


REGIONE BASILICATA 	PROVINCIA DI POTENZA 	COMUNE DI BANZI 
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Denominazione impianto:	“Piano Madama Giulia”	
Ubicazione:	Comune di Banzi (PZ) Località Piano Madama Giulia	Fogli: vari Particelle: varie

PROGETTO DEFINITIVO
di un parco eolico composto da n.10 aerogeneratori da 4MW per una potenza complessiva pari a 40 MW, da ubicarsi in agro del comune di Banzi (PZ) in località “Piano Madama Giulia”, delle opere connesse e delle infrastrutture indispensabili ricadenti nei comuni di Banzi (PZ) e Genzano di Lucania (PZ).

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<i>ELABORATO</i>	SHADOW FLICKERING	Tav. n°	A.8
		Scala	

Aggiornamenti	Numero	Data	Motivo	Eseguito	Verificato	Approvato
	Rev 0	Ottobre 2023	Istanza VIA art.23 D.Lgs 152/06 – Istanza Autorizzazione Unica art.12 D.Lgs 387/03		ING. FORGIONE	ING. FORGIONE

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INDICE

1. INTRODUZIONE	2
2. STUDIO DELL'EVOLUZIONE DELL'OMBRA GIORNALIERA GENERATA DAGLI AEROGENERATORI	3
3. INDIVIDUAZIONE DEI RECETTORI ED IPOTESI DI CALCOLO	4
4. I RISULTATI DEL CALCOLO DELL'EVOLUZIONE DELL'OMBRA	7
5. CONCLUSIONI E RACCOMANDAZIONI	8
6. ELENCO ALLEGATI.....	8

INDICE FIGURE

<i>Figura 1: Planimetria dell'impianto</i>	<i>2</i>
<i>Figura 2: Evoluzione annuale tipo dell'ombra di una pala</i>	<i>4</i>
<i>Figura 3 -Indicazione dei recettori su igm</i>	<i>6</i>

INDICE TABELLE

<i>Tab. 1 – Coordinate aeroogeneratori.....</i>	<i>2</i>
<i>Tab. 2 – Coordinate ricettori.....</i>	<i>4</i>
<i>Tab. 3 –Distanze delle turbine dai ricettori più prossimi</i>	<i>6</i>



1. INTRODUZIONE

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 Banzi ubicato a nord-est del centro abitato alla località “Piano Madama Giulia”, costituito da n. 10 aerogeneratori da 4 MW per una potenza complessiva di 40 MW e aventi un'altezza al mozzo pari a 123 metri ed un diametro del rotore pari a 150 metri. In particolare la posizione degli aerogeneratori è la seguente:

AEROGENERATORE	COORDINATE UTM33 WGS84		IDENTIFICATIVO CATASTALE		
	EST	NORD	Comune	Foglio	Particella
WTG1	587604	4527856	Banzi	11	13-4
WTG2	588271	4528348	Banzi	12	37-38-40-41-28-29-30-31-11-20-32-88-89
WTG3	588870	4528441	Banzi	12	130-104-50-86
WTG4	588403	4527504	Banzi	17	63
WTG5	587816	4526718	Banzi	17	10
WTG6	589507	4527215	Banzi	18	81
WTG7	589846	4530007	Banzi	13	161-162-165-164-171-110
WTG8	591759	4529327	Banzi	13	4-138
WTG9	593346	4527267	Banzi	19	328
WTG10	593946	4528242	Banzi	14	338

Tab. 1 – Coordinate aeroogeneratori



Figura 1: Planimetria dell'impianto

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.

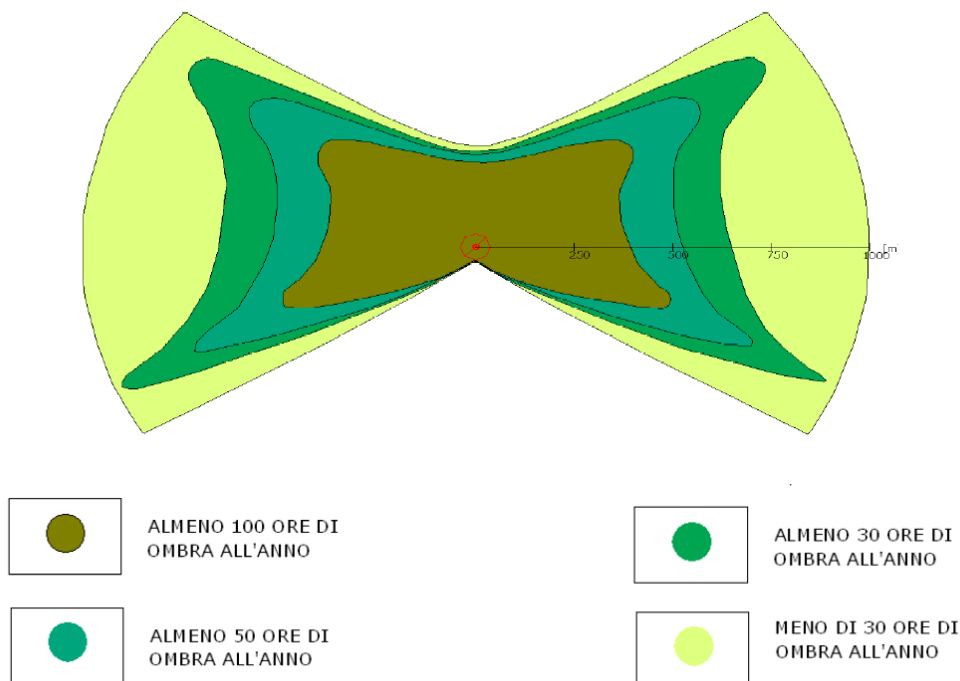


Figura 2: Evoluzione annuale tipo dell'ombra di una pala

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

3.1 Individuazione dei ricettori

Il progetto in esame nel comune di Banzi prevede l'installazione di 10 aerogeneratori in località “Piano Madama Giulia”.

L'analisi di shadow-flickering di cui al presente studio è stata elaborata per specifici 26 ricettori 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.

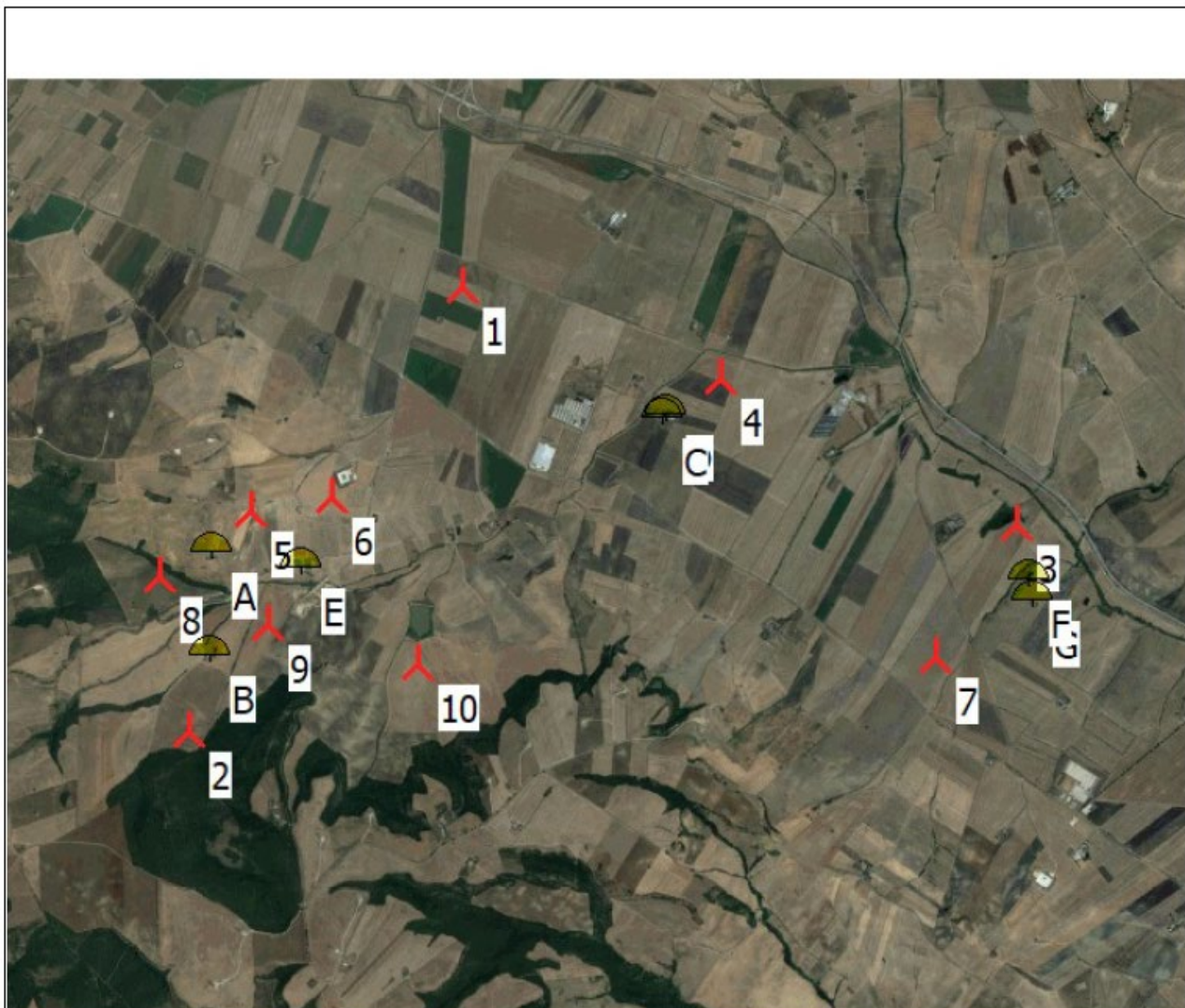
A tal riguardo per eventuali approfondimenti, si faccia riferimento allo specifico elaborato di progetto “Allegato 1 – Documentazione fotografica relativa ai ricettori considerati nelle analisi acustiche”.

	COMUNE	FOGLIO	PARTICELLA	TIPOLOGIA
RECETTORE 1	BANZI	11	72	A03 + C06
RECETTORE 2	BANZI	11	3	PASCOLO
RECETTORE 3	BANZI	12	16	FABB DIRUTO
			17	FABB DIRUTO
			18	FABB DIRUTO
			121	F02
			87	FABB DIRUTO
RECETTORE 4	BANZI	12	122	C02 - F03




RECETTORE 5	BANZI	12	52	FABB DIRUTO
			59	FABB DIRUTO
			60	FABB DIRUTO
			61	FABB DIRUTO
RECETTORE 6	BANZI	12	65	SEMINATIVO
RECETTORE 7	BANZI	17	64	F02
RECETTORE 8	BANZI	17	59	A02 - D10
RECETTORE 9	BANZI	17	60	C02
RECETTORE 10	BANZI	17	75	E09 - E09
RECETTORE 11	BANZI	12	120	A03 - D10
RECETTORE 12	BANZI	12	164	E09
RECETTORE 13	BANZI	12	117	C02
RECETTORE 14	BANZI	18	156	C02
RECETTORE 15	BANZI	13	292	C02
RECETTORE 16	BANZI	13	293	C02
RECETTORE 17	BANZI	13	313	A04 - D10
			314	A04 - C02 - C06
RECETTORE 18	BANZI	13	335	D10
			336	D10
RECETTORE 19	BANZI	13	337	D10
RECETTORE 20	BANZI	13	338	D10
			339	D10
RECETTORE 21	BANZI	8	115	D10
RECETTORE 22	BANZI	8	116	F02
RECETTORE 23	BANZI	8	102	C06
			127	C02
RECETTORE 24	GENZANO	18	279	A04 - D10
RECETTORE 25	GENZANO	18	290	A04 - D10
RECETTORE 26	GENZANO	18	264	F02

Tab. 2 – Coordinate ricettori



Scale 1:100.000

 New WTG


 Shadow receptor

Figura 3 -Indicazione dei recettori su igm

Nella tabella a seguire sono riportate le distanze minime intercorrenti tra recettori in oggetto e l'aerogeneratore più prossimo.

Ricettore	Torre più prossima	Distanza m
A	1	418
B	5	576
C	4	493
D	8	522
E	8	487
F	10	422
G	10	574

Tab. 3 -Distanze delle turbine dai ricettori più prossimi

In relazione a ciò, si fa presente che già in fase di scelta delle aree sulle quali ubicare l'impianto si è cercato di allontanarsi il più

possibile dall'area urbana e dalle abitazioni ed edifici ritenuti sensibili.

Tale fascia è stata definita in fase di progetto al fine di garantire il rispetto dei limiti in merito non solo all'ombreggiamento ma anche agli impatti acustici, elettromagnetici e in termini di calcolo della gittata.

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.

3.2 Base dati e parametri di calcolo

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.**

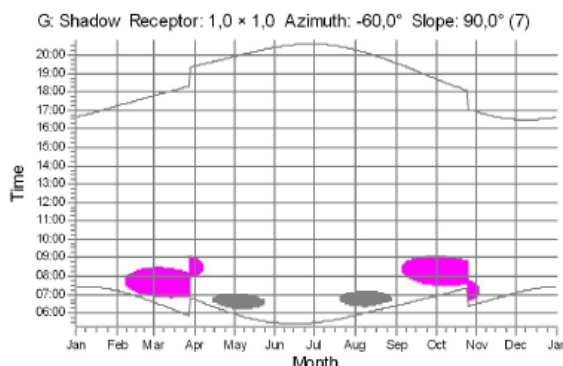
4. I RISULTATI DEL CALCOLO DELL'EVOLUZIONE DELL'OMBRA

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 "A-E" individuati nell'analisi che, nelle ipotesi di "Worst case", subiscono il fenomeno per un periodo che supera di poco 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 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/Giugno e Agosto/Novembre nelle prime ore del mattino. 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 dalla 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 i recettori allocati in prossimità delle turbine.**

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

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.

Altamura, Ottobre 2023

Il tecnico
Dott.Ing. Donato Forgiione

SHADOW - Main Result

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

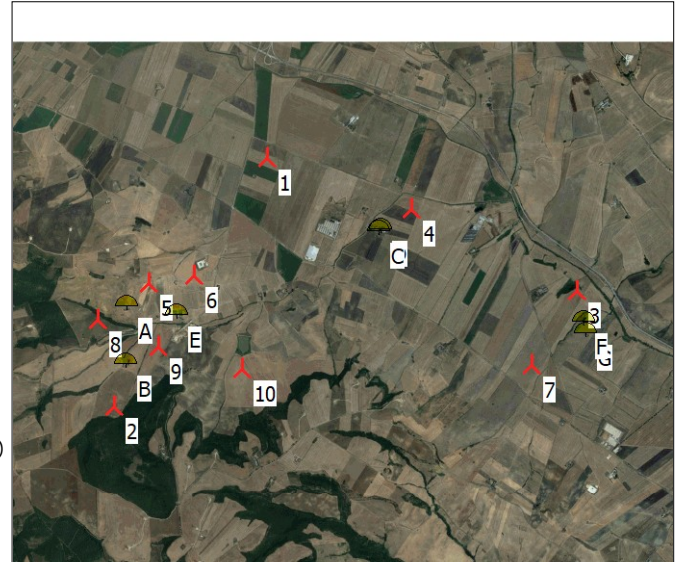
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

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: Banzi_EMDGrid_0.wpg (1)
Obstacles used in calculation
Eye height for map: 1,5 m
Grid resolution: 1,0 m

All coordinates are in
UTM (north)-WGS84 Zone: 33



▲ New WTG

Scale 1:100.000
▲ Shadow receptor

WTGs

Easting	Northing	Z	Row data/Description	WTG type			Shadow data			
				Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]
1	589.847	4.530.007	377,0 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
2	587.816	4.526.719	469,9 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
3	593.946	4.528.242	361,9 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
4	591.759	4.529.327	369,8 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
5	588.271	4.528.348	483,3 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
6	588.871	4.528.441	440,6 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
7	593.346	4.527.267	381,3 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
8	587.605	4.527.857	442,7 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
9	588.404	4.527.505	441,8 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4
10	589.507	4.527.215	432,1 VESTAS V150-4.0 4000 150.0 !O! h...Yes	VESTAS	V150-4.0-4.000	4.000	150,0	123,0	1.904	10,4

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]	[m]	[°]	[°]		[m]
A	587.980	4.528.034	453,3	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
B	587.966	4.527.274	457,1	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
C	591.320	4.529.038	379,6	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
D	591.348	4.529.065	378,3	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
E	588.646	4.527.927	426,3	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
F	594.044	4.527.834	366,4	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0
G	594.064	4.527.679	370,2	1,0	1,0	1,0	0,0	90,0	Fixed direction	2,0

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	130:16	166	1:21
B	4:51	26	0:17
C	0:00	0	0:00
D	0:00	0	0:00
E	110:57	114	1:42

To be continued on next page...

SHADOW - Main Result

...continued from previous page

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
F	51:27	86	0:41
G	37:44	68	0:43

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

No.	Name	Worst case [h/year]
1	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (7)	0:00
2	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (5)	0:00
3	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (10)	0:00
4	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (8)	0:00
5	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (2)	0:00
6	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (3)	0:00
7	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (9)	88:05
8	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (1)	132:38
9	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (4)	76:44
10	VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (6)	36:42

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

Shadow receptor: A - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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			
1	07:21 16:38	08:53 (9) 09:09 (9)	07:08 17:13	07:32 (10) 16:34 (8)	06:32 17:46	15:39 (8) 16:59 (8)	06:41 19:20	05:56 19:52	05:27 20:21
2	07:21 16:39	08:54 (9) 09:08 (9)	07:07 17:14	07:34 (10) 16:37 (8)	06:31 17:48	15:38 (8) 16:58 (8)	06:40 19:21	05:55 19:53	05:27 20:22
3	07:21 16:40	08:57 (9) 09:07 (9)	07:06 17:15	07:35 (10) 16:39 (8)	06:29 17:49	15:39 (8) 16:58 (8)	06:38 19:22	05:53 19:54	05:26 20:23
4	07:21 16:41	09:01 (9) 09:04 (9)	07:05 17:16	07:36 (10) 16:42 (8)	06:27 17:50	15:39 (8) 16:57 (8)	06:37 19:23	05:52 19:55	05:26 20:23
5	07:21 16:42	09:04 (9)	07:04 17:17	07:37 (10) 16:44 (8)	06:26 17:51	15:39 (8) 16:58 (8)	06:35 19:24	05:51 19:56	05:26 20:24
6	07:21 16:43		07:03 17:19	07:38 (10) 16:46 (8)	06:24 17:52	15:39 (8) 16:57 (8)	06:33 19:26	05:50 19:57	05:25 20:25
7	07:21 16:44		07:02 17:20	07:39 (10) 16:48 (8)	06:23 17:53	15:39 (8) 16:56 (8)	06:32 19:27	05:48 19:58	05:25 20:25
8	07:21 16:45		07:00 17:21	07:40 (10) 16:51 (8)	06:21 17:54	15:40 (8) 16:56 (8)	06:30 19:28	05:47 19:59	05:25 20:26
9	07:21 16:46		06:59 17:22	07:41 (10) 16:53 (8)	06:20 17:55	15:40 (8) 16:54 (8)	06:28 19:29	05:46 20:00	05:25 20:27
10	07:21 16:47		06:58 17:24	07:42 (10) 16:55 (8)	06:18 17:57	15:42 (8) 16:54 (8)	06:27 19:30	05:45 20:01	05:24 20:27
11	07:21 16:48		06:57 17:25	07:43 (10) 16:57 (8)	06:16 17:58	15:42 (8) 16:53 (8)	06:25 19:31	05:44 20:02	05:24 20:28
12	07:20 16:49		06:56 17:26	07:44 (10) 16:59 (8)	06:15 17:59	15:42 (8) 16:52 (8)	06:24 19:32	05:43 20:03	05:24 20:28
13	07:20 16:50		06:54 17:27	07:45 (10) 16:52 (8)	06:13 18:00	15:44 (8) 16:51 (8)	06:22 19:33	05:42 20:04	05:24 20:29
14	07:20 16:51		06:53 17:29	07:46 (10) 16:55 (8)	06:11 18:01	15:44 (8) 16:50 (8)	06:21 19:34	05:41 20:05	05:24 20:29
15	07:19 16:52		06:52 17:30	07:47 (10) 16:57 (8)	06:10 18:02	15:45 (8) 16:48 (8)	06:19 19:35	05:40 20:06	05:24 20:29
16	07:19 16:53	07:40 (10)	06:51 17:31	07:48 (10) 16:59 (8)	06:08 18:03	15:47 (8) 16:47 (8)	06:17 19:36	05:39 20:07	05:24 20:30
17	07:18 16:54	07:41 (10)	06:49 17:32	07:49 (10) 16:52 (8)	06:06 18:04	15:47 (8) 16:45 (8)	06:16 19:37	05:38 20:08	05:24 20:30
18	07:18 16:56	07:42 (10)	06:48 17:33	07:50 (10) 16:54 (8)	06:05 18:05	15:48 (8) 16:43 (8)	06:14 19:38	05:37 20:09	05:24 20:31
19	07:17 16:57	07:43 (10)	06:47 17:35	07:51 (10) 16:56 (8)	06:03 18:06	15:51 (8) 16:42 (8)	06:13 19:39	05:36 20:10	05:24 20:31
20	07:17 16:58	07:44 (10)	06:45 17:36	07:52 (10) 16:58 (8)	06:01 18:07	15:52 (8) 16:40 (8)	06:11 19:40	05:35 20:11	05:24 20:31
21	07:16 16:59	07:45 (10)	06:44 17:37	07:53 (10) 16:59 (8)	06:00 18:09	15:54 (8) 16:37 (8)	06:10 19:41	05:34 20:12	05:24 20:31
22	07:16 17:00	07:46 (10)	06:42 17:38	07:54 (10) 16:59 (8)	05:58 18:10	15:57 (8) 16:35 (8)	06:08 19:42	05:34 20:13	05:25 20:32
23	07:15 17:01	07:47 (10)	06:41 17:39	07:55 (10) 16:59 (8)	05:56 18:11	15:59 (8) 16:32 (8)	06:07 19:43	05:33 20:14	05:25 20:32
24	07:14 17:03	07:48 (10)	06:40 17:41	07:56 (10) 16:59 (8)	05:55 18:12	16:02 (8) 16:28 (8)	06:06 19:44	05:32 20:15	05:25 20:32
25	07:14 17:04	07:49 (10)	06:38 17:42	07:57 (10) 16:59 (8)	05:53 18:13	16:08 (8) 16:23 (8)	06:04 19:46	05:31 20:15	05:25 20:32
26	07:13 17:05	07:50 (10)	06:37 17:43	07:58 (10) 16:59 (8)	05:51 18:14		06:03 19:47	05:31 20:16	05:26 20:32
27	07:12 17:06	07:51 (10)	06:35 17:44	07:59 (10) 16:59 (8)	05:50 18:15		06:01 19:48	05:30 20:17	05:26 20:32
28	07:11 17:08	07:52 (10)	06:34 17:45	08:00 (10) 16:59 (8)	05:48 18:16		06:00 19:49	05:29 20:18	05:26 20:32
29	07:10 17:09	07:53 (10)	06:33 17:46	08:01 (10)	05:46		05:59	05:29	05:27
30	07:10 17:10	07:54 (10)	06:32 17:47	08:02 (10)	05:45		19:50	20:19	20:32
31	07:09 17:11	07:55 (10)	06:31 17:48	08:03 (10)	05:44		05:57	05:28	05:27
Potential sun hours	298		297	369		398	448	452	
Total, worst case	247		1866	1537					

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

Shadow receptor: A - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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

	July	August	September	October	November	December		
1	05:28 20:32	05:52 20:13	06:22 19:30	06:52 18:40	16:22 (8) 17:31 (8)	06:26 16:19 (8)	15:17 (8) 16:29	
2	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	16:21 (8) 17:31 (8)	06:27 16:52	15:19 (8) 16:29	
3	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	16:20 (8) 17:32 (8)	06:28 16:51	15:20 (8) 16:29	
4	05:29 20:32	05:54 20:10	06:25 19:26	06:55 18:35	16:18 (8) 17:32 (8)	06:29 16:50	15:21 (8) 16:29	
5	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	16:17 (8) 17:32 (8)	06:31 16:49	15:23 (8) 16:28	
6	05:30 20:31	05:56 20:08	06:27 19:22	06:57 18:32	16:16 (8) 17:32 (8)	06:32 16:48	15:25 (8) 16:28	
7	05:31 20:31	05:57 20:06	06:28 19:21	06:58 18:30	16:15 (8) 17:32 (8)	06:33 16:47	15:27 (8) 16:28	
8	05:32 20:31	05:58 20:05	06:29 19:19	06:59 18:29	16:14 (8) 17:32 (8)	06:34 16:46	15:29 (8) 16:28	
9	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	16:13 (8) 17:32 (8)	06:35 16:44	07:03 (10) 16:28	08:46 (9) 10 08:56 (9)
10	05:33 20:30	06:00 20:03	06:31 19:16	07:01 18:25	16:13 (8) 17:32 (8)	06:37 16:43	07:02 (10) 16:28	07:09 13 08:58 (9)
11	05:34 20:29	06:01 20:01	06:32 19:14	07:02 18:24	16:13 (8) 17:33 (8)	06:38 16:42	07:01 (10) 16:28	07:10 16 09:00 (9)
12	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	16:12 (8) 17:32 (8)	06:39 16:41	07:01 (10) 15:57 (8)	07:11 19 09:01 (9)
13	05:35 20:28	06:03 19:59	06:34 19:11	07:04 18:21	16:12 (8) 17:32 (8)	06:40 16:41	07:03 (10) 07:19 (10)	07:12 21 09:03 (9)
14	05:36 20:28	06:04 19:57	06:35 19:09	07:06 18:19	16:11 (8) 17:32 (8)	06:41 16:40	07:04 (10) 07:19 (10)	07:12 22 09:04 (9)
15	05:37 20:27	06:05 19:56	06:36 19:07	07:07 18:17	16:11 (8) 17:31 (8)	06:42 16:39	07:05 (10) 07:20 (10)	07:13 23 09:05 (9)
16	05:37 20:27	06:06 19:55	06:37 19:05	07:08 18:16	16:11 (8) 17:31 (8)	06:44 16:38	07:06 (10) 07:20 (10)	07:14 24 09:06 (9)
17	05:38 20:26	06:07 19:53	06:38 19:04	07:09 18:14	16:10 (8) 17:30 (8)	06:45 16:37	07:08 (10) 07:21 (10)	07:15 25 09:07 (9)
18	05:39 20:26	06:08 19:52	06:39 19:02	07:10 17:08 (8)	16:10 (8) 17:30 (8)	06:46 16:36	07:09 (10) 07:21 (10)	07:15 25 09:08 (9)
19	05:40 20:25	06:09 19:50	06:40 19:00	07:11 17:14 (8)	16:11 (8) 17:30 (8)	06:47 16:36	07:10 (10) 07:21 (10)	07:16 26 09:08 (9)
20	05:41 20:24	06:10 19:49	06:41 18:59	07:12 17:17 (8)	16:11 (8) 17:30 (8)	06:48 16:35	07:11 (10) 07:20 (10)	07:16 26 09:09 (9)
21	05:41 20:23	06:11 19:47	06:42 18:57	07:13 17:20 (8)	16:11 (8) 17:29 (8)	06:49 16:34	07:13 (10) 07:21 (10)	07:17 26 09:09 (9)
22	05:42 20:23	06:12 19:46	06:43 18:55	07:14 17:22 (8)	16:11 (8) 17:28 (8)	06:51 16:34	07:14 (10) 07:21 (10)	07:18 26 09:10 (9)
23	05:43 20:22	06:13 19:44	06:44 18:54	07:15 17:24 (8)	16:11 (8) 17:27 (8)	06:52 16:33	07:15 (10) 07:20 (10)	07:18 26 09:10 (9)
24	05:44 20:21	06:14 19:43	06:45 18:52	07:17 17:25 (8)	16:12 (8) 17:27 (8)	06:53 16:32	07:16 (10) 07:20 (10)	07:18 26 09:11 (9)
25	05:45 20:20	06:15 19:41	06:46 18:50	07:18 17:26 (8)	16:12 (8) 16:26 (8)	06:54 16:32	07:17 (10) 07:19 (10)	07:19 25 09:11 (9)
26	05:46 20:19	06:16 19:40	06:47 18:48	07:19 17:27 (8)	15:13 (8) 16:25 (8)	06:55 16:31	07:19 (10) 07:20 (10)	07:19 25 09:11 (9)
27	05:47 20:18	06:17 19:38	06:48 18:47	07:20 17:28 (8)	15:13 (8) 16:24 (8)	06:56 16:31	07:20 (10) 16:34	07:20 24 09:12 (9)
28	05:48 20:17	06:18 19:37	06:49 18:45	07:21 17:29 (8)	15:14 (8) 16:23 (8)	06:57 16:30	07:20 (10) 16:35	07:20 23 09:11 (9)
29	05:49 20:16	06:19 19:35	06:50 18:43	07:22 17:30 (8)	15:15 (8) 16:23 (8)	06:58 16:30	07:20 (10) 16:36	07:20 22 09:11 (9)
30	05:50 20:15	06:20 19:34	06:51 18:42	07:24 17:30 (8)	15:16 (8) 16:22 (8)	07:00 16:30	07:21 (10) 16:37	07:21 21 09:11 (9)
31	05:51 20:14	06:21 19:32		07:25 16:55	15:17 (8) 16:21 (8)		07:21 (10) 16:37	07:21 19 09:10 (9)
Potential sun hours	459	428	375	345	298	288	513	
Total, worst case			604	2338	711		513	

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

Shadow receptor: B - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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	July	August	September	October	November	December
1	07:21 16:38	07:08 17:13	06:32 17:46	06:42 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:52 20:13	06:22 19:30	06:52 18:40	06:26 16:54	07:01 16:29
2	07:21 16:39	07:07 17:14	06:31 17:48	06:40 19:21	05:55 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:02 16:29
3	07:21 16:40	07:06 17:15	06:29 17:49	06:38 19:22	05:53 19:54	05:26 20:23	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:03 16:29
4	07:21 16:41	07:05 17:16	06:27 17:50	06:37 19:23	05:52 19:55	05:26 20:23	05:29 20:32	05:54 20:10	06:25 19:26	06:55 18:35	06:29 16:50	07:04 16:29
5	07:21 16:42	07:04 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:26 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:31 16:49	07:05 16:29
6	07:21 16:43	07:03 17:19	06:24 17:52	06:33 19:25	05:50 19:57	05:25 20:25	05:30 20:31	05:56 20:08	06:27 19:22	06:57 18:32	06:32 16:48	07:06 16:28
7	07:21 16:44	07:02 17:20	06:23 17:53	06:32 19:27	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:21	06:58 18:30	06:33 16:47	07:06 16:28
8	07:21 16:45	07:00 17:21	06:21 17:54	06:30 19:28	05:47 19:59	05:25 20:26	05:32 20:31	05:58 20:05	06:29 19:19	06:59 18:29	06:34 16:46	07:07 16:28
9	07:21 16:46	06:59 17:22	06:20 17:55	06:28 19:29	05:46 20:00	05:25 20:27	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:44	07:08 16:28
10	07:21 16:47	06:58 17:24	06:18 17:57	06:27 19:30	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:03	06:31 19:16	07:01 18:25	06:37 16:43	07:09 16:28
11	07:21 16:48	06:57 17:25	06:16 17:58	06:25 19:31	05:44 20:02	05:24 20:28	05:34 20:29	06:01 20:01	06:32 19:14	07:02 18:24	06:38 16:42	07:10 16:28
12	07:20 16:49	06:56 17:26	06:15 17:59	06:24 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:42	07:11 16:28
13	07:20 16:50	06:54 17:27	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:29	05:35 20:28	06:03 19:59	06:34 19:11	07:04 18:21	06:40 16:41	07:12 16:29
14	07:20 16:51	06:53 17:29	06:11 18:01	06:21 19:34	05:41 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:06 18:19	06:41 16:40	07:12 16:29
15	07:19 16:52	06:52 17:30	06:10 18:02	06:20 19:35	05:40 20:06	05:24 20:29	05:37 20:27	06:05 19:56	06:36 19:07	07:07 18:17	06:42 16:39	07:13 16:29
16	07:19 16:53	06:51 17:31	06:08 18:03	06:19 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:55	06:37 19:05	07:07 (10) 07:14 (10)	07:08 18:16	06:44 16:38
17	07:18 16:54	06:49 17:32	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:04	07:05 (10) 07:16 (10)	07:09 18:14	06:45 16:37
18	07:18 16:56	06:48 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:31	05:39 20:26	06:08 19:52	06:39 19:02	07:03 (10) 07:17 (10)	07:10 18:13	06:46 16:36
19	07:17 16:57	06:47 17:35	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:17 (10) 07:17 (10)	07:11 18:11	06:47 16:36
20	07:17 16:58	06:45 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:41 20:24	06:10 19:49	06:41 18:59	07:01 (10) 07:18 (10)	07:12 18:10	06:48 16:35
21	07:16 16:59	06:44 17:37	06:00 18:09	06:10 19:41	05:34 20:12	05:24 20:31	05:42 20:23	06:11 19:47	06:42 18:57	07:02 (10) 07:18 (10)	07:13 18:08	06:49 16:34
22	07:16 17:00	06:42 17:38	05:58 18:10	06:08 19:42	05:34 20:13	05:25 20:32	05:42 20:23	06:12 19:46	06:43 18:55	07:03 (10) 07:18 (10)	07:14 18:07	06:51 16:34
23	07:15 17:01	06:41 17:39	05:56 18:11	06:07 19:43	05:33 20:14	05:25 20:32	05:43 20:22	06:13 19:44	06:44 18:54	07:04 (10) 07:17 (10)	07:15 18:06	06:52 16:33
24	07:14 17:03	06:39 17:41	05:55 18:12	06:06 19:44	05:32 20:15	05:25 20:32	05:44 20:21	06:14 19:43	06:45 18:52	07:05 (10) 07:17 (10)	07:17 18:04	06:53 16:32
25	07:14 17:04	06:38 17:42	05:53 18:13	06:04 19:46	05:31 20:15	05:25 20:32	05:45 20:20	06:15 19:41	06:46 18:50	07:06 (10) 07:16 (10)	06:18 17:03	06:54 16:32
26	07:13 17:05	06:37 17:43	05:51 18:14	06:03 19:47	05:31 20:16	05:26 20:32	05:46 20:19	06:16 19:40	06:47 18:48	07:07 (10) 07:15 (10)	06:19 17:01	06:55 16:31
27	07:12 17:06	06:35 17:44	05:50 18:15	06:01 19:48	05:30 20:17	05:26 20:32	05:47 20:18	06:17 19:38	06:48 18:47	07:08 (10) 07:13 (10)	06:20 17:00	06:56 16:31
28	07:11 17:08	06:34 17:45	05:48 18:16	06:00 19:49	05:29 20:18	05:26 20:32	05:48 20:17	06:18 19:37	06:49 18:45	07:09 (10) 07:11 (10)	06:21 16:59	06:57 16:30
29	07:10 17:09		06:46 19:17	05:59 19:50	05:29 20:19	05:27 20:32	05:49 20:16	06:19 19:35	06:50 18:43	06:22 16:57	06:58 16:30	07:20 16:36
30	07:10 17:10		06:45 19:18	05:57 19:51	05:28 20:20	05:27 20:32	05:50 20:15	06:20 19:34	06:51 18:42	06:24 16:56	06:59 16:30	07:20 16:37
31	07:09 17:11		06:43 19:19		05:28 20:20		05:51 20:14	06:21 19:32		06:25 16:55		07:21 16:37
Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Total, worst case			144						147			

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

Shadow receptor: C - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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	July	August	September	October	November	December
1	07:21 16:38	07:08 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53	07:00 16:29
2	07:21 16:39	07:07 17:14	06:30 17:47	06:40 19:21	05:54 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:01 16:29
3	07:21 16:40	07:06 17:15	06:29 17:49	06:38 19:22	05:53 19:54	05:26 20:23	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:02 16:29
4	07:21 16:41	07:05 17:16	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23	05:29 20:32	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	07:03 16:28
5	07:21 16:42	07:04 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:25 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:30 16:49	07:04 16:28
6	07:21 16:43	07:03 17:19	06:24 17:52	06:33 19:25	05:49 19:57	05:25 20:25	05:30 20:31	05:56 20:07	06:27 19:22	06:57 18:32	06:32 16:48	07:05 16:28
7	07:21 16:44	07:01 17:20	06:23 17:53	06:32 19:26	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:20	06:58 18:30	06:33 16:46	07:06 16:28
8	07:21 16:45	07:00 17:21	06:21 17:54	06:30 19:27	05:47 19:59	05:25 20:26	05:31 20:30	05:58 20:05	06:29 19:19	06:59 18:28	06:34 16:45	07:07 16:28
9	07:21 16:46	06:59 17:22	06:19 17:55	06:28 19:29	05:46 20:00	05:24 20:26	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:44	07:08 16:28
10	07:21 16:47	06:58 17:24	06:18 17:56	06:27 19:30	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:03	06:31 19:15	07:01 18:25	06:36 16:43	07:09 16:28
11	07:20 16:48	06:57 17:25	06:16 17:58	06:25 19:31	05:44 20:02	05:24 20:28	05:33 20:29	06:01 20:01	06:32 19:14	07:02 18:24	06:38 16:42	07:10 16:28
12	07:20 16:49	06:56 17:26	06:14 17:59	06:23 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:41	07:11 16:28
13	07:20 16:50	06:54 17:27	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:28	05:35 20:28	06:03 19:59	06:34 19:10	07:04 18:20	06:40 16:40	07:12 16:28
14	07:20 16:51	06:53 17:28	06:11 18:01	06:20 19:34	05:41 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:05 18:19	06:41 16:39	07:12 16:29
15	07:19 16:52	06:52 17:30	06:10 18:02	06:19 19:35	05:40 20:06	05:24 20:29	05:36 20:27	06:05 19:56	06:36 19:07	07:06 18:17	06:42 16:39	07:13 16:29
16	07:19 16:53	06:50 17:31	06:08 18:03	06:17 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:54	06:37 19:05	07:08 18:16	06:43 16:38	07:14 16:29
17	07:18 16:54	06:49 17:32	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:04	07:09 18:14	06:45 16:37	07:14 16:29
18	07:18 16:55	06:48 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:30	05:39 20:25	06:08 19:52	06:39 19:02	07:10 18:13	06:46 16:36	07:15 16:30
19	07:17 16:57	06:46 17:34	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:11 18:11	06:47 16:35	07:16 16:30
20	07:17 16:58	06:45 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:40 20:24	06:10 19:49	06:41 18:58	07:12 18:10	06:48 16:35	07:16 16:30
21	07:16 16:59	06:44 17:37	06:00 18:08	06:10 19:41	05:34 20:12	05:24 20:31	05:41 20:23	06:11 19:47	06:42 18:57	07:13 18:08	06:49 16:34	07:17 16:31
22	07:16 17:00	06:42 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:32	05:42 20:22	06:12 19:46	06:43 18:55	07:14 18:07	06:50 16:33	07:17 16:31
23	07:15 17:01	06:41 17:39	05:56 18:11	06:07 19:43	05:33 20:14	05:25 20:32	05:43 20:22	06:13 19:44	06:44 18:53	07:15 18:05	06:52 16:33	07:18 16:32
24	07:14 17:02	06:39 17:40	05:55 18:12	06:05 19:44	05:32 20:14	05:25 20:32	05:44 20:21	06:14 19:43	06:45 18:52	07:16 18:04	06:53 16:32	07:18 16:32
25	07:14 17:04	06:38 17:42	05:53 18:13	06:04 19:45	05:31 20:15	05:25 20:32	05:45 20:20	06:15 19:41	06:46 18:50	06:18 17:03	06:54 16:32	07:19 16:33
26	07:13 17:05	06:36 17:43	05:51 18:14	06:03 19:46	05:30 20:16	05:26 20:32	05:46 20:19	06:16 19:40	06:47 18:48	06:19 17:01	06:55 16:31	07:19 16:34
27	07:12 17:06	06:35 17:44	05:50 18:15	06:01 19:48	05:30 20:17	05:26 20:32	05:47 20:18	06:17 19:38	06:48 18:47	06:20 17:00	06:56 16:31	07:20 16:34
28	07:11 17:07	06:33 17:45	05:48 18:16	06:00 19:49	05:29 20:18	05:26 20:32	05:48 20:17	06:18 19:37	06:49 18:45	06:21 16:59	06:57 16:30	07:20 16:35
29	07:10 17:09		06:46 19:17	05:58 19:50	05:29 20:19	05:27 20:32	05:48 20:16	06:19 19:35	06:50 18:43	06:22 16:57	06:58 16:30	07:20 16:36
30	07:09 17:10		06:45 19:18	05:57 19:51	05:28 20:20	05:27 20:32	05:49 20:15	06:20 19:33	06:51 18:42	06:23 16:56	06:59 16:30	07:20 16:36
31	07:09 17:11		06:43 19:19		05:28 20:20		05:50 20:14	06:21 19:32		06:25 16:55		07:21 16:37
Potential sun hours Total, worst case	298	297	369	398	448	452	459	428	375	345	298	288

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

Shadow receptor: D - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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	07:21 16:38	07:08 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53	07:00 16:29
2	07:21 16:39	07:07 17:14	06:30 17:47	06:40 19:21	05:54 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:01 16:29
3	07:21 16:40	07:06 17:15	06:29 17:49	06:38 19:22	05:53 19:54	05:26 20:23	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:02 16:29
4	07:21 16:41	07:05 17:16	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23	05:29 20:32	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	07:03 16:28
5	07:21 16:42	07:04 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:25 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:30 16:49	07:04 16:28
6	07:21 16:43	07:03 17:19	06:24 17:52	06:33 19:25	05:49 19:57	05:25 20:25	05:30 20:31	05:56 20:07	06:27 19:22	06:57 18:32	06:32 16:48	07:05 16:28
7	07:21 16:44	07:01 17:20	06:23 17:53	06:32 19:26	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:20	06:58 18:30	06:33 16:46	07:06 16:28
8	07:21 16:45	07:00 17:21	06:21 17:54	06:30 19:27	05:47 19:59	05:25 20:26	05:31 20:30	05:58 20:05	06:29 19:19	06:59 18:28	06:34 16:45	07:07 16:28
9	07:21 16:46	06:59 17:22	06:19 17:55	06:28 19:29	05:46 20:00	05:24 20:26	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:44	07:08 16:28
10	07:21 16:47	06:58 17:24	06:18 17:56	06:27 19:30	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:03	06:31 19:15	07:01 18:25	06:36 16:43	07:09 16:28
11	07:20 16:48	06:57 17:25	06:16 17:58	06:25 19:31	05:44 20:02	05:24 20:28	05:33 20:29	06:01 20:01	06:32 19:14	07:02 18:24	06:38 16:42	07:10 16:28
12	07:20 16:49	06:56 17:26	06:14 17:59	06:23 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:41	07:11 16:28
13	07:20 16:50	06:54 17:27	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:28	05:35 20:28	06:03 19:59	06:34 19:10	07:04 18:20	06:40 16:40	07:12 16:28
14	07:20 16:51	06:53 17:28	06:11 18:01	06:20 19:34	05:41 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:05 18:19	06:41 16:39	07:12 16:29
15	07:19 16:52	06:52 17:30	06:10 18:02	06:19 19:35	05:40 20:06	05:24 20:29	05:36 20:27	06:05 19:56	06:36 19:07	07:06 18:17	06:42 16:39	07:13 16:29
16	07:19 16:53	06:50 17:31	06:08 18:03	06:17 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:54	06:37 19:05	07:08 18:16	06:43 16:38	07:14 16:29
17	07:18 16:54	06:49 17:32	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:04	07:09 18:14	06:45 16:37	07:14 16:29
18	07:18 16:55	06:48 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:30	05:39 20:25	06:08 19:52	06:39 19:02	07:10 18:13	06:46 16:36	07:15 16:30
19	07:17 16:57	06:46 17:34	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:11 18:11	06:47 16:35	07:16 16:30
20	07:17 16:58	06:45 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:40 20:24	06:10 19:49	06:41 18:58	07:12 18:10	06:48 16:35	07:16 16:30
21	07:16 16:59	06:44 17:37	06:00 18:08	06:10 19:41	05:34 20:12	05:24 20:31	05:41 20:23	06:11 19:47	06:42 18:57	07:13 18:08	06:49 16:34	07:17 16:31
22	07:16 17:00	06:42 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:32	05:42 20:22	06:12 19:46	06:43 18:55	07:14 18:07	06:50 16:33	07:17 16:31
23	07:15 17:01	06:41 17:39	05:56 18:11	06:07 19:43	05:33 20:14	05:25 20:32	05:43 20:22	06:13 19:44	06:44 18:53	07:15 18:05	06:52 16:33	07:18 16:32
24	07:14 17:02	06:39 17:40	05:55 18:12	06:05 19:44	05:32 20:14	05:25 20:32	05:44 20:21	06:14 19:43	06:45 18:52	07:16 18:04	06:53 16:32	07:18 16:32
25	07:14 17:04	06:38 17:42	05:53 18:13	06:04 19:45	05:31 20:15	05:25 20:32	05:45 20:20	06:15 19:41	06:46 18:50	06:18 17:03	06:54 16:32	07:19 16:33
26	07:13 17:05	06:36 17:43	05:51 18:14	06:03 19:46	05:30 20:16	05:26 20:32	05:46 20:19	06:16 19:40	06:47 18:48	06:19 17:01	06:55 16:31	07:19 16:34
27	07:12 17:06	06:35 17:44	05:50 18:15	06:01 19:48	05:30 20:17	05:26 20:32	05:47 20:18	06:17 19:38	06:48 18:47	06:20 17:00	06:56 16:31	07:20 16:34
28	07:11 17:07	06:33 17:45	05:48 18:16	06:00 19:49	05:29 20:18	05:26 20:32	05:48 20:17	06:18 19:37	06:49 18:45	06:21 16:59	06:57 16:30	07:20 16:35
29	07:10 17:09		06:46 19:17	05:58 19:50	05:29 20:19	05:27 20:32	05:48 20:16	06:19 19:35	06:50 18:43	06:22 16:57	06:58 16:30	07:20 16:36
30	07:09 17:10		06:45 19:18	05:57 19:51	05:28 20:20	05:27 20:32	05:49 20:15	06:20 19:33	06:51 18:42	06:23 16:56	06:59 16:30	07:20 16:36
31	07:09 17:11		06:43 19:19		05:28 20:20		05:50 20:14	06:21 19:32		06:25 16:55		07:21 16:37
Potential sun hours Total, worst case	298	297	369	398	448	452	459	428	375	345	298	288

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

Shadow receptor: E - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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		
1	07:21	07:57 (10)	07:08	06:32	06:41	18:15 (8)	05:56	05:27
	16:38	98 14:45 (9)	17:12	17:46	19:20	28 18:43 (8)	19:52	20:21
2	07:21	07:57 (10)	07:07	06:30	06:40	18:15 (8)	05:55	05:27
	16:39	98 14:45 (9)	17:14	17:48	19:21	26 18:41 (8)	19:53	20:22
3	07:21	07:58 (10)	07:06	06:29	06:38	18:17 (8)	05:53	05:26
	16:40	97 14:46 (9)	17:15	17:49	19:22	22 18:39 (8)	19:54	20:23
4	07:21	07:59 (10)	07:05	06:27	06:37	18:18 (8)	05:52	05:26
	16:41	96 14:46 (9)	17:16	17:50	19:23	19 18:37 (8)	19:55	20:23
5	07:21	07:59 (10)	07:04	06:26	06:35	18:19 (8)	05:51	05:26
	16:42	95 14:46 (9)	17:17	17:51	19:24	15 18:34 (8)	19:56	20:24
6	07:21	08:00 (10)	07:03	06:24	06:33	18:23 (8)	05:50	05:25
	16:43	94 14:46 (9)	17:19	17:52	19:25	10 18:33 (8)	19:57	20:25
7	07:21	08:01 (10)	07:02	06:23	06:32		05:48	05:25
	16:44	92 14:46 (9)	17:20	17:53	19:27		19:58	20:25
8	07:21	08:02 (10)	07:00	06:21	06:30		05:47	05:25
	16:45	91 14:47 (9)	17:21	17:54	19:28		19:59	20:26
9	07:21	08:03 (10)	06:59	06:19	06:28		05:46	05:24
	16:46	89 14:47 (9)	17:22	17:55	19:29		20:00	20:26
10	07:21	08:03 (10)	06:58	06:18	06:27		05:45	05:24
	16:47	87 14:46 (9)	17:24	17:57	19:30		20:01	20:27
11	07:21	08:04 (10)	06:57	06:16	06:25		05:44	05:24
	16:48	85 14:46 (9)	17:25	17:58	19:31		20:02	20:28
12	07:20	08:06 (10)	06:56	06:15	06:24		05:43	05:24
	16:49	83 14:47 (9)	17:26	17:59	19:32		20:03	20:28
13	07:20	08:06 (10)	06:54	06:13	06:22		05:42	05:24
	16:50	80 14:46 (9)	17:27	18:00	19:33		20:04	20:29
14	07:20	08:08 (10)	06:53	06:11	06:20		05:41	05:24
	16:51	77 14:46 (9)	17:29	18:01	19:34		20:05	20:29
15	07:19	08:09 (10)	06:52	06:10	06:19		05:40	05:24
	16:52	73 14:45 (9)	17:30	18:02	19:35		20:06	20:29
16	07:19	08:11 (10)	06:51	06:08	06:17		05:39	05:24
	16:53	68 14:45 (9)	17:31	18:03	19:36		20:07	20:30
17	07:18	08:12 (10)	06:49	06:06	17:29 (8) 06:16		05:38	05:24
	16:54	63 14:44 (9)	17:32	18:04	9 17:38 (8) 19:37		20:08	20:30
18	07:18	08:16 (10)	06:48	06:05	17:24 (8) 06:14		05:37	05:24
	16:56	55 14:44 (9)	17:33	18:05	17 17:41 (8) 19:38		20:09	20:31
19	07:17	13:57 (9) 06:47	06:03	06:03	17:23 (8) 06:13		05:36	05:24
	16:57	46 14:43 (9) 17:35	17:35	18:06	21 17:44 (8) 19:39		20:10	20:31
20	07:17	13:59 (9) 06:45	06:01	06:01	17:20 (8) 06:11		05:35	05:24
	16:58	44 14:43 (9) 17:36	17:36	18:07	25 17:45 (8) 19:40		20:11	20:31
21	07:16	14:01 (9) 06:44	06:00	06:00	17:18 (8) 06:10		05:34	05:24
	16:59	40 14:41 (9) 17:37	17:37	18:09	27 17:45 (8) 19:41		20:12	20:31
22	07:16	14:03 (9) 06:42	06:42	06:42	17:18 (8) 06:08		05:34	05:25
	17:00	37 14:40 (9) 17:38	17:38	18:10	29 17:47 (8) 19:42		20:13	20:32
23	07:15	14:06 (9) 06:41	06:41	06:41	17:16 (8) 06:07		05:33	05:25
	17:01	33 14:39 (9) 17:39	17:39	18:11	31 17:47 (8) 19:43		20:14	20:32
24	07:14	14:09 (9) 06:39	06:39	06:39	17:15 (8) 06:05		05:32	05:25
	17:03	28 14:37 (9) 17:41	17:41	18:12	32 17:47 (8) 19:44		20:15	20:32
25	07:14	14:12 (9) 06:38	06:38	06:38	17:15 (8) 06:04		05:31	05:25
	17:04	22 14:34 (9) 17:42	17:42	18:13	33 17:48 (8) 19:46		20:15	20:32
26	07:13	14:17 (9) 06:37	06:37	06:37	17:14 (8) 06:03		05:31	05:26
	17:05	13 14:30 (9) 17:43	17:43	18:14	33 17:47 (8) 19:47		20:16	20:32
27	07:12	06:35	06:35	06:35	17:14 (8) 06:01		05:30	05:26
	17:06	17:44	17:44	18:15	32 17:46 (8) 19:48		20:17	20:32
28	07:11	06:34	06:34	06:34	17:14 (8) 06:00		05:29	05:26
	17:08	17:45	17:45	18:16	33 17:47 (8) 19:49		20:18	20:32
29	07:10	06:46	06:46	06:46	18:14 (8) 05:59		05:29	05:27
	17:09	19:17	19:17	19:17	32 18:46 (8) 19:50		20:19	20:32
30	07:10	06:45	06:45	06:45	18:14 (8) 05:57		05:28	05:27
	17:10	19:18	19:18	19:18	31 18:45 (8) 19:51		20:20	20:32
31	07:09	06:43	06:43	06:43	18:15 (8)		05:28	
	17:11	19:19	19:19	19:19	30 18:45 (8)		20:20	
Potential sun hours	298	297	369	415	398	120	448	452
Total, worst case	1784			415		120		

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

Shadow receptor: E - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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

	July	August	September	October	November	December			
1	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:54	07:01 16:29	07:46 (10) 14:28 (9)		
2	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:02 16:29	07:46 (10) 14:29 (9)		
3	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:03 16:29	07:46 (10) 14:30 (9)		
4	05:29 20:32	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	07:04 16:29	07:46 (10) 14:31 (9)		
5	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:31 16:49	07:05 16:28	07:46 (10) 14:32 (9)		
6	05:30 20:31	05:56 20:08	06:27 19:22	18:19 (8) 18:28 (8)	06:57 18:32	06:32 16:48	07:06 16:28	07:46 (10) 14:32 (9)	
7	05:31 20:31	05:57 20:06	06:28 19:21	18:14 (8) 18:29 (8)	06:58 18:30	06:33 16:47	07:06 16:28	07:46 (10) 14:33 (9)	
8	05:32 20:31	05:58 20:05	06:29 19:19	18:12 (8) 18:31 (8)	06:59 18:28	06:34 16:45	07:07 16:28	07:47 (10) 14:34 (9)	
9	05:32 20:30	05:59 20:04	06:30 19:17	18:10 (8) 18:32 (8)	07:00 18:27	06:35 16:44	07:08 16:28	07:47 (10) 14:35 (9)	
10	05:33 20:30	06:00 20:03	06:31 19:16	18:08 (8) 18:34 (8)	07:01 18:25	06:36 16:43	07:09 16:28	07:47 (10) 14:35 (9)	
11	05:34 20:29	06:01 20:01	06:32 19:14	18:07 (8) 18:35 (8)	07:02 18:24	06:38 16:42	07:10 16:28	07:48 (10) 14:36 (9)	
12	05:34 20:29	06:02 20:00	06:33 19:12	18:06 (8) 18:36 (8)	07:03 18:22	06:39 16:41	07:11 16:28	07:47 (10) 14:36 (9)	
13	05:35 20:28	06:03 19:59	06:34 19:10	18:05 (8) 18:36 (8)	07:04 18:21	06:40 16:41	07:12 16:29	07:48 (10) 14:37 (9)	
14	05:36 20:28	06:04 19:57	06:35 19:09	18:04 (8) 18:36 (8)	07:05 18:19	06:41 16:40	07:12 16:29	07:49 (10) 14:38 (9)	
15	05:37 20:27	06:05 19:56	06:36 19:07	18:04 (8) 18:36 (8)	07:07 18:17	06:42 16:39	07:13 16:29	07:49 (10) 14:38 (9)	
16	05:37 20:27	06:06 19:55	06:37 19:05	18:03 (8) 18:36 (8)	07:08 18:16	06:44 16:38	13:50 (9) 16:29	07:14 16:29	07:49 (10) 14:38 (9)
17	05:38 20:26	06:07 19:53	06:38 19:04	18:03 (8) 18:35 (8)	07:09 18:14	06:45 16:37	13:46 (9) 14:08 (9)	07:15 16:29	07:50 (10) 14:39 (9)
18	05:39 20:26	06:08 19:52	06:39 19:02	18:03 (8) 18:35 (8)	07:10 18:13	06:46 16:36	13:43 (9) 14:11 (9)	07:15 16:30	07:50 (10) 14:40 (9)
19	05:40 20:25	06:09 19:50	06:40 19:00	18:03 (8) 18:34 (8)	07:11 18:11	06:47 16:36	13:40 (9) 14:13 (9)	07:16 16:30	07:50 (10) 14:40 (9)
20	05:41 20:24	06:10 19:49	06:41 18:59	18:03 (8) 18:33 (8)	07:12 18:10	06:48 16:35	13:38 (9) 14:15 (9)	07:16 16:31	07:51 (10) 14:41 (9)
21	05:41 20:23	06:11 19:47	06:42 18:57	18:03 (8) 18:32 (8)	07:13 18:08	06:49 16:34	13:37 (9) 14:17 (9)	07:17 16:31	07:51 (10) 14:41 (9)
22	05:42 20:23	06:12 19:46	06:43 18:55	18:04 (8) 18:31 (8)	07:14 18:07	06:51 16:34	13:35 (9) 14:19 (9)	07:17 16:32	07:52 (10) 14:42 (9)
23	05:43 20:22	06:13 19:44	06:44 18:53	18:04 (8) 18:30 (8)	07:15 18:06	06:52 16:33	13:34 (9) 14:20 (9)	07:18 16:32	07:52 (10) 14:42 (9)
24	05:44 20:21	06:14 19:43	06:45 18:52	18:05 (8) 18:28 (8)	07:17 18:04	06:53 16:32	07:53 (10) 14:21 (9)	07:18 16:33	07:53 (10) 14:43 (9)
25	05:45 20:20	06:15 19:41	06:46 18:50	18:07 (8) 18:25 (8)	06:18 17:03	06:54 16:32	07:50 (10) 14:22 (9)	07:19 16:33	07:53 (10) 14:43 (9)
26	05:46 20:19	06:16 19:40	06:47 18:48	18:10 (8) 18:22 (8)	06:19 17:01	06:55 16:31	07:49 (10) 14:23 (9)	07:19 16:34	07:54 (10) 14:43 (9)
27	05:47 20:18	06:17 19:38	06:48 18:47	18:11 (8) 18:23 (8)	06:20 17:00	06:56 16:31	07:49 (10) 14:25 (9)	07:20 16:34	07:55 (10) 14:44 (9)
28	05:48 20:17	06:18 19:37	06:49 18:45	18:12 (8) 18:31 (8)	06:21 18:07	06:57 16:30	07:48 (10) 14:26 (9)	07:20 16:35	07:55 (10) 14:44 (9)
29	05:49 20:16	06:19 19:35	06:50 18:43	18:13 (8) 18:43 (8)	06:22 16:57	06:58 16:30	07:47 (10) 14:27 (9)	07:20 16:36	07:55 (10) 14:45 (9)
30	05:50 20:15	06:20 19:34	06:51 18:42	18:14 (8) 18:53 (8)	06:23 16:56	06:59 16:30	07:47 (10) 14:28 (9)	07:20 16:37	07:56 (10) 14:45 (9)
31	05:51 20:14	06:21 19:32		18:15 (8) 18:55 (8)	06:25 16:55			07:21 16:37	07:56 (10) 14:45 (9)
Potential sun hours	459	428	375	345	298	288			
Total, worst case			537		761		3040		

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

Shadow receptor: F - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (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	07:21 16:38	15:24 (7) 16:03 (7)	07:07 17:12	15:46 (7) 16:01 (7)	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:27 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53
2	07:21 16:39	15:24 (7) 16:03 (7)	07:07 17:13	15:51 (7) 15:57 (7)	06:30 17:47	06:40 19:21	05:54 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:28	06:53 18:38	06:27 16:52
3	07:21 16:40	15:25 (7) 16:04 (7)	07:06 17:15	15:57 (7) 17:15	06:29 17:48	06:38 19:22	05:53 19:54	05:26 20:22	05:28 20:32	05:53 20:11	06:24 19:27	06:54 18:36	06:28 16:51
4	07:21 16:41	15:25 (7) 16:04 (7)	07:05 17:16	15:57 (7) 17:16	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23	05:29 20:31	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50
5	07:21 16:42	15:25 (7) 16:05 (7)	07:03 17:17	15:57 (7) 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:25 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:30 16:49
6	07:21 16:43	15:26 (7) 16:06 (7)	07:02 17:18	15:57 (7) 17:18	06:24 17:52	06:33 19:25	05:49 19:57	05:25 20:24	05:30 20:31	05:56 20:07	06:27 19:22	06:57 18:31	06:31 16:47
7	07:21 16:44	15:26 (7) 16:06 (7)	07:01 17:20	15:57 (7) 17:20	06:22 17:53	06:31 19:26	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:20	06:58 18:30	06:33 16:46
8	07:21 16:45	15:27 (7) 16:07 (7)	07:00 17:21	15:57 (7) 17:21	06:21 17:54	06:30 19:27	05:47 19:59	05:24 20:26	05:31 20:30	05:58 20:05	06:29 19:19	06:59 18:28	06:34 16:45
9	07:21 16:46	15:27 (7) 16:07 (7)	06:59 17:22	15:57 (7) 17:22	06:19 17:55	06:28 19:28	05:46 20:00	05:24 20:26	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:44
10	07:20 16:47	15:27 (7) 16:08 (7)	06:58 17:23	15:57 (7) 17:23	06:18 17:56	06:27 19:29	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:02	06:31 19:15	07:01 18:25	06:36 16:43
11	07:20 16:48	15:28 (7) 16:08 (7)	06:57 17:25	15:57 (7) 17:25	06:16 17:57	06:25 19:30	05:44 20:02	05:24 20:27	05:33 20:29	06:01 20:01	06:32 19:14	07:02 18:23	06:37 16:42
12	07:20 16:49	15:27 (7) 16:08 (7)	06:55 17:26	15:57 (7) 17:26	06:14 17:58	06:23 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:41
13	07:20 16:50	15:28 (7) 16:09 (7)	06:54 17:27	15:57 (7) 17:27	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:28	05:35 20:28	06:03 19:58	06:34 19:10	07:04 18:20	06:40 16:40
14	07:19 16:51	15:29 (7) 16:10 (7)	06:53 17:28	15:57 (7) 17:28	06:11 18:01	06:20 19:34	05:40 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:05 18:19	06:41 16:39
15	07:19 16:52	15:29 (7) 16:09 (7)	06:52 17:30	15:57 (7) 17:30	06:09 18:02	06:19 19:35	05:39 20:06	05:24 20:29	05:36 20:27	06:05 19:56	06:36 19:07	07:06 18:17	06:42 16:38
16	07:19 16:53	15:30 (7) 16:10 (7)	06:50 17:31	15:57 (7) 17:31	06:08 18:03	06:17 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:54	06:37 19:05	07:07 18:16	06:43 16:38
17	07:18 16:54	15:30 (7) 16:10 (7)	06:49 17:32	15:57 (7) 17:32	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:03	07:08 18:14	06:45 16:37
18	07:18 16:55	15:31 (7) 16:11 (7)	06:48 17:33	15:57 (7) 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:30	05:39 20:25	06:08 19:52	06:39 19:02	07:10 18:13	06:46 16:36
19	07:17 16:56	15:31 (7) 16:10 (7)	06:46 17:34	15:57 (7) 17:34	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:11 18:11	06:47 16:35
20	07:17 16:58	15:31 (7) 16:10 (7)	06:45 17:36	15:57 (7) 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:40 20:24	06:10 19:49	06:41 18:58	07:12 18:10	06:48 16:35
21	07:16 16:59	15:32 (7) 16:11 (7)	06:44 17:37	15:57 (7) 17:37	06:00 18:08	06:10 19:41	05:34 20:12	05:24 20:31	05:41 20:23	06:11 19:47	06:42 18:57	07:13 18:08	06:49 16:34
22	07:15 17:00	15:33 (7) 16:10 (7)	06:42 17:38	15:57 (7) 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:31	05:42 20:22	06:12 19:46	06:42 18:55	07:14 18:07	06:50 16:33
23	07:15 17:01	15:33 (7) 16:10 (7)	06:41 17:39	15:57 (7) 17:39	05:56 18:10	06:07 19:43	05:33 20:13	05:25 20:32	05:43 20:22	06:13 19:44	06:43 18:53	07:15 18:05	06:51 16:33
24	07:14 17:02	15:34 (7) 16:10 (7)	06:39 17:40	15:57 (7) 17:40	05:55 18:11	06:05 19:44	05:32 20:14	05:25 20:32	05:44 20:21	06:14 19:43	06:44 18:52	07:16 18:04	06:53 16:32
25	07:13 17:04	15:36 (7) 16:10 (7)	06:38 17:41	15:57 (7) 17:41	05:53 18:13	06:04 19:45	05:31 20:15	05:25 20:32	05:45 20:20	06:15 19:41	06:45 18:50	07:17 18:02	06:54 16:32
26	07:13 17:05	15:36 (7) 16:09 (7)	06:36 17:43	15:57 (7) 17:43	05:51 18:14	06:02 19:46	05:30 20:16	05:25 20:32	05:46 20:19	06:16 19:40	06:47 18:48	07:19 18:01	06:55 16:31
27	07:12 17:06	15:37 (7) 16:08 (7)	06:35 17:44	15:57 (7) 17:44	05:50 18:15	06:01 19:47	05:30 20:17	05:26 20:32	05:47 20:18	06:17 19:38	06:48 18:46	07:20 18:00	06:56 16:31
28	07:11 17:07	15:39 (7) 16:07 (7)	06:33 17:45	15:57 (7) 17:45	05:48 18:16	06:00 19:48	05:29 20:18	05:26 20:32	05:47 20:17	06:18 19:36	06:49 18:45	07:21 18:00	06:57 16:30
29	07:10 17:09	15:40 (7) 16:06 (7)	06:32 17:46	15:57 (7) 17:46	05:46 18:16	05:58 19:49	05:29 20:19	05:27 20:32	05:48 20:16	06:19 19:35	06:50 18:43	07:22 18:00	06:58 16:30
30	07:09 17:10	15:42 (7) 16:05 (7)	06:31 17:47	15:57 (7) 17:47	05:45 18:17	05:57 19:51	05:28 20:19	05:27 20:32	05:49 20:15	06:20 19:33	06:51 18:41	07:23 18:00	06:59 16:29
31	07:08 17:11	15:44 (7) 16:04 (7)	06:30 17:48	15:57 (7) 17:48	05:43 18:18	05:57 19:52	05:27 20:20	05:26 20:32	05:50 20:14	06:21 19:32	06:52 18:40	07:24 18:00	07:00 16:28
Potential sun hours	298	297	297	297	297	297	297	297	297	297	297	297	297
Total, worst case	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142

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

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

Assumptions for shadow calculations

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

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

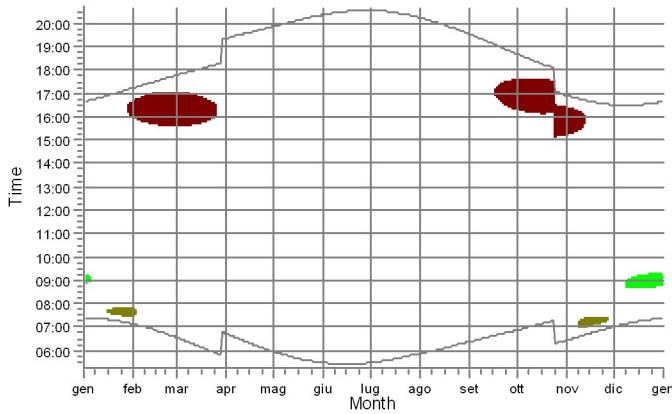
	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:21 16:38	07:07 17:12	16:01 (7) 16:41 (7)	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:27 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53	15:31 (7) 16:13 (7)
2	07:21 16:39	07:07 17:13	16:01 (7) 16:41 (7)	06:30 17:47	06:40 19:21	05:54 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:28	06:53 18:38	06:27 16:52	15:30 (7) 16:13 (7)
3	07:21 16:40	07:06 17:15	16:01 (7) 16:42 (7)	06:29 17:48	06:38 19:22	05:53 19:54	05:26 20:22	05:28 20:32	05:53 20:11	06:24 19:27	06:54 18:36	06:28 16:51	15:31 (7) 16:13 (7)
4	07:21 16:41	07:04 17:16	16:01 (7) 16:42 (7)	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23	05:29 20:31	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	15:31 (7) 16:13 (7)
5	07:21 16:42	07:03 17:17	16:01 (7) 16:43 (7)	06:26 17:51	06:35 19:24	05:51 19:56	05:25 20:24	05:30 20:31	05:55 20:08	06:26 19:24	06:56 18:33	06:30 16:49	15:30 (7) 16:13 (7)
6	07:21 16:43	07:02 17:18	16:01 (7) 16:43 (7)	06:24 17:52	06:33 19:25	05:49 19:57	05:25 20:24	05:30 20:31	05:56 20:07	06:27 19:22	06:57 18:31	06:31 16:47	15:30 (7) 16:13 (7)
7	07:21 16:44	07:01 17:20	16:01 (7) 16:43 (7)	06:22 17:53	06:31 19:26	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:20	06:58 18:30	06:33 16:46	15:31 (7) 16:13 (7)
8	07:21 16:45	07:00 17:21	16:01 (7) 16:44 (7)	06:21 17:54	06:30 19:27	05:47 19:59	05:24 20:26	05:31 20:30	05:58 20:05	06:29 19:19	06:59 18:28	06:34 16:45	15:32 (7) 16:13 (7)
9	07:21 16:46	06:59 17:22	16:01 (7) 16:44 (7)	06:19 17:55	06:28 19:28	05:46 20:00	05:24 20:26	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:44	15:32 (7) 16:12 (7)
10	07:20 16:47	06:58 17:23	16:01 (7) 16:43 (7)	06:18 17:56	06:27 19:29	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:02	06:31 19:15	07:01 18:25	06:36 16:43	15:32 (7) 16:11 (7)
11	07:20 16:48	06:57 17:25	16:02 (7) 16:43 (7)	06:16 17:57	06:25 19:30	05:44 20:02	05:24 20:27	05:33 20:29	06:01 20:01	06:32 19:14	07:02 18:23	06:37 16:42	15:33 (7) 16:12 (7)
12	07:20 16:49	06:55 17:26	16:02 (7) 16:43 (7)	06:14 17:58	06:23 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:41	15:34 (7) 16:11 (7)
13	07:20 16:50	06:54 17:27	16:03 (7) 16:43 (7)	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:28	05:35 20:28	06:03 19:58	06:34 19:10	07:04 18:20	06:40 16:40	15:34 (7) 16:10 (7)
14	07:19 16:51	06:53 17:28	16:03 (7) 16:42 (7)	06:11 18:01	06:20 19:34	05:40 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:05 18:19	06:41 16:39	15:36 (7) 16:10 (7)
15	07:19 16:52	06:52 17:30	16:04 (7) 16:41 (7)	06:09 18:02	06:19 19:35	05:39 20:06	05:24 20:29	05:36 20:27	06:05 19:56	06:36 19:07	07:06 18:17	06:42 16:38	15:37 (7) 16:09 (7)
16	07:19 16:53	06:50 17:31	16:05 (7) 16:41 (7)	06:08 18:03	06:17 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:54	06:37 19:05	07:07 18:16	06:43 16:38	15:38 (7) 16:08 (7)
17	07:18 16:54	06:49 17:32	16:06 (7) 16:39 (7)	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:03	07:08 18:14	06:45 16:37	15:39 (7) 16:07 (7)
18	07:18 16:55	06:48 17:33	16:07 (7) 16:38 (7)	06:04 18:05	06:14 19:38	05:37 20:09	05:24 20:30	05:39 20:25	06:08 19:52	06:39 19:02	07:10 18:13	06:46 16:36	15:41 (7) 16:07 (7)
19	07:17 16:56	06:46 17:34	16:09 (7) 16:37 (7)	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:11 18:11	06:47 16:35	15:42 (7) 16:05 (7)
20	07:17 16:58	16:14 (7) 16:22 (7)	06:45 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:40 20:24	06:10 19:49	06:41 18:58	07:12 18:10	16:45 (7) 16:35	15:44 (7) 16:04 (7)
21	07:16 16:59	16:11 (7) 16:26 (7)	06:44 17:37	06:00 18:08	06:10 19:41	05:34 20:12	05:24 20:31	05:41 20:23	06:11 19:47	06:42 18:57	07:13 18:08	16:43 (7) 16:34	15:46 (7) 16:01 (7)
22	07:15 17:00	16:09 (7) 16:29 (7)	06:42 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:31	05:42 20:22	06:12 19:46	06:42 18:55	07:14 18:07	16:40 (7) 16:33	15:50 (7) 15:58 (7)
23	07:15 17:01	16:07 (7) 16:30 (7)	06:41 17:39	05:56 18:10	06:07 19:43	05:33 20:13	05:25 20:32	05:43 20:22	06:13 19:44	06:43 18:53	07:15 18:05	16:38 (7) 16:28	15:51 (7) 16:03 (7)
24	07:14 17:02	16:07 (7) 16:33 (7)	06:39 17:40	05:55 18:11	06:05 19:44	05:32 20:14	05:25 20:32	05:44 20:21	06:14 19:43	06:44 18:52	07:16 18:04	16:36 (7) 16:28	15:52 (7) 16:32
25	07:13 17:04	16:06 (7) 16:34 (7)	06:38 17:41	05:53 18:13	06:04 19:45	05:31 20:15	05:25 20:32	05:45 20:20	06:15 19:41	06:45 18:50	06:17 17:02	16:35 (7) 16:28	15:53 (7) 16:32
26	07:13 17:05	16:05 (7) 16:35 (7)	06:36 17:43	05:51 18:14	06:02 19:46	05:30 20:16	05:25 20:32	05:46 20:19	06:16 19:40	06:47 18:48	06:19 17:01	16:34 (7) 16:28	15:54 (7) 16:31
27	07:12 17:06	16:04 (7) 16:36 (7)	06:35 17:44	05:50 18:15	06:01 19:47	05:30 20:17	05:26 20:32	05:47 20:18	06:17 19:38	06:48 18:46	06:20 17:00	16:33 (7) 16:28	15:55 (7) 16:31
28	07:11 17:07	16:03 (7) 16:37 (7)	06:33 17:45	05:48 18:16	06:00 19:48	05:29 20:18	05:26 20:32	05:47 20:17	06:18 19:36	06:49 18:45	06:21 16:58	16:32 (7) 16:28	15:56 (7) 16:30
29	07:10 17:09	16:02 (7) 16:38 (7)	06:32 17:45	05:46 18:17	05:58 19:49	05:29 20:19	05:27 20:32	05:48 20:16	06:19 19:35	06:50 18:43	06:22 16:57	16:31 (7) 16:28	15:57 (7) 16:30
30	07:09 17:10	16:02 (7) 16:39 (7)	06:31 17:45	05:45 18:18	05:57 19:51	05:28 20:19	05:27 20:32	05:49 20:15	06:20 19:33	06:51 18:41	06:23 16:56	16:30 (7) 16:28	15:58 (7) 16:31
31	07:08 17:11	16:01 (7) 16:40 (7)	06:30 17:45	05:44 18:19	05:56 20:20	05:27 20:20	05:26 20:32	05:50 20:14	06:21 19:32	06:24 16:55	06:24 16:55	16:29 (7) 16:28	15:59 (7) 16:32
Potential sun hours	298	297	297	369	398	448	452	459	428	375	345	391	298
Total, worst case	328	800										745	288

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

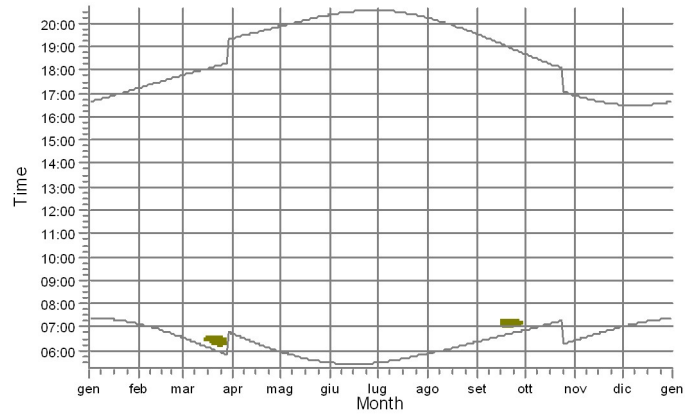
Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar, graphical

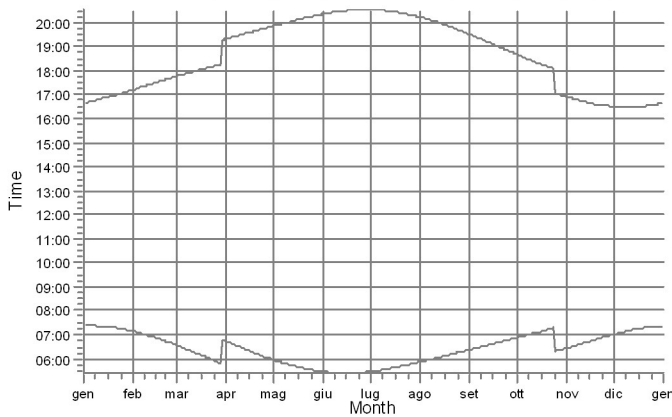
A: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (1)



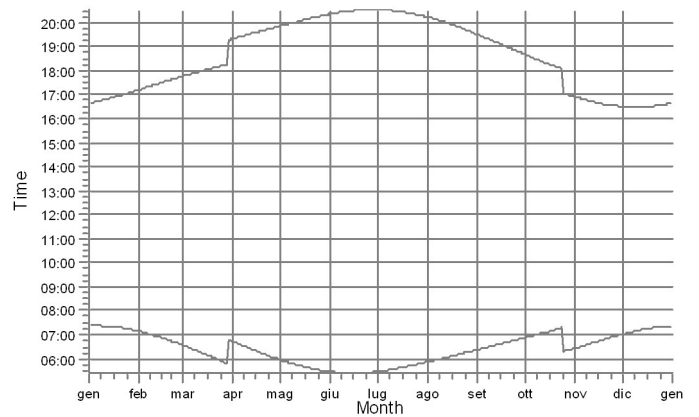
B: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (2)



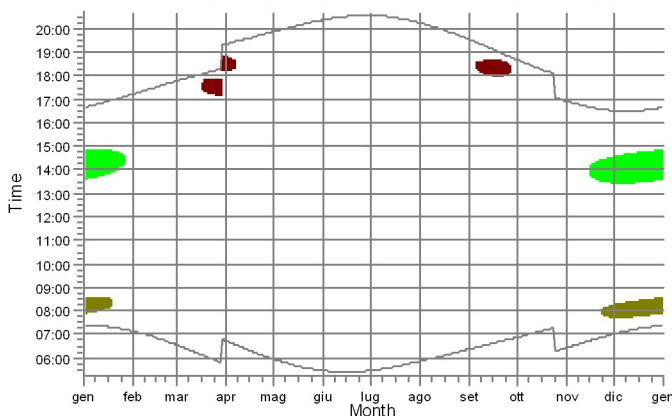
C: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (3)



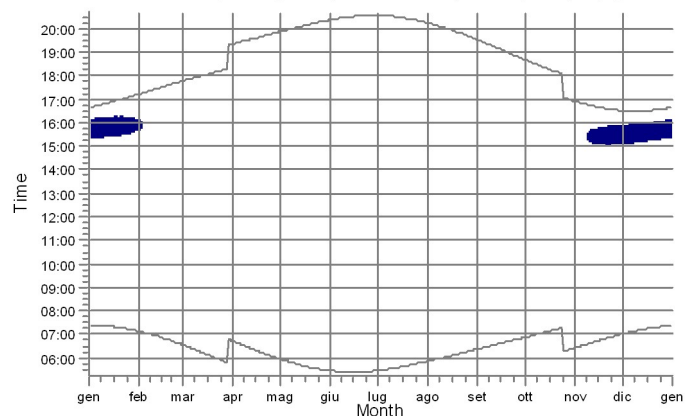
D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (4)



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



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

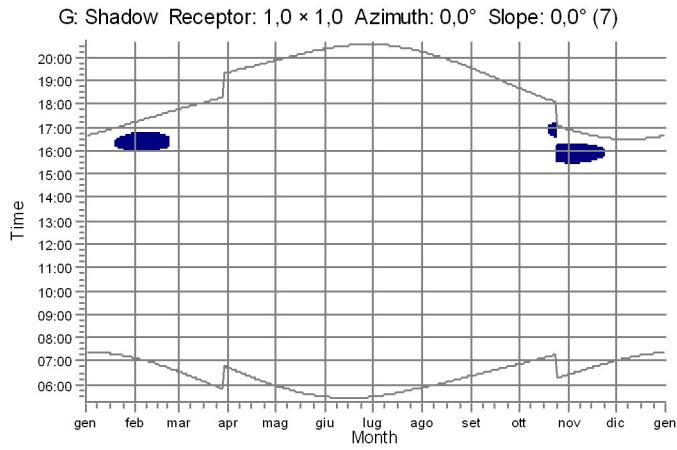


WTGs

7: VESTAS V150-4.0 4000 150.0 IO! hub: 123,0 m (TOT: 198,0 m) (9)
 8: VESTAS V150-4.0 4000 150.0 IO! hub: 123,0 m (TOT: 198,0 m) (1)

9: VESTAS V150-4.0 4000 150.0 IO! hub: 123,0 m (TOT: 198,0 m) (4)
 10: VESTAS V150-4.0 4000 150.0 IO! hub: 123,0 m (TOT: 198,0 m) (6)

SHADOW - Calendar, graphical



WTGs

7: VESTAS V150-4.0 4000 150.0 IO! hub: 123,0 m (TOT: 198,0 m) (9)

SHADOW - Calendar per WTG

WTG: 1 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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	07:21 16:38	07:08 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53	07:01 16:29
2	07:21 16:39	07:07 17:14	06:30 17:47	06:40 19:21	05:54 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:02 16:29
3	07:21 16:40	07:06 17:15	06:29 17:49	06:38 19:22	05:53 19:54	05:26 20:23	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:03 16:29
4	07:21 16:41	07:05 17:16	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23	05:29 20:32	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	07:04 16:29
5	07:21 16:42	07:04 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:25 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:31 16:49	07:05 16:28
6	07:21 16:43	07:03 17:19	06:24 17:52	06:33 19:25	05:50 19:57	05:25 20:25	05:30 20:31	05:56 20:08	06:27 19:22	06:57 18:32	06:32 16:48	07:06 16:28
7	07:21 16:44	07:02 17:20	06:23 17:53	06:32 19:26	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:20	06:58 18:30	06:33 16:46	07:06 16:28
8	07:21 16:45	07:00 17:21	06:21 17:54	06:30 19:28	05:47 19:59	05:25 20:26	05:32 20:31	05:58 20:05	06:29 19:19	06:59 18:28	06:34 16:45	07:07 16:28
9	07:21 16:46	06:59 17:22	06:19 17:55	06:28 19:29	05:46 20:00	05:24 20:27	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:44	07:08 16:28
10	07:21 16:47	06:58 17:24	06:18 17:56	06:27 19:30	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:03	06:31 19:15	07:01 18:25	06:36 16:43	07:09 16:28
11	07:21 16:48	06:57 17:25	06:16 17:58	06:25 19:31	05:44 20:02	05:24 20:28	05:34 20:29	06:01 20:01	06:32 19:14	07:02 18:24	06:38 16:42	07:10 16:28
12	07:20 16:49	06:56 17:26	06:15 17:59	06:24 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:41	07:11 16:28
13	07:20 16:50	06:54 17:27	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:29	05:35 20:28	06:03 19:59	06:34 19:10	07:04 18:20	06:40 16:40	07:12 16:28
14	07:20 16:51	06:53 17:28	06:11 18:01	06:20 19:34	05:41 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:05 18:19	06:41 16:40	07:12 16:29
15	07:19 16:52	06:52 17:30	06:10 18:02	06:19 19:35	05:40 20:06	05:24 20:29	05:36 20:27	06:05 19:56	06:36 19:07	07:06 18:17	06:42 16:39	07:13 16:29
16	07:19 16:53	06:51 17:31	06:08 18:03	06:17 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:55	06:37 19:05	07:08 18:16	06:44 16:38	07:14 16:29
17	07:18 16:54	06:49 17:32	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:04	07:09 18:14	06:45 16:37	07:15 16:29
18	07:18 16:55	06:48 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:31	05:39 20:26	06:08 19:52	06:39 19:02	07:10 18:13	06:46 16:36	07:15 16:30
19	07:17 16:57	06:47 17:35	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:11 18:11	06:47 16:35	07:16 16:30
20	07:17 16:58	06:45 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:40 20:24	06:10 19:49	06:41 18:59	07:12 18:10	06:48 16:35	07:16 16:30
21	07:16 16:59	06:44 17:37	06:00 18:08	06:10 19:41	05:34 20:12	05:24 20:31	05:41 20:23	06:11 19:47	06:42 18:57	07:13 18:08	06:49 16:34	07:17 16:31
22	07:16 17:00	06:42 17:38	05:58 18:10	06:08 19:42	05:33 20:13	05:24 20:32	05:42 20:23	06:12 19:46	06:43 18:55	07:14 18:07	06:51 16:33	07:17 16:31
23	07:15 17:01	06:41 17:39	05:56 18:11	06:07 19:43	05:33 20:14	05:25 20:32	05:43 20:22	06:13 19:44	06:44 18:53	07:15 18:05	06:52 16:33	07:18 16:32
24	07:14 17:03	06:39 17:40	05:55 18:12	06:05 19:44	05:32 20:15	05:25 20:32	05:44 20:21	06:14 19:43	06:45 18:52	07:16 18:04	06:53 16:32	07:18 16:32
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29	07:10 17:09		06:46 19:17	05:58 19:50	05:29 20:19	05:27 20:32	05:49 20:16	06:19 19:35	06:50 18:43	06:22 16:57	06:58 16:30	07:20 16:36
30	07:10 17:10		06:45 19:18	05:57 19:51	05:28 20:20	05:27 20:32	05:49 20:15	06:20 19:34	06:51 18:42	06:23 16:56	06:59 16:30	07:20 16:36
31	07:09 17:11		06:43 19:19		05:28 20:20		05:50 20:14	06:21 19:32		06:25 16:55		07:21 16:37
Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 2 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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	07:21 16:38	07:08 17:13	06:32 17:46	06:42 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:52 20:13	06:22 19:30	06:52 18:40	06:26 16:54	07:01 16:29
2	07:21 16:39	07:07 17:14	06:31 17:48	06:40 19:21	05:55 19:53	05:27 20:22	05:28 20:32	05:53 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:02 16:29
3	07:21 16:40	07:06 17:15	06:29 17:49	06:38 19:22	05:53 19:54	05:26 20:23	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:03 16:29
4	07:21 16:41	07:05 17:16	06:27 17:50	06:37 19:23	05:52 19:55	05:26 20:23	05:29 20:32	05:54 20:10	06:25 19:26	06:55 18:35	06:29 16:50	07:04 16:29
5	07:21 16:42	07:04 17:18	06:26 17:51	06:35 19:24	05:51 19:56	05:26 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:31 16:49	07:05 16:29
6	07:21 16:43	07:03 17:19	06:24 17:52	06:33 19:25	05:50 19:57	05:25 20:25	05:30 20:31	05:56 20:08	06:27 19:22	06:57 18:32	06:32 16:48	07:06 16:28
7	07:21 16:44	07:02 17:20	06:23 17:53	06:32 19:27	05:48 19:58	05:25 20:25	05:31 20:31	05:57 20:06	06:28 19:21	06:58 18:30	06:33 16:47	07:06 16:28
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9	07:21 16:46	06:59 17:22	06:20 17:55	06:28 19:29	05:46 20:00	05:25 20:27	05:32 20:30	05:59 20:04	06:30 19:17	07:00 18:27	06:35 16:45	07:08 16:28
10	07:21 16:47	06:58 17:24	06:18 17:57	06:27 19:30	05:45 20:01	05:24 20:27	05:33 20:30	06:00 20:03	06:31 19:16	07:01 18:25	06:37 16:43	07:09 16:28
11	07:21 16:48	06:57 17:25	06:16 17:58	06:25 19:31	05:44 20:02	05:24 20:28	05:34 20:29	06:01 20:01	06:32 19:14	07:02 18:24	06:38 16:42	07:10 16:28
12	07:20 16:49	06:56 17:26	06:15 17:59	06:24 19:32	05:43 20:03	05:24 20:28	05:34 20:29	06:02 20:00	06:33 19:12	07:03 18:22	06:39 16:42	07:11 16:28
13	07:20 16:50	06:54 17:27	06:13 18:00	06:22 19:33	05:42 20:04	05:24 20:29	05:35 20:28	06:03 19:59	06:34 19:11	07:04 18:21	06:40 16:41	07:12 16:29
14	07:20 16:51	06:53 17:29	06:11 18:01	06:21 19:34	05:41 20:05	05:24 20:29	05:36 20:28	06:04 19:57	06:35 19:09	07:06 18:19	06:41 16:40	07:12 16:29
15	07:19 16:52	06:52 17:30	06:10 18:02	06:19 19:35	05:40 20:06	05:24 20:29	05:37 20:27	06:05 19:56	06:36 19:07	07:07 18:17	06:42 16:39	07:13 16:29
16	07:19 16:53	06:51 17:31	06:08 18:03	06:17 19:36	05:39 20:07	05:24 20:30	05:37 20:27	06:06 19:55	06:37 19:05	07:08 18:16	06:44 16:38	07:14 16:29
17	07:18 16:54	06:49 17:32	06:06 18:04	06:16 19:37	05:38 20:08	05:24 20:30	05:38 20:26	06:07 19:53	06:38 19:04	07:09 18:14	06:45 16:37	07:15 16:30
18	07:18 16:56	06:48 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:31	05:39 20:26	06:08 19:52	06:39 19:02	07:10 18:13	06:46 16:36	07:15 16:30
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20	07:17 16:58	06:45 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:41 20:24	06:10 19:49	06:41 18:59	07:12 18:10	06:48 16:35	07:16 16:31
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31	07:09 17:11		06:43 19:19		05:28 20:20		05:51 20:14	06:21 19:32		06:25 16:55		07:21 16:37
Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 3 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:21 16:38	07:07 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:27 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53	07:00 16:29
2	07:21 16:39	07:07 17:13	06:30 17:47	06:40 19:21	05:54 19:53	05:26 20:22	05:28 20:32	05:52 20:12	06:23 19:28	06:53 18:38	06:27 16:52	07:01 16:29
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4	07:21 16:41	07:05 17:16	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23	05:29 20:31	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	07:03 16:28
5	07:21 16:42	07:03 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:25 20:24	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:30 16:49	07:04 16:28
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22	07:15 17:00	06:42 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:31	05:42 20:22	06:12 19:46	06:43 18:55	07:14 18:07	06:50 16:33	07:17 16:31
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31	07:08 17:11		06:43 19:19		05:27 20:20		05:50 20:14	06:21 19:32		06:24 16:55		07:20 16:37
Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 4 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 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	07:21 16:38	07:08 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:53	07:00 16:29
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22	07:16 17:00	06:42 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:31	05:42 20:22	06:12 19:46	06:43 18:55	07:14 18:07	06:50 16:33	07:17 16:31
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31	07:09 17:11		06:43 19:19		05:28 20:20		05:50 20:14	06:21 19:32		06:25 16:55		07:21 16:37
Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 5 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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	July	August	September	October	November	December
1	07:21 16:38	07:08 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:54	07:01 16:29
2	07:21 16:39	07:07 17:14	06:31 17:48	06:40 19:21	05:55 19:53	05:27 20:22	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:02 16:29
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Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 6 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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	July	August	September	October	November	December
1	07:21 16:38	07:08 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:54	07:01 16:29
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Potential sun hours	298	297	369	398	448	452	459	428	375	345	298	288
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 7 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 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	07:21 15:24-16:03/39 16:38	07:07 15:46-16:41/55 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 15:31-16:13/42 16:53	07:00 15:10-15:50/40 16:29	
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18	07:18 15:31-16:11/40 16:55	06:48 16:07-16:38/31 17:33	06:05 18:05	06:14 19:38	05:37 20:09	05:24 20:30	05:39 20:25	06:08 19:52	06:39 19:02	07:10 18:13	06:46 15:09-16:07/58 16:36	07:15 15:18-15:55/37 16:30	
19	07:17 15:31-16:10/39 16:57	06:46 16:09-16:37/28 17:34	06:03 18:06	06:13 19:39	05:36 20:10	05:24 20:31	05:40 20:25	06:09 19:50	06:40 19:00	07:11 18:11	06:47 15:08-16:05/57 16:35	07:16 15:19-15:56/37 16:30	
20	07:17 16:14-16:22/8 16:58	06:45 16:10-16:35/25 17:36	06:01 18:07	06:11 19:40	05:35 20:11	05:24 20:31	05:40 20:24	06:10 19:49	06:41 18:58	07:12 16:45-17:00/15 18:10	06:48 15:08-16:04/56 16:35	07:16 15:19-15:56/37 16:30	
21	07:16 15:32-16:26/54 16:59	06:44 16:13-16:33/20 17:37	06:00 18:08	06:10 19:41	05:34 20:12	05:24 20:31	05:41 20:23	06:11 19:47	06:42 18:57	07:13 16:43-17:04/21 18:08	06:49 15:07-16:01/54 16:34	07:17 15:20-15:57/37 16:31	
22	07:15 15:33-16:29/56 17:00	06:42 16:16-16:29/13 17:38	05:58 18:09	06:08 19:42	05:33 20:13	05:24 20:31	05:42 20:22	06:12 19:46	06:43 18:55	07:14 16:40-17:06/26 18:07	06:50 15:50-15:58/8 16:33	07:17 15:20-15:57/37 16:31	
23	07:15 15:33-16:30/57 17:01	06:41 17:39	05:56 18:10	06:07 19:43	05:33 20:13	05:25 20:32	05:43 20:22	06:13 19:44	06:44 18:53	07:15 16:38-17:07/29 18:05	06:52 15:08-15:47/39 16:33	07:18 15:21-15:58/37 16:32	
24	07:14 15:35-16:33/58 17:02	06:39 17:40	05:55 18:11	06:05 19:44	05:32 20:14	05:25 20:32	05:44 20:21	06:14 19:43	06:45 18:52	07:16 16:36-17:08/32 18:04	06:53 15:08-15:48/40 16:32	07:18 15:21-15:58/37 16:32	
25	07:13 15:36-16:34/58 17:04	06:38 17:42	05:53 18:13	06:04 19:45	05:31 20:15	05:25 20:32	05:45 20:20	06:15 19:41	06:46 18:50	07:17 15:35-16:09/34 17:03	06:54 15:08-15:48/40 16:32	07:19 15:22-15:59/37 16:33	
26	07:13 15:36-16:35/59 17:05	06:36 17:43	05:51 18:14	06:02 19:46	05:30 20:16	05:25 20:32	05:46 20:19	06:16 19:40	06:47 18:48	07:18 15:35-16:11/36 17:01	06:55 15:08-15:48/40 16:31	07:19 15:22-16:00/38 16:34	
27	07:12 15:37-16:36/59 17:06	06:35 17:44	05:50 18:15	06:01 19:47	05:30 20:17	05:26 20:32	05:47 20:18	06:17 19:38	06:48 18:46	07:19 15:34-16:11/37 17:00	06:56 15:08-15:48/40 16:31	07:19 15:22-16:00/38 16:34	
28	07:11 15:39-16:37/58 17:07	06:33 17:45	05:48 18:16	06:00 19:48	05:29 20:18	05:26 20:32	05:48 20:17	06:18 19:36	06:49 18:45	07:20 15:33-16:11/38 16:58	06:57 15:09-15:50/41 16:30	07:20 15:22-16:00/38 16:35	
29	07:10 15:40-16:38/58 17:09	06:46 17:58	05:58 18:17	06:05 19:49	05:29 20:19	05:27 20:32	05:48 20:16	06:19 19:35	06:50 18:43	07:21 15:32-16:12/40 16:57	06:58 15:09-15:50/41 16:30	07:20 15:23-16:01/38 16:36	
30	07:09 15:42-16:39/57 17:10	06:45 17:59	05:57 18:18	06:04 19:51	05:28 20:19	05:27 20:32	05:49 20:15	06:20 19:33	06:51 18:41	07:22 15:32-16:13/41 16:56	06:59 15:09-15:50/41 16:29	07:20 15:23-16:02/39 16:36	
31	07:08 15:44-16:40/56 17:11	06:43 17:59	05:56 18:19	06:03 19:51	05:27 20:20	05:27 20:32	05:50 20:14	06:21 19:32	06:24 16:55	07:23 15:31-16:13/42 16:57	07:20 15:24-16:02/38 16:37	07:20 15:24-16:02/38 16:37	
	Potential sun hours Sum of minutes with flicker	298 1437	297 821	369 0	398 0	448 0	452 0	459 0	428 0	375 0	345 391	298 1442	288 1194

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

WTG: 8 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 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	07:21 16:38	07:08 16:03-16:34/31 17:13	06:32 15:39-16:59/80 17:46	06:42 18:15-18:43/28 19:20	05:56 19:52	05:27 20:21
2	07:21 16:39	07:07 16:01-16:37/36 17:14	06:31 15:38-16:58/80 17:48	06:40 18:15-18:41/26 19:21	05:55 19:53	05:27 20:22
3	07:21 16:40	07:06 15:58-16:39/41 17:15	06:29 15:39-16:58/79 17:49	06:38 18:17-18:39/22 19:22	05:53 19:54	05:26 20:23
4	07:21 16:41	07:05 15:57-16:42/45 17:16	06:27 15:39-16:57/78 17:50	06:37 18:18-18:37/19 19:23	05:52 19:55	05:26 20:23
5	07:21 16:42	07:04 15:55-16:44/49 17:18	06:26 15:39-16:58/79 17:51	06:35 18:19-18:34/15 19:24	05:51 19:56	05:26 20:24
6	07:21 16:43	07:03 15:53-16:44/51 17:19	06:24 15:39-16:57/78 17:53	06:33 18:23-18:33/10 19:26	05:50 19:57	05:25 20:25
7	07:21 16:44	07:02 15:51-16:46/55 17:20	06:23 15:39-16:56/77 17:53	06:32 19:27	05:48 19:58	05:25 20:25
8	07:21 16:45	07:00 15:50-16:48/58 17:21	06:21 15:40-16:56/76 17:54	06:30 19:28	05:47 19:59	05:25 20:26
9	07:21 16:46	07:00 15:49-16:49/60 17:22	06:20 15:40-16:54/74 17:55	06:28 19:29	05:46 20:00	05:25 20:27
10	07:21 16:47	06:58 15:48-16:51/63 17:24	06:18 15:42-16:54/72 17:57	06:27 19:30	05:45 20:01	05:24 20:27
11	07:21 16:48	06:57 15:47-16:51/64 17:25	06:16 15:42-16:53/71 17:58	06:25 19:31	05:44 20:02	05:24 20:28
12	07:20 16:49	06:56 15:46-16:52/66 17:26	06:15 15:42-16:52/70 17:59	06:24 19:32	05:43 20:03	05:24 20:28
13	07:20 16:50	06:54 15:45-16:54/69 17:27	06:13 15:44-16:51/67 18:00	06:22 19:33	05:42 20:04	05:24 20:29
14	07:20 16:51	06:53 15:45-16:55/70 17:29	06:11 15:44-16:50/66 18:01	06:21 19:34	05:41 20:05	05:24 20:29
15	07:19 16:52	06:52 15:43-16:55/72 17:30	06:10 15:45-16:48/63 18:02	06:19 19:35	05:40 20:06	05:24 20:30
16	07:19 16:53	06:51 15:43-16:56/73 17:31	06:08 15:47-16:47/60 18:03	06:17 19:36	05:39 20:07	05:24 20:30
17	07:18 16:54	06:49 15:43-16:57/74 17:32	06:06 17:29-17:38/9 18:04	06:16 19:37	05:38 20:08	05:24 20:30
18	07:18 16:56	06:48 15:41-16:57/76 17:33	06:05 17:24-17:41/17 18:05	06:14 19:38	05:37 20:09	05:24 20:31
19	07:17 16:57	06:47 15:41-16:58/77 17:35	06:03 17:23-17:44/21 18:06	06:13 19:39	05:36 20:10	05:24 20:31
20	07:17 16:58	06:45 15:40-16:58/78 17:36	06:01 17:20-17:45/25 18:07	06:11 19:40	05:35 20:11	05:24 20:31
21	07:16 16:59	06:44 15:40-16:58/78 17:37	06:00 17:18-17:45/27 18:09	06:10 19:41	05:34 20:12	05:24 20:31
22	07:16 17:00	06:42 15:40-16:59/79 17:38	05:58 17:18-17:47/29 18:10	06:08 19:42	05:34 20:13	05:25 20:32
23	07:15 17:01	06:41 15:39-16:59/80 17:39	05:56 17:16-17:47/31 18:11	06:07 19:43	05:33 20:14	05:25 20:32
24	07:14 17:03	06:40 15:40-16:59/79 17:41	05:55 17:15-17:47/32 18:12	06:06 19:45	05:32 20:15	05:25 20:32
25	07:14 17:04	06:38 15:39-16:59/80 17:42	05:53 17:15-17:48/33 18:13	06:04 19:46	05:31 20:15	05:25 20:32
26	07:13 17:05	06:37 15:39-16:59/80 17:43	05:51 17:14-17:47/33 18:14	06:03 19:47	05:31 20:16	05:26 20:32
27	07:12 17:06	06:35 15:39-16:59/80 17:44	05:50 17:14-17:46/32 18:15	06:01 19:48	05:30 20:17	05:26 20:32
28	07:11 17:08	06:34 15:39-16:59/80 17:45	05:48 17:14-17:47/33 18:16	06:00 19:49	05:29 20:18	05:26 20:32
29	07:10 17:09		06:46 18:14-18:46/32 19:17	05:59 19:50	05:29 20:19	05:27 20:32
30	07:10 16:11-16:26/15 17:10		06:45 18:14-18:45/31 19:18	05:57 19:51	05:28 20:20	05:27 20:32
31	07:09 16:06-16:31/25 17:11		06:43 18:15-18:45/30 19:19		05:28 20:20	
Potential sun hours	298	297	369	398	448	452
Sum of minutes with flicker	40	1844	1952	120	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

WTG: 8 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 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	05:28 20:32	05:52 20:13	06:22 19:30	06:52 16:22-17:31/69 18:40	06:26 15:17-16:19/62 16:54	07:01 16:29
2	05:28 20:32	05:52 20:12	06:23 19:29	06:53 16:21-17:31/70 18:38	06:27 15:19-16:19/60 16:52	07:02 16:29
3	05:29 20:32	05:53 20:11	06:24 19:27	06:54 16:20-17:32/72 18:37	06:28 15:20-16:17/57 16:51	07:03 16:29
4	05:29 20:32	05:54 20:10	06:25 19:26	06:55 16:18-17:32/74 18:35	06:29 15:21-16:16/55 16:50	07:04 16:29
5	05:30 20:31	05:55 20:09	06:26 19:24	06:56 16:17-17:32/75 18:33	06:31 15:23-16:14/51 16:49	07:05 16:29
6	05:30 20:31	05:56 20:08	06:27 18:19-18:28/9 19:22	06:57 16:16-17:32/76 18:32	06:32 15:25-16:13/48 16:48	07:06 16:28
7	05:31 20:31	05:57 20:06	06:28 18:14-18:29/15 19:21	06:58 16:15-17:32/77 18:30	06:33 15:27-16:11/44 16:47	07:07 16:28
8	05:32 20:31	05:58 20:05	06:29 18:12-18:31/19 19:19	06:59 16:14-17:32/78 18:29	06:34 15:29-16:09/40 16:46	07:07 16:28
9	05:32 20:30	05:59 20:04	06:30 18:10-18:32/22 19:17	07:00 16:13-17:32/79 18:27	06:35 15:31-16:07/36 16:44	07:08 16:28
10	05:33 20:30	06:00 20:03	06:31 18:08-18:34/26 19:16	07:01 16:13-17:32/79 18:25	06:37 15:34-16:05/31 16:43	07:09 16:28
11	05:34 20:29	06:01 20:01	06:32 18:07-18:35/28 19:14	07:02 16:13-17:33/80 18:24	06:38 15:37-16:01/24 16:42	07:10 16:28
12	05:34 20:29	06:02 20:00	06:33 18:06-18:36/30 19:12	07:03 16:12-17:32/80 18:22	06:39 15:42-15:57/15 16:42	07:11 16:28
13	05:35 20:28	06:03 19:59	06:34 18:05-18:36/31 19:11	07:04 16:12-17:32/80 18:21	06:40 16:41	07:12 16:29
14	05:36 20:28	06:04 19:57	06:35 18:04-18:36/32 19:09	07:06 16:11-17:32/81 18:19	06:41 16:40	07:12 16:29
15	05:37 20:27	06:05 19:56	06:36 18:04-18:36/32 19:07	07:07 16:11-17:31/80 18:17	06:42 16:39	07:13 16:29
16	05:37 20:27	06:06 19:55	06:37 18:03-18:36/33 19:05	07:08 16:11-17:31/80 18:16	06:44 16:38	07:14 16:29
17	05:38 20:26	06:07 19:53	06:38 18:03-18:35/32 19:04	07:09 16:10-17:30/80 18:14	06:45 16:37	07:15 16:30
18	05:39 20:26	06:08 19:52	06:39 18:03-18:35/32 19:02	07:10 16:10-17:30/80 18:13	06:46 16:36	07:15 16:30
19	05:40 20:25	06:09 19:50	06:40 18:03-18:34/31 19:00	07:11 16:11-17:30/79 18:11	06:47 16:36	07:16 16:30
20	05:41 20:24	06:10 19:49	06:41 18:03-18:33/30 18:59	07:12 16:11-17:30/79 18:10	06:48 16:35	07:16 16:31
21	05:42 20:23	06:11 19:47	06:42 18:03-18:32/29 18:57	07:13 16:11-17:29/78 18:08	06:49 16:34	07:17 16:31
22	05:42 20:23	06:12 19:46	06:43 18:04-18:31/27 18:55	07:14 16:11-17:28/77 18:07	06:51 16:34	07:18 16:32
23	05:43 20:22	06:13 19:44	06:44 18:04-18:30/26 18:54	07:15 16:11-17:27/76 18:06	06:52 16:33	07:18 16:32
24	05:44 20:21	06:14 19:43	06:45 18:05-18:28/23 18:52	07:17 16:12-17:27/75 18:04	06:53 16:32	07:18 16:33
25	05:45 20:20	06:15 19:41	06:46 18:07-18:25/18 18:50	06:18 15:12-16:26/74 17:03	06:54 16:32	07:19 16:33
26	05:46 20:19	06:16 19:40	06:47 18:10-18:22/12 18:48	06:19 15:13-16:25/72 17:01	06:55 16:31	07:19 16:34
27	05:47 20:18	06:17 19:38	06:48 16:29-17:28/59 18:47	06:20 15:13-16:24/71 17:00	06:56 16:31	07:20 16:34
28	05:48 20:17	06:18 19:37	06:49 16:27-17:29/62 18:45	06:21 15:14-16:23/69 16:59	06:57 16:30	07:20 16:35
29	05:49 20:16	06:19 19:35	06:50 16:25-17:30/65 18:43	06:22 15:15-16:23/68 16:57	06:58 16:30	07:20 16:36
30	05:50 20:15	06:20 19:34	06:51 16:24-17:30/66 18:42	06:24 15:16-16:22/66 16:56	07:00 16:30	07:21 16:37
31	05:51 20:14	06:21 19:32		06:25 15:17-16:21/64 16:55		07:21 16:37
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	0	0	1141	2338	523	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

WTG: 9 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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	07:21 13:38-14:45/67 16:38 08:53-09:09/16 07:21 13:39-14:45/66 16:39 08:54-09:08/14	07:08 17:12 07:07 17:46 17:14 17:48	06:32 19:20 06:40 19:52 19:21 19:53	06:41 19:52 06:40 19:55 19:21 19:53	05:56 20:21 05:55 20:22 19:53 20:22	05:27 20:21 05:27 20:32 05:26 20:32	05:28 20:13 05:28 20:13 05:29 20:12	05:52 19:30 05:52 19:30 05:53 20:11	06:22 19:30 06:23 19:30 06:24 19:29	06:52 16:54 06:52 16:52 06:54 16:52	06:26 16:54 06:27 16:52 16:52 16:51	07:01 13:29-14:28/59 16:29 16:29 07:02 13:29-14:29/60 16:29 16:29
2	07:21 13:40-14:46/66 16:40 08:57-09:07/10 07:21 13:40-14:46/66 16:41 09:01-09:04/3	07:05 17:15 07:05 17:49 17:16 17:50	06:27 19:22 06:37 19:54 19:23 19:55	06:37 19:52 06:37 19:52 19:23 19:55	05:52 20:23 05:52 20:23 19:55 20:23	05:26 20:23 05:26 20:32 20:23 20:32	05:29 20:11 05:29 20:11 20:10 19:25	05:54 19:25 05:54 19:25 20:10 19:25	06:25 18:35 06:25 18:35 19:25 18:35	06:55 16:50 06:55 16:50 16:50 16:31	06:29 16:50 06:29 16:50 16:50 16:31	07:03 13:28-14:30/62 16:29 16:29 07:04 13:28-14:31/63 16:29 16:29
3	07:21 13:41-14:46/65 16:42 17:17 07:21 13:42-14:46/64 16:43 17:19	07:04 17:17 07:03 17:51 17:19 17:52	06:26 19:24 06:33 19:56 19:25 19:57	06:35 19:56 06:33 19:56 19:25 19:57	05:51 20:24 05:50 20:25 19:57 20:25	05:26 20:24 05:25 20:30 20:25 20:31	05:30 20:09 05:56 20:08 20:08 19:22	05:54 19:22 05:54 19:22 20:08 19:22	06:26 18:32 06:26 18:32 19:22 18:32	06:56 16:48 06:56 16:48 19:22 16:48	06:31 16:48 06:32 16:48 19:22 16:48	07:05 13:28-14:32/64 16:28 16:28 07:06 13:28-14:32/64 16:28 16:28
4	07:21 13:43-14:46/63 16:44 17:20 07:21 13:44-14:47/63 16:45 17:21	07:02 17:20 07:02 17:53 07:00 17:21	06:23 19:27 06:32 19:58 17:21 17:54	06:32 19:58 06:32 19:58 19:28 19:59	05:48 20:26 05:48 20:26 19:59 20:26	05:25 20:26 05:25 20:32 20:26 20:31	05:31 20:06 05:57 20:05 20:05 19:19	05:57 19:19 05:57 19:19 20:05 19:19	06:28 18:28 06:28 18:28 19:19 18:28	06:58 16:46 06:58 16:46 19:19 16:46	06:33 16:47 06:33 16:47 19:19 16:46	07:06 13:28-14:33/65 16:28 16:28 07:07 13:28-14:34/66 16:28 16:28
5	07:21 13:45-14:47/62 16:46 17:22 07:21 13:46-14:46/60 16:47 17:24	06:59 17:22 06:58 17:57 17:24 17:57	06:19 19:29 06:18 19:27 19:30 20:01	06:28 20:00 06:27 20:01 20:01 20:02	05:46 20:26 05:45 20:27 20:01 20:02	05:25 20:26 05:25 20:33 20:27 20:30	05:32 20:04 05:33 06:00 20:03 19:16	05:59 19:17 06:00 06:31 19:16 18:25	06:30 18:27 06:31 07:01 19:16 18:25	07:00 16:44 06:35 16:44 07:01 16:43	06:35 16:44 06:35 16:44 16:43 16:43	07:08 13:29-14:35/66 16:28 16:28 07:09 13:29-14:35/66 16:28 16:28
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SHADOW - Calendar per WTG

WTG: 10 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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
1	07:21 07:57-08:28/31 16:38	07:08 07:32-07:45/13 17:12	06:32 17:46	06:41 19:20	05:56 19:52	05:27 20:21
2	07:21 07:57-08:29/32 16:39	07:07 07:34-07:43/9 17:14	06:30 17:47	06:40 19:21	05:55 19:53	05:27 20:22
3	07:21 07:58-08:29/31 16:40	07:06 17:15	06:29 17:49	06:38 19:22	05:53 19:54	05:26 20:23
4	07:21 07:59-08:29/30 16:41	07:05 17:16	06:27 17:50	06:36 19:23	05:52 19:55	05:26 20:23
5	07:21 07:59-08:29/30 16:42	07:04 17:17	06:26 17:51	06:35 19:24	05:51 19:56	05:26 20:24
6	07:21 08:00-08:30/30 16:43	07:03 17:19	06:24 17:52	06:33 19:25	05:50 19:57	05:25 20:25
7	07:21 08:01-08:30/29 16:44	07:01 17:20	06:23 17:53	06:32 19:26	05:48 19:58	05:25 20:25
8	07:21 08:02-08:30/28 16:45	07:00 17:21	06:21 17:54	06:30 19:28	05:47 19:59	05:25 20:26
9	07:21 08:03-08:30/27 16:46	06:59 17:22	06:19 17:55	06:28 19:29	05:46 20:00	05:24 20:26
10	07:21 08:03-08:30/27 16:47	06:58 17:24	06:18 17:57	06:27 19:30	05:45 20:01	05:24 20:27
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12	07:20 08:06-08:30/24 16:49	06:56 17:26	06:15 17:59	06:24 19:32	05:43 20:03	05:24 20:28
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14	07:20 08:08-08:29/21 16:51	06:53 17:29	06:11 18:01	06:20 19:34	05:41 20:05	05:24 20:29
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18	07:18 08:16-08:23/7 16:56	06:48 07:39-07:43/4 17:33	06:05 06:23-06:32/9 18:05	06:14 19:38	05:37 20:09	05:24 20:31
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30	07:10 07:30-07:46/16 17:10		06:45 19:18	05:57 19:51	05:28 20:20	05:27 20:32
31	07:09 07:30-07:46/16 17:11		06:43 19:19		05:28 20:20	
Potential sun hours	298	297	369	398	448	452
Sum of minutes with flicker	608	22	144	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

WTG: 10 - VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (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

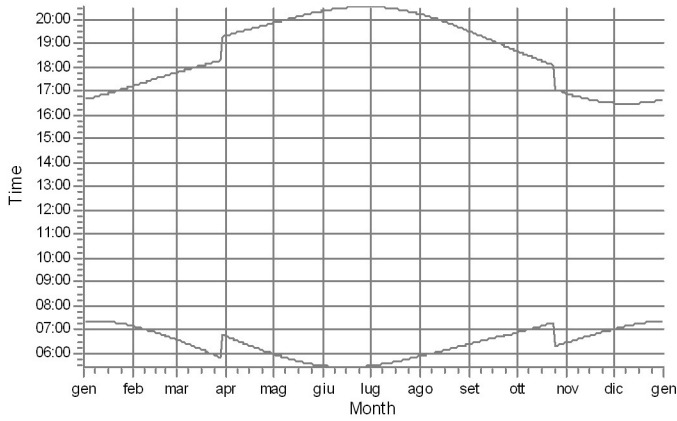
	July	August	September	October	November	December
1	05:28 20:32	05:51 20:13	06:22 19:30	06:52 18:40	06:26 16:54	07:00 07:46-08:12/26 16:29
2	05:28 20:32	05:52 20:12	06:23 19:29	06:53 18:38	06:27 16:52	07:01 07:46-08:13/27 16:29
3	05:29 20:32	05:53 20:11	06:24 19:27	06:54 18:37	06:28 16:51	07:03 07:46-08:13/27 16:29
4	05:29 20:32	05:54 20:10	06:25 19:25	06:55 18:35	06:29 16:50	07:04 07:46-08:14/28 16:29
5	05:30 20:31	05:55 20:09	06:26 19:24	06:56 18:33	06:30 16:49	07:04 07:46-08:15/29 16:28
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26	05:46 20:19	06:16 19:40	06:47 07:07-07:15/8 18:48	07:19 17:01	06:55 07:49-08:05/16 16:31	07:19 07:54-08:26/32 16:34
27	05:47 20:18	06:17 19:38	06:48 07:08-07:13/5 18:47	07:20 17:00	06:56 07:49-08:07/18 16:31	07:20 07:55-08:27/32 16:34
28	05:48 20:17	06:18 19:37	06:49 07:09-07:11/2 18:45	07:21 16:59	06:57 07:48-08:09/21 16:30	07:20 07:55-08:27/32 16:35
29	05:49 20:16	06:19 19:35	06:50 18:43	07:22 16:57	06:58 07:47-08:10/23 16:30	07:20 07:55-08:28/33 16:36
30	05:50 20:15	06:20 19:34	06:51 18:42	07:23 16:56	06:59 07:47-08:11/24 16:30	07:20 07:56-08:28/32 16:37
31	05:51 20:14	06:21 19:32		07:24 16:55		07:21 07:56-08:28/32 16:37
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	0	0	147	0	310	971

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

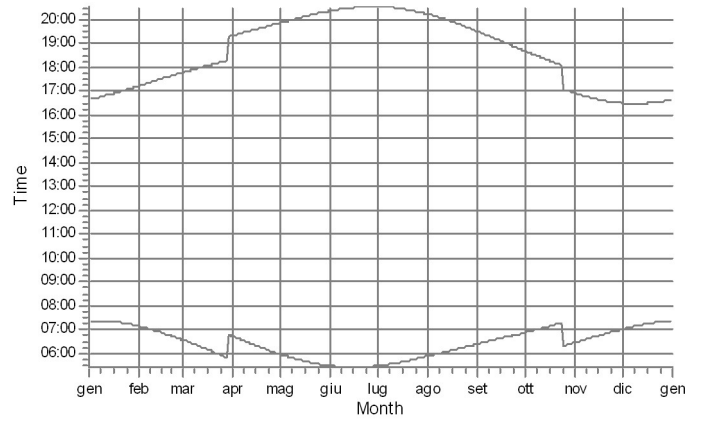
Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
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SHADOW - Calendar per WTG, graphical

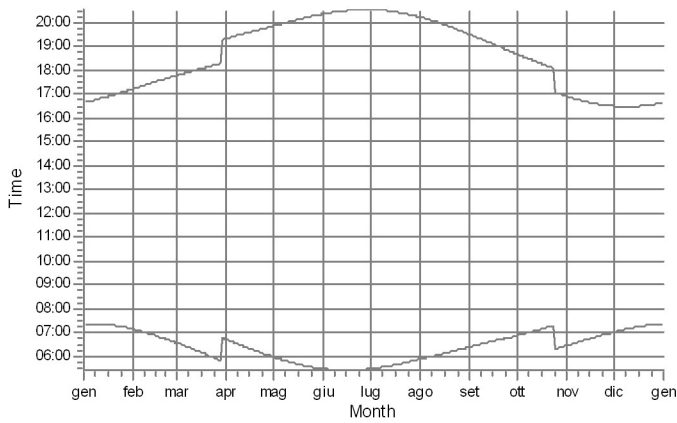
1: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (7)



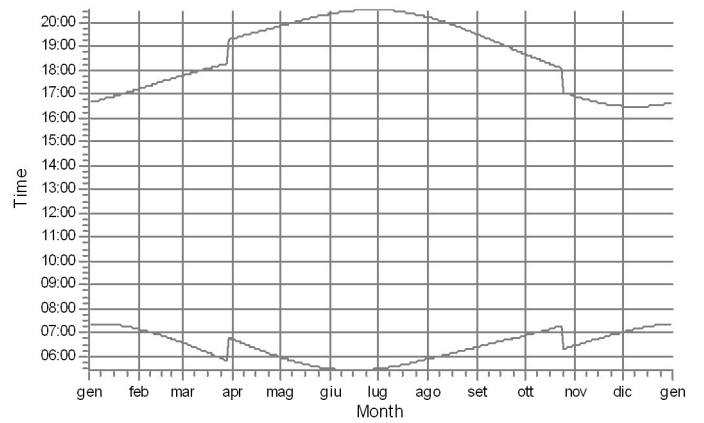
2: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (5)



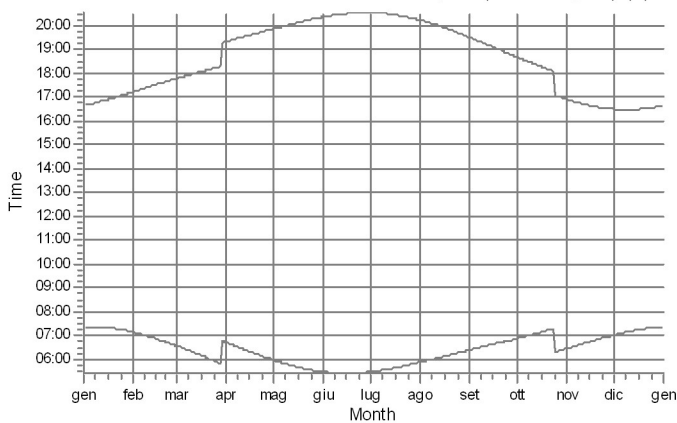
3: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (10)



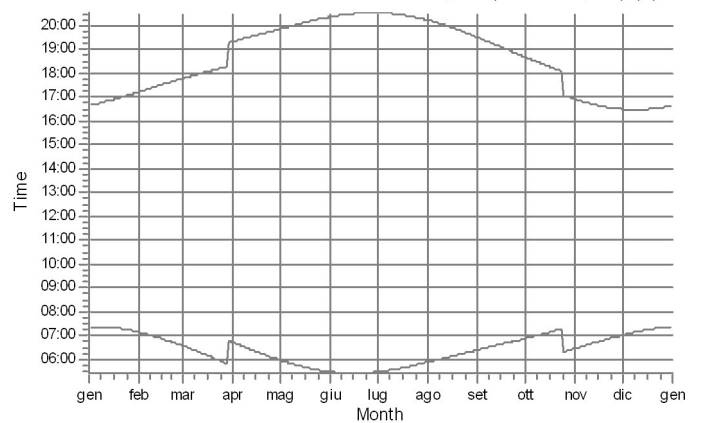
4: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (8)



5: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (2)



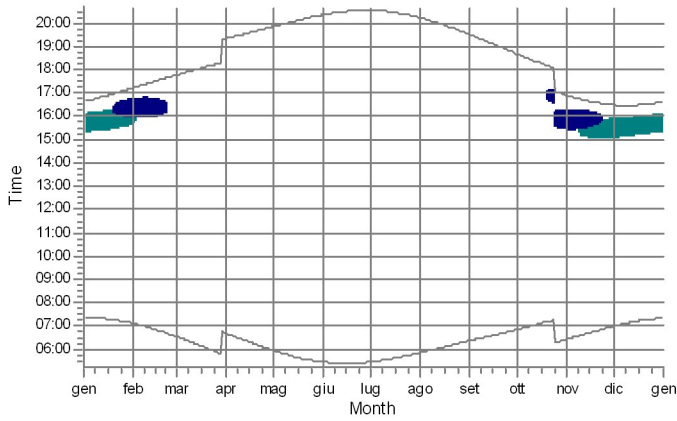
6: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (3)



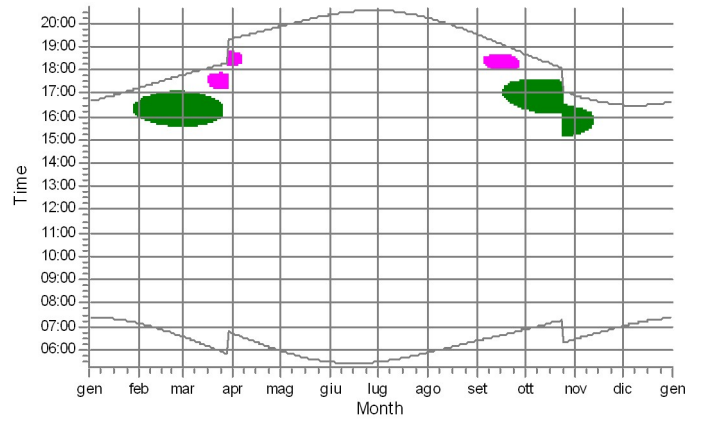
Shadow receptors

SHADOW - Calendar per WTG, graphical

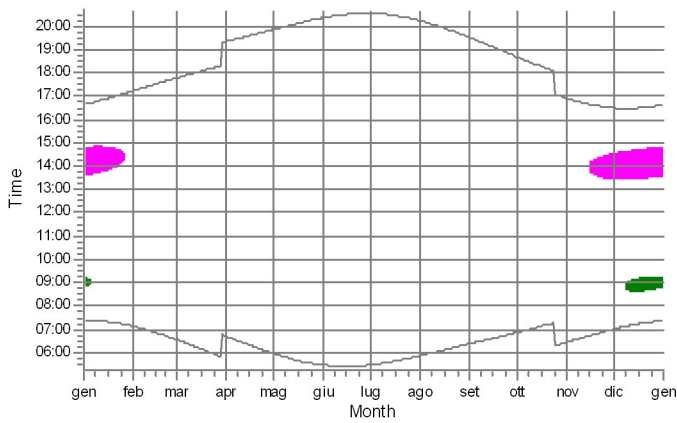
7: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (9)



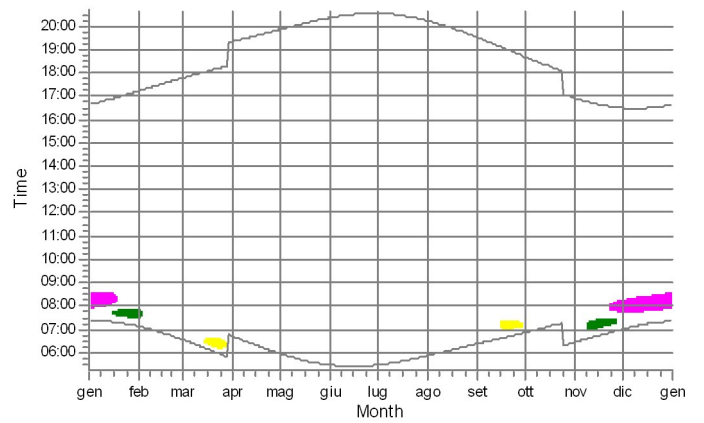
8: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (1)



9: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (4)



10: VESTAS V150-4.0 4000 150.0 !O! hub: 123,0 m (TOT: 198,0 m) (6)

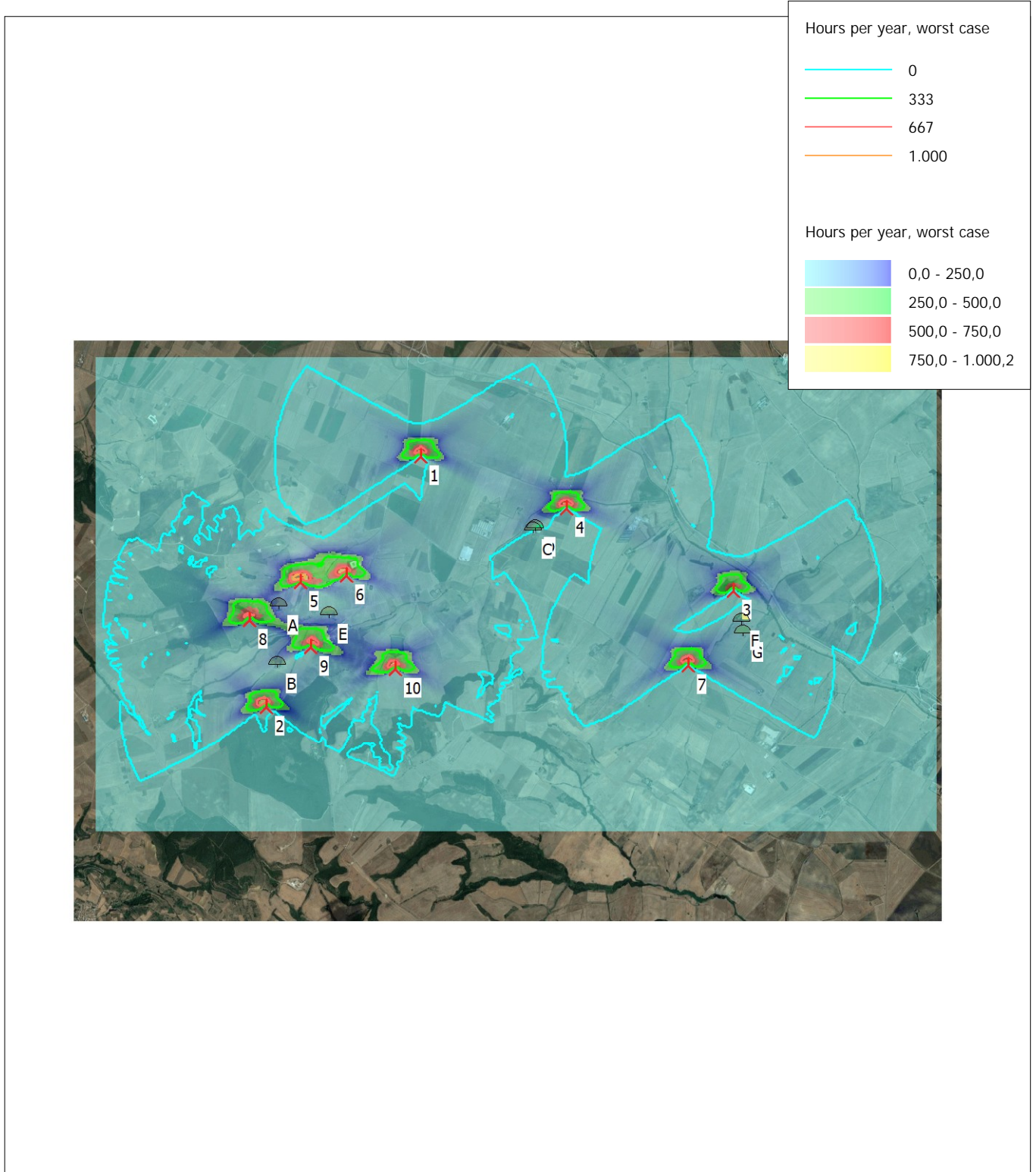


Shadow receptors

- A: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (1)
- B: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (2)
- E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (5)

- F: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (6)
- G: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 0,0° (7)

SHADOW - Map



0 1 2 3 4 km

Map: Ortofoto , Print scale 1:75.000, Map center UTM (north)-WGS84 Zone: 33 East: 591.100 North: 4.528.200

New WTG

Shadow receptor

Flicker map level: Elevation Grid Data Object: Banzi_EMDGrid_0.wpg (1)