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COMUNI DI MANFREDONIA (FG)
LOCALITA' "BORGO FONTE ROSA"

PROGETTO PER LA REALIZZAZIONE DI **IMPIANTO EOLICO** **"BORGO FONTE ROSA 2"**

REDAZIONE / PROGETTISTA:



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TIMBRO E FIRMA PROGETTISTA:



TITOLO ELABORATO:

**RELAZIONE SULL'EVOLUZIONE DELL'OMBRA – FENOMENO
SHADOW FLICKERING**

CODICE ELABORATO:

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**PROGETTO
DEFINITIVO**

REV.	DESCRIZIONE	DATA	REDATTO	VERIFICATO	APPROVATO
00	Prima emissione	11/12/2023	A. Demaio	S. Ulivi	S. Ulivi
01					
02					
03					
04					

1. PREMESSA

Il presente elaborato ha lo scopo di valutare in maniera tecnica l'eventuale impatto generato dall'evoluzione dell'ombra derivante dalla futura installazione di un impianto di produzione di energia da fonte eolica nel Comune di Manfredonia (Fg) in località "Borgo Fonte Rosa" ubicato a circa 20 km a Sud-Ovest del centro abitato e a 19,5 km a Est da Foggia capoluogo di Provincia, costituito da n. 10 aerogeneratori da 4,7 MW per una potenza complessiva di 47 MW e aventi un'altezza al mozzo pari a 90 metri ed un diametro del rotore pari a 155 metri.

A seguito di tutti gli studi effettuati sull'area in esame (analisi orografiche, anemologiche e della rete elettrica) e in base all'ipotesi di rendimento economico, si ritiene che per l'impianto in oggetto possano essere convenientemente utilizzati aerogeneratori di grossa taglia. Tutte le turbine scelte da AREN ELECTRIC POWER sono sempre certificate a livello internazionale, generalmente dalla Germanischer Lloyd, DNV o da altro organismo equivalente. Questa certificazione è essenziale per garantire la bancabilità del progetto e la sicurezza al paese che le turbine produrranno l'energia annunciata (poiché la curva di potenza, $P = f(v_{\text{vento}})$, è certificata).

La turbina utilizzata per lo studio progettuale è caratterizzata da una potenza nominale unitaria pari a 4,7 MW, ed un'altezza massima punta pala di 167,5 mt. Il modello di turbina scelto è il più performante sul mercato per il sito eolico in esame.

Per lo studio dello Shadow Flicker è stata presa in considerazione una SIEMENS GAMESA che ha le medesime caratteristiche dimensionali dell'aerogeneratore di progetto avente un'altezza al mozzo pari a 90 metri ed un diametro del rotore pari a 155 metri.

Lo Shadow-Flickering è l'espressione comunemente impiegata in ambito specialistico per descrivere l'effetto stroboscopico delle ombre proiettate dalle pale rotanti degli aerogeneratori eolici quando sussistono le condizioni meteorologiche opportune; infatti la possibilità e la durata di tali effetti dipendono da una serie di condizioni ambientali, tra cui : la posizione del sole, l'ora del giorno, il giorno dell'anno, le condizioni atmosferiche ambientali e la posizione della turbina eolica rispetto ad un recettore sensibile. La valutazione tecnica è eseguita con l'ausilio di un software di simulazione specifico per la progettazione degli impianti eolici WIND PRO®, costituito da un insieme di moduli di elaborazione orientati alla simulazione di una serie di aspetti che caratterizzano le diverse fasi progettuali. Il modulo SHADOW è quello specifico per la valutazione dell'evoluzione dell'ombra e del flickering. In tale report è riportata:

- *La descrizione del caso studio con le posizioni delle turbine e loro caratteristiche tecniche*
- *Una breve descrizione tecnica del fenomeno di shadow flickering*
- *La descrizione dei recettori soggetti al fenomeno per i quali è stata richiesta questa analisi*
- *Sintesi della metodologia di analisi seguita per lo studio*
- *Sintesi dei risultati ottenuti, con allegati grafici ed analitici di dettaglio che descrivono il fenomeno su ognuno dei recettori e da parte di ognuna delle turbine per tutto l'anno solare.*

2. STUDIO DELL'EVOLUZIONE DELL'OMBRA GIORNALIERA GENERATA DAGLI AEROGENERATORI

Le turbine eoliche, come altre strutture fortemente sviluppate in altezza, proiettano un'ombra sulle aree adiacenti in presenza della luce solare diretta. Per chi vive in tali zone prossime all'insediamento eolico può essere molto fastidioso il cosiddetto fenomeno del "flicker" che consiste in un effetto di lampeggiamento che si verifica quando le pale del rotore in movimento "tagliano" la luce solare in maniera intermittente. Una progettazione attenta a questa problematica permette di evitare questo spiacevole fenomeno semplicemente prevedendo il luogo di incidenza dell'ombra e disponendo le turbine in maniera tale che l'ombra sulle zone sensibili non superi un certo numero di ore all'anno. Il grafico in figura i riporta l'evoluzione annuale dell'ombra di una turbina considerando il caso peggiore di pale sempre in rotazione intorno al mozzo, e orientate sempre ortogonalmente al sole durante la sua evoluzione giornaliera.

Come è evidente dal grafico e dalla legenda le ore annue di ombra sono sempre minori con l'aumentare della distanza dal pilone secondo una particolare geometria dettata dalla posizione geografica; da osservare che l'ombra arriva a proiettarsi anche sino ad una distanza di 1 km, anche se solo per pochi minuti all'anno.

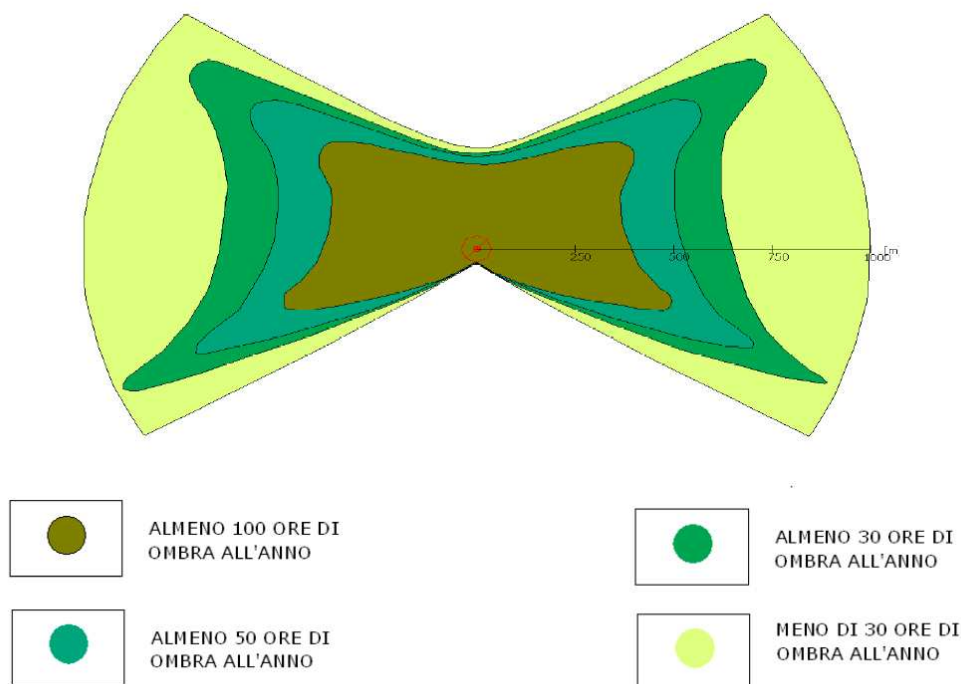


Figura 2: Evoluzione annuale tipo dell'ombra di una pala

Considerati i pochi precedenti esistenti (Germania) e le ipotesi così penalizzanti con cui è stata calcolato tale grafico si è ritenuto opportuno effettuare una sovrapposizione sull'impianto della parte più interna del grafico ovvero dell'area **che supera le 100 ore all'anno di ombra dei punti di installazione, intendendo questo come limite da non superarsi.**

In Italia, così come nella maggior parte dei paesi Europei ed extraeuropei non esiste una normativa specifica in relativa al disturbo generato dal fenomeno di Shadow – Flickering. Esistono delle regolamentazioni locali

ma quasi mai comprendono limiti numerici specifici, quanto piuttosto delle raccomandazioni tese a sottolineare che il fenomeno non sia “unreasonable” o “significant”.

3. INDIVIDUAZIONE DEI RECETTORI ED IPOTESI DI CALCOLO

L’analisi di shadow-flickering di cui al presente studio è stata elaborata per specifici 13 recettori che circondano l’impianto; tuttavia alcune strutture inserite nel modello di simulazione potrebbero essere ruderi non abitati e sostanzialmente privi di caratteristiche minime di abitabilità o agibilità.

NOME	EST	NORD
A	566303	4588548
B	567328	4589824
C	568323	4588794
D	567858	4588502
E	567618	4588514
F	568522	4588384
G	568647	4588353
H	566361	4588484
I	566164	4588475
J	565927	4588348
K	565681	4588194
L	565911	4587445
M	567146	4587486

Tab. 1 – Coordinate ricettori UTM-WGS84

Lo studio, i cui risultati in dettaglio sono riportati di seguito, è stato condotto con uno specifico software (WindPRO).

Nello studio ci si è posti nella condizione più sfavorevole possibile, in quanto si è considerato che:

- il sole risplende per tutta la giornata dall'alba al tramonto (cioè si è sempre in assenza di copertura nuvolosa);
- il piano di rotazione delle pale è sempre perpendicolare alla linea che passa per il sole e per l'aerogeneratore (l'aerogeneratore “insegue” il sole);
- l'aerogeneratore è sempre operativo.

Allo stesso tempo, si è trascurata la presenza degli alberi e di altri ostacoli che bordano le strade “intercettando” l’ombra degli aerogeneratori riducendo il fastidio del flickering.

Ciò significa che i risultati ai quali si perverrà sono ampiamente cautelativi.

In base alla metodologia descritta nei paragrafi precedenti, sono stati utilizzati i seguenti dati di input per impostare il modello di simulazione per la valutazione del fenomeno di Shadow-Flickering degli aerogeneratori di progetto:

- a) **Il DTM o Modello del terreno digitale** per caratterizzare l'orografia è stato estrapolato dal grid

disponibile in download dal SIT della Regione Puglia, georeferenziato, sovrapposto, confrontato e adeguato con le curve di livello presenti sulla cartografia ufficiale CTR 1:5.000 con uno step di 5 m. Il modello digitale ottenuto copre un' area sufficiente ad inglobare l'area del parco eolico di progetto e trova un buon riscontro con l' andamento orografico verificato in sito.

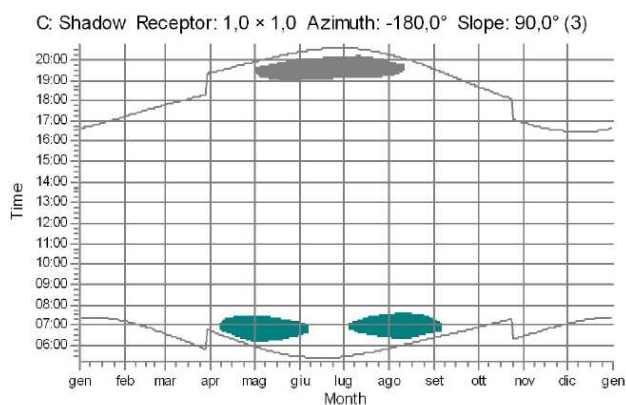
- b) **Posizioni geografiche di recettori con dettaglio dimensionale delle aree più esposte.** Sono i recettori individuati dallo studio acustico e classificati secondo la loro abitabilità e destinazione d'uso. Per tutti i recettori si è ritenuto opportuno usare l'ipotesi di cautela della modalità "green house mode" . Questa scelta è stata operata poiché in talune circostanze anche lo spazio antistante le strutture può essere considerato o adibito a luogo di riposo e relax. La scelta di una singola finestra o di una facciata in alcune condizioni potrebbe risultare riduttiva allo scopo di una vera valutazione d'impatto.
- c) **Posizioni geografiche delle turbine eoliche e loro caratteristiche dimensionali**
Gli aerogeneratori di progetto con le loro caratteristiche dimensionali e tecnologiche
- d) **Nessun ostacolo naturale o artificiale è stato modellato.**

4. I RISULTATI DEL CALCOLO DELL'EVOLUZIONE DELL'OMBRA

Nella procedura "Worst case" il fenomeno di shadow/flickering viene calcolato non tenendo conto delle condizioni di soleggiamento del sito e del vento, dati che allo stato dell'arte per il sito in questione non sono disponibili. Invece se avessimo di dati di cui sopra potremmo calcolare il fenomeno di shadow/flickering con la metodologia ("real case"), che secondo altri casi simili comporterebbe la riduzione del fenomeno ad 1/3 dei valori, il quale seppur più realistico, è comunque sovrastimato poiché non tiene conto della presenza di nubi e di vegetazione ad alto fusto. Dalle simulazioni effettuate, si evince che gli aerogeneratori di progetto generano maggiormente il fenomeno di shadow/flickering sui recettori "B e C" individuati nell'analisi che, nelle ipotesi di "Worst case", subiscono il fenomeno per un periodo che supera le 100 ore/anno, per tutti gli altri rimanenti recettori considerati invece, l'effetto calcolato è più modesto e/o comunque meno rilevante fino a divenire irrilevante e in alcuni casi nullo.

Con le considerazioni di cui sopra, ovvero prevedendo la riduzione ad 1/3 si avranno valori sicuramente più ridotti e nessun recettore supera le 100 ore/anno, tra l'altro il recettore "B" trattasi di rudere e quindi la probabilità di accadimento si riduce quasi al nulla.

E' stato elaborato un calendario dell'ombra riportato in appendice (rif. Appendice Calendar), che riporta in maniera grafica giorno per giorno, per tutto l'anno, la durata giornaliera del fenomeno, l'orario di inizio e di fine del fenomeno, nelle condizioni di caso reale. Dalla lettura del "Calendar" si legge che il fenomeno dell'ombreggiamento, si esplica sui recettori con intensità maggiore nel periodo compreso tra Febbraio, Marzo, Aprile nelle prime ore del mattino e Settembre, Ottobre, Novembre e Dicembre nelle tarde ore pomeridiane. Nella figura che segue è riportato a titolo di esempio il grafico "calendar" di un recettore: le macchie individuano i momenti di shadow, la posizione nel grafico individua tempo e durata del fenomeno, il colore della macchia individua la turbina che causa il fenomeno.



L'allegato 2 riporta il dettaglio analitico di quanto espresso dal grafico precedente con gli specifici orari di inizio e di fine del fenomeno. A seguire è altresì riportata la sintesi grafica annuale (come mostra l'immagine precedente) dell'apporto di ombreggiamento a carico di ogni recettore ed il/gli aerogeneratore/i responsabile/i del fenomeno.

E' stata inoltre elaborata una mappa (report Map, Allegato 3) in cui vengono riportate, con diverse gradazioni di colore, le zone soggette ad una determinata durata del fenomeno dell'ombreggiamento oltre all'estensione areale nella quale il fenomeno risulta significativo.

Il fenomeno dell'ombreggiamento interessa marginalmente tratti di strade comunali e/o private per un numero di ore all'anno del tutto irrilevanti e cioè pari ad un massimo di 30 ore/anno, ma solo in alcuni tratti. Preme tuttavia evidenziare che nelle simulazioni non si è tenuto conto della possibile presenza di vegetazione capace di offrire un effetto "barriera" ai recettori e/o alle strade limitrofe. Inoltre, la percezione dell'impianto dalla strada risulterebbe essere "in movimento" e quindi legata alla breve permanenza delle automobili in transito, per cui il fastidio indotto sarebbe temporalmente limitato. A questo si aggiunge che le simulazioni sono state effettuate assumendo le "condizioni peggiori", sovrastimando pertanto l'effetto di flickering.

5. CONCLUSIONI E RACCOMANDAZIONI

In conclusione, si può affermare che i risultati ottenuti dalle elaborazioni evidenziano, pur considerando le condizioni più sfavorevoli, che le turbine di progetto generano effetti di shadow flickering **i cui impatti risultano essere nulli per molte strutture, e piuttosto modesti (o non particolarmente problematici) per altre.**

In ogni caso è comunque da rimarcare l'effetto di sovrastima dovuto al grado di cautela utilizzato per la simulazione che non tiene in conto di tutte le possibili fonti di attenuazione dell'effetto cui ogni recettore è (o può essere) soggetto quali presenza di alberi, ostacoli, siepi e quant'altro possa attenuare il fenomeno dell'evoluzione giornaliera dell'ombra.

6. ELENCO ALLEGATI

Di seguito vengono riportati i risultati dello Shadow Flicker elaborati con il software *WindPro*

1. Main result: quadro sintetico dei risultati di calcolo;
2. Calendar: analisi giornaliera dell'effetto "flickering" ricevuto da ogni recettore;

3. Calendar, graphical: grafico dell'analisi giornaliera dell'effetto "flickering" ricevuto da ogni recettore;
4. Calendar per WTG: analisi giornaliera dell'effetto "flickering" indotto da ogni aerogeneratore sui recettori;
5. Map: mappa delle aree soggette ad ombreggiamento.

SHADOW - Main Result

Calculation: Shadow

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: Elevation Grid Data Object: Aren_Manfredonia3_EMDG

Obstacles used in calculation

Receptor grid resolution: 1,0 m

All coordinates are in

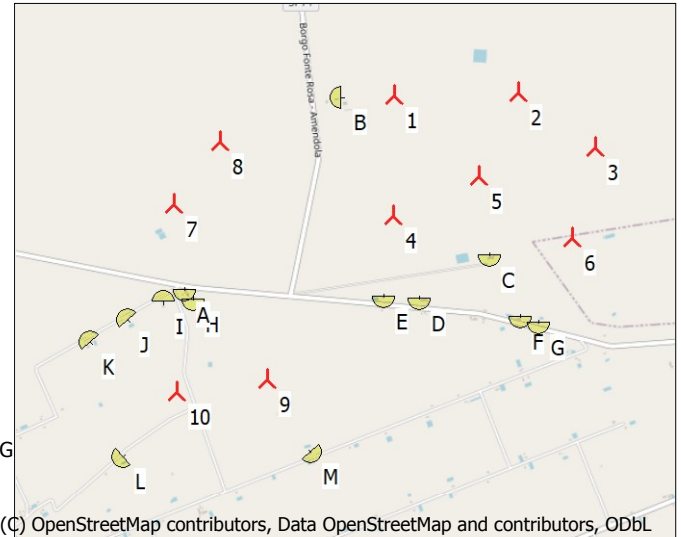
UTM (north)-WGS84 Zone: 33

WTGs

	Easting	Northing	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
			[m]									
1	567.678	4.589.844	11,4	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
2	568.505	4.589.863	7,2	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
3	569.013	4.589.516	8,0	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
4	567.676	4.589.054	13,0	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
5	568.245	4.589.312	10,0	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
6	568.866	4.588.914	10,0	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
7	566.232	4.589.107	14,7	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
8	566.529	4.589.528	14,7	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
9	566.861	4.587.967	15,3	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3
10	566.256	4.587.872	17,7	Siemens Gamesa SG 4.7-...	Yes	Siemens Gamesa	SG 4.7-155-4.700	4.700	155,0	90,0	2.008	9,3

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Degrees from south cw	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]	[°]		[m]
A	566.303	4.588.548	18,2	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
B	567.328	4.589.824	15,9	1,0	1,0	1,0	-90,0	90,0	Fixed direction	2,0
C	568.323	4.588.794	10,1	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
D	567.858	4.588.502	13,0	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
E	567.618	4.588.514	14,0	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
F	568.522	4.588.385	12,0	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
G	568.647	4.588.354	11,1	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
H	566.362	4.588.485	20,7	1,0	1,0	1,0	180,0	90,0	Fixed direction	2,0
I	566.165	4.588.475	19,2	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
J	565.927	4.588.348	20,0	1,0	1,0	1,0	-40,0	90,0	Fixed direction	2,0
K	565.682	4.588.194	21,4	1,0	1,0	1,0	-40,0	90,0	Fixed direction	2,0
L	565.912	4.587.445	17,1	1,0	1,0	1,0	-130,0	90,0	Fixed direction	2,0
M	567.147	4.587.486	14,6	1,0	1,0	1,0	140,0	90,0	Fixed direction	2,0



SHADOW - Main Result

Calculation: Shadow

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]
A	8:48	41	0:19
B	227:40	264	1:40
C	167:25	150	1:36
D	34:32	85	0:42
E	23:51	93	0:23
F	0:00	0	0:00
G	0:00	0	0:00
H	12:00	54	0:20
I	48:49	82	0:44
J	22:15	81	0:33
K	73:29	149	0:56
L	19:01	62	0:25
M	44:02	90	0:38

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

No.	Name	Worst case [h/year]
1	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (1)	202:25
2	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (8)	10:14
3	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (9)	3:05
4	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (10)	91:22
5	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (11)	22:10
6	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (12)	125:06
7	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (13)	15:20
8	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (14)	4:28
9	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (15)	96:08
10	Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (16)	107:45

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: Shadow Shadow receptor: A - Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (1)

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	07:24 16:38	07:10 17:12	06:34 17:47	06:42 19:22	05:56 19:54	06:15 (4) 06:20 (4)	05:27 20:24	05:27 20:35	05:51 20:16	06:13 (4) 06:31 (4)	06:22 19:32	06:53 18:41	06:28 16:54
2	07:24 16:39	07:09 17:14	06:32 17:48	06:41 19:23	05:55 19:55	06:14 (4) 06:21 (4)	05:27 20:25	05:27 20:35	05:52 20:15	06:14 (4) 06:31 (4)	06:23 19:30	06:54 18:39	06:29 16:52
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	06:13 (4) 06:22 (4)	05:28 20:25	05:28 20:35	05:53 20:13	06:15 (4) 06:31 (4)	06:24 19:29	06:55 18:37	06:30 16:51
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	06:12 (4) 06:22 (4)	05:25 20:26	05:28 20:34	05:54 20:12	06:16 (4) 06:32 (4)	06:26 19:27	06:56 18:36	06:31 16:50
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	06:10 (4) 06:22 (4)	05:25 20:27	05:29 20:34	05:55 20:11	06:17 (4) 06:32 (4)	06:27 19:25	06:57 18:34	06:33 16:49
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	06:09 (4) 06:22 (4)	05:25 20:27	05:30 20:34	05:56 20:10	06:18 (4) 06:32 (4)	06:28 19:24	06:58 18:32	06:34 16:48
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	06:08 (4) 06:22 (4)	05:24 20:28	05:30 20:34	05:57 20:09	06:19 (4) 06:31 (4)	06:29 19:22	06:59 18:31	06:35 16:46
8	07:24 16:44	07:02 17:21	06:22 17:55	06:31 19:29	05:47 20:01	06:07 (4) 06:22 (4)	05:24 20:29	05:31 20:33	05:58 20:07	06:20 (4) 06:31 (4)	06:30 19:20	07:00 18:29	06:36 16:45
9	07:24 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	06:06 (4) 06:22 (4)	05:24 20:29	05:32 20:33	05:59 20:06	06:21 (4) 06:31 (4)	06:31 19:19	07:02 18:28	06:37 16:44
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 20:04	06:05 (4) 06:22 (4)	05:24 20:30	05:32 20:33	06:00 20:05	06:22 (4) 06:30 (4)	06:32 19:17	07:03 18:26	06:39 16:43
11	07:23 16:47	06:59 17:25	06:18 17:58	06:26 19:32	05:44 20:05	06:04 (4) 06:21 (4)	05:23 20:30	05:33 20:32	06:01 20:04	06:23 (4) 06:29 (4)	06:33 19:15	07:04 18:24	06:40 16:42
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:42 20:06	06:03 (4) 06:21 (4)	05:23 20:31	05:34 20:32	06:02 20:02	06:24 (4) 06:31 (4)	06:34 19:14	07:05 18:23	06:41 16:41
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:35	05:41 20:07	06:02 (4) 06:20 (4)	05:23 20:31	05:34 20:31	06:03 20:01	06:25 (4) 06:27 (4)	06:35 19:12	07:06 18:21	06:42 16:40
14	07:22 16:51	06:55 17:29	06:13 18:02	06:21 19:36	05:40 20:08	06:01 (4) 06:20 (4)	05:23 20:32	05:35 20:31	06:04 19:59	06:36 19:10	06:07 18:19	07:07 18:19	06:44 16:39
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 20:09	06:00 (4) 06:19 (4)	05:23 20:32	05:36 20:30	06:05 19:58	06:37 19:08	07:08 18:18	07:08 18:18	06:45 16:38
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	06:01 (4) 06:18 (4)	05:23 20:33	05:37 20:29	06:06 19:57	06:38 19:07	07:09 18:16	07:09 18:16	06:46 16:38
17	07:21 16:54	06:51 17:32	06:08 18:05	06:16 19:39	05:37 20:11	06:02 (4) 06:17 (4)	05:23 20:33	05:38 20:29	06:07 19:55	06:39 19:05	07:10 18:15	07:10 18:15	06:47 16:37
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:36 20:12	06:03 (4) 06:15 (4)	05:23 20:33	05:38 20:28	06:08 19:54	06:40 19:03	07:11 18:13	07:11 18:13	06:48 16:36
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:36 20:13	06:05 (4) 06:13 (4)	05:23 20:34	05:39 20:27	06:09 19:52	06:41 19:01	07:13 18:12	07:13 18:12	06:50 16:35
20	07:19 16:57	06:47 17:36	06:02 18:08	06:12 19:42	05:35 20:14	05:23 20:34	05:40 20:27	05:40 20:27	06:10 19:51	06:42 19:00	07:14 18:10	07:14 18:10	06:51 16:34
21	07:19 16:59	06:46 17:37	06:01 18:10	06:10 19:43	05:34 20:14	05:24 20:34	05:41 20:26	05:41 20:26	06:11 19:49	06:43 18:58	07:15 18:09	07:15 18:09	06:52 16:34
22	07:18 17:00	06:44 17:39	05:59 18:11	06:09 19:44	05:33 20:15	05:24 20:35	05:42 20:25	05:42 20:25	06:12 19:48	06:44 18:56	07:16 18:07	07:16 18:07	06:53 16:33
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:24 20:35	05:43 20:24	05:43 20:24	06:13 19:46	06:45 18:55	07:17 18:06	07:17 18:06	06:54 16:33
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 20:17	05:24 20:35	05:44 20:24	05:44 20:24	06:14 19:45	06:46 18:53	07:18 18:04	07:18 18:04	06:55 16:32
25	07:16 17:04	06:40 17:42	05:54 18:14	06:04 19:48	05:31 20:18	05:25 20:35	05:44 20:23	05:44 20:23	06:15 (4) 06:24 (4)	06:15 19:43	06:47 18:51	06:20 17:03	06:57 16:31
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:25 20:35	05:45 20:22	05:45 20:22	06:13 (4) 06:26 (4)	06:16 19:42	06:48 18:49	06:21 17:02	06:58 16:31
27	07:14 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 20:20	05:25 20:35	05:46 20:21	05:46 20:21	06:12 (4) 06:28 (4)	06:17 19:40	06:49 18:48	06:22 17:00	06:59 16:30
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:26 20:35	05:47 20:20	05:47 20:20	06:11 (4) 06:29 (4)	06:18 19:38	06:50 18:46	06:23 16:59	07:00 16:30
29	07:13 17:09	06:34 17:47	05:47 18:18	05:59 19:52	05:28 20:22	05:26 20:35	05:48 20:19	05:48 20:19	06:11 (4) 06:30 (4)	06:19 19:37	06:51 18:44	06:24 16:58	07:01 16:30
30	07:12 17:10	06:33 17:48	05:46 18:19	05:57 19:53	05:28 20:23	05:26 20:35	05:49 20:18	05:49 20:18	06:12 (4) 06:31 (4)	06:20 19:35	06:52 18:43	06:25 16:56	07:02 16:29
31	07:11 17:11	06:32 17:49	05:45 18:20	05:56 19:54	05:27 20:24	05:25 20:36	05:50 20:17	05:50 20:17	06:12 (4) 06:30 (4)	06:21 19:34	06:27 16:55	06:27 16:55	07:23 16:37
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287	
Total, worst case				3	261		115	149					

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: ShadowShadow receptor: B - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)

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
1	07:24 16:38	07:10 17:12	07:30 (5) 08:02 (5)	06:34 17:47	06:53 (3) 06:56 (3)	06:42 19:22
2	07:24 16:38	07:09 17:14	07:29 (5) 08:02 (5)	06:32 17:48	06:51 (3) 06:56 (3)	06:40 19:23
3	07:24 16:39	07:08 17:15	07:30 (5) 08:01 (5)	06:30 17:49	06:49 (3) 06:56 (3)	06:39 19:24
4	07:24 16:40	07:07 17:16	07:31 (5) 08:01 (5)	06:29 17:50	06:48 (3) 06:56 (3)	06:37 19:25
5	07:24 16:41	07:06 17:17	07:32 (5) 08:00 (5)	06:27 17:52	06:46 (3) 06:56 (3)	06:35 19:26
6	07:24 16:42	07:05 17:19	07:34 (5) 07:59 (5)	06:26 17:53	06:45 (3) 06:56 (3)	06:34 19:27
7	07:24 16:43	07:04 17:20	07:35 (5) 07:58 (5)	06:24 17:54	06:43 (3) 06:55 (3)	06:32 19:28
8	07:24 16:44	07:46 (6) 07:48 (5)	07:02 17:21	06:22 17:55	06:41 (3) 06:53 (3)	06:30 19:29
9	07:24 16:45	07:46 (6) 07:49 (5)	07:01 17:22	06:21 17:56	06:40 (3) 06:52 (3)	06:29 19:30
10	07:23 16:46	07:45 (6) 07:50 (5)	07:00 17:24	06:19 17:57	06:39 (3) 06:50 (3)	06:27 19:31
11	07:23 16:47	07:45 (6) 07:51 (5)	06:59 17:25	06:17 17:58	06:26 19:32	06:26 19:32
12	07:23 16:48	07:45 (6) 07:53 (5)	06:58 17:26	06:16 18:00	06:24 19:33	06:24 19:33
13	07:23 16:49	07:44 (6) 07:53 (5)	06:56 17:27	06:14 18:01	06:22 19:35	06:22 19:35
14	07:22 16:50	07:44 (6) 07:55 (5)	06:55 17:29	06:12 18:02	06:21 19:36	06:21 19:36
15	07:22 16:52	07:43 (6) 07:55 (5)	06:54 17:30	06:11 18:03	06:19 19:37	06:19 19:37
16	07:21 16:53	07:43 (6) 07:56 (5)	06:52 17:31	06:09 18:04	06:18 19:38	06:18 19:38
17	07:21 16:54	07:42 (6) 07:57 (5)	06:51 17:32	06:07 18:05	06:28 (1) 06:49 (1)	06:16 19:39
18	07:20 16:55	07:42 (6) 07:58 (5)	06:50 17:34	06:06 18:06	06:24 (1) 06:55 (1)	06:15 19:40
19	07:20 16:56	07:41 (6) 07:59 (5)	06:48 17:35	06:04 18:07	06:23 (1) 06:59 (1)	06:13 19:41
20	07:19 16:57	07:40 (6) 07:59 (5)	06:47 17:36	06:02 18:08	06:21 (1) 07:02 (1)	06:11 19:42
21	07:19 16:59	07:40 (6) 08:00 (5)	06:45 17:37	06:01 18:10	06:19 (1) 07:04 (1)	06:10 19:43
22	07:18 17:00	07:39 (6) 08:01 (5)	06:44 17:38	05:59 18:11	06:18 (2) 07:07 (1)	06:08 19:44
23	07:17 17:01	07:38 (6) 08:01 (5)	06:43 17:40	05:57 18:12	06:16 (2) 07:08 (1)	06:07 19:45
24	07:17 17:02	07:37 (6) 08:01 (5)	06:41 17:41	05:56 18:13	06:14 (2) 07:10 (1)	06:06 19:46
25	07:16 17:03	07:37 (6) 08:02 (5)	06:40 17:42	05:54 18:14	06:13 (2) 07:12 (1)	06:04 19:47
26	07:15 17:05	07:36 (5) 08:02 (5)	06:38 17:43	05:52 18:15	06:11 (2) 07:13 (1)	06:03 19:49
27	07:14 17:06	07:35 (5) 08:02 (5)	06:37 17:44	05:51 18:16	06:09 (2) 07:14 (1)	06:01 19:50
28	07:14 17:07	07:34 (5) 08:02 (5)	06:35 17:46	05:49 18:17	06:07 (2) 07:14 (1)	06:00 19:51
29	07:13 17:08	07:33 (5) 08:02 (5)		06:47 19:18	07:06 (2) 08:16 (1)	05:58 19:52
30	07:12 17:10	07:32 (5) 08:02 (5)		06:45 19:19	07:04 (2) 08:16 (1)	05:57 19:53
31	07:11 17:11	07:31 (5) 08:02 (5)		06:44 19:20	07:02 (2) 08:17 (1)	05:57 19:53
Potential sun hours	296	297	369	399	449	454
Total, worst case	422	240	892	2811	2161	263

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: ShadowShadow receptor: B - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)

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

	July	August	September	October	November	December
1	05:27	05:51	06:54 (1) 06:22	06:43 (1) 06:53	06:28	07:13 (5) 07:03
	20:35	20:16	79 08:13 (1) 19:32	96 08:19 (1) 18:41	16:54	7 07:20 (5) 16:29
2	05:27	07:25 (1) 05:52	80 08:13 (1) 19:30	94 08:18 (1) 18:39	16:52	15 07:08 (5) 07:04
	20:35	07:34 (1) 20:15	80 08:13 (1) 19:30	94 08:18 (1) 18:39	16:52	15 07:23 (5) 16:28
3	05:28	07:24 (1) 05:53	81 08:14 (1) 19:29	93 08:18 (1) 18:37	8 07:18 (3) 06:30	20 07:06 (5) 07:05
	20:35	07:37 (1) 20:13	81 08:14 (1) 19:29	93 08:18 (1) 18:37	8 07:26 (3) 16:51	20 07:26 (5) 16:28
4	05:28	07:21 (1) 05:54	83 08:15 (1) 19:27	91 08:17 (1) 18:36	12 07:16 (3) 06:31	23 07:04 (5) 07:06
	20:34	07:39 (1) 20:12	83 08:15 (1) 19:27	91 08:17 (1) 18:36	12 07:28 (3) 16:50	23 07:27 (5) 16:28
5	05:29	07:20 (1) 05:55	85 08:16 (1) 19:25	89 08:16 (1) 18:34	12 07:17 (3) 06:33	26 07:03 (5) 07:07
	20:34	07:41 (1) 20:11	85 08:16 (1) 19:25	89 08:16 (1) 18:34	12 07:29 (3) 16:49	26 07:29 (5) 16:28
6	05:30	07:18 (1) 05:56	87 08:16 (1) 19:24	87 08:15 (1) 18:32	12 07:19 (3) 06:34	28 07:02 (5) 07:08
	20:34	07:42 (1) 20:10	87 08:16 (1) 19:24	87 08:15 (1) 18:32	12 07:31 (3) 16:48	28 07:30 (5) 16:28
7	05:30	07:17 (1) 05:57	87 08:17 (1) 19:22	86 08:15 (1) 18:31	11 07:20 (3) 06:35	30 07:01 (5) 07:09
	20:34	07:44 (1) 20:09	87 08:17 (1) 19:22	86 08:15 (1) 18:31	11 07:31 (3) 16:46	30 07:31 (5) 16:28
8	05:31	07:16 (1) 05:58	89 08:18 (1) 19:20	84 08:14 (1) 18:29	10 07:21 (3) 06:36	31 07:01 (5) 07:10
	20:33	07:46 (1) 20:07	89 08:18 (1) 19:20	84 08:14 (1) 18:29	10 07:31 (3) 16:45	31 07:31 (5) 16:27
9	05:31	07:15 (1) 05:59	89 08:18 (1) 19:19	82 08:13 (1) 18:27	9 07:22 (3) 06:37	33 07:00 (5) 07:11
	20:33	07:47 (1) 20:06	89 08:18 (1) 19:19	82 08:13 (1) 18:27	9 07:31 (3) 16:44	33 07:31 (5) 16:27
10	05:32	07:14 (1) 06:00	91 08:19 (1) 19:17	80 08:12 (1) 18:26	8 07:23 (3) 06:39	32 07:01 (5) 07:12
	20:33	07:49 (1) 20:05	91 08:19 (1) 19:17	80 08:12 (1) 18:26	8 07:31 (3) 16:43	32 07:31 (5) 16:27
11	05:33	07:13 (1) 06:01	91 08:19 (1) 19:15	77 08:10 (1) 18:24	6 07:24 (3) 06:40	31 07:02 (5) 07:13
	20:32	07:50 (1) 20:03	91 08:19 (1) 19:15	77 08:10 (1) 18:24	6 07:30 (3) 16:42	31 07:33 (5) 16:28
12	05:34	07:11 (1) 06:02	93 08:20 (1) 19:13	75 08:09 (1) 18:23	4 07:25 (3) 06:41	30 07:04 (5) 07:14
	20:32	07:51 (1) 20:02	93 08:20 (1) 19:13	75 08:09 (1) 18:23	4 07:29 (3) 16:41	30 07:29 (5) 16:28
13	05:34	07:11 (1) 06:03	93 08:20 (1) 19:12	73 08:08 (1) 18:21	2 07:26 (3) 06:42	29 07:05 (5) 07:14
	20:31	07:53 (1) 20:01	93 08:20 (1) 19:12	73 08:08 (1) 18:21	2 07:28 (3) 16:40	29 07:34 (5) 16:28
14	05:35	07:10 (1) 06:04	94 08:20 (1) 19:10	70 08:06 (1) 18:19	06:44	28 07:06 (5) 07:15
	20:31	07:54 (1) 19:59	94 08:20 (1) 19:10	70 08:06 (1) 18:19	16:39	28 07:34 (5) 16:28
15	05:36	07:09 (1) 06:05	95 08:21 (1) 19:08	68 08:05 (1) 18:18	06:45	27 07:08 (5) 07:16
	20:30	07:56 (1) 19:58	95 08:21 (1) 19:08	68 08:05 (1) 18:18	16:38	27 07:35 (5) 16:28
16	05:37	07:08 (1) 06:06	96 08:21 (1) 19:07	65 08:03 (1) 18:16	06:46	26 07:09 (5) 07:17
	20:29	07:56 (1) 19:57	96 08:21 (1) 19:07	65 08:03 (1) 18:16	16:38	26 07:35 (5) 16:28
17	05:37	07:07 (1) 06:07	96 08:21 (1) 19:05	62 08:01 (1) 18:15	06:47	25 07:10 (6) 07:17
	20:29	07:58 (1) 19:55	96 08:21 (1) 19:05	62 08:01 (1) 18:15	16:37	25 07:35 (5) 16:29
18	05:38	07:06 (1) 06:08	98 08:22 (1) 19:03	59 07:59 (1) 18:13	06:48	24 07:11 (6) 07:18
	20:28	07:59 (1) 19:54	98 08:22 (1) 19:03	59 07:59 (1) 18:13	16:36	24 07:35 (5) 16:29
19	05:39	07:05 (1) 06:09	98 08:22 (1) 19:01	56 07:57 (1) 18:12	06:50	23 07:13 (6) 07:19
	20:27	08:00 (1) 19:52	98 08:22 (1) 19:01	56 07:57 (1) 18:12	16:35	23 07:36 (5) 16:29
20	05:40	07:05 (1) 06:10	98 08:22 (1) 19:00	53 07:55 (1) 18:10	06:51	22 07:14 (6) 07:19
	20:27	08:02 (1) 19:51	98 08:22 (1) 19:00	53 07:55 (1) 18:10	16:34	22 07:36 (5) 16:30
21	05:41	07:03 (1) 06:11	99 08:22 (1) 18:58	50 07:53 (1) 18:09	06:52	20 07:15 (6) 07:20
	20:26	08:02 (1) 19:49	99 08:22 (1) 18:58	50 07:53 (1) 18:09	16:34	20 07:35 (5) 16:30
22	05:42	07:02 (1) 06:12	99 08:22 (1) 18:56	46 07:50 (1) 18:07	06:53	19 07:16 (6) 07:20
	20:25	08:03 (1) 19:48	99 08:22 (1) 18:56	46 07:50 (1) 18:07	16:33	19 07:35 (5) 16:31
23	05:43	07:01 (1) 06:13	99 08:22 (1) 18:55	42 07:47 (1) 18:06	06:54	18 07:18 (6) 07:21
	20:24	08:04 (1) 19:46	99 08:22 (1) 18:55	42 07:47 (1) 18:06	16:32	18 07:36 (5) 16:31
24	05:43	07:01 (1) 06:14	100 08:22 (1) 18:53	38 07:44 (1) 18:04	06:55	16 07:19 (6) 07:21
	20:23	08:06 (1) 19:45	100 08:22 (1) 18:53	38 07:44 (1) 18:04	16:32	16 07:35 (5) 16:32
25	05:44	07:00 (1) 06:15	100 08:22 (1) 18:51	33 07:40 (1) 17:03	06:57	15 07:20 (6) 07:22
	20:23	08:07 (1) 19:43	100 08:22 (1) 18:51	33 07:40 (1) 17:03	16:31	15 07:35 (5) 16:32
26	05:45	06:59 (1) 06:16	100 08:22 (1) 18:49	26 07:34 (1) 17:02	06:58	14 07:21 (6) 07:22
	20:22	08:08 (1) 19:42	100 08:22 (1) 18:49	26 07:34 (1) 17:02	16:31	14 07:35 (5) 16:33
27	05:46	06:58 (1) 06:17	99 08:21 (1) 18:48	6 07:24 (1) 17:00	06:59	12 07:22 (6) 07:22
	20:21	08:09 (1) 19:40	99 08:21 (1) 18:48	6 07:24 (1) 17:00	16:30	12 07:34 (5) 16:34
28	05:47	06:58 (1) 06:18	99 08:20 (1) 18:46	06:23	07:00	11 07:24 (6) 07:23
	20:20	08:10 (1) 19:38	99 08:20 (1) 18:46	06:23	16:59	11 07:35 (5) 16:34
29	05:48	06:57 (1) 06:19	99 08:20 (1) 18:44	06:24	07:01	9 07:25 (6) 07:23
	20:19	08:11 (1) 19:37	99 08:20 (1) 18:44	06:24	16:57	9 07:34 (5) 16:35
30	05:49	06:55 (1) 06:20	99 08:20 (1) 18:43	06:25	07:02	8 07:26 (6) 07:23
	20:18	08:11 (1) 19:35	99 08:20 (1) 18:43	06:25	16:56	8 07:34 (5) 16:36
31	05:50	06:55 (1) 06:21	97 08:19 (1)	06:27	16:29	8 07:34 (5) 16:36
	20:17	08:12 (1) 19:34	97 08:19 (1)	06:27	16:55	8 07:34 (5) 16:36
Potential sun hours	460	429	375	345	297	286
Total, worst case	1437	2891	1781	94	652	16

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: ShadowShadow receptor: C - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)

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					
1	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 19:54	06:16 (6) 07:21 (6)	05:26 20:24	82	06:35 (6) 19:59 (4)		
2	07:24 16:38	07:09 17:13	06:32 17:48	06:40 19:23	05:54 19:55	06:16 (6) 19:32 (4)	05:26 20:25	78	06:37 (6) 19:59 (4)		
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	06:17 (6) 19:33 (4)	05:26 20:25	75	06:38 (6) 19:59 (4)		
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	06:16 (6) 19:33 (4)	05:25 20:26	72	06:40 (6) 19:59 (4)		
5	07:24 16:41	07:06 17:17	06:27 17:51	06:35 19:26	05:51 19:58	06:16 (6) 19:35 (4)	05:25 20:27	69	06:42 (6) 20:00 (4)		
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	06:16 (6) 19:36 (4)	05:24 20:27	64	06:44 (6) 19:59 (4)		
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	06:17 (6) 19:37 (4)	05:24 20:28	53	19:06 (4) 19:59 (4)		
8	07:24 16:44	07:02 17:21	06:22 17:55	06:30 19:29	06:49 (6) 07:03 (6)	05:47 20:01	06:17 (6) 19:38 (4)	88	05:24 20:29	54	20:00 (4)
9	07:23 16:45	07:01 17:22	06:21 17:56	06:29 19:30	06:47 (6) 07:06 (6)	05:46 20:02	06:17 (6) 19:39 (4)	90	05:24 20:29	53	20:00 (4)
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	06:46 (6) 07:10 (6)	05:45 20:03	06:18 (6) 19:40 (8)	91	05:23 20:30	53	20:00 (4)
11	07:23 16:47	06:59 17:25	06:17 17:58	06:26 19:32	06:44 (6) 07:12 (6)	05:43 20:04	06:18 (6) 19:41 (8)	92	05:23 20:30	54	20:00 (4)
12	07:23 16:48	06:58 17:26	06:16 17:59	06:24 19:33	06:43 (6) 07:14 (6)	05:42 20:05	06:19 (6) 19:42 (8)	93	05:23 20:31	53	20:00 (4)
13	07:22 16:49	06:56 17:27	06:14 18:01	06:22 19:34	06:41 (6) 07:15 (6)	05:41 20:07	06:19 (6) 19:43 (8)	94	05:23 20:31	53	20:00 (4)
14	07:22 16:50	06:55 17:29	06:12 18:02	06:21 19:36	06:39 (6) 07:16 (6)	05:40 20:08	06:19 (6) 19:44 (8)	95	05:23 20:32	53	20:00 (4)
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	06:38 (6) 07:17 (6)	05:39 20:09	06:20 (6) 19:45 (8)	95	05:23 20:32	52	20:00 (4)
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	06:36 (6) 07:18 (6)	05:38 20:10	06:20 (6) 19:46 (8)	95	05:23 20:33	52	20:00 (4)
17	07:21 16:54	06:51 17:32	06:07 18:05	06:16 19:39	06:35 (6) 07:19 (6)	05:37 20:11	06:21 (6) 19:47 (8)	96	05:23 20:33	52	20:00 (4)
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	06:33 (6) 07:19 (6)	05:36 20:11	06:22 (6) 19:47 (8)	94	05:23 20:33	53	20:02 (4)
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	06:32 (6) 07:20 (6)	05:35 20:12	06:22 (6) 19:48 (8)	95	05:23 20:34	53	20:02 (4)
20	07:19 16:57	06:47 17:36	06:02 18:08	06:11 19:42	06:30 (6) 07:20 (6)	05:35 20:13	06:23 (6) 19:49 (8)	94	05:23 20:34	53	20:02 (4)
21	07:19 16:59	06:45 17:37	06:01 18:09	06:10 19:43	06:29 (6) 07:21 (6)	05:34 20:14	06:24 (6) 19:50 (8)	94	05:23 20:34	53	20:02 (4)
22	07:18 17:00	06:44 17:38	05:59 18:11	06:08 19:44	06:27 (6) 07:21 (6)	05:33 20:15	06:25 (6) 19:51 (8)	93	05:24 20:34	53	20:02 (4)
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	06:26 (6) 07:22 (6)	05:32 20:16	06:25 (6) 19:52 (8)	93	05:24 20:35	53	20:03 (4)
24	07:17 17:02	06:41 17:41	05:56 18:13	06:05 19:46	06:25 (6) 07:22 (6)	05:31 20:17	06:26 (6) 19:52 (4)	92	05:24 20:35	53	20:03 (4)
25	07:16 17:03	06:40 17:42	05:54 18:14	06:04 19:47	06:23 (6) 07:22 (6)	05:31 20:18	06:28 (6) 19:54 (4)	91	05:24 20:35	53	20:03 (4)
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:48	06:22 (6) 07:22 (6)	05:30 20:19	06:28 (6) 19:54 (4)	90	05:25 20:35	52	20:02 (4)
27	07:14 17:06	06:37 17:44	05:51 18:16	06:01 19:50	06:20 (6) 07:22 (6)	05:29 20:20	06:30 (6) 19:55 (4)	88	05:25 20:35	52	20:03 (4)
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	06:19 (6) 07:22 (6)	05:29 20:21	06:30 (6) 19:56 (4)	88	05:25 20:35	52	20:03 (4)
29	07:13 17:08		06:47 19:18	05:58 19:52	06:18 (6) 07:22 (6)	05:28 20:21	06:31 (6) 19:56 (4)	86	05:26 20:35	53	20:04 (4)
30	07:12 17:10		06:45 19:19	05:57 19:53	06:16 (6) 07:21 (6)	05:27 20:22	06:33 (6) 19:57 (4)	84	05:26 20:35	53	20:04 (4)
31	07:11 17:11		06:44 19:20			05:27 20:23	06:34 (6) 19:58 (4)	82			
Potential sun hours	296	297	369	399	449	449	454	1708			
Total, worst case				1048		2737					

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: ShadowShadow receptor: C - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)

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

	July	August	September	October	November	December
1	05:27 20:35	19:12 (4) 20:05 (4)	05:51 20:16	06:28 (6) 19:51 (8)	06:22 19:32	06:43 (6) 07:10 (6)
2	05:27 20:35	19:11 (4) 20:04 (4)	05:52 20:14	06:28 (6) 19:50 (8)	06:23 19:30	06:44 (6) 07:08 (6)
3	05:28 20:35	19:12 (4) 20:05 (4)	05:53 20:13	06:27 (6) 19:49 (8)	06:24 19:29	06:45 (6) 07:04 (6)
4	05:28 20:34	19:11 (4) 20:05 (4)	05:54 20:12	06:27 (6) 19:48 (4)	06:25 19:27	06:46 (6) 07:00 (6)
5	05:29 20:34	19:12 (4) 20:06 (4)	05:55 20:11	06:27 (6) 19:47 (4)	06:26 19:25	06:57 18:34
6	05:30 20:34	06:52 (6) 20:05 (4)	05:56 20:10	06:26 (6) 19:46 (4)	06:27 19:24	06:58 18:32
7	05:30 20:34	06:49 (6) 20:06 (4)	05:57 20:09	06:26 (6) 19:45 (4)	06:28 19:22	06:59 18:31
8	05:31 20:33	06:48 (6) 20:06 (4)	05:58 20:07	06:26 (6) 19:44 (4)	06:29 19:20	07:00 18:29
9	05:31 20:33	06:46 (6) 20:06 (4)	05:59 20:06	06:25 (6) 19:43 (4)	06:30 19:19	07:01 18:27
10	05:32 20:33	06:45 (6) 20:07 (4)	06:00 20:05	06:25 (6) 19:42 (4)	06:31 19:17	07:03 18:26
11	05:33 20:32	06:44 (6) 20:07 (4)	06:01 20:03	06:25 (6) 07:30 (6)	06:32 19:15	07:04 18:24
12	05:34 20:32	06:42 (6) 20:06 (4)	06:02 20:02	06:25 (6) 07:30 (6)	06:33 19:13	07:05 18:23
13	05:34 20:31	06:42 (6) 20:06 (4)	06:03 20:01	06:25 (6) 07:30 (6)	06:34 19:12	07:06 18:21
14	05:35 20:31	06:41 (6) 20:06 (4)	06:04 19:59	06:26 (6) 07:30 (6)	06:35 19:10	07:07 18:19
15	05:36 20:30	06:40 (6) 20:05 (4)	06:05 19:58	06:27 (6) 07:30 (6)	06:37 19:08	07:08 18:18
16	05:37 20:29	06:39 (6) 20:04 (4)	06:06 19:57	06:28 (6) 07:29 (6)	06:38 19:07	07:09 18:16
17	05:37 20:29	06:38 (6) 20:04 (4)	06:07 19:55	06:29 (6) 07:29 (6)	06:39 19:05	07:10 18:15
18	05:38 20:28	06:37 (6) 20:03 (4)	06:08 19:54	06:30 (6) 07:28 (6)	06:40 19:03	07:11 18:13
19	05:39 20:27	06:37 (6) 20:03 (4)	06:09 19:52	06:31 (6) 07:28 (6)	06:41 19:01	07:13 18:12
20	05:40 20:27	06:36 (6) 20:02 (8)	06:10 19:51	06:32 (6) 07:27 (6)	06:42 19:00	07:14 18:10
21	05:41 20:26	06:35 (6) 20:01 (8)	06:11 19:49	06:33 (6) 07:27 (6)	06:43 18:58	07:15 18:09
22	05:42 20:25	06:34 (6) 20:00 (8)	06:12 19:48	06:34 (6) 07:26 (6)	06:44 18:56	07:16 18:07
23	05:43 20:24	06:33 (6) 20:00 (8)	06:13 19:46	06:35 (6) 07:25 (6)	06:45 18:54	07:17 18:06
24	05:43 20:23	06:33 (6) 19:59 (8)	06:14 19:45	06:36 (6) 07:24 (6)	06:46 18:53	07:18 18:04
25	05:44 20:23	06:32 (6) 19:58 (8)	06:15 19:43	06:37 (6) 07:23 (6)	06:47 18:51	06:19 17:03
26	05:45 20:22	06:32 (6) 19:58 (8)	06:16 19:42	06:38 (6) 07:22 (6)	06:48 18:49	06:21 17:01
27	05:46 20:21	06:31 (6) 19:57 (8)	06:17 19:40	06:38 (6) 07:20 (6)	06:49 18:48	06:22 17:00
28	05:47 20:20	06:31 (6) 19:56 (8)	06:18 19:38	06:39 (6) 07:18 (6)	06:50 18:46	06:23 16:59
29	05:48 20:19	06:30 (6) 19:55 (8)	06:19 19:37	06:40 (6) 07:17 (6)	06:51 18:44	06:24 16:57
30	05:49 20:18	06:29 (6) 19:53 (8)	06:20 19:35	06:41 (6) 07:15 (6)	06:52 18:42	06:25 16:56
31	05:50 20:17	06:28 (6) 19:52 (8)	06:21 19:34	06:42 (6) 07:13 (6)		06:27 16:55
Potential sun hours	460	429	375	345	297	287
Total, worst case	2521	1947	84			

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: ShadowShadow receptor: D - Shadow Receptor: 1,0 x 1,0 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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 19:54		05:26 20:24					
2	07:24 16:38	07:09 17:14	06:32 17:48	06:40 19:23	05:54 19:55	06:14 (6)	05:26 20:25	24	06:20 (6)	05:27 20:35	8	06:11 (6)
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	06:13 (6)	05:25 20:25	23	06:20 (6)	05:28 20:35	11	06:20 (6)
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	06:11 (6)	05:25 20:26	22	06:19 (6)	05:28 20:34	12	06:21 (6)
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	06:10 (6)	05:25 20:27	20	06:19 (6)	05:29 20:34	14	06:22 (6)
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	06:09 (6)	05:24 20:27	19	06:19 (6)	05:30 20:34	15	06:23 (6)
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	06:08 (6)	05:24 20:28	18	06:18 (6)	05:30 20:34	16	06:24 (6)
8	07:24 16:44	07:02 17:21	06:22 17:55	06:30 19:29	05:47 20:01	06:07 (6)	05:24 20:29	17	06:17 (6)	05:31 20:34	17	06:25 (6)
9	07:23 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	06:06 (6)	05:24 20:29	16	06:16 (6)	05:31 20:33	18	06:26 (6)
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 20:03	06:05 (6)	05:23 20:30	15	06:15 (6)	05:32 20:33	19	06:27 (6)
11	07:23 16:47	06:59 17:25	06:17 17:58	06:26 19:32	05:44 20:04	06:04 (6)	05:23 20:30	14	06:14 (6)	05:33 20:32	20	06:28 (6)
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:42 20:05	06:03 (6)	05:23 20:31	13	06:13 (6)	05:34 20:32	21	06:29 (6)
13	07:22 16:49	06:56 17:27	06:14 18:01	06:22 19:34	05:41 20:07	06:02 (6)	05:23 20:31	12	06:12 (6)	05:34 20:31	22	06:30 (6)
14	07:22 16:50	06:55 17:29	06:12 18:02	06:21 19:36	05:40 20:08	06:01 (6)	05:23 20:32	11	06:11 (6)	05:35 20:31	23	06:31 (6)
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 20:09	06:00 (6)	05:23 20:32	10	06:10 (6)	05:36 20:30	24	06:32 (6)
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	05:59 (6)	05:23 20:33	9	06:09 (6)	05:37 20:29	25	06:33 (6)
17	07:21 16:54	06:51 17:32	06:07 18:05	06:16 19:39	05:37 20:11	05:58 (6)	05:23 20:33	8	06:08 (6)	05:37 20:29	26	06:34 (6)
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:36 20:12	05:57 (6)	05:23 20:33	7	06:07 (6)	05:38 20:28	27	06:35 (6)
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:35 20:12	05:56 (6)	05:23 20:34	6	06:06 (6)	05:39 20:27	28	06:36 (6)
20	07:19 16:57	06:47 17:36	06:02 18:08	06:11 19:42	05:35 20:13	05:55 (6)	05:23 20:34	5	06:05 (6)	05:40 20:27	29	06:37 (6)
21	07:19 16:59	06:45 17:37	06:01 18:10	06:10 19:43	05:34 20:14	05:54 (6)	05:23 20:34	4	06:04 (6)	05:41 20:26	30	06:38 (6)
22	07:18 17:00	06:44 17:38	05:59 18:11	06:08 19:44	05:33 20:15	05:54 (6)	05:24 20:34	3	06:03 (6)	05:42 20:25	31	06:39 (6)
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:53 (6)	05:24 20:35	2	06:02 (6)	05:43 20:24	32	06:40 (6)
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 20:17	05:52 (6)	05:24 20:35	1	06:01 (6)	05:43 20:23	33	06:41 (6)
25	07:16 17:03	06:40 17:42	05:54 18:14	06:04 19:47	05:31 20:18	05:52 (6)	05:24 20:35	0	06:00 (6)	05:44 20:23	34	06:42 (6)
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:52 (6)	05:25 20:35	0	06:00 (6)	05:45 20:22	35	06:43 (6)
27	07:14 17:06	06:37 17:44	05:51 18:16	06:01 19:50	05:29 20:20	05:53 (6)	05:25 20:35	0	06:00 (6)	05:46 20:21	36	06:44 (6)
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:54 (6)	05:26 20:35	0	06:00 (6)	05:47 20:20	37	06:45 (6)
29	07:13 17:08		06:47 19:18	05:58 19:52	05:28 20:21	05:54 (6)	05:26 20:35	0	06:00 (6)	05:48 20:19	38	06:46 (6)
30	07:12 17:10		06:45 19:19	05:57 19:53	05:27 20:22	05:55 (6)	05:26 20:35	0	06:00 (6)	05:49 20:18	39	06:47 (6)
31	07:11 17:11		06:44 19:20		05:27 20:23	05:55 (6)		0	06:00 (6)	05:50 20:17	40	06:48 (6)
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287
Total, worst case					835	205	839	193				

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: ShadowShadow receptor: E - Shadow Receptor: 1,0 × 1,0 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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 19:54	06:15 (6) 06:32 (6)	05:27 20:24	05:51 20:16	06:19 (6) 19:32	06:22 18:41	06:53 16:54	06:28 16:29
2	07:24 16:38	07:09 17:14	06:32 17:48	06:40 19:23	05:54 19:55	06:14 (6) 06:32 (6)	05:26 20:25	05:52 20:14	06:17 (6) 19:50 (7)	06:23 19:30	06:54 18:39	06:29 16:52
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	06:13 (6) 06:32 (6)	05:26 20:25	05:53 20:13	06:16 (6) 19:55 (7)	06:24 20:26	06:55 18:37	06:30 16:51
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	06:11 (6) 06:31 (6)	05:25 20:26	05:54 20:12	06:16 (6) 19:57 (7)	06:25 20:11	06:56 18:34	06:31 16:50
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	06:10 (6) 06:31 (6)	05:25 20:27	05:55 20:07	06:17 (6) 19:51 (7)	06:26 20:10	06:57 18:32	06:33 16:49
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	06:09 (6) 06:31 (6)	05:24 20:27	05:56 20:06	06:18 (6) 19:58 (7)	06:27 20:10	06:58 18:32	06:34 16:48
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8	07:24 16:44	07:02 17:21	06:22 17:55	06:30 19:29	05:47 20:01	06:07 (6) 06:30 (6)	05:24 20:29	05:58 20:07	06:20 (6) 19:50 (7)	06:29 20:07	07:00 18:29	06:36 16:45
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Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287
Total, worst case				75	555	84	399	318				

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: ShadowShadow receptor: F - Shadow Receptor: 1,0 × 1,0 Azimuth: -180,0° 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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 19:54	05:26 20:24	05:27 20:35	05:51 20:16	06:22 19:32	06:53 18:41	06:28 16:54	07:03 16:29
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31	07:11 17:11		06:44 19:20		05:27 20:23		05:50 20:17	06:21 19:34		06:27 16:55		07:23 16:37
Potential sun hours Total, worst case	296	297	369	399	449	454	460	429	375	345	297	287

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: ShadowShadow receptor: G - Shadow Receptor: 1,0 × 1,0 Azimuth: -180,0° Slope: 90,0° (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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 19:54	05:26 20:24	05:27 20:35	05:51 20:16	06:22 19:32	06:53 18:41	06:28 16:54	07:03 16:29
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19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:35 20:12	05:23 20:34	05:39 20:27	06:09 19:52	06:41 19:01	07:13 18:12	06:49 16:35	07:18 16:29
20	07:19 16:57	06:47 17:36	06:02 18:08	06:11 19:42	05:35 20:13	05:23 20:34	05:40 20:27	06:10 19:51	06:42 19:00	07:14 18:10	06:51 16:34	07:19 16:30
21	07:19 16:59	06:45 17:37	06:01 18:09	06:10 19:43	05:34 20:14	05:23 20:34	05:41 20:26	06:11 19:49	06:43 18:58	07:15 18:09	06:52 16:34	07:20 16:30
22	07:18 17:00	06:44 17:38	05:59 18:11	06:08 19:44	05:33 20:15	05:24 20:34	05:42 20:25	06:12 19:48	06:44 18:56	07:16 18:07	06:53 16:33	07:20 16:31
23	07:17 17:01	06:42 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:24 20:35	05:43 20:24	06:13 19:46	06:45 18:54	07:17 18:06	06:54 16:32	07:21 16:31
24	07:17 17:02	06:41 17:41	05:56 18:13	06:05 19:46	05:31 20:17	05:24 20:35	05:43 20:23	06:14 19:45	06:46 18:53	07:18 18:04	06:55 16:32	07:21 16:32
25	07:16 17:03	06:40 17:42	05:54 18:14	06:04 19:47	05:31 20:18	05:24 20:35	05:44 20:23	06:15 19:43	06:47 18:51	06:19 17:03	06:56 16:31	07:22 16:32
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:48	05:30 20:19	05:25 20:35	05:45 20:22	06:16 19:42	06:48 18:49	06:21 17:01	06:58 16:31	07:22 16:33
27	07:14 17:06	06:37 17:44	05:50 18:16	06:01 19:50	05:29 20:20	05:25 20:35	05:46 20:21	06:17 19:40	06:49 18:48	06:22 17:00	06:59 16:30	07:22 16:34
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:25 20:35	05:47 20:20	06:18 19:38	06:50 18:46	06:23 16:59	07:00 16:30	07:23 16:34
29	07:13 17:08		06:47 19:18	05:58 19:52	05:28 20:21	05:26 20:35	05:48 20:19	06:19 19:37	06:51 18:44	06:24 16:57	07:01 16:29	07:23 16:35
30	07:12 17:10		06:45 19:19	05:57 19:53	05:27 20:22	05:26 20:35	05:49 20:18	06:20 19:35	06:52 18:42	06:25 16:56	07:02 16:29	07:23 16:36
31	07:11 17:11		06:44 19:20		05:27 20:23		05:50 20:17	06:21 19:34		06:27 16:55		07:23 16:37
Potential sun hours Total, worst case	296	297	369	399	449	454	460	429	375	345	297	287

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: ShadowShadow receptor: H - Shadow Receptor: 1,0 x 1,0 Azimuth: -180,0° Slope: 90,0° (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	07:24 16:38	07:10 17:12	06:34 17:47	06:42 19:22	05:56 19:54	05:27 20:24	05:56 (4) 20:35	05:51 20:16	06:13 (4) 19:32	06:22 18:41	06:53 16:54	06:28 16:29
2	07:24 16:39	07:09 17:14	06:32 17:48	06:40 19:23	05:55 19:55	05:26 20:25	05:58 (4) 20:35	05:52 20:15	06:14 (4) 19:30	06:23 18:39	06:54 16:52	06:29 16:29
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 20:25	06:05 (4) 20:35	05:28 20:13	06:15 (4) 19:29	06:24 18:37	06:55 16:51	06:30 16:28
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	05:25 20:26	05:25 20:26	05:28 20:12	06:16 (4) 19:27	06:26 18:36	06:56 16:50	06:31 16:28
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	05:25 20:27	05:25 20:27	05:29 20:34	06:17 (4) 19:25	06:27 18:34	06:57 16:49	06:33 16:28
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	05:25 20:27	05:25 20:27	05:30 20:34	06:19 (4) 19:24	06:28 18:32	06:58 16:48	06:34 16:28
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	06:08 (4) 20:28	05:24 20:34	05:30 20:09	06:09 (4) 19:22	06:29 18:31	06:59 16:46	06:35 16:28
8	07:24 16:44	07:02 17:21	06:22 17:55	06:31 19:29	05:47 20:01	06:07 (4) 20:29	05:24 20:33	05:31 20:07	06:07 (4) 19:20	06:30 18:29	07:00 16:45	06:36 16:28
9	07:24 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	06:06 (4) 20:29	05:24 20:33	05:32 20:06	06:11 (4) 19:19	06:31 18:28	07:02 16:44	06:37 16:28
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 20:04	06:05 (4) 20:30	05:32 20:33	05:32 20:05	06:07 (4) 19:17	06:32 18:26	07:03 16:43	06:39 16:28
11	07:23 16:47	06:59 17:25	06:18 17:58	06:26 19:32	05:44 20:05	06:04 (4) 20:30	05:33 20:32	05:33 20:04	06:05 (4) 19:15	06:01 18:24	07:04 16:42	06:40 16:28
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:42 20:06	06:03 (4) 20:31	05:34 20:32	05:34 20:02	06:03 (4) 19:14	06:02 18:23	07:05 16:41	06:41 16:28
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:35	05:41 20:07	06:02 (4) 20:31	05:34 20:31	05:34 20:01	06:02 (4) 19:12	06:03 18:26	07:06 16:40	06:42 16:28
14	07:22 16:51	06:55 17:29	06:13 18:02	06:21 19:36	05:40 20:08	06:01 (4) 20:32	05:35 20:31	05:35 20:04	06:02 (4) 19:09	06:04 18:19	07:07 16:39	06:44 16:28
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 20:09	06:00 (4) 20:32	05:36 20:30	05:36 20:06	06:01 (4) 19:08	06:05 18:18	07:08 16:38	06:45 16:28
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	05:59 (4) 20:33	05:37 20:29	05:37 20:04	06:00 (4) 19:07	06:06 18:16	07:09 16:38	06:46 16:28
17	07:21 16:54	06:51 17:32	06:08 18:05	06:16 19:39	05:37 20:11	05:58 (4) 20:33	05:38 20:29	05:38 20:04	06:00 (4) 19:05	06:07 18:15	07:10 16:37	06:47 16:29
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:36 20:12	05:57 (4) 20:33	05:38 20:28	05:38 20:04	06:01 (4) 19:04	06:08 19:03	07:11 16:36	06:48 16:29
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:36 20:13	05:56 (4) 20:34	05:39 20:27	05:39 20:04	06:02 (4) 19:02	06:09 18:12	07:13 16:35	06:50 16:29
20	07:19 16:57	06:47 17:36	06:02 18:08	06:12 19:42	05:35 20:14	05:55 (4) 20:34	05:40 20:27	05:40 20:04	06:03 (4) 19:01	06:10 18:10	07:14 16:34	06:51 16:30
21	07:19 16:59	06:46 17:37	06:01 18:10	06:10 19:43	05:34 20:14	05:55 (4) 20:34	05:41 20:26	05:41 20:04	06:04 (4) 19:04	06:11 18:09	07:15 16:34	06:52 16:30
22	07:18 17:00	06:44 17:39	05:59 18:11	06:09 19:44	05:33 20:15	05:54 (4) 20:35	05:42 20:25	05:42 20:04	06:04 (4) 19:04	06:12 18:07	07:16 16:33	06:53 16:31
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:53 (4) 20:35	05:43 20:24	05:43 20:04	06:05 (4) 19:04	06:13 18:06	07:17 16:32	06:54 16:31
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 20:17	05:52 (4) 20:35	05:44 20:23	05:44 20:04	06:06 (4) 19:04	06:14 18:04	07:18 16:32	06:55 16:32
25	07:16 17:04	06:40 17:42	05:54 18:14	06:04 19:48	05:31 20:18	05:52 (4) 20:35	05:44 20:23	05:44 20:04	06:07 (4) 19:04	06:15 18:04	07:19 16:31	06:56 16:32
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:51 (4) 20:35	05:45 20:22	05:45 20:04	06:08 (4) 19:04	06:16 18:04	07:20 16:31	06:57 16:33
27	07:14 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 20:20	05:51 (4) 20:35	05:46 20:21	05:46 20:04	06:09 (4) 19:04	06:17 18:04	07:21 16:30	06:58 16:34
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:52 (4) 20:35	05:47 20:20	05:47 20:04	06:10 (4) 19:04	06:18 18:04	07:22 16:30	06:59 16:34
29	07:13 17:09		06:47 19:18	05:59 19:52	05:28 20:22	05:53 (4) 20:35	05:48 20:19	05:48 20:04	06:11 (4) 19:04	06:19 18:04	07:23 16:29	07:01 16:35
30	07:12 17:10		06:46 19:19	05:57 19:53	05:28 20:22	05:54 (4) 20:35	05:49 20:18	05:49 20:04	06:12 (4) 19:04	06:20 18:04	07:24 16:29	07:02 16:36
31	07:11 17:11		06:44 19:20		05:27 20:23	05:55 (4) 20:35	05:50 20:17	05:50 20:04	06:12 (4) 19:04	06:21 18:04	07:25 16:29	07:03 16:37
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287
Total, worst case					341	17	333	29				

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)

Project:

Aren_Manfredonia3

Licensed user:

Vega sas
Via delli Carri, 48
IT-71100 Foggia
+39 0881 756251
VEGA / info@studiovega.org
Calculated:
14/12/2023 08:47/3.5.584

SHADOW - Calendar

Calculation: ShadowShadow receptor: I - Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (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

Table with 12 columns for months (January to December) and multiple rows for days. Columns contain sun rise and set times, and minutes with flicker. Bottom row shows 'Potential sun hours' and 'Total, worst case' for each month.

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

Matrix with 4 columns: 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)

SHADOW - Calendar

Calculation: ShadowShadow receptor: J - Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (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
1	07:24 16:38	07:10 17:12	6 07:30 (9) 07:36 (9)	06:34 17:47	06:42 19:22	05:56 20:24
2	07:24 16:39	07:09 17:14	9 07:29 (9) 07:38 (9)	06:32 17:48	06:41 19:23	05:55 20:25
3	07:24 16:39	07:08 17:15	11 07:28 (9) 07:39 (9)	06:30 17:49	06:39 19:24	05:53 20:25
4	07:24 16:40	07:07 17:16	13 07:27 (9) 07:40 (9)	06:29 17:50	06:37 19:25	05:52 20:26
5	07:24 16:41	07:06 17:17	16 07:26 (9) 07:42 (9)	06:27 17:52	06:36 19:26	05:51 20:27
6	07:24 16:42	07:05 17:19	18 07:25 (9) 07:43 (9)	06:26 17:53	06:34 19:27	05:49 20:28
7	07:24 16:43	07:04 17:20	19 07:24 (9) 07:43 (9)	06:24 17:54	06:32 19:28	05:48 20:28
8	07:24 16:44	07:03 17:21	21 07:22 (9) 07:43 (9)	06:22 17:55	06:31 19:29	05:47 20:29
9	07:24 16:45	07:01 17:22	23 07:21 (9) 07:44 (9)	06:21 17:56	06:29 19:30	05:46 20:29
10	07:23 16:46	07:00 17:24	25 07:20 (9) 07:45 (9)	06:19 17:57	06:27 19:31	05:45 20:30
11	07:23 16:47	06:59 17:25	26 07:19 (9) 07:45 (9)	06:18 17:58	06:26 19:32	05:44 20:30
12	07:23 16:48	06:58 17:26	27 07:17 (9) 07:44 (9)	06:16 18:00	06:24 19:33	05:43 20:31
13	07:23 16:49	06:56 17:27	29 07:16 (9) 07:45 (9)	06:14 18:01	06:22 19:35	05:41 20:31
14	07:22 16:51	06:55 17:29	30 07:15 (9) 07:45 (9)	06:13 18:02	06:21 19:36	05:40 20:32
15	07:22 16:52	06:54 17:30	31 07:13 (9) 07:44 (9)	06:11 18:03	06:19 19:37	05:39 20:32
16	07:21 16:53	06:52 17:31	32 07:12 (9) 07:44 (9)	06:09 18:04	06:18 19:38	05:38 20:33
17	07:21 16:54	06:51 17:32	33 07:11 (9) 07:44 (9)	06:08 18:05	06:16 19:39	05:37 20:33
18	07:20 16:55	06:50 17:34	33 07:10 (9) 07:43 (9)	06:06 18:06	06:15 19:40	05:36 20:33
19	07:20 16:56	06:48 17:35	31 07:11 (9) 07:42 (9)	06:04 18:07	06:13 19:41	05:36 20:34
20	07:19 16:57	06:47 17:36	30 07:11 (9) 07:41 (9)	06:02 18:09	06:12 19:42	05:35 20:34
21	07:19 16:59	06:46 17:37	27 07:13 (9) 07:40 (9)	06:01 18:10	06:10 19:43	05:34 20:34
22	07:18 17:00	06:44 17:39	24 07:14 (9) 07:38 (9)	05:59 18:11	06:09 19:44	05:33 20:35
23	07:17 17:01	06:43 17:40	20 07:16 (9) 07:36 (9)	05:57 18:12	06:07 19:45	05:32 20:35
24	07:17 17:02	06:41 17:41	15 07:18 (9) 07:33 (9)	05:56 18:13	06:06 19:46	05:31 20:35
25	07:16 17:04	06:40 17:42		05:54 18:14	06:04 19:48	05:29 20:35
26	07:15 17:05	06:38 17:43		05:52 18:15	06:03 19:49	05:28 20:35
27	07:14 17:06	06:37 17:45		05:51 18:16	06:01 19:50	05:27 20:35
28	07:14 17:07	06:35 17:46		05:49 18:17	06:00 19:51	05:26 20:35
29	07:13 17:09			06:47 19:18	05:59 19:52	05:28 20:35
30	07:12 17:10			06:46 19:19	05:57 19:53	05:28 20:35
31	07:11 17:11	07:31 (9) 07:34 (9)		06:44 19:20	05:27 20:23	
Potential sun hours	296	297	369	399	449	454
Total, worst case	3	549			111	

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: ShadowShadow receptor: J - Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (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

	July	August	September	October	November	December
1	05:27	05:51	06:13 (4)	06:22	06:53	06:28
	20:35	20:16	06:21 (4)	19:32	18:41	16:54
2	05:27	05:52	06:14 (4)	06:24	06:54	06:29
	20:35	20:15	06:22 (4)	19:30	18:39	16:52
3	05:28	05:53	06:15 (4)	06:25	06:55	06:30
	20:35	20:13	06:22 (4)	19:29	18:38	16:51
4	05:28	05:54	06:16 (4)	06:26	06:56	06:31
	20:34	20:12	06:21 (4)	19:27	18:36	16:50
5	05:29	05:55	06:17 (4)	06:27	06:57	06:33
	20:34	20:11	06:21 (4)	19:25	18:34	16:49
6	05:30	05:56	06:18 (4)	06:28	06:58	06:34
	20:34	20:10	06:21 (4)	19:24	18:32	16:48
7	05:30	05:57	06:19 (4)	06:29	06:59	06:35
	20:34	20:09	06:20 (4)	19:22	18:31	16:47
8	05:31	05:58		06:30	07:00	06:36
	20:33	20:07		19:20	18:29	16:45
9	05:32	05:59		06:31	07:02	06:38
	20:33	20:06		19:19	18:28	16:44
10	05:32	06:00		06:32	07:03	06:39
	20:33	20:05		19:17	18:26	16:43
11	05:33	06:01		06:33	07:04	06:40
	20:32	20:04		19:15	18:24	16:42
12	05:34	06:02		06:34	07:05	06:41
	20:32	20:02		19:14	18:23	16:41
13	05:34	06:03		06:35	07:06	06:42
	20:31	20:01		19:12	18:21	16:40
14	05:35	06:04		06:36	07:07	06:44
	20:31	19:59		19:10	18:19	16:39
15	05:36	06:05		06:37	07:08	06:45
	20:30	19:58		19:08	18:18	16:39
16	05:37	06:06		06:38	07:09	06:46
	20:29	19:57		19:07	18:16	16:38
17	05:38	06:07		06:39	07:10	07:53 (9)
	20:29	19:55		19:05	18:15	08:02 (9)
18	05:38	06:08		06:40	07:12	07:49 (9)
	20:28	19:54		19:03	18:13	08:05 (9)
19	05:39	06:09		06:41	07:13	07:46 (9)
	20:27	19:52		19:01	18:12	08:07 (9)
20	05:40	06:10		06:42	07:14	07:45 (9)
	20:27	19:51		19:00	18:10	08:10 (9)
21	05:41	06:11		06:43	07:15	07:43 (9)
	20:26	19:49		18:58	18:09	08:11 (9)
22	05:42	06:12		06:44	07:16	07:42 (9)
	20:25	19:48		18:56	18:07	08:11 (9)
23	05:43	06:13		06:45	07:17	07:40 (9)
	20:24	19:46		18:55	18:06	08:12 (9)
24	05:44	06:09 (4)	06:14	06:46	07:18	07:39 (9)
	20:24	06:15 (4)	19:45	18:53	18:04	08:12 (9)
25	05:45	06:07 (4)	06:15	06:47	06:20	06:41 (9)
	20:23	06:17 (4)	19:43	18:51	17:03	07:14 (9)
26	05:45	06:08 (4)	06:16	06:48	06:21	06:42 (9)
	20:22	06:18 (4)	19:42	18:49	17:02	07:14 (9)
27	05:46	06:09 (4)	06:17	06:49	06:22	06:43 (9)
	20:21	06:20 (4)	19:40	18:48	17:00	07:14 (9)
28	05:47	06:10 (4)	06:18	06:50	06:23	06:44 (9)
	20:20	06:20 (4)	19:38	18:46	16:59	07:14 (9)
29	05:48	06:11 (4)	06:19	06:51	06:24	06:46 (9)
	20:19	06:21 (4)	19:37	18:44	16:58	07:14 (9)
30	05:49	06:12 (4)	06:20	06:52	06:25	06:47 (9)
	20:18	06:22 (4)	19:35	18:43	16:56	07:14 (9)
31	05:50	06:13 (4)	06:21		06:27	06:48 (9)
	20:17	06:22 (4)	19:34		16:55	07:14 (9)
Potential sun hours	460	429		375	345	297
Total, worst case	76	36		400	160	287

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: ShadowShadow receptor: K - Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (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
1	07:24 16:38	07:46 (10) 07:10 17:12	07:30 (10) 06:34 17:47	06:53 (9) 06:42 19:22	05:56 19:54	05:27 20:24
2	07:24 16:39	07:46 (10) 07:09 17:14	07:29 (10) 06:32 17:48	06:51 (9) 06:41 19:23	05:55 19:55	05:26 20:25
3	07:24 16:39	07:46 (10) 07:08 17:15	07:28 (10) 06:30 17:49	06:49 (9) 06:39 19:24	05:53 19:56	05:26 20:25
4	07:24 16:40	07:46 (10) 07:07 17:16	07:27 (10) 06:29 17:50	06:48 (9) 06:37 19:25	05:52 19:57	05:25 20:26
5	07:24 16:41	07:46 (10) 07:06 17:17	07:27 (10) 06:27 17:52	06:46 (9) 06:36 19:26	05:51 19:58	05:25 20:27
6	07:24 16:42	07:46 (10) 07:05 17:19	07:27 (10) 06:26 17:53	06:45 (9) 06:34 19:27	05:49 19:59	05:25 20:28
7	07:24 16:43	07:46 (10) 07:04 17:20	07:28 (10) 06:24 17:54	06:43 (9) 06:32 19:28	05:48 20:00	05:24 20:28
8	07:24 16:44	07:46 (10) 07:03 17:21	07:27 (10) 06:22 17:55	06:41 (9) 06:31 19:29	05:47 20:01	05:24 20:29
9	07:24 16:45	07:46 (10) 07:01 17:22	07:28 (10) 06:21 17:56	06:40 (9) 06:29 19:30	05:46 20:02	05:24 20:29
10	07:23 16:46	07:45 (10) 07:00 17:24	07:29 (10) 06:19 17:57	06:38 (9) 06:27 19:31	05:45 20:04	05:24 20:30
11	07:23 16:47	07:45 (10) 06:59 17:25	07:30 (10) 06:18 17:58	06:37 (9) 06:26 19:32	05:44 20:05	05:23 20:30
12	07:23 16:48	07:45 (10) 06:58 17:26	07:29 (10) 06:16 18:00	06:39 (9) 06:24 19:33	05:43 20:06	05:23 20:31
13	07:23 16:49	07:44 (10) 06:56 17:28	07:31 (10) 06:14 18:01	06:40 (9) 06:22 19:35	05:41 20:07	05:23 20:31
14	07:22 16:51	07:44 (10) 06:55 17:29	07:32 (10) 06:13 18:02	06:42 (9) 06:21 19:36	05:40 20:08	05:23 20:32
15	07:22 16:52	07:43 (10) 06:54 17:30	07:32 (10) 06:11 18:03	06:54 (9) 19:36 19:37	05:39 20:09	05:23 20:32
16	07:21 16:53	07:43 (10) 06:52 17:31	07:33 (10) 06:09 18:04	06:18 19:38	05:38 20:10	05:23 20:33
17	07:21 16:54	07:42 (10) 06:51 17:32	07:35 (10) 06:08 18:05	06:16 19:39	05:37 20:11	05:23 20:33
18	07:20 16:55	07:42 (10) 06:50 17:34	07:36 (10) 06:06 18:06	06:15 19:40	05:37 20:12	05:23 20:33
19	07:20 16:56	07:41 (10) 06:48 17:35	07:38 (10) 06:04 18:07	06:13 19:41	05:36 20:13	05:23 20:34
20	07:19 16:58	07:40 (10) 06:47 17:36	07:39 (10) 06:02 18:09	06:12 19:42	05:35 20:14	05:23 20:34
21	07:19 16:59	07:40 (10) 06:46 17:37	07:42 (10) 06:01 18:10	06:10 19:43	05:34 20:14	05:24 20:34
22	07:18 17:00	07:39 (10) 06:44 17:39	07:45 (10) 05:59 18:11	06:09 19:44	05:33 20:15	05:24 20:35
23	07:17 17:01	07:38 (10) 06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:24 20:35
24	07:17 17:02	07:38 (10) 06:41 17:41	05:56 18:13	06:06 19:46	05:31 20:17	05:24 20:35
25	07:16 17:04	07:37 (10) 06:40 17:42	06:59 (9) 05:54 18:14	06:04 19:48	05:31 20:18	05:25 20:35
26	07:15 17:05	07:36 (10) 06:38 17:43	06:57 (9) 05:52 18:15	06:03 19:49	05:30 20:19	05:25 20:35
27	07:14 17:06	07:35 (10) 06:37 17:45	06:56 (9) 05:51 18:16	06:01 19:50	05:29 20:20	05:25 20:35
28	07:14 17:07	07:34 (10) 06:35 17:46	06:54 (9) 05:49 18:17	06:00 19:51	05:29 20:21	05:26 20:35
29	07:13 17:09	07:33 (10) 06:34 17:47	06:47 19:18	05:59 19:52	05:28 20:22	05:26 20:35
30	07:12 17:10	07:32 (10) 06:33 17:48	06:46 19:19	05:57 19:53	05:28 20:22	05:26 20:35
31	07:11 17:11	07:31 (10) 06:32 17:49	06:44 19:21	05:56 19:54	05:27 20:23	05:25 20:35
Potential sun hours	296	297	369	399	449	454
Total, worst case	890	1024	268			

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: ShadowShadow receptor: K - Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (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

	July	August	September	October	November	December							
1	05:27	05:51	06:23	06:53	07:18 (9)	06:28	06:58 (10)	07:03	07:27 (10)				
	20:35	20:16	19:32	18:41	18:41	20	07:38 (9)	16:54	53	06:58 (10)	07:04	21	07:48 (10)
2	05:27	05:52	06:24	06:54	07:16 (9)	06:29	06:58 (10)	07:04	07:28 (10)				
	20:35	20:15	19:30	18:39	23	07:39 (9)	16:52	53	07:51 (10)	16:29	20	07:48 (10)	
3	05:28	05:53	06:25	06:55	07:15 (9)	06:30	06:57 (10)	07:05	07:29 (10)				
	20:35	20:13	19:29	18:38	25	07:40 (9)	16:51	54	07:51 (10)	16:28	18	07:47 (10)	
4	05:28	05:54	06:26	06:56	07:16 (9)	06:31	06:56 (10)	07:06	07:30 (10)				
	20:35	20:12	19:27	18:36	24	07:40 (9)	16:50	55	07:51 (10)	16:28	17	07:47 (10)	
5	05:29	05:55	06:27	06:57	07:18 (9)	06:33	06:57 (10)	07:07	07:31 (10)				
	20:34	20:11	19:25	18:34	23	07:41 (9)	16:49	55	07:52 (10)	16:28	15	07:46 (10)	
6	05:30	05:56	06:28	06:58	07:19 (9)	06:34	06:57 (10)	07:08	07:32 (10)				
	20:34	20:10	19:24	18:33	22	07:41 (9)	16:48	55	07:52 (10)	16:28	14	07:46 (10)	
7	05:30	05:57	06:29	06:59	07:20 (9)	06:35	06:57 (10)	07:09	07:33 (10)				
	20:34	20:09	19:22	18:31	21	07:41 (9)	16:47	55	07:52 (10)	16:28	12	07:45 (10)	
8	05:31	05:58	06:30	07:00	07:21 (9)	06:36	06:59 (10)	07:10	07:34 (10)				
	20:33	20:07	19:20	18:29	20	07:41 (9)	16:45	54	07:53 (10)	16:28	11	07:45 (10)	
9	05:32	05:59	06:31	07:02	07:22 (9)	06:38	07:00 (10)	07:11	07:35 (10)				
	20:33	20:06	19:19	18:28	19	07:41 (9)	16:44	53	07:53 (10)	16:28	9	07:44 (10)	
10	05:32	06:00	06:32	07:03	07:23 (9)	06:39	07:01 (10)	07:12	07:36 (10)				
	20:33	20:05	19:17	18:26	17	07:40 (9)	16:43	52	07:53 (10)	16:28	8	07:44 (10)	
11	05:33	06:01	06:33	07:04	07:24 (9)	06:40	07:03 (10)	07:13	07:37 (10)				
	20:32	20:04	19:15	18:24	15	07:39 (9)	16:42	50	07:53 (10)	16:28	6	07:43 (10)	
12	05:34	06:02	06:34	07:05	07:25 (9)	06:41	07:04 (10)	07:14	07:37 (10)				
	20:32	20:02	19:14	18:23	13	07:38 (9)	16:41	49	07:53 (10)	16:28	5	07:42 (10)	
13	05:34	06:03	06:35	07:06	07:26 (9)	06:42	07:05 (10)	07:14	07:38 (10)				
	20:31	20:01	19:12	18:21	11	07:37 (9)	16:40	48	07:53 (10)	16:28	3	07:41 (10)	
14	05:35	06:04	06:36	07:07	07:28 (9)	06:44	07:06 (10)	07:15	07:39 (10)				
	20:31	19:59	19:10	18:20	9	07:37 (9)	16:39	47	07:53 (10)	16:28	2	07:41 (10)	
15	05:36	06:05	06:37	07:08	07:29 (9)	06:45	07:08 (10)	07:16					
	20:30	19:58	19:08	18:18	6	07:35 (9)	16:39	45	07:53 (10)	16:28			
16	05:37	06:06	06:38	07:09	07:30 (9)	06:46	07:09 (10)	07:17					
	20:30	19:57	19:07	18:16	3	07:33 (9)	16:38	44	07:53 (10)	16:29			
17	05:38	06:07	06:39	07:10		06:47	07:10 (10)	07:17					
	20:29	19:55	19:05	18:15		16:37	07:52 (10)	16:29					
18	05:38	06:08	06:40	07:12		06:48	07:12 (10)	07:18					
	20:28	19:54	19:03	18:13		16:36	07:53 (10)	16:29					
19	05:39	06:09	06:41	07:13		06:50	07:13 (10)	07:19					
	20:27	19:52	19:01	18:12	9	08:29 (10)	16:35	39	07:52 (10)	16:30			
20	05:40	06:10	06:42	07:14		08:16 (10)	06:51	07:14 (10)	07:19				
	20:27	19:51	19:00	18:10	19	08:35 (10)	16:35	38	07:52 (10)	16:30			
21	05:41	06:11	06:43	07:15		08:12 (10)	06:52	07:15 (10)	07:20				
	20:26	19:49	18:58	18:09	26	08:38 (10)	16:34	36	07:51 (10)	16:30			
22	05:42	06:12	06:44	07:16		08:09 (10)	06:53	07:17 (10)	07:20				
	20:25	19:48	18:56	18:07	31	08:40 (10)	16:33	35	07:52 (10)	16:31			
23	05:43	06:13	06:45	07:17		08:07 (10)	06:54	07:18 (10)	07:21				
	20:24	19:46	18:55	18:06	34	08:41 (10)	16:33	33	07:51 (10)	16:31			
24	05:44	06:14	06:46	07:18		08:06 (10)	06:55	07:19 (10)	07:21				
	20:24	19:45	18:53	18:04	38	08:44 (10)	16:32	32	07:51 (10)	16:32			
25	05:45	06:15	06:47	07:19		07:04 (10)	06:57	07:20 (10)	07:22				
	20:23	19:43	18:51	17:03	41	07:45 (10)	16:31	30	07:50 (10)	16:33			
26	05:45	06:16	06:48	07:20		07:03 (10)	06:58	07:21 (10)	07:22				
	20:22	19:42	18:49	17:02	43	07:46 (10)	16:31	29	07:50 (10)	16:33			
27	05:46	06:17	06:49	07:21		07:01 (10)	06:59	07:22 (10)	07:22				
	20:21	19:40	18:48	17:00	46	07:47 (10)	16:30	27	07:49 (10)	16:34			
28	05:47	06:18	06:50	07:22		07:00 (10)	07:00	07:24 (10)	07:23				
	20:20	19:38	18:46	16:59	47	07:47 (10)	16:30	26	07:50 (10)	16:34			
29	05:48	06:19	06:51	07:24 (9)	06:24	07:00 (10)	07:01	07:25 (10)	07:23			07:46 (10)	
	20:19	19:37	18:44	9	07:33 (9)	16:58	07:49 (10)	16:30	24	07:49 (10)	16:35	1	07:47 (10)
30	05:49	06:20	06:52	07:20 (9)	06:25	06:59 (10)	07:02	07:26 (10)	07:23				07:46 (10)
	20:18	19:35	18:43	16	07:36 (9)	16:56	07:49 (10)	16:29	23	07:49 (10)	16:36	3	07:49 (10)
31	05:50	06:21			06:27	06:58 (10)		07:23					07:46 (10)
	20:17	19:34			16:55	07:50 (10)		16:37				4	07:50 (10)
Potential sun hours	460	429	375	345	297	287							
Total, worst case			25	756	1277	169							

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: ShadowShadow receptor: L - Shadow Receptor: 1,0 × 1,0 Azimuth: -130,0° Slope: 90,0° (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	07:24 16:38	07:10 17:12	06:34 17:47	06:42 19:22	05:56 19:54	05:27 20:24	05:48 (9) 20:35	05:50 (9) 20:16	05:51 20:16	06:23 19:32	06:53 18:41	06:28 16:54	07:03 16:29
2	07:24 16:39	07:09 17:14	06:32 17:48	06:41 19:23	05:55 19:55	05:26 20:25	05:48 (9) 20:35	05:50 (9) 20:15	05:52 20:15	06:24 19:30	06:54 18:39	06:29 16:52	07:04 16:29
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 20:25	05:47 (9) 20:35	05:51 (9) 20:13	05:53 20:13	06:25 19:29	06:55 18:38	06:30 16:51	07:05 16:28
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	05:25 20:26	05:47 (9) 20:34	05:51 (9) 20:12	05:54 20:12	06:26 19:27	06:56 18:36	06:31 16:50	07:06 16:28
5	07:24 16:41	07:06 17:17	06:27 17:52	06:36 19:26	05:51 19:58	05:25 20:27	05:47 (9) 20:34	05:52 (9) 20:11	05:55 20:11	06:27 19:25	06:57 18:34	06:33 16:49	07:07 16:28
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	05:25 20:27	05:46 (9) 20:34	05:52 (9) 20:10	05:56 20:10	06:28 19:24	06:58 18:32	06:34 16:48	07:08 16:28
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	05:24 20:28	05:46 (9) 20:34	05:53 (9) 20:09	05:57 20:09	06:29 19:22	06:59 18:31	06:35 16:47	07:09 16:28
8	07:24 16:44	07:02 17:21	06:22 17:55	06:31 19:29	05:47 20:01	05:24 20:29	05:46 (9) 20:33	05:54 (9) 20:07	05:58 20:07	06:30 19:20	07:00 18:29	06:36 16:45	07:10 16:28
9	07:24 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	05:24 20:29	05:46 (9) 20:33	05:54 (9) 20:06	05:59 20:06	06:31 19:19	07:02 18:28	06:37 16:44	07:11 16:28
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 20:04	05:24 20:30	05:46 (9) 20:33	05:55 (9) 20:05	06:00 20:05	06:32 19:17	07:03 18:26	06:39 16:43	07:12 16:28
11	07:23 16:47	06:59 17:25	06:18 17:58	06:26 19:32	05:44 20:05	05:23 20:30	05:46 (9) 20:32	05:56 (9) 20:04	06:01 20:04	06:33 19:15	07:04 18:24	06:40 16:42	07:13 16:28
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:43 20:06	05:23 20:31	05:46 (9) 20:32	05:56 (9) 20:02	06:02 20:02	06:34 19:14	07:05 18:23	06:41 16:41	07:14 16:28
13	07:23 16:49	06:56 17:28	06:14 18:01	06:22 19:35	05:41 20:07	05:23 20:31	05:45 (9) 20:31	05:57 (9) 20:01	06:03 20:01	06:35 19:12	07:06 18:21	06:42 16:40	07:14 16:28
14	07:22 16:51	06:55 17:29	06:13 18:02	06:21 19:36	05:40 20:08	05:23 20:32	05:45 (9) 20:31	05:58 (9) 19:59	06:04 19:59	06:36 19:10	07:07 18:20	06:44 16:39	07:15 16:28
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 20:09	05:23 20:32	05:45 (9) 20:30	05:59 (9) 19:58	06:05 19:58	06:37 19:08	07:08 18:18	06:45 16:39	07:16 16:28
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	05:23 20:33	05:46 (9) 20:29	05:59 (9) 19:57	06:06 19:57	06:38 19:07	07:09 18:16	06:46 16:38	07:17 16:29
17	07:21 16:54	06:51 17:32	06:08 18:05	06:16 19:39	05:37 20:11	05:23 20:33	05:46 (9) 20:29	06:00 (9) 19:55	06:07 19:55	06:39 19:05	07:10 18:15	06:47 16:37	07:17 16:29
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:37 20:12	05:23 20:33	05:46 (9) 20:28	06:01 (9) 19:54	06:08 19:54	06:40 19:03	07:11 18:13	06:48 16:36	07:18 16:29
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:36 20:13	05:23 20:34	05:46 (9) 20:27	06:02 (9) 19:52	06:09 19:52	06:41 19:01	07:13 18:12	06:50 16:35	07:19 16:30
20	07:19 16:58	06:47 17:36	06:02 18:09	06:12 19:42	05:35 20:13	05:23 20:34	05:46 (9) 20:27	06:03 (9) 19:51	06:10 19:51	06:42 19:00	07:14 18:10	06:51 16:35	07:19 16:30
21	07:19 16:59	06:46 17:37	06:01 18:10	06:10 19:43	05:34 20:14	05:24 20:34	05:46 (9) 20:26	06:04 (9) 19:49	06:11 19:49	06:43 18:58	07:15 18:09	06:52 16:34	07:20 16:30
22	07:18 17:00	06:44 17:39	05:59 18:11	06:09 19:44	05:33 20:15	05:24 20:35	05:46 (9) 20:25	06:04 (9) 19:48	06:12 19:48	06:44 18:56	07:16 18:07	06:53 16:33	07:20 16:31
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:24 20:35	05:47 (9) 20:24	06:06 (9) 19:46	06:13 19:46	06:45 18:55	07:17 18:06	06:54 16:33	07:21 16:31
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:32 20:17	05:24 20:35	05:47 (9) 20:23	06:06 (9) 19:45	06:14 19:45	06:46 18:53	07:18 18:04	06:55 16:32	07:21 16:32
25	07:16 17:04	06:40 17:42	05:54 18:14	06:04 19:48	05:31 20:18	05:25 20:35	05:47 (9) 20:23	06:05 19:43	06:15 19:43	06:47 18:51	06:20 17:03	06:57 16:31	07:22 16:33
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:25 20:35	05:48 (9) 20:22	06:16 19:42	06:48 19:42	06:21 18:49	06:58 17:02	06:58 16:31	07:22 16:33
27	07:14 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 20:20	05:25 20:35	05:48 (9) 20:21	06:17 19:40	06:49 18:48	06:22 17:00	06:59 16:30	07:22 16:34	07:23 16:34
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:26 20:35	05:48 (9) 20:20	06:18 19:38	06:50 18:46	06:23 16:59	07:00 16:30	07:23 16:34	07:24 16:34
29	07:13 17:09	06:37 17:45	05:49 18:18	06:00 19:52	05:29 20:22	05:26 20:35	05:49 (9) 20:19	06:19 19:37	06:51 18:44	06:24 16:58	07:01 16:30	07:23 16:35	07:25 16:35
30	07:12 17:10	06:36 17:46	05:49 18:19	06:00 19:53	05:28 20:22	05:26 20:35	05:49 (9) 20:18	06:20 19:35	06:52 18:43	06:25 16:56	07:02 16:29	07:23 16:36	07:26 16:36
31	07:11 17:11	06:35 17:47	05:49 18:20	06:00 19:54	05:28 20:23	05:26 20:35	05:50 20:17	06:21 19:34	06:53 18:43	06:26 16:55	07:03 16:29	07:23 16:37	07:27 16:37
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287	
Total, worst case					104	693	344						

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: ShadowShadow receptor: M - Shadow Receptor: 1,0 × 1,0 Azimuth: 140,0° Slope: 90,0° (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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:22	05:56 19:54	05:27 20:24	19:23 (10) 19:59 (10)	05:27 20:35	19:31 (10) 20:16	05:51 19:38 (10)	06:22 19:51 (10)	06:53 18:41	06:28 16:54
2	07:24 16:39	07:09 17:14	06:32 17:48	06:40 19:23	05:54 19:55	05:26 20:25	19:24 (10) 20:00 (10)	05:27 20:35	19:30 (10) 20:14	05:52 19:39 (10)	06:23 19:50 (10)	06:54 18:39	06:29 16:52
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 20:25	19:23 (10) 20:00 (10)	05:28 20:35	19:31 (10) 20:13	05:53 19:41 (10)	06:24 19:29	06:55 18:37	06:30 16:51
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	05:25 20:26	19:24 (10) 20:01 (10)	05:28 20:34	19:30 (10) 20:12	05:54 19:48 (10)	06:25 19:27	06:56 18:36	06:31 16:50
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	05:25 20:27	19:24 (10) 20:02 (10)	05:29 20:34	19:31 (10) 20:11	05:55 19:46 (10)	06:26 19:25	06:57 18:34	06:33 16:49
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	05:25 20:27	19:24 (10) 20:02 (10)	05:30 20:34	19:30 (10) 20:10	05:56 19:24	06:27 18:32	06:58 18:32	06:34 16:48
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	05:24 20:28	19:25 (10) 20:02 (10)	05:30 20:34	19:31 (10) 20:09	05:57 19:22	06:29 18:31	06:59 18:31	06:35 16:46
8	07:24 16:44	07:02 17:21	06:22 17:55	06:31 19:29	05:47 20:01	05:24 20:29	19:25 (10) 19:38 (10)	05:31 20:33	19:31 (10) 20:07	05:58 19:20	06:30 18:29	07:00 18:29	06:36 16:45
9	07:23 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	05:24 20:29	19:33 (10) 19:39 (10)	05:32 20:33	19:31 (10) 20:06	05:59 19:19	06:31 18:27	07:02 18:27	06:37 16:44
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 20:03	05:24 20:30	19:31 (10) 19:40 (10)	05:32 20:33	19:31 (10) 20:05	06:00 19:17	06:32 18:26	07:03 18:26	06:39 16:43
11	07:23 16:47	06:59 17:25	06:17 17:58	06:26 19:32	05:44 20:04	05:23 20:30	19:29 (10) 19:41 (10)	05:33 20:32	19:31 (10) 20:03	06:01 19:15	06:33 18:24	07:04 18:24	06:40 16:42
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:42 20:06	05:23 20:31	19:28 (10) 19:42 (10)	05:34 20:32	19:31 (10) 20:02	06:02 19:13	06:34 18:23	07:05 18:23	06:41 16:41
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:34	05:41 20:07	05:23 20:31	19:27 (10) 19:43 (10)	05:34 20:31	19:31 (10) 20:01	06:03 19:12	06:35 18:21	07:06 18:21	06:42 16:40
14	07:22 16:51	06:55 17:29	06:13 18:02	06:21 19:36	05:40 20:08	05:23 20:32	19:26 (10) 19:44 (10)	05:35 20:31	19:31 (10) 20:04	06:04 19:10	06:36 18:19	07:07 18:19	06:43 16:39
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 20:09	05:23 20:32	19:25 (10) 19:45 (10)	05:36 20:30	19:32 (10) 20:05	06:05 19:08	06:37 18:18	07:08 18:18	06:45 16:38
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	05:23 20:33	19:25 (10) 19:46 (10)	05:37 20:29	19:31 (10) 20:06	06:06 19:07	06:38 18:16	07:09 18:16	06:46 16:38
17	07:21 16:54	06:51 17:32	06:07 18:05	06:16 19:39	05:37 20:11	05:23 20:33	19:24 (10) 19:46 (10)	05:38 20:29	19:31 (10) 20:04	06:07 19:05	06:39 18:15	07:10 18:15	06:47 16:37
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:36 20:12	05:23 20:33	19:23 (10) 19:47 (10)	05:38 20:28	19:32 (10) 20:03	06:08 19:03	06:40 18:13	07:11 18:13	06:48 16:36
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:36 20:12	05:23 20:34	19:23 (10) 19:48 (10)	05:39 20:27	19:32 (10) 20:03	06:09 19:01	06:41 18:12	07:13 18:12	06:49 16:35
20	07:19 16:57	06:47 17:36	06:02 18:08	06:12 19:42	05:35 20:13	05:23 20:34	19:22 (10) 19:49 (10)	05:40 20:27	19:32 (10) 20:02	06:10 19:00	06:42 18:10	07:14 18:10	06:51 16:34
21	07:19 16:59	06:45 17:37	06:01 18:10	06:10 19:43	05:34 20:14	05:24 20:34	19:23 (10) 19:50 (10)	05:41 20:26	19:32 (10) 20:01	06:11 19:49	06:43 18:09	07:15 18:09	06:52 16:34
22	07:18 17:00	06:44 17:39	05:59 18:11	06:09 19:44	05:33 20:15	05:24 20:34	19:22 (10) 19:51 (10)	05:42 20:25	19:32 (10) 20:00	06:12 19:48	06:44 18:07	07:16 18:07	06:53 16:33
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:24 20:35	19:22 (10) 19:52 (10)	05:43 20:24	19:33 (10) 20:00	06:13 19:46	06:45 18:06	07:17 18:06	06:54 16:32
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 20:17	05:24 20:35	19:22 (10) 19:52 (10)	05:44 20:23	19:33 (10) 20:01	06:14 19:45	06:46 18:04	07:18 18:04	06:55 16:32
25	07:16 17:04	06:40 17:42	05:54 18:14	06:04 19:47	05:31 20:18	05:25 20:35	19:22 (10) 19:54 (10)	05:45 20:23	19:34 (10) 20:03	06:15 19:43	06:47 18:03	07:19 18:03	06:56 16:31
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:25 20:35	19:22 (10) 19:54 (10)	05:45 20:22	19:34 (10) 20:02	06:16 19:42	06:48 18:01	07:20 18:01	06:58 16:30
27	07:14 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 20:20	05:25 20:35	19:23 (10) 19:55 (10)	05:46 20:21	19:35 (10) 20:01	06:17 19:40	06:49 18:00	07:21 18:00	06:59 16:30
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:26 20:35	19:22 (10) 19:56 (10)	05:47 20:20	19:35 (10) 20:00	06:18 19:38	06:50 18:00	07:22 18:00	07:00 16:29
29	07:13 17:09		06:47 19:18	05:59 19:52	05:28 20:21	05:26 20:35	19:23 (10) 19:57 (10)	05:48 20:19	19:36 (10) 20:00	06:19 19:37	06:51 18:00	07:23 18:00	07:01 16:29
30	07:12 17:10		06:46 19:19	05:57 19:53	05:28 20:22	05:26 20:35	19:23 (10) 19:57 (10)	05:49 20:18	19:37 (10) 19:35	06:20 19:35	06:52 18:00	07:24 18:00	07:02 16:29
31	07:11 17:11		06:44 19:20		05:27 20:23	05:25 20:35	19:23 (10) 19:58 (10)	05:50 20:17	19:37 (10) 19:34	06:21 19:34	06:27 18:00	07:25 18:00	07:23 16:29
Potential sun hours	296	297	369	399	449	566	454	1086	952	460	38	375	345
Total, worst case													

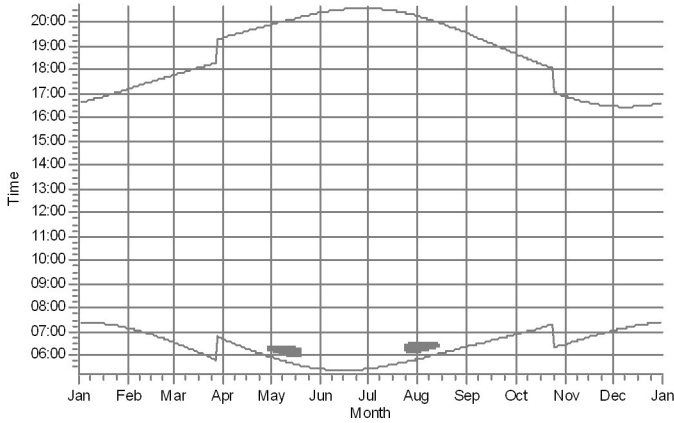
Table layout: For each day in each month the following matrix apply

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)

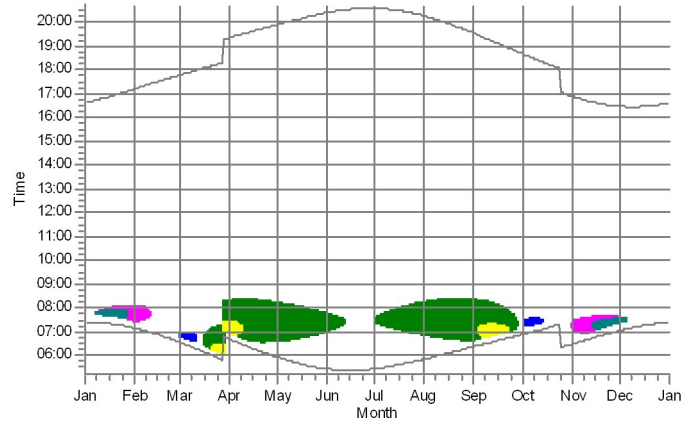
SHADOW - Calendar, graphical

Calculation: Shadow

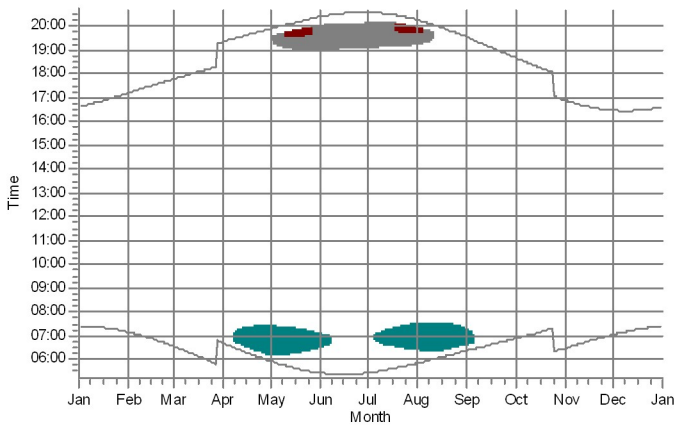
A: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)



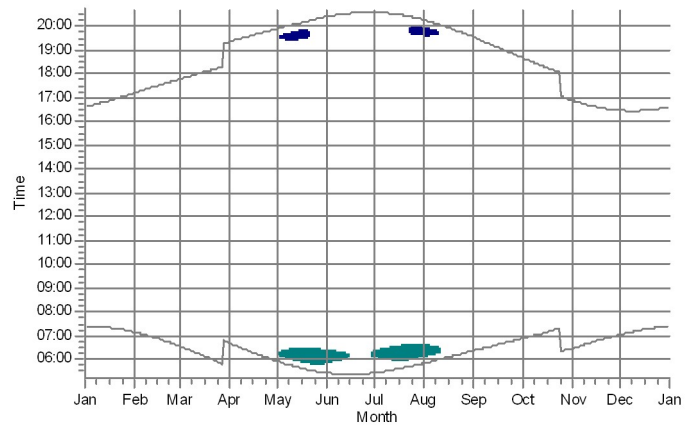
B: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)



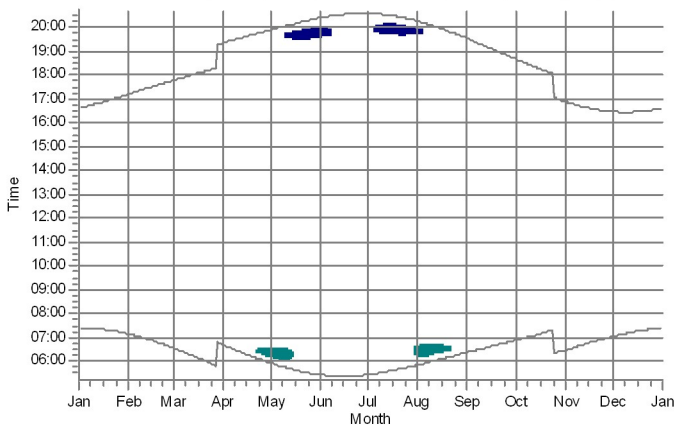
C: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)



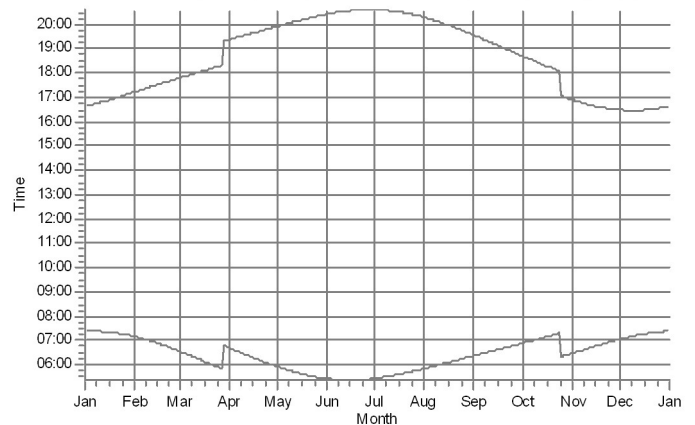
D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)



E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)



F: Shadow Receptor: 1,0 × 1,0 Azimuth: -180,0° Slope: 90,0° (6)



WTGs

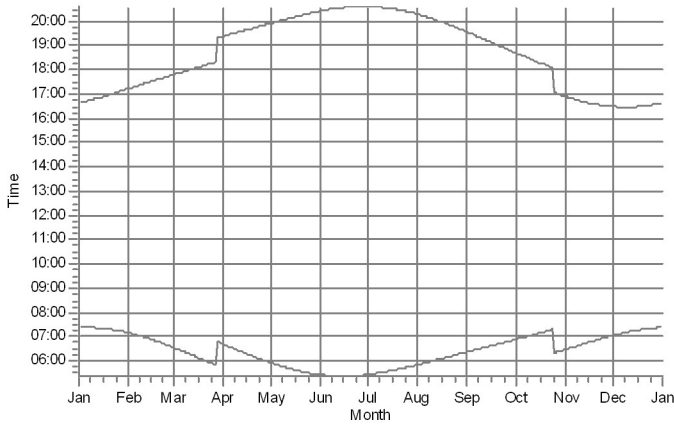
- 1: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (1)
- 2: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (8)
- 3: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (9)
- 4: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (10)

- 5: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (11)
- 6: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (12)
- 7: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (13)
- 8: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (14)

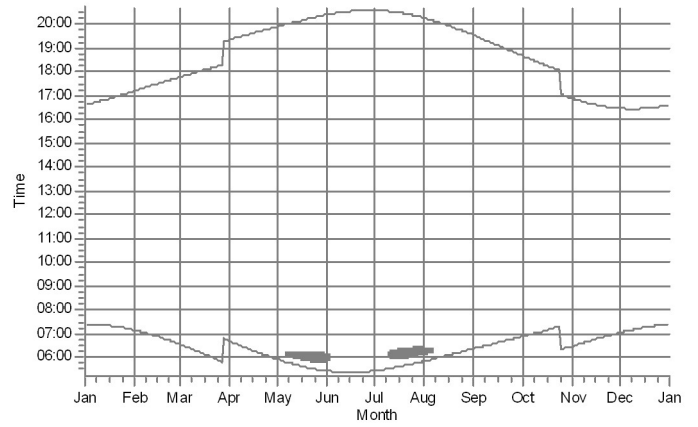
SHADOW - Calendar, graphical

Calculation: Shadow

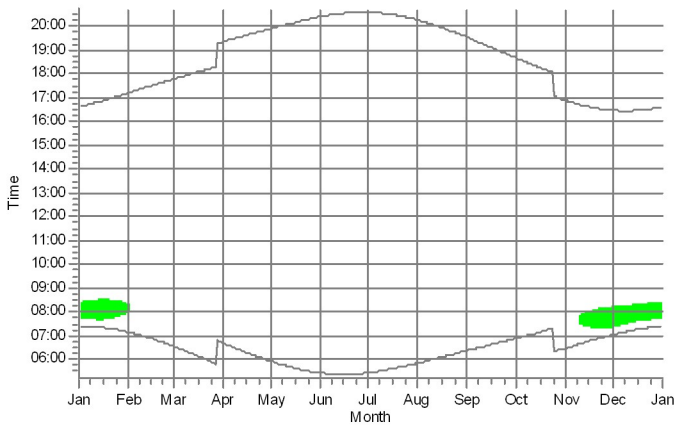
G: Shadow Receptor: 1,0 × 1,0 Azimuth: -180,0° Slope: 90,0° (7)



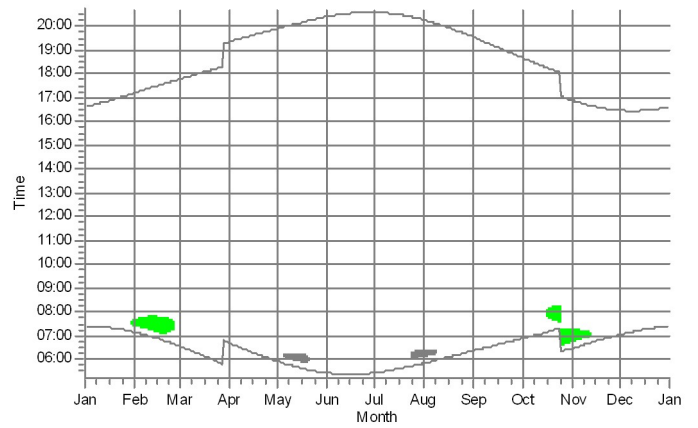
H: Shadow Receptor: 1,0 × 1,0 Azimuth: -180,0° Slope: 90,0° (8)



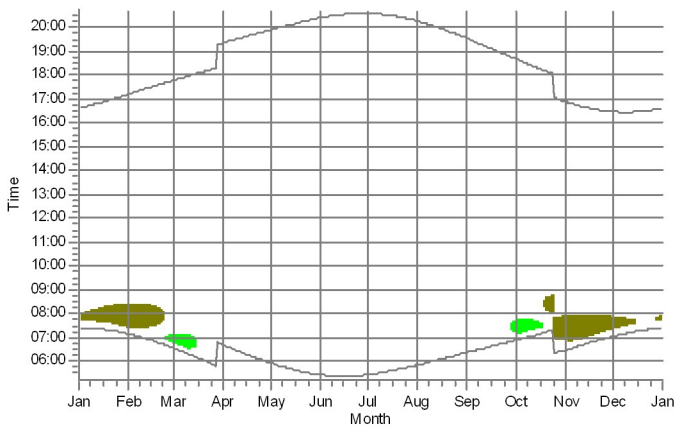
I: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)



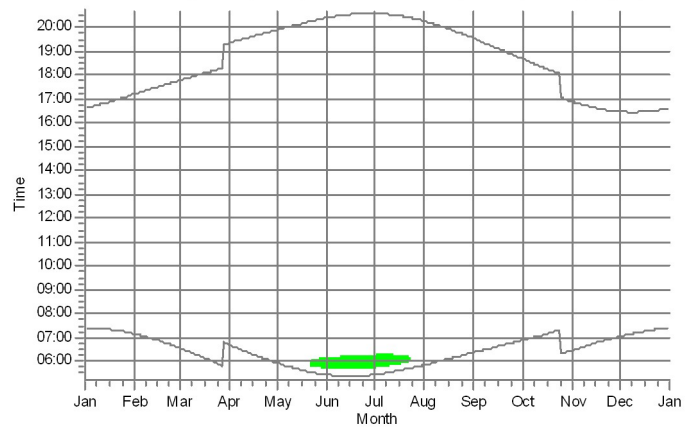
J: Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (10)



K: Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (11)



L: Shadow Receptor: 1,0 × 1,0 Azimuth: -130,0° Slope: 90,0° (12)



WTGs

4: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (10)
9: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (15)

10: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (16)

Project:

Aren_Manfredonia3

Licensed user:

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IT-71100 Foggia

+39 0881 756251

VEGA / info@studiovega.org

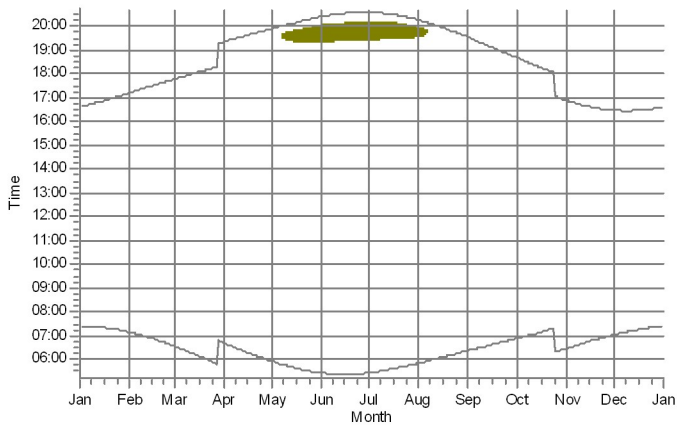
Calculated:

14/12/2023 08:47/3.5.584

SHADOW - Calendar, graphical

Calculation: Shadow

Mt Shadow Receptor: 1,0 × 1,0 Azimuth: 140,0° Slope: 90,0° (13)



WTGs

10: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (16)

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 1 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (1)

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			
1	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:22	07:01-08:18/77 19:22	05:56 19:54	06:39-08:11/92 20:24	05:26 20:24	07:04-07:43/39
2	07:24 16:38	07:09 17:13	06:32 17:48	06:40 19:23	06:59-08:18/79 19:23	05:54 19:55	06:39-08:10/91 20:25	05:26 20:25	07:06-07:42/36
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	06:57-08:18/81 19:24	05:53 19:56	06:40-08:10/90 20:25	05:26 20:25	07:07-07:40/33
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	06:56-08:19/83 19:25	05:52 19:57	06:39-08:08/89 20:26	05:25 20:26	07:09-07:39/30
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	06:54-08:19/85 19:26	05:51 19:58	06:40-08:08/88 20:27	05:25 20:27	07:10-07:39/29
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	06:52-08:19/87 19:27	05:49 19:59	06:41-08:07/86 20:27	05:24 20:27	07:11-07:37/26
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	06:51-08:20/89 19:28	05:48 20:00	06:41-08:06/85 20:28	05:24 20:28	07:13-07:35/22
8	07:24 16:44	07:02 17:21	06:22 17:55	06:30 19:29	06:49-08:20/91 19:29	05:47 20:01	06:42-08:06/84 20:29	05:24 20:29	07:15-07:34/19
9	07:24 16:45	07:01 17:22	06:21 17:56	06:29 19:30	06:47-08:20/93 19:30	05:46 20:02	06:43-08:05/82 20:29	05:24 20:29	07:17-07:33/16
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	06:46-08:20/94 19:31	05:45 20:03	06:43-08:04/81 20:30	05:23 20:30	07:20-07:31/11
11	07:23 16:47	06:59 17:25	06:17 17:58	06:26 19:32	06:44-08:20/96 19:32	05:43 20:05	06:44-08:03/79 20:30	05:23 20:30	07:24-07:26/2
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	06:43-08:20/97 19:33	05:42 20:06	06:45-08:03/78 20:31	05:23 20:31	
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:34	06:41-08:20/99 19:34	05:41 20:07	06:45-08:02/77 20:31	05:23 20:31	
14	07:22 16:50	06:55 17:29	06:12 18:02	06:21 19:36	06:40-08:19/99 19:36	05:40 20:08	06:46-08:01/75 20:32	05:23 20:32	
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	06:40-08:19/99 19:37	05:39 20:09	06:47-08:00/73 20:32	05:23 20:32	
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	06:39-08:19/100 19:38	05:38 20:10	06:47-07:59/72 20:33	05:23 20:33	
17	07:21 16:54	06:51 17:32	06:07 18:05	06:16 19:39	06:39-08:19/100 19:39	05:37 20:11	06:48-07:58/70 20:33	05:23 20:33	
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	06:38-08:18/100 19:40	05:36 20:12	06:49-07:57/68 20:33	05:23 20:33	
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	06:39-08:18/99 19:41	05:35 20:13	06:50-07:56/66 20:34	05:23 20:34	
20	07:19 16:57	06:47 17:36	06:02 18:08	06:11 19:42	06:38-08:17/99 19:42	05:35 20:13	06:50-07:55/65 20:34	05:23 20:34	
21	07:19 16:59	06:45 17:37	06:01 18:10	06:10 19:43	06:38-08:17/99 19:43	05:34 20:14	06:52-07:54/62 20:34	05:23 20:34	
22	07:18 17:00	06:44 17:38	05:59 18:11	06:08 19:44	06:37-08:16/99 19:44	05:33 20:15	06:53-07:53/60 20:34	05:24 20:34	
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	06:38-08:16/98 19:45	05:32 20:16	06:54-07:52/58 20:35	05:24 20:35	
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	06:38-08:16/98 19:46	05:31 20:17	06:54-07:51/57 20:35	05:24 20:35	
25	07:16 17:03	06:40 17:42	05:54 18:14	06:04 19:47	06:38-08:15/97 19:47	05:31 20:18	06:56-07:50/54 20:35	05:24 20:35	
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	06:38-08:14/96 19:49	05:30 20:19	06:57-07:49/52 20:35	05:25 20:35	
27	07:14 17:06	06:37 17:44	05:51 18:16	06:01 19:50	06:38-08:13/95 19:50	05:29 20:20	06:59-07:49/50 20:35	05:25 20:35	
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	06:38-08:13/95 19:51	05:29 20:21	06:59-07:47/48 20:35	05:25 20:35	
29	07:13 17:08		06:47 19:18	05:58 19:52	06:39-08:13/94 19:52	05:28 20:22	07:00-07:46/46 20:35	05:26 20:35	
30	07:12 17:10		06:45 19:19	05:57 19:53	06:38-08:11/93 19:53	05:27 20:22	07:02-07:45/43 20:35	05:26 20:35	
31	07:11 17:11		06:44 19:20		07:02-08:17/75 19:20	05:27 20:23	07:03-07:43/40 20:35		
Potential sun hours	296	297	369	399	449	454			
Sum of minutes with flicker	0	0	801	2811	2161	263			

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 1 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (1)

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

	July	August	September	October	November	December
1	05:27 20:35	05:51 06:54-08:13/79 20:16	06:22 06:43-08:19/96 19:32	06:53 18:41	06:28 16:54	07:03 16:29
2	05:27 07:25-07:34/9 20:35	05:52 06:53-08:13/80 20:15	06:23 06:44-08:18/94 19:30	06:54 18:39	06:29 16:52	07:04 16:28
3	05:28 07:24-07:37/13 20:35	05:53 06:53-08:14/81 20:13	06:24 06:45-08:18/93 19:29	06:55 18:37	06:30 16:51	07:05 16:28
4	05:28 07:21-07:39/18 20:34	05:54 06:52-08:15/83 20:12	06:25 06:46-08:17/91 19:27	06:56 18:36	06:31 16:50	07:06 16:28
5	05:29 07:20-07:41/21 20:34	05:55 06:51-08:16/85 20:11	06:26 06:47-08:16/89 19:25	06:57 18:34	06:33 16:49	07:07 16:28
6	05:30 07:18-07:42/24 20:34	05:56 06:51-08:16/85 20:10	06:27 06:48-08:15/87 19:24	06:58 18:32	06:34 16:48	07:08 16:28
7	05:30 07:17-07:44/27 20:34	05:57 06:50-08:17/87 20:09	06:28 06:49-08:15/86 19:22	06:59 18:31	06:35 16:46	07:09 16:28
8	05:31 07:16-07:46/30 20:33	05:58 06:49-08:18/89 20:07	06:29 06:50-08:14/84 19:20	07:00 18:29	06:36 16:45	07:10 16:27
9	05:31 07:15-07:47/32 20:33	05:59 06:49-08:18/89 20:06	06:30 06:51-08:13/82 19:19	07:01 18:27	06:37 16:44	07:11 16:27
10	05:32 07:14-07:49/35 20:33	06:00 06:48-08:19/91 20:05	06:31 06:52-08:12/80 19:17	07:03 18:26	06:39 16:43	07:12 16:27
11	05:33 07:13-07:50/37 20:32	06:01 06:48-08:19/91 20:03	06:32 06:53-08:10/77 19:15	07:04 18:24	06:40 16:42	07:13 16:28
12	05:34 07:11-07:51/40 20:32	06:02 06:47-08:20/93 20:02	06:34 06:54-08:09/75 19:13	07:05 18:23	06:41 16:41	07:14 16:28
13	05:34 07:11-07:53/42 20:31	06:03 06:47-08:20/93 20:01	06:35 06:55-08:08/73 19:12	07:06 18:21	06:42 16:40	07:14 16:28
14	05:35 07:10-07:54/44 20:31	06:04 06:46-08:20/94 19:59	06:36 06:56-08:06/70 19:10	07:07 18:19	06:43 16:39	07:15 16:28
15	05:36 07:09-07:56/47 20:30	06:05 06:46-08:21/95 19:58	06:37 06:57-08:05/68 19:08	07:08 18:18	06:45 16:38	07:16 16:28
16	05:37 07:08-07:56/48 20:29	06:06 06:45-08:21/96 19:57	06:38 06:58-08:03/65 19:07	07:09 18:16	06:46 16:38	07:17 16:28
17	05:37 07:07-07:58/51 20:29	06:07 06:45-08:21/96 19:55	06:39 06:59-08:01/62 19:05	07:10 18:15	06:47 16:37	07:17 16:29
18	05:38 07:06-07:59/53 20:28	06:08 06:44-08:22/98 19:54	06:40 07:00-07:59/59 19:03	07:11 18:13	06:48 16:36	07:18 16:29
19	05:39 07:05-08:00/55 20:27	06:09 06:44-08:22/98 19:52	06:41 07:01-07:57/56 19:01	07:13 18:12	06:49 16:35	07:19 16:29
20	05:40 07:05-08:02/57 20:27	06:10 06:44-08:22/98 19:51	06:42 07:02-07:55/53 19:00	07:14 18:10	06:51 16:34	07:19 16:30
21	05:41 07:03-08:02/59 20:26	06:11 06:43-08:22/99 19:49	06:43 07:03-07:53/50 18:58	07:15 18:09	06:52 16:34	07:20 16:30
22	05:42 07:02-08:03/61 20:25	06:12 06:43-08:22/99 19:48	06:44 07:04-07:50/46 18:56	07:16 18:07	06:53 16:33	07:20 16:31
23	05:43 07:01-08:04/63 20:24	06:13 06:43-08:22/99 19:46	06:45 07:05-07:47/42 18:55	07:17 18:06	06:54 16:32	07:21 16:31
24	05:43 07:01-08:06/65 20:23	06:14 06:42-08:22/100 19:45	06:46 07:06-07:44/38 18:53	07:18 18:04	06:55 16:32	07:21 16:32
25	05:44 07:00-08:07/67 20:23	06:15 06:42-08:22/100 19:43	06:47 07:07-07:40/33 18:51	07:19 17:03	06:56 16:31	07:22 16:32
26	05:45 06:59-08:08/69 20:22	06:16 06:42-08:22/100 19:42	06:48 07:08-07:34/26 18:49	07:20 17:01	06:58 16:31	07:22 16:33
27	05:46 06:58-08:09/71 20:21	06:17 06:42-08:21/99 19:40	06:49 07:18-07:24/6 18:48	07:21 17:00	06:59 16:30	07:22 16:34
28	05:47 06:58-08:10/72 20:20	06:18 06:41-08:20/99 19:38	06:50 18:46	07:22 16:59	07:00 16:30	07:23 16:34
29	05:48 06:57-08:11/74 20:19	06:19 06:41-08:20/99 19:37	06:51 18:44	07:23 16:57	07:01 16:29	07:23 16:35
30	05:49 06:55-08:11/76 20:18	06:20 06:41-08:20/99 19:35	06:52 18:42	07:24 16:56	07:02 16:29	07:23 16:36
31	05:50 06:55-08:12/77 20:17	06:21 06:42-08:19/97 19:34		07:25 16:55		07:23 16:37
Potential sun hours	460	429	375	345	297	286
Sum of minutes with flicker	1437	2891	1781	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 2 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	07:01-07:24/23 19:21	05:56 19:54	05:26 20:24	05:27 20:35	05:51 20:16	06:22 19:32	06:53 18:41	06:28 16:53
2	07:24 16:38	07:09 17:13	06:32 17:48	06:40 19:23	06:59-07:23/24 19:23	05:54 19:55	05:26 20:25	05:27 20:35	05:52 20:14	06:23 19:30	06:54 18:39	06:29 16:52
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	06:57-07:21/24 19:24	05:53 19:56	05:25 20:25	05:28 20:35	05:53 20:13	06:24 19:29	06:55 18:37	06:30 16:51
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	06:56-07:21/25 19:25	05:52 19:57	05:25 20:26	05:28 20:34	05:54 20:12	06:25 19:27	06:59-07:08/9 19:27	06:56 16:50
5	07:24 16:41	07:06 17:17	06:27 17:51	06:35 19:26	06:56-07:19/23 19:26	05:51 19:58	05:25 20:27	05:29 20:34	05:55 20:11	06:26 19:25	06:55-07:11/16 19:25	06:57 18:34
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	06:57-07:17/20 19:27	05:49 19:59	05:24 20:27	05:29 20:34	05:56 20:10	06:27 19:24	06:53-07:13/20 19:24	06:58 18:32
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	06:59-07:15/16 19:28	05:48 20:00	05:24 20:28	05:30 20:34	05:57 20:09	06:28 19:22	06:51-07:14/23 19:22	06:59 18:31
8	07:24 16:44	07:02 17:21	06:22 17:55	06:30 19:29	07:02-07:11/9 19:29	05:47 20:01	05:24 20:29	05:31 20:33	05:58 20:07	06:29 19:20	06:50-07:15/25 19:20	07:00 18:29
9	07:23 16:45	07:01 17:22	06:21 17:56	06:29 19:30	07:02-07:11/9 19:30	05:46 20:02	05:24 20:29	05:31 20:33	05:59 20:06	06:30 19:19	06:51-07:15/24 19:19	07:01 18:27
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	07:02-07:11/9 19:31	05:45 20:03	05:23 20:30	05:32 20:33	06:00 20:05	06:31 19:17	06:52-07:16/24 19:17	07:03 18:26
11	07:23 16:47	06:59 17:25	06:17 17:58	06:26 19:32	07:02-07:11/9 19:32	05:43 20:04	05:23 20:30	05:33 20:32	06:01 20:03	06:32 19:15	06:53-07:16/23 19:15	07:04 18:24
12	07:23 16:48	06:58 17:26	06:16 17:59	06:24 19:33	07:02-07:11/9 19:33	05:42 20:05	05:23 20:31	05:33 20:32	06:02 20:02	06:33 19:13	06:54-07:16/22 19:13	07:05 18:23
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:34	07:02-07:11/9 19:34	05:41 20:07	05:23 20:31	05:34 20:31	06:03 20:01	06:34 19:12	06:55-07:16/21 19:12	07:06 18:21
14	07:22 16:50	06:55 17:29	06:12 18:02	06:21 19:36	07:02-07:11/9 19:36	05:40 20:08	05:23 20:32	05:35 20:31	06:04 19:59	06:35 19:10	06:56-07:15/19 19:10	07:07 18:19
15	07:22 16:51	06:54 17:30	06:11 18:03	06:19 19:37	07:02-07:11/9 19:37	05:39 20:09	05:23 20:30	05:36 20:30	06:05 19:58	06:36 19:08	06:57-07:15/18 19:08	07:08 18:18
16	07:21 16:52	06:52 17:31	06:09 18:04	06:18 19:38	07:02-07:11/9 19:38	05:38 20:10	05:23 20:33	05:37 20:29	06:06 19:57	06:38 19:07	06:58-07:14/16 19:07	07:09 18:16
17	07:21 16:53	06:51 17:32	06:07 18:05	06:16 19:39	07:02-07:11/9 19:39	05:37 20:11	05:23 20:33	05:37 20:29	06:07 19:55	06:39 19:05	06:59-07:13/14 19:05	07:10 18:15
18	07:20 16:55	06:50 17:34	06:06 18:06	06:14 19:40	07:02-07:11/9 19:40	05:36 20:12	05:23 20:33	05:38 20:28	06:08 19:54	06:40 19:03	07:00-07:12/12 19:03	07:11 18:13
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	07:02-07:11/9 19:41	05:35 20:12	05:23 20:34	05:39 20:27	06:09 19:52	06:41 19:01	07:01-07:11/10 19:01	07:13 18:12
20	07:19 16:57	06:47 17:36	06:02 18:08	06:11 19:42	07:02-07:11/9 19:42	05:35 20:13	05:23 20:34	05:40 20:27	06:10 19:51	06:42 19:00	07:02-07:09/7 19:00	07:14 18:10
21	07:19 16:58	06:45 17:37	06:01 18:09	06:10 19:43	07:02-07:11/9 19:43	05:34 20:14	05:23 20:34	05:41 20:26	06:11 19:49	06:43 18:58	07:03-07:08/5 18:58	07:15 18:09
22	07:18 17:00	06:44 17:38	05:59 18:11	06:08 19:44	07:02-07:11/9 19:44	05:33 20:15	05:24 20:34	05:42 20:25	06:12 19:48	06:44 18:56	07:04-07:05/1 18:56	07:16 18:07
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	07:02-07:11/9 19:45	05:32 20:16	05:24 20:35	05:43 20:24	06:13 19:46	06:45 18:54	07:04-07:05/1 18:54	07:17 18:06
24	07:17 17:02	06:41 17:41	05:56 18:13	06:05 19:46	07:02-07:11/9 19:46	05:31 20:17	05:24 20:35	05:43 20:23	06:14 19:45	06:46 18:53	07:04-07:05/1 18:53	07:18 18:04
25	07:16 17:03	06:40 17:42	05:54 18:14	06:04 19:47	07:02-07:11/9 19:47	05:31 20:18	05:24 20:35	05:44 20:23	06:15 19:43	06:47 18:51	07:04-07:05/1 18:51	07:19 18:03
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	07:02-07:11/9 19:49	05:30 20:19	05:25 20:35	05:45 20:22	06:16 19:42	06:48 18:49	07:04-07:05/1 18:49	07:21 18:01
27	07:14 17:06	06:37 17:44	05:51 18:16	06:01 19:50	07:02-07:11/9 19:50	05:29 20:20	05:25 20:35	05:46 20:21	06:17 19:40	06:49 18:48	07:04-07:05/1 18:48	07:22 18:00
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	07:02-07:11/9 19:51	05:29 20:21	05:25 20:35	05:47 20:20	06:18 19:38	06:50 18:46	07:04-07:05/1 18:46	07:23 18:00
29	07:13 17:08	06:34 17:45	05:48 18:18	06:00 19:52	07:02-07:11/9 19:52	05:28 20:22	05:26 20:35	05:48 20:19	06:19 19:37	06:51 18:44	07:04-07:05/1 18:44	07:24 18:00
30	07:12 17:10	06:33 17:44	05:47 18:19	06:00 19:53	07:02-07:11/9 19:53	05:27 20:23	05:26 20:35	05:49 20:18	06:20 19:35	06:52 18:42	07:04-07:05/1 18:42	07:25 18:00
31	07:11 17:11	06:32 17:43	05:46 18:20	06:00 19:54	07:02-07:11/9 19:54	05:27 20:24	05:26 20:35	05:50 20:17	06:21 19:34	06:53 18:43	07:04-07:05/1 18:43	07:26 18:00
Potential sun hours	296	297	369	399	449	454	460	429	375	309	345	297
Sum of minutes with flicker	0	0	141	164	0	0	0	0	0	309	0	0

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 3 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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	07:24 16:38	07:10 17:12	06:33 17:47	06:53-06:56/3	06:42 19:21	05:56 19:54	05:26 20:24	05:27 20:35	05:51 20:16	06:22 19:32	06:53 18:41	06:28 16:53
2	07:24 16:38	07:09 17:13	06:32 17:48	06:51-06:56/5	06:40 19:23	05:54 19:55	05:26 20:25	05:27 20:35	05:52 20:14	06:23 19:30	06:54 18:39	06:29 16:52
3	07:24 16:39	07:08 17:15	06:30 17:49	06:49-06:56/7	06:39 19:24	05:53 19:56	05:25 20:25	05:28 20:35	05:53 20:13	06:24 19:29	06:55 18:37	07:18-07:26/8 06:30 16:51
4	07:24 16:40	07:07 17:16	06:29 17:50	06:48-06:56/8	06:37 19:25	05:52 19:57	05:25 20:26	05:28 20:34	05:54 20:12	06:25 19:27	06:56 18:36	07:16-07:28/12 06:31 16:50
5	07:24 16:41	07:06 17:17	06:27 17:51	06:46-06:56/10	06:35 19:26	05:51 19:58	05:25 20:27	05:29 20:34	05:55 20:11	06:26 19:25	06:57 18:34	07:17-07:29/12 06:33 16:49
6	07:24 16:42	07:05 17:19	06:26 17:53	06:45-06:56/11	06:34 19:27	05:49 19:59	05:24 20:27	05:29 20:34	05:56 20:10	06:27 19:24	06:58 18:32	07:19-07:31/12 06:34 16:47
7	07:24 16:43	07:04 17:20	06:24 17:54	06:43-06:55/12	06:32 19:28	05:48 20:00	05:24 20:28	05:30 20:34	05:57 20:09	06:28 19:22	06:59 18:31	07:20-07:31/11 06:35 16:46
8	07:24 16:44	07:02 17:21	06:22 17:55	06:41-06:53/12	06:30 19:29	05:47 20:01	05:24 20:29	05:31 20:33	05:58 20:07	06:29 19:20	07:00 18:29	07:21-07:31/10 06:36 16:45
9	07:23 16:45	07:01 17:22	06:21 17:56	06:40-06:52/12	06:29 19:30	05:46 20:02	05:24 20:29	05:31 20:33	05:59 20:06	06:30 19:19	07:01 18:27	07:22-07:31/9 06:37 16:44
10	07:23 16:46	07:00 17:24	06:19 17:57	06:39-06:50/11	06:27 19:31	05:45 20:03	05:23 20:30	05:32 20:32	06:00 20:05	06:31 19:17	07:03 18:26	07:23-07:31/8 06:39 16:43
11	07:23 16:47	06:59 17:25	06:17 17:58		06:26 19:32	05:43 20:04	05:23 20:30	05:33 20:32	06:01 20:03	06:32 19:15	07:04 18:24	07:24-07:30/6 06:40 16:42
12	07:23 16:48	06:58 17:26	06:16 17:59		06:24 19:33	05:42 20:05	05:23 20:31	05:33 20:32	06:02 20:02	06:33 19:13	07:05 18:23	07:25-07:29/4 06:41 16:41
13	07:22 16:49	06:56 17:27	06:14 18:01		06:22 19:34	05:41 20:06	05:23 20:31	05:34 20:31	06:03 20:01	06:34 19:12	07:06 18:21	07:26-07:28/2 06:42 16:40
14	07:22 16:50	06:55 17:29	06:12 18:02		06:21 19:36	05:40 20:08	05:23 20:32	05:35 20:31	06:04 19:59	06:35 19:10	07:07 18:19	06:43 16:39
15	07:22 16:51	06:54 17:30	06:11 18:03		06:19 19:37	05:39 20:09	05:23 20:32	05:36 20:30	06:05 19:58	06:36 19:08	07:08 18:18	06:45 16:38
16	07:21 16:53	06:52 17:31	06:09 18:04		06:18 19:38	05:38 20:10	05:23 20:33	05:37 20:29	06:06 19:57	06:37 19:07	07:09 18:16	06:46 16:37
17	07:21 16:54	06:51 17:32	06:07 18:05		06:16 19:39	05:37 20:10	05:23 20:33	05:37 20:29	06:07 19:55	06:38 19:05	07:10 18:15	06:47 16:37
18	07:20 16:55	06:50 17:34	06:06 18:06		06:14 19:40	05:36 20:11	05:23 20:33	05:38 20:28	06:08 19:54	06:40 19:03	07:11 18:13	06:48 16:36
19	07:20 16:56	06:48 17:35	06:04 18:07		06:13 19:41	05:35 20:12	05:23 20:34	05:39 20:27	06:09 19:52	06:41 19:01	07:13 18:12	06:49 16:35
20	07:19 16:57	06:47 17:36	06:02 18:08		06:11 19:42	05:35 20:13	05:23 20:34	05:40 20:27	06:10 19:51	06:42 19:00	07:14 18:10	06:51 16:34
21	07:19 16:59	06:45 17:37	06:01 18:09		06:10 19:43	05:34 20:14	05:23 20:34	05:41 20:26	06:11 19:49	06:43 18:58	07:15 18:09	06:52 16:34
22	07:18 17:00	06:44 17:38	05:59 18:11		06:08 19:44	05:33 20:15	05:24 20:34	05:42 20:25	06:12 19:48	06:44 18:56	07:16 18:07	06:53 16:33
23	07:17 17:01	06:42 17:40	05:57 18:12		06:07 19:45	05:32 20:16	05:24 20:35	05:43 20:24	06:13 19:46	06:45 18:54	07:17 18:06	06:54 16:32
24	07:17 17:02	06:41 17:41	05:56 18:13		06:05 19:46	05:31 20:17	05:24 20:35	05:43 20:23	06:14 19:45	06:46 18:53	07:18 18:04	06:55 16:32
25	07:16 17:03	06:40 17:42	05:54 18:14		06:04 19:47	05:31 20:18	05:24 20:35	05:44 20:23	06:15 19:43	06:47 18:51	06:19 17:03	06:56 16:31
26	07:15 17:05	06:38 17:43	05:52 18:15		06:03 19:48	05:30 20:19	05:25 20:35	05:45 20:22	06:16 19:42	06:48 18:49	06:21 17:01	06:58 16:33
27	07:14 17:06	06:36 17:44	05:50 18:16		06:01 19:50	05:29 20:20	05:25 20:35	05:46 20:21	06:17 19:40	06:49 18:48	06:22 17:00	06:59 16:30
28	07:14 17:07	06:35 17:46	05:49 18:17		06:00 19:51	05:29 20:21	05:25 20:35	05:47 20:20	06:18 19:38	06:50 18:46	06:23 16:59	07:00 16:30
29	07:13 17:08		06:47 19:18		05:58 19:52	05:28 20:21	05:26 20:35	05:48 20:19	06:19 19:37	06:51 18:44	06:24 16:57	07:01 16:29
30	07:12 17:10		06:45 19:19		05:57 19:53	05:27 20:22	05:26 20:35	05:49 20:18	06:20 19:35	06:52 18:42	06:25 16:56	07:02 16:29
31	07:11 17:11		06:44 19:20			05:27 20:23		05:50 20:17	06:21 19:34		06:27 16:55	07:23 16:36
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287
Sum of minutes with flicker	0	0	91	0	0	0	0	0	0	0	94	0

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 4 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains a range of times (hh:mm) representing shadow periods. Summary rows at the bottom show 'Potential sun hours' and 'Sum of minutes with flicker' for each month.

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

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), First time (hh:mm) with flicker / Last time (hh:mm) with flicker / Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 5 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 19:54	05:26 20:24	05:27 20:35	05:51 20:16	06:22 19:32	06:53 18:41	06:28 16:54	07:13-07:20/7 16:29
2	07:24 16:38	07:09 17:13	06:32 17:48	06:40 19:23	05:54 19:55	05:26 20:25	05:27 20:35	05:52 20:14	06:23 19:30	06:54 18:39	06:29 16:52	07:08-07:23/15 16:28
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 20:25	05:28 20:35	05:53 20:13	06:24 19:29	06:55 18:37	06:30 16:51	07:06-07:26/20 16:28
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	05:25 20:26	05:28 20:34	05:54 20:12	06:25 19:27	06:56 18:36	06:31 16:50	07:04-07:27/23 16:28
5	07:24 16:41	07:06 17:17	06:27 17:51	06:35 19:26	05:51 19:58	05:25 20:27	05:29 20:34	05:58 20:11	06:26 19:25	06:57 18:34	06:33 16:49	07:03-07:29/26 16:28
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	05:24 20:27	05:29 20:34	05:56 20:10	06:27 19:24	06:58 18:32	06:34 16:48	07:02-07:30/28 16:28
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	05:24 20:28	05:30 20:34	05:57 20:09	06:28 19:22	06:59 18:31	06:35 16:46	07:01-07:31/30 16:28
8	07:24 16:44	07:46-07:48/2 17:21	07:02-07:36-07:55/19 17:21	06:30 17:55	05:47 19:29	05:24 20:01	05:31 20:29	05:58 20:07	06:29 19:20	07:00 18:29	06:36 16:45	07:01-07:32/31 16:27
9	07:23 16:45	07:46-07:49/3 17:22	07:01-07:39-07:53/14 17:22	06:21 17:56	06:29 19:30	05:46 20:02	05:24 20:29	05:31 20:33	06:30 20:06	07:01 18:27	06:37 16:44	07:00-07:33/33 16:27
10	07:23 16:46	07:45-07:50/5 17:24	07:00-07:44-07:49/5 17:24	06:19 17:57	06:27 19:31	05:45 20:03	05:23 20:30	05:32 20:33	06:00 20:05	06:31 19:17	07:03 18:26	07:01-07:33/32 16:27
11	07:23 16:47	07:45-07:51/6 17:25	06:59 17:58	06:17 19:32	06:26 19:32	05:43 20:04	05:23 20:30	05:33 20:32	06:01 20:03	06:32 19:15	07:04 18:24	06:32-07:02-07:33/31 16:41
12	07:23 16:48	07:45-07:53/8 17:26	06:58 17:59	06:16 19:33	06:24 19:33	05:42 20:05	05:23 20:31	05:34 20:32	06:02 20:02	06:33 19:13	07:05 18:23	06:41-07:04-07:34/30 16:41
13	07:23 16:49	07:44-07:53/9 17:27	06:56 17:59	06:14 19:34	06:22 19:34	05:41 20:07	05:23 20:31	05:34 20:31	06:03 20:01	06:34 19:12	07:06 18:21	06:42-07:05-07:34/29 16:40
14	07:22 16:50	07:44-07:55/11 17:29	06:55 18:02	06:12 19:36	06:21 19:36	05:40 20:08	05:23 20:32	05:35 20:31	06:04 19:59	06:35 19:10	07:07 18:19	06:43-07:06-07:34/28 16:39
15	07:22 16:52	07:43-07:55/12 17:30	06:54 18:03	06:11 19:37	06:19 19:37	05:39 20:09	05:23 20:32	05:36 20:30	06:05 19:58	06:37 19:08	07:08 18:18	06:45-07:08-07:35/27 16:38
16	07:21 16:53	07:43-07:56/13 17:31	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	05:23 20:33	05:37 20:29	06:06 19:57	06:38 19:07	07:09 18:16	06:46-07:09-07:35/26 16:38
17	07:21 16:54	07:42-07:57/15 17:32	06:51 17:32	06:07 18:05	06:16 19:39	05:37 20:11	05:23 20:33	05:37 20:29	06:07 19:55	06:39 19:05	07:10 18:15	06:47-07:10-07:35/25 16:37
18	07:20 16:55	07:42-07:58/16 17:34	06:50 17:34	06:06 18:06	06:14 19:40	05:36 20:12	05:23 20:33	05:38 20:28	06:08 19:54	06:40 19:03	07:11 18:13	06:48-07:11-07:35/24 16:36
19	07:20 16:56	07:41-07:59/18 17:35	06:48 17:35	06:04 18:07	06:13 19:41	05:35 20:12	05:23 20:34	05:39 20:27	06:09 19:52	06:41 19:01	07:13 18:12	06:49-07:13-07:36/23 16:35
20	07:19 16:57	07:40-07:59/19 17:36	06:47 17:36	06:02 18:08	06:11 19:42	05:35 20:13	05:23 20:34	05:40 20:27	06:10 19:51	06:42 19:00	07:14 18:10	06:51-07:14-07:36/22 16:34
21	07:19 16:59	07:40-08:00/20 17:37	06:45 17:37	06:01 18:09	06:10 19:43	05:34 20:14	05:23 20:34	05:41 20:26	06:11 19:49	06:43 18:58	07:15 18:09	06:52-07:15-07:35/20 16:34
22	07:18 17:00	07:39-08:01/22 17:38	06:44 17:38	05:59 18:11	06:08 19:44	05:33 20:15	05:24 20:34	05:42 20:25	06:12 19:48	06:44 18:56	07:16 18:07	06:53-07:16-07:35/19 16:33
23	07:17 17:01	07:38-08:01/23 17:40	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	05:24 20:35	05:43 20:24	06:13 19:46	06:45 18:54	07:17 18:06	06:54-07:18-07:36/18 16:32
24	07:17 17:02	07:37-08:01/24 17:41	06:41 17:41	05:56 18:13	06:05 19:46	05:31 20:17	05:24 20:35	05:43 20:23	06:14 19:45	06:46 18:53	07:18 18:04	06:55-07:19-07:35/16 16:32
25	07:16 17:03	07:37-08:02/25 17:42	06:40 17:42	05:54 18:14	06:04 19:47	05:31 20:18	05:24 20:35	05:44 20:23	06:15 19:43	06:47 18:51	06:19 17:03	06:56-07:20-07:35/15 16:31
26	07:15 17:05	07:36-08:02/26 17:43	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:25 20:35	05:45 20:22	06:16 19:42	06:48 18:49	06:21 17:01	06:58-07:21-07:35/14 16:31
27	07:14 17:06	07:35-08:02/27 17:44	06:37 17:44	05:51 18:16	06:01 19:50	05:29 20:20	05:25 20:35	05:46 20:21	06:17 19:40	06:49 18:48	06:22 17:00	06:59-07:22-07:34/12 16:30
28	07:14 17:07	07:34-08:02/28 17:46	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:25 20:35	05:47 20:20	06:18 19:38	06:50 18:46	06:23 16:59	07:00-07:24-07:35/11 16:30
29	07:13 17:08	07:33-08:02/29 17:47	06:34 17:47	05:48 18:18	05:58 19:52	05:28 20:21	05:26 20:35	05:48 20:19	06:19 19:37	06:51 18:44	06:24 16:57	07:01-07:25-07:34/9 16:29
30	07:12 17:10	07:32-08:02/30 17:48	06:33 17:48	05:47 18:19	05:57 19:53	05:27 20:22	05:26 20:35	05:49 20:18	06:20 19:35	06:52 18:42	06:25 16:56	07:02-07:26-07:34/8 16:29
31	07:11 17:11	07:31-08:02/31 17:49	06:32 17:49	05:46 18:20	05:56 19:54	05:26 20:23	05:25 20:35	05:50 20:17	06:21 19:34	06:53 16:55	06:26 16:55	07:03-07:27-07:33/6 16:37
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287
Sum of minutes with flicker	422	240	0	0	0	0	0	0	0	0	652	16

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 6 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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
1	07:24 16:38	07:10 17:12	06:33 17:47	06:42 19:21	05:56 06:15-07:21/66 19:54	05:26 05:56-06:20/24 20:24 06:35-07:02/27
2	07:24 16:38	07:09 17:13	06:32 17:48	06:40 19:23	05:54 06:14-07:21/67 19:55	05:26 05:57-06:20/23 20:25 06:37-07:01/24
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 06:13-07:21/68 19:56	05:25 05:57-06:19/22 20:25 06:38-06:59/21
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 06:11-07:20/69 19:57	05:25 05:59-06:19/20 20:26 06:40-06:58/18
5	07:24 16:41	07:06 17:17	06:27 17:51	06:35 19:26	05:51 06:10-07:20/70 19:58	05:25 06:00-06:19/19 20:27 06:42-06:57/15
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 06:09-07:20/71 19:59	05:24 06:00-06:18/18 20:27 06:44-06:54/10
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 06:08-07:20/72 20:00	05:24 06:01-06:17/16 20:28
8	07:24 07:46-07:47/1 16:44	07:02 17:21	06:22 17:55	06:30 06:49-07:03/14 19:29	05:47 06:07-07:19/72 20:01	05:24 06:02-06:17/15 20:29
9	07:23 07:46-07:48/2 16:45	07:01 17:22	06:21 17:56	06:29 06:47-07:06/19 19:30	05:46 06:06-07:19/73 20:02	05:24 06:03-06:16/13 20:29
10	07:23 07:45-07:48/3 16:46	07:00 17:24	06:19 17:57	06:27 06:46-07:10/24 19:31	05:45 06:05-07:19/74 20:03	05:23 06:05-06:16/11 20:30
11	07:23 07:45-07:49/4 16:47	06:59 17:25	06:17 17:58	06:26 06:44-07:12/28 19:32	05:43 06:04-07:18/74 20:04	05:23 06:05-06:14/9 20:30
12	07:23 07:45-07:50/5 16:48	06:58 17:26	06:16 17:59	06:24 06:43-07:14/31 19:33	05:42 06:03-07:18/75 20:05	05:23 06:07-06:13/6 20:31
13	07:22 07:44-07:49/5 16:49	06:56 17:27	06:14 18:01	06:22 06:41-07:15/34 19:34	05:41 06:02-07:17/75 20:06	05:23 06:09-06:12/3 20:31
14	07:22 07:44-07:50/6 16:50	06:55 17:29	06:12 18:02	06:21 06:39-07:16/37 19:36	05:40 06:01-07:17/76 20:07	05:23 20:32
15	07:22 07:43-07:50/7 16:52	06:54 17:30	06:11 18:03	06:19 06:38-07:17/39 19:37	05:39 06:00-07:16/76 20:09	05:23 20:32
16	07:21 07:43-07:51/8 16:53	06:52 17:31	06:09 18:04	06:18 06:36-07:18/42 19:38	05:38 05:59-07:15/76 20:09	05:23 20:33
17	07:21 07:42-07:51/9 16:54	06:51 17:32	06:07 18:05	06:16 06:35-07:19/44 19:39	05:37 05:58-07:15/77 20:10	05:23 20:33
18	07:20 07:42-07:52/10 16:55	06:50 17:34	06:06 18:06	06:14 06:33-07:19/46 19:40	05:36 05:57-07:14/77 20:11	05:23 20:33
19	07:20 07:41-07:52/11 16:56	06:48 17:35	06:04 18:07	06:13 06:32-07:20/48 19:41	05:35 05:56-07:13/77 20:12	05:23 20:34
20	07:19 07:40-07:51/11 16:57	06:47 17:36	06:02 18:08	06:11 06:30-07:20/50 19:42	05:35 05:55-07:12/77 20:13	05:23 20:34
21	07:19 07:40-07:52/12 16:59	06:45 17:37	06:01 18:09	06:10 06:29-07:21/52 19:43	05:34 05:55-07:12/77 20:14	05:23 20:34
22	07:18 07:39-07:52/13 17:00	06:44 17:38	05:59 18:11	06:08 06:27-07:21/54 19:44	05:33 05:54-06:24/30 20:15	05:24 20:34
23	07:17 07:38-07:51/13 17:01	06:42 17:40	05:57 18:12	06:07 06:26-07:22/56 19:45	05:32 05:53-06:23/30 20:16	05:24 20:35
24	07:17 07:37-07:50/13 17:02	06:41 17:41	05:56 18:13	06:05 06:25-07:22/57 19:46	05:31 05:52-06:23/31 20:17	05:24 20:35
25	07:16 07:37-07:50/13 17:03	06:40 17:42	05:54 18:14	06:04 06:23-07:22/59 19:47	05:31 05:52-06:23/31 20:18	05:24 20:35
26	07:15 07:38-07:49/11 17:05	06:38 17:43	05:52 18:15	06:03 06:22-07:22/60 19:48	05:30 05:52-06:23/31 20:19	05:25 20:35
27	07:14 07:41-07:46/5 17:06	06:37 17:44	05:50 18:16	06:01 06:20-07:22/62 19:50	05:29 05:53-06:23/30 20:20	05:25 20:35
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 06:19-07:22/63 19:51	05:29 05:54-06:22/28 20:21	05:25 20:35
29	07:13 17:08		06:47 19:18	05:58 06:18-07:22/64 19:52	05:28 05:54-06:21/27 20:21	05:26 20:35
30	07:12 17:10		06:45 19:19	05:57 06:16-07:21/65 19:53	05:27 05:55-06:21/26 20:22	05:26 06:11-06:17/6 20:35
31	07:11 17:11		06:44 19:20		05:27 05:55-06:20/25 20:23	
Potential sun hours	296	297	369	399	449	454
Sum of minutes with flicker	162	0	0	1048	2209	320

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 6 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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

	July	August	September	October	November	December
1	05:27 06:11-06:19/8 20:35	05:51 06:13-07:28/75 20:16	06:22 06:43-07:10/27 19:32	06:53 18:41	06:28 16:53	07:03 07:27-07:31/4 16:29
2	05:27 06:09-06:20/11 20:35	05:52 06:14-07:28/74 20:14	06:23 06:44-07:08/24 19:30	06:54 18:39	06:29 16:52	07:04 07:28-07:31/3 16:28
3	05:28 06:09-06:21/12 20:35	05:53 06:15-07:29/74 20:13	06:24 06:45-07:04/19 19:29	06:55 18:37	06:30 16:51	07:05 07:29-07:31/2 16:28
4	05:28 06:08-06:22/14 20:34	05:54 06:16-07:29/73 20:12	06:25 06:46-07:00/14 19:27	06:56 18:36	06:31 16:50	07:06 07:30-07:31/1 16:28
5	05:29 06:08-06:23/15 20:34	05:55 06:17-07:29/72 20:11	06:26 19:25	06:57 18:34	06:33 16:49	07:07 16:28
6	05:29 06:06-06:24/18 20:34 06:52-06:59/7	05:56 06:18-07:30/72 20:10	06:27 19:24	06:58 18:32	06:34 16:47	07:08 16:28
7	05:30 06:06-06:25/19 20:34 06:49-07:02/13	05:57 06:19-07:30/71 20:09	06:28 19:22	06:59 18:31	06:35 16:46	07:09 16:27
8	05:31 06:06-06:26/20 20:33 06:48-07:05/17	05:58 06:20-07:30/70 20:07	06:29 19:20	07:00 18:29	06:36 16:45	07:10 16:27
9	05:31 06:05-06:26/21 20:33 06:46-07:06/20	05:59 06:21-07:30/69 20:06	06:30 19:19	07:01 18:27	06:37 16:44	07:11 16:27
10	05:32 06:05-06:27/22 20:32 06:45-07:08/23	06:00 06:22-07:30/68 20:05	06:31 19:17	07:03 18:26	06:39 16:43	07:12 16:27
11	05:33 06:05-06:28/23 20:32 06:44-07:09/25	06:01 06:23-07:30/67 20:03	06:32 19:15	07:04 18:24	06:40 16:42	07:13 16:27
12	05:34 06:04-06:28/24 20:32 06:42-07:10/28	06:02 06:24-07:30/66 20:02	06:33 19:13	07:05 18:23	06:41 16:41	07:13 16:28
13	05:34 06:03-06:29/26 20:31 06:42-07:12/30	06:03 06:25-07:30/65 20:01	06:34 19:12	07:06 18:21	06:42 16:40	07:14 16:28
14	05:35 06:03-06:30/27 20:31 06:41-07:13/32	06:04 06:26-07:30/64 19:59	06:35 19:10	07:07 18:19	06:43 16:39	07:15 16:28
15	05:36 06:03-06:31/28 20:30 06:40-07:15/35	06:05 06:27-07:30/63 19:58	06:36 19:08	07:08 18:18	06:45 07:14-07:19/5 16:38	07:16 16:28
16	05:37 06:02-06:31/29 20:29 06:39-07:15/36	06:06 06:28-07:29/61 19:57	06:37 19:07	07:09 18:16	06:46 07:11-07:22/11 16:37	07:16 16:28
17	05:37 06:02-06:32/30 20:29 06:38-07:16/38	06:07 06:29-07:29/60 19:55	06:39 19:05	07:10 18:15	06:47 07:10-07:23/13 16:37	07:17 16:29
18	05:38 06:02-06:32/30 20:28 06:37-07:18/41	06:08 06:30-07:28/58 19:54	06:40 19:03	07:11 18:13	06:48 07:11-07:24/13 16:36	07:18 16:29
19	05:39 06:02-06:33/31 20:27 06:37-07:19/42	06:09 06:31-07:28/57 19:52	06:41 19:01	07:13 18:12	06:49 07:13-07:26/13 16:35	07:18 16:29
20	05:40 06:03-06:34/31 20:27 06:36-07:20/44	06:10 06:32-07:27/55 19:51	06:42 19:00	07:14 18:10	06:51 07:14-07:27/13 16:34	07:19 16:30
21	05:41 06:03-06:33/30 20:26 06:35-07:20/45	06:11 06:33-07:27/54 19:49	06:43 18:58	07:15 18:09	06:52 07:15-07:27/12 16:34	07:20 16:30
22	05:42 06:04-07:21/77 20:25	06:12 06:34-07:26/52 19:48	06:44 18:56	07:16 18:07	06:53 07:16-07:27/11 16:33	07:20 16:31
23	05:43 06:05-07:22/77 20:24	06:13 06:35-07:25/50 19:46	06:45 18:54	07:17 18:06	06:54 07:18-07:29/11 16:32	07:21 16:31
24	05:43 06:06-07:23/77 20:23	06:14 06:36-07:24/48 19:45	06:46 18:53	07:18 18:04	06:55 07:19-07:29/10 16:32	07:21 16:32
25	05:44 06:07-07:24/77 20:23	06:15 06:37-07:23/46 19:43	06:47 18:51	07:19 17:03	06:56 07:20-07:29/9 16:31	07:22 16:32
26	05:45 06:08-07:25/77 20:22	06:16 06:38-07:22/44 19:42	06:48 18:49	07:20 17:01	06:58 07:21-07:29/8 16:31	07:22 16:33
27	05:46 06:09-07:25/76 20:21	06:17 06:38-07:20/42 19:40	06:49 18:48	07:21 17:00	06:59 07:22-07:29/7 16:30	07:22 16:34
28	05:47 06:10-07:26/76 20:20	06:18 06:39-07:18/39 19:38	06:50 18:46	07:22 16:59	07:00 07:24-07:31/7 16:30	07:23 16:34
29	05:48 06:11-07:27/76 20:19	06:19 06:40-07:17/37 19:37	06:51 18:44	07:23 16:57	07:01 07:25-07:31/6 16:29	07:23 16:35
30	05:49 06:11-07:26/75 20:18	06:20 06:41-07:15/34 19:35	06:52 18:42	07:24 16:56	07:02 07:26-07:31/5 16:29	07:23 16:36
31	05:50 06:12-07:27/75 20:17	06:21 06:42-07:13/31 19:34	 	06:27 16:55	 	07:23 16:37
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1708	1811	84	0	154	10

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 7 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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	07:24 16:38	07:10 17:12	06:34 17:47	06:42 19:22	05:56 19:54	05:27 19:40-19:57/17	05:27 20:24	05:51 20:16	19:40-19:51/11	06:22 19:32	06:53 18:41	06:28 16:54	07:03 16:29
2	07:24 16:39	07:09 17:14	06:32 17:48	06:41 19:23	05:55 19:55	05:26 20:25	05:27 20:35	05:52 20:15	19:39-19:50/11	06:23 19:30	06:54 18:39	06:29 16:52	07:04 16:28
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 20:25	05:28 20:35	05:53 20:13	19:39-19:49/10	06:24 19:29	06:55 18:37	06:30 16:51	07:05 16:28
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	19:32-19:33/1	05:28 20:26	05:54 20:12	19:40-19:48/8	06:26 19:27	06:56 18:36	06:31 16:50	07:06 16:28
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	19:31-19:35/4	05:25 20:27	05:55 20:11	19:49-19:54/10	06:27 19:25	06:57 18:34	06:33 16:49	07:07 16:28
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	19:31-19:36/5	05:25 20:28	05:56 20:10	19:40-19:46/6	06:28 19:24	06:58 18:32	06:34 16:48	07:08 16:28
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	19:30-19:37/7	05:24 20:28	05:57 20:09	19:40-19:45/5	06:29 19:22	06:59 18:31	06:35 16:46	07:09 16:28
8	07:24 16:44	07:03 17:21	06:22 17:55	06:31 19:29	05:47 20:01	19:30-19:38/8	05:24 20:29	05:58 20:07	19:41-19:44/3	06:30 19:20	07:00 18:29	06:36 16:45	07:10 16:28
9	07:24 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	19:30-19:39/9	05:24 20:29	05:59 20:06	19:42-19:43/1	06:31 19:19	07:02 18:28	06:37 16:44	07:11 16:28
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 20:04	19:30-19:40/10	05:24 20:30	06:00 20:05		06:32 19:17	07:03 18:26	06:39 16:43	07:12 16:28
11	07:23 16:47	06:59 17:25	06:18 17:58	06:26 19:32	05:44 20:05	19:30-19:41/11	05:23 20:30	06:01 20:04		06:33 19:15	07:04 18:24	06:40 16:42	07:13 16:28
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:42 20:06	19:30-19:42/12	05:23 20:31	06:02 20:02		06:34 19:14	07:05 18:23	06:41 16:41	07:14 16:28
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:35	05:41 20:07	19:30-19:43/13	05:23 20:31	06:03 20:01		06:35 19:12	07:06 18:21	06:42 16:40	07:14 16:28
14	07:22 16:51	06:55 17:29	06:13 18:02	06:21 19:36	05:40 20:08	19:31-19:44/13	05:23 20:32	06:04 19:59		06:36 19:10	07:07 18:19	06:44 16:39	07:15 16:28
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 20:09	19:31-19:45/14	05:23 20:32	06:05 19:58		06:37 19:08	07:08 18:18	06:45 16:38	07:16 16:28
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 20:10	19:32-19:46/14	05:23 20:33	06:06 19:57		06:38 19:07	07:09 18:16	06:46 16:38	07:17 16:28
17	07:21 16:54	06:51 17:32	06:08 18:05	06:16 19:39	05:37 20:11	19:32-19:47/15	05:23 20:33	06:07 19:55		06:39 19:05	07:10 18:15	06:47 16:37	07:17 16:29
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:36 20:12	19:33-19:47/14	05:23 20:33	06:08 19:54		06:40 19:03	07:11 18:13	06:48 16:36	07:18 16:29
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:36 20:13	19:34-19:48/14	05:23 20:34	06:09 19:52		06:41 19:01	07:13 18:12	06:50 16:35	07:19 16:29
20	07:19 16:57	06:47 17:36	06:02 18:08	06:12 19:42	05:35 20:14	19:34-19:49/15	05:23 20:34	06:10 19:51		06:42 19:00	07:14 18:10	06:51 16:34	07:19 16:30
21	07:19 16:59	06:46 17:37	06:01 18:10	06:10 19:43	05:34 20:14	19:35-19:50/15	05:24 20:34	06:11 19:49		06:43 18:58	07:15 18:09	06:52 16:34	07:20 16:30
22	07:18 17:00	06:44 17:39	05:59 18:11	06:09 19:44	05:33 20:15	19:35-19:51/16	05:24 20:35	06:12 19:48		06:44 18:56	07:16 18:07	06:53 16:33	07:20 16:31
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 20:16	19:35-19:52/17	05:24 20:35	06:13 19:46		06:45 18:55	07:17 18:06	06:54 16:32	07:21 16:31
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 20:17	19:35-19:52/17	05:24 20:35	06:14 19:45		06:46 18:53	07:18 18:04	06:55 16:32	07:21 16:32
25	07:16 17:04	06:40 17:42	05:54 18:14	06:04 19:48	05:31 20:18	19:36-19:54/18	05:25 20:35	06:15 19:43		06:47 18:51	07:19 17:03	06:57 16:31	07:22 16:32
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	19:36-19:54/18	05:25 20:35	06:16 19:42		06:48 18:49	07:20 17:02	06:58 16:31	07:22 16:33
27	07:14 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 20:20	19:37-19:55/18	05:25 20:35	06:17 19:40		06:49 18:48	07:21 17:00	06:59 16:30	07:22 16:34
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	19:37-19:56/19	05:26 20:35	06:18 19:38		06:50 18:46	07:22 16:59	07:00 16:30	07:23 16:34
29	07:13 17:09	06:47 19:18	05:59 18:18	06:05 19:52	05:28 20:22	19:37-19:56/19	05:26 20:35	06:19 19:37		06:51 18:44	07:23 16:57	07:01 16:29	07:23 16:35
30	07:12 17:10	06:46 19:19	05:57 18:19	06:04 19:53	05:28 20:22	19:38-19:57/19	05:26 20:35	06:20 19:35		06:52 18:43	07:24 16:56	07:02 16:29	07:23 16:36
31	07:11 17:11	06:44 19:20	05:56 18:20	06:03 20:23	05:27 20:23	19:39-19:58/19	05:27 20:35	06:21 19:34		06:27 16:55	07:25 16:55	07:03 16:27	07:23 16:37
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287	0
Sum of minutes with flicker	0	0	0	0	374	84	400	62	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 8 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (14)

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	07:24 16:38	07:10 17:12	06:34 17:47	06:42 19:22	05:56 19:54	05:26 20:24	05:27 20:35	05:51 19:47-19:51/4 20:16	06:22 19:32	06:53 18:41	06:28 16:54	07:03 16:29
2	07:24 16:39	07:09 17:14	06:32 17:48	06:40 19:23	05:54 19:55	05:26 20:25	05:27 20:35	05:52 19:47-19:50/3 20:15	06:23 19:30	06:54 18:39	06:29 16:52	07:04 16:28
3	07:24 16:39	07:08 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 20:25	05:28 20:35	05:53 19:48-19:49/1 20:13	06:24 19:29	06:55 18:37	06:30 16:51	07:05 16:28
4	07:24 16:40	07:07 17:16	06:29 17:50	06:37 19:25	05:52 19:57	05:25 20:26	05:28 20:35	05:54 20:12	06:25 19:27	06:56 18:36	06:31 16:50	07:06 16:28
5	07:24 16:41	07:06 17:17	06:27 17:52	06:35 19:26	05:51 19:58	05:25 20:27	05:29 20:34	05:55 20:11	06:26 19:25	06:57 18:34	06:33 16:49	07:07 16:28
6	07:24 16:42	07:05 17:19	06:26 17:53	06:34 19:27	05:49 19:59	05:24 20:28	05:30 20:34	05:56 20:10	06:28 19:24	06:58 18:32	06:34 16:48	07:08 16:28
7	07:24 16:43	07:04 17:20	06:24 17:54	06:32 19:28	05:48 20:00	05:24 20:28	05:30 20:34	05:57 20:09	06:29 19:22	06:59 18:31	06:35 16:46	07:09 16:28
8	07:24 16:44	07:03 17:21	06:22 17:55	06:31 19:29	05:47 20:01	05:24 20:29	05:31 20:33	05:58 20:07	06:30 19:20	07:00 18:29	06:36 16:45	07:10 16:28
9	07:24 16:45	07:01 17:22	06:21 17:56	06:29 19:30	05:46 20:02	05:24 20:29	05:31 20:33	05:59 20:06	06:31 19:19	07:02 18:28	06:37 16:44	07:11 16:28
10	07:23 16:46	07:00 17:24	06:19 17:57	06:27 19:31	05:45 19:38-19:40/2 20:04	05:23 20:30	05:32 20:33	06:00 20:05	06:32 19:17	07:03 18:26	06:39 16:43	07:12 16:28
11	07:23 16:47	06:59 17:25	06:18 17:58	06:26 19:32	05:44 19:38-19:41/3 20:05	05:23 20:30	05:33 20:32	06:01 20:04	06:33 19:15	07:04 18:24	06:40 16:42	07:13 16:28
12	07:23 16:48	06:58 17:26	06:16 18:00	06:24 19:33	05:42 19:37-19:42/5 20:06	05:23 20:31	05:34 20:32	06:02 20:02	06:34 19:14	07:05 18:23	06:41 16:41	07:14 16:28
13	07:23 16:49	06:56 17:27	06:14 18:01	06:22 19:35	05:41 19:37-19:43/6 20:07	05:23 20:31	05:34 20:31	06:03 20:01	06:35 19:12	07:06 18:21	06:42 16:40	07:14 16:28
14	07:22 16:50	06:55 17:29	06:13 18:02	06:21 19:36	05:40 19:37-19:44/7 20:08	05:23 20:32	05:35 20:31	06:04 19:59	06:36 19:10	07:07 18:19	06:44 16:39	07:15 16:28
15	07:22 16:52	06:54 17:30	06:11 18:03	06:19 19:37	05:39 19:37-19:45/8 20:09	05:23 20:32	05:36 20:30	06:05 19:58	06:37 19:08	07:08 18:18	06:45 16:38	07:16 16:28
16	07:21 16:53	06:52 17:31	06:09 18:04	06:18 19:38	05:38 19:37-19:46/9 20:10	05:23 20:33	05:37 20:29	06:06 19:57	06:38 19:07	07:09 18:16	06:46 16:38	07:17 16:28
17	07:21 16:54	06:51 17:32	06:08 18:05	06:16 19:39	05:37 19:37-19:47/10 20:11	05:23 20:33	05:37 20:29	06:07 19:55	06:39 19:05	07:10 18:15	06:47 16:37	07:17 16:29
18	07:20 16:55	06:50 17:34	06:06 18:06	06:15 19:40	05:36 19:37-19:47/10 20:12	05:23 20:33	05:38 19:55-19:58/3 20:28	06:08 19:54	06:40 19:03	07:11 18:13	06:48 16:36	07:18 16:29
19	07:20 16:56	06:48 17:35	06:04 18:07	06:13 19:41	05:36 19:37-19:48/11 20:13	05:23 20:34	05:39 19:52-20:00/8 20:27	06:09 19:52	06:41 19:01	07:13 18:12	06:50 16:35	07:19 16:29
20	07:19 16:57	06:47 17:36	06:02 18:08	06:12 19:42	05:35 19:38-19:49/11 20:14	05:23 20:34	05:40 19:51-20:02/11 20:27	06:10 19:51	06:42 19:00	07:14 18:10	06:51 16:34	07:19 16:30
21	07:19 16:59	06:46 17:37	06:01 18:10	06:10 19:43	05:34 19:39-19:50/11 20:14	05:23 20:34	05:41 19:49-20:01/12 20:26	06:11 19:49	06:43 18:58	07:15 18:09	06:52 16:34	07:20 16:30
22	07:18 17:00	06:44 17:39	05:59 18:11	06:09 19:44	05:33 19:40-19:51/11 20:15	05:24 20:35	05:42 19:49-20:00/11 20:25	06:12 19:48	06:44 18:56	07:16 18:07	06:53 16:33	07:20 16:31
23	07:17 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 19:40-19:52/12 20:16	05:24 20:35	05:43 19:48-20:00/12 20:24	06:13 19:46	06:45 18:55	07:17 18:06	06:54 16:32	07:21 16:31
24	07:17 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 19:41-19:51/10 20:17	05:24 20:35	05:44 19:48-19:59/11 20:24	06:14 19:45	06:46 18:53	07:18 18:04	06:55 16:32	07:21 16:32
25	07:16 17:04	06:40 17:42	05:54 18:14	06:04 19:48	05:31 19:44-19:50/6 20:18	05:24 20:35	05:44 19:48-19:58/10 20:23	06:15 19:43	06:47 18:51	07:19 17:03	06:57 16:31	07:22 16:32
26	07:15 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 20:19	05:25 20:35	05:45 19:47-19:58/11 20:22	06:16 19:42	06:48 18:49	07:20 17:02	06:58 16:31	07:22 16:33
27	07:14 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 20:20	05:25 20:35	05:46 19:47-19:57/10 20:21	06:17 19:40	06:49 18:48	07:22 17:00	06:59 16:30	07:22 16:34
28	07:14 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 20:21	05:26 20:35	05:47 19:47-19:56/9 20:20	06:18 19:38	06:50 18:46	07:23 16:59	07:00 16:30	07:23 16:34
29	07:13 17:08	06:34 17:47	05:48 18:18	05:59 19:52	05:28 20:22	05:26 20:35	05:48 19:47-19:55/8 20:19	06:19 19:37	06:51 18:44	07:24 16:57	07:01 16:29	07:23 16:35
30	07:12 17:10	06:33 17:48	05:47 18:19	05:57 19:53	05:28 20:22	05:26 20:35	05:49 19:46-19:53/7 20:18	06:20 19:35	06:52 18:43	07:25 16:56	07:02 16:29	07:23 16:36
31	07:11 17:11	06:32 17:49	05:46 18:20	05:56 19:54	05:27 20:23	05:26 20:35	05:50 19:47-19:52/5 20:17	06:21 19:34	06:27 16:55	07:26 16:55	07:03 16:30	07:23 16:37
Potential sun hours	296	297	369	399	449	454	460	429	375	345	297	287
Sum of minutes with flicker	0	0	0	0	132	0	128	8	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 9 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (15)

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
1	07:24 07:46-08:22/36 16:38	07:10 07:30-07:36/6 17:12	06:34 06:53-07:05/12 17:47	06:42 06:42-07:05/12 19:22	05:56 05:56-07:05/12 19:54	05:27 05:48-06:05/17 20:24
2	07:24 07:46-08:23/37 16:39	07:09 07:29-07:38/9 17:14	06:32 06:51-07:05/14 17:48	06:40 06:40-07:05/14 19:23	05:54 05:54-07:05/14 19:55	05:26 05:48-06:06/18 20:25
3	07:24 07:46-08:23/37 16:39	07:08 07:28-07:39/11 17:15	06:30 06:49-07:05/16 17:49	06:39 06:39-07:05/16 19:24	05:53 05:53-07:05/16 19:56	05:26 05:47-06:06/19 20:25
4	07:24 07:46-08:24/38 16:40	07:07 07:27-07:40/13 17:16	06:29 06:48-07:06/18 17:50	06:37 06:37-07:06/18 19:25	05:52 05:52-07:06/18 19:57	05:25 05:47-06:07/20 20:26
5	07:24 07:46-08:24/38 16:41	07:06 07:26-07:42/16 17:17	06:27 06:46-07:05/19 17:52	06:35 06:35-07:05/19 19:26	05:51 05:51-07:05/19 19:58	05:25 05:47-06:07/20 20:27
6	07:24 07:46-08:25/39 16:42	07:05 07:25-07:43/18 17:19	06:26 06:45-07:06/21 17:53	06:34 06:34-07:06/21 19:27	05:49 05:49-07:06/21 19:59	05:25 05:46-06:07/21 20:27
7	07:24 07:46-08:25/39 16:43	07:04 07:24-07:43/19 17:20	06:24 06:43-07:05/22 17:54	06:32 06:32-07:05/22 19:28	05:48 05:48-07:05/22 20:00	05:24 05:46-06:07/21 20:28
8	07:24 07:46-08:26/40 16:44	07:02 07:22-07:43/21 17:21	06:22 06:41-07:04/23 17:55	06:31 06:31-07:04/23 19:29	05:47 05:47-07:04/23 20:01	05:24 05:46-06:08/22 20:29
9	07:24 07:46-08:26/40 16:45	07:01 07:21-07:44/23 17:22	06:21 06:40-07:04/24 17:56	06:29 06:29-07:04/24 19:30	05:46 05:46-07:04/24 20:02	05:24 05:46-06:08/22 20:29
10	07:23 07:45-08:26/41 16:46	07:00 07:20-07:45/25 17:24	06:19 06:38-07:02/24 17:57	06:27 06:27-07:02/24 19:31	05:45 05:45-07:02/24 20:03	05:24 05:46-06:09/23 20:30
11	07:23 07:45-08:27/42 16:47	06:59 07:19-07:45/26 17:25	06:17 06:37-07:01/24 17:58	06:26 06:26-07:01/24 19:32	05:44 05:44-07:01/24 20:05	05:23 05:46-06:09/23 20:30
12	07:23 07:45-08:27/42 16:48	06:58 07:17-07:44/27 17:26	06:16 06:39-07:00/21 18:00	06:24 06:24-07:00/21 19:33	05:42 05:42-07:00/21 20:06	05:23 05:46-06:10/24 20:31
13	07:23 07:44-08:27/43 16:49	06:56 07:16-07:45/29 17:27	06:14 06:40-06:58/18 18:01	06:22 06:22-06:58/18 19:35	05:41 05:41-06:58/18 20:07	05:23 05:45-06:09/24 20:31
14	07:22 07:44-08:28/44 16:51	06:55 07:15-07:45/30 17:29	06:13 06:42-06:54/12 18:02	06:21 06:21-06:54/12 19:36	05:40 05:40-06:54/12 20:08	05:23 05:45-06:09/24 20:32
15	07:22 07:44-08:27/43 16:52	06:54 07:13-07:44/31 17:30	06:11 06:11-07:44/31 18:03	06:19 06:19-07:44/31 19:37	05:39 05:39-07:44/31 20:09	05:23 05:45-06:09/24 20:32
16	07:21 07:45-08:28/43 16:53	06:52 07:12-07:44/32 17:31	06:09 06:09-07:44/32 18:04	06:18 06:18-07:44/32 19:38	05:38 05:38-07:44/32 20:10	05:23 05:46-06:11/25 20:33
17	07:21 07:45-08:27/42 16:54	06:51 07:11-07:44/33 17:32	06:07 06:07-07:44/33 18:05	06:16 06:16-07:44/33 19:39	05:37 05:37-07:44/33 20:11	05:23 05:46-06:11/25 20:33
18	07:20 07:47-08:28/41 16:55	06:50 07:10-07:43/33 17:34	06:06 06:06-07:43/33 18:06	06:15 06:15-07:43/33 19:40	05:36 05:36-07:43/33 20:12	05:23 05:46-06:11/25 20:33
19	07:20 07:47-08:27/40 16:56	06:48 07:11-07:42/31 17:35	06:04 06:04-07:42/31 18:07	06:13 06:13-07:42/31 19:41	05:36 05:36-07:42/31 20:13	05:23 05:46-06:11/25 20:34
20	07:19 07:47-08:27/40 16:57	06:47 07:11-07:41/30 17:36	06:02 06:02-07:41/30 18:08	06:12 06:12-07:41/30 19:42	05:35 05:35-07:41/30 20:13	05:23 05:46-06:11/25 20:34
21	07:19 07:49-08:27/38 16:59	06:45 07:13-07:40/27 17:37	06:01 06:01-07:40/27 18:10	06:10 06:10-07:40/27 19:43	05:34 05:34-07:40/27 20:14	05:24 05:46-06:11/25 20:34
22	07:18 07:49-08:27/38 17:00	06:44 07:14-07:38/24 17:39	05:59 05:59-07:38/24 18:11	06:09 06:09-07:38/24 19:44	05:33 05:54-05:57/3 20:15	05:24 05:46-06:11/25 20:34
23	07:17 07:50-08:26/36 17:01	06:43 07:16-07:36/20 17:40	05:57 05:57-07:36/20 18:12	06:07 06:07-07:36/20 19:45	05:32 05:53-05:58/5 20:16	05:24 05:47-06:12/25 20:35
24	07:17 07:52-08:26/34 17:02	06:41 07:18-07:33/15 17:41	05:56 05:56-07:33/15 18:13	06:06 06:06-07:33/15 19:46	05:31 05:53-06:00/7 20:17	05:24 05:47-06:12/25 20:35
25	07:16 07:53-08:26/33 17:04	06:40 06:59-07:00/1 17:42	05:54 05:54-07:00/1 18:14	06:04 06:04-07:00/1 19:47	05:31 05:52-06:01/9 20:18	05:25 05:47-06:12/25 20:35
26	07:15 07:54-08:25/31 17:05	06:38 06:57-07:01/4 17:43	05:52 05:52-07:01/4 18:15	06:03 06:03-07:01/4 19:49	05:30 05:51-06:01/10 20:19	05:25 05:48-06:13/25 20:35
27	07:14 07:55-08:24/29 17:06	06:37 06:56-07:03/7 17:45	05:51 05:51-07:03/7 18:16	06:01 06:01-07:03/7 19:50	05:29 05:51-06:03/12 20:20	05:25 05:48-06:12/24 20:35
28	07:14 07:57-08:22/25 17:07	06:35 06:54-07:04/10 17:46	05:49 05:49-07:04/10 18:17	06:00 06:00-07:04/10 19:51	05:29 05:50-06:03/13 20:21	05:26 05:48-06:12/24 20:35
29	07:13 07:59-08:21/22 17:09		06:47 06:47-08:21/22 19:18	05:59 05:59-08:21/22 19:52	05:28 05:50-06:04/14 20:21	05:26 05:49-06:13/24 20:35
30	07:12 08:01-08:18/17 17:10		06:46 06:46-08:18/17 19:19	05:57 05:57-08:18/17 19:53	05:28 05:49-06:04/15 20:22	05:26 05:49-06:13/24 20:35
31	07:11 07:31-07:34/3 17:11		06:44 06:44-07:34/3 19:20		05:27 05:49-06:05/16 20:23	
Potential sun hours	296	297	369	399	449	454
Sum of minutes with flicker	1121	571	268	0	104	693

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 9 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (15)

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

	July	August	September	October	November	December
1	05:27 05:50-06:13/23 20:35	05:51 20:16	06:22 19:32	06:53 07:18-07:38/20 18:41	06:28 06:50-07:14/24 16:54	07:03 07:27-08:09/42 16:29
2	05:27 05:50-06:13/23 20:35	05:52 20:14	06:23 19:30	06:54 07:16-07:39/23 18:39	06:29 06:51-07:14/23 16:52	07:04 07:28-08:09/41 16:28
3	05:28 05:51-06:14/23 20:35	05:53 20:13	06:24 19:29	06:55 07:15-07:40/25 18:37	06:30 06:52-07:13/21 16:51	07:05 07:29-08:09/40 16:28
4	05:28 05:51-06:13/22 20:34	05:54 20:12	06:25 19:27	06:56 07:16-07:40/24 18:36	06:31 06:53-07:12/19 16:50	07:06 07:30-08:10/40 16:28
5	05:29 05:52-06:14/22 20:34	05:55 20:11	06:26 19:25	06:57 07:18-07:41/23 18:34	06:33 06:55-07:12/17 16:49	07:07 07:31-08:10/39 16:28
6	05:30 05:52-06:13/21 20:34	05:56 20:10	06:28 19:24	06:58 07:19-07:41/22 18:32	06:34 06:56-07:11/15 16:48	07:08 07:32-08:11/39 16:28
7	05:30 05:53-06:13/20 20:34	05:57 20:09	06:29 19:22	06:59 07:20-07:41/21 18:31	06:35 06:57-07:10/13 16:46	07:09 07:33-08:11/38 16:28
8	05:31 05:54-06:14/20 20:33	05:58 20:07	06:30 19:20	07:00 07:21-07:41/20 18:29	06:36 06:59-07:10/11 16:45	07:10 07:34-08:12/38 16:28
9	05:32 05:54-06:13/19 20:33	05:59 20:06	06:31 19:19	07:02 07:22-07:41/19 18:27	06:37 07:00-07:08/8 16:44	07:11 07:35-08:12/37 16:28
10	05:32 05:55-06:13/18 20:33	06:00 20:05	06:32 19:17	07:03 07:23-07:40/17 18:26	06:39 07:01-07:07/6 16:43	07:12 07:36-08:13/37 16:28
11	05:33 05:56-06:14/18 20:32	06:01 20:03	06:33 19:15	07:04 07:24-07:39/15 18:24	06:40 07:03-07:06/3 16:42	07:13 07:37-08:13/36 16:28
12	05:34 05:56-06:13/17 20:32	06:02 20:02	06:34 19:13	07:05 07:25-07:38/13 18:23	06:41 07:33-07:50/17 16:41	07:14 07:37-08:13/36 16:28
13	05:34 05:57-06:13/16 20:31	06:03 20:01	06:35 19:12	07:06 07:26-07:37/11 18:21	06:42 07:30-07:53/23 16:40	07:14 07:38-08:13/35 16:28
14	05:35 05:58-06:13/15 20:31	06:04 19:59	06:36 19:10	07:07 07:28-07:37/9 18:19	06:44 07:29-07:54/25 16:39	07:15 07:39-08:14/35 16:28
15	05:36 05:59-06:13/14 20:30	06:05 19:58	06:37 19:08	07:08 07:29-07:35/6 18:18	06:45 07:28-07:57/29 16:38	07:16 07:40-08:15/35 16:28
16	05:37 05:59-06:11/12 20:29	06:06 19:57	06:38 19:07	07:09 07:30-07:33/3 18:16	06:46 07:27-07:58/31 16:38	07:17 07:40-08:14/34 16:28
17	05:38 06:00-06:11/11 20:29	06:07 19:55	06:39 19:05	07:10 07:53-08:02/9 18:15	06:47 07:26-07:59/33 16:37	07:17 07:41-08:15/34 16:29
18	05:38 06:01-06:11/10 20:28	06:08 19:54	06:40 19:03	07:11 07:49-08:05/16 18:13	06:48 07:25-07:59/34 16:36	07:18 07:42-08:16/34 16:29
19	05:39 06:02-06:10/8 20:27	06:09 19:52	06:41 19:01	07:13 07:46-08:07/21 18:12	06:49 07:25-08:01/36 16:35	07:19 07:42-08:16/34 16:29
20	05:40 06:03-06:09/6 20:27	06:10 19:51	06:42 19:00	07:14 07:45-08:10/25 18:10	06:51 07:24-08:02/38 16:34	07:19 07:43-08:17/34 16:30
21	05:41 06:04-06:08/4 20:26	06:11 19:49	06:43 18:58	07:15 07:43-08:11/28 18:09	06:52 07:24-08:02/38 16:34	07:20 07:43-08:17/34 16:30
22	05:42 06:04-06:06/2 20:25	06:12 19:48	06:44 18:56	07:16 07:42-08:11/29 18:07	06:53 07:23-08:03/40 16:33	07:20 07:44-08:18/34 16:31
23	05:43 20:24	06:13 19:46	06:45 18:55	07:17 07:40-08:12/32 18:06	06:54 07:24-08:05/41 16:32	07:21 07:44-08:18/34 16:31
24	05:44 20:23	06:14 19:45	06:46 18:53	07:18 07:39-08:12/33 18:04	06:55 07:24-08:05/41 16:32	07:21 07:45-08:19/34 16:32
25	05:44 20:23	06:15 19:43	06:47 18:51	06:19 06:41-07:14/33 17:03	06:56 07:23-08:05/42 16:31	07:22 07:45-08:19/34 16:32
26	05:45 20:22	06:16 19:42	06:48 18:49	06:21 06:42-07:14/32 17:02	06:58 07:23-08:06/43 16:31	07:22 07:45-08:19/34 16:33
27	05:46 20:21	06:17 19:40	06:49 18:48	06:22 06:43-07:14/31 17:00	06:59 07:23-08:06/43 16:30	07:22 07:46-08:20/34 16:34
28	05:47 20:20	06:18 19:38	06:50 18:46	06:23 06:44-07:14/30 16:59	07:00 07:24-08:08/44 16:30	07:23 07:46-08:21/35 16:34
29	05:48 20:19	06:19 19:37	06:51 07:24-07:33/9 18:44	06:24 06:46-07:14/28 16:57	07:01 07:25-08:08/43 16:29	07:23 07:46-08:21/35 16:35
30	05:49 20:18	06:20 19:35	06:52 07:20-07:36/16 18:43	06:25 06:47-07:14/27 16:56	07:02 07:26-08:08/42 16:29	07:23 07:46-08:21/35 16:36
31	05:50 20:17	06:21 19:34		06:27 06:48-07:14/26 16:55		07:23 07:46-08:22/36 16:37
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	344	0	25	671	854	1117

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

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

SHADOW - Calendar per WTG

Calculation: ShadowWTG: 10 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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
1	07:24 07:46-07:52/6 16:38	07:10 07:30-08:22/52 17:12	06:34 17:47	06:42 19:22	05:56 19:54	05:27 19:23-19:59/36 20:24
2	07:24 07:46-07:54/8 16:39	07:09 07:29-08:22/53 17:14	06:32 17:48	06:41 19:23	05:55 19:55	05:26 19:24-20:00/36 20:25
3	07:24 07:46-07:55/9 16:39	07:08 07:28-08:22/54 17:15	06:30 17:49	06:39 19:24	05:53 19:56	05:26 19:23-20:00/37 20:25
4	07:24 07:46-07:57/11 16:40	07:07 07:27-08:22/55 17:16	06:29 17:50	06:37 19:25	05:52 19:57	05:25 19:24-20:01/37 20:26
5	07:24 07:46-07:58/12 16:41	07:06 07:27-08:22/55 17:17	06:27 17:52	06:36 19:26	05:51 19:58	05:25 19:24-20:02/38 20:27
6	07:24 07:46-08:00/14 16:42	07:05 07:27-08:23/56 17:19	06:26 17:53	06:34 19:27	05:49 19:59	05:25 19:24-20:02/38 20:27
7	07:24 07:46-08:01/15 16:43	07:04 07:28-08:23/55 17:20	06:24 17:54	06:32 19:28	05:48 20:00	05:24 19:25-20:02/37 20:28
8	07:24 07:46-08:03/17 16:44	07:02 07:27-08:21/54 17:21	06:22 17:55	06:31 19:29	05:47 19:35-19:38/3 20:01	05:24 19:25-20:03/38 20:29
9	07:24 07:46-08:04/18 16:45	07:01 07:28-08:21/53 17:22	06:21 17:56	06:29 19:30	05:46 19:33-19:39/6 20:02	05:24 19:26-20:03/37 20:29
10	07:23 07:45-08:05/20 16:46	07:00 07:29-08:21/52 17:24	06:19 17:57	06:27 19:31	05:45 19:31-19:40/9 20:03	05:24 19:26-20:03/37 20:30
11	07:23 07:45-08:06/21 16:47	06:59 07:30-08:21/51 17:25	06:18 17:58	06:26 19:32	05:44 19:29-19:41/12 20:05	05:23 19:27-20:03/36 20:30
12	07:23 07:45-08:08/23 16:48	06:58 07:29-08:19/50 17:26	06:16 18:00	06:24 19:33	05:43 19:28-19:42/14 20:06	05:23 19:26-20:02/36 20:31
13	07:23 07:44-08:08/24 16:49	06:56 07:31-08:19/48 17:27	06:14 18:01	06:22 19:35	05:41 19:27-19:43/16 20:07	05:23 19:26-20:03/37 20:31
14	07:22 07:44-08:10/26 16:51	06:55 07:32-08:18/46 17:29	06:13 18:02	06:21 19:36	05:40 19:26-19:44/18 20:08	05:23 19:27-20:03/36 20:32
15	07:22 07:43-08:10/27 16:52	06:54 07:32-08:17/45 17:30	06:11 18:03	06:19 19:37	05:39 19:25-19:45/20 20:09	05:23 19:27-20:03/36 20:32
16	07:21 07:43-08:12/29 16:53	06:52 07:33-08:16/43 17:31	06:09 18:04	06:18 19:38	05:38 19:25-19:46/21 20:10	05:23 19:27-20:03/36 20:33
17	07:21 07:42-08:12/30 16:54	06:51 07:35-08:15/40 17:32	06:08 18:05	06:16 19:39	05:37 19:24-19:46/22 20:11	05:23 19:28-20:04/36 20:33
18	07:20 07:42-08:14/32 16:55	06:50 07:36-08:13/37 17:34	06:06 18:06	06:15 19:40	05:36 19:23-19:47/24 20:12	05:23 19:29-20:04/35 20:33
19	07:20 07:41-08:14/33 16:56	06:48 07:38-08:11/33 17:35	06:04 18:07	06:13 19:41	05:36 19:23-19:48/25 20:13	05:23 19:29-20:04/35 20:34
20	07:19 07:40-08:15/35 16:57	06:47 07:39-08:08/29 17:36	06:02 18:08	06:12 19:42	05:35 19:22-19:49/27 20:13	05:23 19:29-20:04/35 20:34
21	07:19 07:40-08:16/36 16:59	06:46 07:42-08:06/24 17:37	06:01 18:10	06:10 19:43	05:34 19:23-19:50/27 20:14	05:24 19:29-20:04/35 20:34
22	07:18 07:39-08:17/38 17:00	06:44 07:45-08:02/17 17:39	05:59 18:11	06:09 19:44	05:33 19:22-19:51/29 20:15	05:24 19:29-20:04/35 20:34
23	07:17 07:38-08:17/39 17:01	06:43 17:40	05:57 18:12	06:07 19:45	05:32 19:22-19:52/30 20:16	05:24 19:30-20:05/35 20:35
24	07:17 07:38-08:19/41 17:02	06:41 17:41	05:56 18:13	06:06 19:46	05:31 19:22-19:52/30 20:17	05:24 19:30-20:05/35 20:35
25	07:16 07:37-08:19/42 17:04	06:40 17:42	05:54 18:14	06:04 19:47	05:31 19:22-19:54/32 20:18	05:25 19:29-20:05/36 20:35
26	07:15 07:36-08:20/44 17:05	06:38 17:43	05:52 18:15	06:03 19:49	05:30 19:22-19:54/32 20:19	05:25 19:30-20:06/36 20:35
27	07:14 07:35-08:20/45 17:06	06:37 17:45	05:51 18:16	06:01 19:50	05:29 19:23-19:55/32 20:20	05:25 19:30-20:06/36 20:35
28	07:14 07:34-08:21/47 17:07	06:35 17:46	05:49 18:17	06:00 19:51	05:29 19:22-19:56/34 20:21	05:26 19:30-20:06/36 20:35
29	07:13 07:33-08:21/48 17:09		06:47 19:18	05:59 19:52	05:28 19:23-19:57/34 20:22	05:26 19:30-20:07/37 20:35
30	07:12 07:32-08:21/49 17:10		06:46 19:19	05:57 19:53	05:28 19:23-19:57/34 20:22	05:26 19:30-20:06/36 20:35
31	07:11 07:31-08:22/51 17:11		06:44 19:20		05:27 19:23-19:58/35 20:23	
Potential sun hours	296	297	369	399	449	454
Sum of minutes with flicker	890	1002	0	0	566	1086

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

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

Calculation: ShadowWTG: 10 - Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 m) (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

	July	August	September	October	November	December
1	05:27 19:31-20:07/36 20:35	05:51 19:38-19:51/13 20:16	06:22 19:32 06:53 18:41		06:28 06:58-07:51/53 16:54	07:03 07:27-07:48/21 16:29
2	05:27 19:30-20:07/37 20:35	05:52 19:39-19:50/11 20:15	06:23 19:30 06:54 18:39		06:29 06:58-07:51/53 16:52	07:04 07:28-07:48/20 16:29
3	05:28 19:31-20:08/37 20:35	05:53 19:41-19:49/8 20:13	06:25 19:29 06:55 18:37		06:30 06:57-07:51/54 16:51	07:05 07:29-07:47/18 16:28
4	05:28 19:30-20:08/38 20:34	05:54 19:43-19:48/5 20:12	06:26 19:27 06:56 18:36		06:31 06:56-07:51/55 16:50	07:06 07:30-07:47/17 16:28
5	05:29 19:31-20:08/37 20:34	05:55 19:46-19:47/1 20:11	06:27 19:25 06:57 18:34		06:33 06:57-07:52/55 16:49	07:07 07:31-07:46/15 16:28
6	05:30 19:30-20:08/38 20:34	05:56 20:10 05:57 20:09	06:28 19:24 06:59 18:32		06:34 06:57-07:52/55 16:48	07:08 07:32-07:46/14 16:28
7	05:30 19:31-20:08/37 20:34	05:57 20:09 05:58 20:07	06:29 19:22 07:00 18:31		06:35 06:57-07:52/55 16:46	07:09 07:33-07:45/12 16:28
8	05:31 19:31-20:08/37 20:33	05:58 20:07 05:59 20:06	06:30 19:20 07:02 18:29		06:36 06:59-07:53/54 16:45	07:10 07:34-07:45/11 16:28
9	05:32 19:31-20:07/36 20:33	05:59 20:06 06:00 20:05	06:31 19:19 07:03 18:28		06:37 07:00-07:53/53 16:44	07:11 07:35-07:44/9 16:28
10	05:32 19:31-20:07/36 20:33	06:00 20:05 06:01 20:04	06:32 19:17 07:04 18:26		06:39 07:01-07:53/52 16:43	07:12 07:36-07:44/8 16:28
11	05:33 19:31-20:07/36 20:32	06:01 20:04 06:02 20:02	06:33 19:15 07:05 18:24		06:40 07:03-07:53/50 16:42	07:13 07:37-07:43/6 16:28
12	05:34 19:31-20:06/35 20:32	06:02 20:02 06:03 20:01	06:34 19:14 07:06 18:23		06:41 07:04-07:53/49 16:41	07:14 07:37-07:42/5 16:28
13	05:34 19:31-20:06/35 20:31	06:03 20:01 06:04 19:59	06:35 19:12 07:07 18:21		06:42 07:05-07:53/48 16:40	07:14 07:38-07:41/3 16:28
14	05:35 19:31-20:06/35 20:31	06:04 19:59 06:05 19:58	06:36 19:10 07:08 18:19		06:44 07:06-07:53/47 16:39	07:15 07:39-07:41/2 16:28
15	05:36 19:32-20:05/33 20:30	06:05 19:58 06:06 19:57	06:37 19:08 07:09 18:18		06:45 07:08-07:53/45 16:39	07:16 16:28
16	05:37 19:31-20:04/33 20:29	06:06 19:57 06:07 19:55	06:38 19:07 07:10 18:16		06:46 07:09-07:53/44 16:38	07:17 16:29
17	05:38 19:31-20:04/33 20:29	06:07 19:55 06:08 19:54	06:39 19:05 07:11 18:15		06:47 07:10-07:52/42 16:37	07:17 16:29
18	05:38 19:32-20:03/31 20:28	06:08 19:54 06:09 19:52	06:40 19:03 07:13 18:13		06:48 07:12-07:53/41 16:36	07:18 16:29
19	05:39 19:32-20:03/31 20:27	06:09 19:52 06:10 19:51	06:41 19:01 07:14 18:12	08:20-08:29/9	06:50 16:35	07:19 16:30
20	05:40 19:32-20:02/30 20:27	06:10 19:51 06:11 19:50	06:42 19:00 07:15 18:10	08:16-08:35/19	06:51 16:35	07:19 16:30
21	05:41 19:32-20:01/29 20:26	06:11 19:49 06:12 19:48	06:43 18:58 07:16 18:09	08:12-08:38/26	06:52 16:34	07:20 16:30
22	05:42 19:32-20:00/28 20:25	06:12 19:48 06:13 19:46	06:44 18:56 07:17 18:06	08:09-08:40/31	06:53 16:33	07:21 16:31
23	05:43 19:33-20:00/27 20:24	06:13 19:46 06:14 19:45	06:45 18:55 07:18 18:04	08:07-08:41/34	06:54 16:32	07:21 16:32
24	05:44 19:33-19:59/26 20:23	06:14 19:45 06:15 19:43	06:46 18:53 07:19 18:02	08:06-08:44/38	06:55 16:31	07:22 16:32
25	05:45 19:34-19:58/24 20:23	06:15 19:43 06:16 19:42	06:47 18:51 07:20 17:03	07:04-07:45/41	06:57 16:31	07:22 16:32
26	05:45 19:34-19:57/23 20:22	06:16 19:42 06:17 19:40	06:48 18:49 07:21 17:02	07:03-07:46/43	06:58 16:31	07:22 16:33
27	05:46 19:35-19:57/22 20:21	06:17 19:40 06:18 18:48	06:49 18:48 07:22 17:00	07:01-07:47/46	06:59 16:30	07:22 16:34
28	05:47 19:35-19:56/21 20:20	06:18 19:38 06:19 19:37	06:50 18:46 07:23 16:59	07:00-07:47/47	07:00 16:30	07:23 16:34
29	05:48 19:36-19:55/19 20:19	06:19 19:37 06:20 19:35	06:51 18:44 07:24 16:58	07:00-07:49/49	07:01 16:30	07:23 16:35
30	05:49 19:37-19:54/17 20:18	06:20 19:35 06:21 19:34	06:52 18:43 07:25 16:56	07:00-07:49/50	07:02 16:29	07:23 16:36
31	05:50 19:37-19:52/15 20:17	06:21 19:34 06:22 19:33	06:53 18:42 07:26 16:55	06:58-07:50/52		07:23 16:37
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	952	38	0	485	1277	169

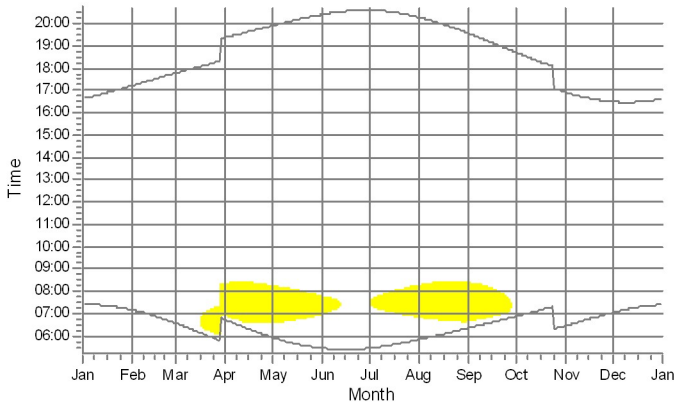
Table layout: For each day in each month the following matrix apply

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

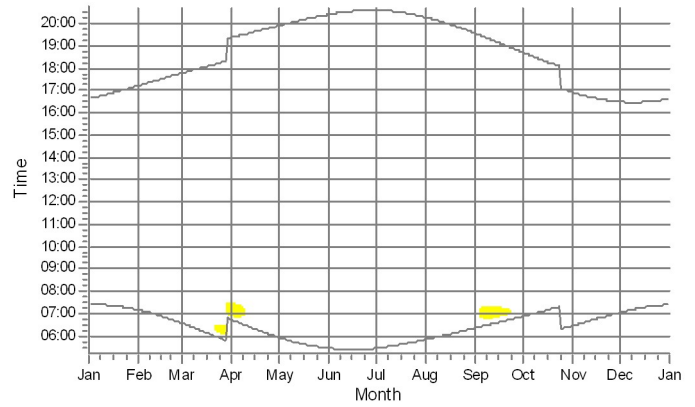
SHADOW - Calendar per WTG, graphical

Calculation: Shadow

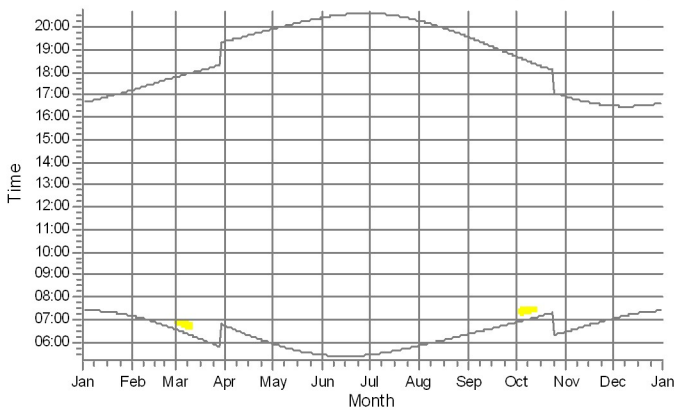
1: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



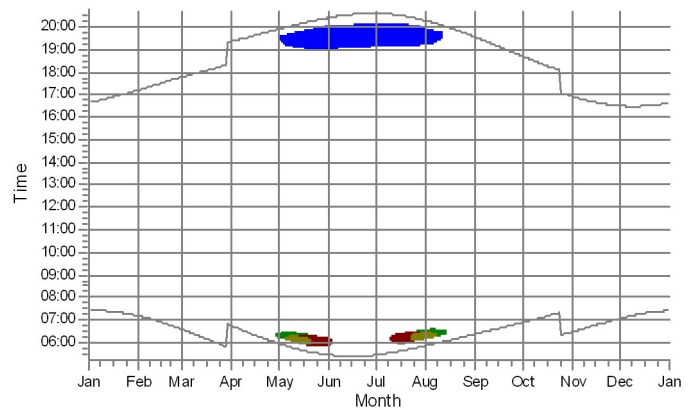
2: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



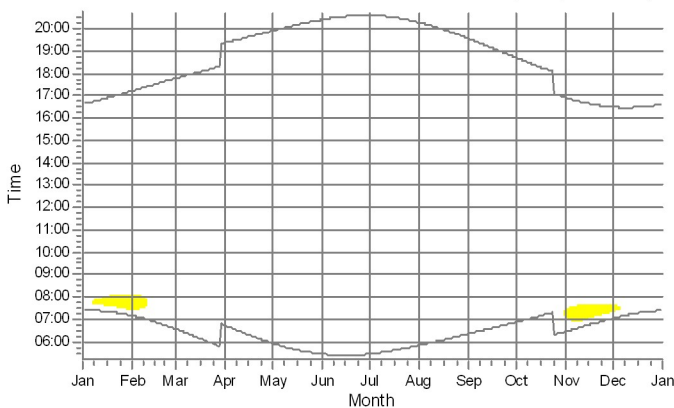
3: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



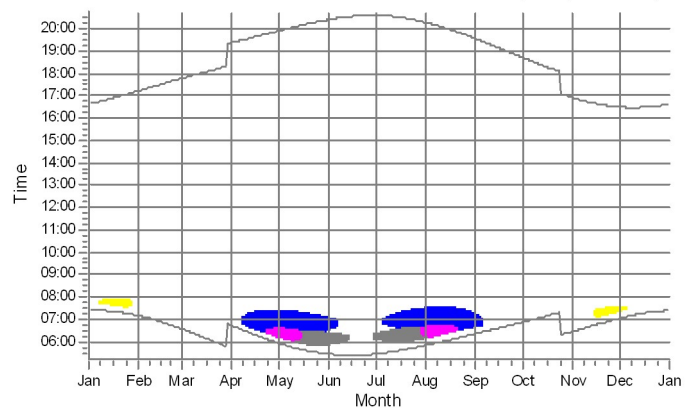
4: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



5: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



6: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



Shadow receptors

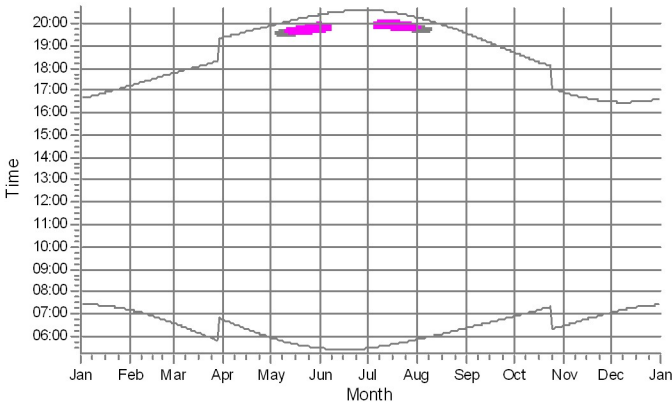
- A: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)
- B: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)
- C: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)
- D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)

- E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)
- H: Shadow Receptor: 1,0 × 1,0 Azimuth: -180,0° Slope: 90,0° (8)
- J: Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (10)

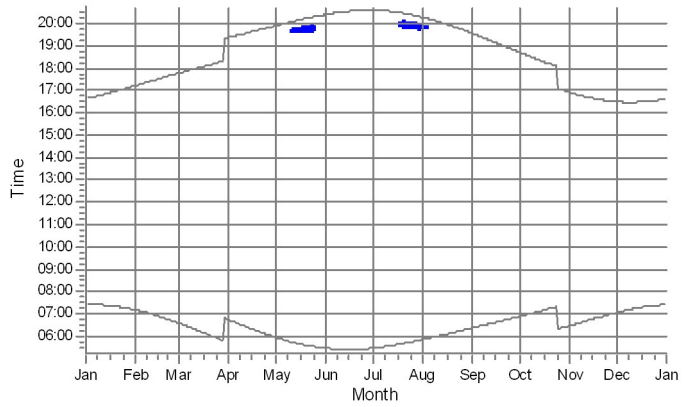
SHADOW - Calendar per WTG, graphical

Calculation: Shadow

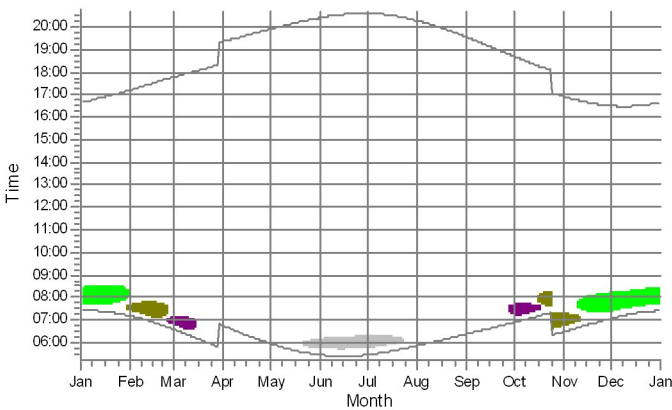
7: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



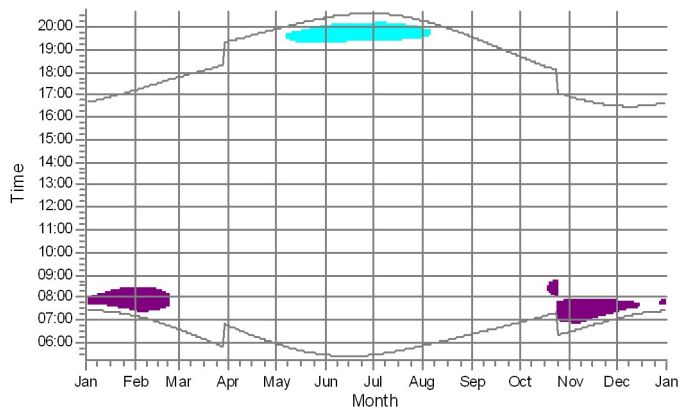
8: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



9: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n



10: Siemens Gamesa SG 4.7-155 4700 155.0 !O! hub: 90,0 m (TOT: 167,5 n

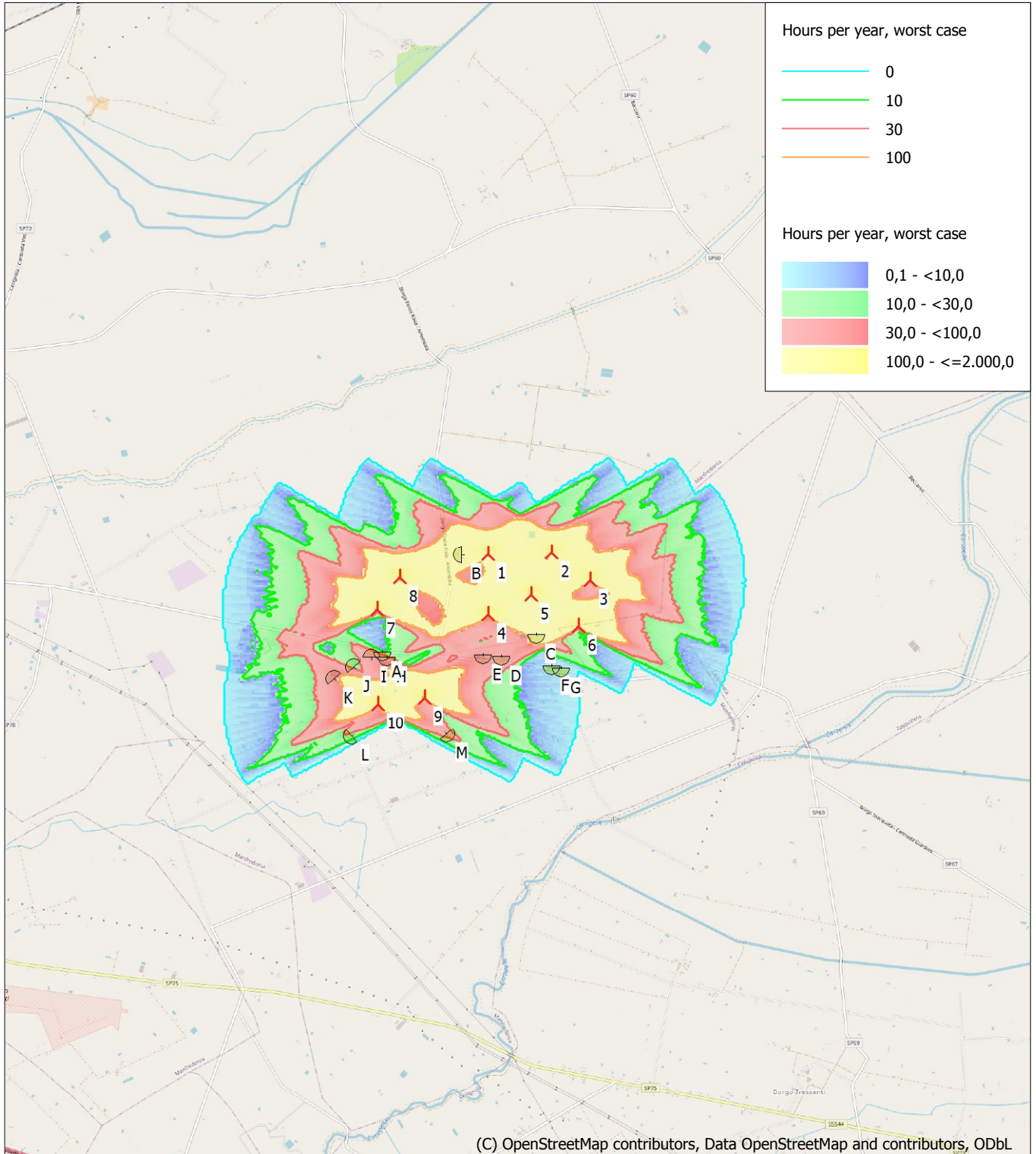


Shadow receptors

- C: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)
- D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)
- E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)
- I: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)

- J: Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (10)
- K: Shadow Receptor: 1,0 × 1,0 Azimuth: -40,0° Slope: 90,0° (11)
- L: Shadow Receptor: 1,0 × 1,0 Azimuth: -130,0° Slope: 90,0° (12)
- M: Shadow Receptor: 1,0 × 1,0 Azimuth: 140,0° Slope: 90,0° (13)

SHADOW - Map
Calculation: Shadow



Map: EMD OpenStreetMap , Print scale 1:75.000, Map center UTM (north)-WGS84 Zone: 33 East: 567.990 North: 4.589.430

New WTG

Shadow receptor

Flicker map level: Elevation Grid Data Object: Aren_Manfredonia3_EMDGrid_0.wpg (1)
Time step: 4 minutes, Day step: 14 days, Map resolution: 30 m, Visibility resolution: 15 m, Eye height: 1,5 m