IMPIANTO EOLICO DENOMINATO "ENERGIA MONTE PIZZINNU"

- COMUNI DI BESSUDE, BORUTTA, ITTIRI E THIESI (SS) -

OGGETTO	***TITOLO***
STUDIO DI IMPATTO AMBIENTALE	***ANALISI DEGLI EFFETTI DI SHADOW FLICKERING***

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INDICE

1 CRITERI GENERALI DI ANALISI E VALUTAZIONE

Il presente elaborato, facente parte integrante dello Studio di impatto ambientale allegato al progetto del parco eolico denominato "Energia Monte Pizzinnu", nei territori di Bessude e Borutta (SS), esamina compiutamente il potenziale disturbo da ombreggiamento intermittente (*shadow flickering - SF*) sui potenziali ricettori individuati nell'area interessata dal proposto impianto, entro una distanza indicativa di 1000 metri dagli aerogeneratori.

A tal fine, nel seguito, si farà riferimento alla ricognizione sugli edifici esistenti eseguita nell'ambito della definizione del layout di impianto e dell'analisi ambientale, i cui risultati sono riepilogati in opportune "schede fabbricati e siti sensibili" all'interno di apposito report allegato allo SIA (Elaborato FORI-BE-RA14).

Sotto il profilo metodologico, il documento è strutturato in una sezione introduttiva atta a descrivere la natura del fenomeno dell'ombreggiamento intermittente e le ipotesi alla base dei calcoli previsionali, eseguiti a mezzo di specifico software specialistico. Poiché il modello di calcolo si basa sull'assunzione di ipotesi estremamente conservative, come più sotto esplicitato, si è proceduto successivamente ad affinare la stima introducendo ulteriori elementi di analisi e valutazione condizionanti sensibilmente l'entità del fenomeno (condizioni di funzionamento dell'impianto in rapporto al regime anemologico del sito e la durata del soleggiamento nell'area di intervento, ossia la durata effettiva dell'illuminazione solare senza l'interposizione delle nuvole).

2 DESCRIZIONE DEL FENOMENO

Un ostacolo solido posto tra il sole e il terreno genera un'ombra. Generalmente se l'ostacolo è fermo, l'ombra si proietta al suolo seguendo le regole del movimento relativo del sole sull'orizzonte. Le dimensioni dell'ombra proiettata sono funzione inversa dell'angolo che i raggi del sole formano sull'orizzonte per cui si ha la massima dimensione (elongazione sul terreno) dell'ombra all'alba ed al tramonto con il minimo quando il sole raggiunge la massima altezza (mezzogiorno).

Anche gli aerogeneratori durante il giorno proiettano un'ombra che in parte è fissa (torre e navicella) e in parte è mobile (pale del rotore).

Se l'ombra del rotore invece che sul terreno si proietta sulle aperture di un fabbricato può venirsi a creare l'effetto di ombra intermittente o *shadow flickering* (sfarfallio dell'ombra); in talune circostanze, tale fenomeno di pulsazioni "luce – ombra" può potenzialmente essere all'origine di un disturbo alle normali attività che possono svolgersi all'interno dell'ambiente abitativo.

Il fenomeno si verifica durante il giorno in presenza di cielo sereno ed in assenza di ostacoli naturali, quali vegetazione, alberi, muri ecc., e con le turbine in movimento.

Per le ragioni anzidette, a distanze turbine-ricettore superiori a circa 300 metri solitamente il fenomeno di *shadow flickering* si manifesta all'alba o al tramonto, allorquando le ombre proiettate sono sufficientemente lunghe. Per le stesse ragioni il tremolio dell'ombra è un fenomeno particolarmente avvertito nelle regioni del nord Europa (Germania, Danimarca, ecc.) piuttosto che alle latitudini del Mediterraneo.

L'intensità del *shadow flickering* è definita come la differenza in luminosità, in un determinato sito, in presenza ed assenza di un'ombra.

Di seguito si riassumono alcuni aspetti caratteristici del fenomeno:

- la pala delle turbine eoliche è stretta in corrispondenza dell'estremità più esterna ed assume progressivamente maggiore larghezza verso la giunzione con il mozzo. Quando una turbina è posizionata sufficientemente vicino ad un ricettore, cosicché la porzione più larga della pala oscura una porzione maggiore del campo visivo (o meglio del disco solare), l'intensità di *shadow flickering* aumenterà. A distanze maggiori l'intensità del fenomeno sarà minore in quanto le pale copriranno una porzione inferiore del disco solare;
- l'intensità del *shadow flickering* è più bassa quando l'ombra che intercetta un ricettore si origina dall'estremità esterna del rotore (minore spessore della pala). L'intensità aumenterà allorché l'ombra si muove lungo lo sviluppo della pala fino ad arrivare ad un massimo in corrispondenza del mozzo; a tal punto l'intensità diminuisce quando l'ombra si sposta verso l'estremità della pala opposta;
- bassi impatti da *shadow flickering* sono generalmente indicativi di grandi distanze tra

turbine e ricettore e ombre incidenti originate dalle estremità del rotore;

- situazioni di precaria visibilità determineranno modeste intensità di *S. flickering*;
- a distanze ancora maggiori le ombre proiettate risulteranno "fuori-fuoco". Ciò non è causa di un'intensità inferiore del *shadow flickering* ma contribuisce a rendere meno distinto il fenomeno;
- all'interno di un ambiente ben illuminato le ombre svaniscono. Conseguentemente l'accensione di luci in un ambiente riduce l'incidenza del *shadow flickering*;
- schermare una finestra (con tende o quant'altro) previene il fenomeno;
- schermare un edificio (ad esempio con alberature) può rappresentare una misura di mitigazione per prevenire il fenomeno.

La frequenza di pulsazione del tremolio dell'ombra è proporzionale alla velocità di rotazione del rotore. La tipica frequenza di passo fra le pale del rotore (tripala) è compresa tra 0.6 ed 1 Hz (velocità con cui le pale passano attraverso una posizione specifica).

Nel caso specifico, considerando un rotore del diametro indicativo di 162 metri con una velocità massima nominale di rotazione di circa 12 RPM si avrà una frequenza di passo pari a circa 0,6 Hz. Tali frequenze di oscillazione luminosa sono prive di rischi significativi per la salute.

Ricerche finalizzate alla definizione di relazioni cause-effetto tra fenomeni stroboscopici ed attacchi epilettici (Graham e Pamela Harding della *Aston University* e Arnold Wilkins della *University of Essex*) attestano che, al fine di escludere rischi sulla salute, le turbine eoliche dovrebbero ruotare a velocità superiori a 60 RPM (velocità di passo superiori a 3 Hz). Peraltro, non può disconoscersi come il fenomeno del *shadow flickering* possa talvolta costituire, in particolari situazioni, un disturbo per i ricettori più esposti.

Per analizzare i risultati e quindi definire l'effettiva portata del disturbo, è dunque fondamentale conoscere l'esatta destinazione del fabbricato ricettore. Nel seguito, tra i fabbricati, saranno considerati potenziali ricettori i soli edifici che, sulla base delle informazioni disponibili e delle verifiche condotte in sito, possono ricondursi alla fattispecie di civili abitazioni.

3 INDIVIDUAZIONE DEI RICETTORI

Al fine di procedere all'individuazione di potenziali ricettori nelle aree più direttamente interessate dalle installazioni eoliche, ricomprese entro una distanza massima di 1000 m dalle postazioni di macchina, si è proceduto ad una individuazione complessiva dei fabbricati con l'ausilio della cartografia ufficiale di riferimento (Carta Tecnica Regionale in scala 1:10.000). Successivamente si è proceduto a verificarne l'effettiva esistenza e consistenza dall'esame di foto aeree e satellitari nonché attraverso specifici sopralluoghi sul campo e interviste ai fruitori dell'area. In tal modo sono state acquisite le necessarie informazioni preliminari sulle caratteristiche tipologico-costruttive e le condizioni di utilizzo degli edifici. Per completezza di analisi sono stati inclusi nel censimento anche quei fabbricati che, in modo manifesto, non presentavano caratteristiche di potenziali ambienti abitativi (p.e. ruderi o depositi). A valle di tali riscontri, si è proceduto ad accertare la categoria catastale di appartenenza degli edifici, laddove disponibile.

L'Elaborato FORI-BE-RA14-1 (*Carta con individuazione dei fabbricati e siti sensibili*) riporta l'individuazione dei fabbricati censiti in accordo con la metodologia precedentemente indicata. Lo stralcio della ripresa aerea zenitale, la categoria catastale di appartenenza ed una fotografia prospettica degli edifici sono riportati nell'Elaborato FORI-BE-RA14 allegato alla documentazione progettuale.

Nel caso specifico, ai fini dei calcoli di esposizione all'ombra intermittente, sono stati individuati come ricettori n. 11 fabbricati ubicati entro una distanza di 1000 m dalle postazioni eoliche, con destinazione abitativa accertata (edifici con categoria catastale "A" – abitazioni - e "B" – edifici pubblici/patrimonio immobiliare urbano) o riferibili a luoghi di culto (chiesa campestre di S. Maria in territorio di Bonnanaro).

Entro tali distanze è, infatti, ragionevole che si manifestino i più avertiti effetti di disturbo in rapporto al fattore di impatto in esame. La Tabella 3.1 riporta, per ciascun ricettore individuato, le relative coordinate secondo il sistema Gauss Boaga, la categoria Catastale e la distanza dal più prossimo aerogeneratore.

Tabella 3.1: Fabbricati con destinazione abitativa esposti al potenziale disturbo da shadow flickering

Fabbricato	Comune	GB Est	GB Nord	Distanza dal più prossimo WTG [m]	WTG più prossimo [m]	Categoria Catasto Fabbricati
F046	Thiesi	1477233	4486840	992	T5	A4 - Abitazioni di tipo popolare
F054	Thiesi	1477080	4486747	984	T6	A3 – Abitazioni di tipo economico
F063	Thiesi	1476901	4486950	985	T6	A3 – Abitazioni di tipo economico
F132	Bessude	1477275	4489186	920	T8	A3 – Abitazioni di tipo economico
F142	Borutta	1479014	4486224	999	T4	A3 – Abitazioni di tipo economico
F143	Borutta	1479038	4486232	999	T4	A3 – Abitazioni di tipo economico
F150	Bonnanaro	1479564	4486746	946	T4	A3 – Abitazioni di tipo economico
F151	Bonnanaro	1479613	4486840	952	T4	A3 – Abitazioni di tipo economico
F135	Bessude	1477136	4489072	945	T8	B4 – Uffici Pubblici
F134	Bessude	1477168	4489067	916	T8	B4 – Uffici Pubblici
F158	Bonnanaro	1479521	4487177	798	T4	Chiesa campestre

Lo stralcio della ripresa aerea, la categoria catastale di appartenenza (laddove disponibile) ed una fotografia dei fabbricati censiti sono riportati nell'Elaborato FORI-BE-RA14-1 allegato allo SIA.

4 IPOTESI ALLA BASE DEL CALCOLO E SOGLIE DI RIFERIMENTO

Il software specialistico utilizzato per la stima dell'entità del fenomeno, nello scenario c.d. *worst case* impiega un modello estremamente conservativo per il calcolo del *shadow flickering*. Nessuno, tra i fattori di influenza indicati al capitolo 2 è contemplato nei calcoli del modello di simulazione. In situazioni di cielo coperto o calma di vento, o in caso di direzione del vento tale da porre il piano del rotore in posizione parallela rispetto alla linea sole-ricettore, la WTG non produrrà ombra intermittente, ma il suo contributo teorico è comunque computato dal *software*. Inoltre, per ovvie ragioni, la simulazione contempla il solo effetto dell'orografia sulla propagazione dell'ombra, ignorando l'azione schermante "sito-specifica" esercitata dai manufatti e dalle alberature. In altre parole, il calcolo descrive lo scenario peggiore possibile, e rappresenta quindi il massimo rischio potenziale di disturbo.

Conseguentemente è altamente verosimile che presso tutti i ricettori considerati nelle simulazioni si manifesti un effetto di *shadow flickering* significativamente inferiore a quello ipotizzato dal modello. È molto probabile, inoltre, che alcuni ricettori non saranno soggetti ad alcun effetto da *shadow flickering*.

In definitiva, affinché il fenomeno dell'ombra intermittente possa costituire un disturbo per i soggetti più sensibili dovrebbero verificarsi simultaneamente le seguenti circostanze:

- il vento deve soffiare ad una velocità superiore a 3 m/s (velocità di *cut-in* del rotore);
- presenza di luminosità solare diretta;
- l'osservatore deve risultare sufficientemente vicino alla sorgente di *shadow flickering*;
- il ricettore deve essere effettivamente esposto al campo di luce tremolante;
- l'illuminazione dell'ambiente residenziale deve essere bassa;
- il contrasto tra luci ed ombre deve essere alto;
- non devono essere presenti schermature che ostacolino la propagazione dell'ombra (come tendaggi o alberature);
- gli individui potenzialmente soggetti ad un impatto da *shadow flickering* dovrebbero permanere esposti alla luce tremolante per un tempo sufficiente ad avvertire fastidio.

Per le finalità del presente studio, in assenza di una specifica disciplina normativa nazionale o regionale sull'argomento, si è fatto riferimento alle linee guida elaborate dal Gruppo Federale tedesco di Controllo delle Emissioni (*Bund-/Länder-Arbeitsgemeinschaft für Immissionsschutz - LAI*) – aggiornamento 2020.

Per la valutazione degli effetti del tremolio dell'ombra, peraltro, lo stesso legislatore tedesco non ha finora emanato, né risulta che sia in procinto di emanare, norme giuridicamente vincolanti.

Secondo le richiamate linee guida, affinché il fenomeno di ombreggiamento sia significativo

dovrebbero essere simultaneamente verificate le seguenti circostanze

- L'angolo del sole sopra l'orizzonte deve essere almeno 3°;
- l'ingombro della pala della turbina eolica deve coprire almeno il 20% del disco solare.

Il massimo ombreggiamento su un edificio secondo tali linee-guida è stabilito in:

- 30 ore di ombreggiamento annuale;
- 30 minuti di ombreggiamento giornaliero.

In tali archi temporali (30 ore/anno e 30 minuti/giorno), trattandosi di un disturbo effettivamente avvertito dagli occupanti l'edificio, dovrebbero risultare simultaneamente verificate le seguenti condizioni:

- gli ambienti esposti all'ombreggiamento sono occupati;
- gli occupanti sono svegli.

Considerata l'esigua probabilità che si verifichino contemporaneamente tutte le condizioni precedentemente illustrate per l'intera durata del fenomeno, ne deriva che il risultato del calcolo rappresenta comunque una stima oltremodo prudenziale dell'impatto.

La Figura 4.1 e la Figura 4.2 mostrano i parametri necessari al modello utilizzato dal modulo SHADOW per valutare l'effetto del tremolio dell'ombra.

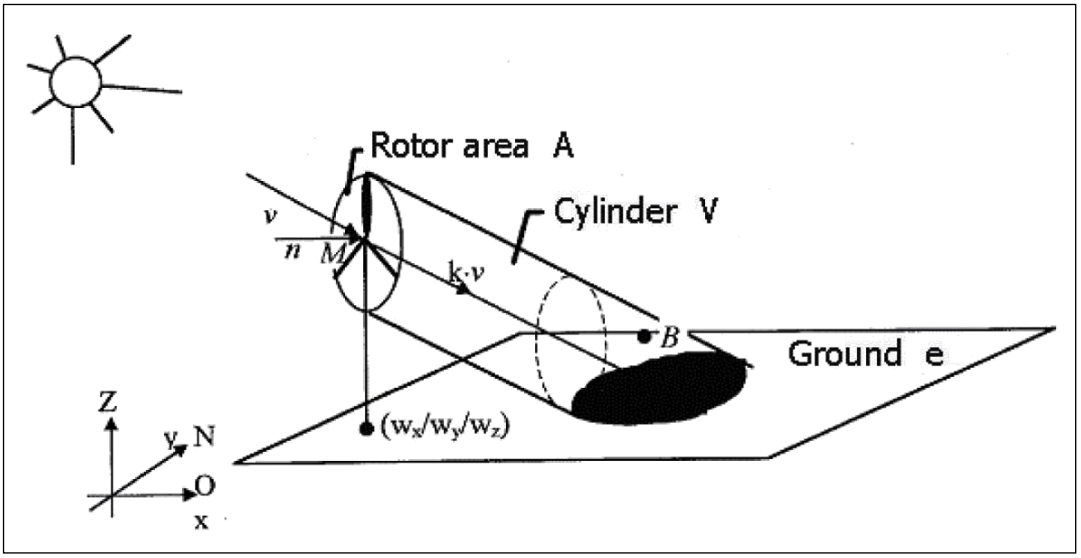

Figura 4.1: Rappresentazione schematica della proiezione dell'ombra del rotore.

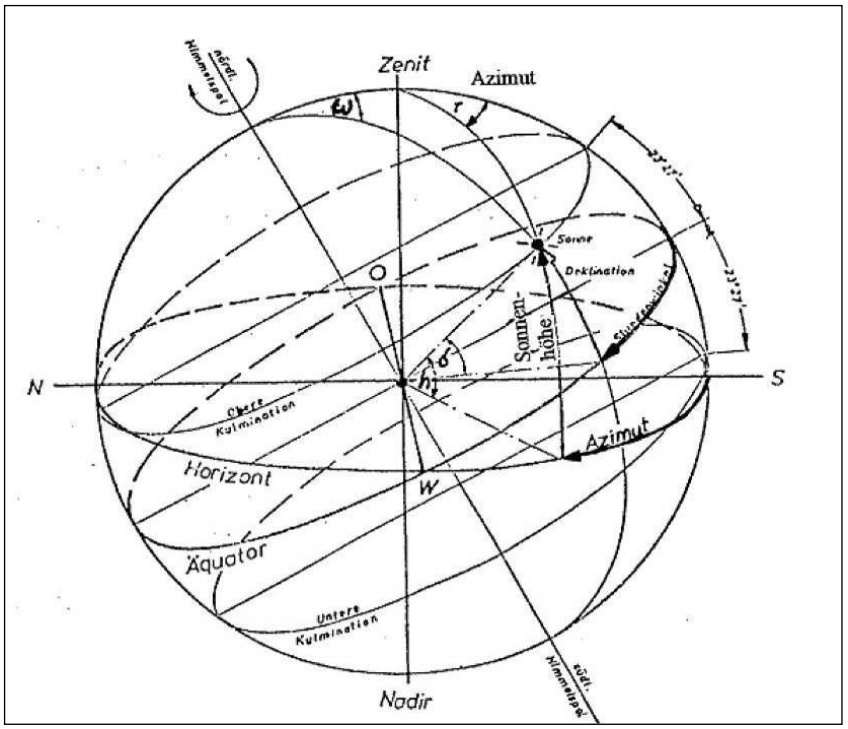

Figura 4.2: Schema dei moti terrestri e parametri di calcolo.

5 RISULTATI

Il risultato dei calcoli è reso disponibile dal programma di simulazione (*Windpro*) sotto diversi formati:

- Tabellare, (calendario per ciascun ricettore) nel quale per ogni giorno dell'anno sono indicate le ore di luce e l'intervallo di tempo di esposizione all'ombra con l'orario in cui si verifica il fenomeno;
- Grafico, (per ciascun ricettore) nel quale vengono rappresentati i periodi dell'anno in cui si verifica il fenomeno, l'orario e le turbine responsabili dell'ombra;
- grafico globale, con la rappresentazione di isolinee rappresentanti l'incidenza dell'ombra espressa in ore/anno.

Con riferimento allo scenario di progetto, le isolinee d'ombra sono state rappresentate su specifico elaborato grafico, in scala adeguata alla dimensione territoriale da rappresentare, per facilitarne la lettura. L'elaborato è stato realizzato, pertanto, su base cartografica in scala 1:10.000 (Elaborato FORI-BE-RA12-1).

I risultati forniti dal modello di calcolo consentono di valutare approssimativamente sia l'impatto puntuale sul singolo ricettore, sia l'impatto distribuito sul territorio (movimento e persistenza dell'ombra).

Nello specifico, all'interno dell'allegato report di calcolo sono indicati, per il singolo ricettore, i valori totali di interferenza da *shadow flickering* (espressi in h/anno), il numero di giorni in cui si verifica l'interferenza ed infine la durata massima per singolo giorno.

Come evidenziato sopra, peraltro, l'output fornito dal modello è alquanto conservativo e non realistico, giacché la simulazione non tiene in considerazione i numerosi fattori sfavorevoli al verificarsi del disturbo.

Per quanto precede, nel seguito si procederà ad esaminare le risultanze dei calcoli modellistici, introducendo nella valutazione di impatto ulteriori elementi che tengano conto delle effettive condizioni di funzionamento dell'impianto, in rapporto al quadro anemologico atteso, nonché delle condizioni meteoclimatiche caratteristiche del sito di Bessude-Borutta, con particolare riferimento alle condizioni medie di copertura del cielo.

I risultati numerici delle simulazioni modellistiche, condotti con riferimento a ciascuno scenario di calcolo, sono riportati in Appendice.

6 ANALISI E POST-ELABORAZIONE DEI RISULTATI

Le risultanze del calcolo modellistico atto a stimare i valori totali di potenziale incidenza del fenomeno di *shadow flickering* in corrispondenza dei ricettori abitativi individuati nell'areale di interesse sono riportate in Tabella 6.1.

Tabella 6.1: Durata massima del fenomeno di shadow flickering potenziale (SF_P) in corrispondenza delle abitazioni riconosciute all'interno dell'areale di interesse

ID	Ricettore	SF_P [h/anno]	SF_P [gg/anno]	SF_P [max h/giorno]
1	F132	46:43:00	104	00:40
2	F134	37:41:00	88	00:39
3	F135	35:17:00	83	00:38
4	F142	0:00:00	0	00:00
5	F143	0:00:00	0	00:00
6	F150	13:03	40	0:25
7	F151	0:00	0	0:00
8	F158	39:36	72	0:43
9	F46	0:05	3	0:02
10	F54	36:58	62	0:48
11	F63	23:52	60	0:35

Nota: in rosso i fabbricati esposti a SF potenziale di durata superiore alle 30 ore/anno

Dall'esame della Tabella 6.1 si evince quanto segue:

- tra i n. 11 edifici individuati come potenziali ricettori del fenomeno di *shadow flickering* entro l'areale di interesse, n. 3 fabbricati (F142, F143 e F151) non risulteranno esposti ad alcun impatto potenziale da SF;
- stanti le ipotesi estremamente cautelative alla base della simulazione modellistica, l'incidenza del *shadow flickering* indotto dal progetto, assunta la soglia di SF_P=30 h/anno come valore di riferimento per una valutazione di significatività, si manifesterà in modo potenzialmente avvertibile su n. 5 edifici abitativi (F132, F134, F135, F158 e F54), riportati in Tabella 6.2.

Tabella 6.2: Durata massima potenziale del fenomeno di shadow flickering restituita dal software di calcolo in corrispondenza dei ricettori più esposti (SF_P>=30 h/anno) all'interno dell'areale di interesse

Ricettore	Scenario 1 SF_P [h/anno]	WTG interessati
F132	46:43:00	T1, T8
F134	37:41:00	T1, T8
F135	35:17:00	T1, T8
F158	39:36	T4
F54	36:58	T4, T5

Relativamente ai ricettori potenzialmente più esposti di cui alla Tabella 6.2 - individuati in base al criterio di una incidenza del SF_P>=30 h/anno - tenuto conto della rilevanza e consistenza numerica delle ipotesi conservative alla base del calcolo modellistico, si è proceduto ad affinare la stima dei valori di effettiva esposizione all'ombra intermittente introducendo un opportuno coefficiente di riduzione.

Il principale coefficiente di riduzione – di seguito indicato come R_N - tiene conto dell'incidenza media delle condizioni meteo di "cielo coperto" che caratterizzano il territorio di interesse, in concomitanza con le quali il fenomeno del *shadow flickering* non sarebbe avvertibile. Per la determinazione di R_N si è fatto riferimento ai dati di copertura nuvolosa pubblicati nell'Atlante Climatologico elaborato dai dati delle Stazioni della Rete Operativa del Servizio Meteorologico dell'Aeronautica Militare Italiana nel periodo 1971÷2000.

La nuvolosità, o copertura del cielo, rappresenta la frazione della volta celeste coperta da nubi, esprimendo il rapporto tra la parte di cielo coperta e la superficie totale del cielo.

La copertura del cielo viene valutata a vista durante le osservazioni da terra effettuate dalle stazioni metereologiche e la frazione che la rappresenta viene espressa in ottavi, da 0 a 8.

Quando il cielo è coperto per più della metà da nubi con la base sotto i 20.000 piedi si dice che le nubi formano un soffitto (*ceiling*). Quando non esistono nubi si dice che il cielo è sereno (*clear sky*). Di seguito si riporta la scala convenzionale di nuvolosità in ottavi:

Copertura tra 1 e 2 ottavi – poche nubi (*few*);

Copertura tra 3 e 4 ottavi – nubi sparse (*scattered*);

Copertura tra 5 e 7 ottavi – copertura con squarci (*broken*);

Copertura totale >7 ottavi (*overcast).*

La Tabella 6.3 riporta, per la stazione A.M. più prossima al sito in esame (Capo Frasca - OR), il numero medio di giorni al mese con copertura nuvolosa > 4/8 alle ore 06:00 ed alle ore 18:00, ossia con presenza di cielo "coperto" (Ng h6 Nuv>4 e Ngh18 Nuv>4 rispettivamente).

Sulla base dei mensili di SF_P calcolati per ciascun ricettore nello Scenario 1 è stato possibile pervenire alla stima dei valori di SF al netto delle giornate con presenza di cielo coperto (SF_{NC}) attraverso la seguente espressione:

$$SF_{NC}[h/anno] = \sum_{i=1}^{12} SF_{Pi} \cdot (1 - R_{Ni})$$

Dove:

SF_{NC} = h/anno di *shadow flickering* potenziale al netto delle giornate con presenza di cielo coperto;

SF_{Pi} = ore di *shadow flickering* teorico da modello di calcolo per il mese i-esimo;

R_{Ni} = frequenza dei giorni con copertura del cielo >4/8 per il mese i-esimo.

Con riferimento ai ricettori di interesse, i dati di SF_{NC} sono riportati in Tabella 6.4.

Tabella 6.3: Aeronautica Militare – Stazione di Capo Frasca (OR). Dati medi di copertura nuvolosa >4/8 registrati nel periodo 1971÷2000 (Fonte, Aeronautica Militare Italiana)

	Ng h6 Nuv>4	**Ngh18 Nuv>4**	**Media Nuv>4**	**Media Nuv>4 (%)**
gen	14,5	16,5	15,5	50%
feb	14,5	16,6	15,6	56%
mar	16,5	17,6	17,1	55%
apr	19,4	18,4	18,9	63%
mag	15,2	14,8	15,0	48%
giu	11,4	10	10,7	36%
lug	7,9	6,1	7,0	23%
ago	7,8	6,9	7,4	24%
set	10,2	10,6	10,4	35%
ott	15,2	14,7	15,0	48%
nov	15,3	15,5	15,4	51%
dic	14,6	16,3	15,5	50%

Ng h6Nuv>4: Numero medio di giorni al mese con copertura nuvolosa > 4/8 alle ore 6
Ngh18Nuv>4: Numero medio di giorni al mese con copertura nuvolosa > 4/8 alle ore 18
MediaNuv>4: Media del numero medio di giorni al mese con copertura nuvolosa > 4/8 registrata alle ore 6 ed alle 18

L'esame della Tabella 6.4 mostra come l'incidenza del fenomeno del *shadow flickering*, al netto delle giornate con cielo coperto (SF_{NC}), si presenti inferiore alla soglia di riferimento di 30 h/anno in corrispondenza di tutti i ricettori individuati.

Tabella 6.4: Incidenza del fenomeno del shadow flickering al netto delle giornate con cielo coperto in corrispondenza dei ricettori più esposti (SF_P>=30 h/anno) all'interno dell'areale di interesse

Ricettore	SF_P [h/anno]	SF_{NC} [h/anno]	WTG interessati
F132	46:43:00	**22:34:20**	T1, T8
F134	37:41:00	**18:12:11**	T1, T8
F135	35:17:00	**17:03:06**	T1, T8
F158	39:36:00	**24:01:56**	T4
F54	36:58:00	**22:55:37**	T4, T5

Da quanto precede si può concludere con ragionevole certezza che l'entità effettiva del fenomeno risulterà inferiore alla soglia di significatività in corrispondenza di tutti i fabbricati con destinazione abitativa individuati entro una distanza di 1000 metri dagli aerogeneratori in progetto.

7 CONCLUSIONI

Il documento ha esaminato il potenziale disturbo da ombreggiamento intermittente (*shadow flickering*) sui potenziali ricettori individuati nell'area interessata dal proposto parco eolico "Energia Monte Pizzinnu", entro una distanza indicativa di 1000 metri dagli aerogeneratori in progetto. L'individuazione dei ricettori ha fatto riferimento alla ricognizione sugli edifici esistenti eseguita nell'ambito della definizione del layout di impianto e dell'analisi ambientale, i cui risultati sono riepilogati in opportune "schede fabbricati" all'interno di apposito report allegato alla documentazione progettuale.

Ai fini dei calcoli di esposizione all'ombra intermittente sono stati sottoposti a verifica n. 11 fabbricati, con destinazione abitativa accertata (edifici con categoria catastale "A" – abitazioni - e "B" – edifici pubblici/patrimonio immobiliare urbano) o riferibili a luoghi di culto (chiesa campestre di S. Maria in territorio di Bonnanaro).

Per le finalità del presente studio, in assenza di una specifica disciplina normativa nazionale o regionale, si è fatto riferimento alle linee guida elaborate dal Gruppo Federale tedesco di Controllo delle Emissioni (*Bund-/Länder-Arbeitsgemeinschaft für Immissionsschutz - LAI*) – aggiornamento 2020.

Relativamente allo Scenario di progetto si è evidenziato come l'incidenza del fenomeno del *shadow flickering*, al netto delle giornate con cielo coperto, si presenti potenzialmente superiore alla soglia di riferimento di 30 h/anno presso n. 5 edifici abitativi.

Relativamente ai ricettori potenzialmente più esposti (SF_P>=30 h/anno), tenuto conto della rilevanza e consistenza numerica delle ipotesi conservative alla base del calcolo modellistico, si è proceduto ad affinare la stima dei valori di effettiva esposizione all'ombra intermittente introducendo un opportuno coefficiente di riduzione (R_N); questo tiene conto dell'incidenza media delle condizioni meteo di "cielo coperto" che caratterizzano il territorio di interesse, in concomitanza con le quali il fenomeno del *shadow flickering* non sarebbe avvertibile. Per la determinazione di R_N si è fatto riferimento ai dati di copertura nuvolosa pubblicati nell'Atlante Climatologico elaborato dai dati delle Stazioni della Rete Operativa del Servizio Meteorologico dell'Aeronautica Militare Italiana nel periodo 1971÷2000.

Le risultanze delle suddette attività di post-elaborazione dei dati restituiti dal modello di calcolo hanno mostrato come l'incidenza del fenomeno del *shadow flickering*, al netto delle giornate con cielo coperto (SF_{NC}), si presenti inferiore alla soglia di riferimento di 30 h/anno in corrispondenza di tutti i ricettori individuati.

Da quanto precede si può concludere con ragionevole certezza che l'entità effettiva del fenomeno di *shadow-flickering* risulterà inferiore alla soglia di significatività in corrispondenza di tutti i fabbricati con destinazione abitativa individuati entro una distanza di 1000 metri dagli aerogeneratori in progetto.

APPENDICE - REPORT DEI RISULTATI DEL CALCOLO MODELLISTICO – SCENARIO DI PROGETTO PRESSO I RICETTORI INDIVIDUATI

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Main Result

Calculation: Progetto_2022_05_05

Assumptions for shadow calculations

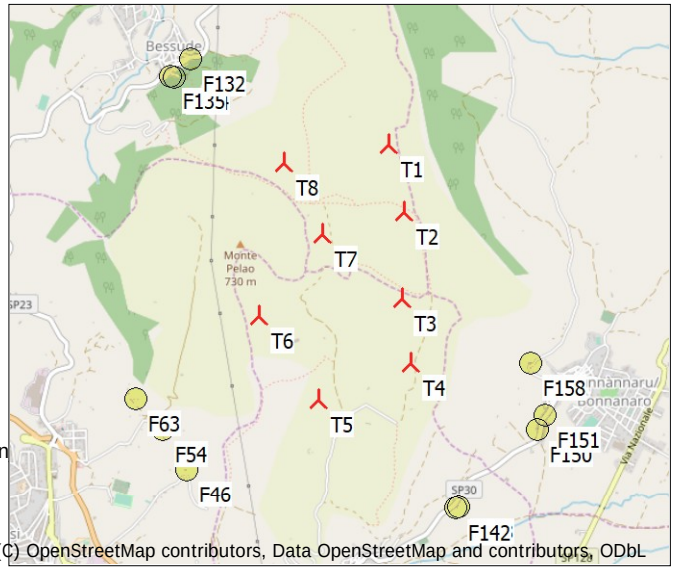
Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

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

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

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_Progetto_Fred_Olsen
Obstacles used in calculation
Eye height for map: 1,5 m
Grid resolution: 1,0 m

All coordinates are in
Italian Gauss-Boaga west-ROMA40 (IT-peninsular <±4m)



Scale 1:50.000
New WTG Shadow receptor

WTGs

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
T1	1.478.583	4.488.617	658,9	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T2	1.478.681	4.488.178	669,5	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T3	1.478.662	4.487.610	674,6	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T4	1.478.724	4.487.180	647,1	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T5	1.478.109	4.486.943	600,0	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T6	1.477.722	4.487.493	663,6	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T7	1.478.143	4.488.036	679,4	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0
T8	1.477.887	4.488.500	647,1	VESTAS V162 6800 162.0 !O! hu...	Yes	VESTAS	V162-6.800	6.800	162,0	149,0	2.042	0,0

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
F132	1.477.275	4.489.186	444,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F134	1.477.168	4.489.067	457,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F135	1.477.136	4.489.072	455,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F142	1.479.014	4.486.224	443,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F143	1.479.038	4.486.232	440,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F150	1.479.564	4.486.746	409,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F151	1.479.613	4.486.840	403,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F158	1.479.521	4.487.177	455,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F46	1.477.233	4.486.479	480,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F54	1.477.080	4.486.747	535,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F63	1.476.901	4.486.950	547,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6

Calculation Results

Shadow receptor

No.	Shadow, worst case Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
F132	46:43	104	0:40
F134	37:41	88	0:39
F135	35:17	83	0:38
F142	0:00	0	0:00
F143	0:00	0	0:00

To be continued on next page...

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05/05/2022 11:01/3.4.415

SHADOW - Main Result

Calculation: Progetto_2022_05_05

...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]
F150	13:03	40	0:25
F151	0:00	0	0:00
F158	39:36	72	0:43
F46	0:05	3	0:02
F54	36:58	62	0:48
F63	23:52	60	0:35

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

No.	Name	Worst case [h/year]
T1	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (8)	21:15
T2	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (7)	0:00
T3	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (5)	0:00
T4	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (3)	59:28
T5	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (2)	57:59
T6	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (4)	0:00
T7	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (6)	0:00
T8	VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (9)	66:03

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.

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F132 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (4)

Assumptions for shadow calculations

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

	January			February			March			April	May	June
1	07:49			07:36		09:35 (T8)	07:01		08:09 (T1)	07:11	06:26	05:58
	17:09			17:43	39	10:14 (T8)	18:16	26	08:35 (T1)	19:49	20:20	20:49
2	07:49			07:35		09:35 (T8)	06:59		08:09 (T1)	07:09	06:25	05:57
	17:10			17:44	39	10:14 (T8)	18:17	25	08:34 (T1)	19:50	20:21	20:50
3	07:49			07:34		09:35 (T8)	06:58		08:09 (T1)	07:08	06:23	05:57
	17:10			17:45	39	10:14 (T8)	18:18	25	08:34 (T1)	19:51	20:23	20:51
4	07:49			07:33		09:36 (T8)	06:56		08:09 (T1)	07:06	06:22	05:56
	17:11			17:46	37	10:13 (T8)	18:19	24	08:33 (T1)	19:52	20:24	20:52
5	07:49			07:32		09:36 (T8)	06:55		08:10 (T1)	07:04	06:21	05:56
	17:12			17:47	37	10:13 (T8)	18:20	22	08:32 (T1)	19:53	20:25	20:52
6	07:49			07:31		09:37 (T8)	06:53		08:11 (T1)	07:03	06:20	05:56
	17:13			17:49	36	10:13 (T8)	18:22	20	08:31 (T1)	19:54	20:26	20:53
7	07:49			07:30		09:37 (T8)	06:52		08:11 (T1)	07:01	06:18	05:55
	17:14			17:50	35	10:12 (T8)	18:23	17	08:28 (T1)	19:56	20:27	20:53
8	07:49			07:29		09:38 (T8)	06:50		08:14 (T1)	07:00	06:17	05:55
	17:15			17:51	33	10:11 (T8)	18:24	13	08:27 (T1)	19:57	20:28	20:54
9	07:49			07:28		09:38 (T8)	06:49		08:17 (T1)	06:58	06:16	05:55
	17:16			17:52	32	10:10 (T8)	18:25	5	08:22 (T1)	19:58	20:29	20:55
10	07:49			07:27		09:40 (T8)	06:47			06:56	06:15	05:55
	17:17			17:54	29	10:09 (T8)	18:26			19:59	20:30	20:55
11	07:49		09:45 (T8)	07:26		09:41 (T8)	06:45			06:55	06:14	05:55
	17:18	8	09:53 (T8)	17:55	26	10:07 (T8)	18:27			20:00	20:31	20:56
12	07:49		09:43 (T8)	07:24		09:43 (T8)	06:44			06:53	06:13	05:54
	17:19	13	09:56 (T8)	17:56	23	10:06 (T8)	18:28			20:01	20:32	20:56
13	07:48		09:41 (T8)	07:23		09:44 (T8)	06:42			06:52	06:12	05:54
	17:20	17	09:58 (T8)	17:57	19	10:03 (T8)	18:29			20:02	20:33	20:57
14	07:48		09:40 (T8)	07:22		09:48 (T8)	06:41			06:50	06:11	05:54
	17:21	20	10:00 (T8)	17:58	11	09:59 (T8)	18:30			20:03	20:34	20:57
15	07:48		09:40 (T8)	07:21			06:39			06:49	06:10	05:54
	17:22	22	10:02 (T8)	18:00			18:31			20:04	20:35	20:58
16	07:47		09:38 (T8)	07:19			06:37			06:47	06:09	05:54
	17:24	25	10:03 (T8)	18:01			18:32			20:05	20:36	20:58
17	07:47		09:38 (T8)	07:18			06:36			06:46	06:08	05:54
	17:25	27	10:05 (T8)	18:02			18:34			20:06	20:36	20:58
18	07:46		09:37 (T8)	07:17			06:34			06:44	06:07	05:54
	17:26	28	10:05 (T8)	18:03			18:35			20:07	20:37	20:59
19	07:46		09:37 (T8)	07:15			06:32			06:43	06:06	05:55
	17:27	30	10:07 (T8)	18:04			18:36			20:08	20:38	20:59
20	07:45		09:36 (T8)	07:14			06:31			06:41	06:05	05:55
	17:28	32	10:08 (T8)	18:06			18:37			20:09	20:39	20:59
21	07:45		09:36 (T8)	07:13		08:20 (T1)	06:29			06:40	06:05	05:55
	17:29	32	10:08 (T8)	18:07	7	08:27 (T1)	18:38			20:10	20:40	21:00
22	07:44		09:36 (T8)	07:11		08:16 (T1)	06:27			06:38	06:04	05:55
	17:30	34	10:10 (T8)	18:08	14	08:30 (T1)	18:39			20:11	20:41	21:00
23	07:43		09:35 (T8)	07:10		08:14 (T1)	06:26			06:37	06:03	05:55
	17:32	35	10:10 (T8)	18:09	18	08:32 (T1)	18:40			20:12	20:42	21:00
24	07:43		09:35 (T8)	07:08		08:12 (T1)	06:24			06:35	06:02	05:56
	17:33	36	10:11 (T8)	18:10	21	08:33 (T1)	18:41			20:13	20:43	21:00
25	07:42		09:34 (T8)	07:07		08:12 (T1)	06:22			06:34	06:02	05:56
	17:34	37	10:11 (T8)	18:11	22	08:34 (T1)	18:42			20:14	20:44	21:00
26	07:41		09:35 (T8)	07:05		08:10 (T1)	06:21			06:33	06:01	05:56
	17:35	38	10:13 (T8)	18:13	24	08:34 (T1)	18:43			20:15	20:45	21:00
27	07:41		09:35 (T8)	07:04		08:10 (T1)	06:19			06:31	06:00	05:56
	17:36	38	10:13 (T8)	18:14	25	08:35 (T1)	18:44			20:16	20:45	21:00
28	07:40		09:35 (T8)	07:02		08:09 (T1)	06:17			06:30	06:00	05:57
	17:38	38	10:13 (T8)	18:15	25	08:34 (T1)	18:45			20:17	20:46	21:00
29	07:39		09:34 (T8)				07:16			06:28	05:59	05:57
	17:39	39	10:13 (T8)				19:46			20:18	20:47	21:00
30	07:38		09:34 (T8)				07:14			06:27	05:59	05:58
	17:40	40	10:14 (T8)				19:47			20:19	20:48	21:00
31	07:37		09:34 (T8)				07:13				05:58	
	17:41	40	10:14 (T8)				19:48				20:49	
Potential sun hours	299			298			370			398	447	451
Total, worst case		629			591			177				

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F132 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (4)

Assumptions for shadow calculations

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

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

	July		August		September		October			November			December		
1	05:58		06:22		06:52		07:21			06:55		09:09 (T8)	07:29		09:27 (T8)
	21:00		20:42		19:59		19:09			17:23	30	09:39 (T8)	17:00	8	09:35 (T8)
2	05:59		06:23		06:53		07:22			06:56		09:08 (T8)	07:30		
	21:00		20:41		19:58		19:08			17:22	32	09:40 (T8)	16:59		
3	05:59		06:24		06:54		07:23			06:57		09:07 (T8)	07:31		
	21:00		20:39		19:56		19:06			17:21	33	09:40 (T8)	16:59		
4	06:00		06:24		06:55		07:24			06:58		09:07 (T8)	07:32		
	21:00		20:38		19:54		19:04			17:20	35	09:42 (T8)	16:59		
5	06:00		06:25		06:56		07:25		08:52 (T1)	06:59		09:06 (T8)	07:33		
	21:00		20:37		19:53		19:03	10	09:02 (T1)	17:19	37	09:43 (T8)	16:59		
6	06:01		06:26		06:57		07:26		08:49 (T1)	07:00		09:06 (T8)	07:34		
	20:59		20:36		19:51		19:01	15	09:04 (T1)	17:18	37	09:43 (T8)	16:59		
7	06:01		06:27		06:58		07:27		08:47 (T1)	07:02		09:05 (T8)	07:35		
	20:59		20:35		19:49		19:00	19	09:06 (T1)	17:17	38	09:43 (T8)	16:59		
8	06:02		06:28		06:59		07:28		08:45 (T1)	07:03		09:06 (T8)	07:36		
	20:59		20:34		19:48		18:58	22	09:07 (T1)	17:15	38	09:44 (T8)	16:59		
9	06:03		06:29		07:00		07:29		08:44 (T1)	07:04		09:06 (T8)	07:37		
	20:58		20:32		19:46		18:56	23	09:07 (T1)	17:14	39	09:45 (T8)	16:59		
10	06:03		06:30		07:00		07:30		08:43 (T1)	07:05		09:06 (T8)	07:37		
	20:58		20:31		19:45		18:55	24	09:07 (T1)	17:13	39	09:45 (T8)	16:59		
11	06:04		06:31		07:01		07:31		08:43 (T1)	07:06		09:05 (T8)	07:38		
	20:58		20:30		19:43		18:53	25	09:08 (T1)	17:12	40	09:45 (T8)	16:59		
12	06:05		06:32		07:02		07:32		08:42 (T1)	07:07		09:06 (T8)	07:39		
	20:57		20:29		19:41		18:52	25	09:07 (T1)	17:11	40	09:46 (T8)	16:59		
13	06:05		06:33		07:03		07:33		08:43 (T1)	07:09		09:06 (T8)	07:40		
	20:57		20:27		19:40		18:50	25	09:08 (T1)	17:11	39	09:45 (T8)	16:59		
14	06:06		06:34		07:04		07:34		08:43 (T1)	07:10		09:07 (T8)	07:41		
	20:56		20:26		19:38		18:49	25	09:08 (T1)	17:10	38	09:45 (T8)	16:59		
15	06:07		06:35		07:05		07:36		08:43 (T1)	07:11		09:07 (T8)	07:41		
	20:56		20:25		19:36		18:47	24	09:07 (T1)	17:09	38	09:45 (T8)	16:59		
16	06:08		06:36		07:06		07:37		08:43 (T1)	07:12		09:08 (T8)	07:42		
	20:55		20:23		19:35		18:45	23	09:06 (T1)	17:08	38	09:46 (T8)	17:00		
17	06:08		06:37		07:07		07:38		08:44 (T1)	07:13		09:08 (T8)	07:43		
	20:54		20:22		19:33		18:44	21	09:05 (T1)	17:07	37	09:45 (T8)	17:00		
18	06:09		06:38		07:08		07:39		08:44 (T1)	07:14		09:09 (T8)	07:43		
	20:54		20:20		19:31		18:42	20	09:04 (T1)	17:06	36	09:45 (T8)	17:00		
19	06:10		06:39		07:09		07:40		08:45 (T1)	07:16		09:09 (T8)	07:44		
	20:53		20:19		19:29		18:41	17	09:02 (T1)	17:06	35	09:44 (T8)	17:01		
20	06:11		06:40		07:10		07:41		08:47 (T1)	07:17		09:11 (T8)	07:45		
	20:52		20:18		19:28		18:40	13	09:00 (T1)	17:05	34	09:45 (T8)	17:01		
21	06:12		06:41		07:11		07:42		08:52 (T1)	07:18		09:12 (T8)	07:45		
	20:52		20:16		19:26		18:38	4	08:56 (T1)	17:04	32	09:44 (T8)	17:01		
22	06:13		06:42		07:12		07:43			07:19		09:12 (T8)	07:46		
	20:51		20:15		19:24		18:37			17:04	32	09:44 (T8)	17:02		
23	06:13		06:43		07:13		07:44			07:20		09:13 (T8)	07:46		
	20:50		20:13		19:23		18:35			17:03	30	09:43 (T8)	17:02		
24	06:14		06:44		07:14		07:45			07:21		09:14 (T8)	07:47		
	20:49		20:12		19:21		18:34			17:03	28	09:42 (T8)	17:03		
25	06:15		06:45		07:15		06:47			07:22		09:16 (T8)	07:47		
	20:48		20:10		19:19		17:32			17:02	27	09:43 (T8)	17:04		
26	06:16		06:46		07:16		06:48			07:23		09:17 (T8)	07:47		
	20:48		20:09		19:18		17:31			17:02	25	09:42 (T8)	17:04		
27	06:17		06:47		07:17		06:49			07:25		09:19 (T8)	07:48		
	20:47		20:07		19:16		17:30			17:01	22	09:41 (T8)	17:05		
28	06:18		06:48		07:18		06:50		09:16 (T8)	07:26		09:20 (T8)	07:48		
	20:46		20:06		19:14		17:28	14	09:30 (T8)	17:01	20	09:40 (T8)	17:05		
29	06:19		06:49		07:19		06:51		09:13 (T8)	07:27		09:22 (T8)	07:48		
	20:45		20:04		19:13		17:27	20	09:33 (T8)	17:00	17	09:39 (T8)	17:06		
30	06:20		06:50		07:20		06:52		09:11 (T8)	07:28		09:24 (T8)	07:49		
	20:44		20:02		19:11		17:26	24	09:35 (T8)	17:00	13	09:37 (T8)	17:07		
31	06:21		06:51				06:53		09:11 (T8)				07:49		
	20:43		20:01				17:25	26	09:37 (T8)				17:08		
Potential sun hours	457		427		375		346			299			289		
Total, worst case								419			979			8	

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F134 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (10)

Assumptions for shadow calculations

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

	January	February			March			April	May	June
1	07:49	07:36		09:19 (T8)	07:01			07:11	06:26	05:58
	17:09	17:43	5	09:24 (T8)	18:16			19:49	20:20	20:49
2	07:49	07:35		09:14 (T8)	06:59		08:01 (T1)	07:09	06:25	05:57
	17:10	17:44	15	09:29 (T8)	18:17	4	08:05 (T1)	19:50	20:21	20:50
3	07:49	07:34		09:12 (T8)	06:58		07:57 (T1)	07:08	06:23	05:57
	17:10	17:45	20	09:32 (T8)	18:18	12	08:09 (T1)	19:51	20:23	20:51
4	07:49	07:33		09:10 (T8)	06:56		07:54 (T1)	07:06	06:22	05:56
	17:11	17:46	24	09:34 (T8)	18:19	17	08:11 (T1)	19:52	20:24	20:52
5	07:49	07:32		09:09 (T8)	06:55		07:53 (T1)	07:04	06:21	05:56
	17:12	17:47	26	09:35 (T8)	18:20	19	08:12 (T1)	19:53	20:25	20:52
6	07:49	07:31		09:08 (T8)	06:53		07:51 (T1)	07:03	06:20	05:56
	17:13	17:49	29	09:37 (T8)	18:22	22	08:13 (T1)	19:54	20:26	20:53
7	07:49	07:30		09:07 (T8)	06:52		07:50 (T1)	07:01	06:18	05:55
	17:14	17:50	31	09:38 (T8)	18:23	23	08:13 (T1)	19:56	20:27	20:53
8	07:49	07:29		09:06 (T8)	06:50		07:50 (T1)	07:00	06:17	05:55
	17:15	17:51	33	09:39 (T8)	18:24	24	08:14 (T1)	19:57	20:28	20:54
9	07:49	07:28		09:05 (T8)	06:49		07:49 (T1)	06:58	06:16	05:55
	17:16	17:52	34	09:39 (T8)	18:25	24	08:13 (T1)	19:58	20:29	20:55
10	07:49	07:27		09:04 (T8)	06:47		07:49 (T1)	06:56	06:15	05:55
	17:17	17:54	36	09:40 (T8)	18:26	25	08:14 (T1)	19:59	20:30	20:55
11	07:49	07:26		09:04 (T8)	06:45		07:49 (T1)	06:55	06:14	05:55
	17:18	17:55	37	09:41 (T8)	18:27	24	08:13 (T1)	20:00	20:31	20:56
12	07:49	07:24		09:04 (T8)	06:44		07:48 (T1)	06:53	06:13	05:54
	17:19	17:56	37	09:41 (T8)	18:28	24	08:12 (T1)	20:01	20:32	20:56
13	07:48	07:23		09:03 (T8)	06:42		07:49 (T1)	06:52	06:12	05:54
	17:20	17:57	38	09:41 (T8)	18:29	22	08:11 (T1)	20:02	20:33	20:57
14	07:48	07:22		09:03 (T8)	06:41		07:50 (T1)	06:50	06:11	05:54
	17:21	17:58	38	09:41 (T8)	18:30	20	08:10 (T1)	20:03	20:34	20:57
15	07:48	07:21		09:03 (T8)	06:39		07:50 (T1)	06:49	06:10	05:54
	17:22	18:00	39	09:42 (T8)	18:31	18	08:08 (T1)	20:04	20:35	20:58
16	07:47	07:19		09:03 (T8)	06:37		07:52 (T1)	06:47	06:09	05:54
	17:24	18:01	39	09:42 (T8)	18:32	14	08:06 (T1)	20:05	20:36	20:58
17	07:47	07:18		09:03 (T8)	06:36		07:54 (T1)	06:46	06:08	05:54
	17:25	18:02	38	09:41 (T8)	18:34	9	08:03 (T1)	20:06	20:36	20:58
18	07:46	07:17		09:03 (T8)	06:34			06:44	06:07	05:54
	17:26	18:03	38	09:41 (T8)	18:35			20:07	20:37	20:59
19	07:46	07:15		09:03 (T8)	06:32			06:43	06:06	05:55
	17:27	18:04	37	09:40 (T8)	18:36			20:08	20:38	20:59
20	07:45	07:14		09:03 (T8)	06:31			06:41	06:05	05:55
	17:28	18:06	36	09:39 (T8)	18:37			20:09	20:39	20:59
21	07:45	07:13		09:04 (T8)	06:29			06:40	06:05	05:55
	17:29	18:07	35	09:39 (T8)	18:38			20:10	20:40	21:00
22	07:44	07:11		09:04 (T8)	06:27			06:38	06:04	05:55
	17:30	18:08	33	09:37 (T8)	18:39			20:11	20:41	21:00
23	07:43	07:10		09:06 (T8)	06:26			06:37	06:03	05:55
	17:32	18:09	30	09:36 (T8)	18:40			20:12	20:42	21:00
24	07:43	07:08		09:06 (T8)	06:24			06:35	06:02	05:56
	17:33	18:10	28	09:34 (T8)	18:41			20:13	20:43	21:00
25	07:42	07:07		09:08 (T8)	06:22			06:34	06:02	05:56
	17:34	18:11	25	09:33 (T8)	18:42			20:14	20:44	21:00
26	07:41	07:05		09:09 (T8)	06:21			06:33	06:01	05:56
	17:35	18:13	21	09:30 (T8)	18:43			20:15	20:45	21:00
27	07:41	07:04		09:12 (T8)	06:19			06:31	06:00	05:56
	17:36	18:14	16	09:28 (T8)	18:44			20:16	20:45	21:00
28	07:40	07:02		09:15 (T8)	06:17			06:30	06:00	05:57
	17:38	18:15	7	09:22 (T8)	18:45			20:17	20:46	21:00
29	07:39				07:16			06:28	05:59	05:57
	17:39				19:46			20:18	20:47	21:00
30	07:38				07:14			06:27	05:59	05:58
	17:40				19:47			20:19	20:48	21:00
31	07:37				07:13				05:58	
	17:41				19:48				20:49	
Potential sun hours	299	298			370			398	447	451
Total, worst case			825			301				

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F134 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (10)

Assumptions for shadow calculations

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

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

	July	August	September			October			November			December
1	05:58	06:22	06:52			07:21		08:28 (T1)	06:55		08:34 (T8)	07:29
	21:00	20:42	19:59			19:09	23	08:51 (T1)	17:23	36	09:10 (T8)	17:00
2	05:59	06:23	06:53			07:22		08:27 (T1)	06:56		08:35 (T8)	07:30
	21:00	20:41	19:58			19:08	24	08:51 (T1)	17:22	34	09:09 (T8)	16:59
3	05:59	06:24	06:54			07:23		08:27 (T1)	06:57		08:35 (T8)	07:31
	21:00	20:39	19:56			19:06	24	08:51 (T1)	17:21	33	09:08 (T8)	16:59
4	06:00	06:25	06:55			07:24		08:26 (T1)	06:58		08:37 (T8)	07:32
	21:00	20:38	19:54			19:04	25	08:51 (T1)	17:20	31	09:08 (T8)	16:59
5	06:00	06:25	06:56			07:25		08:26 (T1)	06:59		08:38 (T8)	07:33
	21:00	20:37	19:53			19:03	24	08:50 (T1)	17:19	29	09:07 (T8)	16:59
6	06:01	06:26	06:57			07:26		08:26 (T1)	07:00		08:39 (T8)	07:34
	20:59	20:36	19:51			19:01	24	08:50 (T1)	17:18	26	09:05 (T8)	16:59
7	06:01	06:27	06:58			07:27		08:27 (T1)	07:02		08:40 (T8)	07:35
	20:59	20:35	19:49			19:00	22	08:49 (T1)	17:17	23	09:03 (T8)	16:59
8	06:02	06:28	06:59			07:28		08:27 (T1)	07:03		08:43 (T8)	07:36
	20:59	20:34	19:48			18:58	21	08:48 (T1)	17:15	19	09:02 (T8)	16:59
9	06:03	06:29	07:00			07:29		08:28 (T1)	07:04		08:46 (T8)	07:37
	20:58	20:32	19:46			18:56	18	08:46 (T1)	17:14	14	09:00 (T8)	16:59
10	06:03	06:30	07:00			07:30		08:29 (T1)	07:05		08:50 (T8)	07:37
	20:58	20:31	19:45			18:55	15	08:44 (T1)	17:13	5	08:55 (T8)	16:59
11	06:04	06:31	07:01			07:31		08:32 (T1)	07:06			07:38
	20:58	20:30	19:43			18:53	9	08:41 (T1)	17:12			16:59
12	06:05	06:32	07:02			07:32			07:07			07:39
	20:57	20:29	19:41			18:52			17:11			16:59
13	06:05	06:33	07:03			07:33			07:09			07:40
	20:57	20:27	19:40			18:50			17:11			16:59
14	06:06	06:34	07:04			07:34		09:47 (T8)	07:10			07:41
	20:56	20:26	19:38			18:49	11	09:58 (T8)	17:10			16:59
15	06:07	06:35	07:05			07:36		09:43 (T8)	07:11			07:41
	20:56	20:25	19:36			18:47	19	10:02 (T8)	17:09			16:59
16	06:08	06:36	07:06			07:37		09:41 (T8)	07:12			07:42
	20:55	20:23	19:35			18:45	23	10:04 (T8)	17:08			17:00
17	06:08	06:37	07:07			07:38		09:39 (T8)	07:13			07:43
	20:54	20:22	19:33			18:44	26	10:05 (T8)	17:07			17:00
18	06:09	06:38	07:08			07:39		09:37 (T8)	07:14			07:43
	20:54	20:20	19:31			18:42	29	10:06 (T8)	17:06			17:00
19	06:10	06:39	07:09			07:40		09:36 (T8)	07:16			07:44
	20:53	20:19	19:29			18:41	31	10:07 (T8)	17:06			17:01
20	06:11	06:40	07:10			07:41		09:35 (T8)	07:17			07:45
	20:52	20:18	19:28			18:40	33	10:08 (T8)	17:05			17:01
21	06:12	06:41	07:11			07:42		09:35 (T8)	07:18			07:45
	20:52	20:16	19:26			18:38	35	10:10 (T8)	17:04			17:01
22	06:13	06:42	07:12			07:43		09:34 (T8)	07:19			07:46
	20:51	20:15	19:24			18:37	36	10:10 (T8)	17:04			17:02
23	06:13	06:43	07:13			07:44		09:33 (T8)	07:20			07:46
	20:50	20:13	19:23			18:35	37	10:10 (T8)	17:03			17:02
24	06:14	06:44	07:14			07:45		09:33 (T8)	07:21			07:47
	20:49	20:12	19:21			18:34	38	10:11 (T8)	17:03			17:03
25	06:15	06:45	07:15			06:47		08:32 (T8)	07:22			07:47
	20:48	20:10	19:19			17:32	39	09:11 (T8)	17:02			17:04
26	06:16	06:46	07:16		08:39 (T1)	06:48		08:33 (T8)	07:24			07:47
	20:48	20:09	19:18	4	08:43 (T1)	17:31	38	09:11 (T8)	17:02			17:04
27	06:17	06:47	07:17		08:35 (T1)	06:49		08:33 (T8)	07:25			07:48
	20:47	20:07	19:16	12	08:47 (T1)	17:30	38	09:11 (T8)	17:01			17:05
28	06:18	06:48	07:18		08:32 (T1)	06:50		08:33 (T8)	07:26			07:48
	20:46	20:06	19:14	17	08:49 (T1)	17:28	38	09:11 (T8)	17:01			17:06
29	06:19	06:49	07:19		08:31 (T1)	06:51		08:33 (T8)	07:27			07:48
	20:45	20:04	19:13	19	08:50 (T1)	17:27	38	09:11 (T8)	17:00			17:06
30	06:20	06:50	07:20		08:29 (T1)	06:52		08:33 (T8)	07:28			07:49
	20:44	20:02	19:11	22	08:51 (T1)	17:26	37	09:10 (T8)	17:00			17:07
31	06:21	06:51				06:53		08:34 (T8)				07:49
	20:43	20:01				17:25	36	09:10 (T8)				17:08
Potential sun hours	457	427	375			346			299			289
Total, worst case				74			811			250		

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F135 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (11)

Assumptions for shadow calculations

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

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

	January	February			March			April	May	June
1	07:49	07:36			07:01			07:11	06:26	05:58
	17:09	17:43			18:16			19:49	20:20	20:49
2	07:49	07:35		09:17 (T8)	06:59			07:09	06:25	05:57
	17:10	17:44	1	09:18 (T8)	18:17			19:50	20:21	20:50
3	07:49	07:34		09:11 (T8)	06:58		07:56 (T1)	07:08	06:23	05:57
	17:10	17:45	13	09:24 (T8)	18:18	12	08:08 (T1)	19:51	20:23	20:51
4	07:49	07:33		09:09 (T8)	06:56		07:53 (T1)	07:06	06:22	05:56
	17:11	17:46	18	09:27 (T8)	18:19	16	08:09 (T1)	19:52	20:24	20:52
5	07:49	07:32		09:07 (T8)	06:55		07:52 (T1)	07:04	06:21	05:56
	17:12	17:47	22	09:29 (T8)	18:20	19	08:11 (T1)	19:53	20:25	20:52
6	07:49	07:31		09:05 (T8)	06:53		07:51 (T1)	07:03	06:20	05:56
	17:13	17:49	26	09:31 (T8)	18:22	20	08:11 (T1)	19:54	20:26	20:53
7	07:49	07:30		09:04 (T8)	06:52		07:49 (T1)	07:01	06:18	05:55
	17:14	17:50	29	09:33 (T8)	18:23	22	08:11 (T1)	19:56	20:27	20:53
8	07:49	07:29		09:03 (T8)	06:50		07:49 (T1)	07:00	06:17	05:55
	17:15	17:51	31	09:34 (T8)	18:24	23	08:12 (T1)	19:57	20:28	20:54
9	07:49	07:28		09:02 (T8)	06:49		07:48 (T1)	06:58	06:16	05:55
	17:16	17:52	32	09:34 (T8)	18:25	24	08:12 (T1)	19:58	20:29	20:55
10	07:49	07:27		09:01 (T8)	06:47		07:48 (T1)	06:56	06:15	05:55
	17:17	17:54	34	09:35 (T8)	18:26	24	08:12 (T1)	19:59	20:30	20:55
11	07:49	07:26		09:01 (T8)	06:45		07:48 (T1)	06:55	06:14	05:55
	17:18	17:55	35	09:36 (T8)	18:27	23	08:11 (T1)	20:00	20:31	20:56
12	07:49	07:24		09:01 (T8)	06:44		07:48 (T1)	06:53	06:13	05:54
	17:19	17:56	35	09:36 (T8)	18:28	22	08:10 (T1)	20:01	20:32	20:56
13	07:48	07:23		08:59 (T8)	06:42		07:49 (T1)	06:52	06:12	05:54
	17:20	17:57	37	09:36 (T8)	18:29	21	08:10 (T1)	20:02	20:33	20:57
14	07:48	07:22		08:59 (T8)	06:41		07:49 (T1)	06:50	06:11	05:54
	17:21	17:58	38	09:37 (T8)	18:30	19	08:08 (T1)	20:03	20:34	20:57
15	07:48	07:21		09:00 (T8)	06:39		07:49 (T1)	06:49	06:10	05:54
	17:22	18:00	37	09:37 (T8)	18:31	17	08:06 (T1)	20:04	20:35	20:58
16	07:47	07:19		09:00 (T8)	06:37		07:52 (T1)	06:47	06:09	05:54
	17:24	18:01	37	09:37 (T8)	18:32	13	08:05 (T1)	20:05	20:36	20:58
17	07:47	07:18		08:59 (T8)	06:36		07:54 (T1)	06:46	06:08	05:54
	17:25	18:02	37	09:36 (T8)	18:34	7	08:01 (T1)	20:06	20:36	20:58
18	07:46	07:17		08:59 (T8)	06:34			06:44	06:07	05:54
	17:26	18:03	37	09:36 (T8)	18:35			20:07	20:37	20:59
19	07:46	07:15		08:59 (T8)	06:32			06:43	06:06	05:55
	17:27	18:04	36	09:35 (T8)	18:36			20:08	20:38	20:59
20	07:45	07:14		09:00 (T8)	06:31			06:41	06:05	05:55
	17:28	18:06	35	09:35 (T8)	18:37			20:09	20:39	20:59
21	07:45	07:13		09:00 (T8)	06:29			06:40	06:05	05:55
	17:29	18:07	35	09:35 (T8)	18:38			20:10	20:40	21:00
22	07:44	07:11		09:00 (T8)	06:27			06:38	06:04	05:55
	17:30	18:08	33	09:33 (T8)	18:39			20:11	20:41	21:00
23	07:43	07:10		09:02 (T8)	06:26			06:37	06:03	05:55
	17:32	18:09	30	09:32 (T8)	18:40			20:12	20:42	21:00
24	07:43	07:08		09:02 (T8)	06:24			06:35	06:02	05:56
	17:33	18:10	28	09:30 (T8)	18:41			20:13	20:43	21:00
25	07:42	07:07		09:04 (T8)	06:22			06:34	06:02	05:56
	17:34	18:11	25	09:29 (T8)	18:42			20:14	20:44	21:00
26	07:41	07:05		09:04 (T8)	06:21			06:33	06:01	05:56
	17:35	18:13	23	09:27 (T8)	18:43			20:15	20:45	21:00
27	07:41	07:04		09:07 (T8)	06:19			06:31	06:00	05:56
	17:36	18:14	17	09:24 (T8)	18:44			20:16	20:45	21:00
28	07:40	07:02		09:10 (T8)	06:17			06:30	06:00	05:57
	17:38	18:15	10	09:20 (T8)	18:45			20:17	20:46	21:00
29	07:39				07:16			06:28	05:59	05:57
	17:39				19:46			20:18	20:47	21:00
30	07:38				07:14			06:27	05:59	05:58
	17:40				19:47			20:19	20:48	21:00
31	07:37				07:13				05:58	
	17:41				19:48				20:49	
Potential sun hours	299	298			370			398	447	451
Total, worst case			771			282				

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F135 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (11)

Assumptions for shadow calculations

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

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

	July	August	September			October			November			December
1	05:58	06:22	06:52			07:21		08:27 (T1)	06:55		08:31 (T8)	07:29
	21:00	20:42	19:59			19:09	23	08:50 (T1)	17:23	34	09:05 (T8)	17:00
2	05:59	06:23	06:53			07:22		08:27 (T1)	06:56		08:32 (T8)	07:30
	21:00	20:41	19:58			19:08	23	08:50 (T1)	17:22	32	09:04 (T8)	16:59
3	05:59	06:24	06:54			07:23		08:26 (T1)	06:57		08:32 (T8)	07:31
	21:00	20:39	19:56			19:06	24	08:50 (T1)	17:21	30	09:02 (T8)	16:59
4	06:00	06:25	06:55			07:24		08:26 (T1)	06:58		08:34 (T8)	07:32
	21:00	20:38	19:54			19:04	23	08:49 (T1)	17:20	28	09:02 (T8)	16:59
5	06:00	06:25	06:56			07:25		08:25 (T1)	06:59		08:35 (T8)	07:33
	21:00	20:37	19:53			19:03	24	08:49 (T1)	17:19	26	09:01 (T8)	16:59
6	06:01	06:26	06:57			07:26		08:26 (T1)	07:00		08:37 (T8)	07:34
	20:59	20:36	19:51			19:01	22	08:48 (T1)	17:18	22	08:59 (T8)	16:59
7	06:01	06:27	06:58			07:27		08:26 (T1)	07:02		08:39 (T8)	07:35
	20:59	20:35	19:50			19:00	21	08:47 (T1)	17:17	18	08:57 (T8)	16:59
8	06:02	06:28	06:59			07:28		08:26 (T1)	07:03		08:42 (T8)	07:36
	20:59	20:34	19:48			18:58	20	08:46 (T1)	17:15	13	08:55 (T8)	16:59
9	06:03	06:29	07:00			07:29		08:27 (T1)	07:04			07:37
	20:58	20:32	19:46			18:56	18	08:45 (T1)	17:14			16:59
10	06:03	06:30	07:00			07:30		08:29 (T1)	07:05			07:37
	20:58	20:31	19:45			18:55	14	08:43 (T1)	17:13			16:59
11	06:04	06:31	07:01			07:31		08:31 (T1)	07:06			07:38
	20:58	20:30	19:43			18:53	9	08:40 (T1)	17:12			16:59
12	06:05	06:32	07:02			07:32			07:07			07:39
	20:57	20:29	19:41			18:52			17:11			16:59
13	06:05	06:33	07:03			07:33			07:09			07:40
	20:57	20:27	19:40			18:50			17:11			16:59
14	06:06	06:34	07:04			07:34		09:42 (T8)	07:10			07:41
	20:56	20:26	19:38			18:49	13	09:55 (T8)	17:10			16:59
15	06:07	06:35	07:05			07:36		09:39 (T8)	07:11			07:41
	20:56	20:25	19:36			18:47	19	09:58 (T8)	17:09			16:59
16	06:08	06:36	07:06			07:37		09:36 (T8)	07:12			07:42
	20:55	20:23	19:35			18:45	24	10:00 (T8)	17:08			17:00
17	06:08	06:37	07:07			07:38		09:35 (T8)	07:13			07:43
	20:54	20:22	19:33			18:44	26	10:01 (T8)	17:07			17:00
18	06:09	06:38	07:08			07:39		09:33 (T8)	07:14			07:43
	20:54	20:20	19:31			18:42	29	10:02 (T8)	17:06			17:00
19	06:10	06:39	07:09			07:40		09:32 (T8)	07:16			07:44
	20:53	20:19	19:29			18:41	31	10:03 (T8)	17:06			17:01
20	06:11	06:40	07:10			07:41		09:31 (T8)	07:17			07:45
	20:52	20:18	19:28			18:40	33	10:04 (T8)	17:05			17:01
21	06:12	06:41	07:11			07:42		09:31 (T8)	07:18			07:45
	20:52	20:16	19:26			18:38	34	10:05 (T8)	17:04			17:01
22	06:13	06:42	07:12			07:43		09:30 (T8)	07:19			07:46
	20:51	20:15	19:24			18:37	36	10:06 (T8)	17:04			17:02
23	06:13	06:43	07:13			07:44		09:30 (T8)	07:20			07:46
	20:50	20:13	19:23			18:35	36	10:06 (T8)	17:03			17:02
24	06:14	06:44	07:14			07:45		09:29 (T8)	07:21			07:47
	20:49	20:12	19:21			18:34	37	10:06 (T8)	17:03			17:03
25	06:15	06:45	07:15			06:47		08:29 (T8)	07:22			07:47
	20:48	20:10	19:19			17:32	37	09:06 (T8)	17:02			17:04
26	06:16	06:46	07:16			06:48		08:29 (T8)	07:24			07:47
	20:48	20:09	19:18			17:31	38	09:07 (T8)	17:02			17:04
27	06:17	06:47	07:17		08:34 (T1)	06:49		08:29 (T8)	07:25			07:48
	20:47	20:07	19:16	11	08:45 (T1)	17:30	38	09:07 (T8)	17:01			17:05
28	06:18	06:48	07:18		08:32 (T1)	06:50		08:29 (T8)	07:26			07:48
	20:46	20:06	19:14	15	08:47 (T1)	17:28	37	09:06 (T8)	17:01			17:06
29	06:19	06:49	07:19		08:30 (T1)	06:51		08:29 (T8)	07:27			07:48
	20:45	20:04	19:13	18	08:48 (T1)	17:27	37	09:06 (T8)	17:00			17:06
30	06:20	06:50	07:20		08:28 (T1)	06:52		08:29 (T8)	07:28			07:49
	20:44	20:02	19:11	21	08:49 (T1)	17:26	36	09:05 (T8)	17:00			17:07
31	06:21	06:51				06:53		08:31 (T8)				07:49
	20:43	20:01				17:25	34	09:05 (T8)				17:08
Potential sun hours	457	427	375			346			299			289
Total, worst case				65			796			203		

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F142 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (5)

Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:25	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:40	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:24	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:25	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:26	20:53	20:59	20:35	19:49	18:59	17:16	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55	06:02	06:28	06:58	07:28	07:03	07:35
	17:15	17:51	18:24	19:56	20:27	20:54	20:59	20:34	19:48	18:58	17:15	16:59
9	07:49	07:28	06:48	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:57	20:28	20:55	20:58	20:32	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:29	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:30	20:56	20:57	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:31	20:56	20:57	20:28	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:08	07:40
	17:20	17:57	18:29	20:02	20:32	20:57	20:56	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:40
	17:21	17:58	18:30	20:03	20:33	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:47	07:20	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:57	20:55	20:24	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37	07:12	07:42
	17:24	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:55	06:10	06:39	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:44
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:39	17:05	17:01
21	07:45	07:12	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:51	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:56	06:14	06:44	07:14	07:45	07:21	07:46
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	20:44	21:00	20:47	20:08	19:18	17:31	17:02	17:04
27	07:40	07:04	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49	07:24	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:46	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:12		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:48		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
Total, worst case												

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F143 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (6)

Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:25	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:40	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:24	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:25	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:26	20:53	20:59	20:35	19:49	18:59	17:16	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55	06:02	06:28	06:58	07:28	07:03	07:35
	17:15	17:51	18:24	19:56	20:27	20:54	20:59	20:34	19:48	18:58	17:15	16:59
9	07:49	07:28	06:48	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:57	20:28	20:54	20:58	20:32	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:29	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:30	20:56	20:57	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:31	20:56	20:57	20:28	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:08	07:40
	17:20	17:57	18:29	20:02	20:32	20:57	20:56	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:40
	17:21	17:58	18:30	20:03	20:33	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:47	07:20	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:57	20:55	20:24	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37	07:12	07:42
	17:24	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:55	06:10	06:39	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:44
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:39	17:05	17:01
21	07:45	07:12	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:51	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:56	06:14	06:44	07:14	07:45	07:21	07:46
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	20:44	21:00	20:47	20:08	19:18	17:31	17:02	17:04
27	07:40	07:04	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49	07:24	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:46	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:12		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:48		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
Total, worst case												

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F150 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (7)

Assumptions for shadow calculations

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

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

	January	February	March	April		May		June	July	August		September	October	November	December
1	07:49	07:36	07:01	07:11		06:26		18:49 (T5)	05:58	05:58	06:22		06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49		20:20	24	19:13 (T5)	20:49	21:00	20:41		19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09		06:24		18:50 (T5)	05:57	05:59	06:23		06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50		20:21	23	19:13 (T5)	20:50	21:00	20:40		19:57	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08		06:23		18:50 (T5)	05:57	05:59	06:23		06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51		20:22	21	19:11 (T5)	20:51	21:00	20:39		19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06		06:22		18:51 (T5)	05:56	06:00	06:24		06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52		20:23	19	19:10 (T5)	20:51	21:00	20:38		19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04		06:21		18:52 (T5)	05:56	06:00	06:25	19:06 (T5)	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53		20:24	17	19:09 (T5)	20:52	20:59	20:37	8 19:14 (T5)	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03		06:20		18:53 (T5)	05:56	06:01	06:26	19:04 (T5)	06:57	07:26	07:00	07:34
	17:13	17:49	18:21	19:54		20:25	15	19:08 (T5)	20:53	20:59	20:36	13 19:17 (T5)	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01		06:18		18:55 (T5)	05:55	06:01	06:27	19:02 (T5)	06:57	07:27	07:01	07:35
	17:14	17:50	18:23	19:55		20:26	11	19:06 (T5)	20:53	20:59	20:35	16 19:18 (T5)	19:49	18:59	17:16	16:59
8	07:49	07:29	06:50	07:00		06:17		18:58 (T5)	05:55	06:02	06:28	19:01 (T5)	06:58	07:28	07:03	07:35
	17:15	17:51	18:24	19:56		20:27	5	19:03 (T5)	20:54	20:59	20:34	18 19:19 (T5)	19:48	18:58	17:15	16:58
9	07:49	07:28	06:48	06:58		06:16			05:55	06:03	06:29	19:00 (T5)	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:57		20:28			20:54	20:58	20:32	20 19:20 (T5)	19:46	18:56	17:14	16:58
10	07:49	07:27	06:47	06:56		06:15			05:55	06:03	06:30	18:59 (T5)	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59		20:29			20:55	20:58	20:31	22 19:21 (T5)	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55		06:14			05:55	06:04	06:31	18:58 (T5)	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00		20:30			20:56	20:57	20:30	23 19:21 (T5)	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53		06:13			05:54	06:05	06:32	18:58 (T5)	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01		20:31			20:56	20:57	20:28	24 19:22 (T5)	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52		06:12			05:54	06:05	06:33	18:57 (T5)	07:03	07:33	07:08	07:40
	17:20	17:57	18:29	20:02		20:32			20:57	20:56	20:27	25 19:22 (T5)	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50		06:11			05:54	06:06	06:34	18:57 (T5)	07:04	07:34	07:10	07:40
	17:21	17:58	18:30	20:03		20:33			20:57	20:56	20:26	25 19:22 (T5)	19:38	18:48	17:10	16:59
15	07:47	07:20	06:39	06:49		06:10			05:54	06:07	06:35	18:56 (T5)	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04		20:34			20:57	20:55	20:24	25 19:21 (T5)	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47		06:09			05:54	06:08	06:36	18:56 (T5)	07:06	07:36	07:12	07:42
	17:23	18:01	18:32	20:05		20:35			20:58	20:55	20:23	25 19:21 (T5)	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:45		06:08			05:54	06:08	06:37	18:56 (T5)	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06		20:36			20:58	20:54	20:22	24 19:20 (T5)	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44		06:07			05:54	06:09	06:38	18:56 (T5)	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07		20:37			20:59	20:54	20:20	24 19:20 (T5)	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:42	18:59 (T5)	06:06			05:54	06:10	06:39	18:56 (T5)	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	8 19:07 (T5)	20:38			20:59	20:53	20:19	23 19:19 (T5)	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	18:56 (T5)	06:05			05:55	06:11	06:40	18:57 (T5)	07:10	07:41	07:17	07:44
	17:28	18:05	18:37	20:09	14 19:10 (T5)	20:39			20:59	20:52	20:17	21 19:18 (T5)	19:28	18:39	17:05	17:01
21	07:45	07:12	06:29	06:40	18:53 (T5)	06:05			05:55	06:12	06:41	18:57 (T5)	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	18 19:11 (T5)	20:40			20:59	20:51	20:16	20 19:17 (T5)	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	18:52 (T5)	06:04			05:55	06:13	06:42	18:59 (T5)	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20 19:12 (T5)	20:41			21:00	20:51	20:14	17 19:16 (T5)	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	18:51 (T5)	06:03			05:55	06:13	06:43	19:00 (T5)	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	22 19:13 (T5)	20:42			21:00	20:50	20:13	14 19:14 (T5)	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	18:50 (T5)	06:02			05:55	06:14	06:44	19:03 (T5)	07:14	07:45	07:21	07:46
	17:33	18:10	18:41	20:13	24 19:14 (T5)	20:43			21:00	20:49	20:12	7 19:10 (T5)	19:21	18:34	17:02	17:03
25	07:42	07:07	06:22	06:34	18:50 (T5)	06:02			05:56	06:15	06:45		07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	24 19:14 (T5)	20:44			21:00	20:48	20:10		19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	18:49 (T5)	06:01			05:56	06:16	06:46		07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	25 19:14 (T5)	20:44			21:00	20:47	20:08		19:18	17:31	17:01	17:04
27	07:40	07:04	06:19	06:31	18:49 (T5)	06:00			05:56	06:17	06:47		07:17	06:49	07:24	07:48
	17:36	18:14	18:44	20:16	25 19:14 (T5)	20:45			21:00	20:46	20:07		19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	18:49 (T5)	06:00			05:57	06:18	06:48		07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	25 19:14 (T5)	20:46			21:00	20:46	20:05		19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	18:48 (T5)	05:59			05:57	06:19	06:49		07:19	06:51	07:27	07:48
	17:39		19:46	20:18	25 19:13 (T5)	20:47			21:00	20:45	20:04		19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	18:49 (T5)	05:59			05:58	06:20	06:50		07:20	06:52	07:28	07:49
	17:40		19:47	20:19	24 19:13 (T5)	20:48			21:00	20:44	20:02		19:11	17:26	17:00	17:07
31	07:37		07:12			05:58				06:21	06:51			06:53		07:49
	17:41		19:48			20:48				20:43	20:01			17:25		17:08
Potential sun hours	299	298	370	398		447		451	457	427		375	346	299	289
Total, worst case					254		135				394				

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F151 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (8)

Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49	20:20	20:49	21:00	20:41	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:24	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:40	19:57	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:23	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:21	19:54	20:25	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:57	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:26	20:53	20:59	20:35	19:49	18:59	17:16	16:59
8	07:49	07:29	06:50	06:59	06:17	05:55	06:02	06:28	06:58	07:28	07:03	07:35
	17:15	17:51	18:24	19:56	20:27	20:54	20:59	20:34	19:48	18:58	17:15	16:58
9	07:49	07:28	06:48	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:57	20:28	20:54	20:58	20:32	19:46	18:56	17:14	16:58
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:53	18:26	19:59	20:29	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:30	20:56	20:57	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:31	20:56	20:57	20:28	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:08	07:40
	17:20	17:57	18:29	20:02	20:32	20:57	20:56	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:40
	17:21	17:58	18:30	20:03	20:33	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:47	07:20	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:57	20:55	20:24	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:36	07:12	07:42
	17:23	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:45	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:42	06:06	05:54	06:10	06:39	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:44
	17:28	18:05	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:39	17:05	17:01
21	07:45	07:12	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:51	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:14	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:55	06:14	06:44	07:14	07:45	07:21	07:46
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:02	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	20:44	21:00	20:47	20:08	19:18	17:31	17:01	17:04
27	07:40	07:04	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49	07:24	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:46	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:58	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:12		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:48		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
Total, worst case												

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F158 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (12)

Assumptions for shadow calculations

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

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

	January	February	March	April		May		June	July		August		September	October	November	December
1	07:49	07:36	07:01	07:11		06:26		17:49 (T4)	05:58		06:22		18:04 (T4)	06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49		20:20	43	18:32 (T4)	20:49		20:42	33	18:37 (T4)	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09		06:24		17:50 (T4)	05:57		06:23		18:04 (T4)	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50		20:21	42	18:32 (T4)	20:50		20:40	34	18:38 (T4)	19:57	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08		06:23		17:49 (T4)	05:57		06:23		18:03 (T4)	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51		20:22	42	18:31 (T4)	20:51		20:39	35	18:38 (T4)	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06		06:22		17:50 (T4)	05:56		06:24		18:02 (T4)	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52		20:23	41	18:31 (T4)	20:51		20:38	37	18:39 (T4)	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04		06:21		17:50 (T4)	05:56		06:25		18:01 (T4)	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53		20:24	41	18:31 (T4)	20:52		20:37	38	18:39 (T4)	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03		06:20		17:51 (T4)	05:56		06:26		18:01 (T4)	06:57	07:26	07:00	07:34
	17:13	17:49	18:21	19:54		20:25	39	18:30 (T4)	20:53		20:36	39	18:40 (T4)	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01		06:18		17:51 (T4)	05:55		06:27		18:00 (T4)	06:57	07:27	07:01	07:35
	17:14	17:50	18:23	19:55		20:26	39	18:30 (T4)	20:53		20:35	40	18:40 (T4)	19:49	18:59	17:16	16:59
8	07:49	07:29	06:50	07:00		06:17		17:52 (T4)	05:55		06:28		18:00 (T4)	06:58	07:28	07:03	07:35
	17:15	17:51	18:24	19:56		20:27	38	18:30 (T4)	20:54		20:34	40	18:40 (T4)	19:48	18:58	17:15	16:58
9	07:49	07:28	06:48	06:58		06:16		17:53 (T4)	05:55		06:29		17:59 (T4)	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:57		20:28	36	18:29 (T4)	20:55		20:32	42	18:41 (T4)	19:46	18:56	17:14	16:58
10	07:49	07:27	06:47	06:56		06:15		17:53 (T4)	05:55		06:30		17:59 (T4)	07:00	07:30	07:05	07:37
	17:17	17:53	18:26	19:59		20:29	36	18:29 (T4)	20:55		20:31	42	18:41 (T4)	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55		06:14		17:54 (T4)	05:55		06:31		17:58 (T4)	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00		20:30	34	18:28 (T4)	20:56		20:30	43	18:41 (T4)	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53		06:13		17:55 (T4)	05:54		06:32		17:58 (T4)	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01		20:31	32	18:27 (T4)	20:56		20:28	43	18:41 (T4)	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52		06:12		17:56 (T4)	05:54		06:33		17:58 (T4)	07:03	07:33	07:08	07:40
	17:20	17:57	18:29	20:02		20:32	30	18:26 (T4)	20:57		20:27	42	18:40 (T4)	19:39	18:50	17:10	16:59
14	07:48	07:22	06:40	06:50		06:11		17:57 (T4)	05:54		06:34		17:57 (T4)	07:04	07:34	07:10	07:40
	17:21	17:58	18:30	20:03		20:33	28	18:25 (T4)	20:57		20:26	42	18:39 (T4)	19:38	18:48	17:10	16:59
15	07:47	07:20	06:39	06:49		06:10		17:58 (T4)	05:54		06:35		17:57 (T4)	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04	13	18:19 (T4)		20:34	26	18:24 (T4)	20:57		20:55	24	42	18:39 (T4)	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47		18:03 (T4)		06:09		17:59 (T4)	05:54		06:08		06:36		17:56 (T4)	07:06	07:36	07:12	07:42
	17:23	18:01	18:32	20:05	20	18:23 (T4)		20:35	24	18:23 (T4)	20:58		20:55		20:23	42	18:38 (T4)	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:45		18:00 (T4)		06:08		18:01 (T4)	05:54		06:08		06:37		17:57 (T4)	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06	24	18:24 (T4)		20:36	20	18:21 (T4)	20:58		20:54		20:22	41	18:38 (T4)	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44		17:58 (T4)		06:07		18:02 (T4)	05:54		06:09		06:38		17:57 (T4)	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	28	18:26 (T4)		20:37	18	18:20 (T4)	20:59		20:54		20:20	40	18:37 (T4)	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:42		17:56 (T4)		06:06		18:04 (T4)	05:54		06:10		06:39		17:57 (T4)	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	31	18:27 (T4)		20:38	14	18:18 (T4)	20:59		20:53		20:19	40	18:37 (T4)	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41		17:55 (T4)		06:05		18:08 (T4)	05:55		06:11		06:40		17:57 (T4)	07:10	07:41	07:17	07:44
	17:28	18:05	18:37	20:09	34	18:29 (T4)		20:39	7	18:15 (T4)	20:59		20:52		20:17	39	18:36 (T4)	19:28	18:39	17:05	17:01
21	07:45	07:12	06:29	06:40		17:53 (T4)		06:04			05:55		06:12		06:41		17:58 (T4)	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	36	18:29 (T4)		20:40			20:59		20:51		20:16	37	18:35 (T4)	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38		17:53 (T4)		06:04			05:55		06:13		06:42		17:58 (T4)	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	37	18:30 (T4)		20:41			21:00		20:51		20:14	36	18:34 (T4)	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37		17:51 (T4)		06:03			05:55		06:13		06:43		17:59 (T4)	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	39	18:30 (T4)		20:42			21:00		20:50		20:13	33	18:32 (T4)	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35		17:51 (T4)		06:02			05:55		06:14	18:16 (T4)	06:44		18:00 (T4)	07:14	07:45	07:21	07:46
	17:33	18:10	18:41	20:13	40	18:31 (T4)		20:43			21:00		20:49	11 18:27 (T4)	20:12	31	18:31 (T4)	19:21	18:34	17:02	17:03
25	07:42	07:07	06:22	06:34		17:51 (T4)		06:02			05:56		06:15	18:14 (T4)	06:45		18:01 (T4)	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	41	18:32 (T4)		20:44			21:00		20:48	15 18:29 (T4)	20:10	28	18:29 (T4)	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32		17:50 (T4)		06:01			05:56		06:16	18:12 (T4)	06:46		18:03 (T4)	07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	41	18:31 (T4)		20:44			21:00		20:47	19 18:31 (T4)	20:08	24	18:27 (T4)	19:18	17:31	17:01	17:04
27	07:40	07:04	06:19	06:31		17:50 (T4)		06:00			05:56		06:17	18:11 (T4)	06:47		18:05 (T4)	07:17	06:49	07:24	07:48
	17:36	18:14	18:44	20:16	42	18:32 (T4)		20:45			21:00		20:46	22 18:33 (T4)	20:07	19	18:24 (T4)	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30		17:50 (T4)		06:00			05:57		06:18	18:09 (T4)	06:48		18:08 (T4)	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	42	18:32 (T4)		20:46			21:00		20:46	25 18:34 (T4)	20:05	12	18:20 (T4)	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28		17:49 (T4)		05:59			05:57		06:19	18:08 (T4)	06:49			07:19	06:51	07:27	07:48
	17:39		19:46	20:18	42	18:31 (T4)		20:47			21:00		20:45	27 18:35 (T4)	20:04			19:13	17:27	17:00	17:06
30	07:38		07:14	06:27		17:49 (T4)		05:58			05:58		06:20	18:07 (T4)	06:50			07:20	06:52	07:28	07:49
	17:40		19:47	20:19	43	18:32 (T4)		20:48			21:00		20:44	29 18:36 (T4)	20:02			19:11	17:26	17:00	17:07
31	07:37		07:12					05:58					06:21	18:06 (T4)	06:51				06:53		07:49
	17:41		19:48					20:48					20:43	31 18:37 (T4)	20:01				17:25		17:08
Potential sun hours	299	298	370	398		447		451	457		427		375	346	299	289
Total, worst case					553		630			179		1014				

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F46 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (9)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June		July	August	September	October	November	December
1	07:49	07:36	07:01	07:11	06:26	05:58		05:58	06:22	06:52	07:21	06:55	07:29
	17:09	17:43	18:16	19:49	20:20	20:49		21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:25	05:57		05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50		21:00	20:41	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57		05:59	06:24	06:54	07:23	06:57	07:31
	17:11	17:45	18:18	19:51	20:22	20:51		21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56		06:00	06:25	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51		21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56		06:00	06:26	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:25	20:52		20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56		06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:26	20:53		20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:19	05:55		06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:56	20:27	20:53		20:59	20:35	19:49	19:00	17:17	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55		06:02	06:28	06:59	07:28	07:03	07:36
	17:15	17:51	18:24	19:57	20:28	20:54		20:59	20:34	19:48	18:58	17:16	16:59
9	07:49	07:28	06:49	06:58	06:16	05:55		06:03	06:29	07:00	07:29	07:04	07:36
	17:16	17:52	18:25	19:58	20:29	20:55		20:58	20:32	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56	06:15	05:55		06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:30	20:55		20:58	20:31	19:45	18:55	17:13	16:59
11	07:49	07:26	06:45	06:55	06:14	05:55		06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:31	20:56		20:58	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:55		06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:32	20:56		20:57	20:29	19:41	18:52	17:12	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54		06:06	06:33	07:03	07:33	07:09	07:40
	17:20	17:57	18:29	20:02	20:33	20:57		20:57	20:27	19:40	18:50	17:11	16:59
14	07:48	07:22	06:41	06:50	06:11	05:54		06:06	06:34	07:04	07:34	07:10	07:41
	17:21	17:58	18:30	20:03	20:34	20:57		20:56	20:26	19:38	18:49	17:10	16:59
15	07:48	07:21	06:39	06:49	06:10	05:54		06:07	06:35	07:05	07:36	07:11	07:41
	17:22	18:00	18:31	20:04	20:35	20:58		20:56	20:25	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54		06:08	06:36	07:06	07:37	07:12	07:42
	17:24	18:01	18:32	20:05	20:35	20:58		20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54		06:09	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:34	20:06	20:36	20:58		20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54		06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59		20:54	20:20	19:31	18:43	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:55		06:10	06:39	07:09	07:40	07:16	07:44
	17:27	18:04	18:36	20:08	20:38	20:59		20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55		06:52 (T4)	06:11	06:40	07:10	07:41	07:17	07:45
	17:28	18:06	18:37	20:09	20:39	20:59	1	06:53 (T4)	20:52	20:18	19:28	18:40	17:05	17:01
21	07:45	07:13	06:29	06:40	06:05	05:55		06:51 (T4)	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	2	06:53 (T4)	20:52	20:16	19:26	18:38	17:04	17:02
22	07:44	07:11	06:27	06:38	06:04	05:55		06:51 (T4)	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	2	06:53 (T4)	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55			06:14	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00			20:50	20:13	19:23	18:35	17:03	17:03
24	07:43	07:08	06:24	06:35	06:02	05:56			06:14	06:44	07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	20:43	21:00			20:49	20:12	19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56			06:15	06:45	07:15	06:47	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00			20:48	20:10	19:19	17:33	17:02	17:04
26	07:41	07:05	06:21	06:33	06:01	05:56			06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:13	18:43	20:15	20:45	21:00			20:47	20:09	19:18	17:31	17:02	17:04
27	07:40	07:04	06:19	06:31	06:00	05:57			06:17	06:47	07:17	06:49	07:25	07:48
	17:36	18:14	18:44	20:16	20:45	21:00			20:47	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57			06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00			20:46	20:05	19:14	17:29	17:01	17:06
29	07:39		07:16	06:28	05:59	05:57			06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00			20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58			06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00			20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:13		05:58				06:21	06:51		06:53		07:49
	17:41		19:48		20:49				20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451			457	427	375	346	299	289
Total, worst case							5							

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F54 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (2)

Assumptions for shadow calculations

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

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

	January	February	March	April			May		June	July			August			September	October	November	December
1	07:49	07:36	07:01	07:11			06:26		07:01 (T4)	05:58			06:22		07:09 (T4)	06:52	07:21	06:55	07:29
	17:09	17:43	18:16	19:49			20:20	45	07:46 (T5)	20:49			20:42	44	07:53 (T5)	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09			06:25		07:00 (T4)	05:57			06:23		07:07 (T4)	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50			20:21	47	07:47 (T5)	20:50			20:41	46	07:53 (T5)	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08			06:23		06:59 (T4)	05:57			06:24		07:07 (T4)	06:54	07:23	06:57	07:31
	17:11	17:45	18:18	19:51			20:22	48	07:47 (T5)	20:51			20:39	46	07:53 (T5)	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06			06:22		06:58 (T4)	05:56			06:25		07:07 (T4)	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52			20:23	48	07:46 (T5)	20:51			20:38	47	07:54 (T5)	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04			06:21		06:58 (T4)	05:56			06:26		07:07 (T4)	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53			20:25	48	07:46 (T5)	20:52			20:37	47	07:54 (T5)	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03			06:20		06:57 (T4)	05:56			06:26		07:07 (T4)	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54			20:26	48	07:45 (T5)	20:53			20:36	48	07:55 (T5)	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01			06:19		06:57 (T4)	05:55			06:27		07:07 (T4)	06:58	07:27	07:02	07:35
	17:14	17:50	18:23	19:56			20:27	48	07:45 (T5)	20:53			20:35	48	07:55 (T5)	19:49	19:00	17:17	16:59
8	07:49	07:29	06:50	07:00			06:17		06:57 (T4)	05:55			06:28		07:07 (T4)	06:59	07:28	07:03	07:36
	17:15	17:51	18:24	19:57			20:28	48	07:45 (T5)	20:54			20:34	48	07:55 (T5)	19:48	18:58	17:16	16:59
9	07:49	07:28	06:49	06:58			06:16		06:57 (T4)	05:55			06:29		07:08 (T4)	07:00	07:29	07:04	07:36
	17:16	17:52	18:25	19:58			20:29	47	07:44 (T5)	20:55			20:32	47	07:55 (T5)	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56			06:15		06:58 (T4)	05:55			06:30		07:08 (T4)	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59			20:30	46	07:44 (T5)	20:55			20:31	47	07:55 (T5)	19:45	18:55	17:13	16:59
11	07:49	07:26	06:45	06:55			06:14		06:58 (T4)	05:55			06:31		07:09 (T4)	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00			20:31	45	07:43 (T5)	20:56			20:30	46	07:55 (T5)	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53			06:13		06:58 (T4)	05:55			06:32		07:10 (T4)	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01			20:32	44	07:42 (T5)	20:56			20:29	45	07:55 (T5)	19:41	18:52	17:12	16:59
13	07:48	07:23	06:42	06:52			06:12		06:59 (T4)	05:54			06:33		07:12 (T4)	07:03	07:33	07:09	07:40
	17:20	17:57	18:29	20:02			20:33	42	07:41 (T5)	20:57			20:27	43	07:55 (T5)	19:40	18:50	17:11	16:59
14	07:48	07:22	06:41	06:50			06:11		06:59 (T4)	05:54			06:34		07:14 (T4)	07:04	07:34	07:10	07:41
	17:21	17:58	18:30	20:03			20:34	41	07:40 (T5)	20:57			20:26	40	07:54 (T5)	19:38	18:49	17:10	16:59
15	07:48	07:21	06:39	06:49			06:10		07:00 (T4)	05:54			06:35		07:20 (T5)	07:05	07:36	07:11	07:41
	17:22	18:00	18:31	20:04			20:35	39	07:39 (T5)	20:58			20:25	34	07:54 (T5)	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47			06:09		07:01 (T4)	05:54			06:36		07:20 (T5)	07:06	07:37	07:12	07:42
	17:24	18:01	18:32	20:05			20:35	36	07:38 (T5)	20:58			20:23	32	07:52 (T5)	19:35	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46			06:08		07:02 (T4)	05:54			06:37		07:20 (T5)	07:07	07:38	07:13	07:43
	17:25	18:02	18:34	20:06			20:36	31	07:37 (T5)	20:58			20:22	31	07:51 (T5)	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44			06:07		07:05 (T4)	05:54			06:38		07:21 (T5)	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07			20:37	22	07:35 (T5)	20:59			20:20	29	07:50 (T5)	19:31	18:43	17:06	17:00
19	07:46	07:15	06:32	06:43			06:06		07:22 (T5)	05:55			06:39		07:22 (T5)	07:09	07:40	07:16	07:44
	17:27	18:04	18:36	20:08			20:38	11	07:33 (T5)	20:59			20:19	27	07:49 (T5)	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41		07:25 (T5)	06:05		07:25 (T5)	05:55			06:40		07:23 (T5)	07:10	07:41	07:17	07:45
	17:28	18:06	18:37	20:09	12	07:37 (T5)	20:39	5	07:30 (T5)	20:59			20:18	25	07:48 (T5)	19:28	18:40	17:05	17:01
21	07:45	07:13	06:29	06:40		07:21 (T5)	06:05			05:55			06:41		07:24 (T5)	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	18	07:39 (T5)	20:40			20:59			20:16	22	07:46 (T5)	19:26	18:38	17:04	17:02
22	07:44	07:11	06:27	06:38		07:19 (T5)	06:04			05:55			06:42		07:27 (T5)	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	22	07:41 (T5)	20:41			21:00			20:15	16	07:43 (T5)	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37		07:18 (T5)	06:03			05:55			06:43		07:30 (T5)	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	25	07:43 (T5)	20:42			21:00			20:13	10	07:40 (T5)	19:23	18:35	17:03	17:03
24	07:43	07:08	06:24	06:35		07:16 (T5)	06:02			05:56		07:34 (T5)	06:44			07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	27	07:43 (T5)	20:43			21:00	8	07:42 (T5)	20:12			19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34		07:15 (T5)	06:02			05:56		07:30 (T5)	06:45			07:15	06:47	07:22	07:47
	17:34	18:11	18:42	20:14	30	07:45 (T5)	20:44			21:00	14	07:44 (T5)	20:10			19:19	17:33	17:02	17:04
26	07:41	07:05	06:21	06:33		07:13 (T5)	06:01			05:56		07:14 (T4)	06:46			07:16	06:48	07:23	07:47
	17:35	18:13	18:43	20:15	32	07:45 (T5)	20:45			21:00	26	07:46 (T5)	20:09			19:18	17:31	17:02	17:04
27	07:41	07:04	06:19	06:31		07:13 (T5)	06:00			05:57		07:12 (T4)	06:47			07:17	06:49	07:25	07:48
	17:36	18:14	18:44	20:16	32	07:45 (T5)	20:45			21:00	34	07:48 (T5)	20:07			19:16	17:30	17:01	17:05
28	07:40	07:02	06:18	06:30		07:12 (T5)	06:00			05:57		07:11 (T4)	06:48			07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	34	07:46 (T5)	20:46			21:00	38	07:49 (T5)	20:06			19:14	17:29	17:01	17:06
29	07:39		07:16	06:28		07:06 (T4)	05:59			05:57		07:10 (T4)	06:49			07:19	06:51	07:27	07:48
	17:39		19:46	20:18	41	07:47 (T5)	20:47			21:00	40	07:50 (T5)	20:04			19:13	17:27	17:00	17:06
30	07:38		07:14	06:27		07:02 (T4)	05:59			05:58		07:10 (T4)	06:50			07:20	06:52	07:28	07:49
	17:40		19:47	20:19	44	07:46 (T5)	20:48			21:00	41	07:51 (T5)	20:02			19:11	17:26	17:00	17:07
31	07:37		07:13				05:58					07:09 (T4)	06:51				06:53		07:49
	17:41		19:48				20:49				43	07:52 (T5)	20:01				17:25		17:08
Potential sun hours	299	298	370	398			447		451	457			427			375	346	299	289
Total, worst case					317			789			244			868					

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar

Calculation: Progetto_2022_05_05Shadow receptor: F63 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (3)

Assumptions for shadow calculations

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

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

	January	February	March		April		May	June	July	August		September		October	November	December
1	07:49	07:36	07:01		07:11		07:44 (T5)	06:26	05:58	05:58	06:22			07:21	06:55	07:29
	17:09	17:43	18:16		19:49	28	08:12 (T5)	20:20	20:49	21:00	20:42			19:09	17:23	17:00
2	07:49	07:35	06:59		07:09		07:43 (T5)	06:25	05:57	05:59	06:23			07:22	06:56	07:30
	17:10	17:44	18:17		19:50	30	08:13 (T5)	20:21	20:50	21:00	20:41			19:08	17:22	16:59
3	07:49	07:34	06:58		07:08		07:42 (T5)	06:23	05:57	05:59	06:24			07:23	06:57	07:31
	17:11	17:45	18:18		19:51	30	08:12 (T5)	20:22	20:51	21:00	20:39			19:06	17:21	16:59
4	07:49	07:33	06:56		07:06		07:41 (T5)	06:22	05:56	06:00	06:25			07:24	06:58	07:32
	17:11	17:46	18:19		19:52	31	08:12 (T5)	20:24	20:51	21:00	20:38			19:04	17:20	16:59
5	07:49	07:32	06:55		07:04		07:42 (T5)	06:21	05:56	06:00	06:26			07:25	06:59	07:33
	17:12	17:48	18:21		19:53	30	08:12 (T5)	20:25	20:52	21:00	20:37			19:03	17:19	16:59
6	07:49	07:31	06:53		07:03		07:41 (T5)	06:20	05:56	06:01	06:26			07:26	07:00	07:34
	17:13	17:49	18:22		19:54	30	08:11 (T5)	20:26	20:53	20:59	20:36			19:01	17:18	16:59
7	07:49	07:30	06:52		07:01		07:42 (T5)	06:19	05:55	06:01	06:27			07:27	07:02	07:35
	17:14	17:50	18:23		19:56	29	08:11 (T5)	20:27	20:53	20:59	20:35			19:00	17:17	16:59
8	07:49	07:29	06:50		07:00		07:41 (T5)	06:17	05:55	06:02	06:28			07:28	07:03	07:36
	17:15	17:51	18:24		19:57	29	08:10 (T5)	20:28	20:54	20:59	20:34			18:58	17:16	16:59
9	07:49	07:28	06:49		06:58		07:41 (T5)	06:16	05:55	06:03	06:29			07:29	07:04	07:36
	17:16	17:52	18:25		19:58	28	08:09 (T5)	20:29	20:55	20:58	20:32			18:56	17:14	16:59
10	07:49	07:27	06:47		06:56		07:42 (T5)	06:15	05:55	06:03	06:30			07:30	07:05	07:37
	17:17	17:54	18:26		19:59	26	08:08 (T5)	20:30	20:55	20:58	20:31			18:55	17:13	16:59
11	07:49	07:26	06:45		06:55		07:25 (T4)	06:14	05:55	06:04	06:31			07:31	07:06	07:38
	17:18	17:55	18:27		20:00	33	08:06 (T5)	20:31	20:56	20:58	20:30			18:53	17:12	16:59
12	07:49	07:24	06:44		06:53		07:24 (T4)	06:13	05:55	06:05	06:32			07:32	07:07	07:39
	17:19	17:56	18:28		20:01	34	08:05 (T5)	20:32	20:56	20:57	20:29			18:52	17:12	16:59
13	07:48	07:23	06:42		06:52		07:21 (T4)	06:12	05:54	06:06	06:33			07:33	07:09	07:40
	17:20	17:57	18:29		20:02	35	08:03 (T5)	20:33	20:57	20:57	20:27			18:50	17:11	16:59
14	07:48	07:22	06:41		06:50		07:21 (T4)	06:11	05:54	06:06	06:34			07:34	07:10	07:41
	17:21	17:58	18:30		20:03	31	08:01 (T5)	20:34	20:57	20:56	20:26			18:49	17:10	16:59
15	07:48	07:21	06:39		06:49		07:19 (T4)	06:10	05:54	06:07	06:35			07:36	07:11	07:41
	17:22	18:00	18:31		20:04	21	07:54 (T5)	20:35	20:58	20:56	20:25			18:47	17:09	16:59
16	07:47	07:19	06:37		06:47		07:19 (T4)	06:09	05:54	06:08	06:36			07:37	07:12	07:42
	17:24	18:01	18:33		20:05	20	07:39 (T4)	20:35	20:58	20:55	20:23			18:46	17:08	17:00
17	07:47	07:18	06:36		06:46		07:18 (T4)	06:08	05:54	06:09	06:37			07:38	07:13	07:43
	17:25	18:02	18:34		20:06	21	07:39 (T4)	20:36	20:58	20:54	20:22			18:44	17:07	17:00
18	07:46	07:17	06:34		06:44		07:19 (T4)	06:07	05:55	06:09	06:38			07:39	07:14	07:43
	17:26	18:03	18:35		20:07	20	07:39 (T4)	20:37	20:59	20:54	20:20			18:43	17:06	17:00
19	07:46	07:15	06:32		06:43		07:18 (T4)	06:06	05:55	06:10	06:39	07:28 (T4)		07:40	07:16	07:44
	17:27	18:04	18:36		20:08	20	07:38 (T4)	20:38	20:59	20:53	20:19	9 07:37 (T4)		18:41	17:06	17:01
20	07:45	07:14	06:31		06:41		07:19 (T4)	06:05	05:55	06:11	06:40	07:26 (T4)		07:41	07:17	07:45
	17:28	18:06	18:37		20:09	19	07:38 (T4)	20:39	20:59	20:52	20:18	13 07:39 (T4)		18:40	17:05	17:01
21	07:45	07:13	06:29		06:40		07:18 (T4)	06:05	05:55	06:12	06:41	07:24 (T4)		07:42	07:18	07:45
	17:29	18:07	18:38		20:10	18	07:36 (T4)	20:40	20:59	20:52	20:16	16 07:40 (T4)		18:38	17:04	17:02
22	07:44	07:11	06:27		06:38		07:20 (T4)	06:04	05:55	06:13	06:42	07:23 (T4)		07:43	07:19	07:46
	17:30	18:08	18:39		20:11	15	07:35 (T4)	20:41	21:00	20:51	20:15	18 07:41 (T4)		18:37	17:04	17:02
23	07:43	07:10	06:26		06:37		07:21 (T4)	06:03	05:55	06:14	06:43	07:22 (T4)		07:44	07:20	07:46
	17:32	18:09	18:40		20:12	13	07:34 (T4)	20:42	21:00	20:50	20:13	19 07:41 (T4)		18:35	17:03	17:03
24	07:43	07:08	06:24		06:35		07:23 (T4)	06:02	05:56	06:14	06:44	07:22 (T4)		07:45	07:21	07:47
	17:33	18:10	18:41		20:13	8	07:31 (T4)	20:43	21:00	20:49	20:12	20 07:42 (T4)		18:34	17:03	17:03
25	07:42	07:07	06:22		06:34			06:02	05:56	06:15	06:45	07:21 (T4)		06:47	07:22	07:47
	17:34	18:11	18:42		20:14			20:44	21:00	20:48	20:10	21 07:42 (T4)		17:33	17:02	17:04
26	07:41	07:05	06:21	06:57 (T5)	06:33			06:01	05:56	06:16	06:46	07:21 (T4)		06:48	07:23	07:47
	17:35	18:13	18:43	5 07:02 (T5)	20:15			20:45	21:00	20:47	20:09	21 07:42 (T4)		17:31	17:02	17:04
27	07:41	07:04	06:19	06:53 (T5)	06:31			06:00	05:57	06:17	06:47	07:21 (T4)		06:49	07:25	07:48
	17:36	18:14	18:44	14 07:07 (T5)	20:16			20:45	21:00	20:47	20:07	20 07:41 (T4)		17:30	17:01	17:05
28	07:40	07:02	06:18	06:50 (T5)	06:30			06:00	05:57	06:18	06:48	07:21 (T4)		06:50	07:26	07:48
	17:38	18:15	18:45	19 07:09 (T5)	20:17			20:46	21:00	20:46	20:06	24 07:57 (T5)		17:29	17:01	17:06
29	07:39		07:16	07:48 (T5)	06:29			05:59	05:57	06:19	06:49	07:22 (T4)		06:51	07:27	07:48
	17:39		19:46	22 08:10 (T5)	20:18			20:47	21:00	20:45	20:04	31 08:02 (T5)		17:27	17:00	17:06
30	07:38		07:14	07:47 (T5)	06:27			05:59	05:58	06:20	06:50	07:22 (T4)		06:52	07:28	07:49
	17:40		19:47	25 08:12 (T5)	20:19			20:48	21:00	20:44	20:02	35 08:04 (T5)		17:26	17:00	17:07
31	07:37		07:13	07:45 (T5)				05:58		06:21	06:51	07:23 (T4)		06:53		07:49
	17:41		19:48	27 08:12 (T5)				20:49		20:43	20:01	34 08:04 (T5)		17:25		17:08
Potential sun hours	299	298	370		398		447	451	457	427		375		346	299	289
Total, worst case				112		599					281		440			

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

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

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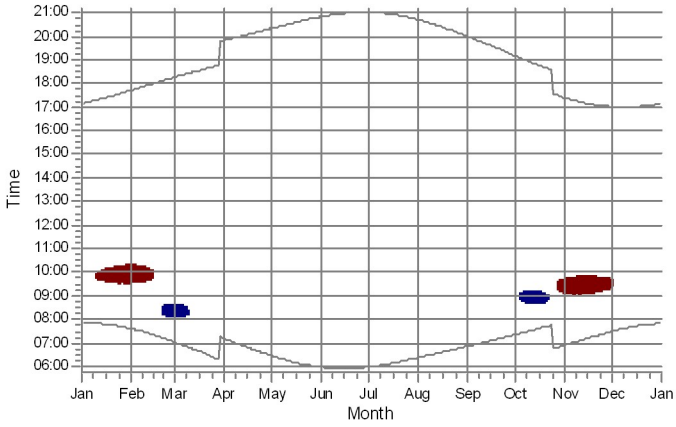
Calculated:
05/05/2022 11:01/3.4.415

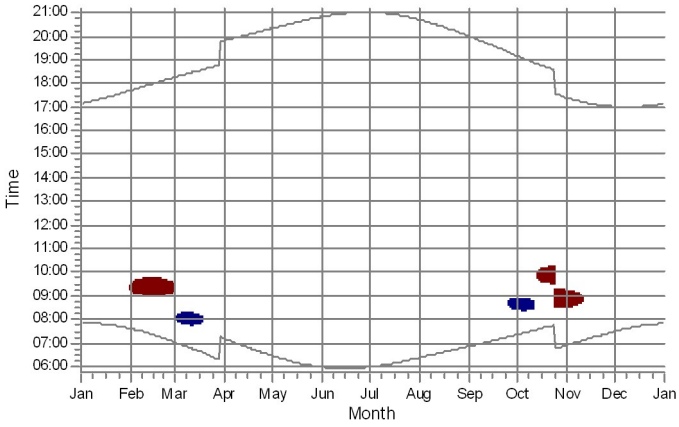
SHADOW - Calendar, graphical

Calculation: Progetto_2022_05_05

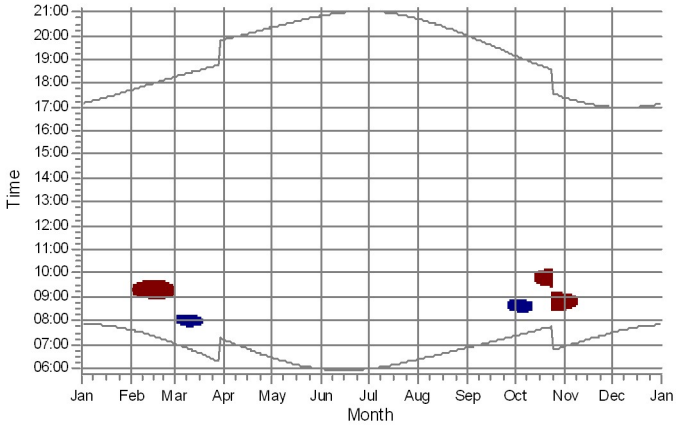
F132: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (4)



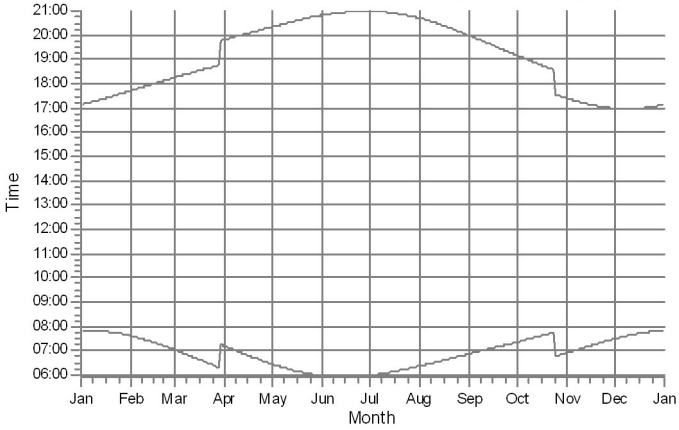
F134: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (10)



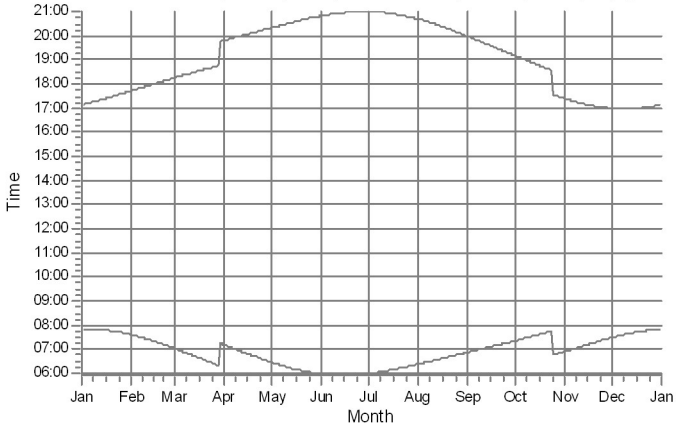
F135: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (11)



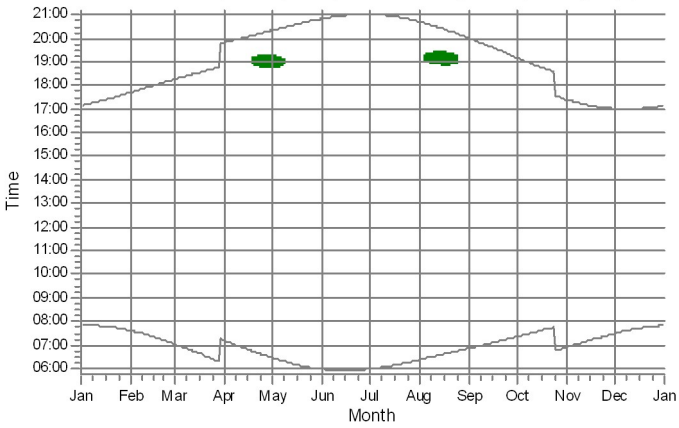
F142: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (5)



F143: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (6)



F150: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (7)



WTGs

T5: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (2)

T1: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (8)

T8: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (9)

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Calculated:
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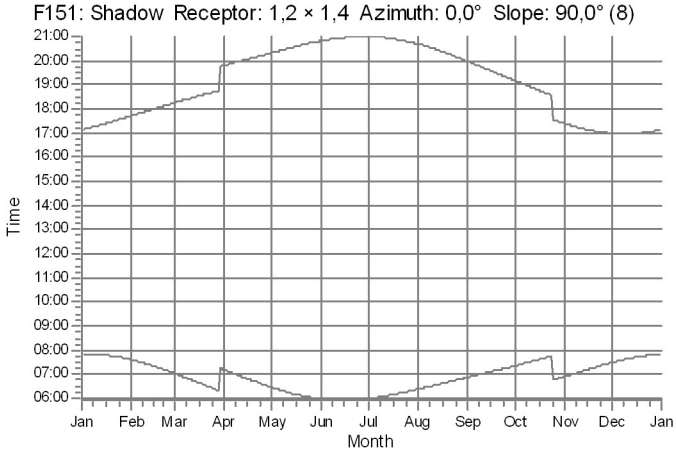
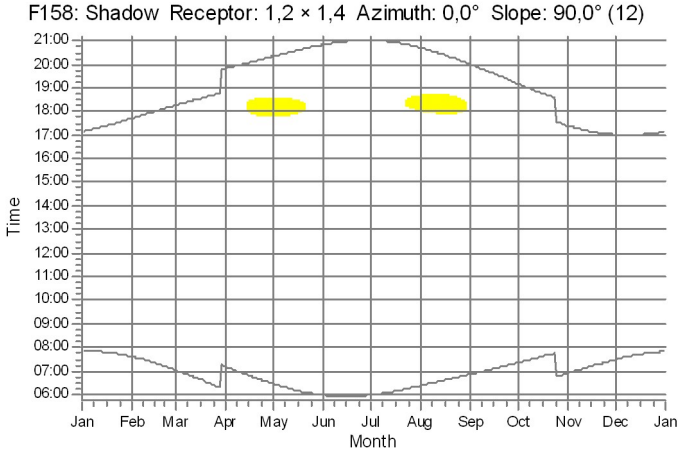
SHADOW - Calendar, graphical

Calculation: Progetto_2022_05_05

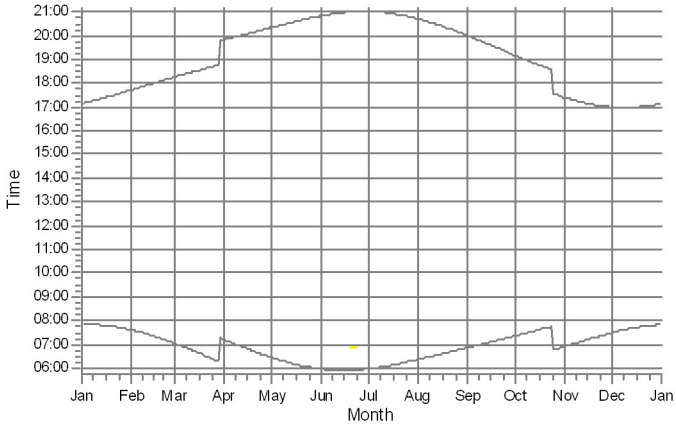
F151: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (8)



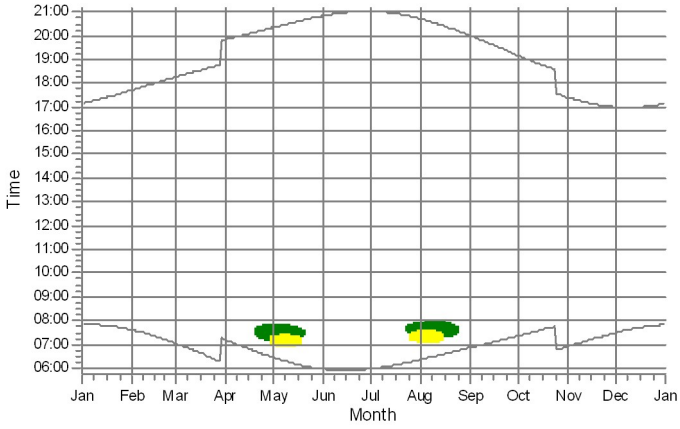
F158: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (12)



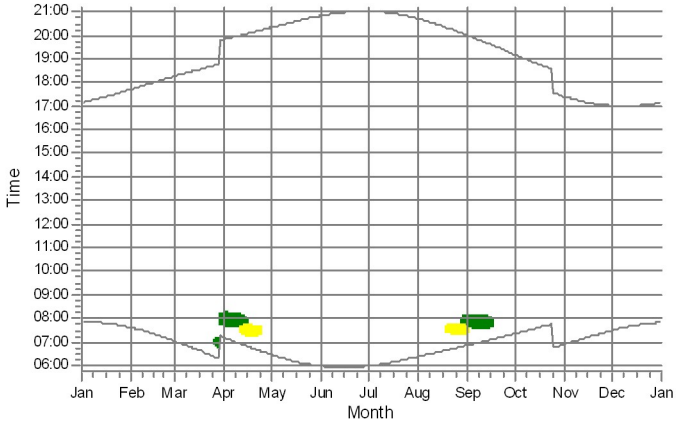
F46: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (9)



F54: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (2)



F63: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (3)



WTGs

T5: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (2)

T4: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (3)

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T1 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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	07:49	07:36	07:01 08:09-08:35/26	07:11	06:26	05:58	05:58	06:22	06:52	07:21 08:27-08:51/24	06:54	07:29
	17:09	17:42	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59 08:01-08:05/4	07:09	06:24	05:57	05:59	06:23	06:53	07:22 08:27-08:51/24	06:56	07:30
	17:10	17:44	18:17 08:09-08:34/25	19:50	20:21	20:50	21:00	20:41	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58 07:56-08:34/38	07:08	06:23	05:57	05:59	06:23	06:54	07:23 08:26-08:51/25	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56 07:53-08:33/40	07:06	06:22	05:56	06:00	06:24	06:55	07:24 08:26-08:51/25	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55 07:52-08:32/40	07:04	06:21	05:56	06:00	06:25	06:56	07:25 08:25-08:50/25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03 08:52-09:02/10	17:19	16:59
6	07:49	07:31	06:53 07:51-08:31/40	07:03	06:20	05:56	06:01	06:26	06:57	07:26 08:26-09:04/38	07:00	07:34
	17:13	17:49	18:22	19:54	20:26	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52 07:49-08:28/39	07:01	06:18	05:55	06:01	06:27	06:58	07:27 08:26-09:06/40	07:01	07:35
	17:14	17:50	18:23	19:55	20:27	20:53	20:59	20:35	19:49	19:00	17:16	16:59
8	07:49	07:29	06:50 07:49-08:27/38	07:00	06:17	05:55	06:02	06:28	06:58	07:28 08:26-09:07/41	07:03	07:36
	17:15	17:51	18:24	19:56	20:28	20:54	20:59	20:34	19:48	18:58	17:15	16:58
9	07:49	07:28	06:48 07:48-08:13/25	06:58	06:16	05:55	06:03	06:29	06:59	07:29 08:27-09:07/40	07:04	07:36
	17:16	17:52	18:25 08:17-08:22/5	19:58	20:29	20:55	20:58	20:32	19:46	18:56	17:14	16:58
10	07:49	07:27	06:47 07:48-08:14/26	06:56	06:15	05:55	06:03	06:30	07:00	07:30 08:29-09:07/38	07:05	07:37
	17:17	17:54	18:26	19:59	20:30	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45 07:48-08:13/25	06:55	06:14	05:55	06:04	06:31	07:01	07:31 08:31-08:41/10	07:06	07:38
	17:18	17:55	18:27	20:00	20:31	20:56	20:58	20:30	19:43	18:53 08:43-09:08/25	17:12	16:59
12	07:48	07:24	06:44 07:48-08:12/24	06:53	06:13	05:54	06:05	06:32	07:02	07:32 08:42-09:07/25	07:07	07:39
	17:19	17:56	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42 07:49-08:11/22	06:52	06:12	05:54	06:05	06:33	07:03	07:33 08:43-09:08/25	07:09	07:40
	17:20	17:57	18:29	20:02	20:33	20:57	20:57	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40 07:49-08:10/21	06:50	06:11	05:54	06:06	06:34	07:04	07:34 08:43-09:08/25	07:10	07:41
	17:21	17:58	18:30	20:03	20:34	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:48	07:21	06:39 07:49-08:08/19	06:49	06:10	05:54	06:07	06:35	07:05	07:35 08:43-09:07/24	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:58	20:56	20:25	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37 07:52-08:06/14	06:47	06:09	05:54	06:08	06:36	07:06	07:37 08:43-09:06/23	07:12	07:42
	17:23	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36 07:54-08:03/9	06:46	06:08	05:54	06:08	06:37	07:07	07:38 08:44-09:05/21	07:13	07:43
	17:25	18:02	18:33	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39 08:44-09:04/20	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:54	06:10	06:39	07:09	07:40 08:45-09:02/17	07:16	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41 08:47-09:00/13	07:17	07:45
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:39	17:05	17:01
21	07:45	07:13 08:20-08:27/7	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42 08:52-08:56/4	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11 08:16-08:30/14	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10 08:14-08:32/18	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08 08:12-08:33/21	06:24	06:35	06:02	05:55	06:14	06:44	07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:02	17:03
25	07:42	07:07 08:12-08:34/22	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05 08:10-08:34/24	06:21	06:32	06:01	05:56	06:16	06:46	07:16 08:39-08:43/4	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	20:45	21:00	20:47	20:09	19:18	17:31	17:01	17:04
27	07:40	07:04 08:10-08:35/25	06:19	06:31	06:00	05:56	06:17	06:47	07:17 08:34-08:47/13	06:49	07:25	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:47	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02 08:09-08:34/25	06:17	06:30	06:00	05:57	06:18	06:48	07:18 08:32-08:49/17	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19 08:30-08:50/20	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:58	05:58	06:20	06:50	07:20 08:28-08:51/23	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:12		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:49		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
Sum of minutes with flicker	0	156	480	0	0	0	0	0	77	562	0	0

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T2 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:24	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:40	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:23	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:25	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:27	20:53	20:59	20:35	19:49	18:59	17:16	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55	06:02	06:28	06:58	07:28	07:03	07:36
	17:15	17:51	18:24	19:56	20:28	20:54	20:59	20:34	19:48	18:58	17:15	16:58
9	07:49	07:28	06:48	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:58	20:29	20:55	20:58	20:32	19:46	18:56	17:14	16:58
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:30	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:31	20:56	20:57	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:09	07:40
	17:20	17:57	18:29	20:02	20:33	20:57	20:57	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:41
	17:21	17:58	18:30	20:03	20:34	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:47	07:21	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:58	20:56	20:25	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37	07:12	07:42
	17:23	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:54	06:10	06:39	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:45
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:39	17:05	17:01
21	07:45	07:13	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:55	06:14	06:44	07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:02	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	20:45	21:00	20:47	20:09	19:18	17:31	17:01	17:04
27	07:40	07:04	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49	07:25	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:47	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:12		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:49		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T3 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:42	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:25	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:40	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:24	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:25	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:27	20:53	20:59	20:35	19:49	19:00	17:16	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55	06:02	06:28	06:58	07:28	07:03	07:36
	17:15	17:51	18:24	19:56	20:28	20:54	20:59	20:34	19:48	18:58	17:15	16:59
9	07:49	07:28	06:48	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:58	20:29	20:55	20:58	20:32	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:30	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:25	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:31	20:56	20:57	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:08	07:40
	17:20	17:57	18:29	20:02	20:33	20:57	20:57	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:40
	17:21	17:58	18:30	20:03	20:33	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:47	07:21	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:35	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:57	20:55	20:24	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37	07:12	07:42
	17:23	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:33	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:55	06:10	06:39	07:09	07:40	07:15	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:44
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:39	17:05	17:01
21	07:45	07:12	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:56	06:14	06:44	07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:12	18:43	20:15	20:44	21:00	20:47	20:09	19:18	17:31	17:01	17:04
27	07:40	07:04	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49	07:24	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:47	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:12		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:49		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T4 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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
1	07:49	07:36	07:01	07:11	06:26 07:01-07:17/16	05:58
	17:09	17:42	18:16	19:49	20:20 17:49-18:32/43	20:49
2	07:49	07:35	06:59	07:09	06:25 07:00-07:19/19	05:57
	17:10	17:44	18:17	19:50	20:21 17:50-18:32/42	20:50
3	07:49	07:34	06:58	07:08	06:23 06:59-07:19/20	05:57
	17:10	17:45	18:18	19:51	20:22 17:49-18:31/42	20:51
4	07:49	07:33	06:56	07:06	06:22 06:58-07:19/21	05:56
	17:11	17:46	18:19	19:52	20:23 17:50-18:31/41	20:51
5	07:49	07:32	06:55	07:04	06:21 06:58-07:19/21	05:56
	17:12	17:47	18:20	19:53	20:24 17:50-18:31/41	20:52
6	07:49	07:31	06:53	07:03	06:20 06:57-07:20/23	05:56
	17:13	17:49	18:22	19:54	20:25 17:51-18:30/39	20:53
7	07:49	07:30	06:52	07:01	06:18 06:57-07:20/23	05:55
	17:14	17:50	18:23	19:55	20:26 17:51-18:30/39	20:53
8	07:49	07:29	06:50	07:00	06:17 06:57-07:20/23	05:55
	17:15	17:51	18:24	19:56	20:28 17:52-18:30/38	20:54
9	07:49	07:28	06:48	06:58	06:16 06:57-07:20/23	05:55
	17:16	17:52	18:25	19:58	20:29 17:53-18:29/36	20:55
10	07:49	07:27	06:47	06:56	06:15 06:58-07:20/22	05:55
	17:17	17:54	18:26	19:59	20:30 17:53-18:29/36	20:55
11	07:49	07:25	06:45	06:55 07:25-07:35/10	06:14 06:58-07:19/21	05:55
	17:18	17:55	18:27	20:00	20:31 17:54-18:28/34	20:56
12	07:48	07:24	06:44	06:53 07:24-07:37/13	06:13 06:58-07:19/21	05:54
	17:19	17:56	18:28	20:01	20:32 17:55-18:27/32	20:56
13	07:48	07:23	06:42	06:52 07:21-07:38/17	06:12 06:59-07:18/19	05:54
	17:20	17:57	18:29	20:02	20:33 17:56-18:26/30	20:57
14	07:48	07:22	06:40	06:50 07:21-07:39/18	06:11 06:59-07:17/18	05:54
	17:21	17:58	18:30	20:03	20:33 17:57-18:25/28	20:57
15	07:47	07:21	06:39	06:49 07:19-07:39/20	06:10 07:00-07:16/16	05:54
	17:22	18:00	18:31	20:04 18:06-18:19/13	20:34 17:58-18:24/26	20:57
16	07:47	07:19	06:37	06:47 07:19-07:39/20	06:09 07:01-07:15/14	05:54
	17:24	18:01	18:32	20:05 18:03-18:23/20	20:35 17:59-18:23/24	20:58
17	07:47	07:18	06:36	06:46 07:18-07:39/21	06:08 07:02-07:13/11	05:54
	17:25	18:02	18:33	20:06 18:00-18:24/24	20:36 18:01-18:21/20	20:58
18	07:46	07:17	06:34	06:44 07:19-07:39/20	06:07 07:05-07:11/6	05:54
	17:26	18:03	18:35	20:07 17:58-18:26/28	20:37 18:02-18:20/18	20:59
19	07:46	07:15	06:32	06:43 07:18-07:38/20	06:06 18:04-18:18/14	05:55
	17:27	18:04	18:36	20:08 17:56-18:27/31	20:38	20:59
20	07:45	07:14	06:31	06:41 07:19-07:38/19	06:05 18:08-18:15/7	05:55 06:52-06:53/1
	17:28	18:06	18:37	20:09 17:55-18:29/34	20:39	20:59
21	07:45	07:12	06:29	06:40 07:18-07:36/18	06:05	05:55 06:51-06:53/2
	17:29	18:07	18:38	20:10 17:53-18:29/36	20:40	20:59
22	07:44	07:11	06:27	06:38 07:20-07:35/15	06:04	05:55 06:51-06:53/2
	17:30	18:08	18:39	20:11 17:53-18:30/37	20:41	21:00
23	07:43	07:10	06:26	06:37 07:21-07:34/13	06:03	05:55
	17:32	18:09	18:40	20:12 17:51-18:30/39	20:42	21:00
24	07:43	07:08	06:24	06:35 07:23-07:31/8	06:02	05:56
	17:33	18:10	18:41	20:13 17:51-18:31/40	20:43	21:00
25	07:42	07:07	06:22	06:34 17:51-18:32/41	06:02	05:56
	17:34	18:11	18:42	20:14	20:44	21:00
26	07:41	07:05	06:21	06:32 17:50-18:31/41	06:01	05:56
	17:35	18:12	18:43	20:15	20:44	21:00
27	07:40	07:04	06:19	06:31 17:50-18:32/42	06:00	05:56
	17:36	18:14	18:44	20:16	20:45	21:00
28	07:40	07:02	06:17	06:30 17:50-18:32/42	06:00	05:57
	17:38	18:15	18:45	20:17	20:46	21:00
29	07:39		07:16	06:28 07:06-07:15/9	05:59	05:57
	17:39		19:46	20:18 17:49-18:31/42	20:47	21:00
30	07:38		07:14	06:27 07:02-07:16/14	05:59	05:58
	17:40		19:47	20:19 17:49-18:32/43	20:48	21:00
31	07:37		07:12		05:58	
	17:41		19:48		20:49	
Potential sun hours	299	298	370	398	447	451
Sum of minutes with flicker	0	0	0	808	967	5

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T4 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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

	July		August		September		October	November	December
1	05:58		06:22	07:09-07:29/20	06:52	07:25-07:33/8	07:21	06:54	07:29
	21:00		20:42	18:04-18:37/33	19:59		19:09	17:23	17:00
2	05:59		06:23	07:07-07:29/22	06:53		07:22	06:56	07:30
	21:00		20:40	18:04-18:38/34	19:58		19:08	17:22	16:59
3	05:59		06:24	07:07-07:29/22	06:54		07:23	06:57	07:31
	21:00		20:39	18:03-18:38/35	19:56		19:06	17:21	16:59
4	06:00		06:24	07:07-07:29/22	06:55		07:24	06:58	07:32
	21:00		20:38	18:02-18:39/37	19:54		19:04	17:20	16:59
5	06:00		06:25	07:07-07:30/23	06:56		07:25	06:59	07:33
	20:59		20:37	18:01-18:39/38	19:53		19:03	17:19	16:59
6	06:01		06:26	07:07-07:30/23	06:57		07:26	07:00	07:34
	20:59		20:36	18:01-18:40/39	19:51		19:01	17:18	16:59
7	06:01		06:27	07:07-07:29/22	06:58		07:27	07:01	07:35
	20:59		20:35	18:00-18:40/40	19:49		19:00	17:16	16:59
8	06:02		06:28	07:07-07:29/22	06:58		07:28	07:03	07:36
	20:59		20:34	18:00-18:40/40	19:48		18:58	17:15	16:59
9	06:03		06:29	07:08-07:29/21	06:59		07:29	07:04	07:36
	20:58		20:32	17:59-18:41/42	19:46		18:56	17:14	16:59
10	06:03		06:30	07:08-07:28/20	07:00		07:30	07:05	07:37
	20:58		20:31	17:59-18:41/42	19:44		18:55	17:13	16:59
11	06:04		06:31	07:09-07:27/18	07:01		07:31	07:06	07:38
	20:57		20:30	17:58-18:41/43	19:43		18:53	17:12	16:59
12	06:05		06:32	07:10-07:26/16	07:02		07:32	07:07	07:39
	20:57		20:28	17:58-18:41/43	19:41		18:52	17:11	16:59
13	06:05		06:33	07:12-07:24/12	07:03		07:33	07:08	07:40
	20:57		20:27	17:58-18:40/42	19:39		18:50	17:11	16:59
14	06:06		06:34	07:14-07:21/7	07:04		07:34	07:10	07:40
	20:56		20:26	17:57-18:39/42	19:38		18:48	17:10	16:59
15	06:07		06:35	17:57-18:39/42	07:05		07:35	07:11	07:41
	20:55		20:24		19:36		18:47	17:09	16:59
16	06:08		06:36	17:56-18:38/42	07:06		07:37	07:12	07:42
	20:55		20:23		19:34		18:45	17:08	17:00
17	06:08		06:37	17:57-18:38/41	07:07		07:38	07:13	07:43
	20:54		20:22		19:33		18:44	17:07	17:00
18	06:09		06:38	17:57-18:37/40	07:08		07:39	07:14	07:43
	20:54		20:20		19:31		18:42	17:06	17:00
19	06:10		06:39	07:28-07:37/9	07:09		07:40	07:15	07:44
	20:53		20:19	17:57-18:37/40	19:29		18:41	17:06	17:01
20	06:11		06:40	07:26-07:39/13	07:10		07:41	07:17	07:44
	20:52		20:17	17:57-18:36/39	19:28		18:39	17:05	17:01
21	06:12		06:41	07:24-07:40/16	07:11		07:42	07:18	07:45
	20:52		20:16	17:58-18:35/37	19:26		18:38	17:04	17:01
22	06:13		06:42	07:23-07:41/18	07:12		07:43	07:19	07:46
	20:51		20:15	17:58-18:34/36	19:24		18:37	17:04	17:02
23	06:13		06:43	07:22-07:41/19	07:13		07:44	07:20	07:46
	20:50		20:13	17:59-18:32/33	19:23		18:35	17:03	17:02
24	06:14	18:16-18:27/11	06:44	07:22-07:42/20	07:14		07:45	07:21	07:47
	20:49		20:12	18:00-18:31/31	19:21		18:34	17:03	17:03
25	06:15	18:14-18:29/15	06:45	07:21-07:42/21	07:15		06:46	07:22	07:47
	20:48		20:10	18:01-18:29/28	19:19		17:32	17:02	17:04
26	06:16	07:14-07:23/9	06:46	07:21-07:42/21	07:16		06:48	07:23	07:47
	20:47	18:12-18:31/19	20:09	18:03-18:27/24	19:18		17:31	17:02	17:04
27	06:17	07:12-07:25/13	06:47	07:21-07:41/20	07:17		06:49	07:24	07:48
	20:46	18:11-18:33/22	20:07	18:05-18:24/19	19:16		17:30	17:01	17:05
28	06:18	07:11-07:26/15	06:48	07:21-07:41/20	07:18		06:50	07:26	07:48
	20:46	18:09-18:34/25	20:05	18:08-18:20/12	19:14		17:28	17:01	17:05
29	06:19	07:10-07:27/17	06:49	07:22-07:40/18	07:19		06:51	07:27	07:48
	20:45	18:08-18:35/27	20:04		19:13		17:27	17:00	17:06
30	06:20	07:10-07:28/18	06:50	07:22-07:39/17	07:20		06:52	07:28	07:49
	20:44	18:07-18:36/29	20:02		19:11		17:26	17:00	17:07
31	06:21	07:09-07:29/20	06:51	07:23-07:36/13			06:53		07:49
	20:43	18:06-18:37/31	20:01				17:25		17:08
Potential sun hours	457		427		375		346	299	289
Sum of minutes with flicker	271		1509		8		0	0	0

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T5 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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
1	07:49	07:36	07:01		07:11	07:44-08:12/28	06:26	07:11-07:46/35	05:58
	17:09	17:43	18:16		19:49		20:20	18:49-19:13/24	20:49
2	07:49	07:35	06:59		07:09	07:43-08:13/30	06:25	07:11-07:47/36	05:57
	17:10	17:44	18:17		19:50		20:21	18:50-19:13/23	20:50
3	07:49	07:34	06:58		07:08	07:42-08:12/30	06:23	07:11-07:47/36	05:57
	17:10	17:45	18:18		19:51		20:22	18:50-19:11/21	20:51
4	07:49	07:33	06:56		07:06	07:41-08:12/31	06:22	07:10-07:46/36	05:56
	17:11	17:46	18:19		19:52		20:23	18:51-19:10/19	20:51
5	07:49	07:32	06:55		07:04	07:42-08:12/30	06:21	07:10-07:46/36	05:56
	17:12	17:47	18:20		19:53		20:24	18:52-19:09/17	20:52
6	07:49	07:31	06:53		07:03	07:41-08:11/30	06:20	07:10-07:45/35	05:56
	17:13	17:49	18:22		19:54		20:26	18:53-19:08/15	20:53
7	07:49	07:30	06:52		07:01	07:42-08:11/29	06:18	07:10-07:45/35	05:55
	17:14	17:50	18:23		19:55		20:27	18:55-19:06/11	20:53
8	07:49	07:29	06:50		07:00	07:41-08:10/29	06:17	07:11-07:45/34	05:55
	17:15	17:51	18:24		19:57		20:28	18:58-19:03/5	20:54
9	07:49	07:28	06:48		06:58	07:41-08:09/28	06:16	07:11-07:44/33	05:55
	17:16	17:52	18:25		19:58		20:29		20:55
10	07:49	07:27	06:47		06:56	07:42-08:08/26	06:15	07:12-07:44/32	05:55
	17:17	17:54	18:26		19:59		20:30		20:55
11	07:49	07:25	06:45		06:55	07:43-08:06/23	06:14	07:12-07:43/31	05:55
	17:18	17:55	18:27		20:00		20:31		20:56
12	07:48	07:24	06:44		06:53	07:44-08:05/21	06:13	07:13-07:42/29	05:54
	17:19	17:56	18:28		20:01		20:32		20:56
13	07:48	07:23	06:42		06:52	07:45-08:03/18	06:12	07:13-07:41/28	05:54
	17:20	17:57	18:29		20:02		20:33		20:57
14	07:48	07:22	06:40		06:50	07:48-08:01/13	06:11	07:14-07:40/26	05:54
	17:21	17:58	18:30		20:03		20:34		20:57
15	07:47	07:21	06:39		06:49	07:53-07:54/1	06:10	07:15-07:39/24	05:54
	17:22	18:00	18:31		20:04		20:34		20:57
16	07:47	07:19	06:37		06:47		06:09	07:16-07:38/22	05:54
	17:24	18:01	18:32		20:05		20:35		20:58
17	07:47	07:18	06:36		06:46		06:08	07:17-07:37/20	05:54
	17:25	18:02	18:34		20:06		20:36		20:58
18	07:46	07:17	06:34		06:44		06:07	07:19-07:35/16	05:54
	17:26	18:03	18:35		20:07		20:37		20:59
19	07:46	07:15	06:32		06:43	18:59-19:07/8	06:06	07:22-07:33/11	05:55
	17:27	18:04	18:36		20:08		20:38		20:59
20	07:45	07:14	06:31		06:41	07:25-07:37/12	06:05	07:25-07:30/5	05:55
	17:28	18:06	18:37		20:09	18:56-19:10/14	20:39		20:59
21	07:45	07:13	06:29		06:40	07:21-07:39/18	06:05		05:55
	17:29	18:07	18:38		20:10	18:53-19:11/18	20:40		20:59
22	07:44	07:11	06:27		06:38	07:19-07:41/22	06:04		05:55
	17:30	18:08	18:39		20:11	18:52-19:12/20	20:41		21:00
23	07:43	07:10	06:26		06:37	07:18-07:43/25	06:03		05:55
	17:32	18:09	18:40		20:12	18:51-19:13/22	20:42		21:00
24	07:43	07:08	06:24		06:35	07:16-07:43/27	06:02		05:56
	17:33	18:10	18:41		20:13	18:50-19:14/24	20:43		21:00
25	07:42	07:07	06:22		06:34	07:15-07:45/30	06:02		05:56
	17:34	18:11	18:42		20:14	18:50-19:14/24	20:44		21:00
26	07:41	07:05	06:21	06:57-07:02/5	06:33	07:13-07:45/32	06:01		05:56
	17:35	18:13	18:43		20:15	18:49-19:14/25	20:45		21:00
27	07:40	07:04	06:19	06:53-07:07/14	06:31	07:13-07:45/32	06:00		05:57
	17:36	18:14	18:44		20:16	18:49-19:14/25	20:45		21:00
28	07:40	07:02	06:17	06:50-07:09/19	06:30	07:12-07:46/34	06:00		05:57
	17:38	18:15	18:45		20:17	18:49-19:14/25	20:46		21:00
29	07:39		07:16	07:48-08:10/22	06:28	07:12-07:47/35	05:59		05:57
	17:39		19:46		20:18	18:48-19:13/25	20:47		21:00
30	07:38		07:14	07:47-08:12/25	06:27	07:11-07:46/35	05:59		05:58
	17:40		19:47		20:19	18:49-19:13/24	20:48		21:00
31	07:37		07:13	07:45-08:12/27			05:58		
	17:41		19:48				20:49		
Potential sun hours	299	298	370		398		447		451
Sum of minutes with flicker	0	0	112		923		695		0

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T5 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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

	July		August		September		October	November	December
1	05:58		06:22	07:23-07:53/30	06:52	07:42-08:05/23	07:21	06:54	07:29
	21:00		20:42		19:59		19:09	17:23	17:00
2	05:59		06:23	07:22-07:53/31	06:53	07:40-08:06/26	07:22	06:56	07:30
	21:00		20:40		19:58		19:08	17:22	16:59
3	05:59		06:24	07:21-07:53/32	06:54	07:39-08:07/28	07:23	06:57	07:31
	21:00		20:39		19:56		19:06	17:21	16:59
4	06:00		06:25	07:21-07:54/33	06:55	07:38-08:07/29	07:24	06:58	07:32
	21:00		20:38		19:54		19:04	17:20	16:59
5	06:00		06:25	07:20-07:54/34	06:56	07:38-08:07/29	07:25	06:59	07:33
	20:59		20:37	19:06-19:14/8	19:53		19:03	17:19	16:59
6	06:01		06:26	07:20-07:55/35	06:57	07:37-08:07/30	07:26	07:00	07:34
	20:59		20:36	19:04-19:17/13	19:51		19:01	17:18	16:59
7	06:01		06:27	07:20-07:55/35	06:58	07:37-08:07/30	07:27	07:01	07:35
	20:59		20:35	19:02-19:18/16	19:49		19:00	17:17	16:59
8	06:02		06:28	07:19-07:55/36	06:59	07:37-08:07/30	07:28	07:03	07:36
	20:59		20:34	19:01-19:19/18	19:48		18:58	17:15	16:59
9	06:03		06:29	07:19-07:55/36	06:59	07:36-08:07/31	07:29	07:04	07:36
	20:58		20:32	19:00-19:20/20	19:46		18:56	17:14	16:59
10	06:03		06:30	07:19-07:55/36	07:00	07:36-08:06/30	07:30	07:05	07:37
	20:58		20:31	18:59-19:21/22	19:44		18:55	17:13	16:59
11	06:04		06:31	07:19-07:55/36	07:01	07:37-08:05/28	07:31	07:06	07:38
	20:57		20:30	18:58-19:21/23	19:43		18:53	17:12	16:59
12	06:05		06:32	07:19-07:55/36	07:02	07:37-08:04/27	07:32	07:07	07:39
	20:57		20:29	18:58-19:22/24	19:41		18:52	17:11	16:59
13	06:05		06:33	07:20-07:55/35	07:03	07:38-08:03/25	07:33	07:09	07:40
	20:57		20:27	18:57-19:22/25	19:39		18:50	17:11	16:59
14	06:06		06:34	07:20-07:54/34	07:04	07:38-08:01/23	07:34	07:10	07:41
	20:56		20:26	18:57-19:22/25	19:38		18:48	17:10	16:59
15	06:07		06:35	07:20-07:54/34	07:05	07:39-07:59/20	07:35	07:11	07:41
	20:55		20:25	18:56-19:21/25	19:36		18:47	17:09	16:59
16	06:08		06:36	07:20-07:52/32	07:06	07:41-07:56/15	07:37	07:12	07:42
	20:55		20:23	18:56-19:21/25	19:34		18:45	17:08	17:00
17	06:08		06:37	07:20-07:51/31	07:07	07:44-07:52/8	07:38	07:13	07:43
	20:54		20:22	18:56-19:20/24	19:33		18:44	17:07	17:00
18	06:09		06:38	07:21-07:50/29	07:08		07:39	07:14	07:43
	20:54		20:20	18:56-19:20/24	19:31		18:42	17:06	17:00
19	06:10		06:39	07:22-07:49/27	07:09		07:40	07:15	07:44
	20:53		20:19	18:56-19:19/23	19:29		18:41	17:06	17:01
20	06:11		06:40	07:23-07:48/25	07:10		07:41	07:17	07:45
	20:52		20:17	18:57-19:18/21	19:28		18:40	17:05	17:01
21	06:12		06:41	07:24-07:46/22	07:11		07:42	07:18	07:45
	20:52		20:16	18:57-19:17/20	19:26		18:38	17:04	17:01
22	06:13		06:42	07:27-07:43/16	07:12		07:43	07:19	07:46
	20:51		20:15	18:59-19:16/17	19:24		18:37	17:04	17:02
23	06:13		06:43	07:30-07:40/10	07:13		07:44	07:20	07:46
	20:50		20:13	19:00-19:14/14	19:23		18:35	17:03	17:02
24	06:14	07:34-07:42/8	06:44	19:03-19:10/7	07:14		07:45	07:21	07:47
	20:49		20:12		19:21		18:34	17:03	17:03
25	06:15	07:30-07:44/14	06:45		07:15		06:46	07:22	07:47
	20:48		20:10		19:19		17:32	17:02	17:04
26	06:16	07:29-07:46/17	06:46		07:16		06:48	07:23	07:47
	20:47		20:09		19:18		17:31	17:02	17:04
27	06:17	07:27-07:48/21	06:47		07:17		06:49	07:24	07:48
	20:47		20:07		19:16		17:30	17:01	17:05
28	06:18	07:26-07:49/23	06:48	07:53-07:57/4	07:18		06:50	07:26	07:48
	20:46		20:05		19:14		17:28	17:01	17:06
29	06:19	07:25-07:50/25	06:49	07:49-08:02/13	07:19		06:51	07:27	07:48
	20:45		20:04		19:13		17:27	17:00	17:06
30	06:20	07:25-07:51/26	06:50	07:46-08:04/18	07:20		06:52	07:28	07:49
	20:44		20:02		19:11		17:26	17:00	17:07
31	06:21	07:24-07:52/28	06:51	07:43-08:04/21			06:53		07:49
	20:43		20:01				17:25		17:08
Potential sun hours	457		427		375		346	299	289
Sum of minutes with flicker	162		1155		432		0	0	0

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

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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T6 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:43	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:25	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:41	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:24	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:25	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:25	20:52	21:00	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:26	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:27	20:53	20:59	20:35	19:49	19:00	17:17	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55	06:02	06:28	06:59	07:28	07:03	07:36
	17:15	17:51	18:24	19:57	20:28	20:54	20:59	20:34	19:48	18:58	17:15	16:59
9	07:49	07:28	06:49	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:58	20:29	20:55	20:58	20:32	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:30	20:55	20:58	20:31	19:45	18:55	17:13	16:59
11	07:49	07:26	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:31	20:56	20:58	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:09	07:40
	17:20	17:57	18:29	20:02	20:33	20:57	20:57	20:27	19:40	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:41
	17:21	17:58	18:30	20:03	20:34	20:57	20:56	20:26	19:38	18:49	17:10	16:59
15	07:48	07:21	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:36	07:11	07:41
	17:22	18:00	18:31	20:04	20:35	20:58	20:56	20:25	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37	07:12	07:42
	17:24	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:34	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:55	06:10	06:39	07:09	07:40	07:16	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:45
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:18	19:28	18:40	17:05	17:01
21	07:45	07:13	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:56	06:14	06:44	07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:33	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:13	18:43	20:15	20:45	21:00	20:47	20:09	19:18	17:31	17:02	17:04
27	07:40	07:04	06:19	06:31	06:00	05:57	06:17	06:47	07:17	06:49	07:25	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:47	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:06
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:13		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:49		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T7 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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	July	August	September	October	November	December
1	07:49	07:36	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:54	07:29
	17:09	17:43	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35	06:59	07:09	06:25	05:57	05:59	06:23	06:53	07:22	06:56	07:30
	17:10	17:44	18:17	19:50	20:21	20:50	21:00	20:41	19:58	19:08	17:22	16:59
3	07:49	07:34	06:58	07:08	06:23	05:57	05:59	06:24	06:54	07:23	06:57	07:31
	17:10	17:45	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58	07:32
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59	07:33
	17:12	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00	07:34
	17:13	17:49	18:22	19:54	20:26	20:53	20:59	20:36	19:51	19:01	17:18	16:59
7	07:49	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:01	07:35
	17:14	17:50	18:23	19:55	20:27	20:53	20:59	20:35	19:49	19:00	17:16	16:59
8	07:49	07:29	06:50	07:00	06:17	05:55	06:02	06:28	06:59	07:28	07:03	07:36
	17:15	17:51	18:24	19:57	20:28	20:54	20:59	20:34	19:48	18:58	17:15	16:59
9	07:49	07:28	06:48	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04	07:36
	17:16	17:52	18:25	19:58	20:29	20:55	20:58	20:32	19:46	18:56	17:14	16:59
10	07:49	07:27	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05	07:37
	17:17	17:54	18:26	19:59	20:30	20:55	20:58	20:31	19:44	18:55	17:13	16:59
11	07:49	07:26	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06	07:38
	17:18	17:55	18:27	20:00	20:31	20:56	20:58	20:30	19:43	18:53	17:12	16:59
12	07:48	07:24	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07	07:39
	17:19	17:56	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:52	17:11	16:59
13	07:48	07:23	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:09	07:40
	17:20	17:57	18:29	20:02	20:33	20:57	20:57	20:27	19:39	18:50	17:11	16:59
14	07:48	07:22	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34	07:10	07:41
	17:21	17:58	18:30	20:03	20:34	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:48	07:21	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:36	07:11	07:41
	17:22	18:00	18:31	20:04	20:34	20:58	20:56	20:25	19:36	18:47	17:09	16:59
16	07:47	07:19	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37	07:12	07:42
	17:24	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47	07:18	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38	07:13	07:43
	17:25	18:02	18:34	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:14	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46	07:15	06:32	06:43	06:06	05:55	06:10	06:39	07:09	07:40	07:16	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45	07:14	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41	07:17	07:45
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:17	19:28	18:40	17:05	17:01
21	07:45	07:13	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42	07:18	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01
22	07:44	07:11	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43	07:19	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43	07:10	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44	07:20	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43	07:08	06:24	06:35	06:02	05:56	06:14	06:44	07:14	07:45	07:21	07:47
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:03	17:03
25	07:42	07:07	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46	07:22	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41	07:05	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48	07:23	07:47
	17:35	18:13	18:43	20:15	20:45	21:00	20:47	20:09	19:18	17:31	17:02	17:04
27	07:40	07:04	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49	07:25	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:47	20:07	19:16	17:30	17:01	17:05
28	07:40	07:02	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50	07:26	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28	17:01	17:05
29	07:39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51	07:27	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27	17:00	17:06
30	07:38		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52	07:28	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26	17:00	17:07
31	07:37		07:13		05:58		06:21	06:51		06:53		07:49
	17:41		19:48		20:49		20:43	20:01		17:25		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
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

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Calculated:
05/05/2022 11:01/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_2022_05_05WTG: T8 - VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 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	07:49	07:36 09:19-09:24/5	07:01	07:11	06:26	05:58	05:58	06:22	06:52	07:21	06:55 08:31-09:39/68	07:29 09:27-09:35/8
	17:09	17:43 09:35-10:14/39	18:16	19:49	20:20	20:49	21:00	20:42	19:59	19:09	17:23	17:00
2	07:49	07:35 09:14-09:29/15	06:59	07:09	06:25	05:57	05:59	06:23	06:53	07:22	06:56 08:32-09:40/68	07:30
	17:10	17:44 09:35-10:14/39	18:17	19:50	20:21	20:50	21:00	20:41	19:58	19:08	17:22	16:59
3	07:49	07:34 09:11-09:32/21	06:58	07:08	06:23	05:57	05:59	06:24	06:54	07:23	06:57 08:32-09:40/68	07:31
	17:10	17:45 09:35-10:14/39	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:21	16:59
4	07:49	07:33 09:09-09:34/25	06:56	07:06	06:22	05:56	06:00	06:24	06:55	07:24	06:58 08:34-09:42/68	07:32
	17:11	17:46 09:36-10:13/37	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:20	16:59
5	07:49	07:32 09:07-09:35/28	06:55	07:04	06:21	05:56	06:00	06:25	06:56	07:25	06:59 08:35-09:43/68	07:33
	17:12	17:47 09:36-10:13/37	18:20	19:53	20:25	20:52	21:00	20:37	19:53	19:03	17:19	16:59
6	07:49	07:31 09:05-10:13/68	06:53	07:03	06:20	05:56	06:01	06:26	06:57	07:26	07:00 08:37-09:05/28	07:34
	17:13	17:49	18:22	19:54	20:26	20:53	20:59	20:36	19:51	19:01	17:18 09:06-09:43/37	16:59
7	07:49	07:30 09:04-10:12/68	06:52	07:01	06:18	05:55	06:01	06:27	06:58	07:27	07:02 08:39-09:03/24	07:35
	17:14	17:50	18:23	19:55	20:27	20:53	20:59	20:35	19:49	19:00	17:16 09:05-09:43/38	16:59
8	07:49	07:29 09:03-10:11/68	06:50	07:00	06:17	05:55	06:02	06:28	06:59	07:28	07:03 08:42-09:02/20	07:36
	17:15	17:51	18:24	19:57	20:28	20:54	20:59	20:34	19:48	18:58	17:15 09:06-09:44/38	16:59
9	07:49	07:28 09:02-10:10/68	06:49	06:58	06:16	05:55	06:03	06:29	06:59	07:29	07:04 08:46-09:00/14	07:36
	17:16	17:52	18:25	19:58	20:29	20:55	20:58	20:32	19:46	18:56	17:14 09:06-09:45/39	16:59
10	07:49	07:27 09:01-10:09/68	06:47	06:56	06:15	05:55	06:03	06:30	07:00	07:30	07:05 08:50-08:55/5	07:37
	17:17	17:54	18:26	19:59	20:30	20:55	20:58	20:31	19:45	18:55	17:13 09:06-09:45/39	16:59
11	07:49 09:45-09:53/8	07:26 09:01-10:07/66	06:45	06:55	06:14	05:55	06:04	06:31	07:01	07:31	07:06 09:05-09:45/40	07:38
	17:18	17:55	18:27	20:00	20:31	20:56	20:58	20:30	19:43	18:53	17:12	16:59
12	07:48 09:43-09:56/13	07:24 09:01-09:41/40	06:44	06:53	06:13	05:54	06:05	06:32	07:02	07:32	07:07 09:06-09:46/40	07:39
	17:19	17:56 09:43-10:06/23	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:52	17:11	16:59
13	07:48 09:41-09:58/17	07:23 08:59-09:41/42	06:42	06:52	06:12	05:54	06:05	06:33	07:03	07:33	07:09 09:06-09:45/39	07:40
	17:20	17:57 09:44-10:03/19	18:29	20:02	20:33	20:57	20:57	20:27	19:40	18:50	17:11	16:59
14	07:48 09:40-10:00/20	07:22 08:59-09:41/42	06:40	06:50	06:11	05:54	06:06	06:34	07:04	07:34 09:42-09:58/16	07:10 09:07-09:45/38	07:41
	17:21	17:58 09:48-09:59/11	18:30	20:03	20:34	20:57	20:56	20:26	19:38	18:48	17:10	16:59
15	07:48 09:40-10:02/22	07:21 09:00-09:42/42	06:39	06:49	06:10	05:54	06:07	06:35	07:05	07:36 09:39-10:02/23	07:11 09:07-09:45/38	07:41
	17:22	18:00	18:31	20:04	20:35	20:58	20:56	20:25	19:36	18:47	17:09	16:59
16	07:47 09:38-10:03/25	07:19 09:00-09:42/42	06:37	06:47	06:09	05:54	06:08	06:36	07:06	07:37 09:36-10:04/28	07:12 09:08-09:46/38	07:42
	17:24	18:01	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:08	17:00
17	07:47 09:38-10:05/27	07:18 08:59-09:41/42	06:36	06:46	06:08	05:54	06:08	06:37	07:07	07:38 09:35-10:05/30	07:13 09:08-09:45/37	07:43
	17:25	18:02	18:34	20:06	20:36	20:58	20:54	20:22	19:33	18:44	17:07	17:00
18	07:46 09:37-10:05/28	07:17 08:59-09:41/42	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39 09:33-10:06/33	07:14 09:09-09:45/36	07:43
	17:26	18:03	18:35	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	17:00
19	07:46 09:37-10:07/30	07:15 08:59-09:40/41	06:32	06:43	06:06	05:55	06:10	06:39	07:09	07:40 09:32-10:07/35	07:16 09:09-09:44/35	07:44
	17:27	18:04	18:36	20:08	20:38	20:59	20:53	20:19	19:29	18:41	17:06	17:01
20	07:45 09:36-10:08/32	07:14 09:00-09:39/39	06:31	06:41	06:05	05:55	06:11	06:40	07:10	07:41 09:31-10:08/37	07:17 09:11-09:45/34	07:45
	17:28	18:06	18:37	20:09	20:39	20:59	20:52	20:18	19:28	18:40	17:05	17:01
21	07:45 09:36-10:08/32	07:13 09:00-09:39/39	06:29	06:40	06:05	05:55	06:12	06:41	07:11	07:42 09:31-10:10/39	07:18 09:12-09:44/32	07:45
	17:29	18:07	18:38	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01
22	07:44 09:36-10:10/34	07:11 09:00-09:37/37	06:27	06:38	06:04	05:55	06:13	06:42	07:12	07:43 09:30-10:10/40	07:19 09:12-09:44/32	07:46
	17:30	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:37	17:04	17:02
23	07:43 09:35-10:10/35	07:10 09:02-09:36/34	06:26	06:37	06:03	05:55	06:13	06:43	07:13	07:44 09:30-10:10/40	07:20 09:13-09:43/30	07:46
	17:32	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	17:02
24	07:43 09:35-10:11/36	07:08 09:02-09:34/32	06:24	06:35	06:02	05:56	06:14	06:44	07:14	07:45 09:29-10:11/42	07:21 09:14-09:42/28	07:47
	17:33	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:34	17:03	17:03
25	07:42 09:34-10:11/37	07:07 09:04-09:33/29	06:22	06:34	06:02	05:56	06:15	06:45	07:15	06:46 08:29-09:11/42	07:22 09:16-09:43/27	07:47
	17:34	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	17:32	17:02	17:04
26	07:41 09:35-10:13/38	07:05 09:04-09:30/26	06:21	06:32	06:01	05:56	06:16	06:46	07:16	06:48 08:29-09:11/42	07:23 09:17-09:42/25	07:47
	17:35	18:13	18:43	20:15	20:45	21:00	20:47	20:09	19:18	17:31	17:02	17:04
27	07:41 09:35-10:13/38	07:04 09:07-09:28/21	06:19	06:31	06:00	05:56	06:17	06:47	07:17	06:49 08:29-09:11/42	07:25 09:19-09:41/22	07:48
	17:36	18:14	18:44	20:16	20:45	21:00	20:47	20:07	19:16	17:30	17:01	17:05
28	07:40 09:35-10:13/38	07:02 09:10-09:22/12	06:17	06:30	06:00	05:57	06:18	06:48	07:18	06:50 08:29-09:11/42	07:26 09:20-09:40/20	07:48
	17:38	18:15	18:45	20:17	20:46	21:00	20:46	20:05	19:14	17:28 09:16-09:30/14	17:01	17:05
29	07:39 09:34-10:13/39		07:16	06:28	05:59	05:57	06:19	06:49	07:19	06:51 08:29-09:11/42	07:27 09:22-09:39/17	07:48
	17:39		19:46	20:18	20:47	21:00	20:45	20:04	19:13	17:27 09:13-09:33/20	17:00	17:06
30	07:38 09:34-10:14/40		07:14	06:27	05:59	05:58	06:20	06:50	07:20	06:52 08:29-09:10/41	07:28 09:24-09:37/13	07:49
	17:40		19:47	20:19	20:48	21:00	20:44	20:02	19:11	17:26 09:11-09:35/24	17:00	17:07
31	07:37 09:34-10:14/40		07:13		05:58		06:21	06:51		06:53 08:31-09:10/39		07:49
	17:41		19:48		20:49		20:43	20:01		17:25 09:11-09:37/26		17:08
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
Sum of minutes with flicker	629	1346	0	0	0	0	0	0	0	737	1243	8

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

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

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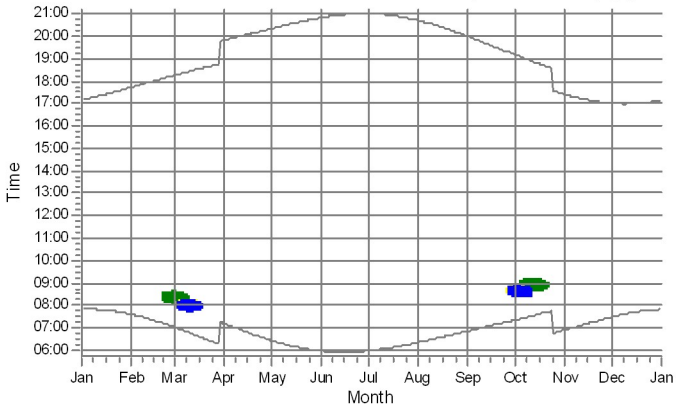
Calculated:
05/05/2022 11:01/3.4.415

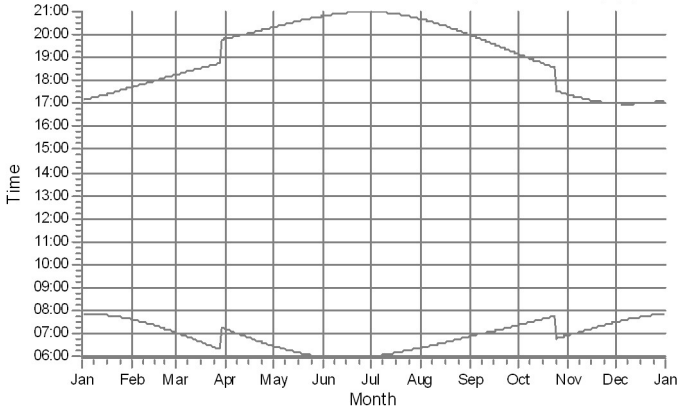
SHADOW - Calendar per WTG, graphical

Calculation: Progetto_2022_05_05

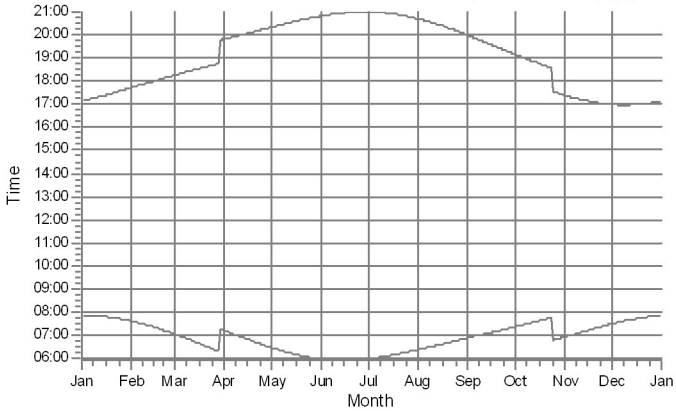
T1: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (8)



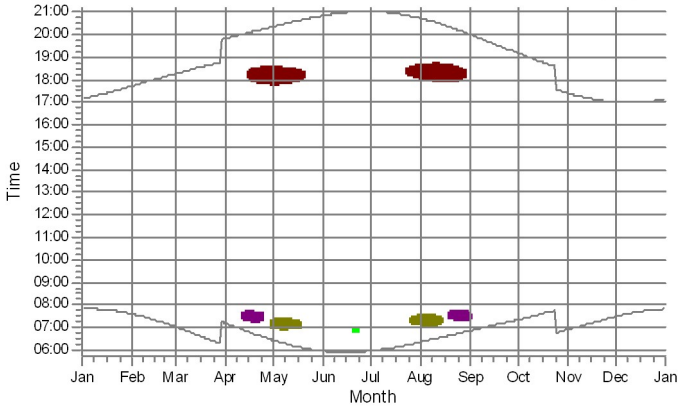
T2: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (7)



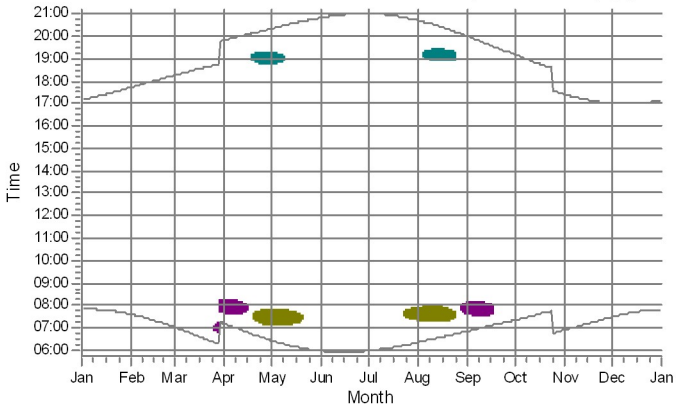
T3: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (5)



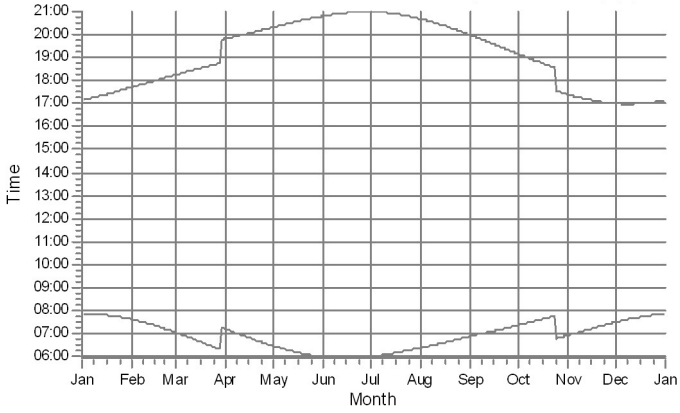
T4: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (3)



T5: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (2)



T6: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (4)



Shadow receptors

- F132: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (4)
- F134: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (10)
- F135: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (11)
- F150: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (7)
- F158: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (12)
- F46: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (9)
- F54: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (2)
- F63: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (3)

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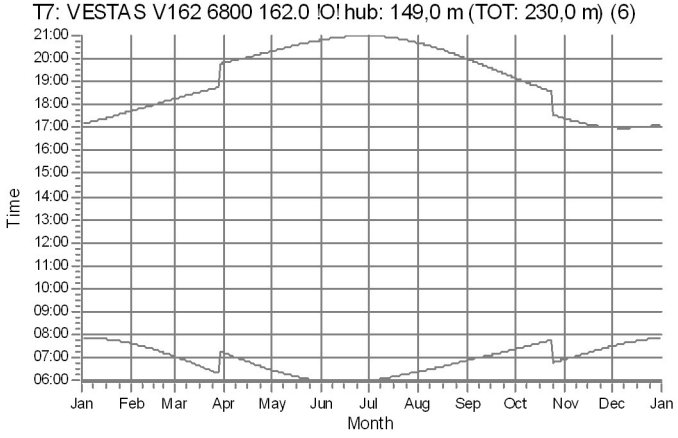
Calculated:
05/05/2022 11:01/3.4.415

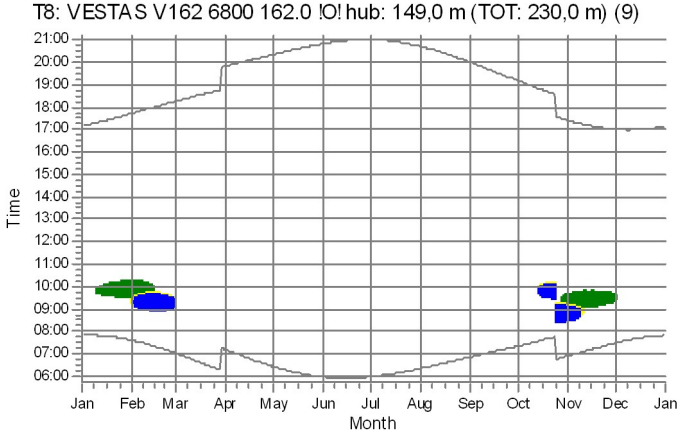
SHADOW - Calendar per WTG, graphical

Calculation: Progetto_2022_05_05

T7: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (6)



T8: VESTAS V162 6800 162.0 !O! hub: 149,0 m (TOT: 230,0 m) (9)



Shadow receptors

F132: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (4)

F134: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (10)

F135: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (11)