

# Parco Eolico "Pizzu Boi"

## Comune di Selegas e Guamaggiore (SU)

### Proponente



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### STUDIO SUGLI EFFETTI DI SHADOW – FLICKERING

### Progettista



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## INDICE

1	Premessa .....	3
2	Scopo .....	4
3	Proponente .....	4
4	Effetto di shadow-flickering .....	4
5	Potenziali recettori .....	5
6	Metodologia .....	7
7	Risultati .....	8
8	Conclusioni.....	10
	ALLEGATO I.....	11

## 1 Premessa

La società Sorgenia Renewables Srl, d'ora in avanti il proponente, intende realizzare un impianto di produzione di energia elettrica da fonte eolica nella provincia del Sud Sardegna, in agro dei comuni di Selegas e Guamaggiore.

L'impianto, denominato parco eolico "Pizzu Boi", sarà costituito da 9 aerogeneratori di potenza unitaria nominale fino a 6 MW, per una potenza installata complessiva fino a 54 MW.

Data la potenza dell'impianto, superiore ai 10.000 kW, il servizio di connessione sarà erogato in alta tensione (AT), ai sensi della Deliberazione dell'Autorità per l'energia elettrica e il gas 23 luglio 2008 n.99 e s.m.i.

Gli aerogeneratori forniscono energia elettrica in bassa tensione (690V) e sono pertanto dotati di un trasformatore MT/BT ciascuno, alloggiato all'interno dell'aerogeneratore stesso e in grado di elevare la tensione a quella della rete del parco. La rete del parco è costituita da un cavidotto interrato in media tensione (30kV), tramite il quale l'energia elettrica viene convogliata dagli aerogeneratori alla sottostazione elettrica (SSE) di trasformazione AT/MT di proprietà del proponente che sarà collegata in antenna ad una nuova stazione elettrica (SE) di smistamento a 380/150/36 kV della RTN, da inserirsi in modalità entra-esce sulla linea a 380 kV "Ittiri-Selargius" (nel seguito "nuova SE").

Le opere progettuali sono quindi sintetizzate nel seguente elenco:

- parco eolico composto da 9 aerogeneratori, da 6 MW ciascuno, con torre di altezza fino a 125 m e diametro del rotore fino a 170 m, e dalle relative opere civili connesse quali strade di accesso, piazzole e fondazioni;
- impianto di rete, consistente in una nuova SE di smistamento a 380/150/36 kV della RTN da inserirsi in modalità entra-esce sulla futura linea a 380 kV "Ittiri-Selargius" denominata "Furtei 380";
- impianto di utenza per la connessione alla RTN, consistente nella rete di terra, nella rete di comunicazione in fibra ottica, nel cavidotto in media tensione (30kV) interamente interrato e sviluppato principalmente sotto strade esistenti, nella SSE di trasformazione 150/30 kV di proprietà del Proponente e nell'elettrodotto a 150 kV di collegamento tra la SSE e la nuova SE.

I progetti del tipo in esame rispondono a finalità di interesse pubblico (riduzione dei gas ad effetto serra, risparmio di fonti fossili scarse ed importate) ed in quanto tali sono indifferibili ed urgenti, come stabilito dalla legge 1° giugno 2002, n. 120, concernente "Ratifica ed esecuzione del Protocollo di Kyoto alla Convenzione quadro delle Nazioni Unite sui cambiamenti climatici, fatto a Kyoto l'11 dicembre 1997" e dal D.Lgs. 29 dicembre 2003, n.387 "Attuazione della direttiva 2001/77/CE relativa alla promozione dell'energia elettrica prodotta da fonti energetiche rinnovabili nel mercato interno dell'elettricità" e s.m.i..

L'utilizzo di fonti rinnovabili comporta infatti beneficio a livello ambientale, in termini di tonnellate equivalenti di petrolio (TEP) risparmiate e mancate emissioni di gas serra, polveri e inquinanti. Per il progetto in esame si stima una producibilità del parco eolico superiore a 176 GWh/anno, che consente di risparmiare almeno 32'970 TEP/anno (*fonte ARERA: 0,187 TEP/MWh*) e di evitare almeno 87'000 ton/anno di emissioni di CO<sub>2</sub> (*fonte ISPRA,2020: 493,80 gCO<sub>2</sub>/kWh*).

## 2 Scopo

Scopo della presente relazione è analizzare gli effetti di ombreggiamento e sfarfallio (shadow-flickering) causati dal parco eolico "Pizzu Boi", che la società Sorgenia Renewables Srl propone di realizzare in agro dei comuni di Selegas e Guamaggiore (SU).

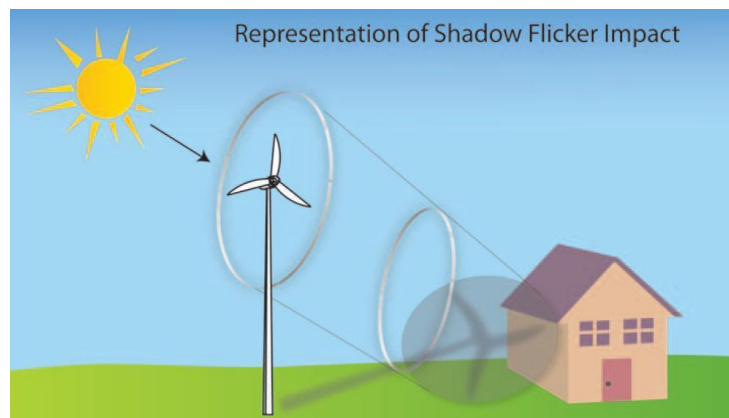
L'analisi condotta permette di determinare l'entità del fenomeno, in termini di aree interessate e tempo di occorrenza, e di studiarne l'impatto sui potenziali recettori sensibili presenti in prossimità dell'impianto.

## 3 Proponente

Il soggetto proponente del progetto in esame è Sorgenia Renewables S.r.l., interamente parte del gruppo Sorgenia Spa, uno dei maggiori operatori energetici italiani. Il Gruppo è attivo nella produzione di energia elettrica con oltre 4'750 MW di capacità di generazione installata e oltre 400'000 clienti in fornitura in tutta Italia. Efficienza energetica e attenzione all'ambiente sono le linee guida della sua crescita. Il parco di generazione, distribuito su tutto il territorio nazionale, è costituito dai più avanzati impianti a ciclo combinato e da impianti a fonte rinnovabile, per una capacità di circa 370 MW tra biomassa ed eolico. Nell'ambito delle energie rinnovabili, il Gruppo, nel corso della sua storia, ha anche sviluppato, realizzato e gestito impianti di tipo fotovoltaico (ca. 24 MW), ed idroelettrico (ca.33 MW). In quest'ultimo settore, Sorgenia è attiva con oltre 75 MW di potenza installata gestita tramite la società Tirreno Power, detenuta al 50%. Il Gruppo Sorgenia, tramite le sue controllate, fra le quali Sorgenia Renewables S.r.l., è attualmente impegnata nello sviluppo di un importante portafoglio di progetti rinnovabili di tipo eolico, fotovoltaico, biometano, geotermico ed idroelettrico, caratterizzati dall'impiego delle Best Available Technologies nel pieno rispetto dell'ambiente.

## 4 Effetto di shadow-flickering

L'effetto "Shadow-flickering" è dovuto all'ombra delle pale in movimento e comporta un effetto di sfarfallio che può avere un impatto negativo sulle persone che vivono in prossimità del parco eolico. In particolare la variazione di intensità luminosa genera un senso di fastidio a frequenze comprese tra i 2,5 ed i 20 Hz [Verkuijlen and Westra, 1984].



**Figura 4-1 – Rappresentazione dell'impatto dovuto all'effetto "shadow-flickering"**

Gli aerogeneratori di grande taglia, come quelli a progetto, sono caratterizzati da basse velocità di rotazione (8-10 rpm) che si traducono in frequenze di passaggio dell'ombra dell'ordine dei 0,5-1,5 Hz. Tali valori, inferiori al ragnone considerato fastidioso per l'individuo, possono essere considerati innocui e non correlabili ad eventuali malesseri o attacchi di natura epilettica.

In ogni caso, gli effetti negativi di tale fenomeno stroboscopico dipendono da una serie di condizioni ambientali, tra cui la posizione del sole, variabile a seconda dell'ora del giorno e del giorno dell'anno, le condizioni meteorologiche e la posizione di recettori sensibili rispetto agli aerogeneratori.

## 5 Potenziali recettori

In Figura 5-1 sono illustrati i recettori sensibili presenti nell'area, presi in considerazione nella presente analisi. I fabbricati sono identificabili mediante riferimento numerico e i relativi dati catastali sono riportati in Tabella 5.1. Per maggiori dettagli il censimento dei ricettori sensibili è riportato nell'Allegato II. Gli aerogeneratori considerati nello studio hanno un'altezza al mozzo pari a 125 m e diametro del rotore di 170 m.

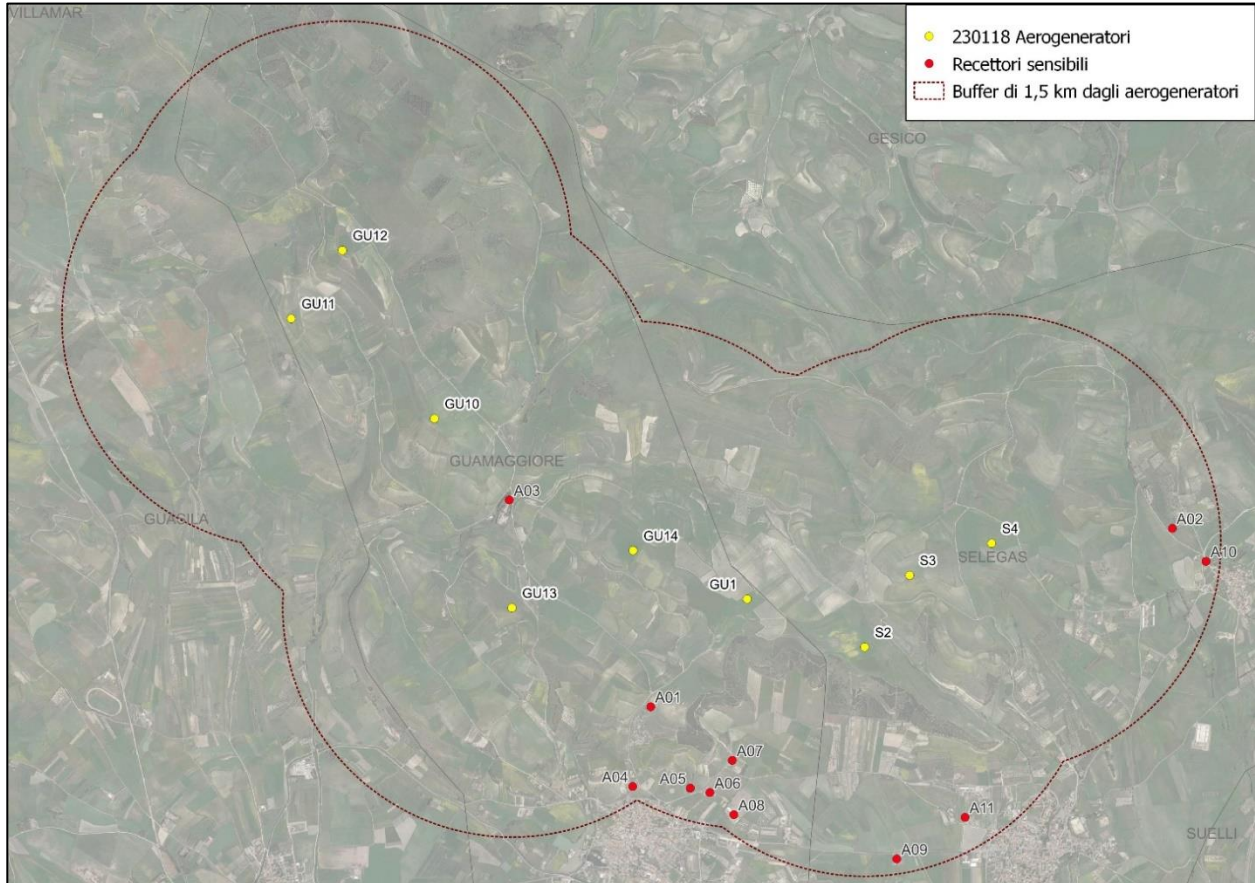
**Tabella 5.1 – Dati catastali e coordinate dei ricettori sensibili presenti nell'area**

ID	Comune	Foglio	Particella	Categoria	Coordinate WGS84		Elevazione [m.s.l.m.]
					UTM 33N		
A01	Guamaggiore	11	109	D08, D10, A04	506414	4380776	318.3
A02	Selegas	7	188	F03, A02	509828	4381943	353.9
A03	Guamaggiore	7	141	A04	505490	4382124	257.0
A04	Guamaggiore	10	266	A03	506296	4380254	240.0
A05	Guamaggiore	12	96, 98	A04	506674	4380244	230.0
A06	Guamaggiore	12	106	A03, C06	506801	4380214	228.8
A07	Guamaggiore	13	136	D10, F03	506948	4380426	244.3
A08	Guamaggiore	12	103,104	A02	506958	4380070	228.1
A09	Selegas	13	2373	A04, D10	508024	4379780	207.9
A10	Selegas	7	154	A04	510048	4381727	330.1
A11	Selegas	13	2362	A02	508471	4380052	216.0

**Tabella 5.2 – Legenda categorie catastali**

Categoria	Descrizione
A/2	Abitazioni di tipo civile
A/3	Abitazioni di tipo economico
A/4	Abitazioni di tipo popolare
A/7	Abitazioni in villini

C/2	Magazzini e locali di deposito
F/3	Unità in corso di costruzione



**Figura 5-1 – Localizzazione recettori sensibili presenti nell'area di impianto**

## 6 Metodologia

L'analisi è stata condotta mediante l'utilizzo del software WindPro.

Gli scenari considerati sono:

- **caso peggiore**, basato sulle ipotesi di:
  - impianto in funzione per 8760 ore l'anno, ovvero presenza costante di vento;
  - sole splendente per tutto l'anno dall'alba al tramonto;
  - rotore orientato sempre ortogonalmente all'asse di congiunzione tra il sole e il ricettore;
- **caso reale**, basato sulle ipotesi di:
  - impianto funzionante per 7959 ore l'anno. Tale valore è determinato sulla base dei dati di vento utilizzati per la stima di producibilità dell'impianto (elaborato "21056 SLG.PD.R.08-01");
  - probabilità di presenza del sole espressa come media mensile di ore al giorno di sole come riportato nella seguente tabella.

**Tabella 6.1 – Media mensile di ore al giorno di presenza sole**

Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Tali valori si riferiscono a registrazioni effettuate nel periodo temporale 1969-1993 presso la stazione di Cagliari-Elmas, ad un'elevazione di 4 m.s.l.m. e ad una distanza di circa 43 km dal sito di progetto;

- rotore orientato in funzione della direzione prevalente del vento (nord-ovest), determinata sulla base dei dati usati per la stima di producibilità dell'impianto (rif. elaborato "21056 SLG.PD.R.08-01").

Per entrambi gli scenari (caso peggiore e caso reale) sono valide le seguenti assunzioni :

- altezza minima del sole sull'orizzonte pari a 3°;
- assenza di ostacoli nell'area, che blocchino l'ombra;
- ombra proiettata fino a una distanza di 2040 m da ciascun aerogeneratore;
- ricettori dotati di finestre con dimensione standard pari a 1,5x1,5 m e altezza da terra pari a 1 m;
- altezza occhio umano pari a 1,7 m.
- "green-house mode", ovvero che le finestre degli edifici sono modellate come ortogonali a tutti gli aerogeneratori.

Il censimento dei potenziali recettori è stato effettuato mediante l'utilizzo di mappa catastale e opportuni sopralluoghi in campo. Nella presente analisi sono stati considerati "recettori sensibili" i fabbricati regolarmente censiti a catasto con destinazione d'uso abitativa (categoria A) e i fabbricati caratterizzati dalla presenza continuativa di persone.

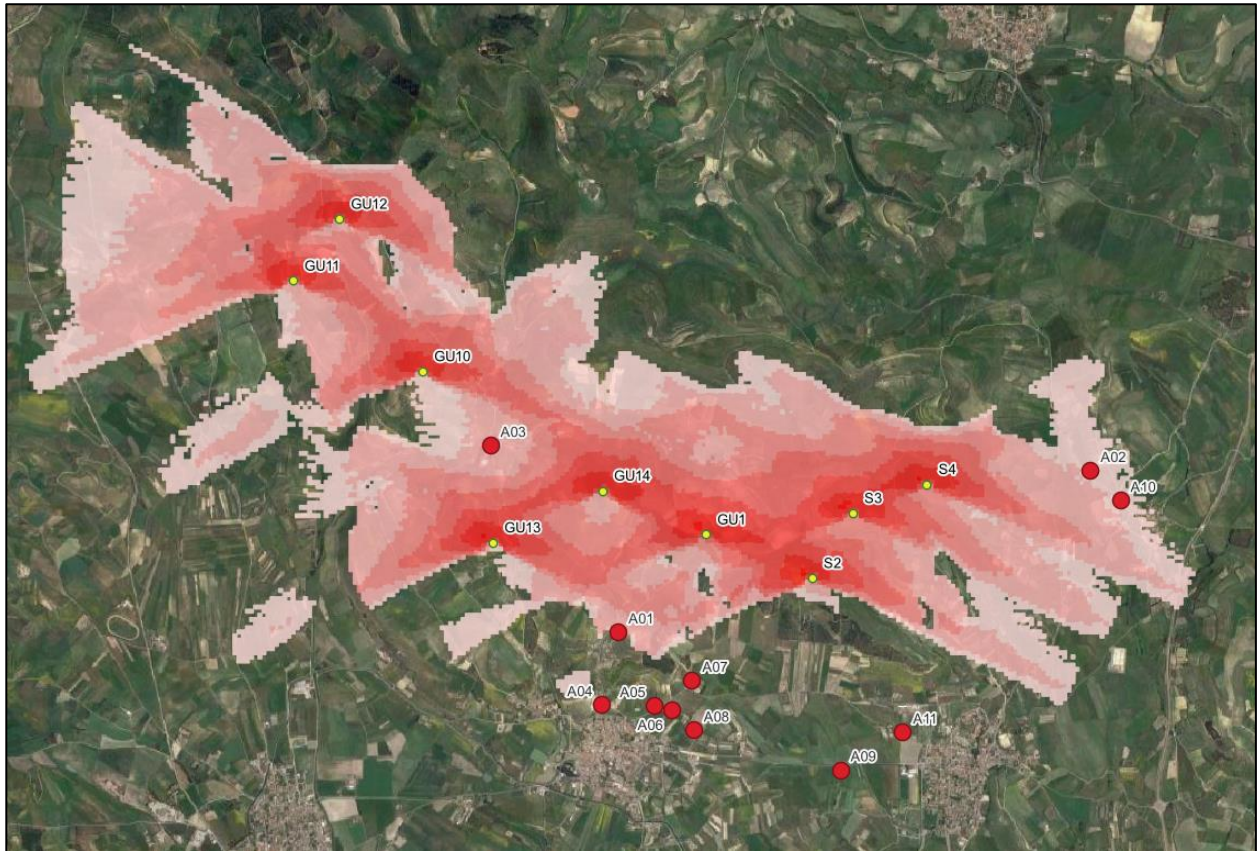
## 7 Risultati

In Tabella 7.1 sono riportati i risultati di calcolo in termini di numero massimo di ore d’ombra all’anno stimate, ad altezza uomo, in corrispondenza di ciascun recettore e dovute alla presenza dell’intero parco eolico. I risultati illustrati fanno riferimento ai due scenari (caso peggiore e caso reale) descritti nel precedente paragrafo. I risultati completi ottenuti dal software WindPro sono riportati alla fine della presente relazione nell’Allegato I. Il caso reale viene, inoltre, illustrato graficamente nell’immagine seguente, nella quale il numero di ore/anno di ombreggiamento viene indicato sull’area di interesse tramite differenti colorazioni.

**Tabella 7.1 – Numero di ore d’ombra all’anno e numero massimo di minuti d’ombra al giorno al ricettore calcolato mediante software WindPro**

ricettore	caso peggiore		caso reale	
	[h/year]	[h:mm/day]	[h/year]	[h:mm/day]
A01	00:00	00:00	00:00	00:00
A02	25:09	00:33	09:12	00:12
A03	36:40	00:46	13:16	00:15
A04	00:00	00:00	00:00	00:00
A05	00:00	00:00	00:00	00:00
A06	00:00	00:00	00:00	00:00
A07	00:00	00:00	00:00	00:00
A08	00:00	00:00	00:00	00:00
A09	00:00	00:00	00:00	00:00
A10	20:39	00:28	08:22	00:12
A11	00:00	00:00	00:00	00:00





**Legenda:**

- Aerogeneratori
- Ricettori sensibili

Coni d'ombra [ore/anno]

- 0 - 5
- 5 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100 - 200
- 200 - 400
- 400 - 800

**Figura 7-1 – Rappresentazione grafica del numero di ore d'ombra all'anno calcolato mediante software WindPro per lo scenario "caso reale"**

## **8 Conclusioni**

In conclusione, si sottolinea come seppure lo scenario “caso peggiore” sia modellato con assunzioni estremamente cautelative, conduce a valori di ore d’ombra contenuti: al massimo 36:40 ore/anno (ricettore A3).

Tali valori sono notevolmente ridotti nello scenario “caso reale”: al massimo 13:16 ore/anno (ricettore A3); scenario che comunque mantiene assunzioni conservative, quali ad esempio la totale assenza di ostacoli tra ricettori e parco eolico e la modellazione in greehouse mode, con finestre sempre rivolte verso l’aerogeneratore.

Ne emerge dunque che gli effetti di shadow flickering hanno un impatto del tutto trascurabile e non presentano ripercussioni negative sul territorio in cui si inseriscono le opere di progetto.

## **ALLEGATO I**

Risultati della simulazione di shadow-flickering del parco eolico "Pizzu Boi"  
eseguita mediante software WindPro

## SHADOW - Main Result

Calculation: WORST

### 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  
The calculated times are "worst case" given by the following assumptions:  
The sun is shining all the day, from sunrise to sunset  
The rotor plane is always perpendicular to the line from the WTG to the sun  
The WTG is always operating

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: Height Contours: WASP obj  
Obstacles used in calculation  
Eye height for map: 1.7 m  
Grid resolution: 1.0 m  
Topographic shadow included in calculation

All coordinates are in  
UTM (north)-WGS84 Zone: 32

### WTGs

	Easting	Northing	Z	Row data/Description	WTG type			Shadow data				
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
GU1	507,046	4,381,481	380.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU10	504,999	4,382,660	330.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU11	504,061	4,383,314	349.6	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU12	504,396	4,383,761	380.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU13	505,506	4,381,423	310.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU14	506,299	4,381,798	366.8	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
S2	507,814	4,381,166	360.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
S3	508,109	4,381,635	390.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
S4	508,645	4,381,845	400.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8

### Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
	[m]	[m]	[m]	[m]	[m]	[m]	[°]		[m]
A01	506,414	4,380,776	318.3	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A02	509,828	4,381,943	353.9	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A03	505,488	4,382,128	256.2	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A04	506,296	4,380,254	240.0	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A05	506,674	4,380,244	230.0	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A06	506,801	4,380,214	228.8	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A07	506,948	4,380,426	244.3	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A08	506,958	4,380,070	228.1	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A09	508,024	4,379,780	207.9	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A10	510,048	4,381,727	330.1	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A11	508,471	4,380,052	216.0	1.5	1.5	1.0	90.0	"Green house mode"	2.5

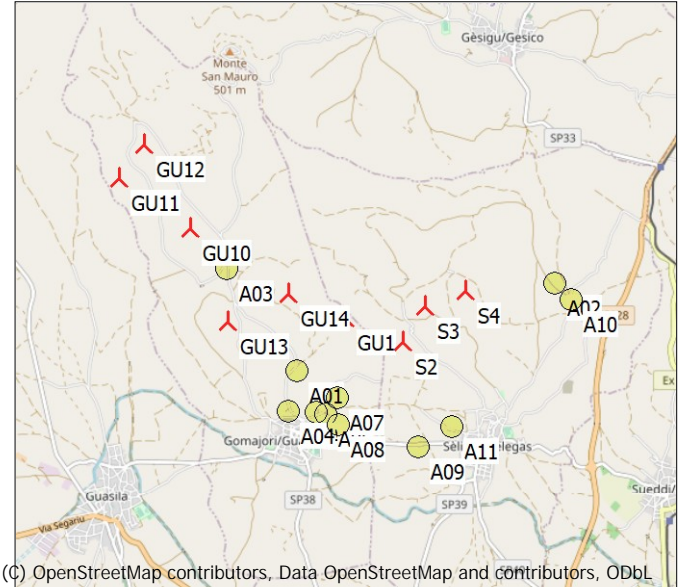
### Calculation Results

Shadow receptor

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A01	0:00	0	0:00
A02	25:09	65	0:33
A03	36:40	69	0:46

To be continued on next page...



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:100,000  
New WTG Shadow receptor

## SHADOW - Main Result

Calculation: WORST

...continued from previous page

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A04	0:00	0	0:00
A05	0:00	0	0:00
A06	0:00	0	0:00
A07	0:00	0	0:00
A08	0:00	0	0:00
A09	0:00	0	0:00
A10	20:39	65	0:28
A11	0:00	0	0:00

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

No.	Name	Worst case [h/year]
GU1	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (15)	6:33
GU10	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (10)	0:00
GU11	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (11)	0:00
GU12	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (12)	0:00
GU13	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (13)	0:00
GU14	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (14)	32:01
S2	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (2)	0:00
S3	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (3)	14:37
S4	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (4)	31:47

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: WORSTShadow receptor: A01 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (5)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:59 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:56	06:23 20:38	06:51 19:57	07:19 19:08	06:52 17:24	07:25 17:01
2	07:45 17:11	07:32 17:44	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:46	06:00 20:56	06:24 20:37	06:52 19:55	07:20 19:07	06:53 17:23	07:26 17:01
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:54	07:21 19:05	06:54 17:21	07:27 17:01
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	06:23 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:28 17:00
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:48	06:02 20:55	06:26 20:34	06:55 19:51	07:23 19:02	06:56 17:19	07:29 17:00
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:03 20:55	06:27 20:33	06:56 19:49	07:24 19:00	06:57 17:18	07:30 17:00
7	07:45 17:16	07:27 17:50	06:50 18:22	07:01 19:53	06:19 20:23	05:57 20:49	06:03 20:55	06:28 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:30 17:00
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:50	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:01 17:15	07:32 17:00
10	07:45 17:18	07:24 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:51	06:05 20:54	06:31 20:28	07:00 19:43	07:28 18:54	07:02 17:14	07:33 17:00
11	07:45 17:19	07:23 17:55	06:44 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:06 20:53	06:32 20:27	07:01 19:41	07:29 18:53	07:03 17:13	07:34 17:00
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:52	06:06 20:53	06:33 20:25	07:02 19:39	07:30 18:51	07:04 17:12	07:35 17:00
13	07:44 17:22	07:20 17:57	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 17:11	07:36 17:00
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:53	06:08 20:52	06:35 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:36 17:01
15	07:44 17:24	07:18 18:00	06:37 18:30	06:48 20:01	06:11 20:31	05:56 20:53	06:08 20:51	06:36 20:21	07:04 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	07:43 17:25	07:17 18:01	06:36 18:31	06:47 20:02	06:10 20:32	05:56 20:53	06:09 20:51	06:37 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:38 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:33	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:44	07:10 17:08	07:38 17:01
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:11 20:50	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:39 17:02
19	07:42 17:28	07:13 18:04	06:31 18:34	06:43 20:05	06:07 20:34	05:56 20:54	06:12 20:49	06:39 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:40 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:07 20:35	05:56 20:55	06:12 20:48	06:40 20:15	07:09 19:26	07:38 18:39	07:13 17:06	07:40 17:03
21	07:41 17:30	07:10 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:55	06:13 20:48	06:41 20:13	07:10 19:25	07:40 18:38	07:14 17:05	07:41 17:03
22	07:40 17:31	07:09 18:08	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:41 18:37	07:15 17:05	07:41 17:04
23	07:40 17:33	07:07 18:09	06:25 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	07:16 17:04	07:42 17:04
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 20:39	05:57 20:55	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:40	05:58 20:56	06:16 20:44	06:45 20:07	07:14 19:18	06:44 17:32	07:18 17:03	07:43 17:05
26	07:38 17:36	07:03 18:12	06:20 18:41	06:33 20:12	06:02 20:40	05:58 20:56	06:17 20:44	06:46 20:06	07:15 19:16	06:45 17:31	07:20 17:03	07:43 17:06
27	07:37 17:37	07:02 18:13	06:18 18:42	06:31 20:13	06:02 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:16 19:15	06:46 17:30	07:21 17:02	07:43 17:06
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	06:01 20:42	05:59 20:56	06:19 20:42	06:48 20:03	07:17 19:13	06:47 17:29	07:22 17:02	07:44 17:07
29	07:35 17:40		07:15 19:44	06:29 20:15	06:01 20:43	05:59 20:56	06:20 20:41	06:49 20:01	07:17 19:12	06:48 17:27	07:23 17:02	07:44 17:08
30	07:35 17:41		07:13 19:45	06:28 20:16	06:00 20:44	05:59 20:56	06:21 20:40	06:50 20:00	07:18 19:10	06:49 17:26	07:24 17:01	07:44 17:09
31	07:34 17:42		07:12 19:46		06:00 20:44		06:22 20:39	06:51 19:58		06:50 17:25		07:45 17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A02 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (4)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:45 17:10	07:33 17:43	06:59 18:15	07:10 19:47	18:39 (S4) 19:02 (S4)	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	18:21 (S3) 18:41 (S3)	06:51 17:24
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	18:41 (S4) 18:59 (S4)	06:25 20:18	05:59 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:07	18:20 (S3) 18:42 (S3)	06:52 17:22
3	07:45 17:12	07:31 17:45	06:56 18:17	07:07 19:49	17:48 (S3) 17:56 (S3)	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:54	07:21 19:05	18:19 (S3) 18:42 (S3)	06:54 17:21
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	17:46 (S3) 17:58 (S3)	06:23 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	18:19 (S3) 18:41 (S3)	06:55 17:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	17:44 (S3) 17:59 (S3)	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:34	06:55 19:50	07:23 19:02	18:19 (S3) 18:40 (S3)	06:56 17:19
6	07:45 17:14	07:28 17:49	06:51 18:21	07:02 19:52	17:44 (S3) 18:00 (S3)	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	18:19 (S3) 18:38 (S3)	06:57 17:18
7	07:45 17:15	07:27 17:50	06:50 18:22	07:00 19:53	17:42 (S3) 18:01 (S3)	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	18:19 (S3) 18:37 (S3)	06:58 17:17
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	17:41 (S3) 18:02 (S3)	06:18 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	18:19 (S3) 18:35 (S3)	06:59 17:16
9	07:45 17:17	07:25 17:53	06:47 18:24	06:57 19:55	17:41 (S3) 18:03 (S3)	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:38 (S4)	18:20 (S3) 18:51 (S4)	07:00 18:55
10	07:45 17:18	07:24 17:54	06:45 18:25	06:56 19:56	17:41 (S3) 18:03 (S3)	06:16 20:26	05:56 20:51	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:53 (S4)	18:22 (S3) 18:54 (S4)	07:02 18:54
11	07:45 17:19	07:22 17:55	06:43 18:26	06:54 19:57	17:41 (S3) 18:03 (S3)	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:01 19:41	07:29 18:32 (S4)	18:24 (S3) 18:54 (S4)	07:03 18:52
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58	17:41 (S3) 18:02 (S3)	06:14 20:28	05:56 20:52	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:55 (S4)	18:30 (S4) 18:51 (S4)	07:04 18:51
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	17:42 (S3) 18:01 (S3)	06:13 20:29	05:56 20:52	06:07 20:52	06:34 20:24	07:02 19:37	07:31 18:29 (S4)	18:31 (S4) 18:56 (S4)	07:05 18:49
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	17:43 (S3) 18:00 (S3)	06:12 20:30	05:56 20:53	06:08 20:52	06:34 20:23	07:03 19:36	07:32 18:57 (S4)	18:32 (S4) 18:57 (S4)	07:06 18:48
15	07:43 17:24	07:18 18:00	06:37 18:30	06:48 20:01	17:44 (S3) 18:02 (S4)	06:11 20:31	05:56 20:53	06:08 20:51	06:35 20:25	07:04 19:34	07:33 18:27 (S4)	18:33 (S4) 18:57 (S4)	07:07 18:46
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	17:46 (S4) 18:05 (S4)	06:10 20:32	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:26 (S4)	18:34 (S4) 18:57 (S4)	07:08 18:45
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	17:44 (S4) 18:06 (S4)	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:25 (S4)	18:35 (S4) 18:57 (S4)	07:09 18:43
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	17:42 (S4) 18:08 (S4)	06:08 20:33	05:56 20:54	06:11 20:49	06:38 20:17	07:07 19:29	07:36 18:25 (S4)	18:36 (S4) 18:57 (S4)	07:11 18:42
19	07:42 17:28	07:13 18:04	06:31 18:34	06:42 20:05	17:41 (S4) 18:09 (S4)	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:24 (S4)	18:37 (S4) 18:57 (S4)	07:12 18:41
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	17:39 (S4) 18:09 (S4)	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:23 (S4)	18:38 (S4) 18:55 (S4)	07:13 18:39
21	07:41 17:30	07:10 18:06	06:28 18:36	06:40 20:07	17:39 (S4) 18:10 (S4)	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:23 (S4)	18:39 (S4) 18:55 (S4)	07:14 18:38
22	07:40 17:31	07:08 18:08	06:26 18:37	06:38 20:08	17:38 (S4) 18:09 (S4)	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:23 (S4)	18:40 (S4) 18:54 (S4)	07:15 18:36
23	07:40 17:32	07:07 18:09	06:24 18:38	06:37 20:09	17:38 (S4) 18:10 (S4)	06:04 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:23 (S4)	18:37 (S4) 18:53 (S4)	07:16 18:35
24	07:39 17:34	07:06 18:10	06:23 18:39	06:35 20:10	17:37 (S4) 18:10 (S4)	06:03 20:39	05:57 20:55	06:15 20:45	06:44 20:09	07:13 19:19	07:43 18:24 (S4)	18:34 (S4) 18:52 (S4)	07:17 18:34
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	17:36 (S4) 18:09 (S4)	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:14 19:18	07:44 18:24 (S4)	18:35 (S4) 18:51 (S4)	07:18 18:32
26	07:38 17:36	07:03 18:12	06:20 18:41	06:33 20:12	17:37 (S4) 18:09 (S4)	06:02 20:40	05:58 20:56	06:17 20:43	06:46 20:06	07:14 19:16	07:45 18:25 (S4)	18:36 (S4) 18:49 (S4)	07:19 18:31
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	17:36 (S4) 18:08 (S4)	06:02 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:15 19:15	07:46 18:27 (S4)	18:37 (S4) 18:47 (S4)	07:20 18:30
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	17:36 (S4) 18:07 (S4)	06:01 20:42	05:58 20:56	06:19 20:42	06:48 20:03	07:16 19:13	07:47 18:26 (S3)	18:38 (S3) 18:45 (S3)	07:22 18:28
29	07:35 17:39		07:15 19:44	06:29 20:15	18:37 (S4) 19:06 (S4)	06:00 20:43	05:59 20:56	06:20 20:41	06:49 20:01	07:17 19:11	07:48 18:24 (S3)	18:39 (S3) 18:41 (S4)	07:23 18:27
30	07:34 17:41		07:13 19:45	06:27 20:16	18:37 (S4) 19:05 (S4)	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	07:49 18:22 (S3)	18:40 (S3) 18:41 (S3)	07:24 18:26
31	07:34 17:42		07:12 19:46	06:25 20:17	18:39 (S4) 19:04 (S4)	05:59 20:44		06:22 20:39	06:50 19:58		07:50 17:25		07:44 17:09
Potential sun hours	301	299	370	397	444	448	455	425	374	347	301	292	
Total, worst case			694	54					571	190			

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

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

## SHADOW - Calendar

Calculation: WORSTShadow receptor: A03 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (16)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:45 17:10	07:33 17:43	06:59 18:15	07:57 (GU14) 19:47	07:10 20:17	06:26 20:45	05:59 20:56	06:00 20:38	06:23 19:57	06:51 19:57	07:19 19:08	08:39 (GU14) 17:24	06:52 17:01
2	07:45 17:11	07:32 17:44	06:57 18:17	07:58 (GU14) 19:48	07:09 20:18	06:25 20:46	05:59 20:56	06:00 20:37	06:24 19:55	06:52 19:55	07:20 19:07	08:38 (GU14) 17:23	06:53 17:01
3	07:45 17:12	07:31 17:46	06:56 18:18	07:57 (GU14) 19:49	07:07 20:19	06:24 20:47	05:58 20:56	06:01 20:36	06:24 19:54	06:53 19:54	07:21 19:05	08:37 (GU14) 17:21	06:54 17:01
4	07:45 17:13	07:30 17:47	06:54 18:19	07:57 (GU14) 19:50	07:05 20:20	06:23 20:47	05:58 20:55	06:01 20:35	06:25 19:52	06:54 19:52	07:22 19:04	08:35 (GU14) 17:20	06:55 17:00
5	07:45 17:14	07:29 17:48	06:53 18:20	07:57 (GU14) 19:51	07:04 20:21	06:22 20:48	05:58 20:55	06:02 20:34	06:26 19:51	06:55 19:51	07:23 19:02	08:34 (GU14) 17:19	06:56 17:00
6	07:45 17:15	07:28 17:49	06:51 18:21	07:57 (GU14) 19:52	07:02 20:22	06:20 20:48	05:57 20:55	06:03 20:33	06:27 19:49	06:56 19:49	07:24 19:00	08:34 (GU14) 17:18	06:57 17:00
7	07:45 17:16	07:27 17:50	06:50 18:22	07:57 (GU14) 19:53	07:01 20:23	06:19 20:49	05:57 20:55	06:03 20:31	06:28 19:47	06:57 19:47	07:25 18:59	08:33 (GU14) 17:17	06:58 17:00
8	07:45 17:17	07:26 17:52	06:48 18:23	07:58 (GU14) 19:54	06:59 20:24	06:18 20:50	05:57 20:54	06:04 20:30	06:29 19:46	06:58 19:46	07:26 18:57	08:32 (GU14) 17:16	06:59 17:00
9	07:45 17:18	07:25 17:53	06:47 18:24	07:58 (GU14) 19:55	06:58 20:25	06:17 20:50	05:57 20:54	06:04 20:29	06:30 19:44	06:59 19:44	07:27 18:56	08:32 (GU14) 17:15	07:01 17:00
10	07:45 17:19	07:24 17:54	06:45 18:25	07:59 (GU14) 19:56	06:56 20:26	06:16 20:51	05:56 20:54	06:05 20:28	06:06 19:43	06:57 19:43	07:28 18:54	08:32 (GU14) 17:14	07:02 17:00
11	07:45 17:20	07:23 17:55	06:44 18:26	07:59 (GU14) 19:57	06:55 20:27	06:15 20:51	05:56 20:53	06:06 20:27	06:32 19:41	07:01 19:41	07:29 18:53	08:31 (GU14) 17:13	07:03 17:00
12	07:45 17:21	07:21 17:56	06:42 18:27	08:05 (GU1) 19:58	06:42 20:28	06:35 20:52	06:06 20:53	06:06 20:25	06:33 19:39	07:02 19:39	07:30 18:51	09:14 (GU14) 17:12	07:04 17:00
13	07:44 17:22	07:20 17:57	06:40 18:28	08:04 (GU1) 19:59	06:40 20:29	06:33 20:52	06:07 20:52	06:07 20:24	06:34 19:38	07:03 19:38	07:31 18:50	09:14 (GU14) 17:11	07:05 17:00
14	07:44 17:23	07:19 17:59	06:39 18:29	08:03 (GU1) 20:00	06:39 20:30	06:32 20:53	06:08 20:52	06:35 20:23	07:03 19:36	07:03 19:36	07:32 18:48	08:31 (GU14) 17:11	07:06 17:01
15	07:44 17:24	07:18 18:00	06:37 18:30	08:02 (GU1) 20:01	06:37 20:31	06:31 20:53	06:08 20:51	06:36 20:21	07:04 19:34	07:04 19:34	07:33 18:47	08:31 (GU14) 17:10	07:07 17:01
16	07:43 17:25	07:17 18:01	06:36 18:31	08:01 (GU1) 20:02	06:36 20:32	06:10 20:54	05:56 20:51	06:09 20:20	06:37 19:33	07:05 19:33	07:34 18:45	08:29 (GU1) 17:09	07:09 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	08:00 (GU1) 20:03	06:34 20:03	06:09 20:54	05:56 20:50	06:10 20:19	06:38 19:31	07:06 19:31	07:35 18:44	08:26 (GU1) 17:08	07:10 17:01
18	07:42 17:27	07:14 18:03	06:33 18:33	07:59 (GU1) 20:04	06:33 20:04	06:08 20:54	05:56 20:50	06:11 20:17	06:38 19:30	07:07 19:30	07:36 18:42	08:24 (GU1) 17:07	07:11 17:02
19	07:42 17:28	07:13 18:04	06:31 18:34	07:58 (GU1) 20:05	06:31 20:05	06:07 20:54	05:56 20:49	06:12 20:16	06:39 19:28	07:08 19:28	07:37 18:41	08:24 (GU1) 17:07	07:12 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	07:56 (GU1) 20:06	06:29 20:06	06:07 20:55	05:56 20:48	06:12 20:15	06:40 19:26	07:09 19:26	07:39 18:39	08:25 (GU1) 17:06	07:13 17:03
21	07:41 17:30	07:10 18:07	06:28 18:36	07:55 (GU1) 20:07	06:28 20:07	06:06 20:55	05:57 20:48	06:13 20:13	06:41 19:25	07:10 19:25	07:40 18:38	08:26 (GU1) 17:05	07:14 17:03
22	07:40 17:31	07:09 18:08	06:26 18:37	07:53 (GU1) 20:08	06:26 20:08	06:05 20:57	05:57 20:47	06:14 20:12	06:42 19:23	07:11 19:23	07:41 18:37	08:27 (GU1) 17:05	07:15 17:04
23	07:40 17:33	07:07 18:09	06:25 18:38	07:52 (GU1) 20:09	06:25 20:09	06:04 20:55	05:57 20:46	06:15 20:10	06:42 19:21	07:12 19:21	07:42 18:35	08:28 (GU1) 17:04	07:16 17:04
24	07:39 17:34	07:06 18:10	06:23 18:39	07:54 (GU1) 20:10	06:23 20:10	06:04 20:56	05:57 20:45	06:16 20:09	06:44 19:20	07:13 19:20	07:43 18:34	08:29 (GU1) 17:04	07:17 17:05
25	07:38 17:35	07:05 18:11	06:21 18:40	07:55 (GU1) 20:11	06:21 20:11	06:03 20:56	05:58 20:45	06:16 20:07	06:45 19:18	07:14 19:18	06:44 17:33	07:30 (GU1) 17:03	07:19 17:05
26	07:38 17:36	07:03 18:12	06:20 18:41	08:00 (GU1) 20:12	06:20 20:12	06:02 20:56	05:58 20:44	06:17 20:06	06:46 19:16	07:15 19:16	06:45 17:31	07:31 (GU1) 17:03	07:20 17:06
27	07:37 17:37	07:02 18:13	06:18 18:42	07:59 (GU1) 20:13	06:18 20:13	06:02 20:41	05:58 20:43	06:18 20:04	06:47 19:15	07:16 19:15	06:46 17:30	07:32 (GU1) 17:02	07:21 17:06
28	07:36 17:38	07:00 18:14	06:17 18:43	07:58 (GU1) 20:14	06:17 20:14	06:01 20:42	05:59 20:42	06:19 20:03	06:48 19:13	07:17 19:13	06:47 17:29	08:46 (GU1) 17:02	07:22 17:07
29	07:35 17:40	07:35 18:14	06:15 19:44	08:41 (GU1) 20:15	06:15 20:15	06:01 20:43	05:59 20:41	06:20 20:01	06:49 19:12	07:18 19:12	06:48 17:25	08:43 (GU1) 17:02	07:23 17:08
30	07:35 17:41	07:35 18:14	06:13 19:45	08:41 (GU1) 20:16	06:13 20:16	06:00 20:44	05:59 20:40	06:21 20:00	06:50 19:10	07:18 19:10	06:49 17:26	08:41 (GU1) 17:02	07:24 17:09
31	07:34 17:42	07:34 18:14	06:12 19:46	07:12 20:16	06:12 20:16	06:00 20:44	06:22 20:39	06:51 19:58	06:51 19:58	07:18 19:58	06:50 17:25	07:36 (GU1) 17:01	07:45 17:09
Potential sun hours	301	299	517	370	397	445	448	455	425	374	84	1028	301
Total, worst case													

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

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

Calculation: WORSTShadow receptor: A04 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (13)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:52	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:22	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:51	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:19	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:43	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:36
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:11	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:17	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:02
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:57	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:25	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	07:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	07:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	07:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	07:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	07:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:12	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	06:00	06:21	06:50	07:18	07:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A05 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (12)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:51	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:25	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A06 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (11)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A07 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (6)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A08 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (10)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:00	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:22	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:16	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:34		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A09 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (9)

### Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:23	06:52	07:20	06:53	07:26
	17:11	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:07	17:22	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:00
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:16	17:51	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:57	06:17	05:57	06:04	06:30	06:59	07:27	07:00	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:22	06:43	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:52	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:20	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:02	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:49	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:43	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:32	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:36	17:05	17:03
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:35	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	07:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:39	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	07:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	07:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:16	07:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	07:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:34		07:13	06:28	06:00	05:59	06:21	06:50	07:18	07:49	07:24	07:44
	17:41		19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:01	17:08
31	07:34		07:12		06:00		06:22	06:50		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: WORSTShadow receptor: A10 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (7)  
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:22	06:51	18:58 (S4)	07:19	06:51	07:25	
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	28	19:26 (S4)	19:08	17:24	17:01
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:23	06:52	18:57 (S4)	07:20	06:52	07:26	
	17:11	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	27	19:24 (S4)	19:07	17:22	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	27	18:57 (S4)	07:21	06:54	07:27
	17:12	17:45	18:17	19:49	4	19:17 (S4)	20:19	20:46	19:54	27	19:24 (S4)	19:05	17:21	17:00
4	07:45	07:30	06:54	07:05	06:22	05:58	06:01	06:25	06:54	28	18:58 (S4)	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	13	19:21 (S4)	20:20	20:47	19:52	25	19:23 (S4)	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:57	06:02	06:26	06:55	25	18:58 (S4)	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	18	19:24 (S4)	20:21	20:48	19:50	24	19:22 (S4)	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	24	18:59 (S4)	07:24	06:57	07:29
	17:14	17:49	18:21	19:52	21	19:24 (S4)	20:22	20:48	19:49	21	19:20 (S4)	19:00	17:18	17:00
7	07:45	07:27	06:50	07:00	06:19	05:57	06:03	06:28	06:57	21	19:01 (S4)	07:25	06:58	07:30
	17:15	17:50	18:22	19:53	24	19:26 (S4)	20:23	20:49	19:47	18	19:19 (S4)	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	25	19:01 (S4)	06:18	05:57	06:58	13	19:03 (S4)	07:26	06:59	07:31
	17:16	17:51	18:23	19:54	24	19:26 (S4)	20:24	20:49	19:46	13	19:16 (S4)	18:57	17:16	17:00
9	07:45	07:25	06:47	06:57	18:59 (S4)	06:17	05:56	06:04	06:59	13	19:06 (S4)	07:27	07:00	07:32
	17:17	17:53	18:24	19:55	27	19:26 (S4)	20:25	20:50	19:44	6	19:12 (S4)	18:55	17:15	17:00
10	07:45	07:24	06:45	06:56	18:59 (S4)	06:16	05:56	06:05	07:00	6	19:12 (S4)	18:55	17:15	17:00
	17:18	17:54	18:25	19:56	27	19:26 (S4)	20:26	20:51	19:42	6	19:12 (S4)	18:55	17:15	17:00
11	07:45	07:22	06:43	06:54	18:58 (S4)	06:15	05:56	06:05	07:01	6	19:12 (S4)	18:55	17:15	17:00
	17:19	17:55	18:26	19:57	28	19:26 (S4)	20:27	20:51	19:41	6	19:12 (S4)	18:55	17:15	17:00
12	07:44	07:21	06:42	06:53	18:58 (S4)	06:14	05:56	06:06	07:01	6	19:12 (S4)	18:55	17:15	17:00
	17:20	17:56	18:27	19:58	28	19:26 (S4)	20:28	20:52	19:39	6	19:12 (S4)	18:55	17:15	17:00
13	07:44	07:20	06:40	06:51	18:58 (S4)	06:13	05:56	06:07	07:02	6	18:53 (S3)	07:31	07:05	07:35
	17:21	17:57	18:28	19:59	28	19:26 (S4)	20:29	20:52	19:37	6	18:59 (S3)	18:49	17:11	17:00
14	07:44	07:19	06:39	06:50	18:58 (S4)	06:12	05:56	06:08	07:03	6	18:50 (S3)	07:32	07:06	07:36
	17:22	17:58	18:29	20:00	28	19:26 (S4)	20:30	20:52	19:36	12	19:02 (S3)	18:48	17:10	17:00
15	07:43	07:18	06:37	06:48	18:58 (S4)	06:11	05:56	06:08	07:04	12	18:48 (S3)	07:33	07:07	07:37
	17:23	18:00	18:30	20:01	26	19:24 (S4)	20:31	20:53	19:34	15	19:03 (S3)	18:46	17:09	17:01
16	07:43	07:16	06:36	06:47	18:59 (S4)	06:10	05:56	06:09	07:05	15	18:46 (S3)	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	25	19:24 (S4)	20:32	20:53	19:33	18	19:04 (S3)	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	19:00 (S4)	06:09	05:56	06:10	07:06	18	18:45 (S3)	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	24	19:24 (S4)	20:32	20:54	19:31	19	19:04 (S3)	18:43	17:08	17:01
18	07:42	07:14	06:32	18:06 (S3)	06:44	19:00 (S4)	06:08	05:56	07:07	19	19:04 (S3)	18:43	17:08	17:01
	17:27	18:03	18:33	6	18:12 (S3)	20:04	19:22 (S4)	20:33	19:29	19	19:04 (S3)	18:42	17:07	17:02
19	07:42	07:12	06:31	18:02 (S3)	06:42	19:01 (S4)	06:07	05:56	07:08	19	18:44 (S3)	07:37	07:12	07:39
	17:28	18:04	18:34	12	18:14 (S3)	20:05	19:21 (S4)	20:34	19:28	20	19:04 (S3)	18:41	17:06	17:02
20	07:41	07:11	06:29	18:00 (S3)	06:41	19:02 (S4)	06:06	05:56	07:09	20	18:43 (S3)	07:38	07:13	07:40
	17:29	18:05	18:35	14	18:14 (S3)	20:06	19:18 (S4)	20:35	19:26	20	19:03 (S3)	18:39	17:06	17:02
21	07:41	07:10	06:28	17:59 (S3)	06:40	19:04 (S4)	06:06	05:56	07:10	20	18:43 (S3)	07:39	07:14	07:41
	17:30	18:06	18:36	17	18:16 (S3)	20:07	19:16 (S4)	20:36	19:27	19	19:02 (S3)	18:38	17:05	17:03
22	07:40	07:08	06:26	17:58 (S3)	06:38	06:05	05:57	06:14	07:11	19	19:09 (S4)	07:11	18:43 (S3)	07:40
	17:31	18:08	18:37	18	18:16 (S3)	20:08	20:37	20:55	19:21 (S4)	18	19:21 (S4)	19:23	18:19 (S3)	18:36
23	07:40	07:07	06:24	17:58 (S3)	06:37	06:04	05:57	06:15	07:12	18	19:07 (S4)	07:12	18:44 (S3)	07:41
	17:32	18:09	18:38	19	18:17 (S3)	20:09	20:38	20:55	19:23 (S4)	15	18:59 (S3)	18:35	17:04	17:04
24	07:39	07:06	06:23	17:57 (S3)	06:35	06:03	05:57	06:15	07:13	16	19:04 (S4)	07:13	18:45 (S3)	07:43
	17:34	18:10	18:39	20	18:17 (S3)	20:10	20:39	20:55	19:24 (S4)	12	19:24 (S4)	19:19	18:57 (S3)	18:34
25	07:38	07:04	06:21	17:56 (S3)	06:34	06:03	05:57	06:16	07:14	12	19:02 (S4)	07:14	18:47 (S3)	07:44
	17:35	18:11	18:40	20	18:16 (S3)	20:11	20:39	20:55	19:25 (S4)	9	18:56 (S3)	19:18	18:57 (S3)	17:32
26	07:38	07:03	06:20	17:57 (S3)	06:33	06:02	05:58	06:17	07:15	9	18:56 (S3)	19:18	18:57 (S3)	17:32
	17:36	18:12	18:41	19	18:16 (S3)	20:12	20:40	20:56	19:01 (S4)	24	19:25 (S4)	19:16	17:31	17:03
27	07:37	07:01	06:18	17:57 (S3)	06:31	06:02	05:58	06:18	07:16	24	19:25 (S4)	19:16	17:31	17:03
	17:37	18:13	18:42	18	18:15 (S3)	20:13	20:41	20:56	19:02 (S4)	19	19:04 (S3)	18:43	17:08	17:01
28	07:36	07:00	06:16	17:57 (S3)	06:30	06:01	05:58	06:19	07:17	19	19:04 (S3)	18:43	17:08	17:01
	17:38	18:14	18:43	16	18:13 (S3)	20:14	20:42	20:56	19:04 (S3)	26	19:26 (S4)	19:13	17:28	17:02
29	07:35	07:15	06:53	18:59 (S3)	06:29	06:00	05:59	06:20	07:18	26	19:26 (S4)	19:13	17:28	17:02
	17:39	18:15	18:44	13	19:12 (S3)	20:15	20:43	20:56	18:59 (S4)	17	18:59 (S4)	07:17	17:27	17:01
30	07:34	07:13	06:52	19:01 (S3)	06:27	06:00	05:59	06:21	07:19	17	18:59 (S4)	07:18	17:26	17:01
	17:41	18:16	18:45	7	19:08 (S3)	20:16	20:43	20:56	19:26 (S4)	17	19:26 (S4)	19:10	17:26	17:01
31	07:34	07:12	06:51	19:00 (S3)	06:26	06:00	05:59	06:22	07:20	17	18:59 (S4)	07:19	17:26	17:01
	17:42	18:17	18:46	19:08 (S3)	06:27	06:01	05:59	06:23	19:26 (S4)	17	19:26 (S4)	19:10	17:26	17:01
Potential sun hours	301	299	370	397	444	448	455	425	374	391	347	301	292	
Total, worst case			199	416				233						

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

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

Calculation: WORSTShadow receptor: A11 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (8)

### Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:23	06:52	07:20	06:53	07:26
	17:11	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:07	17:22	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:00
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:15	17:50	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:16	17:51	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:57	06:17	05:57	06:04	06:30	06:59	07:27	07:00	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:22	06:43	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:52	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:20	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:02	07:31	07:05	07:35
	17:21	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:49	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:58	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:43	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:14	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
	17:30	18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:36	17:05	17:03
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:35	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:15	06:46	07:20	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:16	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	17:08
30	07:34		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:01	17:08
31	07:34		07:12		06:00		06:22	06:50		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												

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

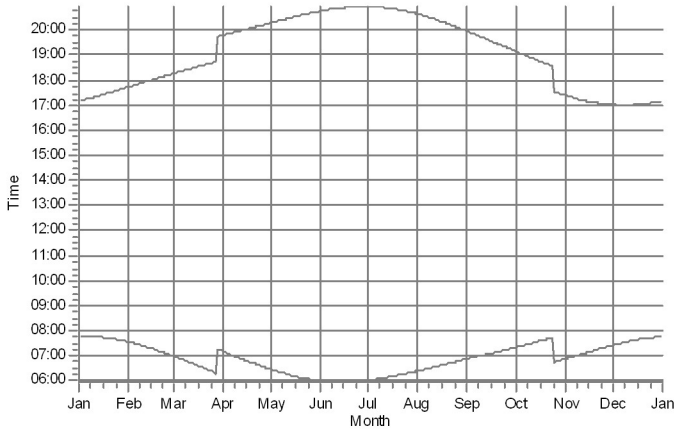
Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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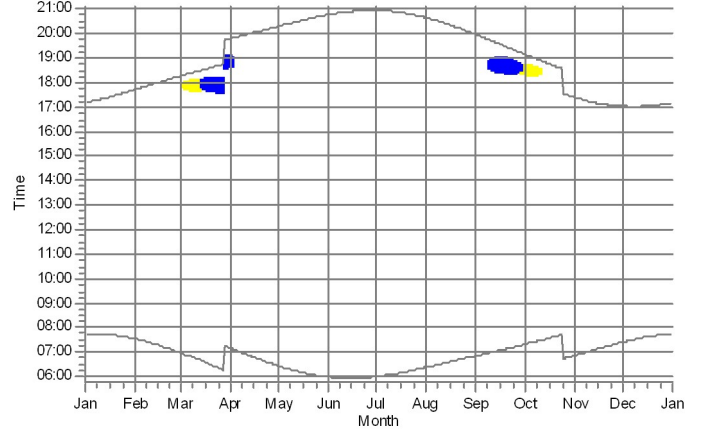
## SHADOW - Calendar, graphical

Calculation: WORST

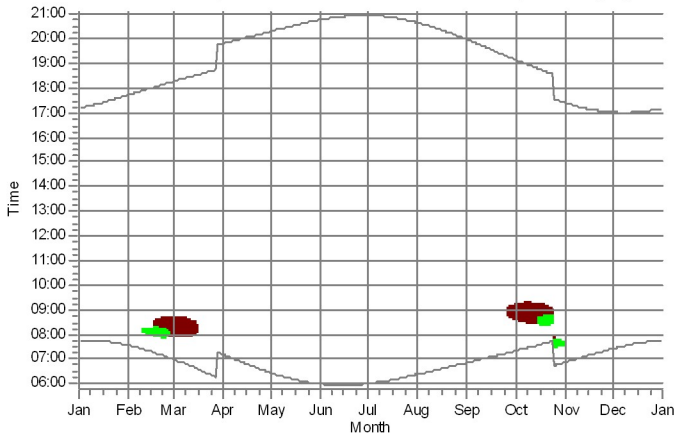
A01: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (5)



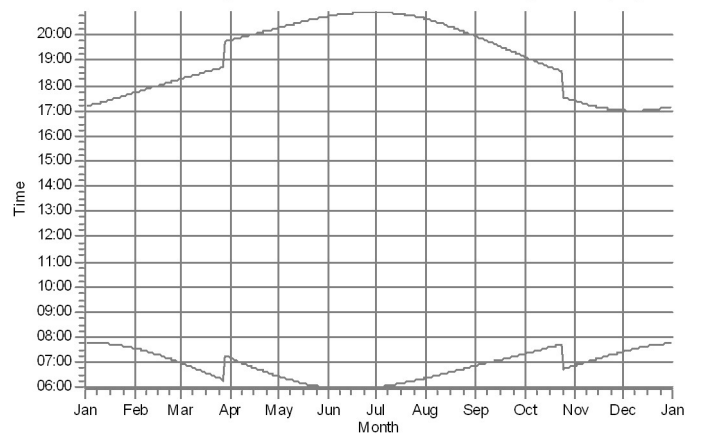
A02: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (4)



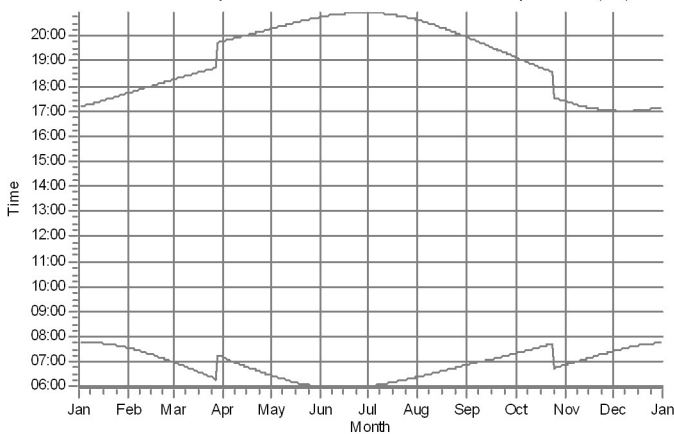
A03: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (16)



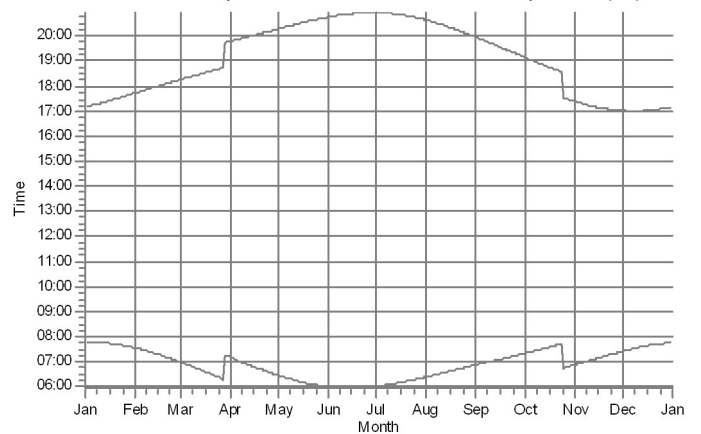
A04: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (13)



A05: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (12)



A06: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (11)



### WTGs

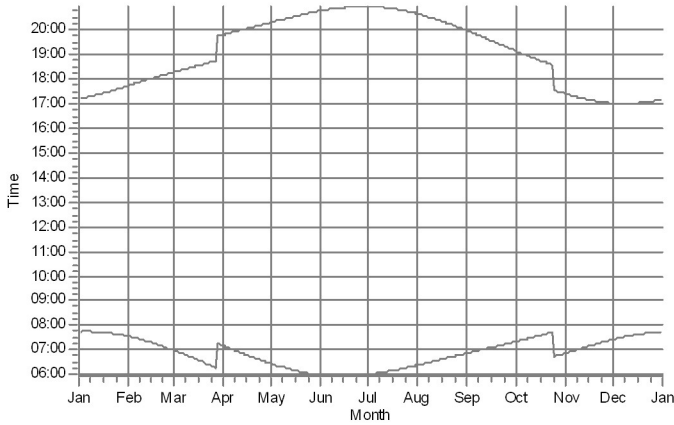
- S3: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (3)
- S4: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (4)

- GU14: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (14)
- GU1: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (15)

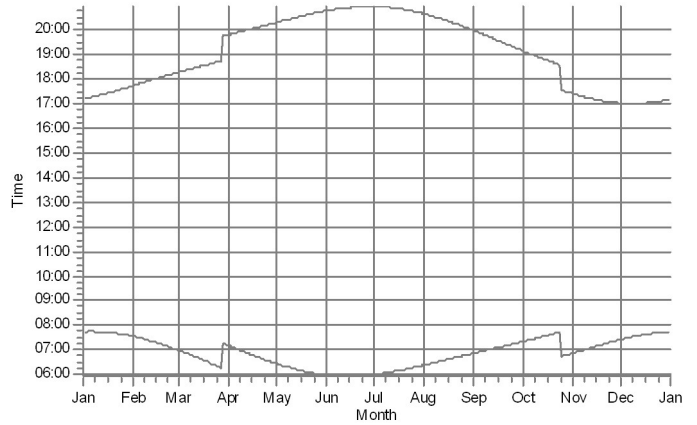
## SHADOW - Calendar, graphical

Calculation: WORST

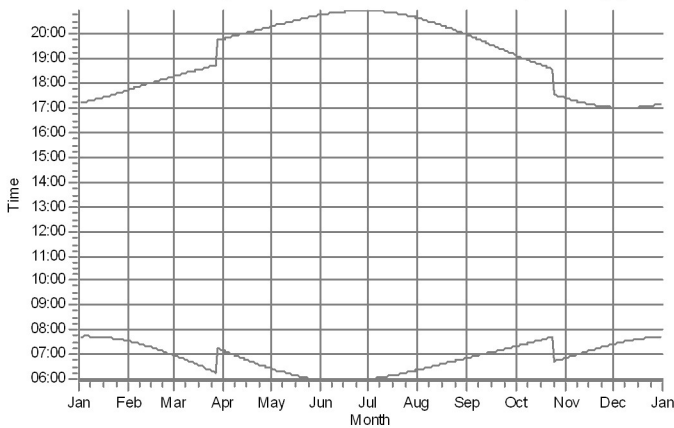
A07: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (6)



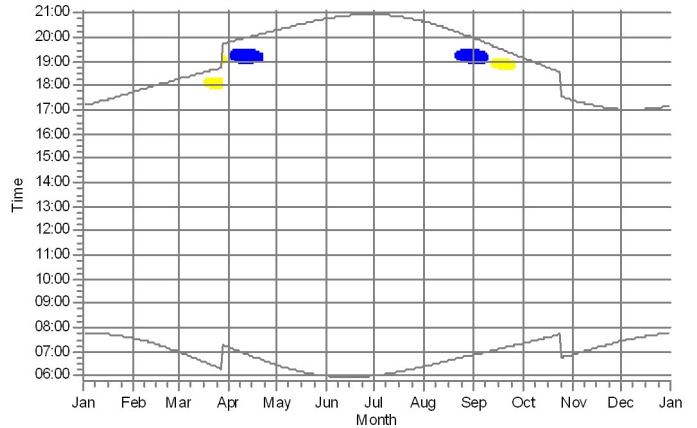
A08: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (10)



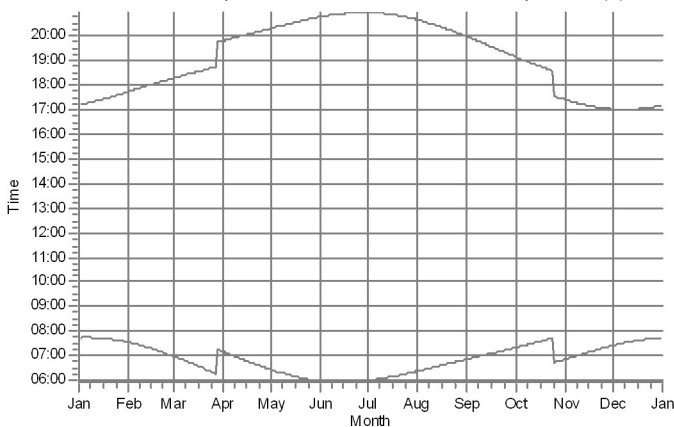
A09: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (9)



A10: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (7)




A11: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (8)



WTGs

 S3: Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (3)

 S4: Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (4)

## SHADOW - Main Result

Calculation: REAL CASE

### 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) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4.40	5.05	5.88	7.00	8.45	9.88	10.82	10.03	8.08	6.09	5.07	4.27

Operational hours are calculated from WTGs in calculation and wind distribution:

Site data: WASP

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
178	118	168	364	749	378	182	227	401	424	339	263

W WNW NW NNW Sum

521 1,283 1,516 849 7,959

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

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: Height Contours: WASP obj

Obstacles used in calculation

Eye height for map: 1.7 m

Grid resolution: 1.0 m

Topographic shadow included in calculation

All coordinates are in

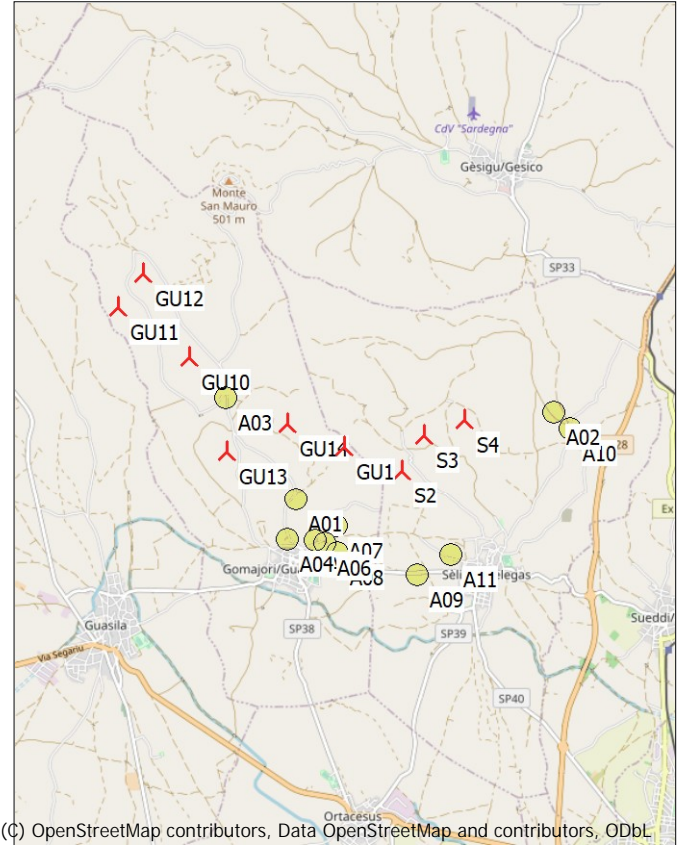
UTM (north)-WGS84 Zone: 32

### WTGs

	Easting	Northing	Z	Row data/Description	WTG type			Shadow data				
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
GU1	507,046	4,381,481	380.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU10	504,999	4,382,660	330.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU11	504,061	4,383,314	349.6	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU12	504,396	4,383,761	380.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU13	505,506	4,381,423	310.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
GU14	506,299	4,381,798	366.8	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
S2	507,814	4,381,166	360.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
S3	508,109	4,381,635	390.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8
S4	508,645	4,381,845	400.0	Siemens Gamesa SG 17...	Yes	Siemens Gamesa	SG 170-6,000	6,000	170.0	125.0	2,040	8.8

### Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
	[m]	[m]	[m]	[m]	[m]	[m]	[°]		[m]
A01	506,414	4,380,776	318.3	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A02	509,828	4,381,943	353.9	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A03	505,488	4,382,128	256.2	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A04	506,296	4,380,254	240.0	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A05	506,674	4,380,244	230.0	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A06	506,801	4,380,214	228.8	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A07	506,948	4,380,426	244.3	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A08	506,958	4,380,070	228.1	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A09	508,024	4,379,780	207.9	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A10	510,048	4,381,727	330.1	1.5	1.5	1.0	90.0	"Green house mode"	2.5
A11	508,471	4,380,052	216.0	1.5	1.5	1.0	90.0	"Green house mode"	2.5



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:100,000  
▲ New WTG      ● Shadow receptor

## SHADOW - Main Result

Calculation: REAL CASE

### Calculation Results

Shadow receptor

Shadow, expected values

No.	Shadow hours per year [h/year]
A01	0:00
A02	9:12
A03	13:16
A04	0:00
A05	0:00
A06	0:00
A07	0:00
A08	0:00
A09	0:00
A10	8:22
A11	0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
GU1	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (15)	6:33	2:19
GU10	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (10)	0:00	0:00
GU11	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (11)	0:00	0:00
GU12	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (12)	0:00	0:00
GU13	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (13)	0:00	0:00
GU14	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (14)	32:01	11:37
S2	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (2)	0:00	0:00
S3	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (3)	14:37	5:14
S4	Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (4)	31:47	12:34

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: REAL CASEShadow receptor: A01 - Shadow Receptor: 1.5 x 1.5 Azimuth: 0.0° Slope: 90.0° (5)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:52	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:22	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:51	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:43	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:36
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:17	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:25	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	07:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	07:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	07:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	07:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	07:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:12	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	07:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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## SHADOW - Calendar

Calculation: REAL CASEShadow receptor: A02 - Shadow Receptor: 1.5 x 1.5 Azimuth: 0.0° Slope: 90.0° (4)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:45 17:10	07:33 17:43	06:59 18:15	07:10 19:47	18:39 (S4) 19:02 (S4)	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	18:21 (S3) 18:41 (S3)	06:51 17:24
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	18:41 (S4) 18:59 (S4)	06:25 20:18	05:59 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:07	18:20 (S3) 18:42 (S3)	06:52 17:22
3	07:45 17:12	07:31 17:45	06:56 18:17	07:07 19:49	17:48 (S3) 17:56 (S3)	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:54	07:21 19:05	18:19 (S3) 18:42 (S3)	06:54 17:21
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	17:46 (S3) 17:58 (S3)	06:23 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	18:19 (S3) 18:41 (S3)	06:55 17:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	17:44 (S3) 17:59 (S3)	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:34	06:55 19:50	07:23 19:02	18:19 (S3) 18:40 (S3)	06:56 17:19
6	07:45 17:14	07:28 17:49	06:51 18:21	07:02 19:52	17:44 (S3) 18:00 (S3)	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	18:19 (S3) 18:38 (S3)	06:57 17:18
7	07:45 17:15	07:27 17:50	06:50 18:22	07:00 19:53	17:42 (S3) 18:01 (S3)	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	18:19 (S3) 18:37 (S3)	06:58 17:17
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	17:41 (S3) 18:02 (S3)	06:18 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	18:19 (S3) 18:35 (S3)	06:59 17:16
9	07:45 17:17	07:25 17:53	06:47 18:24	06:57 19:55	17:41 (S3) 18:03 (S3)	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:51 (S4)	18:38 (S4) 18:33 (S3)	07:00 17:15
10	07:45 17:18	07:24 17:54	06:45 18:25	06:56 19:56	17:41 (S3) 18:03 (S3)	06:16 20:26	05:56 20:51	06:05 20:53	06:31 20:28	07:00 19:42	18:35 (S4) 18:53 (S4)	18:35 (S4) 18:54 (S4)	07:28 17:14
11	07:45 17:19	07:22 17:55	06:43 18:26	06:54 19:57	17:41 (S3) 18:03 (S3)	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:01 19:41	18:32 (S4) 18:54 (S4)	18:32 (S4) 18:52 (S4)	07:29 17:13
12	07:45 17:20	07:21 17:56	06:42 18:27	06:53 19:58	17:41 (S3) 18:02 (S3)	06:14 20:28	05:56 20:52	06:06 20:53	06:33 20:25	07:01 19:39	18:30 (S4) 18:55 (S4)	18:30 (S4) 18:51 (S4)	07:30 17:12
13	07:45 17:21	07:20 17:57	06:40 18:28	06:51 19:59	17:42 (S3) 18:01 (S3)	06:13 20:29	05:56 20:52	06:07 20:52	06:34 20:24	07:02 19:37	18:29 (S4) 18:56 (S4)	18:29 (S4) 18:49 (S4)	07:31 17:11
14	07:45 17:22	07:19 17:58	06:39 18:29	06:50 20:00	17:43 (S3) 18:00 (S3)	06:12 20:30	05:56 20:53	06:08 20:52	06:34 20:23	07:03 19:36	18:28 (S4) 18:57 (S4)	18:28 (S4) 18:48 (S4)	07:32 17:10
15	07:43 17:24	07:18 18:00	06:37 18:30	06:48 20:01	17:44 (S3) 18:02 (S4)	06:11 20:31	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	18:27 (S4) 18:57 (S4)	18:27 (S4) 18:46 (S4)	07:33 17:09
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	17:46 (S4) 18:05 (S4)	06:10 20:32	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:33	18:26 (S4) 18:57 (S4)	18:26 (S4) 18:45 (S4)	07:34 17:09
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	17:44 (S4) 18:06 (S4)	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	18:25 (S4) 18:57 (S4)	18:25 (S4) 18:43 (S4)	07:35 17:08
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	17:42 (S4) 18:08 (S4)	06:08 20:33	05:56 20:54	06:11 20:49	06:38 20:17	07:07 19:29	18:25 (S4) 18:57 (S4)	18:25 (S4) 18:42 (S4)	07:36 17:07
19	07:42 17:28	07:13 18:04	06:31 18:34	06:42 20:05	17:41 (S4) 18:09 (S4)	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	18:24 (S4) 18:57 (S4)	18:24 (S4) 18:41 (S4)	07:37 17:07
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	17:39 (S4) 18:09 (S4)	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 19:26	18:23 (S4) 18:55 (S4)	18:23 (S4) 18:39 (S4)	07:38 17:06
21	07:41 17:30	07:10 18:06	06:28 18:36	06:40 20:07	17:39 (S4) 18:10 (S4)	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	18:23 (S4) 18:55 (S4)	18:23 (S4) 18:38 (S4)	07:39 17:05
22	07:40 17:31	07:08 18:08	06:26 18:37	06:38 20:08	17:38 (S4) 18:09 (S4)	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	18:23 (S4) 18:54 (S4)	18:23 (S4) 18:36 (S4)	07:40 17:05
23	07:40 17:32	07:07 18:09	06:24 18:38	06:37 20:09	17:38 (S4) 18:10 (S4)	06:04 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	18:23 (S4) 18:53 (S4)	18:23 (S4) 18:35 (S4)	07:42 17:04
24	07:39 17:34	07:06 18:10	06:23 18:39	06:35 20:10	17:37 (S4) 18:10 (S4)	06:03 20:39	05:57 20:55	06:15 20:45	06:44 20:09	07:13 19:19	18:24 (S4) 18:52 (S4)	18:24 (S4) 18:34 (S4)	07:43 17:04
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	17:36 (S4) 18:09 (S4)	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:14 19:18	18:24 (S4) 18:51 (S4)	18:24 (S4) 17:32 (S4)	07:44 17:03
26	07:38 17:36	07:03 18:12	06:20 18:41	06:33 20:12	17:37 (S4) 18:09 (S4)	06:02 20:40	05:58 20:56	06:17 20:43	06:46 20:06	07:14 19:16	18:25 (S4) 18:49 (S4)	18:25 (S4) 17:31 (S4)	07:45 17:03
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	17:36 (S4) 18:08 (S4)	06:02 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:15 19:15	18:27 (S4) 18:47 (S4)	18:27 (S4) 17:30 (S4)	07:46 17:02
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	17:36 (S4) 18:07 (S4)	06:01 20:42	05:58 20:56	06:19 20:42	06:48 20:03	07:16 19:13	18:26 (S3) 18:45 (S4)	18:26 (S3) 17:28 (S4)	07:47 17:02
29	07:35 17:39	07:15 19:44	07:15 19:44	06:29 20:15	18:37 (S4) 19:06 (S4)	06:00 20:43	05:59 20:56	06:20 20:41	06:49 20:01	07:17 19:11	18:24 (S3) 18:41 (S4)	18:24 (S3) 17:27 (S4)	06:48 17:01
30	07:34 17:41	07:13 19:45	07:13 19:45	06:27 20:16	18:37 (S4) 19:05 (S4)	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	18:22 (S3) 18:41 (S3)	18:22 (S3) 17:26 (S4)	06:49 17:01
31	07:34 17:42	07:12 19:46	07:12 19:46	06:27 20:16	18:39 (S4) 19:04 (S4)	06:00 20:44	05:59 20:56	06:21 20:39	06:49 19:58	07:18 19:10	18:22 (S3) 18:41 (S3)	18:22 (S3) 17:26 (S4)	06:49 17:01
Potential sun hours	301	299	370	397	444	448	455	425	374	347	301	292	
Total, worst case			694	54					571		190		
Sun reduction			0.49	0.53					0.65		0.54		
Oper. time red.			0.91	0.91					0.91		0.91		
Wind dir. red.			0.72	0.73					0.73		0.70		
Total reduction			0.32	0.35					0.43		0.35		
Total, real			224	19					244		66		

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

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

## SHADOW - Calendar

Calculation: REAL CASEShadow receptor: A03 - Shadow Receptor: 1.5 x 1.5 Azimuth: 0.0° Slope: 0.0° (16)  
Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:45	07:33	06:59	07:57 (GU14)	07:10	06:26	05:59	06:00	06:23	06:51	07:19	08:39 (GU14)	06:52	07:25	
	17:10	17:43	18:15	43 08:40 (GU14)	19:47	20:17	20:45	20:56	20:38	19:57	19:08	32 09:11 (GU14)	17:24	17:01	
2	07:45	07:32	06:57	07:58 (GU14)	07:09	06:25	05:59	06:00	06:24	06:52	07:20	08:38 (GU14)	06:53	07:26	
	17:11	17:44	18:17	43 08:41 (GU14)	19:48	20:18	20:46	20:56	20:37	19:55	19:07	34 09:12 (GU14)	17:23	17:01	
3	07:45	07:31	06:56	07:57 (GU14)	07:07	06:24	05:58	06:01	06:24	06:53	07:21	08:37 (GU14)	06:54	07:27	
	17:12	17:46	18:18	43 08:40 (GU14)	19:49	20:19	20:47	20:56	20:36	19:54	19:05	36 09:13 (GU14)	17:21	17:01	
4	07:45	07:30	06:54	07:57 (GU14)	07:05	06:23	05:58	06:01	06:25	06:54	07:22	08:35 (GU14)	06:55	07:28	
	17:13	17:47	18:19	43 08:40 (GU14)	19:50	20:20	20:47	20:55	20:35	19:52	19:04	38 09:13 (GU14)	17:20	17:00	
5	07:45	07:29	06:53	07:57 (GU14)	07:04	06:22	05:58	06:02	06:26	06:55	07:23	08:34 (GU14)	06:56	07:29	
	17:14	17:48	18:20	42 08:39 (GU14)	19:51	20:21	20:48	20:55	20:34	19:51	19:02	40 09:14 (GU14)	17:19	17:00	
6	07:45	07:28	06:51	07:57 (GU14)	07:02	06:20	05:57	06:03	06:27	06:56	07:24	08:34 (GU14)	06:57	07:30	
	17:15	17:49	18:21	42 08:39 (GU14)	19:52	20:22	20:48	20:55	20:33	19:49	19:00	40 09:14 (GU14)	17:18	17:00	
7	07:45	07:27	06:50	07:57 (GU14)	07:01	06:19	05:57	06:03	06:28	06:57	07:25	08:33 (GU14)	06:58	07:31	
	17:16	17:50	18:22	41 08:38 (GU14)	19:53	20:23	20:49	20:55	20:31	19:47	18:59	42 09:15 (GU14)	17:17	17:00	
8	07:45	07:26	06:48	07:58 (GU14)	06:59	06:18	05:57	06:04	06:29	06:58	07:26	08:32 (GU14)	06:59	07:31	
	17:17	17:52	18:23	40 08:38 (GU14)	19:54	20:24	20:50	20:54	20:30	19:46	18:57	43 09:15 (GU14)	17:16	17:00	
9	07:45	07:25	06:47	07:58 (GU14)	06:58	06:17	05:57	06:04	06:30	06:59	07:27	08:32 (GU14)	07:01	07:32	
	17:18	17:53	18:24	38 08:36 (GU14)	19:55	20:25	20:50	20:54	20:29	19:44	18:56	43 09:15 (GU14)	17:15	17:00	
10	07:45	07:24	06:45	07:59 (GU14)	06:56	06:16	05:56	06:05	06:31	07:00	07:28	08:32 (GU14)	07:02	07:33	
	17:19	17:54	18:25	37 08:36 (GU14)	19:56	20:26	20:51	20:54	20:28	19:43	18:54	43 09:14 (GU14)	17:14	17:00	
11	07:45	07:23	06:44	07:59 (GU14)	06:55	06:15	05:56	06:06	06:32	07:01	07:29	08:31 (GU14)	07:03	07:34	
	17:20	17:55	2 08:09 (GU1)	18:26	35 08:34 (GU14)	19:57	20:27	20:51	20:53	20:27	19:41	43 09:14 (GU14)	17:13	17:00	
12	07:45	07:21	06:42	08:05 (GU1)	06:42	06:14	05:56	06:06	06:33	07:02	07:30	08:31 (GU14)	07:04	07:35	
	17:21	17:56	5 08:10 (GU1)	18:27	33 08:32 (GU14)	19:58	20:28	20:52	20:53	20:25	19:39	43 09:14 (GU14)	17:12	17:00	
13	07:44	07:20	06:40	08:04 (GU1)	06:40	06:13	05:56	06:07	06:34	07:03	07:31	08:31 (GU14)	07:05	07:36	
	17:22	17:57	7 08:11 (GU1)	18:28	29 08:30 (GU14)	19:59	20:29	20:52	20:52	20:24	19:38	43 09:14 (GU14)	17:11	17:00	
14	07:44	07:19	06:39	08:03 (GU1)	06:39	06:12	05:56	06:08	06:35	07:03	07:32	08:31 (GU14)	07:06	07:36	
	17:23	17:59	9 08:12 (GU1)	18:29	26 08:28 (GU14)	20:00	20:30	20:53	20:52	20:23	19:36	42 09:13 (GU14)	17:11	17:01	
15	07:44	07:18	06:37	08:02 (GU1)	06:37	06:05	05:56	06:08	06:36	07:04	07:33	08:31 (GU14)	07:07	07:37	
	17:24	18:00	11 08:13 (GU1)	18:30	21 08:26 (GU14)	20:01	20:31	20:53	20:51	20:21	19:34	41 09:12 (GU14)	17:10	17:01	
16	07:43	07:17	06:36	08:01 (GU1)	06:36	06:07	05:56	06:09	06:37	07:05	07:34	08:29 (GU1)	07:09	07:38	
	17:25	18:01	12 08:13 (GU1)	18:31	15 08:22 (GU14)	20:02	20:32	20:54	20:51	20:20	19:33	43 09:12 (GU14)	17:09	17:01	
17	07:43	07:15	06:34	08:00 (GU1)	06:34	06:46	06:09	05:56	06:10	06:38	07:06	08:26 (GU1)	07:10	07:38	
	17:26	18:02	23 08:25 (GU1)	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	45 09:11 (GU14)	17:08	17:01	
18	07:42	07:14	06:33	07:59 (GU1)	06:33	06:44	06:08	05:56	06:11	06:38	07:07	08:24 (GU1)	07:11	07:39	
	17:27	18:03	31 08:30 (GU14)	18:33	20:04	20:34	20:54	20:50	20:17	19:30	18:42	46 09:10 (GU14)	17:07	17:02	
19	07:42	07:13	06:31	07:58 (GU1)	06:31	06:43	06:07	05:56	06:12	06:39	07:08	08:24 (GU1)	07:12	07:40	
	17:28	18:04	35 08:33 (GU14)	18:34	20:05	20:34	20:55	20:49	20:16	19:28	18:41	45 09:09 (GU14)	17:07	17:02	
20	07:41	07:11	06:29	07:56 (GU1)	06:29	06:41	06:07	05:56	06:12	06:40	07:09	08:25 (GU1)	07:13	07:40	
	17:29	18:05	38 08:34 (GU14)	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	43 09:08 (GU14)	17:06	17:03	
21	07:41	07:10	06:28	07:55 (GU1)	06:28	06:40	06:06	05:57	06:13	06:41	07:10	08:26 (GU1)	07:14	07:41	
	17:30	18:07	41 08:36 (GU14)	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	40 09:06 (GU14)	17:05	17:03	
22	07:40	07:09	06:26	07:53 (GU1)	06:26	06:38	06:05	05:57	06:14	06:42	07:11	08:27 (GU1)	07:15	07:41	
	17:31	18:08	44 08:37 (GU14)	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	37 09:04 (GU14)	17:05	17:04	
23	07:40	07:07	06:25	07:52 (GU1)	06:25	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42	
	17:33	18:09	46 08:38 (GU14)	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	34 09:02 (GU14)	17:04	17:04	
24	07:39	07:06	06:23	07:54 (GU1)	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42	
	17:34	18:10	45 08:39 (GU14)	18:39	20:10	20:39	20:56	20:45	20:09	19:20	18:34	30 08:59 (GU14)	17:04	17:05	
25	07:38	07:05	06:21	07:55 (GU1)	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:19	07:43	
	17:35	18:11	44 08:39 (GU14)	18:40	20:11	20:40	20:56	20:45	20:07	19:18	17:33	18 07:53 (GU14)	17:03	17:05	
26	07:38	07:03	06:20	08:00 (GU1)	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43	
	17:36	18:12	40 08:38 (GU14)	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	12 07:31 (GU1)	17:03	17:06	
27	07:37	07:02	06:18	07:59 (GU14)	06:18	06:32	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:44	
	17:37	18:13	41 08:40 (GU14)	18:42	20:13	20:41	20:56	20:43	20:04	19:15	12 09:02 (GU14)	17:30	11 07:43 (GU1)	17:02	17:06
28	07:36	07:00	06:17	07:58 (GU14)	06:17	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44	
	17:38	18:14	43 08:41 (GU14)	18:43	20:14	20:42	20:56	20:42	20:03	19:13	19 09:05 (GU14)	17:29	9 07:42 (GU1)	17:02	17:07
29	07:35	06:59	06:15	07:57 (GU1)	06:15	06:29	06:01	05:59	06:20	06:49	07:18	06:48	07:23	07:44	
	17:40	18:17	42 08:42 (GU14)	18:44	20:15	20:43	20:56	20:41	20:01	19:12	25 09:08 (GU14)	17:27	7 07:41 (GU1)	17:02	17:08
30	07:35	06:58	06:13	07:56 (GU1)	06:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44	
	17:41	18:18	41 08:41 (GU14)	18:45	20:16	20:44	20:56	20:40	20:00	19:10	28 09:09 (GU14)	17:26	4 07:39 (GU1)	17:01	17:09
31	07:34	06:57	06:11	07:55 (GU1)	06:11	06:00	05:58	06:22	06:51	06:50	07:17	06:50	07:36 (GU1)	07:45	17:09
	17:42	18:19	40 08:42 (GU14)	18:46	20:17	20:45	20:57	20:39	19:58	17:25	1 07:37 (GU1)	17:25	301	292	
Potential sun hours	301	299	370	397	445	448	455	425	374	84	1028	347	301	292	
Total, worst case		517	571							84	1028				
Sun reduction		0.47	0.49							0.65	0.54				
Oper. time red.		0.91	0.91							0.91	0.91				
Wind dir. red.		0.77	0.77							0.77	0.77				
Total reduction		0.33	0.34							0.45	0.38				
Total, real		171	197							38	391				

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

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

Calculation: REAL CASEShadow receptor: A04 - Shadow Receptor: 1.5 x 1.5 Azimuth: 0.0° Slope: 0.0° (13)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

#### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:52	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:22	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:51	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:19	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:43	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:36
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:11	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:17	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:02
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:57	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:25	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:12	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	06:00	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12	06:27	06:00	06:00	06:22	06:51		06:50		07:45
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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: REAL CASEShadow receptor: A05 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (12)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:51	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:25	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12	06:27	06:00	06:00	06:22	06:51		06:50		07:45
	17:42		19:46	20:17	20:44		20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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: REAL CASEShadow receptor: A06 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (11)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
	17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
	17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:33	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:40	07:14	07:41
	17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
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	17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
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	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09
31	07:34		07:12	06:27	06:00	06:00	06:22	06:51		06:50		07:45
	17:42		19:46	20:17	20:44	20:56	20:39	19:58		17:25		17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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: REAL CASEShadow receptor: A07 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (6)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01	
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
17:11	17:44	18:17	19:48	20:18	20:46	20:56	20:37	19:55	19:07	17:23	17:01	
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:01	
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00	
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00	
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:33	19:49	19:00	17:18	17:00	
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00	
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
17:17	17:52	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00	
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:01	07:32
17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00	
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00	
11	07:45	07:23	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:27	19:41	18:53	17:13	17:00	
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
17:21	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00	
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:11	17:00	
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01	
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01	
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01	
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
17:26	18:02	18:32	20:03	20:33	20:54	20:50	20:19	19:31	18:44	17:08	17:01	
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
17:27	18:03	18:33	20:04	20:33	20:54	20:50	20:17	19:29	18:42	17:07	17:02	
19	07:42	07:13	06:31	06:43	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:40
17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02	
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03	
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
17:30	18:07	18:36	20:07	20:36	20:55	20:48	20:13	19:25	18:38	17:05	17:03	
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04	
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04	
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05	
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
17:35	18:11	18:40	20:11	20:40	20:56	20:44	20:07	19:18	17:32	17:03	17:05	
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:20	07:43
17:36	18:12	18:41	20:12	20:40	20:56	20:44	20:06	19:16	17:31	17:03	17:06	
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06	
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:17	06:47	07:22	07:44
17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07	
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08	
30	07:35		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
17:41		19:45	20:16	20:44	20:56	20:40	20:00	19:10	17:26	17:01	17:09	
31	07:34		07:12	06:27	06:00	06:22	06:51		06:50		07:45	
17:42		19:46		20:44		20:39	19:58		17:25		17:09	
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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: REAL CASEShadow receptor: A08 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (10)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:24	06:52	07:20	06:53	07:26
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
6	07:45	07:28	06:51	07:02	06:20	05:57	06:03	06:27	06:56	07:24	06:57	07:30
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
9	07:45	07:25	06:47	06:58	06:17	05:57	06:04	06:30	06:59	07:27	07:00	07:32
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
11	07:45	07:22	06:44	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:03	07:31	07:05	07:35
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
15	07:44	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:37	07:05	07:34	07:08	07:38
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
19	07:42	07:13	06:31	06:43	06:07	05:56	06:12	06:39	07:08	07:37	07:12	07:40
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
24	07:39	07:06	06:23	06:36	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:19	07:43
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	06:46	07:21	07:43
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:16	06:47	07:22	07:44
29	07:35	18:14	06:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
30	07:34	18:13	06:14	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
31	07:34	18:12	06:13	06:27	06:00	05:59	06:22	06:51	07:19	06:50	07:25	07:45
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

## SHADOW - Calendar

Calculation: REAL CASEShadow receptor: A09 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (9)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01	
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:23	06:52	07:20	06:53	07:26
17:11	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:07	17:22	17:01	
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:00	
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00	
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00	
6	07:45	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29
17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00	
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
17:16	17:50	18:22	19:53	20:23	20:49	20:55	20:31	19:47	18:59	17:17	17:00	
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
17:16	17:51	18:23	19:54	20:24	20:50	20:54	20:30	19:46	18:57	17:16	17:00	
9	07:45	07:25	06:47	06:57	06:17	05:57	06:04	06:30	06:59	07:27	07:00	07:32
17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00	
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00	
11	07:45	07:22	06:43	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:52	17:13	17:00	
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
17:20	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00	
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:02	07:31	07:05	07:35
17:22	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:49	17:11	17:00	
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
17:23	17:59	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01	
15	07:43	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:10	17:01	
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:38
17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01	
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:10	07:38
17:26	18:02	18:32	20:03	20:32	20:54	20:50	20:19	19:31	18:44	17:08	17:01	
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:02	
19	07:42	07:13	06:31	06:43	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:40
17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02	
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:15	19:26	18:39	17:06	17:03	
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
17:30	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:38	17:05	17:03	
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:41	07:15	07:41
17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:36	17:05	17:03	
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04	
24	07:39	07:06	06:23	06:35	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05	
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	07:44	07:18	07:43
17:35	18:11	18:40	20:11	20:39	20:56	20:44	20:07	19:18	17:32	17:03	17:05	
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	07:45	07:19	07:43
17:36	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:03	17:06	
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:16	07:46	07:21	07:43
17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06	
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:16	07:47	07:22	07:44
17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07	
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	07:48	07:23	07:44
17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:02	17:08	
30	07:34		07:13	06:28	06:00	05:59	06:21	06:50	07:18	07:49	07:24	07:44
17:41		19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:01	17:08	
31	07:34		07:12	06:27	06:00	06:22	06:50		06:50		07:44	
17:42		19:46		20:44		20:39	19:58		17:25		17:09	
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
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: REAL CASEShadow receptor: A10 - Shadow Receptor: 1.5 x 1.5 Azimuth: 0.0° Slope: 0.0° (7)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December					
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:22	06:51	18:58 (S4)	07:19	06:51	07:25				
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	28	19:26 (S4)	19:08	17:24	17:01			
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:23	06:52	18:57 (S4)	07:20	06:52	07:26				
	17:11	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	27	19:24 (S4)	19:07	17:22	17:01			
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	18:57 (S4)	07:21	06:54	07:27				
	17:12	17:45	18:17	19:49	4 19:17 (S4)	20:19	20:46	20:55	19:54	27	19:24 (S4)	19:05	17:21	17:00			
4	07:45	07:30	06:54	07:05	19:08 (S4)	06:22	05:58	06:01	06:25	06:54	18:58 (S4)	07:22	06:55	07:28			
	17:13	17:47	18:19	19:50	13 19:21 (S4)	20:20	20:47	20:55	19:52	25	19:23 (S4)	19:03	17:20	17:00			
5	07:45	07:29	06:53	07:04	19:06 (S4)	06:21	05:57	06:02	06:26	06:55	18:58 (S4)	07:23	06:56	07:29			
	17:14	17:48	18:20	19:51	18 19:24 (S4)	20:21	20:48	20:55	19:50	24	19:22 (S4)	19:02	17:19	17:00			
6	07:45	07:28	06:51	07:02	19:03 (S4)	06:20	05:57	06:02	06:27	06:56	18:59 (S4)	07:24	06:57	07:29			
	17:14	17:49	18:21	19:52	21 19:24 (S4)	20:22	20:48	20:55	19:49	21	19:20 (S4)	19:00	17:18	17:00			
7	07:45	07:27	06:50	07:00	19:02 (S4)	06:19	05:57	06:03	06:28	06:57	19:01 (S4)	07:25	06:58	07:30			
	17:15	17:50	18:22	19:53	24 19:26 (S4)	20:23	20:49	20:54	19:47	18	19:19 (S4)	18:59	17:17	17:00			
8	07:45	07:26	06:48	06:59	19:01 (S4)	06:18	05:57	06:04	06:29	06:58	19:03 (S4)	07:26	06:59	07:31			
	17:16	17:51	18:23	19:54	25 19:26 (S4)	20:24	20:49	20:54	19:46	13	19:16 (S4)	18:57	17:16	17:00			
9	07:45	07:25	06:47	06:57	18:59 (S4)	06:17	05:56	06:04	06:30	06:59	19:06 (S4)	07:27	07:00	07:32			
	17:17	17:53	18:24	19:55	27 19:26 (S4)	20:25	20:50	20:54	19:44	6	19:12 (S4)	18:55	17:15	17:00			
10	07:45	07:24	06:45	06:56	18:59 (S4)	06:16	05:56	06:05	06:31	07:00	19:02 (S4)	07:28	07:02	07:33			
	17:18	17:54	18:25	19:56	27 19:26 (S4)	20:26	20:51	20:53	19:42	18	19:19 (S4)	18:54	17:14	17:00			
11	07:45	07:22	06:43	06:54	18:58 (S4)	06:15	05:56	06:05	06:32	07:01	19:04 (S4)	07:29	07:03	07:34			
	17:19	17:55	18:26	19:57	28 19:26 (S4)	20:27	20:51	20:53	19:41	18	19:18 (S4)	18:52	17:13	17:00			
12	07:44	07:21	06:42	06:53	18:58 (S4)	06:14	05:56	06:06	06:33	07:01	19:06 (S4)	07:30	07:04	07:35			
	17:20	17:56	18:27	19:58	28 19:26 (S4)	20:28	20:52	20:53	19:39	12	19:12 (S4)	18:51	17:12	17:00			
13	07:44	07:20	06:40	06:51	18:58 (S4)	06:13	05:56	06:07	06:34	07:02	18:53 (S3)	07:31	07:05	07:35			
	17:21	17:57	18:28	19:59	28 19:26 (S4)	20:29	20:52	20:52	19:37	6	18:59 (S3)	18:49	17:11	17:00			
14	07:44	07:19	06:39	06:50	18:58 (S4)	06:12	05:56	06:08	06:24	07:03	18:50 (S3)	07:32	07:06	07:36			
	17:22	17:58	18:29	20:00	28 19:26 (S4)	20:30	20:52	20:52	19:36	12	19:02 (S3)	18:48	17:10	17:00			
15	07:43	07:18	06:37	06:48	18:58 (S4)	06:11	05:56	06:08	06:23	07:04	18:48 (S3)	07:33	07:07	07:37			
	17:23	18:00	18:30	20:01	26 19:24 (S4)	20:31	20:53	20:51	19:34	15	19:03 (S3)	18:46	17:09	17:01			
16	07:43	07:16	06:36	06:47	18:59 (S4)	06:10	05:56	06:09	06:36	07:05	18:46 (S3)	07:34	07:08	07:38			
	17:25	18:01	18:31	20:02	25 19:24 (S4)	20:32	20:53	20:51	19:33	18	19:04 (S3)	18:45	17:09	17:01			
17	07:43	07:15	06:34	06:45	19:00 (S4)	06:09	05:56	06:10	06:37	07:06	18:45 (S3)	07:35	07:09	07:38			
	17:26	18:02	18:32	20:03	24 19:24 (S4)	20:32	20:54	20:50	19:31	19	19:04 (S3)	18:43	17:08	17:01			
18	07:42	07:14	06:32	18:06 (S3)	06:44	06:08	05:56	06:11	06:38	07:07	18:45 (S3)	07:36	07:11	07:39			
	17:27	18:03	18:33	6 18:12 (S3)	20:04	22 19:22 (S4)	20:33	20:54	19:29	19	19:04 (S3)	18:42	17:07	17:02			
19	07:42	07:12	06:31	18:02 (S3)	06:42	19:01 (S4)	06:07	05:56	06:11	06:39	18:44 (S3)	07:37	07:12	07:39			
	17:28	18:04	18:34	12 18:14 (S3)	20:05	20 19:21 (S4)	20:34	20:54	19:28	20	19:04 (S3)	18:41	17:06	17:02			
20	07:41	07:11	06:29	18:00 (S3)	06:41	19:02 (S4)	06:06	05:56	06:12	06:40	18:43 (S3)	07:38	07:13	07:40			
	17:29	18:05	18:35	14 18:14 (S3)	20:06	16 19:18 (S4)	20:35	20:55	19:26	20	19:03 (S3)	18:39	17:06	17:02			
21	07:41	07:10	06:28	17:59 (S3)	06:40	19:04 (S4)	06:06	05:56	06:13	06:41	18:43 (S3)	07:39	07:14	07:41			
	17:30	18:06	18:36	17 18:16 (S3)	20:07	12 19:16 (S4)	20:36	20:55	19:24	4	19:17 (S4)	19:24	19	19:02 (S3)	18:38	17:05	17:03
22	07:40	07:08	06:26	17:58 (S3)	06:38	06:05	05:57	06:14	06:42	19:09 (S4)	07:11	18:43 (S3)	07:40	07:15	07:41		
	17:31	18:08	18:37	18 18:16 (S3)	20:08	20:37	20:55	20:47	20:12	12	19:21 (S4)	19:23	18	19:01 (S3)	18:36	17:05	17:03
23	07:40	07:07	06:24	17:58 (S3)	06:37	06:04	05:57	06:15	06:43	19:07 (S4)	07:12	18:44 (S3)	07:41	07:16	07:42		
	17:32	18:09	18:38	19 18:17 (S3)	20:09	20:38	20:55	20:46	20:10	16	19:23 (S4)	19:21	15	18:59 (S3)	18:35	17:04	17:04
24	07:39	07:06	06:23	17:57 (S3)	06:35	06:03	05:57	06:15	06:44	19:04 (S4)	07:13	18:45 (S3)	07:43	07:17	07:42		
	17:34	18:10	18:39	20 18:17 (S3)	20:10	20:39	20:55	20:45	20:09	20	19:24 (S4)	19:19	12	18:57 (S3)	18:34	17:04	17:04
25	07:38	07:04	06:21	17:56 (S3)	06:34	06:03	05:57	06:16	06:45	19:02 (S4)	07:14	18:47 (S3)	06:44	07:18	07:43		
	17:35	18:11	18:40	20 18:16 (S3)	20:11	20:39	20:55	20:44	20:07	23	19:25 (S4)	19:18	9	18:56 (S3)	17:32	17:03	17:05
26	07:38	07:03	06:20	17:57 (S3)	06:33	06:02	05:58	06:17	06:46	19:01 (S4)	07:14	18:46 (S3)	07:45	07:19	07:43		
	17:36	18:12	18:41	19 18:16 (S3)	20:12	20:40	20:56	20:43	20:06	24	19:25 (S4)	19:16	17	18:56 (S3)	17:31	17:03	17:06
27	07:37	07:01	06:18	17:57 (S3)	06:31	06:02	05:58	06:18	06:47	19:00 (S4)	07:15	18:46 (S3)	07:46	07:20	07:43		
	17:37	18:13	18:42	18 18:15 (S3)	20:13	20:41	20:56	20:43	20:04	26	19:26 (S4)	19:15	17	18:56 (S3)	17:30	17:02	17:06
28	07:36	07:00	06:16	17:57 (S3)	06:30	06:01	05:58	06:19	06:48	19:00 (S4)	07:16	18:47 (S3)	07:47	07:22	07:44		
	17:38	18:14	18:43	16 18:13 (S3)	20:14	20:42	20:56	20:42	20:03	26	19:26 (S4)	19:13	17	18:56 (S3)	17:28	17:02	17:07
29	07:35	07:15	06:15	18:59 (S3)	06:29	06:00	05:59	06:20	06:48	18:59 (S4)	07:17	18:48 (S3)	07:48	07:23	07:44		
	17:39	18:14	18:43	13 19:12 (S3)	20:15	20:43	20:56	20:41	20:01	27	19:26 (S4)	19:11	17	18:56 (S3)	17:27	17:01	17:08
30	07:34	07:13	06:13	19:01 (S3)	06:27	06:00	05:59	06:21	06:49	18:59 (S4)	07:18	18:49 (S3)	07:49	07:24	07:44		
	17:41	18:16	18:45	7 19:08 (S3)	20:16	20:43	20:56	20:40	20:00	27	19:26 (S4)	19:10	17	18:56 (S3)	17:26	17:01	17:08
31	07:34	07:12	06:12	19:01 (S3)	06:27	06:00	05:59	06:22	06:50	18:58 (S4)	07:18	18:49 (S3)	07:49	07:24	07:44		
	17:42	18:17	18:46	19:08 (S3)	20:16	20:44	20:57	20:39	19:58	28	19:26 (S4)	19:10	17	18:56 (S3)	17:25	17:01	17:09
Potential sun hours	301	299	370	397	444	448	455	425	374	347	301	292					
Total, worst case			199	416				233	391								
Sun reduction			0.49	0.53				0.73	0.65								
Oper. time red.			0.91	0.91				0.91	0.91								
Wind dir. red.			0.73	0.75				0.75	0.74								
Total reduction			0.33	0.36				0.50	0.44								
Total, real			65	150				116	171								

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

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

## SHADOW - Calendar

Calculation: REAL CASEShadow receptor: A11 - Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (8)  
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]  
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  
4.40 5.05 5.88 7.00 8.45 9.88 10.82 10.03 8.08 6.09 5.07 4.27

### Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum  
178 118 168 364 749 378 182 227 401 424 339 263 521 1,283 1,516 849 7,959  
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59	07:10	06:26	05:59	06:00	06:23	06:51	07:19	06:51	07:25
	17:10	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:08	06:25	05:59	06:00	06:23	06:52	07:20	06:53	07:26
	17:11	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:07	17:22	17:01
3	07:45	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:21	17:00
4	07:45	07:30	06:54	07:05	06:23	05:58	06:01	06:25	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:53	07:04	06:21	05:58	06:02	06:26	06:55	07:23	06:56	07:29
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00
7	07:45	07:27	06:50	07:01	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:15	17:50	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:16	17:51	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:57	06:17	05:57	06:04	06:30	06:59	07:27	07:00	07:32
	17:17	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:56	06:05	06:31	07:00	07:28	07:02	07:33
	17:18	17:54	18:25	19:56	20:26	20:51	20:54	20:28	19:42	18:54	17:14	17:00
11	07:45	07:22	06:43	06:54	06:15	05:56	06:06	06:32	07:01	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:52	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:33	07:02	07:30	07:04	07:35
	17:20	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:34	07:02	07:31	07:05	07:35
	17:21	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:49	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:08	06:35	07:03	07:32	07:06	07:36
	17:23	17:58	18:29	20:00	20:30	20:53	20:52	20:23	19:36	18:48	17:10	17:01
15	07:43	07:18	06:37	06:48	06:11	05:56	06:08	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:38
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:54	20:50	20:19	19:31	18:44	17:08	17:01
18	07:42	07:14	06:32	06:44	06:08	05:56	06:11	06:38	07:07	07:36	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:02
19	07:42	07:13	06:31	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:40
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:02
20	07:41	07:11	06:29	06:41	06:07	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:55	20:48	20:14	19:26	18:39	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:13	06:41	07:10	07:39	07:14	07:41
	17:30	18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:38	17:05	17:03
22	07:40	07:09	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:31	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:36	17:05	17:03
23	07:40	07:07	06:24	06:37	06:04	05:57	06:15	06:43	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:35	06:04	05:57	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:16	06:45	07:14	06:44	07:18	07:43
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:03	17:05
26	07:38	07:03	06:20	06:33	06:02	05:58	06:17	06:46	07:15	06:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:31	06:02	05:58	06:18	06:47	07:15	06:46	07:20	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:59	06:19	06:48	07:16	06:47	07:22	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:07
29	07:35		07:15	06:29	06:01	05:59	06:20	06:49	07:17	06:48	07:23	07:44
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	17:08
30	07:34		07:13	06:28	06:00	05:59	06:21	06:50	07:18	06:49	07:24	07:44
	17:41		19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:01	17:08
31	07:34		07:12	06:27	06:00	05:58	06:22	06:50	07:17	06:50	07:23	07:44
	17:42		19:46	20:17	20:44	20:56	20:39	19:58	17:25	17:25	17:01	17:09
Potential sun hours	301	299	370	397	444	447	455	425	374	347	301	292
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

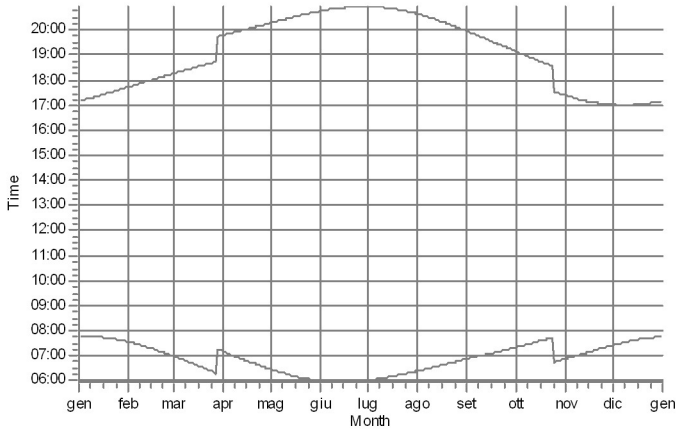
Table layout: For each day in each month the following matrix apply

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

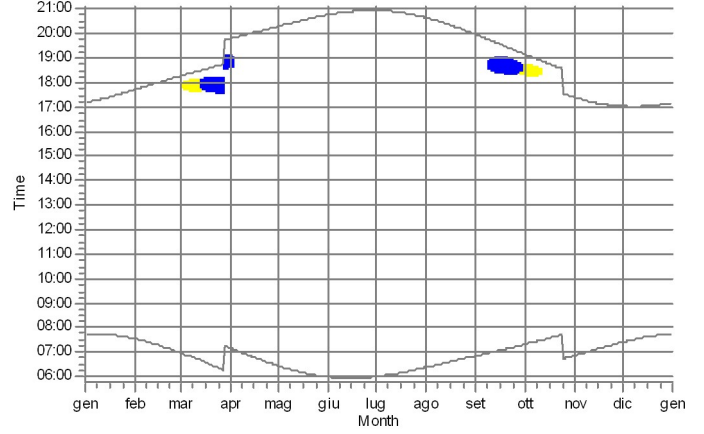
## SHADOW - Calendar, graphical

Calculation: REAL CASE

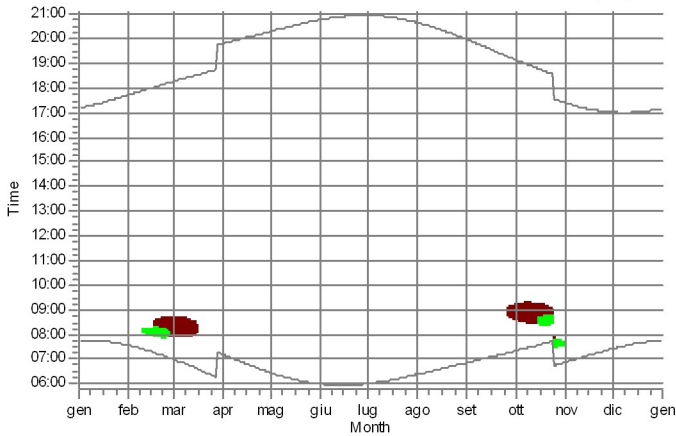
A01: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (5)



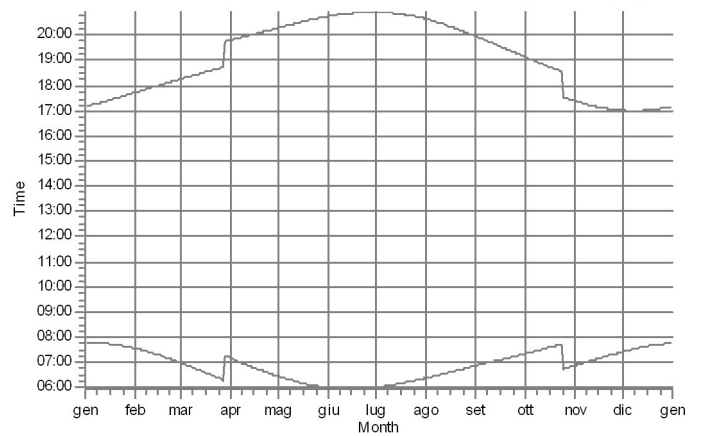
A02: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (4)



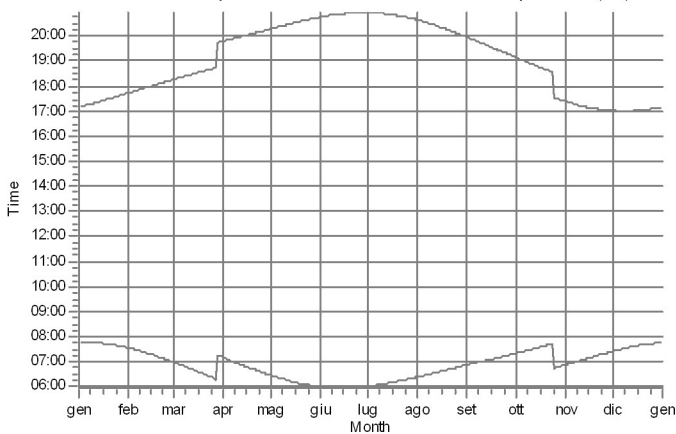
A03: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (16)



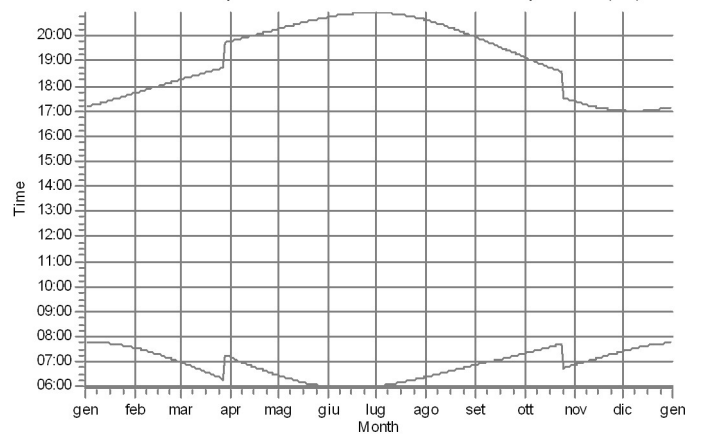
A04: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (13)



A05: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (12)



A06: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (11)



### WTGs

- S3: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (3)
- S4: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (4)

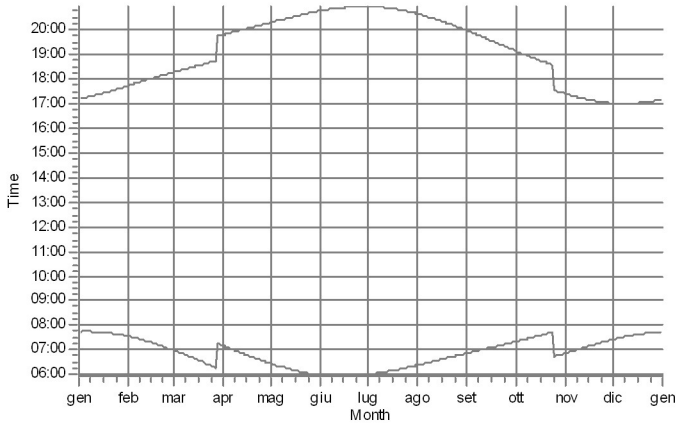
- GU14: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (14)
- GU1: Siemens Gamesa SG 170 6000 170.0 IO! hub: 125.0 m (TOT: 210.0 m) (15)



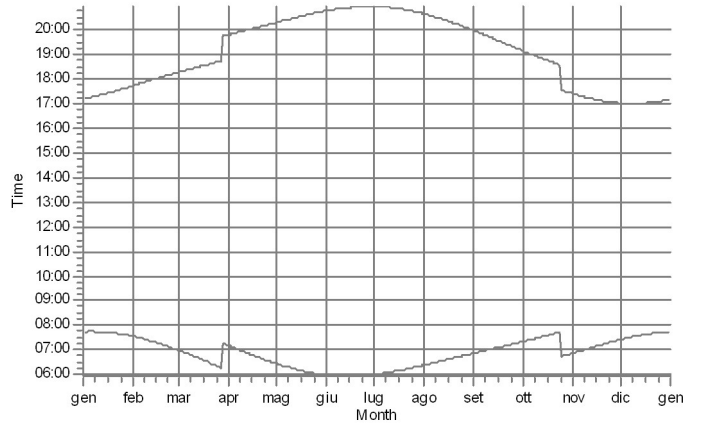
## SHADOW - Calendar, graphical

Calculation: REAL CASE

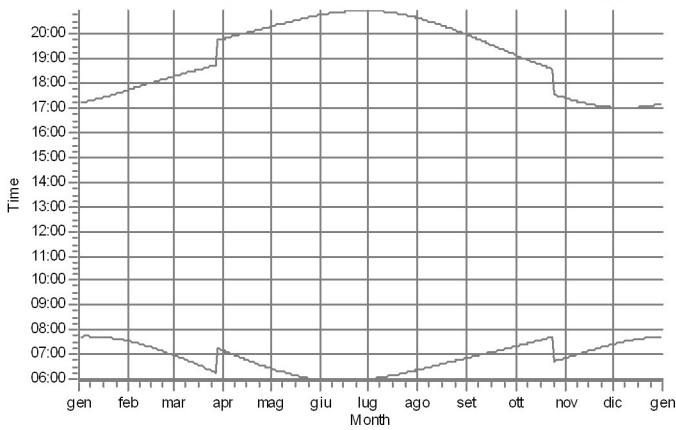
A07: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 90.0° (6)



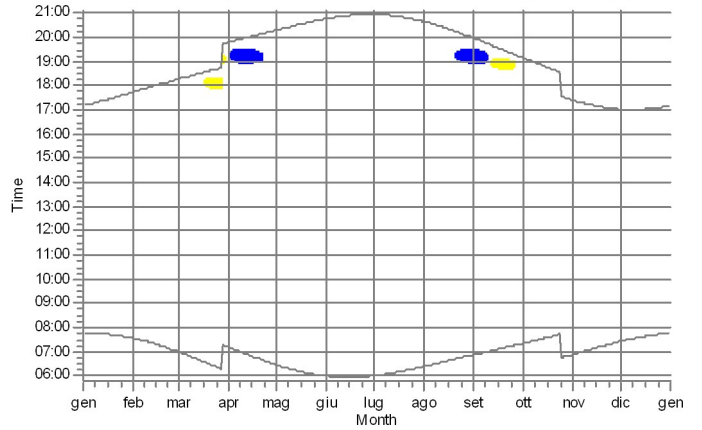
A08: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (10)



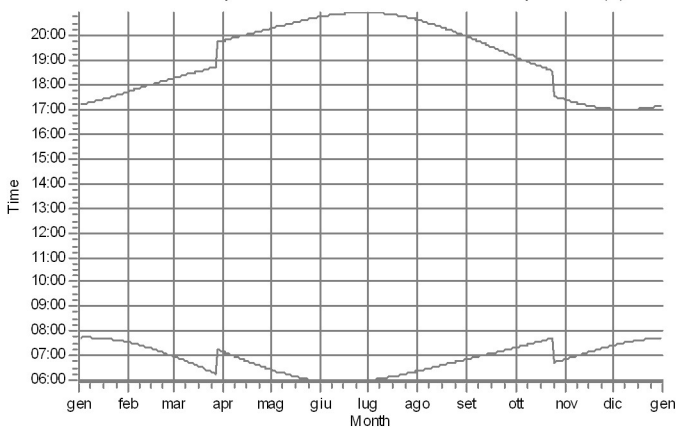
A09: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (9)



A10: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (7)



A11: Shadow Receptor: 1.5 × 1.5 Azimuth: 0.0° Slope: 0.0° (8)



WTGs

 S3: Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (3)

 S4: Siemens Gamesa SG 170 6000 170.0 !O! hub: 125.0 m (TOT: 210.0 m) (4)