

Project:

Debnica Kaszubska

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Biuro Projektów i Wdrożeń Proekologicznych PROEKO Maciej Przewozniak

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January	February	March	April	May	June	July	August	September	October	November	December				
1	08:13	08:48 (2)	07:42	09:03 (1)	06:43	06:26	05:16	04:25	04:20	05:01	05:57	06:52	06:51	07:48	08:23 (3)	
2	15:37	6 08:54 (2)	16:29	32 09:35 (1)	17:26	19:26	20:23	21:14	21:29	20:53	19:45	18:30	16:18	15:32	42 09:05 (1)	
3	08:13	08:48 (2)	07:40	09:03 (1)	06:40	06:24	05:14	04:24	04:21	05:03	05:59	06:54	06:53	08:43 (1)	07:49	08:25 (3)
4	15:38	8 08:56 (2)	16:31	32 09:35 (1)	17:28	19:28	20:25	21:16	21:29	20:51	19:43	18:28	16:16	13 08:56 (1)	15:32	39 09:04 (1)
5	08:13	08:47 (2)	07:38	09:04 (1)	06:38	06:21	05:12	04:23	04:22	05:05	06:01	06:55	06:55	08:40 (1)	07:51	08:27 (3)
6	15:39	9 08:56 (2)	16:33	30 09:34 (1)	17:30	19:30	20:27	21:17	21:29	20:49	19:40	18:25	16:14	18 08:58 (1)	15:31	36 09:04 (1)
7	08:12	08:47 (2)	07:36	09:05 (1)	06:36	06:19	05:09	04:22	04:23	05:07	06:03	06:57	06:57	08:38 (1)	07:52	08:28 (3)
8	15:40	11 08:58 (2)	16:35	29 09:34 (1)	17:32	19:32	20:29	21:18	21:28	20:47	19:38	18:23	16:12	22 09:00 (1)	15:30	31 09:02 (1)
9	08:12	08:46 (2)	07:34	09:06 (1)	06:33	06:16	05:07	04:21	04:24	05:08	06:04	06:59	06:59	08:37 (1)	07:54	08:30 (2)
10	15:42	13 08:59 (2)	16:37	27 09:33 (1)	17:34	19:34	20:30	21:19	21:28	20:46	19:35	18:20	16:10	25 09:02 (1)	15:30	26 09:02 (1)
11	08:11	08:46 (2)	07:33	09:07 (1)	06:31	06:14	05:05	04:20	04:25	05:10	06:06	07:01	07:01	08:36 (1)	07:55	08:31 (2)
12	15:43	20 09:14 (1)	16:39	25 09:32 (1)	17:36	19:36	20:32	21:20	21:27	20:44	19:33	18:18	16:08	27 09:03 (1)	15:29	20 08:59 (1)
13	08:11	08:45 (2)	07:31	09:09 (1)	06:28	06:11	05:03	04:20	04:26	05:12	06:08	07:03	07:03	08:36 (1)	07:57	08:33 (2)
14	15:44	25 09:16 (1)	16:41	21 09:30 (1)	17:38	19:38	20:34	21:21	21:26	20:42	19:30	18:15	16:06	28 09:04 (1)	15:28	13 08:46 (2)
15	08:10	08:44 (3)	07:29	09:11 (1)	06:26	06:09	05:01	04:19	04:27	05:14	06:10	07:05	07:05	08:35 (1)	07:58	08:34 (2)
16	15:46	30 09:18 (1)	16:44	17 09:28 (1)	17:40	19:39	20:36	21:22	21:25	20:40	19:28	18:13	16:04	30 09:05 (1)	15:28	11 08:45 (2)
17	08:10	08:43 (3)	07:27	09:14 (1)	06:24	06:07	04:59	04:19	04:28	05:15	06:12	07:07	07:07	08:34 (1)	07:59	08:36 (2)
18	15:47	36 09:20 (1)	16:46	12 09:26 (1)	17:42	19:41	20:38	21:23	21:25	20:38	19:25	18:10	16:03	32 09:06 (1)	15:28	10 08:46 (2)
19	08:09	08:42 (3)	07:25	06:21	06:04	04:58	04:18	04:29	05:17	06:13	07:09	07:09	07:09	08:34 (1)	08:00	08:37 (2)
20	15:49	38 09:21 (1)	16:48	17:44	19:43	20:39	21:24	21:24	20:35	19:23	18:08	16:01	32 09:06 (1)	15:27	8 08:45 (2)	
21	08:08	08:41 (3)	07:23	06:19	06:02	04:56	04:18	04:30	05:19	06:15	07:10	07:11	07:11	08:33 (1)	08:02	08:38 (2)
22	15:50	42 09:23 (1)	16:50	17:46	19:45	20:41	21:25	21:23	20:33	19:20	18:05	15:59	33 09:06 (1)	15:27	6 08:44 (2)	
23	08:08	08:40 (3)	07:21	06:16	05:59	04:54	04:17	04:31	05:21	06:17	07:12	07:13	07:13	08:33 (1)	08:03	08:39 (2)
24	15:52	44 09:24 (1)	16:52	17:48	19:47	20:43	21:26	21:22	20:31	19:18	18:03	15:57	34 09:07 (1)	15:27	4 08:43 (2)	
25	08:07	08:39 (3)	07:19	06:14	05:57	04:52	04:17	04:32	05:23	06:19	07:14	07:15	07:15	08:29 (2)	08:04	
26	15:54	46 09:25 (1)	16:54	17:50	19:49	20:45	21:26	21:21	20:29	19:15	18:01	15:56	39 09:08 (1)	15:27		
27	08:06	08:38 (3)	07:17	06:11	05:54	04:50	04:16	04:34	05:24	06:21	07:16	07:17	07:17	08:20 (3)	08:05	
28	15:55	48 09:26 (1)	16:56	17:52	19:51	20:47	21:27	21:20	20:27	19:13	17:58	15:54	45 09:08 (1)	15:27		
29	08:05	08:37 (3)	07:14	06:09	05:52	04:48	04:16	04:35	05:26	06:23	07:18	07:19	07:19	08:17 (3)	08:06	
30	15:57	51 09:28 (1)	16:58	17:54	19:53	20:48	21:28	21:19	20:25	19:10	17:56	15:52	51 09:08 (1)	15:27		
31	08:04	08:37 (3)	07:12	06:06	05:50	04:47	04:16	04:36	05:28	06:24	07:20	07:21	07:21	08:16 (3)	08:07	
32	15:59	52 09:29 (1)	17:00	17:56	19:55	20:50	21:28	21:18	20:23	19:08	17:54	15:51	52 09:08 (1)	15:27		
33	08:03	08:37 (3)	07:10	06:04	05:47	04:45	04:16	04:38	05:30	06:26	07:22	07:23	07:23	08:15 (3)	08:07	
34	16:00	52 09:29 (1)	17:02	17:58	19:56	20:52	21:29	21:16	20:20	19:05	17:51	15:49	53 09:08 (1)	15:27		
35	08:02	08:37 (3)	07:08	06:01	05:45	04:43	04:16	04:39	05:32	06:28	07:24	07:25	07:25	08:14 (3)	08:08	
36	16:02	53 09:30 (1)	17:04	17:59	19:58	20:53	21:29	21:15	20:18	19:03	17:49	15:48	54 09:08 (1)	15:27		
37	08:01	08:38 (3)	07:06	05:59	05:43	04:42	04:16	04:41	05:33	06:30	07:26	07:27	07:27	08:14 (3)	08:09	
38	16:04	54 09:32 (1)	17:06	18:01	20:00	20:55	21:29	21:14	20:16	19:00	17:47	15:46	54 09:08 (1)	15:27		
39	08:00	08:38 (3)	07:03	05:56	05:40	04:40	04:16	04:42	05:35	06:32	07:28	07:29	07:29	08:14 (3)	08:10	
40	16:06	54 09:32 (1)	17:08	18:03	20:02	20:57	21:30	21:12	20:14	18:58	17:44	15:45	54 09:08 (1)	15:28		
41	08:00	08:39 (3)	07:01	05:54	05:38	04:39	04:16	04:44	05:37	06:33	07:30	07:30	07:30	08:14 (3)	08:10	
42	16:08	54 09:33 (1)	17:10	18:05	20:04	20:58	21:30	21:11	20:11	18:55	17:42	15:43	54 09:08 (1)	15:28		
43	08:00	08:39 (3)	06:59	05:51	05:36	04:37	04:16	04:45	05:39	06:35	07:32	07:32	07:32	08:14 (3)	08:11	
44	16:10	54 09:33 (1)	17:12	18:07	20:06	21:00	21:30	21:10	20:09	18:53	17:40	15:42	54 09:08 (1)	15:28		
45	08:00	08:40 (3)	06:57	05:49	05:33	04:36	04:16	04:47	05:41	06:37	07:34	07:34	07:34	08:14 (3)	08:11	
46	16:11	54 09:34 (1)	17:14	18:09	20:08	21:02	21:30	21:08	20:07	18:50	17:37	15:41	54 09:08 (1)	15:29		
47	08:00	08:40 (3)	06:54	05:46	05:31	04:34	04:17	04:48	05:43	06:39	07:36	07:36	07:36	08:14 (3)	08:12	
48	16:13	54 09:34 (1)	17:16	18:11	20:10	21:03	21:31	21:07	20:04	18:48	17:35	15:40	53 09:07 (1)	15:30		
49	08:00	08:42 (3)	06:52	05:44	05:29	04:33	04:17	04:50	05:44	06:41	07:38	07:38	07:38	08:15 (3)	08:12	
50	16:15	53 09:35 (1)	17:18	18:13	20:12	21:05	21:31	21:05	20:02	18:45	17:33	15:38	52 09:07 (1)	15:30		
51	08:00	08:43 (3)	06:50	05:41	05:27	04:32	04:18	04:51	05:46	06:43	07:40	07:40	07:40	08:16 (3)	08:12	
52	16:17	52 09:35 (1)	17:20	18:15	20:14	21:06	21:31	21:03	20:00	18:43	17:31	15:37	51 09:07 (1)	15:31		
53	08:00	08:44 (3)	06:48	05:39	05:24	04:30	04:18	04:53	05:48	06:44	07:41	07:41	07:41	08:16 (3)	08:13	
54	16:19	51 09:35 (1)	17:22	18:17	20:15	21:08	21:30	21:02	19:57	18:40	17:29	15:36	51 09:07 (1)	15:32		
55	08:00	08:47 (3)	06:45	05:36	05:22	04:29	04:19	04:55	05:50	06:46	07:43	07:43	07:43	08:18 (3)	08:13	
56	16:21	45 09:35 (1)	17:24	18:19	20:17	21:09	21:30	21:00	19:55	18:38	17:26	15:35	49 09:07 (1)	15:33		
57	08:00	08:57 (2)		06:34	05:20	04:28	04:19	04:56	05:52	06:48	07:44	07:44	07:44	08:20 (3)	08:13	
58	16:23	39 09:36 (1)		19:20	20:19	21:10	21:30	20:58	19:52	18:35	17:24	15:34	46 09:06 (1)	15:33		
59	08:00	09:02 (1)		06:31	05:18	04:27	04:20	04:58	05:53	06:50	07:46	07:46	07:46	08:22 (3)	08:13	
60	16:25	34 09:36 (1)		19:22	20:21	21:12	21:30	20:57	19:50	18:33	17:22	15:33	44 09:06 (1)	15:34		
61	08:00	09:02 (1)		06:29		04:26		05:00	05:55		06:49			08:13	08:48 (2)	
62	16:27	34 09:36 (1)		19:24		21:13		20:55	19:48		16:20			15:35	3 08:51 (2)	
Potential sun hours	247	272	367	421	497	514	516	462	383	327	257	1204	249			
Total, worst case	1216	225										0,17	0,14			
Sun reduction	0,17	0,19										0,18	0,18			
Oper. time red.	0,18	0,18										0,73	0,73			
Wind dir. red.	0,73	0,75										0,02	0,02			
Total reduction	0,02	0,03										0,28	0,28			
Total, real	27	6										28	5			

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

		January	February	March	April	May	June	July	August	September	October	November	December					
1	08:13	08:51 (3)	07:42	06:43	06:26	05:16	04:25	04:20	05:01	05:57	06:52	06:51	07:48	08:37 (3)				
2	15:37	63	09:56 (1)	16:29	17:26	19:26	21:14	21:29	20:53	19:45	18:30	16:18	15:32	61	09:42 (1)			
	08:13	08:52 (3)	07:40	06:40	06:24	05:14	04:24	04:21	05:03	05:59	06:54	06:53	07:49	08:38 (3)				
3	15:38	64	09:57 (1)	16:31	17:28	19:28	20:25	21:16	21:29	20:51	19:43	18:28	16:16	15:32	61	09:42 (1)		
	08:13	08:51 (3)	07:38	06:38	06:21	05:11	04:23	04:22	05:05	06:01	06:55	06:55	07:51	08:38 (3)				
4	15:39	65	09:57 (1)	16:33	17:30	19:30	20:27	21:17	21:29	20:49	19:40	18:25	16:14	15:31	62	09:43 (1)		
	08:12	08:52 (3)	07:36	06:36	06:19	05:09	04:22	04:23	05:07	06:03	06:57	06:57	07:52	08:38 (3)				
5	15:40	65	09:58 (1)	16:35	17:32	19:32	20:29	21:18	21:28	20:47	19:38	18:23	16:12	15:30	62	09:43 (1)		
	08:12	08:52 (3)	07:34	06:33	06:16	05:07	04:21	04:24	05:08	06:04	06:59	06:59	07:54	08:39 (3)				
6	15:42	65	09:58 (1)	16:37	17:34	19:34	20:30	21:19	21:28	20:46	19:35	18:20	16:10	15:29	63	09:44 (1)		
	08:11	08:53 (3)	07:33	06:31	06:14	05:05	04:20	04:25	05:10	06:06	07:01	07:01	07:55	08:38 (3)				
7	15:43	64	09:59 (1)	16:39	17:36	19:36	20:32	21:20	21:27	20:44	19:33	18:18	16:08	15:29	65	09:44 (1)		
	08:11	08:54 (3)	07:31	06:28	06:11	05:03	04:20	04:26	05:12	06:08	07:03	07:03	07:57	08:39 (3)				
8	15:44	63	09:59 (1)	16:41	17:38	19:38	20:34	21:21	21:26	20:42	19:30	18:15	16:06	15:28	65	09:45 (1)		
	08:10	08:54 (3)	07:29	06:26	06:09	05:01	04:19	04:27	05:14	06:10	07:05	07:05	07:58	08:39 (3)				
9	15:46	63	09:59 (1)	16:44	17:40	19:39	20:36	21:22	21:25	20:40	19:28	18:13	16:04	15:28	65	09:45 (1)		
	08:10	08:54 (3)	07:27	06:24	06:07	04:59	04:19	04:28	05:15	06:12	07:07	07:07	07:59	08:40 (3)				
10	15:47	62	09:59 (1)	16:46	17:42	19:41	20:38	21:23	21:25	20:38	19:25	18:10	16:03	15:28	65	09:46 (1)		
	08:09	08:55 (3)	07:25	06:21	06:04	04:58	04:18	04:29	05:17	06:13	07:09	07:09	08:00	08:41 (3)				
11	15:49	61	09:59 (1)	16:48	17:44	19:43	20:39	21:24	21:24	20:35	19:23	18:08	16:01	15:27	64	09:46 (1)		
	08:08	08:55 (3)	07:23	06:19	06:02	04:56	04:18	04:30	05:19	06:15	07:10	07:11	08:02	08:41 (3)				
12	15:50	60	09:59 (1)	16:50	17:46	19:45	20:41	21:25	21:23	20:33	19:20	18:05	15:59	15:27	63	09:46 (1)		
	08:08	08:56 (3)	07:21	06:16	05:59	04:54	04:17	04:31	05:21	06:17	07:12	07:13	08:03	08:41 (3)				
13	15:52	60	10:00 (1)	16:52	17:48	19:47	20:43	21:26	21:22	20:31	19:18	18:03	15:57	15:27	64	09:46 (1)		
	08:07	08:57 (3)	07:19	06:14	05:57	04:52	04:17	04:32	05:23	06:19	07:14	07:15	08:04	08:42 (3)				
14	15:54	58	10:00 (1)	16:54	17:50	19:49	20:45	21:26	21:21	20:29	19:15	18:01	15:56	15:27	63	09:46 (1)		
	08:06	08:58 (3)	07:17	06:11	05:54	04:50	04:16	04:34	05:24	06:21	07:16	07:17	08:05	08:43 (3)				
15	15:55	53	10:00 (1)	16:56	17:52	19:51	20:47	21:27	21:20	20:27	19:13	17:58	15:54	15:27	63	09:48 (1)		
	08:05	08:59 (3)	07:14	06:09	05:52	04:48	04:16	04:35	05:26	06:23	07:18	07:19	08:06	08:44 (3)				
16	15:57	49	10:00 (1)	16:58	17:54	19:53	20:48	21:28	21:19	20:25	19:10	17:56	15:52	15:27	63	09:48 (1)		
	08:04	09:01 (3)	07:12	06:06	05:50	04:47	04:16	04:36	05:28	06:24	07:20	07:21	08:07	08:43 (3)				
17	15:59	43	10:01 (1)	17:00	17:56	19:55	20:50	21:28	21:18	20:23	19:08	17:53	15:51	15:27	63	09:48 (1)		
	08:03	09:04 (3)	07:10	06:04	05:47	04:45	04:16	04:38	05:30	06:26	07:22	07:23	08:07	08:44 (3)				
18	16:00	32	10:01 (1)	17:02	17:58	19:56	20:52	21:29	21:16	20:20	19:05	17:51	15:49	15:27	62	09:48 (1)		
	08:02	09:35 (1)	07:08	06:01	05:45	04:43	04:16	04:39	05:32	06:28	07:24	07:25	09:18 (1)	08:08	08:45 (3)			
19	16:02	25	10:00 (1)	17:04	17:59	19:58	20:53	21:29	21:15	20:18	19:03	17:49	15:48	10	09:28 (1)	15:27	63	09:49 (1)
	08:01	09:36 (1)	07:06	05:59	05:43	04:42	04:16	04:41	05:33	06:30	07:26	07:27	09:16 (1)	08:09	08:46 (3)			
20	16:04	24	10:00 (1)	17:06	18:01	20:00	20:55	21:29	21:14	20:16	19:00	17:46	15:46	14	09:30 (1)	15:27	62	09:50 (1)
	07:59	09:37 (1)	07:04	05:56	05:40	04:40	04:16	04:42	05:35	06:32	07:28	07:29	09:14 (1)	08:10	08:46 (3)			
21	16:06	22	09:59 (1)	17:08	18:03	20:02	20:57	21:30	21:12	20:14	18:58	17:44	15:45	18	09:32 (1)	15:28	62	09:50 (1)
	07:58	09:38 (1)	07:01	05:54	05:38	04:39	04:16	04:44	05:37	06:33	07:30	07:30	09:13 (1)	08:10	08:47 (3)			
22	16:08	20	09:58 (1)	17:10	18:05	20:04	20:58	21:30	21:11	20:11	18:55	17:42	15:43	20	09:33 (1)	15:28	61	09:50 (1)
	07:57	09:39 (1)	06:59	05:51	05:36	04:37	04:16	04:45	05:39	06:35	07:32	07:32	09:13 (1)	08:11	08:47 (3)			
23	16:10	18	09:57 (1)	17:12	18:07	20:06	21:00	21:30	21:10	20:09	18:53	17:40	15:42	22	09:35 (1)	15:28	61	09:50 (1)
	07:56	09:42 (1)	06:57	05:49	05:33	04:36	04:16	04:47	05:41	06:37	07:34	07:34	09:12 (1)	08:11	08:48 (3)			
24	16:11	14	09:56 (1)	17:14	18:09	20:08	21:02	21:30	21:08	20:07	18:50	17:37	15:41	24	09:36 (1)	15:29	61	09:51 (1)
	07:54	09:44 (1)	06:54	05:46	05:31	04:34	04:17	04:48	05:43	06:39	07:36	07:36	09:12 (1)	08:12	08:48 (3)			
25	16:13	10	09:54 (1)	17:16	18:11	20:10	21:03	21:31	21:07	20:04	18:48	17:35	15:40	25	09:37 (1)	15:30	62	09:52 (1)
	07:53		06:52	05:44	05:29	04:33	04:17	04:50	05:44	06:41	06:38	07:38	07:38	08:41 (3)	08:12	08:48 (3)		
26	16:15		17:18	18:13	20:12	21:05	21:31	21:05	20:02	18:45	16:33	15:38	30	09:38 (1)	15:30	63	09:52 (1)	
	07:51		06:50	05:41	05:27	04:32	04:18	04:51	05:46	06:43	06:40	07:39	07:39	08:39 (3)	08:12	08:49 (3)		
27	16:17		17:20	18:15	20:14	21:06	21:31	21:03	20:00	18:43	16:31	15:37	42	09:39 (1)	15:31	63	09:53 (1)	
	07:50		06:48	05:39	05:24	04:30	04:18	04:53	05:48	06:44	06:41	07:41	07:41	08:39 (3)	08:13	08:49 (3)		
28	16:19		17:22	18:17	20:15	21:08	21:30	21:02	19:57	18:40	16:29	15:36	47	09:39 (1)	15:32	63	09:54 (1)	
	07:48		06:45	05:36	05:22	04:29	04:19	04:55	05:50	06:46	06:43	07:43	07:43	08:38 (3)	08:13	08:49 (3)		
29	16:21		17:24	18:19	20:17	21:09	21:30	21:00	19:55	18:38	16:26	15:35	53	09:40 (1)	15:33	64	09:54 (1)	
	07:47		06:34	05:20	04:28	04:19	04:56	05:52	06:48	06:45	07:44	07:44	08:38 (3)	08:13	08:50 (3)			
30	16:23		19:20	20:19	21:10	21:30	20:58	19:52	18:35	16:24	15:34	58	09:41 (1)	15:33	63	09:55 (1)		
	07:45		06:31	05:18	04:27	04:20	04:58	05:53	06:50	06:47	07:46	07:46	08:38 (3)	08:13	08:50 (3)			
31	16:25		19:22	20:21	21:12	21:30	20:57	19:50	18:33	16:22	15:33	60	09:42 (1)	15:34	64	09:55 (1)		
	07:43		06:29		04:26		05:00	05:55		06:49			08:13	08:50 (3)				
	16:27		19:24		21:13		20:55	19:48		16:20			15:35	63	09:55 (1)			
Potential sun hours	247		272	367	421	497	514	516	462	383	327	257	230					
Total, worst case		1123										423		1949				
Sun reduction		0,17										0,17		0,14				
Oper. time red.		0,18										0,18		0,18				
Wind dir. red.		0,81										0,82		0,80				
Total reduction		0,02										0,03		0,02				
Total, real		28										11		41				

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)

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:13	09:04 (4)	07:42	06:43	06:26	05:16	04:25	04:20	05:01	05:57	06:52	07:48
15:37	64	11:07 (1)	16:29	17:26	19:26	20:23	21:14	21:29	20:53	19:45	18:30	16:18
2	08:13	09:05 (4)	07:40	06:40	06:24	05:14	04:24	04:21	05:03	05:59	06:54	07:49
15:38	57	11:08 (1)	16:31	17:28	19:28	20:25	21:16	21:29	20:51	19:43	18:28	16:16
3	08:13	09:05 (4)	07:38	06:38	06:21	05:11	04:23	04:22	05:05	06:01	06:55	07:51
15:39	55	11:08 (1)	16:33	17:30	19:30	20:27	21:17	21:29	20:49	19:40	18:25	16:14
4	08:12	09:06 (4)	07:36	06:36	06:19	05:09	04:22	04:23	05:07	06:03	06:57	07:52
15:40	50	11:08 (1)	16:35	17:32	19:32	20:28	21:18	21:28	20:47	19:38	18:23	16:12
5	08:12	09:07 (4)	07:34	06:33	06:16	05:07	04:21	04:24	05:08	06:04	06:59	07:54
15:42	47	11:08 (1)	16:37	17:34	19:34	20:30	21:19	21:28	20:46	19:35	18:20	16:10
6	08:11	09:08 (4)	07:32	06:31	06:14	05:05	04:20	04:25	05:10	06:06	07:01	07:55
15:43	41	11:09 (1)	16:39	17:36	19:36	20:32	21:20	21:27	20:44	19:33	18:18	16:08
7	08:11	09:09 (4)	07:31	06:28	06:11	05:03	04:20	04:26	05:12	06:08	07:03	07:57
15:44	38	11:08 (1)	16:41	17:38	19:38	20:34	21:21	21:26	20:42	19:30	18:15	16:06
8	08:10	09:10 (4)	07:29	06:26	06:09	05:01	04:19	04:27	05:14	06:10	07:05	07:58
15:46	36	11:08 (1)	16:43	17:40	19:39	20:36	21:22	21:25	20:40	19:28	18:13	16:04
9	08:10	09:13 (4)	07:27	06:24	06:07	04:59	04:19	04:28	05:15	06:12	07:07	07:59
15:47	30	11:08 (1)	16:46	17:42	19:41	20:38	21:23	21:25	20:35	19:25	18:10	16:02
10	08:09	10:41 (1)	07:25	06:21	06:04	04:58	04:18	04:29	05:17	06:13	07:09	07:59
15:49	26	11:07 (1)	16:48	17:44	19:43	20:39	21:24	21:24	20:35	19:23	18:08	16:01
11	08:08	10:42 (1)	07:23	06:19	06:02	04:56	04:18	04:30	05:19	06:15	07:11	07:59
15:50	25	11:07 (1)	16:50	17:46	19:45	20:41	21:25	21:23	20:33	19:20	18:05	15:59
12	08:08	10:44 (1)	07:21	06:16	05:59	04:54	04:17	04:31	05:21	06:17	07:12	07:59
15:52	22	11:06 (1)	16:52	17:48	19:47	20:43	21:26	21:22	20:31	19:18	18:03	15:57
13	08:07	10:45 (1)	07:19	06:14	05:57	04:52	04:17	04:32	05:23	06:19	07:14	07:59
15:54	21	11:06 (1)	16:54	17:50	19:49	20:45	21:26	21:21	20:29	19:15	18:01	15:55
14	08:06	10:47 (1)	07:16	06:11	05:54	04:50	04:16	04:34	05:24	06:21	07:16	07:59
15:55	18	11:05 (1)	16:56	17:52	19:51	20:47	21:27	21:20	20:27	19:13	17:58	15:54
15	08:05	10:49 (1)	07:14	06:09	05:52	04:48	04:16	04:35	05:26	06:22	07:18	07:59
15:57	15	11:04 (1)	16:58	17:54	19:53	20:48	21:28	21:19	20:25	19:10	17:56	15:52
16	08:04	10:52 (1)	07:12	06:06	05:50	04:47	04:16	04:36	05:28	06:24	07:20	07:59
15:59	10	11:02 (1)	17:00	17:56	19:55	20:50	21:28	21:18	20:23	19:08	17:53	15:51
17	08:03		07:10	06:04	05:47	04:45	04:16	04:38	05:30	06:26	07:22	07:59
16:00		17:02	17:58	19:56	20:52	21:29	21:16	20:20	19:05	17:51	15:49	
18	08:02	07:08	06:01	05:45	04:43	04:16	04:39	05:32	06:28	07:24	07:25	
16:02		17:04	17:59	19:58	20:53	21:29	21:15	20:18	19:03	17:49	15:48	
19	08:01	07:06	05:59	05:43	04:42	04:16	04:41	05:33	06:30	07:26	07:27	
16:04		17:06	18:01	20:00	20:55	21:29	21:14	20:16	19:00	17:46	15:46	
20	07:59	07:03	05:56	05:40	04:40	04:16	04:42	05:35	06:32	07:28	07:29	
16:06		17:08	18:03	20:02	20:57	21:30	21:12	20:14	18:58	17:44	15:45	
21	07:58	07:01	05:54	05:38	04:39	04:16	04:44	05:37	06:33	07:30	07:30	
16:08		17:10	18:05	20:04	20:58	21:30	21:11	20:11	18:55	17:42	15:43	
22	07:57	06:59	05:51	05:36	04:37	04:16	04:45	05:39	06:35	07:32	07:32	
16:10		17:12	18:07	20:06	21:00	21:30	21:10	20:09	18:53	17:40	15:42	
23	07:56	06:57	05:49	05:33	04:36	04:16	04:47	05:41	06:37	07:34	07:34	
16:11		17:14	18:09	20:08	21:01	21:30	21:08	20:07	18:50	17:37	15:41	
24	07:54	06:54	05:46	05:31	04:34	04:17	04:48	05:43	06:39	07:36	07:36	
16:13		17:16	18:11	20:10	21:03	21:31	21:07	20:04	18:48	17:35	15:40	
25	07:53	06:52	05:44	05:29	04:33	04:17	04:50	05:44	06:41	07:38	07:38	
16:15		17:18	18:13	20:12	21:05	21:31	21:05	20:02	18:45	16:33	15:38	
26	07:51	06:50	05:41	05:27	04:32	04:18	04:51	05:46	06:43	07:40	07:39	
16:17		17:20	18:15	20:13	21:06	21:31	21:03	20:00	18:43	16:31	15:37	
27	07:50	06:47	05:39	05:24	04:30	04:18	04:53	05:48	06:44	07:41	07:41	
16:19		17:22	18:17	20:15	21:07	21:30	21:02	19:57	18:40	16:29	15:36	
28	07:48	06:45	05:36	05:22	04:29	04:19	04:55	05:50	06:46	07:43	07:43	
16:21		17:24	18:19	20:17	21:09	21:30	21:00	19:55	18:38	16:26	15:35	
29	07:47		06:34	05:20	04:28	04:19	04:56	05:52	06:48	07:44	07:44	
16:23		19:20	20:19	21:10	21:30	20:58	19:52	18:35	16:24	15:34	21	
30	07:45		06:31	05:18	04:27	04:20	04:58	05:53	06:50	07:46	07:46	
16:25		19:22	20:21	21:12	21:30	20:57	19:50	18:33	16:22	15:33	22	
31	07:43		06:29		04:26		05:00	05:55		06:49		
16:27		19:24			21:13		20:55	19:48		16:20		
Potential sun hours	247	272	367	421	497	514	516	462	383	327	257	230
Total, worst case	555											2020
Sun reduction	0,17										0,17	0,14
Oper. time red.	0,18										0,18	0,18
Wind dir. red.	0,92										0,96	0,89
Total reduction	0,03										0,03	0,02
Total, real	16										3	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)

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:13	13:22 (2) 07:41	06:43	06:26	05:16	04:25	04:20	05:01	05:57	06:52	06:51	14:50 (1) 07:48
2	15:37	29 13:51 (2) 16:29	17:26	19:26	20:23	21:14	21:29	20:53	19:45	18:30	16:18	28 15:18 (1) 15:32
3	08:13	13:23 (2) 07:40	06:40	06:24	05:14	04:24	04:21	05:03	05:59	06:54	06:53	14:51 (1) 07:49
4	15:38	28 13:51 (2) 16:31	17:28	19:28	20:25	21:15	21:29	20:51	19:43	18:27	16:16	27 15:18 (1) 15:31
5	08:12	13:23 (2) 07:38	15:29 (1) 06:38	06:21	05:11	04:23	04:22	05:05	06:01	06:55	06:55	14:52 (1) 07:51
6	15:39	28 13:51 (2) 16:33	11 15:40 (1) 17:30	19:30	20:27	21:17	21:29	20:49	19:40	18:25	16:14	26 15:18 (1) 15:31
7	08:12	13:24 (2) 07:36	15:26 (1) 06:36	06:19	05:09	04:22	04:23	05:07	06:03	06:57	06:57	14:53 (1) 07:52
8	15:40	28 13:52 (2) 16:35	16 15:42 (1) 17:32	19:32	20:28	21:18	21:28	20:47	19:38	18:22	16:12	23 15:16 (1) 15:30
9	08:12	13:24 (2) 07:34	15:25 (1) 06:33	06:16	05:07	04:21	04:24	05:08	06:04	06:59	06:59	14:54 (1) 07:54
10	15:42	27 13:51 (2) 16:37	19 15:44 (1) 17:34	19:34	20:30	21:19	21:27	20:45	19:35	18:20	16:10	21 15:15 (1) 15:29
11	08:11	13:24 (2) 07:32	15:24 (1) 06:31	06:14	05:05	04:20	04:25	05:10	06:06	07:01	07:01	14:55 (1) 07:55
12	15:43	27 13:51 (2) 16:39	22 15:46 (1) 17:36	19:36	20:32	21:20	21:27	20:43	19:33	18:18	16:08	19 15:14 (1) 15:29
13	08:11	13:26 (2) 07:31	15:23 (1) 06:28	06:11	05:03	04:20	04:26	05:12	06:08	07:03	07:03	14:56 (1) 07:56
14	15:44	26 13:52 (2) 16:41	24 15:47 (1) 17:38	19:37	20:34	21:21	21:26	20:41	19:30	18:15	16:06	16 15:12 (1) 15:28
15	08:10	13:26 (2) 07:29	15:22 (1) 06:26	06:09	05:01	04:19	04:27	05:14	06:10	07:05	07:05	15:00 (1) 07:58
16	15:46	26 13:52 (2) 16:43	26 15:48 (1) 17:40	19:39	20:36	21:22	21:25	20:39	19:28	18:13	16:04	10 15:10 (1) 15:28
17	08:10	13:27 (2) 07:27	15:22 (1) 06:23	06:06	04:59	04:18	04:28	05:15	06:12	07:07	07:07	15:09
18	15:47	25 13:52 (2) 16:45	27 15:49 (1) 17:42	19:41	20:38	21:23	21:25	20:37	19:25	18:10	16:02	15:28
19	08:09	13:28 (2) 07:25	15:21 (1) 06:21	06:04	04:57	04:18	04:29	05:17	06:13	07:09	07:09	15:09
20	15:49	23 13:51 (2) 16:48	29 15:50 (1) 17:44	19:43	20:39	21:24	21:24	20:35	19:23	18:08	16:01	15:27
21	08:08	13:29 (2) 07:23	15:20 (1) 06:19	06:02	04:56	04:17	04:30	05:19	06:15	07:10	07:11	15:01
22	15:50	22 13:51 (2) 16:50	29 15:49 (1) 17:46	19:45	20:41	21:25	21:23	20:33	19:20	18:05	15:59	15:27
23	08:08	13:30 (2) 07:21	15:20 (1) 06:16	06:05	04:54	04:17	04:31	05:21	06:17	07:12	07:13	15:03
24	15:52	21 13:51 (2) 16:52	30 15:50 (1) 17:48	19:47	20:43	21:25	21:22	20:31	19:18	18:03	15:57	15:27
25	08:07	13:31 (2) 07:19	15:20 (1) 06:14	06:04	04:52	04:17	04:32	05:23	06:19	07:14	07:15	15:04
26	15:53	19 13:50 (2) 16:54	30 15:50 (1) 17:50	19:49	20:45	21:26	21:21	20:29	19:15	18:01	15:55	15:27
27	08:06	13:33 (2) 07:16	15:20 (1) 06:11	06:04	04:50	04:16	04:34	05:24	06:21	07:16	07:17	15:05
28	15:55	17 13:50 (2) 16:56	30 15:50 (1) 17:52	19:51	20:46	21:27	21:20	20:27	19:13	17:58	15:54	15:27
29	08:05	13:35 (2) 07:14	15:21 (1) 06:09	06:05	04:48	04:16	04:35	05:26	06:22	07:18	07:19	15:06
30	15:57	14 13:49 (2) 16:58	29 15:50 (1) 17:54	19:53	20:48	21:27	21:19	20:25	19:10	17:56	15:52	15:27
31	08:04	13:38 (2) 07:12	15:20 (1) 06:06	06:05	04:47	04:16	04:36	05:28	06:24	07:20	07:21	15:07
32	15:59	10 13:48 (2) 17:00	29 15:49 (1) 17:56	19:55	20:50	21:28	21:18	20:22	19:08	17:53	15:51	15:27
33	08:03	13:42 (2) 07:10	15:21 (1) 06:04	06:04	04:45	04:16	04:38	05:30	06:26	07:22	07:23	15:07
34	16:00	2 13:43 (2) 17:02	28 15:49 (1) 17:57	19:56	20:52	21:29	21:16	20:20	19:05	17:51	15:49	15:27
35	08:02	17:08	15:22 (1) 06:01	06:05	04:45	04:16	04:39	05:32	06:28	07:24	07:25	15:08
36	16:02	17:04	27 15:49 (1) 17:59	19:58	20:53	21:29	21:15	20:18	19:03	17:49	15:48	15:27
37	08:01	17:06	15:22 (1) 06:05	06:04	04:42	04:16	04:41	05:33	06:30	07:26	07:27	15:09
38	16:04	17:06	25 15:47 (1) 18:01	20:00	20:55	21:29	21:14	20:16	19:00	17:46	15:46	15:27
39	07:59	17:03	15:23 (1) 06:05	06:04	04:40	04:16	04:42	05:35	06:32	07:28	07:28	15:07
40	16:06	17:08	24 15:47 (1) 18:03	20:02	20:57	21:30	21:12	20:13	18:58	17:44	15:45	15:28
41	07:58	17:10	15:25 (1) 06:04	06:03	04:39	04:16	04:43	05:37	06:33	07:30	07:30	15:05
42	16:08	17:12	21 15:46 (1) 18:05	20:04	20:58	21:30	21:11	20:11	18:55	17:42	15:43	15:28
43	07:57	17:12	15:26 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
44	16:09	17:12	17 15:43 (1) 18:07	20:06	21:00	21:30	21:10	20:09	18:53	17:40	15:42	15:28
45	07:55	17:14	15:29 (1) 06:04	06:03	04:36	04:16	04:47	05:41	06:37	07:34	07:34	15:02
46	16:11	17:14	12 15:41 (1) 18:09	20:08	21:01	21:30	21:08	20:07	18:50	17:37	15:41	15:29
47	07:54	17:16	15:46 (1) 18:05	20:04	20:58	21:30	21:11	20:11	18:55	17:42	15:43	15:28
48	16:13	17:16	15:26 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
49	07:53	17:18	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
50	16:15	17:18	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
51	07:51	17:20	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
52	16:17	17:22	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
53	07:50	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
54	16:19	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
55	07:48	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
56	16:21	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
57	07:46	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
58	16:23	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
59	07:45	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
60	16:25	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
61	07:43	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
62	16:27	17:24	15:22 (1) 06:01	06:01	04:37	04:16	04:45	05:39	06:35	07:32	07:32	15:03
63	247	272	367	421	497	514	516	462	383	327	257	230
64	372	505	605	683	743	783	803	743	603	503	403	303
65	0,17	0,19	0,21	0,23	0,25	0,26	0,26	0,26	0,26	0,26	0,26	0,26
66	0,18	0,18	0,18	0,18	0,18	0,18	0,18	0,18	0,18	0,18	0,18	0,18
67	0,93	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65
68	0,03	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02
69	11	12	12	12	12	12	12	12	12	12	12	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)

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:13	13:40 (2)	07:41	15:14 (1)	06:43	06:26	05:16	04:25	04:20	05:01	05:57	06:52
2	15:37	18	13:58 (2)	16:29	23	15:37 (1)	17:26	19:26	20:23	21:14	21:29	20:53
3	08:13	13:41 (2)	07:40	15:14 (1)	06:40	06:24	05:14	04:24	04:21	05:03	05:59	06:54
4	15:38	18	13:59 (2)	16:31	24	15:38 (1)	17:28	19:28	20:25	21:15	21:29	20:51
5	08:12	13:41 (2)	07:38	15:14 (1)	06:38	06:21	05:11	04:23	04:22	05:05	06:01	06:55
6	15:39	17	13:58 (2)	16:33	24	15:38 (1)	17:30	19:30	20:27	21:17	21:29	20:49
7	08:12	13:43 (2)	07:36	15:14 (1)	06:36	06:19	05:09	04:22	04:23	05:06	06:02	06:57
8	15:40	15	13:58 (2)	16:35	24	15:38 (1)	17:32	19:32	20:28	21:18	21:28	20:47
9	08:12	13:44 (2)	07:34	15:14 (1)	06:33	06:16	05:07	04:21	04:24	05:08	06:04	06:59
10	15:42	14	13:58 (2)	16:37	24	15:38 (1)	17:34	19:34	20:30	21:19	21:27	20:45
11	08:11	13:44 (2)	07:32	15:14 (1)	06:31	06:14	05:05	04:20	04:25	05:10	06:06	07:01
12	15:43	13	13:57 (2)	16:39	24	15:38 (1)	17:36	19:36	20:32	21:20	21:27	20:43
13	08:11	13:47 (2)	07:31	15:15 (1)	06:28	06:11	05:03	04:20	04:26	05:12	06:08	07:03
14	15:44	10	13:57 (2)	16:41	23	15:38 (1)	17:38	19:37	20:34	21:21	21:26	20:41
15	08:10	13:48 (2)	07:29	15:16 (1)	06:26	06:09	05:01	04:19	04:27	05:14	06:10	07:05
16	15:46	8	13:56 (2)	16:43	22	15:38 (1)	17:40	19:39	20:36	21:22	21:25	20:39
17	08:10	13:52 (2)	07:27	15:16 (1)	06:23	06:06	04:59	04:18	04:28	05:15	06:12	07:07
18	15:47	2	13:53 (2)	16:45	22	15:38 (1)	17:42	19:41	20:38	21:23	21:25	20:37
19	08:09		07:25	15:17 (1)	06:21	06:04	04:57	04:18	04:29	05:17	06:13	07:09
20	15:49		16:48	15:37 (1)	17:44	19:43	20:39	21:24	21:24	20:35	19:23	18:08
21	08:08		07:23	15:18 (1)	06:19	06:02	04:56	04:17	04:30	05:19	06:15	07:10
22	15:50		16:50	15:35 (1)	17:46	19:45	20:41	21:25	21:23	20:33	19:20	18:05
23	08:08		07:21	15:20 (1)	06:16	05:59	04:54	04:17	04:31	05:21	06:17	07:12
24	15:52		16:52	15:34 (1)	17:48	19:47	20:43	21:25	21:22	20:31	19:18	18:03
25	08:07		07:19	15:23 (1)	06:14	05:57	04:52	04:17	04:32	05:23	06:19	07:14
26	15:53		16:54	15:31 (1)	17:50	19:49	20:45	21:26	21:21	20:29	19:15	18:01
27	08:06		07:16		06:11	05:54	04:50	04:16	04:34	05:24	06:21	07:16
28	15:55		16:56		17:52	19:51	20:46	21:27	21:20	20:27	19:13	17:58
29	08:05		07:14		06:09	05:52	04:48	04:16	04:35	05:26	06:22	07:18
30	15:57		16:58		17:54	19:53	20:48	21:27	21:19	20:25	19:10	17:56
31	08:04		07:12		06:06	05:50	04:47	04:16	04:36	05:28	06:24	07:20
32	15:59		17:00		17:56	19:54	20:50	21:28	21:18	20:22	19:08	17:53
33	08:03		07:10		06:04	05:47	04:45	04:16	04:38	05:30	06:26	07:22
34	16:00		17:02		17:57	19:56	20:52	21:29	21:16	20:20	19:05	17:51
35	08:02		07:08		06:01	05:45	04:43	04:16	04:39	05:32	06:28	07:24
36	16:02		17:04		17:59	19:58	20:53	21:29	21:15	20:18	19:03	17:49
37	08:01		07:06		05:59	05:43	04:42	04:16	04:41	05:33	06:30	07:26
38	16:04		17:06		18:01	20:00	20:55	21:29	21:14	20:16	19:00	17:46
39	07:59		07:03		05:56	05:40	04:40	04:16	04:42	05:35	06:31	07:28
40	16:06		17:08		18:03	20:02	20:57	21:30	21:12	20:13	18:58	17:44
41	07:58		07:01		05:54	05:38	04:39	04:16	04:43	05:37	06:33	07:30
42	16:08		17:10		18:05	20:04	20:58	21:30	21:11	20:11	18:55	17:42
43	07:57		06:59		05:51	05:36	04:37	04:16	04:45	05:39	06:35	07:32
44	16:09		17:12		18:07	20:06	21:00	21:30	21:10	20:09	18:53	17:40
45	07:55		06:57		05:49	05:33	04:36	04:16	04:47	05:41	06:37	07:34
46	16:11		17:14		18:09	20:08	21:01	21:30	21:08	20:07	18:50	17:37
47	07:54		06:54		05:46	05:31	04:34	04:17	04:48	05:42	06:39	07:35
48	16:13		17:16		18:11	20:10	21:03	21:30	21:07	20:04	18:47	17:35
49	07:53		06:52		05:44	05:29	04:33	04:17	04:50	05:44	06:41	07:37
50	16:15		17:18		18:13	20:12	21:04	21:30	21:05	20:02	18:45	16:33
51	07:51		06:50		05:41	05:27	04:32	04:17	04:51	05:46	06:42	07:39
52	16:17	9	15:29 (1)	17:20	18:15	20:13	21:06	21:30	21:03	19:59	18:42	16:31
53	07:50		15:18 (1)	16:47	05:39	05:24	04:30	04:18	04:53	05:48	06:44	06:41
54	16:19	13	15:31 (1)	17:22	18:17	20:15	21:07	21:30	21:02	19:57	18:40	16:28
55	07:48		15:16 (1)	16:45	05:36	05:22	04:29	04:18	04:55	05:50	06:46	06:43
56	16:21	17	15:33 (1)	17:24	18:18	20:17	21:09	21:30	21:00	19:55	18:37	16:26
57	07:46		15:15 (1)		06:34	05:20	04:28	04:19	04:56	05:52	06:48	06:45
58	16:23	19	15:34 (1)		19:20	20:19	21:10	21:30	20:58	19:52	18:35	16:24
59	07:45		15:16 (1)		06:31	05:18	04:27	04:20	04:58	05:53	06:50	06:47
60	16:25	20	15:36 (1)		19:22	20:21	21:12	21:30	20:57	19:50	18:32	16:22
61	07:43		15:15 (1)		06:29		04:26		05:00	05:55		06:49
62	16:27	21	15:36 (1)		19:24		21:13		20:55	19:47		16:20
63	Potential sun hours	247		272		367	421	497	514	516	462	383
64	Total, worst case	214		269								43
65	Sun reduction	0,17		0,19								0,26
66	Oper. time red.	0,18		0,18								0,18
67	Wind dir. red.	0,81		0,69								0,69
68	Total reduction	0,03		0,02								0,03
69	Total, real	5		7								1
70												7
71												230
72												520
73												0,14
74												0,18
75												0,91
76												0,02
77												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)
	Minutes with flicker		

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January		February		March		April		May		June		
1	08:13		10:44 (6)	07:41	12:45 (5)	06:43	15:07 (4)	06:26	17:39 (3)	05:16	19:17 (1)	04:25	
2	15:37	82	13:19 (5)	16:29	13:26 (5)	17:26	15:56 (4)	19:26	18:12 (3)	20:23	17	19:34 (1)	21:14
	08:13		10:44 (6)	07:40	12:46 (5)	06:40	15:07 (4)	06:24	17:41 (3)	05:14	19:18 (1)	04:24	
3	15:38	82	13:19 (5)	16:31	13:26 (5)	17:28	15:56 (4)	19:28	18:54 (2)	20:25	15	19:33 (1)	21:15
	08:12		10:46 (6)	07:38	12:48 (5)	06:38	15:07 (4)	06:21	17:41 (3)	05:11	19:19 (1)	04:23	
4	15:39	80	13:20 (5)	16:33	13:25 (5)	17:30	15:56 (4)	19:30	18:56 (2)	20:26	12	19:31 (1)	21:17
	08:12		10:47 (6)	07:36	12:49 (5)	06:36	15:07 (4)	06:19	17:43 (3)	05:09	19:21 (1)	04:22	
5	15:40	81	13:21 (5)	16:35	13:23 (5)	17:32	15:55 (4)	19:32	18:58 (2)	20:28	8	19:29 (1)	21:18
	08:12		10:47 (6)	07:34	12:51 (5)	06:33	15:08 (4)	06:16	17:44 (3)	05:07		04:21	
6	15:42	81	13:21 (5)	16:37	13:22 (5)	17:34	15:55 (4)	19:34	18:58 (2)	20:30		21:19	
	08:11		10:48 (6)	07:32	12:53 (5)	06:31	15:07 (4)	06:14	17:46 (3)	05:05		04:20	
7	15:43	80	13:22 (5)	16:39	13:20 (5)	17:36	15:54 (4)	19:35	19:00 (2)	20:32		21:20	
	08:11		10:49 (6)	07:30	12:56 (5)	06:28	15:08 (4)	06:11	17:49 (3)	05:03		04:20	
8	15:44	80	13:23 (5)	16:41	13:17 (5)	17:38	15:53 (4)	19:37	19:00 (2)	20:34		21:21	
	08:10		10:50 (6)	07:29	13:01 (5)	06:26	15:08 (4)	06:09	18:34 (2)	05:01		04:19	
9	15:46	78	13:23 (5)	16:43	13:13 (5)	17:40	15:52 (4)	19:39	19:00 (2)	20:36		21:22	
	08:10		10:51 (6)	07:27		06:23	15:10 (4)	06:06	18:33 (2)	04:59		04:18	
10	15:47	78	13:24 (5)	16:45		17:42	15:51 (4)	19:41	19:01 (2)	20:38		21:23	
	08:09		10:52 (6)	07:25		06:21	15:10 (4)	06:04	18:32 (2)	04:57		04:18	
11	15:49	77	13:24 (5)	16:48		17:44	15:50 (4)	19:43	19:00 (2)	20:39		21:24	
	08:08		10:53 (6)	07:23		06:19	15:12 (4)	06:02	18:32 (2)	04:56		04:17	
12	15:50	75	13:25 (5)	16:50		17:46	15:49 (4)	19:45	19:00 (2)	20:41		21:25	
	08:07		10:54 (6)	07:21		06:16	15:13 (4)	05:59	18:32 (2)	04:54		04:17	
13	15:52	73	13:25 (5)	16:52		17:48	15:46 (4)	19:47	18:59 (2)	20:43		21:25	
	08:07		10:56 (6)	07:18	15:26 (4)	06:14	15:15 (4)	05:57	18:32 (2)	04:52		04:17	
14	15:53	72	13:26 (5)	16:54	13	15:39 (4)	17:50	30	15:45 (4)	19:49	27	18:59 (2)	20:45
	08:06		10:58 (6)	07:16	15:22 (4)	06:11	15:17 (4)	05:54	18:32 (2)	04:50		04:16	
15	15:55	68	13:26 (5)	16:56	21	15:43 (4)	17:52	25	15:42 (4)	19:51	26	18:58 (2)	20:46
	08:05		11:01 (6)	07:14	15:19 (4)	06:09	15:20 (4)	05:52	18:32 (2)	04:48		04:16	
16	15:57	64	13:27 (5)	16:58	26	15:45 (4)	17:54	22	17:03 (3)	19:53	25	18:57 (2)	20:48
	08:04		11:05 (6)	07:12	15:17 (4)	06:06	15:26 (4)	05:50	18:33 (2)	04:47		04:16	
17	15:59	56	13:27 (5)	17:00	30	15:47 (4)	17:56	22	17:08 (3)	19:54	23	18:56 (2)	20:50
	08:03		12:35 (5)	07:10	15:16 (4)	06:04	16:50 (3)	05:47	18:34 (2)	04:45		04:16	
18	16:00	52	13:27 (5)	17:02	33	15:49 (4)	17:57	21	17:11 (3)	19:56	21	18:55 (2)	20:52
	08:02		12:36 (5)	07:08	15:15 (4)	06:01	16:47 (3)	05:45	18:35 (2)	04:43		04:16	
19	16:02	52	13:28 (5)	17:04	36	15:51 (4)	17:59	25	17:12 (3)	19:58	18	18:53 (2)	20:53
	08:01		12:37 (5)	07:06	15:13 (4)	05:59	16:46 (3)	05:43	18:37 (2)	04:42		04:16	
20	16:04	51	13:28 (5)	17:06	39	15:52 (4)	18:01	28	17:14 (3)	20:00	14	18:51 (2)	20:55
	07:59		12:36 (5)	07:03	15:12 (4)	05:56	16:44 (3)	05:40	18:41 (2)	04:40		04:16	
21	16:06	52	13:28 (5)	17:08	41	15:53 (4)	18:03	31	17:15 (3)	20:02	16	19:32 (1)	20:57
	07:58		12:37 (5)	07:01	15:11 (4)	05:54	16:43 (3)	05:38	19:20 (1)	04:39		04:16	
22	16:08	52	13:29 (5)	17:10	43	15:54 (4)	18:05	33	17:16 (3)	20:04	14	19:34 (1)	20:58
	07:57		12:37 (5)	06:59	15:10 (4)	05:51	16:42 (3)	05:36	19:19 (1)	04:37		04:16	
23	16:09	51	13:28 (5)	17:12	44	15:54 (4)	18:07	34	17:16 (3)	20:06	16	19:35 (1)	21:00
	07:55		12:38 (5)	06:57	15:09 (4)	05:49	16:41 (3)	05:33	19:17 (1)	04:36		04:16	
24	16:11	51	13:29 (5)	17:14	46	15:55 (4)	18:09	36	17:17 (3)	20:08	18	19:35 (1)	21:01
	07:54		12:39 (5)	06:54	15:09 (4)	05:46	16:40 (3)	05:31	19:16 (1)	04:34		04:17	
25	16:13	50	13:29 (5)	17:16	47	15:56 (4)	18:11	36	17:16 (3)	20:10	20	19:36 (1)	21:03
	07:53		12:39 (5)	06:52	15:08 (4)	05:44	16:40 (3)	05:29	19:16 (1)	04:33		04:17	
26	16:15	49	13:28 (5)	17:18	48	15:56 (4)	18:13	37	17:17 (3)	20:11	20	19:36 (1)	21:04
	07:51		12:40 (5)	06:50	15:08 (4)	05:41	16:39 (3)	05:27	19:16 (1)	04:32		04:17	
27	16:17	49	13:29 (5)	17:20	48	15:56 (4)	18:15	37	17:16 (3)	20:13	20	19:36 (1)	21:06
	07:50		12:40 (5)	06:47	15:07 (4)	05:39	16:39 (3)	05:24	19:16 (1)	04:30		04:18	
28	16:19	49	13:29 (5)	17:22	49	15:56 (4)	18:17	37	17:16 (3)	20:15	20	19:36 (1)	21:07
	07:48		12:41 (5)	06:45	15:07 (4)	05:36	16:39 (3)	05:22	19:16 (1)	04:29		04:18	
29	16:21	47	13:28 (5)	17:24	49	15:56 (4)	18:18	36	17:15 (3)	20:17	20	19:36 (1)	21:09
	07:46		12:42 (5)			06:34	17:39 (3)	05:20	19:16 (1)	04:28		04:19	
30	16:23	46	13:28 (5)			19:20	18:15 (3)	20:19	19	19:35 (1)	21:10	21:30	
	07:45		12:43 (5)			06:31	17:39 (3)	05:18	19:16 (1)	04:27		04:20	
31	16:25	45	13:28 (5)			19:22	18:14 (3)	20:21	19	19:35 (1)	21:12	21:30	
	07:43		12:44 (5)			06:29	17:40 (3)			04:26			
Potential sun hours	247			272		367		421		497		514	
Total, worst case	1946			856		1124		775		52			
Sun reduction	0,17			0,19		0,31		0,38		0,44			
Oper. time red.	0,18			0,18		0,18		0,18		0,18			
Wind dir. red.	0,97			0,72		0,43		0,12		0,24			
Total reduction	0,04			0,03		0,03		0,01		0,02			
Total, real	72			26		34		8		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)
	Minutes with flicker		

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	July	August	September	October	November	December
1	04:20 21:29	05:01 20:53	05:57 19:45	18:31 (2) 18:59 (2)	06:52 16:25 (4)	06:51 16:18
2	04:21 21:29	05:03 20:51	05:59 19:43	18:31 (2) 18:59 (2)	06:53 16:26 (4)	06:53 16:16
3	04:22 21:28	05:05 20:49	06:01 19:40	18:30 (2) 18:58 (2)	06:55 16:27 (4)	12:30 (5) 12:44 (5)
4	04:23 21:28	05:07 20:47	06:02 19:38	18:31 (2) 18:57 (2)	06:57 16:28 (4)	12:26 (5) 12:48 (5)
5	04:24 21:27	05:08 20:45	06:04 19:35	17:46 (3) 18:57 (2)	06:59 16:29 (4)	12:23 (5) 12:50 (5)
6	04:25 21:27	05:10 20:43	06:06 19:33	17:42 (3) 18:56 (2)	07:01 16:29 (4)	12:21 (5) 12:52 (5)
7	04:26 21:26	05:12 20:41	06:08 19:30	17:39 (3) 18:54 (2)	07:03 16:29 (4)	12:19 (5) 12:53 (5)
8	04:27 21:25	05:14 20:39	06:10 19:28	17:37 (3) 18:52 (2)	07:05 16:30 (4)	12:18 (5) 12:55 (5)
9	04:28 21:24	05:15 20:37	19:30 (1) 19:39 (1)	06:12 19:25	07:07 18:50 (2)	12:17 (5) 12:56 (5)
10	04:29 21:24	05:17 20:35	19:27 (1) 19:40 (1)	06:13 19:23	07:08 18:47 (2)	12:16 (5) 12:57 (5)
11	04:30 21:23	05:19 20:33	19:26 (1) 19:41 (1)	06:15 19:20	07:10 18:04 (3)	12:15 (5) 12:58 (5)
12	04:31 21:22	05:21 20:31	19:25 (1) 19:42 (1)	06:17 19:18	07:12 18:05 (3)	12:14 (5) 12:59 (5)
13	04:32 21:21	05:23 20:29	19:24 (1) 19:42 (1)	06:19 19:15	07:14 18:05 (3)	12:13 (5) 12:59 (5)
14	04:34 21:20	05:24 20:27	19:23 (1) 19:43 (1)	06:21 19:13	07:16 18:06 (3)	12:13 (5) 13:00 (5)
15	04:35 21:19	05:26 20:25	19:23 (1) 19:43 (1)	06:22 19:10	07:18 18:05 (3)	12:13 (5) 13:01 (5)
16	04:36 21:17	05:28 20:22	19:22 (1) 19:43 (1)	06:24 19:08	07:20 18:05 (3)	12:13 (5) 13:02 (5)
17	04:38 21:16	05:30 20:20	19:22 (1) 19:43 (1)	06:26 19:05	07:22 18:05 (3)	12:13 (5) 13:02 (5)
18	04:39 21:15	05:32 20:18	19:23 (1) 19:42 (1)	06:28 19:03	07:24 18:04 (3)	12:12 (5) 13:03 (5)
19	04:41 21:14	05:33 20:16	19:22 (1) 19:41 (1)	06:30 19:00	07:26 18:03 (3)	12:12 (5) 13:03 (5)
20	04:42 21:12	05:35 20:13	19:23 (1) 19:41 (1)	06:31 18:58	07:28 18:02 (3)	12:12 (5) 13:03 (5)
21	04:43 21:11	05:37 20:11	19:24 (1) 19:40 (1)	06:33 18:55	07:30 18:02 (3)	12:12 (5) 13:04 (5)
22	04:45 21:09	05:39 20:09	19:25 (1) 19:38 (1)	06:35 18:53	07:32 18:01 (3)	12:13 (5) 13:04 (5)
23	04:47 21:08	05:41 20:06	18:44 (2) 19:35 (1)	06:37 18:50	07:33 17:59 (3)	12:13 (5) 13:04 (5)
24	04:48 21:06	05:42 20:04	18:41 (2) 18:55 (2)	06:39 18:47	07:35 17:58 (3)	12:13 (5) 13:05 (5)
25	04:50 21:05	05:44 20:02	18:39 (2) 18:57 (2)	06:41 18:45	07:37 17:56 (3)	12:13 (5) 13:05 (5)
26	04:51 21:03	05:46 19:59	18:37 (2) 18:58 (2)	06:42 18:42	07:39 17:54 (3)	10:43 (6) 13:06 (5)
27	04:53 21:02	05:48 19:57	18:35 (2) 18:58 (2)	06:44 18:40	07:41 17:51 (3)	10:40 (6) 13:06 (5)
28	04:55 21:00	05:50 19:55	18:34 (2) 18:59 (2)	06:46 18:37	07:43 17:47 (3)	10:38 (6) 13:06 (5)
29	04:56 20:58	05:52 19:52	18:33 (2) 18:59 (2)	06:48 18:35	07:44 16:22 (4)	10:37 (6) 13:07 (5)
30	04:58 20:57	05:53 19:50	18:32 (2) 18:59 (2)	06:50 18:32	06:47 16:24 (4)	10:36 (6) 15:33
31	05:00 20:55	05:55 19:47	18:31 (2) 18:59 (2)	06:49 16:20	06:49 16:20	08:13 15:35
Potential sun hours	516	462	383	327	257	230
Total, worst case		437	988	1172	1317	2508
Sun reduction		0,51	0,38	0,26	0,17	0,14
Oper. time red.		0,18	0,18	0,18	0,18	0,18
Wind dir. red.		0,15	0,20	0,62	0,97	0,97
Total reduction		0,02	0,02	0,04	0,04	0,03
Total, real		7	17	43	50	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)
	Minutes with flicker		

Project:

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January		February		March		April		May		June					
1	08:13		10:57 (6)	07:41	13:08 (5)	06:43	15:38 (4)	06:26	17:54 (3)	05:16	19:21 (1)	04:25				
	15:37	77	13:42 (5)	16:29	52	14:00 (5)	17:26	39	16:17 (4)	19:26	35	18:29 (3)	20:23	19	19:40 (1)	21:14
2	08:13		10:57 (6)	07:40	13:08 (5)	06:40	15:36 (4)	06:24	17:54 (3)	05:14	19:22 (1)	04:24				
	15:38	77	13:42 (5)	16:31	52	14:00 (5)	17:28	42	16:18 (4)	19:28	35	18:29 (3)	20:25	17	19:39 (1)	21:15
3	08:12		10:58 (6)	07:38	13:09 (5)	06:38	15:35 (4)	06:21	17:53 (3)	05:11	19:22 (1)	04:23				
	15:39	79	13:44 (5)	16:33	51	14:00 (5)	17:30	44	16:19 (4)	19:30	35	18:28 (3)	20:26	16	19:38 (1)	21:17
4	08:12		10:59 (6)	07:36	13:09 (5)	06:36	15:34 (4)	06:19	17:54 (3)	05:09	19:23 (1)	04:22				
	15:40	78	13:45 (5)	16:35	50	13:59 (5)	17:32	45	16:19 (4)	19:32	33	18:27 (3)	20:28	14	19:37 (1)	21:18
5	08:12		11:00 (6)	07:34	13:10 (5)	06:33	15:34 (4)	06:16	17:54 (3)	05:07	19:25 (1)	04:21				
	15:42	78	13:45 (5)	16:37	49	13:59 (5)	17:34	45	16:19 (4)	19:34	32	18:26 (3)	20:30	10	19:35 (1)	21:19
6	08:11		11:00 (6)	07:32	13:11 (5)	06:31	15:33 (4)	06:14	17:55 (3)	05:05	19:27 (1)	04:20				
	15:43	79	13:46 (5)	16:39	47	13:58 (5)	17:36	46	16:19 (4)	19:35	42	19:03 (2)	20:32	5	19:32 (1)	21:20
7	08:11		11:01 (6)	07:30	13:12 (5)	06:28	15:33 (4)	06:11	17:55 (3)	05:03		04:20				
	15:44	78	13:47 (5)	16:41	46	13:58 (5)	17:38	47	16:20 (4)	19:37	45	19:04 (2)	20:34		21:21	
8	08:10		11:02 (6)	07:29	13:13 (5)	06:26	15:32 (4)	06:09	17:56 (3)	05:01		04:19				
	15:46	78	13:48 (5)	16:43	44	13:57 (5)	17:40	47	16:19 (4)	19:39	47	19:06 (2)	20:36		21:22	
9	08:10		11:03 (6)	07:27	13:14 (5)	06:23	15:32 (4)	06:06	17:58 (3)	04:59		04:18				
	15:47	79	13:49 (5)	16:45	42	13:56 (5)	17:42	47	16:19 (4)	19:41	45	19:07 (2)	20:38		21:23	
10	08:09		11:03 (6)	07:25	13:15 (5)	06:21	15:31 (4)	06:04	17:59 (3)	04:57		04:18				
	15:49	79	13:49 (5)	16:48	39	13:54 (5)	17:44	48	16:19 (4)	19:43	44	19:07 (2)	20:39		21:24	
11	08:08		11:04 (6)	07:23	13:16 (5)	06:19	15:32 (4)	06:02	18:01 (3)	04:56		04:17				
	15:50	79	13:50 (5)	16:50	37	13:53 (5)	17:46	47	16:19 (4)	19:45	41	19:08 (2)	20:41		21:25	
12	08:07		11:05 (6)	07:21	13:18 (5)	06:16	15:32 (4)	05:59	18:05 (3)	04:54		04:17				
	15:52	78	13:51 (5)	16:52	34	13:52 (5)	17:48	46	16:18 (4)	19:47	31	19:07 (2)	20:43		21:25	
13	08:07		11:06 (6)	07:18	13:21 (5)	06:14	15:32 (4)	05:57	18:41 (2)	04:52		04:17				
	15:53	78	13:52 (5)	16:54	29	13:50 (5)	17:50	46	16:18 (4)	19:49	27	19:08 (2)	20:45		21:26	
14	08:06		11:08 (6)	07:16	13:24 (5)	06:11	15:32 (4)	05:54	18:41 (2)	04:50		04:16				
	15:55	77	13:53 (5)	16:56	24	13:48 (5)	17:52	44	16:16 (4)	19:51	27	19:08 (2)	20:46		21:27	
15	08:05		11:09 (6)	07:14	13:27 (5)	06:09	15:33 (4)	05:52	18:41 (2)	04:48		04:16				
	15:57	76	13:54 (5)	16:58	16	13:43 (5)	17:54	43	16:16 (4)	19:53	26	19:07 (2)	20:48		21:27	
16	08:04		11:11 (6)	07:12		06:06	15:33 (4)	05:50	18:41 (2)	04:47		04:16				
	15:59	74	13:55 (5)	17:00		17:56	42	16:15 (4)	19:54	26	19:07 (2)	20:50		21:28		
17	08:03		11:12 (6)	07:10		06:04	15:34 (4)	05:47	18:41 (2)	04:45		04:16				
	16:00	72	13:55 (5)	17:02		17:57	40	16:14 (4)	19:56	25	19:06 (2)	20:52		21:28		
18	08:02		11:15 (6)	07:08		06:01	15:35 (4)	05:45	18:41 (2)	04:43		04:16				
	16:02	69	13:56 (5)	17:04		17:59	37	16:12 (4)	19:58	24	19:05 (2)	20:53		21:29		
19	08:00		11:18 (6)	07:06		05:59	15:37 (4)	05:43	18:42 (2)	04:42		04:16				
	16:04	64	13:57 (5)	17:06		18:01	34	16:11 (4)	20:00	22	19:04 (2)	20:55		21:29		
20	07:59		13:04 (5)	07:03		05:56	15:38 (4)	05:40	18:43 (2)	04:40		04:16				
	16:06	53	13:57 (5)	17:08		18:03	31	16:09 (4)	20:02	20	19:03 (2)	20:57		21:30		
21	07:58		13:05 (5)	07:01		05:54	15:40 (4)	05:38	18:45 (2)	04:39		04:16				
	16:08	53	13:58 (5)	17:10		18:05	35	17:19 (3)	20:04	16	19:01 (2)	20:58		21:30		
22	07:57		13:04 (5)	06:59		15:54 (4)	15:42 (4)	05:36	18:47 (2)	04:37		04:16				
	16:09	54	13:58 (5)	17:12	8	16:02 (4)	18:07	38	17:22 (3)	20:06	22	19:37 (1)	21:00		21:30	
23	07:55		13:05 (5)	06:57		15:49 (4)	05:49	15:46 (4)	05:33	18:50 (2)	04:36	04:16				
	16:11	54	13:59 (5)	17:14	18	16:07 (4)	18:09	36	17:25 (3)	20:08	18	19:38 (1)	21:01		21:30	
24	07:54		13:05 (5)	06:54		15:46 (4)	05:46	17:01 (3)	05:31	19:23 (1)	04:34	04:17				
	16:13	54	13:59 (5)	17:16	24	16:10 (4)	18:11	25	17:26 (3)	20:10	16	19:39 (1)	21:03		21:30	
25	07:53		13:05 (5)	06:52		15:43 (4)	05:44	17:00 (3)	05:29	19:22 (1)	04:33	04:17				
	16:15	54	13:59 (5)	17:18	29	16:12 (4)	18:13	28	17:28 (3)	20:11	18	19:40 (1)	21:04		21:30	
26	07:51		13:06 (5)	06:50		15:42 (4)	05:41	16:58 (3)	05:27	19:22 (1)	04:32	04:17				
	16:17	54	14:00 (5)	17:20	32	16:14 (4)	18:15	30	17:28 (3)	20:13	18	19:40 (1)	21:06		21:30	
27	07:50		13:06 (5)	06:47		15:39 (4)	05:39	16:57 (3)	05:24	19:21 (1)	04:30	04:18				
	16:19	54	14:00 (5)	17:22	36	16:15 (4)	18:17	32	17:29 (3)	20:15	19	19:40 (1)	21:07		21:30	
28	07:48		13:06 (5)	06:45		15:38 (4)	05:36	16:56 (3)	05:22	19:21 (1)	04:29	04:18				
	16:21	54	14:00 (5)	17:24	38	16:16 (4)	18:18	33	17:29 (3)	20:17	20	19:41 (1)	21:09		21:30	
29	07:46		13:06 (5)			06:34	17:56 (3)	05:20	19:21 (1)	04:28		04:19				
	16:23	53	13:59 (5)			19:20	34	18:30 (3)	20:19	19	19:40 (1)	21:10		21:30		
30	07:45		13:07 (5)			06:31	17:54 (3)	05:18	19:21 (1)	04:27		04:20				
	16:25	53	14:00 (5)			19:22	35	18:29 (3)	20:21	19	19:40 (1)	21:12		21:30		
31	07:43		13:07 (5)			06:29	17:55 (3)			04:26						
	16:27	53	14:00 (5)			19:24	34	18:29 (3)		21:13						
Potential sun hours	247		272			367		421		497		514				
Total, worst case	2092		797			1220		847		81						
Sun reduction	0,17		0,19			0,31		0,38		0,44						
Oper. time red.	0,18		0,18			0,18		0,18		0,18						
Wind dir. red.	0,95		0,84			0,42		0,13		0,26						
Total reduction	0,04		0,04			0,03		0,01		0,03						
Total, real	76		29			35		10		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)
	Minutes with flicker		

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	July	August	September	October	November	December				
1	04:20 21:29	05:01 20:53	05:57 19:45	18:00 (3) 19:07 (2)	06:52 18:30	16:11 (4) 16:57 (4)	06:51 16:18	12:44 (5) 13:24 (5)	07:48 15:32	10:46 (6) 13:32 (5)
2	04:21 21:29	05:03 20:51	05:59 19:43	17:58 (3) 19:06 (2)	06:53 18:27	16:10 (4) 16:57 (4)	06:53 16:16	12:43 (5) 13:25 (5)	07:49 15:31	10:46 (6) 13:33 (5)
3	04:22 21:28	05:05 20:49	06:01 19:40	17:55 (3) 19:04 (2)	06:55 18:25	16:10 (4) 16:57 (4)	06:55 16:14	12:42 (5) 13:27 (5)	07:51 15:31	10:47 (6) 13:33 (5)
4	04:23 21:28	05:07 20:47	06:02 19:38	17:53 (3) 19:03 (2)	06:57 18:22	16:09 (4) 16:56 (4)	06:57 16:12	12:41 (5) 13:28 (5)	07:52 15:30	10:46 (6) 13:32 (5)
5	04:24 21:27	05:08 20:45	06:04 19:35	17:52 (3) 19:01 (2)	06:59 18:20	16:09 (4) 16:56 (4)	06:59 16:10	12:40 (5) 13:28 (5)	07:54 15:29	10:46 (6) 13:33 (5)
6	04:25 21:27	05:10 20:43	06:06 19:33	17:51 (3) 18:59 (2)	07:01 18:18	16:09 (4) 16:56 (4)	07:01 16:08	12:40 (5) 13:29 (5)	07:55 15:29	10:46 (6) 13:32 (5)
7	04:26 21:26	05:12 20:41	19:35 (1) 19:43 (1)	06:08 19:30	17:49 (3) 18:53 (2)	16:09 (4) 16:55 (4)	07:03 16:06	12:39 (5) 13:29 (5)	07:56 15:28	10:47 (6) 13:33 (5)
8	04:27 21:25	05:14 20:39	19:34 (1) 19:45 (1)	06:10 19:28	17:48 (3) 18:21 (3)	16:09 (4) 16:55 (4)	07:05 16:04	12:39 (5) 13:30 (5)	07:58 15:28	10:46 (6) 13:32 (5)
9	04:28 21:24	05:15 20:37	19:32 (1) 19:46 (1)	06:12 19:25	17:48 (3) 18:22 (3)	16:09 (4) 16:54 (4)	07:07 16:02	12:39 (5) 13:31 (5)	07:59 15:28	10:46 (6) 13:32 (5)
10	04:29 21:24	05:17 20:35	19:31 (1) 19:47 (1)	06:13 19:23	17:47 (3) 18:22 (3)	16:09 (4) 16:53 (4)	07:09 16:01	12:38 (5) 13:31 (5)	08:00 15:27	10:47 (6) 13:33 (5)
11	04:30 21:23	05:19 20:33	19:30 (1) 19:48 (1)	06:15 19:20	17:46 (3) 18:21 (3)	16:10 (4) 16:52 (4)	07:11 15:59	12:38 (5) 13:31 (5)	08:01 15:27	10:47 (6) 13:32 (5)
12	04:31 21:22	05:21 20:31	19:30 (1) 19:48 (1)	06:17 19:18	17:46 (3) 18:21 (3)	16:10 (4) 16:51 (4)	07:13 15:57	12:38 (5) 13:31 (5)	08:02 15:27	10:47 (6) 13:32 (5)
13	04:32 21:21	05:23 20:29	19:28 (1) 19:48 (1)	06:19 19:15	17:46 (3) 18:20 (3)	16:11 (4) 16:50 (4)	07:15 15:55	12:38 (5) 13:31 (5)	08:04 15:27	10:48 (6) 13:32 (5)
14	04:34 21:20	05:24 20:27	19:28 (1) 19:48 (1)	06:21 19:13	17:46 (3) 18:20 (3)	16:12 (4) 16:49 (4)	07:17 15:54	12:38 (5) 13:31 (5)	08:05 15:27	10:48 (6) 13:32 (5)
15	04:35 21:19	05:26 20:25	19:29 (1) 19:48 (1)	06:22 19:10	17:45 (3) 18:18 (3)	16:13 (4) 16:47 (4)	07:19 15:52	12:39 (5) 13:32 (5)	08:06 15:27	10:48 (6) 13:33 (5)
16	04:36 21:17	05:28 20:22	19:28 (1) 19:47 (1)	06:24 19:08	17:46 (3) 18:18 (3)	16:14 (4) 16:45 (4)	07:21 15:51	12:39 (5) 13:33 (5)	08:06 15:27	10:49 (6) 13:33 (5)
17	04:38 21:16	05:30 20:20	19:28 (1) 19:47 (1)	06:26 19:05	17:46 (3) 18:17 (3)	16:16 (4) 16:43 (4)	07:23 15:49	12:39 (5) 13:33 (5)	08:07 15:27	10:49 (6) 13:33 (5)
18	04:39 21:15	05:32 20:18	19:29 (1) 19:46 (1)	06:28 19:03	17:47 (3) 18:15 (3)	16:18 (4) 16:40 (4)	07:25 15:48	12:39 (5) 13:33 (5)	08:08 15:27	10:50 (6) 13:34 (5)
19	04:41 21:14	05:33 20:16	19:29 (1) 19:44 (1)	06:30 19:00	17:47 (3) 18:13 (3)	16:21 (4) 16:37 (4)	07:27 15:46	12:39 (5) 13:33 (5)	08:09 15:27	10:51 (6) 13:34 (5)
20	04:42 21:12	05:35 20:13	18:54 (2) 19:43 (1)	06:31 18:58	16:33 (4) 18:11 (3)	07:28 17:44	07:28 15:45	12:39 (5) 13:33 (5)	08:10 15:28	10:50 (6) 13:34 (5)
21	04:43 21:11	05:37 20:11	18:51 (2) 19:41 (1)	06:33 18:55	16:28 (4) 18:09 (3)	07:30 17:42	07:30 15:43	12:40 (5) 13:33 (5)	08:10 15:28	10:51 (6) 13:35 (5)
22	04:45 21:09	05:39 20:09	18:49 (2) 19:06 (2)	06:35 18:52	16:25 (4) 18:05 (3)	07:32 17:40	07:32 15:42	12:40 (5) 13:33 (5)	08:11 15:28	10:51 (6) 13:35 (5)
23	04:47 21:08	05:41 20:06	19:07 (2) 19:07 (2)	06:37 18:50	16:23 (4) 16:53 (4)	07:33 17:37	07:34 15:41	12:40 (5) 13:33 (5)	08:11 15:29	10:52 (6) 13:36 (5)
24	04:48 21:06	05:42 20:04	18:46 (2) 19:08 (2)	06:39 18:47	16:21 (4) 16:54 (4)	07:35 17:35	07:36 15:39	12:40 (5) 13:33 (5)	08:12 15:30	10:53 (6) 13:36 (5)
25	04:50 21:05	05:44 20:02	18:45 (2) 19:08 (2)	06:41 18:45	16:18 (4) 16:54 (4)	06:37 16:33	07:37 15:38	12:40 (5) 13:33 (5)	08:12 15:30	10:53 (6) 13:37 (5)
26	04:51 21:03	05:46 19:59	18:44 (2) 19:09 (2)	06:42 18:42	16:17 (4) 16:55 (4)	06:39 16:31	13:02 (5) 13:08 (5)	07:39 15:37	10:49 (6) 13:33 (5)	10:53 (6) 13:37 (5)
27	04:53 21:02	05:48 19:57	18:43 (2) 19:08 (2)	06:44 18:40	16:15 (4) 16:56 (4)	06:41 16:28	12:56 (5) 13:15 (5)	07:41 15:36	10:48 (6) 13:33 (5)	10:53 (6) 13:38 (5)
28	04:55 21:00	05:50 19:55	18:42 (2) 19:09 (2)	06:46 18:37	16:14 (4) 16:57 (4)	06:43 16:26	12:53 (5) 13:18 (5)	07:43 15:35	10:48 (6) 13:33 (5)	10:54 (6) 13:38 (5)
29	04:56 20:58	05:52 19:52	18:42 (2) 19:09 (2)	06:48 18:35	16:13 (4) 16:57 (4)	06:45 16:24	12:50 (5) 13:20 (5)	07:44 15:34	10:48 (6) 13:33 (5)	10:55 (6) 13:39 (5)
30	04:58 20:57	05:53 19:50	18:41 (2) 19:08 (2)	06:50 18:32	16:12 (4) 16:57 (4)	06:47 16:22	12:48 (5) 13:22 (5)	07:46 15:33	10:46 (6) 13:32 (5)	10:55 (6) 13:40 (5)
31	05:00 20:55	05:55 19:47	18:04 (3) 19:07 (2)	06:49 16:20	06:49 16:20	12:46 (5) 13:23 (5)	07:47 13:23 (5)	08:13 15:35	13:32 (5) 15:35	10:56 (6) 13:41 (5)
Potential sun hours	516	462	383	327	257	230	2368			
Total, worst case		503	1108	902	1704	2368				
Sun reduction		0,51	0,38	0,26	0,17	0,14				
Oper. time red.		0,18	0,18	0,18	0,18	0,18				
Wind dir. red.		0,16	0,26	0,58	0,94	0,96				
Total reduction		0,02	0,02	0,03	0,04	0,03				
Total, real		9	24	31	62	74				

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

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

Project:

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January		February		March		April		May		June	
1	08:13		11:37 (6)	07:41	13:41 (5)	06:43	15:43 (4)	06:26	17:54 (3)	05:16	04:25	
	15:37	61	14:07 (5)	16:29	14:24 (5)	17:26	16:21 (4)	19:26	18:56 (2)	20:23	21:14	
2	08:13		11:37 (6)	07:40	13:41 (5)	06:40	15:42 (4)	06:24	17:56 (3)	05:14	04:24	
	15:38	60	14:07 (5)	16:31	14:24 (5)	17:28	16:21 (4)	19:28	18:58 (2)	20:25	21:15	
3	08:12		11:38 (6)	07:38	13:42 (5)	06:38	15:42 (4)	06:21	17:57 (3)	05:11	04:23	
	15:39	60	14:08 (5)	16:33	14:24 (5)	17:30	16:21 (4)	19:30	18:58 (2)	20:26	21:17	
4	08:12		11:40 (6)	07:36	13:43 (5)	06:36	15:41 (4)	06:19	18:03 (3)	05:09	04:22	
	15:40	60	14:10 (5)	16:35	14:23 (5)	17:32	16:21 (4)	19:32	18:59 (2)	20:28	21:18	
5	08:12		11:40 (6)	07:34	13:44 (5)	06:33	15:41 (4)	06:16	18:36 (2)	05:07	04:21	
	15:42	60	14:10 (5)	16:37	14:23 (5)	17:34	16:21 (4)	19:34	18:59 (2)	20:30	21:19	
6	08:11		11:41 (6)	07:32	13:45 (5)	06:31	15:41 (4)	06:14	18:36 (2)	05:05	04:20	
	15:43	60	14:11 (5)	16:39	14:22 (5)	17:36	16:20 (4)	19:35	18:59 (2)	20:32	21:20	
7	08:11		11:43 (6)	07:30	13:46 (5)	06:28	15:41 (4)	06:11	18:35 (2)	05:03	04:20	
	15:44	59	14:12 (5)	16:41	14:21 (5)	17:38	16:20 (4)	19:37	18:59 (2)	20:34	21:21	
8	08:10		11:44 (6)	07:29	13:48 (5)	06:26	15:41 (4)	06:09	18:35 (2)	05:01	04:19	
	15:46	59	14:13 (5)	16:43	14:20 (5)	17:40	16:19 (4)	19:39	18:59 (2)	20:36	21:22	
9	08:10		11:45 (6)	07:27	13:49 (5)	06:23	15:42 (4)	06:06	18:35 (2)	04:59	04:18	
	15:47	58	14:14 (5)	16:45	14:19 (5)	17:42	16:19 (4)	19:41	18:59 (2)	20:38	21:23	
10	08:09		11:46 (6)	07:25	13:51 (5)	06:21	15:42 (4)	06:04	18:35 (2)	04:57	04:18	
	15:49	56	14:14 (5)	16:48	14:16 (5)	17:44	16:17 (4)	19:43	18:57 (2)	20:39	21:24	
11	08:08		11:48 (6)	07:23	13:54 (5)	06:19	15:43 (4)	06:02	18:35 (2)	04:56	04:17	
	15:50	54	14:15 (5)	16:50	14:14 (5)	17:46	16:17 (4)	19:45	18:57 (2)	20:41	21:25	
12	08:07		11:50 (6)	07:20	13:58 (5)	06:16	15:44 (4)	05:59	18:35 (2)	04:54	04:17	
	15:52	51	14:16 (5)	16:52	14:11 (5)	17:48	16:15 (4)	19:47	18:55 (2)	20:43	21:25	
13	08:07		11:54 (6)	07:18		06:14	15:46 (4)	05:57	18:37 (2)	04:52	04:17	
	15:53	45	14:17 (5)	16:54		17:50	16:14 (4)	19:49	18:54 (2)	20:45	21:26	
14	08:06		13:37 (5)	07:16		06:11	15:47 (4)	05:54	18:38 (2)	04:50	04:16	
	15:55	41	14:18 (5)	16:56		17:52	16:11 (4)	19:51	18:52 (2)	20:46	21:27	
15	08:05		13:37 (5)	07:14		06:09	15:50 (4)	05:52	18:40 (2)	04:48	04:16	
	15:57	42	14:19 (5)	16:58		17:54	16:09 (4)	19:53	18:49 (2)	20:48	21:27	
16	08:04		13:37 (5)	07:12		06:06	15:52 (4)	05:50	19:21 (1)	04:47	04:16	
	15:59	43	14:20 (5)	17:00		17:56	17:14 (3)	19:54	19:26 (1)	20:50	21:28	
17	08:03		13:36 (5)	07:10		06:04	17:01 (3)	05:47	19:18 (1)	04:45	04:16	
	16:00	44	14:20 (5)	17:02		17:57	17:18 (3)	19:56	19:28 (1)	20:52	21:28	
18	08:02		13:37 (5)	07:08		06:01	16:58 (3)	05:45	19:15 (1)	04:43	04:16	
	16:02	44	14:21 (5)	17:04		17:59	17:19 (3)	19:58	19:29 (1)	20:53	21:29	
19	08:00		13:37 (5)	07:06		16:02 (4)	16:57 (3)	05:43	19:14 (1)	04:42	04:16	
	16:04	45	14:22 (5)	17:06	2	16:03 (4)	17:21 (3)	20:00	19:30 (1)	20:55	21:29	
20	07:59		13:37 (5)	07:03		15:55 (4)	16:55 (3)	05:40	19:14 (1)	04:40	04:16	
	16:06	45	14:22 (5)	17:08	15	16:10 (4)	17:21 (3)	20:02	19:31 (1)	20:57	21:30	
21	07:58		13:37 (5)	07:01		15:52 (4)	16:55 (3)	05:38	19:13 (1)	04:39	04:16	
	16:08	46	14:23 (5)	17:10	21	16:13 (4)	17:22 (3)	20:04	19:32 (1)	20:58	21:30	
22	07:57		13:37 (5)	06:59		15:50 (4)	16:53 (3)	05:36	19:13 (1)	04:37	04:16	
	16:09	46	14:23 (5)	17:12	25	16:15 (4)	17:22 (3)	20:06	19:32 (1)	21:00	21:30	
23	07:55		13:38 (5)	06:57		15:48 (4)	16:53 (3)	05:33	19:12 (1)	04:36	04:16	
	16:11	46	14:24 (5)	17:14	29	16:17 (4)	17:23 (3)	20:08	19:31 (1)	21:01	21:30	
24	07:54		13:37 (5)	06:54		15:47 (4)	16:52 (3)	05:31	19:13 (1)	04:34	04:17	
	16:13	47	14:24 (5)	17:16	31	16:18 (4)	17:22 (3)	20:10	19:30 (1)	21:03	21:30	
25	07:53		13:37 (5)	06:52		15:45 (4)	16:52 (3)	05:29	19:13 (1)	04:33	04:17	
	16:15	47	14:24 (5)	17:18	34	16:19 (4)	17:23 (3)	20:11	19:30 (1)	21:04	21:30	
26	07:51		13:38 (5)	06:50		15:45 (4)	16:51 (3)	05:27	19:14 (1)	04:32	04:17	
	16:17	46	14:24 (5)	17:20	35	16:20 (4)	17:22 (3)	20:13	19:29 (1)	21:06	21:30	
27	07:50		13:38 (5)	06:47		15:43 (4)	16:52 (3)	05:24	19:15 (1)	04:30	04:18	
	16:19	46	14:24 (5)	17:22	37	16:20 (4)	17:22 (3)	20:15	19:28 (1)	21:07	21:30	
28	07:48		13:38 (5)	06:45		15:43 (4)	16:51 (3)	05:22	19:16 (1)	04:29	04:18	
	16:21	46	14:24 (5)	17:24	38	16:21 (4)	17:21 (3)	20:17	19:26 (1)	21:09	21:30	
29	07:46		13:39 (5)			06:34	17:52 (3)	05:20	19:19 (1)	04:28	04:19	
	16:23	45	14:24 (5)			19:20	18:20 (3)	20:19	4	19:23 (1)	21:10	21:30
30	07:45		13:40 (5)			06:31	17:52 (3)	05:18			04:27	04:20
	16:25	45	14:25 (5)			19:22	18:19 (3)	20:21		21:12	21:30	
31	07:43		13:40 (5)			06:29	17:53 (3)			04:26		
	16:27	45	14:25 (5)			19:24	18:54 (2)			21:13		
Potential sun hours	247		272		367		421		497		514	
Total, worst case	1552		666		957		548					
Sun reduction	0,17		0,19		0,31		0,38					
Oper. time red.	0,18		0,18		0,18		0,18					
Wind dir. red.	0,91		0,74		0,37		0,10					
Total reduction	0,03		0,03		0,03		0,01					
Total, real	54		21		24		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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	July	August	September	October	November	December
1	04:20 21:29	05:01 20:53	05:57 19:45	18:34 (2) 18:56 (2)	06:52 18:30	16:23 (4) 16:53 (4)
2	04:21 21:29	05:03 20:51	05:59 19:43	18:34 (2) 18:56 (2)	06:53 18:27	16:22 (4) 16:54 (4)
3	04:22 21:28	05:05 20:49	06:01 19:40	18:32 (2) 18:56 (2)	06:55 18:25	16:21 (4) 16:55 (4)
4	04:23 21:28	05:07 20:47	06:02 19:38	18:32 (2) 18:56 (2)	06:57 18:22	16:19 (4) 16:55 (4)
5	04:24 21:27	05:08 20:45	06:04 19:35	18:32 (2) 18:56 (2)	06:59 18:20	16:18 (4) 16:56 (4)
6	04:25 21:27	05:10 20:43	06:06 19:33	18:32 (2) 18:55 (2)	07:01 18:18	16:18 (4) 16:56 (4)
7	04:26 21:26	05:12 20:41	06:08 19:30	18:31 (2) 18:54 (2)	07:03 18:15	16:17 (4) 16:56 (4)
8	04:27 21:25	05:14 20:39	06:10 19:28	18:31 (2) 18:53 (2)	07:05 18:13	16:17 (4) 16:56 (4)
9	04:28 21:24	05:15 20:37	06:12 19:25	17:52 (3) 18:52 (2)	07:07 18:10	16:16 (4) 16:56 (4)
10	04:29 21:24	05:17 20:35	06:13 19:23	17:49 (3) 18:51 (2)	07:08 18:08	16:16 (4) 16:56 (4)
11	04:30 21:23	05:19 20:33	06:15 19:20	17:46 (3) 18:48 (2)	07:10 18:05	16:16 (4) 16:55 (4)
12	04:31 21:22	05:21 20:31	06:17 19:18	17:45 (3) 18:45 (2)	07:12 18:03	16:16 (4) 16:55 (4)
13	04:32 21:21	05:23 20:29	06:19 19:15	17:43 (3) 18:10 (3)	07:14 18:01	16:16 (4) 16:54 (4)
14	04:34 21:20	05:24 20:27	06:21 19:13	17:42 (3) 18:11 (3)	07:16 17:58	16:16 (4) 16:53 (4)
15	04:35 21:19	05:26 20:25	06:22 19:11	17:41 (3) 18:10 (3)	07:18 17:56	16:17 (4) 16:53 (4)
16	04:36 21:17	05:28 20:22	06:24 19:08	17:40 (3) 18:10 (3)	07:20 17:53	16:17 (4) 16:52 (4)
17	04:38 21:16	05:30 20:20	06:26 19:05	17:40 (3) 18:10 (3)	07:22 17:51	16:18 (4) 16:50 (4)
18	04:39 21:15	05:32 20:18	06:28 19:03	17:39 (3) 18:10 (3)	07:24 17:49	16:19 (4) 16:49 (4)
19	04:41 21:14	05:33 20:16	06:30 19:00	17:38 (3) 18:09 (3)	07:26 17:46	16:20 (4) 16:47 (4)
20	04:42 21:12	05:35 20:13	06:31 18:58	17:38 (3) 18:09 (3)	07:28 17:44	16:21 (4) 16:45 (4)
21	04:43 21:11	05:37 20:11	06:33 18:55	17:39 (3) 18:08 (3)	07:30 17:42	16:24 (4) 16:43 (4)
22	04:45 21:09	05:39 20:09	06:35 18:52	17:39 (3) 18:07 (3)	07:32 17:40	16:27 (4) 16:39 (4)
23	04:47 21:08	05:41 20:06	06:37 18:50	17:40 (3) 18:06 (3)	07:33 17:37	16:39 (4) 15:41
24	04:48 21:06	05:42 20:04	06:39 18:47	17:40 (3) 18:05 (3)	07:35 17:35	16:39 (4) 15:39
25	04:50 21:05	05:44 20:02	06:41 18:45	17:41 (3) 18:02 (3)	07:37 16:33	15:38
26	04:51 21:03	05:46 19:59	06:42 18:42	17:42 (3) 18:00 (3)	07:39 16:31	15:37
27	04:53 21:02	05:48 19:57	06:44 18:40	16:36 (4) 17:57 (3)	06:41 16:28	15:36
28	04:55 21:00	05:50 19:55	06:46 18:37	16:31 (4) 16:49 (4)	06:43 16:26	15:35
29	04:56 20:58	05:52 19:52	06:48 18:35	16:29 (4) 16:51 (4)	06:45 16:24	15:34
30	04:58 20:57	05:53 19:50	06:50 18:32	16:26 (4) 16:53 (4)	06:47 16:22	13:26 (5) 13:41 (5)
31	05:00 20:55	05:55 19:47	18:35 (2) 18:55 (2)	16:49 16:20	06:49 13:44 (5)	15:33 15:35
Potential sun hours	516	462	383	327	257	230
Total, worst case		257	795	770	1275	1817
Sun reduction		0,51	0,38	0,26	0,17	0,14
Oper. time red.		0,18	0,18	0,18	0,18	0,18
Wind dir. red.		0,16	0,17	0,53	0,89	0,95
Total reduction		0,02	0,01	0,03	0,03	0,03
Total, real		5	11	24	44	55

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

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

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January		February		March		April		May		June	
1	08:13		13:16 (5)	07:41	14:55 (4)	06:43	16:05 (3)	06:26	18:37 (1)	05:16	04:25	
	15:37	30	13:46 (5)	16:29	15:24 (4)	17:26	16:30 (3)	19:26	18:55 (1)	20:23	21:14	
2	08:13		13:16 (5)	07:40	14:55 (4)	06:40	16:05 (3)	06:24	18:37 (1)	05:13	04:24	
	15:38	29	13:45 (5)	16:31	15:25 (4)	17:28	16:28 (3)	19:28	18:55 (1)	20:25	21:15	
3	08:12		13:17 (5)	07:38	14:55 (4)	06:38	16:06 (3)	06:21	18:36 (1)	05:11	04:23	
	15:39	29	13:46 (5)	16:33	15:25 (4)	17:30	16:28 (3)	19:30	18:54 (1)	20:26	21:17	
4	08:12		13:18 (5)	07:36	14:55 (4)	06:36	16:06 (3)	06:19	18:37 (1)	05:09	04:22	
	15:40	29	13:47 (5)	16:35	15:25 (4)	17:32	16:26 (3)	19:32	18:54 (1)	20:28	21:18	
5	08:12		13:18 (5)	07:34	14:55 (4)	06:33	16:08 (3)	06:16	18:37 (1)	05:07	04:21	
	15:42	29	13:47 (5)	16:37	15:25 (4)	17:34	16:25 (3)	19:34	18:53 (1)	20:30	21:19	
6	08:11		13:18 (5)	07:32	14:55 (4)	06:31	16:10 (3)	06:14	18:38 (1)	05:05	04:20	
	15:43	28	13:46 (5)	16:39	15:25 (4)	17:36	16:22 (3)	19:35	18:52 (1)	20:32	21:20	
7	08:11		13:20 (5)	07:30	14:56 (4)	06:28		06:11	18:38 (1)	05:03	04:20	
	15:44	27	13:47 (5)	16:41	15:25 (4)	17:38		19:37	18:50 (1)	20:34	21:21	
8	08:10		13:20 (5)	07:29	14:56 (4)	06:26		17:03 (2)	18:41 (1)	05:01	04:19	
	15:46	27	13:47 (5)	16:43	15:25 (4)	17:40	4	17:07 (2)	18:47 (1)	20:36	21:22	
9	08:10		13:21 (5)	07:27	14:57 (4)	06:23		16:59 (2)		04:59	04:18	
	15:47	26	13:47 (5)	16:45	15:25 (4)	17:42	12	17:11 (2)		20:38	21:23	
10	08:09		13:22 (5)	07:25	14:57 (4)	06:21		16:57 (2)		04:57	04:18	
	15:49	25	13:47 (5)	16:48	15:23 (4)	17:44	15	17:12 (2)		20:39	21:24	
11	08:08		13:22 (5)	07:23	14:58 (4)	06:19		16:55 (2)		04:56	04:17	
	15:50	25	13:47 (5)	16:50	15:22 (4)	17:46	19	17:14 (2)		20:41	21:25	
12	08:07		13:24 (5)	07:21	15:00 (4)	06:16		16:54 (2)		04:54	04:17	
	15:52	22	13:46 (5)	16:52	15:22 (4)	17:48	20	17:14 (2)		20:43	21:25	
13	08:07		13:25 (5)	07:18	15:02 (4)	06:14		16:53 (2)		04:52	04:17	
	15:53	21	13:46 (5)	16:54	15:20 (4)	17:50	22	17:15 (2)		20:45	21:26	
14	08:06		13:26 (5)	07:16	15:04 (4)	06:11		16:52 (2)		04:50	04:16	
	15:55	20	13:46 (5)	16:56	15:18 (4)	17:52	22	17:14 (2)		20:46	21:27	
15	08:05		13:28 (5)	07:14	15:07 (4)	06:09		16:53 (2)		04:48	04:16	
	15:57	17	13:45 (5)	16:58	15:14 (4)	17:54	22	17:15 (2)		20:48	21:27	
16	08:04		13:30 (5)	07:12		06:06		16:52 (2)		04:47	04:16	
	15:59	14	13:44 (5)	17:00		17:55	22	17:14 (2)		20:50	21:28	
17	08:03		13:32 (5)	07:10		06:04		16:53 (2)		04:45	04:16	
	16:00	10	13:42 (5)	17:02		17:57	21	17:14 (2)		20:52	21:28	
18	08:02		13:37 (5)	07:08	16:14 (3)	06:01		16:52 (2)		04:43	04:16	
	16:02	2	13:38 (5)	17:04	16:22 (3)	17:59	20	17:12 (2)		20:53	21:29	
19	08:01			07:06	16:10 (3)	05:59		16:54 (2)		04:42	04:16	
	16:04			17:06	16:25 (3)	18:01	18	17:12 (2)		20:55	21:29	
20	07:59			07:03	16:09 (3)	05:56		16:54 (2)		04:40	04:16	
	16:06			17:08	16:27 (3)	18:03	15	17:09 (2)		20:57	21:30	
21	07:58			07:01	16:08 (3)	05:54		16:57 (2)		04:39	04:16	
	16:08			17:10	16:28 (3)	18:05	11	17:08 (2)		20:58	21:30	
22	07:57		15:03 (4)	06:59	16:06 (3)	05:51		05:36		04:37	04:16	
	16:09	8	15:11 (4)	17:12	16:29 (3)	18:07		20:06		21:00	21:30	
23	07:55		15:01 (4)	06:57	16:05 (3)	05:49		05:33		04:36	04:16	
	16:11	14	15:15 (4)	17:14	16:30 (3)	18:09		20:08		21:01	21:30	
24	07:54		14:59 (4)	06:54	16:05 (3)	05:46		05:31		04:34	04:17	
	16:13	17	15:16 (4)	17:16	16:31 (3)	18:11		20:10		21:03	21:30	
25	07:53		14:58 (4)	06:52	16:04 (3)	05:44		05:29		04:33	04:17	
	16:15	20	15:18 (4)	17:18	16:30 (3)	18:13		20:11		21:04	21:30	
26	07:51		14:58 (4)	06:50	16:04 (3)	05:41		05:26		04:32	04:17	
	16:17	22	15:20 (4)	17:20	16:31 (3)	18:15		20:13		21:06	21:30	
27	07:50		14:57 (4)	06:47	16:04 (3)	05:39		05:24		04:30	04:18	
	16:19	24	15:21 (4)	17:22	16:30 (3)	18:17		20:15		21:07	21:30	
28	07:48		14:56 (4)	06:45	16:04 (3)	05:36		17:46 (1)		04:29	04:18	
	16:21	25	15:21 (4)	17:24	16:30 (3)	18:18	3	17:49 (1)		21:09	21:30	
29	07:46		14:55 (4)			06:34		18:42 (1)		04:28	04:19	
	16:23	27	15:22 (4)			19:20	11	18:53 (1)		21:10	21:30	
30	07:45		14:56 (4)			06:31		18:40 (1)		04:27	04:20	
	16:25	28	15:24 (4)			19:22	14	18:54 (1)		21:12	21:30	
31	07:43		14:55 (4)			06:29		18:39 (1)		04:26		
	16:27	29	15:24 (4)			19:24	16	18:55 (1)		21:13		
Potential sun hours	247			272		367		421		497	514	
Total, worst case	624			616		406		119				
Sun reduction	0,17			0,19		0,31		0,38				
Oper. time red.	0,18			0,18		0,18		0,18				
Wind dir. red.	0,87			0,63		0,29		0,01				
Total reduction	0,03			0,03		0,02		0,00				
Total, real	19			16		8		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)
	Minutes with flicker		

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

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

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	July	August	September	October	November	December							
1	04:20	05:01	05:57	06:52	17:32 (2)	06:51	14:27 (4)	07:48	13:05 (5)				
	21:29	20:53	19:45	18:30	21	17:53 (2)	16:18	26	14:53 (4)	15:32	24	13:29 (5)	
2	04:21	05:03	05:59	06:53	17:33 (2)	06:53	14:26 (4)	07:49	13:05 (5)				
	21:29	20:51	19:43	18:27	19	17:52 (2)	16:16	27	14:53 (4)	15:31	25	13:30 (5)	
3	04:22	05:05	06:01	06:55	17:34 (2)	06:55	14:26 (4)	07:51	13:05 (5)				
	21:28	20:49	19:40	18:25	17	17:51 (2)	16:14	29	14:55 (4)	15:31	26	13:31 (5)	
4	04:23	05:06	06:02	18:38 (1)	06:57	17:35 (2)	06:57	14:25 (4)	07:52	13:04 (5)			
	21:28	20:47	19:38	6 18:44 (1)	18:22	14	17:49 (2)	16:12	30	14:55 (4)	15:30	27	13:31 (5)
5	04:24	05:08	06:04	18:35 (1)	06:59	17:38 (2)	06:59	14:25 (4)	07:54	13:05 (5)			
	21:27	20:45	19:35	12 18:47 (1)	18:20	8 17:46 (2)	16:10	30	14:55 (4)	15:29	27	13:32 (5)	
6	04:25	05:10	06:06	18:34 (1)	07:01	07:01	14:25 (4)	07:55	13:04 (5)				
	21:27	20:43	19:33	14 18:48 (1)	18:18	16:08	14:55 (4)	15:29	29	13:33 (5)			
7	04:26	05:12	06:08	18:32 (1)	07:03	16:48 (3)	07:03	14:25 (4)	07:56	13:05 (5)			
	21:26	20:41	19:30	16 18:48 (1)	18:15	8 16:56 (3)	16:06	30	14:55 (4)	15:28	29	13:34 (5)	
8	04:27	05:14	06:10	18:31 (1)	07:05	16:44 (3)	07:05	14:26 (4)	07:58	13:05 (5)			
	21:25	20:39	19:28	17 18:48 (1)	18:13	15 16:59 (3)	16:04	30	14:56 (4)	15:28	29	13:34 (5)	
9	04:28	05:15	06:12	18:31 (1)	07:07	16:42 (3)	07:07	14:26 (4)	07:59	13:05 (5)			
	21:25	20:37	19:25	17 18:48 (1)	18:10	19 17:01 (3)	16:02	30	14:56 (4)	15:27	29	13:34 (5)	
10	04:29	05:17	06:13	18:31 (1)	07:08	16:41 (3)	07:09	14:26 (4)	08:00	13:06 (5)			
	21:24	20:35	19:23	17 18:48 (1)	18:08	21 17:02 (3)	16:01	29	14:55 (4)	15:27	29	13:35 (5)	
11	04:30	05:19	06:15	18:30 (1)	07:10	16:39 (3)	07:11	14:26 (4)	08:01	13:06 (5)			
	21:23	20:33	19:20	17 18:47 (1)	18:05	23 17:02 (3)	15:59	29	14:55 (4)	15:27	30	13:36 (5)	
12	04:31	05:21	06:17	18:30 (1)	07:12	16:38 (3)	07:13	14:27 (4)	08:02	13:06 (5)			
	21:22	20:31	19:18	16 18:46 (1)	18:03	25 17:03 (3)	15:57	27	14:54 (4)	15:27	30	13:36 (5)	
13	04:32	05:22	06:19	18:31 (1)	07:14	16:38 (3)	07:15	14:27 (4)	08:04	13:06 (5)			
	21:21	20:29	19:15	14 18:45 (1)	18:00	25 17:03 (3)	15:55	27	14:54 (4)	15:27	31	13:37 (5)	
14	04:34	05:24	06:21	18:32 (1)	07:16	16:37 (3)	07:17	14:28 (4)	08:05	13:06 (5)			
	21:20	20:27	19:13	11 18:43 (1)	17:58	26 17:03 (3)	15:54	25	14:53 (4)	15:27	31	13:37 (5)	
15	04:35	05:26	06:22	18:34 (1)	07:18	16:37 (3)	07:19	14:30 (4)	08:06	13:07 (5)			
	21:19	20:25	19:10	5 18:39 (1)	17:56	26 17:03 (3)	15:52	23	14:53 (4)	15:27	31	13:38 (5)	
16	04:36	05:28	06:24		07:20	16:36 (3)	07:21	14:31 (4)	08:06	13:07 (5)			
	21:17	20:22	19:08		17:53	27 17:03 (3)	15:51	22	14:53 (4)	15:27	31	13:38 (5)	
17	04:38	05:30	06:26		07:22	16:36 (3)	07:23	14:32 (4)	08:07	13:08 (5)			
	21:16	20:20	19:05		17:51	26 17:02 (3)	15:49	19	14:51 (4)	15:27	31	13:39 (5)	
18	04:39	05:32	06:28		07:24	16:37 (3)	07:25	14:33 (4)	08:08	13:09 (5)			
	21:15	20:18	19:03		17:49	25 17:02 (3)	15:47	17	14:50 (4)	15:27	31	13:40 (5)	
19	04:41	05:33	06:30		07:26	16:37 (3)	07:27	14:35 (4)	08:09	13:09 (5)			
	21:14	20:16	19:00		17:46	24 17:01 (3)	15:46	14	14:49 (4)	15:27	31	13:40 (5)	
20	04:42	05:35	06:31		07:28	16:38 (3)	07:28	14:38 (4)	08:10	13:09 (5)			
	21:12	20:13	18:58		17:44	22 17:00 (3)	15:45	8 14:46 (4)	15:28	31	13:40 (5)		
21	04:43	05:37	06:33		07:30	16:38 (3)	07:30		08:10	13:10 (5)			
	21:11	20:11	18:55		17:42	20 16:58 (3)	15:43		15:28	31	13:41 (5)		
22	04:45	05:39	06:35		17:42 (2)	07:32	16:40 (3)	14:40 (4)	08:11	13:10 (5)			
	21:09	20:09	18:52	9 17:51 (2)	17:40	17 16:57 (3)	15:42		15:28	31	13:41 (5)		
23	04:47	05:41	06:37		17:39 (2)	07:33	16:41 (3)	14:41 (4)	08:11	13:11 (5)			
	21:08	20:06	18:50	15 17:54 (2)	17:37	13 16:54 (3)	15:41		15:29	31	13:42 (5)		
24	04:48	05:42	06:39		17:37 (2)	07:35	16:45 (3)	14:42 (4)	08:12	13:11 (5)			
	21:06	20:04	18:47	17 17:54 (2)	17:35	5 16:50 (3)	15:39		15:30	31	13:42 (5)		
25	04:50	05:44	06:41		17:35 (2)	06:37	16:40 (3)	14:43 (4)	08:12	13:11 (5)			
	21:05	20:02	18:45	20 17:55 (2)	16:33		15:38	10 13:20 (5)	15:30	31	13:42 (5)		
26	04:51	05:46	06:42		17:34 (2)	06:39	16:41 (3)	14:44 (4)	08:13	13:12 (5)			
	21:03	19:59	18:42	21 17:55 (2)	16:31		15:37	14 13:22 (5)	15:31	31	13:43 (5)		
27	04:53	05:48	06:44		17:34 (2)	06:41	14:36 (4)	13:07 (5)	08:13	13:12 (5)			
	21:02	19:57	18:40	22 17:56 (2)	16:28	10 14:46 (4)	15:36	17 13:24 (5)	15:32	31	13:43 (5)		
28	04:55	05:50	06:46		17:33 (2)	06:43	14:33 (4)	13:06 (5)	08:13	13:14 (5)			
	21:00	19:55	18:37	23 17:56 (2)	16:26	15 14:48 (4)	15:35	20 13:26 (5)	15:32	30	13:44 (5)		
29	04:56	05:52	06:48		17:33 (2)	06:45	14:31 (4)	13:06 (5)	08:13	13:13 (5)			
	20:58	19:52	18:35	22 17:55 (2)	16:24	19 14:50 (4)	15:34	21 13:27 (5)	15:33	31	13:44 (5)		
30	04:58	05:53	06:50		17:33 (2)	06:47	14:29 (4)	13:05 (5)	08:13	13:14 (5)			
	20:57	19:50	18:32	22 17:55 (2)	16:22	22 14:51 (4)	15:33	22 13:27 (5)	15:34	30	13:44 (5)		
31	05:00	05:55			06:49		14:28 (4)		08:13	13:15 (5)			
	20:55	19:47			16:20	24 14:52 (4)			15:35	30	13:45 (5)		
Potential sun hours	516	462	383		327		257		230				
Total, worst case			333		536		606		920				
Sun reduction			0,38		0,26		0,17		0,14				
Oper. time red.			0,18		0,18		0,18		0,18				
Wind dir. red.			0,14		0,49		0,77		0,94				
Total reduction			0,01		0,03		0,03		0,03				
Total, real			4		15		17		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		

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar**Shadow receptor: J - Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (11)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	January		February		March		April		May		June	
1	08:13		10:38 (6)	07:41	12:45 (5)	06:43	15:26 (4)	06:26	17:51 (3)	05:16	19:23 (1)	04:25
	15:37	85	13:24 (5)	16:29	13:39 (5)	17:26	16:10 (4)	19:26	18:29 (3)	20:23	19:43 (1)	21:14
2	08:13		10:38 (6)	07:40	12:46 (5)	06:40	15:24 (4)	06:24	17:51 (3)	05:14	19:23 (1)	04:24
	15:38	85	13:24 (5)	16:31	13:39 (5)	17:28	16:11 (4)	19:28	18:29 (3)	20:25	19:43 (1)	21:15
3	08:12		10:39 (6)	07:38	12:46 (5)	06:38	15:24 (4)	06:21	17:51 (3)	05:11	19:23 (1)	04:23
	15:39	86	13:25 (5)	16:33	13:39 (5)	17:30	16:12 (4)	19:30	18:28 (3)	20:26	19:42 (1)	21:17
4	08:12		10:40 (6)	07:36	12:47 (5)	06:36	15:22 (4)	06:19	17:51 (3)	05:09	19:24 (1)	04:22
	15:40	86	13:27 (5)	16:35	13:38 (5)	17:32	16:11 (4)	19:32	18:28 (3)	20:28	19:42 (1)	21:18
5	08:12		10:40 (6)	07:34	12:48 (5)	06:33	15:22 (4)	06:16	17:50 (3)	05:07	19:24 (1)	04:21
	15:42	86	13:27 (5)	16:37	13:38 (5)	17:34	16:12 (4)	19:34	18:27 (3)	20:30	19:41 (1)	21:19
6	08:11		10:41 (6)	07:32	12:49 (5)	06:31	15:21 (4)	06:14	17:51 (3)	05:05	19:25 (1)	04:20
	15:43	86	13:27 (5)	16:39	13:37 (5)	17:36	16:12 (4)	19:35	18:27 (3)	20:32	19:40 (1)	21:20
7	08:11		10:42 (6)	07:30	12:50 (5)	06:28	15:21 (4)	06:11	17:51 (3)	05:03	19:26 (1)	04:20
	15:44	87	13:29 (5)	16:41	13:36 (5)	17:38	16:12 (4)	19:37	19:03 (2)	20:34	19:38 (1)	21:21
8	08:10		10:42 (6)	07:29	12:51 (5)	06:26	15:20 (4)	06:09	17:52 (3)	05:01	19:27 (1)	04:19
	15:46	87	13:29 (5)	16:43	13:36 (5)	17:40	16:12 (4)	19:39	19:06 (2)	20:36	19:36 (1)	21:22
9	08:10		10:43 (6)	07:27	12:53 (5)	06:23	15:21 (4)	06:06	17:53 (3)	04:59		04:18
	15:47	87	13:30 (5)	16:45	13:35 (5)	17:42	16:12 (4)	19:41	19:07 (2)	20:38		21:23
10	08:09		10:44 (6)	07:25	12:53 (5)	06:21	15:20 (4)	06:04	17:53 (3)	04:57		04:18
	15:49	86	13:31 (5)	16:48	13:33 (5)	17:44	16:11 (4)	19:43	19:08 (2)	20:39		21:24
11	08:08		10:45 (6)	07:23	12:55 (5)	06:19	15:20 (4)	06:02	17:55 (3)	04:56		04:17
	15:50	85	13:31 (5)	16:50	13:31 (5)	17:46	16:11 (4)	19:45	19:09 (2)	20:41		21:25
12	08:07		10:45 (6)	07:21	12:58 (5)	06:16	15:20 (4)	05:59	17:55 (3)	04:54		04:17
	15:52	86	13:32 (5)	16:52	13:29 (5)	17:48	16:10 (4)	19:47	19:09 (2)	20:43		21:25
13	08:07		10:46 (6)	07:18	13:01 (5)	06:14	15:21 (4)	05:57	17:58 (3)	04:52		04:17
	15:53	86	13:33 (5)	16:54	13:27 (5)	17:50	16:10 (4)	19:49	19:09 (2)	20:45		21:26
14	08:06		10:48 (6)	07:16	13:04 (5)	06:11	15:21 (4)	05:54	18:01 (3)	04:50		04:16
	15:55	84	13:33 (5)	16:56	13:24 (5)	17:52	16:09 (4)	19:51	19:10 (2)	20:46		21:27
15	08:05		10:49 (6)	07:14	13:10 (5)	06:09	15:22 (4)	05:52	18:41 (2)	04:48		04:16
	15:57	83	13:34 (5)	16:58	13:17 (5)	17:54	16:09 (4)	19:53	19:09 (2)	20:48		21:27
16	08:04		10:50 (6)	07:12		06:06	15:22 (4)	05:50	18:41 (2)	04:47		04:16
	15:59	82	13:35 (5)	17:00		17:56	16:07 (4)	19:54	19:09 (2)	20:50		21:28
17	08:03		10:51 (6)	07:10		06:04	15:23 (4)	05:47	18:42 (2)	04:45		04:16
	16:00	81	13:35 (5)	17:02		17:57	16:07 (4)	19:56	19:09 (2)	20:52		21:28
18	08:02		10:53 (6)	07:08		06:01	15:23 (4)	05:45	18:41 (2)	04:43		04:16
	16:02	78	13:36 (5)	17:04		17:59	16:05 (4)	19:58	19:08 (2)	20:53		21:29
19	08:01		10:55 (6)	07:06		05:59	15:25 (4)	05:43	18:41 (2)	04:42		04:16
	16:04	76	13:37 (5)	17:06		18:01	16:04 (4)	20:00	19:08 (2)	20:55		21:29
20	07:59		10:57 (6)	07:03		05:56	15:26 (4)	05:40	18:42 (2)	04:40		04:16
	16:06	72	13:37 (5)	17:08		18:03	16:02 (4)	20:02	19:07 (2)	20:57		21:30
21	07:58		11:01 (6)	07:01	15:42 (4)	05:54	15:28 (4)	05:38	18:43 (2)	04:39		04:16
	16:08	65	13:38 (5)	17:10	15:56 (4)	18:05	16:01 (4)	20:04	19:06 (2)	20:58		21:30
22	07:57		12:41 (5)	06:59	15:37 (4)	05:51	15:29 (4)	05:36	18:44 (2)	04:37		04:16
	16:09	57	13:38 (5)	17:12	15:59 (4)	18:07	17:19 (3)	20:06	19:05 (2)	21:00		21:30
23	07:55		12:42 (5)	06:57	15:35 (4)	05:49	15:32 (4)	05:33	18:44 (2)	04:36		04:16
	16:11	57	13:39 (5)	17:14	16:02 (4)	18:09	17:23 (3)	20:08	19:36 (1)	21:01		21:30
24	07:54		12:42 (5)	06:54	15:33 (4)	05:46	15:35 (4)	05:31	18:46 (2)	04:34		04:17
	16:13	56	13:38 (5)	17:16	16:05 (4)	18:11	17:24 (3)	20:10	19:39 (1)	21:03		21:30
25	07:53		12:42 (5)	06:52	15:30 (4)	05:44	16:59 (3)	05:29	18:49 (2)	04:33		04:17
	16:15	56	13:38 (5)	17:18	16:06 (4)	18:13	17:26 (3)	20:11	19:41 (1)	21:04		21:30
26	07:51		12:43 (5)	06:50	15:29 (4)	05:41	16:57 (3)	05:27	19:25 (1)	04:32		04:17
	16:17	56	13:39 (5)	17:20	16:07 (4)	18:15	17:27 (3)	20:13	19:42 (1)	21:06		21:30
27	07:50		12:43 (5)	06:47	15:27 (4)	05:39	16:56 (3)	05:24	19:24 (1)	04:30		04:18
	16:19	56	13:39 (5)	17:22	16:08 (4)	18:17	17:28 (3)	20:15	19:43 (1)	21:07		21:30
28	07:48		12:43 (5)	06:45	15:26 (4)	05:36	16:54 (3)	05:22	19:24 (1)	04:29		04:18
	16:21	56	13:39 (5)	17:24	16:09 (4)	18:18	17:28 (3)	20:17	19:43 (1)	21:09		21:30
29	07:46		12:43 (5)			06:34	17:54 (3)	05:20	19:23 (1)	04:28		04:19
	16:23	56	13:39 (5)			19:20	18:29 (3)	20:19	19:43 (1)	21:10		21:30
30	07:45		12:44 (5)			06:31	17:53 (3)	05:18	19:23 (1)	04:27		04:20
	16:25	56	13:40 (5)			19:22	18:29 (3)	20:21	19:43 (1)	21:12		21:30
31	07:43		12:45 (5)			06:29	17:52 (3)			04:26		
	16:27	54	13:39 (5)			19:24	18:29 (3)			21:13		
Potential sun hours	247		272		367		421		497		514	
Total, worst case	2299		855		1332		975		130			
Sun reduction	0,17		0,19		0,31		0,38		0,44			
Oper. time red.	0,18		0,18		0,18		0,18		0,18			
Wind dir. red.	0,97		0,84		0,46		0,13		0,27			
Total reduction	0,04		0,04		0,03		0,01		0,03			
Total, real	85		31		42		11		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)

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar**Shadow receptor: J - Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (11)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,34	1,85	3,61	5,29	7,09	8,59	7,69	7,57	4,82	2,77	1,47	1,06

Operational time

0 Sum

1 600 1 600

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

	July	August	September	October	November	December
1	04:20 21:29	05:01 20:53	05:57 19:45	17:54 (3) 19:08 (2)	06:52 18:30	15:59 (4) 16:18
2	04:21 21:29	05:03 20:51	05:59 19:43	17:52 (3) 19:07 (2)	06:53 18:27	15:59 (4) 16:16
3	04:22 21:28	05:05 20:49	06:01 19:40	17:50 (3) 19:05 (2)	06:55 18:25	15:58 (4) 16:14
4	04:23 21:28	05:07 20:47	19:40 (1) 19:44 (1)	06:02 19:38	17:49 (3) 19:03 (2)	06:57 18:22
5	04:24 21:27	05:08 20:45	19:37 (1) 19:36 (1)	06:04 19:35	17:48 (3) 19:00 (2)	06:59 18:20
6	04:25 21:27	05:10 20:43	19:36 (1) 19:34 (1)	06:06 19:33	17:47 (3) 18:23 (3)	07:01 18:18
7	04:26 21:26	05:12 20:41	19:34 (1) 19:49 (1)	06:08 19:30	17:46 (3) 18:22 (3)	07:03 18:15
8	04:27 21:25	05:14 20:39	19:33 (1) 19:50 (1)	06:10 19:28	17:45 (3) 18:22 (3)	07:05 18:13
9	04:28 21:24	05:15 20:37	19:33 (1) 19:51 (1)	06:12 19:25	17:45 (3) 18:22 (3)	07:07 18:10
10	04:29 21:24	05:17 20:35	19:32 (1) 19:51 (1)	06:13 19:23	17:45 (3) 18:22 (3)	07:08 18:08
11	04:30 21:23	05:19 20:33	19:31 (1) 19:51 (1)	06:15 19:20	17:44 (3) 18:21 (3)	07:10 18:05
12	04:31 21:22	05:21 20:31	19:31 (1) 19:52 (1)	06:17 19:18	17:44 (3) 18:20 (3)	07:12 18:03
13	04:32 21:21	05:23 20:29	19:31 (1) 19:51 (1)	06:19 19:15	17:44 (3) 18:20 (3)	07:14 18:01
14	04:34 21:20	05:24 20:27	19:31 (1) 19:51 (1)	06:21 19:13	17:44 (3) 18:19 (3)	07:16 17:58
15	04:35 21:19	05:26 20:25	19:31 (1) 19:51 (1)	06:22 19:10	17:44 (3) 18:18 (3)	07:18 17:56
16	04:36 21:17	05:28 20:22	19:31 (1) 19:49 (1)	06:24 19:08	17:44 (3) 18:17 (3)	07:20 17:53
17	04:38 21:16	05:30 20:20	19:32 (1) 19:48 (1)	06:26 19:05	17:45 (3) 18:15 (3)	07:22 17:51
18	04:39 21:15	05:32 20:18	18:55 (2) 19:47 (1)	06:28 19:03	17:46 (3) 18:14 (3)	07:24 17:49
19	04:41 21:14	05:33 20:16	18:51 (2) 19:45 (1)	06:30 19:00	16:23 (4) 18:11 (3)	07:26 17:46
20	04:42 21:12	05:35 20:13	18:50 (2) 19:41 (1)	06:31 18:58	16:19 (4) 18:09 (3)	07:28 17:44
21	04:44 21:11	05:37 20:11	18:48 (2) 19:10 (2)	06:33 18:55	16:16 (4) 18:06 (3)	07:30 17:42
22	04:45 21:09	05:39 20:09	18:47 (2) 19:11 (2)	06:35 18:53	16:13 (4) 16:45 (4)	07:32 17:40
23	04:47 21:08	05:41 20:06	18:46 (2) 19:11 (2)	06:37 18:50	16:11 (4) 16:46 (4)	07:33 17:37
24	04:48 21:06	05:42 20:04	18:45 (2) 19:11 (2)	06:39 18:47	16:09 (4) 16:48 (4)	07:35 17:35
25	04:50 21:05	05:44 20:02	18:45 (2) 19:12 (2)	06:41 18:45	16:06 (4) 16:48 (4)	07:37 16:33
26	04:51 21:03	05:46 19:59	18:44 (2) 19:12 (2)	06:42 18:42	16:05 (4) 16:48 (4)	07:39 16:31
27	04:53 21:02	05:48 19:57	18:43 (2) 19:11 (2)	06:44 18:40	16:04 (4) 16:49 (4)	07:41 16:28
28	04:55 21:00	05:50 19:55	18:43 (2) 19:11 (2)	06:46 18:37	16:03 (4) 16:49 (4)	07:43 16:26
29	04:56 20:58	05:52 19:52	18:02 (3) 19:11 (2)	06:48 18:35	16:02 (4) 16:50 (4)	07:44 16:24
30	04:58 20:57	05:53 19:50	17:58 (3) 19:09 (2)	06:50 18:32	16:01 (4) 16:50 (4)	07:46 16:22
31	05:00 20:55	05:55 19:47	17:55 (3) 19:09 (2)		06:49 16:20	12:25 (5) 13:01 (5)
Potential sun hours	516	462	383	327	257	230
Total, worst case		646	1199	1010	1833	2623
Sun reduction		0,51	0,38	0,26	0,17	0,14
Oper. time red.		0,18	0,18	0,18	0,18	0,18
Wind dir. red.		0,17	0,28	0,60	0,97	0,97
Total reduction		0,02	0,02	0,04	0,04	0,03
Total, real		12	29	36	69	82

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

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