

## SHADOW - Main Result

Calculation: Schadow WEA 2 Mondorf

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

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

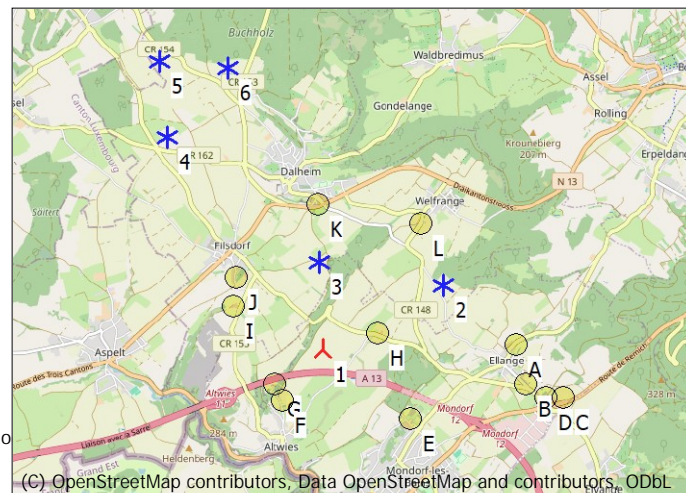
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Project Wizard Elevation Data Grid (Luxembourgish Elevation Model)  
Receptor grid resolution: 1,0 m

All coordinates are in  
Luxemburgian TM-LUREF (LU)



Scale 1:100 000  
New WTG  
Shadow receptor  
Existing WTG

### WTGs

	X	Y	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
1	86 953	65 285	260,7	WP Mondorf WEA 2	Yes	ENERCON	E-175 EP5 E2-7 000	7 000	175,0	174,5	1 736	-
2	88 544	66 138	282,2	WP Duelem WEA 1	No	ENERCON	E-115 EP3 E3-4 200	4 200	115,7	149,0	1 618	12,9
3	86 902	66 430	318,3	WP Duelem WEA 3	No	ENERCON	E-115 EP3 E3-4 200	4 200	115,7	149,0	1 618	12,9
4	84 883	68 088	305,3	WP Duelem WEA 5	No	ENERCON	E-115 EP3 E3-4 200	4 200	115,7	149,0	1 618	12,9
5	84 781	69 096	317,8	WP Duelem WEA 7	No	ENERCON	E-115 EP3 E3-4 200	4 200	115,7	149,0	1 618	12,9
6	85 688	68 990	329,7	WP Duelem WEA 8	No	ENERCON	E-115 EP3 E3-4 200	4 200	115,7	149,0	1 618	12,9

### Shadow receptor-Input

No.	Name	X	Y	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
A	Ellange, Route d'Erpeldange 30	89 505	65 345	216,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
B	Ellange, Rue du Cimetiere 23	89 651	64 823	237,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0
C	Ellange, Route de Remich 1	90 140	64 652	250,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
D	Ellange, Rue de la Gare 10	89 913	64 652	238,6	1,0	1,0	1,0	90,0	"Green house mode"	2,0
E	Mondorf-les-Bains, Hannert de Wangerten 3	88 113	64 367	232,2	1,0	1,0	1,0	90,0	"Green house mode"	2,0
F	Altwies, Rue des Romains (limite)	86 413	64 604	238,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
G	Altwies, Rue des Romains 61	86 317	64 820	272,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
H	Altwies, Bremhaff 1	87 686	65 493	252,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
I	Filsdorf, Woneschwee 21	85 761	65 847	274,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
J	Filsdorf, Am Eck 19	85 800	66 228	280,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0
K	Dalheim, Redoutewee 5	86 885	67 203	327,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
L	Welfrange, Munnerferwee 15	88 252	66 943	294,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0

### Calculation Results

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	Ellange, Route d'Erpeldange 30	0:00	0	0:00	0:00	
B	Ellange, Rue du Cimetiere 23	0:00	0	0:00	0:00	
C	Ellange, Route de Remich 1	0:00	0	0:00	0:00	
D	Ellange, Rue de la Gare 10	0:00	0	0:00	0:00	
E	Mondorf-les-Bains, Hannert de Wangerten 3	0:00	0	0:00	0:00	
F	Altwies, Rue des Romains (limite)	0:00	0	0:00	0:00	
G	Altwies, Rue des Romains 61	0:00	0	0:00	0:00	

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## SHADOW - Main Result

Calculation: Schadow WEA 2 Mondorf

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No.	Name	Shadow, worst case		Max shadow hours per day	Shadow, expected values
		Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]
	H Altwies, Bremhaff 1	43:40	66	0:51	14:46
	I Filsdorf, Woneschwee 21	33:21	94	0:31	11:22
	J Filsdorf, Am Eck 19	33:37	101	0:29	8:46
	K Dalheim, Redoutewee 5	0:00	0	0:00	0:00
	L Welfrange, Munneréferwee 15	5:57	25	0:18	1:37

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case	Expected
		[h/year]	[h/year]
1	WP Mondorf WEA 2	82:43	22:59
2	WP Duelem WEA 1	0:00	0:00
3	WP Duelem WEA 3	33:52	13:33
4	WP Duelem WEA 5	0:00	0:00
5	WP Duelem WEA 7	0:00	0:00
6	WP Duelem WEA 8	0:00	0:00

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: A - Ellange, Route d'Erpeldange 30

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
1,29 2,62 3,51 5,39 6,60 6,56 7,20 6,77 4,98 2,92 1,63 1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46	08:09 17:30	07:20 18:17	07:15 20:05	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:17	06:50 20:21	07:34 19:16	07:22 17:15	08:09 16:39
2	08:32 16:47	08:07 17:31	07:18 18:18	07:12 20:07	06:13 20:53	05:33 21:34	05:33 21:45	06:06 21:16	06:51 20:18	07:35 19:14	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:09	06:11 20:54	05:33 21:35	05:33 21:45	06:08 21:14	06:53 20:16	07:37 19:12	07:26 17:12	08:12 16:38
4	08:32 16:49	08:04 17:35	07:14 18:21	07:08 20:10	06:10 20:56	05:32 21:36	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:37
5	08:31 16:50	08:03 17:36	07:12 18:23	07:06 20:12	06:08 20:57	05:31 21:36	05:35 21:44	06:11 21:11	06:55 20:12	07:40 19:07	07:29 17:08	08:14 16:37
6	08:31 16:51	08:01 17:38	07:10 18:25	07:04 20:13	06:06 20:59	05:31 21:37	05:36 21:44	06:12 21:10	06:57 20:10	07:41 19:05	07:31 17:07	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:43	06:13 21:08	06:58 20:08	07:43 19:03	07:32 17:05	08:16 16:36
8	08:31 16:53	07:58 17:41	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:06	07:00 20:06	07:44 19:01	07:34 17:04	08:18 16:36
9	08:30 16:55	07:57 17:43	07:04 18:30	06:58 20:18	06:01 21:03	05:29 21:40	05:38 21:42	06:16 21:05	07:01 20:04	07:46 18:59	07:35 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:02 18:31	06:56 20:19	06:00 21:05	05:29 21:40	05:39 21:42	06:18 21:03	07:03 20:01	07:47 18:57	07:37 17:01	08:20 16:36
11	08:29 16:57	07:53 17:47	06:59 18:33	06:53 20:21	05:58 21:06	05:29 21:41	05:40 21:41	06:19 21:01	07:04 19:59	07:49 18:55	07:39 16:59	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:51 20:22	05:57 21:08	05:29 21:42	05:41 21:40	06:20 20:59	07:06 19:57	07:50 18:53	07:40 16:58	08:22 16:36
13	08:28 17:00	07:50 17:50	06:55 18:36	06:49 20:24	05:55 21:09	05:28 21:42	05:42 21:39	06:22 20:58	07:07 19:55	07:52 18:51	07:42 16:57	08:23 16:36
14	08:28 17:01	07:48 17:52	06:53 18:37	06:47 20:25	05:54 21:10	05:28 21:43	05:43 21:39	06:23 20:56	07:09 19:53	07:54 18:49	07:43 16:55	08:24 16:36
15	08:27 17:03	07:47 17:53	06:51 18:39	06:45 20:27	05:52 21:12	05:28 21:43	05:44 21:38	06:25 20:54	07:10 19:51	07:55 18:47	07:45 16:54	08:24 16:36
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:28	05:51 21:13	05:28 21:44	05:45 21:37	06:26 20:52	07:11 19:48	07:57 18:45	07:47 16:53	08:25 16:36
17	08:25 17:06	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:14	05:28 21:44	05:46 21:36	06:28 20:50	07:13 19:46	07:58 18:43	07:48 16:52	08:26 16:36
18	08:25 17:07	07:41 17:58	06:45 18:44	06:39 20:32	05:48 21:16	05:28 21:45	05:47 21:35	06:29 20:48	07:14 19:44	08:00 18:41	07:50 16:50	08:27 16:36
19	08:24 17:09	07:39 18:00	06:42 18:45	06:37 20:33	05:47 21:17	05:28 21:45	05:48 21:34	06:31 20:47	07:16 19:42	08:01 18:39	07:51 16:49	08:27 16:37
20	08:23 17:10	07:37 18:02	06:40 18:47	06:35 20:35	05:46 21:18	05:28 21:45	05:50 21:33	06:32 20:45	07:17 19:40	08:03 18:37	07:53 16:48	08:28 16:37
21	08:22 17:12	07:36 18:03	06:38 18:48	06:33 20:36	05:45 21:20	05:28 21:46	05:51 21:32	06:34 20:43	07:19 19:38	08:05 18:35	07:54 16:47	08:29 16:37
22	08:21 17:13	07:34 18:05	06:36 18:50	06:31 20:38	05:44 21:21	05:28 21:46	05:52 21:31	06:35 20:41	07:20 19:35	08:06 18:33	07:56 16:46	08:29 16:38
23	08:20 17:15	07:32 18:07	06:34 18:52	06:29 20:39	05:42 21:22	05:29 21:46	05:53 21:30	06:36 20:39	07:22 19:33	08:08 18:31	07:58 16:45	08:30 16:38
24	08:19 17:16	07:30 18:08	06:32 18:53	06:28 20:41	05:41 21:24	05:29 21:46	05:54 21:28	06:38 20:37	07:23 19:31	08:09 18:29	07:59 16:44	08:30 16:39
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	08:00 16:43	08:30 16:40
26	08:16 17:20	07:26 18:12	06:27 18:56	06:24 20:44	05:39 21:26	05:30 21:46	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:25	08:02 16:42	08:31 16:40
27	08:15 17:21	07:24 18:13	06:25 18:58	06:22 20:45	05:38 21:27	05:30 21:46	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	08:03 16:42	08:31 16:41
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:37 21:28	05:30 21:46	06:00 21:23	06:44 20:29	07:29 19:22	07:16 17:22	08:05 16:41	08:31 16:42
29	08:13 17:25		07:21 20:01	06:18 20:48	05:36 21:29	05:31 21:46	06:01 21:22	06:45 20:27	07:31 19:20	07:17 17:20	08:06 16:40	08:32 16:43
30	08:11 17:26		07:19 20:02	06:17 20:50	05:36 21:30	05:31 21:46	06:02 21:20	06:47 20:25	07:32 19:18	07:19 17:18	08:08 16:40	08:32 16:43
31	08:10 17:28		07:17 20:04		05:35 21:32		06:04 21:19	06:48 20:23		07:21 17:17		08:32 16:44
Potential sun hours	269	283	368	411	475	486	490	447	379	335	275	255
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: B - Ellange, Rue du Cimetiere 23

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46	08:09 17:30	07:20 18:17	07:15 20:05	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:17	06:50 20:21	07:34 19:16	07:22 17:15	08:09 16:39
2	08:32 16:47	08:07 17:31	07:18 18:18	07:12 20:07	06:13 20:53	05:33 21:34	05:33 21:45	06:06 21:16	06:51 20:18	07:35 19:14	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:08	06:11 20:54	05:33 21:35	05:33 21:45	06:08 21:14	06:53 20:16	07:37 19:12	07:26 17:12	08:12 16:38
4	08:32 16:49	08:04 17:35	07:14 18:21	07:08 20:10	06:10 20:56	05:32 21:35	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:37
5	08:31 16:50	08:03 17:36	07:12 18:23	07:06 20:12	06:08 20:57	05:31 21:36	05:35 21:44	06:11 21:11	06:55 20:12	07:40 19:07	07:29 17:08	08:14 16:37
6	08:31 16:51	08:01 17:38	07:10 18:25	07:04 20:13	06:06 20:59	05:31 21:37	05:36 21:44	06:12 21:10	06:57 20:10	07:41 19:05	07:30 17:07	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:43	06:13 21:08	06:58 20:08	07:43 19:03	07:32 17:05	08:16 16:36
8	08:31 16:53	07:58 17:41	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:06	07:00 20:06	07:44 19:01	07:34 17:04	08:17 16:36
9	08:30 16:55	07:57 17:43	07:04 18:30	06:58 20:18	06:01 21:03	05:29 21:40	05:38 21:42	06:16 21:05	07:01 20:04	07:46 18:59	07:35 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:01 18:31	06:56 20:19	06:00 21:05	05:29 21:40	05:39 21:42	06:18 21:03	07:03 20:01	07:47 18:57	07:37 17:01	08:20 16:36
11	08:29 16:57	07:53 17:47	06:59 18:33	06:53 20:21	05:58 21:06	05:29 21:41	05:40 21:41	06:19 21:01	07:04 19:59	07:49 18:55	07:39 16:59	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:51 20:22	05:57 21:07	05:29 21:42	05:41 21:40	06:20 20:59	07:06 19:57	07:50 18:53	07:40 16:58	08:22 16:36
13	08:28 17:00	07:50 17:50	06:55 18:36	06:49 20:24	05:55 21:09	05:28 21:42	05:42 21:39	06:22 20:58	07:07 19:55	07:52 18:51	07:42 16:57	08:23 16:36
14	08:27 17:01	07:48 17:52	06:53 18:37	06:47 20:25	05:54 21:10	05:28 21:43	05:43 21:39	06:23 20:56	07:09 19:53	07:54 18:49	07:43 16:55	08:23 16:36
15	08:27 17:03	07:47 17:53	06:51 18:39	06:45 20:27	05:52 21:12	05:28 21:43	05:44 21:38	06:25 20:54	07:10 19:51	07:55 18:47	07:45 16:54	08:24 16:36
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:28	05:51 21:13	05:28 21:44	05:45 21:37	06:26 20:52	07:11 19:48	07:57 18:45	07:47 16:53	08:25 16:36
17	08:25 17:06	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:14	05:28 21:44	05:46 21:36	06:28 20:50	07:13 19:46	07:58 18:43	07:48 16:52	08:26 16:36
18	08:24 17:07	07:41 17:58	06:45 18:44	06:39 20:32	05:48 21:16	05:28 21:45	05:47 21:35	06:29 20:48	07:14 19:44	08:00 18:41	07:50 16:50	08:27 16:36
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20	08:23 17:10	07:37 18:02	06:40 18:47	06:35 20:35	05:46 21:18	05:28 21:45	05:50 21:33	06:32 20:45	07:17 19:40	08:03 18:37	07:53 16:48	08:28 16:37
21	08:22 17:12	07:36 18:03	06:38 18:48	06:33 20:36	05:45 21:20	05:28 21:46	05:51 21:32	06:34 20:43	07:19 19:38	08:05 18:35	07:54 16:47	08:29 16:37
22	08:21 17:13	07:34 18:05	06:36 18:50	06:31 20:38	05:44 21:21	05:28 21:46	05:52 21:31	06:35 20:41	07:20 19:35	08:06 18:33	07:56 16:46	08:30 16:38
23	08:20 17:15	07:32 18:07	06:34 18:52	06:29 20:39	05:42 21:22	05:29 21:46	05:53 21:30	06:36 20:39	07:22 19:33	08:08 18:31	07:57 16:45	08:30 16:38
24	08:19 17:16	07:30 18:08	06:32 18:53	06:28 20:41	05:41 21:24	05:29 21:46	05:54 21:28	06:38 20:37	07:23 19:31	08:09 18:29	07:59 16:44	08:30 16:39
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	08:00 16:43	08:30 16:40
26	08:16 17:20	07:26 18:12	06:27 18:56	06:24 20:44	05:39 21:26	05:30 21:46	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:25	08:02 16:42	08:31 16:40
27	08:15 17:21	07:24 18:13	06:25 18:58	06:22 20:45	05:38 21:27	05:30 21:46	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	08:03 16:42	08:31 16:41
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:37 21:28	05:30 21:46	06:00 21:23	06:44 20:29	07:29 19:22	07:16 17:22	08:05 16:41	08:31 16:42
29	08:13 17:25		07:21 20:01	06:18 20:48	05:36 21:29	05:31 21:46	06:01 21:22	06:45 20:27	07:31 19:20	07:17 17:20	08:06 16:40	08:32 16:43
30	08:11 17:26		07:19 20:02	06:17 20:50	05:36 21:30	05:31 21:46	06:02 21:20	06:47 20:25	07:32 19:18	07:19 17:18	08:08 16:40	08:32 16:43
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Potential sun hours	269	283	368	411	475	486	490	447	379	335	275	255
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: C - Ellange, Route de Remich 1

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46	08:09 17:30	07:20 18:17	07:14 20:05	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:17	06:50 20:20	07:34 19:16	07:22 17:15	08:09 16:39
2	08:32 16:47	08:07 17:31	07:18 18:18	07:12 20:07	06:13 20:53	05:33 21:34	05:33 21:45	06:06 21:16	06:51 20:18	07:35 19:14	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:08	06:11 20:54	05:33 21:35	05:33 21:45	06:08 21:14	06:53 20:16	07:37 19:12	07:26 17:12	08:11 16:38
4	08:32 16:49	08:04 17:35	07:14 18:21	07:08 20:10	06:10 20:56	05:32 21:35	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:37
5	08:31 16:50	08:03 17:36	07:12 18:23	07:06 20:12	06:08 20:57	05:31 21:36	05:35 21:44	06:10 21:11	06:55 20:12	07:40 19:07	07:29 17:08	08:14 16:37
6	08:31 16:51	08:01 17:38	07:10 18:25	07:04 20:13	06:06 20:59	05:31 21:37	05:36 21:44	06:12 21:10	06:57 20:10	07:41 19:05	07:30 17:07	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:43	06:13 21:08	06:58 20:08	07:43 19:03	07:32 17:05	08:16 16:36
8	08:31 16:53	07:58 17:41	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:06	07:00 20:06	07:44 19:01	07:34 17:04	08:17 16:36
9	08:30 16:55	07:57 17:43	07:04 18:29	06:58 20:18	06:01 21:03	05:29 21:40	05:38 21:42	06:16 21:05	07:01 20:04	07:46 18:59	07:35 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:01 18:31	06:56 20:19	06:00 21:05	05:29 21:40	05:39 21:42	06:18 21:03	07:03 20:01	07:47 18:57	07:37 17:01	08:20 16:36
11	08:29 16:57	07:53 17:47	06:59 18:33	06:53 20:21	05:58 21:06	05:29 21:41	05:40 21:41	06:19 21:01	07:04 19:59	07:49 18:55	07:39 16:59	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:51 20:22	05:57 21:07	05:29 21:42	05:41 21:40	06:20 20:59	07:06 19:57	07:50 18:53	07:40 16:58	08:22 16:36
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Potential sun hours	269	283	368	411	475	486	490	447	379	335	275	256
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: D - Ellange, Rue de la Gare 10

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
1,29 2,62 3,51 5,39 6,60 6,56 7,20 6,77 4,98 2,92 1,63 1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
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Potential sun hours	269	283	368	411	475	486	490	447	379	335	275	256
Total, worst case												
Sun reduction												
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Wind dir. red.												
Total reduction												
Total, real												

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

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



## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: E - Mondorf-les-Bains, Hannert de Wangerten 3  
Assumptions for shadow calculations  
Sunshine probability S (Average daily sunshine hours) [TRIER]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
1,29 2,62 3,51 5,39 6,60 6,56 7,20 6,77 4,98 2,92 1,63 1,15

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	January	February	March	April	May	June	July	August	September	October	November	December
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23	08:20 17:15	07:32 18:07	06:34 18:52	06:30 20:39	05:43 21:22	05:29 21:46	05:53 21:30	06:37 20:39	07:22 19:33	08:08 18:31	07:58 16:45	08:30 16:39
24	08:19 17:17	07:30 18:08	06:32 18:53	06:28 20:41	05:41 21:24	05:29 21:46	05:55 21:28	06:38 20:37	07:23 19:31	08:09 18:29	07:59 16:44	08:30 16:39
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	08:01 16:43	08:31 16:40
26	08:16 17:20	07:26 18:12	06:27 18:56	06:24 20:44	05:39 21:26	05:30 21:46	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:26	08:02 16:43	08:31 16:40
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28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:37 21:28	05:31 21:46	06:00 21:23	06:44 20:29	07:29 19:22	07:16 17:22	08:05 16:41	08:31 16:42
29	08:13 17:25		07:21 20:01	06:18 20:48	05:37 21:29	05:31 21:46	06:01 21:22	06:45 20:27	07:31 19:20	07:18 17:20	08:06 16:40	08:32 16:43
30	08:12 17:26		07:19 20:02	06:17 20:50	05:36 21:31	05:32 21:46	06:02 21:20	06:47 20:25	07:32 19:18	07:19 17:18	08:08 16:40	08:32 16:44
31	08:10 17:28		07:17 20:04		05:35 21:32		06:04 21:19	06:48 20:23		07:21 17:17		08:32 16:44
Potential sun hours	269	283	368	411	475	486	490	447	379	335	275	256
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: F - Altwies,Rue des Romains (limite)

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

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
1,29 2,62 3,51 5,39 6,60 6,56 7,20 6,77 4,98 2,92 1,63 1,15

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

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

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

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



## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: G - Altwies, Rue des Romains 61

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
1,29 2,62 3,51 5,39 6,60 6,56 7,20 6,77 4,98 2,92 1,63 1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46	08:09 17:30	07:20 18:17	07:15 20:06	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:18	06:50 20:21	07:34 19:16	07:23 17:15	08:09 16:39
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Total reduction												
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Table layout: For each day in each month the following matrix apply

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	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: H - Altwies, Bremhaff 1

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

### Assumptions for shadow calculations

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:32 16:46	08:09 17:30	07:20 18:17	07:15 20:06	17:59 (1) 18:36 (1)	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:18	06:50 20:21	07:34 19:16	17:39 (1) 18:23 (1)	07:22 17:15	08:09 16:39
2	08:32 16:47	08:07 17:31	07:18 18:18	07:12 20:07	18:01 (1) 18:34 (1)	06:13 20:53	05:33 21:34	05:33 21:46	06:06 21:16	06:51 20:19	07:35 19:14	17:41 (1) 18:22 (1)	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:09	18:03 (1) 18:32 (1)	06:11 20:54	05:33 21:35	05:33 21:45	06:08 21:15	06:53 20:16	07:37 19:12	17:42 (1) 18:21 (1)	07:26 17:12	08:12 16:38
4	08:32 16:49	08:05 17:35	07:14 18:22	07:08 20:10	18:05 (1) 18:30 (1)	06:10 20:56	05:32 21:36	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	17:43 (1) 18:19 (1)	07:27 17:10	08:13 16:37
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6	08:31 16:51	08:02 17:38	07:10 18:25	07:04 20:13	18:13 (1) 18:21 (1)	06:06 20:59	05:31 21:37	05:36 21:44	06:12 21:10	06:57 20:10	7 18:09 (1)	17:46 (1) 19:05	07:31 18:14 (1)	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:44	06:13 21:48	06:03 21:08	06:58 20:08	18 18:21 (1)	17:48 (1) 19:03	07:32 18:12 (1)	08:16 16:36
8	08:31 16:53	07:58 17:42	07:06 18:28	07:01 20:16	17:07 (1) 17:39 (1)	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:07	07:00 20:06	18 18:24 (1)	17:51 (1) 19:01	07:34 18:07 (1)	08:18 16:36
9	08:30 16:55	07:57 17:43	07:04 18:30	07:00 20:18	17:06 (1) 17:41 (1)	06:01 21:03	05:30 21:40	05:38 21:42	06:16 21:05	07:01 20:04	25 18:26 (1)	17:57 (1) 18:59	07:46 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:02 18:31	06:56 20:19	17:04 (1) 17:42 (1)	06:00 21:05	05:29 21:41	05:39 21:42	06:18 21:03	07:03 20:02	29 18:27 (1)	17:54 (1) 18:57	07:47 17:01	08:20 16:36
11	08:29 16:57	07:54 17:47	07:00 18:33	06:54 20:21	05:58 17:01 (1)	05:29 21:06	05:40 21:41	06:19 21:41	07:04 21:01	07:04 19:59	33 18:28 (1)	17:52 (1) 18:55	07:49 17:01	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:51 20:22	06:51 17:44 (1)	05:57 21:08	05:29 21:42	06:21 21:40	07:06 21:00	07:06 19:57	36 18:29 (1)	17:50 (1) 18:53	07:51 17:01	08:22 16:36
13	08:28 17:00	07:50 17:50	06:55 18:36	06:49 20:24	17:00 (1) 17:45 (1)	05:55 21:09	05:28 21:42	06:22 21:40	07:07 20:58	07:07 19:55	39 18:30 (1)	17:48 (1) 18:51	07:52 17:01	08:23 16:36
14	08:28 17:01	07:48 17:52	06:53 18:38	06:47 20:26	16:59 (1) 17:45 (1)	05:54 21:10	05:28 21:43	06:23 21:39	07:09 20:56	07:09 19:53	44 18:31 (1)	17:47 (1) 18:49	07:54 17:01	08:24 16:36
15	08:27 17:03	07:47 17:53	06:51 18:39	06:45 20:27	16:58 (1) 17:46 (1)	05:53 21:12	05:28 21:44	06:25 21:38	07:10 20:54	07:10 19:51	45 18:31 (1)	17:46 (1) 18:47	07:55 17:01	08:24 16:36
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:29	16:58 (1) 17:46 (1)	05:51 21:13	05:28 21:44	06:26 21:37	07:12 20:52	07:12 19:49	47 18:31 (1)	17:44 (1) 18:45	07:57 17:01	08:25 16:36
17	08:25 17:06	07:43 17:57	06:47 18:42	06:41 20:30	16:56 (1) 17:46 (1)	05:50 21:15	05:28 21:44	06:28 21:36	07:13 20:50	07:13 19:46	48 18:31 (1)	17:43 (1) 18:43	07:58 17:01	08:26 16:36
18	08:25 17:07	07:41 17:58	06:45 18:44	06:39 20:32	16:56 (1) 17:46 (1)	05:49 21:16	05:28 21:45	06:29 21:35	07:15 20:49	07:15 19:44	49 18:31 (1)	17:42 (1) 18:41	08:00 17:01	08:27 16:36
19	08:24 17:09	07:39 18:00	06:43 18:45	06:37 20:33	16:55 (1) 17:46 (1)	05:47 21:17	05:28 21:45	06:31 21:34	07:16 20:47	07:16 19:42	50 18:32 (1)	17:41 (1) 18:39	08:01 17:01	08:27 16:37
20	08:23 17:10	07:38 18:02	06:40 18:47	06:35 20:35	16:55 (1) 17:46 (1)	05:46 21:19	05:28 21:46	06:32 21:33	07:17 20:45	07:17 19:40	50 18:31 (1)	17:41 (1) 18:37	08:03 17:01	08:28 16:37
21	08:22 17:12	07:36 18:03	06:38 18:49	06:33 20:36	16:55 (1) 17:46 (1)	05:45 21:20	05:28 21:46	06:34 21:32	07:19 20:43	07:19 19:38	51 18:31 (1)	17:40 (1) 18:35	08:05 17:01	08:29 16:38
22	08:21 17:13	07:34 18:05	06:36 18:50	06:31 20:38	16:55 (1) 17:46 (1)	05:44 21:21	05:28 21:46	06:35 21:31	07:20 20:41	07:20 19:36	51 18:31 (1)	17:40 (1) 18:33	08:06 17:01	08:29 16:38
23	08:20 17:15	07:32 18:07	06:34 18:52	06:30 20:39	16:54 (1) 17:45 (1)	05:43 21:22	05:29 21:46	06:37 21:30	07:22 20:39	07:22 19:33	51 18:31 (1)	17:40 (1) 18:31	08:08 17:01	08:30 16:39
24	08:19 17:17	07:30 18:08	06:32 18:53	06:28 20:41	16:54 (1) 17:44 (1)	05:41 21:24	05:29 21:46	06:38 21:28	07:23 20:37	07:23 19:31	51 18:30 (1)	17:39 (1) 18:29	08:09 17:01	08:30 16:44
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	16:55 (1) 17:44 (1)	05:40 21:25	05:29 21:46	06:39 21:27	07:25 20:35	07:25 19:29	51 18:30 (1)	17:39 (1) 17:27	08:01 17:01	08:31 16:40
26	08:17 17:20	07:26 18:12	06:27 18:56	06:24 20:44	16:55 (1) 17:43 (1)	05:39 21:26	05:30 21:46	06:41 21:26	07:26 20:33	07:26 19:27	50 18:29 (1)	17:39 (1) 17:26	08:02 17:01	08:31 16:40
27	08:15 17:21	07:24 18:13	06:25 18:58	06:22 20:45	16:55 (1) 17:42 (1)	05:38 21:27	05:30 21:46	06:42 21:25	07:28 20:31	07:28 19:25	49 18:27 (1)	17:38 (1) 17:24	08:03 17:01	08:31 16:41
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	16:56 (1) 17:42 (1)	05:37 21:28	05:31 21:46	06:44 21:23	07:29 20:29	07:29 19:23	48 18:27 (1)	17:39 (1) 17:22	08:05 17:01	08:31 16:42
29	08:13 17:25	07:21 18:15	06:21 19:01	06:18 20:48	17:56 (1) 18:40 (1)	05:37 21:29	05:31 21:46	06:45 21:22	07:31 20:27	07:31 19:20	47 18:25 (1)	17:38 (1) 17:20	08:06 17:01	08:32 16:43
30	08:12 17:26	07:19 18:12	06:19 19:02	06:17 20:50	17:57 (1) 18:39 (1)	05:36 21:31	05:32 21:46	06:47 21:21	07:32 20:25	07:32 19:18	46 18:25 (1)	17:39 (1) 17:18	08:08 17:01	08:32 16:44
31	08:10 17:28	07:17 18:10	06:17 19:04	06:15 20:49	17:58 (1) 18:37 (1)	05:35 21:32	06:04 21:19	06:48 20:23	07:25 20:23	07:25 19:18	46 18:25 (1)	17:21 17:17	08:07 17:01	08:32 16:44
Potential sun hours	269	283	368	411	475	486	490	447	379	335	261	275	255	
Total, worst case			1151	151					1057		261			
Sun reduction			0.30	0.39					0.39		0.27			
Oper. time red.			1.00	1.00					1.00		1.00			
Wind dir. red.			1.00	1.00					1.00		1.00			
Total reduction			0.30	0.39					0.39		0.27			
Total, real			341	59					416		71			

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: I - Filsdorf, Woneschwee 21

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June
1	08:32 16:46	08:09 17:30	07:20 18:17	08:14 (1) 18:32 (1)	07:15 20:06	06:15 21:33
2	08:32 16:47	08:08 17:31	07:18 18:18	08:16 (1) 18:29 (1)	07:13 20:07	06:13 21:34
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:09	06:11 20:55	05:33 21:35
4	08:32 16:49	08:05 17:35	07:14 18:22	07:08 20:10	06:10 20:56	05:32 21:36
5	08:32 16:50	08:03 17:37	07:12 18:23	07:06 20:12	06:08 20:58	05:32 21:37
6	08:31 16:51	08:02 17:38	07:10 18:25	07:04 20:13	06:06 20:59	05:31 21:38
7	08:31 16:52	08:00 17:40	07:08 18:27	07:02 20:15	06:05 21:00	05:31 21:38
8	08:31 16:54	07:59 17:42	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39
9	08:30 16:55	07:57 17:43	07:04 18:30	06:58 20:18	06:02 21:03	05:30 21:40
10	08:30 16:56	07:55 17:45	07:02 18:31	06:56 20:19	06:00 21:05	05:29 21:41
11	08:29 16:57	07:54 17:47	07:00 18:33	06:54 20:21	05:58 21:06	05:29 21:41
12	08:29 16:59	07:52 17:48	06:58 18:34	06:52 20:23	05:57 21:08	05:29 21:42
13	08:28 17:00	07:50 17:50	06:55 18:36	06:50 20:24	05:56 21:09	05:28 21:43
14	08:28 17:01	07:49 17:52	06:53 18:38	06:47 20:26	05:54 21:11	05:28 21:43
15	08:27 17:03	07:47 17:54	06:51 18:39	06:45 20:27	05:53 21:12	05:28 21:44
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:29	05:51 21:13	05:28 21:44
17	08:26 17:06	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:15	05:28 21:45
18	08:25 17:07	07:41 17:59	06:45 18:44	06:39 20:32	05:49 21:16	05:28 21:45
19	08:24 17:09	07:40 18:00	06:43 18:46	06:37 20:33	05:47 21:17	05:28 21:45
20	08:23 17:10	07:38 18:02	06:40 18:47	06:35 20:35	05:46 21:19	05:28 21:46
21	08:22 17:12	07:36 18:04	06:38 18:49	06:34 20:36	05:45 21:20	05:28 21:46
22	08:21 17:13	07:34 18:05	06:36 18:50	06:32 20:38	05:44 21:21	05:29 21:46
23	08:20 17:15	07:32 18:07	06:34 18:52	06:30 20:39	05:43 21:23	05:29 21:46
24	08:19 17:17	07:30 18:09	06:32 18:53	06:28 20:41	05:42 21:24	05:29 21:46
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46
26	08:17 17:20	07:26 18:12	06:28 18:56	06:24 20:44	05:39 21:26	05:30 21:46
27	08:15 17:22	07:24 18:14	06:25 18:58	06:22 20:45	05:38 21:27	05:30 21:46
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:38 21:28	05:31 21:46
29	08:13 17:25		06:21 20:01	06:18 20:49	05:37 21:30	05:31 21:46
30	08:12 17:26		06:19 20:03	06:17 20:50	05:36 21:31	05:32 21:46
31	08:10 17:28		06:17 20:04		05:35 21:32	05:32 21:46
Potential sun hours	269	283	368	411	475	486
Total, worst case		480	31		54	636
Sun reduction		0,26	0,30		0,43	0,40
Oper. time red.		1,00	1,00		1,00	1,00
Wind dir. red.		1,00	1,00		1,00	1,00
Total reduction		0,26	0,30		0,43	0,40
Total, real		125	9		23	257

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: I - Filsdorf, Woneschwee 21

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	July	August	September	October	November	December
1	05:32 21:46	06:24 (3) 06:46 (3)	06:05 21:18	06:50 20:21	07:34 19:16	07:23 17:15
2	05:33 21:46	06:25 (3) 06:46 (3)	06:07 21:16	06:51 20:19	07:35 19:14	07:24 17:13
3	05:34 21:45	06:26 (3) 06:47 (3)	06:08 21:15	06:53 20:17	07:37 19:12	07:26 17:12
4	05:34 21:45	06:25 (3) 06:46 (3)	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10
5	05:35 21:45	06:26 (3) 06:47 (3)	06:11 21:12	06:56 20:12	07:40 19:08	07:29 17:09
6	05:36 21:44	06:27 (3) 06:47 (3)	06:12 21:10	06:57 20:10	07:41 19:06	07:31 17:07
7	05:37 21:44	06:27 (3) 06:47 (3)	06:14 21:08	06:59 20:08	07:43 19:03	07:32 17:05
8	05:37 21:43	06:28 (3) 06:47 (3)	06:15 21:07	07:00 20:06	07:44 19:01	07:34 17:04
9	05:38 21:43	06:27 (3) 06:46 (3)	06:16 21:05	07:01 20:04	07:46 18:59	07:36 17:02
10	05:39 21:42	06:28 (3) 06:46 (3)	06:18 21:03	07:03 20:02	07:48 18:57	07:37 17:01
11	05:40 21:41	06:29 (3) 06:46 (3)	06:19 21:01	07:04 19:59	07:49 18:55	07:39 17:00
12	05:41 21:40	06:30 (3) 06:45 (3)	07:06 21:00	07:51 19:57	08:49 (1) 18:53	07:40 16:58
13	05:42 21:40	06:30 (3) 06:45 (3)	07:07 20:58	07:52 19:55	08:46 (1) 18:51	07:42 16:57
14	05:43 21:39	06:31 (3) 06:44 (3)	07:09 20:56	07:54 19:53	08:45 (1) 18:49	07:44 16:55
15	05:44 21:38	06:33 (3) 06:43 (3)	07:10 20:54	07:55 19:51	08:44 (1) 18:47	07:45 16:54
16	05:45 21:37	06:34 (3) 06:42 (3)	07:12 20:52	07:57 19:49	08:42 (1) 18:45	07:47 16:53
17	05:46 21:36	06:28 20:51	07:13 19:46	07:58 18:43	08:42 (1) 18:41	07:48 16:52
18	05:47 21:35	06:29 20:49	07:15 19:44	08:00 18:41	08:41 (1) 18:39	07:50 16:51
19	05:49 21:34	06:31 20:47	07:16 19:42	08:02 18:39	08:40 (1) 18:37	07:52 16:49
20	05:50 21:33	06:32 20:45	07:18 19:40	08:03 18:37	08:40 (1) 18:35	07:53 16:48
21	05:51 21:32	06:34 20:43	07:19 19:38	08:05 18:35	08:40 (1) 18:33	07:55 16:47
22	05:52 21:31	06:35 20:41	07:20 19:36	08:06 18:33	08:39 (1) 18:31	07:56 16:46
23	05:53 21:30	06:37 20:39	07:22 19:33	08:08 18:31	08:40 (1) 18:29	07:58 16:45
24	05:55 21:29	06:38 20:37	07:23 19:31	08:10 18:29	08:40 (1) 18:27	07:59 16:44
25	05:56 21:27	06:40 20:35	07:25 19:29	07:11 17:28	07:40 (1) 18:09	08:01 16:43
26	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:26	07:41 (1) 18:08	08:02 16:43
27	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	07:42 (1) 18:08	08:04 16:42
28	06:00 21:23	06:44 20:29	07:29 19:23	07:16 17:22	07:43 (1) 18:07	08:05 16:41
29	06:01 21:22	06:45 20:27	07:31 19:20	07:18 17:20	07:44 (1) 18:05	08:06 16:40
30	06:02 21:21	06:47 20:25	07:32 19:18	07:19 17:19	07:46 (1) 18:03	08:08 16:40
31	06:04 21:19	06:48 20:23	07:21 17:17	07:21 17:17	07:48 (1) 18:01	08:32 16:45
Potential sun hours	490	447	379	335	275	255
Total, worst case	280			517	3	
Sun reduction	0,46			0,27	0,18	
Oper. time red.	1,00			1,00	1,00	
Wind dir. red.	1,00			1,00	1,00	
Total reduction	0,46			0,27	0,18	
Total, real	127			140	1	

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: J - Filsdorf, Am Eck 19

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June
1	08:32 16:46	08:09 17:30	08:58 (1) 09:19 (1)	07:20 18:17	07:15 20:06	06:15 20:52
2	08:32 16:47	08:08 17:31	09:00 (1) 09:18 (1)	07:18 18:18	07:13 20:07	22 07:36 (3) 06:13 20:53
3	08:32 16:48	08:06 17:33	09:01 (1) 09:16 (1)	07:16 18:20	07:10 20:09	20 07:34 (3) 06:11 20:55
4	08:32 16:49	09:00 (1) 09:02 (1)	08:05 17:35	07:14 18:22	07:08 20:10	19 07:34 (3) 06:10 20:56
5	08:32 16:50	09:00 (1) 09:05 (1)	08:03 17:37	07:12 18:23	07:06 20:12	16 07:32 (3) 06:08 20:58
6	08:31 16:51	08:59 (1) 09:06 (1)	08:02 17:38	07:10 18:25	07:04 20:13	13 07:30 (3) 06:06 20:59
7	08:31 16:52	08:59 (1) 09:08 (1)	08:00 17:40	07:08 18:27	07:02 20:15	8 07:28 (3) 06:05 21:00
8	08:31 16:54	08:58 (1) 09:09 (1)	07:59 17:42	07:06 18:28	07:00 20:16	06:03 21:02
9	08:30 16:55	08:58 (1) 09:11 (1)	07:57 17:43	07:04 18:30	06:58 20:18	06:02 21:03
10	08:30 16:56	08:57 (1) 09:12 (1)	07:55 17:45	07:02 18:31	06:56 20:19	21:00 21:05
11	08:29 16:57	08:57 (1) 09:13 (1)	07:54 17:47	07:00 18:33	06:54 20:21	05:58 21:06
12	08:29 16:59	08:56 (1) 09:14 (1)	07:52 17:48	06:58 18:35	06:52 20:23	05:57 21:08
13	08:28 17:00	08:55 (1) 09:15 (1)	07:50 17:50	06:55 18:36	06:50 20:24	05:56 21:09
14	08:28 17:01	08:55 (1) 09:16 (1)	07:49 17:52	06:53 18:38	06:47 20:26	05:54 21:11
15	08:27 17:03	08:54 (1) 09:17 (1)	07:47 17:54	06:51 18:39	06:45 20:27	05:53 21:12
16	08:26 17:04	08:53 (1) 09:18 (1)	07:45 17:55	06:49 18:41	06:43 20:29	05:51 21:13
17	08:26 17:06	08:52 (1) 09:18 (1)	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:15
18	08:25 17:07	08:52 (1) 09:19 (1)	07:41 17:59	06:45 18:44	06:39 20:32	05:49 21:16
19	08:24 17:09	08:52 (1) 09:20 (1)	07:40 18:00	06:43 18:46	06:37 20:33	05:47 21:17
20	08:23 17:10	08:52 (1) 09:20 (1)	07:38 18:02	06:40 18:47	06:35 20:35	11 07:32 (3) 05:46 21:19
21	08:22 17:12	08:53 (1) 09:21 (1)	07:36 18:04	06:38 18:49	06:34 20:36	15 07:35 (3) 05:45 21:20
22	08:21 17:13	08:53 (1) 09:21 (1)	07:34 18:05	06:36 18:50	06:32 20:38	18 07:36 (3) 05:44 21:21
23	08:20 17:15	08:53 (1) 09:22 (1)	07:32 18:07	06:34 18:52	06:30 20:39	21 07:37 (3) 05:43 21:23
24	08:19 17:17	08:53 (1) 09:21 (1)	07:30 18:09	06:32 18:53	06:28 20:41	22 07:37 (3) 05:42 21:24
25	08:18 17:18	08:53 (1) 09:22 (1)	07:28 18:10	06:30 18:55	06:26 20:42	23 07:37 (3) 05:40 21:25
26	08:17 17:20	08:54 (1) 09:22 (1)	07:26 18:12	06:28 18:56	06:24 20:44	23 07:37 (3) 05:39 21:26
27	08:15 17:21	08:54 (1) 09:21 (1)	07:24 18:14	06:25 18:58	06:22 20:45	24 07:37 (3) 05:38 21:27
28	08:14 17:23	08:55 (1) 09:22 (1)	07:22 18:15	06:23 18:59	06:20 20:47	25 07:38 (3) 05:38 21:29
29	08:13 17:25	08:56 (1) 09:22 (1)		07:21 20:01	06:18 20:49	24 07:37 (3) 05:37 21:30
30	08:12 17:26	08:56 (1) 09:21 (1)		07:19 20:03	06:17 20:50	23 07:36 (3) 05:36 21:31
31	08:10 17:28	08:58 (1) 09:20 (1)		07:17 20:04		23 07:37 (3) 05:35 21:32
Potential sun hours	269	283	368	412	475	486
Total, worst case	591	63		252	98	
Sun reduction	0,15	0,26		0,39	0,43	
Oper. time red.	1,00	1,00		1,00	1,00	
Wind dir. red.	1,00	1,00		1,00	1,00	
Total reduction	0,15	0,26		0,39	0,43	
Total, real	88	16		99	42	

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: J - Filsdorf, Am Eck 19

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	July	August	September	October	November	December
1	05:32 21:46	06:05 21:18	06:50 20:21	07:34 19:16	07:23 17:15	08:09 16:39
2	05:33 21:46	06:07 21:16	06:51 20:19	07:35 19:14	07:24 17:13	16 08:55 (1) 15 08:55 (1)
3	05:33 21:45	06:08 21:15	06:53 20:17	07:37 19:12	07:26 17:12	08:12 16:38
4	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	13 08:54 (1) 11 08:54 (1)
5	05:35 21:45	06:11 21:12	06:56 20:12	07:40 19:08	07:29 17:09	08:14 16:37
6	05:36 21:44	06:12 21:10	07:33 (3) 20:10	06:57 19:06	07:31 17:07	9 08:53 (1) 7 08:52 (1)
7	05:36 21:44	06:14 21:08	07:28 (3) 20:08	06:59 19:03	07:32 17:05	08:34 (1) 11 08:45 (1)
8	05:37 21:43	06:15 21:07	07:26 (3) 20:06	07:00 19:01	07:34 17:04	16:36 15 08:47 (1)
9	05:38 21:43	06:16 21:05	07:25 (3) 20:04	07:01 18:59	07:36 17:02	08:31 (1) 18 08:49 (1)
10	05:39 21:42	06:18 21:03	07:24 (3) 20:02	07:03 18:57	07:37 17:01	16:36 21 08:50 (1)
11	05:40 21:41	06:19 21:01	07:22 (3) 20:00	07:04 18:55	07:39 17:00	08:28 (1) 23 08:51 (1)
12	05:41 21:40	06:21 21:00	07:22 (3) 20:00	07:06 18:53	07:40 17:00	08:28 (1) 25 08:53 (1)
13	05:42 21:40	06:22 20:58	07:21 (3) 20:00	07:07 18:51	07:42 16:57	08:28 (1) 26 08:54 (1)
14	05:43 21:39	06:24 20:56	07:20 (3) 20:00	07:09 18:49	07:44 16:55	08:27 (1) 26 08:53 (1)
15	05:44 21:38	06:25 20:54	07:21 (3) 20:00	07:10 18:47	07:45 16:54	08:27 (1) 27 08:54 (1)
16	05:45 21:37	06:26 20:52	07:20 (3) 20:00	07:12 18:45	07:47 16:53	08:27 (1) 28 08:55 (1)
17	05:46 21:36	06:28 20:51	07:21 (3) 20:00	07:13 18:43	07:48 16:52	08:27 (1) 29 08:56 (1)
18	05:47 21:35	06:29 20:49	07:20 (3) 20:00	07:15 18:41	07:50 16:51	08:27 (1) 28 08:55 (1)
19	05:49 21:34	06:31 20:47	07:20 (3) 20:00	07:16 18:39	07:52 16:49	08:27 (1) 29 08:56 (1)
20	05:50 21:33	06:32 20:45	07:21 (3) 20:00	07:18 18:37	07:53 16:48	08:28 (1) 28 08:56 (1)
21	05:51 21:32	06:34 20:43	07:21 (3) 20:00	07:19 18:35	07:55 16:47	08:28 (1) 28 08:56 (1)
22	05:52 21:31	06:35 20:41	07:22 (3) 20:00	07:20 18:33	07:56 16:46	08:28 (1) 28 08:56 (1)
23	05:53 21:30	06:37 20:39	07:24 (3) 20:00	07:22 18:31	07:58 16:45	08:29 (1) 28 08:57 (1)
24	05:55 21:29	06:38 20:37	07:25 (3) 20:00	07:23 18:29	07:59 16:44	08:29 (1) 27 08:56 (1)
25	05:56 21:27	06:40 20:35	07:25 (3) 20:00	07:25 18:29	08:01 16:43	08:30 (1) 27 08:57 (1)
26	05:57 21:26	06:41 20:33	07:26 (3) 20:00	07:26 18:28	08:02 16:43	08:31 (1) 25 08:56 (1)
27	05:58 21:25	06:42 20:31	07:28 (3) 20:00	07:28 18:25	08:04 16:42	08:33 (1) 23 08:56 (1)
28	06:00 21:23	06:44 20:29	07:29 (3) 20:00	07:29 18:23	08:05 16:41	08:34 (1) 22 08:56 (1)
29	06:01 21:22	06:45 20:27	07:31 (3) 20:00	07:31 18:20	08:06 16:40	08:36 (1) 20 08:56 (1)
30	06:02 21:21	06:47 20:25	07:32 (3) 20:00	07:32 18:19	08:08 16:40	08:37 (1) 18 08:55 (1)
31	06:04 21:19	06:48 20:23	07:33 (3) 20:00	07:33 18:17	08:09 16:40	08:38 (1) 16:44
Potential sun hours	491	447	379	335	275	255
Total, worst case		355			580	78
Sun reduction		0,47			0,18	0,14
Oper. time red.		1,00			1,00	1,00
Wind dir. red.		1,00			1,00	1,00
Total reduction		0,47			0,18	0,14
Total, real		167			103	11

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

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



## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: K - Dalheim, Redoutewee 5

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46	08:09 17:30	07:20 18:17	07:15 20:06	06:15 20:52	05:34 21:33	05:32 21:46	06:05 21:18	06:50 20:21	07:34 19:16	07:23 17:15	08:09 16:39
2	08:32 16:47	08:08 17:31	07:18 18:18	07:13 20:07	06:13 20:53	05:33 21:34	05:33 21:46	06:06 21:16	06:51 20:19	07:35 19:14	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:09	06:11 20:55	05:33 21:35	05:33 21:45	06:08 21:15	06:53 20:17	07:37 19:12	07:26 17:12	08:12 16:38
4	08:32 16:49	08:05 17:35	07:14 18:22	07:08 20:10	06:10 20:56	05:32 21:36	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:37
5	08:32 16:50	08:03 17:36	07:12 18:23	07:06 20:12	06:08 20:58	05:31 21:37	05:35 21:45	06:11 21:12	06:56 20:12	07:40 19:08	07:29 17:08	08:14 16:37
6	08:31 16:51	08:02 17:38	07:10 18:25	07:04 20:13	06:06 20:59	05:31 21:38	05:36 21:44	06:12 21:10	06:57 20:10	07:41 19:05	07:31 17:07	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:44	06:13 21:08	06:58 20:08	07:43 19:03	07:32 17:05	08:17 16:36
8	08:31 16:53	07:59 17:42	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:07	07:00 20:06	07:44 19:01	07:34 17:04	08:18 16:36
9	08:30 16:55	07:57 17:43	07:04 18:30	06:58 20:18	06:01 21:03	05:30 21:40	05:38 21:43	06:16 21:05	07:01 20:04	07:46 18:59	07:36 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:02 18:31	06:56 20:19	06:00 21:05	05:29 21:41	05:39 21:42	06:18 21:03	07:03 20:02	07:47 18:57	07:37 17:01	08:20 16:36
11	08:29 16:57	07:54 17:47	07:00 18:33	06:54 20:21	05:58 21:06	05:29 21:41	05:40 21:41	06:19 21:01	07:04 19:59	07:49 18:55	07:39 16:59	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:52 20:23	05:57 21:08	05:29 21:42	05:41 21:40	06:21 21:00	07:06 19:57	07:51 18:53	07:40 16:58	08:22 16:36
13	08:28 17:00	07:50 17:50	06:55 18:36	06:49 20:24	05:55 21:09	05:28 21:43	05:42 21:40	06:22 20:58	07:07 19:55	07:52 18:51	07:42 16:57	08:23 16:36
14	08:28 17:01	07:48 17:52	06:53 18:38	06:47 20:26	05:54 21:11	05:28 21:43	05:43 21:39	06:23 20:56	07:09 19:53	07:54 18:49	07:44 16:55	08:24 16:36
15	08:27 17:03	07:47 17:53	06:51 18:39	06:45 20:27	05:53 21:12	05:28 21:44	05:44 21:38	06:25 20:54	07:10 19:51	07:55 18:47	07:45 16:54	08:25 16:36
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:29	05:51 21:13	05:28 21:44	05:45 21:37	06:26 20:52	07:12 19:49	07:57 18:45	07:47 16:53	08:25 16:36
17	08:26 17:06	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:15	05:28 21:45	05:46 21:36	06:28 20:51	07:13 19:46	07:58 18:43	07:48 16:52	08:26 16:36
18	08:25 17:07	07:41 17:58	06:45 18:44	06:39 20:32	05:49 21:16	05:28 21:45	05:47 21:35	06:29 20:49	07:15 19:44	08:00 18:41	07:50 16:50	08:27 16:36
19	08:24 17:09	07:39 18:00	06:43 18:45	06:37 20:33	05:47 21:17	05:28 21:45	05:48 21:34	06:31 20:47	07:16 19:42	08:02 18:39	07:52 16:49	08:28 16:37
20	08:23 17:10	07:38 18:02	06:40 18:47	06:35 20:35	05:46 21:19	05:28 21:46	05:50 21:33	06:32 20:45	07:17 19:40	08:03 18:37	07:53 16:48	08:28 16:37
21	08:22 17:12	07:36 18:04	06:38 18:49	06:33 20:36	05:45 21:20	05:28 21:46	05:51 21:32	06:34 20:43	07:19 19:38	08:05 18:35	07:55 16:47	08:29 16:38
22	08:21 17:13	07:34 18:05	06:36 18:50	06:32 20:38	05:44 21:21	05:28 21:46	05:52 21:31	06:35 20:41	07:20 19:36	08:06 18:33	07:56 16:46	08:29 16:38
23	08:20 17:15	07:32 18:07	06:34 18:52	06:30 20:39	05:43 21:23	05:29 21:46	05:53 21:30	06:37 20:39	07:22 19:33	08:08 18:31	07:58 16:45	08:30 16:39
24	08:19 17:17	07:30 18:08	06:32 18:53	06:28 20:41	05:41 21:24	05:29 21:46	05:54 21:29	06:38 20:37	07:23 19:31	08:10 18:29	07:59 16:44	08:30 16:39
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	08:01 16:43	08:31 16:40
26	08:17 17:20	07:26 18:12	06:28 18:56	06:24 20:44	05:39 21:26	05:30 21:46	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:26	08:02 16:43	08:31 16:40
27	08:15 17:21	07:24 18:13	06:25 18:58	06:22 20:45	05:38 21:27	05:30 21:46	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	08:04 16:42	08:31 16:41
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:37 21:28	05:30 21:46	06:00 21:23	06:44 20:29	07:29 19:23	07:16 17:22	08:05 16:41	08:32 16:42
29	08:13 17:25		07:21 20:01	06:18 20:48	05:37 21:30	05:31 21:46	06:01 21:22	06:45 20:27	07:31 19:20	07:18 17:20	08:06 16:40	08:32 16:43
30	08:12 17:26		07:19 20:02	06:17 20:50	05:36 21:31	05:32 21:46	06:02 21:21	06:47 20:25	07:32 19:18	07:19 17:18	08:08 16:40	08:32 16:44
31	08:10 17:28		07:17 20:04		05:35 21:32		06:04 21:19	06:48 20:23		07:21 17:17		08:32 16:44
Potential sun hours	269	283	368	412	475	486	491	447	379	335	275	255
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

## SHADOW - Calendar

Calculation: Schadow WEA 2 Mondorf Shadow receptor: L - Welfrange, Munneréferwee 15  
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [TRIER]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
1,29 2,62 3,51 5,39 6,60 6,56 7,20 6,77 4,98 2,92 1,63 1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:32 16:46	08:09 17:30	07:20 18:17	17:17 (3) 17:35 (3)	07:15 20:06	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:18	06:50 20:21	07:34 19:16	07:22 17:15	08:09 16:39
2	08:32 16:47	08:07 17:31	07:18 18:18	17:17 (3) 17:34 (3)	07:12 20:07	06:13 20:53	05:33 21:34	05:33 21:46	06:06 21:16	06:51 20:19	07:35 19:14	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	17:17 (3) 17:34 (3)	07:10 20:09	06:11 20:54	05:33 21:35	05:33 21:45	06:08 21:15	06:53 20:16	07:37 19:12	07:26 17:12	08:12 16:38
4	08:32 16:49	08:05 17:35	07:14 18:22	17:18 (3) 17:32 (3)	07:08 20:10	06:10 20:56	05:32 21:36	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:37
5	08:32 16:50	08:03 17:36	07:12 18:23	17:20 (3) 17:31 (3)	07:06 20:12	06:08 20:57	05:31 21:37	05:35 21:44	06:11 21:11	06:56 20:12	07:40 19:07	07:29 17:08	08:14 16:37
6	08:31 16:51	08:02 17:38	07:10 18:25	17:24 (3) 17:27 (3)	07:04 20:13	06:06 20:59	05:31 21:37	05:36 21:44	06:12 21:10	06:57 20:10	07:41 19:05	07:31 17:07	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:44	06:13 21:08	06:58 20:08	07:43 19:03	07:32 17:05	08:17 16:36	
8	08:31 16:53	07:58 17:41	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:07	07:00 20:06	07:44 19:01	17:56 (3) 18:04 (3)	07:34 17:04	08:18 16:36
9	08:30 16:55	07:57 17:43	07:04 18:30	06:58 20:18	06:01 21:03	05:29 21:40	05:38 21:42	06:16 21:05	07:01 20:04	07:46 18:59	17:54 (3) 18:07 (3)	07:36 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:02 18:31	06:56 20:19	06:00 21:05	05:29 21:41	05:39 21:42	06:18 21:03	07:03 20:02	07:47 18:57	17:52 (3) 18:07 (3)	07:37 17:01	08:20 16:36
11	08:29 16:57	07:54 17:47	06:59 18:33	06:54 20:21	05:58 21:06	05:29 21:41	05:40 21:41	06:19 21:01	07:04 19:59	07:49 18:55	17:51 (3) 18:08 (3)	07:39 16:59	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:51 20:22	05:57 21:08	05:29 21:42	05:41 21:40	06:21 21:00	07:06 19:57	07:51 18:53	17:51 (3) 18:09 (3)	07:40 16:58	08:22 16:36
13	08:28 17:00	07:50 17:50	06:55 18:36	06:49 20:24	05:55 21:09	05:28 21:43	05:42 21:40	06:22 20:58	07:07 19:55	07:52 18:51	17:50 (3) 18:08 (3)	07:42 16:57	08:23 16:36
14	08:28 17:01	07:48 17:52	06:53 18:38	06:47 20:25	05:54 21:10	05:28 21:43	05:43 21:39	06:23 20:56	07:09 19:53	07:54 18:49	17:50 (3) 18:08 (3)	07:44 16:55	08:24 16:36
15	08:27 17:03	07:47 17:53	06:51 18:39	06:45 20:27	05:53 21:12	05:28 21:44	05:44 21:38	06:25 20:54	07:10 19:51	07:55 18:47	17:50 (3) 18:08 (3)	07:45 16:54	08:25 16:36
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:29	05:51 21:13	05:28 21:44	05:45 21:37	06:26 20:52	07:12 19:49	07:57 18:45	17:50 (3) 18:07 (3)	07:47 16:53	08:25 16:36
17	08:25 17:06	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:15	05:28 21:45	05:46 21:36	06:28 20:50	07:13 19:46	07:58 18:43	17:51 (3) 18:06 (3)	07:48 16:52	08:26 16:36
18	08:25 17:07	07:41 17:58	06:45 18:44	06:39 20:32	05:48 21:16	05:28 21:45	05:47 21:35	06:29 20:49	07:14 19:44	08:00 18:41	17:51 (3) 18:04 (3)	07:50 16:50	08:27 16:36
19	08:24 17:09	07:39 18:00	06:42 18:45	06:37 20:33	05:47 21:17	05:28 21:45	05:48 21:34	06:31 20:47	07:16 19:42	08:01 18:39	17:53 (3) 18:02 (3)	07:52 16:49	08:28 16:37
20	08:23 17:10	07:38 18:02	06:40 18:47	06:35 20:35	05:46 21:19	05:28 21:46	05:50 21:33	06:32 20:45	07:17 19:40	08:03 18:37	17:53 (3) 18:02 (3)	07:53 16:48	08:28 16:37
21	08:22 17:12	07:36 18:03	06:38 18:48	06:33 20:36	05:45 21:20	05:28 21:46	05:51 21:32	06:34 20:43	07:19 19:38	08:05 18:35	17:53 (3) 18:02 (3)	07:55 16:47	08:29 16:37
22	08:21 17:13	07:34 18:05	06:36 18:50	06:31 20:38	05:44 21:21	05:28 21:46	05:52 21:31	06:35 20:41	07:20 19:35	08:06 18:33	17:53 (3) 18:02 (3)	07:56 16:46	08:29 16:38
23	08:20 17:15	07:32 18:07	06:34 18:52	06:30 20:39	05:42 21:22	05:29 21:46	05:53 21:30	06:36 20:39	07:22 19:33	08:08 18:31	17:53 (3) 18:02 (3)	07:58 16:45	08:30 16:38
24	08:19 17:16	07:30 18:08	06:32 18:53	06:28 20:41	05:41 21:24	05:29 21:46	05:54 21:28	06:38 20:37	07:23 19:31	08:09 18:29	17:53 (3) 18:02 (3)	07:59 16:44	08:30 16:39
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	17:53 (3) 18:02 (3)	08:01 16:43	08:31 16:40
26	08:17 17:20	07:26 18:12	06:27 18:56	06:24 20:44	05:39 21:26	05:30 21:46	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:26	17:53 (3) 18:02 (3)	08:02 16:42	08:31 16:40
27	08:15 17:21	07:24 18:13	06:25 18:58	06:22 20:45	05:38 21:27	05:30 21:46	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	17:53 (3) 18:02 (3)	08:04 16:42	08:31 16:41
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:37 21:28	05:30 21:46	06:00 21:23	06:44 20:29	07:29 19:22	07:16 17:22	17:53 (3) 18:02 (3)	08:05 16:41	08:31 16:42
29	08:13 17:25	07:21 18:11	06:21 19:01	06:18 20:01	05:36 21:30	05:31 21:46	06:01 21:22	06:45 20:27	07:31 19:20	07:18 17:20	17:53 (3) 18:02 (3)	08:06 16:40	08:32 16:43
30	08:12 17:26	07:20 18:10	06:19 19:00	06:17 20:02	05:36 21:31	05:31 21:46	06:02 21:21	06:47 20:25	07:32 17:18	07:19 17:18	17:53 (3) 18:02 (3)	08:08 16:40	08:32 16:43
31	08:10 17:28	07:18 18:08	06:17 19:00	06:15 20:04	05:35 21:32	05:31 21:46	06:04 21:19	06:48 20:23	07:31 17:17	07:18 17:17	17:53 (3) 18:02 (3)	08:09 16:40	08:32 16:44
Potential sun hours	269	283	368	412	475	486	491	447	379	335	275	255	
Total, worst case		98	80							179			
Sun reduction		0,26	0,30							0,27			
Oper. time red.		1,00	1,00							1,00			
Wind dir. red.		1,00	1,00							1,00			
Total reduction		0,26	0,30							0,27			
Total, real		25	24							48			

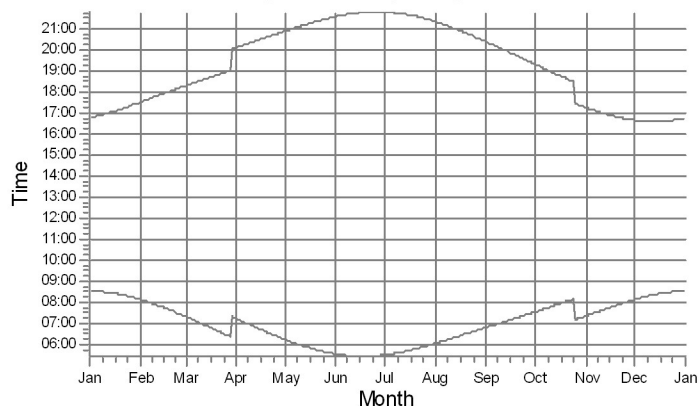
Table layout: For each day in each month the following matrix apply

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

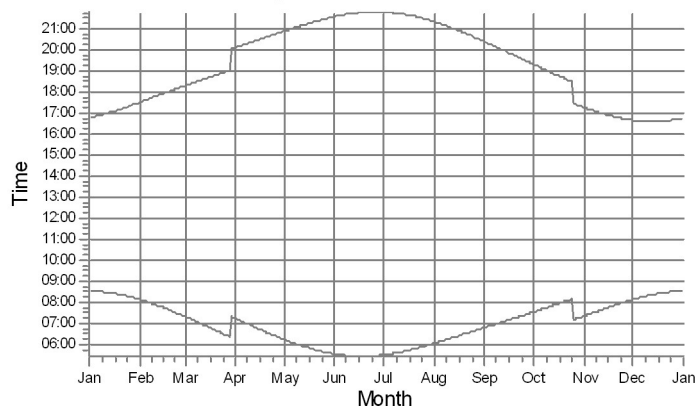
## SHADOW - Calendar, graphical

Calculation: Schadow WEA 2 Mondorf

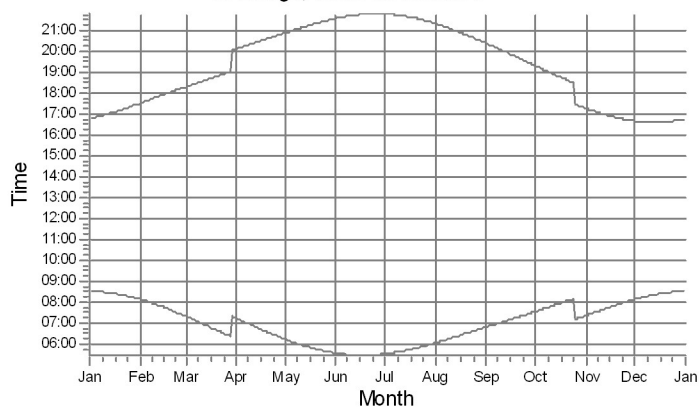
A: Ellange, Route d'Erpeldange 30



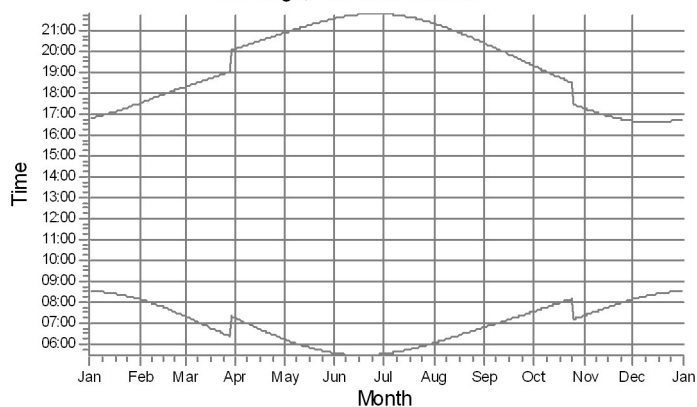
B: Ellange, Rue du Cimetiere 23



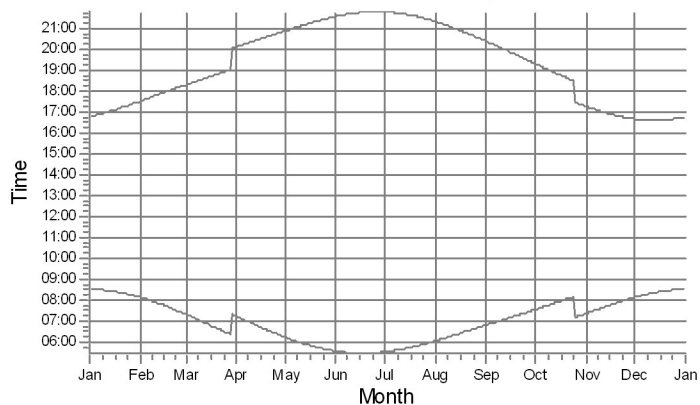
C: Ellange, Route de Renich 1



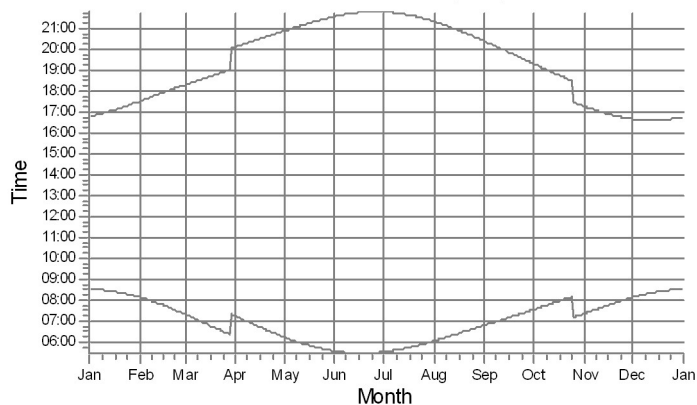
D: Ellange, Rue de la Gare 10



E: Mondorf-les-Bains, Hannert de Wangerten 3



F: Altwies, Rue des Romains (limite)

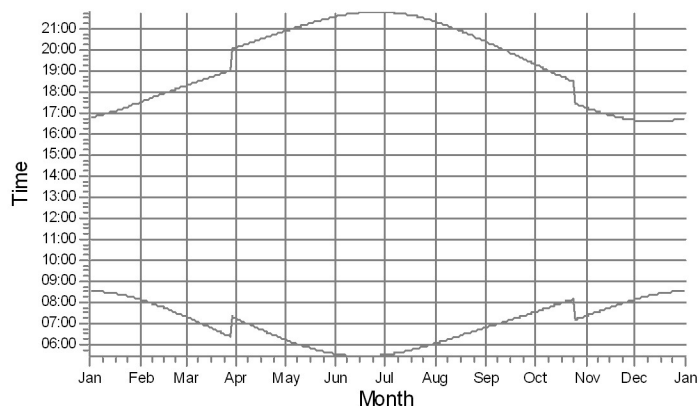


WTGs

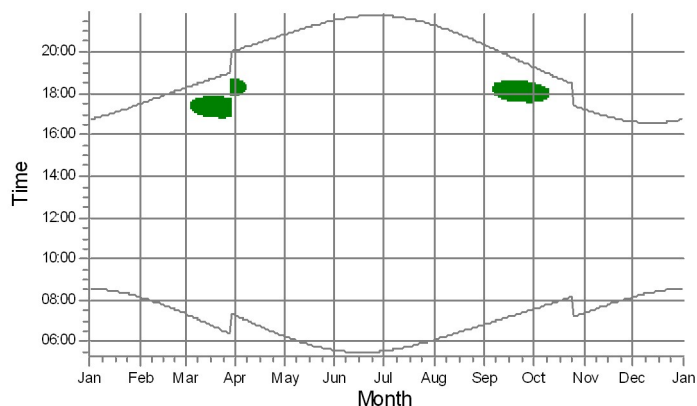
## SHADOW - Calendar, graphical

Calculation: Schadow WEA 2 Mondorf

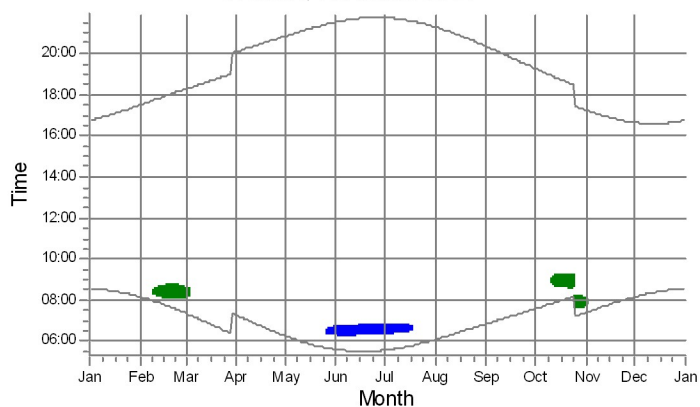
G: Altwies, Rue des Romains 61



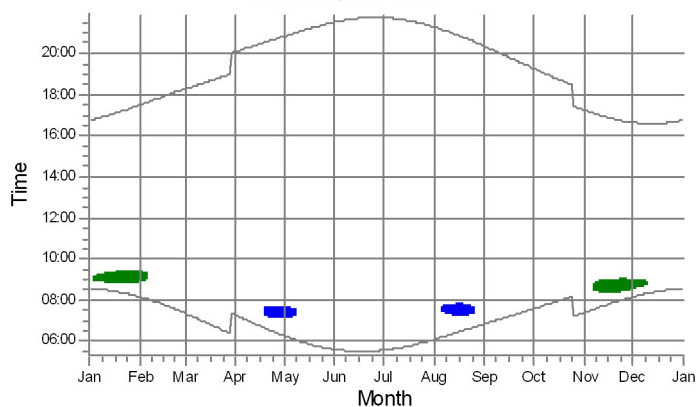
H: Altwies, Bremhaff 1



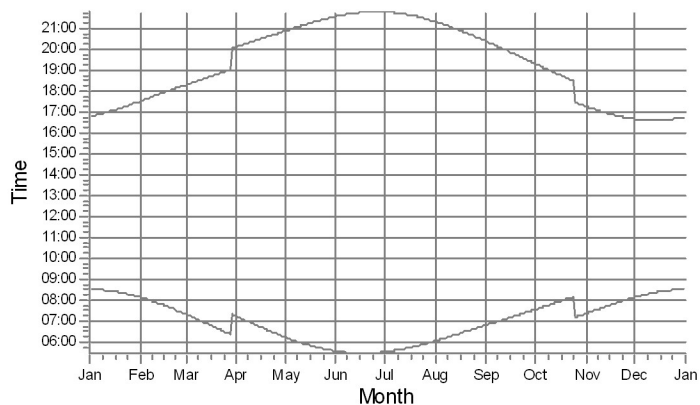
I: Filsdorf, Woneschwee 21



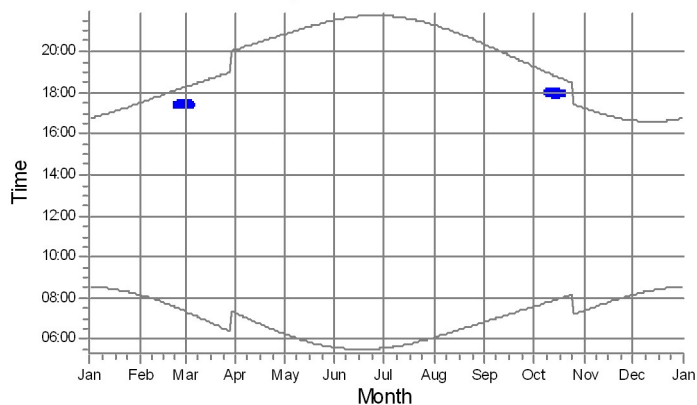
J: Filsdorf, Am Eck 19



K: Dalheim, Redoutewe 5



L: Welfrange, Munnerferwe 15



WTGs

1: WP Mondorf WEA 2 3: WP Duelem WEA 3

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 1 - WP Mondorf WEA 2

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June
1	08:32 16:46	08:09 08:58-09:19/21 17:30	07:20 08:14-08:32/18 18:17	07:15 17:59-18:36/37 20:06	06:15 20:51	05:34 21:33
2	08:32 16:47	08:08 09:00-09:18/18 17:31	07:18 08:16-08:29/13 18:18	07:13 18:01-18:34/33 20:07	06:13 20:53	05:33 21:34
3	08:32 16:48	08:06 09:01-09:16/15 17:33	07:16 18:20	07:10 18:03-18:32/29 20:09	06:11 20:54	05:33 21:35
4	08:32 09:00-09:02/2 16:49	08:05 09:05-09:14/9 17:35	07:14 18:22	07:08 18:05-18:30/25 20:10	06:10 20:56	05:32 21:36
5	08:32 09:00-09:05/5 16:50	08:03 17:36	07:12 17:19-17:29/10 18:23	07:06 18:08-18:27/19 20:12	06:08 20:57	05:32 21:37
6	08:31 08:59-09:06/7 16:51	08:02 17:38	07:10 17:14-17:34/20 18:25	07:04 18:13-18:21/8 20:13	06:06 20:59	05:31 21:37
7	08:31 08:59-09:08/9 16:52	08:00 17:40	07:08 17:11-17:37/26 18:26	07:02 20:15	06:05 21:00	05:30 21:38
8	08:31 08:58-09:09/11 16:53	07:58 17:42	07:06 17:08-17:39/31 18:28	07:00 20:16	06:03 21:02	05:30 21:39
9	08:30 08:58-09:11/13 16:55	07:57 17:43	07:04 17:06-17:41/35 18:30	06:58 20:18	06:02 21:03	05:30 21:40
10	08:30 08:57-09:12/15 16:56	07:55 08:22-08:28/6 17:45	07:02 17:04-17:42/38 18:31	06:56 20:19	06:00 21:05	05:29 21:41
11	08:29 08:57-09:13/16 16:57	07:54 08:18-08:32/14 17:47	07:00 17:02-17:43/41 18:33	06:54 20:21	05:58 21:06	05:29 21:41
12	08:29 08:56-09:14/18 16:59	07:52 08:16-08:34/18 17:48	06:57 17:01-17:44/43 18:34	06:52 20:22	05:57 21:08	05:29 21:42
13	08:28 08:55-09:15/20 17:00	07:50 08:14-08:35/21 17:50	06:55 17:00-17:45/45 18:36	06:49 20:24	05:55 21:09	05:28 21:43
14	08:28 08:55-09:16/21 17:01	07:48 08:13-08:37/24 17:52	06:53 16:59-17:45/46 18:38	06:47 20:26	05:54 21:10	05:28 21:43
15	08:27 08:54-09:17/23 17:03	07:47 08:12-08:38/26 17:53	06:51 16:58-17:46/48 18:39	06:45 20:27	05:53 21:12	05:28 21:44
16	08:26 08:53-09:18/25 17:04	07:45 08:11-08:39/28 17:55	06:49 16:58-17:46/48 18:41	06:43 20:29	05:51 21:13	05:28 21:44
17	08:25 08:52-09:18/26 17:06	07:43 08:10-08:39/29 17:57	06:47 16:56-17:46/50 18:42	06:41 20:30	05:50 21:15	05:28 21:45
18	08:25 08:52-09:19/27 17:07	07:41 08:10-08:40/30 17:59	06:45 16:56-17:46/50 18:44	06:39 20:32	05:49 21:16	05:28 21:45
19	08:24 08:52-09:20/28 17:09	07:39 08:09-08:40/31 18:00	06:43 16:55-17:46/51 18:45	06:37 20:33	05:47 21:17	05:28 21:45
20	08:23 08:52-09:20/28 17:10	07:38 08:09-08:40/31 18:02	06:40 16:55-17:46/51 18:47	06:35 20:35	05:46 21:19	05:28 21:46
21	08:22 08:53-09:21/28 17:12	07:36 08:09-08:40/31 18:04	06:38 16:55-17:46/51 18:49	06:33 20:36	05:45 21:20	05:28 21:46
22	08:21 08:53-09:21/28 17:13	07:34 08:10-08:40/30 18:05	06:36 16:55-17:46/51 18:50	06:32 20:38	05:44 21:21	05:28 21:46
23	08:20 08:53-09:22/29 17:15	07:32 08:10-08:40/30 18:07	06:34 16:54-17:45/51 18:52	06:30 20:39	05:43 21:22	05:29 21:46
24	08:19 08:53-09:21/28 17:17	07:30 08:10-08:39/29 18:09	06:32 16:54-17:44/50 18:53	06:28 20:41	05:41 21:24	05:29 21:46
25	08:18 08:53-09:22/29 17:18	07:28 08:11-08:39/28 18:10	06:30 16:55-17:44/49 18:55	06:26 20:42	05:40 21:25	05:29 21:46
26	08:17 08:54-09:22/28 17:20	07:26 08:11-08:38/27 18:12	06:28 16:55-17:43/48 18:56	06:24 20:44	05:39 21:26	05:30 21:46
27	08:15 08:54-09:21/27 17:21	07:24 08:12-08:37/25 18:13	06:25 16:55-17:42/47 18:58	06:22 20:45	05:38 21:27	05:30 21:46
28	08:14 08:55-09:22/27 17:23	07:22 08:12-08:34/22 18:15	06:23 16:56-17:42/46 18:59	06:20 20:47	05:37 21:28	05:31 21:46
29	08:13 08:56-09:22/26 17:25		07:21 17:56-18:40/44 20:01	06:18 20:48	05:37 21:30	05:31 21:46
30	08:12 08:56-09:21/25 17:26		07:19 17:57-18:39/42 20:02	06:17 20:50	05:36 21:31	05:32 21:46
31	08:10 08:58-09:20/22 17:28		07:17 17:58-18:37/39 20:04		05:35 21:32	
Potential sun hours	269	283	368	411	475	486
Sum of minutes with flicker	591	543	1182	151	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

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 1 - WP Mondorf WEA 2

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	July	August	September	October	November	December
1	05:32 21:46	06:05 21:18	06:50 20:21	07:34 17:39-18:23/44 19:16	07:22 07:53-07:56/3 17:15	08:09 08:39-08:55/16 16:39
2	05:33 21:46	06:06 21:16	06:51 20:19	07:35 17:41-18:22/41 19:14	07:24 17:13	08:10 08:40-08:55/15 16:39
3	05:33 21:45	06:08 21:15	06:53 20:16	07:37 17:42-18:21/39 19:12	07:26 17:12	08:12 08:41-08:54/13 16:38
4	05:34 21:45	06:09 21:13	06:54 20:14	07:38 17:43-18:19/36 19:10	07:27 17:10	08:13 08:43-08:54/11 16:38
5	05:35 21:44	06:11 21:11	06:56 20:12	07:40 17:44-18:17/33 19:08	07:29 17:08	08:14 08:44-08:53/9 16:37
6	05:36 21:44	06:12 21:10	06:57 18:09-18:16/7 20:10	07:41 17:46-18:14/28 19:05	07:31 17:07	08:15 08:45-08:52/7 16:37
7	05:36 21:44	06:13 21:08	06:59 18:03-18:21/18 20:08	07:43 17:48-18:12/24 19:03	07:32 08:34-08:45/11 17:05	08:17 08:47-08:52/5 16:36
8	05:37 21:43	06:15 21:07	07:00 17:59-18:24/25 20:06	07:44 17:51-18:07/16 19:01	07:34 08:32-08:47/15 17:04	08:18 08:48-08:50/2 16:36
9	05:38 21:42	06:16 21:05	07:01 17:57-18:26/29 20:04	07:46 18:59	07:36 08:31-08:49/18 17:02	08:19 16:36
10	05:39 21:42	06:18 21:03	07:03 17:54-18:27/33 20:02	07:47 18:57	07:37 08:29-08:50/21 17:01	08:20 16:36
11	05:40 21:41	06:19 21:01	07:04 17:52-18:28/36 19:59	07:49 08:53-09:01/8 18:55	07:39 08:28-08:51/23 16:59	08:21 16:36
12	05:41 21:40	06:21 21:00	07:06 17:50-18:29/39 19:57	07:51 08:49-09:05/16 18:53	07:40 08:28-08:53/25 16:58	08:22 16:36
13	05:42 21:40	06:22 20:58	07:07 17:48-18:30/42 19:55	07:52 08:46-09:06/20 18:51	07:42 08:28-08:54/26 16:57	08:23 16:36
14	05:43 21:39	06:24 20:56	07:09 17:47-18:31/44 19:53	07:54 08:45-09:08/23 18:49	07:44 08:27-08:53/26 16:55	08:24 16:36
15	05:44 21:38	06:25 20:54	07:10 17:46-18:31/45 19:51	07:55 08:44-09:09/25 18:47	07:45 08:27-08:54/27 16:54	08:25 16:36
16	05:45 21:37	06:26 20:52	07:12 17:44-18:31/47 19:49	07:57 08:42-09:09/27 18:45	07:47 08:27-08:55/28 16:53	08:25 16:36
17	05:46 21:36	06:28 20:51	07:13 17:43-18:31/48 19:46	07:58 08:42-09:10/28 18:43	07:48 08:27-08:56/29 16:52	08:26 16:36
18	05:47 21:35	06:29 20:49	07:15 17:42-18:31/49 19:44	08:00 08:41-09:11/30 18:41	07:50 08:27-08:55/28 16:50	08:27 16:36
19	05:49 21:34	06:31 20:47	07:16 17:42-18:32/50 19:42	08:02 08:40-09:10/30 18:39	07:52 08:27-08:56/29 16:49	08:28 16:37
20	05:50 21:33	06:32 20:45	07:17 17:41-18:31/50 19:40	08:03 08:40-09:11/31 18:37	07:53 08:28-08:56/28 16:48	08:28 16:37
21	05:51 21:32	06:34 20:43	07:19 17:40-18:31/51 19:38	08:05 08:40-09:11/31 18:35	07:55 08:28-08:56/28 16:47	08:29 16:38
22	05:52 21:31	06:35 20:41	07:20 17:40-18:31/51 19:36	08:06 08:39-09:10/31 18:33	07:56 08:28-08:56/28 16:46	08:29 16:38
23	05:53 21:30	06:37 20:39	07:22 17:40-18:31/51 19:33	08:08 08:40-09:10/30 18:31	07:58 08:29-08:57/28 16:45	08:30 16:39
24	05:55 21:28	06:38 20:37	07:23 17:39-18:30/51 19:31	08:09 08:40-09:10/30 18:29	07:59 08:29-08:56/27 16:44	08:30 16:39
25	05:56 21:27	06:40 20:35	07:25 17:39-18:30/51 19:29	07:11 07:40-08:09/29 17:27	08:01 08:30-08:57/27 16:43	08:31 16:40
26	05:57 21:26	06:41 20:33	07:26 17:39-18:29/50 19:27	07:13 07:41-08:08/27 17:26	08:02 08:31-08:56/25 16:43	08:31 16:40
27	05:58 21:25	06:42 20:31	07:28 17:38-18:27/49 19:25	07:14 07:42-08:08/26 17:24	08:04 08:33-08:56/23 16:42	08:31 16:41
28	06:00 21:23	06:44 20:29	07:29 17:39-18:27/48 19:23	07:16 07:43-08:07/24 17:22	08:05 08:34-08:56/22 16:41	08:31 16:42
29	06:01 21:22	06:45 20:27	07:31 17:38-18:25/47 19:20	07:18 07:44-08:05/21 17:20	08:06 08:36-08:56/20 16:40	08:32 16:43
30	06:02 21:21	06:47 20:25	07:32 17:39-18:25/46 19:18	07:19 07:46-08:03/17 17:18	08:08 08:37-08:55/18 16:40	08:32 16:44
31	06:04 21:19	06:48 20:23		07:21 07:48-08:01/13 17:17		08:32 16:44
Potential sun hours	490	447	379	335	275	255
Sum of minutes with flicker	0	0	1057	778	583	78

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



## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 2 - WP Duelem WEA 1

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46	08:09 17:30	07:20 18:17	07:15 20:05	06:15 20:51	05:34 21:33	05:32 21:46	06:05 21:18	06:50 20:21	07:34 19:16	07:22 17:15	08:09 16:39
2	08:32 16:47	08:07 17:31	07:18 18:18	07:12 20:07	06:13 20:53	05:33 21:34	05:33 21:46	06:06 21:16	06:51 20:19	07:35 19:14	07:24 17:13	08:10 16:38
3	08:32 16:48	08:06 17:33	07:16 18:20	07:10 20:09	06:11 20:54	05:33 21:35	05:33 21:45	06:08 21:15	06:53 20:16	07:37 19:12	07:26 17:12	08:12 16:38
4	08:32 16:49	08:05 17:35	07:14 18:22	07:08 20:10	06:10 20:56	05:32 21:36	05:34 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:37
5	08:32 16:50	08:03 17:36	07:12 18:23	07:06 20:12	06:08 20:57	05:31 21:37	05:35 21:44	06:11 21:11	06:55 20:12	07:40 19:07	07:29 17:08	08:14 16:37
6	08:31 16:51	08:02 17:38	07:10 18:25	07:04 20:13	06:06 20:59	05:31 21:37	05:36 21:44	06:12 21:10	06:57 20:10	07:41 19:05	07:31 17:07	08:15 16:37
7	08:31 16:52	08:00 17:40	07:08 18:26	07:02 20:15	06:05 21:00	05:30 21:38	05:36 21:43	06:13 21:08	06:58 20:08	07:43 19:03	07:32 17:05	08:16 16:36
8	08:31 16:53	07:58 17:41	07:06 18:28	07:00 20:16	06:03 21:02	05:30 21:39	05:37 21:43	06:15 21:06	07:00 20:06	07:44 19:01	07:34 17:04	08:18 16:36
9	08:30 16:55	07:57 17:43	07:04 18:30	06:58 20:18	06:01 21:03	05:29 21:40	05:38 21:42	06:16 21:05	07:01 20:04	07:46 18:59	07:35 17:02	08:19 16:36
10	08:30 16:56	07:55 17:45	07:02 18:31	06:56 20:19	06:00 21:05	05:29 21:41	05:39 21:42	06:18 21:03	07:03 20:01	07:47 18:57	07:37 17:01	08:20 16:36
11	08:29 16:57	07:54 17:47	06:59 18:33	06:54 20:21	05:58 21:06	05:29 21:41	05:40 21:41	06:19 21:01	07:04 19:59	07:49 18:55	07:39 16:59	08:21 16:36
12	08:29 16:59	07:52 17:48	06:57 18:34	06:51 20:22	05:57 21:08	05:29 21:42	05:41 21:40	06:21 21:00	07:06 19:57	07:50 18:53	07:40 16:58	08:22 16:36
13	08:28 17:00	07:50 17:50	06:55 18:36	06:49 20:24	05:55 21:09	05:28 21:42	05:42 21:40	06:22 20:58	07:07 19:55	07:52 18:51	07:42 16:57	08:23 16:36
14	08:28 17:01	07:48 17:52	06:53 18:38	06:47 20:25	05:54 21:10	05:28 21:43	05:43 21:39	06:23 20:56	07:09 19:53	07:54 18:49	07:44 16:55	08:24 16:36
15	08:27 17:03	07:47 17:53	06:51 18:39	06:45 20:27	05:53 21:12	05:28 21:44	05:44 21:38	06:25 20:54	07:10 19:51	07:55 18:47	07:45 16:54	08:24 16:36
16	08:26 17:04	07:45 17:55	06:49 18:41	06:43 20:29	05:51 21:13	05:28 21:44	05:45 21:37	06:26 20:52	07:12 19:49	07:57 18:45	07:47 16:53	08:25 16:36
17	08:25 17:06	07:43 17:57	06:47 18:42	06:41 20:30	05:50 21:15	05:28 21:44	05:46 21:36	06:28 20:50	07:13 19:46	07:58 18:43	07:48 16:52	08:26 16:36
18	08:25 17:07	07:41 17:58	06:45 18:44	06:39 20:32	05:48 21:16	05:28 21:45	05:47 21:35	06:29 20:49	07:14 19:44	08:00 18:41	07:50 16:50	08:27 16:36
19	08:24 17:09	07:39 18:00	06:42 18:45	06:37 20:33	05:47 21:17	05:28 21:45	05:48 21:34	06:31 20:47	07:16 19:42	08:01 18:39	07:51 16:49	08:27 16:37
20	08:23 17:10	07:38 18:02	06:40 18:47	06:35 20:35	05:46 21:19	05:28 21:46	05:50 21:33	06:32 20:45	07:17 19:40	08:03 18:37	07:53 16:48	08:28 16:37
21	08:22 17:12	07:36 18:03	06:38 18:48	06:33 20:36	05:45 21:20	05:28 21:46	05:51 21:32	06:34 20:43	07:19 19:38	08:05 18:35	07:55 16:47	08:29 16:37
22	08:21 17:13	07:34 18:05	06:36 18:50	06:31 20:38	05:44 21:21	05:28 21:46	05:52 21:31	06:35 20:41	07:20 19:35	08:06 18:33	07:56 16:46	08:29 16:38
23	08:20 17:15	07:32 18:07	06:34 18:52	06:30 20:39	05:42 21:22	05:29 21:46	05:53 21:30	06:36 20:39	07:22 19:33	08:08 18:31	07:58 16:45	08:30 16:38
24	08:19 17:16	07:30 18:08	06:32 18:53	06:28 20:41	05:41 21:24	05:29 21:46	05:54 21:28	06:38 20:37	07:23 19:31	08:09 18:29	07:59 16:44	08:30 16:39
25	08:18 17:18	07:28 18:10	06:30 18:55	06:26 20:42	05:40 21:25	05:29 21:46	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	08:01 16:43	08:31 16:40
26	08:17 17:20	07:26 18:12	06:27 18:56	06:24 20:44	05:39 21:26	05:30 21:46	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:26	08:02 16:42	08:31 16:40
27	08:15 17:21	07:24 18:13	06:25 18:58	06:22 20:45	05:38 21:27	05:30 21:46	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	08:03 16:42	08:31 16:41
28	08:14 17:23	07:22 18:15	06:23 18:59	06:20 20:47	05:37 21:28	05:30 21:46	06:00 21:23	06:44 20:29	07:29 19:22	07:16 17:22	08:05 16:41	08:31 16:42
29	08:13 17:25		07:21 20:01	06:18 20:48	05:36 21:29	05:31 21:46	06:01 21:22	06:45 20:27	07:31 19:20	07:18 17:20	08:06 16:40	08:32 16:43
30	08:12 17:26		07:19 20:02	06:17 20:50	05:36 21:31	05:31 21:46	06:02 21:20	06:47 20:25	07:32 19:18	07:19 17:18	08:08 16:40	08:32 16:43
31	08:10 17:28		07:17 20:04		05:35 21:32		06:04 21:19	06:48 20:23		07:21 17:17		08:32 16:44
Potential sun hours	269	283	368	412	475	486	491	447	379	335	275	255
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 3 - WP Duelem WEA 3

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June
1	08:32 16:46 08:32	08:09 17:30 08:08	07:20 17:17-17:35/18 18:17 07:18 17:17-17:34/17	07:15 20:06 07:13	06:15 07:14-07:36/22 20:51 06:13 07:14-07:34/20	05:34 06:22-06:38/16 21:33 05:33 06:21-06:38/17
2	16:47 08:32 16:48	17:31 08:06 17:33	18:18 07:16 17:17-17:34/17 18:20	20:07 07:10 20:09	20:53 06:11 07:15-07:34/19 20:54	21:34 05:33 06:20-06:39/19 21:35
3	08:32 16:48 08:32	08:05 17:35 08:03	07:14 17:18-17:32/14 18:22 07:12 17:20-17:31/11	07:08 20:10 07:06	06:10 07:16-07:32/16 20:56 06:08 07:17-07:30/13	05:32 06:21-06:40/19 21:36 05:31 06:20-06:40/20
4	16:49 08:32 16:50	17:35 08:03 17:36	07:10 17:24-17:27/3 18:25 07:08	20:13 07:02 20:12	20:59 06:06 07:20-07:28/8 20:57	21:37 05:31 06:20-06:40/20 21:37
5	08:31 16:52 08:31	08:00 17:40 07:59	07:08 18:26 07:06	07:02 20:15 07:00	06:05 21:00 06:03	05:30 06:21-06:41/20 21:38 05:30 06:20-06:41/21
6	16:53 08:31 16:53	17:38 08:00 17:42	18:25 07:06 18:28	20:13 07:00 20:16	20:59 06:03 21:02	21:37 05:30 06:21-06:41/20 21:39
7	08:30 16:55 08:30	07:57 17:43 07:55	07:04 18:30 07:02	06:58 20:18 06:56	06:01 21:03 06:00	05:30 06:20-06:42/22 21:40 05:29 06:21-06:42/21
8	16:56 08:30 16:56	17:45 07:54 17:47	18:31 07:00 18:33	20:19 06:54 20:21	21:05 05:58 21:06	21:41 05:29 06:20-06:42/22 21:41
9	08:29 16:57 08:29	07:52 17:47 07:52	06:57 18:33 06:57	06:52 20:21 06:52	05:57 21:06 05:57	05:29 06:20-06:42/22 21:41 05:29 06:20-06:42/22
10	16:59 08:28 17:00	17:48 07:50 17:50	18:34 06:55 18:36	20:22 06:49 20:24	21:08 05:55 21:09	21:42 05:28 06:21-06:43/22 21:43
11	08:28 17:00 08:28	07:50 17:50 07:48	06:55 18:36 06:53	06:49 20:24 06:47	05:55 21:09 05:54	05:28 06:21-06:43/22 21:43 05:28 06:21-06:43/22
12	17:01 08:27 17:03	17:52 07:47 17:53	18:38 06:51 18:39	20:26 06:45 20:27	21:11 05:53 21:12	21:43 05:28 06:21-06:43/22 21:44
13	08:26 17:04 08:26	07:45 17:55 07:43	06:49 18:41 06:47	06:43 20:29 06:41	05:51 21:13 05:50	05:28 06:21-06:44/23 21:44 05:28 06:22-06:44/22
14	17:06 08:25 17:07	17:57 07:41 17:58	18:42 06:45 18:44	20:30 06:39 20:32	21:15 05:49 21:16	21:45 05:28 06:22-06:44/22 21:45
15	08:24 17:09 08:23	07:39 18:00 07:38	06:43 18:45 06:40	06:37 07:21-07:32/11 20:33 06:35 07:20-07:35/15	05:47 21:17 05:46	05:28 06:22-06:44/22 21:45 05:28 06:22-06:44/22
16	17:10 08:22 17:12	18:02 07:36 18:04	20:35 06:38 18:49	21:19 06:33 07:18-07:36/18 21:20	21:46 05:45 21:20	21:46 05:28 06:22-06:44/22 21:46
17	08:21 17:13 08:20	07:34 17:25-17:28/3 18:05 07:32 17:21-17:32/11	06:36 18:50 06:34	06:32 07:16-07:37/21 20:38 06:30 07:15-07:37/22	05:44 21:21 05:43	05:28 06:23-06:45/22 21:46 05:29 06:23-06:45/22
18	17:15 08:19 17:17	18:07 07:30 17:19-17:33/14 18:08	18:52 06:32 18:53	20:39 06:28 07:14-07:37/23 20:41	21:22 05:41 21:24	21:46 05:29 06:23-06:45/22 21:46
19	08:18 17:18 08:17	07:28 17:18-17:34/16 18:10 07:26 17:17-17:35/18	06:30 18:55 06:28	06:26 07:14-07:37/23 20:42 06:24 07:13-07:37/24	05:40 21:25 05:39	05:29 06:24-06:46/22 21:46 05:30 06:23-06:46/23
20	17:20 08:17 17:20	18:12 07:26 17:17-17:35/18 18:12	18:56 06:25 18:58	20:44 06:22 07:13-07:38/25 20:45	21:26 05:38 06:26-06:31/5 21:27	21:46 05:30 06:23-06:45/22 21:46
21	08:15 17:21 08:14	07:24 17:17-17:35/18 18:13 07:22 17:17-17:35/18	06:25 18:58 06:23	06:20 07:13-07:37/24 20:47 06:18 07:13-07:36/23	05:37 06:25-06:34/9 21:28 05:37 06:24-06:35/11	05:31 06:24-06:46/22 21:46 05:31 06:24-06:46/22
22	17:23 08:13 17:25	18:15 07:22 17:17-17:35/18 18:15	18:59 07:21 20:01	20:47 06:18 07:13-07:36/23 20:48	21:28 05:37 06:24-06:35/11 21:30	21:46 05:31 06:24-06:46/22 21:46
23	08:12 17:26 08:10	07:22 17:17-17:35/18 18:15 07:22 17:17-17:35/18	20:02 07:19 20:02	20:50 06:17 07:14-07:37/23 20:50	21:31 05:36 06:22-06:36/14 21:31	21:46 05:32 06:25-06:46/21 21:46
24	17:28 08:10 17:28	07:22 17:17-17:35/18 18:15 07:22 17:17-17:35/18	20:04 07:17 20:04	21:32 05:35 06:22-06:37/15 21:32	21:46 05:35 06:22-06:37/15 21:32	21:46 05:35 06:22-06:37/15 21:32
Potential sun hours	269	283	368	412	475	486
Sum of minutes with flicker	0	98	80	252	152	636

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

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 3 - WP Duelem WEA 3

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	July	August	September	October	November	December
1	05:32 06:24-06:46/22 21:46	06:05 21:18	06:50 20:21	07:34 19:16	07:23 17:15	08:09 16:39
2	05:33 06:25-06:46/21 21:46	06:06 21:16	06:51 20:19	07:35 19:14	07:24 17:13	08:10 16:38
3	05:33 06:26-06:47/21 21:45	06:08 21:15	06:53 20:16	07:37 19:12	07:26 17:12	08:12 16:38
4	05:34 06:25-06:46/21 21:45	06:09 21:13	06:54 20:14	07:38 19:10	07:27 17:10	08:13 16:38
5	05:35 06:26-06:47/21 21:45	06:11 21:11	06:56 20:12	07:40 19:08	07:29 17:08	08:14 16:37
6	05:36 06:27-06:47/20 21:44	06:12 07:33-07:35/2 21:10	06:57 20:10	07:41 19:05	07:31 17:07	08:15 16:37
7	05:36 06:27-06:47/20 21:44	06:13 07:28-07:39/11 21:08	06:59 20:08	07:43 19:03	07:32 17:05	08:17 16:36
8	05:37 06:28-06:47/19 21:43	06:15 07:26-07:40/14 21:07	07:00 20:06	07:44 17:56-18:04/8 19:01	07:34 17:04	08:18 16:36
9	05:38 06:27-06:46/19 21:42	06:16 07:25-07:42/17 21:05	07:01 20:04	07:46 17:54-18:07/13 18:59	07:36 17:02	08:19 16:36
10	05:39 06:28-06:46/18 21:42	06:18 07:24-07:43/19 21:03	07:03 20:02	07:47 17:52-18:07/15 18:57	07:37 17:01	08:20 16:36
11	05:40 06:29-06:46/17 21:41	06:19 07:22-07:43/21 21:01	07:04 19:59	07:49 17:51-18:08/17 18:55	07:39 16:59	08:21 16:36
12	05:41 06:30-06:45/15 21:40	06:21 07:22-07:44/22 21:00	07:06 19:57	07:51 17:51-18:09/18 18:53	07:40 16:58	08:22 16:36
13	05:42 06:30-06:45/15 21:40	06:22 07:21-07:44/23 20:58	07:07 19:55	07:52 17:50-18:08/18 18:51	07:42 16:57	08:23 16:36
14	05:43 06:31-06:44/13 21:39	06:23 07:20-07:44/24 20:56	07:09 19:53	07:54 17:50-18:08/18 18:49	07:44 16:55	08:24 16:36
15	05:44 06:33-06:43/10 21:38	06:25 07:21-07:45/24 20:54	07:10 19:51	07:55 17:50-18:08/18 18:47	07:45 16:54	08:25 16:36
16	05:45 06:34-06:42/8 21:37	06:26 07:20-07:44/24 20:52	07:12 19:49	07:57 17:50-18:07/17 18:45	07:47 16:53	08:25 16:36
17	05:46 21:36	06:28 07:21-07:45/24 20:51	07:13 19:46	07:58 17:51-18:06/15 18:43	07:48 16:52	08:26 16:36
18	05:47 21:35	06:29 07:20-07:44/24 20:49	07:15 19:44	08:00 17:51-18:04/13 18:41	07:50 16:50	08:27 16:36
19	05:48 21:34	06:31 07:20-07:43/23 20:47	07:16 19:42	08:02 17:53-18:02/9 18:39	07:52 16:49	08:28 16:37
20	05:50 21:33	06:32 07:21-07:43/22 20:45	07:17 19:40	08:03 18:37	07:53 16:48	08:28 16:37
21	05:51 21:32	06:34 07:21-07:41/20 20:43	07:19 19:38	08:05 18:35	07:55 16:47	08:29 16:38
22	05:52 21:31	06:35 07:22-07:39/17 20:41	07:20 19:36	08:06 18:33	07:56 16:46	08:29 16:38
23	05:53 21:30	06:37 07:24-07:38/14 20:39	07:22 19:33	08:08 18:31	07:58 16:45	08:30 16:39
24	05:55 21:29	06:38 07:25-07:35/10 20:37	07:23 19:31	08:10 18:29	07:59 16:44	08:30 16:39
25	05:56 21:27	06:39 20:35	07:25 19:29	07:11 17:27	08:01 16:43	08:31 16:40
26	05:57 21:26	06:41 20:33	07:26 19:27	07:13 17:26	08:02 16:43	08:31 16:40
27	05:58 21:25	06:42 20:31	07:28 19:25	07:14 17:24	08:04 16:42	08:31 16:41
28	06:00 21:23	06:44 20:29	07:29 19:23	07:16 17:22	08:05 16:41	08:32 16:42
29	06:01 21:22	06:45 20:27	07:31 19:20	07:18 17:20	08:06 16:40	08:32 16:43
30	06:02 21:21	06:47 20:25	07:32 19:18	07:19 17:18	08:08 16:40	08:32 16:44
31	06:04 21:19	06:48 20:23	 	07:21 17:17	 	08:32 16:44
Potential sun hours	491	447	379	335	275	255
Sum of minutes with flicker	280	355	0	179	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

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 4 - WP Duelem WEA 5

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46 16:47	08:09 17:30 17:31	07:20 18:17 18:18	07:15 20:06 20:07	06:15 20:52 20:53	05:34 21:33 21:34	05:32 21:46 21:46	06:05 21:18 21:16	06:50 20:21 20:19	07:34 19:16 19:14	07:23 17:15 17:13	08:09 16:39 16:39
2	08:32 16:48 16:47	08:08 17:33 17:31	07:18 18:20 18:16	07:13 20:09 20:10	06:13 20:55 20:56	05:33 21:35 21:36	05:33 21:45 21:45	06:07 21:15 21:13	06:51 20:17 20:15	07:35 19:12 19:10	07:24 17:12 17:10	08:11 16:38 16:38
3	08:32 16:48 16:49	08:06 17:33 17:35	07:16 18:20 18:22	07:10 20:09 20:10	06:11 20:55 20:56	05:33 21:35 21:36	05:33 21:45 21:45	06:08 21:15 21:13	06:53 20:17 20:15	07:37 19:12 19:10	07:26 17:12 17:10	08:12 16:38 16:38
4	08:32 16:49 16:49	08:05 17:35 17:35	07:14 18:22 18:22	07:08 20:10 20:10	06:10 20:56 20:56	05:32 21:36 21:36	05:34 21:45 21:45	06:09 21:13 21:13	06:54 20:15 20:15	07:38 19:10 19:10	07:28 17:10 17:10	08:13 16:38 16:38
5	08:32 16:50 16:51	08:03 17:37 17:38	07:12 18:23 18:25	07:06 20:12 20:13	06:08 20:58 20:59	05:32 21:37 21:38	05:35 21:45 21:44	06:11 21:12 21:10	06:56 20:12 20:10	07:40 19:08 19:06	07:29 17:09 17:07	08:14 16:37 16:37
6	08:32 16:51 16:51	08:02 17:38 17:38	07:10 18:25 18:25	07:04 20:13 20:13	06:06 20:59 20:59	05:31 21:38 21:38	05:36 21:44 21:44	06:12 21:08 21:08	06:57 20:08 20:08	07:41 19:03 19:03	07:31 17:05 17:05	08:16 16:36 16:36
7	08:31 16:52 16:52	08:00 17:40 17:40	07:08 18:27 18:27	07:02 20:15 20:15	06:05 21:01 21:01	05:30 21:39 21:39	05:36 21:44 21:44	06:14 21:08 21:08	06:59 20:08 20:08	07:43 19:03 19:03	07:32 17:05 17:05	08:17 16:36 16:36
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31	08:10 17:28 17:28		07:17 20:04 20:04		05:35 21:32 21:32		06:04 21:19 21:19	06:48 20:23 20:23		07:21 17:17 17:17		08:32 16:44 16:44
Potential sun hours	269	283	368	412	475	486	491	447	379	335	275	255
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 5 - WP Duelem WEA 7

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46 16:47	08:09 17:30 17:31	07:20 18:17 18:18	07:15 20:06 20:07	06:15 20:52 20:53	05:34 21:33 21:34	05:32 21:46 21:46	06:05 21:18 21:16	06:50 20:21 20:19	07:34 19:16 19:14	07:23 17:15 17:13	08:09 16:39 16:38
2	08:32 16:48 16:47	08:08 17:33 17:31	07:18 18:20 18:16	07:13 20:09 20:10	06:13 20:55 20:56	05:33 21:35 21:36	05:33 21:46 21:45	06:06 21:15 21:13	06:51 20:17 20:15	07:35 19:12 19:10	07:24 17:12 17:10	08:11 16:38 16:38
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4	08:32 16:49 16:49	08:05 17:35 17:35	07:14 18:22 18:22	07:08 20:10 20:10	06:10 20:56 20:56	05:32 21:36 21:36	05:34 21:45 21:45	06:09 21:13 21:13	06:54 20:15 20:15	07:38 19:10 19:10	07:28 17:10 17:10	08:13 16:38 16:38
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Potential sun hours	269	283	368	412	476	486	491	447	379	335	274	255
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

## SHADOW - Calendar per WTG

Calculation: Schadow WEA 2 Mondorf WTG: 6 - WP Duelem WEA 8

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,29	2,62	3,51	5,39	6,60	6,56	7,20	6,77	4,98	2,92	1,63	1,15

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:32 16:46 16:47	08:09 17:30 17:31	07:20 18:17 18:18	07:15 20:06 20:07	06:15 20:52 20:53	05:34 21:33 21:34	05:32 21:46 21:46	06:05 21:18 21:16	06:50 20:21 20:19	07:34 19:16 19:14	07:23 17:15 17:13	08:09 16:39 16:38
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Potential sun hours	269	283	368	412	476	486	491	447	379	335	274	255
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

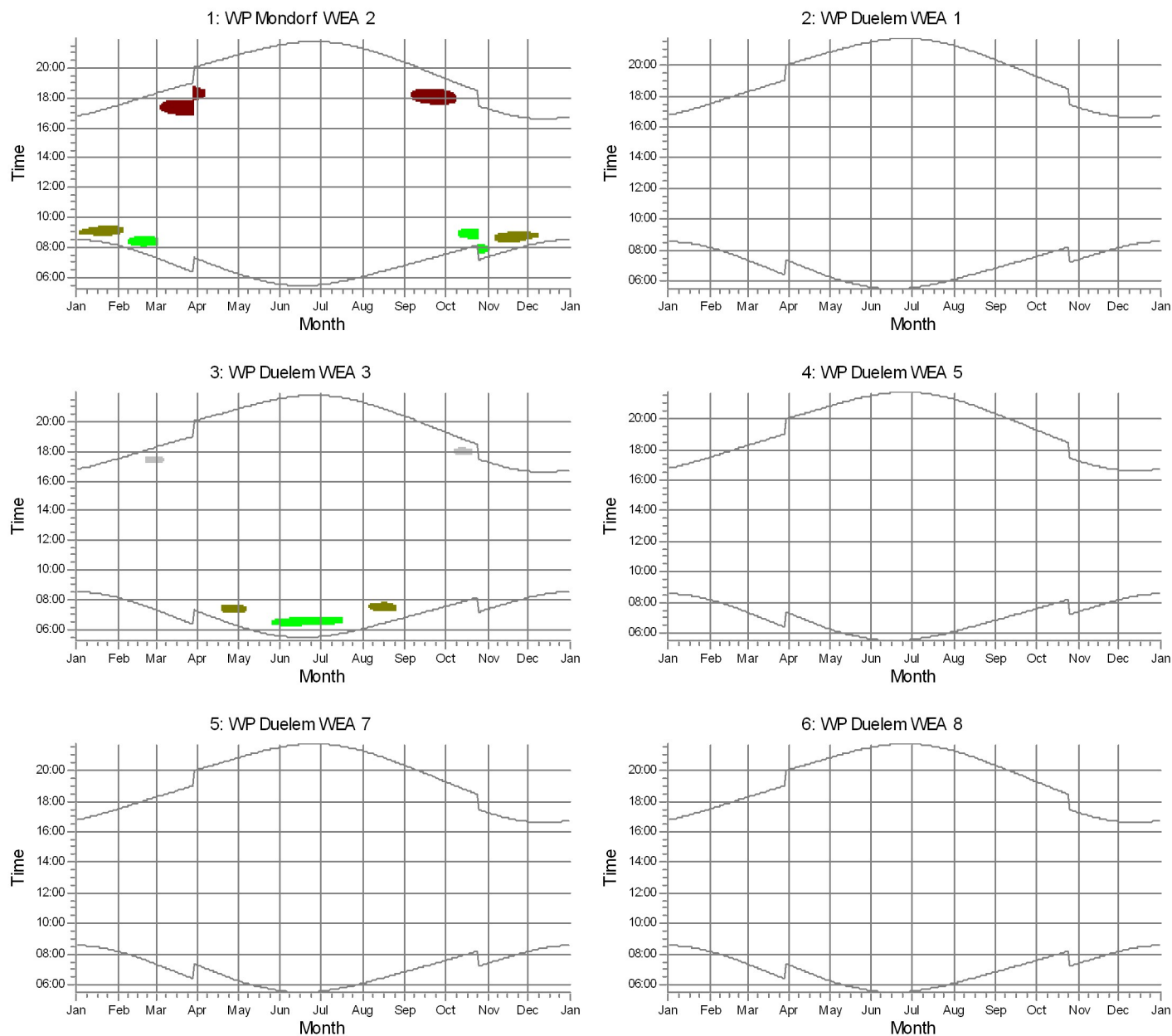
Table layout: For each day in each month the following matrix apply

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



## SHADOW - Calendar per WTG, graphical

Calculation: Schadow WEA 2 Mondorf

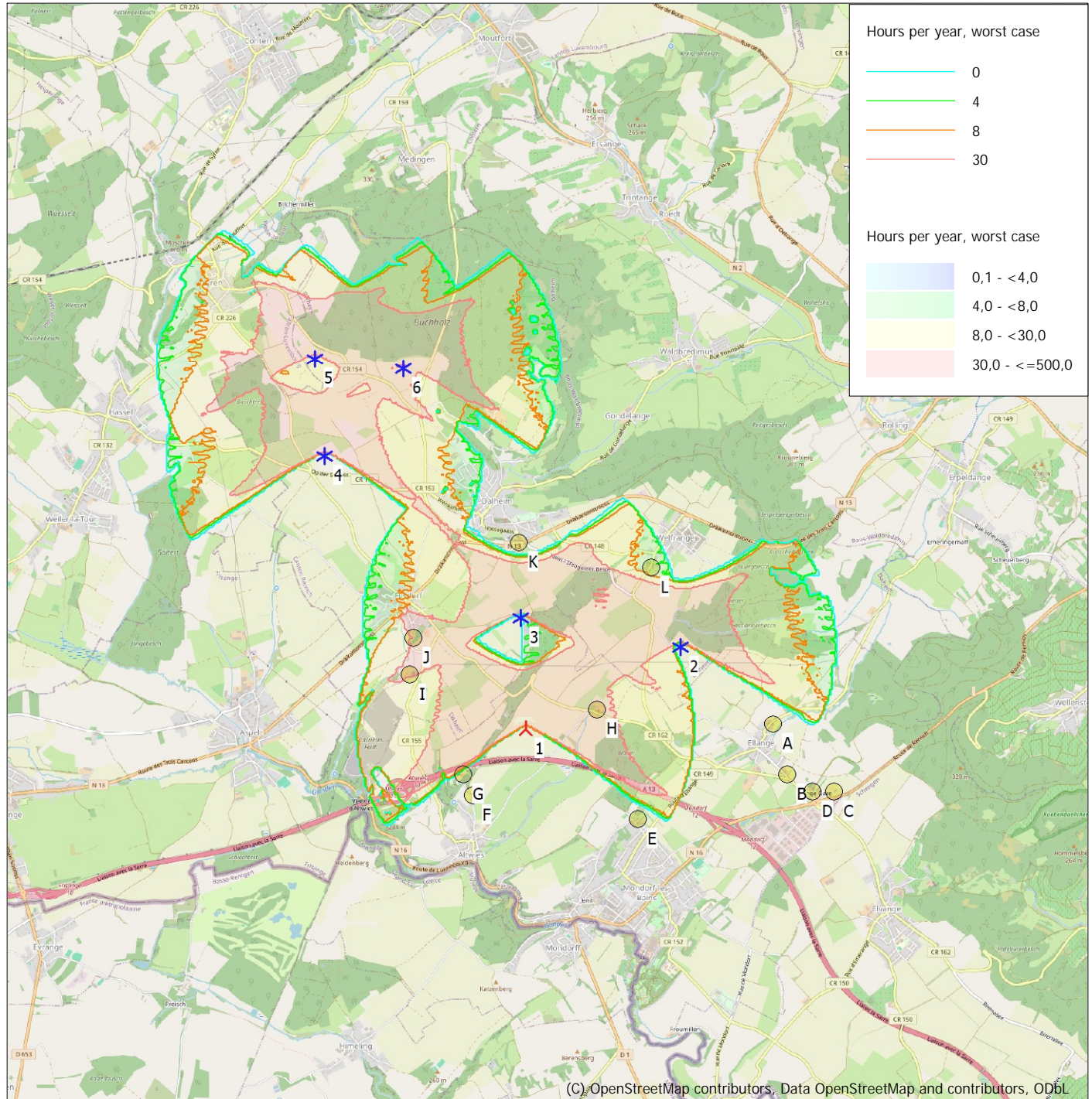


Shadow receptors

H: Altwies, Bremhaff 1	J: Filsdorf, Am Eck 19
I: Filsdorf, Woneschwee 21	L: Welfrange, Munneréferwee 15

## SHADOW - Map

Calculation: Schadow WEA 2 Mondorf



0 1 2 3 4 km

Map: EMD OpenStreetMap, Print scale 1:60 000, Map center Luxemburgian TM-LUREF (LU) East: 87 360 North: 67 320

New WTG

Existing WTG

Shadow receptor

Flicker map level: Project Wizard Elevation Data Grid (Luxembourgish Elevation Model - 5m)

Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1,5 m