42 17:06	05:43 16:14 (23) 17:53	05:36 17:04 (22) 19:43	04:45 17:16 (22) 20:29	04:27 17:16 (22) 20:56
22	07:29 16:14	06:40 17:08	05:40 16:14 (23) 17:55	05:34 17:04 (22) 19:45	04:44 17:17 (22) 20:30	04:28 17:17 (22) 20:56
23	07:28 16:16	06:38 17:10	05:38 16:15 (23) 17:56	05:32 17:04 (22) 19:46	04:43 17:18 (22) 20:31	04:28 17:18 (22) 20:56
24	07:27 16:17	06:36 17:11	05:36 16:15 (23) 17:58	05:30 17:04 (22) 19:48	04:42 17:19 (22) 20:33	04:28 17:19 (22) 20:56
25	07:26 16:19	06:34 17:13	05:34 16:17 (23) 18:00	05:28 17:04 (22) 19:49	04:40 17:20 (22) 20:34	04:28 17:20 (22) 20:56
26	07:25 16:21	06:32 17:15	05:32 16:19 (23) 18:01	05:26 17:04 (22) 19:51	04:39 17:21 (22) 20:35	04:29 17:21 (22) 20:56
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 17:04 (22) 19:52	04:38 17:22 (22) 20:36	04:29 17:22 (22) 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 17:04 (22) 19:54	04:37 17:23 (22) 20:37	04:30 17:23 (22) 20:56
29	07:21 16:26		06:25 19:06	05:20 17:04 (22) 19:56	04:36 17:24 (22) 20:39	04:30 17:24 (22) 20:56
30	07:19 16:27		06:23 19:08	05:18 17:04 (22) 19:57	04:35 17:25 (22) 20:40	04:31 17:25 (22) 20:56
31	07:18 16:29		06:20 19:09		04:35 20:41	
Potential sun hours	265	280	367	413	479	491
Total, worst case		207	64			
Sun reduction		0,31	0,31			
Oper. time red.		0,86	0,86			
Wind dir. red.		0,69	0,71			
Total reduction		0,18	0,19			
Total, real		37	12			

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

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

## SHADOW - Calendar

**Shadow receptor:** L - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (12)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 19:27	05:52 19:27	06:39 18:20	17:41 (22) 16:17	15:46 (17) 15:39
2	04:32 20:55	05:07 19:25	05:54 19:25	06:40 18:18	17:42 (22) 16:15	07:19 15:39
3	04:33 20:55	05:09 19:22	05:55 19:22	06:42 18:16	17:42 (22) 16:14	07:20 15:38
4	04:33 20:54	05:10 19:20	05:57 19:20	06:43 18:14	17:44 (22) 16:12	07:22 15:37
5	04:34 20:54	05:11 19:18	05:59 19:18	06:45 18:11	17:47 (22) 16:10	07:23 15:37
6	04:35 20:54	05:13 19:16	06:00 19:16	06:46 18:09	16:08 16:08	07:24 15:37
7	04:36 20:53	05:14 19:14	06:02 19:14	06:48 18:07	06:40 16:07	07:25 15:36
8	04:37 20:52	05:16 19:12	06:03 19:12	06:50 18:05	06:41 16:05	07:27 15:36
9	04:38 20:52	05:17 19:09	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	04:38 20:51	05:19 19:07	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	04:39 20:50	05:20 19:05	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:35
12	04:40 20:50	05:22 19:03	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	04:42 20:49	05:23 19:00	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	04:43 20:48	05:25 18:58	06:12 18:58	06:59 17:52	06:51 15:56	07:33 15:35
15	04:44 20:47	05:26 18:56	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:35
16	04:45 20:46	05:28 18:54	06:15 18:54	07:03 17:48	16:50 (23) 16:59 (23)	06:55 15:54
17	04:46 20:45	05:29 18:51	06:17 18:51	07:04 17:46	16:47 (23) 17:00 (23)	06:56 15:53
18	04:47 20:44	05:31 18:49	06:18 18:49	07:06 17:44	16:46 (23) 17:01 (23)	06:58 15:51
19	04:48 20:43	05:33 18:47	06:20 18:47	07:07 17:42	16:46 (23) 17:02 (23)	07:00 15:50
20	04:50 20:42	05:34 18:45	06:21 18:45	07:09 17:40	16:45 (23) 17:02 (23)	07:01 15:49
21	04:51 20:41	05:36 18:42	06:23 18:42	07:11 17:38	16:44 (23) 17:01 (23)	07:03 15:48
22	04:52 20:40	05:37 18:40	06:25 18:40	07:12 17:36	16:45 (23) 17:01 (23)	07:04 15:47
23	04:53 20:38	05:39 18:38	06:26 18:38	07:14 17:34	16:45 (23) 17:01 (23)	07:06 15:46
24	04:55 20:37	05:40 18:36	06:28 18:36	07:16 17:32	16:46 (23) 17:00 (23)	07:07 15:45
25	04:56 20:36	05:42 18:34	06:29 18:34	06:17 16:30	15:45 (17) 15:58 (23)	07:09 15:44
26	04:57 20:35	05:43 18:31	06:31 18:31	06:19 16:28	15:44 (17) 15:56 (23)	07:11 15:43
27	04:59 20:33	05:45 18:29	06:32 18:29	17:47 (22) 17:51 (22)	15:43 (17) 15:55 (17)	07:12 15:42
28	05:00 20:32	05:46 18:27	06:34 18:27	17:44 (22) 17:53 (22)	06:23 16:24	07:14 15:41
29	05:01 20:30	05:48 18:25	06:35 18:25	17:43 (22) 17:54 (22)	06:24 16:22	07:15 15:41
30	05:03 20:29	05:49 18:22	06:37 18:22	17:41 (22) 17:53 (22)	06:26 16:21	07:16 15:40
31	05:04 20:27	05:51 19:29		06:28 16:19	15:44 (17) 15:50 (17)	07:17 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case			36	238	2	
Sun reduction			0,34	0,37	0,25	
Oper. time red.			0,86	0,86	0,86	
Wind dir. red.			0,71	0,69	0,69	
Total reduction			0,21	0,22	0,15	
Total, real			7	51	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	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

## SHADOW - Calendar

**Shadow receptor:** M - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (13)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	07:18 15:39
2	07:41 15:46	07:15 16:33	06:24 17:21	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:38
3	07:41 15:47	07:14 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:08 20:23	05:55 19:22	06:42 18:16	06:33 16:13	07:20 15:38
4	07:41 15:48	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:03	04:32 20:45	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:13	06:34 16:12	07:22 15:37
5	07:41 15:50	07:10 16:38	06:17 17:27	06:09 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:11 20:19	05:58 19:18	06:45 18:11	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:07 20:07	04:30 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:08	07:24 15:37
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:25 15:36
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:49	04:37 20:52	05:16 20:14	06:03 19:11	06:50 18:05	06:41 16:05	07:27 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:02 20:11	04:29 20:49	04:37 20:52	05:17 20:12	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:28 20:50	04:38 20:51	05:19 20:11	06:06 19:07	06:53 18:00	06:45 16:02	07:29 15:35
11	07:38 15:57	07:01 16:48	06:05 17:37	05:56 19:27	04:59 20:14	04:28 20:51	04:39 20:50	05:20 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:35
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:16	04:28 20:51	04:40 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:41 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	07:36 16:01	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:27 20:53	04:42 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:56	07:33 15:35
15	07:36 16:03	06:53 16:55	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:26 20:01	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:35
16	07:35 16:04	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:15 18:54	07:03 17:48	06:55 15:54	07:35 15:35
17	07:34 16:06	06:50 16:59	05:51 17:46	05:44 19:36	04:50 20:23	04:27 20:54	04:46 20:45	05:29 19:58	06:17 18:51	07:04 17:46	06:56 15:52	07:35 15:36
18	07:33 16:07	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:55	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:02	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:32 19:54	06:20 18:47	07:07 17:42	07:00 15:50	07:37 15:36
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55	04:49 20:42	05:34 19:52	06:21 18:45	07:09 17:40	07:01 15:49	07:37 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:27 20:56	04:51 20:41	05:36 19:50	06:23 18:42	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	04:27 20:56	04:52 20:40	05:37 19:48	06:24 18:40	07:12 17:36	07:04 15:47	07:39 15:37
23	07:28 16:16	06:38 17:09	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:38	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:41 20:32	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:07 15:45	07:39 15:39
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:40 20:34	04:28 20:56	04:56 20:36	05:42 19:42	06:29 18:33	06:17 16:30	07:09 15:44	07:40 15:39
26	07:25 16:21	06:32 17:15	05:31 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:35	05:43 19:39	06:31 18:31	06:19 16:28	07:11 15:43	07:40 15:40
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	07:40 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:13 15:41	07:41 15:41
29	07:21 16:26		06:25 19:06	05:20 19:56	04:36 20:39	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:25	06:24 16:22	07:15 15:40	07:41 15:42
30	07:19 16:27		06:23 19:08	05:18 19:57	04:35 20:40	04:31 20:56	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:20	07:16 15:40	07:41 15:43
31	07:18 16:29		06:20 19:09		04:35 20:41		05:04 20:27		05:51 19:29	06:28 16:19		07:41 15:44
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

**Shadow receptor:** N - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (14)

### Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	14:27 (1) 14:56 (5)	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	15:24 (7) 15:36 (7)
2	07:41 15:46	14:27 (1) 14:55 (5)	06:24 17:21	06:16 19:12	05:14 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:24	06:40 18:18	06:31 16:15	15:23 (7) 15:36 (7)
3	07:41 15:47	14:28 (1) 14:56 (5)	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:08 20:22	05:55 19:22	06:42 18:16	06:33 16:13	15:23 (7) 15:37 (7)
4	07:41 15:48	14:30 (1) 14:56 (5)	06:19 17:25	06:12 19:15	05:11 20:03	04:31 20:45	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:13	06:34 16:12	15:22 (7) 15:36 (7)
5	07:40 15:50	14:32 (1) 14:56 (5)	06:17 17:26	06:09 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:11 20:19	05:58 19:18	06:45 18:11	06:36 16:10	15:23 (7) 15:36 (7)
6	07:40 15:51	14:33 (1) 14:55 (5)	06:15 17:28	06:07 19:19	05:07 20:06	04:30 20:47	04:35 20:53	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:08	15:24 (7) 15:36 (7)
7	07:40 15:52	14:32 (1) 14:54 (5)	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48	04:36 20:53	05:14 20:16	06:01 19:14	06:48 18:07	06:39 16:07	15:25 (7) 15:35 (7)
8	07:39 15:53	14:31 (1) 14:54 (5)	06:11 17:31	06:03 19:22	05:04 20:10	04:29 20:48	04:37 20:52	05:16 20:14	06:03 19:11	06:49 18:05	06:41 16:05	15:26 (7) 15:34 (7)
9	07:39 15:55	14:30 (1) 14:54 (5)	06:09 17:33	06:01 19:24	05:02 20:11	04:29 20:49	04:37 20:52	05:17 20:12	06:05 19:09	06:51 18:03	06:43 16:04	15:28 (7) 15:36 (7)
10	07:39 15:56	14:29 (1) 14:54 (5)	06:07 17:35	05:59 19:25	05:01 20:13	04:28 20:50	04:38 20:51	05:19 20:11	06:06 19:07	06:53 18:00	06:44 16:02	15:29 (7) 15:35 (7)
11	07:38 15:57	14:28 (1) 14:54 (5)	06:04 17:36	05:56 19:27	05:04 20:14	04:28 20:51	04:39 20:50	05:20 20:09	06:08 19:05	06:54 17:58	06:46 16:01	15:30 (7) 15:35 (7)
12	07:37 15:59	14:27 (1) 14:54 (5)	06:02 17:38	05:54 19:28	05:02 20:16	04:28 20:51	04:40 20:49	05:22 20:07	06:09 19:02	06:56 17:56	06:48 15:59	15:31 (7) 15:35 (7)
13	07:37 16:00	14:26 (1) 14:54 (5)	06:00 17:40	05:52 19:30	05:00 20:17	04:28 20:52	04:41 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	15:32 (7) 15:35 (7)
14	07:36 16:01	14:25 (1) 14:54 (5)	05:58 17:41	05:50 19:32	04:55 20:19	04:27 20:53	04:42 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:56	15:33 (7) 15:35 (7)
15	07:35 16:03	14:24 (1) 14:54 (5)	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:26 20:01	06:14 18:56	07:01 17:50	06:53 15:55	15:34 (7) 15:35 (7)
16	07:35 16:04	14:23 (1) 14:54 (5)	05:54 17:45	05:46 19:35	04:52 20:21	04:27 20:54	04:45 20:46	05:28 19:59	06:15 18:54	07:02 17:48	06:54 15:54	15:36 (7) 15:35 (7)
17	07:34 16:06	14:22 (1) 14:54 (5)	05:51 17:46	05:44 19:36	04:50 20:23	04:27 20:54	04:46 20:45	05:29 19:57	06:17 18:51	07:04 17:46	06:56 15:52	15:37 (7) 15:36 (7)
18	07:33 16:07	14:21 (1) 14:54 (5)	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:54	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	15:38 (7) 15:36 (7)
19	07:32 16:09	14:20 (1) 14:54 (5)	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:32 19:54	06:20 18:47	07:07 17:42	06:59 15:50	15:39 (7) 15:36 (7)
20	07:31 16:11	14:19 (1) 14:54 (5)	05:45 17:04	05:38 19:41	04:46 20:27	04:27 20:55	04:49 20:42	05:34 19:52	06:21 18:45	07:09 17:40	07:01 15:49	15:40 (7) 15:37 (7)
21	07:30 16:12	14:18 (1) 14:54 (5)	05:42 17:06	05:36 19:43	04:45 20:28	04:27 20:55	04:51 20:41	05:35 19:50	06:23 18:42	07:11 17:38	07:03 15:48	15:41 (7) 15:37 (7)
22	07:29 16:14	14:17 (1) 14:54 (5)	05:40 17:08	05:34 19:44	04:44 20:30	04:27 20:56	04:52 20:39	05:37 19:48	06:24 18:40	07:12 17:36	07:04 15:47	15:42 (7) 15:37 (7)
23	07:28 16:15	14:16 (1) 14:54 (5)	05:38 17:09	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:38	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	15:43 (7) 15:38 (7)
24	07:27 16:17	14:15 (1) 14:54 (5)	05:36 17:11	05:30 19:48	04:41 20:32	04:28 20:56	04:55 20:37	05:40 19:43	06:27 18:36	07:16 17:32	07:07 15:45	15:44 (7) 15:39 (7)
25	07:26 16:19	14:14 (1) 14:54 (5)	05:34 17:13	05:28 19:49	04:40 20:34	04:28 20:56	04:56 20:36	05:42 19:41	06:29 18:33	06:17 17:30	07:09 15:44	15:45 (7) 15:40 (7)
26	07:24 16:20	14:13 (1) 14:54 (5)	05:31 17:15	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:34	05:43 19:39	06:31 18:31	06:19 17:28	07:10 15:43	15:46 (7) 15:40 (7)
27	07:23 16:22	14:12 (1) 14:54 (5)	05:29 17:16	05:24 18:03	04:38 19:52	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 17:26	07:12 15:42	15:47 (7) 15:41 (7)
28	07:22 16:24	14:11 (1) 14:54 (5)	05:27 17:18	05:22 18:04	04:37 19:54	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:22 17:24	07:13 15:41	15:48 (7) 15:41 (7)
29	07:21 16:26	14:10 (1) 14:54 (5)	05:25 17:20	05:20 19:06	04:36 19:55	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:24	06:24 17:22	07:15 15:40	15:49 (7) 15:42 (7)
30	07:19 16:27	14:09 (1) 14:54 (5)	05:23 17:22	05:18 19:07	04:35 19:57	04:31 20:55	05:03 20:29	05:49 19:31	06:37 18:22	06:26 17:20	07:16 15:40	15:50 (7) 15:43 (7)
31	07:18 16:29	14:08 (1) 14:54 (5)	05:20 17:23	05:15 19:09	04:34 20:41	04:30 20:57	05:04 20:27	05:51 19:29	06:27 18:19	06:27 17:15	07:17 15:35 (7)	15:51 (7) 15:44 (7)
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case	106	110								18	96	651
Sun reduction	0,26	0,31								0,37	0,25	0,19
Oper. time red.	0,86	0,86								0,86	0,86	0,86
Wind dir. red.	0,68	0,70								0,70	0,70	0,68
Total reduction	0,15	0,18								0,22	0,15	0,11
Total, real	16	20								4	15	72

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

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



## SHADOW - Calendar

**Shadow receptor:** O - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (15)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May		June	
1	07:41		14:20 (2)	07:16			06:26		15:58 (1)	06:18		05:16			04:34	
	15:45	8	14:28 (2)	16:31			17:20	26	16:43 (6)	19:11		19:59			20:42	
2	07:41		14:20 (2)	07:15			06:24		16:00 (1)	06:16		05:14			04:33	
	15:46	7	14:27 (2)	16:33			17:21	14	16:14 (1)	19:12		20:00			20:43	
3	07:41		14:22 (2)	07:13			06:22		16:04 (1)	06:14		05:13			04:32	
	15:47	4	14:26 (2)	16:34			17:23	6	16:10 (1)	19:14		20:02			20:44	
4	07:41			07:12		15:56 (5)	06:19			06:12		05:11			04:32	
	15:48			16:36	7	16:03 (5)	17:25			19:15		20:03			20:45	
5	07:40			07:10		15:54 (5)	06:17			06:09		05:09			04:31	
	15:50			16:38	10	16:04 (5)	17:26			19:17		20:05			20:46	
6	07:40			07:09		15:52 (5)	06:15			06:07		05:07			04:30	
	15:51			16:40	14	16:06 (5)	17:28			19:19		20:06			20:47	
7	07:40			07:07		15:52 (5)	06:13			06:05		05:06			04:30	
	15:52			16:41	15	16:07 (5)	17:30			19:20		20:08			20:48	
8	07:39			07:05		15:52 (5)	06:11			06:03		05:04			04:29	
	15:53			16:43	16	16:08 (5)	17:32			19:22		20:09			20:48	
9	07:39			07:04		15:51 (5)	06:09			06:01		05:02			04:29	
	15:55			16:45	17	16:08 (5)	17:33			19:24		20:11			20:49	
10	07:39			07:02		15:51 (5)	06:07			05:59		05:01			04:28	
	15:56			16:47	17	16:08 (5)	17:35			19:25		20:13			20:50	
11	07:38			07:00		15:51 (5)	06:04		17:03 (7)	05:56		04:59			04:28	
	15:57			16:48	16	16:07 (5)	17:36	6	17:09 (7)	19:27		20:14			20:51	
12	07:37			06:59		15:52 (5)	06:02		16:59 (7)	05:54		04:58			04:28	
	15:59			16:50	16	16:08 (5)	17:38	11	17:10 (7)	19:28		20:16			20:51	
13	07:37			06:57		15:53 (5)	06:00		16:58 (7)	05:52		04:56			04:28	
	16:00			16:52	14	16:07 (5)	17:40	13	17:11 (7)	19:30		20:17			20:52	
14	07:36			06:55		15:54 (5)	05:58		16:57 (7)	05:50		04:55			04:27	
	16:01			16:54	19	16:13 (1)	17:41	15	17:12 (7)	19:32		20:18			20:53	
15	07:35			06:53		15:56 (5)	05:56		16:57 (7)	05:48		04:53			04:27	
	16:03			16:55	20	16:16 (1)	17:43	15	17:12 (7)	19:33		20:20			20:53	
16	07:35			06:51		15:59 (1)	05:54		16:57 (7)	05:46		04:52			04:27	
	16:04			16:57	18	16:17 (1)	17:45	15	17:12 (7)	19:35		20:21			20:54	
17	07:34			06:50		15:58 (1)	05:51		16:56 (7)	05:44		04:50			04:27	
	16:06			16:59	21	16:19 (1)	17:46	15	17:11 (7)	19:36		20:23			20:54	
18	07:33			06:48		15:57 (1)	05:49		16:57 (7)	05:42		04:49			04:27	
	16:07			17:01	23	16:20 (1)	17:48	13	17:10 (7)	19:38		20:24			20:54	
19	07:32			06:46		15:56 (1)	05:47		16:58 (7)	05:40		04:48			04:27	
	16:09			17:02	24	16:20 (1)	17:50	12	17:25 (9)	19:40		20:26			20:55	
20	07:31			06:44		15:56 (1)	05:45		17:00 (7)	05:38		04:46			04:27	
	16:11			17:04	25	16:21 (1)	17:51	13	17:27 (9)	19:41		20:27			20:55	
21	07:30			06:42		15:55 (1)	05:42		17:19 (9)	05:36		04:45			04:27	
	16:12			17:06	26	16:21 (1)	17:53	9	17:28 (9)	19:43		20:28			20:55	
22	07:29			06:40		15:55 (1)	05:40		17:19 (9)	05:34		04:44			04:27	
	16:14			17:08	30	16:42 (6)	17:55	11	17:30 (9)	19:44		20:30			20:56	
23	07:28			06:38		15:55 (1)	05:38		17:18 (9)	05:32		04:43			04:28	
	16:15			17:09	34	16:44 (6)	17:56	12	17:30 (9)	19:46		20:31			20:56	
24	07:27			06:36		15:55 (1)	05:36		17:19 (9)	05:30		04:41			04:28	
	16:17			17:11	36	16:45 (6)	17:58	10	17:29 (9)	19:48		20:32			20:56	
25	07:26			06:34		15:55 (1)	05:34		17:19 (9)	05:28		04:40			04:28	
	16:19			17:13	37	16:46 (6)	17:59	8	17:27 (9)	19:49		20:34			20:56	
26	07:24			06:32		15:56 (1)	05:31		17:22 (9)	05:26		04:39			04:29	
	16:20			17:15	36	16:46 (6)	18:01	2	17:24 (9)	19:51		20:35			20:56	
27	07:23			06:30		15:57 (1)	05:29			05:24		04:38			04:29	
	16:22			17:16	34	16:46 (6)	18:03			19:52		20:36			20:56	
28	07:22			06:28		15:58 (1)	05:27			05:22		04:37			04:30	
	16:24			17:18	30	16:45 (6)	18:04			19:54		20:37			20:56	
29	07:21						06:25			05:20		04:36			04:30	
	16:26						19:06			19:55		20:38			20:56	
30	07:19						06:23			05:18		04:35			04:31	
	16:27						19:07			19:57		20:40			20:55	
31	07:18						06:20					04:35				
	16:29						19:09					20:41				
Potential sun hours	265			280			367			413		479			491	
Total, worst case		19		555			226									
Sun reduction		0,26		0,31			0,31									
Oper. time red.		0,86		0,86			0,86									
Wind dir. red.		0,67		0,69			0,71									
Total reduction		0,15		0,18			0,19									
Total, real		3		101			42									

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

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

## SHADOW - Calendar

**Shadow receptor:** O - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (15)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 19:27	05:52 19:27	06:38 18:20	17:39 (7) 16:17	15:21 (5) 15:39
2	04:32 20:55	05:07 19:24	05:54 19:24	06:40 18:18	17:39 (7) 16:15	15:21 (5) 15:38
3	04:33 20:55	05:08 19:22	05:55 19:22	06:42 18:16	17:48 (7) 16:13	15:21 (5) 15:38
4	04:33 20:54	05:10 19:20	05:57 19:20	06:43 18:13	16:33 16:12	15:21 (5) 15:37
5	04:34 20:54	05:11 19:18	05:58 19:18	06:45 18:11	16:36 16:10	15:22 (5) 15:37
6	04:35 20:53	05:13 19:16	06:00 19:16	06:46 18:09	16:38 16:08	15:24 (5) 15:37
7	04:36 20:53	05:14 19:14	06:01 19:14	06:48 18:07	16:39 16:07	15:26 (5) 15:36
8	04:37 20:52	05:16 19:11	06:03 19:11	06:49 18:05	16:41 16:05	15:32 (5) 15:36
9	04:37 20:52	05:17 19:09	06:05 19:09	06:51 18:03	16:43 16:04	15:36 14:12 (2)
10	04:38 20:51	05:19 19:07	06:06 19:07	06:53 18:00	16:44 16:02	15:36 14:15 (2)
11	04:39 20:50	05:20 19:05	06:08 19:05	06:54 17:58	16:46 (1) 16:01	15:35 14:10 (2)
12	04:40 20:49	05:22 19:02	06:09 19:02	06:56 17:56	16:33 (1) 15:59	15:35 14:09 (2)
13	04:41 20:49	05:23 19:00	06:11 19:00	06:58 17:54	16:31 (1) 15:58	15:35 14:09 (2)
14	04:42 20:48	05:25 18:58	06:12 18:58	06:59 17:52	16:29 (1) 15:56	15:35 14:10 (2)
15	04:44 20:47	05:26 18:56	06:14 18:56	07:01 17:50	16:28 (1) 15:55	15:33 14:10 (2)
16	04:45 20:46	05:28 18:54	06:15 18:54	07:02 17:48	16:27 (1) 15:54	15:35 14:22 (2)
17	04:46 20:45	05:29 18:51	06:17 18:51	07:04 17:46	16:26 (1) 15:52	15:35 14:10 (2)
18	04:47 20:44	05:31 18:49	06:18 18:49	07:06 17:44	16:26 (1) 15:51	15:36 14:24 (2)
19	04:48 20:43	05:32 18:47	06:20 18:47	07:07 17:42	16:26 (1) 15:50	15:37 14:11 (2)
20	04:49 20:42	05:34 18:45	06:21 18:45	07:09 17:40	16:25 (1) 15:49	15:36 14:12 (2)
21	04:51 20:41	05:35 18:42	06:23 18:42	07:11 17:38	16:26 (1) 15:48	15:37 14:26 (2)
22	04:52 20:39	05:37 18:40	06:24 18:40	07:12 17:36	16:26 (1) 15:47	15:37 14:12 (2)
23	04:53 20:38	05:39 18:38	06:26 18:38	07:14 17:34	16:27 (1) 15:46	15:37 14:26 (2)
24	04:55 20:37	05:40 18:36	06:27 18:36	07:16 17:32	16:27 (1) 15:45	15:38 14:13 (2)
25	04:56 20:36	05:42 18:33	06:29 18:33	07:17 17:30	16:49 (1) 15:44	15:39 14:27 (2)
26	04:57 20:34	05:43 18:31	06:31 18:31	07:19 17:28	15:28 (5) 15:43	15:40 14:13 (2)
27	04:59 20:33	05:45 18:29	06:32 18:29	07:21 17:26	15:25 (5) 15:42	15:40 14:15 (2)
28	05:00 20:32	05:46 18:27	06:34 18:27	07:22 17:24	15:23 (5) 15:41	15:41 14:28 (2)
29	05:01 20:30	05:48 18:24	06:35 18:24	07:24 17:22	15:21 (5) 15:40	15:41 14:16 (2)
30	05:03 20:29	05:49 18:22	06:37 18:22	07:26 17:20	15:21 (5) 15:40	15:42 14:28 (2)
31	05:04 20:27	05:51 19:29	18:22 19:29	17:22 16:19	15:37 (5) 15:37 (5)	15:43 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case			164	534	92	273
Sun reduction			0,34	0,37	0,25	0,19
Oper. time red.			0,86	0,86	0,86	0,86
Wind dir. red.			0,71	0,69	0,70	0,67
Total reduction			0,21	0,22	0,15	0,11
Total, real			34	116	14	30

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

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

## SHADOW - Calendar

**Shadow receptor:** P - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (16)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	14:14 (1) 15:00 (5)	07:16 16:31	15:53 (6) 16:01 (6)	06:26 17:20	06:18 19:11
2	07:41 15:46	14:13 (1) 14:59 (5)	07:15 16:33	15:53 (6) 16:04 (6)	06:24 17:21	06:16 19:12
3	07:41 15:47	14:14 (1) 15:00 (5)	07:13 16:34	15:52 (6) 16:04 (6)	06:22 17:23	06:14 19:14
4	07:41 15:48	14:15 (1) 15:01 (5)	07:12 16:36	15:52 (6) 16:05 (6)	06:19 17:25	06:12 19:15
5	07:40 15:50	14:16 (1) 15:02 (5)	07:10 16:38	15:52 (6) 16:05 (6)	06:17 17:26	06:09 19:17
6	07:40 15:51	14:16 (1) 15:01 (5)	07:09 16:40	15:52 (6) 16:05 (6)	06:15 17:28	06:07 19:19
7	07:40 15:52	14:17 (1) 15:02 (5)	07:07 16:41	15:53 (6) 16:05 (6)	06:13 17:30	06:05 19:20
8	07:39 15:53	14:17 (1) 15:02 (5)	07:06 16:43	15:54 (6) 16:04 (6)	06:11 17:32	06:03 19:22
9	07:39 15:55	14:18 (1) 15:03 (5)	07:04 16:45	15:55 (6) 16:03 (6)	06:09 17:33	06:01 19:24
10	07:39 15:56	14:18 (1) 15:03 (5)	07:02 16:47	06:07 17:35	06:07 19:25	05:59 20:13
11	07:38 15:57	14:19 (1) 15:02 (5)	07:00 16:48	06:04 17:37	05:56 19:27	04:59 20:14
12	07:37 15:59	14:19 (1) 15:02 (5)	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:16
13	07:37 16:00	14:21 (1) 15:03 (5)	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17
14	07:36 16:01	14:22 (1) 15:02 (5)	06:55 16:54	05:58 17:41	05:50 19:32	04:55 20:19
15	07:35 16:03	14:23 (1) 15:01 (5)	06:53 16:55	05:56 17:43	05:48 19:33	04:53 20:20
16	07:35 16:04	14:24 (1) 15:00 (5)	06:51 16:57	05:54 17:45	05:46 19:35	04:52 20:21
17	07:34 16:06	14:25 (1) 14:41 (1)	06:50 16:59	05:51 17:46	05:44 19:36	04:50 20:23
18	07:33 16:07	14:27 (1) 14:40 (1)	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24
19	07:32 16:09	14:29 (1) 14:38 (1)	06:46 17:02	05:47 17:50	05:40 19:40	04:48 20:26
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:28	04:27 20:55
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	04:27 20:56
23	07:28 16:15	06:38 17:09	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:41 20:32	04:28 20:56
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:40 20:34	04:28 20:56
26	07:24 16:20	06:32 17:15	05:31 18:01	05:26 19:51	04:39 20:35	04:29 20:56
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56
29	07:21 16:26		06:25 19:06	05:20 19:55	04:36 20:38	04:30 20:56
30	07:19 16:27		06:23 19:07	05:18 19:57	04:35 20:40	04:31 20:55
31	07:18 16:29	15:55 (6) 16:00 (6)	06:20 19:09		04:35 20:41	
Potential sun hours	265		367	413	479	491
Total, worst case	653	256	76			
Sun reduction	0,26	0,31	0,31			
Oper. time red.	0,86	0,86	0,86			
Wind dir. red.	0,68	0,69	0,70			
Total reduction	0,15	0,18	0,19			
Total, real	97	46	14			

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

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

## SHADOW - Calendar

**Shadow receptor:** P - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (16)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	15:27 (6) 15:30 (6)
2	04:32 20:55	05:07 20:24	05:54 19:24	06:40 18:18	06:31 16:15	15:25 (6) 15:33 (6)
3	04:33 20:55	05:08 20:22	05:55 19:22	06:42 18:16	06:33 16:13	15:23 (6) 15:34 (6)
4	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:13	17:29 (9) 17:33 (9)	15:22 (6) 15:34 (6)
5	04:34 20:54	05:11 20:19	05:58 19:18	06:45 18:11	17:25 (9) 17:34 (9)	15:22 (6) 15:35 (6)
6	04:35 20:53	05:13 20:18	06:00 19:16	06:46 18:09	17:24 (9) 17:35 (9)	15:22 (6) 15:35 (6)
7	04:36 20:53	05:14 20:16	06:01 19:14	06:48 18:07	17:23 (9) 17:35 (9)	15:22 (6) 15:35 (6)
8	04:37 20:52	05:16 20:14	06:03 19:11	06:49 18:05	17:23 (9) 17:35 (9)	15:23 (6) 15:35 (6)
9	04:37 20:52	05:17 20:12	06:05 19:09	06:51 18:03	17:23 (9) 17:35 (9)	15:24 (6) 15:34 (6)
10	04:38 20:51	05:19 20:11	06:06 19:07	06:53 18:00	17:23 (9) 17:33 (9)	15:25 (6) 15:33 (6)
11	04:39 20:50	05:20 20:09	06:08 19:05	06:54 17:58	17:24 (9) 17:31 (9)	15:26 (6) 15:31 (6)
12	04:40 20:49	05:22 20:07	06:09 19:02	06:56 17:56	06:48 15:59	07:31 15:35
13	04:41 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	04:42 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:56	07:33 15:35
15	04:44 20:47	05:26 20:01	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:35
16	04:45 20:46	05:28 19:59	06:15 18:54	07:02 17:48	06:54 15:54	07:34 15:36
17	04:46 20:45	05:29 19:57	06:17 18:51	07:04 17:46	06:56 16:45 (7)	07:35 15:36
18	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	16:42 (7) 16:53 (7)	07:36 15:36
19	04:48 20:43	05:32 19:54	06:20 18:47	07:07 17:42	16:41 (7) 16:54 (7)	07:37 15:36
20	04:49 20:42	05:34 19:52	06:21 18:45	07:09 17:40	16:39 (7) 16:54 (7)	07:37 15:37
21	04:51 20:41	05:35 19:50	06:23 18:42	07:11 17:38	16:38 (7) 16:55 (7)	07:38 15:37
22	04:52 20:39	05:37 19:48	06:24 18:40	07:12 17:36	16:38 (7) 16:55 (7)	07:38 15:37
23	04:53 20:38	05:39 19:46	06:26 18:38	07:14 17:34	16:38 (7) 16:56 (7)	14:07 (1) 14:15 (1)
24	04:55 20:37	05:40 19:43	06:28 18:36	07:16 17:32	16:39 (7) 16:55 (7)	14:04 (1) 14:17 (1)
25	04:56 20:36	05:42 19:41	06:29 18:33	07:17 16:30	15:38 (7) 15:54 (7)	14:03 (1) 14:19 (1)
26	04:57 20:34	05:43 19:39	06:31 18:31	07:19 16:28	15:39 (7) 15:53 (7)	14:03 (1) 14:39 (5)
27	04:59 20:33	05:45 19:37	06:32 18:29	07:21 16:26	15:40 (7) 15:52 (7)	14:02 (1) 14:40 (5)
28	05:00 20:32	05:46 19:35	06:34 18:27	07:22 16:24	15:42 (7) 15:50 (7)	14:02 (1) 14:42 (5)
29	05:01 20:30	05:48 19:33	06:35 18:24	07:24 16:22	07:15 15:40	14:01 (1) 14:43 (5)
30	05:03 20:29	05:49 19:31	06:37 18:22	07:26 16:20	07:16 15:40	14:01 (1) 14:44 (5)
31	05:04 20:27	05:51 19:29		06:27 16:19		07:41 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case				239	298	1312
Sun reduction				0,37	0,25	0,19
Oper. time red.				0,86	0,86	0,86
Wind dir. red.				0,69	0,68	0,68
Total reduction				0,22	0,15	0,11
Total, real				52	44	145

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

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

## SHADOW - Calendar

**Shadow receptor:** Q - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (17)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May		June	
1	07:41			07:16	15:16 (7)	06:26		16:26 (9)	06:18			05:16		04:34		
	15:45			16:31	23 15:39 (7)	17:20	15	16:41 (9)	19:11			19:59		20:42		
2	07:41			07:15	15:17 (7)	06:24		16:27 (9)	06:16		18:44 (11)	05:14		04:33		
	15:46			16:33	23 15:40 (7)	17:21	13	16:40 (9)	19:12	3	18:47 (11)	20:00		20:43		
3	07:41			07:13	15:16 (7)	06:22		16:28 (9)	06:14		18:43 (11)	05:13		04:32		
	15:47			16:34	24 15:40 (7)	17:23	11	16:39 (9)	19:14	6	18:49 (11)	20:02		20:44		
4	07:41			07:12	15:17 (7)	06:20		16:30 (9)	06:12		18:41 (11)	05:11		04:32		
	15:48			16:36	24 15:41 (7)	17:25	7	16:37 (9)	19:16	9	18:50 (11)	20:03		20:45		
5	07:40			07:10	15:17 (7)	06:17		16:59 (10)	06:09		18:40 (11)	05:09		04:31		
	15:50			16:38	23 15:40 (7)	17:26	3	17:02 (10)	19:17	12	18:52 (11)	20:05		20:46		
6	07:40			07:09	15:17 (7)	06:15		16:56 (10)	06:07		18:40 (11)	05:07		04:30		
	15:51			16:40	23 15:40 (7)	17:28	8	17:04 (10)	19:19	12	18:52 (11)	20:06		20:47		
7	07:40			07:07	15:19 (7)	06:13		16:54 (10)	06:05		18:41 (11)	05:06		04:30		
	15:52			16:41	21 15:40 (7)	17:30	10	17:04 (10)	19:20	10	18:51 (11)	20:08		20:48		
8	07:39		15:11 (6)	07:06	15:19 (7)	06:11		16:54 (10)	06:03		18:42 (11)	05:04		04:29		
	15:53	4	15:15 (6)	16:43	20 15:39 (7)	17:32	11	17:05 (10)	19:22	8	18:50 (11)	20:10		20:48		
9	07:39		15:11 (6)	07:04	15:20 (7)	06:09		16:53 (10)	06:01		18:45 (11)	05:02		04:29		
	15:55	7	15:18 (6)	16:45	18 15:38 (7)	17:33	12	17:05 (10)	19:24	2	18:47 (11)	20:11		20:49		
10	07:39		15:10 (6)	07:02	15:21 (7)	06:07		16:54 (10)	05:59			05:01		04:28		
	15:56	9	15:19 (6)	16:47	21 16:19 (8)	17:35	11	17:05 (10)	19:25			20:13		20:50		
11	07:38		15:09 (6)	07:00	15:23 (7)	06:05		16:55 (10)	05:56			04:59		04:28		
	15:57	11	15:20 (6)	16:48	20 16:21 (8)	17:37	9	17:04 (10)	19:27			20:14		20:51		
12	07:37		15:09 (6)	06:59	15:28 (7)	06:02		16:55 (10)	05:54			04:58		04:28		
	15:59	13	15:22 (6)	16:50	14 16:23 (8)	17:38	6	17:01 (10)	19:28			20:16		20:51		
13	07:37		15:09 (6)	06:57	16:13 (8)	06:00			05:52			04:56		04:28		
	16:00	13	15:22 (6)	16:52	12 16:25 (8)	17:40			19:30			20:17		20:52		
14	07:36		15:09 (6)	06:55	16:13 (8)	05:58			05:50			04:55		04:27		
	16:01	14	15:23 (6)	16:54	11 16:24 (8)	17:41			19:32			20:19		20:53		
15	07:35		15:09 (6)	06:53	16:13 (8)	05:56			05:48			04:53		04:27		
	16:03	15	15:24 (6)	16:55	11 16:24 (8)	17:43			19:33			20:20		20:53		
16	07:35		15:09 (6)	06:51	16:14 (8)	05:54			05:46			04:52		04:27		
	16:04	15	15:24 (6)	16:57	9 16:23 (8)	17:45			19:35			20:21		20:54		
17	07:34		15:09 (6)	06:50	16:15 (8)	05:51			05:44			04:50		04:27		
	16:06	16	15:25 (6)	16:59	6 16:21 (8)	17:46			19:36			20:23		20:54		
18	07:33		15:09 (6)	06:48		05:49			05:42			04:49		04:27		
	16:07	16	15:25 (6)	17:01		17:48			19:38			20:24		20:54		
19	07:32		15:09 (6)	06:46		05:47			05:40			04:48		04:27		
	16:09	17	15:26 (6)	17:02		17:50			19:40			20:26		20:55		
20	07:31		15:10 (6)	06:44		05:45			05:38			04:46		04:27		
	16:11	16	15:26 (6)	17:04		17:51			19:41			20:27		20:55		
21	07:30		15:11 (6)	06:42		05:43			05:36			04:45		04:27		
	16:12	15	15:26 (6)	17:06		17:53			19:43			20:28		20:55		
22	07:29		15:11 (6)	06:40		05:40			05:34			04:44		04:27		
	16:14	15	15:26 (6)	17:08		17:55			19:44			20:30		20:56		
23	07:28		15:11 (6)	06:38		16:31 (9)	05:38		05:32			04:43		04:28		
	16:16	14	15:25 (6)	17:09	8 16:39 (9)	17:56			19:46			20:31		20:56		
24	07:27		15:13 (6)	06:36		16:29 (9)	05:36		05:30			04:41		04:28		
	16:17	16	15:29 (7)	17:11	12 16:41 (9)	17:58			19:48			20:32		20:56		
25	07:26		15:14 (6)	06:34		16:28 (9)	05:34		05:28			04:40		04:28		
	16:19	18	15:32 (7)	17:13	14 16:42 (9)	17:59			19:49			20:34		20:56		
26	07:24		15:15 (6)	06:32		16:27 (9)	05:31		05:26			04:39		04:29		
	16:21	19	15:34 (7)	17:15	15 16:42 (9)	18:01			19:51			20:35		20:56		
27	07:23		15:19 (7)	06:30		16:27 (9)	05:29		05:24			04:38		04:29		
	16:22	17	15:36 (7)	17:16	16 16:43 (9)	18:03			19:52			20:36		20:56		
28	07:22		15:18 (7)	06:28		16:27 (9)	05:27		05:22			04:37		04:30		
	16:24	19	15:37 (7)	17:18	15 16:42 (9)	18:04			19:54			20:37		20:56		
29	07:21		15:17 (7)			06:25			05:20			04:36		04:30		
	16:26	21	15:38 (7)			19:06			19:55			20:38		20:56		
30	07:19		15:17 (7)			06:23			05:18			04:35		04:31		
	16:27	22	15:39 (7)			19:07			19:57			20:40		20:56		
31	07:18		15:17 (7)			06:20						04:35				
	16:29	22	15:39 (7)			19:09						20:41				
Potential sun hours	265			280		367		413				479		491		
Total, worst case	364			383		116		62								
Sun reduction	0,26			0,31		0,31		0,31								
Oper. time red.	0,86			0,86		0,86		0,86								
Wind dir. red.	0,70			0,70		0,70		0,70								
Total reduction	0,15			0,18		0,19		0,19								
Total, real	56			70		22		11								

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

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



## SHADOW - Calendar

**Shadow receptor:** Q - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (17)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 19:27	05:52 19:27	06:38 18:20	17:37 (10) 16:17	14:51 (7) 15:39
2	04:32 20:55	05:07 19:24	05:54 19:24	06:40 18:18	17:33 (10) 16:15	14:49 (7) 15:38
3	04:33 20:55	05:08 19:22	05:55 19:22	18:43 (11) 06:42	17:32 (10) 16:13	14:49 (7) 15:38
4	04:33 20:54	05:10 19:20	05:57 19:20	18:39 (11) 18:13	17:31 (10) 16:12	14:48 (7) 15:37
5	04:34 20:54	05:11 19:18	05:58 19:18	18:37 (11) 18:11	17:30 (10) 16:10	14:47 (7) 15:37
6	04:35 20:53	05:13 19:16	06:00 19:16	18:37 (11) 18:09	17:31 (10) 16:08	14:47 (7) 15:37
7	04:36 20:53	05:14 19:14	06:01 19:14	18:36 (11) 18:07	17:31 (10) 16:07	14:47 (7) 15:36
8	04:37 20:52	05:16 19:11	06:03 19:11	18:36 (11) 18:05	17:32 (10) 16:05	14:47 (7) 15:36
9	04:37 20:52	05:17 19:09	06:05 19:09	18:36 (11) 18:03	17:07 (9) 16:04	14:47 (7) 15:36
10	04:38 20:51	05:19 19:07	06:06 19:07	18:37 (11) 18:00	17:03 (9) 16:02	14:48 (7) 15:35
11	04:39 20:50	05:20 19:05	06:08 19:05	06:54 17:58	17:01 (9) 16:01	14:47 (7) 15:35
12	04:40 20:50	05:22 19:03	06:09 19:03	06:56 17:56	17:00 (9) 15:59	14:48 (7) 15:35
13	04:41 20:49	05:23 19:00	06:11 19:00	06:58 17:54	16:59 (9) 15:58	14:49 (7) 15:35
14	04:43 20:48	05:25 18:58	06:12 18:58	06:59 17:52	16:59 (9) 15:56	14:50 (7) 15:35
15	04:44 20:47	05:26 18:56	06:14 18:56	07:01 17:50	16:59 (9) 15:55	14:52 (7) 15:35
16	04:45 20:46	05:28 18:54	06:15 18:54	07:02 17:48	17:00 (9) 15:54	14:48 (6) 15:36
17	04:46 20:45	05:29 18:51	06:17 18:51	07:04 17:46	16:59 (9) 15:52	14:47 (6) 15:36
18	04:47 20:44	05:31 18:49	06:18 18:49	07:06 17:44	17:01 (9) 15:51	14:47 (6) 15:36
19	04:48 20:43	05:32 18:47	06:20 18:47	07:07 17:42	17:03 (9) 15:50	14:46 (6) 15:36
20	04:49 20:42	05:34 18:45	06:21 18:45	07:09 17:40	17:09 (9) 15:49	14:45 (6) 15:37
21	04:51 20:41	05:36 18:42	06:23 18:42	07:11 17:38	07:03 15:48	14:46 (6) 15:37
22	04:52 20:39	05:37 18:40	06:24 18:40	07:12 17:36	07:04 15:47	14:46 (6) 15:38
23	04:53 20:38	05:39 18:38	06:26 18:38	07:14 17:34	07:06 15:46	14:46 (6) 15:38
24	04:55 20:37	05:40 18:36	06:28 18:36	07:16 17:32	07:07 15:45	14:46 (6) 15:39
25	04:56 20:36	05:42 18:33	06:29 18:33	06:17 16:30	15:44 (8) 15:44	14:47 (6) 15:39
26	04:57 20:34	05:43 18:31	06:31 18:31	06:19 16:28	15:43 (8) 15:43	14:48 (6) 15:40
27	04:59 20:33	05:45 18:29	06:32 18:29	06:21 16:26	15:42 (8) 15:42	14:48 (6) 15:41
28	05:00 20:32	05:46 18:27	06:34 18:27	06:22 16:24	15:42 (8) 15:41	14:49 (6) 15:41
29	05:01 20:30	05:48 18:24	06:35 18:24	06:24 16:22	15:42 (8) 15:40	14:49 (6) 15:42
30	05:03 20:29	05:49 18:22	06:37 18:22	06:26 16:20	14:55 (7) 15:40	14:50 (6) 15:43
31	05:04 20:27	05:51 19:29		06:27 16:19	14:52 (7) 15:50 (8)	07:41 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case			62	291	554	31
Sun reduction			0,34	0,37	0,25	0,19
Oper. time red.			0,86	0,86	0,86	0,86
Wind dir. red.			0,70	0,70	0,70	0,70
Total reduction			0,20	0,22	0,15	0,11
Total, real			13	63	84	4

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

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

## SHADOW - Calendar

**Shadow receptor:** R - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (18)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:41	08:47 (1)	07:16	15:18 (9)	06:26	16:22 (10)	06:18	05:16	04:34		
	15:45	35 12:16 (7)	16:31	20 15:38 (9)	17:20	19 16:41 (10)	19:11	19:59	20:42		
2	07:41	08:48 (1)	07:15	15:16 (9)	06:24	16:22 (10)	06:16	05:15	04:33		
	15:46	33 12:16 (7)	16:33	23 15:39 (9)	17:21	19 16:41 (10)	19:12	20:00	20:43		
3	07:41	08:48 (1)	07:13	15:15 (9)	06:22	16:23 (10)	06:14	05:13	04:32		
	15:47	23 09:11 (1)	16:34	24 15:39 (9)	17:23	18 16:41 (10)	19:14	20:02	20:44		
4	07:41	08:49 (1)	07:12	15:16 (9)	06:20	16:23 (10)	06:12	05:11	04:32		
	15:48	23 09:12 (1)	16:36	25 15:41 (9)	17:25	17 16:40 (10)	19:16	20:03	20:45		
5	07:40	08:50 (1)	07:10	15:15 (9)	06:17	16:24 (10)	06:09	05:09	04:31		
	15:50	22 09:12 (1)	16:38	26 15:41 (9)	17:27	15 16:39 (10)	19:17	20:05	20:46		
6	07:40	08:50 (1)	07:09	15:14 (9)	06:15	16:26 (10)	06:07	05:07	04:30		
	15:51	22 09:12 (1)	16:40	27 15:41 (9)	17:28	11 16:37 (10)	19:19	20:06	20:47		
7	07:40	08:51 (1)	07:07	15:15 (9)	06:13	16:28 (10)	06:05	05:06	04:30		
	15:52	21 09:12 (1)	16:41	27 15:42 (9)	17:30	5 16:33 (10)	19:20	20:08	20:48		
8	07:40	08:52 (1)	07:06	15:14 (9)	06:11		06:03		18:45 (11)	05:04	04:29
	15:53	20 09:12 (1)	16:43	28 15:42 (9)	17:32		19:22	8 18:53 (11)	20:10	20:48	
9	07:39	08:53 (1)	07:04	15:14 (9)	06:09		06:01		18:43 (11)	05:02	04:29
	15:55	19 09:12 (1)	16:45	28 15:42 (9)	17:33		19:24	12 18:55 (11)	20:11	20:49	
10	07:39	08:54 (1)	07:02	15:14 (9)	06:07		05:59		18:41 (11)	05:01	04:28
	15:56	17 09:11 (1)	16:47	28 15:42 (9)	17:35		19:25	15 18:56 (11)	20:13	20:50	
11	07:38	08:55 (1)	07:00	15:14 (9)	06:05		05:56		18:40 (11)	04:59	04:28
	15:57	16 09:11 (1)	16:48	28 15:42 (9)	17:37		19:27	17 18:57 (11)	20:14	20:51	
12	07:38	08:57 (1)	06:59	15:16 (9)	06:02		05:54		18:38 (11)	04:58	04:28
	15:59	14 09:11 (1)	16:50	26 15:42 (9)	17:38		19:28	18 18:56 (11)	20:16	20:51	
13	07:37	08:59 (1)	06:57	15:16 (9)	06:00		05:52		18:38 (11)	04:56	04:28
	16:00	11 15:22 (8)	16:52	26 15:42 (9)	17:40		19:30	18 18:56 (11)	20:17	20:52	
14	07:36	09:01 (1)	06:55	15:17 (9)	05:58		05:50		18:37 (11)	04:55	04:27
	16:02	15 15:26 (8)	16:54	28 16:27 (14)	17:42		19:32	22 19:04 (12)	20:19	20:53	
15	07:35	15:17 (8)	06:53	15:18 (9)	05:56		05:48		18:37 (11)	04:53	04:27
	16:03	10 15:27 (8)	16:55	29 16:29 (14)	17:43		19:33	28 19:07 (12)	20:20	20:53	
16	07:35	15:17 (8)	06:51	15:19 (9)	05:54		05:46		18:38 (11)	04:52	04:27
	16:04	11 15:28 (8)	16:57	29 16:31 (14)	17:45		19:35	28 19:08 (12)	20:21	20:54	
17	07:34	15:16 (8)	06:50	15:21 (9)	05:51		05:44		18:38 (11)	04:50	04:27
	16:06	14 15:30 (8)	16:59	27 16:32 (14)	17:46		19:36	30 19:09 (12)	20:23	20:54	
18	07:33	15:16 (8)	06:48	15:23 (9)	05:49		05:42		18:39 (11)	04:49	04:27
	16:08	15 15:31 (8)	17:01	25 16:34 (14)	17:48		19:38	28 19:09 (12)	20:24	20:54	
19	07:32	15:16 (8)	06:46	16:21 (14)	05:47		05:40		18:40 (11)	04:48	04:27
	16:09	16 15:32 (8)	17:02	12 16:33 (14)	17:50		19:40	25 19:08 (12)	20:26	20:55	
20	07:31	15:16 (8)	06:44	16:21 (14)	05:45		05:38		18:42 (11)	04:46	04:27
	16:11	16 15:32 (8)	17:04	11 16:32 (14)	17:51		19:41	20 19:08 (12)	20:27	20:55	
21	07:30	15:16 (8)	06:42	16:22 (14)	05:43		05:36		18:55 (12)	04:45	04:27
	16:12	17 15:33 (8)	17:06	9 16:31 (14)	17:53		19:43	12 19:07 (12)	20:28	20:55	
22	07:29	15:16 (8)	06:40	16:25 (14)	05:40		05:34		18:56 (12)	04:44	04:28
	16:14	18 15:34 (8)	17:08	4 16:29 (14)	17:55		19:44	10 19:06 (12)	20:30	20:56	
23	07:28	15:16 (8)	06:38	16:32 (10)	05:38		05:32		18:57 (12)	04:43	04:28
	16:16	17 15:33 (8)	17:09	2 16:34 (10)	17:56		19:46	7 19:04 (12)	20:31	20:56	
24	07:27	15:16 (8)	06:36	16:28 (10)	05:36		05:30			04:41	04:28
	16:17	18 15:34 (8)	17:11	10 16:38 (10)	17:58		19:48		20:32	20:56	
25	07:26	15:17 (8)	06:34	16:26 (10)	05:34		05:28		04:40	04:28	
	16:19	17 15:34 (8)	17:13	14 16:40 (10)	17:59		19:49		20:34	20:56	
26	07:24	15:17 (8)	06:32	16:25 (10)	05:31		05:26		04:39	04:29	
	16:21	17 15:34 (8)	17:15	16 16:41 (10)	18:01		19:51		20:35	20:56	
27	07:23	15:18 (8)	06:30	16:24 (10)	05:29		05:24		04:38	04:29	
	16:22	16 15:34 (8)	17:16	18 16:42 (10)	18:03		19:52		20:36	20:56	
28	07:22	15:19 (8)	06:28	16:24 (10)	05:27		05:22		04:37	04:30	
	16:24	15 15:34 (8)	17:18	18 16:42 (10)	18:04		19:54		20:37	20:56	
29	07:21	15:20 (8)			06:25		05:20		04:36	04:30	
	16:26	12 15:32 (8)			19:06		19:56		20:38	20:56	
30	07:19	15:20 (9)			06:23		05:18		04:35	04:31	
	16:27	14 15:34 (9)			19:07		19:57		20:40	20:56	
31	07:18	15:18 (9)			06:20				04:35		
	16:29	18 15:36 (9)			19:09				20:41		
Potential sun hours	265		280		367		413		479		491
Total, worst case	552		588		104		298				
Sun reduction	0,26		0,31		0,31		0,31				
Oper. time red.	0,86		0,86		0,86		0,86				
Wind dir. red.	0,64		0,70		0,69		0,68				
Total reduction	0,14		0,18		0,18		0,18				
Total, real	76		106		19		54				

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

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

## SHADOW - Calendar

**Shadow receptor:** R - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (18)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December		
1	04:31 20:55	05:06 20:26	05:52 19:27	18:39 (11) 18:56 (11)	06:38 16:17	06:29 15:12 (9)	07:18 15:39	08:37 (1) 08:53 (1)
2	04:32 20:55	05:07 20:24	05:54 19:25	18:39 (11) 18:54 (11)	06:40 16:15	06:31 15:12 (9)	07:19 15:39	08:37 (1) 08:54 (1)
3	04:33 20:55	05:09 20:23	05:55 19:22	18:41 (11) 18:53 (11)	06:42 16:13	06:33 15:12 (9)	07:20 15:38	08:37 (1) 08:55 (1)
4	04:33 20:54	05:10 20:21	05:57 19:20	18:42 (11) 18:50 (11)	06:43 16:13	06:34 15:12 (9)	07:22 15:37	08:36 (1) 08:56 (1)
5	04:34 20:54	05:11 20:19	05:58 19:18		06:45 18:11	06:36 16:10	07:23 15:37	08:37 (1) 08:57 (1)
6	04:35 20:53	05:13 20:18	06:00 19:16		06:46 18:09	06:38 16:08	07:24 15:37	08:36 (1) 08:58 (1)
7	04:36 20:53	05:14 20:16	06:02 19:14		06:48 18:07	06:39 16:07	07:25 15:36	08:36 (1) 08:58 (1)
8	04:37 20:52	05:16 20:14	06:03 19:11		06:50 18:05	06:41 16:05	07:27 15:36	08:37 (1) 09:00 (1)
9	04:38 20:52	05:17 20:12	06:05 19:09		06:51 18:03	06:43 16:04	07:28 15:36	08:37 (1) 09:00 (1)
10	04:38 20:51	05:19 20:11	06:06 19:07		06:53 18:00	06:45 17:14 (10)	07:29 15:36	08:37 (1) 12:04 (7)
11	04:39 20:50	05:20 20:09	06:08 19:05		06:54 17:58	06:46 16:57 (10)	07:30 15:35	08:37 (1) 12:06 (7)
12	04:40 20:50	05:22 20:07	06:09 19:03		06:56 17:56	06:48 15:59	07:31 15:35	08:38 (1) 12:08 (7)
13	04:41 20:49	05:23 20:05	06:11 19:00		06:58 17:54	06:50 15:58	07:32 15:35	08:38 (1) 12:09 (7)
14	04:43 20:48	05:25 20:03	06:12 18:58		06:59 17:52	06:51 15:56	07:33 15:35	08:38 (1) 12:10 (7)
15	04:44 20:47	05:26 20:01	06:14 18:56		07:01 17:50	06:53 15:55	07:34 15:35	08:39 (1) 12:12 (7)
16	04:45 20:46	05:28 19:59	06:15 18:54		07:02 17:48	06:55 15:54	07:34 15:36	08:40 (1) 12:13 (7)
17	04:46 20:45	05:29 19:58	06:17 18:51		07:04 17:46	06:56 15:52	07:35 15:36	08:39 (1) 12:13 (7)
18	04:47 20:44	05:31 19:56	06:18 18:49		07:06 17:44	06:58 15:51	07:36 15:36	08:40 (1) 12:14 (7)
19	04:48 20:43	05:32 19:54	06:20 18:47		07:07 17:42	06:59 15:50	07:37 15:36	08:41 (1) 12:15 (7)
20	04:50 20:42	05:34 19:52	19:02 (12) 18:45		07:09 17:40	07:01 15:49	07:37 15:37	08:41 (1) 12:15 (7)
21	04:51 20:41	05:36 19:50	19:01 (12) 18:42		07:11 17:38	07:03 15:48	07:38 15:37	08:41 (1) 12:16 (7)
22	04:52 20:40	05:37 19:48	19:00 (12) 18:40		07:12 17:36	07:04 15:47	07:38 15:38	08:41 (1) 12:16 (7)
23	04:53 20:38	05:39 19:46	18:46 (11) 19:13 (12)		07:14 17:34	07:06 15:46	07:39 15:38	08:42 (1) 12:17 (7)
24	04:55 20:37	05:40 19:44	18:44 (11) 19:12 (12)		07:16 17:32	07:07 15:45	07:39 15:39	08:43 (1) 12:17 (7)
25	04:56 20:36	05:42 19:41	18:41 (11) 19:11 (12)		06:17 16:30	07:09 16:01 (14)	07:40 15:39	08:43 (1) 12:17 (7)
26	04:57 20:34	05:43 19:39	18:41 (11) 19:11 (12)		06:19 16:28	07:10 16:00 (14)	07:40 15:40	08:44 (1) 12:18 (7)
27	04:59 20:33	05:45 19:37	18:39 (11) 19:10 (12)		06:21 16:26	07:12 15:58 (14)	07:40 15:41	08:44 (1) 12:18 (7)
28	05:00 20:32	05:46 19:35	18:39 (11) 19:09 (12)		06:22 16:24	07:13 15:56 (14)	07:41 15:41	08:45 (1) 12:18 (7)
29	05:01 20:30	05:48 19:33	18:38 (11) 19:04 (12)		06:24 16:22	07:15 15:11 (9)	07:41 15:40	08:45 (1) 12:18 (7)
30	05:03 20:29	05:49 19:31	18:39 (11) 18:57 (11)		06:26 16:20	07:16 15:11 (9)	07:41 15:40	08:46 (1) 12:17 (7)
31	05:04 20:27	05:51 19:29	18:38 (11) 18:56 (11)		06:28 16:19	14:44 (9) 15:11 (9)	07:41 15:44	08:46 (1) 12:17 (7)
Potential sun hours	495	450	380	334	271	251		
Total, worst case		250	52	438	558	1120		
Sun reduction		0,39	0,34	0,37	0,25	0,19		
Oper. time red.		0,86	0,86	0,86	0,86	0,86		
Wind dir. red.		0,68	0,69	0,69	0,69	0,59		
Total reduction		0,22	0,20	0,21	0,15	0,10		
Total, real		56	10	94	83	107		

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

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

## SHADOW - Calendar

**Shadow receptor:** S - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (19)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:41	08:14 (1)	07:16	16:00 (14)	06:26	06:18		05:16		19:18 (13)	04:34
	15:45	66	14:40 (8)	16:31	2	16:02 (14)	17:20	19:11		19:30 (13)	20:42
2	07:41	08:15 (1)	07:15	15:57 (14)	06:24	06:16		05:15		19:17 (13)	04:33
	15:46	67	14:41 (8)	16:33	7	16:04 (14)	17:21	19:12		19:30 (13)	20:43
3	07:41	08:14 (1)	07:14	15:56 (14)	06:22	06:14		05:13		19:17 (13)	04:32
	15:47	66	14:40 (8)	16:34	9	16:05 (14)	17:23	19:14		19:29 (13)	20:44
4	07:41	08:14 (1)	07:12	15:56 (14)	06:20	06:12		05:11		19:18 (13)	04:32
	15:48	66	14:40 (8)	16:36	12	16:08 (14)	17:25	19:16		19:30 (13)	20:45
5	07:40	08:15 (1)	07:10	15:55 (14)	06:17	06:09		18:37 (11)	05:09	19:19 (13)	04:31
	15:50	65	14:40 (8)	16:38	14	16:09 (14)	17:27	19:17	1	18:38 (11)	20:05
6	07:40	08:15 (1)	07:09	15:54 (14)	06:15	06:07		18:31 (11)	05:07	19:20 (13)	04:30
	15:51	65	14:40 (8)	16:40	16	16:10 (14)	17:28	19:19	12	18:43 (11)	20:07
7	07:40	08:15 (1)	07:07	15:55 (14)	06:13	06:05		18:29 (11)	05:06		04:30
	15:52	64	14:40 (8)	16:41	15	16:10 (14)	17:30	19:20	16	18:45 (11)	20:08
8	07:40	08:15 (1)	07:06	15:54 (10)	06:11	06:03		18:28 (11)	05:04		04:29
	15:53	61	14:38 (8)	16:43	16	16:10 (14)	17:32	19:22	19	18:47 (11)	20:10
9	07:39	08:16 (1)	07:04	15:51 (10)	06:09	06:01		18:26 (11)	05:02		04:29
	15:55	57	14:37 (8)	16:45	19	16:10 (14)	17:33	19:24	22	18:48 (11)	20:11
10	07:39	08:16 (1)	07:02	15:49 (10)	06:07	05:59		18:25 (11)	05:01		04:28
	15:56	55	14:21 (9)	16:47	20	16:09 (14)	17:35	19:25	23	18:48 (11)	20:13
11	07:38	08:16 (1)	07:00	15:48 (10)	06:05	05:56		18:25 (11)	04:59		04:28
	15:57	55	14:21 (9)	16:48	19	16:07 (14)	17:37	19:27	24	18:49 (11)	20:14
12	07:38	08:17 (1)	06:59	15:48 (10)	06:02	05:54		18:23 (11)	04:58		04:28
	15:59	55	14:22 (9)	16:50	20	16:08 (10)	17:38	19:28	25	18:48 (11)	20:16
13	07:37	08:17 (1)	06:57	15:47 (10)	06:00	05:52		18:23 (11)	04:56		04:28
	16:00	54	14:22 (9)	16:52	22	16:09 (10)	17:40	19:30	25	18:48 (11)	20:17
14	07:36	08:17 (1)	06:55	15:47 (10)	05:58	05:50		18:23 (11)	04:55		04:27
	16:02	54	14:22 (9)	16:54	22	16:09 (10)	17:42	19:32	30	19:01 (12)	20:19
15	07:35	08:18 (1)	06:53	15:46 (10)	05:56	05:48		18:23 (11)	04:53		04:27
	16:03	54	14:22 (9)	16:56	23	16:09 (10)	17:43	19:33	35	19:03 (12)	20:20
16	07:35	08:18 (1)	06:51	15:46 (10)	05:54	05:46		18:23 (11)	04:52		04:27
	16:04	53	14:22 (9)	16:57	23	16:09 (10)	17:45	19:35	37	19:05 (12)	20:21
17	07:34	08:19 (1)	06:50	15:46 (10)	05:51	05:44		18:23 (11)	04:50		04:27
	16:06	51	14:22 (9)	16:59	23	16:09 (10)	17:46	19:36	38	19:05 (12)	20:23
18	07:33	08:20 (1)	06:48	15:46 (10)	05:49	05:42		18:24 (11)	04:49		04:27
	16:08	50	14:22 (9)	17:01	23	16:09 (10)	17:48	19:38	37	19:05 (12)	20:24
19	07:32	08:20 (1)	06:46	15:47 (10)	05:47	05:40		18:25 (11)	04:48		04:27
	16:09	49	14:22 (9)	17:03	21	16:08 (10)	17:50	19:40	34	19:05 (12)	20:26
20	07:31	08:21 (1)	06:44	15:47 (10)	05:45	05:38		18:26 (11)	04:46		04:27
	16:11	46	14:22 (9)	17:04	21	16:08 (10)	17:51	19:41	33	19:05 (12)	20:27
21	07:30	08:23 (1)	06:42	15:48 (10)	05:43	05:36		18:28 (11)	04:45		04:27
	16:12	43	14:22 (9)	17:06	19	16:07 (10)	17:53	19:43	28	19:05 (12)	20:28
22	07:29	08:24 (1)	06:40	15:49 (10)	05:40	05:34		18:49 (12)	04:44		04:28
	16:14	39	14:22 (9)	17:08	16	16:05 (10)	17:55	19:44	15	19:04 (12)	20:30
23	07:28	08:26 (1)	06:38	15:51 (10)	05:38	05:32		18:49 (12)	04:43		04:28
	16:16	33	14:20 (9)	17:09	12	16:03 (10)	17:56	19:46	14	19:03 (12)	20:31
24	07:27	13:57 (9)	06:36	15:55 (10)	05:36	05:30		18:50 (12)	04:41		04:28
	16:17	23	14:20 (9)	17:11	5	16:00 (10)	17:58	19:48	11	19:01 (12)	20:32
25	07:26	13:59 (9)	06:34		05:34	05:28		18:53 (12)	04:40		04:28
	16:19	20	14:19 (9)	17:13		17:59	19:49	7	19:00 (12)	20:34	20:56
26	07:25	14:00 (9)	06:32		05:31	05:26			04:39		04:29
	16:21	17	14:17 (9)	17:15		18:01	19:51		20:35		20:56
27	07:23	14:03 (9)	06:30		05:29	05:24		19:22 (13)	04:38		04:29
	16:22	13	14:16 (9)	17:16		18:03	19:52	3	19:25 (13)	20:36	20:56
28	07:22	14:09 (9)	06:28		05:27	05:22		19:20 (13)	04:37		04:30
	16:24	3	14:12 (9)	17:18		18:04	19:54	7	19:27 (13)	20:37	20:56
29	07:21				06:25	05:20		19:19 (13)	04:36		04:30
	16:26				19:06	19:56		9	19:28 (13)	20:38	20:56
30	07:19				06:23	05:18			19:19 (13)	04:35	04:31
	16:27				19:08	19:57		11	19:30 (13)	20:40	20:56
31	07:18				06:20				04:35		
	16:29				19:09				20:41		
Potential sun hours	265		280		367	413		479		491	
Total, worst case	1344		399			516		64			
Sun reduction	0,26		0,31			0,31		0,35			
Oper. time red.	0,86		0,86			0,86		0,86			
Wind dir. red.	0,64		0,70			0,69		0,64			
Total reduction	0,14		0,18			0,18		0,19			
Total, real	188		73			94		12			

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

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

## SHADOW - Calendar

**Shadow receptor:** S - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (19)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31 20:55	05:06 20:26		05:52 19:27	24	18:24 (11) 18:48 (11)	06:38 18:20	06:29 16:17	15:19 (10) 15:39 (14)	07:18 15:39	07:58 (1) 14:03 (9)
2	04:32 20:55	05:07 20:24		05:54 19:25	23	18:23 (11) 18:46 (11)	06:40 18:18	06:31 16:15	15:21 (10) 15:39 (14)	07:19 15:39	07:59 (1) 14:04 (9)
3	04:33 20:55	05:09 20:23		05:55 19:22	22	18:24 (11) 18:46 (11)	06:42 18:16	06:33 16:13	15:25 (10) 15:40 (14)	07:20 15:38	07:59 (1) 14:04 (9)
4	04:33 20:54	05:10 20:21		05:57 19:20	19	18:25 (11) 18:44 (11)	06:43 18:13	06:34 16:12	15:25 (14) 15:40 (14)	07:22 15:37	08:00 (1) 14:23 (8)
5	04:34 20:54	05:11 20:19		05:58 19:18	17	18:26 (11) 18:43 (11)	06:45 18:11	06:36 16:10	15:24 (14) 15:39 (14)	07:23 15:37	08:00 (1) 14:25 (8)
6	04:35 20:53	05:13 20:18	4	19:31 (13) 19:35 (13)	13	18:27 (11) 18:40 (11)	06:46 18:09	06:38 16:08	15:25 (14) 15:39 (14)	07:24 15:37	08:01 (1) 14:26 (8)
7	04:36 20:53	05:14 20:16	7	19:30 (13) 19:37 (13)	3	18:31 (11) 18:34 (11)	06:48 18:07	06:39 16:07	15:26 (14) 15:37 (14)	07:25 15:36	08:01 (1) 14:26 (8)
8	04:37 20:52	05:16 20:14	10	19:28 (13) 19:38 (13)		06:03 19:11	06:50 18:05	06:41 16:05	15:27 (14) 15:36 (14)	07:27 15:36	08:02 (1) 14:28 (8)
9	04:38 20:52	05:17 20:12	11	19:27 (13) 19:38 (13)		06:05 19:09	06:51 18:03	06:43 16:04	15:28 (14) 15:34 (14)	07:28 15:36	08:03 (1) 14:29 (8)
10	04:38 20:51	05:19 20:11	12	19:27 (13) 19:39 (13)		06:06 19:07	06:53 18:00	06:45 16:02	15:31 (14) 15:33 (14)	07:29 15:36	08:04 (1) 14:30 (8)
11	04:39 20:50	05:20 20:09	13	19:26 (13) 19:39 (13)		06:08 19:05	06:54 17:58	06:46 16:01		07:30 15:35	08:04 (1) 14:30 (8)
12	04:40 20:50	05:22 20:07	13	19:26 (13) 19:39 (13)		06:09 19:03	06:56 17:56	06:48 15:59		07:31 15:35	08:05 (1) 14:31 (8)
13	04:41 20:49	05:23 20:05	11	19:26 (13) 19:37 (13)		06:11 19:00	06:58 17:54	06:50 15:58		07:32 15:35	08:06 (1) 14:32 (8)
14	04:43 20:48	05:25 20:03	9	19:27 (13) 19:36 (13)		06:12 18:58	06:59 17:52	06:51 15:56	13:40 (9) 13:44 (9)	07:33 15:35	08:06 (1) 14:32 (8)
15	04:44 20:47	05:26 20:01	6	19:28 (13) 19:34 (13)		06:14 18:56	07:01 17:50	06:53 15:55	13:36 (9) 13:49 (9)	07:34 15:35	08:07 (1) 14:33 (8)
16	04:45 20:46	05:28 19:59	2	19:30 (13) 19:32 (13)		06:15 18:54	07:02 17:48	06:55 15:54	13:33 (9) 13:50 (9)	07:34 15:36	08:08 (1) 14:34 (8)
17	04:46 20:45	05:29 19:58		06:17 18:51		07:04 17:46	07:04 17:46	06:56 15:52	13:32 (9) 13:52 (9)	07:35 15:36	08:08 (1) 14:34 (8)
18	04:47 20:44	05:31 19:56	8	18:58 (12) 19:06 (12)		06:18 18:49	07:06 17:44	06:58 16:25 (10) 15:51	13:31 (9) 13:54 (9)	07:36 15:36	08:09 (1) 14:34 (8)
19	04:48 20:43	05:32 19:54	11	18:57 (12) 19:08 (12)		06:20 18:47	07:07 17:42	06:59 16:22 (10) 15:50	08:01 (1) 13:55 (9)	07:37 15:36	08:10 (1) 14:35 (8)
20	04:50 20:42	05:34 19:52	14	18:55 (12) 19:09 (12)		06:21 18:45	07:09 17:40	07:01 16:19 (10) 15:49	07:59 (1) 13:57 (9)	07:37 15:37	08:10 (1) 14:35 (8)
21	04:51 20:41	05:36 19:50	20	18:37 (11) 19:10 (12)		06:23 18:42	07:11 17:38	07:03 16:18 (10) 15:48	07:08 (1) 13:57 (9)	07:38 15:37	08:11 (1) 14:36 (8)
22	04:52 20:40	05:37 19:48	28	18:32 (11) 19:09 (12)		06:24 18:40	07:12 17:36	07:04 16:17 (10) 15:47	07:58 (1) 13:58 (9)	07:38 15:38	08:11 (1) 14:36 (8)
23	04:53 20:38	05:39 19:46	33	18:31 (11) 19:10 (12)		06:26 18:38	07:14 17:34	07:06 16:17 (10) 15:46	07:57 (1) 13:59 (9)	07:39 15:38	08:12 (1) 14:37 (8)
24	04:55 20:37	05:40 19:44	35	18:29 (11) 19:09 (12)		06:28 18:36	07:16 17:32	07:07 16:17 (10) 15:45	07:57 (1) 13:59 (9)	07:39 15:39	08:12 (1) 14:37 (8)
25	04:56 20:36	05:42 19:41	36	18:27 (11) 19:08 (12)		06:29 18:33	06:17 16:30	07:09 15:15 (10) 15:44	07:57 (1) 14:00 (9)	07:40 15:39	08:12 (1) 14:37 (8)
26	04:57 20:34	05:43 19:39	38	18:26 (11) 19:08 (12)		06:31 18:31	06:19 16:28	07:10 15:16 (10) 15:43	07:57 (1) 14:01 (9)	07:40 15:40	08:13 (1) 14:38 (8)
27	04:59 20:33	05:45 19:37	36	18:25 (11) 19:06 (12)		06:32 18:29	06:21 16:26	07:12 15:16 (10) 15:42	07:57 (1) 14:01 (9)	07:40 15:41	08:13 (1) 14:39 (8)
28	05:00 20:32	05:46 19:35	35	18:25 (11) 19:05 (12)		06:34 18:27	06:22 16:24	07:13 15:16 (10) 15:41	07:57 (1) 14:02 (9)	07:41 15:41	08:13 (1) 14:39 (8)
29	05:01 20:30	05:48 19:33	30	18:24 (11) 19:02 (12)		06:35 18:25	06:24 16:22	07:15 15:17 (10) 15:40	07:57 (1) 14:02 (9)	07:41 15:42	08:13 (1) 14:39 (8)
30	05:03 20:29	05:49 19:31	25	18:24 (11) 18:49 (11)		06:37 18:22	06:26 16:21	07:16 15:17 (10) 15:40	07:58 (1) 14:03 (9)	07:41 15:43	08:14 (1) 14:39 (8)
31	05:04 20:27	05:51 19:29	25	18:23 (11) 18:48 (11)		06:38 18:19	06:28 16:19	15:18 (10) 15:37 (14)		07:41 15:44	08:14 (1) 14:40 (8)
Potential sun hours	495	450		380		334	277	271		251	1984
Total, worst case			472	121		0,34	0,37	0,25			0,19
Sun reduction			0,39	0,86		0,70	0,65	0,14			0,11
Oper. time red.			0,68	0,20		0,22	0,60	0,110			209
Wind dir. red.			0,22								
Total reduction			105	24							
Total, real											

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

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



## SHADOW - Calendar

**Shadow receptor:** T - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (20)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:41 15:45		07:17 16:31	25	15:07 (12) 15:32 (12)	06:26 17:20		06:18 19:11	05:16 19:59	04:34 20:42	
2	07:41 15:46		07:15 16:33	25	15:07 (12) 15:32 (12)	06:24 17:21		06:16 19:12	05:15 20:00	04:33 20:43	
3	07:41 15:47		07:14 16:34	24	15:07 (12) 15:31 (12)	06:22 17:23		06:14 19:14	05:13 20:02	04:32 20:44	
4	07:41 15:48		07:12 16:36	23	15:08 (12) 15:31 (12)	06:20 17:25		06:12 19:16	05:11 20:03	04:32 20:45	
5	07:41 15:50		07:10 16:38	22	15:09 (12) 15:31 (12)	06:17 17:27		06:09 19:17	05:09 20:05	04:31 20:46	
6	07:40 15:51		07:09 16:40	21	15:09 (12) 15:30 (12)	06:15 17:28		06:07 19:19	05:07 20:07	04:30 20:47	
7	07:40 15:52		07:07 16:41	18	15:11 (12) 15:29 (12)	06:13 17:30	10	16:47 (13) 16:57 (13)	06:05 19:20	05:06 20:08	04:30 20:48
8	07:40 15:53		07:06 16:43	15	15:13 (12) 15:28 (12)	06:11 17:32	14	16:44 (13) 16:58 (13)	06:03 19:22	05:04 20:10	04:29 20:49
9	07:39 15:55		07:04 16:45	10	15:15 (12) 15:25 (12)	06:09 17:33	16	16:43 (13) 16:42 (13)	06:01 05:59	05:02 05:01	04:29 04:28
10	07:39 15:56		07:02 16:47			06:07 17:35	18	17:00 (13) 16:41 (13)	05:59 05:57	05:01 04:59	04:28 04:28
11	07:38 15:57		07:01 16:48			06:05 17:37	19	17:00 (13) 16:41 (13)	05:57 05:54	04:59 04:52	04:28 04:27
12	07:38 15:59		06:59 16:50			06:02 17:38	20	16:41 (13) 17:01 (13)	05:54 19:28	04:58 20:16	04:28 20:51
13	07:37 16:00		06:57 16:52			06:00 17:40	20	16:40 (13) 17:00 (13)	05:52 19:30	04:56 20:17	04:28 20:52
14	07:36 16:02		06:55 16:54			05:58 17:42	19	16:40 (13) 16:59 (13)	05:50 19:32	04:55 20:19	04:27 20:53
15	07:36 16:03		06:53 16:56			05:56 17:43	18	16:41 (13) 16:59 (13)	05:48 19:33	04:53 20:20	04:27 20:53
16	07:35 16:04		06:52 16:57			05:54 17:45	17	16:41 (13) 16:58 (13)	05:46 19:35	04:52 20:22	04:27 20:54
17	07:34 16:06		06:50 16:59			05:51 17:46	14	16:42 (13) 16:56 (13)	05:44 19:36	04:50 20:23	04:27 20:54
18	07:33 16:08		06:48 17:01			05:49 17:48	9	16:44 (13) 16:53 (13)	05:42 19:38	04:49 20:24	04:27 20:55
19	07:32 16:09	7	15:12 (12) 15:19 (12)		06:46 17:03	05:47 17:50		05:40 19:40	04:48 20:26	04:27 20:55	
20	07:31 16:11	12	15:10 (12) 15:22 (12)		06:44 17:04	05:45 17:51		05:38 19:41	04:46 20:27	04:27 20:55	
21	07:30 16:12	15	15:09 (12) 15:24 (12)		06:42 17:06	05:43 17:53		05:36 19:43	04:45 20:28	04:27 20:55	
22	07:29 16:14	17	15:09 (12) 15:26 (12)		06:40 17:08	05:40 17:55		05:34 19:44	04:44 20:30	04:28 20:56	
23	07:28 16:16	19	15:07 (12) 15:26 (12)		06:38 17:09	05:38 17:56		05:32 19:46	04:43 20:31	04:28 20:56	
24	07:27 16:17	21	15:07 (12) 15:28 (12)		06:36 17:11	05:36 17:58		05:30 19:48	04:41 20:32	04:28 20:56	
25	07:26 16:19	22	15:07 (12) 15:29 (12)		06:34 17:13	05:34 17:59		05:28 19:49	04:40 20:34	04:28 20:56	
26	07:25 16:21	23	15:06 (12) 15:29 (12)		06:32 17:15	05:32 18:01		05:26 19:51	04:39 20:35	04:29 20:56	
27	07:23 16:22	24	15:06 (12) 15:30 (12)		06:30 17:16	05:29 18:03		05:24 19:52	04:38 20:36	04:29 20:56	
28	07:22 16:24	25	15:06 (12) 15:31 (12)		06:28 17:18	05:27 18:04		05:22 19:54	04:37 20:37	04:30 20:56	
29	07:21 16:26	25	15:06 (12) 15:31 (12)			06:25 19:06		05:20 19:56	04:36 20:39	04:30 20:56	
30	07:19 16:27	26	15:06 (12) 15:32 (12)			06:23 19:08		05:18 19:57	04:35 20:40	04:31 20:56	
31	07:18 16:29	25	15:06 (12) 15:31 (12)			06:20 19:09			04:35 20:41		
Potential sun hours		265		280		367		413	479	491	
Total, worst case		261		265		194					
Sun reduction		0,26		0,31		0,31					
Oper. time red.		0,86		0,86		0,86					
Wind dir. red.		0,70		0,70		0,71					
Total reduction		0,15		0,18		0,19					
Total, real		40		48		37					

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

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

## SHADOW - Calendar

**Shadow receptor:** T - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (20)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 19:27	05:52 19:27	06:38 18:20	17:20 (13) 16:17	07:18 15:39
2	04:32 20:55	05:07 19:25	05:54 19:25	06:40 18:18	17:19 (13) 16:15	14:44 (12) 15:39
3	04:33 20:55	05:09 19:22	05:55 19:22	06:42 18:16	17:19 (13) 16:13	14:42 (12) 15:38
4	04:33 20:54	05:10 19:20	05:57 19:20	06:43 18:14	17:20 (13) 16:12	14:41 (12) 15:37
5	04:34 20:54	05:11 19:18	05:59 19:18	06:45 18:11	17:20 (13) 16:10	14:39 (12) 15:37
6	04:35 20:53	05:13 19:16	06:00 19:16	06:46 18:09	17:22 (13) 16:08	14:38 (12) 15:37
7	04:36 20:53	05:14 19:14	06:02 19:14	06:48 18:07	17:25 (13) 16:07	14:38 (12) 15:36
8	04:37 20:52	05:16 19:11	06:03 19:11	06:50 18:05	17:31 (13) 16:05	15:01 (12) 15:36
9	04:38 20:52	05:17 19:09	06:05 19:09	06:51 18:03	16:04 16:04	15:02 (12) 15:36
10	04:38 20:51	05:19 19:07	06:06 19:07	06:53 18:00	16:05 16:02	14:38 (12) 15:36
11	04:39 20:50	05:20 19:05	06:08 19:05	06:54 17:58	16:06 16:01	14:37 (12) 15:35
12	04:40 20:50	05:22 19:03	06:09 19:03	06:56 17:56	16:08 15:59	14:37 (12) 15:35
13	04:41 20:49	05:23 19:00	06:11 19:00	06:58 17:54	16:50 15:58	14:38 (12) 15:35
14	04:43 20:48	05:25 18:58	06:12 18:58	06:59 17:52	17:05 (16) 17:09 (16)	14:38 (12) 15:35
15	04:44 20:47	05:26 18:56	06:14 18:56	07:01 17:50	17:03 (16) 17:12 (16)	14:39 (12) 15:35
16	04:45 20:46	05:28 18:54	06:15 18:54	07:03 17:48	17:02 (16) 17:13 (16)	14:40 (12) 15:36
17	04:46 20:45	05:29 18:51	06:17 18:51	07:04 17:46	17:00 (16) 17:12 (16)	14:40 (12) 15:36
18	04:47 20:44	05:31 18:49	06:18 18:49	07:06 17:44	17:00 (16) 17:13 (16)	14:41 (12) 15:36
19	04:48 20:43	05:33 18:47	06:20 18:47	07:07 17:42	17:00 (16) 17:12 (16)	14:42 (12) 15:36
20	04:50 20:42	05:34 18:45	06:21 18:45	07:09 17:40	17:01 (16) 17:12 (16)	14:44 (12) 15:37
21	04:51 20:41	05:36 18:42	06:23 18:42	07:11 17:38	17:01 (16) 17:10 (16)	14:44 (12) 15:37
22	04:52 20:40	05:37 18:40	06:25 18:40	07:12 17:36	17:04 (16) 17:08 (16)	14:46 (12) 15:38
23	04:53 20:38	05:39 18:38	06:26 18:38	07:14 17:34	15:47 15:46	14:58 (12) 15:38
24	04:55 20:37	05:40 18:36	06:28 18:36	07:16 17:32	07:06 15:45	14:49 (12) 15:39
25	04:56 20:36	05:42 18:33	06:29 18:33	07:17 17:35 (13)	07:09 15:44	15:40 15:40
26	04:57 20:34	05:43 18:31	06:31 18:31	07:19 17:38 (13)	07:10 15:43	15:41 15:40
27	04:59 20:33	05:45 18:29	06:32 18:29	07:21 17:39 (13)	07:12 15:42	15:41 15:41
28	05:00 20:32	05:46 18:27	06:34 18:27	07:22 17:39 (13)	07:13 15:41	15:41 15:41
29	05:01 20:30	05:48 18:25	06:35 18:25	07:24 17:40 (13)	07:15 15:40	15:41 15:42
30	05:03 20:29	05:49 18:22	06:37 18:22	07:26 17:40 (13)	07:16 15:40	15:41 15:43
31	05:04 20:27	05:51 19:29	06:38 19:29	07:28 16:19	15:40 16:19	15:43 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case			91	193	445	
Sun reduction			0,34	0,37	0,25	
Oper. time red.			0,86	0,86	0,86	
Wind dir. red.			0,71	0,70	0,70	
Total reduction			0,21	0,22	0,15	
Total, real			19	42	68	

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

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

## SHADOW - Calendar

**Shadow receptor:** U - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (21)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:41 15:45		07:17 16:31		06:26 17:20	15:44 (13) 16:13 (13)	06:18 19:11		05:16 19:59	04:34 20:42	
2	07:41 15:46	15:13 (15)	07:15 16:33		06:24 17:22	15:43 (13) 16:11 (13)	06:16 19:12		05:15 20:00	04:33 20:43	
3	07:41 15:47	15:12 (15)	07:14 16:34		06:22 17:23	15:44 (13) 16:10 (13)	06:14 19:14	18:42 (23)	05:13 20:02	04:32 20:44	
4	07:41 15:49	15:12 (15)	07:12 16:36	15:59 (16)	06:20 17:25	15:45 (13) 16:09 (13)	06:12 19:16	18:40 (23)	05:11 20:03	04:32 20:45	
5	07:41 15:50	15:13 (15)	07:11 16:38	16:03 (16)	06:17 17:27	15:56 (16) 16:07 (13)	06:09 19:17	18:38 (23)	05:09 20:05	04:31 20:46	
6	07:40 15:51	15:12 (15)	07:09 16:40	16:06 (16)	06:15 17:28	15:49 (13) 16:05 (13)	06:07 19:19	18:38 (23)	05:08 20:07	04:30 20:47	
7	07:40 15:52	15:13 (15)	07:07 16:41	15:54 (16)	06:13 17:30	15:53 (13) 16:02 (13)	06:05 19:20	18:37 (23)	05:06 20:08	04:30 20:48	
8	07:40 15:53	15:12 (15)	07:06 16:43	16:09 (16)	06:11 17:32		06:03 19:22	18:38 (23)	05:04 20:10	04:29 20:49	
9	07:39 15:55	15:13 (15)	07:04 16:45	15:53 (16)	06:09 17:33		06:01 19:24	18:38 (23)	05:02 20:11	04:29 20:49	
10	07:39 15:56	15:22 (15)	07:02 16:47	16:09 (16)	06:07 17:35	15:53 (16)	06:07 19:25	18:40 (23)	05:01 20:13	04:29 20:50	
11	07:38 15:57	15:23 (15)	07:01 16:48	16:09 (16)	06:05 17:37		05:57 19:27	18:47 (23)	04:59 20:14	04:28 20:51	
12	07:38 15:59	15:13 (15)	06:59 16:50	15:54 (16)	06:02 17:38		05:54 19:28		04:58 20:16	04:28 20:51	
13	07:37 16:00	15:15 (15)	06:57 16:52	15:55 (16)	06:00 17:40		05:52 19:30		04:56 20:17	04:28 20:52	
14	07:36 16:02	15:28 (15)	06:55 16:54	16:09 (16)	05:58 17:42		05:50 19:32		04:55 20:19	04:27 20:53	
15	07:36 16:03	15:15 (15)	06:53 16:56	15:54 (13)	05:56 17:43		05:48 19:33		04:53 20:20	04:27 20:53	
16	07:35 16:05	15:28 (15)	06:52 16:57	16:06 (16)	05:54 17:45		05:46 19:35		04:52 20:22	04:27 20:54	
17	07:34 16:06	15:16 (15)	06:50 16:59	15:51 (13)	05:51 17:47		05:44 19:36		04:50 20:23	04:27 20:54	
18	07:33 16:08	15:27 (15)	06:48 17:01	16:07 (13)	05:49 17:48		05:42 19:38		04:49 20:24	04:27 20:55	
19	07:32 16:09	15:19 (15)	06:46 17:03	15:46 (13)	05:47 17:50		05:40 19:40		04:48 20:26	04:27 20:55	
20	07:31 16:11	15:20 (15)	06:44 17:04	16:11 (13)	05:45 17:51		05:38 19:41		04:46 20:27	04:27 20:55	
21	07:30 16:12		06:42 17:06	15:45 (13)	05:43 17:53		05:36 19:43		04:45 20:29	04:27 20:55	
22	07:29 16:14		06:40 17:08	16:13 (13)	05:40 17:55		05:34 19:44		04:44 20:30	04:28 20:56	
23	07:28 16:16		06:38 17:09	15:43 (13)	05:38 17:56		05:32 19:46		04:43 20:31	04:28 20:56	
24	07:27 16:17		06:36 17:11	16:14 (13)	05:36 17:58		05:30 19:48		04:42 20:32	04:28 20:56	
25	07:26 16:19		06:34 17:13	15:42 (13)	05:34 17:59		05:28 19:49		04:40 20:34	04:28 20:56	
26	07:25 16:21		06:32 17:15	16:14 (13)	05:32 18:01		05:26 19:51		04:39 20:35	04:29 20:56	
27	07:23 16:22		06:30 17:16	15:43 (13)	05:29 18:03		05:24 19:52		04:38 20:36	04:29 20:56	
28	07:22 16:24		06:28 17:18	16:14 (13)	05:27 18:04		05:22 19:54		04:37 20:37	04:30 20:56	
29	07:21 16:26				06:25 19:06		05:20 19:56		04:36 20:39	04:30 20:56	
30	07:19 16:27				06:23 19:08		05:18 19:57		04:35 20:40	04:31 20:56	
31	07:18 16:29				06:20 19:09				04:35 20:41		
Potential sun hours		265	280	367	413	479	491				
Total, worst case	148		515		152	84					
Sun reduction	0,26		0,31		0,31	0,31					
Oper. time red.	0,86		0,86		0,86	0,86					
Wind dir. red.	0,70		0,69		0,69	0,70					
Total reduction	0,15		0,18		0,18	0,19					
Total, real	23		94		28	16					

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

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

## SHADOW - Calendar

**Shadow receptor:** U - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (21)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 19:27	05:52 19:27	06:39 18:20	06:29 16:17	15:23 (16) 15:39 (16)
2	04:32 20:55	05:07 19:25	05:54 19:25	18:38 (23) 18:45 (23)	06:31 16:15	15:23 (16) 15:39 (16)
3	04:33 20:55	05:09 19:22	05:55 19:22	18:36 (23) 18:47 (23)	06:33 16:13	15:23 (16) 15:39 (16)
4	04:33 20:54	05:10 19:20	05:57 19:20	18:35 (23) 18:47 (23)	06:34 16:12	15:24 (16) 15:38 (16)
5	04:34 20:54	05:11 19:18	05:59 19:18	18:35 (23) 18:47 (23)	06:36 16:10	15:24 (16) 15:37 (16)
6	04:35 20:54	05:13 19:16	06:00 19:16	18:34 (23) 18:46 (23)	06:38 16:08	15:26 (16) 15:35 (16)
7	04:36 20:53	05:14 19:14	06:02 19:14	18:33 (23) 18:45 (23)	06:40 16:07	15:29 (16) 15:33 (16)
8	04:37 20:52	05:16 19:11	06:03 19:11	18:34 (23) 18:45 (23)	06:41 16:05	15:33 (16) 15:36 (16)
9	04:38 20:52	05:17 19:09	06:05 19:09	18:35 (23) 18:42 (23)	06:43 16:04	15:36 (16) 15:36 (16)
10	04:38 20:51	05:19 19:07	06:06 19:07	06:53 18:01	16:19 (13) 16:44 (13)	07:29 15:36
11	04:39 20:50	05:20 19:05	06:08 19:05	06:54 17:58	16:18 (13) 16:45 (13)	07:30 15:35
12	04:40 20:50	05:22 19:03	06:09 19:03	06:56 17:56	16:17 (13) 16:45 (13)	07:31 15:35
13	04:42 20:49	05:23 19:00	06:11 19:00	06:58 17:54	16:16 (13) 16:46 (13)	07:32 15:58
14	04:43 20:48	05:25 18:58	06:12 18:58	06:59 17:52	16:15 (13) 16:46 (13)	07:33 15:56
15	04:44 20:47	05:26 18:56	06:14 18:56	07:01 17:50	16:15 (13) 16:46 (13)	07:34 15:55
16	04:45 20:46	05:28 18:54	06:15 18:54	07:03 17:48	16:15 (13) 16:46 (13)	07:34 15:54
17	04:46 20:45	05:29 18:51	06:17 18:51	07:04 17:46	16:14 (13) 16:45 (13)	07:35 15:53
18	04:47 20:44	05:31 18:49	06:18 18:49	07:06 17:44	16:14 (13) 16:45 (13)	07:36 15:51
19	04:48 20:43	05:33 18:47	06:20 18:47	07:07 17:42	16:14 (13) 16:45 (13)	07:37 15:50
20	04:50 20:42	05:34 18:45	06:21 18:45	07:09 17:40	16:15 (13) 16:45 (13)	07:01 15:49
21	04:51 20:41	05:36 18:42	06:23 18:42	07:11 17:38	16:15 (13) 16:43 (13)	07:03 15:48
22	04:52 20:40	05:37 18:40	06:25 18:40	07:12 17:36	16:16 (13) 16:42 (13)	07:04 15:47
23	04:53 20:38	05:39 18:38	06:26 18:38	07:14 17:34	16:17 (13) 16:41 (13)	07:06 15:46
24	04:55 20:37	05:40 18:36	06:28 18:36	07:16 17:32	16:18 (13) 16:40 (13)	07:07 15:45
25	04:56 20:36	05:42 18:33	06:29 18:33	06:17 16:30	15:19 (13) 15:38 (13)	07:09 15:44
26	04:57 20:35	05:43 18:31	06:31 18:31	06:19 16:28	15:21 (13) 15:35 (13)	07:10 15:43
27	04:59 20:33	05:45 18:29	06:32 18:29	06:21 16:26	15:25 (13) 15:36 (16)	07:12 15:42
28	05:00 20:32	05:46 18:27	06:34 18:27	06:23 16:24	15:25 (16) 15:37 (16)	07:13 15:41
29	05:01 20:30	05:48 18:25	06:35 18:25	06:24 16:22	15:24 (16) 15:38 (16)	07:15 15:40
30	05:03 20:29	05:49 18:22	06:37 18:22	06:26 16:21	15:23 (16) 15:38 (16)	07:16 15:40
31	05:04 20:27	05:51 19:29		06:28 16:19	15:22 (16) 15:39 (16)	07:17 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case			84	581	174	101
Sun reduction			0,34	0,37	0,25	0,19
Oper. time red.			0,86	0,86	0,86	0,86
Wind dir. red.			0,70	0,69	0,70	0,66
Total reduction			0,20	0,22	0,15	0,11
Total, real			17	126	26	11

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

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

## SHADOW - Calendar

**Shadow receptor:** V - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (22)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:41		11:54 (13)	07:17	06:26				06:18		18:41 (22)	05:16		04:34			
	15:45	4	11:58 (13)	16:31	17:20				19:11	4	18:45 (22)	19:59		20:42			
2	07:41			07:15	06:24				06:16		18:39 (22)	05:15		04:33			
	15:46			16:33	17:22				19:12	8	18:47 (22)	20:00		20:43			
3	07:41			07:14	06:22				06:14		18:37 (22)	05:13		04:32			
	15:47			16:34	17:23				19:14	11	18:48 (22)	20:02		20:44			
4	07:41			07:12	06:20			16:50 (17)	06:12		18:37 (22)	05:11		04:32			
	15:49			16:36	17:25	9	16:59 (17)	19:16	12	18:49 (22)	20:04		20:45				
5	07:41			07:11	06:18			16:49 (17)	06:10		18:35 (22)	05:09		04:31			
	15:50			16:38	17:27	11	17:00 (17)	19:17	13	18:48 (22)	20:05		20:46				
6	07:40			07:09	06:15			16:48 (17)	06:07		18:35 (22)	05:08		04:30			
	15:51			16:40	17:28	13	17:01 (17)	19:19	13	18:48 (22)	20:07		20:47				
7	07:40			07:07	06:13			16:48 (17)	06:05		18:36 (22)	05:06		04:30			
	15:52			16:41	17:30	13	17:01 (17)	19:20	11	18:47 (22)	20:08		20:48				
8	07:40			07:06	06:11			16:47 (17)	06:03		18:37 (22)	05:04		04:29			
	15:53			16:43	17:32	13	17:00 (17)	19:22	8	18:45 (22)	20:10		20:49				
9	07:39			07:04	06:09			16:48 (17)	06:01		18:40 (22)	05:03		04:29			
	15:55			16:45	17:33	11	16:59 (17)	19:24	2	18:42 (22)	20:11		20:49				
10	07:39			07:02	06:07			16:49 (17)	05:59			05:01		04:29			
	15:56			16:47	17:35	9	16:58 (17)	19:25			20:13		20:50				
11	07:38			07:01	06:05			16:51 (17)	05:57			04:59		04:28			
	15:57			16:49	17:37	4	16:55 (17)	19:27			20:14		20:51				
12	07:38			06:59	06:02				05:54			04:58		04:28			
	15:59			16:50	17:38				19:28			20:16		20:52			
13	07:37			06:57	06:00				05:52			04:56		04:28			
	16:00			16:52	17:40				19:30			20:17		20:52			
14	07:36			06:55	05:58				05:50			04:55		04:27			
	16:02			16:54	17:42				19:32			20:19		20:53			
15	07:36			06:53	05:56				05:48			04:53		04:27			
	16:03			16:56	17:43				19:33			20:20		20:53			
16	07:35			06:52	05:54				05:46			04:52		04:27			
	16:05			16:57	17:45				19:35			20:22		20:54			
17	07:34			06:50	05:51				05:44			04:50		04:27			
	16:06			16:59	17:47				19:37			20:23		20:54			
18	07:33			06:48	05:49				05:42			04:49		04:27			
	16:08			17:01	17:48				19:38			20:24		20:55			
19	07:32			06:46	05:47				05:40			04:48		04:27			
	16:09			17:03	17:50				19:40			20:26		20:55			
20	07:31			06:44	05:45			17:08 (23)	05:38			04:46		04:27			
	16:11			17:04	17:51	10	17:18 (23)	19:41			20:27		20:55				
21	07:30			06:42	05:43			17:06 (23)	05:36			04:45		04:27			
	16:12			17:06	17:53	14	17:20 (23)	19:43			20:29		20:56				
22	07:29			06:40	05:40			17:04 (23)	05:34			04:44		04:28			
	16:14			17:08	17:55	16	17:20 (23)	19:45			20:30		20:56				
23	07:28			06:38	05:38			17:03 (23)	05:32			04:43		04:28			
	16:16			17:10	17:56	18	17:21 (23)	19:46			20:31		20:56				
24	07:27			06:36	05:36			17:02 (23)	05:30			04:42		04:28			
	16:17			17:11	17:58	19	17:21 (23)	19:48			20:32		20:56				
25	07:26			06:34	05:34			17:02 (23)	05:28			04:40		04:28			
	16:19			17:13	18:00	19	17:21 (23)	19:49			20:34		20:56				
26	07:25			06:32	05:32			17:01 (23)	05:26			04:39		04:29			
	16:21			17:15	18:01	19	17:20 (23)	19:51			20:35		20:56				
27	07:23			06:30	05:29			17:01 (23)	05:24			04:38		04:29			
	16:22			17:16	18:03	19	17:20 (23)	19:52			20:36		20:56				
28	07:22			06:28	05:27			17:02 (23)	05:22			04:37		04:30			
	16:24			17:18	18:04	17	17:19 (23)	19:54			20:37		20:56				
29	07:21				06:25			18:03 (23)	05:20			04:36		04:30			
	16:26				19:06	15	18:18 (23)	19:56			20:39		20:56				
30	07:19				06:23			18:05 (23)	05:18			04:35		04:31			
	16:27				19:08	11	18:16 (23)	19:57			20:40		20:56				
31	07:18				06:20			18:07 (23)				04:35					
	16:29				19:09	4	18:11 (23)				20:41						
Potential sun hours	265			280	367			413			479		491				
Total, worst case		4				264		82									
Sun reduction		0,26				0,31		0,31									
Oper. time red.		0,86				0,86		0,86									
Wind dir. red.		0,60				0,71		0,70									
Total reduction		0,13				0,19		0,18									
Total, real		1				49		15									

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

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

## SHADOW - Calendar

**Shadow receptor:** V - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (22)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 19:27	05:52 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	04:32 20:55	05:07 19:25	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	04:33 20:55	05:09 19:22	05:55 19:22	18:38 (22) 18:40 (22)	06:42 17:35 (17)	06:33 16:14
4	04:33 20:54	05:10 19:20	05:57 19:20	18:34 (22) 18:42 (22)	06:43 17:36 (17)	06:34 16:12
5	04:34 20:54	05:11 19:19	05:59 19:18	18:33 (22) 18:44 (22)	06:45 17:36 (17)	06:36 16:10
6	04:35 20:54	05:13 19:18	06:00 19:16	18:32 (22) 18:44 (22)	06:46 17:37 (17)	06:38 16:09
7	04:36 20:53	05:14 19:16	06:02 19:14	18:31 (22) 18:44 (22)	06:48 17:37 (17)	06:40 16:07
8	04:37 20:52	05:16 19:14	06:03 19:12	18:31 (22) 18:43 (22)	06:41 17:35 (17)	06:41 16:05
9	04:38 20:52	05:17 19:13	06:05 19:09	18:30 (22) 18:42 (22)	06:51 17:34 (17)	06:43 16:04
10	04:39 20:51	05:19 19:11	06:06 19:07	18:32 (22) 18:41 (22)	06:53 17:33 (17)	06:45 16:02
11	04:39 20:50	05:20 19:09	06:08 19:05	18:33 (22) 18:38 (22)	06:54 16:01	07:30 15:35
12	04:40 20:50	05:22 19:07	06:09 19:03	18:00 (23) 18:03 (23)	06:56 15:59	07:31 15:35
13	04:42 20:49	05:23 19:05	06:11 19:00	17:55 (23) 18:06 (23)	06:58 15:58	07:32 15:35
14	04:43 20:48	05:25 19:03	06:12 18:58	17:54 (23) 18:08 (23)	06:59 15:56	07:33 15:35
15	04:44 20:47	05:26 19:01	06:14 18:56	17:52 (23) 18:08 (23)	07:01 15:55	07:34 15:35
16	04:45 20:46	05:28 19:00	06:15 18:54	17:51 (23) 18:09 (23)	07:03 15:54	07:35 15:36
17	04:46 20:45	05:30 18:58	06:17 18:51	17:50 (23) 18:08 (23)	07:04 15:53	07:35 15:36
18	04:47 20:44	05:31 18:56	06:18 18:49	17:50 (23) 18:09 (23)	07:06 15:51	07:36 15:36
19	04:48 20:43	05:33 18:54	06:20 18:47	17:49 (23) 18:08 (23)	07:07 15:50	07:37 15:36
20	04:50 20:42	05:34 18:52	06:21 18:45	17:49 (23) 18:07 (23)	07:09 15:49	07:37 15:37
21	04:51 20:41	05:36 18:50	06:23 18:42	17:49 (23) 18:06 (23)	07:11 15:48	07:38 15:37
22	04:52 20:40	05:37 18:48	06:25 18:40	17:50 (23) 18:05 (23)	07:12 15:47	07:39 15:38
23	04:53 20:38	05:39 18:46	06:26 18:38	17:51 (23) 18:02 (23)	07:14 15:46	07:39 15:38
24	04:55 20:37	05:40 18:44	06:28 18:36	17:54 (23) 18:00 (23)	07:16 15:45	07:39 15:39
25	04:56 20:36	05:42 18:42	06:29 18:34	06:17 16:30	07:09 15:44	07:40 15:39
26	04:57 20:35	05:43 18:39	06:31 18:31	06:19 16:28	07:11 15:43	07:40 15:40
27	04:59 20:33	05:45 18:37	06:32 18:29	06:21 16:26	07:12 15:42	07:40 15:41
28	05:00 20:32	05:46 18:35	06:34 18:27	06:23 16:24	07:13 15:41	07:41 15:41
29	05:01 20:30	05:48 18:33	06:35 18:25	06:24 16:22	07:15 15:41	07:41 15:42
30	05:03 20:29	05:49 18:31	06:37 18:22	06:26 16:21	07:16 15:40	07:41 15:43
31	05:04 20:27	05:51 19:29		06:28 16:19		07:41 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case			269	83		318
Sun reduction			0,34	0,37		0,19
Oper. time red.			0,86	0,86		0,86
Wind dir. red.			0,71	0,71		0,60
Total reduction			0,20	0,22		0,10
Total, real			54	18		31

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

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



## SHADOW - Calendar

**Shadow receptor:** W - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (23)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

		January	February	March		April		May		June	
	1	07:41	07:17	06:26		06:19		05:17		06:07 (21)	04:34
		15:46	16:31	17:20		19:11		19:59	9	06:16 (21)	20:42
	2	07:41	07:15	06:24		06:16		05:15			04:33
		15:47	16:33	17:22		19:13		20:01			20:43
	3	07:41	07:14	06:22		06:14		05:13			04:33
		15:48	16:35	17:23		19:14		20:02			20:44
	4	07:41	07:12	06:20		06:12		05:11			04:32
		15:49	16:36	17:25		19:16		20:04			20:45
	5	07:41	07:11	06:18		06:10		05:09			04:31
		15:50	16:38	17:27		19:17		20:05			20:46
	6	07:41	07:09	06:16		06:08		05:08			04:31
		15:51	16:40	17:29		19:19		20:07			20:47
	7	07:40	07:08	06:13		06:05		05:06			04:30
		15:52	16:42	17:30		19:21		20:08			20:48
	8	07:40	07:06	06:11		06:03		05:04			04:30
		15:54	16:43	17:32		19:22		20:10			20:49
	9	07:39	07:04	06:09		06:01		05:03			04:29
		15:55	16:45	17:34		19:24		20:11			20:50
	10	07:39	07:03	06:07		05:59		05:01			04:29
		15:56	16:47	17:35		19:25		20:13			20:50
	11	07:38	07:01	06:05		05:57		05:00			04:28
		15:58	16:49	17:37		19:27		20:14			20:51
	12	07:38	06:59	06:03		05:55		04:58			04:28
		15:59	16:51	17:39		19:29		20:16			20:52
	13	07:37	06:57	06:00		05:53		04:56			04:28
		16:00	16:52	17:40		19:30		20:17			20:52
	14	07:37	06:55	05:58		05:50		04:55			04:28
		16:02	16:54	17:42		19:32		20:19			20:53
	15	07:36	06:54	05:56		05:48		04:53			04:27
		16:03	16:56	17:43		19:34		20:20			20:53
	16	07:35	06:52	05:54		05:46		04:52			04:27
		16:05	16:58	17:45		19:35		20:22			20:54
	17	07:34	06:50	05:52		05:44		04:51			04:27
		16:06	16:59	17:47		19:37		20:23			20:54
	18	07:33	06:48	05:50		05:42		06:10 (21)			04:27
		16:08	17:01	17:48		19:38	8	06:18 (21)			20:55
	19	07:32	06:46	05:47	06:14 (18)	05:40		06:02 (20)			04:27
		16:09	17:03	17:50	5 06:19 (18)	19:40	14	06:20 (21)			20:55
	20	07:31	06:44	05:45	06:12 (18)	05:38		06:00 (20)			04:27
		16:11	17:05	17:52	10 06:22 (18)	19:42	21	06:21 (21)			20:55
	21	07:30	06:42	05:43	06:10 (18)	05:36		05:59 (20)			04:28
		16:13	17:06	17:53	13 06:23 (18)	19:43	24	06:23 (21)			20:56
	22	07:29	06:40	05:41	06:09 (18)	05:34		05:57 (20)			04:28
		16:14	17:08	17:55	15 06:24 (18)	19:45	26	06:23 (21)			20:56
	23	07:28	06:38	05:38	06:08 (18)	05:32		05:55 (20)			04:28
		16:16	17:10	17:57	15 06:23 (18)	19:46	28	06:23 (21)			20:56
	24	07:27	06:36	05:36	06:07 (18)	05:30		05:55 (20)			04:28
		16:17	17:11	17:58	16 06:23 (18)	19:48	28	06:23 (21)			20:56
	25	07:26	06:34	05:34	06:08 (18)	05:28		05:55 (20)			04:29
		16:19	17:13	18:00	15 06:23 (18)	19:50	28	06:23 (21)			20:56
	26	07:25	06:32	05:32	06:08 (18)	05:26		05:55 (20)			04:29
		16:21	17:15	18:01	14 06:22 (18)	19:51	27	06:22 (21)			20:56
	27	07:24	06:30	05:30	06:08 (18)	05:24		05:57 (20)			04:29
		16:23	17:17	18:03	12 06:20 (18)	19:53	23	06:21 (21)			20:56
	28	07:22	06:28	05:27	06:09 (18)	05:22		06:03 (21)			04:30
		16:24	17:18	18:05	10 06:19 (18)	19:54	17	06:20 (21)			20:56
	29	07:21		06:25		05:20		06:05 (21)			04:30
		16:26		19:06		19:56	15	06:20 (21)			20:56
	30	07:20		06:23		05:18		06:06 (21)			04:31
		16:28		19:08		19:57	12	06:18 (21)			20:56
	31	07:18		06:21				04:35			
		16:29		19:09				20:41			
Potential sun hours		265	280	367		413		479			491
Total, worst case				125		271		9			
Sun reduction				0,31		0,31		0,35			
Oper. time red.				0,86		0,86		0,86			
Wind dir. red.				0,70		0,71		0,71			
Total reduction				0,19		0,19		0,21			
Total, real				23		51		2			

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

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

## SHADOW - Calendar

**Shadow receptor:** W - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (23)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:32 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:30 16:17	07:18 15:39
2	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38
4	04:34 20:55	05:10 20:21	05:57 19:21	06:43 18:14	06:35 16:12	07:22 15:38
5	04:34 20:54	05:12 20:20	05:59 19:18	06:45 18:12	06:36 16:10	07:23 15:37
6	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	07:24 15:37
7	04:36 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:37
8	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:06	07:27 15:36
9	04:38 20:52	05:18 20:13	06:05 19:10	06:51 18:03	06:43 16:04	07:28 15:36
10	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	04:40 20:51	05:21 20:09	06:19 (21) 19:05	06:55 17:59	06:47 16:01	07:30 15:36
12	04:41 20:50	05:22 20:07	06:15 (21) 19:03	06:56 17:56	06:48 16:00	07:31 15:36
13	04:42 20:49	05:24 20:05	06:13 (21) 19:01	06:58 17:54	06:50 15:58	07:32 15:36
14	04:43 20:48	05:25 20:04	06:12 (21) 18:58	07:00 17:52	06:52 15:57	07:33 15:36
15	04:44 20:47	05:27 20:02	06:11 (21) 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	04:45 20:46	05:28 20:00	06:04 (20) 18:54	06:58 (18) 17:48	07:03 15:54	07:35 15:36
17	04:46 20:45	05:30 19:58	06:02 (20) 18:52	06:57 (18) 17:46	07:04 15:53	07:36 15:36
18	04:47 20:44	05:31 19:56	06:01 (20) 18:49	06:55 (18) 17:44	07:06 15:52	07:36 15:36
19	04:49 20:43	05:33 19:54	06:00 (20) 18:47	06:55 (18) 17:42	07:08 15:50	07:37 15:37
20	04:50 20:42	05:34 19:52	06:00 (20) 18:45	06:54 (18) 17:40	07:09 15:49	07:38 15:37
21	04:51 20:41	05:36 19:50	06:02 (20) 18:43	06:54 (18) 17:38	07:11 15:48	07:38 15:37
22	04:52 20:40	05:37 19:48	06:03 (20) 18:40	06:54 (18) 17:36	07:13 15:47	07:39 15:38
23	04:54 20:39	05:39 19:46	06:05 (20) 18:38	06:56 (18) 17:34	07:14 15:46	07:39 15:38
24	04:55 20:37	05:40 19:44	06:06 (20) 18:36	06:57 (18) 17:32	07:16 15:45	07:40 15:39
25	04:56 20:36	05:42 19:42	06:14 (21) 18:34	06:18 16:30	07:09 15:44	07:40 15:40
26	04:58 20:35	05:43 19:40	06:31 18:32	06:19 16:28	07:11 15:43	07:40 15:40
27	04:59 20:33	05:45 19:38	06:33 18:29	06:21 16:26	07:12 15:42	07:41 15:41
28	05:00 20:32	05:47 19:36	06:34 18:27	06:23 16:24	07:14 15:41	07:41 15:42
29	05:02 20:31	05:48 19:33	06:36 18:25	06:24 16:23	07:15 15:41	07:41 15:43
30	05:03 20:29	05:50 19:31	06:37 18:23	06:26 16:21	07:17 15:40	07:41 15:43
31	05:04 20:28	05:51 19:29		06:28 16:19		07:41 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case		285	128			
Sun reduction		0,39	0,34			
Oper. time red.		0,86	0,86			
Wind dir. red.		0,71	0,70			
Total reduction		0,23	0,20			
Total, real		67	26			

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

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

## SHADOW - Calendar

**Shadow receptor:** X - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (24)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 12 05:21 (20)
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 12 05:10 (20)
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:33 11 05:10 (20)
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 9 05:20 (20)
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 8 05:20 (20)
6	07:41 15:51	07:09 16:40	06:16 17:28	06:08 19:19	05:08 20:07	04:31 6 05:19 (20)
7	07:40 15:52	07:08 16:42	06:13 17:30	06:05 19:21	05:06 20:08	04:30 2 05:15 (20)
8	07:40 15:54	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:30 20:49
9	07:39 15:55	07:04 16:45	06:09 17:34	06:01 19:24	05:03 20:11	04:29 20:50
10	07:39 15:56	07:03 16:47	06:07 17:35	05:59 19:25	06:30 (18) 06:41 (18)	05:01 20:13
11	07:38 15:58	07:01 16:49	06:05 17:37	05:57 19:27	06:28 (18) 06:43 (18)	05:00 20:14
12	07:38 15:59	06:59 16:50	06:03 17:39	05:55 19:29	06:17 (19) 06:45 (18)	04:58 20:16
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	06:15 (19) 06:45 (18)	04:56 20:17
14	07:37 16:02	06:55 16:54	05:58 17:42	05:50 19:32	06:13 (19) 06:46 (18)	04:55 20:19
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	06:10 (19) 06:45 (18)	04:53 20:20
16	07:35 16:05	06:52 16:58	05:54 17:45	05:46 19:35	06:08 (19) 06:45 (18)	04:52 20:22
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	06:07 (19) 06:45 (18)	04:51 2 05:16 (20)
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	06:08 (19) 06:45 (18)	2 05:18 (20) 5 05:20 (20)
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	06:11 (19) 06:44 (18)	5 05:13 (20) 7 05:20 (20)
20	07:31 16:11	06:44 17:05	05:45 17:52	05:38 19:41	06:21 (18) 06:44 (18)	7 05:12 (20) 9 05:21 (20)
21	07:30 16:13	06:42 17:06	05:43 17:53	05:36 19:43	06:23 (18) 06:44 (18)	9 05:11 (20) 10 05:21 (20)
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	06:23 (18) 06:42 (18)	10 05:10 (20) 12 05:22 (20)
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	06:24 (18) 06:41 (18)	12 05:09 (20) 13 05:22 (20)
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	06:25 (18) 06:39 (18)	13 05:08 (20) 14 05:22 (20)
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	06:28 (18) 06:36 (18)	14 05:07 (20) 16 05:23 (20)
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	06:30 (18) 06:36 (18)	16 05:07 (20) 16 05:23 (20)
27	07:24 16:22	06:30 17:17	05:30 18:03	05:24 19:53	06:31 (18) 06:37 (18)	16 05:07 (20) 15 05:22 (20)
28	07:22 16:24	06:28 17:18	05:27 18:05	05:22 19:54	06:32 (18) 06:38 (18)	15 05:07 (20) 15 05:22 (20)
29	07:21 16:26		06:25 19:06	05:20 19:56	06:33 (18) 06:39 (18)	15 05:07 (20) 15 05:22 (20)
30	07:20 16:28		06:23 19:08	05:18 19:57	06:34 (18) 06:40 (18)	14 05:08 (20) 14 05:22 (20)
31	07:18 16:29		06:21 19:09		06:35 (18) 06:41 (18)	13 05:09 (20) 13 05:22 (20)
Potential sun hours	265	280	367	413	479	491
Total, worst case				355	176	60
Sun reduction				0,31	0,35	0,32
Oper. time red.				0,86	0,86	0,86
Wind dir. red.				0,71	0,69	0,69
Total reduction				0,19	0,21	0,19
Total, real				67	36	11

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

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

## SHADOW - Calendar

**Shadow receptor:** X - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (24)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:32		05:06		05:53		06:27 (18)		06:39		07:18
	20:56		20:26		19:27	15	06:42 (18)		18:20		15:39
2	04:32		05:07		05:54		06:28 (18)		06:40		07:19
	20:55		20:24		19:25	11	06:39 (18)		18:18		15:39
3	04:33		05:09		05:56		06:33 (18)		06:42		07:21
	20:55		20:23		19:23	1	06:34 (18)		18:16		15:38
4	04:34		05:10		05:57				06:43		07:22
	20:55		20:21		19:20				18:14		15:38
5	04:34		05:12		05:59				06:45		07:23
	20:54		20:20		19:18				18:12		15:37
6	04:35		05:13		06:00				06:47		07:24
	20:54	4	05:24 (20)		19:16				18:09		15:37
7	04:36		05:15		06:02				06:48		07:26
	20:53	7	05:26 (20)		19:14				18:07		15:37
8	04:37		05:16		06:03				06:50		07:27
	20:53	9	05:27 (20)		19:12				18:05		15:36
9	04:38		05:18		06:05				06:51		07:28
	20:52	10	05:28 (20)		19:09				18:03		15:36
10	04:39		05:19		06:06				06:53		07:29
	20:51	11	05:29 (20)		19:07				18:01		15:36
11	04:40		05:21		06:08				06:55		07:30
	20:51	13	05:30 (20)		19:05				17:59		15:36
12	04:41		05:22		06:09				06:56		07:31
	20:50	13	05:30 (20)		19:03				17:56		15:36
13	04:42		05:24		06:11				06:58		07:32
	20:49	14	05:31 (20)		19:01				17:54		15:36
14	04:43		05:25		06:12				06:59		07:33
	20:48	14	05:31 (20)		18:58				17:52		15:36
15	04:44		05:27		06:14				07:01		07:34
	20:47	16	05:32 (20)		18:56				17:50		15:36
16	04:45		05:28		06:16				07:03		07:35
	20:46	16	05:32 (20)		18:54				17:48		15:36
17	04:46		05:30		06:17				07:04		07:36
	20:45	16	05:32 (20)		18:52				17:46		15:36
18	04:47		05:31		06:19				07:06		07:36
	20:44	16	05:32 (20)	9	06:43 (18)				17:44		15:36
19	04:49		05:33		06:20				07:08		07:37
	20:43	15	05:32 (20)	14	06:45 (18)				17:42		15:37
20	04:50		05:34		06:29 (18)				07:09		07:38
	20:42	14	05:32 (20)	17	06:46 (18)				17:40		15:37
21	04:51		05:36		06:28 (18)				07:11		07:38
	20:41	13	05:33 (20)	19	06:47 (18)				17:38		15:37
22	04:52		05:37		06:26 (18)				07:13		07:39
	20:40	11	05:32 (20)	21	06:47 (18)				17:36		15:38
23	04:54		05:39		06:26 (18)				07:14		07:39
	20:39	10	05:32 (20)	22	06:48 (18)				17:34		15:38
24	04:55		05:40		06:14 (19)				07:16		07:40
	20:37	8	05:31 (20)	26	06:48 (18)				17:32		15:39
25	04:56		05:42		06:12 (19)				06:18		07:09
	20:36	6	05:30 (20)	32	06:49 (18)				16:30		15:40
26	04:58		05:43		06:10 (19)				06:19		07:11
	20:35	4	05:30 (20)	34	06:48 (18)				16:28		15:40
27	04:59		05:45		06:11 (19)				06:21		07:12
	20:33	1	05:28 (20)	33	06:48 (18)				16:26		15:41
28	05:00		05:47		06:12 (19)				06:23		07:14
	20:32		19:35	31	06:47 (18)				16:24		15:42
29	05:02		05:48		06:14 (19)				06:24		07:15
	20:31		19:33	28	06:47 (18)				16:23		15:43
30	05:03		05:50		06:15 (19)				06:26		07:17
	20:29		19:31	24	06:45 (18)				16:21		15:43
31	05:04		05:51		06:16 (19)				06:28		07:18
	20:28		19:29	19	06:43 (18)				16:19		15:44
Potential sun hours	495		450		380				334		251
Total, worst case	241		329		27						
Sun reduction	0,36		0,39		0,34						
Oper. time red.	0,86		0,86		0,86						
Wind dir. red.	0,69		0,71		0,71						
Total reduction	0,21		0,23		0,21						
Total, real	51		77		6						

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

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

## SHADOW - Calendar

**Shadow receptor:** Y - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (25)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	05:01 (19) 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:30 16:17	07:18 15:39
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 20:43	05:01 (19) 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:33 20:44	05:00 (19) 20:55	05:05 (19) 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:59 (19) 20:55	05:10 20:21	05:57 19:20	06:43 18:14	06:35 16:12	07:22 15:38
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:59 (19) 20:54	05:12 20:20	05:59 19:18	06:45 18:12	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:16 17:28	06:08 19:19	05:08 20:07	04:31 20:47	04:58 (19) 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	07:24 15:37
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48	04:59 (19) 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:37
8	07:40 15:54	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:30 20:49	05:00 (19) 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:06	07:27 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:50	05:00 (19) 20:52	05:18 20:13	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	05:00 (19) 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	07:38 15:58	07:01 16:49	06:05 17:37	05:57 19:27	05:04 20:14	04:28 20:51	05:01 (19) 20:51	05:19 20:09	06:08 19:05	06:55 17:59	06:46 16:01	07:30 15:36
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	05:08 20:16	04:28 20:52	05:01 (19) 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:36
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	05:06 20:17	04:28 20:52	05:01 (19) 20:49	05:24 20:05	06:11 19:01	06:58 17:54	06:50 15:58	07:32 15:36
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	05:05 20:19	04:28 20:53	05:02 (19) 20:48	05:25 20:04	06:12 18:58	06:59 17:52	06:52 15:57	07:33 15:36
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	05:03 20:20	04:27 20:53	05:02 (19) 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	07:35 16:05	06:52 16:58	05:54 17:45	05:46 19:35	05:02 20:22	04:27 20:54	05:02 (19) 20:46	05:28 20:00	06:16 18:54	07:03 17:48	06:55 15:54	07:35 15:36
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	05:01 20:23	04:27 20:54	05:03 (19) 20:45	05:30 20:05	06:17 18:52	07:04 17:46	06:56 15:53	07:35 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	05:00 20:25	04:27 20:55	05:03 (19) 20:44	05:31 20:05	06:19 18:49	07:06 17:44	06:58 15:52	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	05:00 20:26	04:27 20:55	05:03 (19) 20:43	05:33 20:05	06:20 18:47	07:08 17:42	07:00 15:50	07:37 15:37
20	07:31 16:11	06:44 17:05	05:45 17:52	05:38 19:41	05:00 20:27	04:27 20:55	05:03 (19) 20:42	05:34 20:05	06:22 18:45	07:09 17:40	07:01 15:49	07:38 15:37
21	07:30 16:13	06:42 17:06	05:43 17:53	05:36 19:43	05:00 20:29	04:28 20:56	05:04 (19) 20:41	05:36 20:05	06:23 18:43	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	05:00 20:30	04:28 20:56	05:04 (19) 20:40	05:37 20:05	06:25 18:40	07:13 17:36	07:05 15:47	07:39 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	05:00 20:31	04:28 20:56	05:04 (19) 20:39	05:39 20:05	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	05:00 20:33	04:28 20:56	05:04 (19) 20:37	05:40 20:05	06:28 18:36	07:16 17:32	07:08 15:45	07:40 15:39
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	05:00 20:34	04:29 20:56	05:05 (19) 20:36	05:42 20:05	06:29 18:34	06:18 17:30	07:09 15:44	07:40 15:40
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	05:00 20:35	04:29 20:56	05:05 (19) 20:35	05:43 20:05	06:31 18:31	06:19 17:28	07:11 15:43	07:40 15:40
27	07:24 16:22	06:30 17:17	05:30 18:03	05:24 19:53	05:00 20:36	04:29 20:56	05:05 (19) 20:33	05:45 20:05	06:32 18:29	06:21 17:26	07:12 15:42	07:41 15:41
28	07:22 16:24	06:28 17:18	05:27 18:05	05:22 19:54	05:00 20:38	04:30 20:56	05:05 (19) 20:32	05:47 20:05	06:34 18:27	06:23 17:24	07:14 15:41	07:41 15:42
29	07:21 16:26	06:25 17:16	05:20 18:06	05:20 19:56	05:00 20:39	04:30 20:56	05:05 (19) 20:30	05:48 20:05	06:36 18:25	06:24 17:23	07:15 15:41	07:41 15:43
30	07:20 16:28	06:23 17:18	05:18 18:08	05:18 19:57	05:00 20:40	04:31 20:56	05:05 (19) 20:29	05:50 20:05	06:37 18:23	06:26 17:21	07:17 15:40	07:41 15:43
31	07:18 16:29	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09	06:21 19:09
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case					35	316	171					
Sun reduction					0,35	0,32	0,36					
Oper. time red.					0,86	0,86	0,86					
Wind dir. red.					0,70	0,70	0,70					
Total reduction					0,21	0,19	0,21					
Total, real					7	60	37					

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

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

## SHADOW - Calendar

**Shadow receptor:** Z - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (26)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	04:32 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:21 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:34 20:55	05:10 20:21	05:57 19:20	06:43 18:14	06:35 16:12	07:22 15:38
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:20	05:59 19:18	06:45 18:12	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:16 17:28	06:08 19:19	05:08 20:07	04:31 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:47 18:09	06:38 16:09	07:24 15:37
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48	04:36 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:26 15:36
8	07:40 15:54	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:30 20:49	04:37 20:53	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05	07:27 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49	04:38 20:52	05:18 20:13	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:40 20:51	05:21 20:09	06:08 19:05	06:55 17:59	06:46 16:01	07:30 15:36
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	04:58 20:16	04:28 20:52	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:36
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:24 20:05	06:11 19:01	06:58 17:54	06:50 15:58	07:32 15:36
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	04:43 20:48	05:25 20:04	06:12 18:58	06:59 17:52	06:52 15:57	07:33 15:36
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:27 20:02	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	07:35 16:05	06:52 16:58	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54	04:45 20:46	05:28 20:00	06:16 18:54	07:03 17:48	06:55 15:54	07:35 15:36
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	04:51 20:23	04:27 20:56	04:46 20:45	05:30 20:58	06:17 18:52	07:04 17:46	06:56 15:53	07:35 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:25	04:27 20:55	04:47 20:44	05:31 20:56	06:19 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:49 20:43	05:33 20:54	06:20 18:47	07:08 17:42	07:00 15:50	07:37 15:37
20	07:31 16:11	06:44 17:04	05:45 17:52	05:38 19:41	04:47 20:27	04:27 20:55	04:50 20:42	05:34 20:52	06:22 18:45	07:09 17:40	07:01 15:49	07:38 15:37
21	07:30 16:13	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:28 20:56	04:51 20:41	05:36 20:50	06:23 18:43	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	04:44 20:30	04:28 20:56	04:52 20:40	05:37 20:48	06:25 18:40	07:13 17:36	07:05 15:47	07:39 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:54 20:39	05:39 20:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:28 20:56	04:55 20:37	05:40 20:44	06:28 18:36	07:16 17:32	07:08 15:45	07:40 15:39
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:41 20:34	04:29 20:56	04:56 20:36	05:42 20:42	06:29 18:34	07:18 17:30	07:10 15:44	07:40 15:40
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:40 20:35	04:29 20:56	04:58 20:35	05:43 20:40	06:31 18:31	07:19 17:28	07:11 15:43	07:40 15:40
27	07:24 16:22	06:30 17:17	05:30 18:03	05:24 19:53	04:39 20:36	04:29 20:56	04:59 20:33	05:45 20:38	06:32 18:29	07:21 17:26	07:12 15:42	07:41 15:41
28	07:22 16:24	06:28 17:18	05:27 18:05	05:22 19:54	04:38 20:38	04:30 20:56	05:00 20:32	05:46 20:35	06:34 18:27	07:23 17:24	07:14 15:41	07:41 15:42
29	07:21 16:26		06:25 19:06	05:20 19:56	04:37 20:39	04:30 20:56	05:02 20:30	05:48 20:33	06:36 18:25	07:24 17:25	07:15 15:41	07:41 15:43
30	07:20 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:56	05:03 20:29	05:50 20:31	06:37 18:23	07:26 17:21	07:17 15:40	07:41 15:43
31	07:18 16:29		06:21 19:09		04:35 20:41		05:04 20:27	05:51 20:29		06:28 16:19		07:41 15:44
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case				61	91		90	63				
Sun reduction				0,31	0,35		0,36	0,39				
Oper. time red.				0,86	0,86		0,86	0,86				
Wind dir. red.				0,71	0,69		0,69	0,71				
Total reduction				0,19	0,21		0,21	0,23				
Total, real				11	19		19	15				

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

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



## SHADOW - Calendar

**Shadow receptor:** AA - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (27)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	05:55 (17) 06:02 (17)
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:13	05:15 20:01	04:33 20:43
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46
6	07:40 15:51	07:09 16:40	06:16 17:28	06:07 19:19	05:08 20:07	04:31 20:47
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:21	05:06 20:08	04:30 20:48
8	07:40 15:54	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:30 20:49
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	04:58 20:16	04:28 20:52
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:22	04:27 20:54
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	04:51 20:23	04:27 20:54
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:25	04:27 20:55
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55
20	07:31 16:11	06:44 17:04	05:45 17:52	05:38 19:41	04:47 20:27	04:27 20:55
21	07:30 16:13	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:28 20:56
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	04:44 20:30	04:28 20:56
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:28 20:56
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:41 20:34	04:29 20:56
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:40 20:35	04:29 20:56
27	07:23 16:22	06:30 17:17	05:29 18:03	05:24 19:53	04:38 20:36	04:29 20:56
28	07:22 16:24	06:28 17:18	05:27 18:05	05:22 19:54	04:38 20:38	04:30 20:56
29	07:21 16:26		06:25 19:06	05:20 19:56	04:37 20:39	04:30 20:56
30	07:20 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:56
31	07:18 16:29		06:21 19:09		04:35 20:41	
Potential sun hours	265	280	367	413	479	491
Total, worst case				118	7	122
Sun reduction				0,31	0,35	0,32
Oper. time red.				0,86	0,86	0,86
Wind dir. red.				0,70	0,70	0,70
Total reduction				0,19	0,21	0,19
Total, real				22	1	23

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

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

## SHADOW - Calendar

**Shadow receptor:** AA - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (27)

### Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:32	05:01 (22)	05:06	05:53	06:39	06:29	07:18				
	20:56	4 05:05 (22)	20:26	19:27	18:20	16:17	15:39				
2	04:32	05:01 (22)	05:07	05:54	06:40	06:31	07:19				
	20:55	3 05:04 (22)	20:24	19:25	18:18	16:15	15:39				
3	04:33	05:02 (22)	05:09	05:56	06:42	06:33	07:21				
	20:55	2 05:04 (22)	20:23	19:23	18:16	16:14	15:38				
4	04:34		05:10	05:57	06:43	06:35	07:22				
	20:55		20:21	19:20	18:14	16:12	15:38				
5	04:34		05:12	05:59	06:45	06:36	07:23				
	20:54		20:20	19:18	18:12	16:10	15:37				
6	04:35		05:13	06:00	06:47	06:38	07:24				
	20:54		20:18	19:16	18:09	16:09	15:37				
7	04:36		05:15	06:02	06:48	06:40	07:26				
	20:53		20:16	19:14	18:07	16:07	15:36				
8	04:37		05:16	06:03	06:50	06:41	07:27				
	20:53		20:14	19:12	18:05	16:05	15:36				
9	04:38		05:18	06:05	06:51	06:43	07:28				
	20:52		20:13	19:09	18:03	16:04	15:36				
10	04:39		05:19	06:06	06:53	06:45	07:29				
	20:51		20:11	19:07	18:01	16:02	15:36				
11	04:40		05:21	06:08	06:55	06:46	07:30				
	20:51		20:09	19:05	17:59	16:01	15:36				
12	04:41		05:22	06:03 (17)	06:09	06:56	07:31				
	20:50		8 20:07	06:11 (17)	19:03	17:56	15:36				
13	04:42		05:24	06:01 (17)	06:11	06:58	07:32				
	20:49		20:05	11 06:12 (17)	19:01	17:54	15:36				
14	04:43		05:25	06:00 (17)	06:12	06:59	07:33				
	20:48		20:04	13 06:13 (17)	18:58	17:52	15:36				
15	04:44		05:27	05:59 (17)	06:14	07:01	07:34				
	20:47		20:02	14 06:13 (17)	18:56	17:50	15:36				
16	04:45		05:28	05:59 (17)	06:16	07:03	07:35				
	20:46		20:00	15 06:14 (17)	18:54	17:48	15:36				
17	04:46		05:30	05:58 (17)	06:17	07:04	07:35				
	20:45		19:58	15 06:13 (17)	18:52	17:46	15:36				
18	04:47		05:31	05:59 (17)	06:19	07:06	07:36				
	20:44		19:56	14 06:13 (17)	18:49	17:44	15:36				
19	04:49		05:33	05:59 (17)	06:20	07:08	07:37				
	20:43		19:54	13 06:12 (17)	18:47	17:42	15:37				
20	04:50		05:34	06:00 (17)	06:22	07:09	07:38				
	20:42		19:52	11 06:11 (17)	18:45	17:40	15:37				
21	04:51		05:36	06:02 (17)	06:23	07:11	07:38				
	20:41		19:50	8 06:10 (17)	18:43	17:38	15:37				
22	04:52		05:37	06:03 (17)	06:25	07:13	07:39				
	20:40		19:48	4 06:07 (17)	18:40	17:36	15:38				
23	04:54		05:39		06:26	07:14	07:39				
	20:39		19:46		18:38	17:34	15:38				
24	04:55		05:40		06:28	07:16	07:40				
	20:37		19:44		18:36	17:32	15:39				
25	04:56		05:42		06:29	06:18	07:09				
	20:36		19:42		18:34	16:30	15:39				
26	04:57		05:43		06:31	06:19	07:11				
	20:35		19:40		18:31	16:28	15:40				
27	04:59		05:45		06:32	06:21	07:12				
	20:33		19:38		18:29	16:26	15:41				
28	05:00		05:46		06:34	06:23	07:14				
	20:32		19:35		18:27	16:24	15:41				
29	05:02		05:48		06:36	06:24	07:15				
	20:30		19:33		18:25	16:23	15:41				
30	05:03		05:50		06:37	06:26	07:16				
	20:29		19:31		18:23	16:21	15:40				
31	05:04		05:51			06:28	07:17				
	20:27		19:29			16:19	15:44				
Potential sun hours	495		450		380	334	271		251		
Total, worst case		9		126							
Sun reduction		0,36		0,39							
Oper. time red.		0,86		0,86							
Wind dir. red.		0,70		0,70							
Total reduction		0,22		0,23							
Total, real		2		29							

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

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

**Shadow receptor:** AB - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (28)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	
1	07:41	07:17	06:26	06:49 (15)	06:18	05:17	04:34 05:29 (17)
	15:46	16:31	17:20	7 06:56 (15)	19:11	19:59	20:42 16 05:45 (17)
2	07:41	07:15	06:24	06:50 (15)	06:16	05:15	04:33 05:30 (17)
	15:47	16:33	17:22	3 06:53 (15)	19:13	20:00	20:43 15 05:45 (17)
3	07:41	07:14	06:22		06:14	05:13	04:32 05:30 (17)
	15:48	16:35	17:23		19:14	20:02	20:44 14 05:44 (17)
4	07:41	07:12	06:20		06:12	05:11	04:32 05:31 (17)
	15:49	16:36	17:25		19:16	20:04	20:45 12 05:43 (17)
5	07:41	07:11	06:18		06:10	05:09	04:31 05:32 (17)
	15:50	16:38	17:27		19:17	20:05	20:46 11 05:43 (17)
6	07:40	07:09	06:16		06:07	05:08	04:31 05:33 (17)
	15:51	16:40	17:28		19:19	20:07	20:47 9 05:42 (17)
7	07:40	07:07	06:13		06:05	05:06	04:30 05:35 (17)
	15:52	16:42	17:30		19:21	20:08	20:48 6 05:41 (17)
8	07:40	07:06	06:11		06:03	05:04	04:30 05:37 (17)
	15:53	16:43	17:32		19:22	20:10	20:49 3 05:40 (17)
9	07:39	07:04	06:09		06:01	05:03	04:29
	15:55	16:45	17:33		19:24	20:11	20:49
10	07:39	07:02	06:07		05:59	05:01	04:29
	15:56	16:47	17:35		19:25	20:13	20:50
11	07:38	07:01	06:05		05:57	04:59	05:34 (17) 04:28
	15:57	16:49	17:37		19:27	20:14	05:38 (17) 20:51
12	07:38	06:59	06:03		05:55	04:58	05:31 (17) 04:28
	15:59	16:50	17:38		19:29	20:16	10 05:41 (17) 20:52
13	07:37	06:57	06:00		05:52	04:56	05:21 (23) 04:28
	16:00	16:52	17:40		19:30	20:17	16 05:42 (17) 20:52
14	07:36	06:55	05:58		05:50	04:55	05:20 (23) 04:28
	16:02	16:54	17:42		19:32	20:19	22 05:44 (17) 20:53
15	07:36	06:54	05:56		05:48	04:53	05:18 (23) 04:27
	16:03	16:56	17:43		19:33	20:20	25 05:44 (17) 20:53
16	07:35	06:52	05:54		05:46	04:52	05:17 (23) 04:27
	16:05	16:57	17:45		19:35	20:22	28 05:45 (17) 20:54
17	07:34	06:50	05:52		05:44	04:51	05:16 (23) 04:27
	16:06	16:59	17:47		19:37	20:23	30 05:46 (17) 20:54
18	07:33	06:48	05:49		05:42	04:49	05:15 (23) 04:27
	16:08	17:01	17:48		19:38	20:25	31 05:46 (17) 20:55
19	07:32	06:46	05:47		05:40	04:48	05:13 (23) 04:27
	16:09	17:03	17:50		19:40	20:26	33 05:46 (17) 20:55
20	07:31	06:44	05:45		05:38	04:47	05:13 (23) 04:27
	16:11	17:04	17:52		19:41	20:27	33 05:46 (17) 20:55
21	07:30	06:42	05:43		05:36	04:45	05:14 (23) 04:28
	16:12	17:06	17:53		19:43	20:29	33 05:47 (17) 20:56
22	07:29	06:40	05:41		05:34	04:44	05:14 (23) 04:28
	16:14	17:08	17:55		19:45	20:30	33 05:47 (17) 20:56
23	07:28	06:38	05:38		05:32	04:43	05:15 (23) 04:28
	16:16	17:10	17:56		19:46	20:31	32 05:47 (17) 20:56
24	07:27	06:36	05:36		05:30	04:42	05:15 (23) 04:28
	16:17	17:11	17:58		19:48	20:33	32 05:47 (17) 20:56
25	07:26	06:34	05:34		05:28	04:41	05:16 (23) 04:29
	16:19	17:13	18:00		19:49	20:34	31 05:47 (17) 20:56
26	07:25	06:32	06:55 (15) 05:32		05:26	04:39	05:17 (23) 04:29
	16:21	17:15	3 06:58 (15) 18:01		19:51	20:35	29 05:47 (17) 20:56
27	07:23	06:30	06:53 (15) 05:29		05:24	04:38	05:19 (23) 04:29
	16:22	17:17	5 06:58 (15) 18:03		19:53	20:36	24 05:46 (17) 20:56
28	07:22	06:28	06:51 (15) 05:27		05:22	04:37	05:27 (17) 04:30
	16:24	17:18	6 06:57 (15) 18:04		19:54	20:38	19 05:46 (17) 20:56
29	07:21		06:25		05:20	04:37	05:27 (17) 04:30
	16:26		19:06		19:56	20:39	19 05:46 (17) 20:56
30	07:20		06:23		05:18	04:36	05:28 (17) 04:31
	16:28		19:08		19:57	20:40	18 05:46 (17) 20:56
31	07:18		06:21			04:35	05:28 (17)
	16:29		19:09			20:41	17 05:45 (17)
Potential sun hours	265	280	367	413	479		491
Total, worst case		14	10		519		86
Sun reduction		0,31	0,31		0,35		0,32
Oper. time red.		0,86	0,86		0,86		0,86
Wind dir. red.		0,65	0,65		0,69		0,68
Total reduction		0,17	0,17		0,20		0,19
Total, real		2	2		106		16

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

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

## SHADOW - Calendar

**Shadow receptor:** AB - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (28)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:32		05:06	05:42 (17)	05:53		06:39		06:29		07:18
	20:56		20:26	9 05:51 (17)	19:27		18:20		16:17		15:39
2	04:32		05:07		05:54		06:40		06:31		07:19
	20:55		20:24		19:25		18:18		16:15		15:39
3	04:33		05:09		05:56		06:42		06:33		07:21
	20:55		20:23		19:23		18:16		16:14		15:38
4	04:34		05:10		05:57		06:43		06:35		07:22
	20:55		20:21		19:20		18:14		16:12		15:38
5	04:34		05:12		05:59		06:45		06:36		07:23
	20:54	6	05:47 (17)		19:18		18:11		16:10		15:37
6	04:35		05:13		06:00		06:47		06:38		07:24
	20:54	8	05:48 (17)		19:16		18:09		16:09		15:37
7	04:36		05:15		06:02		06:48		06:40		07:26
	20:53	10	05:49 (17)		19:14		18:07		16:07		15:36
8	04:37		05:16		06:03		06:50		06:41		07:27
	20:53	11	05:50 (17)		19:12		18:05		16:05		15:36
9	04:38		05:18		06:05		06:51		06:43		07:28
	20:52	13	05:51 (17)		19:09		18:03		16:04		15:36
10	04:39		05:19		06:06		06:53		06:45		07:29
	20:51	14	05:52 (17)		19:07		18:01		16:02		15:36
11	04:40		05:21		06:08		06:55		06:46		07:30
	20:51	16	05:53 (17)		19:05		17:59		16:01		15:36
12	04:41		05:22		06:09		06:56		06:48		07:31
	20:50	17	05:54 (17)		19:03		17:56	6 07:22 (15)	06:48		07:31
13	04:42		05:24		06:11		06:58		06:50		07:32
	20:49	17	05:54 (17)		19:01		17:54	7 07:30 (15)	15:58		15:35
14	04:43		05:25		06:12		06:59		06:51		07:33
	20:48	19	05:55 (17)		18:58		17:52	6 07:30 (15)	15:57		15:36
15	04:44		05:27		06:14		07:01		06:53		07:34
	20:47	19	05:55 (17)		18:56		17:50	4 07:30 (15)	15:55		15:36
16	04:45		05:28		06:15		07:03		06:55		07:35
	20:46	23	05:56 (17)		18:54		17:48	2 07:28 (15)	15:54		15:36
17	04:46		05:30		06:17		07:04		06:56		07:35
	20:45	27	05:56 (17)		18:52		17:46		15:53		15:36
18	04:47		05:31		06:19		07:06		06:58		07:36
	20:44	30	05:56 (17)		18:49		17:44		15:51		15:36
19	04:48		05:33		06:20		07:08		07:00		07:37
	20:43	31	05:56 (17)		18:47		17:42		15:50		15:37
20	04:50		05:34		06:22		07:09		07:01		07:37
	20:42	31	05:56 (17)		18:45		17:40		15:49		15:37
21	04:51		05:36		06:23		07:11		07:03		07:38
	20:41	32	05:56 (17)		18:43		17:38		15:48		15:37
22	04:52		05:37		06:25		07:13		07:04		07:39
	20:40	32	05:57 (17)		18:40		17:36		15:47		15:38
23	04:54		05:39		06:26		07:14		07:06		07:39
	20:39	33	05:57 (17)		18:38		17:34		15:46		15:38
24	04:55		05:40		06:28		07:16		07:08		07:40
	20:37	33	05:57 (17)		18:36		17:32		15:45		15:39
25	04:56		05:42		06:29		06:18		07:09		07:40
	20:36	32	05:56 (17)		18:34		16:30		15:44		15:39
26	04:57		05:43		06:31		06:19		07:11		07:40
	20:35	31	05:57 (17)		18:31		16:28		15:43		15:40
27	04:59		05:45		06:32		06:21		07:12		07:41
	20:33	29	05:56 (17)		18:29		16:26		15:42		15:41
28	05:00		05:46		06:34		06:23		07:14		07:41
	20:32	27	05:55 (17)		18:27		16:24		15:41		15:42
29	05:02		05:48		06:36		06:24		07:15		07:41
	20:30	24	05:55 (17)		18:25		16:23		15:41		15:42
30	05:03		05:50		06:37		06:26		07:16		07:41
	20:29	20	05:54 (17)		18:23		16:21		15:40		15:43
31	05:04		05:51				06:28				07:41
	20:27	14	05:52 (17)				16:19				15:44
Potential sun hours	495		450		380		334		271		251
Total, worst case	599		9				25				
Sun reduction	0,36		0,39				0,37				
Oper. time red.	0,86		0,86				0,86				
Wind dir. red.	0,69		0,68				0,65				
Total reduction	0,21		0,23				0,20				
Total, real	126		2				5				

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

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

## SHADOW - Calendar

**Shadow receptor:** AC - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (29)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	06:40 (16) 19:59	04:34 20:42	04:31 20:56	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:13	06:38 (16) 19:59	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	07:16 (15) 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	06:36 (16) 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:34 (16) 18:16	07:13 (15) 16:14	07:21 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	06:34 (16) 20:04	04:32 20:45	04:34 20:55	05:10 20:21	05:57 19:20	06:31 (16) 18:14	07:12 (15) 16:12	07:22 15:38
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	06:34 (16) 20:05	04:31 20:46	04:34 20:54	05:12 20:19	05:59 19:18	06:30 (16) 18:11	07:10 (15) 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	06:33 (16) 20:07	04:31 20:47	04:35 20:54	05:13 20:18	06:00 19:16	06:29 (16) 18:09	07:11 (15) 16:09	07:24 15:37
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:21	06:33 (16) 20:08	04:30 20:48	04:36 20:53	05:15 20:16	06:02 19:14	06:29 (16) 18:07	07:13 (15) 16:07	07:26 15:36
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	06:34 (16) 20:10	04:30 20:49	04:37 20:53	06:03 20:14	06:03 19:12	06:28 (16) 18:05	07:14 (15) 16:05	07:27 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	06:36 (16) 20:11	04:29 20:49	04:38 20:52	06:05 20:13	06:05 19:09	06:30 (16) 18:03	07:16 (15) 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	06:34 (15) 20:13	04:29 20:50	04:39 20:51	06:06 20:11	06:06 19:07	06:31 (16) 18:01	07:18 (15) 16:02	07:29 15:36
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	06:36 (15) 20:14	04:28 20:51	04:40 20:51	06:08 20:09	06:08 19:05	06:33 (16) 17:59	07:20 (15) 16:01	07:30 15:36
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	06:44 (15) 20:16	04:28 20:52	04:41 20:50	06:09 20:07	06:09 19:03	06:37 (16) 17:56	07:21 (15) 15:59	07:31 15:36
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	06:44 (15) 20:17	04:28 20:52	04:42 20:49	06:11 20:05	06:11 19:01	06:38 (16) 17:54	07:22 (15) 15:58	07:32 15:35
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	06:44 (15) 20:19	04:28 20:53	04:43 20:48	06:12 20:03	06:12 18:58	06:39 (16) 17:52	07:23 (15) 15:57	07:33 15:36
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	06:44 (15) 20:20	04:27 20:53	04:44 20:47	06:14 20:02	06:14 18:56	06:40 (16) 17:50	07:24 (15) 15:55	07:34 15:36
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	06:44 (15) 20:22	04:27 20:54	04:45 20:46	06:15 20:00	06:15 18:54	06:41 (16) 17:48	07:25 (15) 15:54	07:35 15:36
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	06:44 (15) 20:23	04:27 20:54	04:46 20:45	06:17 19:58	06:17 18:52	06:42 (16) 17:46	07:26 (15) 15:53	07:36 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	06:44 (15) 20:24	04:27 20:55	04:47 20:44	06:19 19:56	06:19 18:49	06:43 (16) 17:44	07:27 (15) 15:51	07:37 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	06:44 (15) 20:26	04:27 20:55	04:48 20:43	06:20 19:54	06:20 18:47	06:44 (16) 17:42	07:28 (15) 15:50	07:38 15:37
20	07:31 16:11	06:44 17:04	05:45 17:52	05:38 19:41	06:44 (15) 20:27	04:27 20:55	04:50 20:42	06:22 19:52	06:22 18:45	06:45 (16) 17:40	07:29 (15) 15:49	07:39 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	06:44 (15) 20:29	04:28 20:56	04:51 20:41	06:23 19:50	06:23 18:43	06:46 (16) 17:38	07:30 (15) 15:48	07:40 15:37
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	06:44 (15) 20:30	04:28 20:56	04:52 20:40	06:25 19:48	06:25 18:40	06:47 (16) 17:36	07:31 (15) 15:47	07:41 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	06:44 (15) 20:31	04:28 20:56	04:53 20:39	06:26 19:46	06:26 18:38	06:48 (16) 17:34	07:32 (15) 15:46	07:42 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	06:44 (15) 20:33	04:28 20:56	04:55 20:37	06:28 19:44	06:28 18:36	06:49 (16) 17:32	07:33 (15) 15:45	07:43 15:39
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	06:44 (15) 20:34	04:29 20:56	04:56 20:36	06:29 19:42	06:29 18:34	06:50 (16) 17:30	07:34 (15) 15:44	07:44 15:39
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	06:44 (15) 20:35	04:29 20:56	04:57 20:35	06:31 19:40	06:31 18:31	06:51 (16) 17:28	07:35 (15) 15:43	07:45 15:40
27	07:23 16:22	06:30 17:17	05:29 18:03	05:24 19:53	06:44 (15) 20:36	04:29 20:56	04:59 20:33	06:32 19:38	06:32 18:29	06:52 (16) 17:26	07:36 (15) 15:42	07:46 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	06:44 (15) 20:37	04:30 20:56	04:30 20:52	06:34 19:35	06:34 18:27	06:53 (16) 17:24	07:37 (15) 15:41	07:47 15:42
29	07:21 16:26	06:25 17:16	05:25 18:06	05:20 19:56	06:44 (15) 20:39	04:30 20:56	05:02 20:30	06:36 19:33	06:36 18:25	06:54 (16) 17:23	07:38 (15) 15:41	07:48 15:42
30	07:19 16:28	06:23 17:18	05:23 18:08	05:18 19:57	06:44 (15) 20:40	04:31 20:56	05:03 20:29	06:37 19:31	06:37 18:22	06:55 (16) 17:21	07:39 (15) 15:40	07:49 15:43
31	07:18 16:29	06:21 17:19	05:21 18:09	05:17 19:57	06:44 (15) 20:41	04:32 20:57	05:04 20:27	06:38 19:29	06:38 18:19	06:56 (16) 17:20	07:40 (15) 15:41	07:50 15:44
Potential sun hours	265	280	367	413	479	491	495	450	380	334	271	251
Total, worst case			79	84					86	81		
Sun reduction			0,31	0,31					0,34	0,37		
Oper. time red.			0,86	0,86					0,86	0,86		
Wind dir. red.			0,67	0,71					0,71	0,67		
Total reduction			0,18	0,19					0,21	0,21		
Total, real			14	16					18	17		

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

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

## SHADOW - Calendar

**Shadow receptor:** AD - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (30)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	06:43 (15) 06:59 (15)	05:17 19:59
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:13	06:42 (15) 07:00 (15)	05:15 20:00
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	06:42 (15) 07:00 (15)	05:13 20:02
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	06:42 (15) 07:00 (15)	05:11 20:04
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	06:42 (15) 06:59 (15)	05:09 20:05
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	06:42 (15) 06:57 (15)	05:08 20:07
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:21	06:42 (15) 06:56 (15)	05:06 20:08
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	06:44 (15) 06:54 (15)	05:04 20:10
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	06:46 (15) 06:51 (15)	05:03 20:11
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:59 20:15
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	05:37 (16) 20:51
12	07:38 15:59	06:59 16:50	06:03 17:38	05:55 19:29	04:58 20:16	05:38 (16) 20:52
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	05:38 (16) 20:52
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	05:39 (16) 20:53
15	07:36 16:03	06:54 16:56	05:56 17:43	05:48 19:33	04:53 20:20	05:41 (16) 20:53
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:22	04:47 20:54
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	04:51 20:23	04:47 20:54
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:47 20:55
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:47 20:55
20	07:31 16:11	06:44 17:04	05:45 17:52	05:38 19:41	04:47 20:27	04:47 20:55
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:29	04:48 20:56
22	07:29 16:14	06:40 17:08	05:41 17:55	05:34 19:45	04:44 20:30	04:48 20:56
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:48 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:33	04:48 20:56
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:41 20:34	04:49 20:56
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:49 20:56
27	07:23 16:22	06:30 17:17	05:29 18:03	05:24 19:53	04:38 20:36	04:49 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:49 20:56
29	07:21 16:26		06:25 19:06	06:50 (15) 06:56 (15)	04:37 20:39	04:30 20:56
30	07:19 16:28		06:23 19:08	06:47 (15) 06:58 (15)	04:36 20:40	04:31 20:56
31	07:18 16:29		06:21 19:09	06:44 (15) 06:58 (15)	04:35 20:41	
Potential sun hours	265	280	367	413	479	491
Total, worst case			31	131	170	
Sun reduction			0,31	0,31	0,35	
Oper. time red.			0,86	0,86	0,86	
Wind dir. red.			0,71	0,71	0,69	
Total reduction			0,19	0,19	0,21	
Total, real			6	25	35	

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

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



## SHADOW - Calendar

**Shadow receptor:** AD - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (30)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:06	05:48 (16)	05:53		06:39	06:29	07:18			
	20:55	20:26	14 06:02 (16)	19:27		18:20	16:17	15:39			
2	04:32	05:07	05:47 (16)	05:54		06:40	06:31	07:19			
	20:55	20:24	15 06:02 (16)	19:25		18:18	16:15	15:39			
3	04:33	05:09	05:46 (16)	05:56		06:44 (15)	06:42	06:33	07:21		
	20:55	20:23	16 06:02 (16)	19:23	5	06:49 (15)	18:16	16:14	15:38		
4	04:34	05:10	05:47 (16)	05:57		06:41 (15)	06:43	06:35	07:22		
	20:54	20:21	15 06:02 (16)	19:20	10	06:51 (15)	18:14	16:12	15:38		
5	04:34	05:12	05:46 (16)	05:59		06:39 (15)	06:45	06:36	07:23		
	20:54	20:19	16 06:02 (16)	19:18	14	06:53 (15)	18:11	16:10	15:37		
6	04:35	05:13	05:46 (16)	06:00		06:38 (15)	06:47	06:38	07:24		
	20:54	20:18	15 06:01 (16)	19:16	15	06:53 (15)	18:09	16:09	15:37		
7	04:36	05:15	05:47 (16)	06:02		06:37 (15)	06:48	06:40	07:26		
	20:53	20:16	14 06:01 (16)	19:14	17	06:54 (15)	18:07	16:07	15:36		
8	04:37	05:16	05:47 (16)	06:03		06:36 (15)	06:50	06:41	07:27		
	20:52	20:14	13 06:00 (16)	19:12	18	06:54 (15)	18:05	16:05	15:36		
9	04:38	05:18	05:48 (16)	06:05		06:36 (15)	06:51	06:43	07:28		
	20:52	20:13	12 06:00 (16)	19:09	18	06:54 (15)	18:03	16:04	15:36		
10	04:39	05:19	05:49 (16)	06:06		06:36 (15)	06:53	06:45	07:29		
	20:51	20:11	9 05:58 (16)	19:07	17	06:53 (15)	18:01	16:02	15:36		
11	04:40	05:21	05:52 (16)	06:08		06:36 (15)	06:55	06:46	07:30		
	20:50	20:09	2 05:54 (16)	19:05	17	06:53 (15)	17:59	16:01	15:36		
12	04:41	05:22		06:09		06:36 (15)	06:56	06:48	07:31		
	20:50	20:07		19:03	15	06:51 (15)	17:56	15:59	15:36		
13	04:42	05:24		06:11		06:37 (15)	06:58	06:50	07:32		
	20:49	20:05		19:00	12	06:49 (15)	17:54	15:58	15:35		
14	04:43	05:25		06:12		06:39 (15)	06:59	06:51	07:33		
	20:48	20:03		18:58	7	06:46 (15)	17:52	15:57	15:36		
15	04:44	05:27		06:14			07:01	06:53	07:34		
	20:47	20:02		18:56			17:50	15:55	15:36		
16	04:45	05:28		06:15			07:03	06:55	07:35		
	20:46	20:00		18:54			17:48	15:54	15:36		
17	04:46	05:30		06:17			07:04	06:56	07:35		
	20:45	19:58		18:52			17:46	15:53	15:36		
18	04:47	05:31		06:19			07:06	06:58	07:36		
	20:44	19:56		18:49			17:44	15:51	15:36		
19	04:48	05:33		06:20			07:08	07:00	07:37		
	20:43	19:54		18:47			17:42	15:50	15:37		
20	04:50	05:34		06:22			07:09	07:01	07:37		
	20:42	19:52		18:45			17:40	15:49	15:37		
21	04:51	05:36		06:23			07:11	07:03	07:38		
	20:41	19:50		18:43			17:38	15:48	15:37		
22	04:52	05:37		06:25			07:13	07:04	07:39		
	20:40	19:48		18:40			17:36	15:47	15:38		
23	04:53	05:39		06:26			07:14	07:06	07:39		
	20:38	19:46		18:38			17:34	15:46	15:38		
24	04:55	05:40		06:28			07:16	07:08	07:40		
	20:37	19:44		18:36			17:32	15:45	15:39		
25	04:56	05:42		06:29			06:18	07:09	07:40		
	20:36	19:42		18:34			16:30	15:44	15:39		
26	04:57	05:43		06:31			06:19	07:11	07:40		
	20:35	19:40		18:31			16:28	15:43	15:40		
27	04:59	05:45		06:32			06:21	07:12	07:41		
	20:33	19:37		18:29			16:26	15:42	15:41		
28	05:00	05:46		06:34			06:23	07:14	07:41		
	20:32	19:35		18:27			16:24	15:41	15:42		
29	05:02	05:51 (16)	05:48	06:36			06:24	07:15	07:41		
	20:30	05:58 (16)	19:33	18:25			16:23	15:41	15:42		
30	05:03	05:49 (16)	05:49	06:37			06:26	07:16	07:41		
	20:29	06:00 (16)	19:31	18:22			16:21	15:40	15:43		
31	05:04	05:48 (16)	05:51				06:28		07:41		
	20:27	06:00 (16)	19:29				16:19		15:44		
Potential sun hours	495		450		380		334	271	251		
Total, worst case		30	141		165						
Sun reduction		0,36	0,39		0,34						
Oper. time red.		0,86	0,86		0,86						
Wind dir. red.		0,69	0,69		0,71						
Total reduction		0,21	0,23		0,21						
Total, real		6	32		34						

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

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

## SHADOW - Calendar

**Shadow receptor:** AE - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (31)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April	May		June
1	07:41	07:17	06:26		06:18	05:17		04:34
	15:45	16:31	17:20		19:11	19:59	27	05:59 (15)
2	07:41	07:15	06:24		06:16	05:15		04:33
	15:47	16:33	17:22		19:12	20:00	27	06:00 (15)
3	07:41	07:14	06:22		06:14	05:13		04:32
	15:48	16:35	17:23		19:14	20:02	27	05:59 (15)
4	07:41	07:12	06:20		06:12	05:11		04:32
	15:49	16:36	17:25		19:16	20:04	27	05:59 (15)
5	07:41	07:11	06:18		06:10	05:09		04:31
	15:50	16:38	17:27		19:17	20:05	26	05:59 (15)
6	07:40	07:09	06:15		06:07	05:08		04:31
	15:51	16:40	17:28		19:19	20:07	26	05:59 (15)
7	07:40	07:07	06:13		06:05	05:06		04:30
	15:52	16:42	17:30		19:21	20:08	25	05:59 (15)
8	07:40	07:06	06:11		06:03	05:04		04:30
	15:53	16:43	17:32		19:22	20:10	25	06:00 (15)
9	07:39	07:04	06:09		06:01	05:03		04:29
	15:55	16:45	17:33		19:24	20:11	25	05:59 (15)
10	07:39	07:02	06:07		05:59	05:01		04:29
	15:56	16:47	17:35		19:25	20:13	24	05:59 (15)
11	07:38	07:01	06:05		05:57	04:59		04:28
	15:57	16:49	17:37		19:27	20:14	23	05:59 (15)
12	07:38	06:59	06:03		05:55	04:58	7	05:41 (15)
	15:59	16:50	17:38		19:29	20:16	24	05:59 (15)
13	07:37	06:57	06:00		05:52	04:56		05:38 (15)
	16:00	16:52	17:40		19:30	20:17	13	05:51 (15)
14	07:36	06:55	05:58		05:50	04:55		05:37 (15)
	16:02	16:54	17:42		19:32	20:19	16	05:53 (15)
15	07:36	06:53	05:56		05:48	04:53		05:35 (15)
	16:03	16:56	17:43		19:33	20:20	18	05:53 (15)
16	07:35	06:52	05:54		05:46	04:52		05:34 (15)
	16:05	16:57	17:45		19:35	20:22	21	05:55 (15)
17	07:34	06:50	05:52	06:14 (14)	05:44	04:51		05:33 (15)
	16:06	16:59	17:47	2	06:16 (14)	19:37	23	05:56 (15)
18	07:33	06:48	05:49	06:11 (14)	05:42	04:49		05:33 (15)
	16:08	17:01	17:48	6	06:17 (14)	19:38	24	05:57 (15)
19	07:32	06:46	05:47	06:09 (14)	05:40	04:48		05:32 (15)
	16:09	17:03	17:50	8	06:17 (14)	19:40	24	05:56 (15)
20	07:31	06:44	05:45	06:07 (14)	05:38	04:46		05:31 (15)
	16:11	17:04	17:51	10	06:17 (14)	19:41	26	05:57 (15)
21	07:30	06:42	05:43	06:06 (14)	05:36	04:45		05:31 (15)
	16:12	17:06	17:53	11	06:17 (14)	19:43	27	05:58 (15)
22	07:29	06:40	05:41	06:06 (14)	05:34	04:44		05:31 (15)
	16:14	17:08	17:55	8	06:14 (14)	19:45	27	05:58 (15)
23	07:28	06:38	05:38	06:08 (14)	05:32	04:43		05:31 (15)
	16:16	17:10	17:56	4	06:12 (14)	19:46	27	05:58 (15)
24	07:27	06:36	05:36		05:30	04:42		05:31 (15)
	16:17	17:11	17:58		19:48	20:33	28	05:59 (15)
25	07:26	06:34	05:34		05:28	04:41		05:31 (15)
	16:19	17:13	18:00		19:49	20:34	28	05:59 (15)
26	07:25	06:32	05:32		05:26	04:39		05:31 (15)
	16:21	17:15	18:01		19:51	20:35	28	05:59 (15)
27	07:23	06:30	05:29		05:24	04:38		05:31 (15)
	16:22	17:16	18:03		19:53	20:36	28	05:59 (15)
28	07:22	06:28	05:27		05:22	04:37		05:31 (15)
	16:24	17:18	18:04		19:54	20:37	28	05:59 (15)
29	07:21		06:25		05:20	04:37		05:31 (15)
	16:26		19:06		19:56	20:39	28	05:59 (15)
30	07:19		06:23		05:18	04:36		05:32 (15)
	16:28		19:08		19:57	20:40	28	06:00 (15)
31	07:18		06:21			04:35		05:32 (15)
	16:29		19:09			20:41	27	05:59 (15)
Potential sun hours	265	280	367		413	479		491
Total, worst case			49			476		697
Sun reduction			0,31			0,35		0,32
Oper. time red.			0,86			0,86		0,86
Wind dir. red.			0,70			0,68		0,68
Total reduction			0,19			0,20		0,19
Total, real			9			97		130

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

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

**Shadow receptor:** AE - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (31)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:40 (15)	05:06	05:53 (15)	05:53	06:39	06:29	07:18			
	20:55	23 06:03 (15)	20:26	3 05:56 (15)	19:27	18:20	16:17	15:39			
2	04:32	05:39 (15)	05:07		05:54	06:40	06:31	07:19			
	20:55	24 06:03 (15)	20:24		19:25	18:18	16:15	15:39			
3	04:33	05:40 (15)	05:09		05:56	06:42	06:33	07:20			
	20:55	24 06:04 (15)	20:23		19:23	18:16	16:14	15:38			
4	04:34	05:40 (15)	05:10		05:57	06:43	06:34	07:22			
	20:54	25 06:05 (15)	20:21		19:20	18:14	16:12	15:38			
5	04:34	05:40 (15)	05:12		05:59	06:45	06:36	07:23			
	20:54	25 06:05 (15)	20:19		19:18	18:11	16:10	15:37			
6	04:35	05:39 (15)	05:13		06:00	06:47	06:38	07:24			
	20:54	26 06:05 (15)	20:18		19:16	18:09	16:09	15:37			
7	04:36	05:40 (15)	05:15		06:02	06:48	06:40	07:25			
	20:53	26 06:06 (15)	20:16		19:14	18:07	16:07	15:36			
8	04:37	05:40 (15)	05:16		06:03	06:50	06:41	07:27			
	20:52	26 06:06 (15)	20:14		19:12	18:05	16:05	15:36			
9	04:38	05:40 (15)	05:18		06:05	06:51	06:43	07:28			
	20:52	27 06:07 (15)	20:13		19:09	18:03	16:04	15:36			
10	04:39	05:40 (15)	05:19		06:06	06:53	06:45	07:29			
	20:51	27 06:07 (15)	20:11		19:07	18:01	16:02	15:36			
11	04:40	05:40 (15)	05:21		06:08	06:55	06:46	07:30			
	20:50	27 06:07 (15)	20:09		19:05	17:58	16:01	15:36			
12	04:41	05:40 (15)	05:22		06:09	06:56	06:48	07:31			
	20:50	28 06:08 (15)	20:07		19:03	17:56	15:59	15:36			
13	04:42	05:40 (15)	05:24		06:11	06:58	06:50	07:32			
	20:49	28 06:08 (15)	20:05		19:00	17:54	15:58	15:35			
14	04:43	05:40 (15)	05:25		06:12	06:59	06:51	07:33			
	20:48	28 06:08 (15)	20:03		18:58	17:52	15:57	15:36			
15	04:44	05:40 (15)	05:27		06:14	07:01	06:53	07:34			
	20:47	28 06:08 (15)	20:02		18:56	17:50	15:55	15:36			
16	04:45	05:40 (15)	05:28		06:15	07:03	06:55	07:35			
	20:46	28 06:08 (15)	20:00		18:54	17:48	15:54	15:36			
17	04:46	05:40 (15)	05:30		06:17	07:04	06:56	07:35			
	20:45	28 06:08 (15)	19:58		18:52	17:46	15:53	15:36			
18	04:47	05:40 (15)	05:31		06:18	07:06	06:58	07:36			
	20:44	28 06:08 (15)	19:56		18:49	17:44	15:51	15:36			
19	04:48	05:40 (15)	05:33		06:20	07:08	07:00	07:37			
	20:43	28 06:08 (15)	19:54		18:47	17:42	15:50	15:36			
20	04:50	05:40 (15)	05:34		06:22	06:56 (14)	07:09	07:01	07:37		
	20:42	28 06:08 (15)	19:52		18:45	1 06:57 (14)	17:40	15:49	15:37		
21	04:51	05:40 (15)	05:36		06:23	06:52 (14)	07:11	07:03	07:38		
	20:41	28 06:08 (15)	19:50		18:43	8 07:00 (14)	17:38	15:48	15:37		
22	04:52	05:42 (15)	05:37		06:25	06:51 (14)	07:13	07:04	07:39		
	20:40	26 06:08 (15)	19:48		18:40	10 07:01 (14)	17:36	15:47	15:38		
23	04:53	05:42 (15)	05:39		06:26	06:51 (14)	07:14	07:06	07:39		
	20:38	26 06:08 (15)	19:46		18:38	10 07:01 (14)	17:34	15:46	15:38		
24	04:55	05:42 (15)	05:40		06:28	06:52 (14)	07:16	07:08	07:39		
	20:37	25 06:07 (15)	19:44		18:36	9 07:01 (14)	17:32	15:45	15:39		
25	04:56	05:42 (15)	05:42		06:29	06:54 (14)	06:18	07:09	07:40		
	20:36	25 06:07 (15)	19:42		18:34	6 07:00 (14)	16:30	15:44	15:39		
26	04:57	05:44 (15)	05:43		06:31	06:55 (14)	06:19	07:11	07:40		
	20:35	23 06:07 (15)	19:40		18:31	4 06:59 (14)	16:28	15:43	15:40		
27	04:59	05:44 (15)	05:45		06:32		06:21	07:12	07:40		
	20:33	22 06:06 (15)	19:37		18:29		16:26	15:42	15:41		
28	05:00	05:45 (15)	05:46		06:34		06:23	07:14	07:41		
	20:32	20 06:05 (15)	19:35		18:27		16:24	15:41	15:42		
29	05:02	05:46 (15)	05:48		06:35		06:24	07:15	07:41		
	20:30	17 06:03 (15)	19:33		18:25		16:22	15:41	15:42		
30	05:03	05:48 (15)	05:49		06:37		06:26	07:16	07:41		
	20:29	14 06:02 (15)	19:31		18:22		16:21	15:40	15:43		
31	05:04	05:49 (15)	05:51				06:28		07:41		
	20:27	11 06:00 (15)	19:29				16:19		15:44		
Potential sun hours	495		450		380		334	271	251		
Total, worst case	769		3		48						
Sun reduction	0,36		0,39		0,34						
Oper. time red.	0,86		0,86		0,86						
Wind dir. red.	0,68		0,68		0,70						
Total reduction	0,21		0,23		0,20						
Total, real	161		1		10						

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

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

## SHADOW - Calendar

**Shadow receptor:** AF - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (32)**Assumptions for shadow calculations**

Sunshine probability 'S' (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April	May		June
1	07:41	07:17	06:26		06:18	05:17		04:34
	15:45	16:31	17:20		19:11	19:59	25	05:55 (15)
2	07:41	07:15	06:24		06:16	05:15		04:33
	15:46	16:33	17:22		19:12	20:00	26	05:56 (15)
3	07:41	07:14	06:22		06:14	05:13		04:32
	15:48	16:35	17:23		19:14	20:02	28	05:57 (15)
4	07:41	07:12	06:20		06:12	05:11		04:32
	15:49	16:36	17:25		19:16	20:04	28	05:57 (15)
5	07:41	07:11	06:18		06:10	05:09		04:31
	15:50	16:38	17:27		19:17	20:05	29	05:58 (15)
6	07:40	07:09	06:15		06:07	05:08		04:31
	15:51	16:40	17:28		19:19	20:07	30	05:58 (15)
7	07:40	07:07	06:13		06:05	05:06		04:30
	15:52	16:42	17:30		19:21	20:08	31	05:59 (15)
8	07:40	07:06	06:11		06:03	05:04		04:29
	15:53	16:43	17:32		19:22	20:10	32	06:00 (15)
9	07:39	07:04	06:09		06:01	05:03		04:29
	15:55	16:45	17:33		19:24	20:11	32	06:00 (15)
10	07:39	07:02	06:07		05:59	05:01		04:29
	15:56	16:47	17:35		19:25	20:13	33	06:01 (15)
11	07:38	07:01	06:05		05:57	04:59		04:28
	15:57	16:49	17:37		19:27	20:14	3	05:27 (12)
12	07:38	06:59	06:03	06:25 (14)	05:54	04:58	3	05:27 (12)
	15:59	16:50	17:38	2	19:29	20:16	6	05:29 (12)
13	07:37	06:57	06:00	06:22 (14)	05:52	04:56		05:21 (12)
	16:00	16:52	17:40	6	19:30	20:17	8	05:29 (12)
14	07:36	06:55	05:58	06:20 (14)	05:50	04:55		05:20 (12)
	16:02	16:54	17:42	9	19:32	20:19	10	05:30 (12)
15	07:36	06:53	05:56	06:18 (14)	05:48	04:53		05:18 (12)
	16:03	16:56	17:43	11	19:33	20:20	11	05:29 (12)
16	07:35	06:52	05:54	06:16 (14)	05:46	04:52		05:17 (12)
	16:05	16:57	17:45	13	19:35	20:22	13	05:30 (12)
17	07:34	06:50	05:52	06:16 (14)	05:44	04:50		05:17 (12)
	16:06	16:59	17:47	12	19:37	20:23	13	05:30 (12)
18	07:33	06:48	05:49	06:16 (14)	05:42	04:49		05:18 (12)
	16:08	17:01	17:48	10	19:38	20:24	12	05:30 (12)
19	07:32	06:46	05:47	06:18 (14)	05:40	04:48		05:17 (12)
	16:09	17:03	17:50	7	19:40	20:26	12	05:29 (12)
20	07:31	06:44	05:45		05:38	04:46		05:18 (12)
	16:11	17:04	17:51		19:41	20:27	11	05:29 (12)
21	07:30	06:42	05:43		05:36	04:45		05:19 (12)
	16:12	17:06	17:53		19:43	20:29	10	05:29 (12)
22	07:29	06:40	05:40		05:34	04:44		05:20 (12)
	16:14	17:08	17:55		19:45	20:30	8	05:28 (12)
23	07:28	06:38	05:38		05:32	04:43		05:21 (12)
	16:16	17:10	17:56		19:46	20:31	6	05:27 (12)
24	07:27	06:36	05:36		05:30	04:42		04:28
	16:17	17:11	17:58		19:48	20:33		04:28
25	07:26	06:34	05:34		05:28	04:41		04:29
	16:19	17:13	18:00		19:49	20:34		04:29
26	07:25	06:32	05:32		05:26	04:39		04:29
	16:21	17:15	18:01		19:51	20:35	4	05:44 (15)
27	07:23	06:30	05:29		05:24	04:38		05:36 (15)
	16:22	17:16	18:03		19:52	20:36	12	05:48 (15)
28	07:22	06:28	05:27		05:22	04:37		05:34 (15)
	16:24	17:18	18:04		19:54	20:37	16	05:50 (15)
29	07:21		06:25		05:20	04:36		05:33 (15)
	16:26		19:06		19:56	20:39	18	05:51 (15)
30	07:19		06:23		05:18	04:36		05:32 (15)
	16:28		19:08		19:57	20:40	21	05:53 (15)
31	07:18		06:21			04:35		05:31 (15)
	16:29		19:09			20:41	23	05:54 (15)
Potential sun hours	265	280	367		413	479		491
Total, worst case			70			217		994
Sun reduction			0,31			0,35		0,32
Oper. time red.			0,86			0,86		0,86
Wind dir. red.			0,69			0,69		0,69
Total reduction			0,18			0,21		0,19
Total, real			13			45		187

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

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

## SHADOW - Calendar

**Shadow receptor:** AF - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (32)**Assumptions for shadow calculations**

Sunshine probability 'S' (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:32 (15)	05:06	05:33 (12)	05:53	06:39	07:03 (14)	06:29	07:18		
	20:55	06:06 (15)	20:26	5 05:38 (12)	19:27	18:20	4 07:07 (14)	16:17	15:39		
2	04:32	05:32 (15)	05:07	05:35 (12)	05:54	06:40		06:31	07:19		
	20:55	06:05 (15)	20:24	1 05:36 (12)	19:25	18:18		16:15	15:39		
3	04:33	05:33 (15)	05:09		05:56	06:42		06:33	07:20		
	20:55	06:05 (15)	20:23		19:23	18:16		16:14	15:38		
4	04:34	05:34 (15)	05:10		05:57	06:43		06:34	07:22		
	20:54	06:06 (15)	20:21		19:20	18:14		16:12	15:38		
5	04:34	05:33 (15)	05:12		05:59	06:45		06:36	07:23		
	20:54	06:05 (15)	20:19		19:18	18:11		16:10	15:37		
6	04:35	05:34 (15)	05:13		06:00	06:46		06:38	07:24		
	20:54	06:05 (15)	20:18		19:16	18:09		16:09	15:37		
7	04:36	05:35 (15)	05:15		06:02	06:48		06:40	07:25		
	20:53	06:05 (15)	20:16		19:14	18:07		16:07	15:36		
8	04:37	05:36 (15)	05:16		06:03	06:50		06:41	07:27		
	20:52	06:05 (15)	20:14		19:12	18:05		16:05	15:36		
9	04:38	05:37 (15)	05:18		06:05	06:51		06:43	07:28		
	20:52	06:04 (15)	20:13		19:09	18:03		16:04	15:36		
10	04:39	05:37 (15)	05:19		06:06	06:53		06:45	07:29		
	20:51	06:04 (15)	20:11		19:07	18:01		16:02	15:36		
11	04:40	05:38 (15)	05:21		06:08	06:54		06:46	07:30		
	20:50	06:04 (15)	20:09		19:05	17:58		16:01	15:36		
12	04:41	05:39 (15)	05:22		06:09	06:56		06:48	07:31		
	20:50	06:03 (15)	20:07		19:03	17:56		15:59	15:35		
13	04:42	05:40 (15)	05:24		06:11	06:58		06:50	07:32		
	20:49	06:02 (15)	20:05		19:00	17:54		15:58	15:35		
14	04:43	05:42 (15)	05:25		06:12	06:59		06:51	07:33		
	20:48	06:01 (15)	20:03		18:58	17:52		15:57	15:35		
15	04:44	05:43 (15)	05:27		06:14	07:01		06:53	07:34		
	20:47	06:00 (15)	20:02		18:56	17:50		15:55	15:36		
16	04:45	05:45 (15)	05:28		06:15	07:03		06:55	07:35		
	20:46	05:58 (15)	20:00		18:54	17:48		15:54	15:36		
17	04:46	05:47 (15)	05:30		06:17	07:04		06:56	07:35		
	20:45	05:56 (15)	19:58		18:52	17:46		15:53	15:36		
18	04:47		05:31		06:18	07:06		06:58	07:36		
	20:44		19:56		18:49	17:44		15:51	15:36		
19	04:48		05:33		06:20	07:08		07:00	07:37		
	20:43		19:54		18:47	17:42		15:50	15:36		
20	04:50	05:32 (12)	05:34		06:22	07:09		07:01	07:37		
	20:42	05:35 (12)	19:52		18:45	17:40		15:49	15:37		
21	04:51	05:30 (12)	05:36		06:23	07:11		07:03	07:38		
	20:41	05:37 (12)	19:50		18:43	17:38		15:48	15:37		
22	04:52	05:30 (12)	05:37		06:25	07:13		07:04	07:39		
	20:40	05:39 (12)	19:48		18:40	17:36		15:47	15:38		
23	04:53	05:29 (12)	05:39		06:26	07:14		07:06	07:39		
	20:38	05:39 (12)	19:46		18:38	17:34		15:46	15:38		
24	04:55	05:28 (12)	05:40		06:28	07:16	07:03 (14)	07:07	07:39		
	20:37	05:40 (12)	19:44		18:36	4 07:07 (14)	17:32	15:45	15:39		
25	04:56	05:28 (12)	05:42		06:29	07:00 (14)	06:18	07:09	07:40		
	20:36	05:40 (12)	19:42		18:34	10 07:10 (14)	16:30	15:44	15:39		
26	04:57	05:28 (12)	05:43		06:31	06:58 (14)	06:19	07:11	07:40		
	20:35	05:41 (12)	19:40		18:31	12 07:10 (14)	16:28	15:43	15:40		
27	04:59	05:28 (12)	05:45		06:32	06:58 (14)	06:21	07:12	07:40		
	20:33	05:41 (12)	19:37		18:29	13 07:11 (14)	16:26	15:42	15:41		
28	05:00	05:28 (12)	05:46		06:34	06:58 (14)	06:23	07:14	07:41		
	20:32	05:40 (12)	19:35		18:27	12 07:10 (14)	16:24	15:41	15:42		
29	05:02	05:29 (12)	05:48		06:35	07:00 (14)	06:24	07:15	07:41		
	20:30	05:40 (12)	19:33		18:25	10 07:10 (14)	16:22	15:41	15:42		
30	05:03	05:31 (12)	05:49		06:37	07:01 (14)	06:26	07:16	07:41		
	20:29	05:40 (12)	19:31		18:22	7 07:08 (14)	16:21	15:40	15:43		
31	05:04	05:32 (12)	05:51			06:28			07:41		
	20:27	7 05:39 (12)	19:29			16:19			15:44		
Potential sun hours	495		450		380	334		271	251		
Total, worst case	555		6		68	4					
Sun reduction	0,36		0,39		0,34	0,37					
Oper. time red.	0,86		0,86		0,86	0,86					
Wind dir. red.	0,69		0,69		0,69	0,69					
Total reduction	0,21		0,23		0,20	0,22					
Total, real	118		1		14	1					

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

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

## SHADOW - Calendar

**Shadow receptor:** AG - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (33)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	06:41 (14) 06:52 (14)	05:17 19:59
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	06:39 (14) 06:53 (14)	05:15 20:00
3	07:41 15:48	07:14 16:34	06:22 17:23	06:14 19:14	06:38 (14) 06:54 (14)	05:13 20:02
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	06:38 (14) 06:54 (14)	05:11 20:03
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	06:36 (14) 06:53 (14)	05:09 20:05
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	06:36 (14) 06:53 (14)	05:08 20:07
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:20	06:36 (14) 06:52 (14)	05:06 20:08
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	06:37 (14) 06:51 (14)	05:04 20:10
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	06:38 (14) 06:50 (14)	05:03 20:11
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	06:40 (14) 06:48 (14)	05:01 20:13
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27		04:59 20:14
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:29		04:58 20:16
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30		04:56 20:17
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	06:12 (10) 06:17 (10)	04:55 20:19
15	07:36 16:03	06:53 16:56	05:56 17:43	05:48 19:33	06:10 (10) 06:18 (10)	04:53 20:20
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	06:08 (10) 06:19 (10)	04:52 20:22
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:37	06:07 (10) 06:19 (10)	04:50 20:23
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	06:07 (10) 06:19 (10)	04:49 20:24
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	06:07 (10) 06:18 (10)	04:48 20:26
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	06:07 (10) 06:17 (10)	04:46 20:27
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	06:08 (10) 06:15 (10)	04:45 20:29
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:45		04:44 20:30
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46		04:43 20:31
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48		04:42 20:32
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49		04:41 20:34
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51		04:39 20:35
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52		04:38 20:36
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54		04:37 20:37
29	07:21 16:26		06:25 19:06	05:20 19:56		04:36 20:39
30	07:19 16:28		06:23 19:08	05:18 19:57		04:36 20:40
31	07:18 16:29		06:21 19:09	06:44 (14) 06:49 (14)		04:35 20:41
Potential sun hours	265	281	367	413	479	491
Total, worst case			66	217	109	
Sun reduction			0,31	0,31	0,35	
Oper. time red.			0,86	0,86	0,86	
Wind dir. red.			0,70	0,71	0,69	
Total reduction			0,19	0,19	0,21	
Total, real			12	41	23	

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

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



## SHADOW - Calendar

**Shadow receptor:** AG - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (33)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31 20:55	05:06 20:26		05:53 19:27		06:39 18:20		06:29 16:17		07:18 15:39	
2	04:32 20:55	05:07 20:24		05:54 19:25	8	06:38 (14) 06:46 (14)	06:40 18:18	06:31 16:15		07:19 15:39	
3	04:33 20:55	05:09 20:23		05:56 19:22	12	06:36 (14) 06:48 (14)	06:42 18:16	06:33 16:14		07:20 15:38	
4	04:34 20:54	05:10 20:21		05:57 19:20	14	06:34 (14) 06:48 (14)	06:43 18:14	06:34 16:12		07:22 15:38	
5	04:34 20:54	05:12 20:19		05:59 19:18	15	06:34 (14) 06:49 (14)	06:45 18:11	06:36 16:10		07:23 15:37	
6	04:35 20:54	05:13 20:18		06:00 19:16	17	06:32 (14) 06:49 (14)	06:46 18:09	06:38 16:09		07:24 15:37	
7	04:36 20:53	05:15 20:16		06:02 19:14	17	06:32 (14) 06:49 (14)	06:48 18:07	06:40 16:07		07:25 15:36	
8	04:37 20:52	05:16 20:14		06:03 19:12	16	06:32 (14) 06:48 (14)	06:50 18:05	06:41 16:05		07:27 15:36	
9	04:38 20:52	05:18 20:13		06:05 19:09	16	06:32 (14) 06:48 (14)	06:51 18:03	06:43 16:04		07:28 15:36	
10	04:39 20:51	05:19 20:11		06:06 19:07	14	06:32 (14) 06:46 (14)	06:53 18:01	06:45 16:02		07:29 15:36	
11	04:40 20:50	05:21 20:09		06:08 19:05	11	06:33 (14) 06:44 (14)	06:54 17:58	06:46 16:01		07:30 15:36	
12	04:41 20:50	05:22 20:07		06:09 19:03	6	06:36 (14) 06:42 (14)	06:56 17:56	06:48 15:59		07:31 15:35	
13	04:42 20:49	05:22 (11) 05:25 (11)	05:24 20:05	06:11 19:00		06:42 (14) 17:54	17:56 15:58	15:59 15:35		07:32 15:35	
14	04:43 20:48	05:20 (11) 05:26 (11)	05:25 20:03	06:12 18:58		06:59 17:52	15:58 15:57	15:35 15:35		07:33 15:35	
15	04:44 20:47	05:19 (11) 05:27 (11)	05:27 20:01	06:14 18:56		07:01 17:50	15:53 15:55	15:33 15:36		07:34 15:36	
16	04:45 20:46	05:19 (11) 05:28 (11)	05:28 20:00	06:15 18:54	7	06:48 (8) 06:55 (8)	07:03 17:48	06:55 15:54		07:35 15:36	
17	04:46 20:45	05:18 (11) 05:29 (11)	05:30 19:58	06:17 18:51	10	06:46 (8) 06:56 (8)	07:04 17:46	06:56 15:53		07:35 15:36	
18	04:47 20:44	05:18 (11) 05:29 (11)	05:31 19:56	06:18 18:49	12	06:45 (8) 06:57 (8)	07:06 17:44	06:58 15:51		07:36 15:36	
19	04:48 20:43	05:18 (11) 05:29 (11)	05:33 19:54	06:20 18:47	12	06:44 (8) 06:56 (8)	07:08 17:42	07:00 15:50		07:37 15:36	
20	04:50 20:42	05:18 (11) 05:29 (11)	05:34 19:52	06:22 18:45	10	06:46 (8) 06:56 (8)	07:09 17:40	07:01 15:49		07:37 15:37	
21	04:51 20:41	05:19 (11) 05:29 (11)	05:36 19:50	06:23 18:43	7	06:47 (8) 06:54 (8)	07:11 17:38	07:03 15:48		07:38 15:37	
22	04:52 20:40	05:21 (11) 05:30 (11)	05:37 19:48	06:25 18:40	4	06:49 (8) 06:53 (8)	07:12 17:36	07:04 15:47		07:39 15:38	
23	04:53 20:38	05:22 (11) 05:30 (11)	05:39 19:46	06:26 18:38		07:14 17:34	07:06 15:46	07:06 15:38		07:39 15:38	
24	04:55 20:37	05:23 (11) 05:29 (11)	05:40 19:44	06:28 18:36	12	06:10 (10) 06:22 (10)	07:16 17:32	07:07 15:45		07:39 15:39	
25	04:56 20:36	05:24 (11) 05:29 (11)	05:42 19:42	06:29 18:34	13	06:10 (10) 06:23 (10)	07:19 16:30	07:09 15:44		07:40 15:39	
26	04:57 20:35	05:26 (11) 05:29 (11)	05:43 19:40	06:31 18:31	12	06:10 (10) 06:22 (10)	07:19 16:28	07:11 15:43		07:40 15:40	
27	04:59 20:33	05:29 (11) 19:37	05:45 19:37	06:32 18:29	11	06:10 (10) 06:21 (10)	07:21 16:26	07:12 15:42		07:40 15:41	
28	05:00 20:32	05:46 19:35	05:46 19:35	06:34 18:27	8	06:12 (10) 06:20 (10)	07:23 16:24	07:13 15:41		07:41 15:42	
29	05:02 20:30	05:48 19:33	05:48 19:33	06:35 18:25	5	06:13 (10) 06:18 (10)	07:24 16:22	07:15 15:41		07:41 15:42	
30	05:03 20:29	05:49 19:31	05:49 19:31	06:37 18:22		06:37 16:21	07:16 15:40	07:16 15:40		07:41 15:43	
31	05:04 20:27	05:51 19:29	05:51 19:29			06:28 16:19		07:17 15:44		07:41 15:44	
Potential sun hours	495	450		380		334	271	251			
Total, worst case	111	79		208							
Sun reduction	0,36	0,39		0,34							
Oper. time red.	0,86	0,86		0,86							
Wind dir. red.	0,69	0,71		0,71							
Total reduction	0,21	0,23		0,21							
Total, real	24	19		43							

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

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

## SHADOW - Calendar

**Shadow receptor:** AH - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (34)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	07:17 16:31	06:26 17:20	06:18 19:11	06:50 (14) 06:56 (14)	04:34 20:42
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	06:47 (14) 07:00 (14)	04:33 20:43
3	07:41 15:48	07:14 16:34	06:22 17:23	06:14 19:14	06:44 (14) 07:01 (14)	04:32 20:44
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	06:43 (14) 07:03 (14)	04:32 20:45
5	07:41 15:50	07:11 16:38	06:18 17:27	06:10 19:17	06:41 (14) 07:03 (14)	04:31 20:46
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	06:40 (14) 07:03 (14)	04:30 20:47
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:20	06:27 (9) 07:03 (14)	04:30 20:48
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	06:25 (9) 07:03 (14)	04:29 20:49
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	06:23 (9) 07:03 (14)	04:29 20:49
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	06:21 (9) 07:03 (14)	04:29 20:50
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	06:21 (9) 07:03 (14)	04:28 20:51
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:28	06:21 (9) 07:02 (14)	04:28 20:51
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	06:20 (9) 07:00 (14)	04:28 20:52
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	06:22 (9) 06:59 (14)	04:28 20:53
15	07:36 16:03	06:53 16:56	05:56 17:43	05:48 19:33	06:40 (14) 06:57 (14)	04:27 20:53
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	06:42 (14) 06:55 (14)	04:27 20:54
17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:36	06:45 (14) 06:51 (14)	04:27 20:54
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:55
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	06:04 (10) 06:12 (10)	04:27 20:55
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	06:02 (10) 06:14 (10)	04:27 20:55
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	06:01 (10) 06:14 (10)	04:27 20:55
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	06:00 (10) 06:15 (10)	04:28 20:56
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	05:59 (10) 06:15 (10)	04:28 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	05:59 (10) 06:16 (10)	04:28 20:56
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	05:59 (10) 06:15 (10)	04:29 20:56
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	05:59 (10) 06:15 (10)	04:29 20:56
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	05:59 (10) 06:14 (10)	04:29 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	06:00 (10) 06:12 (10)	04:37 20:56
29	07:21 16:26		06:25 19:06	05:20 19:56	06:01 (10) 06:11 (10)	04:30 20:56
30	07:19 16:28		06:23 19:08	05:18 19:57	06:04 (10) 06:09 (10)	04:31 20:56
31	07:18 16:29		06:21 19:09			04:35 20:41
Potential sun hours	265	281	367	413	479	491
Total, worst case			115	548		94
Sun reduction			0,31	0,31		0,32
Oper. time red.			0,86	0,86		0,86
Wind dir. red.			0,70	0,71		0,70
Total reduction			0,19	0,19		0,19
Total, real			21	103		18

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

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

## SHADOW - Calendar

**Shadow receptor:** AH - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (34)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:01 (11)	05:06	05:52	06:19 (9)	06:39	06:29	07:18			
	20:55	2	05:03 (11)	20:26	19:27	37	07:02 (14)	18:20	16:17	15:39	
2	04:32		05:07	05:54	06:19 (9)	06:40	06:31	07:19			
	20:55		20:24	19:25	36	07:01 (14)	18:18	16:15	15:39		
3	04:33		05:09	05:56	06:21 (9)	06:42	06:33	07:20			
	20:55		20:23	19:22	34	07:01 (14)	18:16	16:14	15:38		
4	04:33		05:10	05:57	06:22 (9)	06:43	06:34	07:22			
	20:54		20:21	19:20	32	07:01 (14)	18:14	16:12	15:38		
5	04:34		05:12	05:59	06:24 (9)	06:45	06:36	07:23			
	20:54		20:19	19:18	28	07:00 (14)	18:11	16:10	15:37		
6	04:35		05:13	06:00	06:36 (14)	06:46	06:38	07:24			
	20:53		20:18	19:16	23	06:59 (14)	18:09	16:09	15:37		
7	04:36		05:15	06:02	06:37 (14)	06:48	06:40	07:25			
	20:53		20:16	19:14	22	06:59 (14)	18:07	16:07	15:36		
8	04:37		05:16	06:03	06:37 (14)	06:50	06:41	07:27			
	20:52		20:14	19:12	20	06:57 (14)	18:05	16:05	15:36		
9	04:38		05:18	06:05	06:37 (14)	06:51	06:43	07:28			
	20:52		20:12	19:09	18	06:55 (14)	18:03	16:04	15:36		
10	04:39		05:19	06:06	06:40 (14)	06:53	06:45	07:29			
	20:51		20:11	19:07	13	06:53 (14)	18:01	16:02	15:36		
11	04:40		05:20	06:08	06:42 (14)	06:54	06:46	07:30			
	20:50		20:09	19:05	7	06:49 (14)	17:58	16:01	15:36		
12	04:41		05:22	06:09		06:56	06:48	07:31			
	20:50		20:07	19:03		17:56	15:59	15:35			
13	04:42		05:24	06:11 (10)	06:11	06:58	06:50	07:32			
	20:49		20:05	6	06:17 (10)	19:00	17:54	15:58	15:35		
14	04:43		05:25	06:09 (10)	06:12	06:59	06:51	07:33			
	20:48		20:03	11	06:20 (10)	18:58	17:52	15:57	15:35		
15	04:44		05:27	06:07 (10)	06:14	07:01	06:53	07:34			
	20:47		20:01	13	06:20 (10)	18:56	17:50	15:55	15:36		
16	04:45		05:28	06:07 (10)	06:15	06:57 (8)	07:03	06:55	07:34		
	20:46		20:00	14	06:21 (10)	18:54	7	07:04 (8)	17:48	15:54	15:36
17	04:46		05:30	06:06 (10)	06:17	06:54 (8)	07:04	06:56	07:35		
	20:45		19:58	15	06:21 (10)	18:51	11	07:05 (8)	17:46	15:53	15:36
18	04:47		05:31	06:05 (10)	06:18	06:53 (8)	07:06	06:58	07:36		
	20:44		19:56	16	06:21 (10)	18:49	13	07:06 (8)	17:44	15:51	15:36
19	04:48		05:33	06:05 (10)	06:20	06:51 (8)	07:07	07:00	07:37		
	20:43		19:54	16	06:21 (10)	18:47	15	07:06 (8)	17:42	15:50	15:36
20	04:50		05:34	06:05 (10)	06:22	06:51 (8)	07:09	07:01	07:37		
	20:42		19:52	16	06:21 (10)	18:45	15	07:06 (8)	17:40	15:49	15:37
21	04:51		05:36	06:05 (10)	06:23	06:50 (8)	07:11	07:03	07:38		
	20:41		19:50	15	06:20 (10)	18:43	15	07:05 (8)	17:38	15:48	15:37
22	04:52		05:37	06:05 (10)	06:25	06:51 (8)	07:12	07:04	07:38		
	20:40		19:48	14	06:19 (10)	18:40	14	07:05 (8)	17:36	15:47	15:38
23	04:53		05:39	06:07 (10)	06:26	06:51 (8)	07:14	07:06	07:39		
	20:38		19:46	11	06:18 (10)	18:38	12	07:03 (8)	17:34	15:46	15:38
24	04:55		05:40	06:08 (10)	06:28	06:52 (8)	07:16	07:07	07:39		
	20:37		19:44	7	06:15 (10)	18:36	10	07:02 (8)	17:32	15:45	15:39
25	04:56		05:42		06:29	06:55 (8)	06:17	07:09	07:40		
	20:36		19:42		18:34	5	07:00 (8)	16:30	15:44	15:39	
26	04:57		05:43	06:47 (14)	06:31		06:19	07:10	07:40		
	20:35		19:39	8	06:55 (14)	18:31		16:28	15:43	15:40	
27	04:59		05:45	06:44 (14)	06:32		06:21	07:12	07:40		
	20:33		19:37	13	06:57 (14)	18:29		16:26	15:42	15:41	
28	05:00		05:46	06:42 (14)	06:34		06:23	07:13	07:41		
	20:32		19:35	17	06:59 (14)	18:27		16:24	15:41	15:42	
29	05:02		05:48	06:23 (9)	06:35		06:24	07:15	07:41		
	20:30		19:33	26	07:00 (14)	18:25		16:22	15:41	15:42	
30	05:03		05:49	06:21 (9)	06:37		06:26	07:16	07:41		
	20:29		19:31	32	07:01 (14)	18:22		16:21	15:40	15:43	
31	05:04		05:51	06:20 (9)			06:28		07:41		
	20:27		19:29	34	07:01 (14)		16:19		15:44		
Potential sun hours	495		450		380		334	271	251		
Total, worst case		2		284		387					
Sun reduction		0,36		0,39		0,34					
Oper. time red.		0,86		0,86		0,86					
Wind dir. red.		0,70		0,71		0,71					
Total reduction		0,22		0,23		0,21					
Total, real		0		66		79					

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

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

## SHADOW - Calendar

**Shadow receptor:** AI - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (35)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April		May		June
1	07:41	07:17	06:26		06:18		05:16		04:34
	15:45	16:31	17:20		19:11		19:59	17	06:13 (10)
2	07:41	07:15	06:24		06:16		05:15		04:33
	15:46	16:33	17:22		19:12	12	06:54 (14)	15	05:57 (10)
3	07:41	07:14	06:22		06:14		05:13		04:32
	15:48	16:34	17:23		19:14	18	07:09 (14)	13	06:10 (10)
4	07:41	07:12	06:20		06:12		05:11		04:32
	15:49	16:36	17:25		19:16	21	07:10 (14)	10	06:09 (10)
5	07:41	07:11	06:18		06:10		05:09		04:31
	15:50	16:38	17:27		19:17	24	07:10 (14)	4	06:06 (10)
6	07:40	07:09	06:15		06:07		05:08		04:30
	15:51	16:40	17:28		19:19	26	07:11 (14)		20:47
7	07:40	07:07	06:13		06:05		05:06		04:30
	15:52	16:42	17:30		19:20	28	07:12 (14)		20:48
8	07:40	07:06	06:11		06:03		05:04		04:29
	15:53	16:43	17:32		19:22	35	07:12 (14)		20:49
9	07:39	07:04	06:09		06:01		05:03		04:29
	15:55	16:45	17:33		19:24	40	07:13 (14)		20:49
10	07:39	07:02	06:07		05:59		05:01		04:29
	15:56	16:47	17:35		19:25	43	07:13 (14)		20:50
11	07:38	07:01	06:05		05:57		04:59		04:28
	15:57	16:49	17:37		19:27	44	07:13 (14)		20:51
12	07:38	06:59	06:02		05:54		04:58		04:28
	15:59	16:50	17:38		19:28	44	07:12 (14)		20:51
13	07:37	06:57	06:00		05:52		04:56		04:28
	16:00	16:52	17:40	2	06:24 (6)	43	07:11 (14)		20:52
14	07:36	06:55	05:58		06:20 (6)		04:55		04:28
	16:02	16:54	17:42	5	06:25 (6)	40	07:10 (14)		20:53
15	07:36	06:53	05:56		06:18 (6)		04:53		04:27
	16:03	16:56	17:43	8	06:26 (6)	36	07:09 (14)		20:53
16	07:35	06:52	05:54		06:16 (6)		04:52		04:27
	16:05	16:57	17:45	11	06:27 (6)	30	07:08 (14)		20:54
17	07:34	06:50	05:52		06:14 (6)		04:50		04:27
	16:06	16:59	17:47	11	06:25 (6)	24	07:07 (14)		20:54
18	07:33	06:48	05:49		06:14 (8)		04:49		04:27
	16:08	17:01	17:48	11	06:25 (6)	22	07:06 (14)		20:55
19	07:32	06:46	05:47		06:12 (8)		04:48		04:27
	16:09	17:03	17:50	15	06:27 (8)	19	07:04 (14)		20:55
20	07:31	06:44	05:45		06:11 (8)		04:46		04:27
	16:11	17:04	17:51	16	06:27 (8)	16	07:02 (14)		20:55
21	07:30	06:42	05:43		06:11 (8)		04:45		04:27
	16:12	17:06	17:53	17	06:28 (8)	11	06:58 (14)		20:55
22	07:29	06:40	05:40		06:10 (8)		04:44		04:28
	16:14	17:08	17:55	17	06:27 (8)	10	06:11 (10)		20:56
23	07:28	06:38	05:38		06:10 (8)		04:43		04:28
	16:16	17:10	17:56	16	06:26 (8)	13	06:12 (10)		20:56
24	07:27	06:36	05:36		06:10 (8)		04:42		04:28
	16:17	17:11	17:58	16	06:26 (8)	15	06:14 (10)		20:56
25	07:26	06:34	05:34		06:11 (8)		04:40		04:29
	16:19	17:13	18:00	14	06:25 (8)	17	06:14 (10)		20:56
26	07:25	06:32	05:32		06:11 (8)		04:39		04:29
	16:21	17:15	18:01	11	06:22 (8)	18	06:15 (10)		20:56
27	07:23	06:30	05:29		06:14 (8)		04:38		04:29
	16:22	17:16	18:03	6	06:20 (8)	18	06:14 (10)		20:56
28	07:22	06:28	05:27		05:22		04:37		04:30
	16:24	17:18	18:04		19:54	18	06:14 (10)		20:56
29	07:21		06:25		05:20		04:36		04:30
	16:26		19:06		19:56	19	06:14 (10)		20:56
30	07:19		06:23		05:18		04:36		04:31
	16:27		19:08		19:57	18	06:14 (10)		20:56
31	07:18		06:21				04:35		
	16:29		19:09				20:41		
Potential sun hours	265	281	367		413		479		491
Total, worst case			176		722		59		
Sun reduction			0,31		0,31		0,35		
Oper. time red.			0,86		0,86		0,86		
Wind dir. red.			0,69		0,71		0,70		
Total reduction			0,18		0,19		0,21		
Total, real			33		136		12		

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

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

## SHADOW - Calendar

**Shadow receptor:** AI - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (35)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:31 20:55	05:06 20:26	05:52 19:27	06:20 (9) 07:11 (14)	06:39 18:20	06:29 16:17
2	04:32 20:55	05:07 20:24	05:54 19:25	06:19 (9) 07:11 (14)	06:40 18:18	06:31 16:15
3	04:33 20:55	05:09 20:23	05:56 19:22	06:21 (9) 07:11 (14)	06:42 18:16	06:33 16:14
4	04:33 20:54	05:10 20:21	05:57 19:20	06:22 (9) 07:09 (14)	06:43 18:14	06:34 16:12
5	04:34 20:54	05:12 20:19	05:59 19:18	06:41 (14) 07:09 (14)	06:45 18:11	06:36 16:10
6	04:35 20:53	05:13 20:18	06:00 19:16	06:41 (14) 07:08 (14)	06:46 18:09	06:38 16:09
7	04:36 20:53	05:15 20:16	06:02 19:14	06:42 (14) 07:07 (14)	06:48 18:07	06:40 16:07
8	04:37 20:52	05:16 20:14	06:10 (10) 19:12	06:43 (14) 07:05 (14)	06:50 18:05	06:41 16:05
9	04:38 20:52	05:17 20:12	06:17 (10) 19:09	06:44 (14) 07:02 (14)	06:51 18:03	06:43 16:04
10	04:39 20:51	05:19 20:11	06:07 (10) 19:07	06:46 (14) 07:00 (14)	06:53 18:01	06:45 16:02
11	04:40 20:50	05:20 20:09	06:05 (10) 19:05	06:51 (14) 06:53 (14)	06:54 17:58	06:46 16:01
12	04:41 20:50	05:22 20:07	06:05 (10) 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	04:42 20:49	05:24 20:05	06:04 (10) 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	04:43 20:48	05:25 20:03	06:04 (10) 18:58	06:59 17:52	06:51 15:57	07:33 15:35
15	04:44 20:47	05:27 20:01	06:03 (10) 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	04:45 20:46	05:28 20:00	06:04 (10) 18:54	07:04 (8) 07:08 (8)	07:03 17:48	06:55 15:54
17	04:46 20:45	05:30 19:58	06:03 (10) 18:51	07:00 (8) 07:10 (8)	07:04 17:46	06:56 15:53
18	04:47 20:44	05:31 19:56	06:03 (10) 18:49	06:59 (8) 07:12 (8)	07:06 17:44	06:58 15:51
19	04:48 20:43	05:33 19:54	06:04 (10) 18:47	06:57 (8) 07:12 (8)	07:07 17:42	07:00 15:50
20	04:50 20:42	05:34 19:52	06:05 (10) 18:45	06:56 (8) 07:13 (8)	07:09 17:40	07:01 15:49
21	04:51 20:41	05:36 19:50	06:07 (10) 18:42	06:55 (8) 07:12 (8)	07:11 17:38	07:03 15:48
22	04:52 20:40	05:37 19:48	06:53 (14) 18:40	06:55 (8) 07:12 (8)	07:12 17:36	07:04 15:47
23	04:53 20:38	05:39 19:46	06:51 (14) 18:38	06:55 (8) 07:11 (8)	07:14 17:34	07:06 15:46
24	04:55 20:37	05:40 19:44	06:48 (14) 18:36	06:56 (8) 07:10 (8)	07:16 17:32	07:07 15:45
25	04:56 20:36	05:42 19:42	06:47 (14) 18:34	06:57 (8) 07:09 (8)	06:17 16:30	07:09 15:44
26	04:57 20:34	05:43 19:39	06:45 (14) 18:31	06:57 (6) 07:08 (6)	06:19 16:28	07:10 15:43
27	04:59 20:33	05:45 19:37	06:25 (9) 18:29	06:57 (6) 07:08 (6)	06:21 16:26	07:12 15:42
28	05:00 20:32	05:46 19:35	06:23 (9) 18:27	06:58 (6) 07:07 (6)	06:23 16:24	07:13 15:41
29	05:02 20:30	05:48 19:33	06:21 (9) 18:25	07:00 (6) 07:07 (6)	06:24 16:22	07:15 15:41
30	05:03 20:29	05:49 19:31	06:20 (9) 18:22	07:01 (6) 07:04 (6)	06:26 16:21	07:16 15:40
31	05:04 20:27	05:51 19:29	06:19 (9) 18:11 (14)	06:28 16:19	06:28 16:19	07:17 15:44
Potential sun hours	495	450	380	334	271	251
Total, worst case		498	473			
Sun reduction		0,39	0,34			
Oper. time red.		0,86	0,86			
Wind dir. red.		0,71	0,70			
Total reduction		0,23	0,20			
Total, real		116	97			

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

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

## SHADOW - Calendar

**Shadow receptor:** AJ - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (36)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	07:17 16:31	06:26 17:20	06:51 (4) 19:11	05:16 19:59	05:47 (7) 20:42
2	07:41 15:46	07:15 16:33	06:24 17:22	06:51 (4) 19:12	05:15 20:00	05:49 (7) 20:43
3	07:41 15:48	07:14 16:34	06:22 17:23	06:53 (4) 19:14	05:13 20:02	05:53 (7) 20:44
4	07:41 15:49	07:12 16:36	06:20 17:25	06:58 (4) 19:16	05:11 20:03	05:50 (8) 20:45
5	07:41 15:50	07:10 16:38	06:18 17:27	06:10 19:17	05:09 20:05	05:47 (8) 20:46
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:07	05:46 (8) 20:47
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:20	05:06 20:08	05:45 (8) 20:48
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	05:43 (8) 20:48
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	05:43 (8) 20:49
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	05:42 (8) 20:50
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	05:01 20:14	05:42 (8) 20:51
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:28	05:00 20:16	05:42 (8) 20:51
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	05:00 20:17	05:42 (8) 20:52
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	05:00 20:19	05:42 (8) 20:53
15	07:36 16:03	06:53 16:56	05:56 17:43	05:48 19:33	05:00 20:20	05:42 (8) 20:53
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	05:00 20:22	05:42 (8) 20:54
17	07:34 16:06	06:50 16:59	05:51 17:47	05:44 19:36	05:00 20:23	05:43 (8) 20:54
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	05:00 20:24	05:44 (8) 20:55
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	05:00 20:26	05:43 (8) 20:55
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	05:00 20:27	05:17 (9) 20:55
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	05:00 20:28	05:16 (9) 20:55
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	05:00 20:30	05:15 (9) 20:56
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	05:00 20:31	05:14 (9) 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	05:00 20:32	05:14 (9) 20:56
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	05:00 20:34	05:14 (9) 20:56
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	05:00 20:35	05:14 (9) 20:56
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	05:00 20:36	05:13 (9) 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	05:00 20:37	05:13 (9) 20:56
29	07:21 16:26		06:25 19:06	05:20 19:56	05:00 20:39	05:13 (9) 20:56
30	07:19 16:27		06:23 19:08	05:18 19:57	05:00 20:40	05:14 (9) 20:56
31	07:18 16:29		06:21 19:09	05:17 20:41	05:00 20:41	05:14 (9) 20:56
Potential sun hours	265	281	367	413	479	491
Total, worst case		37	25	156	540	162
Sun reduction		0,31	0,31	0,31	0,35	0,32
Oper. time red.		0,86	0,86	0,86	0,86	0,86
Wind dir. red.		0,65	0,65	0,71	0,69	0,69
Total reduction		0,17	0,17	0,19	0,21	0,19
Total, real		6	4	29	112	31

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

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



## SHADOW - Calendar

**Shadow receptor:** AJ - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (36)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:24 (9)	05:06	05:52 (8)	05:52	06:21 (6)	06:39	06:29	07:18		
	20:55	8 05:32 (9)	20:26	22 06:14 (8)	19:27	10 06:31 (6)	18:20	16:17	15:39		
2	04:32	05:23 (9)	05:07	05:53 (8)	05:54	06:22 (6)	06:40	06:31	07:19		
	20:55	9 05:32 (9)	20:24	21 06:14 (8)	19:25	7 06:29 (6)	18:18	16:15	15:39		
3	04:33	05:23 (9)	05:09	05:53 (8)	05:56		06:42	06:33	07:20		
	20:55	10 05:33 (9)	20:23	20 06:13 (8)	19:22		18:16	16:14	15:38		
4	04:33	05:23 (9)	05:10	05:54 (8)	05:57		06:43	06:34	07:22		
	20:54	11 05:34 (9)	20:21	19 06:13 (8)	19:20		18:14	16:12	15:38		
5	04:34	05:23 (9)	05:12	05:54 (8)	05:59		06:45	06:36	07:23		
	20:54	10 05:33 (9)	20:19	18 06:12 (8)	19:18		18:11	16:10	15:37		
6	04:35	05:23 (9)	05:13	05:54 (8)	06:00		06:46	06:38	07:24		
	20:53	11 05:34 (9)	20:18	17 06:11 (8)	19:16		18:09	16:09	15:37		
7	04:36	05:23 (9)	05:15	05:56 (8)	06:02		06:48	06:40	07:25		
	20:53	12 05:35 (9)	20:16	14 06:10 (8)	19:14		18:07	16:07	15:36		
8	04:37	05:23 (9)	05:16	05:57 (8)	06:03		06:50	06:41	07:27		
	20:52	13 05:36 (9)	20:14	11 06:08 (8)	19:11		18:05	16:05	15:36		
9	04:38	05:23 (9)	05:17	06:00 (8)	06:05		06:51	06:43	07:28		
	20:52	13 05:36 (9)	20:12	6 06:06 (8)	19:09		18:03	16:04	15:36		
10	04:39	05:23 (9)	05:19		06:06		06:53	06:45	07:29		
	20:51	14 05:37 (9)	20:11		19:07		18:01	16:02	15:36		
11	04:40	05:23 (9)	05:20	05:57 (7)	06:08		06:54	06:46	07:30		
	20:50	14 05:37 (9)	20:09	5 06:02 (7)	19:05		17:58	07:33 (4)	16:01	15:36	
12	04:41	05:23 (9)	05:22	05:56 (7)	06:09		06:56	07:25 (4)	06:48	07:31	
	20:50	15 05:38 (9)	20:07	8 06:04 (7)	19:03		17:56	10 07:35 (4)	15:59	15:35	
13	04:42	05:23 (9)	05:23	05:54 (7)	06:11		06:58	07:24 (4)	06:50	07:32	
	20:49	15 05:38 (9)	20:05	10 06:04 (7)	19:00		17:54	12 07:36 (4)	15:58	15:35	
14	04:43	05:23 (9)	05:25	05:54 (7)	06:12		06:59	07:24 (4)	06:51	07:33	
	20:48	15 05:38 (9)	20:03	11 06:05 (7)	18:58		17:52	11 07:35 (4)	15:57	15:35	
15	04:44	05:23 (9)	05:27	05:54 (7)	06:14		07:01	07:26 (4)	06:53	07:34	
	20:47	15 05:38 (9)	20:01	11 06:05 (7)	18:56		17:50	9 07:35 (4)	15:55	15:36	
16	04:45	05:23 (9)	05:28	05:54 (7)	06:15		07:03	07:28 (4)	06:55	07:34	
	20:46	15 05:38 (9)	20:00	10 06:04 (7)	18:54		17:48	7 07:35 (4)	15:54	15:36	
17	04:46	05:23 (9)	05:30	05:56 (7)	06:17		07:04	07:29 (4)	06:56	07:35	
	20:45	15 05:38 (9)	19:58	8 06:04 (7)	18:51		17:46	4 07:33 (4)	15:53	15:36	
18	04:47	05:23 (9)	05:31	05:57 (7)	06:18		07:06	07:31 (4)	06:58	07:36	
	20:44	15 05:38 (9)	19:56	5 06:02 (7)	18:49		17:44	1 07:32 (4)	15:51	15:36	
19	04:48	05:23 (9)	05:33	05:59 (7)	06:20		07:07	07:00	07:37		
	20:43	20 06:06 (8)	19:54	1 06:00 (7)	18:47		17:42	15:50	15:36		
20	04:50	05:24 (9)	05:34		06:21		07:09	07:01	07:37		
	20:42	23 06:08 (8)	19:52		18:45		17:40	15:49	15:37		
21	04:51	05:24 (9)	05:36		06:23		07:11	07:03	07:38		
	20:41	25 06:09 (8)	19:50		18:42		17:38	15:48	15:37		
22	04:52	05:26 (9)	05:37		06:25		07:12	07:04	07:38		
	20:40	25 06:11 (8)	19:48		18:40		17:36	15:47	15:38		
23	04:53	05:27 (9)	05:39		06:26		07:14	07:06	07:39		
	20:38	25 06:12 (8)	19:46		18:38		17:34	15:46	15:38		
24	04:55	05:28 (9)	05:40		06:28		07:16	07:07	07:39		
	20:37	23 06:12 (8)	19:44		18:36		17:32	15:45	15:39		
25	04:56	05:54 (8)	05:42	7 06:25 (6)	06:29		06:17	07:09	07:40		
	20:36	18 06:12 (8)	19:42	7 06:32 (6)	18:34		16:30	15:44	15:39		
26	04:57	05:54 (8)	05:43	06:23 (6)	06:31		06:19	07:10	07:40		
	20:34	20 06:14 (8)	19:39	10 06:33 (6)	18:31		16:28	15:43	15:40		
27	04:59	05:53 (8)	05:45	06:21 (6)	06:32		06:21	07:12	07:40		
	20:33	21 06:14 (8)	19:37	12 06:33 (6)	18:29		16:26	15:42	15:41		
28	05:00	05:53 (8)	05:46	06:21 (6)	06:34		06:23	07:13	07:41		
	20:32	21 06:14 (8)	19:35	13 06:34 (6)	18:27		16:24	15:41	15:42		
29	05:02	05:52 (8)	05:48	06:20 (6)	06:35		06:24	07:15	07:41		
	20:30	22 06:14 (8)	19:33	13 06:33 (6)	18:25		16:22	15:41	15:42		
30	05:03	05:53 (8)	05:49	06:20 (6)	06:37		06:26	07:16	07:41		
	20:29	22 06:15 (8)	19:31	13 06:33 (6)	18:22		16:21	15:40	15:43		
31	05:04	05:52 (8)	05:51	06:20 (6)			06:28		07:41		
	20:27	22 06:14 (8)	19:29	12 06:32 (6)			16:19		15:44		
Potential sun hours	495		450		380		334		271		251
Total, worst case	517		297		17		61				
Sun reduction	0,36		0,39		0,34		0,37				
Oper. time red.	0,86		0,86		0,86		0,86				
Wind dir. red.	0,69		0,70		0,71		0,65				
Total reduction	0,21		0,23		0,21		0,20				
Total, real	110		69		4		12				

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

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

## SHADOW - Calendar

**Shadow receptor:** AK - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (37)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	06:46 (3) 06:57 (3)	05:16 19:59
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	06:42 (4) 06:56 (3)	05:15 20:00
3	07:41 15:48	07:14 16:34	06:22 17:23	06:14 19:14	06:40 (4) 06:52 (3)	05:13 20:02
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	06:38 (4) 06:53 (4)	05:11 20:03
5	07:40 15:50	07:10 16:38	06:17 17:27	06:10 19:17	06:36 (4) 06:53 (4)	05:09 20:05
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	06:35 (4) 06:53 (4)	05:08 20:07
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	06:35 (4) 06:53 (4)	05:06 20:08
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	06:35 (4) 06:53 (4)	05:04 20:10
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	06:35 (4) 06:52 (4)	05:03 20:11
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	06:35 (4) 06:52 (4)	05:01 20:13
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	06:36 (4) 06:51 (4)	05:26 (5) 20:14
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:28	06:37 (4) 06:49 (4)	05:24 (5) 20:16
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	06:38 (4) 06:46 (4)	05:24 (5) 20:17
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	05:24 (5) 20:53
15	07:35 16:03	06:53 16:56	05:56 17:43	05:48 19:33	04:53 20:20	05:23 (5) 20:53
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:21	05:23 (5) 20:54
17	07:34 16:06	06:50 16:59	05:51 17:47	05:44 19:36	04:50 20:23	05:23 (5) 20:54
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	05:23 (5) 20:54
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	05:23 (5) 20:55
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	05:24 (5) 20:55
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:28	05:25 (5) 20:55
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	05:26 (5) 20:56
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	05:27 (5) 20:56
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:32	05:32 (5) 20:56
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:40 20:34	04:42 20:56
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:42 20:56
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 05:51 (3)	04:38 05:57 (3)	04:42 20:56
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 05:59 (3)	04:37 05:54 (3)	04:42 20:56
29	07:21 16:26		06:25 19:06	05:20 06:47 (3)	04:36 05:50 (3)	04:42 20:56
30	07:19 16:27		06:23 19:08	05:18 06:49 (3)	04:36 05:52 (3)	04:42 20:56
31	07:18 16:29		06:20 19:09	05:17 06:46 (3)	04:35 20:41	04:42 20:56
Potential sun hours	265	281	367	413	479	491
Total, worst case			52	192	130	
Sun reduction			0,31	0,31	0,35	
Oper. time red.			0,86	0,86	0,86	
Wind dir. red.			0,71	0,71	0,69	
Total reduction			0,19	0,19	0,20	
Total, real			10	36	27	

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

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

## SHADOW - Calendar

**Shadow receptor:** AK - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (37)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:06	05:35 (5)	05:52	06:35 (4)	06:39	06:29	07:18			
	20:55	20:26	8 05:43 (5)	19:27	15 06:50 (4)	18:20	16:17	15:39			
2	04:32	05:07	05:38 (5)	05:54	06:33 (4)	06:40	06:31	07:19			
	20:55	20:24	4 05:42 (5)	19:25	17 06:50 (4)	18:18	16:15	15:39			
3	04:33	05:09		05:56	06:33 (4)	06:42	06:33	07:20			
	20:55	20:23		19:22	17 06:50 (4)	18:16	16:14	15:38			
4	04:33	05:10		05:57	06:32 (4)	06:43	06:34	07:22			
	20:54	20:21		19:20	18 06:50 (4)	18:14	16:12	15:38			
5	04:34	05:12		05:59	06:32 (4)	06:45	06:36	07:23			
	20:54	20:19		19:18	18 06:50 (4)	18:11	16:10	15:37			
6	04:35	05:13		06:00	06:31 (4)	06:46	06:38	07:24			
	20:53	20:18		19:16	18 06:49 (4)	18:09	16:09	15:37			
7	04:36	05:15		06:02	06:32 (4)	06:48	06:39	07:25			
	20:53	20:16		19:14	17 06:49 (4)	18:07	16:07	15:36			
8	04:37	05:16		06:03	06:32 (4)	06:50	06:41	07:27			
	20:52	20:14		19:11	15 06:47 (4)	18:05	16:05	15:36			
9	04:38	05:17		06:05	06:33 (4)	06:51	06:43	07:28			
	20:52	20:12		19:09	12 06:45 (4)	18:03	16:04	15:36			
10	04:39	05:19		06:06	06:35 (4)	06:53	06:45	07:29			
	20:51	20:11		19:07	14 06:49 (3)	18:01	16:02	15:36			
11	04:40	05:20		06:08	06:39 (3)	06:54	06:46	07:30			
	20:50	20:09		19:05	10 06:49 (3)	17:58	16:01	15:36			
12	04:41	05:22		06:09	06:38 (3)	06:56	06:48	07:31			
	20:50	20:07		19:03	12 06:50 (3)	17:56	15:59	15:35			
13	04:42	05:23		06:11	06:37 (3)	06:58	06:50	07:32			
	20:49	20:05		19:00	12 06:49 (3)	17:54	15:58	15:35			
14	04:43	05:25		06:12	06:37 (3)	06:59	06:51	07:33			
	20:48	20:03		18:58	12 06:49 (3)	17:52	15:57	15:35			
15	04:44	05:27		06:14	06:38 (3)	07:01	06:53	07:34			
	20:47	20:01		18:56	10 06:48 (3)	17:50	15:55	15:36			
16	04:45	05:28		06:15	06:40 (3)	07:03	06:55	07:34			
	20:46	19:59		18:54	7 06:47 (3)	17:48	15:54	15:36			
17	04:46	05:30		06:17	06:41 (3)	07:04	06:56	07:35			
	20:45	19:58		18:51	3 06:44 (3)	17:46	15:53	15:36			
18	04:47	05:31		06:18		07:06	06:58	07:36			
	20:44	19:56		18:49		17:44	15:51	15:36			
19	04:48	05:33		06:20		07:07	06:59	07:37			
	20:43	19:54		18:47		17:42	15:50	15:36			
20	04:50	05:38 (5)	05:34	06:21		07:09	07:01	07:37			
	20:42	2 05:40 (5)	19:52	18:45		17:40	15:49	15:37			
21	04:51	05:36 (5)	05:36	06:23		07:11	07:03	07:38			
	20:41	6 05:42 (5)	19:50	18:42		17:38	15:48	15:37			
22	04:52	05:36 (5)	05:37	06:25		07:12	07:04	07:38			
	20:40	8 05:44 (5)	19:48	18:40		17:36	15:47	15:38			
23	04:53	05:35 (5)	05:39	06:26		07:14	07:06	07:39			
	20:38	10 05:45 (5)	19:46	18:38		17:34	15:46	15:38			
24	04:55	05:34 (5)	05:40	06:28		07:16	07:07	07:39			
	20:37	11 05:45 (5)	19:44	18:36		17:32	15:45	15:39			
25	04:56	05:33 (5)	05:42	06:29		06:17	07:09	07:40			
	20:36	12 05:45 (5)	19:42	18:34		16:30	15:44	15:39			
26	04:57	05:34 (5)	05:43	06:31		06:19	07:10	07:40			
	20:34	12 05:46 (5)	19:39	18:31		16:28	15:43	15:40			
27	04:59	05:33 (5)	05:45	06:32		06:21	07:12	07:40			
	20:33	13 05:46 (5)	19:37	18:29		16:26	15:42	15:41			
28	05:00	05:33 (5)	05:46	06:34		06:22	07:13	07:41			
	20:32	13 05:46 (5)	19:35	18:27		16:24	15:41	15:42			
29	05:02	05:33 (5)	05:48	06:35		06:24	07:15	07:41			
	20:30	12 05:45 (5)	19:33	18:25		16:22	15:41	15:42			
30	05:03	05:34 (5)	05:49	06:39 (4)	06:37	06:26	07:16	07:41			
	20:29	12 05:46 (5)	19:31	8 06:47 (4)	18:22	16:21	15:40	15:43			
31	05:04	05:35 (5)	05:51	06:36 (4)		06:28		07:41			
	20:27	10 05:45 (5)	19:29	12 06:48 (4)		16:19		15:44			
Potential sun hours	495		450	380		334	271	251			
Total, worst case	121		32	227							
Sun reduction	0,36		0,39	0,34							
Oper. time red.	0,86		0,86	0,86							
Wind dir. red.	0,69		0,70	0,71							
Total reduction	0,21		0,23	0,21							
Total, real	26		7	47							

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

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

## SHADOW - Calendar

**Shadow receptor:** AL - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (38)**Assumptions for shadow calculations**

Sunshine probability 'S' (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	05:45 (2) 06:31 (4)
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	06:40 (3) 06:47 (3)	05:15 20:00
3	07:41 15:48	07:14 16:34	06:22 17:23	06:14 19:14	06:37 (3) 06:49 (3)	05:13 20:02
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	06:36 (3) 06:50 (3)	05:11 20:03
5	07:40 15:50	07:10 16:38	06:17 17:27	06:10 19:17	06:34 (3) 06:49 (3)	05:09 20:05
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	06:34 (3) 06:49 (3)	05:08 20:06
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	06:34 (3) 06:49 (3)	05:06 20:08
8	07:40 15:53	07:06 16:43	06:11 17:32	06:03 19:22	06:34 (3) 06:49 (3)	05:04 20:10
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	06:34 (3) 06:48 (3)	05:03 20:11
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	06:35 (3) 06:46 (3)	05:01 20:13
11	07:38 15:57	07:00 16:49	06:05 17:37	05:57 19:27	06:37 (3) 06:44 (3)	04:59 20:14
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:16	04:28 20:51
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53
15	07:35 16:03	06:53 16:56	05:56 17:43	05:48 19:33	06:24 (4) 06:27 (4)	04:53 20:20
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	06:19 (4) 06:31 (4)	04:52 20:21
17	07:34 16:06	06:50 16:59	05:51 17:46	05:44 19:36	06:17 (4) 06:33 (4)	04:50 20:23
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	06:15 (4) 06:34 (4)	04:49 20:24
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	06:14 (4) 06:35 (4)	04:48 20:26
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	06:13 (4) 06:36 (4)	04:46 20:27
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	06:12 (4) 06:36 (4)	04:45 20:28
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	06:11 (4) 06:36 (4)	04:44 20:30
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	06:11 (4) 06:36 (4)	04:43 20:31
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	06:11 (4) 06:37 (4)	04:42 20:32
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	06:11 (4) 06:36 (4)	04:40 20:34
26	07:24 16:21	06:32 17:15	05:32 18:01	05:26 19:51	05:50 (2) 06:36 (4)	04:39 20:35
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	05:47 (2) 06:35 (4)	04:38 20:36
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	05:46 (2) 06:34 (4)	04:37 20:37
29	07:21 16:26		06:25 19:06	05:20 19:56	05:45 (2) 06:33 (4)	04:36 20:38
30	07:19 16:27		06:23 19:08	05:18 19:57	05:45 (2) 06:33 (4)	04:36 20:40
31	07:18 16:29		06:20 19:09		04:35 20:41	
Potential sun hours	265	281	367	413	479	491
Total, worst case				501	88	237
Sun reduction				0,31	0,35	0,32
Oper. time red.				0,86	0,86	0,86
Wind dir. red.				0,71	0,70	0,70
Total reduction				0,19	0,21	0,19
Total, real				94	18	45

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

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

## SHADOW - Calendar

**Shadow receptor:** AL - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (38)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	04:31	05:07 (5)	05:06	05:52	06:36 (3)	06:39	06:29	07:18			
	20:55	9 05:16 (5)	20:26	19:27	7 06:43 (3)	18:20	16:17	15:39			
2	04:32	05:07 (5)	05:07	05:54	06:33 (3)	06:40	06:31	07:19			
	20:55	8 05:15 (5)	20:24	19:25	11 06:44 (3)	18:18	16:15	15:39			
3	04:33	05:08 (5)	05:09	05:55	06:32 (3)	06:42	06:33	07:20			
	20:55	7 05:15 (5)	20:23	19:22	14 06:46 (3)	18:16	16:14	15:38			
4	04:33	05:09 (5)	05:10	05:57	06:31 (3)	06:43	06:34	07:22			
	20:54	5 05:14 (5)	20:21	19:20	15 06:46 (3)	18:14	16:12	15:38			
5	04:34	05:10 (5)	05:12	05:59	06:31 (3)	06:45	06:36	07:23			
	20:54	2 05:12 (5)	20:19	19:18	15 06:46 (3)	18:11	16:10	15:37			
6	04:35		05:13	06:00	06:30 (3)	06:46	06:38	07:24			
	20:53		20:18	19:16	15 06:45 (3)	18:09	16:09	15:37			
7	04:36		05:14	06:02	06:29 (3)	06:48	06:39	07:25			
	20:53		20:16	19:14	15 06:44 (3)	18:07	16:07	15:36			
8	04:37		05:16	05:56 (2)	06:03	06:30 (3)	06:50	06:41	07:26		
	20:52		20:14	7 06:03 (2)	19:11	14 06:44 (3)	18:05	16:05	15:36		
9	04:38		05:17	05:54 (2)	06:05	06:30 (3)	06:51	06:43	07:28		
	20:52		20:12	14 06:33 (4)	19:09	12 06:42 (3)	18:03	16:04	15:36		
10	04:39		05:19	05:54 (2)	06:06	06:32 (3)	06:53	06:45	07:29		
	20:51		20:11	23 06:37 (4)	19:07	8 06:40 (3)	18:01	16:02	15:36		
11	04:40		05:20	05:53 (2)	06:08		06:54	06:46	07:30		
	20:50		20:09	27 06:38 (4)	19:05		17:58	16:01	15:36		
12	04:41		05:22	05:53 (2)	06:09		06:56	06:48	07:31		
	20:50		20:07	31 06:40 (4)	19:03		17:56	15:59	15:35		
13	04:42		05:23	05:53 (2)	06:11		06:58	06:50	07:32		
	20:49		20:05	33 06:41 (4)	19:00		17:54	15:58	15:35		
14	04:43		05:25	05:54 (2)	06:12		06:59	06:51	07:33		
	20:48		20:03	33 06:42 (4)	18:58		17:52	15:57	15:35		
15	04:44		05:27	05:54 (2)	06:14		07:01	06:53	07:34		
	20:47		20:01	33 06:42 (4)	18:56		17:50	15:55	15:36		
16	04:45		05:28	05:54 (2)	06:15		07:02	06:55	07:34		
	20:46		19:59	32 06:42 (4)	18:54		17:48	15:54	15:36		
17	04:46		05:30	06:18 (4)	06:17		07:04	06:56	07:35		
	20:45		19:58	25 06:43 (4)	18:51		17:46	15:53	15:36		
18	04:47		05:31	06:17 (4)	06:18		07:06	06:58	07:36		
	20:44		19:56	25 06:42 (4)	18:49		17:44	15:51	15:36		
19	04:48		05:33	06:17 (4)	06:20		07:07	06:59	07:37		
	20:43		19:54	25 06:42 (4)	18:47		17:42	15:50	15:36		
20	04:50		05:34	06:17 (4)	06:21		07:09	07:01	07:37		
	20:42		19:52	25 06:42 (4)	18:45		17:40	15:49	15:37		
21	04:51		05:36	06:17 (4)	06:23		07:11	07:03	07:38		
	20:41		19:50	25 06:42 (4)	18:42		17:38	15:48	15:37		
22	04:52		05:37	06:17 (4)	06:25		07:12	07:04	07:38		
	20:40		19:48	24 06:41 (4)	18:40		17:36	15:47	15:38		
23	04:53		05:39	06:18 (4)	06:26		07:14	07:06	07:39		
	20:38		19:46	22 06:40 (4)	18:38		17:34	15:46	15:38		
24	04:55		05:40	06:18 (4)	06:28		07:16	07:07	07:39		
	20:37		19:44	21 06:39 (4)	18:36		17:32	15:45	15:39		
25	04:56		05:42	06:18 (4)	06:29		06:17	07:09	07:40		
	20:36		19:41	19 06:37 (4)	18:33		16:30	15:44	15:39		
26	04:57		05:43	06:20 (4)	06:31		06:19	07:10	07:40		
	20:34		19:39	16 06:36 (4)	18:31		16:28	15:43	15:40		
27	04:59		05:45	06:21 (4)	06:32		06:21	07:12	07:40		
	20:33		19:37	12 06:33 (4)	18:29		16:26	15:42	15:41		
28	05:00		05:46		06:34		06:22	07:13	07:41		
	20:32		19:35		18:27		16:24	15:41	15:42		
29	05:01		05:48		06:35		06:24	07:15	07:41		
	20:30		19:33		18:25		16:22	15:41	15:42		
30	05:03		05:49		06:37		06:26	07:16	07:41		
	20:29		19:31		18:22		16:21	15:40	15:43		
31	05:04		05:51				06:28		07:41		
	20:27		19:29				16:19		15:44		
Potential sun hours	495		450		380		334		271		251
Total, worst case		31		472		126					
Sun reduction		0,36		0,39		0,34					
Oper. time red.		0,86		0,86		0,86					
Wind dir. red.		0,70		0,71		0,71					
Total reduction		0,22		0,23		0,21					
Total, real		7		110		26					

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

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

## SHADOW - Calendar

**Shadow receptor:** AM - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (39)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	07:18 15:39
2	07:41 15:46	07:15 16:33	06:24 17:21	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:13 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:55 19:22	06:42 18:16	06:33 16:14	07:20 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:03	04:32 20:45	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:14	06:34 16:12	07:22 15:38
5	07:40 15:50	07:10 16:38	06:17 17:27	06:09 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:19	05:59 19:18	06:45 18:11	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:06	04:30 20:47	04:35 20:53	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:09	07:24 15:37
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:39 16:07	07:25 15:36
8	07:39 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:48	04:37 20:52	05:16 20:14	06:03 19:11	06:50 18:05	06:41 16:05	07:26 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49	04:38 20:52	05:17 20:12	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:44 16:02	07:29 15:36
11	07:38 15:57	07:00 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:40 20:50	05:20 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:36
12	07:37 15:59	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:16	04:28 20:51	04:41 20:49	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:57	07:33 15:35
15	07:35 16:03	06:53 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:26 20:01	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	07:35 16:05	06:51 16:57	05:54 17:45	05:46 19:35	04:52 20:21	04:27 20:54	04:45 20:46	05:28 19:59	06:15 18:54	07:02 17:48	06:55 15:54	07:34 15:36
17	07:34 16:06	06:50 16:59	05:51 17:46	05:44 19:36	04:50 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:51	07:04 17:46	06:56 15:53	07:35 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:54	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:07 17:42	06:59 15:50	07:37 15:36
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:21 18:45	07:09 17:40	07:01 15:49	07:37 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:28	04:27 20:55	04:51 20:41	05:36 19:50	06:23 18:42	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	04:28 20:56	04:52 20:39	05:37 19:48	06:25 18:40	07:12 17:36	07:04 15:47	07:38 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:38	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:32	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:07 15:45	07:39 15:39
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:40 20:34	04:28 20:56	04:56 20:36	05:42 19:41	06:29 18:33	06:17 16:30	07:09 15:44	07:40 15:39
26	07:24 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:34	05:43 19:39	06:31 18:31	06:19 16:28	07:10 15:43	07:40 15:40
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	07:40 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:22 16:24	07:13 15:41	07:41 15:42
29	07:21 16:26		06:25 19:06	05:20 19:56	04:36 20:38	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:25	06:24 16:22	07:15 15:41	07:41 15:42
30	07:19 16:27		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:55	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	07:16 15:40	07:41 15:43
31	07:18 16:29		06:20 19:09		04:35 20:41		05:04 20:27	05:51 19:29		06:28 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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



## SHADOW - Calendar

**Shadow receptor:** AN - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (40)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	05:09 (3) 20:55	05:06 20:26	05:52 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:46	07:15 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43	05:11 (3) 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	05:11 (3) 20:55	05:09 20:23	05:56 19:22	06:42 18:16	06:33 16:14	07:20 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:03	04:32 20:45	05:13 (3) 20:54	05:10 20:21	05:57 19:20	06:43 18:14	06:34 16:12	07:22 15:38
5	07:40 15:50	07:10 16:38	06:17 17:27	06:10 19:17	05:09 20:05	04:31 20:46	05:14 (3) 20:54	05:12 20:19	05:59 19:18	06:45 18:11	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:06	04:31 20:47	05:14 (3) 20:53	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:09	07:24 15:37
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48	05:15 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:39 16:07	07:25 15:36
8	07:39 15:53	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:29 20:48	05:16 20:52	05:16 20:14	06:03 19:11	06:50 18:05	06:41 16:05	07:26 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49	05:19 (3) 20:52	05:18 20:12	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	05:18 (3) 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	07:38 15:57	07:00 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	05:18 (3) 20:50	05:21 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:36
12	07:37 15:59	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:16	04:28 20:51	05:17 (3) 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:35
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	05:17 (3) 20:49	05:24 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:35
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	05:17 (3) 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:57	07:33 15:35
15	07:35 16:03	06:53 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	05:17 (3) 20:47	05:27 20:01	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36
16	07:35 16:05	06:52 16:57	05:54 17:45	05:46 19:35	04:52 20:21	04:27 20:54	05:16 (3) 20:46	05:28 19:59	06:15 18:54	07:02 17:48	06:55 15:54	07:34 15:36
17	07:34 16:06	06:50 16:59	05:51 17:47	05:44 19:36	04:50 20:22	04:27 20:54	05:16 (3) 20:45	05:30 19:58	06:17 18:51	07:04 17:46	06:56 15:53	07:35 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:54	05:16 (3) 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	05:17 (3) 20:43	05:33 19:54	06:20 18:47	07:07 17:42	06:59 15:50	07:37 15:36
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55	05:18 (3) 20:42	05:34 19:52	06:21 18:45	07:09 17:40	07:01 15:49	07:37 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:28	04:28 20:55	05:19 (3) 20:41	05:36 19:50	06:23 18:42	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	04:28 20:56	05:21 (3) 20:42	05:37 19:48	06:25 18:40	07:12 17:36	07:04 15:47	07:38 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	05:22 (3) 20:38	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:32	04:28 20:56	05:23 (3) 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:07 15:45	07:39 15:39
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:41 20:34	04:29 20:56	05:25 (3) 20:36	05:42 19:41	06:29 18:34	07:17 17:29	07:09 15:44	07:40 15:39
26	07:24 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:39 20:35	04:29 20:56	05:27 (3) 20:34	05:43 19:39	06:31 18:31	07:19 17:28	07:10 15:43	07:40 15:40
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56	05:28 (3) 20:33	05:45 19:37	06:32 18:29	07:20 17:26	07:12 15:42	07:40 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56	05:29 (3) 20:32	05:46 19:35	06:34 18:27	07:21 17:24	07:13 15:41	07:41 15:42
29	07:21 16:26		06:25 19:06	05:20 19:56	04:36 20:38	04:30 20:56	05:30 (3) 20:30	05:48 19:33	06:35 18:25	07:22 17:22	07:15 15:41	07:41 15:42
30	07:19 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:55	05:03 (3) 20:29	05:49 19:31	06:37 18:22	07:23 17:21	07:16 15:40	07:41 15:43
31	07:18 16:29		06:20 19:09		04:35 20:41	05:09 (3) 20:51	05:04 (3) 20:27	05:51 19:29		06:28 16:19	15:40	07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case					115		20					
Sun reduction					0,35		0,32					
Oper. time red.					0,86		0,86					
Wind dir. red.					0,69		0,69					
Total reduction					0,21		0,19					
Total, real					24		4					

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

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

## SHADOW - Calendar

**Shadow receptor:** AO - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (41)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	07:18 15:39
2	07:41 15:46	07:15 16:33	06:24 17:21	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:24	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:47	07:13 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:22	05:55 19:22	06:42 18:16	06:33 16:13	07:20 15:38
4	07:41 15:49	07:12 16:36	06:19 17:25	06:12 19:15	05:11 20:03	04:32 20:45	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:13	06:34 16:12	07:22 15:38
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6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:06	04:30 20:47	04:35 20:53	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:08	07:24 15:37
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8	07:39 15:53	07:05 16:43	06:11 17:32	06:03 19:22	05:04 20:09	04:29 20:48	04:37 20:52	05:16 20:14	06:03 19:11	06:49 18:05	06:41 16:05	07:26 15:36
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14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:18	04:27 20:52	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:56	07:33 15:35
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31	07:18 16:29		06:20 19:09		04:35 20:41		05:04 20:27		05:51 19:29	06:27 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

**Shadow receptor:** AP - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (42)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	07:17 15:39
2	07:41 15:46	07:15 16:33	06:24 17:21	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:24	06:40 18:18	06:31 16:15	07:19 15:39
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11	07:38 15:57	07:00 16:48	06:04 17:37	05:56 19:27	04:59 20:14	04:28 20:51	04:40 20:50	05:20 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:35
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31	07:18 16:29		06:20 19:09		04:35 20:41		05:04 20:27		05:51 19:29	06:27 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

**Shadow receptor:** AQ - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (43)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
2,18 3,07 3,69 4,28 5,39 5,21 5,74 5,60 4,30 3,94 2,30 1,54

Operational time

N NE E SE S SW W NW Sum  
525 525 600 750 825 1 125 2 025 1 125 7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	19:48 (3) 19:56 (3)	05:52 19:27	06:38 18:20	06:29 16:17
2	07:41 15:46	07:15 16:33	06:24 17:21	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	19:49 (3) 19:56 (3)	05:54 19:24	06:40 18:18	06:31 16:15
3	07:41 15:47	07:13 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:22	19:51 (3) 19:54 (3)	05:55 19:22	06:42 18:16	06:33 16:13
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22	07:29 16:14	06:40 17:08	05:40 17:54	05:34 19:44	04:44 20:30	19:38 (3) 19:49 (3)	04:28 20:55	05:37 19:47	06:24 18:40	07:12 17:36	07:04 15:47	07:38 15:38
23	07:28 16:16	06:38 17:09	05:38 17:56	05:32 19:46	04:43 20:31	19:39 (3) 19:49 (3)	04:28 20:56	05:39 19:47	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:47	04:41 20:32	19:40 (3) 19:48 (3)	04:28 20:56	05:40 20:37	06:27 18:36	07:16 17:32	07:07 15:45	07:39 15:39
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:40 20:33	19:43 (3) 19:46 (3)	04:28 20:56	05:42 20:36	06:29 18:33	06:17 16:30	07:09 15:44	07:40 15:39
26	07:24 16:21	06:32 17:15	05:31 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:34	05:43 19:39	06:31 18:31	06:19 16:28	07:10 15:43	07:40 15:40
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	07:40 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56	05:00 20:31	05:46 19:35	06:34 18:27	06:22 16:24	07:13 15:41	07:40 15:41
29	07:20 16:26		06:25 19:06	05:20 19:55	04:36 20:38	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:24	06:24 16:22	07:15 15:40	07:41 15:42
30	07:19 16:27		06:23 19:07	05:18 19:57	04:35 20:39	04:31 20:55	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:20	07:16 15:40	07:41 15:43
31	07:18 16:29		06:20 19:09		04:35 20:41		05:04 20:27	05:51 19:29		06:27 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case					178		163	18				
Sun reduction					0,35		0,36	0,39				
Oper. time red.					0,86		0,86	0,86				
Wind dir. red.					0,63		0,63	0,63				
Total reduction					0,19		0,19	0,21				
Total, real					33		32	4				

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

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

## SHADOW - Calendar

**Shadow receptor:** AR - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (44)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:45	07:16 16:31	06:26 17:20	06:18 19:11	05:16 19:59	04:34 20:42	04:31 20:55	05:06 20:26	05:52 19:27	06:38 18:20	06:29 16:17	07:17 15:39
2	07:41 15:46	07:15 16:33	06:24 17:21	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:24	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:47	07:13 16:34	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:22	05:55 19:22	06:42 18:16	06:33 16:13	07:20 15:38
4	07:41 15:49	07:12 16:36	06:19 17:25	06:12 19:15	05:11 20:03	04:32 20:45	04:33 20:54	05:10 20:21	05:57 19:20	06:43 18:13	06:34 16:12	07:21 15:38
5	07:40 15:50	07:10 16:38	06:17 17:27	06:09 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:11 20:19	05:58 19:18	06:45 18:11	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:06	04:30 20:47	04:35 20:53	05:13 20:17	06:00 19:16	06:46 18:09	06:38 16:08	07:24 15:37
7	07:40 15:52	07:07 16:41	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:47	04:36 20:53	05:14 20:16	06:02 19:14	06:48 18:07	06:39 16:07	07:25 15:36
8	07:39 15:53	07:05 16:43	06:11 17:32	06:03 19:22	05:04 20:09	04:29 20:48	04:37 20:52	05:16 20:14	06:03 19:11	06:49 18:05	06:41 16:05	07:26 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49	04:38 20:52	05:17 20:12	06:05 19:09	06:51 18:03	06:43 16:04	07:27 15:36
10	07:38 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:12	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:00	06:44 16:02	07:29 15:36
11	07:38 15:57	07:00 16:48	06:04 17:37	05:56 19:27	04:59 20:14	04:28 20:51	04:40 20:50	05:20 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:35
12	07:37 15:59	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:15	04:28 20:51	04:41 20:49	05:22 20:07	06:09 19:02	06:56 17:56	06:48 15:59	07:31 15:35
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:23 20:05	06:11 19:00	06:58 17:54	06:49 15:58	07:32 15:35
14	07:36 16:02	06:55 16:54	05:58 17:41	05:50 19:32	04:55 20:18	04:27 20:52	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:56	07:33 15:35
15	07:35 16:03	06:53 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:26 20:01	06:14 18:56	07:01 17:50	06:53 15:55	07:33 15:36
16	07:35 16:05	06:51 16:57	05:54 17:45	05:46 19:35	04:52 20:21	04:27 20:53	04:45 20:46	05:28 19:59	06:15 18:54	07:02 17:48	06:54 15:54	07:34 15:36
17	07:34 16:06	06:50 16:59	05:51 17:46	05:44 19:36	04:50 20:23	04:27 20:54	04:46 20:45	05:29 19:57	06:17 18:51	07:04 17:46	06:56 15:53	07:35 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:54	04:47 20:44	05:31 19:55	06:18 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:48 20:43	05:33 19:54	06:20 18:47	07:07 17:42	06:59 15:50	07:36 15:36
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:46 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:21 18:45	07:09 17:40	07:01 15:49	07:37 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:28	04:27 20:55	04:51 20:41	05:36 19:50	06:23 18:42	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	04:28 20:55	04:52 20:39	05:37 19:48	06:24 18:40	07:12 17:36	07:04 15:47	07:38 15:38
23	07:28 16:16	06:38 17:09	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:53 20:38	05:39 19:45	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:47	04:42 20:32	04:28 20:56	04:55 20:37	05:40 19:43	06:28 18:36	07:16 17:32	07:07 15:45	07:39 15:39
25	07:26 16:19	06:34 17:13	05:34 17:59	05:28 19:49	04:40 20:33	04:28 20:56	04:56 20:36	05:42 19:41	06:29 18:33	06:17 16:30	07:09 15:44	07:40 15:39
26	07:24 16:21	06:32 17:15	05:31 18:01	05:26 19:51	04:39 20:35	04:29 20:56	04:57 20:34	05:43 19:39	06:31 18:31	06:19 16:28	07:10 15:43	07:40 15:40
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	07:40 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:37 20:37	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:22 16:24	07:13 15:41	07:40 15:42
29	07:21 16:26		06:25 19:06	05:20 19:55	04:36 20:38	04:30 20:56	05:01 20:30	05:48 19:33	06:35 18:24	06:24 16:22	07:15 15:41	07:41 15:42
30	07:19 16:27		06:23 19:07	05:18 19:57	04:36 20:39	04:31 20:55	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	07:16 15:40	07:41 15:43
31	07:18 16:29		06:20 19:09		04:35 20:41		05:04 20:27			06:27 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

**Shadow receptor:** AS - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (45)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:46	07:16 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	04:32 20:55	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:22	06:42 18:16	06:33 16:14	07:20 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:03	04:32 20:45	04:34 20:54	05:10 20:21	05:57 19:20	06:43 18:14	06:34 16:12	07:22 15:38
5	07:40 15:50	07:10 16:38	06:18 17:27	06:10 19:17	05:09 20:05	04:31 20:46	04:34 20:54	05:12 20:19	05:59 19:18	06:45 18:11	06:36 16:10	07:23 15:37
6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:07	04:31 20:47	04:35 20:53	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:09	07:24 15:37
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10	07:39 15:56	07:02 16:47	06:07 17:35	05:59 19:25	05:01 20:13	04:29 20:50	04:39 20:51	05:19 20:11	06:06 19:07	06:53 18:01	06:45 16:02	07:29 15:36
11	07:38 15:57	07:01 16:49	06:05 17:37	05:57 19:27	04:59 20:14	04:28 20:51	04:40 20:50	05:21 20:09	06:08 19:05	06:54 17:58	06:46 16:01	07:30 15:36
12	07:38 15:59	06:59 16:50	06:02 17:38	05:54 19:28	04:58 20:16	04:28 20:51	04:41 20:50	05:22 20:07	06:09 19:03	06:56 17:56	06:48 15:59	07:31 15:36
13	07:37 16:00	06:57 16:52	06:00 17:40	05:52 19:30	04:56 20:17	04:28 20:52	04:42 20:49	05:24 20:05	06:11 19:00	06:58 17:54	06:50 15:58	07:32 15:36
14	07:36 16:02	06:55 16:54	05:58 17:42	05:50 19:32	04:55 20:19	04:28 20:53	04:43 20:48	05:25 20:03	06:12 18:58	06:59 17:52	06:51 15:57	07:33 15:36
15	07:35 16:03	06:53 16:56	05:56 17:43	05:48 19:33	04:53 20:20	04:27 20:53	04:44 20:47	05:27 20:01	06:14 18:56	07:01 17:50	06:53 15:55	07:34 15:36
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17	07:34 16:06	06:50 16:59	05:52 17:47	05:44 19:36	04:51 20:23	04:27 20:54	04:46 20:45	05:30 19:58	06:17 18:51	07:04 17:46	06:56 15:53	07:35 15:36
18	07:33 16:08	06:48 17:01	05:49 17:48	05:42 19:38	04:49 20:24	04:27 20:54	04:47 20:44	05:31 19:56	06:18 18:49	07:06 17:44	06:58 15:51	07:36 15:36
19	07:32 16:09	06:46 17:03	05:47 17:50	05:40 19:40	04:48 20:26	04:27 20:55	04:49 20:43	05:33 19:54	06:20 18:47	07:07 17:42	06:59 15:50	07:37 15:37
20	07:31 16:11	06:44 17:04	05:45 17:51	05:38 19:41	04:47 20:27	04:27 20:55	04:50 20:42	05:34 19:52	06:22 18:45	07:09 17:40	07:01 15:49	07:37 15:37
21	07:30 16:12	06:42 17:06	05:43 17:53	05:36 19:43	04:45 20:28	04:28 20:55	04:51 20:41	05:36 19:50	06:23 18:42	07:11 17:38	07:03 15:48	07:38 15:37
22	07:29 16:14	06:40 17:08	05:40 17:55	05:34 19:44	04:44 20:30	04:28 20:56	04:52 20:40	05:37 19:48	06:25 18:40	07:12 17:36	07:04 15:47	07:38 15:38
23	07:28 16:16	06:38 17:10	05:38 17:56	05:32 19:46	04:43 20:31	04:28 20:56	04:54 20:38	05:39 19:46	06:26 18:38	07:14 17:34	07:06 15:46	07:39 15:38
24	07:27 16:17	06:36 17:11	05:36 17:58	05:30 19:48	04:42 20:32	04:28 20:56	04:55 20:37	05:40 19:44	06:28 18:36	07:16 17:32	07:07 15:45	07:39 15:39
25	07:26 16:19	06:34 17:13	05:34 18:00	05:28 19:49	04:41 20:34	04:29 20:56	04:56 20:36	05:42 19:42	06:29 18:34	06:17 16:30	07:09 15:44	07:40 15:40
26	07:25 16:21	06:32 17:15	05:32 18:01	05:26 19:51	04:40 20:35	04:29 20:56	04:57 20:34	05:43 19:39	06:31 18:31	06:19 16:28	07:10 15:43	07:40 15:40
27	07:23 16:22	06:30 17:16	05:29 18:03	05:24 19:52	04:38 20:36	04:29 20:56	04:59 20:33	05:45 19:37	06:32 18:29	06:21 16:26	07:12 15:42	07:40 15:41
28	07:22 16:24	06:28 17:18	05:27 18:04	05:22 19:54	04:38 20:37	04:30 20:56	05:00 20:32	05:46 19:35	06:34 18:27	06:23 16:24	07:13 15:41	07:41 15:42
29	07:21 16:26		06:25 19:06	05:20 19:56	04:37 20:38	04:30 20:56	05:02 20:30	05:48 19:33	06:35 18:25	06:24 16:22	07:15 15:41	07:41 15:42
30	07:19 16:28		06:23 19:08	05:18 19:57	04:36 20:40	04:31 20:56	05:03 20:29	05:49 19:31	06:37 18:22	06:26 16:21	07:16 15:40	07:41 15:43
31	07:18 16:29		06:21 19:09		04:35 20:41		05:04 20:27		05:51 19:29	06:28 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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



## SHADOW - Calendar

**Shadow receptor:** AT - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (46)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	04:32 20:55	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:32 20:44	04:33 20:55	05:09 20:23	05:56 19:22	06:42 18:16	06:33 16:14	07:20 15:38
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6	07:40 15:51	07:09 16:40	06:15 17:28	06:07 19:19	05:08 20:07	04:31 20:47	04:35 20:53	05:13 20:18	06:00 19:16	06:46 18:09	06:38 16:09	07:24 15:37
7	07:40 15:52	07:07 16:42	06:13 17:30	06:05 19:20	05:06 20:08	04:30 20:48	04:36 20:53	05:15 20:16	06:02 19:14	06:48 18:07	06:40 16:07	07:25 15:36
8	07:40 15:54	07:06 16:43	06:11 17:32	06:03 19:22	05:04 20:10	04:30 20:48	04:37 20:52	05:16 20:14	06:03 19:12	06:50 18:05	06:41 16:05	07:27 15:36
9	07:39 15:55	07:04 16:45	06:09 17:33	06:01 19:24	05:03 20:11	04:29 20:49	04:38 20:52	05:18 20:12	06:05 19:09	06:51 18:03	06:43 16:04	07:28 15:36
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31	07:18 16:29		06:21 19:09		04:35 20:41		05:04 20:27		05:51 19:29	06:28 16:19		07:41 15:44
Potential sun hours	265	281	367	413	479	491	495	450	380	334	271	251
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

**Shadow receptor:** AU - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (47)**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [ZAKOPANE]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,18	3,07	3,69	4,28	5,39	5,21	5,74	5,60	4,30	3,94	2,30	1,54

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
525	525	600	750	825	1 125	2 025	1 125	7 500

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:41 15:46	07:17 16:31	06:26 17:20	06:18 19:11	05:17 19:59	04:34 20:42	04:32 20:55	05:06 20:26	05:53 19:27	06:39 18:20	06:29 16:17	07:18 15:39
2	07:41 15:47	07:15 16:33	06:24 17:22	06:16 19:12	05:15 20:00	04:33 20:43	04:32 20:55	05:07 20:24	05:54 19:25	06:40 18:18	06:31 16:15	07:19 15:39
3	07:41 15:48	07:14 16:35	06:22 17:23	06:14 19:14	05:13 20:02	04:33 20:44	04:33 20:55	05:09 20:23	05:56 19:23	06:42 18:16	06:33 16:14	07:20 15:38
4	07:41 15:49	07:12 16:36	06:20 17:25	06:12 19:16	05:11 20:04	04:32 20:45	04:34 20:54	05:10 20:21	05:57 19:20	06:43 18:14	06:34 16:12	07:22 15:38
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	Minutes with flicker		