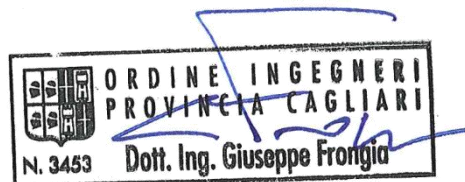


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REGIONE SARDEGNA


Provincia del Sud Sardegna

Parco eolico “Ennas” - Comuni di Suelli e Selegas -




OGGETTO STUDIO DI IMPATTO AMBIENTALE	TITOLO ANALISI DEGLI EFFETTI DI SHADOW - FLICKERING				
PROGETTAZIONE I.A.T. CONSULENZA E PROGETTI S.R.L. ING. GIUSEPPE FRONGIA	<table border="0"> <tr> <td data-bbox="820 1503 1102 1854"> GRUPPO DI PROGETTAZIONE Ing. Giuseppe Frongia (coordinatore e responsabile) Ing. Marianna Barbarino Ing. Enrica Batzella Pian.Terr. Andrea Cappai Ing. Gianfranco Corda Ing. Paolo Desogus Pian. Terr. Veronica Fais Ing. Gianluca Melis Ing. Andrea Onnis Pian. Terr. Eleonora Re Ing. Elisa Roych Ing. Marco Utzeri </td> <td data-bbox="1129 1503 1482 1854"> CONTRIBUTI SPECIALISTICI Ce.Pi.Sar (Chiroterrofauna) Ing. Antonio Dedoni (acustica) Dott. Geol. Maria Francesca Lobina(Geologia) Agr. Dott. Nat. Nicola Manis (Pedologia) Dott. Nat. Francesco Mascia (Flora) Dott. Nat. Maurizio Medda (Fauna) Dott. Matteo Tatti (Archeologia) Dott.ssa Alice Nozza (Archeologia) </td> </tr> </table>	GRUPPO DI PROGETTAZIONE Ing. Giuseppe Frongia (coordinatore e responsabile) Ing. Marianna Barbarino Ing. Enrica Batzella Pian.Terr. Andrea Cappai Ing. Gianfranco Corda Ing. Paolo Desogus Pian. Terr. Veronica Fais Ing. Gianluca Melis Ing. Andrea Onnis Pian. Terr. Eleonora Re Ing. Elisa Roych Ing. Marco Utzeri	CONTRIBUTI SPECIALISTICI Ce.Pi.Sar (Chiroterrofauna) Ing. Antonio Dedoni (acustica) Dott. Geol. Maria Francesca Lobina(Geologia) Agr. Dott. Nat. Nicola Manis (Pedologia) Dott. Nat. Francesco Mascia (Flora) Dott. Nat. Maurizio Medda (Fauna) Dott. Matteo Tatti (Archeologia) Dott.ssa Alice Nozza (Archeologia)		
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1 INTRODUZIONE

La Società Baltex Sardegna 12 Suelli S.r.l. intende realizzare un impianto per la produzione di energia elettrica da fonte rinnovabile eolica composto da n. 8 aerogeneratori, con potenza unitaria di 6,0 MW per una potenza complessiva di 48 MW, ricadente nei territori comunali di Suelli e Selegas (Provincia del Sud Sardegna).

Il presente elaborato, costituente parte integrante dello Studio di impatto ambientale allegato al progetto, esamina compiutamente il potenziale disturbo da ombreggiamento intermittente (*shadow flickering*) sui potenziali ricettori individuati nell'area interessata dal proposto impianto eolico, 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" all'interno di apposito report allegato al progetto del parco eolico (BLTX-SU-RA11_Report dei fabbricati censiti).

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.

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2 CRITERI GENERALI DI ANALISI E VALUTAZIONE

Un ostacolo solido opaco 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 del fenomeno;

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- 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 efficace 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 170 metri con una velocità massima nominale di rotazione di circa 11 RPM si avrà una frequenza di passo pari a circa 0,5 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 saranno considerati potenziali ricettori i soli edifici che, sulla base delle informazioni disponibili e delle verifiche condotte in sito, potrebbero prudenzialmente ricondursi alla fattispecie di “ambienti abitativi”.

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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 ne è stata verificata l'effettiva esistenza e consistenza dall'esame di foto aeree e satellitari nonché attraverso specifici sopralluoghi sul campo. 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 abitazioni (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 BLTX-SU-RA11 (*Report fabbricati censiti*) riporta l'individuazione degli edifici in accordo con la metodologia precedentemente indicata. Nel Report è contenuto inoltre lo stralcio della ripresa aerea zenitale, la categoria catastale di appartenenza ed una fotografia prospettica dei fabbricati.

Il censimento ha condotto all'individuazione di n. 122 edifici, o complessi di fabbricati agricoli; tra questi è stata riscontrata la prevalente presenza di corpi edilizi a servizio di attività del settore terziario come: magazzini e locali di deposito o immobili speciali a destinazione produttiva o terziaria. La frequentazione di tali edifici è saltuaria e, in prossimità dell'area di impianto, principalmente legata alle esigenze di conduzione dei fondi agricoli.

È stata inoltre verificata la presenza di 14 edifici con categoria 1 precedentemente individuata, riferibili a "case rurali ad utilizzazione residenziale (Categoria catastale A) e/o corpi di fabbrica con tipologia costruttiva equiparabile a quella residenziale e/o villaggi turistici". Per tali fabbricati - identificati con le sigle F025, F036, F039, F047, F050, F054, F055, F069, F076, F099, F100, F123, F126 e F150

Nel caso specifico, ai fini dei calcoli di esposizione all'ombra intermittente, sono stati individuati come ricettori n. 14 fabbricati ubicati entro 1.000 m dagli aerogeneratori, riferibili a "case rurali ad utilizzazione residenziale (Categoria catastale A - F025, F050, F054, F055, F069, F099, F100, F123, F126) e/o corpi di fabbrica con tipologia costruttiva equiparabile a quella residenziale (fabbricati identificati con le sigle: F036, F039, F047, F076, F150).

Entro tali distanze è, infatti, ragionevole che si manifestino i più avvertiti effetti di disturbo in rapporto al fattore di impatto in esame. La Tabella 1 riporta, per ciascun ricettore individuato, le relative coordinate secondo il sistema Gauss Boaga, la categoria Catastale e la distanza dal più prossimo aerogeneratore.



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Tabella 1 - Ricettori 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
F025	Senorbi	1514171	4381065	446	AG04	A3 - Abitazioni di tipo economico
F036	Suelli	1512259	4383590	712	AG02	D10 - fabbricati connessi alla attività agricola
F039	Suelli	1512341	4383725	785	AG02	D10 - fabbricati connessi alla attività agricola
F047	Suelli	1512308	4383833	897	AG02	D10 - fabbricati connessi alla attività agricola
F050	Gesico	1511405	4383848	961	AG01	A3 - Abitazioni di tipo economico
F054	Gesico	1511155	4383616	795	AG01	A02 - Abitazioni di tipo civile
F055	Gesico	1511128	4383572	767	AG01	A3 - Abitazioni di tipo economico
F069	Suelli	1512081	4379727	955	AG08	A02 - Abitazioni di tipo civile
F076	Selegas	1510252	4381248	764	AG06	00 (non specificato) - campo sport
F099	Senorbi	1514459	4380682	919	AG04	A3 - Abitazioni di tipo economico
F100	Senorbi	1514465	4380709	904	AG04	A3 - Abitazioni di tipo economico
F123	Selegas	1510339	4381409	747	AG06	A07 - Abitazioni in villini
F126	Suelli	1512716	4381493	467	AG07	A4 - Abitazioni di tipo popolare
F150	Senorbi	1514216	4380597	849	AG04	Non presente al catasto fabbricati

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4 IPOTESI ALLA BASE DEL CALCOLO E SOGLIE DI RIFERIMENTO

4.1 Introduzione

L'analisi dell'effetto di shadow flickering è stata condotta con l'utilizzo del modulo SHADOW del software WindPro 3.4. Il programma esegue una simulazione completa del percorso del sole durante un intero anno.

I calcoli possono essere eseguiti secondo due scenari: lo scenario peggiore (*worst case*) e il caso reale (*real case*).

Nello scenario *worst case* 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*.


Conseguentemente, nello scenario peggiore, è altamente verosimile che i ricettori considerati saranno soggetti ad un impatto da *shadow flickering* significativamente inferiore a quello ipotizzato dal modello.

Nello scenario *real case*, il software può tenere conto delle reali **condizioni di funzionamento degli aerogeneratori** (in termini di ore di funzionamento attese per ogni settore angolare di provenienza del vento) nonché delle condizioni di **Eliofania**, ossia di durata media del soleggiamento della specifica zona di studio.

Peraltro, in entrambi gli scenari di calcolo, se la simulazione contempla l'effetto dell'orografia sulla propagazione dell'ombra, la stessa ignora l'azione schermante "sito-specifica" esercitata dai manufatti e dalle alberature. In altre parole, **il calcolo è sempre conservativo e rappresenta quindi il massimo rischio potenziale di disturbo.**

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;

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- 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, 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 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'impatto del tremolio dell'ombra.

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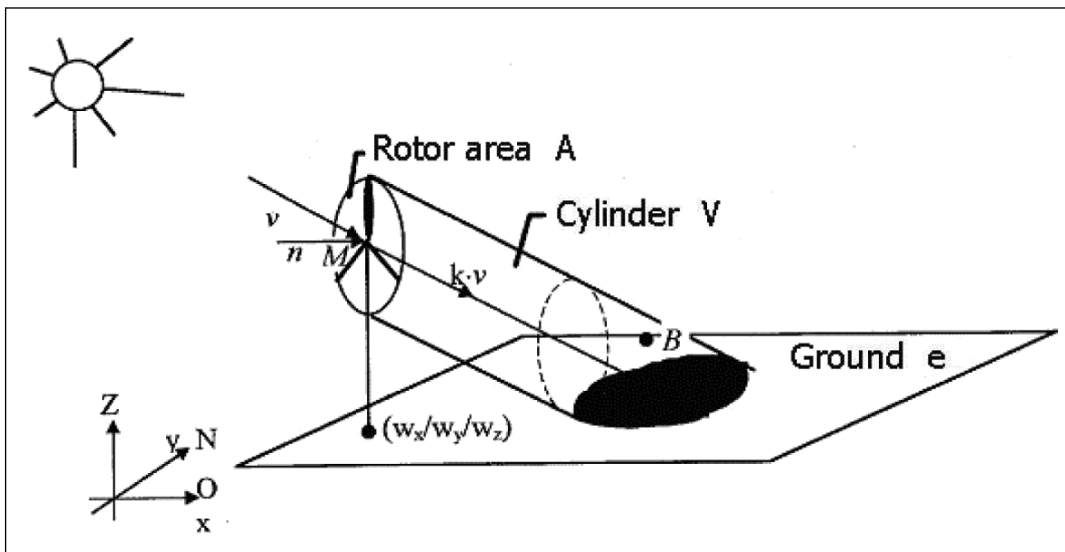


Figura 4.1: Rappresentazione schematica della proiezione dell'ombra del rotore.

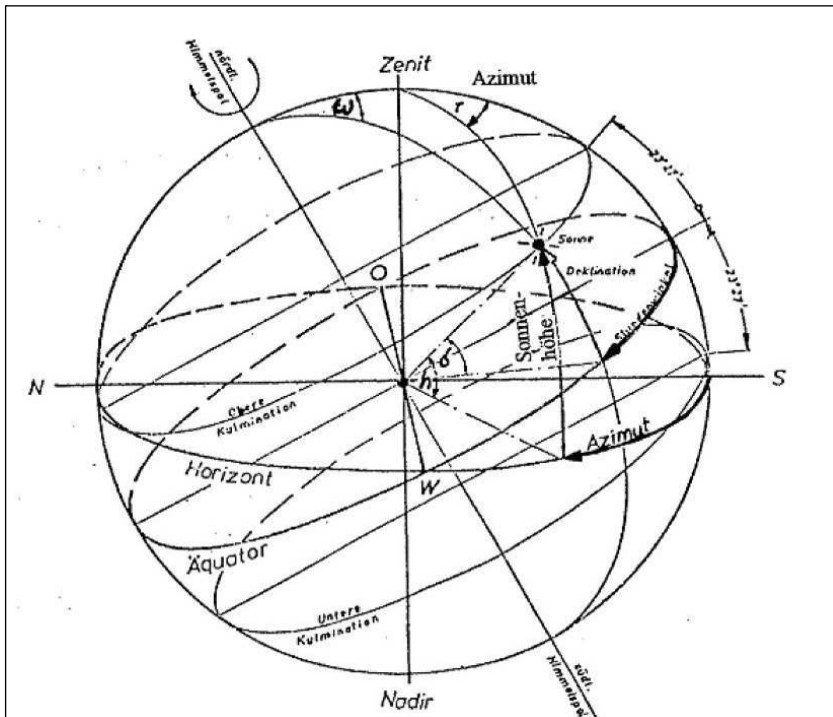



Figura 4.2: Schema dei moti terrestri e parametri di calcolo.

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4.2 Lo scenario peggiore (worst case)

Questi calcoli sono basati sullo scenario più conservativo (ombra massima astronomica, ossia basata sulla posizione del sole rispetto alle WTG). Se il cielo è coperto o c'è calma di vento, o la direzione del vento è tale da porre il piano del rotore in posizione parallela rispetto alla linea sole-edificio, la WTG non produrrà ombra, ma la sua influenza apparirà comunque nei calcoli. In altre parole, il calcolo descrive lo scenario peggiore possibile e rappresenta quindi il massimo rischio potenziale di impatto. Per ciascun recettore il software produce un calendario che indica i giorni ed i periodi di tempo in cui l'ombra sarà presente.

4.3 Lo scenario reale (real case)


Oltre al calcolo che contempla le ore di "ombra massima astronomica" (detta anche ombra peggiore), il software WINDPRO consente di configurare i parametri statistici per calcolare l'"ombra meteorologica probabile" (detta anche ombra reale). In particolare, possono essere configurati due parametri statistici:

1. Statistica delle ore di funzionamento. È il periodo in cui le turbine saranno operative per ciascuna direzione di provenienza del vento nel corso dell'anno.
2. Statistica dell'eliofania. È la percentuale di ore di sole durante il dì (dall'alba al tramonto). Questa varia notevolmente da luogo a luogo, e si rende opportuno utilizzare, pertanto, una statistica proveniente da stazioni di misura vicine al sito.


WindPRO combina ZVI ed il calcolo dell'ombra in modo da escludere il contributo delle turbine non visibili dai recettori. Questo vale anche per la mappa dell'ombra, in cui saranno incluse solo le WTG visibili da ciascun punto di griglia.

Ai fini del calcolo del tremolio dell'ombra il software di simulazione considera i seguenti parametri:

- diametro del sole, D (1.390.000 km);
- distanza Terra-Sole, d (150.000.000 km);
- angolo di attacco (3°);
- coordinate geografiche e altitudine delle turbine in progetto;
- altezza al mozzo (125 m) e diametro del rotore (170 m);
- coordinate dei recettori;
- recettori considerati in modalità "serra", assumendo che vengano interessati dal fenomeno di shadow-flickering indipendentemente dall'orientamento delle finestre (ipotesi conservativa);
- modello digitale del terreno;
- eliofania del sito;

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- statistica delle ore di funzionamento degli aerogeneratori in funzione delle frequenze di provenienza del vento su 12 quadranti convenzionali;
- modello di calcolo della simulazione, che tiene conto sia dell'orbita terrestre rispetto al Sole (rivoluzione), sia della rotazione rispetto al proprio asse.

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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 specifica tavola grafica, in scala adeguata alla dimensione territoriale da rappresentare, per facilitarne la lettura. La tavola è stata realizzata, pertanto, su base cartografica in scala 1:10.000 (Elaborato BW-GM-RA9-1).

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 degli allegati 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.

I risultati numerici delle simulazioni modellistiche, condotti con riferimento a ciascuno scenario di calcolo (*worst* e *real case*), sono riportati in Appendice.

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6 ANALISI DEI RISULTATI

Le risultanze del calcolo modellistico atto a stimare i valori totali di potenziale interferenza da *shadow flickering* in corrispondenza dei ricettori nello scenario di progetto sono riportate in Tabella 2.

Tabella 2 - Risultati dei calcoli di ombreggiamento intermittente presso i ricettori considerati

ID	RICETTORE	Cat. Catastale	WTG SF	WTG Più prossimo	Dist. Min. WTG	h/anno SF Worst Case	h/giorno SF Worst Case	h/anno SF Real Case
1	F025	A03	-	AG04	446	00:00	00:00	00:00
2	F036	D10	AG01	AG02	712	11:11	00:26	02:21
3	F039	D10	-	AG02	785	00:00	00:00	00:00
4	F047	D10	-	AG02	897	00:00	00:00	00:00
5	F050	A03	AG02	AG01	961	20:54	00:25	05:01
6	F054	A02	AG02	AG01	795	07:46	00:21	01:59
7	F055	A03	AG02	AG01	767	07:20	00:20	01:53
8	F069	A02	-	AG08	955	00:00	00:00	00:00
9	F076	00 (non specificato) - campo sport	AG05-AG06-AG08	AG06	764	53:50:00	00:50	14:34
10	F099	A03	-	AG04	919	00:00	00:00	00:00
11	F100	A03	-	AG04	904	00:00	00:00	00:00
12	F123	A07	AG05-AG06-AG08	AG06	747	70:37:00	01:09	18:13
13	F126	A04	AG04-AG05-AG06	AG07	467	116:28:00	01:48	31:41:00
14	F150	seminativo	-	AG04	849	00:00	00:00	00:00

Come si può osservare dall'esame della Tabella 2, l'incidenza dell'ombreggiamento intermittente presso i ricettori considerati nello scenario "real case" prevalentemente al disotto del valore guida di 30 h/anno o, comunque, di poco superiore (31:41 h/anno) per un unico ricettore (F126). Nello specifico, i ricettori F025, F039, F047, F069, F099, F100 e F150, in ragione della loro ubicazione rispetto agli aerogeneratori in progetto, non saranno esposti al fenomeno dell'ombreggiamento

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intermittente mentre può ritenersi trascurabile l'incidenza effettiva del fenomeno presso i ricettori F036, F050, F054 e F055 (compresa indicativamente tra 2:00 h/anno e 5:00 h/anno).

Relativamente ai fabbricati F076 e F123, gli stessi saranno interessati dalla proiezione dell'ombra intermittente per una durata massima stimata rispettivamente in appena 14:34 e 18:13 h/anno nello scenario *real case*, abbondantemente al disotto della soglia di riferimento 30 h/anno.


Come accennato, infine, presso il ricettore F126 il modello di calcolo prospetta un lieve superamento del valore guida di 30 h/anno attribuibile agli aerogeneratori AG04, AG05 e Ag06.

Il calendario grafico dell'ombra relativo al ricettore F126 (Figura 6.1) mostra come il principale contributo al fenomeno dello SF sia atteso nel pomeriggio (nella fascia oraria 16:30-18:30) ad opera dell'aerogeneratore AG05 (indicativamente tra marzo e aprile e tra settembre e ottobre).

Analizzando più in dettaglio le caratteristiche del fenomeno presso il ricettore F126 si ritiene opportuno formulare le seguenti considerazioni:

- Il fabbricato F126 è rappresentato da un edificio ad un unico piano ubicato all'interno di un esteso uliveto;
- La facciata esposta al fenomeno dello SF riferibile all'aerogeneratore AG05, rispetto al quale è atteso il principale contributo all'ombreggiamento, è quella rivolta a ovest, in aderenza alle piante di ulivo, risultando conseguentemente schermata all'ombreggiamento (Figura 6.2);
- affinché il fenomeno dello SF sia percepito come un disturbo da parte degli occupanti l'edificio, tutte le seguenti circostanze dovrebbero essere verificate:
 - o Presenza degli occupanti presso l'ambiente esposto all'ombreggiamento;
 - o Elevato contrasto luci/ombre (assenza di schermature nelle finestre);
 - o gli individui potenzialmente soggetti ad un impatto da *shadow flickering* dovrebbero permanere esposti alla luce tremolante per un tempo sufficiente ad avvertire fastidio.

Tutto ciò considerato è ragionevole affermare che l'effettiva potenziale incidenza del fenomeno dello *shadow flickering* risulterà drasticamente più contenuta di quella prospettata dal software di simulazione e, conseguentemente, al disotto dei richiamati valori guida delle Linee Guida tedesche.

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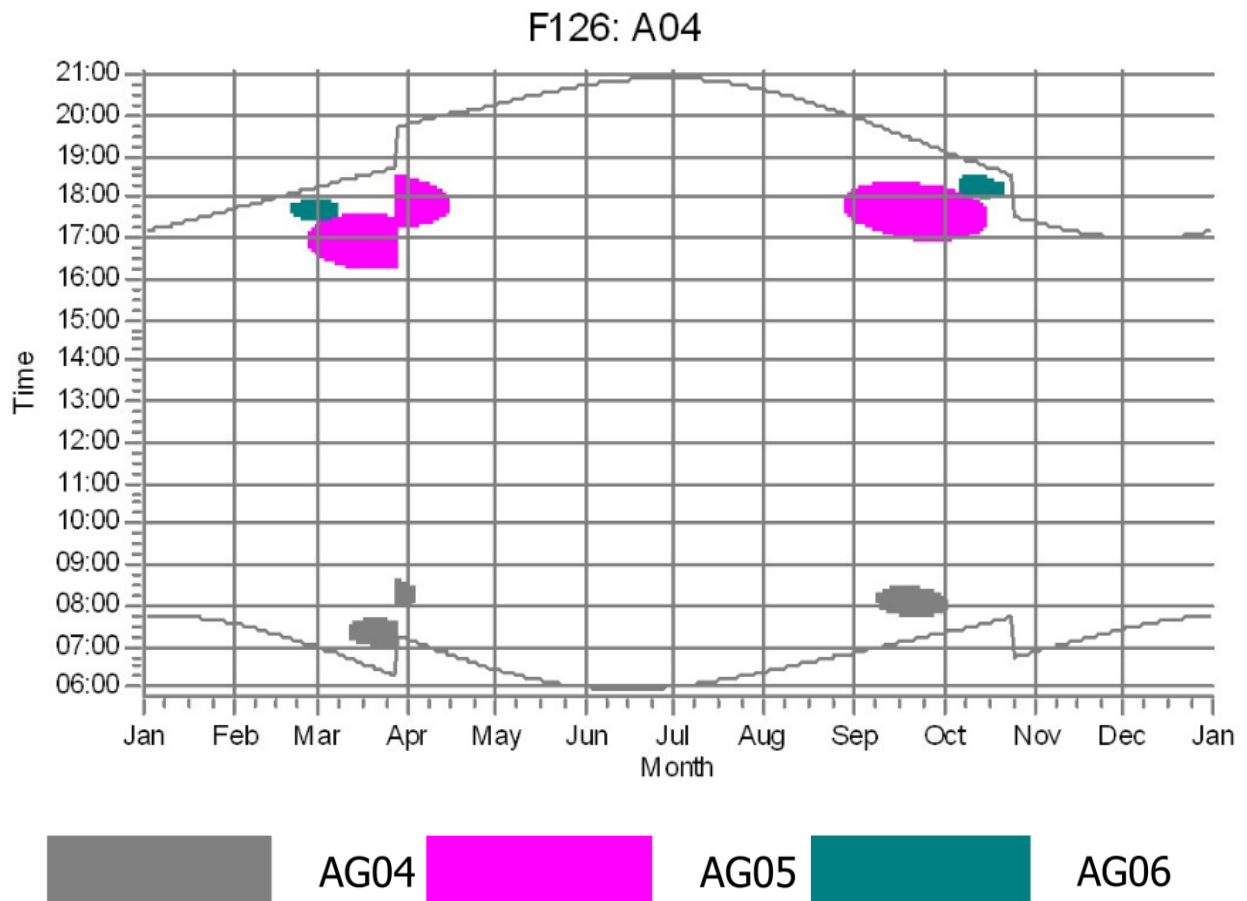


Figura 6.1 – Calendario dell'ombra relativo al ricettore F126



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Figura 6.2 – Fabbricato F126 – Vista aerea da nordest. Si noti come il prospetto ovest (sul retro del fabbricato) risulti in sostanziale aderenza a un filare di ulivi in grado di esercitare un'efficace azione di schermo rispetto all'ombreggiamento intermittente ad opera dell'aerogeneratore AG05.

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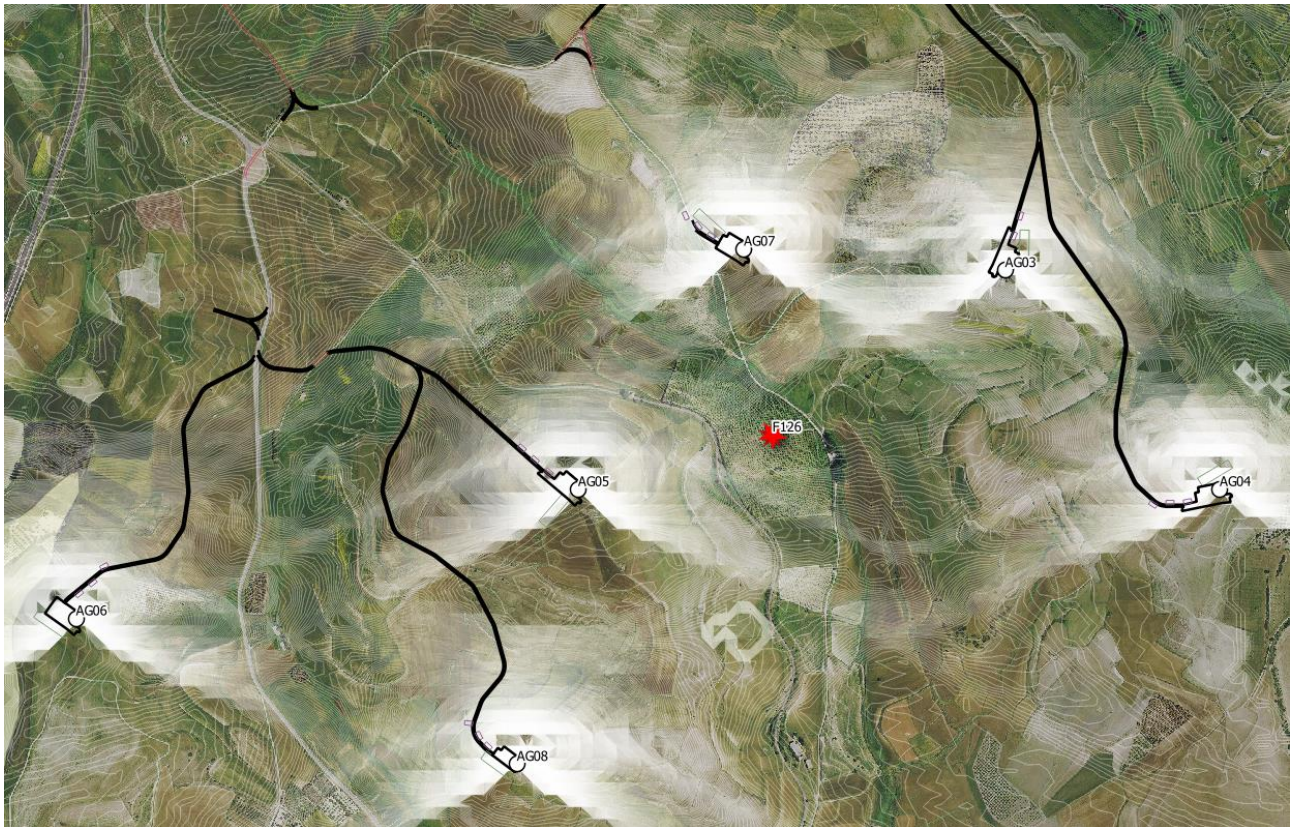



Figura 6.3 – Ricettore F126 e isolinee d'ombra (in bianco)

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7 CONCLUSIONI

Il documento ha esaminato compiutamente il potenziale disturbo da ombreggiamento intermittente (*shadow flickering*) in corrispondenza dei più prossimi fabbricati presenti nell'area interessata dal proposto parco eolico, denominato "Ennas", proposto dalla Baltex Sardegna 12 Suelli S.r.l. nei comuni di Suelli e Selegas (SU). 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 individuati come ricettori n. 14 fabbricati con utilizzo abitativo accertato (n. 9 fabbricati di categoria catastale A2/A3/A4/A7) o presunto (n. 5 fabbricati di caratteristiche tipologico-costruttive assimilabili ad abitazioni), ubicati entro una distanza massima di circa 1000 m dalle più prossime postazioni eoliche.

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.


I calcoli possono essere eseguiti secondo due scenari: lo scenario peggiore (*worst case*) e il caso reale (*real case*).

Nello scenario *real case*, il software può tenere conto delle reali condizioni di funzionamento degli aerogeneratori (in termini di ore di funzionamento attese per ogni settore angolare di provenienza del vento) nonché delle condizioni di Eliofania, ossia di durata media del soleggiamento della specifica zona di studio.

L'incidenza dell'ombreggiamento intermittente presso i ricettori considerati nello scenario "*real case*" è risultata prevalentemente al disotto del valore guida di 30 h/anno o, comunque, di poco superiore (31:41 h/anno) per un unico ricettore (F126).

Si tratta di un edificio ad unico piano con prospetto ovest (potenzialmente esposto allo shadow-flickering dell'aerogeneratore AG05) schermato all'ombreggiamento dalla limitrofa presenza di una cortina arborea.

Considerata la conservatività delle stime in rapporto all'effettivo manifestarsi di un disturbo per gli occupanti l'edificio (aleatorietà circa la presenza degli occupanti, necessità di un sufficiente contrasto luci-ombre, assenza di elementi schermanti quali tendaggi e/o alberature), unitamente alle specifiche caratteristiche costruttive e localizzative del fabbricato, è altamente verosimile che l'effettiva incidenza del fenomeno risulterà drasticamente più contenuta di quella prospettata dal software di simulazione e, conseguentemente, al disotto dei richiamati valori guida delle Linee Guida tedesche.

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APPENDICE: REPORT DEI RISULTATI DEL CALCOLO MODELLISTICO

SHADOW - Main Result

Calculation: Real_case_Progetto_20230705

Assumptions for shadow calculations

Maximum distance for influence

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

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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_Baltex_Suel

Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

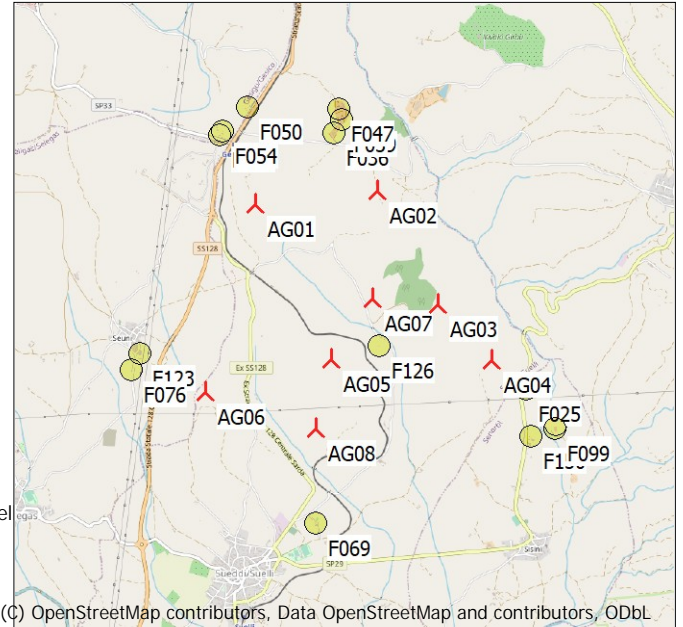
Italian Gauss-Boaga west-ROMA40 (IT-peninsular <±4m)

WTGs

	Easting	Northing	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM [RPM]
			[m]									
AG01	1.511.479	4.382.890	360,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG02	1.512.687	4.383.021	363,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG03	1.513.294	4.381.901	360,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG04	1.513.827	4.381.357	387,3	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG05	1.512.234	4.381.357	360,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG06	1.510.987	4.381.037	347,6	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG07	1.512.645	4.381.954	310,2	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG08	1.512.081	4.380.675	306,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8

Shadow receptor-Input

No.	Name	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]
F025	A03	1.514.171	4.381.065	289,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F036	D10	1.512.259	4.383.590	378,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F039	D10	1.512.341	4.383.725	380,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F047	D10	1.512.308	4.383.833	380,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F050	A03	1.511.405	4.383.848	366,6	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F054	A02	1.511.155	4.383.616	365,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F055	A03	1.511.128	4.383.572	366,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F069	A02	1.512.081	4.379.727	261,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F076	campeggio camper	1.510.252	4.381.248	295,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F099	A03	1.514.459	4.380.682	265,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F100	A03	1.514.465	4.380.709	266,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F123	A07	1.510.339	4.381.409	312,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F126	A04	1.512.716	4.381.493	300,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F150	seminativo	1.514.216	4.380.597	284,6	1,2	1,4	1,2	90,0	"Green house mode"	2,6



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

Scale 1:75.000
 ▲ New WTG
 ● Shadow receptor

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Main Result

Calculation: Real_case_Progetto_20230705

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values
		Shadow hours per year [h/year]
F025	A03	0:00
F036	D10	2:21
F039	D10	0:00
F047	D10	0:00
F050	A03	5:01
F054	A02	1:59
F055	A03	1:53
F069	A02	0:00
F076	campeggio camper	14:34
F099	A03	0:00
F100	A03	0:00
F123	A07	18:13
F126	A04	31:41
F150	seminativo	0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
AG01	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (56)	11:11	2:21
AG02	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57)	31:07	7:38
AG03	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (58)	0:00	0:00
AG04	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (59)	19:50	5:45
AG05	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60)	101:52	27:49
AG06	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)	108:54	28:16
AG07	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (62)	0:00	0:00
AG08	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (63)	10:15	2:37

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.

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F025 - A03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
Via Santa Margherita 4
IT-09124 Cagliari
+39 070 658297
Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F036 - D10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 607 505 420 506 599 570 495 488 555 624 686 669 6.724

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and shadow reduction factors.

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

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

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Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F039 - D10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F047 - D10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
Via Santa Margherita 4
IT-09124 Cagliari
+39 070 658297
Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F050 - A03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains a time range (e.g., 07:45 - 17:10) and a direction (e.g., AG02). Summary rows at the bottom show 'Potential sun hours' and 'Total, real' for each month.

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)

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
Via Santa Margherita 4
IT-09124 Cagliari
+39 070 658297
Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F054 - A02

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 607 505 420 506 599 570 495 488 555 624 686 669 6.724

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, shadow reduction, and operational time.

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

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
Via Santa Margherita 4
IT-09124 Cagliari
+39 070 658297
Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F055 - A03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 607 505 420 506 599 570 495 488 555 624 686 669 6.724

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and shadow reduction percentages.

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

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F069 - A02

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F076 - campeggio camper

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 607 505 420 506 599 570 495 488 555 624 686 669 6.724

	January	February	March	April	May	June
1	07:45 17:10	07:33 17:43	06:59 18:15	07:33 (AG06) 19:47	07:10 19:47	07:28 (AG05) 20:17
2	07:45 17:11	07:32 17:44	06:57 18:16	07:32 (AG06) 19:48	07:08 19:48	07:26 (AG05) 20:18
3	07:45 17:12	07:31 17:45	06:56 18:17	07:31 (AG06) 19:49	07:07 19:49	07:25 (AG05) 20:19
4	07:45 17:13	07:30 17:47	06:54 18:19	07:31 (AG06) 19:50	07:05 19:50	07:24 (AG05) 20:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:30 (AG06) 19:51	07:04 19:51	07:25 (AG05) 20:21
6	07:45 17:14	07:28 17:49	06:51 18:21	07:29 (AG06) 19:52	07:02 19:52	07:24 (AG05) 20:22
7	07:45 17:15	07:27 17:50	06:50 18:22	07:28 (AG06) 19:53	07:00 19:53	07:25 (AG05) 20:23
8	07:45 17:16	07:26 17:51	06:48 18:23	07:28 (AG06) 19:54	06:59 19:54	07:26 (AG05) 20:24
9	07:45 17:17	07:25 17:53	06:46 18:24	07:28 (AG06) 19:55	06:57 19:55	07:26 (AG05) 20:25
10	07:45 17:18	07:23 17:54	06:45 18:25	07:27 (AG06) 19:56	06:56 19:56	07:29 (AG05) 20:26
11	07:44 17:19	07:22 17:55	06:43 18:26	07:28 (AG06) 19:57	06:54 19:57	07:36 (AG05) 20:27
12	07:44 17:20	07:21 17:56	06:42 18:27	07:27 (AG06) 19:58	06:53 19:58	07:38 (AG05) 20:28
13	07:44 17:21	07:20 17:57	06:40 18:28	07:28 (AG06) 19:59	06:51 19:59	07:36 (AG05) 20:29
14	07:44 17:22	07:19 17:58	07:38 (AG08) 18:29	06:39 18:29	07:27 (AG06) 20:00	06:50 20:00
15	07:43 17:23	07:18 18:00	07:37 (AG08) 18:30	06:37 18:30	07:27 (AG06) 20:01	06:48 20:01
16	07:43 17:25	07:16 18:01	07:35 (AG08) 18:31	06:36 18:31	07:28 (AG06) 20:02	06:47 20:02
17	07:43 17:26	07:15 18:02	07:34 (AG08) 18:32	06:34 18:32	07:28 (AG06) 20:03	06:45 20:03
18	07:42 17:27	07:14 18:03	07:33 (AG08) 18:33	06:32 18:33	07:29 (AG06) 20:04	06:44 20:04
19	07:42 17:28	07:12 18:04	07:31 (AG08) 18:34	06:31 18:34	07:30 (AG06) 20:05	06:42 20:05
20	07:41 17:29	07:11 18:05	07:30 (AG08) 18:35	06:29 18:35	07:30 (AG06) 20:06	06:41 20:06
21	07:41 17:30	07:10 18:06	07:29 (AG08) 18:36	06:28 18:36	07:32 (AG06) 20:07	06:40 20:07
22	07:40 17:31	07:08 18:08	07:27 (AG08) 18:37	06:26 18:37	07:33 (AG06) 20:08	06:38 20:08
23	07:39 17:32	07:07 18:09	07:26 (AG08) 18:38	06:24 18:38	07:36 (AG06) 20:09	06:37 20:09
24	07:39 17:34	07:06 18:10	07:24 (AG08) 18:39	06:23 18:39	07:38 (AG06) 20:10	06:35 20:10
25	07:38 17:35	07:04 18:11	07:26 (AG08) 18:40	06:21 18:40	07:42 (AG06) 20:11	06:34 20:11
26	07:37 17:36	07:03 18:12	07:28 (AG08) 18:41	06:20 18:41	07:51 (AG06) 20:12	06:33 20:12
27	07:37 17:37	07:01 18:13	07:36 (AG06) 18:42	06:18 18:42	06:31 20:13	06:02 20:13
28	07:36 17:38	07:00 18:14	08:14 (AG06) 18:43	18:42 18:43	06:30 20:14	06:01 20:14
29	07:35 17:39	07:15 18:15	08:16 (AG06) 19:44	18:43 19:44	07:33 (AG05) 20:15	06:00 20:15
30	07:34 17:41	07:13 18:16	07:40 (AG05) 19:45	19:44 19:45	07:40 (AG05) 20:16	20:15 20:16
31	07:34 17:42	07:12 18:17	07:30 (AG05) 19:46	19:45 19:46	07:30 (AG05) 20:17	20:16 20:17
Potential sun hours	301	299	370	397	444	448
Total, worst case		367	1072		164	
Sun reduction		0,47	0,49		0,53	
Oper. time red.		0,77	0,77		0,77	
Wind dir. red.		0,66	0,65		0,66	
Total reduction		0,24	0,25		0,27	
Total, real		87	265		44	

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

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

Calculation: Real_case_Progetto_20230705Shadow receptor: F076 - campeggio camper

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	July	August	September	October	November	December
1	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	08:07 (AG06) 08:55 (AG06)	06:51 17:24
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	08:06 (AG06) 08:56 (AG06)	06:52 17:22
3	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	08:06 (AG06) 08:55 (AG06)	06:54 17:21
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	08:05 (AG06) 08:55 (AG06)	06:55 17:20
5	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	08:05 (AG06) 08:55 (AG06)	06:56 17:19
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	08:05 (AG06) 08:55 (AG06)	06:57 17:18
7	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	08:05 (AG06) 08:54 (AG06)	06:58 17:17
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	08:05 (AG06) 08:54 (AG06)	06:59 17:16
9	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	08:05 (AG06) 08:53 (AG06)	07:00 17:15
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	08:05 (AG06) 08:52 (AG06)	07:02 17:14
11	06:05 20:53	06:32 20:26	07:01 19:41	07:29 18:52	08:06 (AG06) 08:51 (AG06)	07:03 17:13
12	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	08:06 (AG06) 08:50 (AG06)	07:04 17:12
13	06:07 20:52	06:34 20:24	07:02 19:37	07:31 18:49	08:07 (AG06) 08:49 (AG06)	07:05 17:11
14	06:08 20:52	06:34 20:23	07:03 19:36	07:32 18:48	08:08 (AG06) 08:48 (AG06)	07:06 17:10
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	08:02 (AG08) 08:46 (AG06)	07:07 17:09
16	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:45	07:59 (AG08) 08:44 (AG06)	07:08 17:09
17	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:57 (AG08) 08:42 (AG06)	07:09 17:08
18	06:11 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:56 (AG08) 08:40 (AG06)	07:11 17:07
19	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:41	07:57 (AG08) 08:37 (AG06)	07:12 17:06
20	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:58 (AG08) 08:33 (AG06)	07:13 17:06
21	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	08:00 (AG08) 08:15 (AG08)	07:14 17:05
22	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:36	08:01 (AG08) 08:15 (AG08)	07:15 17:05
23	06:15 20:46	06:43 20:10	07:12 19:21	07:41 18:35	08:02 (AG08) 08:14 (AG08)	07:16 17:04
24	06:15 20:45	06:44 20:09	07:13 19:19	07:43 18:34	08:03 (AG08) 08:14 (AG08)	07:17 17:04
25	06:16 20:44	06:45 20:07	07:14 19:18	07:44 17:32	08:04 (AG08) 07:13 (AG08)	07:18 17:03
26	06:17 20:43	06:46 20:06	07:14 19:16	06:45 17:31	07:05 (AG08) 07:12 (AG08)	07:19 17:03
27	06:18 20:43	06:47 20:04	07:15 19:15	06:46 17:30	07:06 (AG08) 07:10 (AG08)	07:20 17:02
28	06:19 20:42	06:48 20:03	07:16 19:13	06:47 17:28	07:08 (AG08) 07:10 (AG08)	07:21 17:02
29	06:20 20:41	06:48 20:01	07:17 19:11	06:48 17:27	08:08 (AG06) 08:55 (AG06)	07:23 17:01
30	06:21 20:40	06:49 20:00	07:18 19:10	06:49 17:26	08:07 (AG06) 08:55 (AG06)	07:24 17:01
31	06:22 20:39	06:50 19:58		06:50 17:25		07:44 17:09
Potential sun hours	455	425	374	347	301	292
Total, worst case			646	981		
Sun reduction			0,65	0,54		
Oper. time red.			0,77	0,77		
Wind dir. red.			0,65	0,65		
Total reduction			0,33	0,27		
Total, real			210	268		

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

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

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F099 - A03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F100 - A03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F123 - A07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	January	February	March	April	May	June			
1	07:45	07:33	07:52 (AG08)	06:59	07:10	06:26	05:59		
	17:10	17:43	08:55 (AG06)	18:15	19:47	20:17	20:45		
2	07:45	07:32	07:51 (AG08)	06:57	07:08	06:25	05:59		
	17:11	17:44	08:56 (AG06)	18:16	19:48	20:18	20:46		
3	07:45	07:31	07:50 (AG08)	06:56	07:07	06:24	05:58		
	17:12	17:45	08:56 (AG06)	18:17	19:49	20:19	20:46		
4	07:45	07:30	07:49 (AG08)	06:54	07:05	06:22	05:58		
	17:13	17:47	08:56 (AG06)	18:19	19:50	20:20	20:47		
5	07:45	07:29	07:48 (AG08)	06:53	07:04	06:21	05:57		
	17:14	17:48	08:57 (AG06)	18:20	19:51	20:21	20:48		
6	07:45	07:28	07:47 (AG08)	06:51	07:02	06:20	05:57		
	17:14	17:49	08:57 (AG06)	18:21	19:52	20:22	20:48		
7	07:45	07:27	07:46 (AG08)	06:50	07:00	06:19	05:57		
	17:15	17:50	08:57 (AG06)	18:22	19:53	20:23	20:49		
8	07:45	07:26	07:45 (AG08)	06:48	06:59	06:18	05:57		
	17:16	17:51	08:58 (AG06)	18:23	19:54	20:24	20:49		
9	07:45	07:25	07:44 (AG08)	06:46	06:57	06:17	05:56		
	17:17	17:53	08:58 (AG06)	18:24	19:55	20:25	20:50		
10	07:45	07:23	07:43 (AG08)	06:45	06:56	06:16	05:56		
	17:18	17:54	08:58 (AG06)	18:25	19:56	20:26	20:51		
11	07:44	07:22	07:41 (AG08)	06:43	06:54	06:15	05:56		
	17:19	17:55	08:57 (AG06)	18:26	19:57	20:27	20:51		
12	07:44	07:21	07:40 (AG08)	06:42	06:53	06:14	05:56		
	17:20	17:56	08:57 (AG06)	18:27	19:58	20:28	20:52		
13	07:44	07:20	07:40 (AG08)	06:40	06:51	06:13	05:56		
	17:21	17:57	08:57 (AG06)	18:28	19:59	20:29	20:52		
14	07:44	07:19	07:43 (AG08)	06:39	06:50	06:12	05:56		
	17:22	17:58	08:57 (AG06)	18:29	20:00	20:30	20:52		
15	07:43	08:23 (AG06)	07:18	08:07 (AG06)	06:37	06:48	06:11	05:56	
	17:23	5 08:28 (AG06)	18:00	49 08:56 (AG06)	18:30	20:01	20:31	20:53	
16	07:43	08:20 (AG06)	07:16	08:06 (AG06)	06:36	06:47	06:10	05:56	
	17:25	14 08:34 (AG06)	18:01	49 08:55 (AG06)	18:31	20:02	20:31	20:53	
17	07:43	08:17 (AG06)	07:15	08:07 (AG06)	06:34	06:45	06:09	05:56	
	17:26	19 08:36 (AG06)	18:02	47 08:54 (AG06)	18:32	20:03	20:32	20:54	
18	07:42	08:16 (AG06)	07:14	08:08 (AG06)	06:32	06:44	06:08	05:56	
	17:27	23 08:39 (AG06)	18:03	46 08:54 (AG06)	18:33	20:04	20:33	20:54	
19	07:42	08:14 (AG06)	07:12	08:08 (AG06)	06:31	06:49 (AG05)	06:42	06:07	05:56
	17:28	26 08:40 (AG06)	18:04	44 08:52 (AG06)	18:34	6 06:55 (AG05)	20:05	20:34	20:54
20	07:41	08:12 (AG06)	07:11	08:10 (AG06)	06:29	06:47 (AG05)	06:41	06:06	05:56
	17:29	30 08:42 (AG06)	18:05	41 08:51 (AG06)	18:35	9 06:56 (AG05)	20:06	20:35	20:55
21	07:41	08:12 (AG06)	07:10	08:11 (AG06)	06:28	06:46 (AG05)	06:40	06:06	05:56
	17:30	32 08:44 (AG06)	18:06	39 08:50 (AG06)	18:36	12 06:58 (AG05)	20:07	20:36	20:55
22	07:40	08:11 (AG06)	07:08	08:12 (AG06)	06:26	06:44 (AG05)	06:38	06:05	05:57
	17:31	34 08:45 (AG06)	18:08	36 08:48 (AG06)	18:37	15 06:59 (AG05)	20:08	20:37	20:55
23	07:39	08:10 (AG06)	07:07	08:14 (AG06)	06:24	06:43 (AG05)	06:37	06:04	05:57
	17:32	37 08:47 (AG06)	18:09	33 08:47 (AG06)	18:38	17 07:00 (AG05)	20:09	20:38	20:55
24	07:39	08:09 (AG06)	07:06	08:15 (AG06)	06:23	06:41 (AG05)	06:35	06:03	05:57
	17:34	39 08:48 (AG06)	18:10	29 08:44 (AG06)	18:39	18 06:59 (AG05)	20:10	20:39	20:55
25	07:38	08:08 (AG06)	07:04	08:18 (AG06)	06:21	06:39 (AG05)	06:34	06:03	05:57
	17:35	41 08:49 (AG06)	18:11	24 08:42 (AG06)	18:40	20 06:59 (AG05)	20:11	20:39	20:55
26	07:37	08:08 (AG06)	07:03	08:21 (AG06)	06:20	06:39 (AG05)	06:33	06:02	05:58
	17:36	42 08:50 (AG06)	18:12	17 08:38 (AG06)	18:41	20 06:59 (AG05)	20:12	20:40	20:56
27	07:37	08:08 (AG06)	07:01	08:28 (AG06)	06:18	06:38 (AG05)	06:31	06:02	05:58
	17:37	44 08:52 (AG06)	18:13	2 08:30 (AG06)	18:42	20 06:58 (AG05)	20:13	20:41	20:56
28	07:36	08:07 (AG06)	07:00	06:16	06:38 (AG05)	06:30	06:01	05:58	
	17:38	45 08:52 (AG06)	18:14	18:43	19 06:57 (AG05)	20:14	20:42	20:56	
29	07:35	08:07 (AG06)		07:15	07:39 (AG05)	06:29	06:00	05:59	
	17:39	46 08:53 (AG06)		19:44	17 07:56 (AG05)	20:15	20:43	20:56	
30	07:34	08:06 (AG06)		07:13	07:40 (AG05)	06:27	06:00	05:59	
	17:41	48 08:54 (AG06)		19:45	14 07:54 (AG05)	20:16	20:43	20:56	
31	07:34	08:06 (AG06)		07:12	07:43 (AG05)		05:59		
	17:42	48 08:54 (AG06)		19:46	9 07:52 (AG05)		20:44		
Potential sun hours	301	299	370	397	444	448			
Total, worst case	573	1336	196						
Sun reduction	0,45	0,47	0,49						
Oper. time red.	0,77	0,77	0,77						
Wind dir. red.	0,67	0,67	0,66						
Total reduction	0,23	0,24	0,25						
Total, real	134	326	49						

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

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

SHADOW - Calendar

Calculation: Real_case_Progetto_20230705Shadow receptor: F123 - A07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	July	August	September	October	November	December
1	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:24	07:12 (AG08) 08:27 (AG06)
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:14 (AG08) 08:28 (AG06)
3	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:15 (AG08) 08:27 (AG06)
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:16 (AG08) 08:27 (AG06)
5	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:17 (AG08) 08:27 (AG06)
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:18 (AG08) 08:27 (AG06)
7	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:20 (AG08) 08:27 (AG06)
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:21 (AG08) 08:27 (AG06)
9	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:22 (AG08) 08:26 (AG06)
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:02 17:14	07:23 (AG08) 08:26 (AG06)
11	06:05 20:53	06:32 20:26	07:01 19:41	07:29 18:52	07:03 17:13	07:37 (AG06) 08:25 (AG06)
12	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:38 (AG06) 08:26 (AG06)
13	06:07 20:52	06:34 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:39 (AG06) 08:25 (AG06)
14	06:08 20:52	06:34 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:39 (AG06) 08:24 (AG06)
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:40 (AG06) 08:24 (AG06)
16	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:41 (AG06) 08:23 (AG06)
17	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:09 17:08	07:42 (AG06) 08:23 (AG06)
18	06:11 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:43 (AG06) 08:22 (AG06)
19	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:41	07:12 17:06	07:44 (AG06) 08:21 (AG06)
20	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:46 (AG06) 08:20 (AG06)
21	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	07:14 17:05	07:47 (AG06) 08:19 (AG06)
22	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:36	07:15 17:05	07:49 (AG06) 08:19 (AG06)
23	06:15 20:46	06:43 20:10	07:12 19:21	07:41 18:35	07:16 17:04	07:51 (AG06) 08:17 (AG06)
24	06:15 20:45	06:44 20:09	07:13 19:19	07:43 18:34	07:17 17:04	07:53 (AG06) 08:16 (AG06)
25	06:16 20:44	06:45 20:07	07:14 19:18	07:44 18:32	07:18 17:03	07:55 (AG06) 08:14 (AG06)
26	06:17 20:43	06:46 20:06	07:14 19:16	07:45 18:31	07:19 17:03	07:57 (AG06) 08:12 (AG06)
27	06:18 20:43	06:47 20:04	07:15 19:15	07:46 18:30	07:20 17:02	08:02 (AG06) 08:08 (AG06)
28	06:19 20:42	06:48 20:03	07:16 19:13	07:47 18:28	07:21 17:02	07:44 17:07
29	06:20 20:41	06:48 20:01	07:17 19:11	07:48 18:27	07:22 17:01	07:44 17:08
30	06:21 20:40	06:49 20:00	07:18 19:10	07:49 18:26	07:24 17:01	07:44 17:08
31	06:22 20:39	06:50 19:58		07:50 18:25	07:25 17:00	07:44 17:09
Potential sun hours	455	425	374	347	301	292
Total, worst case			196	746	1190	
Sun reduction			0,65	0,54	0,50	
Oper. time red.			0,77	0,77	0,77	
Wind dir. red.			0,66	0,67	0,67	
Total reduction			0,33	0,28	0,26	
Total, real			64	210	310	

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

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

Calculation: Real_case_Progetto_20230705Shadow receptor: F126 - A04

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	January	February	March	April	May	June
1	07:45 17:10	07:33 17:43	06:58 18:15	16:41 (AG05) 19:47	07:10 19:47	08:06 (AG04) 20:17
2	07:45 17:11	07:32 17:44	06:57 18:16	16:39 (AG05) 19:48	07:08 19:48	08:08 (AG04) 20:18
3	07:45 17:12	07:31 17:45	06:55 18:17	16:36 (AG05) 19:49	07:07 19:49	08:13 (AG04) 20:19
4	07:45 17:13	07:30 17:46	06:54 18:18	16:34 (AG05) 19:50	07:05 19:50	17:22 (AG05) 20:20
5	07:45 17:13	07:29 17:48	06:52 18:19	16:32 (AG05) 19:51	07:03 19:51	17:24 (AG05) 20:21
6	07:45 17:14	07:28 17:49	06:51 18:21	16:29 (AG05) 19:52	07:02 19:52	17:24 (AG05) 20:22
7	07:45 17:15	07:27 17:50	06:49 18:22	16:28 (AG05) 19:53	07:00 19:53	17:25 (AG05) 20:23
8	07:45 17:16	07:26 17:51	06:48 18:23	16:27 (AG05) 19:54	06:59 19:54	17:27 (AG05) 20:24
9	07:45 17:17	07:25 17:52	06:46 18:24	16:26 (AG05) 19:55	06:57 19:55	17:28 (AG05) 20:25
10	07:45 17:18	07:23 17:54	06:45 18:25	16:24 (AG05) 19:56	06:56 19:56	17:30 (AG05) 20:26
11	07:44 17:19	07:22 17:55	06:43 18:26	16:24 (AG05) 19:57	06:54 19:57	17:32 (AG05) 20:27
12	07:44 17:20	07:21 17:56	06:42 18:27	16:22 (AG05) 19:58	06:53 19:58	17:35 (AG05) 20:28
13	07:44 17:21	07:20 17:57	06:40 18:28	16:20 (AG04) 19:59	06:51 19:59	17:37 (AG05) 20:29
14	07:44 17:22	07:19 17:58	06:39 18:29	16:19 (AG04) 20:00	06:50 20:00	17:42 (AG05) 20:30
15	07:43 17:23	07:17 17:59	06:37 18:30	16:17 (AG04) 20:01	06:48 20:01	17:58 (AG05) 20:31
16	07:43 17:24	07:16 18:01	06:35 18:31	16:15 (AG04) 20:02	06:47 20:02	17:58 (AG05) 20:32
17	07:43 17:26	07:15 18:02	06:34 18:32	16:14 (AG04) 20:03	06:45 20:03	17:58 (AG05) 20:33
18	07:42 17:27	07:14 18:03	06:32 18:33	16:13 (AG04) 20:04	06:44 20:04	17:58 (AG05) 20:34
19	07:42 17:28	07:12 18:04	06:31 18:34	16:12 (AG04) 20:05	06:42 20:05	17:58 (AG05) 20:35
20	07:41 17:29	07:11 18:05	06:29 18:35	16:11 (AG04) 20:06	06:41 20:06	17:58 (AG05) 20:36
21	07:41 17:30	07:10 18:06	06:27 18:36	16:10 (AG04) 20:07	06:39 20:07	17:58 (AG05) 20:37
22	07:40 17:31	07:08 18:07	06:26 18:37	16:09 (AG04) 20:08	06:38 20:08	17:58 (AG05) 20:38
23	07:39 17:32	07:07 18:09	06:24 18:38	16:08 (AG04) 20:09	06:37 20:09	17:58 (AG05) 20:39
24	07:39 17:33	07:06 18:10	06:23 18:39	16:07 (AG04) 20:10	06:35 20:10	17:58 (AG05) 20:40
25	07:38 17:35	07:04 18:11	06:21 18:40	16:06 (AG04) 20:11	06:34 20:11	17:58 (AG05) 20:41
26	07:37 17:36	07:03 18:12	06:19 18:41	16:05 (AG04) 20:12	06:33 20:12	17:58 (AG05) 20:42
27	07:37 17:37	07:01 18:13	06:18 18:42	16:04 (AG04) 20:13	06:31 20:13	17:58 (AG05) 20:43
28	07:36 17:38	07:00 18:14	06:16 18:43	16:03 (AG04) 20:14	06:30 20:14	17:58 (AG05) 20:44
29	07:35 17:39	07:00 18:15	06:15 18:44	16:02 (AG04) 20:15	06:29 20:15	17:58 (AG05) 20:45
30	07:34 17:41	07:00 18:16	06:14 18:45	16:01 (AG04) 20:16	06:28 20:16	17:58 (AG05) 20:46
31	07:33 17:42	07:00 18:17	06:13 18:46	16:00 (AG04) 20:17	06:27 20:17	17:58 (AG05) 20:47
Potential sun hours	301	299	370	397	444	448
Total, worst case		157	2632	677		
Sun reduction		0,47	0,49	0,53		
Oper. time red.		0,77	0,77	0,77		
Wind dir. red.		0,63	0,63	0,63		
Total reduction		0,23	0,24	0,26		
Total, real		36	631	173		

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

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

Calculation: Real_case_Progetto_20230705Shadow receptor: F126 - A04

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	July	August	September	October	November	December		
1	06:00	06:22	06:51	17:31 (AG05)	07:19	07:59 (AG04)	06:51	07:24
	20:55	20:38	19:57	35 18:06 (AG05)	19:08	73 18:09 (AG05)	17:23	17:01
2	06:00	06:23	06:52	17:28 (AG05)	07:20	17:02 (AG05)	06:52	07:25
	20:55	20:37	19:55	40 18:08 (AG05)	19:06	66 18:08 (AG05)	17:22	17:00
3	06:01	06:24	06:53	17:26 (AG05)	07:21	17:02 (AG05)	06:53	07:26
	20:55	20:36	19:53	44 18:10 (AG05)	19:05	64 18:06 (AG05)	17:21	17:00
4	06:01	06:25	06:54	17:24 (AG05)	07:22	17:03 (AG05)	06:55	07:27
	20:55	20:34	19:52	47 18:11 (AG05)	19:03	62 18:05 (AG05)	17:20	17:00
5	06:02	06:26	06:55	17:22 (AG05)	07:23	17:04 (AG05)	06:56	07:28
	20:55	20:33	19:50	50 18:12 (AG05)	19:02	60 18:04 (AG05)	17:19	17:00
6	06:02	06:27	06:56	17:21 (AG05)	07:24	17:04 (AG05)	06:57	07:29
	20:55	20:32	19:49	52 18:13 (AG05)	19:00	58 18:02 (AG05)	17:18	17:00
7	06:03	06:28	06:57	17:19 (AG05)	07:25	17:05 (AG05)	06:58	07:30
	20:54	20:31	19:47	55 18:14 (AG05)	18:58	65 18:22 (AG06)	17:17	17:00
8	06:03	06:29	06:58	17:17 (AG05)	07:26	17:07 (AG05)	06:59	07:31
	20:54	20:30	19:45	58 18:15 (AG05)	18:57	66 18:24 (AG06)	17:16	17:00
9	06:04	06:30	06:59	08:08 (AG04)	07:27	17:08 (AG05)	07:00	07:32
	20:54	20:29	19:44	63 18:15 (AG05)	18:55	67 18:26 (AG06)	17:15	17:00
10	06:05	06:31	06:59	08:01 (AG04)	07:28	17:09 (AG05)	07:01	07:33
	20:53	20:28	19:42	76 18:15 (AG05)	18:54	65 18:26 (AG06)	17:14	17:00
11	06:05	06:32	07:00	07:59 (AG04)	07:29	17:11 (AG05)	07:03	07:34
	20:53	20:26	19:41	82 18:15 (AG05)	18:52	62 18:27 (AG06)	17:13	17:00
12	06:06	06:32	07:01	07:56 (AG04)	07:30	17:13 (AG05)	07:04	07:34
	20:53	20:25	19:39	89 18:16 (AG05)	18:51	59 18:27 (AG06)	17:12	17:00
13	06:07	06:33	07:02	07:55 (AG04)	07:31	17:16 (AG05)	07:05	07:35
	20:52	20:24	19:37	92 18:16 (AG05)	18:49	52 18:27 (AG06)	17:11	17:00
14	06:07	06:34	07:03	07:53 (AG04)	07:32	17:20 (AG05)	07:06	07:36
	20:52	20:22	19:36	96 18:16 (AG05)	18:48	43 18:25 (AG06)	17:10	17:00
15	06:08	06:35	07:04	07:52 (AG04)	07:33	17:26 (AG05)	07:07	07:37
	20:51	20:21	19:34	99 18:17 (AG05)	18:46	29 18:24 (AG06)	17:09	17:01
16	06:09	06:36	07:05	07:51 (AG04)	07:34	18:04 (AG06)	07:08	07:37
	20:51	20:20	19:32	102 18:17 (AG05)	18:45	18 18:22 (AG06)	17:09	17:01
17	06:10	06:37	07:06	07:50 (AG04)	07:35	18:05 (AG06)	07:09	07:38
	20:50	20:18	19:31	104 18:17 (AG05)	18:43	16 18:21 (AG06)	17:08	17:01
18	06:10	06:38	07:07	07:50 (AG04)	07:36	18:05 (AG06)	07:10	07:39
	20:49	20:17	19:29	104 18:17 (AG05)	18:42	14 18:19 (AG06)	17:07	17:02
19	06:11	06:39	07:08	07:48 (AG04)	07:37	18:07 (AG06)	07:12	07:39
	20:49	20:16	19:28	105 18:15 (AG05)	18:40	11 18:18 (AG06)	17:06	17:02
20	06:12	06:40	07:09	07:48 (AG04)	07:38	18:08 (AG06)	07:13	07:40
	20:48	20:14	19:26	106 18:15 (AG05)	18:39	8 18:16 (AG06)	17:06	17:02
21	06:13	06:41	07:10	07:48 (AG04)	07:39	17:14	07:14	07:41
	20:47	20:13	19:24	106 18:15 (AG05)	18:38	17:05	17:05	17:03
22	06:14	06:42	07:11	07:48 (AG04)	07:40	17:15	07:15	07:41
	20:47	20:11	19:23	107 18:15 (AG05)	18:36	17:04	17:04	17:03
23	06:14	06:43	07:12	07:48 (AG04)	07:41	17:16	07:16	07:42
	20:46	20:10	19:21	105 18:14 (AG05)	18:35	17:04	17:04	17:04
24	06:15	06:44	07:12	07:48 (AG04)	07:42	17:17	07:17	07:42
	20:45	20:09	19:19	104 18:14 (AG05)	18:34	17:03	17:03	17:04
25	06:16	06:45	07:13	07:48 (AG04)	06:44	17:18	07:18	07:42
	20:44	20:07	19:18	103 18:13 (AG05)	17:32	17:03	17:03	17:05
26	06:17	06:46	07:14	07:49 (AG04)	06:45	17:19	07:19	07:43
	20:43	20:06	19:16	101 18:13 (AG05)	17:31	17:02	17:02	17:05
27	06:18	06:47	07:15	07:50 (AG04)	06:46	17:20	07:20	07:43
	20:42	20:04	19:14	98 18:12 (AG05)	17:30	17:02	17:02	17:06
28	06:19	06:47	07:16	07:51 (AG04)	06:47	17:21	07:21	07:44
	20:42	20:03	19:13	94 18:11 (AG05)	17:28	17:02	17:02	17:07
29	06:20	06:48	17:42 (AG05)	07:17	07:52 (AG04)	06:48	17:22	07:44
	20:41	20:01	17 17:59 (AG05)	19:11	90 18:10 (AG05)	17:27	17:01	17:07
30	06:21	06:49	17:38 (AG05)	07:18	07:55 (AG04)	06:49	17:23	07:44
	20:40	20:00	25 18:03 (AG05)	19:10	84 18:10 (AG05)	17:26	17:01	17:08
31	06:21	06:50	17:34 (AG05)	07:19	06:50	17:24	07:24	07:44
	20:39	19:58	31 18:05 (AG05)	17:25	17:25	17:09	17:09	17:09
Potential sun hours	455	425	374	347	301	292		
Total, worst case		73	2491	958				
Sun reduction		0,73	0,65	0,54				
Oper. time red.		0,77	0,77	0,77				
Wind dir. red.		0,63	0,63	0,63				
Total reduction		0,35	0,32	0,26				
Total, real		26	786	251				

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

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

Calculation: Real_case_Progetto_20230705Shadow receptor: F150 - seminativo

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

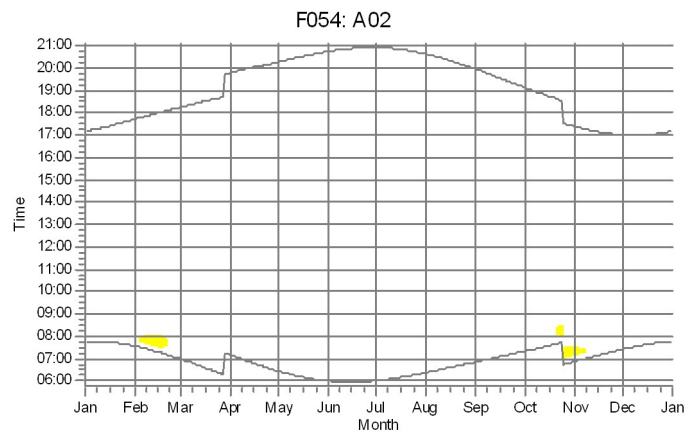
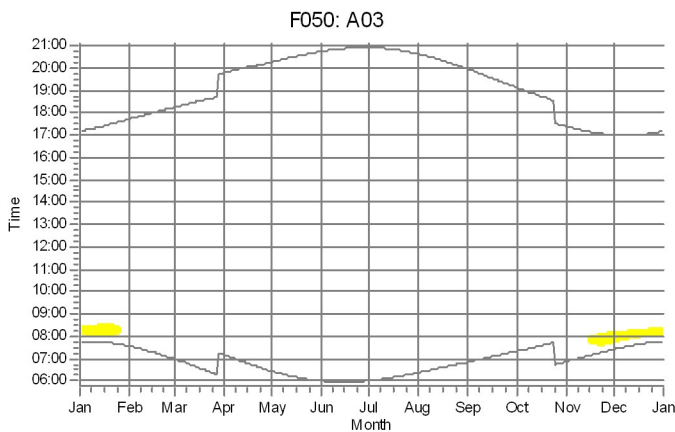
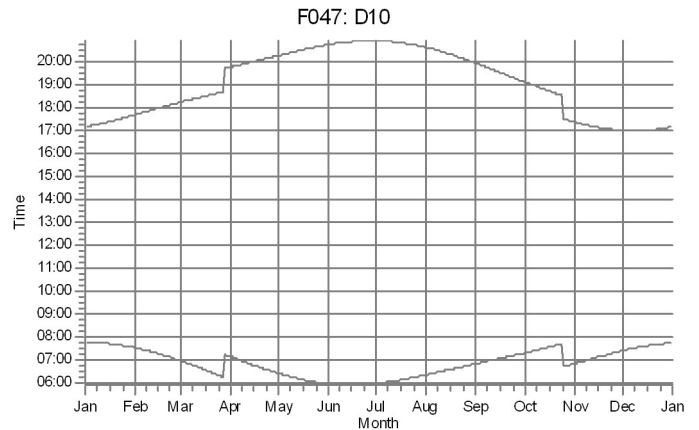
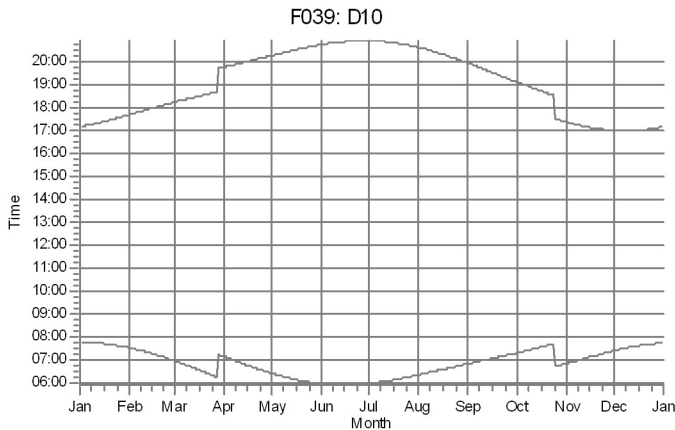
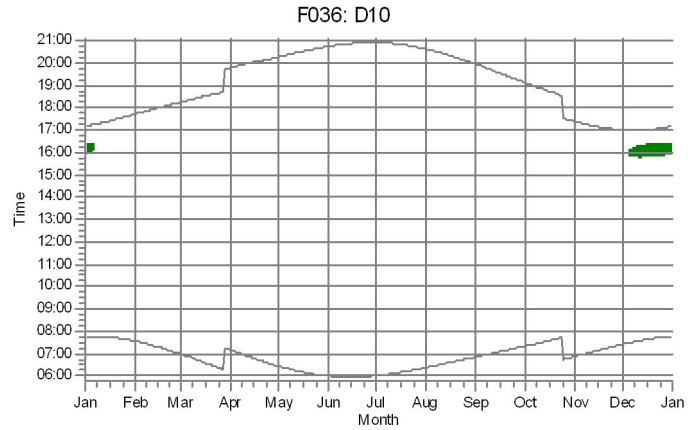
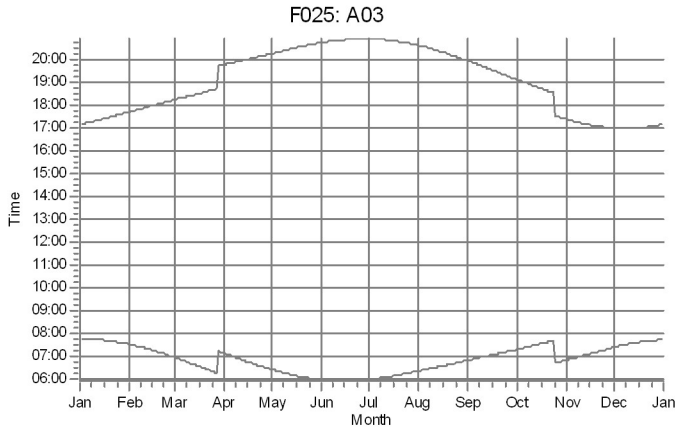
N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

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

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

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

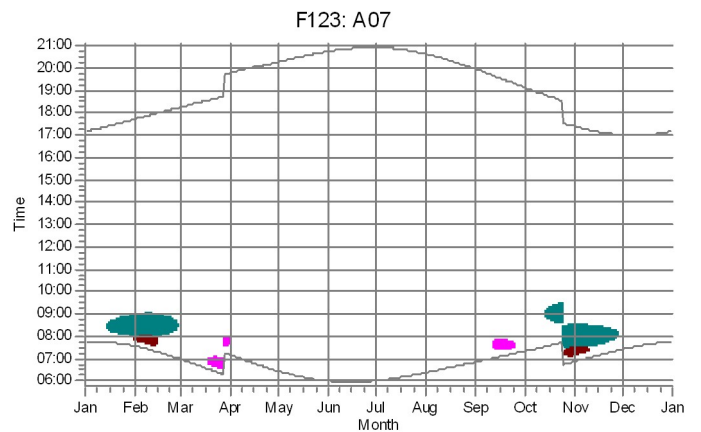
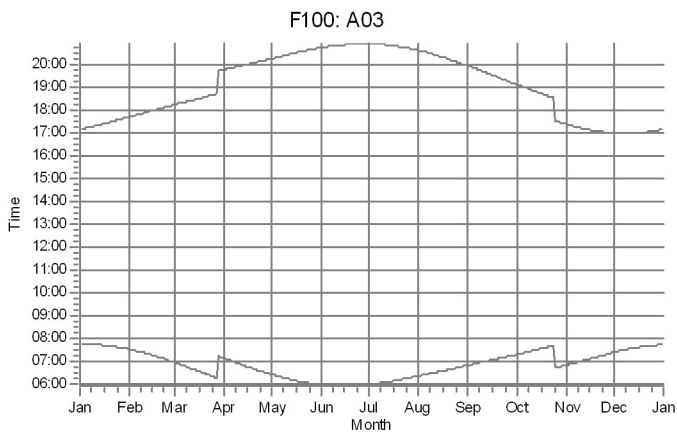
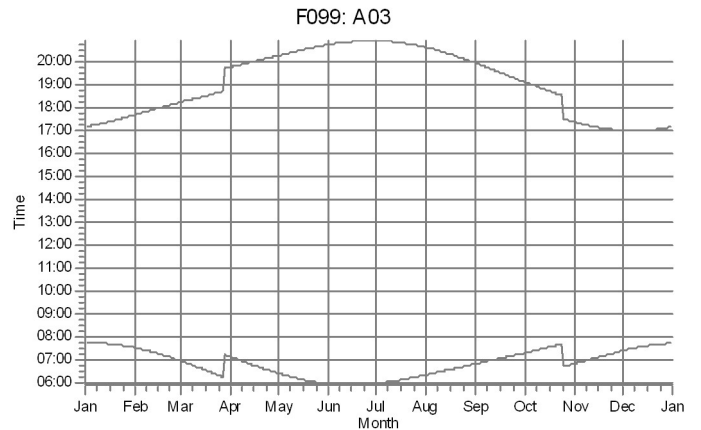
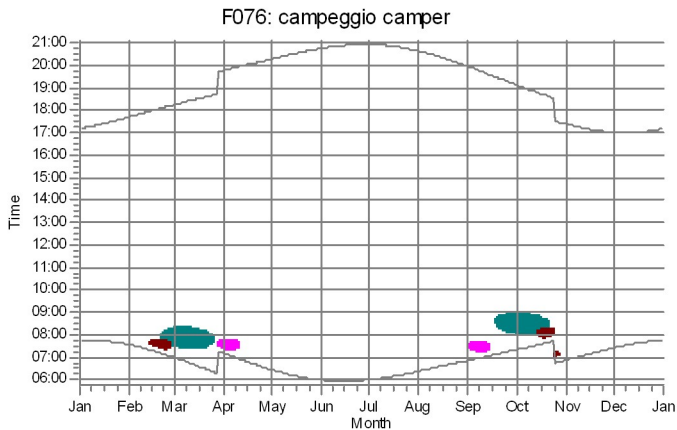
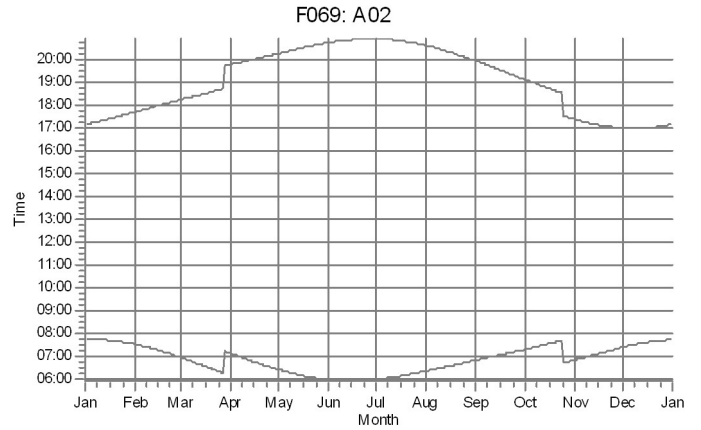
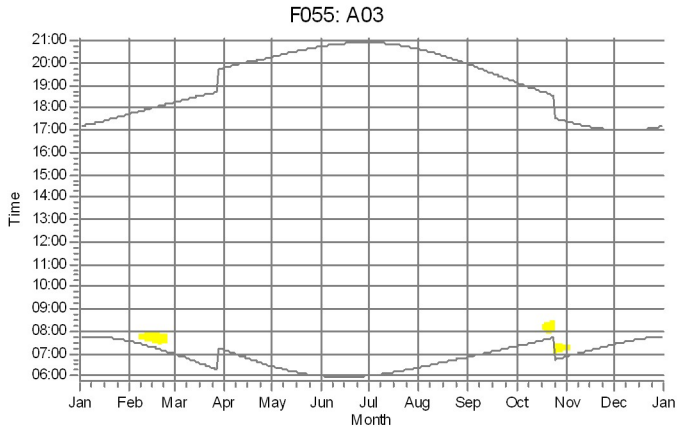
SHADOW - Calendar, graphical
 Calculation: Real_case_Progetto_20230705



WTGs

- AG01: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (56)
- AG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57)

SHADOW - Calendar, graphical
Calculation: Real_case_Progetto_20230705

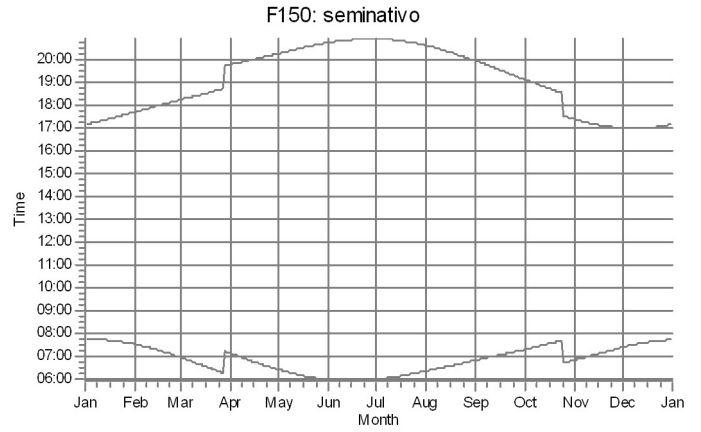
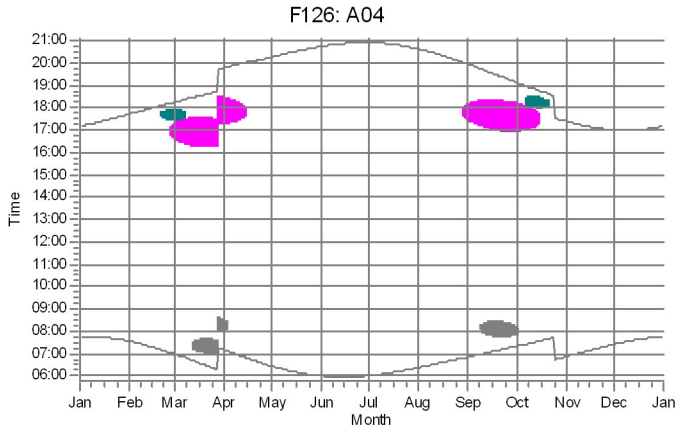


WTGs

- AG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57)
- AG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60)
- AG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)
- AG08: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (63)

SHADOW - Calendar, graphical

Calculation: Real_case_Progetto_20230705



WTGs

- AG04: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (59)
- AG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60)
- AG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG01 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (56) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 16:01-16:22/21 17:10	07:33 06:58 17:43 18:15	07:10 06:26 19:47 20:17	05:59 06:00 20:45 20:56	06:22 06:51 20:38 19:57	07:19 06:51 19:08 17:23	07:25 17:01					
2	07:45 16:03-16:22/19 17:11	07:32 06:57 17:44 18:16	07:08 06:25 19:48 20:18	05:58 06:00 20:46 20:55	06:23 06:52 20:37 19:55	07:20 06:52 19:06 17:22	07:26 17:00					
3	07:45 16:05-16:22/17 17:12	07:31 06:56 17:45 18:17	07:07 06:24 19:49 20:19	05:58 06:01 20:46 20:55	06:24 06:53 20:36 19:53	07:21 06:54 19:05 17:21	07:27 17:00					
4	07:45 16:06-16:21/15 17:13	07:30 06:54 17:47 18:18	07:05 06:22 19:50 20:20	05:58 06:01 20:47 20:55	06:25 06:54 20:35 19:52	07:22 06:55 19:03 17:20	07:28 17:00					
5	07:45 16:07-16:20/13 17:13	07:29 06:53 17:48 18:20	07:04 06:21 19:51 20:21	05:57 06:02 20:48 20:55	06:26 06:55 20:33 19:50	07:23 06:56 19:02 17:19	07:28 17:00					
6	07:45 16:09-16:18/9 17:14	07:28 06:51 17:49 18:21	07:02 06:20 19:52 20:22	05:57 06:02 20:48 20:55	06:27 06:56 20:32 19:49	07:24 06:57 19:00 17:18	07:29 15:55-16:04/9 17:00					
7	07:45 17:15 17:15	07:27 06:50 17:50 18:22	07:00 06:19 19:53 20:23	05:57 06:03 20:49 20:54	06:28 06:57 20:31 19:47	07:25 06:58 18:59 17:17	07:30 15:54-16:06/12 17:00					
8	07:45 17:16 17:16	07:26 06:48 17:51 18:23	06:59 06:18 19:54 20:24	05:57 06:03 20:49 20:54	06:29 06:58 20:30 19:46	07:26 06:59 18:57 17:16	07:31 15:53-16:08/15 17:00					
9	07:45 17:17 17:17	07:25 06:46 17:52 18:24	06:57 06:17 19:55 20:25	05:56 06:04 20:50 20:54	06:30 06:59 20:29 19:44	07:27 07:00 18:55 17:15	07:32 15:53-16:10/17 17:00					
10	07:45 17:18 17:18	07:23 06:45 17:54 18:25	06:56 06:16 19:56 20:26	05:56 06:05 20:51 20:53	06:31 07:00 20:28 19:42	07:28 07:01 18:54 17:14	07:33 15:52-16:11/19 17:00					
11	07:44 17:19 17:19	07:22 06:43 17:55 18:26	06:54 06:15 19:57 20:27	05:56 06:05 20:51 20:53	06:32 07:00 20:26 19:41	07:29 07:03 18:52 17:13	07:34 15:52-16:13/21 17:00					
12	07:44 17:20 17:20	07:21 06:42 17:56 18:27	06:53 06:14 19:58 20:28	05:56 06:06 20:52 20:53	06:33 07:01 20:25 19:39	07:30 07:04 18:51 17:12	07:35 15:51-16:13/22 17:00					
13	07:44 17:21 17:21	07:20 06:40 17:57 18:28	06:51 06:13 19:59 20:29	05:56 06:07 20:52 20:52	06:33 07:02 20:24 19:37	07:31 07:05 18:49 17:11	07:35 15:52-16:14/22 17:00					
14	07:44 17:22 17:22	07:19 06:39 17:58 18:29	06:50 06:12 20:00 20:30	05:56 06:07 20:52 20:52	06:34 07:03 20:23 19:36	07:32 07:06 18:48 17:10	07:36 15:52-16:15/23 17:00					
15	07:43 17:23 17:23	07:18 06:37 17:59 18:30	06:48 06:11 20:01 20:31	05:56 06:08 20:53 20:51	06:35 07:04 20:21 19:34	07:33 07:07 18:46 17:09	07:37 15:52-16:16/24 17:01					
16	07:43 17:24 17:24	07:16 06:35 18:01 18:31	06:47 06:10 20:02 20:31	05:56 06:09 20:53 20:51	06:36 07:05 20:20 19:33	07:34 07:08 18:45 17:09	07:38 15:52-16:16/24 17:01					
17	07:43 17:26 17:26	07:15 06:34 18:02 18:32	06:45 06:09 20:03 20:32	05:56 06:10 20:54 20:50	06:37 07:06 20:19 19:31	07:35 07:09 18:43 17:08	07:38 15:52-16:17/25 17:01					
18	07:42 17:27 17:27	07:14 06:32 18:03 18:33	06:44 06:08 20:04 20:33	05:56 06:10 20:54 20:49	06:38 07:07 20:17 19:29	07:36 07:11 18:42 17:07	07:39 15:53-16:18/25 17:02					
19	07:42 17:28 17:28	07:12 06:31 18:04 18:34	06:42 06:07 20:05 20:34	05:56 06:11 20:54 20:49	06:39 07:08 20:16 19:28	07:37 07:12 18:40 17:06	07:39 15:53-16:18/25 17:02					
20	07:41 17:29 17:29	07:11 06:29 18:05 18:35	06:41 06:06 20:06 20:35	05:56 06:12 20:55 20:48	06:40 07:09 20:14 19:26	07:38 07:13 18:39 17:06	07:40 15:54-16:19/25 17:02					
21	07:41 17:30 17:30	07:10 06:27 18:06 18:36	06:39 06:06 20:07 20:36	05:56 06:13 20:55 20:47	06:41 07:10 20:13 19:24	07:39 07:14 18:38 17:05	07:41 15:53-16:19/26 17:03					
22	07:40 17:31 17:31	07:08 06:26 18:07 18:37	06:38 06:05 20:08 20:37	05:57 06:14 20:55 20:47	06:42 07:11 20:12 19:23	07:40 07:15 18:36 17:05	07:41 15:54-16:20/26 17:03					
23	07:39 17:32 17:32	07:07 06:24 18:09 18:38	06:37 06:04 20:09 20:38	05:57 06:14 20:55 20:46	06:43 07:12 20:10 19:21	07:41 07:16 18:35 17:04	07:42 15:54-16:20/26 17:04					
24	07:39 17:34 17:34	07:06 06:23 18:10 18:39	06:35 06:03 20:10 20:39	05:57 06:15 20:55 20:45	06:44 07:13 20:09 19:19	07:43 07:17 18:34 17:03	07:42 15:56-16:21/25 17:04					
25	07:38 17:35 17:35	07:04 06:21 18:11 18:40	06:34 06:03 20:11 20:39	05:57 06:16 20:55 20:44	06:45 07:13 20:07 19:18	07:44 07:18 17:32 17:03	07:43 15:56-16:21/25 17:05					
26	07:37 17:36 17:36	07:03 06:19 18:12 18:41	06:33 06:02 20:12 20:40	05:58 06:17 20:56 20:43	06:46 07:14 20:06 19:16	07:45 07:19 17:31 17:02	07:43 15:56-16:21/25 17:06					
27	07:37 17:37 17:37	07:01 06:18 18:13 18:42	06:31 06:01 20:13 20:41	05:58 06:18 20:56 20:43	06:47 07:15 20:04 19:15	07:20 07:30 06:46 17:02	07:43 15:58-16:22/24 17:06					
28	07:36 17:38 17:38	07:00 06:16 18:14 18:43	06:30 06:01 20:14 20:42	05:58 06:19 20:56 20:42	06:47 07:16 20:03 19:13	07:21 07:44 17:28 17:02	07:44 15:58-16:22/24 17:07					
29	07:35 17:39 17:39	07:00 06:16 17:15 18:44	06:30 06:01 20:15 20:43	05:59 06:20 20:56 20:41	06:48 07:17 20:01 19:11	07:23 07:44 17:27 17:02	07:44 15:59-16:22/23 17:08					
30	07:34 17:41 17:41	07:00 06:16 17:13 18:42	06:30 06:01 20:16 20:43	05:59 06:21 20:56 20:40	06:49 07:18 20:00 19:10	07:24 07:44 17:26 17:01	07:44 15:59-16:22/23 17:08					
31	07:33 17:42 17:42	07:00 06:16 17:11 18:41	06:30 06:01 20:17 20:44	05:59 06:21 20:56 20:40	06:50 07:19 20:00 19:10	07:25 07:44 17:25 17:01	07:44 16:00-16:22/22 17:09					
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Sum of minutes with flicker	94	0	0	0	0	0	0	0	0	0	0	577

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

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

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG02 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 08:07-08:22/15 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:55	06:22 20:38	06:51 19:57	07:19 19:08	06:51 07:12-07:26/14 17:23	07:25 07:47-08:08/21 17:01
2	07:45 08:07-08:22/15 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 07:14-07:26/12 17:22	07:26 07:49-08:09/20 17:00
3	07:45 08:07-08:23/16 17:12	07:31 17:45	06:55 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:53 07:15-07:26/11 17:21	07:26 07:50-08:10/20 17:00
4	07:45 08:07-08:23/16 17:12	07:30 07:49-07:50/1 17:46	06:54 07:05 18:18	06:22 06:22 19:50	05:58 05:58 20:20	06:01 06:01 20:47	06:25 06:25 20:55	06:25 06:25 20:35	06:54 06:54 19:52	07:22 07:22 19:03	06:55 07:16-07:25/9 17:20	07:27 07:51-08:10/19 17:00
5	07:45 08:07-08:24/17 17:13	07:29 07:48-07:52/4 17:48	06:52 07:03 18:19	06:21 06:21 19:51	05:57 05:57 20:21	06:02 06:02 20:48	06:26 06:26 20:55	06:26 06:26 20:33	06:55 06:55 19:50	07:23 07:23 19:02	06:56 07:17-07:23/6 17:19	07:28 07:51-08:09/18 17:00
6	07:45 08:06-08:24/18 17:14	07:28 07:47-07:54/7 17:49	06:51 07:02 18:21	06:20 06:20 19:52	05:57 05:57 20:22	06:02 06:02 20:48	06:27 06:27 20:55	06:27 06:27 20:32	06:56 06:56 19:49	07:24 07:24 19:00	06:57 07:18-07:22/4 17:18	07:29 07:52-08:10/18 17:00
7	07:45 08:06-08:24/18 17:15	07:27 07:46-07:55/9 17:50	06:49 07:00 18:22	06:19 06:19 19:53	05:57 05:57 20:23	06:03 06:03 20:49	06:28 06:28 20:54	06:28 06:28 20:31	06:57 06:57 19:47	07:25 07:25 18:58	06:58 07:20-07:21/1 17:17	07:30 07:53-08:10/17 17:00
8	07:45 08:06-08:25/19 17:16	07:26 07:45-07:56/11 17:51	06:48 06:59 18:23	06:18 06:18 19:54	05:56 05:56 20:24	06:03 06:03 20:49	06:29 06:29 20:54	06:29 06:29 20:30	06:58 06:58 19:45	07:26 07:26 18:57	06:59 07:00 17:16	07:31 07:54-08:10/16 17:00
9	07:45 08:06-08:25/19 17:17	07:25 07:44-07:57/13 17:52	06:46 06:57 18:24	06:17 06:17 19:55	05:56 05:56 20:25	06:04 06:04 20:50	06:30 06:30 20:54	06:29 06:29 20:29	06:59 06:59 19:44	07:27 07:27 18:55	07:00 07:00 17:15	07:32 07:55-08:11/16 17:00
10	07:45 08:06-08:26/20 17:18	07:23 07:43-07:57/14 17:54	06:45 06:56 18:25	06:16 06:16 19:56	05:56 05:56 20:26	06:05 06:05 20:50	06:31 06:31 20:53	06:29 06:29 20:28	06:59 06:59 19:42	07:28 07:28 18:54	07:01 07:01 17:14	07:33 07:56-08:11/15 17:00
11	07:44 08:05-08:26/21 17:19	07:22 07:41-07:57/16 17:55	06:43 06:54 18:26	06:15 06:15 19:57	05:56 05:56 20:27	06:05 06:05 20:51	06:32 06:32 20:53	07:00 07:00 20:26	07:29 07:29 19:41	07:29 07:29 18:52	07:03 07:03 17:13	07:34 07:57-08:12/15 17:00
12	07:44 08:05-08:26/21 17:20	07:21 07:40-07:57/17 17:56	06:42 06:53 18:27	06:14 06:14 19:58	05:56 05:56 20:28	06:06 06:06 20:52	06:32 06:32 20:25	07:01 07:01 19:39	07:30 07:30 18:51	07:30 07:30 18:51	07:04 07:04 17:12	07:35 07:58-08:12/14 17:00
13	07:44 08:05-08:27/22 17:21	07:20 07:39-07:57/18 17:57	06:40 06:51 18:28	06:13 06:13 19:59	05:56 05:56 20:29	06:07 06:07 20:52	06:33 06:33 20:24	07:02 07:02 19:37	07:31 07:31 18:49	07:31 07:31 18:49	07:06 07:06 17:11	07:36 07:59-08:12/13 17:00
14	07:44 08:04-08:27/23 17:22	07:19 07:38-07:57/19 17:58	06:39 06:50 18:29	06:12 06:12 20:00	05:56 05:56 20:30	06:07 06:07 20:52	06:34 06:34 20:22	07:03 07:03 19:36	07:32 07:32 18:48	07:32 07:32 18:48	07:07 07:07 17:10	07:37 08:00-08:13/13 17:00
15	07:43 08:04-08:27/23 17:23	07:17 07:37-07:57/20 17:59	06:37 06:48 18:30	06:11 06:11 20:01	05:56 05:56 20:30	06:08 06:08 20:53	06:35 06:35 20:21	07:04 07:04 19:34	07:33 07:33 18:46	07:33 07:33 18:46	07:09 07:09 17:09	07:37 08:00-08:13/13 17:01
16	07:43 08:04-08:28/24 17:24	07:16 07:35-07:56/21 18:01	06:35 06:47 18:31	06:10 06:10 20:02	05:56 05:56 20:31	06:09 06:09 20:53	06:36 06:36 20:20	07:05 07:05 19:32	07:34 07:34 18:45	07:34 07:34 18:45	07:09 07:09 17:09	07:37 08:00-08:13/13 17:01
17	07:43 08:03-08:27/24 17:26	07:15 07:34-07:55/21 18:02	06:34 06:45 18:32	06:09 06:09 20:03	05:56 05:56 20:32	06:10 06:10 20:54	06:37 06:37 20:18	07:06 07:06 19:31	07:35 07:35 18:43	07:35 07:35 18:43	07:09 07:09 17:08	07:38 08:01-08:13/12 17:01
18	07:42 08:03-08:28/25 17:27	07:14 07:33-07:54/21 18:03	06:32 06:44 18:33	06:08 06:08 20:04	05:56 05:56 20:33	06:10 06:10 20:54	06:38 06:38 20:17	07:07 07:07 19:29	07:36 07:36 18:42	07:36 07:36 18:42	07:10 07:10 17:07	07:39 08:02-08:14/12 17:01
19	07:42 08:03-08:27/24 17:28	07:12 07:31-07:52/21 18:04	06:31 06:42 18:34	06:07 06:07 20:05	05:56 05:56 20:34	06:11 06:11 20:54	06:39 06:39 20:16	07:08 07:08 19:28	07:37 07:37 18:40	07:37 07:37 18:40	07:12 07:12 17:06	07:39 08:02-08:14/12 17:02
20	07:41 08:04-08:28/24 17:29	07:11 07:30-07:50/20 18:05	06:29 06:41 18:35	06:06 06:06 20:06	05:56 05:56 20:35	06:12 06:12 20:54	06:40 06:40 20:14	07:09 07:09 19:26	07:38 07:38 18:39	07:38 07:38 18:39	07:13 07:13 17:06	07:40 08:03-08:15/12 17:02
21	07:41 08:05-08:27/22 17:30	07:10 07:31-07:50/19 18:06	06:27 06:39 18:36	06:05 06:05 20:07	05:56 05:56 20:36	06:13 06:13 20:55	06:41 06:41 20:13	07:10 07:10 19:24	07:39 07:39 18:38	07:39 07:39 18:38	07:14 07:14 17:05	07:41 08:03-08:15/12 17:03
22	07:40 08:06-08:26/20 17:31	07:08 07:31-07:47/16 18:07	06:26 06:38 18:37	06:05 06:05 20:08	05:57 05:57 20:37	06:14 06:14 20:55	06:42 06:42 20:12	07:11 07:11 19:23	07:40 07:40 18:36	07:40 07:40 18:36	07:15 07:15 17:04	07:41 08:04-08:16/12 17:03
23	07:39 08:08-08:26/18 17:32	07:07 07:34-07:46/12 18:09	06:24 06:37 18:38	06:04 06:04 20:09	05:57 05:57 20:38	06:14 06:14 20:55	06:43 06:43 20:10	07:12 07:12 19:21	07:41 07:41 18:35	07:41 07:41 18:35	07:16 07:16 17:04	07:42 08:04-08:16/12 17:04
24	07:39 08:09-08:25/16 17:33	07:06 07:37-07:41/4 18:10	06:23 06:35 18:39	06:03 06:03 20:10	05:57 05:57 20:39	06:15 06:15 20:55	06:44 06:44 20:09	07:12 07:12 19:19	07:42 07:42 18:33	07:42 07:42 18:33	07:17 07:17 17:03	07:42 08:05-08:17/12 17:04
25	07:38 08:11-08:23/12 17:35	07:04 07:04 18:11	06:21 06:34 18:40	06:03 06:03 20:11	05:57 05:57 20:39	06:16 06:16 20:55	06:45 06:45 20:07	07:13 07:13 19:18	07:44 07:44 18:32	07:44 07:44 18:32	07:18 07:18 17:03	07:42 08:05-08:17/12 17:05
26	07:37 08:13-08:20/7 17:36	07:03 07:03 18:12	06:19 06:32 18:41	06:02 06:02 20:12	05:58 05:58 20:40	06:17 06:17 20:55	06:46 06:46 20:06	07:14 07:14 19:16	07:45 07:45 18:31	07:45 07:45 18:31	07:19 07:19 17:02	07:43 08:05-08:17/12 17:05
27	07:37 07:37 17:37	07:01 07:01 18:13	06:18 06:31 18:42	06:01 06:01 20:13	05:58 05:58 20:41	06:18 06:18 20:56	06:46 06:46 20:04	07:15 07:15 19:14	07:46 07:46 18:30	07:46 07:46 18:30	07:20 07:20 17:02	07:43 08:06-08:19/13 17:06
28	07:36 07:36 17:38	07:00 07:00 18:14	06:16 06:30 18:43	06:01 06:01 20:14	05:58 05:58 20:42	06:19 06:19 20:56	06:47 06:47 20:03	07:16 07:16 19:13	07:47 07:47 18:28	07:47 07:47 18:28	07:21 07:21 17:02	07:44 08:06-08:19/13 17:07
29	07:35 07:35 17:39	07:05 07:05 19:44	06:15 06:29 19:15	06:00 06:00 20:15	05:59 05:59 20:43	06:20 06:20 20:56	06:48 06:48 20:01	07:17 07:17 19:11	07:48 07:48 18:27	07:48 07:48 18:27	07:22 07:22 17:01	07:44 08:06-08:19/13 17:07
30	07:34 07:34 17:41	07:13 07:13 19:45	06:27 06:43 19:15	06:00 06:00 20:16	05:59 05:59 20:43	06:21 06:21 20:56	06:49 06:49 20:00	07:18 07:18 19:10	07:49 07:49 18:26	07:49 07:49 18:26	07:23 07:23 17:01	07:44 08:06-08:20/14 17:08
31	07:33 07:33 17:42	07:11 07:11 19:46	06:25 06:41 19:46	05:59 05:59 20:44	05:59 05:59 20:44	06:21 06:21 20:39	06:50 06:50 19:58	07:15 07:15 18:25	07:46 07:46 17:25	07:46 07:46 17:25	07:24 07:24 17:01	07:44 08:06-08:20/14 17:09
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Sum of minutes with flicker	499	304	0	0	0	0	0	0	0	252	363	449

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

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

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG03 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (58) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG04 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (59) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA SJ

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:45 17:10	07:32 17:43	06:58 18:15	07:10 19:47	08:06-08:26/20	06:26 20:17	05:59 20:45	06:00 20:55	06:22 20:38	06:51 19:56	07:19 19:08	07:59-08:05/6	06:51 17:23	07:24 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	08:08-08:23/15	06:25 20:18	05:58 20:45	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06		06:52 17:22	07:25 17:00
3	07:45 17:12	07:31 17:45	06:55 18:17	07:07 19:49	08:13-08:18/5	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05		06:53 17:21	07:26 17:00
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05 19:50		06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:34	06:54 19:52	07:22 19:03		06:55 17:20	07:27 17:00
5	07:45 17:13	07:29 17:48	06:52 18:19	07:03 19:51		06:21 20:21	05:57 20:47	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02		06:56 17:19	07:28 17:00
6	07:45 17:14	07:28 17:49	06:51 18:20	07:02 19:52		06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00		06:57 17:18	07:29 17:00
7	07:45 17:15	07:27 17:50	06:49 18:22	07:00 19:53		06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58		06:58 17:17	07:30 17:00
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54		06:18 20:24	05:56 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57		06:59 17:16	07:31 17:00
9	07:45 17:17	07:24 17:52	06:46 18:24	06:57 19:55		06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	08:08-08:12/4		07:27 18:55	07:32 17:15
10	07:45 17:18	07:23 17:54	06:45 18:25	06:56 19:56		06:16 20:26	05:56 20:50	06:05 20:53	06:31 20:27	06:59 19:42	08:01-08:16/15		07:28 18:54	07:33 17:14
11	07:44 17:19	07:22 17:55	06:43 18:26	06:54 19:57		06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:59-08:18/19		07:29 18:52	07:34 17:13
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58		06:14 20:28	05:56 20:51	06:06 20:52	06:32 20:25	07:01 19:39	07:56-08:20/24		07:30 18:51	07:34 17:12
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	07:15-07:28/13	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:55-08:21/26		07:31 18:49	07:35 17:11
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	07:13-07:32/19	06:12 20:29	05:56 20:52	06:07 20:52	06:34 20:22	07:03 19:36	07:53-08:22/29		07:32 18:48	07:36 17:10
15	07:43 17:23	07:17 17:59	06:37 18:30	06:48 20:01	07:10-07:33/23	06:11 20:30	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:52-08:22/30		07:33 18:46	07:37 17:09
16	07:43 17:24	07:16 18:01	06:35 18:31	06:47 20:02	07:09-07:35/26	06:10 20:31	05:56 20:53	06:09 20:50	06:36 20:20	07:05 19:32	07:51-08:23/32		07:34 18:45	07:38 17:09
17	07:42 17:26	07:15 18:02	06:34 18:32	06:45 20:03	07:07-07:35/28	06:09 20:32	05:56 20:53	06:10 20:50	06:37 20:18	07:06 19:31	07:50-08:23/33		07:35 18:43	07:39 17:08
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	07:05-07:36/31	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:50-08:23/33		07:36 18:42	07:40 17:07
19	07:42 17:28	07:12 18:04	06:31 18:34	06:42 20:05	07:05-07:37/32	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:27	07:48-08:22/34		07:37 18:40	07:42 17:06
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	07:03-07:36/33	06:06 20:35	05:56 20:54	06:12 20:48	06:40 20:14	07:09 19:26	07:48-08:22/34		07:38 18:39	07:43 17:06
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	07:03-07:37/34	06:05 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:48-08:22/34		07:39 18:38	07:44 17:05
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	07:02-07:37/35	06:05 20:37	05:57 20:55	06:14 20:46	06:42 20:11	07:11 19:23	07:48-08:22/34		07:40 18:36	07:45 17:04
23	07:39 17:32	07:07 18:08	06:24 18:38	06:37 20:09	07:02-07:36/34	06:04 20:38	05:57 20:55	06:14 20:46	06:43 20:10	07:11 19:21	07:48-08:21/33		07:41 18:35	07:46 17:04
24	07:39 17:33	07:06 18:10	06:23 18:39	06:35 20:10	07:02-07:36/34	06:03 20:38	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	07:48-08:20/32		07:42 18:33	07:47 17:03
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	07:01-07:35/34	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	07:48-08:19/31		06:43 17:32	07:48 17:03
26	07:37 17:36	07:03 18:12	06:19 18:41	06:32 20:12	07:02-07:35/33	06:02 20:40	05:58 20:55	06:17 20:43	06:46 20:06	07:14 19:16	07:49-08:18/29		06:45 17:31	07:49 17:02
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	07:02-07:34/32	06:01 20:41	05:58 20:55	06:18 20:42	06:46 20:04	07:15 19:14	07:50-08:17/27		06:46 17:30	07:50 17:02
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	07:02-07:32/30	06:01 20:42	05:58 20:55	06:19 20:41	06:47 20:03	07:16 19:13	07:51-08:15/24		06:47 17:28	07:51 17:02
29	07:35 17:39	07:00 18:14	06:15 18:43	06:29 20:15	08:03-08:32/29	06:00 20:42	05:59 20:55	06:20 20:41	06:48 20:01	07:17 19:11	07:52-08:13/21		06:48 17:27	07:52 17:01
30	07:34 17:40	07:00 18:14	06:16 18:43	06:27 20:16	08:03-08:30/27	06:00 20:43	05:59 20:55	06:20 20:40	06:49 20:00	07:18 19:10	07:55-08:10/15		06:49 17:26	07:53 17:01
31	07:33 17:42	07:00 18:14	06:15 18:43	06:27 20:16	08:05-08:29/24	05:59 20:44	06:21 20:55	06:21 20:39	06:50 19:58	07:18 19:10			06:50 17:25	07:44 17:09
Potential sun hours	301	299	370	397		444	448	455	425	374	347		301	292
Sum of minutes with flicker	0	0	551	40		0	0	0	0	593	6		0	0

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

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

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG05 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 607 505 420 506 599 570 495 488 555 624 686 669 6.724

	January	February	March	April	May	June		
1	07:45 17:10	07:33 17:43	06:58 18:15	16:41-17:14/33	07:10 19:47	17:20-18:23/63 07:28-07:44/16	06:26 20:17	05:59 20:45
2	07:45 17:11	07:32 17:44	06:57 18:16	16:39-17:17/38	07:08 19:48	17:20-18:22/62 07:26-07:44/18	06:25 20:18	05:58 20:46
3	07:45 17:12	07:31 17:45	06:56 18:17	16:36-17:19/43	07:07 19:49	17:22-18:21/59 07:25-07:45/20	06:24 20:19	05:58 20:46
4	07:45 17:13	07:30 17:46	06:54 18:18	16:34-17:21/47	07:05 19:50	17:22-18:20/58 07:24-07:44/20	06:22 20:20	05:58 20:47
5	07:45 17:13	07:29 17:48	06:53 18:19	16:32-17:22/50	07:04 19:51	17:24-18:19/55 07:25-07:44/19	06:21 20:21	05:57 20:48
6	07:45 17:14	07:28 17:49	06:51 18:21	16:29-17:23/54	07:02 19:52	17:24-18:17/53 07:24-07:43/19	06:20 20:22	05:57 20:48
7	07:45 17:15	07:27 17:50	06:49 18:22	16:28-17:25/57	07:00 19:53	17:25-18:15/50 07:25-07:43/18	06:19 20:23	05:57 20:49
8	07:45 17:16	07:26 17:51	06:48 18:23	16:27-17:26/59	06:59 19:54	17:27-18:14/47 07:26-07:41/15	06:18 20:24	05:57 20:49
9	07:45 17:17	07:25 17:52	06:46 18:24	16:26-17:27/61	06:57 19:55	17:28-18:12/44 07:26-07:38/12	06:17 20:25	05:56 20:50
10	07:45 17:18	07:23 17:54	06:45 18:25	16:24-17:27/63	06:56 19:56	17:30-18:10/40 07:29-07:36/7	06:16 20:26	05:56 20:50
11	07:44 17:19	07:22 17:55	06:43 18:26	16:24-17:29/65	06:54 19:57	17:32-18:07/35 17:35-18:05/30	06:15 20:27	05:56 20:51
12	07:44 17:20	07:21 17:56	06:42 18:27	16:22-17:29/67	06:53 19:58	17:35-18:05/30 17:37-18:02/25	06:14 20:28	05:56 20:51
13	07:44 17:21	07:20 17:57	06:40 18:28	16:21-17:29/68	06:51 19:59	17:37-18:02/25 17:42-17:58/16	06:13 20:29	05:56 20:52
14	07:44 17:22	07:19 17:58	06:39 18:29	16:21-17:30/69	06:50 20:00	17:42-17:58/16 16:20-17:30/70	06:12 20:30	05:56 20:52
15	07:43 17:23	07:17 17:59	06:37 18:30	16:20-17:30/70	06:48 20:01	16:20-17:30/70 16:20-17:30/70	06:11 20:30	05:56 20:53
16	07:43 17:24	07:16 18:01	06:35 18:31	16:20-17:30/70	06:47 20:02	16:20-17:30/70 16:19-17:30/71	06:10 20:31	05:56 20:53
17	07:43 17:26	07:15 18:02	06:34 18:32	16:19-17:30/71	06:45 20:03	16:19-17:30/71 16:18-17:30/72	06:09 20:32	05:56 20:54
18	07:42 17:27	07:14 18:03	06:32 18:33	16:18-17:30/72	06:44 20:04	16:18-17:30/72 16:18-17:30/72	06:08 20:33	05:56 20:54
19	07:42 17:28	07:12 18:04	06:31 18:34	16:18-17:30/72	06:42 20:05	16:18-17:30/72 06:49-06:55/6	06:07 20:34	05:56 20:54
20	07:41 17:29	07:11 18:05	06:29 18:35	16:18-17:30/72	06:41 20:06	16:18-17:30/72 06:47-06:56/9	06:06 20:35	05:56 20:54
21	07:41 17:30	07:10 18:06	06:27 18:36	16:18-17:30/72	06:39 20:07	16:18-17:30/72 06:46-06:58/12	06:06 20:36	05:56 20:55
22	07:40 17:31	07:08 18:07	06:26 18:37	16:17-17:30/73	06:38 20:08	16:17-17:30/73 06:44-06:59/15	06:05 20:37	05:57 20:55
23	07:39 17:32	07:07 18:09	06:24 18:38	16:17-17:29/72	06:37 20:09	16:17-17:29/72 06:43-07:00/17	06:04 20:38	05:57 20:55
24	07:39 17:34	07:06 18:10	06:23 18:39	16:18-17:29/71	06:35 20:10	16:18-17:29/71 06:41-06:59/18	06:03 20:38	05:57 20:55
25	07:38 17:35	07:04 18:11	06:21 18:40	16:17-17:28/71	06:34 20:11	16:17-17:28/71 06:39-06:59/20	06:03 20:39	05:57 20:55
26	07:37 17:36	07:03 18:12	06:19 18:41	16:18-17:28/70	06:33 20:12	16:18-17:28/70 06:39-06:59/20	06:02 20:40	05:58 20:55
27	07:37 17:37	07:01 18:13	06:18 18:42	16:18-17:27/69	06:31 20:13	16:18-17:27/69 06:38-06:58/20	06:01 20:41	05:58 20:56
28	07:36 17:38	07:00 18:14	06:16 18:43	16:18-17:26/68	06:30 20:14	16:18-17:26/68 06:38-06:57/19	06:01 20:42	05:58 20:56
29	07:35 17:39		07:15 19:44	17:19-18:26/67	06:29 20:15	17:19-18:26/67 07:33-07:56/23	06:00 20:43	05:59 20:56
30	07:34 17:41		07:13 19:45	17:19-18:25/66	06:27 20:16	17:19-18:25/66 07:31-07:54/23	06:00 20:43	05:59 20:56
31	07:33 17:42		07:11 19:46	17:20-18:25/65		17:20-18:25/65 07:30-07:52/22	05:59 20:44	
Potential sun hours	301	299	370	397	444	448		
Sum of minutes with flicker	0	42	2189	801	0	0		

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

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

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG05 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	July	August	September	October	November	December
1	06:00 20:55	06:22 20:38	06:51 17:31-18:06/35 19:57	07:19 17:02-18:09/67 19:08	06:51 17:23	07:24 17:01
2	06:00 20:55	06:23 20:37	06:52 17:28-18:08/40 19:55 07:27-07:34/7	07:20 17:02-18:08/66 19:06	06:52 17:22	07:25 17:00
3	06:01 20:55	06:24 20:36	06:53 17:26-18:10/44 19:53 07:24-07:36/12	07:21 17:02-18:06/64 19:05	06:53 17:21	07:26 17:00
4	06:01 20:55	06:25 20:35	06:54 17:24-18:11/47 19:52 07:23-07:38/15	07:22 17:03-18:05/62 19:03	06:55 17:20	07:27 17:00
5	06:02 20:55	06:26 20:33	06:55 17:22-18:12/50 19:50 07:21-07:39/18	07:23 17:04-18:04/60 19:02	06:56 17:19	07:28 17:00
6	06:02 20:55	06:27 20:32	06:56 17:21-18:13/52 19:49 07:20-07:39/19	07:24 17:04-18:02/58 19:00	06:57 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 17:19-18:14/55 19:47 07:20-07:39/19	07:25 17:05-18:01/56 18:58	06:58 17:17	07:30 17:00
8	06:03 20:54	06:29 20:30	06:58 17:17-18:15/58 19:45 07:19-07:39/20	07:26 17:07-17:59/52 18:57	06:59 17:16	07:31 17:00
9	06:04 20:54	06:30 20:29	06:59 17:16-18:15/59 19:44 07:19-07:39/20	07:27 17:08-17:57/49 18:55	07:00 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 17:14-18:15/61 19:42 07:20-07:38/18	07:28 17:09-17:55/46 18:54	07:01 17:14	07:33 17:00
11	06:05 20:53	06:32 20:26	07:00 17:12-18:15/63 19:41 07:20-07:36/16	07:29 17:11-17:52/41 18:52	07:03 17:13	07:34 17:00
12	06:06 20:53	06:33 20:25	07:01 17:11-18:16/65 19:39 07:21-07:42/21	07:30 17:13-17:50/37 18:51	07:04 17:12	07:34 17:00
13	06:07 20:52	06:33 20:24	07:02 17:10-18:16/66 19:37 07:22-07:45/23	07:31 17:16-17:46/30 18:49	07:05 17:11	07:35 17:00
14	06:07 20:52	06:34 20:22	07:03 17:09-18:16/67 19:36 07:23-07:46/23	07:32 17:20-17:42/22 18:48	07:06 17:10	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 17:08-18:17/69 19:34 07:28-07:47/19	07:33 17:26-17:35/9 18:46	07:07 17:09	07:37 17:01
16	06:09 20:51	06:36 20:20	07:05 17:07-18:17/70 19:32 07:28-07:47/19	07:34 18:45	07:08 17:09	07:37 17:01
17	06:10 20:50	06:37 20:18	07:06 17:06-18:17/71 19:31 07:27-07:47/20	07:35 18:43	07:09 17:08	07:38 17:01
18	06:10 20:49	06:38 20:17	07:07 17:06-18:17/71 19:29 07:27-07:47/20	07:36 18:42	07:10 17:07	07:39 17:02
19	06:11 20:49	06:39 20:16	07:08 17:04-18:15/71 19:28 07:28-07:47/19	07:37 18:40	07:12 17:06	07:39 17:02
20	06:12 20:48	06:40 20:14	07:09 17:03-18:15/72 19:26 07:28-07:45/17	07:38 18:39	07:13 17:06	07:40 17:02
21	06:13 20:47	06:41 20:13	07:10 17:03-18:15/72 19:24 07:29-07:44/15	07:39 18:38	07:14 17:05	07:41 17:03
22	06:14 20:47	06:42 20:11	07:11 17:02-18:15/73 19:23 07:30-07:43/13	07:40 18:36	07:15 17:05	07:41 17:03
23	06:14 20:46	06:43 20:10	07:12 17:02-18:14/72 19:21 07:31-07:41/10	07:41 18:35	07:16 17:04	07:42 17:04
24	06:15 20:45	06:44 20:09	07:12 17:02-18:14/72 19:19 07:32-07:39/7	07:42 18:34	07:17 17:03	07:42 17:04
25	06:16 20:44	06:45 20:07	07:13 17:01-18:13/72 19:18	06:44 17:32	07:18 17:03	07:42 17:05
26	06:17 20:43	06:46 20:06	07:14 17:01-18:13/72 19:16	06:45 17:31	07:19 17:02	07:43 17:06
27	06:18 20:42	06:47 20:04	07:15 17:01-18:12/71 19:14	06:46 17:30	07:20 17:02	07:43 17:06
28	06:19 20:42	06:47 20:03	07:16 17:01-18:11/70 19:13	06:47 17:28	07:21 17:02	07:44 17:07
29	06:20 20:41	06:48 17:42-17:59/17 20:01	07:17 17:01-18:10/69 19:11	06:48 17:27	07:22 17:01	07:44 17:08
30	06:21 20:40	06:49 17:38-18:03/25 20:00	07:18 17:01-18:10/69 19:10	06:49 17:26	07:23 17:01	07:44 17:08
31	06:21 20:39	06:50 17:34-18:05/31 19:58		06:50 17:25		07:44 17:09
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	0	73	2288	719	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG06 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (61) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Assumptions for shadow calculations

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,40	5,05	5,88	7,00	8,45	9,88	10,82	10,03	8,08	6,09	5,07	4,27

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

| January | February | March | April | May | June

1	07:45 17:10	07:33 08:05-08:55/50 17:43	06:59 17:31-17:53/22 18:15 07:33-08:16/43	07:10 19:47	06:26 20:17	05:59 20:45
2	07:45 17:11	07:32 08:05-08:56/51 17:44	06:57 17:32-17:53/21 18:16 07:32-08:17/45	07:08 19:48	06:25 20:18	05:58 20:46
3	07:45 17:12	07:31 08:05-08:56/51 17:45	06:56 17:32-17:52/20 18:17 07:31-08:17/46	07:07 19:49	06:24 20:19	05:58 20:46
4	07:45 17:13	07:30 08:04-08:56/52 17:47	06:54 17:33-17:51/18 18:18 07:31-08:18/47	07:05 19:50	06:22 20:20	05:58 20:47
5	07:45 17:14	07:29 08:04-08:57/53 17:48	06:53 17:33-17:50/17 18:20 07:30-08:18/48	07:04 19:51	06:21 20:21	05:57 20:48
6	07:45 17:14	07:28 08:04-08:57/53 17:49	06:51 17:35-17:47/12 18:21 07:29-08:18/49	07:02 19:52	06:20 20:22	05:57 20:48
7	07:45 17:15	07:27 08:04-08:57/53 17:50	06:50 17:38-17:44/6 18:22 07:28-08:18/50	07:00 19:53	06:19 20:23	05:57 20:49
8	07:45 17:16	07:26 08:05-08:58/53 17:51	06:48 07:28-08:17/49 18:23	06:59 19:54	06:18 20:24	05:57 20:49
9	07:45 17:17	07:25 08:05-08:58/53 17:52	06:46 07:28-08:18/50 18:24	06:57 19:55	06:17 20:25	05:56 20:50
10	07:45 17:18	07:23 08:05-08:58/53 17:54	06:45 07:27-08:17/50 18:25	06:56 19:56	06:16 20:26	05:56 20:51
11	07:44 17:19	07:22 08:04-08:57/53 17:55	06:43 07:28-08:17/49 18:26	06:54 19:57	06:15 20:27	05:56 20:51
12	07:44 17:20	07:21 08:05-08:57/52 17:56	06:42 07:27-08:16/49 18:27	06:53 19:58	06:14 20:28	05:56 20:52
13	07:44 17:21	07:20 08:05-08:57/52 17:57	06:40 07:28-08:16/48 18:28	06:51 19:59	06:13 20:29	05:56 20:52
14	07:44 17:22	07:19 08:06-08:57/51 17:58	06:39 07:27-08:15/48 18:29	06:50 20:00	06:12 20:30	05:56 20:52
15	07:43 08:23-08:28/5 17:23	07:18 08:07-08:56/49 18:00	06:37 07:27-08:14/47 18:30	06:48 20:01	06:11 20:31	05:56 20:53
16	07:43 08:20-08:34/14 17:25	07:16 08:06-08:55/49 18:01	06:35 07:28-08:13/45 18:31	06:47 20:02	06:10 20:31	05:56 20:53
17	07:43 08:17-08:36/19 17:26	07:15 08:07-08:54/47 18:02	06:34 07:28-08:11/43 18:32	06:45 20:03	06:09 20:32	05:56 20:54
18	07:42 08:16-08:39/23 17:27	07:14 08:08-08:54/46 18:03	06:32 07:29-08:11/42 18:33	06:44 20:04	06:08 20:33	05:56 20:54
19	07:42 08:14-08:40/26 17:28	07:12 08:08-08:52/44 18:04	06:31 07:30-08:09/39 18:34	06:42 20:05	06:07 20:34	05:56 20:54
20	07:41 08:12-08:42/30 17:29	07:11 08:10-08:51/41 18:05	06:29 07:30-08:07/37 18:35	06:41 20:06	06:06 20:35	05:56 20:54
21	07:41 08:12-08:44/32 17:30	07:10 17:40-17:44/4 07:55-07:57/2 18:06 08:11-08:50/39	06:28 07:32-08:05/33 18:36	06:39 20:07	06:06 20:36	05:56 20:55
22	07:40 08:11-08:45/34 17:31	07:08 17:37-17:46/9 07:47-08:04/17 18:07 08:12-08:48/36	06:26 07:33-08:03/30 18:37	06:38 20:08	06:05 20:37	05:57 20:55
23	07:39 08:10-08:47/37 17:32	07:07 17:35-17:47/12 07:44-08:08/24 18:09 08:14-08:47/33	06:24 07:36-08:01/25 18:38	06:37 20:09	06:04 20:38	05:57 20:55
24	07:39 08:09-08:48/39 17:34	07:06 17:34-17:48/14 07:41-08:09/28 18:10 08:15-08:44/29	06:23 07:38-07:57/19 18:39	06:35 20:10	06:03 20:39	05:57 20:55
25	07:38 08:08-08:49/41 17:35	07:04 17:33-17:50/17 07:39-08:11/32 18:11 08:18-08:42/24	06:21 07:42-07:51/9 18:40	06:34 20:11	06:03 20:39	05:57 20:55
26	07:37 08:08-08:50/42 17:36	07:03 17:32-17:50/18 07:38-08:13/35 18:12 08:21-08:38/17	06:19 18:41	06:33 20:12	06:02 20:40	05:58 20:56
27	07:37 08:08-08:52/44 17:37	07:01 17:32-17:52/20 07:36-08:14/38 18:13 08:28-08:30/2	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56
28	07:36 08:07-08:52/45 17:38	07:00 17:32-17:53/21 18:14 07:35-08:16/41	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56
29	07:35 08:07-08:53/46 17:39		07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56
30	07:34 08:06-08:54/48 17:41		07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56
31	07:33 08:06-08:54/48 17:42		07:11 19:46		05:59 20:44	
Potential sun hours	301	299	370	397	444	447
Sum of minutes with flicker	573	1518	1156	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG06 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 607 505 420 506 599 570 495 488 555 624 686 669 6.724

	July	August	September	October	November	December
1	06:00 20:55	06:22 20:38	06:51 19:57	07:19 08:07-08:55/48 19:08	06:51 07:34-08:27/53 17:23	07:25 17:01
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 08:06-08:56/50 19:06	06:52 07:35-08:28/53 17:22	07:26 17:01
3	06:01 20:55	06:24 20:36	06:53 19:53	07:21 08:06-08:55/49 19:05	06:54 07:34-08:27/53 17:21	07:27 17:00
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 08:05-08:55/50 19:03	06:55 07:34-08:27/53 17:20	07:27 17:00
5	06:02 20:55	06:26 20:33	06:55 19:50	07:23 08:05-08:55/50 19:02	06:56 07:34-08:27/53 17:19	07:28 17:00
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 08:05-08:55/50 19:00	06:57 07:34-08:27/53 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:13-18:22/9 18:59 08:05-08:54/49	06:58 07:35-08:27/52 17:17	07:30 17:00
8	06:03 20:54	06:29 20:30	06:58 19:46	07:26 18:10-18:24/14 18:57 08:05-08:54/49	06:59 07:36-08:27/51 17:16	07:31 17:00
9	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:08-18:26/18 18:55 08:05-08:53/48	07:00 07:36-08:26/50 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:07-18:26/19 18:54 08:05-08:52/47	07:01 07:36-08:26/50 17:14	07:33 17:00
11	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:06-18:27/21 18:52 08:06-08:51/45	07:03 07:37-08:25/48 17:13	07:34 17:00
12	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:05-18:27/22 18:51 08:06-08:50/44	07:04 07:38-08:26/48 17:12	07:35 17:00
13	06:07 20:52	06:34 20:24	07:02 19:37	07:31 18:05-18:27/22 18:49 08:07-08:49/42	07:05 07:39-08:25/46 17:11	07:35 17:00
14	06:08 20:52	06:34 20:23	07:03 19:36	07:32 18:04-18:25/21 18:48 08:08-08:48/40	07:06 07:39-08:24/45 17:10	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:04-18:24/20 08:09-08:46/37 18:46 08:56-09:07/11	07:07 07:40-08:24/44 17:09	07:37 17:01
16	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:04-18:22/18 08:10-08:44/34 18:45 08:51-09:11/20	07:08 07:41-08:23/42 17:09	07:37 17:01
17	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:05-18:21/16 08:11-08:42/31 18:43 08:48-09:14/26	07:09 07:42-08:23/41 17:08	07:38 17:01
18	06:11 20:49	06:38 20:17	07:07 08:33-08:37/4 19:29	07:36 18:05-18:19/14 08:13-08:40/27 18:42 08:46-09:16/30	07:11 07:43-08:22/39 17:07	07:39 17:02
19	06:11 20:49	06:39 20:16	07:08 08:26-08:43/17 19:28	07:37 18:07-18:18/11 08:15-08:37/22 18:41 08:44-09:18/34	07:12 07:44-08:21/37 17:06	07:39 17:02
20	06:12 20:48	06:40 20:14	07:09 08:22-08:45/23 19:26	07:38 18:08-18:16/8 08:19-08:33/14 18:39 08:42-09:19/37	07:13 07:46-08:20/34 17:06	07:40 17:02
21	06:13 20:47	06:41 20:13	07:10 08:19-08:48/29 19:24	07:39 08:41-09:21/40 18:38	07:14 07:47-08:19/32 17:05	07:41 17:03
22	06:14 20:47	06:42 20:12	07:11 08:17-08:49/32 19:23	07:40 08:40-09:22/42 18:36	07:15 07:49-08:19/30 17:05	07:41 17:03
23	06:15 20:46	06:43 20:10	07:12 08:15-08:51/36 19:21	07:41 08:39-09:23/44 18:35	07:16 07:51-08:17/26 17:04	07:42 17:04
24	06:15 20:45	06:44 20:09	07:13 08:14-08:52/38 19:19	07:43 08:38-09:24/46 18:34	07:17 07:53-08:16/23 17:03	07:42 17:04
25	06:16 20:44	06:45 20:07	07:13 08:12-08:53/41 19:18	06:44 07:37-08:24/47 17:32	07:18 07:55-08:14/19 17:03	07:42 17:05
26	06:17 20:43	06:46 20:06	07:14 08:11-08:54/43 19:16	06:45 07:36-08:25/49 17:31	07:19 07:57-08:12/15 17:03	07:43 17:06
27	06:18 20:43	06:47 20:04	07:15 08:10-08:54/44 19:15	06:46 07:35-08:25/50 17:30	07:20 08:02-08:08/6 17:02	07:43 17:06
28	06:19 20:42	06:48 20:03	07:16 08:09-08:55/46 19:13	06:47 07:36-08:26/50 17:28	07:21 17:02	07:44 17:07
29	06:20 20:41	06:48 20:01	07:17 08:08-08:55/47 19:11	06:48 07:35-08:27/52 17:27	07:22 17:01	07:44 17:08
30	06:21 20:40	06:49 20:00	07:18 08:07-08:55/48 19:10	06:49 07:34-08:27/53 17:26	07:24 17:01	07:44 17:08
31	06:22 20:39	06:50 19:58	 	06:50 07:34-08:27/53 17:25	 	07:44 17:09
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	0	0	448	1743	1096	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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG07 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (62) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

| January | February | March | April | May | June | July | August | September | October | November | December

1	07:45	07:33	06:58	07:10	06:26	05:59	06:00	06:22	06:51	07:19	06:51	07:24
	17:10	17:43	18:15	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:23	17:01
2	07:45	07:32	06:57	07:08	06:25	05:58	06:00	06:23	06:52	07:20	06:52	07:25
	17:11	17:44	18:16	19:48	20:18	20:45	20:55	20:37	19:55	19:06	17:22	17:00
3	07:45	07:31	06:55	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:53	07:26
	17:12	17:45	18:17	19:49	20:19	20:46	20:55	20:36	19:53	19:05	17:21	17:00
4	07:45	07:30	06:54	07:05	06:22	05:58	06:01	06:25	06:54	07:22	06:55	07:27
	17:13	17:46	18:18	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00
5	07:45	07:29	06:52	07:03	06:21	05:57	06:02	06:26	06:55	07:23	06:56	07:28
	17:13	17:48	18:19	19:51	20:21	20:48	20:55	20:33	19:50	19:02	17:19	17:00
6	07:45	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29
	17:14	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00
7	07:45	07:27	06:49	07:00	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30
	17:15	17:50	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:58	17:17	17:00
8	07:45	07:26	06:48	06:59	06:18	05:57	06:03	06:29	06:58	07:26	06:59	07:31
	17:16	17:51	18:23	19:54	20:24	20:49	20:54	20:30	19:45	18:57	17:16	17:00
9	07:45	07:25	06:46	06:57	06:17	05:56	06:04	06:30	06:59	07:27	07:00	07:32
	17:17	17:52	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:55	17:15	17:00
10	07:45	07:23	06:45	06:56	06:16	05:56	06:05	06:31	06:59	07:28	07:01	07:33
	17:18	17:54	18:25	19:56	20:26	20:50	20:53	20:28	19:42	18:54	17:14	17:00
11	07:44	07:22	06:43	06:54	06:15	05:56	06:05	06:32	07:00	07:29	07:03	07:34
	17:19	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:52	17:13	17:00
12	07:44	07:21	06:42	06:53	06:14	05:56	06:06	06:32	07:01	07:30	07:04	07:34
	17:20	17:56	18:27	19:58	20:28	20:51	20:53	20:25	19:39	18:51	17:12	17:00
13	07:44	07:20	06:40	06:51	06:13	05:56	06:07	06:33	07:02	07:31	07:05	07:35
	17:21	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:37	18:49	17:11	17:00
14	07:44	07:19	06:39	06:50	06:12	05:56	06:07	06:34	07:03	07:32	07:06	07:36
	17:22	17:58	18:29	20:00	20:30	20:52	20:52	20:22	19:36	18:48	17:10	17:00
15	07:43	07:17	06:37	06:48	06:11	05:56	06:08	06:35	07:04	07:33	07:07	07:37
	17:23	17:59	18:30	20:01	20:30	20:53	20:51	20:21	19:34	18:46	17:09	17:01
16	07:43	07:16	06:35	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:37
	17:24	18:01	18:31	20:02	20:31	20:53	20:51	20:20	19:32	18:45	17:09	17:01
17	07:43	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:54	20:50	20:18	19:31	18:43	17:08	17:01
18	07:42	07:14	06:32	06:44	06:08	05:56	06:10	06:38	07:07	07:36	07:10	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:02
19	07:42	07:12	06:31	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:39
	17:28	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:40	17:06	17:02
20	07:41	07:11	06:29	06:41	06:06	05:56	06:12	06:40	07:09	07:38	07:13	07:40
	17:29	18:05	18:35	20:06	20:35	20:54	20:48	20:14	19:26	18:39	17:06	17:02
21	07:41	07:10	06:27	06:39	06:06	05:56	06:13	06:41	07:10	07:39	07:14	07:41
	17:30	18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:38	17:05	17:03
22	07:40	07:08	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:31	18:07	18:37	20:08	20:37	20:55	20:47	20:11	19:23	18:36	17:04	17:03
23	07:39	07:07	06:24	06:37	06:04	05:57	06:14	06:43	07:12	07:41	07:16	07:42
	17:32	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04
24	07:39	07:06	06:23	06:35	06:03	05:57	06:15	06:44	07:12	07:42	07:17	07:42
	17:33	18:10	18:39	20:10	20:38	20:55	20:45	20:09	19:19	18:34	17:03	17:04
25	07:38	07:04	06:21	06:34	06:03	05:57	06:16	06:45	07:13	06:44	07:18	07:42
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:03	17:05
26	07:37	07:03	06:19	06:33	06:02	05:58	06:17	06:46	07:14	06:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:16	17:31	17:02	17:05
27	07:37	07:01	06:18	06:31	06:01	05:58	06:18	06:47	07:15	06:46	07:20	07:43
	17:37	18:13	18:42	20:13	20:41	20:56	20:42	20:04	19:14	17:30	17:02	17:06
28	07:36	07:00	06:16	06:30	06:01	05:58	06:19	06:47	07:16	06:47	07:21	07:44
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:28	17:02	17:07
29	07:35		07:15	06:29	06:00	05:59	06:20	06:48	07:17	06:48	07:22	07:44
	17:39		19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	17:07
30	07:34		07:13	06:27	06:00	05:59	06:21	06:49	07:18	06:49	07:23	07:44
	17:41		19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:01	17:08
31	07:33		07:11		05:59		06:21	06:50		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:09

Potential sun hours | 301 | 299 | 370 | 397 | 444 | 448 | 455 | 425 | 374 | 347 | 301 | 292
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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:50/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20230705WTG: AG08 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (63) Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 505 420 506 599 570 495 488 555 624 686 669 6.724

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:45 17:10	07:33 17:43	07:52-07:54/2 06:58 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:55	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:12-07:27/15 17:01		
2	07:45 17:11	07:32 17:44	07:51-07:55/4 06:56 18:16	07:08 19:48	06:25 20:18	05:58 20:45	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:14-07:28/14 17:00		
3	07:45 17:12	07:31 17:45	07:50-07:56/6 06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:53 17:21	07:15-07:28/13 17:00		
4	07:45 17:13	07:30 17:47	07:49-07:57/8 06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:16-07:28/12 17:00		
5	07:45 17:13	07:29 17:48	07:48-07:57/9 06:53 18:19	07:04 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:17-07:28/11 17:00		
6	07:45 17:14	07:28 17:49	07:47-07:58/11 06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:18-07:27/9 17:00		
7	07:45 17:15	07:27 17:50	07:46-07:58/12 06:49 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58	06:58 17:17	07:20-07:28/8 17:00		
8	07:45 17:16	07:26 17:51	07:45-07:58/13 06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57	06:59 17:16	07:21-07:27/6 17:00		
9	07:45 17:17	07:25 17:52	07:44-07:58/14 06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:22-07:26/4 17:00		
10	07:45 17:18	07:23 17:54	07:43-07:58/15 06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:50	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:01 17:14	07:23-07:25/2 17:00		
11	07:44 17:19	07:22 17:55	07:41-07:56/15 06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13	07:34 17:00		
12	07:44 17:20	07:21 17:56	07:40-07:56/16 06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:51	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:34 17:00		
13	07:44 17:21	07:20 17:57	07:40-07:55/15 06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 17:00		
14	07:44 17:22	07:19 17:58	07:43-07:53/10 06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:07 20:52	06:34 20:22	07:03 19:36	07:32 18:48	07:06 17:10	07:36 17:00		
15	07:43 17:23	07:17 17:59	07:37-07:42/5 06:37 18:30	06:48 20:01	06:11 20:30	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	08:02-08:08/6 18:46	07:07 17:09	07:37 17:01		
16	07:43 17:25	07:16 18:01	07:35-07:42/7 06:35 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:59-08:11/12 17:09	07:38 17:01		
17	07:43 17:26	07:15 18:02	07:34-07:44/10 06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:18	07:06 19:31	07:35 18:43	07:57-08:12/15 17:08	07:39 17:01		
18	07:42 17:27	07:14 18:03	07:33-07:44/11 06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:56-08:13/17 17:07	07:40 17:02		
19	07:42 17:28	07:12 18:04	07:31-07:44/13 06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:57-08:14/17 17:06	07:41 17:02		
20	07:41 17:29	07:11 18:05	07:30-07:44/14 06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:54	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:58-08:14/16 17:06	07:42 17:02		
21	07:41 17:30	07:10 18:06	07:29-07:44/15 06:27 18:36	06:39 20:07	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	08:00-08:15/15 18:38	07:14 17:05	07:41 17:03		
22	07:40 17:31	07:08 18:07	07:27-07:43/16 06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:11	07:11 19:23	08:01-08:15/14 18:36	07:15 17:05	07:41 17:03		
23	07:39 17:32	07:07 18:09	07:26-07:43/17 06:24 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	08:02-08:14/12 18:35	07:16 17:04	07:42 17:04		
24	07:39 17:34	07:06 18:10	07:24-07:41/17 06:23 18:39	06:35 20:10	06:03 20:38	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	08:03-08:14/11 18:34	07:17 17:03	07:42 17:04		
25	07:38 17:35	07:04 18:11	07:26-07:40/14 06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	07:04-07:13/9 17:32	07:18 17:03	07:42 17:05		
26	07:37 17:36	07:03 18:12	07:28-07:39/11 06:19 18:41	06:33 20:12	06:02 20:40	05:58 20:55	06:17 20:43	06:46 20:06	07:14 19:16	07:05-07:12/7 17:31	07:19 17:02	07:43 17:06		
27	07:37 17:37	07:01 18:13	07:28-07:39/11 06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:42	06:47 20:04	07:15 19:14	07:14-07:19/5 17:30	07:20 17:02	07:43 17:06		
28	07:36 17:38	07:00 18:14	07:27-07:43/16 06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56	06:19 20:42	06:47 20:03	07:16 19:13	07:12-07:23/11 17:28	07:21 17:02	07:44 17:07		
29	07:35 17:39	07:00 18:15	07:26-07:43/17 06:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:08	07:17 19:11	07:10-07:25/15 17:27	07:22 17:01	07:44 17:08		
30	07:34 17:41	07:00 18:16	07:25-07:40/14 06:14 19:45	06:27 20:16	06:00 20:43	05:59 20:55	06:21 20:40	06:49 20:00	07:18 19:10	07:10-07:26/16 17:26	07:23 17:01	07:44 17:08		
31	07:33 17:42	07:00 18:17	07:24-07:41/17 06:13 19:46	06:26 20:17	06:00 20:44	05:59 20:56	06:22 20:39	06:50 19:58	07:19 17:25	07:11-07:26/15 17:25	07:24 17:02	07:44 17:09		
Potential sun hours	301	299	302	370	397	444	447	455	425	374	347	219	94	292
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0	0	0

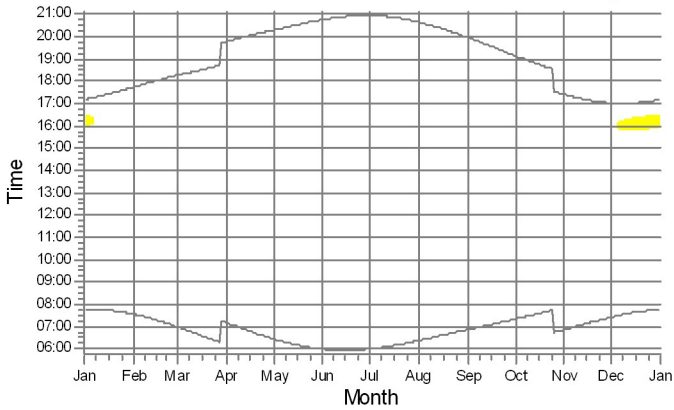
Table layout: For each day in each month the following matrix apply

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

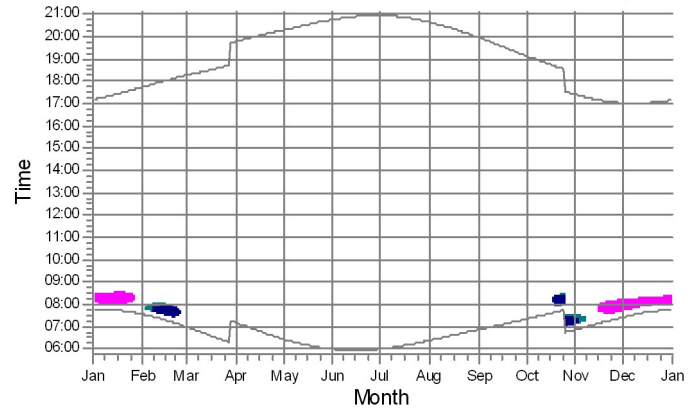
SHADOW - Calendar per WTG, graphical

Calculation: Real_case_Progetto_20230705

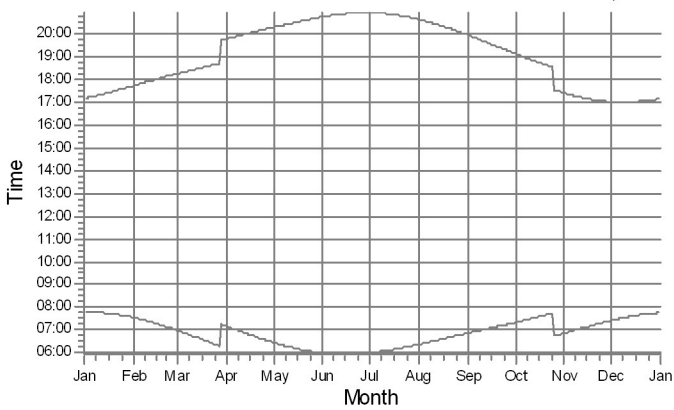
AG01: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



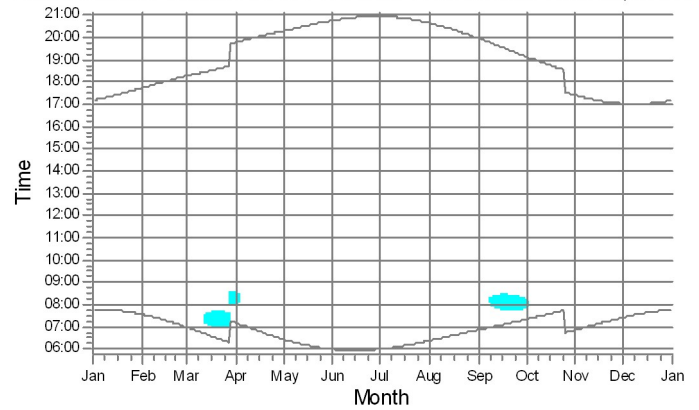
AG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



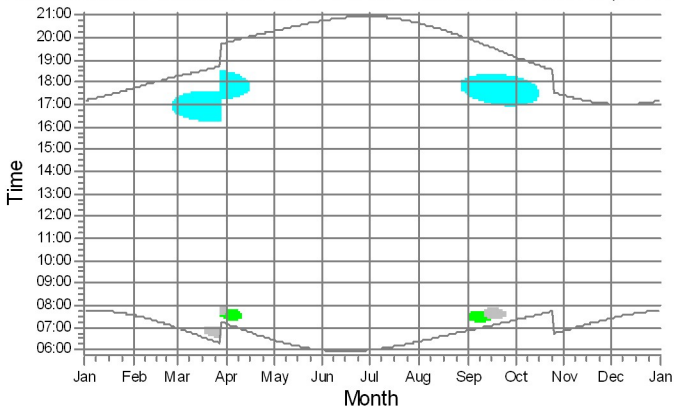
AG03: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



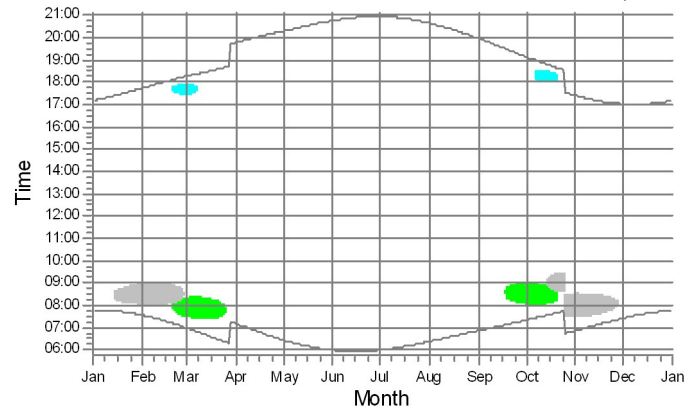
AG04: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)










AG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



AG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



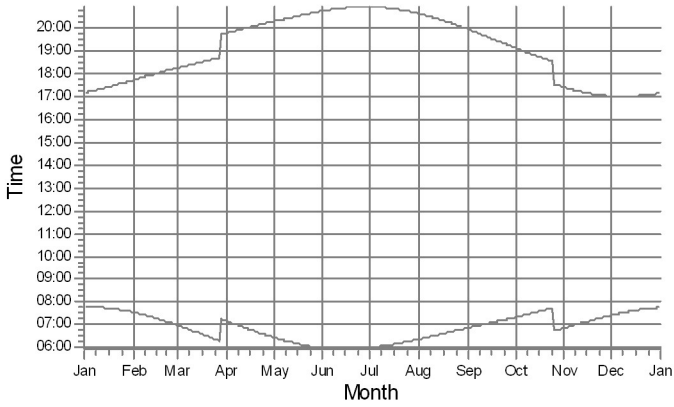
Shadow receptors

	F036: D10		F055: A03		F126: A04
	F050: A03		F076: campeggio camper		
	F054: A02		F123: A07		

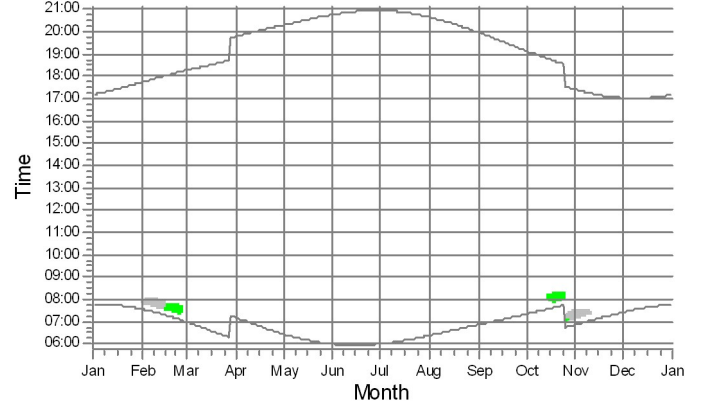
SHADOW - Calendar per WTG, graphical

Calculation: Real_case_Progetto_20230705

AG07: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2



AG08: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2



Shadow receptors



F076: campeggio camper



F123: A07

SHADOW - Main Result

Calculation: Progetto_layout_20230710

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_Baltex_Sue

Obstacles used in calculation

Eye height for map: 1,5 m

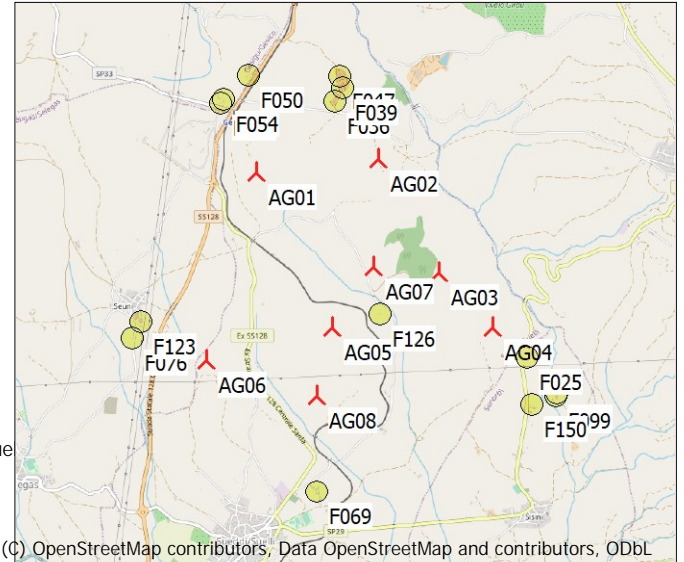
Grid resolution: 1,0 m

All coordinates are in

Italian Gauss-Boaga west-ROMA40 (IT-peninsular <±4m)

WTGs

	Easting	Northing	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM [RPM]
AG01	1.511.479	4.382.890	360,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG02	1.512.687	4.383.021	363,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG03	1.513.294	4.381.901	360,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG04	1.513.827	4.381.357	387,3	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG05	1.512.234	4.381.357	360,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG06	1.510.987	4.381.037	347,6	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG07	1.512.645	4.381.954	310,2	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8
AG08	1.512.081	4.380.675	306,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	115,0	2.041	8,8



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

Scale 1:75.000

New WTG

Shadow receptor

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
				[m]	[m]	[m]	a.g.l.	window		(ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
F025	A03	1.514.171	4.381.065	289,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F036	D10	1.512.259	4.383.590	378,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F039	D10	1.512.341	4.383.725	380,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F047	D10	1.512.308	4.383.833	380,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F050	A03	1.511.405	4.383.848	366,6	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F054	A02	1.511.155	4.383.616	365,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F055	A03	1.511.128	4.383.572	366,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F069	A02	1.512.081	4.379.727	261,1	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F076	campeggio camper	1.510.252	4.381.248	295,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F099	A03	1.514.459	4.380.682	265,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F100	A03	1.514.465	4.380.709	266,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F123	A07	1.510.339	4.381.409	312,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F126	A04	1.512.716	4.381.493	300,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F150	seminativo	1.514.216	4.380.597	284,6	1,2	1,4	1,2	90,0	"Green house mode"	2,6

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case		
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
F025	A03	0:00	0	0:00
F036	D10	11:11	32	0:26

To be continued on next page...

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:55/3.4.415

SHADOW - Main Result

Calculation: Progetto_layout_20230710

...continued from previous page

No.	Name	Shadow, worst case		
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
F039	D10	0:00	0	0:00
F047	D10	0:00	0	0:00
F050	A03	20:54	72	0:25
F054	A02	7:46	34	0:21
F055	A03	7:20	33	0:20
F069	A02	0:00	0	0:00
F076	campeggio camper	53:50	107	0:50
F099	A03	0:00	0	0:00
F100	A03	0:00	0	0:00
F123	A07	70:37	114	1:09
F126	A04	116:28	106	1:48
F150	seminativo	0:00	0	0:00

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

No.	Name	Worst case [h/year]
AG01	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (56)	11:11
AG02	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57)	31:07
AG03	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (58)	0:00
AG04	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (59)	19:50
AG05	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60)	101:52
AG06	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)	108:54
AG07	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (62)	0:00
AG08	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (63)	10:15

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

SHADOW - Calendar

Calculation: Progetto_layout_20230710Shadow receptor: F025 - A03

Assumptions for shadow calculations

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

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

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

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

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

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
 Via Santa Margherita 4
 IT-09124 Cagliari
 +39 070 658297
 Giuseppe Frongia / direttore@iatprogetti.it
 Calculated:
 10/07/2023 14:55/3.4.415

SHADOW - Calendar

Calculation: Progetto_layout_20230710Shadow receptor: F036 - D10

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December								
1	07:45	16:01 (AG01)	07:33	06:58	07:10	06:26	05:59	06:00	06:22	06:51	07:19	06:51	07:25							
	17:10	21	16:22 (AG01)	17:43	18:15	19:47	20:17	20:45	20:56	20:38	19:57	19:08	17:23	17:01						
2	07:45		16:03 (AG01)	07:32	06:57	07:08	06:25	05:58	06:00	06:23	06:52	07:20	06:52	07:26						
	17:11	19	16:22 (AG01)	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:06	17:22	17:00						
3	07:45		16:05 (AG01)	07:31	06:56	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:54	07:27						
	17:12	17	16:22 (AG01)	17:45	18:17	19:49	20:19	20:46	20:55	20:36	19:53	19:05	17:21	17:00						
4	07:45		16:06 (AG01)	07:30	06:54	07:05	06:22	05:58	06:01	06:25	06:54	07:22	06:55	07:28						
	17:13	15	16:21 (AG01)	17:46	18:18	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00						
5	07:45		16:07 (AG01)	07:29	06:53	07:03	06:21	05:57	06:02	06:26	06:55	07:23	06:56	07:28						
	17:13	13	16:20 (AG01)	17:48	18:19	19:51	20:21	20:48	20:55	20:33	19:50	19:02	17:19	17:00						
6	07:45		16:09 (AG01)	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29						
	17:14	9	16:18 (AG01)	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:18	17:00						
7	07:45			07:27	06:49	07:00	06:19	05:57	06:03	06:28	06:57	07:25	06:58	07:30						
	17:15			17:50	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:58	17:17	17:00						
8	07:45			07:26	06:48	06:59	06:18	05:56	06:03	06:29	06:58	07:26	06:59	07:31						
	17:16			17:51	18:23	19:54	20:24	20:49	20:54	20:30	19:45	18:57	17:16	17:00						
9	07:45			07:25	06:46	06:57	06:17	05:56	06:04	06:30	06:59	07:27	07:00	07:32						
	17:17			17:52	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:55	17:15	17:00						
10	07:45			07:23	06:45	06:56	06:16	05:56	06:05	06:31	06:59	07:28	07:01	07:33						
	17:18			17:54	18:25	19:56	20:26	20:51	20:53	20:28	19:42	18:54	17:14	17:00						
11	07:44			07:22	06:43	06:54	06:15	05:56	06:05	06:32	07:00	07:29	07:03	07:34						
	17:19			17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:52	17:13	17:00						
12	07:44			07:21	06:42	06:53	06:14	05:56	06:06	06:32	07:01	07:30	07:04	07:35						
	17:20			17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:12	17:00						
13	07:44			07:20	06:40	06:51	06:13	05:56	06:07	06:33	07:02	07:31	07:05	07:35						
	17:21			17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:37	18:49	17:11	17:00						
14	07:44			07:19	06:39	06:50	06:12	05:56	06:07	06:34	07:03	07:32	07:06	07:36						
	17:22			17:58	18:29	20:00	20:30	20:52	20:52	20:23	19:36	18:48	17:10	17:00						
15	07:43			07:18	06:37	06:48	06:11	05:56	06:08	06:35	07:04	07:33	07:07	07:37						
	17:23			17:59	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:09	17:01						
16	07:43			07:16	06:35	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:38						
	17:24			18:01	18:31	20:02	20:31	20:53	20:51	20:20	19:32	18:45	17:09	17:01						
17	07:43			07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:09	07:38						
	17:26			18:02	18:32	20:03	20:32	20:54	20:50	20:19	19:31	18:43	17:08	17:01						
18	07:42			07:14	06:32	06:44	06:08	05:56	06:10	06:38	07:07	07:36	07:11	07:39						
	17:27			18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:01						
19	07:42			07:12	06:31	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:39						
	17:28			18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:40	17:06	17:02						
20	07:41			07:11	06:29	06:41	06:06	05:56	06:12	06:40	07:09	07:38	07:13	07:40						
	17:29			18:05	18:35	20:06	20:35	20:55	20:48	20:14	19:26	18:39	17:06	17:02						
21	07:41			07:10	06:27	06:39	06:05	05:56	06:13	06:41	07:10	07:39	07:14	07:41						
	17:30			18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:38	17:05	17:03						
22	07:40			07:08	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:40	07:15	07:41						
	17:31			18:07	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:36	17:04	17:03						
23	07:39			07:07	06:24	06:37	06:04	05:57	06:14	06:43	07:12	07:41	07:16	07:42						
	17:32			18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	17:04						
24	07:39			07:06	06:23	06:35	06:03	05:57	06:15	06:44	07:12	07:42	07:17	07:42						
	17:33			18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:19	18:34	17:03	17:04						
25	07:38			07:04	06:21	06:34	06:03	05:57	06:16	06:45	07:13	07:44	07:18	07:43						
	17:35			18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:03	17:05						
26	07:37			07:03	06:19	06:33	06:02	05:58	06:17	06:46	07:14	07:45	07:19	07:43						
	17:36			18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:02	17:05						
27	07:37			07:01	06:18	06:31	06:01	05:58	06:18	06:47	07:15	07:46	07:20	07:43						
	17:37			18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:14	17:30	17:02	17:06						
28	07:36			07:00	06:16	06:30	06:01	05:58	06:19	06:47	07:16	07:47	07:21	07:44						
	17:38			18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:28	17:02	17:07						
29	07:35				07:15	06:29	06:00	05:59	06:20	06:48	07:17	07:48	07:22	07:44						
	17:39				19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	17:07						
30	07:34				07:13	06:27	06:00	05:59	06:21	06:49	07:18	07:49	07:24	07:44						
	17:41				19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:01	17:08						
31	07:33				07:11		05:59		06:21	06:50		06:50		07:44						
	17:42				19:46		20:44		20:39	19:58		17:25		17:09						
Potential sun hours	301		299		397		445		448		425		374		347		301		292	
Total, worst case		94																		577

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F039 - D10

Assumptions for shadow calculations

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

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:25 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:26 17:00
3	07:45 17:12	07:31 17:45	06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:27 17:00
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:28 17:00
5	07:45 17:13	07:29 17:48	06:53 18:19	07:03 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:28 17:00
6	07:45 17:14	07:28 17:49	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:00
7	07:45 17:15	07:27 17:50	06:49 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58	06:58 17:17	07:30 17:00
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	06:18 20:24	05:56 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:17	07:25 17:52	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:32 17:00
10	07:45 17:18	07:23 17:53	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:51	06:05 20:53	06:31 20:28	06:59 19:42	07:28 18:54	07:01 17:14	07:33 17:00
11	07:44 17:19	07:22 17:55	06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13	07:34 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:52	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:35 17:00
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 17:00
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:07 20:52	06:34 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:36 17:00
15	07:43 17:23	07:18 17:59	06:37 18:30	06:48 20:01	06:11 20:31	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:37 17:01
16	07:43 17:24	07:16 18:01	06:35 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:09	07:38 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:09 17:08	07:38 17:01
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:39 17:01
19	07:42 17:28	07:12 18:04	06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:12 17:06	07:39 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:40 17:02
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	06:05 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	07:14 17:05	07:41 17:03
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:36	07:15 17:04	07:41 17:03
23	07:39 17:32	07:07 18:09	06:24 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:14 20:46	06:43 20:10	07:12 19:21	07:41 18:35	07:16 17:04	07:42 17:04
24	07:39 17:33	07:06 18:10	06:23 18:39	06:35 20:10	06:03 20:39	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	07:42 18:33	07:17 17:03	07:42 17:04
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	06:44 17:32	07:18 17:03	07:43 17:05
26	07:37 17:36	07:03 18:12	06:19 18:41	06:32 20:12	06:02 20:40	05:58 20:56	06:17 20:43	06:46 20:06	07:14 19:16	06:45 17:31	07:19 17:02	07:43 17:05
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:15 19:14	06:46 17:30	07:20 17:02	07:43 17:06
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56	06:19 20:42	06:47 20:03	07:16 19:13	06:47 17:28	07:21 17:02	07:44 17:07
29	07:35 17:39		07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:01	07:17 19:11	06:48 17:27	07:22 17:01	07:44 17:07
30	07:34 17:41		07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	06:49 17:26	07:24 17:01	07:44 17:08
31	07:33 17:42		07:11 19:46		05:59 20:44		06:21 20:39	06:50 19:58		06:50 17:25		07:44 17:09
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F047 - D10

Assumptions for shadow calculations

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

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:25 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:26 17:00
3	07:45 17:12	07:31 17:45	06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:27 17:00
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:28 17:00
5	07:45 17:13	07:29 17:48	06:53 18:19	07:03 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:28 17:00
6	07:45 17:14	07:28 17:49	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:00
7	07:45 17:15	07:27 17:50	06:49 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58	06:58 17:17	07:30 17:00
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	06:18 20:24	05:56 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:17	07:25 17:52	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:32 17:00
10	07:45 17:18	07:23 17:53	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:51	06:05 20:53	06:31 20:28	06:59 19:42	07:28 18:54	07:01 17:14	07:33 17:00
11	07:44 17:19	07:22 17:55	06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13	07:34 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:52	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:35 17:00
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 17:00
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:07 20:52	06:34 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:36 17:00
15	07:43 17:23	07:18 17:59	06:37 18:30	06:48 20:01	06:11 20:31	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:37 17:01
16	07:43 17:24	07:16 18:01	06:35 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:09	07:38 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:09 17:08	07:38 17:01
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:39 17:01
19	07:42 17:28	07:12 18:04	06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:12 17:06	07:39 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:40 17:02
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	06:05 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	07:14 17:05	07:41 17:03
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:36	07:15 17:04	07:41 17:03
23	07:39 17:32	07:07 18:09	06:24 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:14 20:46	06:43 20:10	07:12 19:21	07:41 18:35	07:16 17:04	07:42 17:04
24	07:39 17:33	07:06 18:10	06:23 18:39	06:35 20:10	06:03 20:39	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	07:42 18:33	07:17 17:03	07:42 17:04
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	06:44 17:32	07:18 17:03	07:43 17:05
26	07:37 17:36	07:03 18:12	06:19 18:41	06:32 20:12	06:02 20:40	05:58 20:56	06:17 20:43	06:46 20:06	07:14 19:16	06:45 17:31	07:19 17:02	07:43 17:05
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:15 19:14	06:46 17:30	07:20 17:02	07:43 17:06
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29	07:35 17:39		07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:01	07:17 19:11	06:48 17:27	07:23 17:01	07:44 17:07
30	07:34 17:41		07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	06:49 17:26	07:24 17:01	07:44 17:08
31	07:33 17:42		07:11 19:46		05:59 20:44		06:21 20:39	06:50 19:58		06:50 17:25		07:44 17:09
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Total, worst case												

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F050 - A03

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:45 17:10	08:07 (AG02) 17:43	07:33 18:15	06:59 19:47	07:10 20:17	06:26 20:45	05:59 20:56	06:00 20:38	06:22 19:57	06:51 19:08	07:19 17:23	06:51 17:01	07:25 17:01
2	07:45 17:11	08:07 (AG02) 17:44	07:32 18:16	06:57 19:48	07:08 20:18	06:25 20:46	05:58 20:55	06:00 20:37	06:23 19:55	06:52 19:06	07:20 17:22	06:52 17:00	07:26 17:00
3	07:45 17:12	08:07 (AG02) 17:45	07:31 18:17	06:56 19:49	07:07 20:19	06:24 20:46	05:58 20:55	06:01 20:36	06:24 19:53	06:53 19:05	07:21 17:21	06:54 17:00	07:27 17:00
4	07:45 17:13	08:23 (AG02) 17:46	07:30 18:18	06:54 19:50	07:05 20:20	06:22 20:47	05:58 20:55	06:01 20:35	06:25 19:52	06:54 19:03	07:22 17:20	06:55 17:00	07:28 17:00
5	07:45 17:13	08:07 (AG02) 17:48	07:29 18:20	06:53 19:51	07:04 20:21	06:21 20:48	05:57 20:55	06:02 20:33	06:26 19:50	06:55 19:02	07:23 17:19	06:56 17:00	07:28 17:00
6	07:45 17:14	08:06 (AG02) 17:49	07:28 18:21	06:51 19:52	07:02 20:22	06:20 20:48	05:57 20:55	06:02 20:32	06:27 19:49	06:56 19:00	07:24 17:18	06:57 17:00	07:29 17:00
7	07:45 17:15	08:06 (AG02) 17:50	07:27 18:22	06:50 19:53	07:00 20:23	06:19 20:49	05:57 20:54	06:03 20:31	06:28 19:47	06:57 18:59	07:25 17:17	06:58 17:00	07:30 17:00
8	07:45 17:16	08:06 (AG02) 17:51	07:26 18:23	06:48 19:54	06:59 20:24	06:18 20:49	05:57 20:54	06:03 20:30	06:29 19:46	06:58 18:57	07:26 17:16	06:59 17:00	07:31 17:00
9	07:45 17:17	08:06 (AG02) 17:52	07:25 18:24	06:46 19:55	06:57 20:25	06:17 20:50	05:56 20:54	06:04 20:29	06:30 19:44	06:59 18:55	07:27 17:15	07:00 17:00	07:32 17:00
10	07:45 17:18	08:06 (AG02) 17:54	07:23 18:25	06:45 19:56	06:56 20:26	06:16 20:51	05:56 20:53	06:05 20:28	06:31 19:42	07:00 18:54	07:28 17:14	07:01 17:00	07:33 17:00
11	07:45 17:19	08:05 (AG02) 17:55	07:22 18:26	06:43 19:57	06:54 20:27	06:15 20:51	05:56 20:53	06:05 20:26	06:32 19:41	07:00 18:52	07:29 17:13	07:03 17:00	07:34 17:00
12	07:44 17:20	08:05 (AG02) 17:56	07:21 18:27	06:42 19:58	06:53 20:28	06:14 20:52	05:56 20:53	06:06 20:25	06:33 19:39	07:01 18:51	07:30 17:12	07:04 17:00	07:35 17:00
13	07:44 17:21	08:05 (AG02) 17:57	07:20 18:28	06:40 19:59	06:51 20:29	06:13 20:52	05:56 20:52	06:07 20:24	06:33 19:37	07:02 18:49	07:31 17:11	07:05 17:00	07:35 17:00
14	07:44 17:22	08:04 (AG02) 17:58	07:19 18:29	06:39 20:00	06:50 20:30	06:12 20:52	05:56 20:52	06:07 20:23	06:34 19:36	07:03 18:48	07:32 17:10	07:06 17:00	07:36 17:00
15	07:43 17:23	08:04 (AG02) 17:59	07:18 18:30	06:37 20:01	06:48 20:31	06:11 20:53	05:56 20:51	06:08 20:21	06:35 19:34	07:04 18:46	07:33 17:09	07:07 17:00	07:37 17:00
16	07:43 17:24	08:04 (AG02) 18:01	07:16 18:31	06:35 20:02	06:47 20:32	06:10 20:53	05:56 20:51	06:09 20:20	06:36 19:33	07:05 18:45	07:34 17:09	07:08 17:00	07:38 17:00
17	07:43 17:26	08:03 (AG02) 18:02	07:15 18:32	06:34 20:03	06:45 20:32	06:09 20:54	05:56 20:50	06:10 20:19	06:37 19:31	07:06 18:43	07:35 17:08	07:09 17:00	07:38 17:00
18	07:42 17:27	08:03 (AG02) 18:03	07:14 18:33	06:32 20:04	06:44 20:33	06:08 20:54	05:56 20:49	06:10 20:17	06:38 19:29	07:07 18:42	07:36 17:12	07:11 17:00	07:39 17:00
19	07:42 17:28	08:03 (AG02) 18:04	07:12 18:34	06:31 20:05	06:42 20:34	06:07 20:54	05:56 20:49	06:11 20:16	06:39 19:28	07:08 18:40	07:37 17:12	07:12 17:00	07:40 17:00
20	07:41 17:29	08:04 (AG02) 18:05	07:11 18:35	06:29 20:06	06:41 20:35	06:06 20:55	05:56 20:48	06:12 20:14	06:40 19:26	07:09 18:39	07:38 17:06	07:13 17:00	07:41 17:00
21	07:41 17:30	08:04 (AG02) 18:06	07:10 18:36	06:27 20:07	06:39 20:36	06:06 20:55	05:56 20:47	06:13 20:13	06:41 19:24	07:10 18:38	07:39 17:05	07:14 17:00	07:42 17:00
22	07:40 17:31	08:06 (AG02) 18:07	07:08 18:37	06:26 20:08	06:38 20:37	06:05 20:55	05:57 20:47	06:14 20:12	06:42 19:23	07:11 18:36	07:40 17:15	07:15 17:00	07:41 17:00
23	07:39 17:32	08:08 (AG02) 18:09	07:07 18:38	06:24 20:09	06:37 20:38	06:04 20:55	05:57 20:46	06:14 20:10	06:43 19:21	07:12 18:35	07:41 17:16	07:16 17:00	07:42 17:00
24	07:39 17:33	08:09 (AG02) 18:10	07:06 18:39	06:23 20:10	06:35 20:39	06:03 20:55	05:57 20:45	06:15 20:09	06:44 19:19	07:13 18:34	07:43 17:17	07:17 17:00	07:44 17:00
25	07:38 17:35	08:11 (AG02) 18:11	07:04 18:40	06:21 20:11	06:34 20:39	06:03 20:55	05:57 20:44	06:16 20:07	06:45 19:18	07:13 18:32	07:44 17:18	07:18 17:00	07:45 17:00
26	07:37 17:36	08:13 (AG02) 18:12	07:03 18:41	06:19 20:12	06:33 20:40	06:02 20:56	05:58 20:43	06:17 20:06	06:46 19:16	07:14 18:31	07:45 17:19	07:19 17:00	07:46 17:00
27	07:37 17:37	08:20 (AG02) 18:13	07:01 18:42	06:18 20:13	06:31 20:41	06:01 20:56	05:58 20:43	06:18 20:04	06:47 19:15	07:15 18:30	07:46 17:20	07:20 17:00	07:47 17:00
28	07:36 17:38	08:26 (AG02) 18:14	07:00 18:43	06:16 20:14	06:30 20:42	06:01 20:56	05:58 20:42	06:19 20:03	06:47 19:13	07:16 18:29	07:47 17:21	07:21 17:00	07:48 17:00
29	07:35 17:39	08:27 (AG02) 18:15	06:59 19:44	06:15 20:15	06:29 20:43	06:00 20:56	05:59 20:41	06:20 20:01	06:48 19:11	07:17 18:27	07:48 17:22	07:22 17:00	07:49 17:00
30	07:34 17:41	08:28 (AG02) 18:16	06:58 19:45	06:14 20:16	06:28 20:43	06:00 20:56	05:59 20:40	06:21 20:00	06:49 19:10	07:18 18:26	07:49 17:23	07:23 17:00	07:50 17:00
31	07:34 17:42	08:29 (AG02) 18:17	06:57 19:46	06:13 20:17	06:27 20:44	06:00 20:57	05:59 20:39	06:22 19:58	06:50 19:09	07:19 18:25	07:50 17:24	07:24 17:00	07:51 17:00
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	306	292
Total, worst case	499												449

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F054 - A02

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:59 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:12 (AG02) 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:14 (AG02) 17:00
3	07:45 17:12	07:31 17:45	06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:15 (AG02) 17:00
4	07:45 17:13	07:30 17:47	07:49 (AG02) 07:50 (AG02)	06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	07:16 (AG02) 17:00
5	07:45 17:13	07:29 17:48	07:48 (AG02) 07:52 (AG02)	06:53 18:20	07:04 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:34	06:55 19:50	07:23 19:02	07:17 (AG02) 17:00
6	07:45 17:14	07:28 17:49	07:47 (AG02) 07:54 (AG02)	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	07:18 (AG02) 17:00
7	07:45 17:15	07:27 17:50	07:46 (AG02) 07:55 (AG02)	06:50 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	07:20 (AG02) 17:00
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9	07:45 17:17	07:25 17:52	07:44 (AG02) 07:57 (AG02)	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:20 (AG02) 17:00
10	07:45 17:18	07:23 17:54	07:43 (AG02) 07:57 (AG02)	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:51	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:20 (AG02) 17:00
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12	07:44 17:20	07:21 17:56	07:40 (AG02) 07:57 (AG02)	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:52	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:18 (AG02) 17:00
13	07:44 17:21	07:20 17:57	07:39 (AG02) 07:57 (AG02)	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:17 (AG02) 17:00
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15	07:43 17:23	07:18 17:59	07:37 (AG02) 07:57 (AG02)	06:37 18:30	06:48 20:01	06:11 20:31	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:15 (AG02) 17:00
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17	07:43 17:26	07:15 18:02	07:35 (AG02) 07:56 (AG02)	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:13 (AG02) 17:00
18	07:42 17:27	07:14 18:03	07:36 (AG02) 07:54 (AG02)	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:12 (AG02) 17:00
19	07:42 17:28	07:12 18:04	07:37 (AG02) 07:52 (AG02)	06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:11 (AG02) 17:00
20	07:41 17:29	07:11 18:05	07:40 (AG02) 07:50 (AG02)	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:10 (AG02) 17:00
21	07:41 17:30	07:10 18:06	07:40 (AG02) 07:50 (AG02)	06:28 18:36	06:40 20:07	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	07:09 (AG02) 17:00
22	07:40 17:31	07:08 18:07	07:39 (AG02) 07:50 (AG02)	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:36	07:08 (AG02) 17:00
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24	07:39 17:34	07:06 18:10	07:37 (AG02) 07:50 (AG02)	06:23 18:39	06:35 20:10	06:03 20:39	05:57 20:55	06:15 20:45	06:44 20:09	07:13 19:19	07:43 18:34	07:06 (AG02) 17:00
25	07:38 17:35	07:04 18:11	07:36 (AG02) 07:50 (AG02)	06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	07:44 18:32	07:05 (AG02) 17:00
26	07:37 17:36	07:03 18:12	07:35 (AG02) 07:50 (AG02)	06:19 18:41	06:33 20:12	06:02 20:40	05:58 20:56	06:17 20:43	06:46 20:06	07:14 19:16	07:45 18:31	07:04 (AG02) 17:00
27	07:37 17:37	07:01 18:13	07:34 (AG02) 07:50 (AG02)	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:15 19:15	07:46 18:30	07:03 (AG02) 17:00
28	07:36 17:38	07:00 18:14	07:33 (AG02) 07:50 (AG02)	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56	06:19 20:42	06:47 20:03	07:16 19:13	07:47 18:28	07:02 (AG02) 17:00
29	07:35 17:39	07:00 18:15	07:32 (AG02) 07:50 (AG02)	07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:01	07:17 19:11	07:48 18:27	07:01 (AG02) 17:00
30	07:34 17:41	07:00 18:16	07:31 (AG02) 07:50 (AG02)	07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	07:49 18:26	07:00 (AG02) 17:00
31	07:34 17:42	07:00 18:17	07:30 (AG02) 07:50 (AG02)	07:11 19:46	06:26 20:17	05:59 20:44	05:59 20:56	06:21 20:39	06:50 19:58	07:19 19:09	07:50 18:25	06:59 (AG02) 17:00
Potential sun hours	301	299	233	370	397	445	448	455	425	374	347	176
Total, worst case												57

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F055 - A03

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:59 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:12 (AG02) 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:14 (AG02) 17:00
3	07:45 17:12	07:31 17:45	06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:17 (AG02) 17:00
4	07:45 17:13	07:30 17:47	06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:18 (AG02) 17:00
5	07:45 17:13	07:29 17:48	06:53 18:20	07:04 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:34	06:55 19:50	07:23 19:02	06:56 17:19	07:19 (AG02) 17:00
6	07:45 17:14	07:28 17:49	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:20 (AG02) 17:00
7	07:45 17:15	07:27 17:50	06:50 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:21 (AG02) 17:00
8	07:45 17:16	07:26 17:51	07:45 (AG02) 07:46 (AG02)	06:48 18:23	06:59 19:54	06:18 20:24	06:03 20:49	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:22 (AG02) 17:00
9	07:45 17:17	07:25 17:52	07:44 (AG02) 07:48 (AG02)	06:46 18:24	06:57 19:55	06:17 20:25	06:04 20:50	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:23 (AG02) 17:00
10	07:45 17:18	07:23 17:54	07:43 (AG02) 07:49 (AG02)	06:45 18:25	06:56 19:56	06:16 20:26	06:05 20:51	06:31 20:28	07:00 19:42	07:28 18:54	07:02 17:14	07:24 (AG02) 17:00
11	07:45 17:19	07:22 17:55	07:41 (AG02) 07:50 (AG02)	06:43 18:26	06:54 19:57	06:15 20:27	06:05 20:51	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13	07:25 (AG02) 17:00
12	07:44 17:20	07:21 17:56	07:40 (AG02) 07:51 (AG02)	06:42 18:27	06:53 19:58	06:14 20:28	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:26 (AG02) 17:00
13	07:44 17:21	07:20 17:57	07:39 (AG02) 07:52 (AG02)	06:40 18:28	06:51 19:59	06:13 20:29	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:27 (AG02) 17:00
14	07:44 17:22	07:19 17:58	07:38 (AG02) 07:53 (AG02)	06:39 18:29	06:50 20:00	06:12 20:30	06:07 20:52	06:34 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:28 (AG02) 17:00
15	07:43 17:23	07:18 17:59	07:37 (AG02) 07:54 (AG02)	06:37 18:30	06:48 20:01	06:11 20:31	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:29 (AG02) 17:00
16	07:43 17:24	07:16 18:01	07:35 (AG02) 07:52 (AG02)	06:35 18:31	06:47 20:02	06:10 20:32	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:30 (AG02) 17:00
17	07:43 17:26	07:15 18:02	07:34 (AG02) 07:52 (AG02)	06:34 18:32	06:45 20:03	06:09 20:32	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:09 17:08	07:31 (AG02) 17:00
18	07:42 17:27	07:14 18:03	07:33 (AG02) 07:51 (AG02)	06:32 18:33	06:44 20:04	06:08 20:33	06:10 20:54	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:32 (AG02) 17:00
19	07:42 17:28	07:12 18:04	07:31 (AG02) 07:50 (AG02)	06:31 18:34	06:42 20:05	06:07 20:34	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:12 17:06	07:33 (AG02) 17:00
20	07:41 17:29	07:11 18:05	07:30 (AG02) 07:50 (AG02)	06:29 18:35	06:41 20:06	06:06 20:35	06:12 20:55	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:34 (AG02) 17:00
21	07:41 17:30	07:10 18:06	07:29 (AG02) 07:50 (AG02)	06:28 18:36	06:39 20:07	06:06 20:36	06:13 20:55	06:41 20:13	07:10 19:24	07:39 18:38	07:14 17:05	07:35 (AG02) 17:00
22	07:40 17:31	07:08 18:07	07:28 (AG02) 07:47 (AG02)	06:26 18:37	06:38 20:08	06:05 20:37	06:14 20:57	06:42 20:12	07:11 19:23	07:40 18:36	07:15 17:05	07:36 (AG02) 17:00
23	07:40 17:32	07:07 18:09	07:27 (AG02) 07:46 (AG02)	06:24 18:38	06:37 20:09	06:04 20:38	06:14 20:55	06:43 20:10	07:12 19:21	07:41 18:35	07:16 17:04	07:37 (AG02) 17:00
24	07:39 17:34	07:06 18:10	07:26 (AG02) 07:45 (AG02)	06:23 18:39	06:35 20:10	06:03 20:39	06:15 20:55	06:44 20:09	07:13 19:13	07:43 18:34	07:17 17:03	07:38 (AG02) 17:00
25	07:38 17:35	07:04 18:11	07:24 (AG02) 07:44 (AG02)	06:21 18:40	06:34 20:11	06:03 20:39	06:16 20:55	06:45 20:07	07:13 19:18	07:44 18:32	07:18 17:03	07:39 (AG02) 17:00
26	07:37 17:36	07:03 18:12	07:23 (AG02) 07:43 (AG02)	06:19 18:41	06:33 20:12	06:02 20:40	06:17 20:56	06:46 20:06	07:14 19:16	07:45 18:31	07:19 17:02	07:40 (AG02) 17:00
27	07:37 17:37	07:01 18:13	07:22 (AG02) 07:42 (AG02)	06:18 18:42	06:31 20:13	06:01 20:41	06:18 20:56	06:47 20:04	07:15 19:15	07:46 18:30	07:20 17:02	07:41 (AG02) 17:00
28	07:36 17:38	07:00 18:14	07:21 (AG02) 07:41 (AG02)	06:16 18:43	06:30 20:14	06:01 20:42	06:19 20:56	06:47 20:03	07:16 19:13	07:47 18:28	07:22 17:02	07:42 (AG02) 17:00
29	07:35 17:39		07:20 (AG02) 07:40 (AG02)	07:15 19:44	06:29 20:15	06:00 20:43	06:20 20:56	06:48 20:01	07:17 19:11	07:48 18:27	07:23 17:01	07:43 (AG02) 17:00
30	07:34 17:41		07:19 (AG02) 07:39 (AG02)	07:13 19:45	06:27 20:16	06:00 20:43	06:21 20:56	06:49 20:00	07:18 19:10	07:49 18:26	07:24 17:01	07:44 (AG02) 17:00
31	07:34 17:42		07:18 (AG02) 07:38 (AG02)	07:11 19:46	06:26 20:17	05:59 20:44	06:21 20:59	06:50 19:58	07:19 18:25	07:50 17:25	07:25 17:02	07:45 (AG02) 17:00
Potential sun hours	301	299		370	397	445	448	455	425	374	347	212
Total, worst case		219									301	9

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

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

SHADOW - Calendar

Calculation: Progetto_layout_20230710Shadow receptor: F069 - A02

Assumptions for shadow calculations

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

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

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

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

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

SHADOW - Calendar

Calculation: Progetto_layout_20230710Shadow receptor: F076 - campeggio camper

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	07:45 17:10	07:33 17:43	06:59 18:15	07:33 (AG06) 08:16 (AG06)	07:10 19:47	07:28 (AG05) 20:17
2	07:45 17:11	07:32 17:44	06:57 18:16	07:32 (AG06) 08:17 (AG06)	07:08 19:48	07:26 (AG05) 20:18
3	07:45 17:12	07:31 17:45	06:56 18:17	07:31 (AG06) 08:17 (AG06)	07:07 19:49	07:25 (AG05) 20:19
4	07:45 17:13	07:30 17:47	06:54 18:19	07:31 (AG06) 08:18 (AG06)	07:05 19:50	07:24 (AG05) 20:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:30 (AG06) 08:18 (AG06)	07:04 19:51	07:25 (AG05) 20:21
6	07:45 17:14	07:28 17:49	06:51 18:21	07:29 (AG06) 08:18 (AG06)	07:02 19:52	07:24 (AG05) 20:22
7	07:45 17:15	07:27 17:50	06:50 18:22	07:28 (AG06) 08:18 (AG06)	07:00 19:53	07:25 (AG05) 20:23
8	07:45 17:16	07:26 17:51	06:48 18:23	07:28 (AG06) 08:17 (AG06)	06:59 19:54	07:26 (AG05) 20:24
9	07:45 17:17	07:25 17:53	06:46 18:24	07:28 (AG06) 08:18 (AG06)	06:57 19:55	07:26 (AG05) 20:25
10	07:45 17:18	07:23 17:54	06:45 18:25	07:27 (AG06) 08:17 (AG06)	06:56 19:56	07:29 (AG05) 20:26
11	07:44 17:19	07:22 17:55	06:43 18:26	07:28 (AG06) 08:17 (AG06)	06:54 19:57	07:36 (AG05) 20:27
12	07:44 17:20	07:21 17:56	06:42 18:27	07:27 (AG06) 08:16 (AG06)	06:53 19:58	06:14 20:28
13	07:44 17:21	07:20 17:57	06:40 18:28	07:28 (AG06) 08:16 (AG06)	06:51 19:59	06:13 20:29
14	07:44 17:22	07:19 17:58	06:39 18:29	07:27 (AG06) 08:15 (AG06)	06:50 20:00	06:12 20:30
15	07:43 17:23	07:18 18:00	06:37 18:30	07:27 (AG06) 08:14 (AG06)	06:48 20:01	06:11 20:31
16	07:43 17:25	07:16 18:01	06:36 18:31	07:28 (AG06) 08:13 (AG06)	06:47 20:02	06:10 20:31
17	07:43 17:26	07:15 18:02	06:34 18:32	07:28 (AG06) 08:11 (AG06)	06:45 20:03	06:09 20:32
18	07:42 17:27	07:14 18:03	06:32 18:33	07:33 (AG08) 08:11 (AG06)	06:44 20:04	06:08 20:33
19	07:42 17:28	07:12 18:04	06:31 18:34	07:31 (AG08) 08:09 (AG06)	06:42 20:05	06:07 20:34
20	07:41 17:29	07:11 18:05	06:29 18:35	07:30 (AG08) 08:07 (AG06)	06:41 20:06	06:06 20:35
21	07:41 17:30	07:10 18:06	06:28 18:36	07:29 (AG08) 08:05 (AG06)	06:40 20:07	06:06 20:36
22	07:40 17:31	07:08 18:08	06:26 18:37	07:27 (AG08) 08:03 (AG06)	06:38 20:08	06:05 20:37
23	07:39 17:32	07:07 18:09	06:24 18:38	07:26 (AG08) 08:01 (AG06)	06:37 20:09	06:04 20:38
24	07:39 17:34	07:06 18:10	06:23 18:39	07:24 (AG08) 08:09 (AG06)	06:35 20:10	06:03 20:39
25	07:38 17:35	07:04 18:11	06:21 18:40	07:26 (AG08) 08:11 (AG06)	06:34 20:11	06:03 20:39
26	07:37 17:36	07:03 18:12	06:20 18:41	07:28 (AG08) 08:13 (AG06)	06:33 20:12	06:02 20:40
27	07:37 17:37	07:01 18:13	06:18 18:42	07:36 (AG06) 08:14 (AG06)	06:31 20:13	06:02 20:41
28	07:36 17:38	07:00 18:14	06:16 18:43	07:35 (AG06) 08:16 (AG06)	06:30 20:14	06:01 20:42
29	07:35 17:39		07:15 19:44	07:33 (AG05) 07:40 (AG05)	06:29 20:15	06:00 20:43
30	07:34 17:41		07:13 19:45	07:31 (AG05) 07:42 (AG05)	06:27 20:16	06:00 20:43
31	07:34 17:42		07:12 19:46	07:30 (AG05) 07:44 (AG05)		05:59 20:44
Potential sun hours	301	299	370	397	444	448
Total, worst case		367	1072	164		

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F076 - campeggio camper

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	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	08:07 (AG06) 08:55 (AG06)	06:51 17:24	07:25 17:01	
2	06:00 20:55	06:23 20:37	06:52 19:55	07:27 (AG05) 07:34 (AG05)	07:20 19:06	08:06 (AG06) 08:56 (AG06)	06:52 17:22	07:26 17:01
3	06:01 20:55	06:24 20:36	06:53 19:53	07:24 (AG05) 07:36 (AG05)	07:21 19:05	08:06 (AG06) 08:55 (AG06)	06:54 17:21	07:27 17:00
4	06:01 20:55	06:25 20:35	06:54 19:52	07:23 (AG05) 07:38 (AG05)	07:22 19:03	08:05 (AG06) 08:55 (AG06)	06:55 17:20	07:28 17:00
5	06:02 20:55	06:26 20:33	06:55 19:50	07:21 (AG05) 07:39 (AG05)	07:23 19:02	08:05 (AG06) 08:55 (AG06)	06:56 17:19	07:28 17:00
6	06:02 20:55	06:27 20:32	06:56 19:49	07:20 (AG05) 07:39 (AG05)	07:24 19:00	08:05 (AG06) 08:55 (AG06)	06:57 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 19:47	07:20 (AG05) 07:39 (AG05)	07:25 18:59	08:05 (AG06) 08:54 (AG06)	06:58 17:17	07:30 17:00
8	06:04 20:54	06:29 20:30	06:58 19:46	07:19 (AG05) 07:39 (AG05)	07:26 18:57	08:05 (AG06) 08:54 (AG06)	06:59 17:16	07:31 17:00
9	06:04 20:54	06:30 20:29	06:59 19:44	07:19 (AG05) 07:39 (AG05)	07:27 18:55	08:05 (AG06) 08:53 (AG06)	07:00 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	07:20 (AG05) 07:38 (AG05)	07:28 18:54	08:05 (AG06) 08:52 (AG06)	07:02 17:14	07:33 17:00
11	06:05 20:53	06:32 20:26	07:01 19:41	07:20 (AG05) 07:36 (AG05)	07:29 18:52	08:06 (AG06) 08:51 (AG06)	07:03 17:13	07:34 17:00
12	06:06 20:53	06:33 20:25	07:01 19:39	07:21 (AG05) 07:35 (AG05)	07:30 18:51	08:06 (AG06) 08:50 (AG06)	07:04 17:12	07:35 17:00
13	06:07 20:52	06:34 20:24	07:02 19:37	07:22 (AG05) 07:34 (AG05)	07:31 18:49	08:07 (AG06) 08:49 (AG06)	07:05 17:11	07:35 17:00
14	06:08 20:52	06:34 20:23	07:03 19:36	07:23 (AG05) 07:31 (AG05)	07:32 18:48	08:08 (AG06) 08:48 (AG06)	07:06 17:10	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	07:23 (AG05) 07:33 (AG05)	07:33 18:46	08:08 (AG06) 08:46 (AG06)	07:07 17:09	07:37 17:01
16	06:09 20:51	06:36 20:20	07:05 19:33	07:24 (AG05) 07:34 (AG05)	07:34 18:45	08:09 (AG06) 08:44 (AG06)	07:08 17:09	07:38 17:01
17	06:10 20:50	06:37 20:19	07:06 19:31	07:25 (AG05) 07:35 (AG05)	07:35 18:43	08:10 (AG06) 08:42 (AG06)	07:09 17:08	07:39 17:01
18	06:11 20:49	06:38 20:17	07:07 19:29	07:26 (AG05) 08:33 (AG06)	07:36 18:42	08:11 (AG06) 08:40 (AG06)	07:11 17:07	07:40 17:02
19	06:11 20:49	06:39 20:16	07:08 19:28	07:27 (AG05) 08:34 (AG06)	07:37 18:41	08:12 (AG06) 08:37 (AG06)	07:12 17:06	07:41 17:02
20	06:12 20:48	06:40 20:14	07:09 19:26	07:28 (AG05) 08:35 (AG06)	07:38 18:39	08:13 (AG06) 08:33 (AG06)	07:13 17:06	07:42 17:02
21	06:13 20:47	06:41 20:13	07:10 19:24	07:29 (AG05) 08:36 (AG06)	07:39 18:38	08:14 (AG06) 08:15 (AG08)	07:14 17:05	07:43 17:03
22	06:14 20:47	06:42 20:12	07:11 19:23	07:30 (AG05) 08:37 (AG06)	07:40 18:36	08:15 (AG06) 08:15 (AG08)	07:15 17:05	07:44 17:03
23	06:15 20:46	06:43 20:10	07:12 19:21	07:31 (AG05) 08:38 (AG06)	07:41 18:35	08:16 (AG06) 08:14 (AG08)	07:16 17:04	07:45 17:04
24	06:15 20:45	06:44 20:09	07:13 19:19	07:32 (AG05) 08:39 (AG06)	07:42 18:34	08:17 (AG06) 08:14 (AG08)	07:17 17:04	07:46 17:04
25	06:16 20:44	06:45 20:07	07:14 19:18	07:33 (AG05) 08:40 (AG06)	07:43 18:33	08:18 (AG06) 07:04 (AG08)	07:18 17:03	07:47 17:05
26	06:17 20:43	06:46 20:06	07:15 19:16	07:34 (AG05) 08:41 (AG06)	07:44 18:32	08:19 (AG06) 07:05 (AG08)	07:19 17:03	07:48 17:06
27	06:18 20:43	06:47 20:04	07:16 19:15	07:35 (AG05) 08:42 (AG06)	07:45 18:31	08:20 (AG06) 07:06 (AG08)	07:20 17:02	07:49 17:06
28	06:19 20:42	06:48 20:03	07:17 19:13	07:36 (AG05) 08:43 (AG06)	07:46 18:30	08:21 (AG06) 07:07 (AG08)	07:21 17:02	07:50 17:07
29	06:20 20:41	06:49 20:01	07:18 19:11	07:37 (AG05) 08:44 (AG06)	07:47 18:29	08:22 (AG06) 07:08 (AG08)	07:22 17:01	07:51 17:08
30	06:21 20:40	06:49 20:00	07:18 19:10	07:38 (AG05) 08:45 (AG06)	07:48 18:28	08:23 (AG06) 07:09 (AG08)	07:23 17:01	07:52 17:08
31	06:22 20:39	06:50 19:58		07:39 (AG05) 08:46 (AG06)	07:49 18:27	08:24 (AG06) 07:10 (AG08)	07:24 17:01	07:53 17:09
Potential sun hours	455	425	374	347	347	301	292	
Total, worst case			646		981			

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F099 - A03

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

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F100 - A03

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

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F123 - A07

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	07:45 17:10	07:33 17:43	07:52 (AG08) 08:55 (AG06)	06:59 18:15	07:10 19:47	06:26 20:17	05:59 20:45		
2	07:45 17:11	07:32 17:44	07:51 (AG08) 08:56 (AG06)	06:57 18:16	07:08 19:48	06:25 20:18	05:59 20:46		
3	07:45 17:12	07:31 17:45	07:50 (AG08) 08:56 (AG06)	06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46		
4	07:45 17:13	07:30 17:47	07:49 (AG08) 08:56 (AG06)	06:54 18:19	07:05 19:50	06:22 20:20	05:58 20:47		
5	07:45 17:14	07:29 17:48	07:48 (AG08) 08:57 (AG06)	06:53 18:20	07:04 19:51	06:21 20:21	05:57 20:48		
6	07:45 17:14	07:28 17:49	07:47 (AG08) 08:57 (AG06)	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48		
7	07:45 17:15	07:27 17:50	07:46 (AG08) 08:57 (AG06)	06:50 18:22	07:00 19:53	06:19 20:23	05:57 20:49		
8	07:45 17:16	07:26 17:51	07:45 (AG08) 08:58 (AG06)	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49		
9	07:45 17:17	07:25 17:53	07:44 (AG08) 08:58 (AG06)	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50		
10	07:45 17:18	07:23 17:54	07:43 (AG08) 08:58 (AG06)	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:51		
11	07:44 17:19	07:22 17:55	07:41 (AG08) 08:57 (AG06)	06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51		
12	07:44 17:20	07:21 17:56	07:40 (AG08) 08:57 (AG06)	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:52		
13	07:44 17:21	07:20 17:57	07:40 (AG08) 08:57 (AG06)	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52		
14	07:44 17:22	07:19 17:58	07:43 (AG08) 08:57 (AG06)	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52		
15	07:43 17:23	08:23 (AG06) 08:28 (AG06)	07:18 18:00	08:07 (AG06) 08:56 (AG06)	06:37 18:30	06:48 20:01	06:11 20:31	05:56 20:53	
16	07:43 17:25	08:20 (AG06) 08:34 (AG06)	07:16 18:01	08:06 (AG06) 08:55 (AG06)	06:36 18:31	06:47 20:02	06:10 20:31	05:56 20:53	
17	07:43 17:26	08:17 (AG06) 08:36 (AG06)	07:15 18:02	08:07 (AG06) 08:54 (AG06)	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	
18	07:42 17:27	08:16 (AG06) 08:39 (AG06)	07:14 18:03	08:08 (AG06) 08:54 (AG06)	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	
19	07:42 17:28	08:14 (AG06) 08:40 (AG06)	07:12 18:04	08:08 (AG06) 08:52 (AG06)	06:31 18:34	06:49 (AG05) 06:55 (AG05)	06:42 20:05	06:07 20:34	05:56 20:54
20	07:41 17:29	08:12 (AG06) 08:42 (AG06)	07:11 18:05	08:10 (AG06) 08:51 (AG06)	06:29 18:35	06:47 (AG05) 06:56 (AG05)	06:41 20:06	06:06 20:35	05:56 20:55
21	07:41 17:30	08:12 (AG06) 08:44 (AG06)	07:10 18:06	08:11 (AG06) 08:50 (AG06)	06:28 18:36	06:46 (AG05) 06:58 (AG05)	06:40 20:07	06:06 20:36	05:56 20:55
22	07:40 17:31	08:11 (AG06) 08:45 (AG06)	07:08 18:08	08:12 (AG06) 08:48 (AG06)	06:26 18:37	06:44 (AG05) 06:59 (AG05)	06:38 20:08	06:05 20:37	05:57 20:55
23	07:39 17:32	08:10 (AG06) 08:47 (AG06)	07:07 18:09	08:14 (AG06) 08:47 (AG06)	06:24 18:38	06:43 (AG05) 07:00 (AG05)	06:37 20:09	06:04 20:38	05:57 20:55
24	07:39 17:34	08:09 (AG06) 08:48 (AG06)	07:06 18:10	08:15 (AG06) 08:44 (AG06)	06:23 18:39	06:41 (AG05) 06:59 (AG05)	06:35 20:10	06:03 20:39	05:57 20:55
25	07:38 17:35	08:08 (AG06) 08:49 (AG06)	07:04 18:11	08:18 (AG06) 08:42 (AG06)	06:21 18:40	06:39 (AG05) 06:59 (AG05)	06:34 20:11	06:03 20:39	05:57 20:55
26	07:37 17:36	08:08 (AG06) 08:50 (AG06)	07:03 18:12	08:21 (AG06) 08:38 (AG06)	06:20 18:41	06:39 (AG05) 06:59 (AG05)	06:33 20:12	06:02 20:40	05:58 20:56
27	07:37 17:37	08:08 (AG06) 08:52 (AG06)	07:01 18:13	08:28 (AG06) 08:30 (AG06)	06:18 18:42	06:38 (AG05) 06:58 (AG05)	06:31 20:13	06:02 20:41	05:58 20:56
28	07:36 17:38	08:07 (AG06) 08:52 (AG06)	07:00 18:14		06:16 18:43	06:38 (AG05) 06:57 (AG05)	06:30 20:14	06:01 20:42	05:58 20:56
29	07:35 17:39	08:07 (AG06) 08:53 (AG06)			07:15 19:44	07:39 (AG05) 07:56 (AG05)	06:29 20:15	06:00 20:43	05:59 20:56
30	07:34 17:41	08:06 (AG06) 08:54 (AG06)			07:13 19:45	07:40 (AG05) 07:54 (AG05)	06:27 20:16	06:00 20:43	05:59 20:56
31	07:34 17:42	08:06 (AG06) 08:54 (AG06)			07:12 19:46	07:43 (AG05) 07:52 (AG05)	05:59 20:44		
Potential sun hours	301	299	370	397	444	448			
Total, worst case	573	1336	196						

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F123 - A07

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	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:24	07:12 (AG08) 08:27 (AG06)	07:25 17:01
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:14 (AG08) 08:28 (AG06)	07:26 17:01
3	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:15 (AG08) 08:27 (AG06)	07:27 17:00
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:16 (AG08) 08:27 (AG06)	07:28 17:00
5	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:17 (AG08) 08:27 (AG06)	07:28 17:00
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:18 (AG08) 08:27 (AG06)	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:20 (AG08) 08:27 (AG06)	07:30 17:00
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:21 (AG08) 08:27 (AG06)	07:31 17:00
9	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:22 (AG08) 08:26 (AG06)	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:02 17:14	07:23 (AG08) 08:26 (AG06)	07:33 17:00
11	06:05 20:53	06:32 20:26	07:01 19:41	07:29 18:52	07:03 17:13	07:37 (AG06) 08:25 (AG06)	07:34 17:00
12	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:38 (AG06) 08:26 (AG06)	07:35 17:00
13	06:07 20:52	06:34 20:24	07:02 19:37	07:32 (AG05) 07:45 (AG05)	07:31 18:49	07:39 (AG06) 08:25 (AG06)	07:35 17:00
14	06:08 20:52	06:34 20:23	07:03 19:36	07:30 (AG05) 07:46 (AG05)	07:32 18:48	07:39 (AG06) 08:24 (AG06)	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	07:28 (AG05) 07:47 (AG05)	07:33 18:46	08:56 (AG06) 09:07 (AG06)	07:37 17:01
16	06:09 20:51	06:36 20:20	07:05 19:33	07:28 (AG05) 07:47 (AG05)	07:34 18:45	08:51 (AG06) 09:11 (AG06)	07:38 17:01
17	06:10 20:50	06:37 20:19	07:06 19:31	07:27 (AG05) 07:47 (AG05)	07:35 18:43	08:48 (AG06) 09:14 (AG06)	07:38 17:01
18	06:11 20:49	06:38 20:17	07:07 19:29	07:27 (AG05) 07:47 (AG05)	07:36 18:42	08:46 (AG06) 09:16 (AG06)	07:39 17:02
19	06:11 20:49	06:39 20:16	07:08 19:28	07:28 (AG05) 07:47 (AG05)	07:37 18:41	08:44 (AG06) 09:18 (AG06)	07:39 17:02
20	06:12 20:48	06:40 20:14	07:09 19:26	07:28 (AG05) 07:45 (AG05)	07:38 18:39	08:42 (AG06) 09:19 (AG06)	07:40 17:02
21	06:13 20:47	06:41 20:13	07:10 19:24	07:29 (AG05) 07:44 (AG05)	07:39 18:38	08:41 (AG06) 09:21 (AG06)	07:41 17:03
22	06:14 20:47	06:42 20:12	07:11 19:23	07:30 (AG05) 07:43 (AG05)	07:40 18:36	08:40 (AG06) 09:22 (AG06)	07:41 17:03
23	06:15 20:46	06:43 20:10	07:12 19:21	07:31 (AG05) 07:41 (AG05)	07:41 18:35	08:39 (AG06) 09:23 (AG06)	07:42 17:04
24	06:15 20:45	06:44 20:09	07:13 19:19	07:32 (AG05) 07:39 (AG05)	07:43 18:34	08:38 (AG06) 09:24 (AG06)	07:42 17:04
25	06:16 20:44	06:45 20:07	07:14 19:18	07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:37 (AG06) 09:24 (AG06)	07:43 17:05
26	06:17 20:43	06:46 20:06	07:14 19:16	07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:36 (AG06) 09:24 (AG06)	07:43 17:05
27	06:18 20:43	06:47 20:04	07:15 19:15	07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:35 (AG06) 09:24 (AG06)	07:43 17:05
28	06:19 20:42	06:48 20:03	07:16 19:13	07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:34 (AG06) 09:24 (AG06)	07:43 17:05
29	06:20 20:41	06:48 20:01	07:17 19:11	07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:33 (AG06) 09:24 (AG06)	07:43 17:05
30	06:21 20:40	06:49 20:00	07:18 19:10	07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:32 (AG06) 09:24 (AG06)	07:43 17:05
31	06:22 20:39	06:50 19:58		07:32 (AG05) 07:32 (AG05)	07:43 18:34	08:31 (AG06) 09:24 (AG06)	07:43 17:05
Potential sun hours	455	425	374	347	301	292	292
Total, worst case			196	746	1190		

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F126 - A04

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	07:45	07:33	06:58	16:41 (AG05)	07:10	08:06 (AG04)	06:26	05:59
	17:10	17:43	18:15	55 17:53 (AG06)	19:47	83 18:23 (AG05)	20:17	20:45
2	07:45	07:32	06:57	16:39 (AG05)	07:08	08:08 (AG04)	06:25	05:58
	17:11	17:44	18:16	59 17:53 (AG06)	19:48	77 18:22 (AG05)	20:18	20:45
3	07:45	07:31	06:55	16:36 (AG05)	07:07	08:13 (AG04)	06:24	05:58
	17:12	17:45	18:17	63 17:52 (AG06)	19:49	64 18:21 (AG05)	20:19	20:46
4	07:45	07:30	06:54	16:34 (AG05)	07:05	17:22 (AG05)	06:22	05:58
	17:13	17:46	18:18	65 17:51 (AG06)	19:50	58 18:20 (AG05)	20:20	20:47
5	07:45	07:29	06:52	16:32 (AG05)	07:03	17:24 (AG05)	06:21	05:57
	17:13	17:48	18:19	67 17:50 (AG06)	19:51	55 18:19 (AG05)	20:21	20:48
6	07:45	07:28	06:51	16:29 (AG05)	07:02	17:24 (AG05)	06:20	05:57
	17:14	17:49	18:21	66 17:47 (AG06)	19:52	53 18:17 (AG05)	20:22	20:48
7	07:45	07:27	06:49	16:28 (AG05)	07:00	17:25 (AG05)	06:19	05:57
	17:15	17:50	18:22	63 17:44 (AG06)	19:53	50 18:15 (AG05)	20:23	20:49
8	07:45	07:26	06:48	16:27 (AG05)	06:59	17:27 (AG05)	06:18	05:57
	17:16	17:51	18:23	59 17:26 (AG05)	19:54	47 18:14 (AG05)	20:24	20:49
9	07:45	07:25	06:46	16:26 (AG05)	06:57	17:28 (AG05)	06:17	05:56
	17:17	17:52	18:24	61 17:27 (AG05)	19:55	44 18:12 (AG05)	20:25	20:50
10	07:45	07:23	06:45	16:24 (AG05)	06:56	17:30 (AG05)	06:16	05:56
	17:18	17:54	18:25	63 17:27 (AG05)	19:56	40 18:10 (AG05)	20:26	20:50
11	07:44	07:22	06:43	16:24 (AG05)	06:54	17:32 (AG05)	06:15	05:56
	17:19	17:55	18:26	65 17:29 (AG05)	19:57	35 18:07 (AG05)	20:27	20:51
12	07:44	07:21	06:42	16:22 (AG05)	06:53	17:35 (AG05)	06:14	05:56
	17:20	17:56	18:27	67 17:29 (AG05)	19:58	30 18:05 (AG05)	20:28	20:51
13	07:44	07:20	06:40	16:22 (AG05)	06:51	17:37 (AG05)	06:13	05:56
	17:21	17:57	18:28	81 17:29 (AG05)	19:59	25 18:02 (AG05)	20:29	20:52
14	07:44	07:19	06:39	16:21 (AG04)	06:50	17:42 (AG05)	06:12	05:56
	17:22	17:58	18:29	88 17:30 (AG05)	20:00	16 17:58 (AG05)	20:30	20:52
15	07:43	07:17	06:37	16:20 (AG04)	06:48		06:11	05:56
	17:23	17:59	18:30	93 17:30 (AG05)	20:01		20:30	20:53
16	07:43	07:16	06:35	16:19 (AG04)	06:47		06:10	05:56
	17:24	18:01	18:31	96 17:30 (AG05)	20:02		20:31	20:53
17	07:43	07:15	06:34	16:18 (AG04)	06:45		06:09	05:56
	17:26	18:02	18:32	99 17:30 (AG05)	20:03		20:32	20:54
18	07:42	07:14	06:32	16:17 (AG04)	06:44		06:08	05:56
	17:27	18:03	18:33	103 17:30 (AG05)	20:04		20:33	20:54
19	07:42	07:12	06:31	16:16 (AG04)	06:42		06:07	05:56
	17:28	18:04	18:34	104 17:30 (AG05)	20:05		20:34	20:54
20	07:41	07:11	06:29	16:15 (AG04)	06:41		06:06	05:56
	17:29	18:05	18:35	105 17:30 (AG05)	20:06		20:35	20:54
21	07:41	07:10	06:27	16:14 (AG03)	06:39		06:06	05:56
	17:30	18:06	4 17:44 (AG06)	18:36	106 17:30 (AG05)	20:07	20:36	20:55
22	07:40	07:08	17:37 (AG06)	06:26	07:02 (AG04)	06:38	06:05	05:57
	17:31	18:07	9 17:46 (AG06)	18:37	108 17:30 (AG05)	20:08	20:37	20:55
23	07:39	07:07	17:35 (AG06)	06:24	07:02 (AG04)	06:37	06:04	05:57
	17:32	18:09	12 17:47 (AG06)	18:38	106 17:29 (AG05)	20:09	20:38	20:55
24	07:39	07:06	17:34 (AG06)	06:23	07:02 (AG04)	06:35	06:03	05:57
	17:33	18:10	14 17:48 (AG06)	18:39	105 17:29 (AG05)	20:10	20:38	20:55
25	07:38	07:04	17:33 (AG06)	06:21	07:01 (AG04)	06:34	06:03	05:57
	17:35	18:11	17 17:50 (AG06)	18:40	105 17:28 (AG05)	20:11	20:39	20:55
26	07:37	07:03	17:32 (AG06)	06:19	07:02 (AG04)	06:33	06:02	05:58
	17:36	18:12	18 17:50 (AG06)	18:41	103 17:28 (AG05)	20:12	20:40	20:55
27	07:37	07:01	16:50 (AG05)	06:18	07:02 (AG04)	06:31	06:01	05:58
	17:37	18:13	36 17:52 (AG06)	18:42	101 17:27 (AG05)	20:13	20:41	20:55
28	07:36	07:00	16:45 (AG05)	06:16	07:02 (AG04)	06:30	06:01	05:58
	17:38	18:14	47 17:53 (AG06)	18:43	98 17:26 (AG05)	20:14	20:42	20:56
29	07:35			07:15	08:03 (AG04)	06:29	06:00	05:59
	17:39			19:44	96 18:26 (AG05)	20:15	20:43	20:56
30	07:34			07:13	08:03 (AG04)	06:27	06:00	05:59
	17:41			19:45	93 18:25 (AG05)	20:16	20:43	20:55
31	07:33			07:11	08:05 (AG04)		05:59	
	17:42			19:46	89 18:25 (AG05)		20:44	
Potential sun hours	301	299		370	397		444	448
Total, worst case			157	2632	677			

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F126 - A04

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	06:00	06:22	06:51	17:31 (AG05)	07:19	07:59 (AG04)	06:51	07:24
	20:55	20:38	19:57	18:06 (AG05)	19:08	18:09 (AG05)	17:23	17:01
2	06:00	06:23	06:52	17:28 (AG05)	07:20	17:02 (AG05)	06:52	07:25
	20:55	20:37	19:55	18:08 (AG05)	19:06	18:08 (AG05)	17:22	17:00
3	06:01	06:24	06:53	17:26 (AG05)	07:21	17:02 (AG05)	06:53	07:26
	20:55	20:36	19:53	18:10 (AG05)	19:05	18:06 (AG05)	17:21	17:00
4	06:01	06:25	06:54	17:24 (AG05)	07:22	17:03 (AG05)	06:55	07:27
	20:55	20:34	19:52	18:11 (AG05)	19:03	18:05 (AG05)	17:20	17:00
5	06:02	06:26	06:55	17:22 (AG05)	07:23	17:04 (AG05)	06:56	07:28
	20:55	20:33	19:50	18:12 (AG05)	19:02	18:04 (AG05)	17:19	17:00
6	06:02	06:27	06:56	17:21 (AG05)	07:24	17:04 (AG05)	06:57	07:29
	20:55	20:32	19:49	18:13 (AG05)	19:00	18:02 (AG05)	17:18	17:00
7	06:03	06:28	06:57	17:19 (AG05)	07:25	17:05 (AG05)	06:58	07:30
	20:54	20:31	19:47	18:14 (AG05)	18:58	18:22 (AG06)	17:17	17:00
8	06:03	06:29	06:58	17:17 (AG05)	07:26	17:07 (AG05)	06:59	07:31
	20:54	20:30	19:45	18:15 (AG05)	18:57	18:24 (AG06)	17:16	17:00
9	06:04	06:30	06:59	08:08 (AG04)	07:27	17:08 (AG05)	07:00	07:32
	20:54	20:29	19:44	18:15 (AG05)	18:55	18:26 (AG06)	17:15	17:00
10	06:05	06:31	06:59	08:01 (AG04)	07:28	17:09 (AG05)	07:01	07:33
	20:53	20:28	19:42	18:15 (AG05)	18:54	18:26 (AG06)	17:14	17:00
11	06:05	06:32	07:00	07:59 (AG04)	07:29	17:11 (AG05)	07:03	07:34
	20:53	20:26	19:41	18:15 (AG05)	18:52	18:27 (AG06)	17:13	17:00
12	06:06	06:32	07:01	07:56 (AG04)	07:30	17:13 (AG05)	07:04	07:34
	20:53	20:25	19:39	18:16 (AG05)	18:51	18:27 (AG06)	17:12	17:00
13	06:07	06:33	07:02	07:55 (AG04)	07:31	17:16 (AG05)	07:05	07:35
	20:52	20:24	19:37	18:16 (AG05)	18:49	18:27 (AG06)	17:11	17:00
14	06:07	06:34	07:03	07:53 (AG04)	07:32	17:20 (AG05)	07:06	07:36
	20:52	20:22	19:36	18:16 (AG05)	18:48	18:25 (AG06)	17:10	17:00
15	06:08	06:35	07:04	07:52 (AG04)	07:33	17:26 (AG05)	07:07	07:37
	20:51	20:21	19:34	18:17 (AG05)	18:46	18:24 (AG06)	17:09	17:01
16	06:09	06:36	07:05	07:51 (AG04)	07:34	18:04 (AG06)	07:08	07:37
	20:51	20:20	19:32	18:17 (AG05)	18:45	18:22 (AG06)	17:09	17:01
17	06:10	06:37	07:06	07:50 (AG04)	07:35	18:05 (AG06)	07:09	07:38
	20:50	20:18	19:31	18:17 (AG05)	18:43	18:21 (AG06)	17:08	17:01
18	06:10	06:38	07:07	07:50 (AG04)	07:36	18:05 (AG06)	07:10	07:39
	20:49	20:17	19:29	18:17 (AG05)	18:42	18:19 (AG06)	17:07	17:02
19	06:11	06:39	07:08	07:48 (AG04)	07:37	18:07 (AG06)	07:12	07:39
	20:49	20:16	19:28	18:15 (AG05)	18:40	18:18 (AG06)	17:06	17:02
20	06:12	06:40	07:09	07:48 (AG04)	07:38	18:08 (AG06)	07:13	07:40
	20:48	20:14	19:26	18:15 (AG05)	18:39	18:16 (AG06)	17:06	17:02
21	06:13	06:41	07:10	07:48 (AG04)	07:39		07:14	07:41
	20:47	20:13	19:24	18:15 (AG05)	18:38		17:05	17:03
22	06:14	06:42	07:11	07:48 (AG04)	07:40		07:15	07:41
	20:47	20:11	19:23	18:15 (AG05)	18:36		17:04	17:03
23	06:14	06:43	07:12	07:48 (AG04)	07:41		07:16	07:42
	20:46	20:10	19:21	18:14 (AG05)	18:35		17:04	17:04
24	06:15	06:44	07:12	07:48 (AG04)	07:42		07:17	07:42
	20:45	20:09	19:19	18:14 (AG05)	18:34		17:03	17:04
25	06:16	06:45	07:13	07:48 (AG04)	06:44		07:18	07:42
	20:44	20:07	19:18	18:13 (AG05)	17:32		17:03	17:05
26	06:17	06:46	07:14	07:49 (AG04)	06:45		07:19	07:43
	20:43	20:06	19:16	18:13 (AG05)	17:31		17:02	17:05
27	06:18	06:47	07:15	07:50 (AG04)	06:46		07:20	07:43
	20:42	20:04	19:14	18:12 (AG05)	17:30		17:02	17:06
28	06:19	06:47	07:16	07:51 (AG04)	06:47		07:21	07:44
	20:42	20:03	19:13	18:11 (AG05)	17:28		17:02	17:07
29	06:20	06:48	17:42 (AG05)	07:17	07:52 (AG04)	06:48	07:22	07:44
	20:41	20:01	17:59 (AG05)	19:11	18:10 (AG05)	17:27	17:01	17:07
30	06:21	06:49	17:38 (AG05)	07:18	07:55 (AG04)	06:49	07:23	07:44
	20:40	20:00	18:03 (AG05)	19:10	18:10 (AG05)	17:26	17:01	17:08
31	06:21	06:50	17:34 (AG05)		06:50			07:44
	20:39	19:58	18:05 (AG05)		17:25			17:09
Potential sun hours	455	425	374	2491	347	958	301	292
Total, worst case		73						

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

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

Calculation: Progetto_layout_20230710Shadow receptor: F150 - seminativo

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

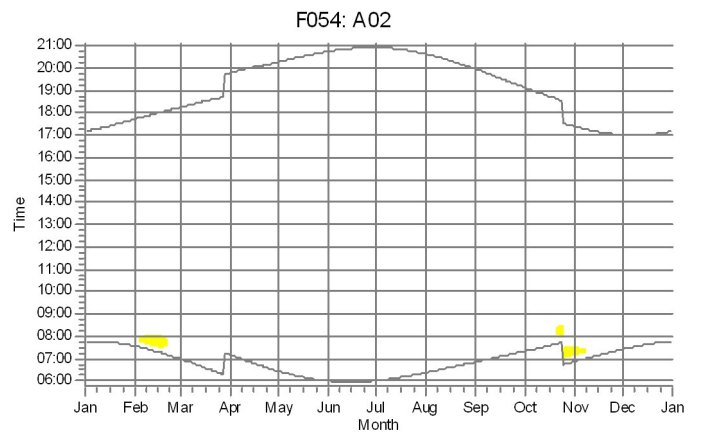
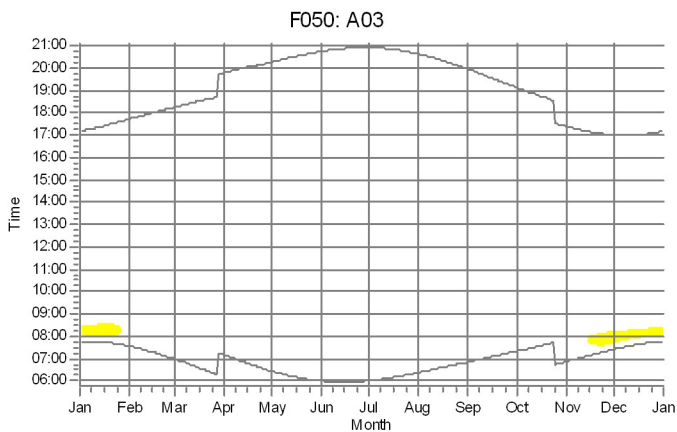
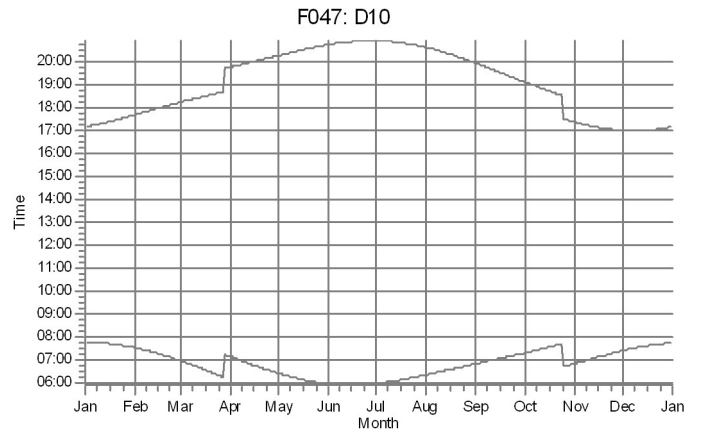
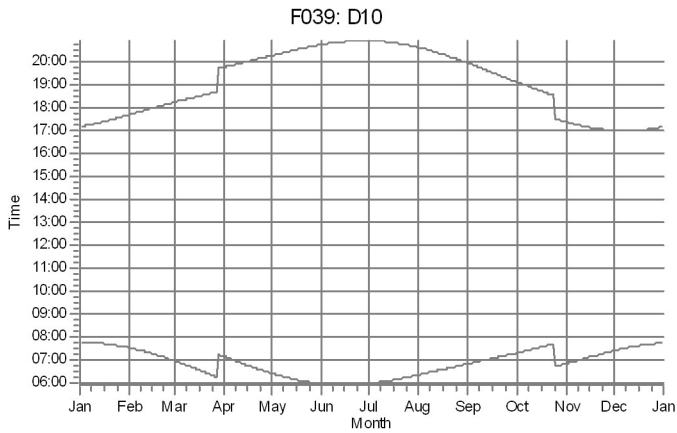
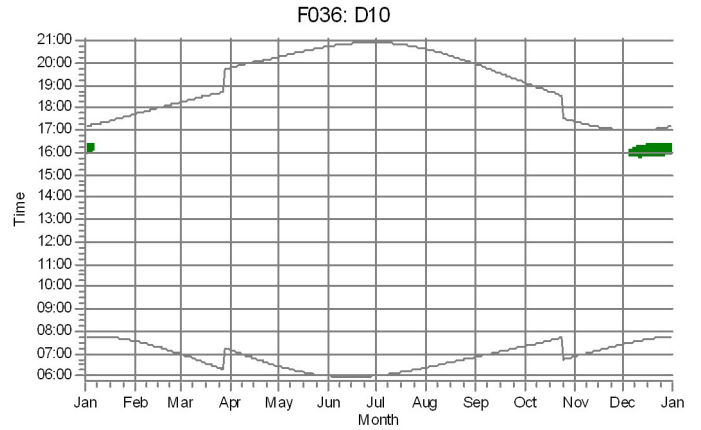
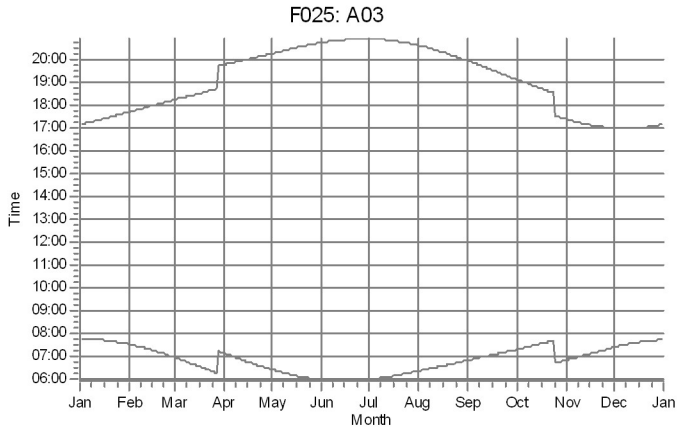
	January	February	March	April	May	June	July	August	September	October	November	December
1	07:44 17:10	07:32 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:55	06:22 20:38	06:51 19:56	07:19 19:08	06:51 17:23	07:24 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:45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

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

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

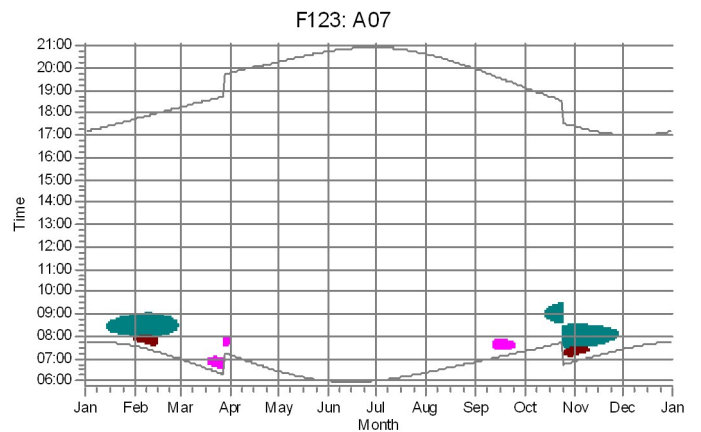
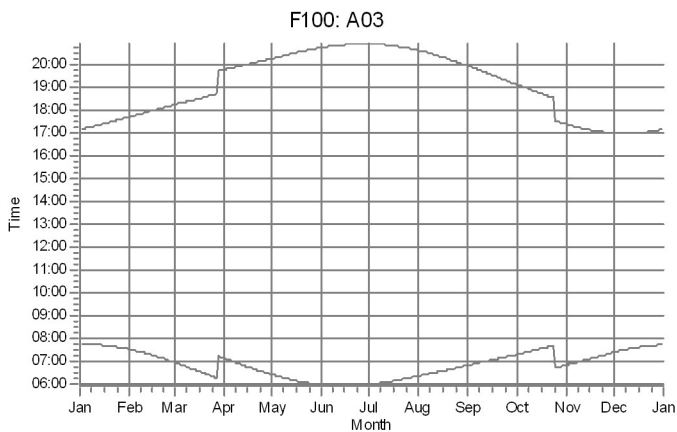
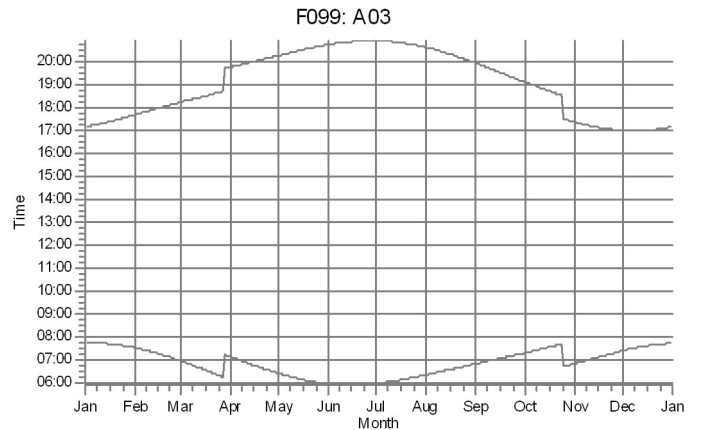
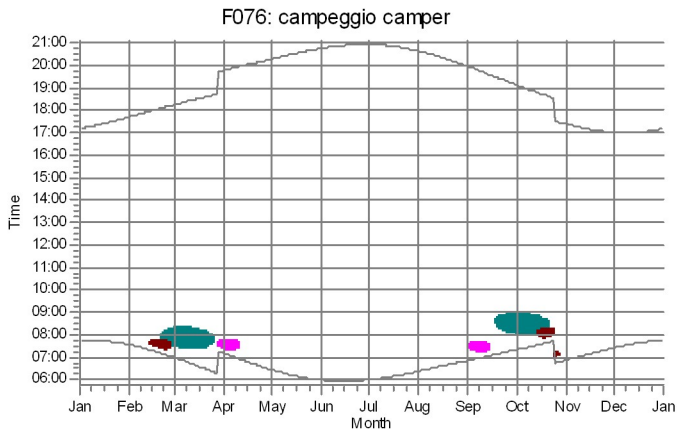
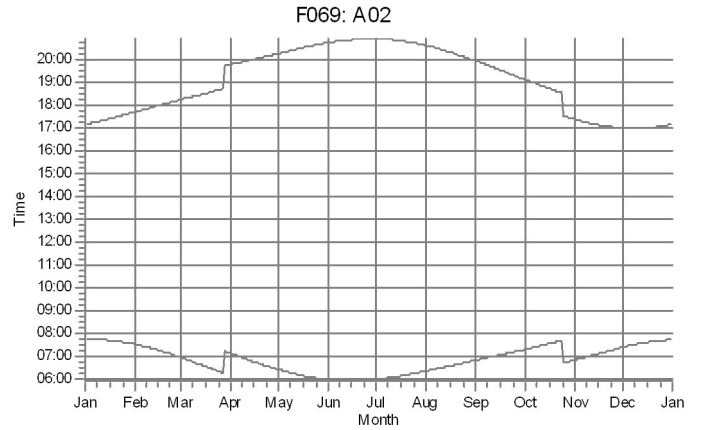
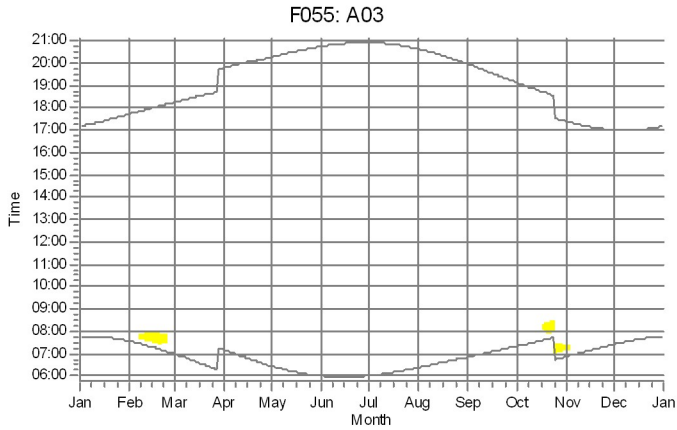
Calculation: Progetto_layout_20230710



WTGs

- AG01: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (56)
- AG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57)

SHADOW - Calendar, graphical
Calculation: Progetto_layout_20230710

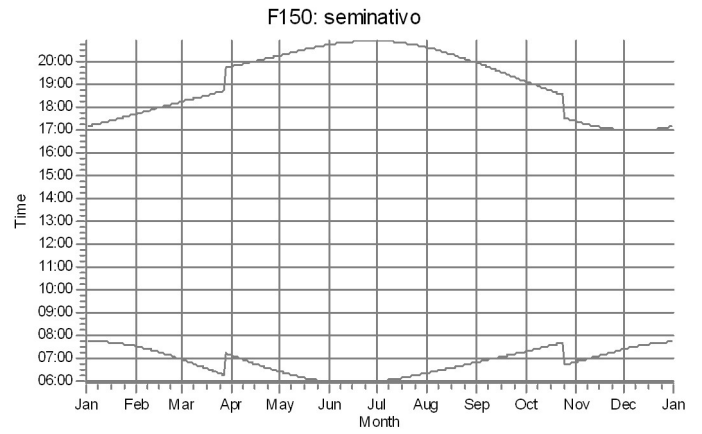
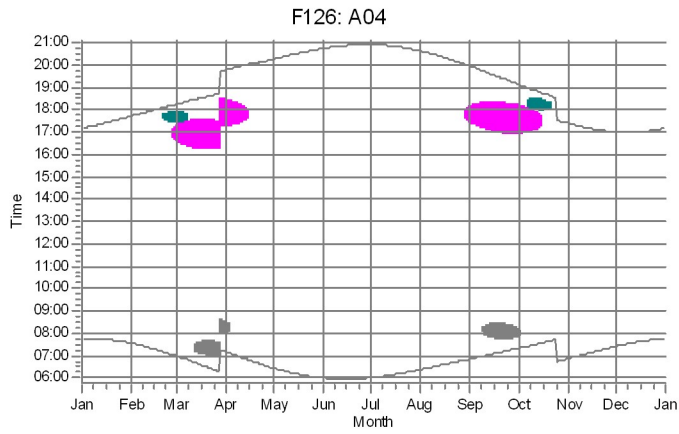


WTGs

- AG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (57)
- AG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60)
- AG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)
- AG08: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (63)

SHADOW - Calendar, graphical

Calculation: Progetto_layout_20230710



WTGs

- AG04: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (59)
- AG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (60)
- AG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
 Via Santa Margherita 4
 IT-09124 Cagliari
 +39 070 658297
 Giuseppe Frongia / direttore@iatprogetti.it
 Calculated:
 10/07/2023 14:55/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG01 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (56)
 Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 16:01-16:22/21 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:56	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:25 17:01
2	07:45 16:03-16:22/19 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:26 17:00
3	07:45 16:05-16:22/17 17:12	07:31 17:45	06:56 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	07:27 17:00
4	07:45 16:06-16:21/15 17:13	07:30 17:47	06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:28 17:00
5	07:45 16:07-16:20/13 17:13	07:29 17:48	06:53 18:20	07:04 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:28 17:00
6	07:45 16:09-16:18/9 17:14	07:28 17:49	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:00
7	07:45 17:15	07:27 17:50	06:50 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:30 17:00
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:03 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:17	07:25 17:52	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:32 17:00
10	07:45 17:18	07:23 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:51	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:01 17:14	07:33 17:00
11	07:44 17:19	07:22 17:55	06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13	07:34 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:52	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:35 17:00
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:36 17:00
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:07 20:52	06:34 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:37 17:00
15	07:43 17:23	07:18 17:59	06:37 18:30	06:48 20:01	06:11 20:31	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:38 17:00
16	07:43 17:24	07:16 18:01	06:35 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:39 17:00
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:43	07:09 17:08	07:40 17:00
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:41 17:00
19	07:42 17:28	07:12 18:04	06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:12 17:06	07:42 17:00
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:43 17:00
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	07:14 17:05	07:44 17:00
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:36	07:15 17:05	07:45 17:00
23	07:39 17:32	07:07 18:09	06:24 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:14 20:46	06:43 20:10	07:12 19:21	07:41 18:35	07:16 17:04	07:46 17:00
24	07:39 17:34	07:06 18:10	06:23 18:39	06:35 20:10	06:03 20:39	05:57 20:55	06:15 20:45	06:44 20:09	07:13 19:19	07:43 18:34	07:17 17:03	07:47 17:00
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	07:44 17:32	07:18 17:03	07:48 17:00
26	07:37 17:36	07:03 18:12	06:19 18:41	06:33 20:12	06:02 20:40	05:58 20:56	06:17 20:43	06:46 20:06	07:14 19:16	06:45 17:31	07:19 17:02	07:49 17:00
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:43	06:47 20:04	07:15 19:15	06:46 17:30	07:20 17:02	07:50 17:00
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56	06:19 20:42	06:47 20:03	07:16 19:13	06:47 17:28	07:21 17:02	07:51 17:00
29	07:35 17:39		07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:01	07:17 19:11	06:48 17:27	07:23 17:01	07:52 17:00
30	07:34 17:41		07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	06:49 17:26	07:24 17:01	07:53 17:00
31	07:33 17:42		07:11 19:46	06:27 20:16	06:00 20:44	05:59 20:56	06:22 20:39	06:50 19:58	07:19 17:25	06:50 17:25	07:25 17:01	07:54 17:00
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Sum of minutes with flicker	94	0	0	0	0	0	0	0	0	0	0	577

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG02 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (57)
 Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 08:07-08:22/15	07:33	06:58	07:10	06:26	05:59	06:00	06:22	06:51	07:19	06:51 07:12-07:26/14	07:25 07:47-08:08/21
2	07:45 08:07-08:22/15	07:32	06:57	07:08	06:25	05:58	06:00	06:23	06:52	07:20	06:52 07:14-07:26/12	07:26 07:49-08:09/20
3	07:45 08:07-08:23/16	07:31	06:55	07:07	06:24	05:58	06:01	06:24	06:53	07:21	06:53 07:15-07:26/11	07:26 07:50-08:10/20
4	07:45 08:07-08:23/16	07:30	06:54	07:05	06:22	05:58	06:01	06:25	06:54	07:22	06:55 07:16-07:25/9	07:27 07:51-08:10/19
5	07:45 08:07-08:24/17	07:29	06:52	07:03	06:21	05:57	06:02	06:26	06:55	07:23	06:56 07:17-07:23/6	07:28 07:51-08:09/18
6	07:45 08:06-08:24/18	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57 07:18-07:22/4	07:29 07:52-08:10/18
7	07:45 08:06-08:24/18	07:27	06:50	07:00	06:19	05:57	06:03	06:28	06:57	07:25	06:58 07:20-07:21/1	07:30 07:53-08:10/17
8	07:45 08:06-08:25/19	07:26	06:48	06:59	06:18	05:56	06:03	06:29	06:58	07:26	06:59	07:31 07:54-08:10/16
9	07:45 08:06-08:25/19	07:25	06:46	06:57	06:17	05:56	06:04	06:30	06:59	07:27	07:00	07:32 07:55-08:11/16
10	07:45 08:06-08:26/20	07:23	06:45	06:56	06:16	05:56	06:05	06:31	06:59	07:28	07:01	07:33 07:56-08-11/15
11	07:44 08:05-08:26/21	07:22	06:43	06:54	06:15	05:56	06:05	06:32	07:00	07:29	07:03	07:34 07:57-08-12/15
12	07:44 08:05-08:26/21	07:21	06:42	06:53	06:14	05:56	06:06	06:32	07:01	07:30	07:04	07:35 07:58-08-12/14
13	07:44 08:05-08:27/22	07:20	06:40	06:51	06:13	05:56	06:07	06:33	07:02	07:31	07:05	07:35 07:58-08-12/14
14	07:44 08:04-08:27/23	07:19	06:39	06:50	06:12	05:56	06:07	06:34	07:03	07:32	07:06	07:36 07:59-08-12/13
15	07:43 08:04-08:27/23	07:17	06:37	06:48	06:11	05:56	06:08	06:35	07:04	07:33	07:07	07:37 08:00-08-13/13
16	07:43 08:04-08:28/24	07:16	06:35	06:47	06:10	05:56	06:09	06:36	07:05	07:34	07:08	07:46-07:53/7
17	07:43 08:03-08:27/24	07:15	06:34	06:45	06:09	05:56	06:10	06:37	07:06	07:35	07:09	07:45-07:57/12
18	07:42 08:03-08:28/25	07:14	06:32	06:44	06:08	05:56	06:10	06:38	07:07	07:36	08:07-08-14/7	07:10 07:43-07:59/16
19	07:42 08:03-08:27/24	07:12	06:31	06:42	06:07	05:56	06:11	06:39	07:08	07:37	08:03-08-17/14	07:12 07:42-08:00/18
20	07:41 08:04-08:28/24	07:11	06:29	06:41	06:06	05:56	06:12	06:40	07:09	07:38	08:01-08-19/18	07:13 07:41-08-01/20
21	07:41 08:05-08:27/22	07:10	06:27	06:39	06:05	05:56	06:13	06:41	07:10	07:39	08:01-08-21/20	07:14 07:40-08-02/22
22	07:40 08:06-08:26/20	07:08	06:26	06:38	06:05	05:57	06:14	06:42	07:11	07:40	08:01-08-21/20	07:15 07:40-08-04/24
23	07:39 08:08-08:26/18	07:07	06:24	06:37	06:04	05:57	06:14	06:43	07:12	07:41	08:02-08-23/21	07:16 07:40-08-04/24
24	07:39 08:09-08:25/16	07:06	06:23	06:35	06:03	05:57	06:15	06:44	07:12	07:42	08:03-08-24/21	07:17 07:40-08-05/25
25	07:38 08:11-08:23/12	07:04	06:21	06:34	06:03	05:57	06:16	06:45	07:13	06:44	07:04-07:25/21	07:18 07:41-08-05/24
26	07:37 08:13-08:20/7	07:03	06:19	06:32	06:02	05:58	06:17	06:46	07:14	06:45	07:05-07:26/21	07:19 07:42-08-06/24
27	07:37	07:01	06:18	06:31	06:01	05:58	06:18	06:46	07:15	06:46	07:06-07:26/20	07:20 07:43-08-06/23
28	07:36	07:00	06:16	06:30	06:01	05:58	06:19	06:47	07:16	06:47	07:08-07:27/19	07:21 07:44-08-07/23
29	07:35	06:59	06:15	06:29	06:00	05:59	06:20	06:48	07:17	06:48	07:09-07:27/18	07:22 07:45-08-07/22
30	07:34	06:58	06:14	06:28	05:59	06:00	06:21	06:49	07:18	06:49	07:10-07:27/17	07:23 07:46-08-08/22
31	07:33	06:57	06:13	06:27	05:59	06:01	06:22	06:50	07:19	06:50	07:11-07:26/15	07:24 08:06-08-20/14
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Sum of minutes with flicker	499	304	0	0	0	0	0	0	0	252	363	449

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG03 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (58)
 Assumptions for shadow calculations

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

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

Project:

Progetto_Baltex_Suelli

Licensed user:

I.A.T. Consulenza e progetti S.r.l.

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

10/07/2023 14:55/3.4.415

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG04 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (59)

Assumptions for shadow calculations

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

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:45 17:10	07:32 17:43	06:58 18:15	07:10 19:47	08:06-08:26/20 20:17	06:26 20:45	05:59 20:55	06:00 20:38	06:22 19:56	06:51 19:08	07:19 19:08	07:59-08:05/6 17:23	06:51 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	08:08-08:23/15 20:18	06:25 20:45	05:58 20:55	06:00 20:37	06:23 19:55	06:52 19:06	07:20 19:06	17:22 17:00	06:52 17:22
3	07:45 17:12	07:31 17:45	06:55 18:17	07:07 19:49	08:13-08:18/5 20:19	06:24 20:46	05:58 20:55	06:01 20:36	06:24 19:53	06:53 19:05	07:21 19:05	17:21 17:00	06:53 17:21
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05 19:50	20:20	06:22 20:47	05:58 20:55	06:01 20:34	06:25 19:52	06:54 19:03	07:22 19:03	17:20 17:00	06:54 17:20
5	07:45 17:13	07:29 17:48	06:52 18:19	07:03 19:51	06:21 20:21	05:57 20:47	06:02 20:55	06:05 20:33	06:26 19:50	06:55 19:02	07:23 19:02	17:19 17:00	06:56 17:19
6	07:45 17:14	07:28 17:49	06:51 18:20	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	07:24 19:00	17:18 17:00	06:57 17:18
7	07:45 17:15	07:27 17:50	06:49 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58	07:25 18:58	17:17 17:00	06:58 17:17
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	06:18 20:24	05:56 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57	07:26 18:57	17:16 17:00	06:59 17:16
9	07:45 17:17	07:24 17:52	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	08:08-08:12/4 18:55	07:27 18:55	17:15 17:00	07:00 17:15
10	07:45 17:18	07:23 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:50	06:05 20:53	06:31 20:27	06:59 19:42	08:01-08:16/15 18:54	07:28 18:54	17:14 17:00	07:01 17:14
11	07:44 17:19	07:22 17:55	06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:59-08:18/19 18:52	07:29 18:52	17:13 17:00	07:02 17:13
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:51	06:06 20:52	06:32 20:25	07:01 19:39	07:56-08:20/24 18:51	07:30 18:51	17:12 17:00	07:04 17:12
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:55-08:21/26 18:49	07:31 19:37	17:11 17:00	07:05 17:11
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	06:12 20:29	05:56 20:52	06:07 20:52	06:34 20:22	07:03 19:36	07:53-08:22/29 18:48	07:32 19:36	17:10 17:00	07:06 17:10
15	07:43 17:23	07:17 17:59	06:37 18:30	06:48 20:01	06:11 20:30	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:52-08:22/30 18:46	07:33 19:34	17:09 17:01	07:07 17:09
16	07:43 17:24	07:16 18:01	06:35 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:50	06:36 20:20	07:05 19:32	07:51-08:23/32 18:45	07:34 19:32	17:09 17:01	07:08 17:09
17	07:42 17:26	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:53	06:10 20:50	06:37 20:18	07:06 19:31	07:50-08:23/33 18:43	07:35 19:31	17:08 17:01	07:09 17:08
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:50-08:23/33 18:42	07:36 19:29	17:07 17:01	07:10 17:07
19	07:42 17:28	07:12 18:04	06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:27	07:48-08:22/34 18:40	07:37 19:27	17:06 17:02	07:12 17:06
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:54	06:12 20:48	06:40 20:14	07:09 19:26	07:48-08:22/34 18:39	07:38 19:26	17:06 17:02	07:13 17:06
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	06:05 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:48-08:22/34 18:38	07:39 19:24	17:05 17:03	07:14 17:05
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:46	06:42 20:11	07:11 19:23	07:48-08:22/34 18:36	07:40 19:23	17:05 17:04	07:15 17:04
23	07:39 17:32	07:07 18:08	06:24 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:14 20:46	06:43 20:10	07:11 19:21	07:48-08:21/33 18:35	07:41 19:21	17:04 17:04	07:16 17:04
24	07:39 17:33	07:06 18:10	06:23 18:39	06:35 20:10	06:03 20:38	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	07:48-08:20/32 18:33	07:42 19:19	17:03 17:04	07:17 17:03
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	07:48-08:19/31 18:32	06:43 19:18	17:03 17:05	07:18 17:03
26	07:37 17:36	07:03 18:12	06:19 18:41	06:32 20:12	06:02 20:40	05:58 20:55	06:17 20:43	06:46 20:06	07:14 19:16	07:49-08:18/29 18:31	06:45 19:16	17:02 17:05	07:19 17:02
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:55	06:18 20:42	06:46 20:04	07:15 19:14	07:50-08:17/27 18:30	06:46 19:14	17:02 17:06	07:20 17:02
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:55	06:19 20:41	06:47 20:03	07:16 19:13	07:51-08:15/24 18:28	06:47 19:13	17:02 17:07	07:21 17:07
29	07:35 17:39	07:15 19:44	08:03-08:32/29 19:44	06:29 20:15	06:00 20:42	05:59 20:55	06:20 20:41	06:48 20:01	07:17 19:11	07:52-08:13/21 18:27	06:48 19:11	17:01 17:07	07:22 17:07
30	07:34 17:40	07:13 19:45	08:03-08:30/27 19:45	06:27 20:16	06:00 20:43	05:59 20:55	06:20 20:40	06:49 20:00	07:18 19:10	07:55-08:10/15 18:26	06:49 19:10	17:01 17:08	07:23 17:08
31	07:33 17:42	07:11 19:46	08:05-08:29/24 19:46	06:25 20:16	05:59 20:44	05:59 20:55	06:21 20:39	06:50 19:58	07:19 19:58	06:50 17:25	06:50 17:25	17:01 17:09	07:44 17:09
Potential sun hours	301	299	370	397	444	448	455	425	374	593	347	301	292
Sum of minutes with flicker	0	0	551	40	0	0	0	0	0	593	6	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG05 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (60)
 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	07:45 17:10	07:33 17:43	06:58 16:41-17:14/33 18:15	07:10 17:20-18:23/63 19:47 07:28-07:44/16	06:26 20:17	05:59 20:45
2	07:45 17:11	07:32 17:44	06:57 16:39-17:17/38 18:16	07:08 17:20-18:22/62 19:48 07:26-07:44/18	06:25 20:18	05:58 20:46
3	07:45 17:12	07:31 17:45	06:56 16:36-17:19/43 18:17	07:07 17:22-18:21/59 19:49 07:25-07:45/20	06:24 20:19	05:58 20:46
4	07:45 17:13	07:30 17:46	06:54 16:34-17:21/47 18:18	07:05 17:22-18:20/58 19:50 07:24-07:44/20	06:22 20:20	05:58 20:47
5	07:45 17:13	07:29 17:48	06:53 16:32-17:22/50 18:19	07:04 17:24-18:19/55 19:51 07:25-07:44/19	06:21 20:21	05:57 20:48
6	07:45 17:14	07:28 17:49	06:51 16:29-17:23/54 18:21	07:02 17:24-18:17/53 19:52 07:24-07:43/19	06:20 20:22	05:57 20:48
7	07:45 17:15	07:27 17:50	06:49 16:28-17:25/57 18:22	07:00 17:25-18:15/50 19:53 07:25-07:43/18	06:19 20:23	05:57 20:49
8	07:45 17:16	07:26 17:51	06:48 16:27-17:26/59 18:23	06:59 17:27-18:14/47 19:54 07:26-07:41/15	06:18 20:24	05:57 20:49
9	07:45 17:17	07:25 17:52	06:46 16:26-17:27/61 18:24	06:57 17:28-18:12/44 19:55 07:26-07:38/12	06:17 20:25	05:56 20:50
10	07:45 17:18	07:23 17:54	06:45 16:24-17:27/63 18:25	06:56 17:30-18:10/40 19:56 07:29-07:36/7	06:16 20:26	05:56 20:50
11	07:44 17:19	07:22 17:55	06:43 16:24-17:29/65 18:26	06:54 17:32-18:07/35 19:57	06:15 20:27	05:56 20:51
12	07:44 17:20	07:21 17:56	06:42 16:22-17:29/67 18:27	06:53 17:35-18:05/30 19:58	06:14 20:28	05:56 20:51
13	07:44 17:21	07:20 17:57	06:40 16:21-17:29/68 18:28	06:51 17:37-18:02/25 19:59	06:13 20:29	05:56 20:52
14	07:44 17:22	07:19 17:58	06:39 16:21-17:30/69 18:29	06:50 17:42-17:58/16 20:00	06:12 20:30	05:56 20:52
15	07:43 17:23	07:17 17:59	06:37 16:20-17:30/70 18:30	06:48 20:01	06:11 20:30	05:56 20:53
16	07:43 17:24	07:16 18:01	06:35 16:20-17:30/70 18:31	06:47 20:02	06:10 20:31	05:56 20:53
17	07:43 17:26	07:15 18:02	06:34 16:19-17:30/71 18:32	06:45 20:03	06:09 20:32	05:56 20:54
18	07:42 17:27	07:14 18:03	06:32 16:18-17:30/72 18:33	06:44 20:04	06:08 20:33	05:56 20:54
19	07:42 17:28	07:12 18:04	06:31 16:18-17:30/72 18:34	06:42 06:49-06:55/6 20:05	06:07 20:34	05:56 20:54
20	07:41 17:29	07:11 18:05	06:29 16:18-17:30/72 18:35	06:41 06:47-06:56/9 20:06	06:06 20:35	05:56 20:54
21	07:41 17:30	07:10 18:06	06:27 16:18-17:30/72 18:36	06:39 06:46-06:58/12 20:07	06:06 20:36	05:56 20:55
22	07:40 17:31	07:08 18:07	06:26 16:17-17:30/73 18:37	06:38 06:44-06:59/15 20:08	06:05 20:37	05:57 20:55
23	07:39 17:32	07:07 18:09	06:24 16:17-17:29/72 18:38	06:37 06:43-07:00/17 20:09	06:04 20:38	05:57 20:55
24	07:39 17:34	07:06 18:10	06:23 16:18-17:29/71 18:39	06:35 06:41-06:59/18 20:10	06:03 20:38	05:57 20:55
25	07:38 17:35	07:04 18:11	06:21 16:17-17:28/71 18:40	06:34 06:39-06:59/20 20:11	06:03 20:39	05:57 20:55
26	07:37 17:36	07:03 18:12	06:19 16:18-17:28/70 18:41	06:33 06:39-06:59/20 20:12	06:02 20:40	05:58 20:55
27	07:37 17:37	07:01 16:50-17:06/16 18:13	06:18 16:18-17:27/69 18:42	06:31 06:38-06:58/20 20:13	06:01 20:41	05:58 20:56
28	07:36 17:38	07:00 16:45-17:11/26 18:14	06:16 16:18-17:26/68 18:43	06:30 06:38-06:57/19 20:14	06:01 20:42	05:58 20:56
29	07:35 17:39		07:15 17:19-18:26/67 19:44	06:29 07:33-07:56/23 20:15	06:00 20:43	05:59 20:56
30	07:34 17:41		07:13 17:19-18:25/66 19:45	06:27 07:31-07:54/23 20:16	06:00 20:43	05:59 20:56
31	07:33 17:42		07:11 17:20-18:25/65 19:46	06:27 07:30-07:52/22 20:16	05:59 20:44	20:56
Potential sun hours	301	299	370	397	444	448
Sum of minutes with flicker	0	42	2189	801	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG05 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (60)
 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	06:00 20:55	06:22 20:38	06:51 17:31-18:06/35 19:57	07:19 17:02-18:09/67 19:08	06:51 17:23	07:24 17:01
2	06:00 20:55	06:23 20:37	06:52 17:28-18:08/40 19:55 07:27-07:34/7	07:20 17:02-18:08/66 19:06	06:52 17:22	07:25 17:00
3	06:01 20:55	06:24 20:36	06:53 17:26-18:10/44 19:53 07:24-07:36/12	07:21 17:02-18:06/64 19:05	06:53 17:21	07:26 17:00
4	06:01 20:55	06:25 20:35	06:54 17:24-18:11/47 19:52 07:23-07:38/15	07:22 17:03-18:05/62 19:03	06:55 17:20	07:27 17:00
5	06:02 20:55	06:26 20:33	06:55 17:22-18:12/50 19:50 07:21-07:39/18	07:23 17:04-18:04/60 19:02	06:56 17:19	07:28 17:00
6	06:02 20:55	06:27 20:32	06:56 17:21-18:13/52 19:49 07:20-07:39/19	07:24 17:04-18:02/58 19:00	06:57 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 17:19-18:14/55 19:47 07:20-07:39/19	07:25 17:05-18:01/56 18:58	06:58 17:17	07:30 17:00
8	06:03 20:54	06:29 20:30	06:58 17:17-18:15/58 19:45 07:19-07:39/20	07:26 17:07-17:59/52 18:57	06:59 17:16	07:31 17:00
9	06:04 20:54	06:30 20:29	06:59 17:16-18:15/59 19:44 07:19-07:39/20	07:27 17:08-17:57/49 18:55	07:00 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 17:14-18:15/61 19:42 07:20-07:38/18	07:28 17:09-17:55/46 18:54	07:01 17:14	07:33 17:00
11	06:05 20:53	06:32 20:26	07:00 17:12-18:15/63 19:41 07:20-07:36/16	07:29 17:11-17:52/41 18:52	07:03 17:13	07:34 17:00
12	06:06 20:53	06:33 20:25	07:01 17:11-18:16/65 19:39 07:21-07:42/21	07:30 17:13-17:50/37 18:51	07:04 17:12	07:34 17:00
13	06:07 20:52	06:33 20:24	07:02 17:10-18:16/66 19:37 07:22-07:45/23	07:31 17:16-17:46/30 18:49	07:05 17:11	07:35 17:00
14	06:07 20:52	06:34 20:22	07:03 17:09-18:16/67 19:36 07:23-07:46/23	07:32 17:20-17:42/22 18:48	07:06 17:10	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 17:08-18:17/69 19:34 07:28-07:47/19	07:33 17:26-17:35/9 18:46	07:07 17:09	07:37 17:01
16	06:09 20:51	06:36 20:20	07:05 17:07-18:17/70 19:32 07:28-07:47/19	07:34 18:45	07:08 17:09	07:37 17:01
17	06:10 20:50	06:37 20:18	07:06 17:06-18:17/71 19:31 07:27-07:47/20	07:35 18:43	07:09 17:08	07:38 17:01
18	06:10 20:49	06:38 20:17	07:07 17:06-18:17/71 19:29 07:27-07:47/20	07:36 18:42	07:10 17:07	07:39 17:02
19	06:11 20:49	06:39 20:16	07:08 17:04-18:15/71 19:28 07:28-07:47/19	07:37 18:40	07:12 17:06	07:39 17:02
20	06:12 20:48	06:40 20:14	07:09 17:03-18:15/72 19:26 07:28-07:45/17	07:38 18:39	07:13 17:06	07:40 17:02
21	06:13 20:47	06:41 20:13	07:10 17:03-18:15/72 19:24 07:29-07:44/15	07:39 18:38	07:14 17:05	07:41 17:03
22	06:14 20:47	06:42 20:11	07:11 17:02-18:15/73 19:23 07:30-07:43/13	07:40 18:36	07:15 17:05	07:41 17:03
23	06:14 20:46	06:43 20:10	07:12 17:02-18:14/72 19:21 07:31-07:41/10	07:41 18:35	07:16 17:04	07:42 17:04
24	06:15 20:45	06:44 20:09	07:12 17:02-18:14/72 19:19 07:32-07:39/7	07:42 18:34	07:17 17:03	07:42 17:04
25	06:16 20:44	06:45 20:07	07:13 17:01-18:13/72 19:18	06:44 17:32	07:18 17:03	07:42 17:05
26	06:17 20:43	06:46 20:06	07:14 17:01-18:13/72 19:16	06:45 17:31	07:19 17:02	07:43 17:06
27	06:18 20:42	06:47 20:04	07:15 17:01-18:12/71 19:14	06:46 17:30	07:20 17:02	07:43 17:06
28	06:19 20:42	06:47 20:03	07:16 17:01-18:11/70 19:13	06:47 17:28	07:21 17:02	07:44 17:07
29	06:20 20:41	06:48 17:42-17:59/17 20:01	07:17 17:01-18:10/69 19:11	06:48 17:27	07:22 17:01	07:44 17:08
30	06:21 20:40	06:49 17:38-18:03/25 20:00	07:18 17:01-18:10/69 19:10	06:49 17:26	07:23 17:01	07:44 17:08
31	06:21 20:39	06:50 17:34-18:05/31 19:58		06:50 17:25		07:44 17:09
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	0	73	2288	719	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG06 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 200,0 m) (61)

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	07:45 17:10	07:33 08:05-08:55/50 17:43	06:59 17:31-17:53/22 18:15 07:33-08:16/43	07:10 19:47	06:26 20:17	05:59 20:45
2	07:45 17:11	07:32 08:05-08:56/51 17:44	06:57 17:32-17:53/21 18:16 07:32-08:17/45	07:08 19:48	06:25 20:18	05:58 20:46
3	07:45 17:12	07:31 08:05-08:56/51 17:45	06:56 17:32-17:52/20 18:17 07:31-08:17/46	07:07 19:49	06:24 20:19	05:58 20:46
4	07:45 17:13	07:30 08:04-08:56/52 17:47	06:54 17:33-17:51/18 18:18 07:31-08:18/47	07:05 19:50	06:22 20:20	05:58 20:47
5	07:45 17:14	07:29 08:04-08:57/53 17:48	06:53 17:33-17:50/17 18:20 07:30-08:18/48	07:04 19:51	06:21 20:21	05:57 20:48
6	07:45 17:14	07:28 08:04-08:57/53 17:49	06:51 17:35-17:47/12 18:21 07:29-08:18/49	07:02 19:52	06:20 20:22	05:57 20:48
7	07:45 17:15	07:27 08:04-08:57/53 17:50	06:50 17:38-17:44/6 18:22 07:28-08:18/50	07:00 19:53	06:19 20:23	05:57 20:49
8	07:45 17:16	07:26 08:05-08:58/53 17:51	06:48 07:28-08:17/49 18:23	06:59 19:54	06:18 20:24	05:57 20:49
9	07:45 17:17	07:25 08:05-08:58/53 17:52	06:46 07:28-08:18/50 18:24	06:57 19:55	06:17 20:25	05:56 20:50
10	07:45 17:18	07:23 08:05-08:58/53 17:54	06:45 07:27-08:17/50 18:25	06:56 19:56	06:16 20:26	05:56 20:51
11	07:44 17:19	07:22 08:04-08:57/53 17:55	06:43 07:28-08:17/49 18:26	06:54 19:57	06:15 20:27	05:56 20:51
12	07:44 17:20	07:21 08:05-08:57/52 17:56	06:42 07:27-08:16/49 18:27	06:53 19:58	06:14 20:28	05:56 20:52
13	07:44 17:21	07:20 08:05-08:57/52 17:57	06:40 07:28-08:16/48 18:28	06:51 19:59	06:13 20:29	05:56 20:52
14	07:44 17:22	07:19 08:06-08:57/51 17:58	06:39 07:27-08:15/48 18:29	06:50 20:00	06:12 20:30	05:56 20:52
15	07:43 08:23-08:28/5 17:23	07:18 08:07-08:56/49 18:00	06:37 07:27-08:14/47 18:30	06:48 20:01	06:11 20:31	05:56 20:53
16	07:43 08:20-08:34/14 17:25	07:16 08:06-08:55/49 18:01	06:35 07:28-08:13/45 18:31	06:47 20:02	06:10 20:31	05:56 20:53
17	07:43 08:17-08:36/19 17:26	07:15 08:07-08:54/47 18:02	06:34 07:28-08:11/43 18:32	06:45 20:03	06:09 20:32	05:56 20:54
18	07:42 08:16-08:39/23 17:27	07:14 08:08-08:54/46 18:03	06:32 07:29-08:11/42 18:33	06:44 20:04	06:08 20:33	05:56 20:54
19	07:42 08:14-08:40/26 17:28	07:12 08:08-08:52/44 18:04	06:31 07:30-08:09/39 18:34	06:42 20:05	06:07 20:34	05:56 20:54
20	07:41 08:12-08:42/30 17:29	07:11 08:10-08:51/41 18:05	06:29 07:30-08:07/37 18:35	06:41 20:06	06:06 20:35	05:56 20:54
21	07:41 08:12-08:44/32 17:30	07:10 17:40-17:44/4 07:55-07:57/2 18:06 08:11-08:50/39	06:28 07:32-08:05/33 18:36	06:39 20:07	06:06 20:36	05:56 20:55
22	07:40 08:11-08:45/34 17:31	07:08 17:37-17:46/9 07:47-08:04/17 18:07 08:12-08:48/36	06:26 07:33-08:03/30 18:37	06:38 20:08	06:05 20:37	05:57 20:55
23	07:39 08:10-08:47/37 17:32	07:07 17:35-17:47/12 07:44-08:08/24 18:09 08:14-08:47/33	06:24 07:36-08:01/25 18:38	06:37 20:09	06:04 20:38	05:57 20:55
24	07:39 08:09-08:48/39 17:34	07:06 17:34-17:48/14 07:41-08:09/28 18:10 08:15-08:44/29	06:23 07:38-07:57/19 18:39	06:35 20:10	06:03 20:39	05:57 20:55
25	07:38 08:08-08:49/41 17:35	07:04 17:33-17:50/17 07:39-08:11/32 18:11 08:18-08:42/24	06:21 07:42-07:51/9 18:40	06:34 20:11	06:03 20:39	05:57 20:55
26	07:37 08:08-08:50/42 17:36	07:03 17:32-17:50/18 07:38-08:13/35 18:12 08:21-08:38/17	06:19 18:41	06:33 20:12	06:02 20:40	05:58 20:56
27	07:37 08:08-08:52/44 17:37	07:01 17:32-17:52/20 07:36-08:14/38 18:13 08:28-08:30/2	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56
28	07:36 08:07-08:52/45 17:38	07:00 17:32-17:53/21 18:14 07:35-08:16/41	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56
29	07:35 08:07-08:53/46 17:39		07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56
30	07:34 08:06-08:54/48 17:41		07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56
31	07:33 08:06-08:54/48 17:42		07:11 19:46		05:59 20:44	
Potential sun hours	301	299	370	397	444	447
Sum of minutes with flicker	573	1518	1156	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG06 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (61)

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	06:00 20:55	06:22 20:38	06:51 19:57	07:19 08:07-08:55/48 19:08	06:51 07:34-08:27/53 17:23	07:25 17:01
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 08:06-08:56/50 19:06	06:52 07:35-08:28/53 17:22	07:26 17:01
3	06:01 20:55	06:24 20:36	06:53 19:53	07:21 08:06-08:55/49 19:05	06:54 07:34-08:27/53 17:21	07:27 17:00
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 08:05-08:55/50 19:03	06:55 07:34-08:27/53 17:20	07:27 17:00
5	06:02 20:55	06:26 20:33	06:55 19:50	07:23 08:05-08:55/50 19:02	06:56 07:34-08:27/53 17:19	07:28 17:00
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 08:05-08:55/50 19:00	06:57 07:34-08:27/53 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:13-18:22/9 18:59 08:05-08:54/49	06:58 07:35-08:27/52 17:17	07:30 17:00
8	06:03 20:54	06:29 20:30	06:58 19:46	07:26 18:10-18:24/14 18:57 08:05-08:54/49	06:59 07:36-08:27/51 17:16	07:31 17:00
9	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:08-18:26/18 18:55 08:05-08:53/48	07:00 07:36-08:26/50 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:07-18:26/19 18:54 08:05-08:52/47	07:01 07:36-08:26/50 17:14	07:33 17:00
11	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:06-18:27/21 18:52 08:06-08:51/45	07:03 07:37-08:25/48 17:13	07:34 17:00
12	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:05-18:27/22 18:51 08:06-08:50/44	07:04 07:38-08:26/48 17:12	07:35 17:00
13	06:07 20:52	06:34 20:24	07:02 19:37	07:31 18:05-18:27/22 18:49 08:07-08:49/42	07:05 07:39-08:25/46 17:11	07:35 17:00
14	06:08 20:52	06:34 20:23	07:03 19:36	07:32 18:04-18:25/21 18:48 08:08-08:48/40	07:06 07:39-08:24/45 17:10	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:04-18:24/20 08:09-08:46/37 18:46 08:56-09:07/11	07:07 07:40-08:24/44 17:09	07:37 17:01
16	06:09 20:51	06:36 20:20	07:05 19:33	07:34 18:04-18:22/18 08:10-08:44/34 18:45 08:51-09:11/20	07:08 07:41-08:23/42 17:09	07:37 17:01
17	06:10 20:50	06:37 20:19	07:06 19:31	07:35 18:05-18:21/16 08:11-08:42/31 18:43 08:48-09:14/26	07:09 07:42-08:23/41 17:08	07:38 17:01
18	06:11 20:49	06:38 20:17	07:07 08:33-08:37/4 19:29	07:36 18:05-18:19/14 08:13-08:40/27 18:42 08:46-09:16/30	07:11 07:43-08:22/39 17:07	07:39 17:02
19	06:11 20:49	06:39 20:16	07:08 08:26-08:43/17 19:28	07:37 18:07-18:18/11 08:15-08:37/22 18:41 08:44-09:18/34	07:12 07:44-08:21/37 17:06	07:39 17:02
20	06:12 20:48	06:40 20:14	07:09 08:22-08:45/23 19:26	07:38 18:08-18:16/8 08:19-08:33/14 18:39 08:42-09:19/37	07:13 07:46-08:20/34 17:06	07:40 17:02
21	06:13 20:47	06:41 20:13	07:10 08:19-08:48/29 19:24	07:39 08:41-09:21/40 18:38	07:14 07:47-08:19/32 17:05	07:41 17:03
22	06:14 20:47	06:42 20:12	07:11 08:17-08:49/32 19:23	07:40 08:40-09:22/42 18:36	07:15 07:49-08:19/30 17:05	07:41 17:03
23	06:15 20:46	06:43 20:10	07:12 08:15-08:51/36 19:21	07:41 08:39-09:23/44 18:35	07:16 07:51-08:17/26 17:04	07:42 17:04
24	06:15 20:45	06:44 20:09	07:13 08:14-08:52/38 19:19	07:43 08:38-09:24/46 18:34	07:17 07:53-08:16/23 17:03	07:42 17:04
25	06:16 20:44	06:45 20:07	07:13 08:12-08:53/41 19:18	06:44 07:37-08:24/47 17:32	07:18 07:55-08:14/19 17:03	07:42 17:05
26	06:17 20:43	06:46 20:06	07:14 08:11-08:54/43 19:16	06:45 07:36-08:25/49 17:31	07:19 07:57-08:12/15 17:03	07:43 17:06
27	06:18 20:43	06:47 20:04	07:15 08:10-08:54/44 19:15	06:46 07:35-08:25/50 17:30	07:20 08:02-08:08/6 17:02	07:43 17:06
28	06:19 20:42	06:48 20:03	07:16 08:09-08:55/46 19:13	06:47 07:36-08:26/50 17:28	07:21 17:02	07:44 17:07
29	06:20 20:41	06:48 20:01	07:17 08:08-08:55/47 19:11	06:48 07:35-08:27/52 17:27	07:22 17:01	07:44 17:08
30	06:21 20:40	06:49 20:00	07:18 08:07-08:55/48 19:10	06:49 07:34-08:27/53 17:26	07:24 17:01	07:44 17:08
31	06:22 20:39	06:50 19:58		06:50 07:34-08:27/53 17:25		07:44 17:09
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	0	0	448	1743	1096	0

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG07 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (62)

Assumptions for shadow calculations

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

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 19:17	05:59 20:45	06:00 20:55	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:24 17:01
2	07:45 17:11	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:45	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:25 17:00
3	07:45 17:12	07:31 17:45	06:55 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:53 17:21	07:26 17:00
4	07:45 17:13	07:30 17:46	06:54 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:27 17:00
5	07:45 17:13	07:29 17:48	06:52 18:19	07:03 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:28 17:00
6	07:45 17:14	07:28 17:49	06:51 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:00
7	07:45 17:15	07:27 17:50	06:49 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58	06:58 17:17	07:30 17:00
8	07:45 17:16	07:26 17:51	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:17	07:25 17:52	06:46 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:32 17:00
10	07:45 17:18	07:23 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:56 20:50	06:05 20:53	06:31 20:28	06:59 19:42	07:28 18:54	07:01 17:14	07:33 17:00
11	07:44 17:19	07:22 17:55	06:43 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13	07:34 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:56 20:51	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:34 17:00
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 17:00
14	07:44 17:22	07:19 17:58	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:07 20:52	06:34 20:22	07:03 19:36	07:32 18:48	07:06 17:10	07:36 17:00
15	07:43 17:23	07:17 17:59	06:37 18:30	06:48 20:01	06:11 20:30	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:37 17:01
16	07:43 17:24	07:16 18:01	06:35 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:09	07:37 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:18	07:06 19:31	07:35 18:43	07:09 17:08	07:38 17:01
18	07:42 17:27	07:14 18:03	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:10 17:07	07:39 17:02
19	07:42 17:28	07:12 18:04	06:31 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:12 17:06	07:39 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:54	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:40 17:02
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	07:14 17:05	07:41 17:03
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:11	07:11 19:23	07:40 18:36	07:15 17:04	07:41 17:03
23	07:39 17:32	07:07 18:09	06:24 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:14 20:46	06:43 20:10	07:12 19:21	07:41 18:35	07:16 17:04	07:42 17:04
24	07:39 17:33	07:06 18:10	06:23 18:39	06:35 20:10	06:03 20:38	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	07:42 18:34	07:17 17:03	07:42 17:04
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	06:44 17:32	07:18 17:03	07:42 17:05
26	07:37 17:36	07:03 18:12	06:19 18:41	06:33 20:12	06:02 20:40	05:58 20:55	06:17 20:43	06:46 20:06	07:14 19:16	06:45 17:31	07:19 17:02	07:43 17:05
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:42	06:47 20:04	07:15 19:14	06:46 17:30	07:20 17:02	07:43 17:06
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	06:01 20:42	05:58 20:56	06:19 20:42	06:47 20:03	07:16 19:13	06:47 17:28	07:21 17:02	07:44 17:07
29	07:35 17:39		07:15 19:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:01	07:17 19:11	06:48 17:27	07:22 17:01	07:44 17:07
30	07:34 17:41		07:13 19:45	06:27 20:16	06:00 20:43	05:59 20:56	06:21 20:40	06:49 20:00	07:18 19:10	06:49 17:26	07:23 17:01	07:44 17:08
31	07:33 17:42		07:11 19:46		05:59 20:44		06:21 20:39	06:50 19:58		06:50 17:25		07:44 17:09
Potential sun hours	301	299	370	397	444	448	455	425	374	347	301	292
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Progetto_layout_20230710WTG: AG08 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 115,0 m (TOT: 200,0 m) (63)
 Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:45 17:10	07:33 17:43	07:52-07:54/2 18:15	07:10 19:47	06:26 20:17	05:59 20:45	06:00 20:55	06:22 20:38	06:51 19:57	07:19 19:08	06:51 17:23	07:12-07:27/15 17:01	07:24 17:01		
2	07:45 17:11	07:32 17:44	07:51-07:55/4 18:16	07:08 19:48	06:25 20:18	05:58 20:45	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:14-07:28/14 17:00	07:25 17:00		
3	07:45 17:12	07:31 17:45	07:50-07:56/6 18:17	07:07 19:49	06:24 20:19	05:58 20:46	06:01 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:53 17:21	07:15-07:28/13 17:00	07:26 17:00		
4	07:45 17:13	07:30 17:47	07:49-07:57/8 18:18	07:05 19:50	06:22 20:20	05:58 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:16-07:28/12 17:00	07:27 17:00		
5	07:45 17:13	07:29 17:48	07:48-07:57/9 18:19	07:04 19:51	06:21 20:21	05:57 20:48	06:02 20:55	06:26 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:17-07:28/11 17:00	07:28 17:00		
6	07:45 17:14	07:28 17:49	07:47-07:58/11 18:21	07:02 19:52	06:20 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:18-07:27/9 17:00	07:29 17:00		
7	07:45 17:15	07:27 17:50	07:46-07:58/12 18:22	07:00 19:53	06:19 20:23	05:57 20:49	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:58	06:58 17:17	07:20-07:28/8 17:00	07:30 17:00		
8	07:45 17:16	07:26 17:51	07:45-07:58/13 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:03 20:54	06:29 20:30	06:58 19:45	07:26 18:57	06:59 17:16	07:21-07:27/6 17:00	07:31 17:00		
9	07:45 17:17	07:25 17:52	07:44-07:58/14 18:24	06:57 19:55	06:17 20:25	05:56 20:50	06:04 20:54	06:30 20:29	06:59 19:44	07:27 18:55	07:00 17:15	07:22-07:26/4 17:00	07:32 17:00		
10	07:45 17:18	07:23 17:54	07:43-07:58/15 18:25	06:56 19:56	06:16 20:26	05:56 20:50	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:01 17:14	07:23-07:25/2 17:00	07:33 17:00		
11	07:44 17:19	07:22 17:55	07:41-07:56/15 18:26	06:54 19:57	06:15 20:27	05:56 20:51	06:05 20:53	06:32 20:26	07:00 19:41	07:29 18:52	07:03 17:13		07:34 17:00		
12	07:44 17:20	07:21 17:56	07:40-07:56/16 18:27	06:53 19:58	06:14 20:28	05:56 20:51	06:06 20:53	06:33 20:25	07:01 19:39	07:30 18:51	07:04 17:12		07:34 17:00		
13	07:44 17:21	07:20 17:57	07:40-07:55/15 18:28	06:51 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11		07:35 17:00		
14	07:44 17:22	07:19 17:58	07:43-07:53/10 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:07 20:52	06:34 20:22	07:03 19:36	07:32 18:48	07:06 17:10		07:36 17:00		
15	07:43 17:23	07:17 17:59	07:37-07:42/5 18:30	06:48 20:01	06:11 20:30	05:56 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	08:02-08:08/6 17:09		07:37 17:01		
16	07:43 17:25	07:16 18:01	07:35-07:42/7 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:59-08:11/12 17:09		07:37 17:01		
17	07:43 17:26	07:15 18:02	07:34-07:44/10 18:32	06:45 20:03	06:09 20:32	05:56 20:54	06:10 20:50	06:37 20:18	07:06 19:31	07:35 18:43	07:57-08:12/15 17:08		07:38 17:01		
18	07:42 17:27	07:14 18:03	07:33-07:44/11 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:56-08:13/17 17:07		07:39 17:02		
19	07:42 17:28	07:12 18:04	07:31-07:44/13 18:34	06:42 20:05	06:07 20:34	05:56 20:54	06:11 20:49	06:39 20:16	07:08 19:28	07:37 18:40	07:57-08:14/17 17:06		07:39 17:02		
20	07:41 17:29	07:11 18:05	07:30-07:44/14 18:35	06:41 20:06	06:06 20:35	05:56 20:54	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:58-08:14/16 17:06		07:40 17:02		
21	07:41 17:30	07:10 18:06	07:29-07:44/15 18:36	06:39 20:07	06:06 20:36	05:56 20:55	06:13 20:47	06:41 20:13	07:10 19:24	07:39 18:38	08:00-08:15/15 17:05		07:41 17:03		
22	07:40 17:31	07:08 18:07	07:27-07:43/16 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:11	07:11 19:23	07:40 18:36	08:01-08:15/14 17:05		07:41 17:03		
23	07:39 17:32	07:07 18:09	07:26-07:43/17 18:38	06:37 20:09	06:04 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:41 18:35	08:02-08:14/12 17:04		07:42 17:04		
24	07:39 17:34	07:06 18:10	07:24-07:41/17 18:39	06:35 20:10	06:03 20:38	05:57 20:55	06:15 20:45	06:44 20:09	07:12 19:19	07:42 18:34	08:03-08:14/11 17:03		07:42 17:04		
25	07:38 17:35	07:04 18:11	07:26-07:40/14 18:40	06:34 20:11	06:03 20:39	05:57 20:55	06:16 20:44	06:45 20:07	07:13 19:18	06:44 17:32	07:04-07:13/9 17:03		07:42 17:05		
26	07:37 17:36	07:03 18:12	07:28-07:39/11 18:41	06:33 20:12	06:02 20:40	05:58 20:55	06:17 20:43	06:46 20:06	07:14 19:16	06:45 17:31	07:05-07:12/7 17:02		07:43 17:06		
27	07:37 17:37	07:01 18:13	07:27-07:39/11 18:42	06:31 20:13	06:01 20:41	05:58 20:56	06:18 20:42	06:47 20:04	07:15 19:14	06:46 17:30	07:14-07:19/5 17:02		07:43 17:06		
28	07:36 17:38	07:00 18:14	07:28-07:39/11 18:43	06:30 20:14	06:01 20:42	05:58 20:56	06:19 20:42	06:47 20:03	07:16 19:13	06:47 17:28	07:12-07:23/11 17:02		07:44 17:07		
29	07:35 17:39	07:00 18:14	07:28-07:39/11 18:44	06:29 20:15	06:00 20:43	05:59 20:56	06:20 20:41	06:48 20:01	07:17 19:11	06:48 17:27	07:10-07:25/15 17:01		07:44 17:08		
30	07:34 17:41	07:00 18:14	07:28-07:39/11 18:45	06:27 20:16	06:00 20:43	05:59 20:55	06:21 20:40	06:49 20:00	07:18 19:10	06:49 17:26	07:10-07:26/16 17:01		07:44 17:08		
31	07:33 17:42	07:00 18:14	07:28-07:39/11 18:46	06:26 20:17	06:00 20:44	05:59 20:55	06:22 20:39	06:50 19:58	07:19 19:09	06:50 17:25	07:11-07:26/15 17:01		07:44 17:09		
Potential sun hours	301	299	302	370	397	444	447	455	425	374	347	219	301	94	292
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

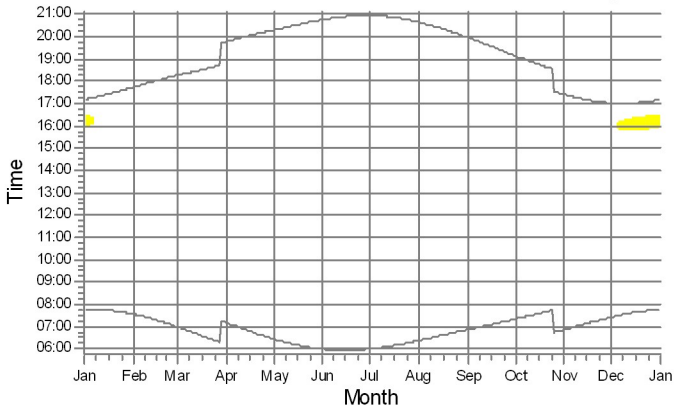
Table layout: For each day in each month the following matrix apply

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

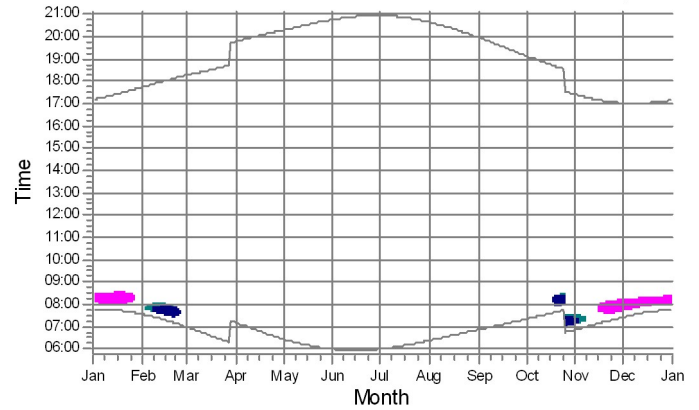
SHADOW - Calendar per WTG, graphical

Calculation: Progetto_layout_20230710

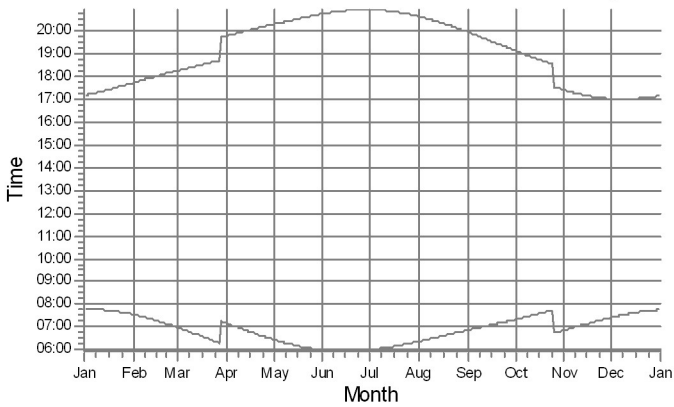
AG01: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



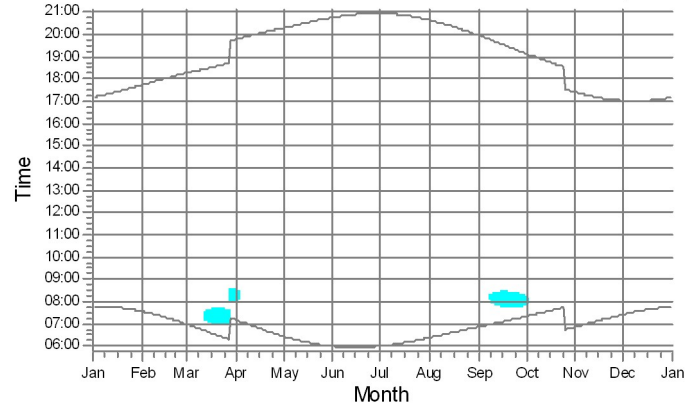
AG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



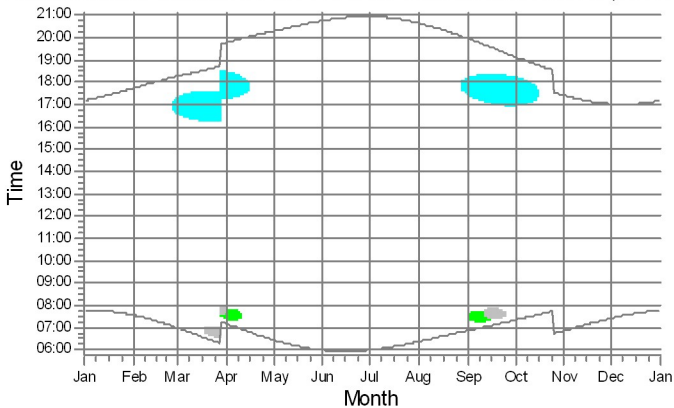
AG03: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



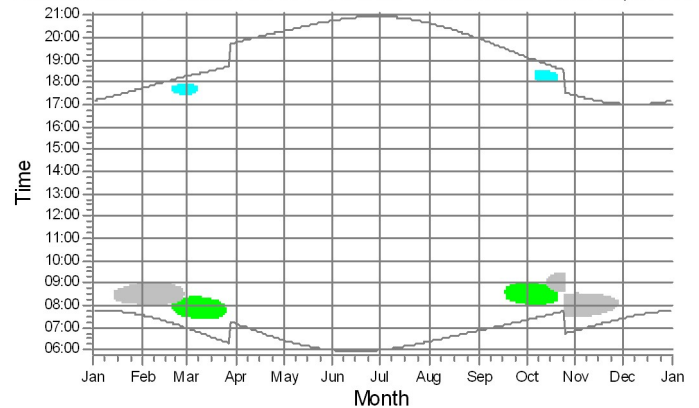
AG04: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)










AG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



AG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2)



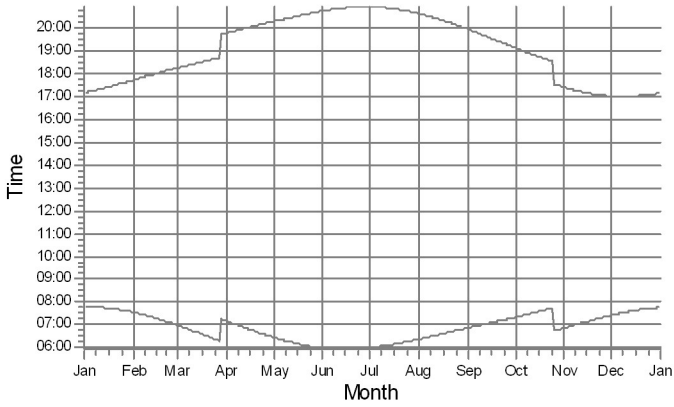
Shadow receptors

	F036: D10		F055: A03		F126: A04
	F050: A03		F076: campeggio camper		
	F054: A02		F123: A07		

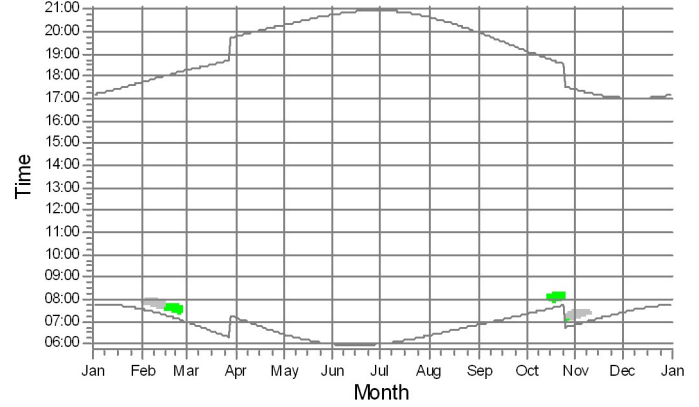
SHADOW - Calendar per WTG, graphical

Calculation: Progetto_layout_20230710

AG07: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2



AG08: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 115,0 m (TOT: 2



Shadow receptors

 F076: campeggio camper  F123: A07