

Project:

Debnica Kaszubska

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Biuro Projektow i Wdrozen Proekologicznych PROEKO Maciej Przewozniak

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Marcin Kulik / km.proeko@proeko.gda.pl

Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 1 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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
1	08:13 09:26-09:56/30 15:37 10:34-11:07/33	07:42 09:03-09:35/32 16:29 15:14-15:37/23	06:43 17:26	06:26 18:37-18:55/18 19:26	05:16 19:17-19:43/26 20:23	04:25 21:14
2	08:13 09:26-09:57/31 15:38 10:35-11:08/33	07:40 09:03-09:35/32 16:31 15:14-15:38/24	06:40 17:28	06:24 18:37-18:55/18 19:28	05:14 19:18-19:43/25 20:25	04:24 21:15
3	08:12 09:26-09:57/31 15:39 10:35-11:08/33	07:38 09:04-09:34/30 15:39-15:40/1 16:33 15:14-15:39/25	06:38 17:30	06:21 18:36-18:54/18 19:30	05:11 19:19-19:42/23 20:27	04:23 21:17
4	08:12 09:27-09:58/31 15:40 10:37-11:08/31	07:36 09:05-09:34/29 15:39-15:42/3 16:35 15:14-15:39/25	06:36 17:32	06:19 18:37-18:54/17 19:32	05:09 19:21-19:42/21 20:28	04:22 21:18
5	08:12 09:27-09:58/31 15:42 10:37-11:08/31	07:34 09:06-09:33/27 15:39-15:44/5 16:37 15:14-15:39/25	06:33 17:34	06:16 18:37-18:53/16 19:34	05:07 19:24-19:41/17 20:30	04:21 21:19
6	08:11 09:09-09:14/5 10:38-11:09/31 15:43 09:28-09:59/31	07:32 09:07-09:32/25 15:39-15:46/7 16:39 15:14-15:39/25	06:31 17:36	06:14 18:38-18:52/14 19:36	05:05 19:25-19:40/15 20:32	04:20 21:20
7	08:11 09:07-09:16/9 10:39-11:08/29 15:44 09:28-09:59/31	07:31 09:09-09:30/21 15:39-15:47/8 16:41 15:15-15:39/24	06:28 17:38	06:11 18:38-18:50/12 19:37	05:03 19:26-19:38/12 20:34	04:20 21:21
8	08:10 09:06-09:18/12 10:39-11:08/29 15:46 09:28-09:59/31	07:29 09:11-09:28/17 15:39-15:48/9 16:44 15:16-15:39/23	06:26 17:40	06:09 18:41-18:47/6 19:39	05:01 19:27-19:36/9 20:36	04:19 21:22
9	08:10 09:04-09:20/16 10:40-11:08/28 15:47 09:29-09:59/30	07:27 09:14-09:26/12 15:39-15:49/10 16:46 15:16-15:39/23	06:24 17:42	06:07 19:41	04:59 20:38	04:19 21:23
10	08:09 09:04-09:21/17 10:41-11:07/26 15:49 09:29-09:59/30	07:25 15:17-15:38/21 16:48 15:38-15:50/12	06:21 17:44	06:04 19:43	04:58 20:39	04:18 21:24
11	08:08 09:03-09:23/20 10:42-11:07/25 15:50 09:30-09:59/29	07:23 15:18-15:36/18 16:50 15:36-15:49/13	06:19 17:46	06:02 19:45	04:56 20:41	04:18 21:25
12	08:08 09:02-09:24/22 10:44-11:06/22 15:52 09:30-10:00/30	07:21 15:20-15:35/15 16:52 15:35-15:50/15	06:16 17:48	05:59 19:47	04:54 20:43	04:17 21:25
13	08:07 09:02-09:25/23 10:45-11:06/21 15:54 09:31-10:00/29	07:19 15:20-15:32/12 16:54 15:32-15:50/18	06:14 17:50	05:57 19:49	04:52 20:45	04:17 21:26
14	08:06 09:02-09:26/24 10:47-11:05/18 15:55 09:32-10:00/28	07:16 15:20-15:50/30 16:56	06:11 17:52	05:54 19:51	04:50 20:47	04:16 21:27
15	08:05 09:01-09:28/27 10:49-11:04/15 15:57 09:32-10:00/28	07:14 15:21-15:50/29 16:58	06:09 17:54	05:52 19:53	04:48 20:48	04:16 21:27
16	08:04 09:01-09:29/28 10:52-11:02/10 15:59 09:33-10:01/28	07:12 15:20-15:49/29 17:00	06:06 17:56	05:50 19:21-19:26/5 19:55	04:47 20:50	04:16 21:28
17	08:03 09:00-09:29/29 16:00 09:34-10:01/27	07:10 15:21-15:49/28 17:02	06:04 17:58	05:47 19:18-19:28/10 19:56	04:45 20:52	04:16 21:29
18	08:02 09:01-09:30/29 16:02 09:35-10:00/25	07:08 15:22-15:49/27 17:04	06:01 17:59	05:45 19:15-19:29/14 19:58	04:43 20:53	04:16 21:29
19	08:01 09:01-09:32/31 16:04 09:36-10:00/24	07:06 15:22-15:47/25 17:06	05:59 18:01	05:43 19:14-19:30/16 20:00	04:42 20:55	04:16 21:29
20	07:59 09:00-09:32/32 16:06 09:37-09:59/22	07:03 15:23-15:47/24 17:08	05:56 18:03	05:40 19:14-19:32/18 20:02	04:40 20:57	04:16 21:30
21	07:58 09:00-09:33/33 16:08 09:38-09:58/20	07:01 15:25-15:46/21 17:10	05:54 18:05	05:38 19:13-19:33/20 20:04 19:33-19:34/1	04:39 20:58	04:16 21:30
22	07:57 09:00-09:33/33 16:10 09:39-09:57/18	06:59 15:26-15:43/17 17:12	05:51 18:07	05:36 19:13-19:34/21 20:06 19:33-19:37/4	04:37 21:00	04:16 21:30
23	07:56 09:01-09:34/33 16:11 09:42-09:56/14	06:57 15:29-15:41/12 17:14	05:49 18:09	05:33 19:12-19:37/25 20:08 19:37-19:38/1	04:36 21:01	04:16 21:30
24	07:54 09:00-09:34/34 16:13 09:44-09:54/10	06:54 17:16	05:46 18:11	05:31 19:13-19:39/26 20:10	04:34 21:03	04:17 21:30
25	07:53 09:01-09:35/34 16:15	06:52 17:18	05:44 18:13	05:29 19:13-19:41/28 20:12	04:33 21:04	04:17 21:30
26	07:51 09:01-09:35/34 16:17 15:20-15:29/9	06:50 17:20	05:41 18:15	05:27 19:14-19:42/28 20:13	04:32 21:06	04:18 21:30
27	07:50 09:01-09:35/34 16:19 15:18-15:31/13	06:47 17:22	05:39 18:17	05:24 19:15-19:43/28 20:15	04:30 21:07	04:18 21:30
28	07:48 09:01-09:35/34 16:21 15:16-15:33/17	06:45 17:24	05:36 17:46-17:49/3 18:19	05:22 19:16-19:43/27 20:17	04:29 21:09	04:19 21:30
29	07:47 09:02-09:36/34 16:23 15:15-15:34/19		06:34 18:42-18:53/11 19:20	05:20 19:16-19:43/27 20:19	04:28 21:10	04:19 21:30
30	07:45 09:02-09:36/34 16:25 15:16-15:36/20		06:31 18:40-18:54/14 19:22	05:18 19:16-19:43/27 20:21	04:27 21:12	04:20 21:30
31	07:43 09:02-09:36/34 16:27 15:15-15:36/21		06:29 18:39-18:55/16 19:24		04:26 21:13	
Potential sun hours	247	272	367	421	497	514
Sum of minutes with flicker	1848	851	44	444	148	0

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

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

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Marcin Kulik / km.proeko@proeko.gda.pl

Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 1 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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

	July	August	September	October	November	December
1	04:20	05:01	05:57	06:52	06:51 14:46-15:07/21	07:48 08:45-09:05/20 10:24-10:49/25
	21:29	20:53	19:45	18:30	16:18 15:07-15:18/11	15:32 09:12-09:42/30
2	04:21	05:03	05:59	06:54	06:53 08:43-08:56/13 15:08-15:18/10	07:49 08:47-09:04/17 10:24-10:50/26
	21:29	20:51	19:43	18:28	16:16 14:46-15:08/22	15:32 09:12-09:42/30
3	04:22	05:05	06:01	06:55	06:55 08:40-08:58/18 15:09-15:18/9	07:51 08:48-09:04/16 10:24-10:52/28
	21:29	20:49	19:40	18:25	16:14 14:45-15:09/24	15:31 09:13-09:43/30
4	04:23	05:07 19:40-19:44/4	06:03 18:38-18:44/6	06:57	06:57 08:38-09:00/22 15:09-15:16/7	07:52 08:49-09:02/13 10:24-10:52/28
	21:28	20:47	19:38	18:23	16:12 14:44-15:09/25	15:30 09:13-09:43/30
5	04:24	05:08 19:37-19:47/10	06:04 18:35-18:47/12	06:59	06:59 08:37-09:02/25 15:09-15:16/6	07:54 08:52-09:02/10 10:24-10:53/29
	21:27	20:45	19:35	18:20	16:10 14:44-15:09/25	15:30 09:13-09:44/31
6	04:25	05:10 19:36-19:49/13	06:06 18:34-18:48/14	07:01	07:01 08:36-09:03/27 15:09-15:14/5	07:55 08:54-08:59/5 10:23-10:54/31
	21:27	20:44	19:33	18:18	16:08 14:44-15:09/25	15:29 09:13-09:44/31
7	04:26	05:12 19:34-19:49/15	06:08 18:32-18:48/16	07:03	07:03 08:36-09:04/28 15:09-15:12/3	07:56 09:14-09:45/31
	21:26	20:42	19:30	18:15	16:06 14:44-15:09/25	15:28 10:24-10:55/31
8	04:27	05:14 19:33-19:50/17	06:10 18:31-18:48/17	07:05	07:05 08:35-09:05/30	07:58 09:14-09:45/31
	21:25	20:39	19:28	18:13	16:04 14:45-15:10/25	15:28 10:24-10:55/31
9	04:28	05:15 19:30-19:51/21	06:12 18:31-18:48/17	07:07	07:07 08:34-09:06/32	07:59 09:15-09:46/31
	21:25	20:37	19:25	18:10	16:03 14:45-15:08/23	15:28 10:24-10:57/33
10	04:29	05:17 19:27-19:51/24	06:13 18:31-18:48/17	07:09	07:09 08:34-09:06/32	08:00 09:15-09:46/31
	21:24	20:35	19:23	18:08	16:01 14:45-15:08/23	15:27 10:24-10:57/33
11	04:30	05:19 19:26-19:51/25	06:15 18:30-18:47/17	07:10	07:11 08:33-09:06/33	08:01 09:16-09:46/30
	21:23	20:33	19:20	18:05	15:59 14:46-15:07/21	15:27 10:24-10:58/34
12	04:31	05:21 19:25-19:52/27	06:17 18:30-18:46/16	07:12	07:13 08:33-09:07/34	08:03 09:16-09:46/30
	21:22	20:31	19:18	18:03	15:57 14:46-15:07/21	15:27 10:24-10:58/34
13	04:32	05:23 19:24-19:51/27	06:19 18:31-18:45/14	07:14	07:15 08:34-09:08/34	08:04 09:16-09:46/30
	21:21	20:29	19:15	18:01	15:56 14:47-15:06/19	15:27 10:25-10:58/33
14	04:34	05:24 19:23-19:51/28	06:21 18:32-18:43/11	07:16	07:17 08:34-09:08/34	08:05 09:18-09:48/30
	21:20	20:27	19:13	17:58	15:54 14:49-15:06/17	15:27 10:26-11:00/34
15	04:35	05:26 19:23-19:51/28	06:22 18:34-18:39/5	07:18	07:19 08:34-09:08/34	08:06 09:18-09:48/30
	21:19	20:25	19:10	17:56	15:52 14:51-15:04/13	15:27 10:25-11:00/35
16	04:36	05:28 19:21-19:49/28	06:24	07:20	07:21 08:34-09:08/34	08:07 09:18-09:48/30
	21:18	20:22	19:08	17:53	15:51 14:53-15:02/9	15:27 10:26-11:00/34
17	04:38	05:30 19:20-19:48/28	06:26	07:22	07:23 08:34-09:08/34	08:07 09:19-09:48/29
	21:16	20:20	19:05	17:51	15:49	15:27 10:26-11:01/35
18	04:39	05:32 19:20-19:47/27	06:28	07:24 16:04-16:09/5	07:25 08:34-09:08/34	08:08 09:19-09:49/30
	21:15	20:18	19:03	17:49	15:48 09:18-09:28/10	15:27 10:27-11:02/35
19	04:41	05:33 19:18-19:45/27	06:30	07:26 15:59-16:13/14	07:27 08:35-09:08/33	08:09 09:20-09:50/30
	21:14	20:16	19:00	17:46	15:46 09:16-09:30/14	15:27 10:27-11:02/35
20	04:42	05:35 19:18-19:36/18 19:42-19:43/1	06:32	07:28 15:57-16:15/18	07:28 08:35-09:08/33	08:10 09:20-09:50/30
	21:12	20:13 19:23-19:42/19	18:58	17:44	15:45 09:14-09:32/18	15:28 10:27-11:02/35
21	04:44	05:37 19:18-19:38/20	06:33	07:30 15:55-16:16/21	07:30 08:36-09:08/32	08:10 09:21-09:50/29
	21:11	20:11 19:37-19:41/4	18:55	17:42	15:43 09:13-09:33/20	15:28 10:28-11:03/35
22	04:45	05:39 19:18-19:37/19	06:35	07:32 15:53-16:17/24	07:32 08:36-09:08/32	08:11 09:21-09:50/29
	21:10	20:09 19:37-19:38/1	18:53	17:40	15:42 09:13-09:35/22	15:28 10:28-11:03/35
23	04:47	05:41 19:18-19:35/17	06:37	07:34 15:52-16:18/26	07:34 08:37-09:08/31	08:11 09:22-09:51/29
	21:08	20:07	18:50	17:37	15:41 09:12-09:36/24	15:29 10:29-11:04/35
24	04:48	05:43 19:18-19:34/16	06:39	07:36 15:51-16:18/27	07:36 08:38-09:07/29	08:12 09:22-09:52/30
	21:07	20:04	18:48	17:35	15:40 09:12-09:37/25	15:30 10:29-11:04/35
25	04:50	05:44 19:19-19:33/14	06:41	06:37 14:50-15:19/29	07:38 08:38-09:07/29	08:12 09:22-09:52/30
	21:05	20:02	18:45	16:33	15:38 09:12-09:38/26	15:30 10:30-11:05/35
26	04:51	05:46 19:21-19:31/10	06:43	06:39 14:51-15:20/29	07:39 08:39-09:07/28 10:30-10:39/9	08:12 09:23-09:53/30
	21:03	19:59	18:43	16:31	15:37 09:12-09:39/27	15:31 10:31-11:06/35
27	04:53	05:48 19:23-19:27/4	06:44	06:41 14:50-15:20/30	07:41 08:40-09:07/27 10:28-10:43/15	08:13 09:24-09:54/30
	21:02	19:57	18:40	16:29	15:36 09:12-09:39/27	15:32 10:31-11:06/35
28	04:55	05:50	06:46	06:43 14:50-15:20/30	07:43 08:42-09:07/25 10:27-10:45/18	08:13 09:24-09:54/30
	21:00	19:55	18:37	16:26	15:35 09:12-09:40/28	15:33 10:32-11:06/34
29	04:56	05:52	06:48	06:45 14:50-15:02/12	07:44 08:43-09:06/23 10:26-10:47/21	08:13 09:25-09:55/30
	20:58	19:52	18:35	16:24 15:02-15:20/18	15:34 09:12-09:41/29	15:33 10:33-11:07/34
30	04:58	05:53	06:50	06:47 14:49-15:05/16	07:46 08:44-09:06/22 10:26-10:48/22	08:13 09:25-09:55/30
	20:57	19:50	18:32	16:22 15:05-15:19/14	15:33 09:12-09:42/30	15:34 10:33-11:07/34
31	05:00	05:55		06:49 14:47-15:06/19		08:13 09:25-09:55/30
	20:55	19:47		16:20 15:06-15:19/13		15:35 10:33-11:07/34
Potential sun hours	516	462	383	327	257	230
Sum of minutes with flicker	0	491	162	345	1616	2033

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

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

Project:

Debnica Kaszubska

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+48 58 558 40 10

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Calculated:

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SHADOW - Calendar per WTG**WTG: 2 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (2)****Assumptions for shadow calculations**

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

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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
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2	08:13 08:48-08:56/8 13:23-13:59/36 15:38 09:04-09:25/21	07:40 06:40 16:31 17:28	06:24 18:40-18:58/18 19:28 20:25	05:14 04:24 20:25 21:15		
3	08:12 08:47-08:56/9 13:23-13:58/35 15:39 09:04-09:25/21	07:38 06:38 16:33 17:30	06:21 18:38-18:58/20 19:30 20:27	05:11 04:23 20:27 21:17		
4	08:12 08:47-08:58/11 13:24-13:58/34 15:40 09:05-09:26/21	07:36 06:36 16:35 17:32	06:19 18:37-18:59/22 19:32 20:28	05:09 04:22 20:28 21:18		
5	08:12 08:46-08:59/13 13:24-13:58/34 15:42 09:05-09:26/21	07:34 06:33 16:37 17:34	06:16 18:36-18:59/23 19:34 20:30	05:07 04:21 20:30 21:19		
6	08:11 08:46-09:01/15 13:24-13:57/33 15:43 09:06-09:26/20	07:32 06:31 16:39 17:36	06:14 18:36-19:00/24 19:36 19:00-19:03/3	05:05 04:20 20:32 21:20		
7	08:11 08:45-09:01/16 13:26-13:57/31 15:44 09:07-09:26/19	07:31 06:28 16:41 17:38	06:11 18:34-19:04/30 19:37 20:34	05:03 04:20 20:34 21:21		
8	08:10 08:45-09:02/17 13:26-13:56/30 15:46 09:07-09:26/19	07:29 06:26 16:43 17:40	17:03-17:07/4 19:39 20:36	05:01 04:19 20:36 21:22		
9	08:10 08:45-09:03/18 13:27-13:53/26 15:47 09:08-09:26/18	07:27 06:23 16:46 17:42	16:59-17:11/12 19:41 20:38	04:59 04:19 20:38 21:23		
10	08:09 08:45-09:03/18 13:28-13:51/23 15:49 09:08-09:26/18	07:25 06:21 16:48 17:44	16:57-17:12/15 19:43 20:39	04:58 04:18 20:39 21:24		
11	08:08 08:44-09:04/20 13:29-13:51/22 15:50 09:09-09:26/17	07:23 06:19 16:50 17:46	16:55-17:14/19 19:45 20:41	04:56 04:18 20:41 21:25		
12	08:08 08:45-09:05/20 13:30-13:51/21 15:52 09:10-09:26/16	07:21 06:16 16:52 17:48	16:54-17:14/20 19:47 20:43	04:54 04:17 20:43 21:25		
13	08:07 08:45-09:06/21 13:31-13:50/19 15:54 09:11-09:26/15	07:19 06:14 16:54 17:50	16:53-17:15/22 19:49 20:45	04:52 04:17 20:45 21:26		
14	08:06 08:45-09:06/21 13:33-13:50/17 15:55 09:13-09:25/12	07:16 06:11 16:56 17:52	16:52-17:14/22 19:51 20:46	04:50 04:16 20:46 21:27		
15	08:05 08:45-09:07/22 13:35-13:49/14 15:57 09:14-09:24/10	07:14 06:09 16:58 17:54	16:53-17:15/22 19:53 20:48	04:48 04:16 20:48 21:27		
16	08:04 08:46-09:08/22 13:38-13:48/10 15:59 09:17-09:23/6	07:12 06:06 17:00 17:56	16:52-17:14/22 19:55 20:50	04:47 04:16 20:50 21:28		
17	08:03 08:45-09:08/23 16:00 13:42-13:43/1	07:10 06:04 17:02 17:58	16:53-17:14/21 19:56 20:52	04:45 04:16 20:52 21:29		
18	08:02 08:46-09:08/22 16:02	07:08 06:01 17:04 17:59	16:52-17:12/20 19:58 20:53	04:43 04:16 20:53 21:29		
19	08:01 08:46-09:09/23 16:04	07:06 05:59 17:06 18:01	16:54-17:12/18 20:00 20:55	04:42 04:16 20:55 21:29		
20	07:59 08:46-09:09/23 16:06	07:03 05:56 17:08 18:03	16:54-17:09/15 20:02 20:57	04:40 04:16 20:57 21:30		
21	07:58 08:47-09:09/22 16:08	07:01 05:54 17:10 18:05	16:57-17:08/11 20:04 20:58	04:39 04:16 20:58 21:30		
22	07:57 08:47-09:09/22 16:10	06:59 05:51 17:12 18:07	05:36 18:44-19:05/21 20:06 21:00	04:37 04:16 21:00 21:30		
23	07:55 08:49-09:09/20 16:11	06:57 05:49 17:14 18:09	05:33 18:44-19:03/19 20:08 21:01	04:36 04:16 21:01 21:30		
24	07:54 08:49-09:09/20 16:13	06:54 05:46 17:16 18:11	05:31 18:46-19:01/15 20:10 21:03	04:34 04:17 21:03 21:30		
25	07:53 08:50-09:09/19 16:15	06:52 05:44 17:18 18:13	05:29 18:49-18:59/10 20:12 21:04	04:33 04:17 21:04 21:30		
26	07:51 08:51-09:08/17 16:17	06:50 05:41 17:20 18:15	05:27 20:13 20:13 21:06	04:32 04:18 21:06 21:30		
27	07:50 08:52-09:07/15 16:19	06:47 05:39 17:22 18:17	05:24 20:15 20:15 21:07	04:30 04:18 21:07 21:30		
28	07:48 08:54-09:05/11 16:21	06:45 05:36 17:24 18:18	05:22 20:17 20:17 21:09	04:29 04:19 21:09 21:30		
29	07:46 08:57-09:04/7 16:23	06:43 05:34 19:20 19:20	05:20 20:19 20:19 21:10	04:28 04:19 21:10 21:30		
30	07:45 16:25	06:41 05:31 19:22 19:22	05:18 20:21 20:21 21:12	04:27 04:20 21:12 21:30		
31	07:43 16:27	06:39 05:29 19:24 19:24	18:46-18:54/8 21:13 21:13	04:26 21:13 21:13 21:13		
Potential sun hours	247	272	367	421	497	514
Sum of minutes with flicker	1203	0	251	691	0	0

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

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

Project:

Debnica Kaszubska

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Marcin Kulik / km.proeko@proeko.gda.pl

Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 2 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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

	July	August	September	October	November	December
1	04:20 21:29	05:01 20:53	05:57 18:31-19:08/37 19:45	06:52 17:32-17:53/21 18:30	06:51 16:18	07:48 08:27-08:46/19 13:11-13:33/22 15:32 08:51-09:08/17
2	04:21 21:29	05:03 20:51	05:59 18:31-19:07/36 19:43	06:54 17:33-17:52/19 18:27	06:53 16:16	07:49 08:28-08:47/19 13:11-13:34/23 15:32 08:51-09:09/18
3	04:22 21:28	05:05 20:49	06:01 18:30-19:05/35 19:40	06:55 17:34-17:51/17 18:25	06:55 16:14	07:51 08:29-08:47/18 13:11-13:36/25 15:31 08:52-09:10/18
4	04:23 21:28	05:07 20:47	06:03 18:31-19:03/32 19:38	06:57 17:35-17:49/14 18:23	06:57 16:12	07:52 08:29-08:46/17 13:11-13:40/29 15:30 08:51-09:10/19
5	04:24 21:27	05:08 20:45	06:04 18:31-19:01/30 19:35	06:59 17:38-17:46/8 18:20	06:59 16:10	07:54 08:30-08:46/16 13:11-13:42/31 15:29 08:52-09:11/19
6	04:25 21:27	05:10 20:43	06:06 18:32-18:56/24 19:33	07:01 18:18	07:01 16:08	07:55 08:31-08:46/15 13:11-13:43/32 15:29 08:52-09:12/20
7	04:26 21:26	05:12 20:41	06:08 18:31-18:54/23 19:30	07:03 18:15	07:03 16:06	07:56 08:33-08:46/13 13:11-13:45/34 15:28 08:52-09:13/21
8	04:27 21:25	05:14 20:39	06:10 18:31-18:53/22 19:28	07:05 18:13	07:05 16:04	07:58 08:34-08:45/11 13:11-13:45/34 15:28 08:52-09:13/21
9	04:28 21:25	05:15 20:37	06:12 18:32-18:52/20 19:25	07:07 18:10	07:07 16:02	07:59 08:36-08:46/10 13:12-13:47/35 15:28 08:53-09:14/21
10	04:29 21:24	05:17 20:35	06:13 18:33-18:51/18 19:23	07:09 18:08	07:09 16:01	08:00 08:37-08:45/8 13:12-13:48/36 15:27 08:53-09:14/21
11	04:30 21:23	05:19 20:33	06:15 18:34-18:48/14 19:20	07:10 18:05	07:11 15:59	08:01 08:38-08:44/6 09:42-09:47/5 15:27 08:53-09:14/21 13:12-13:48/36
12	04:31 21:22	05:21 20:31	06:17 18:36-18:45/9 19:18	07:12 18:03	07:13 15:57	08:03 08:39-08:43/4 09:41-09:49/8 15:27 08:54-09:15/21 13:12-13:49/37
13	04:32 21:21	05:23 20:29	06:19 19:15	07:14 18:01	07:15 08:29-08:36/7 15:55	08:04 08:54-09:15/21 13:12-13:49/37 15:27 09:40-09:50/10
14	04:34 21:20	05:24 20:27	06:21 19:13	07:16 17:58	07:17 08:27-08:38/11 15:54	08:05 08:55-09:16/21 13:12-13:50/38 15:27 09:41-09:52/11
15	04:35 21:19	05:26 20:25	06:22 19:10	07:18 17:56	07:19 08:25-08:40/15 15:52	08:06 08:56-09:17/21 13:13-13:51/38 15:27 09:40-09:52/12
16	04:36 21:17	05:28 20:22	06:24 19:08	07:20 17:53	07:21 08:24-08:41/17 15:51	08:07 08:55-09:16/21 13:13-13:51/38 15:27 09:40-09:53/13
17	04:38 21:16	05:30 20:20	06:26 19:05	07:22 17:51	07:23 08:23-08:42/19 15:49	08:07 08:56-09:17/21 13:14-13:52/38 15:27 09:41-09:54/13
18	04:39 21:15	05:32 18:55-19:06/11 20:18	06:28 19:03	07:24 17:49	07:25 08:23-08:43/20 15:48	08:08 08:57-09:18/21 13:15-13:53/38 15:27 09:41-09:55/14
19	04:41 21:14	05:33 18:51-19:07/16 20:16	06:30 19:00	07:26 17:46	07:27 08:23-08:43/20 15:46	08:09 08:57-09:18/21 13:15-13:54/39 15:27 09:42-09:56/14
20	04:42 21:12	05:35 18:50-19:09/19 20:13	06:32 18:58	07:28 17:44	07:28 08:22-08:44/22 15:45	08:10 08:57-09:18/21 13:15-13:54/39 15:28 09:41-09:56/15
21	04:44 21:11	05:37 18:48-19:10/22 20:11	06:33 18:55	07:30 17:42	07:30 08:22-08:44/22 15:43	08:10 08:58-09:19/21 13:16-13:54/38 15:28 09:42-09:57/15
22	04:45 21:10	05:39 18:47-19:11/24 20:09	06:35 17:42-17:51/9 18:53	07:32 17:40	07:32 08:22-08:45/23 15:42	08:11 08:58-09:19/21 13:16-13:54/38 15:28 09:42-09:57/15
23	04:47 21:08	05:41 18:44-19:11/27 20:07	06:37 17:39-17:54/15 18:50	07:34 17:37	07:34 08:23-08:45/22 15:41	08:11 08:59-09:20/21 13:17-13:56/39 15:29 09:43-09:58/15
24	04:48 21:07	05:43 18:41-19:11/30 20:04	06:39 17:37-17:54/17 18:48	07:36 17:35	07:36 08:23-08:46/23 15:40	08:12 08:59-09:20/21 13:17-13:56/39 15:30 09:44-09:58/14
25	04:50 21:05	05:44 18:39-19:12/33 20:02	06:41 17:35-17:55/20 18:45	07:37 16:33	07:38 08:23-08:46/23 15:38	08:12 08:59-09:21/22 13:17-13:56/39 15:30 09:44-09:58/14
26	04:51 21:03	05:46 18:37-19:12/35 19:59	06:42 17:34-17:55/21 18:42	07:39 16:31	07:39 08:24-08:46/22 13:16-13:26/10 15:37 08:55-09:01/6	08:12 09:01-09:22/21 13:18-13:56/38 15:31 09:45-09:59/14
27	04:53 21:02	05:48 18:35-19:11/36 19:57	06:44 17:34-17:56/22 18:40	07:41 16:29	07:41 08:24-08:46/22 13:14-13:28/14 15:36 08:53-09:03/10	08:13 09:01-09:22/21 13:19-13:57/38 15:32 09:46-09:59/13
28	04:55 21:00	05:50 18:34-19:11/37 19:55	06:46 17:33-17:56/23 18:37	07:43 16:26	07:43 08:25-08:47/22 13:13-13:30/17 15:35 08:53-09:05/12	08:13 09:02-09:23/21 13:20-13:58/38 15:33 09:47-09:59/12
29	04:56 20:58	05:52 18:33-19:11/38 19:52	06:48 17:33-17:55/22 18:35	07:44 16:24	07:44 08:26-08:47/21 13:13-13:31/18 15:34 08:52-09:07/15	08:13 09:02-09:23/21 13:20-13:58/38 15:33 09:48-09:59/11
30	04:58 20:57	05:53 18:32-19:09/37 19:50	06:50 17:33-17:55/22 18:32	07:46 16:22	07:46 08:27-08:47/20 13:12-13:33/21 15:33 08:52-09:08/16	08:13 09:03-09:24/21 13:20-13:57/37 15:34 09:49-09:59/10
31	05:00 20:55	05:55 18:31-19:09/38 19:47		06:49 16:20		08:13 08:48-08:51/3 09:49-09:58/9 15:35 09:02-09:23/21 13:21-13:58/37
Potential sun hours	516	462	383	327	257	230
Sum of minutes with flicker	0	403	474	79	490	2151

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

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

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 3 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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
1	08:13 08:51-09:08/17 15:37 09:23-09:35/12	07:41 16:29	06:43 16:05-16:30/25 17:26	06:26 17:39-18:29/50 19:26	05:16 20:23	04:25 21:14
2	08:13 08:52-09:09/17 15:38 09:24-09:35/11	07:40 16:31	06:40 16:05-16:28/23 17:28	06:24 17:41-18:29/48 19:28	05:14 20:25	04:24 21:15
3	08:12 08:51-09:08/17 15:39 09:25-09:34/9	07:38 16:33	06:38 16:06-16:28/22 17:30	06:21 17:41-18:28/47 19:30	05:11 20:27	04:23 21:17
4	08:12 08:52-09:09/17 15:40 09:27-09:34/7	07:36 16:35	06:36 16:06-16:26/20 17:32	06:19 17:43-18:28/45 19:32	05:09 20:28	04:22 21:18
5	08:12 08:52-09:09/17 15:42 09:28-09:33/5	07:34 16:37	06:33 16:08-16:25/17 17:34	06:16 17:44-18:27/43 19:34	05:07 20:30	04:21 21:19
6	08:11 08:53-09:10/17 15:43	07:32 16:39	06:31 16:10-16:22/12 17:36	06:14 17:46-18:27/41 19:36	05:05 20:32	04:20 21:20
7	08:11 08:54-09:11/17 15:44	07:30 16:41	06:28 17:38	06:11 17:49-18:25/36 19:37	05:03 20:34	04:20 21:21
8	08:10 08:44-08:46/2 15:46 08:54-09:11/17	07:29 16:43	06:26 17:40	06:09 17:52-18:25/33 19:39	05:01 20:36	04:19 21:22
9	08:10 08:43-08:48/5 15:47 08:54-09:11/17	07:27 16:46	06:23 17:42	06:07 17:53-18:24/31 19:41	04:59 20:38	04:19 21:23
10	08:09 08:42-08:49/7 15:49 08:55-09:11/16	07:25 16:48	06:21 17:44	06:04 17:53-18:22/29 19:43	04:58 20:39	04:18 21:24
11	08:08 08:41-08:50/9 15:50 08:55-09:11/16	07:23 16:50	06:19 17:46	06:02 17:55-18:21/26 19:45	04:56 20:41	04:18 21:25
12	08:08 08:40-08:51/11 15:52 08:56-09:11/15	07:21 16:52	06:16 17:48	05:59 17:55-18:18/23 19:47	04:54 20:43	04:17 21:25
13	08:07 08:39-08:52/13 15:54 08:57-09:11/14	07:18 16:54	06:14 17:50	05:57 17:58-18:16/18 19:49	04:52 20:45	04:17 21:26
14	08:06 08:38-08:53/15 15:55 08:58-09:11/13	07:16 16:56	06:11 17:52	05:54 18:01-18:13/12 19:51	04:50 20:46	04:16 21:27
15	08:05 08:37-08:54/17 15:57 08:59-09:10/11	07:14 16:58	06:09 17:54	05:52 17:00-17:03/3 19:53	04:48 20:48	04:16 21:27
16	08:04 08:37-08:55/18 15:59 09:01-09:10/9	07:12 17:00	06:06 16:53-17:14/21 17:56	05:50 19:54	04:47 20:50	04:16 21:28
17	08:03 08:37-08:55/18 16:00 09:04-09:09/5	07:10 17:02	06:04 16:50-17:18/28 17:57	05:47 19:56	04:45 20:52	04:16 21:28
18	08:02 08:37-08:55/18 16:02	07:08 16:14-16:22/8 17:04	06:01 16:47-17:19/32 17:59	05:45 19:58	04:43 20:53	04:16 21:29
19	08:01 08:38-08:56/18 16:04	07:06 16:10-16:25/15 17:06	05:59 16:46-17:21/35 18:01	05:43 20:00	04:42 20:55	04:16 21:29
20	07:59 08:38-08:56/18 16:06	07:03 16:09-16:27/18 17:08	05:56 16:44-17:21/37 18:03	05:40 20:02	04:40 20:57	04:16 21:30
21	07:58 08:39-08:57/18 16:08	07:01 16:08-16:28/20 17:10	05:54 16:43-17:22/39 18:05	05:38 20:04	04:39 20:58	04:16 21:30
22	07:57 08:39-08:56/17 16:10	06:59 16:06-16:29/23 17:12	05:51 16:42-17:21/39 18:07	05:36 20:06	04:37 21:00	04:16 21:30
23	07:55 08:40-08:57/17 16:11	06:57 16:05-16:30/25 17:14	05:49 16:41-17:24/43 18:09	05:33 20:08	04:36 21:01	04:16 21:30
24	07:54 08:40-08:56/16 16:13	06:54 16:05-16:31/26 17:16	05:46 16:40-17:25/45 18:11	05:31 20:10	04:34 21:03	04:17 21:30
25	07:53 08:42-08:56/14 16:15	06:52 16:04-16:30/26 17:18	05:44 16:40-17:27/47 18:13	05:29 20:12	04:33 21:04	04:17 21:30
26	07:51 08:43-08:55/12 16:17	06:50 16:04-16:31/27 17:20	05:41 16:39-17:28/49 18:15	05:27 20:13	04:32 21:06	04:18 21:30
27	07:50 08:44-08:54/10 16:19	06:47 16:04-16:30/26 17:22	05:39 16:39-17:29/50 18:17	05:24 20:15	04:30 21:07	04:18 21:30
28	07:48 08:47-08:51/4 16:21	06:45 16:04-16:30/26 17:24	05:36 16:39-17:29/50 18:18	05:22 20:17	04:29 21:09	04:19 21:30
29	07:46 16:23		06:34 17:39-18:30/51 19:20	05:20 20:19	04:28 21:10	04:19 21:30
30	07:45 16:25		06:31 17:39-18:29/50 19:22	05:18 20:21	04:27 21:12	04:20 21:30
31	07:43 16:27		06:29 17:40-18:29/49 19:24		04:26 21:13	
Potential sun hours	247	272	367	421	497	514
Sum of minutes with flicker	573	240	791	482	0	0

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

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

Project:

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+48 58 558 40 10

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 3 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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

	July	August	September	October	November	December
1	04:20 21:29	05:01 20:53	05:57 17:54-18:20/26 19:45	06:52 18:30	06:51 16:18	07:48 08:23-08:32/9 15:32 08:37-08:53/16
2	04:21 21:29	05:03 20:51	05:59 17:52-18:21/29 19:43	06:54 18:27	06:53 16:16	07:49 08:25-08:32/7 15:32 08:38-08:54/16
3	04:22 21:28	05:05 20:49	06:01 17:50-18:21/31 19:40	06:55 18:25	06:55 16:14	07:51 08:27-08:32/5 15:31 08:38-08:55/17
4	04:23 21:28	05:07 20:47	06:03 17:49-18:22/33 19:38	06:57 18:23	06:57 16:12	07:52 08:28-08:30/2 15:30 08:38-08:55/17
5	04:24 21:27	05:08 20:45	06:04 17:46-18:22/36 19:35	06:59 18:20	06:59 16:10	07:54 08:39-08:56/17 15:29
6	04:25 21:27	05:10 20:43	06:06 17:42-18:23/41 19:33	07:01 18:18	07:01 16:08	07:55 08:38-08:56/18 15:29
7	04:26 21:26	05:12 20:41	06:08 17:39-18:22/43 19:30	07:03 16:48-16:56/8 18:15	07:03 16:06	07:56 08:39-08:57/18 15:28 09:15-09:20/5
8	04:27 21:25	05:14 20:39	06:10 17:37-18:22/45 19:28	07:05 16:44-16:59/15 18:13	07:05 16:04	07:58 08:39-08:57/18 15:28 09:14-09:21/7
9	04:28 21:25	05:15 20:37	06:12 17:35-18:22/47 19:25	07:07 16:42-17:01/19 18:10	07:07 16:02	07:59 08:40-08:58/18 15:28 09:14-09:23/9
10	04:29 21:24	05:17 20:35	06:13 17:34-18:22/48 19:23	07:09 16:41-17:02/21 18:08	07:09 16:01	08:00 08:41-08:58/17 15:27 09:13-09:24/11
11	04:30 21:23	05:19 20:33	06:15 17:32-18:21/49 19:20	07:10 16:39-17:02/23 18:05	07:11 15:59	08:01 08:41-08:58/17 15:27 09:13-09:25/12
12	04:31 21:22	05:21 20:31	06:17 17:31-18:21/50 19:18	07:12 16:38-17:03/25 18:03	07:13 15:57	08:03 08:41-08:58/17 15:27 09:13-09:26/13
13	04:32 21:21	05:23 20:29	06:19 17:30-18:20/50 19:15	07:14 16:38-17:03/25 18:01	07:15 15:55	08:04 08:42-08:58/16 15:27 09:13-09:26/13
14	04:34 21:20	05:24 20:27	06:21 17:30-18:20/50 19:13	07:16 16:37-17:03/26 17:58	07:17 08:20-08:24/4 15:54	08:05 08:43-09:00/17 15:27 09:14-09:28/14
15	04:35 21:19	05:26 20:25	06:22 17:28-18:18/50 19:10	07:18 16:37-17:03/26 17:56	07:19 08:17-08:27/10 15:52	08:06 08:44-09:00/16 15:27 09:13-09:28/15
16	04:36 21:17	05:28 20:22	06:24 17:28-18:18/50 19:08	07:20 16:36-17:03/27 17:53	07:21 08:16-08:28/12 15:51	08:06 08:43-08:59/16 15:27 09:14-09:28/14
17	04:38 21:16	05:30 20:20	06:26 17:28-18:16/48 19:05	07:22 16:36-17:02/26 17:51	07:23 08:15-08:29/14 15:49	08:07 08:44-09:00/16 15:27 09:14-09:29/15
18	04:39 21:15	05:32 20:18	06:28 17:28-18:15/47 19:03	07:24 16:37-17:02/25 17:49	07:25 08:14-08:30/16 15:48	08:08 08:45-09:01/16 15:27 09:15-09:30/15
19	04:41 21:14	05:33 20:16	06:30 17:27-18:12/45 19:00	07:26 16:37-17:01/24 17:46	07:27 08:14-08:31/17 15:46	08:09 08:46-09:01/15 15:27 09:15-09:31/16
20	04:42 21:12	05:35 20:13	06:32 17:27-18:10/43 18:58	07:28 16:38-17:00/22 17:44	07:28 08:14-08:31/17 15:45	08:10 08:46-09:01/15 15:28 09:15-09:31/16
21	04:44 21:11	05:37 20:11	06:33 17:27-18:08/41 18:55	07:30 16:38-16:58/20 17:42	07:30 08:14-08:32/18 15:43	08:10 08:47-09:02/15 15:28 09:16-09:32/16
22	04:45 21:10	05:39 20:09	06:35 17:28-18:07/39 18:53	07:32 16:40-16:57/17 17:40	07:32 08:14-08:32/18 15:42	08:11 08:47-09:02/15 15:28 09:16-09:32/16
23	04:47 21:08	05:41 20:06	06:37 17:28-18:06/38 18:50	07:34 16:41-16:54/13 17:37	07:34 08:14-08:32/18 15:41	08:11 08:48-09:03/15 15:29 09:17-09:33/16
24	04:48 21:07	05:43 20:04	06:39 17:29-18:05/36 18:48	07:35 16:45-16:50/5 17:35	07:36 08:14-08:32/18 15:40	08:12 08:48-09:03/15 15:30 09:17-09:33/16
25	04:50 21:05	05:44 20:02	06:41 17:30-18:02/32 18:45	06:37 16:33	07:38 08:15-08:33/18 15:38	08:12 08:48-09:03/15 15:30 09:17-09:33/16
26	04:51 21:03	05:46 19:59	06:42 17:31-18:00/29 18:42	06:39 16:31	07:39 08:16-08:33/17 15:37	08:12 08:49-09:05/16 15:31 09:19-09:34/15
27	04:53 21:02	05:48 19:57	06:44 17:33-17:57/24 18:40	06:41 16:29	07:41 08:16-08:33/17 15:36	08:13 08:49-09:05/16 15:32 09:19-09:34/15
28	04:55 21:00	05:50 19:55	06:46 17:37-17:47/10 18:37	06:43 16:26	07:43 08:18-08:33/15 15:35	08:13 08:49-09:06/17 15:33 09:20-09:35/15
29	04:56 20:58	05:52 18:02-18:14/12 19:52	06:48 18:35	06:45 16:24	07:44 08:20-08:33/13 15:34	08:13 08:50-09:06/16 15:33 09:21-09:35/14
30	04:58 20:57	05:53 17:58-18:16/18 19:50	06:50 18:32	06:47 16:22	07:46 08:22-08:33/11 15:33	08:13 08:50-09:07/17 15:34 09:21-09:35/14
31	05:00 20:55	05:55 17:55-18:18/23 19:47		06:49 16:20		08:13 08:50-09:07/17 15:35 09:21-09:34/13
Potential sun hours	516	462	383	327	257	230
Sum of minutes with flicker	0	53	1115	367	318	871

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

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

Project:

Debnica Kaszubska

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Marcin Kulik / km.proeko@proeko.gda.pl

Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 4 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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
1	08:13 09:04-09:18/14 15:37	07:41 14:55-15:24/29 16:29	06:43 15:07-16:12/65 17:26 16:11-16:21/10	06:26 19:26 20:23	05:16 21:14	04:25 21:14
2	08:13 09:05-09:18/13 15:38	07:40 14:55-15:25/30 16:31	06:40 15:07-16:13/66 17:28 16:12-16:21/9	06:24 19:28 20:25	05:14 21:15	04:24 21:15
3	08:12 09:05-09:18/13 15:39	07:38 14:55-15:25/30 16:33	06:38 15:07-16:14/67 17:30 16:13-16:21/8	06:21 19:30 20:27	05:11 21:17	04:23 21:17
4	08:12 09:06-09:18/12 15:40	07:36 14:55-15:25/30 16:35	06:36 15:07-16:13/66 17:32 16:12-16:21/9	06:19 19:32 20:28	05:09 21:18	04:22 21:18
5	08:12 09:07-09:18/11 15:42	07:34 14:55-15:25/30 16:37	06:33 15:08-16:14/66 17:34 16:13-16:21/8	06:16 19:34 20:30	05:07 21:19	04:21 21:19
6	08:11 09:08-09:18/10 15:43	07:32 14:55-15:25/30 16:39	06:31 15:07-16:14/67 17:36 16:13-16:20/7	06:14 19:36 20:32	05:05 21:20	04:20 21:20
7	08:11 09:09-09:18/9 15:44	07:30 14:56-15:25/29 16:41	06:28 15:08-16:14/66 17:38 16:13-16:20/7	06:11 19:37 20:34	05:03 21:21	04:20 21:21
8	08:10 09:10-09:17/7 15:46	07:29 14:56-15:25/29 16:43	06:26 15:08-16:14/66 17:40 16:13-16:19/6	06:09 19:39 20:36	05:01 21:22	04:19 21:22
9	08:10 09:13-09:15/2 15:47	07:27 14:57-15:25/28 16:46	06:23 15:10-16:14/64 17:42 16:13-16:19/6	06:07 19:41 20:38	04:59 21:23	04:19 21:23
10	08:09 15:49	07:25 14:57-15:23/26 16:48	06:21 15:10-16:13/63 17:44 16:12-16:19/7	06:04 19:43 20:39	04:58 21:24	04:18 21:24
11	08:08 15:50	07:23 14:58-15:22/24 16:50	06:19 15:12-16:13/61 17:46 16:12-16:19/7	06:02 19:45 20:41	04:56 21:25	04:18 21:25
12	08:08 15:52	07:21 15:00-15:22/22 16:52	06:16 15:13-16:12/59 17:48 16:11-16:18/7	05:59 19:47 20:43	04:54 21:25	04:17 21:25
13	08:07 15:54	07:18 15:02-15:20/18 16:54	06:14 15:15-16:12/57 17:50 16:11-16:18/7	05:57 19:49 20:45	04:52 21:26	04:17 21:26
14	08:06 15:55	07:16 15:04-15:18/14 16:56	06:11 15:17-16:11/54 17:52 16:10-16:16/6	05:54 19:51 20:46	04:50 21:27	04:16 21:27
15	08:05 15:57	07:14 15:07-15:14/7 16:58	06:09 15:20-16:10/50 17:54 16:10-16:16/6	05:52 19:53 20:48	04:48 21:27	04:16 21:27
16	08:04 15:59	07:12 15:17-15:47/30 17:00	06:06 15:22-16:08/46 17:56 16:08-16:15/7	05:50 19:54 20:50	04:47 21:28	04:16 21:28
17	08:03 16:00	07:10 15:16-15:49/33 17:02	06:04 15:23-16:08/45 17:57 16:08-16:14/6	05:47 19:56 20:52	04:45 21:28	04:16 21:28
18	08:02 16:02	07:08 15:15-15:51/36 17:04	06:01 15:23-16:06/43 17:59 16:06-16:12/6	05:45 19:58 20:53	04:43 21:29	04:16 21:29
19	08:01 16:04	07:06 15:13-15:52/39 17:06	05:59 15:25-16:05/40 18:01 16:05-16:11/6	05:43 20:00 20:55	04:42 21:29	04:16 21:29
20	07:59 16:06	07:03 15:12-15:53/41 17:08	05:56 15:26-16:03/37 18:03 16:03-16:09/6	05:40 20:02 20:57	04:40 21:30	04:16 21:30
21	07:58 16:08	07:01 15:11-15:57/46 17:10	05:54 15:28-16:02/34 18:05 16:02-16:07/5	05:38 20:04 20:58	04:39 21:30	04:16 21:30
22	07:57 15:03-15:11/8 16:09	06:59 15:10-16:01/51 17:12	05:51 15:29-15:59/30 18:07 15:59-16:04/5	05:36 20:06 21:00	04:37 21:30	04:16 21:30
23	07:55 15:01-15:15/14 16:11	06:57 15:09-16:04/55 17:14	05:49 15:32-15:57/25 18:09 15:57-16:01/4	05:33 20:08 21:01	04:36 21:30	04:16 21:30
24	07:54 14:59-15:16/17 16:13	06:54 15:09-16:07/58 17:16	05:46 15:35-15:51/16 18:11	05:31 20:10 21:03	04:34 21:30	04:17 21:30
25	07:53 14:58-15:18/20 16:15	06:52 15:08-16:08/60 17:18	05:44 18:13 20:11	05:29 20:11 21:04	04:33 21:30	04:17 21:30
26	07:51 14:58-15:20/22 16:17	06:50 15:08-16:09/61 17:20	05:41 18:15 20:13	05:27 20:13 21:06	04:32 21:30	04:18 21:30
27	07:50 14:57-15:21/24 16:19	06:47 15:07-16:10/63 17:22	05:39 18:17 20:15	05:24 20:15 21:07	04:30 21:30	04:18 21:30
28	07:48 14:56-15:21/25 16:21	06:45 15:07-16:11/64 17:24	05:36 18:18 20:17	05:22 20:17 21:09	04:29 21:30	04:19 21:30
29	07:46 14:55-15:22/27 16:23	06:43 18:19 20:19	05:34 20:19 21:10	05:20 20:19 21:10	04:28 21:30	04:19 21:30
30	07:45 14:56-15:24/28 16:25	06:41 19:22 20:21	05:31 20:21 21:12	05:18 20:21 21:12	04:27 21:30	04:20 21:30
31	07:43 14:55-15:24/29 16:27	06:39 19:24 21:13	05:29 21:13 21:13	05:16 21:13 21:13	04:26 21:13	04:20 21:13
Potential sun hours	247	272	367	421	497	514
Sum of minutes with flicker	305	1186	1394	0	0	0

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

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

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 4 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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

	July	August	September	October	November	December
1	04:20 21:29	05:01 20:53	05:57 19:45	06:52 15:53-16:51/58 18:30 16:50-16:57/7	06:51 14:27-14:53/26 16:18	07:48 15:32
2	04:21 21:29	05:03 20:51	05:59 19:43	06:54 15:51-16:51/60 18:27 16:50-16:57/7	06:53 14:26-14:53/27 16:16	07:49 15:32
3	04:22 21:28	05:05 20:49	06:01 19:40	06:55 15:49-16:51/62 18:25 16:50-16:57/7	06:55 14:26-14:55/29 16:14	07:51 08:57-08:59/2 15:31
4	04:23 21:28	05:07 20:47	06:03 19:38	06:57 15:47-16:51/64 18:22 16:50-16:56/6	06:57 14:25-14:55/30 16:12	07:52 08:54-09:01/7 15:30
5	04:24 21:27	05:08 20:45	06:04 19:35	06:59 15:46-16:51/65 18:20 16:50-16:56/6	06:59 14:25-14:55/30 16:10	07:54 08:54-09:03/9 15:29
6	04:25 21:27	05:10 20:43	06:06 19:33	07:01 15:45-16:50/65 18:18 16:49-16:56/7	07:01 14:25-14:55/30 16:08	07:55 08:53-09:04/11 15:29
7	04:26 21:26	05:12 20:41	06:08 19:30	07:03 15:44-16:50/66 18:15 16:49-16:56/7	07:03 14:25-14:55/30 16:06	07:56 08:54-09:05/11 15:28
8	04:27 21:25	05:14 20:39	06:10 19:28	07:05 15:43-16:49/66 18:13 16:48-16:56/8	07:05 14:26-14:56/30 16:04	07:58 08:53-09:06/13 15:28
9	04:28 21:25	05:15 20:37	06:12 19:25	07:07 15:42-16:49/67 18:10 16:48-16:56/8	07:07 14:26-14:56/30 16:02	07:59 08:54-09:07/13 15:28
10	04:29 21:24	05:17 20:35	06:13 19:23	07:08 15:42-16:48/66 18:08 16:47-16:56/9	07:09 14:26-14:55/29 16:01	08:00 08:54-09:07/13 15:27
11	04:30 21:23	05:19 20:33	06:15 19:20	07:10 15:41-16:47/66 18:05 16:46-16:55/9	07:11 14:26-14:55/29 15:59	08:01 08:54-09:08/14 15:27
12	04:31 21:22	05:21 20:31	06:17 19:18	07:12 15:41-16:46/65 18:03 16:45-16:55/10	07:13 14:27-14:54/27 15:57	08:02 08:54-09:08/14 15:27
13	04:32 21:21	05:23 20:29	06:19 19:15	07:14 15:40-16:45/65 18:01 16:44-16:54/10	07:15 14:27-14:54/27 15:55	08:04 08:54-09:09/15 15:27
14	04:34 21:20	05:24 20:27	06:21 19:13	07:16 15:40-16:44/64 17:58 16:43-16:53/10	07:17 14:28-14:53/25 15:54	08:05 08:55-09:10/15 15:27
15	04:35 21:19	05:26 20:25	06:22 19:10	07:18 15:40-16:43/63 17:56 16:42-16:53/11	07:19 14:30-14:53/23 15:52	08:06 08:55-09:10/15 15:27
16	04:36 21:17	05:28 20:22	06:24 19:08	07:20 15:40-16:41/61 17:53 16:40-16:52/12	07:21 14:31-14:53/22 15:51	08:06 08:55-09:11/16 15:27
17	04:38 21:16	05:30 20:20	06:26 19:05	07:22 15:40-16:39/59 17:51 16:38-16:50/12	07:23 14:32-14:51/19 15:49	08:07 08:56-09:11/15 15:27
18	04:39 21:15	05:32 20:18	06:28 19:03	07:24 15:40-16:37/57 17:49 16:36-16:49/13	07:25 14:33-14:50/17 15:48	08:08 08:56-09:12/16 15:27
19	04:41 21:14	05:33 20:16	06:30 16:23-16:37/14 19:00	07:26 15:41-16:35/54 17:46 16:34-16:47/13	07:27 14:35-14:49/14 15:46	08:09 08:57-09:13/16 15:27
20	04:42 21:12	05:35 20:13	06:31 16:19-16:42/23 18:58 16:42-16:45/3	07:28 15:41-16:30/49 17:44 16:30-16:45/15	07:28 14:38-14:46/8 15:45	08:10 08:57-09:13/16 15:28
21	04:44 21:11	05:37 20:11	06:33 16:16-16:44/28 18:55 16:44-16:49/5	07:30 15:42-16:26/44 17:42 16:26-16:43/17	07:30 15:43	08:10 08:58-09:14/16 15:28
22	04:45 21:09	05:39 20:09	06:35 16:13-16:46/33 18:53 16:46-16:51/5	07:32 15:43-16:23/40 17:40 16:27-16:39/12	07:32 15:42	08:11 08:58-09:13/15 15:28
23	04:47 21:08	05:41 20:06	06:37 16:11-16:47/36 18:50 16:47-16:53/6	07:33 15:43-16:22/39 17:37	07:34 15:41	08:11 08:59-09:15/16 15:29
24	04:48 21:06	05:43 20:04	06:39 16:09-16:49/40 18:47 16:49-16:54/5	07:35 15:44-16:20/36 17:35	07:36 15:40	08:12 08:59-09:15/16 15:30
25	04:50 21:05	05:44 20:02	06:41 16:06-16:49/43 18:45 16:49-16:54/5	06:37 14:46-15:18/32 16:33	07:37 15:38	08:12 08:59-09:15/16 15:30
26	04:51 21:03	05:46 19:59	06:42 16:05-16:49/44 18:42 16:49-16:55/6	06:39 14:47-15:16/29 16:31	07:39 15:37	08:12 09:00-09:16/16 15:31
27	04:53 21:02	05:48 19:57	06:44 16:04-16:50/46 18:40 16:50-16:56/6	06:41 14:36-14:46/10 16:29 14:50-15:15/25	07:41 15:36	08:13 09:01-09:16/15 15:32
28	04:55 21:00	05:50 19:55	06:46 16:03-16:50/47 18:37 16:50-16:57/7	06:43 14:33-14:48/15 16:26 14:53-15:12/19	07:43 15:35	08:13 09:01-09:17/16 15:33
29	04:56 20:58	05:52 19:52	06:48 15:59-16:52/53 18:35 16:52-16:57/5	06:45 14:31-14:50/19 16:24 14:56-15:08/12	07:44 15:34	08:13 09:02-09:17/15 15:33
30	04:58 20:57	05:53 19:50	06:50 15:56-16:52/56 18:32 16:51-16:57/6	06:47 14:29-14:51/22 16:22	07:46 15:33	08:13 09:03-09:18/15 15:34
31	05:00 20:55	05:55 19:47		06:49 14:28-14:52/24 16:20		08:13 09:02-09:17/15 15:35
Potential sun hours	516	462	383	327	257	230
Sum of minutes with flicker	0	0	522	1805	502	402

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

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

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 5 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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
1	08:13	12:31-13:26/55	07:41	12:45-13:40/55	06:43	06:26	05:16	04:25
	15:37	13:25-14:07/42	16:29	13:40-14:24/44	17:26	19:26	20:23	21:14
2	08:13	12:31-13:26/55	07:40	12:46-13:40/54	06:40	06:24	05:14	04:24
	15:38	13:25-14:07/42	16:31	13:40-14:24/44	17:28	19:28	20:25	21:15
3	08:12	12:32-13:27/55	07:38	12:46-13:40/54	06:38	06:21	05:11	04:23
	15:39	13:26-14:08/42	16:33	13:40-14:24/44	17:30	19:30	20:26	21:17
4	08:12	12:32-13:29/57	07:36	12:47-13:39/52	06:36	06:19	05:09	04:22
	15:40	13:28-14:10/42	16:35	13:39-14:23/44	17:32	19:32	20:28	21:18
5	08:12	12:32-13:29/57	07:34	12:48-13:39/51	06:33	06:16	05:07	04:21
	15:42	13:28-14:10/42	16:37	13:39-14:23/44	17:34	19:34	20:30	21:19
6	08:11	12:32-13:29/57	07:32	12:49-13:38/49	06:31	06:14	05:05	04:20
	15:43	13:28-14:11/43	16:39	13:38-14:22/44	17:36	19:35	20:32	21:20
7	08:11	12:33-13:31/58	07:30	12:50-13:37/47	06:28	06:11	05:03	04:20
	15:44	13:30-14:12/42	16:41	13:37-14:21/44	17:38	19:37	20:34	21:21
8	08:10	12:33-13:31/58	07:29	12:51-13:37/46	06:26	06:09	05:01	04:19
	15:46	13:30-14:13/43	16:43	13:37-14:20/43	17:40	19:39	20:36	21:22
9	08:10	12:33-13:32/59	07:27	12:53-13:36/43	06:23	06:06	04:59	04:19
	15:47	13:31-14:14/43	16:46	13:36-14:19/43	17:42	19:41	20:37	21:23
10	08:09	12:33-13:33/60	07:25	12:53-13:34/41	06:21	06:04	04:58	04:18
	15:49	13:32-14:14/42	16:48	13:34-14:16/42	17:44	19:43	20:39	21:24
11	08:08	12:34-13:33/59	07:23	12:55-13:32/37 13:54-14:14/20	06:19	06:02	04:56	04:18
	15:50	13:32-14:15/43	16:50	13:32-13:53/21	17:46	19:45	20:41	21:25
12	08:07	12:34-13:34/60	07:21	12:58-13:30/32 13:58-14:11/13	06:16	05:59	04:54	04:17
	15:52	13:33-14:16/43	16:52	13:30-13:52/22	17:48	19:47	20:43	21:25
13	08:07	12:34-13:35/61	07:18	13:01-13:28/27	06:14	05:57	04:52	04:17
	15:54	13:34-14:17/43	16:54	13:28-13:50/22	17:50	19:49	20:45	21:26
14	08:06	12:35-13:35/60	07:16	13:04-13:25/21	06:11	05:54	04:50	04:16
	15:55	13:34-14:18/44	16:56	13:25-13:48/23	17:52	19:51	20:46	21:27
15	08:05	12:35-13:36/61	07:14	13:10-13:17/7	06:09	05:52	04:48	04:16
	15:57	13:35-14:19/44	16:58	13:27-13:43/16	17:54	19:53	20:48	21:27
16	08:04	12:36-13:37/61	07:12		06:06	05:50	04:47	04:16
	15:59	13:36-14:20/44	17:00		17:56	19:54	20:50	21:28
17	08:03	12:35-13:38/63	07:10		06:04	05:47	04:45	04:16
	16:00	13:36-14:20/44	17:02		17:57	19:56	20:52	21:28
18	08:02	12:36-13:37/61	07:08		06:01	05:45	04:43	04:16
	16:02	13:37-14:21/44	17:04		17:59	19:58	20:53	21:29
19	08:00	12:37-13:39/62	07:06		05:59	05:43	04:42	04:16
	16:04	13:38-14:22/44	17:06		18:01	20:00	20:55	21:29
20	07:59	12:36-13:39/63	07:03		05:56	05:40	04:40	04:16
	16:06	13:38-14:22/44	17:08		18:03	20:02	20:57	21:30
21	07:58	12:37-13:40/63	07:01		05:54	05:38	04:39	04:16
	16:08	13:39-14:23/44	17:10		18:05	20:04	20:58	21:30
22	07:57	12:37-13:40/63	06:59		05:51	05:36	04:37	04:16
	16:09	13:39-14:23/44	17:12		18:07	20:06	21:00	21:30
23	07:55	12:38-13:41/63	06:57		05:49	05:33	04:36	04:16
	16:11	13:40-14:24/44	17:14		18:09	20:08	21:01	21:30
24	07:54	12:39-13:40/61	06:54		05:46	05:31	04:34	04:17
	16:13	13:39-14:24/45	17:16		18:11	20:10	21:03	21:30
25	07:53	12:39-13:40/61	06:52		05:44	05:29	04:33	04:17
	16:15	13:39-14:24/45	17:18		18:13	20:11	21:04	21:30
26	07:51	12:40-13:41/61	06:50		05:41	05:27	04:32	04:18
	16:17	13:40-14:24/44	17:20		18:15	20:13	21:06	21:30
27	07:50	12:40-13:41/61	06:47		05:39	05:24	04:30	04:18
	16:19	13:40-14:24/44	17:22		18:17	20:15	21:07	21:30
28	07:48	12:41-13:41/60	06:45		05:36	05:22	04:29	04:19
	16:21	13:40-14:24/44	17:24		18:18	20:17	21:09	21:30
29	07:46	12:42-13:41/59			06:34	05:20	04:28	04:19
	16:23	13:40-14:24/44			19:20	20:19	21:10	21:30
30	07:45	12:43-13:42/59			06:31	05:18	04:27	04:20
	16:25	13:41-14:25/44			19:22	20:21	21:11	21:30
31	07:43	12:44-13:40/56			06:29		04:26	
	16:27	13:40-14:25/45			19:24		21:13	
Potential sun hours	247		272		367	421	497	514
Sum of minutes with flicker	3166		1189		0	0	0	0

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

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

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 5 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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

	July	August	September	October		November	December
1	04:20	05:01	05:57	06:52		06:51 12:23-13:03/40	07:48 12:16-13:15/59
	21:29	20:53	19:45	18:30		16:18 13:03-13:46/43	15:32 13:14-13:57/43
2	04:21	05:03	05:59	06:53		06:53 12:21-13:04/43	07:49 12:16-13:16/60
	21:29	20:51	19:43	18:27		16:16 13:04-13:48/44	15:32 13:15-13:58/43
3	04:22	05:05	06:01	06:55		06:55 12:21-13:06/45	07:51 12:17-13:16/59
	21:28	20:49	19:40	18:25		16:14 13:06-13:50/44	15:31 13:15-13:58/43
4	04:23	05:07	06:03	06:57		06:57 12:20-13:07/47	07:52 12:17-13:16/59
	21:28	20:47	19:38	18:22		16:12 13:07-13:51/44	15:30 13:15-13:57/42
5	04:24	05:08	06:04	06:59		06:59 12:18-13:08/50	07:54 12:18-13:16/58
	21:27	20:45	19:35	18:20		16:10 13:08-13:52/44	15:29 13:15-13:57/42
6	04:25	05:10	06:06	07:01		07:01 12:18-13:09/51	07:55 12:18-13:16/58
	21:27	20:43	19:33	18:18		16:08 13:09-13:52/43	15:29 13:15-13:57/42
7	04:26	05:12	06:08	07:03		07:03 12:17-13:09/52	07:56 12:19-13:16/57
	21:26	20:41	19:30	18:15		16:06 13:09-13:53/44	15:28 13:15-13:57/42
8	04:27	05:14	06:10	07:05		07:05 12:17-13:10/53	07:58 12:20-13:16/56
	21:25	20:39	19:28	18:13		16:04 13:10-13:55/45	15:28 13:15-13:57/42
9	04:28	05:15	06:12	07:07		07:07 12:16-13:11/55	07:59 12:20-13:16/56
	21:24	20:37	19:25	18:10		16:02 13:11-13:55/44	15:28 13:15-13:56/41
10	04:29	05:17	06:13	07:08		07:09 12:16-13:11/55	08:00 12:21-13:16/55
	21:24	20:35	19:23	18:08		16:01 13:11-13:55/44	15:27 13:15-13:57/42
11	04:30	05:19	06:15	07:10		07:11 12:15-13:11/56	08:01 12:21-13:16/55
	21:23	20:33	19:20	18:05		15:59 13:11-13:56/45	15:27 13:15-13:57/42
12	04:31	05:21	06:17	07:12		07:13 12:14-13:13/59	08:02 12:22-13:16/54
	21:22	20:31	19:18	18:03		15:57 13:12-13:56/44	15:27 13:15-13:57/42
13	04:32	05:23	06:19	07:14		07:15 12:13-13:13/60	08:04 12:22-13:16/54
	21:21	20:29	19:15	18:01		15:55 13:12-13:56/44	15:27 13:15-13:57/42
14	04:34	05:24	06:21	07:16		07:17 12:13-13:13/60	08:05 12:23-13:17/54
	21:20	20:27	19:13	17:58		15:54 13:12-13:56/44	15:27 13:16-13:57/41
15	04:35	05:26	06:22	07:18		07:19 12:13-13:14/61	08:06 12:23-13:17/54
	21:19	20:25	19:10	17:56		15:52 13:13-13:57/44	15:27 13:16-13:57/41
16	04:36	05:28	06:24	07:20		07:21 12:13-13:14/61	08:06 12:24-13:17/53
	21:17	20:22	19:08	17:53		15:51 13:13-13:57/44	15:27 13:16-13:57/41
17	04:38	05:30	06:26	07:22		07:23 12:13-13:14/61	08:07 12:25-13:18/53
	21:16	20:20	19:05	17:51		15:49 13:13-13:58/45	15:27 13:17-13:57/40
18	04:39	05:32	06:28	07:24		07:25 12:12-13:14/62	08:08 12:25-13:18/53
	21:15	20:18	19:03	17:49		15:48 13:13-13:58/45	15:27 13:17-13:58/41
19	04:41	05:33	06:30	07:26		07:27 12:12-13:15/63	08:09 12:26-13:19/53
	21:14	20:16	19:00	17:46		15:46 13:14-13:58/44	15:27 13:18-13:58/40
20	04:42	05:35	06:31	07:28		07:28 12:12-13:15/63	08:09 12:26-13:19/53
	21:12	20:13	18:58	17:44		15:45 13:14-13:58/44	15:28 13:18-13:58/40
21	04:44	05:37	06:33	07:30		07:30 12:12-13:15/63	08:10 12:27-13:20/53
	21:11	20:11	18:55	17:42		15:43 13:14-13:58/44	15:28 13:19-13:59/40
22	04:45	05:39	06:35	07:32		07:32 12:13-13:15/62	08:11 12:27-13:20/53
	21:09	20:09	18:53	17:40		15:42 13:14-13:58/44	15:28 13:19-13:59/40
23	04:47	05:41	06:37	07:33		07:34 12:13-13:15/62	08:11 12:28-13:21/53
	21:08	20:06	18:50	17:37		15:41 13:14-13:58/44	15:29 13:20-14:00/40
24	04:48	05:42	06:39	07:35		07:36 12:13-13:14/61	08:12 12:28-13:21/53
	21:06	20:04	18:47	17:35		15:39 13:14-13:58/44	15:30 13:20-14:00/40
25	04:50	05:44	06:41	06:37		07:37 12:13-13:16/63	08:12 12:28-13:21/53
	21:05	20:02	18:45	16:33		15:38 13:14-13:58/44	15:30 13:20-14:01/41
26	04:51	05:46	06:42	06:39 13:02-13:08/6		07:39 12:14-13:15/61	08:12 12:29-13:21/52
	21:03	19:59	18:42	16:31		15:37 13:14-13:58/44	15:31 13:20-14:01/41
27	04:53	05:48	06:44	06:41 12:38-12:50/12		07:41 12:14-13:15/61	08:12 12:29-13:22/53
	21:02	19:57	18:40	16:28 12:56-13:15/19		15:36 13:14-13:58/44	15:32 13:21-14:02/41
28	04:55	05:50	06:46	06:43 12:33-12:55/22		07:43 12:15-13:16/61	08:13 12:29-13:23/54
	21:00	19:55	18:37	16:26 12:55-13:18/23		15:35 13:15-13:58/43	15:33 13:22-14:02/40
29	04:56	05:52	06:48	06:45 12:29-12:58/29		07:44 12:15-13:16/61	08:13 12:30-13:23/53
	20:58	19:52	18:35	16:24 12:58-13:20/22		15:34 13:15-13:58/43	15:33 13:22-14:03/41
30	04:58	05:53	06:50	06:47 12:27-13:00/33 13:26-13:41/15		07:46 12:15-13:15/60	08:13 12:30-13:24/54
	20:57	19:50	18:32	16:22 13:00-13:22/22		15:33 13:14-13:57/43	15:34 13:23-14:04/41
31	05:00	05:55		06:49 12:25-13:02/37			08:13 12:31-13:25/54
	20:55	19:47		16:20 13:02-13:44/42			15:35 13:24-14:05/41
Potential sun hours	516	462	383	327		257	230
Sum of minutes with flicker	0	0	0	282		3013	2946

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

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

Project:

Debnica Kaszubska

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 6 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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 10:38-11:19/41 11:37-12:08/31	07:41 06:43	06:26 05:16	04:25		
	15:37 11:19-11:36/17	16:29 17:26	19:26 20:23	21:14		
2	08:13 10:38-11:19/41 11:37-12:07/30	07:40 06:40	06:24 05:14	04:24		
	15:38 11:19-11:36/17	16:31 17:28	19:28 20:25	21:15		
3	08:12 10:39-11:20/41 11:38-12:07/29	07:38 06:38	06:21 05:11	04:23		
	15:39 11:20-11:37/17	16:33 17:30	19:30 20:26	21:17		
4	08:12 10:40-11:20/40 11:40-12:08/28	07:36 06:36	06:19 05:09	04:22		
	15:40 11:20-11:37/17	16:35 17:32	19:32 20:28	21:18		
5	08:12 10:40-11:20/40 11:40-12:07/27	07:34 06:33	06:16 05:07	04:21		
	15:42 11:20-11:37/17	16:37 17:34	19:34 20:30	21:19		
6	08:11 10:41-11:20/39 11:41-12:07/26	07:32 06:31	06:14 05:05	04:20		
	15:43 11:20-11:37/17	16:39 17:36	19:35 20:32	21:20		
7	08:11 10:42-11:21/39 11:43-12:07/24	07:30 06:28	06:11 05:03	04:20		
	15:44 11:21-11:37/16	16:41 17:38	19:37 20:34	21:21		
8	08:10 10:42-11:21/39 11:44-12:07/23	07:28 06:26	06:09 05:01	04:19		
	15:46 11:21-11:37/16	16:43 17:40	19:39 20:36	21:22		
9	08:10 10:43-11:21/38 11:45-12:06/21	07:27 06:23	06:06 04:59	04:19		
	15:47 11:21-11:37/16	16:45 17:42	19:41 20:37	21:23		
10	08:09 10:44-11:20/36 11:46-12:05/19	07:25 06:21	06:04 04:58	04:18		
	15:49 11:20-11:37/17	16:48 17:44	19:43 20:39	21:24		
11	08:08 10:45-11:20/35 11:48-12:04/16	07:23 06:19	06:02 04:56	04:18		
	15:50 11:20-11:37/17	16:50 17:46	19:45 20:41	21:25		
12	08:07 10:45-11:20/35 11:50-12:02/12	07:20 06:16	05:59 04:54	04:17		
	15:52 11:20-11:36/16	16:52 17:48	19:47 20:43	21:25		
13	08:07 10:46-11:20/34 11:54-11:59/5	07:18 06:14	05:57 04:52	04:17		
	15:54 11:20-11:36/16	16:54 17:50	19:49 20:45	21:26		
14	08:06 10:48-11:20/32	07:16 06:11	05:54 04:50	04:16		
	15:55 11:20-11:36/16	16:56 17:52	19:51 20:46	21:27		
15	08:05 10:49-11:20/31	07:14 06:09	05:52 04:48	04:16		
	15:57 11:20-11:35/15	16:58 17:54	19:53 20:48	21:27		
16	08:04 10:50-11:19/29	07:12 06:06	05:50 04:47	04:16		
	15:59 11:19-11:35/16	17:00 17:56	19:54 20:50	21:28		
17	08:03 10:51-11:18/27	07:10 06:04	05:47 04:45	04:16		
	16:00 11:18-11:33/15	17:02 17:57	19:56 20:52	21:28		
18	08:02 10:53-11:17/24	07:08 06:01	05:45 04:43	04:16		
	16:02 11:17-11:32/15	17:04 17:59	19:58 20:53	21:29		
19	08:00 10:55-11:15/20	07:06 05:59	05:43 04:42	04:16		
	16:04 11:18-11:30/12	17:06 18:01	20:00 20:55	21:29		
20	07:59 10:57-11:13/16	07:03 05:56	05:40 04:40	04:16		
	16:06	17:08 18:03	20:02 20:56	21:30		
21	07:58 11:01-11:10/9	07:01 05:54	05:38 04:39	04:16		
	16:08	17:10 18:05	20:04 20:58	21:30		
22	07:57	06:59 05:51	05:36 04:37	04:16		
	16:09	17:12 18:07	20:06 21:00	21:30		
23	07:55	06:57 05:49	05:33 04:36	04:16		
	16:11	17:14 18:09	20:08 21:01	21:30		
24	07:54	06:54 05:46	05:31 04:34	04:17		
	16:13	17:16 18:11	20:10 21:03	21:30		
25	07:53	06:52 05:44	05:29 04:33	04:17		
	16:15	17:18 18:13	20:11 21:04	21:30		
26	07:51	06:50 05:41	05:27 04:32	04:18		
	16:17	17:20 18:15	20:13 21:06	21:30		
27	07:50	06:47 05:39	05:24 04:30	04:18		
	16:19	17:22 18:17	20:15 21:07	21:30		
28	07:48	06:45 05:36	05:22 04:29	04:19		
	16:21	17:24 18:18	20:17 21:09	21:30		
29	07:46	06:43 05:34	05:20 04:28	04:19		
	16:23	19:20 20:19	21:10 21:30			
30	07:45	06:41 05:31	05:18 04:27	04:20		
	16:25	19:22 20:21	21:11 21:30			
31	07:43	06:39 05:29	04:26			
	16:27	19:24	21:13			
Potential sun hours	247	272	367	421	496	514
Sum of minutes with flicker	1282	0	0	0	0	0

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

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

Project:

Debnica Kaszubska

Printed/Page

2013-01-24 10:59 / 12

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Calculated:

2013-01-24 10:55/2.8.579

SHADOW - Calendar per WTG**WTG: 6 - GAMESA G128 4500 128.0 !O! hub: 140,0 m (TOT: 204,0 m) (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	06:52 18:30	06:51 16:18	07:47 15:32
2	04:21 21:29	05:03 20:51	05:59 19:42	06:53 18:27	06:53 16:16	07:49 15:32
3	04:22 21:28	05:05 20:49	06:01 19:40	06:55 18:25	06:55 16:14	07:51 15:31
4	04:23 21:28	05:07 20:47	06:02 19:38	06:57 18:22	06:57 16:12	07:52 15:30
5	04:24 21:27	05:08 20:45	06:04 19:35	06:59 18:20	06:59 16:10	07:54 15:29
6	04:25 21:27	05:10 20:43	06:06 19:33	07:01 18:18	07:01 16:08	07:55 15:29
7	04:26 21:26	05:12 20:41	06:08 19:30	07:03 18:15	07:03 16:06	07:56 15:28
8	04:27 21:25	05:14 20:39	06:10 19:28	07:05 18:13	07:05 16:04	07:58 15:28
9	04:28 21:24	05:15 20:37	06:12 19:25	07:07 18:10	07:07 16:02	07:59 15:28
10	04:29 21:24	05:17 20:35	06:13 19:23	07:08 18:08	07:09 16:01	08:00 15:27
11	04:30 21:23	05:19 20:33	06:15 19:20	07:10 18:05	07:11 15:59	08:01 15:27
12	04:31 21:22	05:21 20:31	06:17 19:18	07:12 18:03	07:13 15:57	08:02 15:27
13	04:32 21:21	05:23 20:29	06:19 19:15	07:14 18:01	07:15 15:55	08:03 15:27
14	04:34 21:20	05:24 20:27	06:21 19:13	07:16 17:58	07:17 15:54	08:05 15:27
15	04:35 21:19	05:26 20:25	06:22 19:10	07:18 17:56	07:19 15:52	08:05 15:27
16	04:36 21:17	05:28 20:22	06:24 19:08	07:20 17:53	07:21 15:51	08:06 15:27
17	04:38 21:16	05:30 20:20	06:26 19:05	07:22 17:51	07:23 15:49	08:07 15:27
18	04:39 21:15	05:32 20:18	06:28 19:03	07:24 17:49	07:25 15:48	08:08 15:27
19	04:41 21:14	05:33 20:16	06:30 19:00	07:26 17:46	07:26 15:46	08:09 15:27
20	04:42 21:12	05:35 20:13	06:31 18:58	07:28 17:44	07:28 15:45	08:09 15:28
21	04:44 21:11	05:37 20:11	06:33 18:55	07:30 17:42	07:30 15:43	08:10 15:28
22	04:45 21:09	05:39 20:09	06:35 18:52	07:31 17:40	07:32 15:42	08:11 15:28
23	04:47 21:08	05:41 20:06	06:37 18:50	07:33 17:37	07:34 15:41	08:11 15:29
24	04:48 21:06	05:42 20:04	06:39 18:47	07:35 17:35	07:36 15:39	08:12 15:30
25	04:50 21:05	05:44 20:02	06:41 18:45	07:37 16:33	07:37 15:38	08:12 15:30
26	04:51 21:03	05:46 19:59	06:42 18:42	07:39 16:31	07:39 15:37	08:12 15:31
27	04:53 21:02	05:48 19:57	06:44 18:40	07:41 16:28	07:41 15:36	08:12 15:32
28	04:55 21:00	05:50 19:55	06:46 18:37	07:43 16:26	07:43 15:35	08:13 15:33
29	04:56 20:58	05:52 19:52	06:48 18:35	07:44 16:24	07:44 15:34	08:13 15:33
30	04:58 20:56	05:53 19:50	06:50 18:32	07:46 16:22	07:46 15:33	08:13 15:34
31	05:00 20:55	05:55 19:47	06:55 18:25	07:49 16:20	07:49 15:35	08:13 15:35
Potential sun hours	516	462	383	328	257	230
Sum of minutes with flicker	0	0	0	0	391	2706

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

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