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REGIONE SARDEGNA


Provincia del Sud Sardegna

PARCO EOLICO "SA CORONA"

COMUNI DI NURAMINIS, SAMATZAI E USSANA (SU)




OGGETTO STUDIO DI IMPATTO AMBIENTALE	TITOLO ANALISI DEGLI EFFETTI DI SHADOW - FLICKERING				
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1 CRITERI GENERALI DI ANALISI E VALUTAZIONE

La Società Baltex Sardegna 15 Nuraminis S.r.l. intende realizzare un impianto per la produzione di energia elettrica da fonte rinnovabile eolica composto da n. 11 aerogeneratori, con potenza unitaria di 6,2 MW per una potenza complessiva di 68,2 MW, ricadente nei territori comunali di Nuraminis, Samatzai e Ussana (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-NS-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 DESCRIZIONE DEL FENOMENO

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, allorché 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 si è proceduto a verificarne 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-NS-RA11-1 (Carta con individuazione dei fabbricati) riporta l'individuazione dei fabbricati censiti in accordo con la metodologia precedentemente indicata. Lo stralcio della ripresa aerea zenitale, la categoria catastale di appartenenza ed una fotografia prospettica degli edifici sono riportati nell'Elaborato BLTX-NS-RA11 allegato alla documentazione progettuale.

Nel caso specifico, ai fini dei calcoli di esposizione all'ombra intermittente, sono stati individuati come ricettori n. 15 fabbricati, con destinazione abitativa accertata (edifici con categoria catastale "A" e corpi di fabbrica con tipologia costruttiva equiparabile a quella residenziale), ubicati entro una distanza di 1000 m dalle postazioni eoliche.

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 - Fabbricati con destinazione abitativa esposti al potenziale disturbo da shadow flickering

FABBRICATO	COMUNE	GB EST	GB NORD	DISTANZA DAL PIÙ PROSSIMO WTG [M]	WTG PIÙ PROSSIMO [M]	CATEGORIA CATASTO FABBRICATI
F023	Samatzai	1504537	4367811	607	WTG02	A4 - Abitazioni di tipo popolare
F028	Samatzai	1506168	4367122	966	WTG05	A3 - Abitazioni di tipo economico
F029	Samatzai	1505637	4366465	570	WTG09	A3 - Abitazioni di tipo economico
F030	Samatzai	1505646	4366432	556	WTG09	A2 - Abitazioni di tipo civile
F034	Ussana	1505728	4365598	711	WTG09	A2 - Abitazioni di tipo civile
F038	Ussana	1506100	4364068	823	WTG11	D10 – Fabbricato
F039	Ussana	1506066	4364133	781	WTG11	A3 - Abitazioni di tipo economico
F065	Samatzai	1503162	4369323	854	WTG01	A3 - Abitazioni di tipo economico
F083	Samatzai	1505332	4369123	757	WTG03	D1 - Opifici
F094	Nuraminis	1504788	4363442	905	WTG11	A3 - Abitazioni di tipo economico
F095	Nuraminis	1504736	4363486	900	WTG11	A3 - Abitazioni di tipo economico
F108	Samatzai	1506686	4368804	679	WTG03	A2 - Abitazioni di tipo civile
F111	Pimentel	1506219	4369757	999	WTG03	A2 - Abitazioni di tipo civile
F145	USSANA	1506079	4364104	797	WTG11	Non accatastato
F153	Ussana	1506049	4365610	935	WTG10	A4 - Abitazioni di tipo popolare

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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 ostacolano 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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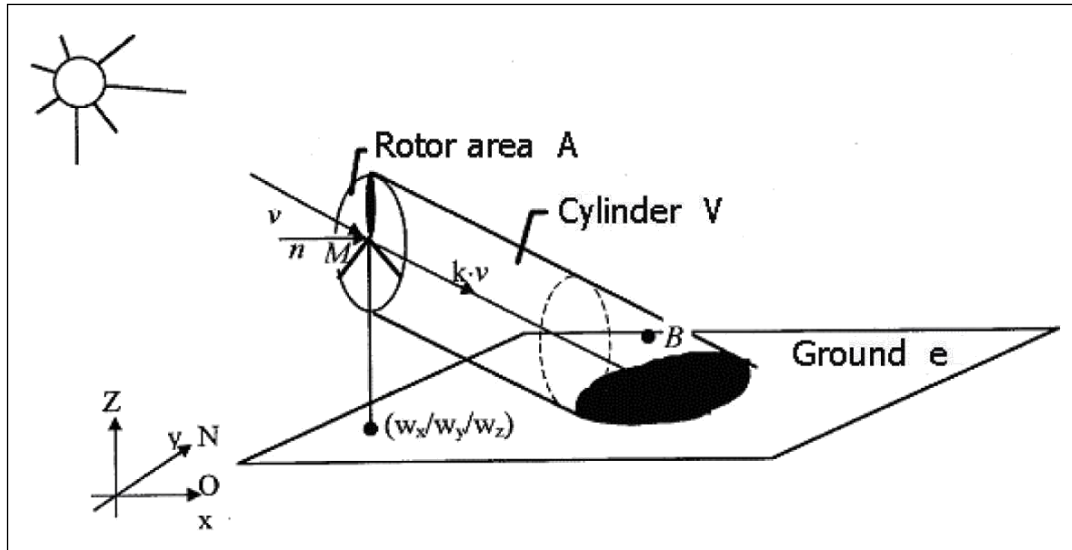


Figura 4.1: Rappresentazione schematica della proiezione dell'ombra del rotore.

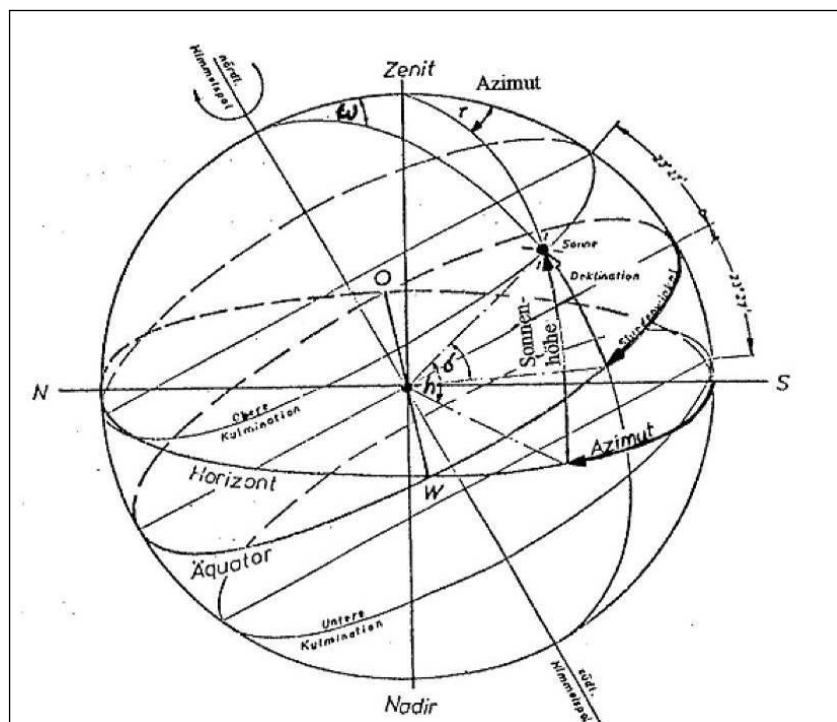



Figura 4.2: Schema dei moti terrestri e parametri di calcolo.

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

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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 ricettore 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;
- 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 BLTX-NS-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	F023	A4	WTG05-WTG04	WTG02	607	52:53	1:04	11:57
2	F028	A3 - D10	WTG05-WTG07	WTG05	966	38:38	0:41	11:36
3	F029	A3	WTG06- WTG07-WTG09	WTG09	570	138:16	1:11	31:08
4	F030	A2 - D7	WTG06- WTG07-WTG09	WTG09	556	148:15	1:12	34:10
5	F034	A2	WTG06- WTG07-WTG08	WTG09	711	52:18	0:38	16:52
6	F038	D10	WTG11	WTG11	823	46:55	0:48	15:13
7	F039	A3 - D10	WTG11	WTG11	781	46:24	0:50	14:37
8	F065	A3-C6	WTG01-WTG02	WTG01	854	33:31	0:41	7:55
9	F083	A3	WTG01- WTG02-WTG03	WTG03	757	99:42	0:53	23:52
10	F094	D1	-	WTG11	905	0:00	0:00	0:00
11	F095	A3	-	WTG11	900	0:00	0:00	0:00
12	F108	A2	WTG03	WTG03	679	55:44	0:57	16:36
13	F111	A2 - C6	WTG11	WTG03	999	0:00	0:00	0:00
14	F145	SEMINATIVO	WTG11	WTG11	797	46:48	0:50	14:58
15	F153	A4	WTG07- WTG08-WTG09	WTG10	935	32:26	0:28	10:16

Come si può osservare dall'esame della Tabella 2, l'incidenza dell'ombreggiamento intermittente presso i ricettori considerati nello "scenario reale" è al disotto del valore guida di 30 h/anno con la sola eccezione dei ricettori F29 e F30, contraddistinti da un'incidenza dell'ombreggiamento intermittente lievemente superiore alla soglia di riferimento di 30 h/anno (31:08 h/anno e 34:10 h/anno rispettivamente).

Nel seguito si focalizzerà l'attenzione sulle situazioni di maggiore incidenza del fenomeno di SF,

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riferibili al fabbricato F30, maggiormente esposto al fenomeno, pervenendo alla conclusione che può ragionevolmente escludersi che lo shadow-flickering possa rappresentare un effettivo disturbo a carico degli occupanti l'edificio. Le stesse considerazioni, come più oltre evidenziato, potranno ritenersi sostanzialmente valide anche per il ricettore F29, ubicato ad appena 20 metri circa a nord di questo.

Ricettore F30

Il calendario grafico dell'ombra relativo al ricettore F30 (Figura 6.1) mostra come il fenomeno dello SF sia prevalentemente atteso nel pomeriggio dei mesi autunnali/invernali (nella fascia oraria 15:00-17:00) ad opera dell'aerogeneratore WTG09 (indicativamente da metà ottobre a metà febbraio). Un ulteriore contributo è rilevabile nel tardo pomeriggio (periodo ottobre-marzo), tra le h. 17:00 e le h. 19.00, attribuibile agli aerogeneratori WTG06 e WTG07.


Analizzando più in dettaglio le caratteristiche del fenomeno presso il ricettore F30 si ritiene opportuno formulare le seguenti considerazioni:

- La facciata principalmente esposta al fenomeno dello SF riferibile agli aerogeneratori potenzialmente disturbanti è quella rivolta a sudovest ed appare schermata da una cortina arborea al bordo del lotto edificato, risultando conseguentemente drasticamente attenuata (se non del tutto eliminata) l'incidenza dell'ombreggiamento (Figura 6.2);
- Il contributo all'ombreggiamento dell'aerogeneratore WTG06, valutabile complessivamente in circa 2/3 h/anno, sarà pressoché inavvertibile in considerazione dell'elevata distanza che lo separa dal ricettore F30 (pari a circa 1.900 metri) e, della conseguente "sfocatura" dell'ombra intermittente;

A questo riguardo deve sottolinearsi che, affinché il fenomeno 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 non distante dai richiamati valori guida delle Linee Guida tedesche.

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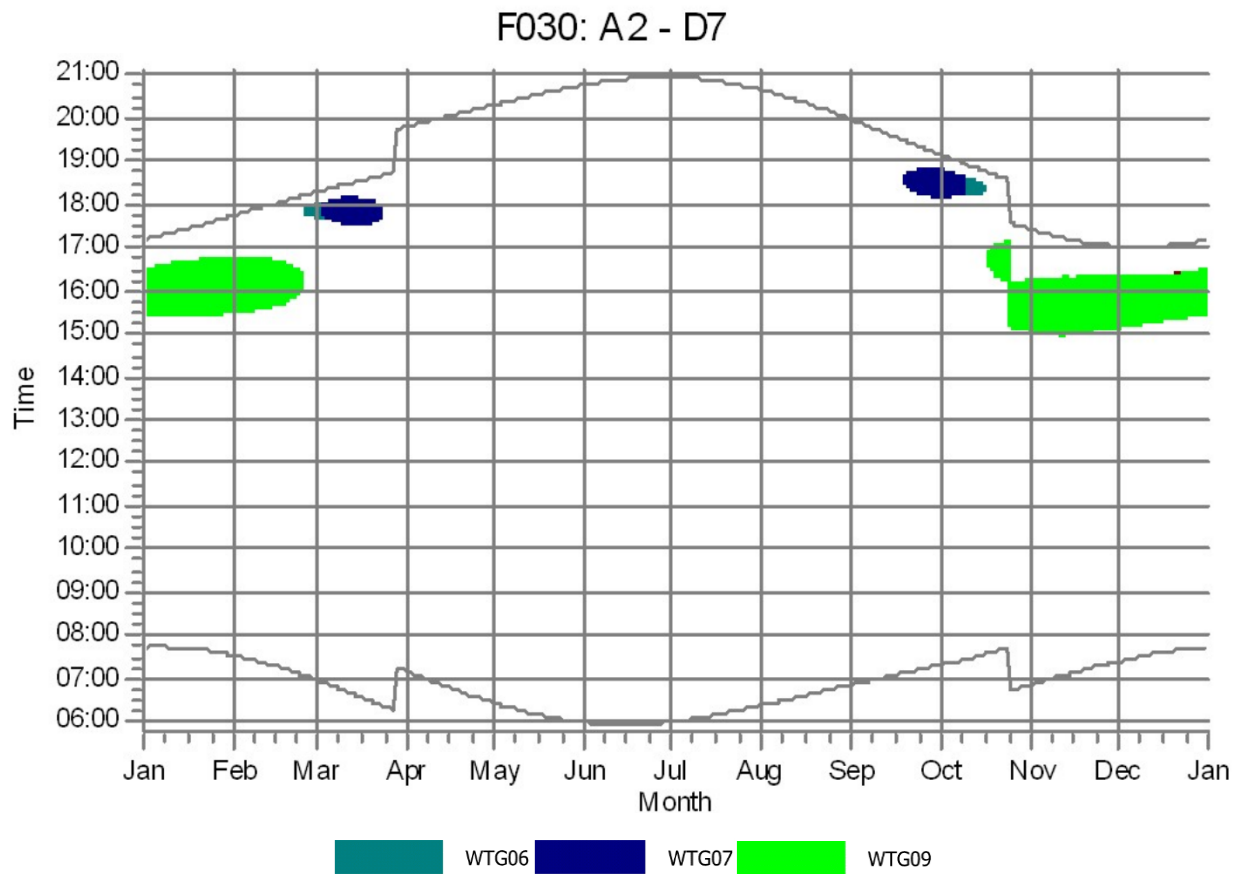


Figura 6.1 – Calendario dell'ombra relativo al ricevitore F30


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Figura 6.2 – Fabbricato F30 – Vista aerea da sud. Si noti la presenza della fitta cortina arborea sul lato sudovest


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Figura 6.3 – Ricettori F 29 e F30 (Vista zenitale) e isolinee d’ombra (in bianco). In evidenza le alberature schermanti a bordo lotto, a sudovest dei fabbricati

Ricettore F29

Il calendario grafico dell’ombra relativo al ricettore F29 (Figura 6.4) è sostanzialmente analogo a quello del fabbricato F30. Anche in questo caso, infatti, il fenomeno dello SF è prevalentemente atteso nel pomeriggio dei mesi invernali (nella fascia oraria 15:00-17:00) ad opera dell’aerogeneratore WTG09 (indicativamente da novembre a metà febbraio). Un ulteriore contributo è rilevabile nel tardo pomeriggio (periodo ottobre-marzo), tra le h. 17:00 e le h. 18:00, attribuibile agli aerogeneratori WTG06 e WTG07.

Analizzando più in dettaglio le caratteristiche del fenomeno presso il ricettore F29 si ritiene opportuno formulare le seguenti considerazioni:


- La facciata esposta al fenomeno dello SF riferibile agli aerogeneratori potenzialmente disturbanti è quella rivolta a sudovest e risulta contraddistinta da superfici fenestrate piuttosto ridotte (Figura 6.5);
- La stessa facciata, inoltre, risulta schermata da una cortina arborea al bordo del lotto

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edificato, risultando conseguentemente drasticamente attenuata l'incidenza dell'ombreggiamento

- Il contributo all'ombreggiamento dell'aerogeneratore WTG06, valutabile complessivamente in circa 2 h/anno, sarà pressoché inavvertibile in considerazione dell'elevata distanza che lo separa dal ricettore F29 (pari a circa 1.900 metri) e, della conseguente "sfocatura" dell'ombra intermittente;
- l'incidenza del fenomeno nel suddetto prospetto sudovest del fabbricato, ove si rivelasse effettivamente disturbante per gli occupanti, potrebbe essere efficacemente mitigata rafforzando la cortina arborea esistente.

Tutto ciò considerato è ragionevole affermare che, in corrispondenza dei ricettori F29 e F30, l'effettiva potenziale incidenza del fenomeno dello *shadow flickering* risulterà drasticamente più contenuta di quella prospettata dal software di simulazione e ricondotta all'interno dei richiamati valori guida delle Linee Guida tedesche. In ogni caso, laddove durante la fase operativa dell'impianto dovesse essere avvertito un effettivo disturbo da parte degli occupanti gli edifici, saranno attuate – a cura e spese della società proponente - efficaci misure di mitigazione quali il rafforzamento delle esistenti alberature perimetrali.

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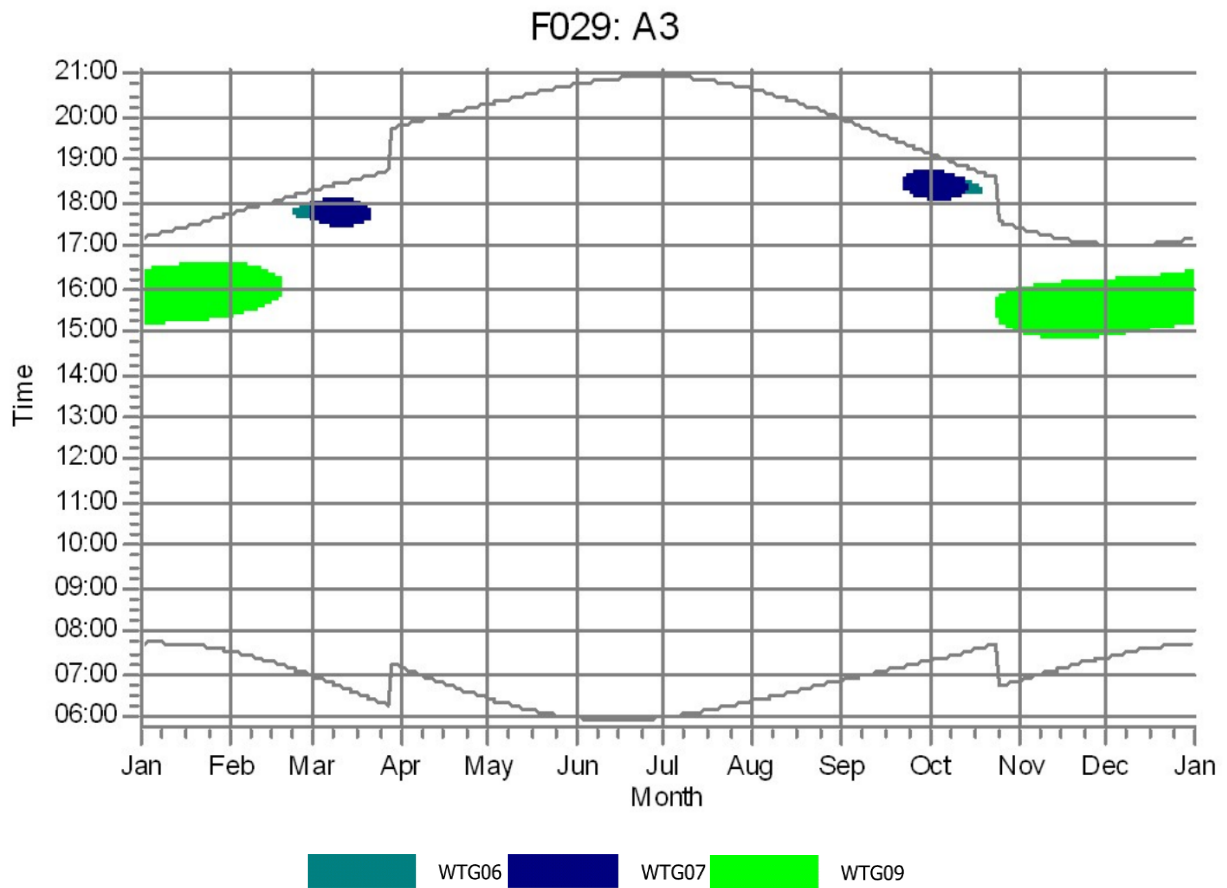


Figura 6.4 – Calendario dell'ombra relativo al ricevitore F29



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Figura 6.5 – Fabbricato F29 – Vista aerea da sud. Si noti la presenza della fitta cortina arborea sul lato sudovest e la ridotta superficie fenestrata dalla facciata esposta a sudovest

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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 abitativi presenti nell'area interessata dal proposto parco eolico di Seneghe e Narbolia proposto Sorgenia Renewables S.r.l.

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.

Nel caso specifico, ai fini dei calcoli di esposizione all'ombra intermittente, sono stati individuati come ricettori n. 15 fabbricati, con destinazione abitativa accertata (edifici con categoria catastale "A" e corpi di fabbrica con tipologia costruttiva equiparabile a quella residenziale), ubicati entro una distanza di 1000 m dalle 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.


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 *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.


I risultati della simulazione modellistica hanno evidenziato come l'incidenza dell'ombreggiamento intermittente presso i ricettori considerati nello "**scenario reale**" sia al disotto del valore guida di 30 h/anno con la sola eccezione dei ricettori F29 e F30, contraddistinti da un'incidenza dell'ombreggiamento intermittente lievemente superiore alla soglia di riferimento di 30 h/anno (31:08 h/anno e 34:10 h/anno rispettivamente).

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 dei fabbricati, contraddistinti da una limitata superficie fenestrata nel prospetto sudovest esposto all'ombreggiamento nel periodo autunnale/invernale (F29) o schermati da alberature (F30), è altamente verosimile che l'effettiva incidenza dello *shadow*

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flickering risulterà drasticamente più contenuta di quella prospettata dal software di simulazione nello scenario "real case".

Da quanto precede, nel concludere che l'effettiva potenziale incidenza del fenomeno dello shadow flickering risulterà prossima ai richiamati valori guida delle Linee Guida tedesche, si evidenzia che, laddove durante la fase operativa dell'impianto dovesse essere avvertito un effettivo disturbo da parte degli occupanti gli edifici più esposti, saranno attuate – a cura e spese della società proponente - efficaci misure di mitigazione quali il rafforzamento delle esistenti alberature perimetrali.

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APPENDICE: REPORT DEI RISULTATI DEL CALCOLO MODELLISTICO

SHADOW - Main Result

Calculation: Real_case_Progetto_20240628

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 Nura

Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

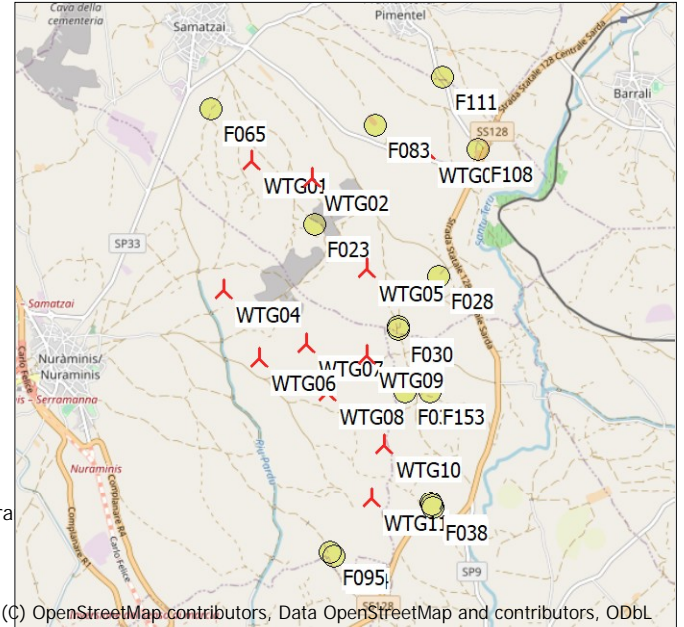
Italian Gauss-Boaga west-ROMA40 (IT-peninsular <±4m)

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]
WTG01	1.503.692	4.368.653	179,7	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG02	1.504.493	4.368.417	181,2	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG03	1.506.007	4.368.780	130,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG04	1.503.325	4.366.944	119,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG05	1.505.208	4.367.227	158,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG06	1.503.792	4.366.047	120,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG07	1.504.411	4.366.234	143,3	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG08	1.504.701	4.365.608	130,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG09	1.505.211	4.366.086	142,6	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG10	1.505.444	4.364.912	146,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8	
WTG11	1.505.287	4.364.197	128,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	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]
F023	A4	1.504.537	4.367.811	180,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F028	A3 - D10	1.506.168	4.367.122	130,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F029	A3	1.505.637	4.366.465	130,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F030	A2 - D7	1.505.646	4.366.432	130,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F034	A2	1.505.728	4.365.598	138,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F038	D10	1.506.100	4.364.068	116,3	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F039	A3 - D10	1.506.066	4.364.133	119,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F065	A3-C6	1.503.162	4.369.323	149,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F083	A3	1.505.332	4.369.123	158,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F094	D1	1.504.788	4.363.442	102,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F095	A3	1.504.736	4.363.486	101,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F108	A2	1.506.686	4.368.804	139,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F111	A2 - C6	1.506.219	4.369.757	143,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F145	SEMINATIVO	1.506.079	4.364.104	117,6	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F153	A4	1.506.049	4.365.610	134,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6



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

Scale 1:100.000
 ▲ New WTG
 ● Shadow receptor

Project:

Progetto_Baltex Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Main Result

Calculation: Real_case_Progetto_20240628

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values
		Shadow hours per year [h/year]
F023	A4	11:57
F028	A3 - D10	11:36
F029	A3	31:08
F030	A2 - D7	34:10
F034	A2	16:52
F038	D10	15:13
F039	A3 - D10	14:37
F065	A3-C6	7:55
F083	A3	23:52
F094	D1	0:00
F095	A3	0:00
F108	A2	16:36
F111	A2 - C6	0:00
F145	SEMINATIVO	14:58
F153	A4	10:16

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

No.	Name		Worst case	Expected
			[h/year]	[h/year]
WTG01	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (33)	15:26	3:40
WTG02	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (34)	62:50	14:09
WTG03	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (35)	110:41	30:35
WTG04	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (36)	12:57	2:48
WTG05	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (37)	70:25	18:58
WTG06	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (38)	10:30	2:56
WTG07	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (39)	63:10	19:25
WTG08	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (40)	36:52	9:48
WTG09	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (41)	152:30	34:44
WTG10	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (42)	1:11	0:14
WTG11	Siemens Gamesa SG 6.2-170 6200 170.0 !O!	hub: 135,0 m (TOT: 220,0 m) (43)	67:47	21:40

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 Nuraminis

Licensed user:

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Calculated:
28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F023 - A4

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 each day of the month. Each cell contains a time range (e.g., 07:45-08:21) and a WTG05 identifier. Summary rows at the bottom show 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and '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

Calculation: Real_case_Progetto_20240628Shadow receptor: F028 - A3 - 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
1	07:45 17:11	07:33 17:43	17:02 (WTG07) 18:16	06:59 18:16	07:10 19:47	06:27 20:17
2	07:45 17:12	07:32 17:45	17:02 (WTG07) 18:17	06:57 18:17	07:09 19:48	06:25 20:18
3	07:45 17:12	07:31 17:46	17:03 (WTG07) 18:18	06:56 18:18	07:07 19:49	06:24 20:19
4	07:45 17:13	07:30 17:47	17:03 (WTG07) 18:19	06:54 18:19	07:05 19:50	06:23 20:20
5	07:45 17:14	07:29 17:48	17:04 (WTG07) 18:20	06:53 18:20	07:04 19:51	06:22 20:21
6	07:45 17:15	07:28 17:49	17:06 (WTG07) 18:21	06:51 18:21	07:02 19:52	06:21 20:22
7	07:45 17:16	07:27 17:51	17:08 (WTG07) 18:22	06:50 18:22	07:01 19:53	06:19 20:23
8	07:45 17:17	07:26 17:52	17:11 (WTG07) 18:23	06:48 18:23	06:59 19:54	06:18 20:24
9	07:45 17:18	07:25 17:53	17:15 (WTG07) 18:24	06:47 18:24	06:58 19:55	06:17 20:25
10	07:45 17:19	07:23 17:54	17:18 (WTG07) 18:25	06:45 18:25	06:56 19:56	06:16 20:26
11	07:44 17:20	07:22 17:55	17:20 (WTG07) 18:26	06:44 18:26	06:55 19:57	06:15 20:27
12	07:44 17:21	07:21 17:56	17:21 (WTG07) 18:27	06:42 18:27	06:53 19:58	06:14 20:28
13	07:44 17:22	07:20 17:58	17:22 (WTG07) 18:28	06:40 18:28	06:52 19:59	06:13 20:29
14	07:44 17:23	07:19 17:59	17:23 (WTG07) 18:29	06:39 18:29	06:50 20:00	06:12 20:30
15	07:43 17:24	07:18 18:00	17:24 (WTG07) 18:30	06:37 18:30	06:49 20:01	06:11 20:30
16	07:43 17:25	07:16 18:01	17:25 (WTG07) 18:31	06:36 18:31	06:47 20:02	06:10 20:31
17	07:42 17:26	07:15 18:02	17:26 (WTG07) 18:32	06:34 18:32	06:46 20:03	06:09 20:32
18	07:42 17:27	07:14 18:03	17:27 (WTG07) 18:33	06:33 18:33	06:44 20:04	06:09 20:33
19	07:42 17:28	07:12 18:04	17:28 (WTG07) 18:34	06:31 18:34	06:43 20:05	06:08 20:34
20	07:41 17:30	07:11 18:06	17:29 (WTG07) 18:35	06:29 18:35	06:41 20:06	06:07 20:35
21	07:41 17:31	07:10 18:07	17:30 (WTG07) 18:36	06:28 18:36	06:40 20:07	06:06 20:36
22	07:40 17:32	17:05 (WTG07) 07:08	17:31 (WTG07) 18:37	06:26 18:37	06:38 20:08	06:05 20:37
23	07:39 17:33	17:04 (WTG07) 07:07	17:32 (WTG07) 18:38	06:25 18:38	06:37 20:09	06:05 20:38
24	07:39 17:34	17:03 (WTG07) 07:06	17:33 (WTG07) 18:39	06:23 18:39	06:36 20:10	06:04 20:38
25	07:38 17:35	17:02 (WTG07) 07:04	17:34 (WTG07) 18:40	06:21 18:40	06:34 20:11	06:03 20:39
26	07:37 17:36	17:11 (WTG07) 07:03	17:35 (WTG07) 18:41	06:20 18:41	06:33 20:12	06:03 20:40
27	07:37 17:38	17:02 (WTG07) 07:02	17:36 (WTG07) 18:42	06:18 18:42	06:32 20:13	06:02 20:41
28	07:36 17:39	17:13 (WTG07) 07:00	17:37 (WTG07) 18:43	06:17 18:43	06:30 20:14	06:02 20:42
29	07:35 17:40	17:02 (WTG07) 07:00	17:38 (WTG07) 18:44	06:15 18:44	06:29 20:15	06:01 20:42
30	07:34 17:41	17:17 (WTG07) 07:00	17:39 (WTG07) 18:45	06:14 18:45	06:28 20:16	06:00 20:43
31	07:33 17:42	17:02 (WTG07) 07:00	17:40 (WTG07) 18:46	06:12 18:46	06:26 20:17	06:00 20:44
Potential sun hours	302	299	370	397	444	447
Total, worst case	107	120			878	48
Sun reduction	0,45	0,47			0,53	0,59
Oper. time red.	0,77	0,77			0,77	0,77
Wind dir. red.	0,63	0,63			0,66	0,66
Total reduction	0,22	0,23			0,27	0,30
Total, real	24	28			236	14

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_20240628Shadow receptor: F028 - A3 - 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

	July	August	September	October	November	December
1	06:00	06:23	06:52	18:53 (WTG05)	07:19	06:51
	20:55	20:38	19:57	35 19:28 (WTG05)	19:08	17:24
2	06:01	06:24	06:53	18:53 (WTG05)	07:20	06:52
	20:55	20:37	19:55	33 19:26 (WTG05)	19:07	17:23
3	06:01	06:25	06:53	18:54 (WTG05)	07:21	06:54
	20:55	20:36	19:54	31 19:25 (WTG05)	19:05	17:22
					6 16:46 (WTG07)	17:01
4	06:02	06:26	06:54	18:55 (WTG05)	07:22	06:55
	20:55	20:35	19:52	27 19:22 (WTG05)	19:04	17:21
					12 16:49 (WTG07)	17:01
5	06:02	06:27	06:55	18:56 (WTG05)	07:23	06:56
	20:55	20:33	19:50	24 19:20 (WTG05)	19:02	17:19
					15 16:50 (WTG07)	17:01
6	06:03	06:28	06:56	18:58 (WTG05)	07:24	06:57
	20:55	20:32	19:49	20 19:18 (WTG05)	19:00	17:18
					17 16:51 (WTG07)	17:00
7	06:03	06:28	06:57	19:01 (WTG05)	07:25	06:58
	20:54	20:31	19:47	13 19:14 (WTG05)	18:59	17:17
					19 16:52 (WTG07)	17:00
8	06:04	06:29	06:58	19:02 (WTG05)	07:26	06:59
	20:54	20:30	19:46		18:57	17:16
					19 16:53 (WTG07)	17:00
9	06:05	06:30	06:59	19:03 (WTG05)	07:27	07:00
	20:54	20:29	19:44		18:56	17:15
					19 16:52 (WTG07)	17:00
10	06:05	06:31	19:09 (WTG05)	07:00	07:28	07:01
	20:53	20:28	13 19:22 (WTG05)	19:42	18:54	17:14
					18 16:51 (WTG07)	17:00
11	06:06	06:32	19:06 (WTG05)	07:01	07:29	07:03
	20:53	20:26	18 19:24 (WTG05)	19:41	18:53	17:13
					17 16:50 (WTG07)	17:01
12	06:07	06:33	19:04 (WTG05)	07:02	07:30	07:04
	20:52	20:25	22 19:26 (WTG05)	19:39	18:51	17:13
					17 16:49 (WTG07)	17:01
13	06:07	06:34	19:02 (WTG05)	07:03	07:31	07:05
	20:52	20:24	26 19:28 (WTG05)	19:38	18:50	17:12
					15 16:49 (WTG07)	17:01
14	06:08	06:35	19:01 (WTG05)	07:04	07:32	07:06
	20:52	20:23	28 19:29 (WTG05)	19:36	18:48	17:11
					13 16:47 (WTG07)	17:01
15	06:09	06:36	19:00 (WTG05)	07:04	07:33	07:07
	20:51	20:21	30 19:30 (WTG05)	19:34	18:47	17:10
					12 16:46 (WTG07)	17:01
16	06:10	06:37	18:59 (WTG05)	07:05	07:34	07:08
	20:50	20:20	32 19:31 (WTG05)	19:33	18:45	17:09
					10 16:45 (WTG07)	17:02
17	06:10	06:38	18:58 (WTG05)	07:06	07:35	07:09
	20:50	20:19	34 19:32 (WTG05)	19:31	18:44	17:08
					9 16:44 (WTG07)	17:02
18	06:11	06:39	18:56 (WTG05)	07:07	07:36	07:10
	20:49	20:17	36 19:32 (WTG05)	19:29	18:42	17:08
					7 16:44 (WTG07)	17:02
19	06:12	06:40	18:55 (WTG05)	07:08	07:37	07:12
	20:49	20:16	37 19:32 (WTG05)	19:28	18:41	17:07
					4 16:43 (WTG07)	17:03
20	06:13	06:40	18:54 (WTG05)	07:09	07:38	07:13
	20:48	20:14	39 19:33 (WTG05)	19:26	18:39	17:06
					3 16:43 (WTG07)	17:03
21	06:13	06:41	18:54 (WTG05)	07:10	07:39	07:14
	20:47	20:13	39 19:33 (WTG05)	19:25	18:38	17:06
						17:03
22	06:14	06:42	18:53 (WTG05)	07:11	07:40	07:15
	20:46	20:12	40 19:33 (WTG05)	19:23	18:37	17:05
						17:04
23	06:15	06:43	18:53 (WTG05)	07:12	07:42	07:16
	20:46	20:10	40 19:33 (WTG05)	19:21	18:35	17:05
						17:04
24	06:16	06:44	18:53 (WTG05)	07:13	07:43	07:17
	20:45	20:09	40 19:33 (WTG05)	19:20	18:34	17:04
						17:05
25	06:17	06:45	18:52 (WTG05)	07:14	06:44	07:18
	20:44	20:07	41 19:33 (WTG05)	19:18	17:33	17:04
						17:06
26	06:18	06:46	18:52 (WTG05)	07:15	06:45	07:19
	20:43	20:06	41 19:33 (WTG05)	19:16	17:31	17:03
						17:06
27	06:19	06:47	18:51 (WTG05)	07:16	06:46	07:20
	20:42	20:04	40 19:31 (WTG05)	19:15	17:30	17:03
						17:07
28	06:19	06:48	18:51 (WTG05)	07:17	06:47	07:21
	20:42	20:03	40 19:31 (WTG05)	19:13	17:29	17:02
						17:07
29	06:20	06:49	18:51 (WTG05)	07:17	06:48	07:22
	20:41	20:01	39 19:30 (WTG05)	19:12	17:28	17:02
						17:08
30	06:21	06:50	18:52 (WTG05)	07:18	06:49	07:23
	20:40	20:00	38 19:30 (WTG05)	19:10	17:26	17:02
						17:09
31	06:22	06:51	18:52 (WTG05)		06:50	
	20:39	19:58	37 19:29 (WTG05)		17:25	
						17:10
Potential sun hours	454	425	374		347	302
Total, worst case						232
Sun reduction						0,50
Oper. time red.						0,77
Wind dir. red.						0,63
Total reduction						0,25
Total, real						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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Project:

Progetto_Baltex Nuraminis

Licensed user:

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 Giuseppe Frongia / direttore@iatprogetti.it
 Calculated:
 28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F029 - A3

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	15:14 (WTG09)	07:33	15:26 (WTG09)	06:59	17:41 (WTG06)	07:10	06:27	06:00			
	17:11	67	16:21 (WTG09)	17:44	65	16:31 (WTG09)	18:16	13	17:54 (WTG06)	19:47	20:17	20:45
2	07:45	15:14 (WTG09)	07:32	15:27 (WTG09)	06:57	17:40 (WTG07)	07:09	06:25	05:59			
	17:12	67	16:21 (WTG09)	17:45	64	16:31 (WTG09)	18:17	16	17:56 (WTG07)	19:48	20:18	20:45
3	07:45	15:15 (WTG09)	07:31	15:28 (WTG09)	06:56	17:38 (WTG07)	07:07	06:24	05:59			
	17:12	67	16:22 (WTG09)	17:46	62	16:30 (WTG09)	18:18	19	17:57 (WTG07)	19:49	20:19	20:46
4	07:45	15:15 (WTG09)	07:30	15:29 (WTG09)	06:54	17:36 (WTG07)	07:05	06:23	05:58			
	17:13	67	16:22 (WTG09)	17:47	61	16:30 (WTG09)	18:19	22	17:58 (WTG07)	19:50	20:20	20:47
5	07:45	15:15 (WTG09)	07:29	15:30 (WTG09)	06:53	17:34 (WTG07)	07:04	06:22	05:58			
	17:14	68	16:23 (WTG09)	17:48	59	16:29 (WTG09)	18:20	25	17:59 (WTG07)	19:51	20:21	20:47
6	07:45	15:16 (WTG09)	07:28	15:31 (WTG09)	06:51	17:34 (WTG07)	07:02	06:21	05:58			
	17:15	68	16:24 (WTG09)	17:49	58	16:29 (WTG09)	18:21	27	18:01 (WTG07)	19:52	20:22	20:48
7	07:45	15:16 (WTG09)	07:27	15:32 (WTG09)	06:50	17:32 (WTG07)	07:01	06:20	05:58			
	17:16	68	16:24 (WTG09)	17:51	56	16:28 (WTG09)	18:22	29	18:01 (WTG07)	19:53	20:23	20:49
8	07:45	15:16 (WTG09)	07:26	15:33 (WTG09)	06:48	17:32 (WTG07)	06:59	06:18	05:57			
	17:17	69	16:25 (WTG09)	17:52	54	16:27 (WTG09)	18:23	31	18:03 (WTG07)	19:54	20:24	20:49
9	07:45	15:17 (WTG09)	07:25	15:35 (WTG09)	06:47	17:31 (WTG07)	06:58	06:17	05:57			
	17:18	69	16:26 (WTG09)	17:53	52	16:27 (WTG09)	18:24	31	18:02 (WTG07)	19:55	20:25	20:50
10	07:45	15:17 (WTG09)	07:23	15:36 (WTG09)	06:45	17:30 (WTG07)	06:56	06:16	05:57			
	17:19	69	16:26 (WTG09)	17:54	50	16:26 (WTG09)	18:25	32	18:02 (WTG07)	19:56	20:26	20:50
11	07:44	15:17 (WTG09)	07:22	15:37 (WTG09)	06:44	17:31 (WTG07)	06:55	06:15	05:57			
	17:20	69	16:26 (WTG09)	17:55	47	16:24 (WTG09)	18:26	31	18:02 (WTG07)	19:57	20:27	20:51
12	07:44	15:17 (WTG09)	07:21	15:39 (WTG09)	06:42	17:30 (WTG07)	06:53	06:14	05:57			
	17:21	70	16:27 (WTG09)	17:56	43	16:22 (WTG09)	18:27	31	18:01 (WTG07)	19:58	20:28	20:51
13	07:44	15:18 (WTG09)	07:20	15:41 (WTG09)	06:40	17:31 (WTG07)	06:52	06:13	05:57			
	17:22	70	16:28 (WTG09)	17:58	40	16:21 (WTG09)	18:28	30	18:01 (WTG07)	19:59	20:29	20:52
14	07:44	15:18 (WTG09)	07:19	15:44 (WTG09)	06:39	17:31 (WTG07)	06:50	06:12	05:57			
	17:23	70	16:28 (WTG09)	17:59	35	16:19 (WTG09)	18:29	29	18:00 (WTG07)	20:00	20:30	20:52
15	07:43	15:18 (WTG09)	07:18	15:46 (WTG09)	06:37	17:32 (WTG07)	06:49	06:11	05:57			
	17:24	71	16:29 (WTG09)	18:00	31	16:17 (WTG09)	18:30	28	18:00 (WTG07)	20:01	20:30	20:53
16	07:43	15:18 (WTG09)	07:16	15:49 (WTG09)	06:36	17:32 (WTG07)	06:47	06:10	05:57			
	17:25	71	16:29 (WTG09)	18:01	25	16:14 (WTG09)	18:31	26	17:58 (WTG07)	20:02	20:31	20:53
17	07:42	15:19 (WTG09)	07:15	15:54 (WTG09)	06:34	17:33 (WTG07)	06:46	06:09	05:57			
	17:26	70	16:29 (WTG09)	18:02	16	16:10 (WTG09)	18:32	23	17:56 (WTG07)	20:03	20:32	20:53
18	07:42	15:19 (WTG09)	07:14		06:33	17:34 (WTG07)	06:44	06:09	05:57			
	17:27	70	16:29 (WTG09)	18:03		18:33	21	17:55 (WTG07)	20:04	20:33	20:54	
19	07:42	15:20 (WTG09)	07:13		06:31	17:36 (WTG07)	06:43	06:08	05:57			
	17:28	70	16:30 (WTG09)	18:05		18:34	16	17:52 (WTG07)	20:05	20:34	20:54	
20	07:41	15:20 (WTG09)	07:11		06:29	17:39 (WTG07)	06:41	06:07	05:57			
	17:30	70	16:30 (WTG09)	18:06		18:35	10	17:49 (WTG07)	20:06	20:35	20:54	
21	07:41	15:21 (WTG09)	07:10		06:28		06:40	06:06	05:57			
	17:31	70	16:31 (WTG09)	18:07		18:36		20:07	20:36	20:55		
22	07:40	15:21 (WTG09)	07:09		06:26		06:39	06:05	05:57			
	17:32	70	16:31 (WTG09)	18:08		18:37		20:08	20:37	20:55		
23	07:39	15:21 (WTG09)	07:07		06:25		06:37	06:05	05:58			
	17:33	70	16:31 (WTG09)	18:09		18:38		20:09	20:38	20:55		
24	07:39	15:22 (WTG09)	07:06	17:46 (WTG06)	06:23		06:36	06:04	05:58			
	17:34	70	16:32 (WTG09)	18:10	2	17:48 (WTG06)	18:39	20:10	20:38	20:55		
25	07:38	15:22 (WTG09)	07:04	17:45 (WTG06)	06:21		06:34	06:03	05:58			
	17:35	70	16:32 (WTG09)	18:11	5	17:50 (WTG06)	18:40	20:11	20:39	20:55		
26	07:37	15:22 (WTG09)	07:03	17:44 (WTG06)	06:20		06:33	06:03	05:58			
	17:36	69	16:31 (WTG09)	18:12	8	17:52 (WTG06)	18:41	20:12	20:40	20:55		
27	07:37	15:23 (WTG09)	07:02	17:42 (WTG06)	06:18		06:32	06:02	05:59			
	17:38	68	16:31 (WTG09)	18:13	10	17:52 (WTG06)	18:42	20:13	20:41	20:55		
28	07:36	15:24 (WTG09)	07:00	17:42 (WTG06)	06:17		06:30	06:02	05:59			
	17:39	68	16:32 (WTG09)	18:15	12	17:54 (WTG06)	18:43	20:14	20:42	20:55		
29	07:35	15:24 (WTG09)			07:15		06:29	06:01	06:00			
	17:40	68	16:32 (WTG09)		19:44		20:15	20:42	20:55			
30	07:34	15:25 (WTG09)			07:13		06:28	06:00	06:00			
	17:41	67	16:32 (WTG09)		19:45		20:16	20:43	20:55			
31	07:33	15:25 (WTG09)			07:12			06:00				
	17:42	66	16:31 (WTG09)		19:46			20:44				
Potential sun hours	302	299	370	397	444	447						
Total, worst case	2136	855	490									
Sun reduction	0,45	0,47	0,49									
Oper. time red.	0,77	0,77	0,77									
Wind dir. red.	0,61	0,61	0,64									
Total reduction	0,21	0,22	0,24									
Total, real	450	188	118									

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_20240628Shadow receptor: F029 - A3

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 20:55	06:23 20:38	06:52 19:57	07:19 19:08	18:10 (WTG07) 18:41 (WTG07)	06:51 17:24
2	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	18:09 (WTG07) 18:41 (WTG07)	06:52 17:23
3	06:01 20:55	06:25 20:36	06:53 19:54	07:21 19:05	18:09 (WTG07) 18:40 (WTG07)	06:54 17:22
4	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04	18:09 (WTG07) 18:40 (WTG07)	06:55 17:21
5	06:02 20:55	06:27 20:33	06:55 19:50	07:23 19:02	18:09 (WTG07) 18:39 (WTG07)	06:56 17:19
6	06:03 20:55	06:28 20:32	06:56 19:49	07:24 19:00	18:09 (WTG07) 18:38 (WTG07)	06:57 17:18
7	06:04 20:54	06:28 20:31	06:57 19:47	07:25 18:59	18:09 (WTG07) 18:37 (WTG07)	06:58 17:17
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	18:10 (WTG07) 18:35 (WTG07)	06:59 17:16
9	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	18:10 (WTG07) 18:34 (WTG07)	07:00 17:15
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	18:11 (WTG07) 18:32 (WTG07)	07:01 17:14
11	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	18:13 (WTG07) 18:30 (WTG07)	07:03 17:13
12	06:07 20:52	06:33 20:25	07:02 19:39	07:30 18:51	18:15 (WTG07) 18:29 (WTG07)	07:04 17:13
13	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	18:15 (WTG06) 18:27 (WTG06)	07:05 17:12
14	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:48	18:15 (WTG06) 18:26 (WTG06)	07:06 17:11
15	06:09 20:51	06:36 20:21	07:04 19:34	07:33 18:47	18:15 (WTG06) 18:24 (WTG06)	07:07 17:10
16	06:10 20:50	06:37 20:20	07:05 19:33	07:34 18:45	18:16 (WTG06) 18:23 (WTG06)	07:08 17:09
17	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	18:17 (WTG06) 18:21 (WTG06)	07:09 17:08
18	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	18:18 (WTG06) 18:19 (WTG06)	07:10 17:08
19	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	18:19 (WTG06) 17:07	17:08 17:07
20	06:13 20:48	06:41 20:14	07:09 19:26	07:38 18:39	18:19 (WTG06) 17:06	17:07 17:06
21	06:14 20:47	06:41 20:13	07:10 19:25	07:39 18:38	18:19 (WTG06) 17:06	17:07 17:06
22	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:37	18:19 (WTG06) 17:05	17:06 17:05
23	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:31	18:24 (WTG07) 18:31 (WTG07)	17:16 17:05
24	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	18:20 (WTG07) 18:35 (WTG07)	17:17 17:04
25	06:17 20:44	06:45 20:07	07:14 19:18	07:44 18:37	18:17 (WTG07) 18:37 (WTG07)	17:18 17:04
26	06:18 20:43	06:46 20:06	07:15 19:16	07:45 18:38	15:22 (WTG09) 15:41 (WTG09)	17:19 17:04
27	06:19 20:42	06:47 20:04	07:16 19:15	07:46 18:39	15:18 (WTG09) 15:44 (WTG09)	17:20 17:03
28	06:19 20:42	06:48 20:03	07:17 19:13	07:47 18:40	15:14 (WTG09) 15:47 (WTG09)	17:21 17:03
29	06:20 20:41	06:49 20:01	07:17 19:12	07:48 18:41	15:13 (WTG09) 15:51 (WTG09)	17:22 17:02
30	06:21 20:40	06:50 20:00	07:18 19:10	07:49 18:41	15:10 (WTG09) 15:52 (WTG09)	17:23 17:02
31	06:22 20:39	06:51 19:58		06:50 17:25	15:06 (WTG09) 15:54 (WTG09)	17:24 17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case			176	604	1976	2059
Sun reduction			0,65	0,54	0,50	0,45
Oper. time red.			0,77	0,77	0,77	0,77
Wind dir. red.			0,64	0,63	0,61	0,61
Total reduction			0,32	0,26	0,24	0,21
Total, real			56	158	464	434

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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F030 - A2 - D7

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	15:28 (WTG09)	07:33	15:32 (WTG09)	06:59	17:45 (WTG06)	07:10	06:27	06:00			
	17:11	57 16:25 (WTG09)	17:44	71 16:43 (WTG09)	18:16	9 17:54 (WTG06)	19:47	20:17	20:45			
2	07:45	15:28 (WTG09)	07:32	15:32 (WTG09)	06:57	17:45 (WTG06)	07:09	06:25	05:59			
	17:12	58 16:26 (WTG09)	17:45	71 16:43 (WTG09)	18:17	11 17:56 (WTG06)	19:48	20:18	20:45			
3	07:45	15:28 (WTG09)	07:31	15:33 (WTG09)	06:56	17:44 (WTG06)	07:07	06:24	05:59			
	17:12	58 16:26 (WTG09)	17:46	70 16:43 (WTG09)	18:18	13 17:57 (WTG06)	19:49	20:19	20:46			
4	07:45	15:28 (WTG09)	07:30	15:33 (WTG09)	06:54	17:44 (WTG06)	07:05	06:23	05:58			
	17:13	59 16:27 (WTG09)	17:47	70 16:43 (WTG09)	18:19	14 17:58 (WTG06)	19:50	20:20	20:47			
5	07:45	15:28 (WTG09)	07:29	15:34 (WTG09)	06:53	17:44 (WTG07)	07:04	06:22	05:58			
	17:14	60 16:28 (WTG09)	17:48	69 16:43 (WTG09)	18:20	15 17:59 (WTG07)	19:51	20:21	20:47			
6	07:45	15:29 (WTG09)	07:28	15:34 (WTG09)	06:51	17:42 (WTG07)	07:02	06:21	05:58			
	17:15	60 16:29 (WTG09)	17:49	68 16:42 (WTG09)	18:21	19 18:01 (WTG07)	19:52	20:22	20:48			
7	07:45	15:29 (WTG09)	07:27	15:35 (WTG09)	06:50	17:39 (WTG07)	07:01	06:20	05:58			
	17:16	61 16:30 (WTG09)	17:51	67 16:42 (WTG09)	18:22	22 18:01 (WTG07)	19:53	20:23	20:49			
8	07:45	15:29 (WTG09)	07:26	15:36 (WTG09)	06:48	17:39 (WTG07)	06:59	06:18	05:57			
	17:17	62 16:31 (WTG09)	17:52	66 16:42 (WTG09)	18:23	24 18:03 (WTG07)	19:54	20:24	20:49			
9	07:45	15:29 (WTG09)	07:25	15:37 (WTG09)	06:47	17:37 (WTG07)	06:58	06:17	05:57			
	17:18	62 16:31 (WTG09)	17:53	65 16:42 (WTG09)	18:24	26 18:03 (WTG07)	19:55	20:25	20:50			
10	07:45	15:30 (WTG09)	07:23	15:38 (WTG09)	06:45	17:36 (WTG07)	06:56	06:16	05:57			
	17:19	62 16:32 (WTG09)	17:54	63 16:41 (WTG09)	18:25	28 18:04 (WTG07)	19:56	20:26	20:50			
11	07:44	15:29 (WTG09)	07:22	15:38 (WTG09)	06:44	17:35 (WTG07)	06:55	06:15	05:57			
	17:20	63 16:32 (WTG09)	17:55	62 16:40 (WTG09)	18:26	30 18:05 (WTG07)	19:57	20:27	20:51			
12	07:44	15:29 (WTG09)	07:21	15:39 (WTG09)	06:42	17:34 (WTG07)	06:53	06:14	05:57			
	17:21	65 16:34 (WTG09)	17:56	60 16:39 (WTG09)	18:27	31 18:05 (WTG07)	19:58	20:28	20:51			
13	07:44	15:30 (WTG09)	07:20	15:40 (WTG09)	06:40	17:35 (WTG07)	06:52	06:13	05:57			
	17:22	65 16:35 (WTG09)	17:58	59 16:39 (WTG09)	18:28	31 18:06 (WTG07)	19:59	20:29	20:52			
14	07:44	15:29 (WTG09)	07:19	15:41 (WTG09)	06:39	17:34 (WTG07)	06:50	06:12	05:57			
	17:23	66 16:35 (WTG09)	17:59	57 16:38 (WTG09)	18:29	31 18:05 (WTG07)	20:00	20:30	20:52			
15	07:43	15:29 (WTG09)	07:18	15:43 (WTG09)	06:37	17:34 (WTG07)	06:49	06:11	05:57			
	17:24	67 16:36 (WTG09)	18:00	55 16:38 (WTG09)	18:30	31 18:05 (WTG07)	20:01	20:30	20:53			
16	07:43	15:29 (WTG09)	07:16	15:43 (WTG09)	06:36	17:34 (WTG07)	06:47	06:10	05:57			
	17:25	67 16:36 (WTG09)	18:01	53 16:36 (WTG09)	18:31	30 18:04 (WTG07)	20:02	20:31	20:53			
17	07:42	15:29 (WTG09)	07:15	15:45 (WTG09)	06:34	17:34 (WTG07)	06:46	06:09	05:57			
	17:26	68 16:37 (WTG09)	18:02	50 16:35 (WTG09)	18:32	29 18:03 (WTG07)	20:03	20:32	20:53			
18	07:42	15:29 (WTG09)	07:14	15:47 (WTG09)	06:33	17:35 (WTG07)	06:44	06:09	05:57			
	17:27	68 16:37 (WTG09)	18:03	47 16:34 (WTG09)	18:33	28 18:03 (WTG07)	20:04	20:33	20:54			
19	07:42	15:30 (WTG09)	07:13	15:48 (WTG09)	06:31	17:35 (WTG07)	06:43	06:08	05:57			
	17:28	68 16:38 (WTG09)	18:05	43 16:31 (WTG09)	18:34	26 18:01 (WTG07)	20:05	20:34	20:54			
20	07:41	15:29 (WTG09)	07:11	15:51 (WTG09)	06:29	17:37 (WTG07)	06:41	06:07	05:57			
	17:30	69 16:38 (WTG09)	18:06	39 16:30 (WTG09)	18:35	23 18:00 (WTG07)	20:06	20:35	20:54			
21	07:41	15:30 (WTG09)	07:10	15:53 (WTG09)	06:28	17:37 (WTG07)	06:40	06:06	05:57			
	17:31	70 16:40 (WTG09)	18:07	35 16:28 (WTG09)	18:36	21 17:58 (WTG07)	20:07	20:36	20:55			
22	07:40	15:30 (WTG09)	07:09	15:55 (WTG09)	06:26	17:39 (WTG07)	06:39	06:05	05:57			
	17:32	70 16:40 (WTG09)	18:08	30 16:25 (WTG09)	18:37	16 17:55 (WTG07)	20:08	20:37	20:55			
23	07:39	15:29 (WTG09)	07:07	16:00 (WTG09)	06:25	17:43 (WTG07)	06:37	06:05	05:58			
	17:33	71 16:40 (WTG09)	18:09	22 16:22 (WTG09)	18:38	9 17:52 (WTG07)	20:09	20:38	20:55			
24	07:39	15:30 (WTG09)	07:06	16:05 (WTG09)	06:23	16:05 (WTG09)	06:36	06:04	05:58			
	17:34	71 16:41 (WTG09)	18:10	10 16:15 (WTG09)	18:39		20:10	20:38	20:55			
25	07:38	15:30 (WTG09)	07:04		06:21		06:34	06:03	05:58			
	17:35	71 16:41 (WTG09)	18:11		18:40		20:11	20:39	20:55			
26	07:37	15:30 (WTG09)	07:03	17:50 (WTG06)	06:20		06:33	06:03	05:58			
	17:36	71 16:41 (WTG09)	18:12	2 17:52 (WTG06)	18:41		20:12	20:40	20:55			
27	07:37	15:30 (WTG09)	07:02	17:47 (WTG06)	06:18		06:32	06:02	05:59			
	17:38	71 16:41 (WTG09)	18:13	5 17:52 (WTG06)	18:42		20:13	20:41	20:55			
28	07:36	15:31 (WTG09)	07:00	17:46 (WTG06)	06:17		06:30	06:02	05:59			
	17:39	71 16:42 (WTG09)	18:15	8 17:54 (WTG06)	18:43		20:14	20:42	20:55			
29	07:35	15:31 (WTG09)			07:15		06:29	06:01	06:00			
	17:40	72 16:43 (WTG09)			19:44		20:15	20:42	20:55			
30	07:34	15:31 (WTG09)			07:13		06:28	06:00	06:00			
	17:41	72 16:43 (WTG09)			19:45		20:16	20:43	20:55			
31	07:33	15:32 (WTG09)			07:12			06:00				
	17:42	71 16:43 (WTG09)			19:46			20:44				
Potential sun hours	302		299		370		397		444		447	
Total, worst case	2046		1317		517							
Sun reduction	0,45		0,47		0,49							
Oper. time red.	0,77		0,77		0,77							
Wind dir. red.	0,62		0,62		0,64							
Total reduction	0,21		0,22		0,24							
Total, real	437		294		126							

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_20240628Shadow receptor: F030 - A2 - D7

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 20:55	06:23 20:38	06:52 19:57	07:19 19:08	18:14 (WTG07) 19:08 31	15:06 (WTG09) 16:10 (WTG09)
2	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	18:14 (WTG07) 18:44 (WTG07)	15:05 (WTG09) 16:11 (WTG09)
3	06:01 20:55	06:25 20:36	06:53 19:54	07:21 19:05	18:14 (WTG07) 18:43 (WTG07)	15:06 (WTG09) 16:12 (WTG09)
4	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04	18:14 (WTG07) 18:42 (WTG07)	15:05 (WTG09) 16:12 (WTG09)
5	06:02 20:55	06:27 20:33	06:55 19:50	07:23 19:02	18:15 (WTG07) 18:40 (WTG07)	15:04 (WTG09) 16:12 (WTG09)
6	06:03 20:55	06:28 20:32	06:56 19:49	07:24 19:00	18:15 (WTG07) 18:38 (WTG07)	15:04 (WTG09) 16:12 (WTG09)
7	06:04 20:54	06:28 20:31	06:57 19:47	07:25 18:59	18:17 (WTG07) 18:37 (WTG07)	15:03 (WTG09) 16:13 (WTG09)
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	18:18 (WTG07) 18:35 (WTG07)	15:04 (WTG09) 16:14 (WTG09)
9	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	18:19 (WTG07) 18:34 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	18:18 (WTG06) 18:32 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
11	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	18:18 (WTG06) 18:30 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
12	06:07 20:52	06:33 20:25	07:02 19:39	07:30 18:51	18:18 (WTG06) 18:29 (WTG06)	15:02 (WTG09) 16:14 (WTG09)
13	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	18:19 (WTG06) 18:27 (WTG06)	15:03 (WTG09) 16:15 (WTG09)
14	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:48	18:19 (WTG06) 18:26 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
15	06:09 20:51	06:36 20:21	07:04 19:34	07:33 18:47	18:20 (WTG06) 18:24 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
16	06:10 20:50	06:37 20:20	07:05 19:33	07:34 18:45	18:22 (WTG06) 18:23 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
17	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	18:23 (WTG06) 18:27 (WTG06)	15:03 (WTG09) 16:14 (WTG09)
18	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	16:34 (WTG09) 16:49 (WTG09)	15:04 (WTG09) 16:15 (WTG09)
19	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	16:29 (WTG09) 16:53 (WTG09)	15:04 (WTG09) 16:15 (WTG09)
20	06:13 20:48	06:41 20:14	07:09 19:26	07:38 18:39	16:25 (WTG09) 16:56 (WTG09)	15:05 (WTG09) 16:15 (WTG09)
21	06:14 20:47	06:41 20:13	07:10 19:25	07:39 18:38	16:23 (WTG09) 16:59 (WTG09)	15:05 (WTG09) 16:15 (WTG09)
22	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:37	16:21 (WTG09) 17:01 (WTG09)	15:05 (WTG09) 16:14 (WTG09)
23	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	16:18 (WTG09) 17:02 (WTG09)	15:07 (WTG09) 16:15 (WTG09)
24	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	16:16 (WTG09) 17:04 (WTG09)	15:07 (WTG09) 16:15 (WTG09)
25	06:17 20:44	06:45 20:07	07:14 19:18	07:44 18:33	15:14 (WTG09) 16:05 (WTG09)	15:07 (WTG09) 16:15 (WTG09)
26	06:18 20:43	06:46 20:06	07:15 19:16	07:45 18:31	15:13 (WTG09) 16:06 (WTG09)	15:08 (WTG09) 16:15 (WTG09)
27	06:19 20:42	06:47 20:04	07:16 19:15	07:46 18:30	15:11 (WTG09) 16:06 (WTG09)	15:08 (WTG09) 16:15 (WTG09)
28	06:19 20:42	06:48 20:03	07:17 19:13	07:47 18:29	15:11 (WTG09) 16:08 (WTG09)	15:09 (WTG09) 16:15 (WTG09)
29	06:20 20:41	06:49 20:01	07:17 19:12	07:48 18:28	15:09 (WTG09) 16:09 (WTG09)	15:10 (WTG09) 16:15 (WTG09)
30	06:21 20:40	06:50 19:59	07:18 19:10	07:49 18:26	15:08 (WTG09) 16:09 (WTG09)	15:10 (WTG09) 16:15 (WTG09)
31	06:22 20:39	06:51 19:58		07:50 17:25	15:07 (WTG09) 16:10 (WTG09)	15:10 (WTG09) 16:15 (WTG09)
Potential sun hours	454	425	374	347	302	293
Total, worst case			268	913	2065	1769
Sun reduction			0,65	0,54	0,50	0,45
Oper. time red.			0,77	0,77	0,77	0,77
Wind dir. red.			0,64	0,62	0,62	0,61
Total reduction			0,32	0,26	0,24	0,21
Total, real			86	238	493	377

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_20240628Shadow receptor: F034 - A2

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	07:44 17:11	07:33 17:44	06:59 18:16	07:10 19:47	18:49 (WTG08) 19:26 (WTG08)	06:00 20:17
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48	18:49 (WTG08) 19:27 (WTG08)	05:59 20:18
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	18:48 (WTG08) 19:26 (WTG08)	05:59 20:19
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	18:49 (WTG08) 19:26 (WTG08)	05:58 20:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	18:48 (WTG08) 19:25 (WTG08)	05:58 20:21
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	18:48 (WTG08) 19:24 (WTG08)	05:58 20:22
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	18:49 (WTG08) 19:23 (WTG08)	05:58 20:23
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	18:49 (WTG08) 19:22 (WTG08)	05:57 20:24
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	18:50 (WTG08) 19:21 (WTG08)	05:57 20:25
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	18:51 (WTG08) 19:19 (WTG08)	05:57 20:26
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	18:52 (WTG08) 19:18 (WTG08)	05:57 20:27
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	18:53 (WTG08) 19:15 (WTG08)	05:57 20:28
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	18:56 (WTG08) 19:13 (WTG08)	05:57 20:29
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	18:59 (WTG08) 19:09 (WTG08)	05:57 20:30
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:30	05:57 20:31
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:32
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	19:39 (WTG06) 19:42 (WTG06)	05:57 20:33
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	19:37 (WTG06) 19:42 (WTG06)	05:57 20:34
19	07:42 17:28	07:13 18:05	06:31 18:34	06:43 20:05	19:37 (WTG06) 19:43 (WTG06)	05:57 20:35
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	19:36 (WTG06) 19:45 (WTG06)	06:07 20:36
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	19:35 (WTG06) 19:45 (WTG06)	4 20:04 (WTG07)
22	07:40 17:32	07:09 18:08	06:26 18:37	06:39 20:08	18:02 (WTG08) 18:16 (WTG08)	8 20:12 (WTG07)
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	18:00 (WTG08) 18:18 (WTG08)	12 20:14 (WTG07)
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	17:57 (WTG08) 18:19 (WTG08)	13 20:14 (WTG07)
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	17:55 (WTG08) 18:19 (WTG08)	15 20:16 (WTG07)
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	17:54 (WTG08) 18:21 (WTG08)	16 20:16 (WTG07)
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	17:52 (WTG08) 18:21 (WTG08)	17 20:17 (WTG07)
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 20:14	17:52 (WTG08) 18:23 (WTG08)	19 20:18 (WTG07)
29	07:35 17:40	07:15 19:44	06:29 19:44	06:29 20:15	18:51 (WTG08) 19:24 (WTG08)	8 19:48 (WTG06)
30	07:34 17:41	07:13 19:45	06:28 19:45	06:28 20:16	18:49 (WTG08) 19:24 (WTG08)	21 20:19 (WTG07)
31	07:33 17:42	07:12 19:46	06:28 19:46	06:28 20:16	18:49 (WTG08) 19:26 (WTG08)	22 20:20 (WTG07)
Potential sun hours	302	299	370	397	444	447
Total, worst case			279	556	176	817
Sun reduction			0,49	0,53	0,59	0,66
Oper. time red.			0,77	0,77	0,77	0,77
Wind dir. red.			0,66	0,66	0,67	0,67
Total reduction			0,25	0,27	0,30	0,34
Total, real			70	149	53	279

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 Nuraminis

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:
 28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F034 - A2

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	20:03 (WTG07)	06:23	06:52	18:51 (WTG08)	07:19	06:51	07:24			
	20:55	27 20:30 (WTG07)	20:38	19:57	26 19:17 (WTG08)	19:08	17:24	17:01			
2	06:01	20:04 (WTG07)	06:24	06:53	18:50 (WTG08)	07:20	06:52	07:25			
	20:55	27 20:31 (WTG07)	20:37	19:55	28 19:18 (WTG08)	19:07	17:23	17:01			
3	06:01	20:03 (WTG07)	06:25	06:53	18:48 (WTG08)	07:21	06:54	07:26			
	20:55	27 20:30 (WTG07)	20:36	19:54	31 19:19 (WTG08)	19:05	17:22	17:01			
4	06:02	20:04 (WTG07)	06:26	06:54	18:47 (WTG08)	07:22	06:55	07:27			
	20:55	27 20:31 (WTG07)	20:34	19:52	33 19:20 (WTG08)	19:04	17:21	17:01			
5	06:02	20:04 (WTG07)	06:27	06:55	18:45 (WTG08)	07:23	06:56	07:28			
	20:55	26 20:30 (WTG07)	20:33	19:50	34 19:19 (WTG08)	19:02	17:19	17:01			
6	06:03	20:04 (WTG07)	06:28	06:56	18:44 (WTG08)	07:24	06:57	07:29			
	20:54	26 20:30 (WTG07)	20:32	19:49	36 19:20 (WTG08)	19:00	17:18	17:01			
7	06:04	20:04 (WTG07)	06:28	06:57	18:43 (WTG08)	07:25	06:58	07:30			
	20:54	25 20:29 (WTG07)	20:31	19:47	37 19:20 (WTG08)	18:59	17:17	17:00			
8	06:04	20:05 (WTG07)	06:29	06:58	18:43 (WTG08)	07:26	06:59	07:31			
	20:54	24 20:29 (WTG07)	20:30	19:46	37 19:20 (WTG08)	18:57	17:16	17:00			
9	06:05	20:06 (WTG07)	06:30	06:59	18:42 (WTG08)	07:27	07:00	07:32			
	20:54	24 20:30 (WTG07)	20:29	19:44	38 19:20 (WTG08)	18:56	17:15	17:00			
10	06:05	20:05 (WTG07)	06:31	07:00	18:42 (WTG08)	07:28	07:01	07:33			
	20:53	24 20:29 (WTG07)	20:28	19:42	38 19:20 (WTG08)	18:54	17:14	17:01			
11	06:06	20:06 (WTG07)	06:32	07:01	18:42 (WTG08)	07:29	07:03	07:34			
	20:53	23 20:29 (WTG07)	20:26	19:41	38 19:20 (WTG08)	18:53	17:13	17:01			
12	06:07	20:07 (WTG07)	06:33	07:02	18:42 (WTG08)	07:30	07:04	07:34			
	20:52	22 20:29 (WTG07)	20:25	19:39	36 19:18 (WTG08)	18:51	17:13	17:01			
13	06:07	20:06 (WTG07)	06:34	19:51 (WTG06)	07:03	18:41 (WTG08)	07:31	07:05	07:35		
	20:52	21 20:27 (WTG07)	20:24	1 19:52 (WTG06)	19:38	34 19:15 (WTG08)	18:50	17:12	17:01		
14	06:08	20:07 (WTG07)	06:35	19:47 (WTG06)	07:04	18:41 (WTG08)	07:32	07:06	07:36		
	20:51	20 20:27 (WTG07)	20:23	10 19:57 (WTG06)	19:36	33 19:14 (WTG08)	18:48	17:11	17:01		
15	06:09	20:08 (WTG07)	06:36	19:45 (WTG06)	07:04	18:41 (WTG08)	07:33	07:07	07:37		
	20:51	19 20:27 (WTG07)	20:21	13 19:58 (WTG06)	19:34	31 19:12 (WTG08)	18:47	17:10	17:01		
16	06:10	20:08 (WTG07)	06:37	19:44 (WTG06)	07:05	18:41 (WTG08)	07:34	07:08	07:37		
	20:50	18 20:26 (WTG07)	20:20	14 19:58 (WTG06)	19:33	30 19:11 (WTG08)	18:45	17:09	17:02		
17	06:10	20:09 (WTG07)	06:38	19:43 (WTG06)	07:06	18:42 (WTG08)	07:35	07:09	07:38		
	20:50	17 20:26 (WTG07)	20:19	14 19:57 (WTG06)	19:31	27 19:09 (WTG08)	18:44	17:08	17:02		
18	06:11	20:10 (WTG07)	06:39	19:41 (WTG06)	07:07	18:43 (WTG08)	07:36	07:10	07:39		
	20:49	15 20:25 (WTG07)	20:17	14 19:55 (WTG06)	19:29	25 19:08 (WTG08)	18:42	17:08	17:02		
19	06:12	20:11 (WTG07)	06:40	19:40 (WTG06)	07:08	18:44 (WTG08)	07:37	07:12	07:39		
	20:49	14 20:25 (WTG07)	20:16	13 19:53 (WTG06)	19:28	22 19:06 (WTG08)	18:41	17:07	17:03		
20	06:13	20:11 (WTG07)	06:41	19:40 (WTG06)	07:09	18:45 (WTG08)	07:38	07:13	07:40		
	20:48	13 20:24 (WTG07)	20:14	12 19:52 (WTG06)	19:26	20 19:05 (WTG08)	18:40	17:06	17:03		
21	06:14	20:12 (WTG07)	06:41	19:40 (WTG06)	07:10	18:48 (WTG08)	07:39	07:14	07:40		
	20:47	11 20:23 (WTG07)	20:13	11 19:51 (WTG06)	19:25	15 19:03 (WTG08)	18:38	17:06	17:04		
22	06:14	20:14 (WTG07)	06:42	19:40 (WTG06)	07:11	18:50 (WTG08)	07:40	07:15	07:41		
	20:46	9 20:23 (WTG07)	20:12	10 19:50 (WTG06)	19:23	11 19:01 (WTG08)	18:37	17:05	17:04		
23	06:15	20:16 (WTG07)	06:43	19:40 (WTG06)	07:12		07:42	07:16	07:41		
	20:46	6 20:22 (WTG07)	20:10	8 19:48 (WTG06)	19:21		18:35	17:05	17:05		
24	06:16		06:44	19:40 (WTG06)	07:13		07:43	07:17	07:42		
	20:45		20:09	7 19:47 (WTG06)	19:20		18:34	17:04	17:05		
25	06:17		06:45	19:41 (WTG06)	07:14		06:44	07:18	07:42		
	20:44		20:07	5 19:46 (WTG06)	19:18		17:33	17:04	17:06		
26	06:18		06:46	19:42 (WTG06)	07:15		06:45	07:19	07:43		
	20:43		20:06	2 19:44 (WTG06)	19:16		17:31	17:03	17:06		
27	06:19		06:47		07:16		06:46	07:20	07:43		
	20:42		20:04		19:15		17:30	17:03	17:07		
28	06:19		06:48		07:17		06:47	07:21	07:43		
	20:42		20:03		19:13		17:29	17:02	17:08		
29	06:20		06:49	18:59 (WTG08)	07:17		06:48	07:22	07:44		
	20:41		20:01	11 19:10 (WTG08)	19:12		17:28	17:02	17:08		
30	06:21		06:50	18:56 (WTG08)	07:18		06:49	07:23	07:44		
	20:40		20:00	17 19:13 (WTG08)	19:10		17:26	17:02	17:09		
31	06:22		06:51	18:53 (WTG08)			06:50	07:24	07:44		
	20:39		19:58	23 19:16 (WTG08)			17:25	17:10	17:10		
Potential sun hours	454		425		374		347		302		293
Total, worst case		465		185		660					
Sun reduction		0,74		0,73		0,65					
Oper. time red.		0,77		0,77		0,77					
Wind dir. red.		0,67		0,66		0,66					
Total reduction		0,38		0,37		0,33					
Total, real		177		68		217					

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 Nuraminis

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:
 28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F038 - 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
1	07:44	07:33	06:59	07:10	06:27	18:49 (WTG11) 06:00
	17:11	17:44	18:16	19:47	20:17	46 19:35 (WTG11) 20:45
2	07:45	07:32	06:57	07:09	06:25	18:49 (WTG11) 05:59
	17:12	17:45	18:17	19:48	20:18	45 19:34 (WTG11) 20:45
3	07:45	07:31	06:56	07:07	06:24	18:50 (WTG11) 05:59
	17:12	17:46	18:18	19:49	20:19	44 19:34 (WTG11) 20:46
4	07:45	07:30	06:54	07:05	06:23	18:51 (WTG11) 05:58
	17:13	17:47	18:19	19:50	20:20	42 19:33 (WTG11) 20:47
5	07:45	07:29	06:53	07:04	06:22	18:51 (WTG11) 05:58
	17:14	17:48	18:20	19:51	20:21	42 19:33 (WTG11) 20:47
6	07:45	07:28	06:51	07:02	06:21	18:52 (WTG11) 05:58
	17:15	17:49	18:21	19:52	20:22	40 19:32 (WTG11) 20:48
7	07:45	07:27	06:50	07:01	06:20	18:53 (WTG11) 05:58
	17:16	17:51	18:22	19:53	20:23	38 19:31 (WTG11) 20:49
8	07:45	07:26	06:48	06:59	06:18	18:54 (WTG11) 05:57
	17:17	17:52	18:23	19:54	20:24	36 19:30 (WTG11) 20:49
9	07:45	07:25	06:47	06:58	19:12 (WTG11) 06:17	18:55 (WTG11) 05:57
	17:18	17:53	18:24	19:55	10 19:22 (WTG11) 20:25	34 19:29 (WTG11) 20:50
10	07:44	07:23	06:45	06:56	19:06 (WTG11) 06:16	18:56 (WTG11) 05:57
	17:19	17:54	18:25	19:56	20 19:26 (WTG11) 20:26	32 19:28 (WTG11) 20:50
11	07:44	07:22	06:44	06:55	19:04 (WTG11) 06:15	18:57 (WTG11) 05:57
	17:20	17:55	18:26	19:57	25 19:29 (WTG11) 20:27	30 19:27 (WTG11) 20:51
12	07:44	07:21	06:42	06:53	19:01 (WTG11) 06:14	18:59 (WTG11) 05:57
	17:21	17:56	18:27	19:58	29 19:30 (WTG11) 20:28	26 19:25 (WTG11) 20:51
13	07:44	07:20	06:40	06:52	18:59 (WTG11) 06:13	19:00 (WTG11) 05:57
	17:22	17:58	18:28	19:59	33 19:32 (WTG11) 20:29	24 19:24 (WTG11) 20:52
14	07:43	07:19	06:39	06:50	18:57 (WTG11) 06:12	19:02 (WTG11) 05:57
	17:23	17:59	18:29	20:00	36 19:33 (WTG11) 20:29	20 19:22 (WTG11) 20:52
15	07:43	07:18	06:37	06:49	18:56 (WTG11) 06:11	19:04 (WTG11) 05:57
	17:24	18:00	18:30	20:01	38 19:34 (WTG11) 20:30	15 19:19 (WTG11) 20:53
16	07:43	07:16	06:36	06:47	18:54 (WTG11) 06:10	19:08 (WTG11) 05:57
	17:25	18:01	18:31	20:02	41 19:35 (WTG11) 20:31	7 19:15 (WTG11) 20:53
17	07:42	07:15	06:34	06:46	18:54 (WTG11) 06:10	05:57
	17:26	18:02	18:32	20:03	42 19:36 (WTG11) 20:32	20:53
18	07:42	07:14	06:33	06:44	18:52 (WTG11) 06:09	05:57
	17:27	18:03	18:33	20:04	44 19:36 (WTG11) 20:33	20:54
19	07:42	07:12	06:31	06:43	18:52 (WTG11) 06:08	05:57
	17:28	18:05	18:34	20:05	44 19:36 (WTG11) 20:34	20:54
20	07:41	07:11	06:29	06:41	18:51 (WTG11) 06:07	05:57
	17:30	18:06	18:35	20:06	46 19:37 (WTG11) 20:35	20:54
21	07:40	07:10	06:28	06:40	18:50 (WTG11) 06:06	05:57
	17:31	18:07	18:36	20:07	47 19:37 (WTG11) 20:36	20:54
22	07:40	07:08	06:26	06:39	18:50 (WTG11) 06:05	05:57
	17:32	18:08	18:37	20:08	47 19:37 (WTG11) 20:37	20:55
23	07:39	07:07	06:25	06:37	18:50 (WTG11) 06:05	05:58
	17:33	18:09	18:38	20:09	48 19:38 (WTG11) 20:38	20:55
24	07:39	07:06	06:23	06:36	18:49 (WTG11) 06:04	05:58
	17:34	18:10	18:39	20:10	48 19:37 (WTG11) 20:38	20:55
25	07:38	07:04	06:21	06:34	18:49 (WTG11) 06:03	05:58
	17:35	18:11	18:40	20:11	48 19:37 (WTG11) 20:39	20:55
26	07:37	07:03	06:20	06:33	18:49 (WTG11) 06:03	05:58
	17:36	18:12	18:41	20:12	48 19:37 (WTG11) 20:40	20:55
27	07:37	07:01	06:18	06:32	18:48 (WTG11) 06:02	05:59
	17:38	18:13	18:42	20:13	48 19:36 (WTG11) 20:41	20:55
28	07:36	07:00	06:17	06:30	18:49 (WTG11) 06:02	05:59
	17:39	18:15	18:43	20:14	47 19:36 (WTG11) 20:42	20:55
29	07:35		07:15	06:29	18:49 (WTG11) 06:01	06:00
	17:40		19:44	20:15	47 19:36 (WTG11) 20:42	20:55
30	07:34		07:13	06:28	18:50 (WTG11) 06:01	06:00
	17:41		19:45	20:16	46 19:36 (WTG11) 20:43	20:55
31	07:33		07:12		06:00	
	17:42		19:46		20:44	
Potential sun hours	302	299	370	397	444	447
Total, worst case				882		521
Sun reduction				0,53		0,59
Oper. time red.				0,77		0,77
Wind dir. red.				0,66		0,66
Total reduction				0,27		0,30
Total, real				237		156

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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F038 - 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

	July	August	September	October	November	December
1	06:00	06:23	19:08 (WTG11)	06:52	19:03 (WTG11)	07:19
	20:55	20:38	27 19:35 (WTG11)	19:57	25 19:28 (WTG11)	19:08
2	06:01	06:24	19:06 (WTG11)	06:53	19:05 (WTG11)	07:20
	20:55	20:37	31 19:37 (WTG11)	19:55	20 19:25 (WTG11)	19:07
3	06:01	06:25	19:05 (WTG11)	06:53	19:10 (WTG11)	07:21
	20:55	20:36	33 19:38 (WTG11)	19:54	10 19:20 (WTG11)	19:05
4	06:02	06:26	19:04 (WTG11)	06:54		07:22
	20:55	20:34	35 19:39 (WTG11)	19:52		19:04
5	06:02	06:27	19:03 (WTG11)	06:55		07:23
	20:55	20:33	37 19:40 (WTG11)	19:50		19:02
6	06:03	06:28	19:02 (WTG11)	06:56		07:24
	20:54	20:32	39 19:41 (WTG11)	19:49		19:00
7	06:04	06:28	19:02 (WTG11)	06:57		07:25
	20:54	20:31	40 19:42 (WTG11)	19:47		18:59
8	06:04	06:29	19:01 (WTG11)	06:58		07:26
	20:54	20:30	41 19:42 (WTG11)	19:46		18:57
9	06:05	06:30	18:59 (WTG11)	06:59		07:27
	20:54	20:29	43 19:42 (WTG11)	19:44		18:56
10	06:05	06:31	18:59 (WTG11)	07:00		07:28
	20:53	20:28	44 19:43 (WTG11)	19:42		18:54
11	06:06	06:32	18:58 (WTG11)	07:01		07:29
	20:53	20:26	45 19:43 (WTG11)	19:41		18:53
12	06:07	06:33	18:58 (WTG11)	07:02		07:30
	20:52	20:25	45 19:43 (WTG11)	19:39		18:51
13	06:07	06:34	18:57 (WTG11)	07:03		07:31
	20:52	20:24	47 19:44 (WTG11)	19:38		18:50
14	06:08	06:35	18:57 (WTG11)	07:04		07:32
	20:51	20:22	47 19:44 (WTG11)	19:36		18:48
15	06:09	06:36	18:56 (WTG11)	07:04		07:33
	20:51	20:21	48 19:44 (WTG11)	19:34		18:47
16	06:10	06:37	18:56 (WTG11)	07:05		07:34
	20:50	20:20	48 19:44 (WTG11)	19:33		18:45
17	06:10	06:38	18:56 (WTG11)	07:06		07:35
	20:50	20:19	48 19:44 (WTG11)	19:31		18:44
18	06:11	06:39	18:56 (WTG11)	07:07		07:36
	20:49	20:17	48 19:44 (WTG11)	19:29		18:42
19	06:12	06:40	18:55 (WTG11)	07:08		07:37
	20:49	20:16	48 19:43 (WTG11)	19:28		18:41
20	06:13	06:41	18:55 (WTG11)	07:09		07:38
	20:48	20:14	47 19:42 (WTG11)	19:26		18:40
21	06:14	06:41	18:55 (WTG11)	07:10		07:39
	20:47	20:13	47 19:42 (WTG11)	19:25		18:38
22	06:14	06:42	18:55 (WTG11)	07:11		07:40
	20:46	20:12	46 19:41 (WTG11)	19:23		18:37
23	06:15	06:43	18:55 (WTG11)	07:12		07:41
	20:46	20:10	46 19:41 (WTG11)	19:21		18:35
24	06:16	06:44	18:56 (WTG11)	07:13		07:42
	20:45	20:09	44 19:40 (WTG11)	19:20		18:34
25	06:17	06:45	18:56 (WTG11)	07:14		06:44
	20:44	20:07	43 19:39 (WTG11)	19:18		17:33
26	06:18	06:46	18:57 (WTG11)	07:15		06:45
	20:43	20:06	41 19:38 (WTG11)	19:16		17:31
27	06:19	06:47	18:56 (WTG11)	07:16		06:46
	20:42	20:04	40 19:36 (WTG11)	19:15		17:30
28	06:19	19:17 (WTG11)	06:48	18:57 (WTG11)	07:17	06:47
	20:41	10 19:27 (WTG11)	20:03	19:35 (WTG11)	19:13	17:29
29	06:20	19:14 (WTG11)	06:49	18:58 (WTG11)	07:17	06:48
	20:41	17 19:31 (WTG11)	20:01	19:34 (WTG11)	19:12	17:28
30	06:21	19:12 (WTG11)	06:50	18:59 (WTG11)	07:18	06:49
	20:40	21 19:33 (WTG11)	20:00	19:32 (WTG11)	19:10	17:26
31	06:22	19:10 (WTG11)	06:51	19:01 (WTG11)		06:50
	20:39	25 19:35 (WTG11)	19:58	19:30 (WTG11)		17:25
Potential sun hours	454	425		374	347	302
Total, worst case	73	1284		55		293
Sun reduction	0,74	0,73		0,65		
Oper. time red.	0,77	0,77		0,77		
Wind dir. red.	0,66	0,66		0,66		
Total reduction	0,37	0,37		0,33		
Total, real	27	476		18		

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_20240628Shadow receptor: F039 - A3 - 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
1	07:44 17:11	07:33 17:44	06:59 18:16	07:10 19:47	18:57 (WTG11) 19:18 (WTG11)	06:27 20:17
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48	18:54 (WTG11) 19:21 (WTG11)	06:25 20:18
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	18:51 (WTG11) 19:22 (WTG11)	06:24 20:19
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	18:50 (WTG11) 19:24 (WTG11)	06:23 20:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	18:48 (WTG11) 19:25 (WTG11)	06:22 20:21
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	18:46 (WTG11) 19:26 (WTG11)	06:21 20:22
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	18:45 (WTG11) 19:27 (WTG11)	06:20 20:23
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	18:43 (WTG11) 19:27 (WTG11)	06:18 20:24
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	18:43 (WTG11) 19:28 (WTG11)	06:17 20:25
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	18:41 (WTG11) 19:28 (WTG11)	06:16 20:26
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	18:41 (WTG11) 19:29 (WTG11)	06:15 20:27
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	18:40 (WTG11) 19:28 (WTG11)	06:14 20:28
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	18:40 (WTG11) 19:29 (WTG11)	06:13 20:29
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	18:39 (WTG11) 19:28 (WTG11)	06:12 20:29
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	18:39 (WTG11) 19:29 (WTG11)	06:11 20:30
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	18:38 (WTG11) 19:28 (WTG11)	06:10 20:31
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	18:38 (WTG11) 19:28 (WTG11)	06:10 20:32
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	18:38 (WTG11) 19:27 (WTG11)	06:09 20:33
19	07:42 17:28	07:12 18:05	06:31 18:34	06:43 20:05	18:38 (WTG11) 19:27 (WTG11)	06:08 20:34
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	18:39 (WTG11) 19:27 (WTG11)	06:07 20:35
21	07:40 17:31	07:10 18:07	06:28 18:36	06:40 20:07	18:38 (WTG11) 19:26 (WTG11)	06:06 20:36
22	07:40 17:32	07:08 18:08	06:26 18:37	06:39 20:08	18:39 (WTG11) 19:26 (WTG11)	06:05 20:37
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	18:40 (WTG11) 19:25 (WTG11)	06:05 20:38
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	18:39 (WTG11) 19:24 (WTG11)	06:04 20:38
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	18:40 (WTG11) 19:23 (WTG11)	06:03 20:39
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	18:41 (WTG11) 19:23 (WTG11)	06:03 20:40
27	07:37 17:38	07:01 18:13	06:18 18:42	06:32 20:13	18:41 (WTG11) 19:21 (WTG11)	06:02 20:41
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 20:14	18:42 (WTG11) 19:20 (WTG11)	06:02 20:42
29	07:35 17:40		07:15 19:44	06:29 20:15	18:44 (WTG11) 19:19 (WTG11)	06:01 20:42
30	07:34 17:41		07:13 19:45	06:28 20:16	18:45 (WTG11) 19:18 (WTG11)	06:01 20:43
31	07:33 17:42		07:12 19:46	19:02 (WTG11) 19:14 (WTG11)		06:00 20:44
Potential sun hours	302	299	370	397	444	447
Total, worst case			12	1274		96
Sun reduction			0,49	0,53		0,59
Oper. time red.			0,77	0,77		0,77
Wind dir. red.			0,66	0,66		0,66
Total reduction			0,25	0,27		0,30
Total, real			3	343		29

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_20240628Shadow receptor: F039 - A3 - 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

	July	August	September	October	November	December
1	06:00 20:55	06:23 20:38	06:52 19:57	18:40 (WTG11) 48 19:28 (WTG11)	07:19 19:08	06:51 17:24
2	06:01 20:55	06:24 20:37	06:53 19:55	18:40 (WTG11) 47 19:27 (WTG11)	07:20 19:07	06:52 17:23
3	06:01 20:55	06:25 20:36	06:53 19:54	18:41 (WTG11) 45 19:26 (WTG11)	07:21 19:05	06:54 17:22
4	06:02 20:55	06:26 20:34	06:54 19:52	18:40 (WTG11) 44 19:24 (WTG11)	07:22 19:04	06:55 17:21
5	06:02 20:55	06:27 20:33	06:55 19:50	18:41 (WTG11) 42 19:23 (WTG11)	07:23 19:02	06:56 17:19
6	06:03 20:54	06:28 20:32	06:56 19:49	18:42 (WTG11) 40 19:22 (WTG11)	07:24 19:00	06:57 17:18
7	06:04 20:54	06:28 20:31	06:57 19:47	18:42 (WTG11) 38 19:20 (WTG11)	07:25 18:59	06:58 17:17
8	06:04 20:54	06:29 20:30	19:05 (WTG11) 19:46	06:58 35 19:19 (WTG11)	18:44 (WTG11) 18:57	06:59 17:16
9	06:05 20:54	06:30 20:29	19:00 (WTG11) 18:54 (WTG11)	06:59 32 19:17 (WTG11)	18:45 (WTG11) 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	18:58 (WTG11) 23 19:21 (WTG11)	07:00 27 19:14 (WTG11)	18:47 (WTG11) 18:54	07:01 17:14
11	06:06 20:53	06:32 20:26	18:56 (WTG11) 27 19:23 (WTG11)	07:01 22 19:11 (WTG11)	18:49 (WTG11) 18:53	07:03 17:13
12	06:07 20:52	06:33 20:25	18:54 (WTG11) 30 19:24 (WTG11)	07:02 14 19:07 (WTG11)	18:53 (WTG11) 18:51	07:04 17:13
13	06:07 20:52	06:34 20:24	18:52 (WTG11) 34 19:26 (WTG11)	07:03 19:38	07:31 18:50	07:05 17:12
14	06:08 20:51	06:35 20:22	18:51 (WTG11) 36 19:27 (WTG11)	07:04 19:36	07:32 18:48	07:06 17:11
15	06:09 20:51	06:36 20:21	18:50 (WTG11) 38 19:28 (WTG11)	07:04 19:34	07:33 18:47	07:07 17:10
16	06:10 20:50	06:37 20:20	18:49 (WTG11) 40 19:29 (WTG11)	07:05 19:33	07:34 18:45	07:08 17:09
17	06:10 20:50	06:38 20:19	18:48 (WTG11) 41 19:29 (WTG11)	07:06 19:31	07:35 18:44	07:09 17:08
18	06:11 20:49	06:39 20:17	18:47 (WTG11) 43 19:30 (WTG11)	07:07 19:29	07:36 18:42	07:10 17:08
19	06:12 20:49	06:40 20:16	18:45 (WTG11) 45 19:30 (WTG11)	07:08 19:28	07:37 18:41	07:12 17:07
20	06:13 20:48	06:41 20:14	18:44 (WTG11) 46 19:30 (WTG11)	07:09 19:26	07:38 18:40	07:13 17:06
21	06:14 20:47	06:41 20:13	18:44 (WTG11) 46 19:30 (WTG11)	07:10 19:25	07:39 18:38	07:14 17:06
22	06:14 20:46	06:42 20:12	18:43 (WTG11) 48 19:31 (WTG11)	07:11 19:23	07:40 18:37	07:15 17:05
23	06:15 20:46	06:43 20:10	18:42 (WTG11) 49 19:31 (WTG11)	07:12 19:21	07:41 18:35	07:16 17:05
24	06:16 20:45	06:44 20:09	18:42 (WTG11) 49 19:31 (WTG11)	07:13 19:20	07:43 18:34	07:17 17:05
25	06:17 20:44	06:45 20:07	18:42 (WTG11) 49 19:31 (WTG11)	07:14 19:18	06:44 17:33	07:18 17:04
26	06:18 20:43	06:46 20:06	18:41 (WTG11) 50 19:31 (WTG11)	07:15 19:16	06:45 17:31	07:19 17:03
27	06:19 20:42	06:47 20:04	18:40 (WTG11) 50 19:30 (WTG11)	07:16 19:15	06:46 17:30	07:20 17:03
28	06:19 20:41	06:48 20:03	18:40 (WTG11) 50 19:30 (WTG11)	07:17 19:13	06:47 17:29	07:21 17:02
29	06:20 20:41	06:49 20:01	18:40 (WTG11) 49 19:29 (WTG11)	07:17 19:12	06:48 17:28	07:22 17:02
30	06:21 20:40	06:50 20:00	18:40 (WTG11) 49 19:29 (WTG11)	07:18 19:10	06:49 17:26	07:23 17:02
31	06:22 20:39	06:51 19:58	18:40 (WTG11) 48 19:28 (WTG11)	07:18	06:50 17:25	07:24 17:10
Potential sun hours	454	425	374		347	293
Total, worst case		968	434			
Sun reduction		0,73	0,65			
Oper. time red.		0,77	0,77			
Wind dir. red.		0,66	0,66			
Total reduction		0,37	0,33			
Total, real		360	143			

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 Nuraminis

Licensed user:

I.A.T. Consulenza e progetti S.r.l.
Via Santa Margherita 4
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+39 070 658297
Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F065 - A3-C6

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 each day of the month, showing sun rise/set times, shadow reduction factors, and operational time. Includes a summary section at the bottom for 'Potential sun hours' and '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)

Project:

Progetto_Baltex Nuraminis

Licensed user:

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 Via Santa Margherita 4
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 +39 070 658297
 Giuseppe Frongia / direttore@iatprogetti.it
 Calculated:
 28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F083 - A3

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	15:50 (WTG02)	07:33	07:52 (WTG03)	06:59	17:29 (WTG01)	07:10	06:27	05:59			
	17:11	38 16:28 (WTG02)	17:43	45 08:37 (WTG03)	18:16	20 17:49 (WTG01)	19:47	20:17	20:45			
2	07:45	15:51 (WTG02)	07:32	07:51 (WTG03)	06:57	17:30 (WTG01)	07:09	06:25	05:59			
	17:12	38 16:29 (WTG02)	17:45	47 08:38 (WTG03)	18:17	19 17:49 (WTG01)	19:48	20:18	20:45			
3	07:45	15:51 (WTG02)	07:31	07:50 (WTG03)	06:56	17:30 (WTG01)	07:07	06:24	05:59			
	17:12	38 16:29 (WTG02)	17:46	48 08:38 (WTG03)	18:18	17 17:47 (WTG01)	19:49	20:19	20:46			
4	07:45	15:52 (WTG02)	07:30	07:49 (WTG03)	06:54	17:33 (WTG01)	07:05	06:23	05:58			
	17:13	37 16:29 (WTG02)	17:47	49 08:38 (WTG03)	18:19	12 17:45 (WTG01)	19:50	20:20	20:47			
5	07:45	15:53 (WTG02)	07:29	07:48 (WTG03)	06:53	17:36 (WTG01)	07:04	06:22	05:58			
	17:14	37 16:30 (WTG02)	17:48	51 08:39 (WTG03)	18:20	5 17:41 (WTG01)	19:51	20:21	20:48			
6	07:45	15:53 (WTG02)	07:28	07:47 (WTG03)	06:51		07:02	06:21	05:58			
	17:15	37 16:30 (WTG02)	17:49	52 08:39 (WTG03)	18:21		19:52	20:22	20:48			
7	07:45	15:54 (WTG02)	07:27	07:46 (WTG03)	06:50		07:01	06:19	05:57			
	17:16	37 16:31 (WTG02)	17:51	53 08:39 (WTG03)	18:22		19:53	20:23	20:49			
8	07:45	15:55 (WTG02)	07:26	07:46 (WTG03)	06:48		06:59	06:18	05:57			
	17:17	36 16:31 (WTG02)	17:52	53 08:39 (WTG03)	18:23		19:54	20:24	20:49			
9	07:45	15:56 (WTG02)	07:25	07:46 (WTG03)	06:47		06:58	06:17	05:57			
	17:18	35 16:31 (WTG02)	17:53	53 08:39 (WTG03)	18:24		19:55	20:25	20:50			
10	07:45	15:57 (WTG02)	07:24	07:47 (WTG03)	06:45		06:56	06:16	05:57			
	17:19	35 16:32 (WTG02)	17:54	52 08:39 (WTG03)	18:25		19:56	20:26	20:50			
11	07:44	15:57 (WTG02)	07:22	07:46 (WTG03)	06:44		06:55	06:15	05:57			
	17:20	34 16:31 (WTG02)	17:55	52 08:38 (WTG03)	18:26		19:57	20:27	20:51			
12	07:44	15:58 (WTG02)	07:21	07:47 (WTG03)	06:42		06:53	06:14	05:57			
	17:21	33 16:31 (WTG02)	17:56	51 08:38 (WTG03)	18:27		19:58	20:28	20:51			
13	07:44	08:05 (WTG03)	07:20	07:47 (WTG03)	06:40		06:52	06:13	05:57			
	17:22	38 16:32 (WTG02)	17:58	51 08:38 (WTG03)	18:28		19:59	20:29	20:52			
14	07:44	08:04 (WTG03)	07:19	07:48 (WTG03)	06:39		06:50	06:12	05:56			
	17:23	42 16:31 (WTG02)	17:59	50 08:38 (WTG03)	18:29		20:00	20:30	20:52			
15	07:43	08:04 (WTG03)	07:18	07:49 (WTG03)	06:37		06:49	06:11	05:56			
	17:24	44 16:31 (WTG02)	18:00	49 08:38 (WTG03)	18:30		20:01	20:31	20:53			
16	07:43	08:03 (WTG03)	07:16	07:49 (WTG03)	06:36		06:47	06:10	05:56			
	17:25	45 16:30 (WTG02)	18:01	47 08:36 (WTG03)	18:31		20:02	20:31	20:53			
17	07:43	08:03 (WTG03)	07:15	07:50 (WTG03)	06:34		06:46	06:09	05:57			
	17:26	46 16:30 (WTG02)	18:02	45 08:35 (WTG03)	18:32		20:03	20:32	20:54			
18	07:42	08:03 (WTG03)	07:14	07:51 (WTG03)	06:33		06:44	06:09	05:57			
	17:27	46 16:30 (WTG02)	18:03	48 17:42 (WTG01)	18:33		20:04	20:33	20:54			
19	07:42	08:02 (WTG03)	07:13	07:51 (WTG03)	06:31		06:43	06:08	05:57			
	17:28	46 16:29 (WTG02)	18:04	50 17:42 (WTG01)	18:34		20:05	20:34	20:54			
20	07:41	08:01 (WTG03)	07:11	07:53 (WTG03)	06:29		06:41	06:07	05:57			
	17:30	46 16:28 (WTG02)	18:06	51 17:44 (WTG01)	18:35		20:06	20:35	20:54			
21	07:41	08:01 (WTG03)	07:10	07:54 (WTG03)	06:28		06:40	06:06	05:57			
	17:31	44 16:27 (WTG02)	18:07	52 17:46 (WTG01)	18:36		20:07	20:36	20:55			
22	07:40	08:00 (WTG03)	07:09	07:55 (WTG03)	06:26		06:39	06:05	05:57			
	17:32	42 16:25 (WTG02)	18:08	50 17:46 (WTG01)	18:37		20:08	20:37	20:55			
23	07:39	07:59 (WTG03)	07:07	07:57 (WTG03)	06:25		06:37	06:05	05:57			
	17:33	38 16:22 (WTG02)	18:09	49 17:48 (WTG01)	18:38		20:09	20:38	20:55			
24	07:39	07:59 (WTG03)	07:06	07:59 (WTG03)	06:23		06:36	06:04	05:58			
	17:34	32 08:31 (WTG03)	18:10	45 17:48 (WTG01)	18:39		20:10	20:39	20:55			
25	07:38	07:58 (WTG03)	07:04	08:03 (WTG03)	06:21		06:34	06:03	05:58			
	17:35	34 08:32 (WTG03)	18:11	40 17:50 (WTG01)	18:40		20:11	20:39	20:55			
26	07:37	07:57 (WTG03)	07:03	08:09 (WTG03)	06:20		06:33	06:03	05:58			
	17:36	36 08:33 (WTG03)	18:12	30 17:52 (WTG01)	18:41		20:12	20:40	20:55			
27	07:37	07:57 (WTG03)	07:02	17:28 (WTG01)	06:18		06:32	06:02	05:59			
	17:38	37 08:34 (WTG03)	18:13	23 17:51 (WTG01)	18:42		20:13	20:41	20:55			
28	07:36	07:56 (WTG03)	07:00	17:29 (WTG01)	06:17		06:30	06:01	05:59			
	17:39	39 08:35 (WTG03)	18:14	22 17:51 (WTG01)	18:43		20:14	20:42	20:56			
29	07:35	07:55 (WTG03)			07:15		06:29	06:01	05:59			
	17:40	41 08:36 (WTG03)			19:44		20:15	20:43	20:56			
30	07:34	07:54 (WTG03)			07:13		06:28	06:00	06:00			
	17:41	42 08:36 (WTG03)			19:45		20:16	20:43	20:55			
31	07:34	07:53 (WTG03)			07:12			06:00				
	17:42	44 08:37 (WTG03)			19:46			20:44				
Potential sun hours	302		299		370		397		444		447	
Total, worst case	1217		1308		73							
Sun reduction	0,45		0,47		0,49							
Oper. time red.	0,77		0,77		0,77							
Wind dir. red.	0,64		0,67		0,63							
Total reduction	0,22		0,24		0,24							
Total, real	269		315		17							

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 Nuraminis

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Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F083 - A3

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 (July-December) and rows for each day (1-31) showing sun rise/set times, operational times, and potential sun hours.

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

Matrix defining table layout: 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 Nuraminis

Licensed user:

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Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F094 - D1

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 17:11	07:33 17:44	06:59 18:16	07:10 19:47	06:27 20:17	06:00 20:45	06:01 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:45	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	07:45 17:13	07:31 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:59 20:46	06:01 20:55	06:25 20:36	06:54 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	07:45 17:13	07:30 17:47	06:54 18:19	07:06 19:50	06:23 20:20	05:59 20:47	06:02 20:55	06:26 20:34	06:54 19:52	07:22 19:04	06:55 17:21	07:27 17:01
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:47	06:03 20:55	06:27 20:33	06:55 19:50	07:23 19:02	06:56 17:20	07:28 17:01
6	07:45 17:15	07:28 17:50	06:51 18:21	07:02 19:52	06:21 20:22	05:58 20:48	06:03 20:54	06:28 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:01
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	06:20 20:23	05:58 20:49	06:04 20:54	06:29 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:30 17:01
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	06:19 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:01
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 17:15	07:32 17:01
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 20:50	06:06 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:01 17:14	07:33 17:01
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	07:03 17:14	07:34 17:01
12	07:44 17:21	07:21 17:57	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51	06:07 20:52	06:33 20:25	07:02 19:39	07:30 18:51	07:04 17:13	07:34 17:01
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:57 20:52	06:08 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:29	05:57 20:52	06:08 20:51	06:35 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:30	05:57 20:53	06:09 20:51	06:36 20:21	07:05 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:53	06:10 20:50	06:37 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:02
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	06:10 20:32	05:57 20:53	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 17:09	07:38 17:02
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:54	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	07:10 17:08	07:39 17:02
19	07:42 17:29	07:13 18:05	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:54	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	06:07 20:35	06:07 20:54	06:13 20:48	06:41 20:14	07:09 19:26	07:38 18:40	07:13 17:06	07:40 17:03
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:55	06:14 20:47	06:42 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:40 17:04
22	07:40 17:32	07:09 18:08	06:26 18:37	06:39 20:08	06:06 20:37	05:57 20:55	06:14 20:46	06:42 20:12	07:11 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	06:05 20:38	05:58 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	07:16 17:05	07:41 17:05
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 20:38	05:58 20:55	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:58 20:55	06:17 20:44	06:45 20:07	07:14 19:18	06:44 17:33	07:18 17:04	07:42 17:06
26	07:37 17:37	07:03 18:12	06:20 18:41	06:33 20:12	06:03 20:40	05:59 20:55	06:18 20:43	06:46 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 20:41	05:59 20:55	06:19 20:42	06:47 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	07:36 17:39	07:00 18:15	06:17 18:43	06:31 20:14	06:02 20:42	05:59 20:55	06:20 20:41	06:48 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:43 17:08
29	07:35 17:40	07:35 19:44	07:15 19:44	06:29 20:15	06:01 20:42	06:00 20:55	06:20 20:41	06:49 20:01	07:18 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	07:34 17:41	07:34 19:45	07:13 19:45	06:28 20:16	06:01 20:43	06:00 20:55	06:21 20:40	06:50 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	07:33 17:42	07:33 19:46	07:12 19:46	06:27 20:17	06:00 20:44	06:00 20:55	06:22 20:39	06:51 19:58	07:19 17:25	06:50 17:25	07:24 17:03	07:44 17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Progetto_Baltex Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F095 - A3

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	07:33	06:59	07:10	06:27	06:00	06:01	06:23	06:52	07:19	06:51	07:24
	17:11	17:44	18:16	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:52	07:25
	17:12	17:45	18:17	19:48	20:18	20:45	20:55	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:26
	17:13	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:22	17:01
4	07:45	07:30	06:54	07:06	06:23	05:59	06:02	06:26	06:54	07:22	06:55	07:27
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:34	19:52	19:04	17:21	17:01
5	07:45	07:29	06:53	07:04	06:22	05:58	06:03	06:27	06:55	07:23	06:56	07:28
	17:14	17:48	18:20	19:51	20:21	20:47	20:55	20:33	19:50	19:02	17:20	17:01
6	07:45	07:28	06:51	07:02	06:21	05:58	06:03	06:28	06:56	07:24	06:57	07:29
	17:15	17:50	18:21	19:52	20:22	20:48	20:54	20:32	19:49	19:00	17:18	17:01
7	07:45	07:27	06:50	07:01	06:20	05:58	06:04	06:29	06:57	07:25	06:58	07:30
	17:16	17:51	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:01
8	07:45	07:26	06:48	06:59	06:19	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:01
9	07:45	07:25	06:47	06:58	06:17	05:57	06:05	06:30	06:59	07:27	07:00	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:01
10	07:44	07:23	06:45	06:56	06:16	05:57	06:06	06:31	07:00	07:28	07:01	07:33
	17:19	17:54	18:25	19:56	20:26	20:50	20:53	20:28	19:42	18:54	17:14	17:01
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:53	17:14	17:01
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30	07:04	07:34
	17:21	17:57	18:27	19:58	20:28	20:51	20:52	20:25	19:39	18:51	17:13	17:01
13	07:44	07:20	06:40	06:52	06:13	05:57	06:08	06:34	07:03	07:31	07:05	07:35
	17:22	17:58	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:12	17:01
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35	07:04	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:52	20:51	20:23	19:36	18:48	17:11	17:01
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36	07:05	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:30	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37	07:05	07:34	07:08	07:37
	17:25	18:01	18:31	20:02	20:31	20:53	20:50	20:20	19:33	18:45	17:09	17:02
17	07:42	07:15	06:34	06:46	06:10	05:57	06:10	06:38	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:53	20:50	20:19	19:31	18:44	17:09	17:02
18	07:42	07:14	06:33	06:44	06:09	05:57	06:11	06:39	07:07	07:36	07:10	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:30	18:42	17:08	17:02
19	07:42	07:13	06:31	06:43	06:08	05:57	06:12	06:40	07:08	07:37	07:12	07:39
	17:29	18:05	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:03
20	07:41	07:11	06:29	06:41	06:07	05:57	06:13	06:41	07:09	07:38	07:13	07:40
	17:30	18:06	18:35	20:06	20:35	20:54	20:48	20:14	19:26	18:40	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:14	06:42	07:10	07:39	07:14	07:40
	17:31	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:25	18:38	17:06	17:04
22	07:40	07:09	06:26	06:39	06:06	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:46	20:12	19:23	18:37	17:05	17:04
23	07:39	07:07	06:25	06:37	06:05	05:58	06:15	06:43	07:12	07:42	07:16	07:41
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:05	17:05
24	07:39	07:06	06:23	06:36	06:04	05:58	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:38	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:17	06:45	07:14	06:44	07:18	07:42
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:33	17:04	17:06
26	07:37	07:03	06:20	06:33	06:03	05:59	06:18	06:46	07:15	06:45	07:19	07:43
	17:37	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:32	06:02	05:59	06:19	06:47	07:16	06:46	07:20	07:43
	17:38	18:13	18:42	20:13	20:41	20:55	20:42	20:04	19:15	17:30	17:03	17:07
28	07:36	07:00	06:17	06:31	06:02	05:59	06:20	06:48	07:17	06:47	07:21	07:43
	17:39	18:15	18:43	20:14	20:42	20:55	20:42	20:03	19:13	17:29	17:02	17:08
29	07:35		07:15	06:29	06:01	06:00	06:20	06:49	07:18	06:48	07:22	07:44
	17:40		19:44	20:15	20:42	20:55	20:41	20:01	19:12	17:28	17:02	17:08
30	07:34		07:13	06:28	06:01	06:00	06:21	06:50	07:18	06:49	07:23	07:44
	17:41		19:45	20:16	20:43	20:55	20:40	20:00	19:10	17:26	17:02	17:09
31	07:33		07:12		06:00		06:22	06:51		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Calculation: Real_case_Progetto_20240628Shadow receptor: F108 - A2

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 17:11	07:33 17:43	06:59 18:16	07:10 19:47	18:22 (WTG03) 19:19 (WTG03)	06:27 20:17
2	07:45 17:11	07:32 17:45	06:57 18:17	07:09 19:48	18:23 (WTG03) 19:19 (WTG03)	06:25 20:18
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	18:22 (WTG03) 19:19 (WTG03)	06:24 20:19
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	18:22 (WTG03) 19:18 (WTG03)	06:23 20:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	18:22 (WTG03) 19:18 (WTG03)	06:22 20:21
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	18:22 (WTG03) 19:17 (WTG03)	06:21 20:22
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	18:22 (WTG03) 19:17 (WTG03)	06:19 20:23
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	18:22 (WTG03) 19:16 (WTG03)	06:18 20:24
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	18:23 (WTG03) 19:15 (WTG03)	06:17 20:25
10	07:45 17:19	07:23 17:54	06:45 18:25	06:56 19:56	18:23 (WTG03) 19:14 (WTG03)	06:16 20:26
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	18:24 (WTG03) 19:14 (WTG03)	06:15 20:27
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	18:24 (WTG03) 19:12 (WTG03)	06:14 20:28
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	18:25 (WTG03) 19:11 (WTG03)	06:13 20:29
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	18:26 (WTG03) 19:09 (WTG03)	06:12 20:30
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	18:27 (WTG03) 19:08 (WTG03)	06:11 20:30
16	07:43 17:25	07:16 18:01	06:36 18:31	17:47 (WTG03) 18:05 (WTG03)	06:47 20:02	18:28 (WTG03) 19:06 (WTG03)
17	07:42 17:26	07:15 18:02	06:34 18:32	17:42 (WTG03) 18:08 (WTG03)	06:46 20:03	18:30 (WTG03) 19:05 (WTG03)
18	07:42 17:27	07:14 18:03	06:32 18:33	17:40 (WTG03) 18:11 (WTG03)	06:44 20:04	18:31 (WTG03) 19:02 (WTG03)
19	07:42 17:28	07:12 18:04	06:31 18:34	17:37 (WTG03) 18:13 (WTG03)	06:43 20:05	18:33 (WTG03) 19:00 (WTG03)
20	07:41 17:29	07:11 18:06	06:29 18:35	17:34 (WTG03) 18:14 (WTG03)	06:41 20:06	18:36 (WTG03) 19:05 (WTG03)
21	07:41 17:31	07:10 18:07	06:28 18:36	17:33 (WTG03) 18:16 (WTG03)	06:40 20:07	18:39 (WTG03) 19:04 (WTG03)
22	07:40 17:32	07:08 18:08	06:26 18:37	17:31 (WTG03) 18:16 (WTG03)	06:38 20:08	18:40 (WTG03) 19:03 (WTG03)
23	07:39 17:33	07:07 18:09	06:25 18:38	17:30 (WTG03) 18:18 (WTG03)	06:37 20:09	18:41 (WTG03) 19:02 (WTG03)
24	07:39 17:34	07:06 18:10	06:23 18:39	17:29 (WTG03) 18:18 (WTG03)	06:36 20:10	18:42 (WTG03) 19:01 (WTG03)
25	07:38 17:35	07:04 18:11	06:21 18:40	17:27 (WTG03) 18:18 (WTG03)	06:34 20:11	18:43 (WTG03) 19:00 (WTG03)
26	07:37 17:36	07:03 18:12	06:20 18:41	17:27 (WTG03) 18:19 (WTG03)	06:33 20:12	18:44 (WTG03) 18:59 (WTG03)
27	07:37 17:38	07:02 18:13	06:18 18:42	17:25 (WTG03) 18:19 (WTG03)	06:32 20:13	18:50 (WTG03) 18:58 (WTG03)
28	07:36 17:39	07:00 18:14	06:17 18:43	17:25 (WTG03) 18:20 (WTG03)	06:30 20:14	18:51 (WTG03) 18:57 (WTG03)
29	07:35 17:40	06:59 19:44	06:15 19:44	18:24 (WTG03) 19:20 (WTG03)	06:29 20:15	18:52 (WTG03) 18:56 (WTG03)
30	07:34 17:41	06:58 19:45	06:14 19:45	18:23 (WTG03) 19:19 (WTG03)	06:28 20:16	18:53 (WTG03) 18:55 (WTG03)
31	07:33 17:42	06:57 19:46	06:13 19:46	18:23 (WTG03) 19:20 (WTG03)	06:27 20:17	18:54 (WTG03) 18:54 (WTG03)
Potential sun hours	302	299	370	397	444	447
Total, worst case			717	944		
Sun reduction			0,49	0,53		
Oper. time red.			0,77	0,77		
Wind dir. red.			0,66	0,66		
Total reduction			0,25	0,27		
Total, real			179	252		

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_20240628Shadow receptor: F108 - A2

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 20:55	06:23 20:38	06:52 19:57	18:23 (WTG03) 19:12 (WTG03)	07:19 19:08	06:51 17:24
2	06:01 20:55	06:24 20:37	06:52 19:55	18:22 (WTG03) 19:13 (WTG03)	07:20 19:07	06:52 17:23
3	06:01 20:55	06:25 20:36	06:53 19:54	18:21 (WTG03) 19:13 (WTG03)	07:21 19:05	06:54 17:22
4	06:02 20:55	06:26 20:35	06:54 19:52	18:19 (WTG03) 19:13 (WTG03)	07:22 19:04	06:55 17:20
5	06:02 20:55	06:27 20:33	06:55 19:50	18:18 (WTG03) 19:13 (WTG03)	07:23 19:02	06:56 17:19
6	06:03 20:55	06:27 20:32	06:56 19:49	18:18 (WTG03) 19:13 (WTG03)	07:24 19:00	06:57 17:18
7	06:03 20:54	06:28 20:31	06:57 19:47	18:17 (WTG03) 19:13 (WTG03)	07:25 18:59	06:58 17:17
8	06:04 20:54	06:29 20:30	06:58 19:46	18:17 (WTG03) 19:13 (WTG03)	07:26 18:57	06:59 17:16
9	06:05 20:54	06:30 20:29	06:59 19:44	18:16 (WTG03) 19:13 (WTG03)	07:27 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	07:00 19:42	18:16 (WTG03) 19:13 (WTG03)	07:28 18:54	07:01 17:14
11	06:06 20:53	06:32 20:26	07:01 19:41	18:16 (WTG03) 19:12 (WTG03)	07:29 18:53	07:03 17:13
12	06:07 20:52	06:33 20:25	07:02 19:39	18:14 (WTG03) 19:11 (WTG03)	07:30 18:51	07:04 17:12
13	06:07 20:52	06:34 20:24	07:03 19:38	18:14 (WTG03) 19:10 (WTG03)	07:31 18:50	07:05 17:12
14	06:08 20:52	06:35 20:23	07:04 19:36	18:14 (WTG03) 19:10 (WTG03)	07:32 18:48	07:06 17:11
15	06:09 20:51	06:36 20:21	07:04 19:34	18:14 (WTG03) 19:09 (WTG03)	07:33 18:47	07:07 17:10
16	06:09 20:50	06:37 20:20	07:05 19:33	18:15 (WTG03) 19:08 (WTG03)	07:34 18:45	07:08 17:09
17	06:10 20:50	06:38 20:19	07:06 19:31	18:15 (WTG03) 19:08 (WTG03)	07:35 18:44	07:09 17:08
18	06:11 20:49	06:39 20:17	07:07 19:29	18:15 (WTG03) 19:07 (WTG03)	07:36 18:42	07:10 17:08
19	06:12 20:49	06:40 20:16	07:08 19:28	18:16 (WTG03) 19:05 (WTG03)	07:37 18:41	07:12 17:07
20	06:13 20:48	06:41 20:14	07:09 19:26	18:16 (WTG03) 19:04 (WTG03)	07:38 18:39	07:13 17:06
21	06:13 20:47	06:41 20:13	07:10 19:25	18:17 (WTG03) 19:03 (WTG03)	07:39 18:38	07:14 17:06
22	06:14 20:47	06:42 20:12	18:43 (WTG03) 19:23	07:11 18:58 (WTG03)	07:40 19:00 (WTG03)	07:15 18:37
23	06:15 20:46	06:43 20:10	18:39 (WTG03) 19:21	07:12 18:59 (WTG03)	07:42 18:35	07:16 17:04
24	06:16 20:45	06:44 20:09	18:37 (WTG03) 19:20	07:13 18:57 (WTG03)	07:43 18:34	07:17 17:05
25	06:17 20:44	06:45 20:07	18:34 (WTG03) 19:18	07:14 19:06 (WTG03)	06:44 18:54 (WTG03)	07:18 17:03
26	06:18 20:43	06:46 20:06	18:32 (WTG03) 19:16	07:15 19:08 (WTG03)	06:45 18:51 (WTG03)	07:19 17:03
27	06:18 20:42	06:47 20:04	18:30 (WTG03) 19:15	07:16 19:08 (WTG03)	06:46 18:48 (WTG03)	07:20 17:03
28	06:19 20:42	06:48 20:03	18:28 (WTG03) 19:13	07:17 19:09 (WTG03)	06:47 18:42 (WTG03)	07:21 17:02
29	06:20 20:41	06:49 20:01	18:27 (WTG03) 19:12	07:17 19:10 (WTG03)	06:48 17:27	07:22 17:02
30	06:21 20:40	06:50 20:00	18:25 (WTG03) 19:11	07:18 19:11 (WTG03)	06:49 17:26	07:23 17:02
31	06:22 20:39	06:51 19:58	18:24 (WTG03) 19:12 (WTG03)	07:18 17:25	06:50 17:25	07:44 17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case		349	1334			
Sun reduction		0,73	0,65			
Oper. time red.		0,77	0,77			
Wind dir. red.		0,66	0,66			
Total reduction		0,37	0,33			
Total, real		129	437			

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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F111 - A2 - C6

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 17:11	07:33 17:43	06:59 18:16	07:10 19:47	06:27 20:17	05:59 20:45	06:00 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	07:45 17:11	07:32 17:45	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:45	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:59 20:46	06:01 20:55	06:25 20:36	06:53 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	06:23 20:20	05:58 20:47	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04	06:55 17:20	07:27 17:01
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:47	06:02 20:55	06:27 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:28 17:01
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	06:21 20:22	05:58 20:48	06:03 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 17:16	07:27 17:51	06:50 18:22	07:01 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 17:17	07:26 17:52	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 17:15	07:32 17:00
10	07:45 17:19	07:24 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 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 17:20	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	07:03 17:13	07:34 17:00
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51	06:07 20:53	06:33 20:25	07:02 19:39	07:30 18:51	07:04 17:12	07:34 17:01
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:31	05:56 20:53	06:09 20:51	06:36 20:21	07:04 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:37 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	06:46 20:03	06:09 20:32	05:56 20:53	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 17:08	07:38 17:02
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:54	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	07:11 17:08	07:39 17:02
19	07:42 17:28	07:13 18:04	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:54	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	07:41 17:29	07:11 18:06	06:29 18:35	06:41 20:06	06:07 20:35	06:07 20:54	06:13 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:40 17:03
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:55	06:13 20:47	06:41 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:40 17:03
22	07:40 17:32	07:09 18:08	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	06:05 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	07:16 17:04	07:42 17:04
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 20:38	05:58 20:55	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:58 20:55	06:17 20:44	06:45 20:07	07:14 19:18	06:44 17:33	07:18 17:03	07:42 17:05
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	06:03 20:40	05:58 20:55	06:18 20:43	06:46 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 20:41	05:59 20:55	06:18 20:42	06:47 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	07:36 17:39	07:00 18:14	06:17 18:43	06:30 20:14	06:01 20:42	05:59 20:55	06:19 20:42	06:48 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:44 17:07
29	07:35 17:40	07:35 19:44	07:15 19:44	06:29 20:15	06:01 20:43	05:59 20:55	06:20 20:41	06:49 20:01	07:17 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	07:34 17:41	07:34 19:45	07:13 19:45	06:28 20:16	06:00 20:43	06:00 20:55	06:21 20:40	06:50 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	07:33 17:42	07:33 19:46	07:12 19:46	06:27 20:44	06:00 20:44	06:00 20:55	06:22 20:39	06:51 19:58	07:19 17:25	06:50 17:25	07:24 17:03	07:44 17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Calculation: Real_case_Progetto_20240628Shadow receptor: F145 - 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
1	07:44	07:33	06:59	07:10	06:27	18:45 (WTG11) 06:00
	17:11	17:44	18:16	19:47	20:17	40 19:25 (WTG11) 20:45
2	07:45	07:32	06:57	07:09	06:25	18:46 (WTG11) 05:59
	17:12	17:45	18:17	19:48	20:18	39 19:25 (WTG11) 20:45
3	07:45	07:31	06:56	07:07	06:24	18:47 (WTG11) 05:59
	17:12	17:46	18:18	19:49	20:19	37 19:24 (WTG11) 20:46
4	07:45	07:30	06:54	07:05	19:08 (WTG11) 06:23	18:49 (WTG11) 05:58
	17:13	17:47	18:19	19:50	8 19:16 (WTG11) 20:20	34 19:23 (WTG11) 20:47
5	07:45	07:29	06:53	07:04	19:02 (WTG11) 06:22	18:50 (WTG11) 05:58
	17:14	17:48	18:20	19:51	19 19:21 (WTG11) 20:21	31 19:21 (WTG11) 20:47
6	07:45	07:28	06:51	07:02	18:58 (WTG11) 06:21	18:51 (WTG11) 05:58
	17:15	17:49	18:21	19:52	25 19:23 (WTG11) 20:22	29 19:20 (WTG11) 20:48
7	07:45	07:27	06:50	07:01	18:56 (WTG11) 06:20	18:53 (WTG11) 05:58
	17:16	17:51	18:22	19:53	30 19:26 (WTG11) 20:23	25 19:18 (WTG11) 20:49
8	07:45	07:26	06:48	06:59	18:54 (WTG11) 06:18	18:55 (WTG11) 05:57
	17:17	17:52	18:23	19:54	33 19:27 (WTG11) 20:24	21 19:16 (WTG11) 20:49
9	07:45	07:25	06:47	06:58	18:52 (WTG11) 06:17	18:58 (WTG11) 05:57
	17:18	17:53	18:24	19:55	37 19:29 (WTG11) 20:25	16 19:14 (WTG11) 20:50
10	07:44	07:23	06:45	06:56	18:50 (WTG11) 06:16	19:02 (WTG11) 05:57
	17:19	17:54	18:25	19:56	39 19:29 (WTG11) 20:26	7 19:09 (WTG11) 20:50
11	07:44	07:22	06:44	06:55	18:49 (WTG11) 06:15	05:57
	17:20	17:55	18:26	19:57	41 19:30 (WTG11) 20:27	20:51
12	07:44	07:21	06:42	06:53	18:48 (WTG11) 06:14	05:57
	17:21	17:56	18:27	19:58	43 19:31 (WTG11) 20:28	20:51
13	07:44	07:20	06:40	06:52	18:47 (WTG11) 06:13	05:57
	17:22	17:58	18:28	19:59	45 19:32 (WTG11) 20:29	20:52
14	07:44	07:19	06:39	06:50	18:46 (WTG11) 06:12	05:57
	17:23	17:59	18:29	20:00	45 19:31 (WTG11) 20:29	20:52
15	07:43	07:18	06:37	06:49	18:45 (WTG11) 06:11	05:57
	17:24	18:00	18:30	20:01	47 19:32 (WTG11) 20:30	20:53
16	07:43	07:16	06:36	06:47	18:44 (WTG11) 06:10	05:57
	17:25	18:01	18:31	20:02	48 19:32 (WTG11) 20:31	20:53
17	07:42	07:15	06:34	06:46	18:44 (WTG11) 06:10	05:57
	17:26	18:02	18:32	20:03	48 19:32 (WTG11) 20:32	20:53
18	07:42	07:14	06:33	06:44	18:43 (WTG11) 06:09	05:57
	17:27	18:03	18:33	20:04	49 19:32 (WTG11) 20:33	20:54
19	07:42	07:12	06:31	06:43	18:43 (WTG11) 06:08	05:57
	17:28	18:05	18:34	20:05	49 19:32 (WTG11) 20:34	20:54
20	07:41	07:11	06:29	06:41	18:43 (WTG11) 06:07	05:57
	17:30	18:06	18:35	20:06	49 19:32 (WTG11) 20:35	20:54
21	07:40	07:10	06:28	06:40	18:42 (WTG11) 06:06	05:57
	17:31	18:07	18:36	20:07	50 19:32 (WTG11) 20:36	20:54
22	07:40	07:08	06:26	06:39	18:43 (WTG11) 06:05	05:57
	17:32	18:08	18:37	20:08	49 19:32 (WTG11) 20:37	20:55
23	07:39	07:07	06:25	06:37	18:43 (WTG11) 06:05	05:58
	17:33	18:09	18:38	20:09	49 19:32 (WTG11) 20:38	20:55
24	07:39	07:06	06:23	06:36	18:42 (WTG11) 06:04	05:58
	17:34	18:10	18:39	20:10	49 19:31 (WTG11) 20:38	20:55
25	07:38	07:04	06:21	06:34	18:43 (WTG11) 06:03	05:58
	17:35	18:11	18:40	20:11	47 19:30 (WTG11) 20:39	20:55
26	07:37	07:03	06:20	06:33	18:44 (WTG11) 06:03	05:58
	17:36	18:12	18:41	20:12	46 19:30 (WTG11) 20:40	20:55
27	07:37	07:01	06:18	06:32	18:43 (WTG11) 06:02	05:59
	17:38	18:13	18:42	20:13	46 19:29 (WTG11) 20:41	20:55
28	07:36	07:00	06:17	06:30	18:44 (WTG11) 06:02	05:59
	17:39	18:15	18:43	20:14	44 19:28 (WTG11) 20:42	20:55
29	07:35		07:15	06:29	18:45 (WTG11) 06:01	06:00
	17:40		19:44	20:15	43 19:28 (WTG11) 20:42	20:55
30	07:34		07:13	06:28	18:45 (WTG11) 06:01	06:00
	17:41		19:45	20:16	42 19:27 (WTG11) 20:43	20:55
31	07:33		07:12		06:00	
	17:42		19:46		20:44	
Potential sun hours	302	299	370	397	444	447
Total, worst case				1120		279
Sun reduction				0,53		0,59
Oper. time red.				0,77		0,77
Wind dir. red.				0,66		0,66
Total reduction				0,27		0,30
Total, real				301		84

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_20240628Shadow receptor: F145 - 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

	July	August	September	October	November	December
1	06:00 20:55	06:23 20:38	06:52 19:57	18:48 (WTG11) 19:29 (WTG11)	07:19 19:08	06:51 17:24
2	06:01 20:55	06:24 20:37	06:53 19:55	18:49 (WTG11) 19:28 (WTG11)	07:20 19:07	06:52 17:23
3	06:01 20:55	06:25 20:36	11 19:10 (WTG11) 19:21 (WTG11)	06:53 19:54	18:50 (WTG11) 19:27 (WTG11)	06:54 17:22
4	06:02 20:55	06:26 20:34	18 19:06 (WTG11) 19:24 (WTG11)	06:54 19:52	18:51 (WTG11) 19:24 (WTG11)	06:55 17:21
5	06:02 20:55	06:27 20:33	23 19:04 (WTG11) 19:27 (WTG11)	06:55 19:50	18:52 (WTG11) 19:22 (WTG11)	06:56 17:19
6	06:03 20:54	06:28 20:32	26 19:02 (WTG11) 19:28 (WTG11)	06:56 19:49	18:54 (WTG11) 19:19 (WTG11)	06:57 17:18
7	06:04 20:54	06:28 20:31	29 19:01 (WTG11) 19:30 (WTG11)	06:57 19:47	18:57 (WTG11) 19:16 (WTG11)	06:58 17:17
8	06:04 20:54	06:29 20:30	32 18:59 (WTG11) 19:31 (WTG11)	06:58 19:46	19:01 (WTG11) 18:57 (WTG11)	06:59 17:16
9	06:05 20:54	06:30 20:29	35 18:57 (WTG11) 19:32 (WTG11)	06:59 19:44	07:27 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	37 18:56 (WTG11) 19:33 (WTG11)	07:00 19:42	07:28 18:54	07:33 17:14
11	06:06 20:53	06:32 20:26	39 18:55 (WTG11) 19:34 (WTG11)	07:01 19:41	07:29 18:53	07:34 17:13
12	06:07 20:52	06:33 20:25	40 18:54 (WTG11) 19:34 (WTG11)	07:02 19:39	07:30 18:51	07:34 17:13
13	06:07 20:52	06:34 20:24	42 18:53 (WTG11) 19:35 (WTG11)	07:03 19:38	07:31 18:50	07:35 17:12
14	06:08 20:51	06:35 20:22	44 18:52 (WTG11) 19:36 (WTG11)	07:04 19:36	07:32 18:48	07:36 17:11
15	06:09 20:51	06:36 20:21	45 18:51 (WTG11) 19:36 (WTG11)	07:04 19:34	07:33 18:47	07:37 17:10
16	06:10 20:50	06:37 20:20	46 18:51 (WTG11) 19:37 (WTG11)	07:05 19:33	07:34 18:45	07:37 17:09
17	06:10 20:50	06:38 20:19	47 18:50 (WTG11) 19:37 (WTG11)	07:06 19:31	07:35 18:44	07:38 17:08
18	06:11 20:49	06:39 20:17	47 18:50 (WTG11) 19:37 (WTG11)	07:07 19:29	07:36 18:42	07:39 17:08
19	06:12 20:49	06:40 20:16	48 18:48 (WTG11) 19:36 (WTG11)	07:08 19:28	07:37 18:41	07:39 17:03
20	06:13 20:48	06:41 20:14	48 18:48 (WTG11) 19:36 (WTG11)	07:09 19:26	07:38 18:40	07:40 17:03
21	06:14 20:47	06:41 20:13	48 18:48 (WTG11) 19:36 (WTG11)	07:10 19:25	07:39 18:38	07:40 17:04
22	06:14 20:46	06:42 20:12	49 18:47 (WTG11) 19:36 (WTG11)	07:11 19:23	07:40 18:37	07:41 17:04
23	06:15 20:46	06:43 20:10	49 18:47 (WTG11) 19:36 (WTG11)	07:12 19:21	07:41 18:35	07:41 17:05
24	06:16 20:45	06:44 20:09	49 18:47 (WTG11) 19:36 (WTG11)	07:13 19:20	07:43 18:34	07:42 17:05
25	06:17 20:44	06:45 20:07	49 18:47 (WTG11) 19:36 (WTG11)	07:14 19:18	06:44 17:33	07:42 17:04
26	06:18 20:43	06:46 20:06	48 18:47 (WTG11) 19:35 (WTG11)	07:15 19:16	06:45 17:31	07:43 17:03
27	06:19 20:42	06:47 20:04	48 18:46 (WTG11) 19:34 (WTG11)	07:16 19:15	06:46 17:30	07:43 17:03
28	06:19 20:41	06:48 20:03	47 18:46 (WTG11) 19:33 (WTG11)	07:17 19:13	06:47 17:29	07:43 17:02
29	06:20 20:41	06:49 20:01	45 18:47 (WTG11) 19:32 (WTG11)	07:17 19:12	06:48 17:28	07:44 17:02
30	06:21 20:40	06:50 20:00	44 18:47 (WTG11) 19:31 (WTG11)	07:18 19:10	06:49 17:26	07:44 17:02
31	06:22 20:39	06:51 19:58	42 18:48 (WTG11) 19:30 (WTG11)		06:50 17:25	07:44 17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case		1175	234			
Sun reduction		0,73	0,65			
Oper. time red.		0,77	0,77			
Wind dir. red.		0,66	0,66			
Total reduction		0,37	0,33			
Total, real		437	77			

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_20240628Shadow receptor: F153 - A4

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	07:44 17:11	07:33 17:44	06:59 18:16	07:10 19:47	18:57 (WTG08) 19:24 (WTG08)	06:27 20:17
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48	18:57 (WTG08) 19:24 (WTG08)	06:25 20:18
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	18:58 (WTG08) 19:22 (WTG08)	06:24 20:19
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	18:59 (WTG08) 19:22 (WTG08)	06:23 20:20
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	19:00 (WTG08) 19:19 (WTG08)	06:22 20:21
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	19:01 (WTG08) 19:17 (WTG08)	06:21 20:22
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	19:04 (WTG08) 19:14 (WTG08)	06:20 20:23
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	06:59 20:24	06:18 20:24
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:25
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 20:50
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:57 20:52
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:29	05:57 20:52
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:30	05:57 20:53
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:53
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	06:09 20:32	05:57 20:53
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:54
19	07:42 17:28	07:12 18:05	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:54
20	07:41 17:30	07:11 18:06	06:29 18:35	18:13 (WTG08) 18:15 (WTG08)	06:41 20:06	05:57 20:54
21	07:41 17:31	07:10 18:07	06:28 18:36	18:07 (WTG08) 18:16 (WTG08)	06:40 20:07	05:57 20:55
22	07:40 17:32	07:08 18:08	06:26 18:37	18:04 (WTG08) 18:16 (WTG08)	06:39 20:08	05:57 20:55
23	07:39 17:33	07:07 18:09	06:25 18:38	18:03 (WTG08) 18:18 (WTG08)	06:37 20:09	05:58 20:55
24	07:39 17:34	07:06 18:10	06:23 18:39	18:01 (WTG08) 18:19 (WTG08)	06:36 20:10	05:58 20:55
25	07:38 17:35	07:04 18:11	06:21 18:40	17:59 (WTG08) 18:19 (WTG08)	06:34 20:11	05:58 20:55
26	07:37 17:36	07:03 18:12	06:20 18:41	17:59 (WTG08) 18:21 (WTG08)	06:33 20:12	05:58 20:55
27	07:37 17:38	07:02 18:13	06:18 18:42	17:58 (WTG08) 18:21 (WTG08)	06:32 20:13	05:59 20:55
28	07:36 17:39	07:00 18:14	06:17 18:43	17:58 (WTG08) 18:23 (WTG08)	06:30 20:14	05:59 20:55
29	07:35 17:40	07:15 19:44	06:29 19:24 (WTG08)	18:57 (WTG08) 19:24 (WTG08)	06:29 20:15	06:00 20:55
30	07:34 17:41	07:13 19:45	06:28 19:24 (WTG08)	18:56 (WTG08) 19:24 (WTG08)	06:28 20:16	06:00 20:55
31	07:33 17:42	07:12 19:46	06:28 19:25 (WTG08)	18:57 (WTG08) 19:25 (WTG08)	06:00 20:44	06:00 20:55
Potential sun hours	302	299	370	397	444	447
Total, worst case			229	146	399	309
Sun reduction			0,49	0,53	0,59	0,66
Oper. time red.			0,77	0,77	0,77	0,77
Wind dir. red.			0,66	0,66	0,66	0,67
Total reduction			0,25	0,27	0,30	0,34
Total, real			57	39	120	106

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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar

Calculation: Real_case_Progetto_20240628Shadow receptor: F153 - A4

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

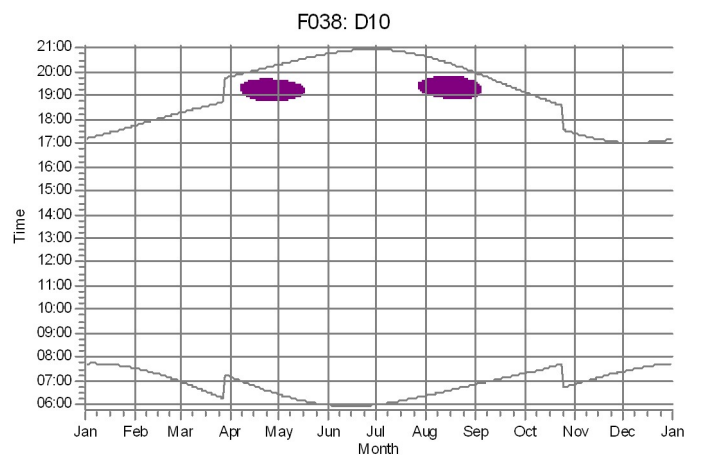
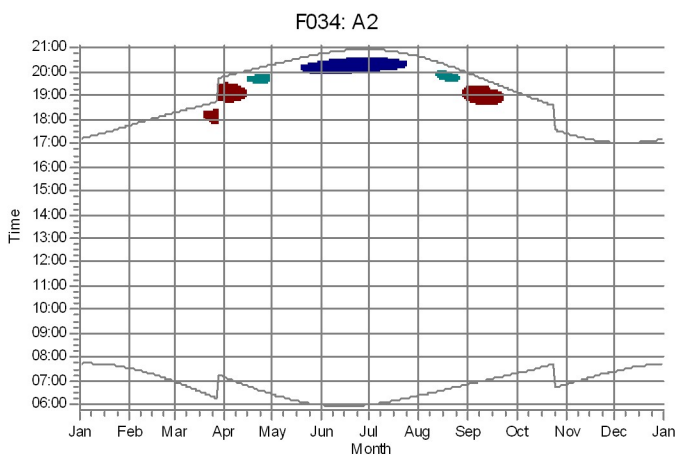
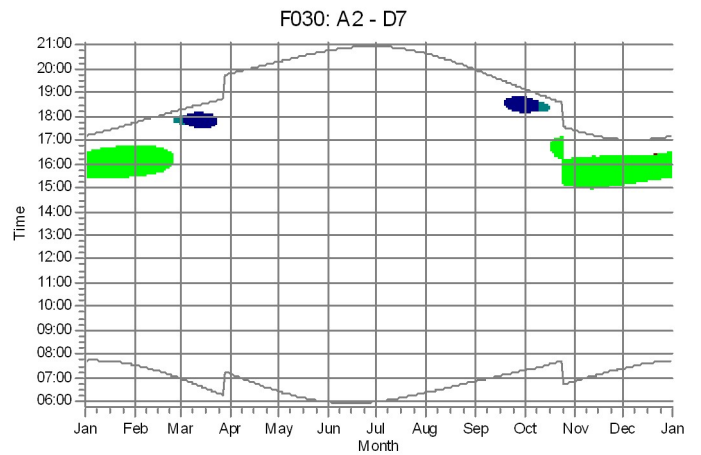
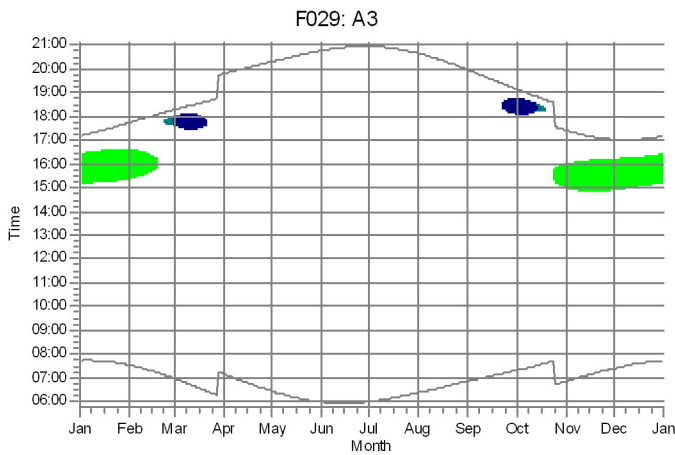
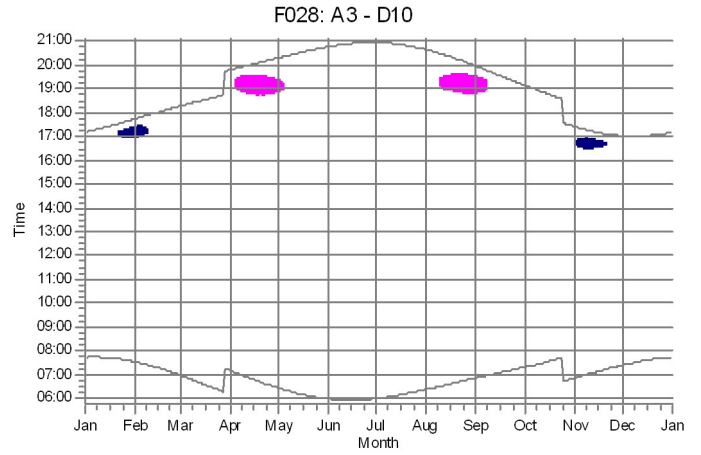
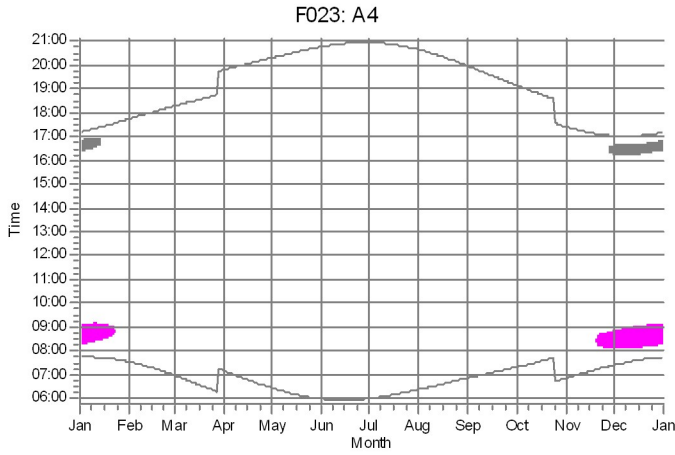
N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	505	420	506	599	570	495	488	555	624	686	669	6.724

	July	August	September	October	November	December					
1	06:00	20:14 (WTG09)	06:23	19:58 (WTG07)	06:52	07:19	06:51	07:24			
	20:55	9 20:23 (WTG09)	20:38	20:14 (WTG07)	19:57	19:08	17:24	17:01			
2	06:01	20:16 (WTG09)	06:24	19:59 (WTG07)	06:53	07:20	06:52	07:25			
	20:55	6 20:22 (WTG09)	20:37	20:13 (WTG07)	19:55	19:07	17:23	17:01			
3	06:01		06:25	19:59 (WTG07)	06:53	07:21	06:54	07:26			
	20:55		20:36	20:12 (WTG07)	19:54	19:05	17:22	17:01			
4	06:02		06:26	20:00 (WTG07)	06:54	07:22	06:55	07:27			
	20:55		20:34	20:12 (WTG07)	19:52	19:04	17:21	17:01			
5	06:02		06:27	20:01 (WTG07)	06:55	19:00 (WTG08)	07:23	06:56	07:28		
	20:55		20:33	20:11 (WTG07)	19:50	19:10 (WTG08)	19:02	17:19	17:01		
6	06:03		06:28	20:03 (WTG07)	06:56	18:57 (WTG08)	07:24	06:57	07:29		
	20:54		20:32	7 20:10 (WTG07)	19:49	19:13 (WTG08)	19:00	17:18	17:01		
7	06:04		06:28	20:05 (WTG07)	06:57	18:55 (WTG08)	07:25	06:58	07:30		
	20:54		20:31	4 20:09 (WTG07)	19:47	19:14 (WTG08)	18:59	17:17	17:00		
8	06:04		06:29		06:58	18:53 (WTG08)	07:26	06:59	07:31		
	20:54		20:30		19:46	23 19:16 (WTG08)	18:57	17:16	17:00		
9	06:05		06:30		06:59	18:52 (WTG08)	07:27	07:00	07:32		
	20:54		20:29		19:44	24 19:16 (WTG08)	18:56	17:15	17:00		
10	06:05		06:31		07:00	18:51 (WTG08)	07:28	07:01	07:33		
	20:53		20:28		19:42	26 19:17 (WTG08)	18:54	17:14	17:01		
11	06:06		06:32		07:01	18:50 (WTG08)	07:29	07:03	07:34		
	20:53		20:26		19:41	27 19:17 (WTG08)	18:53	17:13	17:01		
12	06:07		06:33		07:02	18:49 (WTG08)	07:30	07:04	07:34		
	20:52		20:25		19:39	28 19:17 (WTG08)	18:51	17:13	17:01		
13	06:07		06:34		07:03	18:48 (WTG08)	07:31	07:05	07:35		
	20:52		20:24		19:38	27 19:15 (WTG08)	18:50	17:12	17:01		
14	06:08	20:05 (WTG07)	06:35		07:04	18:47 (WTG08)	07:32	07:06	07:36		
	20:51	7 20:12 (WTG07)	20:23		19:36	27 19:14 (WTG08)	18:48	17:11	17:01		
15	06:09	20:04 (WTG07)	06:36		07:04	18:47 (WTG08)	07:33	07:07	07:37		
	20:51	10 20:14 (WTG07)	20:21		19:34	25 19:12 (WTG08)	18:47	17:10	17:01		
16	06:10	20:02 (WTG07)	06:37		07:05	18:47 (WTG08)	07:34	07:08	07:37		
	20:50	13 20:15 (WTG07)	20:20		19:33	24 19:11 (WTG08)	18:45	17:09	17:02		
17	06:10	20:02 (WTG07)	06:38		07:06	18:47 (WTG08)	07:35	07:09	07:38		
	20:50	14 20:16 (WTG07)	20:19		19:31	22 19:09 (WTG08)	18:44	17:08	17:02	4 15:32 (WTG10)	
18	06:11	20:01 (WTG07)	06:39		07:07	18:48 (WTG08)	07:36	07:10	07:39	15:27 (WTG10)	
	20:49	16 20:17 (WTG07)	20:17		19:29	20 19:08 (WTG08)	18:42	17:08	17:02	6 15:33 (WTG10)	
19	06:12	20:01 (WTG07)	06:40		07:08	18:48 (WTG08)	07:37	07:12	07:39	15:27 (WTG10)	
	20:49	18 20:19 (WTG07)	20:16		19:28	18 19:06 (WTG08)	18:41	17:07	17:03	8 15:35 (WTG10)	
20	06:13	19:59 (WTG07)	06:41		07:09	18:49 (WTG08)	07:38	07:13	07:40	15:27 (WTG10)	
	20:48	19 20:18 (WTG07)	20:14		19:26	16 19:05 (WTG08)	18:39	17:06	17:03	8 15:35 (WTG10)	
21	06:14	19:59 (WTG07)	06:41		07:10	18:50 (WTG08)	07:39	07:14	07:40	15:27 (WTG10)	
	20:47	20 20:19 (WTG07)	20:13		19:25	13 19:03 (WTG08)	18:38	17:06	17:03	9 15:36 (WTG10)	
22	06:14	19:59 (WTG07)	06:42		07:11	18:51 (WTG08)	07:40	07:15	07:41	15:27 (WTG10)	
	20:46	21 20:20 (WTG07)	20:12		19:23	10 19:01 (WTG08)	18:37	17:05	17:04	9 15:36 (WTG10)	
23	06:15	19:59 (WTG07)	06:43		07:12	18:54 (WTG08)	07:42	07:16	07:41	15:28 (WTG10)	
	20:46	22 20:21 (WTG07)	20:10		19:21	5 18:59 (WTG08)	18:35	17:05	17:04	9 15:37 (WTG10)	
24	06:16	19:59 (WTG07)	06:44		07:13	07:43	07:17	07:17	07:42	15:29 (WTG10)	
	20:45	22 20:21 (WTG07)	20:09		19:20		18:34	17:04	17:05	8 15:37 (WTG10)	
25	06:17	19:58 (WTG07)	06:45		07:14	06:44	07:18	07:18	07:42	15:31 (WTG10)	
	20:44	22 20:20 (WTG07)	20:07		19:18		17:33	17:04	17:06	6 15:37 (WTG10)	
26	06:18	19:58 (WTG07)	06:46		07:15	06:45	07:19	07:19	07:43	15:32 (WTG10)	
	20:43	21 20:19 (WTG07)	20:06		19:16		17:31	17:03	17:06	4 15:36 (WTG10)	
27	06:19	19:58 (WTG07)	06:47		07:16	06:46	07:20	07:20	07:43		
	20:42	21 20:19 (WTG07)	20:04		19:15		17:30	17:03	17:07		
28	06:19	19:58 (WTG07)	06:48		07:17	06:47	07:21	07:21	07:43		
	20:41	20 20:18 (WTG07)	20:03		19:13		17:29	17:02	17:08		
29	06:20	19:58 (WTG07)	06:49		07:17	06:48	07:22	07:22	07:44		
	20:41	19 20:17 (WTG07)	20:01		19:12		17:28	17:02	17:08		
30	06:21	19:58 (WTG07)	06:50		07:18	06:49	07:23	07:23	07:44		
	20:40	19 20:17 (WTG07)	20:00		19:10		17:26	17:02	17:09		
31	06:22	19:59 (WTG07)	06:51			06:50			07:44		
	20:39	17 20:16 (WTG07)	19:58			17:25			17:10		
Potential sun hours	454		425		374		347		302		293
Total, worst case		336		76		380					71
Sun reduction		0,74		0,73		0,65					0,45
Oper. time red.		0,77		0,77		0,77					0,77
Wind dir. red.		0,67		0,66		0,66					0,61
Total reduction		0,38		0,37		0,33					0,21
Total, real		127		28		125					15








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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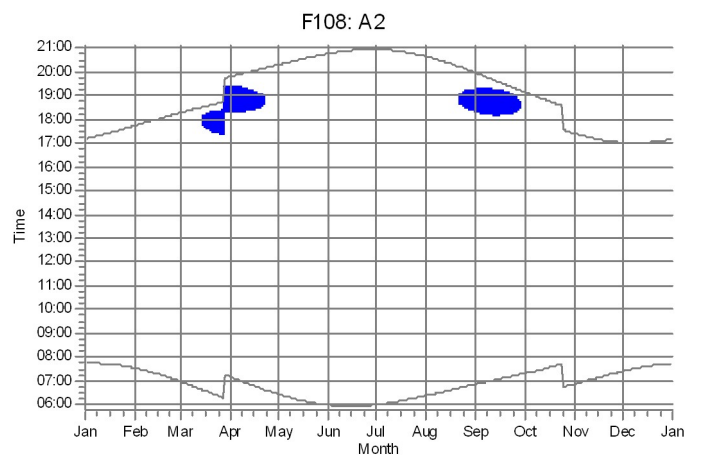
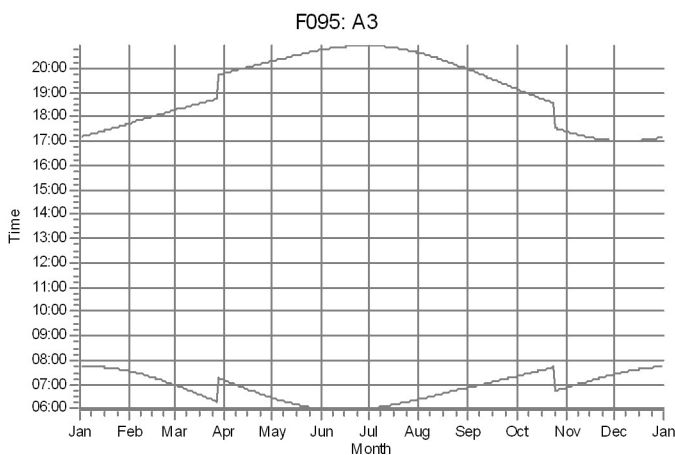
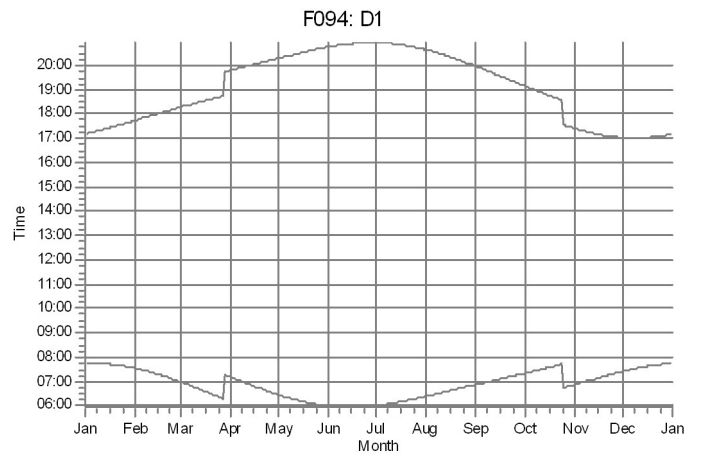
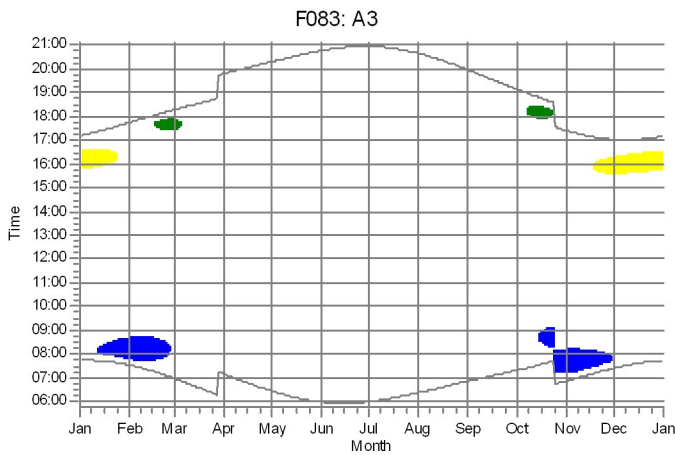
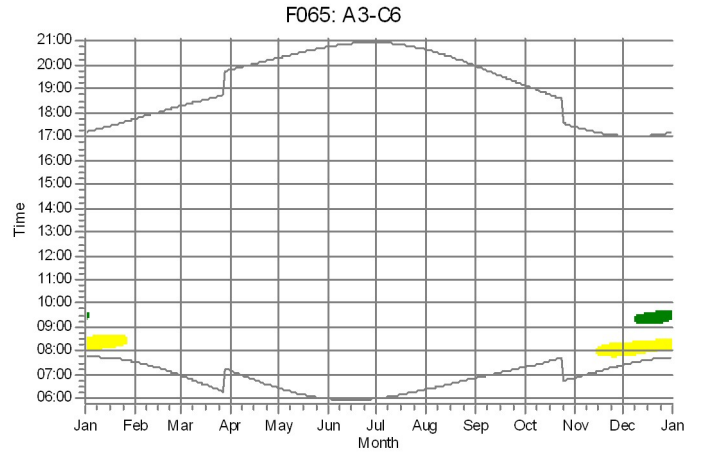
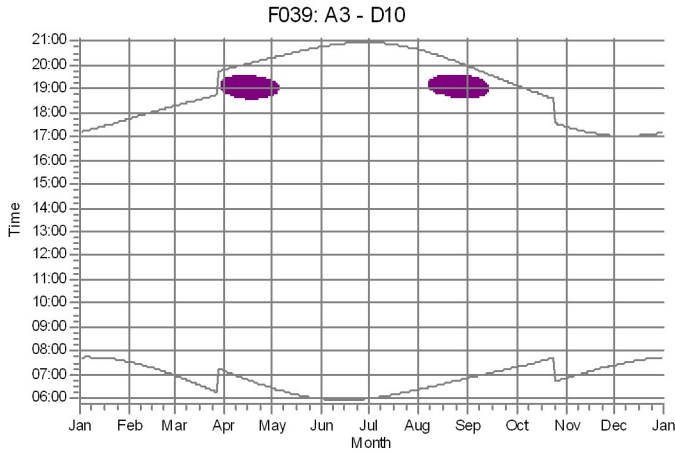
SHADOW - Calendar, graphical
 Calculation: Real_case_Progetto_20240628



WTGs

- | | | | |
|---|--|---|--|
|  | WTG04: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (36) |  | WTG08: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (40) |
|  | WTG05: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (37) |  | WTG09: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (41) |
|  | WTG06: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (38) |  | WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (43) |
|  | WTG07: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (39) | | |

SHADOW - Calendar, graphical
 Calculation: Real_case_Progetto_20240628

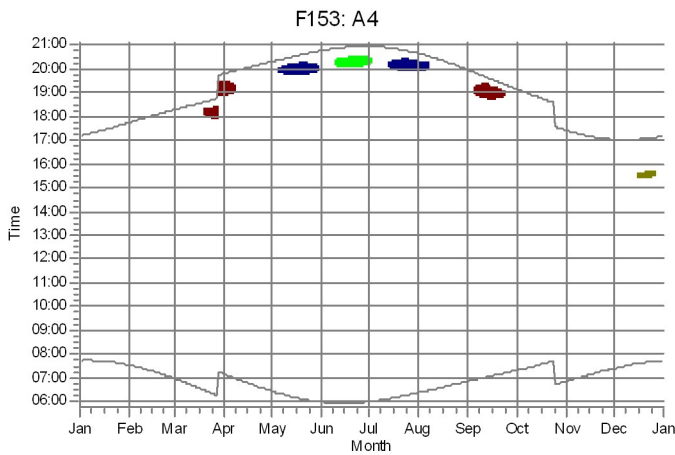
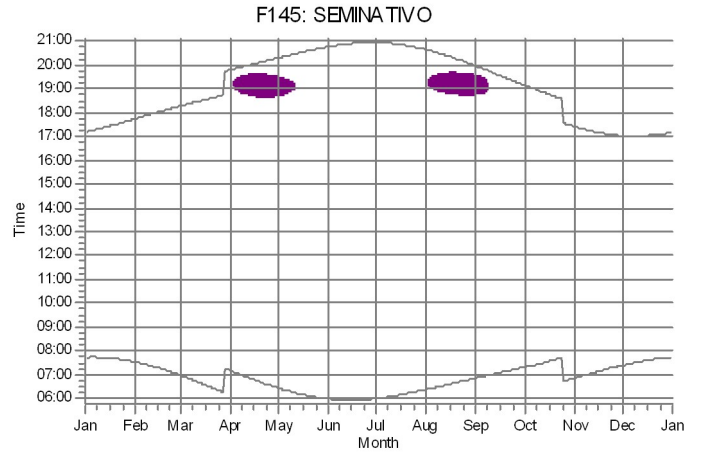
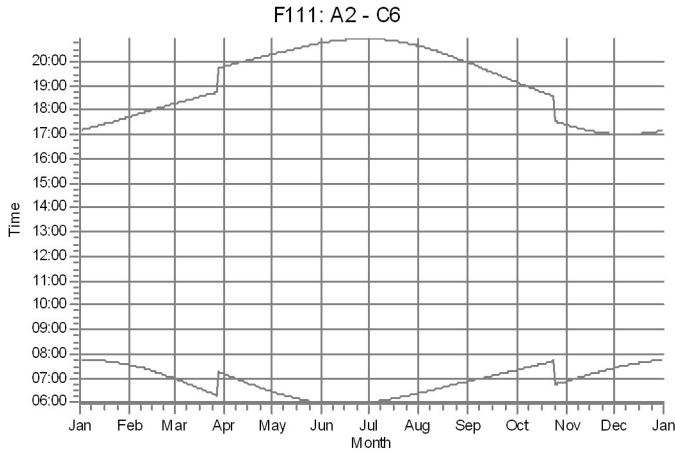


WTGs

- WTG01: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (33)
- WTG02: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (34)

- WTG03: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (35)
- WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (43)

SHADOW - Calendar, graphical
 Calculation: Real_case_Progetto_20240628



WTGs

- WTG07: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (39)
- WTG08: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (40)
- WTG09: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (41)
- WTG10: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (42)
- WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (43)

Project:

Progetto_Baltex Nuraminis

Licensed user:

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

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Calculated:

28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG01 - Siemens Gamesa SG 6.2-170 6200 170.0 !OI! hub: 135,0 m (TOT: 220,0 m) (33) 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 09:24-09:35/11	07:33	06:59 17:29-17:49/20	07:10	06:27	06:00	06:00	06:23	06:52	07:19	06:51	07:25
	17:11	17:44	18:16	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:24	17:01
2	07:45 09:28-09:34/6	07:32	06:57 17:30-17:49/19	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:53	07:26
	17:12	17:45	18:17	19:48	20:18	20:46	20:55	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56 17:30-17:47/17	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:27
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:22	17:01
4	07:45	07:30	06:54 17:33-17:45/12	07:06	06:23	05:58	06:02	06:26	06:54	07:22	06:55	07:28
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:04	17:21	17:01
5	07:45	07:29	06:53 17:36-17:41/5	07:04	06:22	05:58	06:02	06:27	06:55	07:23	06:56	07:28
	17:14	17:48	18:20	19:51	20:21	20:48	20:55	20:34	19:51	19:02	17:20	17:01
6	07:45	07:28	06:51	07:02	06:21	05:58	06:03	06:28	06:56	07:24	06:57	07:29
	17:15	17:49	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:01	17:18	17:01
7	07:45	07:27	06:50	07:01	06:20	05:58	06:04	06:29	06:57	07:25	06:58	07:30
	17:16	17:51	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:01
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:05	06:30	06:59	07:27	18:09-18:18/9	07:00
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:00
10	07:45	07:24	06:45	06:56	06:16	05:57	06:05	06:31	07:00	07:28	18:06-18:20/14	07:02
	17:19	17:54	18:25	19:56	20:26	20:51	20:53	20:28	19:43	18:54	17:14	17:01
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29	18:04-18:22/18	07:03
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:53	17:13	17:01
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30	18:03-18:23/20	07:04
	17:21	17:57	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:51	17:13	17:01
13	07:44	07:20	06:41	06:52	06:13	05:57	06:07	06:34	07:03	07:31	18:02-18:23/21	07:05
	17:22	17:58	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:12	17:01
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35	07:04	07:32	18:01-18:23/22	07:06
	17:23	17:59	18:29	20:00	20:30	20:52	20:52	20:23	19:36	18:48	17:11	17:01
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36	07:05	07:33	18:00-18:23/23	07:07
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37	07:05	07:34	18:00-18:23/23	07:08
	17:25	18:01	18:31	20:02	20:32	20:53	20:51	20:20	19:33	18:45	17:09	17:02
17	07:43	07:15	06:34	06:46	06:10	05:57	06:10	06:38	07:06	07:35	18:00-18:21/21	07:09
	17:26	18:02	18:32	20:03	20:32	20:54	20:50	20:19	19:31	18:44	17:08	17:02
18	07:42	07:14 17:38-17:42/4	06:33	06:44	06:09	05:57	06:11	06:39	07:07	07:36	18:00-18:19/19	07:11
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:30	18:42	17:08	17:02
19	07:42	07:13 17:34-17:42/8	06:31	06:43	06:08	05:57	06:12	06:40	07:08	07:37	18:00-18:18/18	07:12
	17:28	18:05	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:03
20	07:41	07:11 17:32-17:44/12	06:29	06:41	06:07	05:57	06:13	06:41	07:09	07:38	18:01-18:17/16	07:13
	17:30	18:06	18:35	20:06	20:35	20:54	20:48	20:15	19:26	18:40	17:06	17:03
21	07:41	07:10 17:31-17:46/15	06:28	06:40	06:06	05:57	06:14	06:42	07:10	07:40	18:02-18:16/14	07:14
	17:31	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:25	18:38	17:06	17:04
22	07:40	07:09 17:29-17:46/17	06:26	06:39	06:05	05:57	06:14	06:42	07:11	07:41	18:03-18:14/11	07:15
	17:32	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:40	07:07 17:29-17:48/19	06:25	06:37	06:05	05:58	06:15	06:43	07:12	07:42	18:05-18:13/8	07:16
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:05	17:05
24	07:39	07:06 17:28-17:48/20	06:23	06:36	06:04	05:58	06:16	06:44	07:13	07:43	18:10-18:11/1	07:17
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04 17:28-17:50/22	06:21	06:34	06:03	05:58	06:17	06:45	07:14	07:44	18:06-18:17/16	07:18
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:33	17:04	17:06
26	07:38	07:03 17:28-17:52/24	06:20	06:33	06:03	05:58	06:18	06:46	07:15	07:45	18:07-18:18/14	07:19
	17:37	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:17	17:31	17:03	17:06
27	07:37	07:02 17:28-17:51/23	06:18	06:32	06:02	05:59	06:19	06:47	07:16	07:46	18:08-18:19/13	07:20
	17:38	18:13	18:42	20:13	20:41	20:56	20:43	20:04	19:15	17:30	17:03	17:07
28	07:36	07:00 17:29-17:51/22	06:17	06:30	06:02	05:59	06:19	06:48	07:17	07:47	18:09-18:20/12	07:21
	17:39	18:15	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:29	17:02	17:08
29	07:35		07:15	06:29	06:01	06:00	06:20	06:49	07:18	07:48	18:10-18:21/11	07:22
	17:40		19:44	20:15	20:43	20:56	20:41	20:01	19:12	17:28	17:02	17:08
30	07:34		07:13	06:28	06:01	06:00	06:21	06:50	07:19	07:49	18:11-18:22/10	07:23
	17:41		19:45	20:16	20:43	20:56	20:40	20:00	19:10	17:26	17:02	17:08
31	07:34		07:12		06:00		06:22	06:51		07:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:09
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	17	186	73	0	0	0	0	0	0	258	0	392

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 Nuraminis

Licensed user:

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

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Calculated:

28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG02 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (34) 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 15:50-16:28/38 17:11 08:06-08:29/23	07:33 06:59 07:10 17:44 18:16 19:47	06:59 07:07 06:24 18:18 19:49 20:19	07:10 06:27 20:17 20:45 20:55 20:38	06:27 06:00 06:00 20:45 20:55 20:38	06:00 06:00 06:23 20:45 20:55 20:38	06:00 06:23 06:52 20:45 20:55 20:38	06:23 06:52 07:19 20:45 20:55 20:38	06:52 07:19 06:51 19:08 17:24	07:19 06:51 07:25 19:08 17:24	06:51 07:25 07:31 17:24 17:22	07:25 15:39-16:13/34 17:01 07:50-08:17/27
2	07:45 15:51-16:29/38 17:12 08:07-08:31/24	07:32 06:57 07:09 17:46 18:18 19:49	06:57 07:09 06:25 18:19 19:50 20:20	07:09 06:25 20:19 20:46 20:55 20:36	06:25 05:59 06:01 20:46 20:55 20:36	06:01 06:24 06:53 20:46 20:55 20:36	06:24 06:53 07:20 20:46 20:55 20:36	06:53 07:20 06:54 19:54 19:05	07:20 06:53 07:26 19:05 17:22	06:53 07:26 07:32 17:22 17:22	06:53 07:26 07:32 17:22 17:22	07:26 15:39-16:14/35 17:01 07:51-08:17/26
3	07:45 15:51-16:29/38 17:12 08:07-08:31/24	07:31 06:56 07:07 17:46 18:18 19:49	06:56 07:07 06:24 18:19 19:50 20:20	07:07 06:24 20:19 20:46 20:55 20:36	06:24 05:59 06:01 20:46 20:55 20:36	06:01 06:25 06:54 20:46 20:55 20:36	06:25 06:54 07:21 20:46 20:55 20:36	06:54 07:21 06:54 19:05 17:22	07:21 06:54 07:27 19:05 17:22	06:54 07:27 07:33 17:22 17:22	06:54 07:27 07:33 17:22 17:22	07:27 15:39-16:14/35 17:01 07:52-08:18/26
4	07:45 15:52-16:29/37 17:13 08:07-08:32/25	07:30 06:54 07:06 17:47 18:19 19:50	06:54 07:06 06:23 18:19 19:50 20:20	07:06 06:23 20:20 20:47 20:55 20:35	06:23 05:58 06:02 20:47 20:55 20:35	06:02 06:26 06:54 20:47 20:55 20:35	06:26 06:54 07:21 20:47 20:55 20:35	06:54 07:21 06:54 19:52 19:04	07:21 06:54 07:27 19:04 17:21	06:54 07:27 07:33 17:21 17:21	06:54 07:27 07:33 17:21 17:21	07:27 15:39-16:15/36 17:01 07:52-08:17/25
5	07:45 15:53-16:30/37 17:14 08:07-08:31/24	07:29 06:53 07:04 17:48 18:20 19:51	06:53 07:04 06:22 18:20 19:51 20:21	07:04 06:22 20:21 20:48 20:55 20:34	06:22 05:58 06:02 20:48 20:55 20:34	06:02 06:27 06:55 20:48 20:55 20:34	06:27 06:55 07:23 20:48 20:55 20:34	06:55 07:23 06:56 19:02 17:19	07:23 06:56 07:28 19:02 17:19	06:55 07:23 06:56 19:02 17:19	06:55 07:23 06:56 19:02 17:19	07:28 15:39-16:16/37 17:01 07:53-08:18/25
6	07:45 15:53-16:30/37 17:14 08:07-08:31/24	07:28 06:51 07:02 17:49 18:21 19:52	06:51 07:02 06:21 18:21 19:52 20:22	07:02 06:21 20:22 20:48 20:55 20:32	06:21 05:58 06:03 20:48 20:55 20:32	06:02 06:28 06:56 20:48 20:55 20:32	06:28 06:56 07:24 20:48 20:55 20:32	06:56 07:24 06:57 19:00 17:18	07:24 06:57 07:29 19:00 17:18	06:56 07:24 06:57 19:00 17:18	06:56 07:24 06:57 19:00 17:18	07:29 15:39-16:16/37 17:01 07:54-08:19/25
7	07:45 15:54-16:31/37 17:16 08:07-08:33/26	07:27 06:50 07:01 17:51 18:22 19:53	06:50 07:01 06:20 18:22 19:53 20:23	07:01 06:20 20:23 20:49 20:54 20:31	06:20 05:58 06:04 20:49 20:54 20:31	06:02 06:28 06:57 20:49 20:54 20:31	06:28 06:57 07:25 20:49 20:54 20:31	06:57 07:25 06:58 19:47 18:59	07:25 06:58 07:30 19:47 18:59	06:57 07:25 06:58 19:47 18:59	06:57 07:25 06:58 19:47 18:59	07:30 15:40-16:17/37 17:00 07:54-08:18/24
8	07:45 15:55-16:31/36 17:17 08:08-08:33/25	07:26 06:48 06:59 17:52 18:23 19:54	06:48 06:59 06:18 18:23 19:54 20:24	06:59 06:18 20:24 20:49 20:54 20:30	06:18 05:57 06:04 20:49 20:54 20:30	06:02 06:29 06:58 20:49 20:54 20:30	06:29 06:58 07:26 20:49 20:54 20:30	06:58 07:26 06:59 18:57 17:16	07:26 06:59 07:31 18:57 17:16	06:58 07:26 06:59 18:57 17:16	06:58 07:26 06:59 18:57 17:16	07:31 15:40-16:18/38 17:00 07:54-08:19/25
9	07:45 15:56-16:31/35 17:18 08:08-08:34/26	07:25 06:47 06:58 17:53 18:24 19:55	06:47 06:58 06:17 18:24 19:55 20:25	06:58 06:17 20:25 20:50 20:54 20:29	06:17 05:57 06:05 20:50 20:54 20:29	06:02 06:29 06:58 20:50 20:54 20:29	06:29 06:58 07:27 20:50 20:54 20:29	06:58 07:27 07:00 18:56 17:15	07:27 07:00 07:32 18:56 17:15	06:58 07:27 07:00 18:56 17:15	06:58 07:27 07:00 18:56 17:15	07:32 15:41-16:18/37 17:00 07:55-08:19/24
10	07:45 15:57-16:32/35 17:19 08:09-08:35/26	07:24 06:45 06:56 17:54 18:25 19:56	06:45 06:56 06:16 18:25 19:56 20:26	06:56 06:16 20:26 20:50 20:53 20:28	06:16 05:57 06:05 20:50 20:53 20:28	06:02 06:29 06:58 20:50 20:53 20:28	06:29 06:58 07:28 20:50 20:53 20:28	06:58 07:28 07:01 18:54 17:14	07:28 07:01 07:34 18:54 17:14	06:58 07:28 07:01 18:54 17:14	06:58 07:28 07:01 18:54 17:14	07:33 15:41-16:19/38 17:01 07:56-08:19/23
11	07:44 15:57-16:31/34 17:20 08:08-08:34/26	07:22 06:44 06:55 17:55 18:26 19:57	06:44 06:55 06:15 18:26 19:57 20:27	06:55 06:15 20:27 20:51 20:53 20:26	06:15 05:57 06:06 20:51 20:53 20:26	06:02 06:29 06:58 20:51 20:53 20:26	06:27 06:58 07:28 20:51 20:53 20:26	06:58 07:28 07:01 18:53 17:13	07:28 07:01 07:34 18:53 17:13	06:58 07:28 07:01 18:53 17:13	06:58 07:28 07:01 18:53 17:13	07:34 15:42-16:20/38 17:01 07:57-08:20/23
12	07:44 15:58-16:31/33 17:21 08:09-08:35/26	07:21 06:42 06:53 17:57 18:27 19:58	06:42 06:53 06:14 18:27 19:58 20:28	06:53 06:14 20:28 20:51 20:53 20:25	06:14 05:57 06:07 20:51 20:53 20:25	06:02 06:29 06:58 20:51 20:53 20:25	06:28 06:58 07:29 20:51 20:53 20:25	06:58 07:29 07:02 18:51 17:13	07:29 07:02 07:35 18:51 17:13	06:58 07:29 07:02 18:51 17:13	06:58 07:29 07:02 18:51 17:13	07:35 15:41-16:19/38 17:01 07:58-08:20/22
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14	07:44 15:59-16:31/32 17:23 08:10-08:36/26	07:19 06:39 06:50 17:59 18:29 20:00	06:39 06:50 06:12 18:29 20:00 20:30	06:50 06:12 20:30 20:52 20:52 20:23	06:12 05:57 06:08 20:52 20:52 20:23	06:02 06:29 06:58 20:52 20:52 20:23	06:29 06:58 07:31 20:52 20:52 20:23	06:58 07:31 07:04 18:48 17:11	07:31 07:04 07:37 18:48 17:11	06:58 07:31 07:04 18:48 17:11	06:58 07:31 07:04 18:48 17:11	07:37 15:43-16:21/39 17:01 07:59-08:20/21
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22	07:40 16:11-16:25/14 17:32 08:15-08:35/20	07:09 06:26 06:39 18:08 18:37 20:08	06:26 06:39 06:05 18:37 20:08 20:37	06:39 06:05 20:37 20:55 20:47 20:12	06:05 05:57 06:14 20:55 20:47 20:12	06:02 06:29 06:58 20:55 20:47 20:12	06:31 06:58 07:39 20:55 20:47 20:12	06:58 07:39 07:11 18:37 17:05	07:39 07:11 07:45 18:37 17:05	06:58 07:39 07:11 18:37 17:05	06:58 07:39 07:11 18:37 17:05	07:42 15:46-16:25/39 17:04 08:04-08:24/20
23	07:39 16:14-16:22/8 17:33 08:17-08:35/18	07:07 06:25 06:37 18:09 18:38 20:09	06:25 06:37 06:05 18:38 20:09 20:38	06:37 06:05 20:38 20:55 20:46 20:10	06:05 05:58 06:15 20:55 20:46 20:10	06:02 06:29 06:58 20:55						

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG03 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (35) 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 17:11	07:33 07:52-08:37/45 17:43	06:59 18:16	07:10 18:22-19:19/57 19:47	06:27 20:17	05:59 20:45
2	07:45 17:11	07:32 07:51-08:38/47 17:45	06:57 18:17	07:09 18:23-19:19/56 19:48	06:25 20:18	05:59 20:45
3	07:45 17:12	07:31 07:50-08:38/48 17:46	06:56 18:18	07:07 18:22-19:19/57 19:49	06:24 20:19	05:59 20:46
4	07:45 17:13	07:30 07:49-08:38/49 17:47	06:54 18:19	07:05 18:22-19:18/56 19:50	06:23 20:20	05:58 20:47
5	07:45 17:14	07:29 07:48-08:39/51 17:48	06:53 18:20	07:04 18:22-19:18/56 19:51	06:22 20:21	05:58 20:47
6	07:45 17:15	07:28 07:47-08:39/52 17:49	06:51 18:21	07:02 18:22-19:17/55 19:52	06:21 20:22	05:58 20:48
7	07:45 17:16	07:27 07:46-08:39/53 17:51	06:50 18:22	07:01 18:22-19:17/55 19:53	06:19 20:23	05:57 20:49
8	07:45 17:17	07:26 07:46-08:39/53 17:52	06:48 18:23	06:59 18:22-19:16/54 19:54	06:18 20:24	05:57 20:49
9	07:45 17:18	07:25 07:46-08:39/53 17:53	06:47 18:24	06:58 18:23-19:15/52 19:55	06:17 20:25	05:57 20:50
10	07:45 17:19	07:24 07:47-08:39/52 17:54	06:45 18:25	06:56 18:23-19:14/51 19:56	06:16 20:26	05:57 20:50
11	07:44 17:20	07:22 07:46-08:38/52 17:55	06:44 18:26	06:55 18:24-19:14/50 19:57	06:15 20:27	05:57 20:51
12	07:44 17:21	07:21 07:47-08:38/51 17:56	06:42 18:27	06:53 18:24-19:12/48 19:58	06:14 20:28	05:57 20:51
13	07:44 08:05-08:10/5 17:22	07:20 07:47-08:38/51 17:58	06:40 18:28	06:52 18:25-19:11/46 19:59	06:13 20:29	05:57 20:52
14	07:44 08:04-08:14/10 17:23	07:19 07:48-08:38/50 17:59	06:39 18:29	06:50 18:26-19:09/43 20:00	06:12 20:30	05:56 20:52
15	07:43 08:04-08:17/13 17:24	07:18 07:49-08:38/49 18:00	06:37 18:30	06:49 18:27-19:08/41 20:01	06:11 20:30	05:56 20:53
16	07:43 08:03-08:19/16 17:25	07:16 07:49-08:36/47 18:01	06:36 17:47-18:05/18 18:31	06:47 18:28-19:06/38 20:02	06:10 20:31	05:56 20:53
17	07:43 08:03-08:21/18 17:26	07:15 07:50-08:35/45 18:02	06:34 17:42-18:08/26 18:32	06:46 18:30-19:05/35 20:03	06:09 20:32	05:57 20:53
18	07:42 08:03-08:23/20 17:27	07:14 07:51-08:35/44 18:03	06:33 17:40-18:11/31 18:33	06:44 18:31-19:02/31 20:04	06:09 20:33	05:57 20:54
19	07:42 08:02-08:24/22 17:28	07:13 07:51-08:33/42 18:04	06:31 17:37-18:13/36 18:34	06:43 18:33-19:00/27 20:05	06:08 20:34	05:57 20:54
20	07:41 08:01-08:25/24 17:29	07:11 07:53-08:32/39 18:06	06:29 17:34-18:14/40 18:35	06:41 18:36-18:58/22 20:06	06:07 20:35	05:57 20:54
21	07:41 08:01-08:27/26 17:31	07:10 07:54-08:31/37 18:07	06:28 17:33-18:16/43 18:36	06:40 18:39-18:53/14 20:07	06:06 20:36	05:57 20:55
22	07:40 08:00-08:28/28 17:32	07:09 07:55-08:28/33 18:08	06:26 17:31-18:16/45 18:37	06:38 20:08	06:05 20:37	05:57 20:55
23	07:39 07:59-08:29/30 17:33	07:07 07:57-08:27/30 18:09	06:25 17:30-18:18/48 18:38	06:37 20:09	06:05 20:38	05:57 20:55
24	07:39 07:59-08:31/32 17:34	07:06 07:59-08:24/25 18:10	06:23 17:29-18:18/49 18:39	06:36 20:10	06:04 20:38	05:58 20:55
25	07:38 07:58-08:32/34 17:35	07:04 08:03-08:21/18 18:11	06:21 17:27-18:18/51 18:40	06:34 20:11	06:03 20:39	05:58 20:55
26	07:37 07:57-08:33/36 17:36	07:03 08:09-08:15/6 18:12	06:20 17:27-18:19/52 18:41	06:33 20:12	06:03 20:40	05:58 20:55
27	07:37 07:57-08:34/37 17:38	07:02 18:13	06:18 17:25-18:19/54 18:42	06:32 20:13	06:02 20:41	05:59 20:55
28	07:36 07:56-08:35/39 17:39	07:00 18:14	06:17 17:25-18:20/55 18:43	06:30 20:14	06:01 20:42	05:59 20:55
29	07:35 07:55-08:36/41 17:40		07:15 18:24-19:20/56 19:44	06:29 20:15	06:01 20:43	05:59 20:55
30	07:34 07:54-08:36/42 17:41		07:13 18:23-19:19/56 19:45	06:28 20:16	06:00 20:43	06:00 20:55
31	07:33 07:53-08:37/44 17:42		07:12 18:23-19:20/57 19:46		06:00 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	517	1122	717	944	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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG03 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (35) 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	06:23 20:38	06:52 18:23-19:12/49 19:57	07:19 19:08	06:51 07:16-08:08/52 17:24	07:24 17:01
2	06:01 20:55	06:24 20:37	06:53 18:22-19:13/51 19:55	07:20 19:07	06:52 07:16-08:09/53 17:23	07:25 17:01
3	06:01 20:55	06:25 20:36	06:53 18:21-19:13/52 19:54	07:21 19:05	06:54 07:16-08:09/53 17:22	07:26 17:01
4	06:02 20:55	06:26 20:35	06:54 18:19-19:13/54 19:52	07:22 19:04	06:55 07:16-08:09/53 17:20	07:27 17:01
5	06:02 20:55	06:27 20:33	06:55 18:18-19:13/55 19:50	07:23 19:02	06:56 07:17-08:09/52 17:19	07:28 17:01
6	06:03 20:55	06:27 20:32	06:56 18:18-19:13/55 19:49	07:24 19:00	06:57 07:18-08:09/51 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 18:17-19:13/56 19:47	07:25 18:59	06:58 07:20-08:09/49 17:17	07:30 17:00
8	06:04 20:54	06:29 20:30	06:58 18:17-19:13/56 19:46	07:26 18:57	06:59 07:21-08:09/48 17:16	07:31 17:00
9	06:05 20:54	06:30 20:29	06:59 18:16-19:13/57 19:44	07:27 18:56	07:00 07:22-08:09/47 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 18:16-19:13/57 19:42	07:28 18:54	07:01 07:23-08:08/45 17:14	07:33 17:00
11	06:06 20:53	06:32 20:26	07:01 18:16-19:12/56 19:41	07:29 18:53	07:03 07:24-08:08/44 17:13	07:34 17:01
12	06:07 20:53	06:33 20:25	07:02 18:14-19:11/57 19:39	07:30 18:51	07:04 07:26-08:08/42 17:12	07:34 17:01
13	06:07 20:52	06:34 20:24	07:03 18:14-19:10/56 19:38	07:31 18:50	07:05 07:27-08:08/41 17:12	07:35 17:01
14	06:08 20:52	06:35 20:23	07:04 18:14-19:10/56 19:36	07:32 18:48	07:06 07:28-08:07/39 17:11	07:36 17:01
15	06:09 20:51	06:36 20:21	07:04 18:14-19:09/55 19:34	07:33 18:47	07:07 07:29-08:06/37 17:10	07:37 17:01
16	06:10 20:50	06:37 20:20	07:05 18:15-19:08/53 19:33	07:34 08:37-08:49/12 18:45	07:08 07:30-08:06/36 17:09	07:37 17:02
17	06:10 20:50	06:38 20:19	07:06 18:15-19:08/53 19:31	07:35 08:33-08:53/20 18:44	07:09 07:32-08:06/34 17:08	07:38 17:02
18	06:11 20:49	06:39 20:17	07:07 18:15-19:07/52 19:29	07:36 08:30-08:56/26 18:42	07:10 07:33-08:05/32 17:08	07:39 17:02
19	06:12 20:49	06:40 20:16	07:08 18:16-19:05/49 19:28	07:37 08:27-08:58/31 18:41	07:12 07:34-08:04/30 17:07	07:39 17:03
20	06:13 20:48	06:40 20:14	07:09 18:16-19:04/48 19:26	07:38 08:26-09:01/35 18:39	07:13 07:35-08:03/28 17:06	07:40 17:03
21	06:13 20:47	06:41 20:13	07:10 18:17-19:03/46 19:25	07:39 08:24-09:02/38 18:38	07:14 07:36-08:02/26 17:06	07:40 17:03
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23	06:15 20:46	06:43 18:39-19:02/23 20:10	07:12 18:18-18:59/41 19:21	07:42 08:22-09:04/42 18:35	07:16 07:39-08:01/22 17:05	07:42 17:04
24	06:16 20:45	06:44 18:37-19:04/27 20:09	07:13 18:20-18:57/37 19:20	07:43 08:20-09:05/45 18:34	07:17 07:40-08:00/20 17:04	07:42 17:05
25	06:17 20:44	06:45 18:34-19:06/32 20:07	07:14 18:22-18:54/32 19:18	06:44 07:19-08:05/46 17:33	07:18 07:41-07:59/18 17:04	07:42 17:06
26	06:18 20:43	06:46 18:32-19:08/36 20:06	07:15 18:24-18:51/27 19:16	06:45 07:18-08:06/48 17:31	07:19 07:42-07:58/16 17:03	07:43 17:06
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28	06:19 20:42	06:48 18:28-19:09/41 20:03	07:17 18:32-18:42/10 19:13	06:47 07:18-08:08/50 17:29	07:21 07:44-07:54/10 17:02	07:43 17:07
29	06:20 20:41	06:49 18:27-19:10/43 20:01	07:17 19:12 19:12	06:48 07:17-08:08/51 17:28	07:22 07:45-07:51/6 17:02	07:44 17:08
30	06:21 20:40	06:50 18:25-19:11/46 20:00	07:18 19:10 19:10	06:49 07:16-08:08/52 17:26	07:23 17:02 17:02	07:44 17:09
31	06:22 20:39	06:51 18:24-19:12/48 19:58		06:50 07:16-08:08/52 17:25		07:44 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	0	349	1334	637	1021	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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG04 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (36) 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 16:27-16:45/18 17:11	07:33 17:44 18:16	06:59 18:17 19:47	07:10 19:47 20:17	06:27 20:17 20:45	06:00 20:55 20:38	06:00 20:55 20:38	06:23 19:57 20:38	06:52 19:08 19:57	07:20 17:24 17:01	06:51 17:24 17:01	07:25 16:19-16:33/14 17:01
2	07:45 16:28-16:46/18 17:12	07:32 17:45 18:17	06:57 18:17 19:48	07:09 20:18 20:46	06:25 20:55 20:37	05:59 20:55 20:37	06:01 20:55 20:37	06:24 19:55 20:37	06:53 19:07 19:55	07:20 17:23 17:01	06:53 17:23 17:01	07:26 16:18-16:34/16 17:01
3	07:45 16:28-16:47/19 17:12	07:30 17:47 18:18	06:54 18:19 19:50	07:06 20:20 20:47	06:23 20:58 20:47	05:58 20:55 20:36	06:02 20:55 20:36	06:26 19:54 20:36	06:55 19:05 19:52	07:22 17:22 17:01	06:55 17:22 17:01	07:27 16:17-16:36/19 17:01
4	07:45 16:30-16:49/19 17:13	07:29 17:47 18:20	06:53 18:19 19:51	07:04 20:21 20:48	06:22 20:58 20:48	05:58 20:55 20:34	06:02 20:55 20:34	06:27 19:51 20:34	06:55 19:02 19:51	07:23 17:20 17:01	06:56 17:20 17:01	07:28 16:17-16:36/19 17:01
5	07:45 16:31-16:50/19 17:14	07:28 17:50 18:21	06:51 18:21 19:52	07:02 20:22 20:48	06:21 20:58 20:48	05:58 20:55 20:32	06:03 20:55 20:32	06:28 19:49 20:32	06:56 19:01 19:49	07:24 17:18 17:01	06:57 17:18 17:01	07:29 16:17-16:36/19 17:01
6	07:45 16:32-16:51/19 17:15	07:27 17:51 18:22	06:50 18:22 19:53	07:01 20:23 20:49	06:20 20:58 20:49	05:58 20:54 20:30	06:04 20:54 20:30	06:29 19:46 20:30	06:57 18:59 19:46	07:25 17:17 17:01	06:58 17:17 17:01	07:30 16:17-16:36/19 17:01
7	07:45 16:33-16:52/19 17:16	07:26 17:52 18:23	06:48 18:23 19:54	06:59 20:24 20:49	06:19 20:57 20:49	05:57 20:54 20:30	06:04 20:54 20:30	06:29 19:46 20:30	06:58 18:57 19:46	07:26 17:16 17:01	06:59 17:16 17:01	07:31 16:17-16:36/19 17:01
8	07:45 16:35-16:52/17 17:18	07:25 17:53 18:24	06:47 18:24 19:55	06:58 20:25 20:50	06:17 20:57 20:54	05:57 20:54 20:29	06:05 20:54 20:29	06:30 19:44 20:29	06:59 18:56 19:44	07:27 17:15 17:01	07:00 17:15 17:01	07:32 16:18-16:36/18 17:01
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10	07:44 16:37-16:51/14 17:20	07:22 17:55 18:26	06:44 18:26 19:57	06:55 20:27 20:51	06:15 20:57 20:53	06:06 20:53 20:26	06:32 20:53 20:26	07:01 19:41 20:26	07:29 18:53 19:41	07:14 17:14 17:01	07:03 17:14 17:01	07:34 16:18-16:36/18 17:01
11	07:44 16:39-16:50/11 17:21	07:21 17:57 18:27	06:42 18:27 19:58	06:53 20:28 20:51	06:14 20:57 20:53	06:07 20:53 20:25	06:33 20:53 20:25	07:02 19:39 20:25	07:30 18:51 19:39	07:04 17:13 17:01	07:04 17:13 17:01	07:35 16:18-16:36/18 17:01
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28	07:36 17:39 17:39	07:00 18:15 18:43	06:17 18:43 20:14	06:31 20:42 20:56	06:02 20:55 20:42	06:20 20:42 20:03	06:48 20:42 20:03	07:17 19:13 19:13	07:47 17:29 19:13	07:21 17:02 17:01	07:21 17:02 17:01	07:44 16:25-16:43/18 17:08
29	07:35 17:40 17:40	07:15 19:44 20:15	06:29 19:44 20:15	06:01 20:43 20:56	06:00 20:56 20:41	06:20 20:41 20:01	06:49 20:41 20:01	07:18 19:12 19:12	07:48 17:28 19:12	16:22-16:29/7 17:02	16:22-16:29/7 17:02	07:44 16:26-16:43/17 17:08
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31	07:34 17:42 17:42	07:12 19:46 20:16	06:27 19:46 20:16	06:00 20:44 20:56	06:00 20:56 20:39	06:22 20:39 19:58	06:51 20:39 19:58	07:19 17:25 19:58	07:50 17:25 19:58	17:02 17:02 17:01	17:02 17:02 17:01	07:44 16:26-16:44/18 17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	215	0	0	0	0	0	0	0	0	0	18	544

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_20240628WTG: WTG05 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (37) 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 08:21-09:05/44 17:11	07:33 17:44	06:59 18:16	07:10 19:47	06:27 18:56-19:17/21	06:00 20:17
2	07:45 08:21-09:05/44 17:12	07:32 17:45	06:57 18:17	07:09 19:48	06:25 18:58-19:15/17	05:59 20:18
3	07:45 08:22-09:05/43 17:12	07:31 17:46	06:56 18:18	07:07 19:49	06:24 19:02-19:12/10	05:59 20:19
4	07:45 08:23-09:05/42 17:13	07:30 17:47	06:54 18:19	07:05 19:50	06:23 20:20	05:58 20:20
5	07:45 08:23-09:06/43 17:14	07:29 17:48	06:53 18:20	07:04 19:51	19:06-19:19/13	06:22 20:21
6	07:45 08:24-09:06/42 17:15	07:28 17:49	06:51 18:21	07:02 19:52	19:02-19:22/20	06:21 20:22
7	07:45 08:25-09:06/41 17:16	07:27 17:51	06:50 18:22	07:01 19:53	19:00-19:24/24	06:20 20:23
8	07:45 08:26-09:06/40 17:17	07:26 17:52	06:48 18:23	06:59 19:54	18:58-19:25/27	06:18 20:24
9	07:45 08:27-09:06/39 17:18	07:25 17:53	06:47 18:24	06:58 19:55	18:56-19:27/31	06:17 20:25
10	07:45 08:28-09:07/39 17:19	07:24 17:54	06:45 18:25	06:56 19:56	18:54-19:28/34	06:16 20:26
11	07:44 08:28-09:06/38 17:20	07:22 17:55	06:44 18:26	06:55 19:57	18:54-19:29/35	06:15 20:27
12	07:44 08:29-09:06/37 17:21	07:21 17:56	06:42 18:27	06:53 19:58	18:52-19:29/37	06:14 20:28
13	07:44 08:31-09:06/35 17:22	07:20 17:58	06:40 18:28	06:52 19:59	18:52-19:30/38	06:13 20:29
14	07:44 08:31-09:05/34 17:23	07:19 17:59	06:39 18:29	06:50 20:00	18:50-19:29/39	06:12 20:30
15	07:43 08:33-09:05/32 17:24	07:18 18:00	06:37 18:30	06:49 20:01	18:50-19:30/40	06:11 20:30
16	07:43 08:33-09:03/30 17:25	07:16 18:01	06:36 18:31	06:47 20:02	18:49-19:29/40	06:10 20:31
17	07:43 08:35-09:03/28 17:26	07:15 18:02	06:34 18:32	06:46 20:03	18:49-19:30/41	06:09 20:32
18	07:42 08:37-09:03/26 17:27	07:14 18:03	06:33 18:33	06:44 20:04	18:48-19:29/41	06:09 20:33
19	07:42 08:39-09:01/22 17:28	07:13 18:05	06:31 18:34	06:43 20:05	18:49-19:29/40	06:08 20:34
20	07:41 08:40-08:59/19 17:30	07:11 18:06	06:29 18:35	06:41 20:06	18:49-19:29/40	06:07 20:35
21	07:41 08:44-08:57/13 17:31	07:10 18:07	06:28 18:36	06:40 20:07	18:48-19:28/40	06:06 20:36
22	07:40 08:50-08:51/1 17:32	07:09 18:08	06:26 18:37	06:39 20:08	18:49-19:28/39	06:05 20:37
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	18:50-19:28/38	06:05 20:38
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	18:49-19:26/37	06:04 20:38
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	18:50-19:26/36	06:03 20:39
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	18:51-19:25/34	06:03 20:40
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	18:51-19:23/32	06:02 20:41
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 20:14	18:52-19:22/30	06:02 20:42
29	07:35 17:40	07:00 19:44	06:15 19:44	06:29 20:15	18:54-19:21/27	06:01 20:43
30	07:34 17:41	07:00 19:45	06:14 19:45	06:28 20:16	18:55-19:20/25	06:00 20:43
31	07:33 17:42	07:00 19:46	06:13 19:46	06:27 20:17		06:00 20:44
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	732	0	0	878	48	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_20240628WTG: WTG05 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (37) 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	06:23 20:38	06:52 18:53-19:28/35 19:57	07:19 19:08	06:51 17:24	07:24 08:10-08:48/38 17:01
2	06:01 20:55	06:24 20:37	06:53 18:53-19:26/33 19:55	07:20 19:07	06:52 17:23	07:25 08:10-08:49/39 17:01
3	06:01 20:55	06:25 20:36	06:53 18:54-19:25/31 19:54	07:21 19:05	06:54 17:22	07:26 08:10-08:49/39 17:01
4	06:02 20:55	06:26 20:35	06:54 18:55-19:22/27 19:52	07:22 19:04	06:55 17:21	07:27 08:10-08:50/40 17:01
5	06:02 20:55	06:27 20:33	06:55 18:56-19:20/24 19:50	07:23 19:02	06:56 17:19	07:28 08:10-08:51/41 17:01
6	06:03 20:55	06:28 20:32	06:56 18:58-19:18/20 19:49	07:24 19:00	06:57 17:18	07:29 08:10-08:52/42 17:01
7	06:04 20:54	06:28 20:31	06:57 19:01-19:14/13 19:47	07:25 18:59	06:58 17:17	07:30 08:10-08:53/43 17:00
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 08:11-08:53/42 17:00
9	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 17:15	07:32 08:11-08:54/43 17:00
10	06:05 20:53	06:31 19:09-19:22/13 20:28	07:00 19:42	07:28 18:54	07:01 17:14	07:33 08:11-08:55/44 17:01
11	06:06 20:53	06:32 19:06-19:24/18 20:26	07:01 19:41	07:29 18:53	07:03 17:13	07:34 08:12-08:56/44 17:01
12	06:07 20:53	06:33 19:04-19:26/22 20:25	07:02 19:39	07:30 18:51	07:04 17:13	07:34 08:11-08:56/45 17:01
13	06:07 20:52	06:34 19:02-19:28/26 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 08:12-08:56/44 17:01
14	06:08 20:52	06:35 19:01-19:29/28 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 08:13-08:57/44 17:01
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19	06:12 20:49	06:40 18:55-19:32/37 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 08:14-09:00/46 17:03
20	06:13 20:48	06:41 18:54-19:33/39 20:14	07:09 19:26	07:38 18:40	07:13 08:25-08:26/1 17:06	07:40 08:15-09:01/46 17:03
21	06:14 20:47	06:41 18:54-19:33/39 20:13	07:10 19:25	07:39 18:38	07:14 08:19-08:32/13 17:06	07:40 08:15-09:01/46 17:03
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24	06:16 20:45	06:44 18:53-19:33/40 20:09	07:13 19:20	07:43 18:34	07:17 08:14-08:40/26 17:04	07:42 08:16-09:02/46 17:05
25	06:17 20:44	06:45 18:52-19:33/41 20:07	07:14 19:18	07:44 17:33	07:18 08:13-08:41/28 17:04	07:42 08:17-09:03/46 17:06
26	06:18 20:43	06:46 18:52-19:33/41 20:06	07:15 19:16	07:45 17:31	07:19 08:13-08:42/29 17:03	07:43 08:18-09:03/45 17:06
27	06:19 20:42	06:47 18:51-19:31/40 20:04	07:16 19:15	07:46 17:30	07:20 08:12-08:44/32 17:03	07:43 08:18-09:03/45 17:07
28	06:19 20:42	06:48 18:51-19:31/40 20:03	07:17 19:13	07:47 17:29	07:21 08:11-08:45/34 17:02	07:43 08:19-09:04/45 17:08
29	06:20 20:41	06:49 18:51-19:30/39 20:01	07:18 19:12	07:48 17:28	07:22 08:11-08:46/35 17:02	07:44 08:19-09:04/45 17:08
30	06:21 20:40	06:50 18:52-19:30/38 20:00	07:18 19:10	07:49 17:26	07:23 08:11-08:47/36 17:02	07:44 08:20-09:04/44 17:09
31	06:22 20:39	06:51 18:52-19:29/37 19:58		06:50 17:25		07:44 08:20-09:05/45 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	0	750	183	0	274	1360

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 Nuraminis

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:
28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG06 - Siemens Gamesa SG 6.2-170 6200 170.0 !OI! hub: 135,0 m (TOT: 220,0 m) (38) 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 17:11	07:33 17:44	06:59 17:41-17:54/13 18:16	07:10 19:47	06:27 20:17	06:00 20:45	06:00 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 17:24	07:25 17:01
2	07:45 17:12	07:32 17:45	06:57 17:42-17:56/14 18:17	07:09 19:48	06:25 20:18	05:59 20:45	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:53 17:23	07:26 17:01
3	07:45 17:12	07:31 17:46	06:56 17:41-17:57/16 18:18	07:07 19:49	06:24 20:19	05:59 20:46	06:01 20:55	06:25 20:36	06:54 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	07:45 17:13	07:30 17:47	06:54 17:42-17:58/16 18:19	07:06 19:50	06:23 20:20	05:58 20:47	06:02 20:55	06:26 20:35	06:54 19:52	07:22 18:25-18:36/11 19:04	06:55 17:21	07:27 17:01
5	07:45 17:14	07:29 17:48	06:53 17:42-17:59/17 18:20	07:04 19:51	06:22 20:21	05:58 20:47	06:02 20:55	06:27 20:33	06:55 19:51	07:23 18:23-18:37/14 19:02	06:56 17:20	07:28 17:01
6	07:45 17:15	07:28 17:50	06:51 17:43-18:01/18 18:21	07:02 19:52	06:21 20:22	05:58 20:48	06:03 20:55	06:28 20:32	06:56 19:49	07:24 18:21-18:38/17 19:01	06:57 17:18	07:29 17:01
7	07:45 17:16	07:27 17:51	06:50 17:44-18:01/17 18:22	07:01 19:53	06:20 20:23	05:58 20:49	06:04 20:54	06:29 20:31	06:57 19:47	07:25 18:20-18:37/17 18:59	06:58 17:17	07:30 17:01
8	07:45 17:17	07:26 17:52	06:48 17:46-18:02/16 18:23	06:59 19:54	06:19 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:18-18:35/17 18:57	06:59 17:16	07:31 17:01
9	07:45 17:18	07:25 17:53	06:47 17:47-17:59/12 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:17-18:34/17 18:56	07:00 17:15	07:32 17:01
10	07:45 17:19	07:24 17:54	06:45 17:49-17:55/6 18:25	06:56 19:56	06:16 20:26	05:57 20:50	06:06 20:53	06:31 20:28	07:00 19:43	07:28 18:16-18:32/16 18:54	07:02 17:14	07:33 17:01
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:15-18:30/15 18:53	07:03 17:14	07:34 17:01
12	07:44 17:21	07:21 17:57	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51	06:07 20:53	06:33 20:25	07:02 19:39	07:30 18:15-18:29/14 18:51	07:04 17:13	07:34 17:01
13	07:44 17:22	07:20 17:58	06:41 18:28	06:52 19:59	06:13 20:29	05:57 20:52	06:08 20:52	06:34 20:24	07:03 19:38	07:31 18:15-18:27/12 18:50	07:05 17:12	07:35 17:01
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:30	05:57 20:52	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:15-18:26/11 18:48	07:06 17:11	07:36 17:01
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:31	05:57 20:53	06:09 20:51	06:36 20:21	07:05 19:34	07:33 18:15-18:24/9 18:47	07:07 17:10	07:37 17:01
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:53	06:10 20:51	06:37 20:20	07:05 19:33	07:34 18:16-18:23/7 18:45	07:08 17:09	07:37 17:02
17	07:43 17:26	07:15 18:02	06:34 18:32	06:46 19:39-19:42/3 20:03	06:10 20:32	05:57 20:53	06:10 20:50	06:38 19:43-19:57/14 20:19	07:06 19:31	07:35 18:17-18:21/4 18:44	07:09 17:09	07:38 17:02
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 19:37-19:42/5 20:04	06:09 20:33	05:57 20:54	06:11 20:49	06:39 19:41-19:55/14 20:17	07:07 19:30	07:36 18:18-18:19/1 18:42	07:11 17:08	07:39 17:02
19	07:42 17:29	07:13 18:05	06:31 18:34	06:43 19:37-19:43/6 20:05	06:08 20:34	05:57 20:54	06:12 20:49	06:40 19:40-19:53/13 20:16	07:08 19:28	07:37 18:15-18:26/11 18:41	07:12 17:07	07:39 17:03
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 19:36-19:45/9 20:06	06:07 20:35	05:57 20:54	06:13 20:48	06:41 19:40-19:52/12 20:15	07:09 19:26	07:38 18:16-18:23/7 18:40	07:13 17:06	07:40 17:03
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 19:35-19:45/10 20:07	06:06 20:36	05:57 20:55	06:14 20:47	06:42 19:40-19:51/11 20:13	07:10 19:25	07:39 18:15-18:22/6 18:38	07:14 17:06	07:41 17:04
22	07:40 17:32	07:09 18:08	06:26 18:37	06:39 19:35-19:46/11 20:08	06:06 20:37	05:57 20:55	06:14 20:47	06:42 19:40-19:50/10 20:12	07:11 19:23	07:40 18:14-18:21/5 18:37	07:15 17:05	07:41 17:04
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 19:35-19:48/13 20:09	06:05 20:38	05:58 20:55	06:15 20:46	06:43 19:40-19:48/8 20:10	07:12 19:21	07:42 18:13-18:20/4 18:35	07:16 17:05	07:42 17:05
24	07:39 17:34	07:06 18:10	17:46-17:48/2 06:23	06:36 19:35-19:48/13 20:10	06:04 20:39	05:58 20:55	06:16 20:45	06:44 19:40-19:47/7 20:09	07:13 19:20	07:43 18:12-18:19/3 18:34	07:17 17:04	07:42 17:05
25	07:38 17:35	07:04 18:11	17:45-17:50/5 06:21	06:35 19:35-19:49/14 20:11	06:03 20:39	05:58 20:55	06:17 20:44	06:45 19:41-19:46/5 20:07	07:14 19:18	07:44 18:11-18:18/2 17:33	07:18 17:04	07:42 17:06
26	07:37 17:37	07:03 18:12	17:44-17:52/8 06:20	06:33 19:36-19:50/14 20:12	06:03 20:40	05:59 20:55	06:18 20:43	06:46 19:42-19:44/2 20:06	07:15 19:17	07:45 18:10-18:17/1 17:31	07:19 17:03	07:43 17:06
27	07:37 17:38	07:02 18:14	17:42-17:52/10 06:18	06:32 19:36-19:50/14 20:13	06:02 20:41	05:59 20:55	06:19 20:43	06:47 20:04 20:04	07:16 19:15	07:46 18:09-18:16/0 17:30	07:20 17:03	07:43 17:07
28	07:36 17:39	07:00 18:15	17:42-17:54/12 06:17	06:31 19:38-19:50/12 20:14	06:02 20:42	05:59 20:55	06:20 20:42	06:48 20:03 20:03	07:17 19:13	07:47 18:08-18:15/0 17:29	07:21 17:02	07:44 17:08
29	07:35 17:40		07:15 19:44	06:29 19:40-19:48/8 20:15	06:01 20:43	06:00 20:55	06:20 20:41	06:49 20:01 20:01	07:18 19:12	07:48 18:07-18:14/0 17:28	07:22 17:02	07:44 17:08
30	07:34 17:41		07:13 19:45	06:28 20:16	06:01 20:43	06:00 20:55	06:21 20:40	06:50 20:00 20:00	07:19 19:10	07:49 18:06-18:13/0 17:26	07:23 17:02	07:44 17:09
31	07:34 17:42		07:12 19:46		06:00 20:44		06:22 20:39	06:51 19:58 20:00		06:50 17:25		07:44 17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	0	37	145	132	0	0	0	134	0	182	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_20240628WTG: WTG07 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (39) 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 17:11	07:33 17:02-17:20/18 17:44	06:59 17:43-17:53/10 18:16	07:10 19:47	06:27 20:17	06:00 19:58-20:20/22 20:45
2	07:45 17:12	07:32 17:02-17:21/19 17:45	06:57 17:40-17:56/16 18:17	07:09 19:48	06:25 20:18	05:59 19:58-20:21/23 20:45
3	07:45 17:12	07:31 17:03-17:22/19 17:46	06:56 17:38-17:57/19 18:18	07:07 19:49	06:24 20:19	05:59 19:58-20:22/24 20:46
4	07:45 17:13	07:30 17:03-17:22/19 17:47	06:54 17:36-17:58/22 18:19	07:06 19:50	06:23 20:20	05:58 19:58-20:22/24 20:47
5	07:45 17:14	07:29 17:04-17:21/17 17:48	06:53 17:34-17:59/25 18:20	07:04 19:51	06:22 20:21	05:58 19:58-20:23/25 20:47
6	07:45 17:15	07:28 17:06-17:20/14 17:49	06:51 17:34-18:01/27 18:21	07:02 19:52	06:21 19:54-19:59/5 20:22	05:58 19:58-20:24/26 20:48
7	07:45 17:16	07:27 17:08-17:18/10 17:51	06:50 17:32-18:01/29 18:22	07:01 19:53	06:20 19:53-20:00/7 20:23	05:58 19:59-20:25/26 20:49
8	07:45 17:17	07:26 17:11-17:15/4 17:52	06:48 17:32-18:03/31 18:23	06:59 19:54	06:18 19:51-20:01/10 20:24	05:57 19:58-20:24/26 20:49
9	07:45 17:18	07:25 17:53	06:47 17:31-18:03/32 18:24	06:58 19:55	06:17 19:50-20:02/12 20:25	05:57 19:58-20:25/27 20:50
10	07:45 17:19	07:24 17:54	06:45 17:30-18:04/34 18:25	06:56 19:56	06:16 19:49-20:03/14 20:26	05:57 19:59-20:26/27 20:50
11	07:44 17:20	07:22 17:55	06:44 17:31-18:05/34 18:26	06:55 19:57	06:15 19:49-20:04/15 20:27	05:57 19:59-20:26/27 20:51
12	07:44 17:21	07:21 17:57	06:42 17:30-18:05/35 18:27	06:53 19:58	06:14 19:48-20:05/17 20:28	05:57 19:59-20:27/28 20:51
13	07:44 17:22	07:20 17:58	06:40 17:31-18:06/35 18:28	06:52 19:59	06:13 19:48-20:06/18 20:29	05:57 19:59-20:27/28 20:52
14	07:44 17:23	07:19 17:59	06:39 17:31-18:05/34 18:29	06:50 20:00	06:12 19:48-20:06/18 20:30	05:57 20:00-20:28/28 20:52
15	07:43 17:24	07:18 18:00	06:37 17:32-18:05/33 18:30	06:49 20:01	06:11 19:47-20:07/20 20:31	05:57 20:00-20:28/28 20:53
16	07:43 17:25	07:16 18:01	06:36 17:32-18:04/32 18:31	06:47 20:02	06:10 19:47-20:08/21 20:31	05:57 20:00-20:28/28 20:53
17	07:43 17:26	07:15 18:02	06:34 17:33-18:03/30 18:32	06:46 20:03	06:10 19:47-20:09/22 20:32	05:57 20:00-20:28/28 20:53
18	07:42 17:27	07:14 18:03	06:33 17:34-18:03/29 18:33	06:44 20:04	06:09 19:47-20:09/22 20:33	05:57 20:00-20:29/29 20:54
19	07:42 17:29	07:13 18:05	06:31 17:35-18:01/26 18:34	06:43 20:05	06:08 19:48-20:11/23 20:34	05:57 20:00-20:29/29 20:54
20	07:41 17:30	07:11 18:06	06:29 17:37-18:00/23 18:35	06:41 20:06	06:07 19:48-20:11/23 20:35	05:57 20:01-20:30/29 20:54
21	07:41 17:31	07:10 18:07	06:28 17:37-17:58/21 18:36	06:40 20:07	06:06 19:48-20:12/24 20:36	05:57 20:01-20:30/29 20:55
22	07:40 17:05-17:08/3 17:32	07:09 18:08	06:26 17:39-17:55/16 18:37	06:39 20:08	06:06 19:49-20:13/24 20:37	05:57 20:01-20:30/29 20:55
23	07:39 17:04-17:08/4 17:33	07:07 18:09	06:25 17:43-17:52/9 18:38	06:37 20:09	06:05 19:50-20:14/24 20:38	05:58 20:01-20:30/29 20:55
24	07:39 17:03-17:10/7 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 19:50-20:14/24 20:38	05:58 20:02-20:31/29 20:55
25	07:38 17:02-17:11/9 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 19:51-20:16/25 20:39	05:58 20:02-20:31/29 20:55
26	07:37 17:02-17:12/10 17:37	07:03 18:12	06:20 18:41	06:33 20:12	06:03 19:52-20:16/24 20:40	05:58 20:02-20:30/28 20:55
27	07:37 17:01-17:13/12 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 19:53-20:17/24 20:41	05:59 20:03-20:31/28 20:55
28	07:36 17:02-17:16/14 17:39	07:00 18:15	06:17 18:43	06:30 20:14	06:02 19:54-20:18/24 20:42	05:59 20:03-20:31/28 20:55
29	07:35 17:02-17:17/15 17:40		07:15 19:44	06:29 20:15	06:01 19:56-20:19/23 20:43	06:00 20:02-20:30/28 20:55
30	07:34 17:02-17:18/16 17:41		07:13 19:45	06:28 20:16	06:01 19:58-20:19/21 20:43	06:00 20:03-20:31/28 20:55
31	07:33 17:02-17:19/17 17:42		07:12 19:46		06:00 19:58-20:20/22 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	107	120	602	0	506	817

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_20240628WTG: WTG07 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (39)
 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 20:03-20:30/27 20:55	06:23 19:58-20:14/16 20:38	06:52 19:57	07:19 18:10-18:45/35 19:08	06:51 17:24	07:24 17:01
2	06:01 20:04-20:31/27 20:55	06:24 19:59-20:13/14 20:37	06:53 19:55	07:20 18:09-18:44/35 19:07	06:53 17:23	07:25 17:01
3	06:01 20:03-20:30/27 20:55	06:25 19:59-20:12/13 20:36	06:54 19:54	07:21 18:09-18:43/34 19:05	06:54 16:40-16:46/6 17:22	07:26 17:01
4	06:02 20:04-20:31/27 20:55	06:26 20:00-20:12/12 20:35	06:54 19:52	07:22 18:09-18:42/33 19:04	06:55 16:37-16:49/12 17:21	07:27 17:01
5	06:02 20:04-20:30/26 20:55	06:27 20:01-20:11/10 20:33	06:55 19:50	07:23 18:09-18:40/31 19:02	06:56 16:35-16:50/15 17:20	07:28 17:01
6	06:03 20:04-20:30/26 20:55	06:28 20:03-20:10/7 20:32	06:56 19:49	07:24 18:09-18:38/29 19:00	06:57 16:34-16:51/17 17:18	07:29 17:01
7	06:04 20:04-20:29/25 20:54	06:29 20:05-20:09/4 20:31	06:57 19:47	07:25 18:09-18:37/28 18:59	06:58 16:33-16:52/19 17:17	07:30 17:01
8	06:04 20:05-20:29/24 20:54	06:29 20:30	06:58 19:46	07:26 18:10-18:35/25 18:57	06:59 16:34-16:53/19 17:16	07:31 17:01
9	06:05 20:06-20:30/24 20:54	06:30 20:29	06:59 19:44	07:27 18:10-18:34/24 18:56	07:00 16:33-16:52/19 17:15	07:32 17:01
10	06:05 20:05-20:29/24 20:53	06:31 20:28	07:00 19:43	07:28 18:11-18:32/21 18:54	07:01 16:33-16:51/18 17:14	07:33 17:01
11	06:06 20:06-20:29/23 20:53	06:32 20:26	07:01 19:41	07:29 18:13-18:30/17 18:53	07:03 16:33-16:50/17 17:14	07:34 17:01
12	06:07 20:07-20:29/22 20:53	06:33 20:25	07:02 19:39	07:30 18:15-18:29/14 18:51	07:04 16:32-16:49/17 17:13	07:34 17:01
13	06:07 20:06-20:27/21 20:52	06:34 20:24	07:03 19:38	07:31 18:20-18:23/3 18:50	07:05 16:34-16:49/15 17:12	07:35 17:01
14	06:08 20:05-20:27/22 20:52	06:35 20:23	07:04 19:36	07:32 18:48	07:06 16:34-16:47/13 17:11	07:36 17:01
15	06:09 20:04-20:27/23 20:51	06:36 20:21	07:05 19:34	07:33 18:47	07:07 16:34-16:46/12 17:10	07:37 17:01
16	06:10 20:02-20:26/24 20:50	06:37 20:20	07:05 19:33	07:34 18:45	07:08 16:35-16:45/10 17:09	07:37 17:02
17	06:10 20:02-20:26/24 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 16:35-16:44/9 17:09	07:38 17:02
18	06:11 20:01-20:25/24 20:49	06:39 20:17	07:07 19:30	07:36 18:42	07:11 16:37-16:44/7 17:08	07:39 17:02
19	06:12 20:01-20:25/24 20:49	06:40 20:16	07:08 19:28	07:37 18:41	07:12 16:39-16:43/4 17:07	07:39 17:03
20	06:13 19:59-20:24/25 20:48	06:41 20:14	07:09 18:30-18:37/7 19:26	07:38 18:40	07:13 16:40-16:43/3 17:06	07:40 17:03
21	06:14 19:59-20:23/24 20:47	06:42 20:13	07:10 18:26-18:41/15 19:25	07:39 18:38	07:14 17:06	07:40 17:04
22	06:14 19:59-20:23/24 20:47	06:42 20:12	07:11 18:22-18:42/20 19:23	07:41 18:37	07:15 17:05	07:41 17:04
23	06:15 19:59-20:22/23 20:46	06:43 20:10	07:12 18:20-18:43/23 19:21	07:42 18:35	07:16 17:05	07:42 17:05
24	06:16 19:59-20:21/22 20:45	06:44 20:09	07:13 18:19-18:44/25 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	06:17 19:58-20:20/22 20:44	06:45 20:07	07:14 18:17-18:45/28 19:18	06:44 17:33	07:18 17:04	07:42 17:06
26	06:18 19:58-20:19/21 20:43	06:46 20:06	07:15 18:15-18:45/30 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	06:19 19:58-20:19/21 20:42	06:47 20:04	07:16 18:14-18:45/31 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	06:19 19:58-20:18/20 20:42	06:48 20:03	07:17 18:13-18:46/33 19:13	06:47 17:29	07:21 17:02	07:43 17:08
29	06:20 19:58-20:17/19 20:41	06:49 20:01	07:18 18:11-18:45/34 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	06:21 19:58-20:17/19 20:40	06:50 20:00	07:19 18:11-18:45/34 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	06:22 19:59-20:16/17 20:39	06:51 19:58	06:51 19:58	06:50 17:25	06:50 17:25	07:44 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	721	76	280	329	232	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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG08 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (40) 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 16:01-16:23/22	07:33 06:59	07:10 18:49-19:26/37	06:27 06:00				
	17:11 17:44 18:16 19:47 20:17 20:45							
2	07:45 16:02-16:23/21	07:32 06:57	07:09 18:49-19:27/38	06:25 05:59				
	17:12 17:45 18:17 19:48 20:18 20:45							
3	07:45 16:03-16:23/20	07:31 06:56	07:07 18:48-19:26/38	06:24 05:59				
	17:12 17:46 18:18 19:49 20:19 20:46							
4	07:45 16:04-16:23/19	07:30 06:54	07:06 18:49-19:26/37	06:23 05:58				
	17:13 17:47 18:19 19:50 20:20 20:47							
5	07:45 16:05-16:23/18	07:29 06:53	07:04 18:48-19:25/37	06:22 05:58				
	17:14 17:48 18:20 19:51 20:21 20:47							
6	07:45 16:06-16:22/16	07:28 06:51	07:02 18:48-19:24/36	06:21 05:58				
	17:15 17:49 18:21 19:52 20:22 20:48							
7	07:45 16:08-16:22/14	07:27 06:50	07:01 18:49-19:23/34	06:20 05:58				
	17:16 17:51 18:22 19:53 20:23 20:49							
8	07:45 16:10-16:21/11	07:26 06:48	06:59 18:49-19:22/33	06:18 05:57				
	17:17 17:52 18:23 19:54 20:24 20:49							
9	07:45 16:13-16:19/6	07:25 06:47	06:58 18:50-19:21/31	06:17 05:57				
	17:18 17:53 18:24 19:55 20:25 20:50							
10	07:45 16:13-16:19/6	07:24 06:45	06:56 18:51-19:19/28	06:16 05:57				
	17:19 17:54 18:25 19:56 20:26 20:50							
11	07:44 16:13-16:19/6	07:22 06:44	06:55 18:52-19:18/26	06:15 05:57				
	17:20 17:55 18:26 19:57 20:27 20:51							
12	07:44 16:13-16:19/6	07:21 06:42	06:53 18:53-19:15/22	06:14 05:57				
	17:21 17:57 18:27 19:58 20:28 20:51							
13	07:44 16:13-16:19/6	07:20 06:40	06:52 18:56-19:13/17	06:13 05:57				
	17:22 17:58 18:28 19:59 20:29 20:52							
14	07:44 16:13-16:19/6	07:19 06:39	06:50 18:59-19:09/10	06:12 05:57				
	17:23 17:59 18:29 20:00 20:30 20:52							
15	07:43 16:13-16:19/6	07:18 06:37	06:49 18:59-19:09/10	06:11 05:57				
	17:24 18:00 18:30 20:01 20:30 20:53							
16	07:43 16:13-16:19/6	07:16 06:36	06:47 18:59-19:09/10	06:10 05:57				
	17:25 18:01 18:31 20:02 20:31 20:53							
17	07:43 16:13-16:19/6	07:15 06:34	06:46 18:59-19:09/10	06:10 05:57				
	17:26 18:02 18:32 20:03 20:32 20:53							
18	07:42 16:13-16:19/6	07:14 06:33	06:44 18:59-19:09/10	06:09 05:57				
	17:27 18:03 18:33 20:04 20:33 20:54							
19	07:42 16:13-16:19/6	07:13 06:31	06:43 18:59-19:09/10	06:08 05:57				
	17:29 18:05 18:34 20:05 20:34 20:54							
20	07:41 16:13-16:19/6	07:11 06:29 18:13-18:15/2	06:41 18:59-19:09/10	06:07 05:57				
	17:30 18:06 18:35 20:06 20:35 20:54							
21	07:41 16:13-16:19/6	07:10 06:28 18:07-18:16/9	06:40 18:59-19:09/10	06:06 05:57				
	17:31 18:07 18:36 20:07 20:36 20:55							
22	07:40 16:13-16:19/6	07:09 06:26 18:02-18:16/14	06:39 18:59-19:09/10	06:06 05:57				
	17:32 18:08 18:37 20:08 20:37 20:55							
23	07:39 16:13-16:19/6	07:07 06:25 18:00-18:18/18	06:37 18:59-19:09/10	06:05 05:58				
	17:33 18:09 18:38 20:09 20:38 20:55							
24	07:39 16:13-16:19/6	07:06 06:23 17:57-18:19/22	06:36 18:59-19:09/10	06:04 05:58				
	17:34 18:10 18:39 20:10 20:38 20:55							
25	07:38 16:13-16:19/6	07:04 06:21 17:55-18:19/24	06:34 18:59-19:09/10	06:03 05:58				
	17:35 18:11 18:40 20:11 20:39 20:55							
26	07:37 16:13-16:19/6	07:03 06:20 17:54-18:21/27	06:33 18:59-19:09/10	06:03 05:58				
	17:37 18:12 18:41 20:12 20:40 20:55							
27	07:37 16:13-16:19/6	07:02 06:18 17:52-18:21/29	06:32 18:59-19:09/10	06:02 05:59				
	17:38 18:13 18:42 20:13 20:41 20:55							
28	07:36 16:13-16:19/6	07:00 06:17 17:52-18:23/31	06:30 18:59-19:09/10	06:02 05:59				
	17:39 18:15 18:43 20:14 20:42 20:55							
29	07:35 16:13-16:19/6	07:15 18:51-19:24/33	06:29 18:59-19:09/10	06:01 06:00				
	17:40 19:44 20:15 20:15 20:42 20:55							
30	07:34 16:13-16:19/6	07:13 18:49-19:24/35	06:28 18:59-19:09/10	06:01 06:00				
	17:41 19:45 20:16 20:16 20:43 20:55							
31	07:33 16:13-16:19/6	07:12 18:49-19:26/37	06:27 18:59-19:09/10	06:00 06:00				
	17:42 19:46 20:17 20:17 20:44 20:55							
Potential sun hours	302	299	370	397	444	447	0	0
Sum of minutes with flicker	147	0	281	424	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: Real_case_Progetto_20240628WTG: WTG08 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (40) 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	06:23 20:38	06:52 18:51-19:17/26 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	06:01 20:55	06:24 20:37	06:53 18:50-19:18/28 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	06:01 20:55	06:25 20:36	06:54 18:48-19:19/31 19:54	07:21 19:05	06:54 17:22	07:26 15:56-16:02/6 17:01
4	06:02 20:55	06:26 20:35	06:54 18:47-19:20/33 19:52	07:22 19:04	06:55 17:21	07:27 15:54-16:05/11 17:01
5	06:02 20:55	06:27 20:33	06:55 18:45-19:19/34 19:50	07:23 19:02	06:56 17:20	07:28 15:53-16:07/14 17:01
6	06:03 20:55	06:28 20:32	06:56 18:44-19:20/36 19:49	07:24 19:00	06:57 17:18	07:29 15:53-16:08/15 17:01
7	06:04 20:54	06:29 20:31	06:57 18:43-19:20/37 19:47	07:25 18:59	06:58 17:17	07:30 15:52-16:10/18 17:01
8	06:04 20:54	06:29 20:30	06:58 18:43-19:20/37 19:46	07:26 18:57	06:59 17:16	07:31 15:52-16:11/19 17:01
9	06:05 20:54	06:30 20:29	06:59 18:42-19:20/38 19:44	07:27 18:56	07:00 17:15	07:32 15:52-16:12/20 17:01
10	06:05 20:53	06:31 20:28	07:00 18:42-19:20/38 19:43	07:28 18:54	07:01 17:14	07:33 15:52-16:13/21 17:01
11	06:06 20:53	06:32 20:26	07:01 18:42-19:20/38 19:41	07:29 18:53	07:03 17:14	07:34 15:51-16:13/22 17:01
12	06:07 20:52	06:33 20:25	07:02 18:42-19:18/36 19:39	07:30 18:51	07:04 17:13	07:34 15:51-16:14/23 17:01
13	06:07 20:52	06:34 20:24	07:03 18:41-19:15/34 19:38	07:31 18:50	07:05 17:12	07:35 15:52-16:15/23 17:01
14	06:08 20:52	06:35 20:23	07:04 18:41-19:14/33 19:36	07:32 18:48	07:06 17:11	07:36 15:52-16:16/24 17:01
15	06:09 20:51	06:36 20:21	07:05 18:41-19:12/31 19:34	07:33 18:47	07:07 17:10	07:37 15:52-16:16/24 17:01
16	06:10 20:50	06:37 20:20	07:05 18:41-19:11/30 19:33	07:34 18:45	07:08 17:09	07:37 15:52-16:17/25 17:02
17	06:10 20:50	06:38 20:19	07:06 18:42-19:09/27 19:31	07:35 18:44	07:09 17:09	07:38 15:53-16:18/25 17:02
18	06:11 20:49	06:39 20:17	07:07 18:43-19:08/25 19:30	07:36 18:42	07:10 17:08	07:39 15:52-16:18/26 17:02
19	06:12 20:49	06:40 20:16	07:08 18:44-19:06/22 19:28	07:37 18:41	07:12 17:07	07:39 15:53-16:19/26 17:03
20	06:13 20:48	06:41 20:14	07:09 18:45-19:05/20 19:26	07:38 18:40	07:13 17:06	07:40 15:53-16:19/26 17:03
21	06:14 20:47	06:42 20:13	07:10 18:48-19:03/15 19:25	07:39 18:38	07:14 17:06	07:40 15:54-16:20/26 17:04
22	06:14 20:47	06:42 20:12	07:11 18:50-19:01/11 19:23	07:41 18:37	07:15 17:05	07:41 15:54-16:20/26 17:04
23	06:15 20:46	06:43 20:10	07:12 18:54-18:59/5 19:21	07:42 18:35	07:16 17:05	07:41 15:55-16:21/26 17:05
24	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 15:55-16:21/26 17:05
25	06:17 20:44	06:45 20:07	07:14 19:18	06:44 17:33	07:18 17:04	07:42 15:56-16:22/26 17:06
26	06:18 20:43	06:46 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 15:57-16:22/25 17:06
27	06:19 20:42	06:47 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 15:57-16:22/25 17:07
28	06:19 20:42	06:48 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:43 15:58-16:23/25 17:08
29	06:20 20:41	06:49 18:59-19:10/11 20:01	07:18 19:12	06:48 17:28	07:22 17:02	07:44 15:59-16:23/24 17:08
30	06:21 20:40	06:50 18:56-19:13/17 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 15:59-16:23/24 17:09
31	06:22 20:39	06:51 18:53-19:16/23 19:58		06:50 17:25		07:44 16:00-16:23/23 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	0	51	665	0	0	644

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_20240628WTG: WTG09 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (41) 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 15:14-16:25/71 17:11	07:33 15:26-16:43/77 17:44	06:59	07:10	06:27	06:00
2	07:45 15:14-16:26/72 17:12	07:32 15:27-16:43/76 17:45	06:57	07:09	06:25	05:59
3	07:45 15:15-16:26/71 17:12	07:31 15:28-16:43/75 17:46	06:56	07:07	06:24	05:59
4	07:45 15:15-16:27/72 17:13	07:30 15:29-16:43/74 17:47	06:54	07:06	06:23	05:58
5	07:45 15:15-16:28/73 17:14	07:29 15:30-16:43/73 17:48	06:53	07:04	06:22	05:58
6	07:45 15:16-16:29/73 17:15	07:28 15:31-16:42/71 17:49	06:51	07:02	06:21	05:58
7	07:45 15:16-16:30/74 17:16	07:27 15:32-16:42/70 17:51	06:50	07:01	06:20	05:58
8	07:45 15:16-16:31/75 17:17	07:26 15:33-16:42/69 17:52	06:48	06:59	06:18	05:57
9	07:45 15:17-16:31/74 17:18	07:25 15:35-16:42/67 17:53	06:47	06:58	06:17	05:57
10	07:45 15:17-16:32/75 17:19	07:23 15:36-16:41/65 17:54	06:45	06:56	06:16	05:57 20:13-20:15/2
11	07:44 15:17-16:32/75 17:20	07:22 15:37-16:40/63 17:55	06:44	06:55	06:15	05:57 20:10-20:18/8
12	07:44 15:17-16:34/77 17:21	07:21 15:39-16:39/60 17:57	06:42	06:53	06:14	05:57 20:09-20:20/11
13	07:44 15:18-16:35/77 17:22	07:20 15:40-16:39/59 17:58	06:40	06:52	06:13	05:57 20:08-20:21/13
14	07:44 15:18-16:35/77 17:23	07:19 15:41-16:38/57 17:59	06:39	06:50	06:12	05:57 20:08-20:22/14
15	07:43 15:18-16:36/78 17:24	07:18 15:43-16:38/55 18:00	06:37	06:49	06:11	05:57 20:08-20:23/15
16	07:43 15:18-16:36/78 17:25	07:16 15:43-16:36/53 18:01	06:36	06:47	06:10	05:57 20:07-20:23/16
17	07:43 15:19-16:37/78 17:26	07:15 15:45-16:35/50 18:02	06:34	06:46	06:10	05:57 20:07-20:24/17
18	07:42 15:19-16:37/78 17:27	07:14 15:47-16:34/47 18:03	06:33	06:44	06:09	05:57 20:07-20:24/17
19	07:42 15:20-16:38/78 17:28	07:13 15:48-16:31/43 18:05	06:31	06:43	06:08	05:57 20:07-20:25/18
20	07:41 15:20-16:38/78 17:30	07:11 15:51-16:30/39 18:06	06:29	06:41	06:07	05:57 20:08-20:26/18
21	07:41 15:21-16:40/79 17:31	07:10 15:53-16:28/35 18:07	06:28	06:40	06:06	05:57 20:08-20:26/18
22	07:40 15:21-16:40/79 17:32	07:09 15:55-16:25/30 18:08	06:26	06:39	06:05	05:57 20:08-20:26/18
23	07:39 15:21-16:40/79 17:33	07:07 16:00-16:22/22 18:09	06:25	06:37	06:05	05:58 20:08-20:26/18
24	07:39 15:22-16:41/79 17:34	07:06 16:05-16:15/10 18:10	06:23	06:36	06:04	05:58 20:09-20:26/17
25	07:38 15:22-16:41/79 17:35	07:04 18:11	06:21	06:34	06:03	05:58 20:09-20:26/17
26	07:37 15:22-16:41/79 17:36	07:03 18:12	06:20	06:33	06:03	05:58 20:09-20:26/17
27	07:37 15:23-16:41/78 17:38	07:02 18:13	06:18	06:32	06:02	05:59 20:10-20:26/16
28	07:36 15:24-16:42/78 17:39	07:00 18:15	06:17	06:30	06:02	05:59 20:11-20:25/14
29	07:35 15:24-16:43/79 17:40		07:15 19:44	06:29 20:15	06:01 20:42	06:00 20:11-20:25/14 20:55
30	07:34 15:25-16:43/78 17:41		07:13 19:45	06:28 20:16	06:01 20:43	06:00 20:13-20:24/11 20:55
31	07:33 15:25-16:43/78 17:42		07:12 19:46		06:00 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	2369	1340	0	0	0	309

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_20240628WTG: WTG09 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (41)
 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 20:14-20:23/9	06:23	06:52	07:19	06:51 15:05-16:10/65	07:24 14:59-16:15/76
	20:55	20:38	19:57	19:08	17:24	17:01
2	06:01 20:16-20:22/6	06:24	06:53	07:20	06:52 15:03-16:11/68	07:25 14:59-16:15/76
	20:55	20:37	19:55	19:07	17:23	17:01
3	06:01	06:25	06:54	07:21	06:54 15:03-16:12/69	07:26 15:00-16:15/75
	20:55	20:36	19:54	19:05	17:22	17:01
4	06:02	06:26	06:54	07:22	06:55 15:01-16:12/71	07:27 15:00-16:15/75
	20:55	20:35	19:52	19:04	17:21	17:01
5	06:02	06:27	06:55	07:23	06:56 15:00-16:12/72	07:28 15:01-16:15/74
	20:55	20:33	19:50	19:02	17:19	17:01
6	06:03	06:28	06:56	07:24	06:57 14:59-16:12/73	07:29 15:02-16:15/73
	20:55	20:32	19:49	19:00	17:18	17:01
7	06:04	06:28	06:57	07:25	06:58 14:58-16:13/75	07:30 15:02-16:15/73
	20:54	20:31	19:47	18:59	17:17	17:01
8	06:04	06:29	06:58	07:26	06:59 14:58-16:14/76	07:31 15:03-16:15/72
	20:54	20:30	19:46	18:57	17:16	17:00
9	06:05	06:30	06:59	07:27	07:00 14:58-16:14/76	07:32 15:04-16:15/71
	20:54	20:29	19:44	18:56	17:15	17:00
10	06:05	06:31	07:00	07:28	07:01 14:57-16:14/77	07:33 15:04-16:16/72
	20:53	20:28	19:42	18:54	17:14	17:01
11	06:06	06:32	07:01	07:29	07:03 14:56-16:14/78	07:34 15:04-16:15/71
	20:53	20:26	19:41	18:53	17:13	17:01
12	06:07	06:33	07:02	07:30	07:04 14:56-16:14/78	07:34 15:05-16:15/70
	20:52	20:25	19:39	18:51	17:13	17:01
13	06:07	06:34	07:03	07:31	07:05 14:56-16:15/79	07:35 15:06-16:16/70
	20:52	20:24	19:38	18:50	17:12	17:01
14	06:08	06:35	07:04	07:32	07:06 14:56-16:14/78	07:36 15:06-16:16/70
	20:52	20:23	19:36	18:48	17:11	17:01
15	06:09	06:36	07:05	07:33	07:07 14:55-16:14/79	07:37 15:06-16:16/70
	20:51	20:21	19:34	18:47	17:10	17:01
16	06:10	06:37	07:05	07:34	07:08 14:55-16:14/79	07:37 15:07-16:16/69
	20:50	20:20	19:33	18:45	17:09	17:02
17	06:10	06:38	07:06	07:35	07:09 14:55-16:14/79	07:38 15:08-16:17/69
	20:50	20:19	19:31	18:44	17:08	17:02
18	06:11	06:39	07:07	07:36 16:34-16:49/15	07:10 14:56-16:15/79	07:39 15:08-16:17/69
	20:49	20:17	19:29	18:42	17:08	17:02
19	06:12	06:40	07:08	07:37 16:29-16:53/24	07:12 14:56-16:15/79	07:39 15:09-16:18/69
	20:49	20:16	19:28	18:41	17:07	17:03
20	06:13	06:41	07:09	07:38 16:25-16:56/31	07:13 14:56-16:15/79	07:40 15:09-16:17/68
	20:48	20:14	19:26	18:40	17:06	17:03
21	06:14	06:41	07:10	07:39 16:23-16:59/36	07:14 14:56-16:15/79	07:40 15:10-16:18/68
	20:47	20:13	19:25	18:38	17:06	17:04
22	06:14	06:42	07:11	07:40 16:21-17:01/40	07:15 14:56-16:14/78	07:41 15:10-16:18/68
	20:47	20:12	19:23	18:37	17:05	17:04
23	06:15	06:43	07:12	07:42 16:18-17:02/44	07:16 14:57-16:15/78	07:41 15:11-16:19/68
	20:46	20:10	19:21	18:35	17:05	17:05
24	06:16	06:44	07:13	07:43 16:16-17:04/48	07:17 14:57-16:15/78	07:42 15:11-16:20/69
	20:45	20:09	19:20	18:34	17:04	17:05
25	06:17	06:45	07:14	06:44 15:14-16:05/51	07:18 14:57-16:15/78	07:42 15:12-16:21/69
	20:44	20:07	19:18	17:33	17:04	17:06
26	06:18	06:46	07:15	06:45 15:13-16:06/53	07:19 14:57-16:15/78	07:43 15:12-16:21/69
	20:43	20:06	19:16	17:31	17:03	17:06
27	06:19	06:47	07:16	06:46 15:11-16:06/55	07:20 14:57-16:15/78	07:43 15:12-16:21/69
	20:42	20:04	19:15	17:30	17:03	17:07
28	06:19	06:48	07:17	06:47 15:11-16:08/57	07:21 14:58-16:15/77	07:43 15:13-16:23/70
	20:42	20:03	19:13	17:29	17:02	17:08
29	06:20	06:49	07:18	06:48 15:09-16:09/60	07:22 14:58-16:15/77	07:44 15:13-16:23/70
	20:41	20:01	19:12	17:28	17:02	17:08
30	06:21	06:50	07:18	06:49 15:08-16:09/61	07:23 14:59-16:15/76	07:44 15:14-16:24/70
	20:40	20:00	19:10	17:26	17:02	17:09
31	06:22	06:51		06:50 15:06-16:10/64		07:44 15:14-16:24/70
	20:39	19:58		17:25		17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	15	0	0	639	2286	2192

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 Nuraminis

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:

28/06/2024 12:34/3.4.415

SHADOW - Calendar per WTG

Calculation: Real_case_Progetto_20240628WTG: WTG10 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (42) 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	07:33	06:59	07:10	06:27	06:00	06:00	06:23	06:52	07:19	06:51	07:24
	17:11	17:44	18:16	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:52	07:25
	17:12	17:45	18:17	19:48	20:18	20:45	20:55	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:26
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:22	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:02	06:26	06:54	07:22	06:55	07:27
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:34	19:52	19:04	17:21	17:01
5	07:45	07:29	06:53	07:04	06:22	05:58	06:02	06:27	06:55	07:23	06:56	07:28
	17:14	17:48	18:20	19:51	20:21	20:47	20:55	20:33	19:50	19:02	17:19	17:01
6	07:45	07:28	06:51	07:02	06:21	05:58	06:03	06:28	06:56	07:24	06:57	07:29
	17:15	17:49	18:21	19:52	20:22	20:48	20:54	20:32	19:49	19:00	17:18	17:01
7	07:45	07:27	06:50	07:01	06:20	05:58	06:04	06:29	06:57	07:25	06:58	07:30
	17:16	17:51	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:01
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:05	06:30	06:59	07:27	07:00	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:01
10	07:44	07:23	06:45	06:56	06:16	05:57	06:05	06:31	07:00	07:28	07:01	07:33
	17:19	17:54	18:25	19:56	20:26	20:50	20:53	20:28	19:42	18:54	17:14	17:01
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:53	17:13	17:01
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30	07:04	07:34
	17:21	17:57	18:27	19:58	20:28	20:51	20:52	20:25	19:39	18:51	17:13	17:01
13	07:44	07:20	06:40	06:52	06:13	05:57	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:58	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:12	17:01
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35	07:04	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:29	20:52	20:51	20:23	19:36	18:48	17:11	17:01
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:30	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37	07:05	07:34	07:08	07:37
	17:25	18:01	18:31	20:02	20:31	20:53	20:50	20:20	19:33	18:45	17:09	17:02
17	07:42	07:15	06:34	06:46	06:10	05:57	06:10	06:38	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:53	20:50	20:19	19:31	18:44	17:08	17:02
18	07:42	07:14	06:33	06:44	06:09	05:57	06:11	06:39	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	17:08	17:02
19	07:42	07:13	06:31	06:43	06:08	05:57	06:12	06:40	07:08	07:37	07:12	07:39
	17:28	18:05	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:03
20	07:41	07:11	06:29	06:41	06:07	05:57	06:13	06:41	07:09	07:38	07:13	07:40
	17:30	18:06	18:35	20:06	20:35	20:54	20:48	20:14	19:26	18:40	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:14	06:41	07:10	07:39	07:14	07:40
	17:31	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:25	18:38	17:06	17:04
22	07:40	07:09	06:26	06:39	06:05	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:46	20:12	19:23	18:37	17:05	17:04
23	07:39	07:07	06:25	06:37	06:05	05:58	06:15	06:43	07:12	07:42	07:16	07:41
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:05	17:05
24	07:39	07:06	06:23	06:36	06:04	05:58	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:38	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:17	06:45	07:14	07:44	07:18	07:42
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:33	17:04	17:06
26	07:37	07:03	06:20	06:33	06:03	05:58	06:18	06:46	07:15	07:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:32	06:02	05:59	06:19	06:47	07:16	07:46	07:20	07:43
	17:38	18:13	18:42	20:13	20:41	20:55	20:42	20:04	19:15	17:30	17:03	17:07
28	07:36	07:00	06:17	06:30	06:02	05:59	06:19	06:48	07:17	07:47	07:21	07:43
	17:39	18:15	18:43	20:14	20:42	20:55	20:41	20:03	19:13	17:29	17:02	17:08
29	07:35		07:15	06:29	06:01	06:00	06:20	06:49	07:17	07:48	07:22	07:44
	17:40		19:44	20:15	20:42	20:55	20:41	20:01	19:12	17:28	17:02	17:08
30	07:34		07:13	06:28	06:01	06:00	06:21	06:50	07:18	07:49	07:23	07:44
	17:41		19:45	20:16	20:43	20:55	20:40	20:00	19:10	17:26	17:02	17:09
31	07:33		07:12		06:00		06:22	06:51		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	71

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_20240628WTG: WTG11 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (43)
 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	07:44 17:11	07:33 17:44	06:59 18:16	07:10 18:57-19:18/21 19:47	06:27 18:45-19:35/50 20:17	06:00 20:45
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 18:54-19:21/27 19:48	06:25 18:46-19:34/48 20:18	05:59 20:45
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 18:51-19:22/31 19:49	06:24 18:47-19:34/47 20:19	05:59 20:46
4	07:45 17:13	07:30 17:47	06:54 18:19	07:06 18:50-19:24/34 19:50	06:23 18:49-19:33/44 20:20	05:58 20:47
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 18:48-19:25/37 19:51	06:22 18:50-19:33/43 20:21	05:58 20:47
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 18:46-19:26/40 19:52	06:21 18:51-19:32/41 20:22	05:58 20:48
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 18:45-19:27/42 19:53	06:20 18:53-19:31/38 20:23	05:58 20:49
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 18:43-19:27/44 19:54	06:18 18:54-19:30/36 20:24	05:57 20:49
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 18:43-19:29/46 19:55	06:17 18:55-19:29/34 20:25	05:57 20:50
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 18:41-19:29/48 19:56	06:16 18:56-19:28/32 20:26	05:57 20:50
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 18:41-19:30/49 19:57	06:15 18:57-19:27/30 20:27	05:57 20:51
12	07:44 17:21	07:21 17:57	06:42 18:27	06:53 18:40-19:31/51 19:58	06:14 18:59-19:25/26 20:28	05:57 20:51
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 18:40-19:32/52 19:59	06:13 19:00-19:24/24 20:29	05:57 20:52
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 18:39-19:33/54 20:00	06:12 19:02-19:22/20 20:29	05:57 20:52
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 18:39-19:34/55 20:01	06:11 19:04-19:19/15 20:30	05:57 20:53
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 18:38-19:35/57 20:02	06:10 19:08-19:15/7 20:31	05:57 20:53
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 18:38-19:36/58 20:03	06:10 20:32	05:57 20:53
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 18:38-19:36/58 20:04	06:09 20:33	05:57 20:54
19	07:42 17:29	07:13 18:05	06:31 18:34	06:43 18:38-19:36/58 20:05	06:08 20:34	05:57 20:54
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 18:39-19:37/58 20:06	06:07 20:35	05:57 20:54
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 18:38-19:37/59 20:07	06:06 20:36	05:57 20:55
22	07:40 17:32	07:09 18:08	06:26 18:37	06:39 18:39-19:37/58 20:08	06:06 20:37	05:57 20:55
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 18:40-19:38/58 20:09	06:05 20:38	05:58 20:55
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 18:39-19:37/58 20:10	06:04 20:38	05:58 20:55
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 18:40-19:37/57 20:11	06:03 20:39	05:58 20:55
26	07:37 17:37	07:03 18:12	06:20 18:41	06:33 18:41-19:37/56 20:12	06:03 20:40	05:58 20:55
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 18:41-19:36/55 20:13	06:02 20:41	05:59 20:55
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 18:42-19:36/54 20:14	06:02 20:42	05:59 20:55
29	07:35 17:40		07:15 19:44	06:29 18:44-19:36/52 20:15	06:01 20:42	06:00 20:55
30	07:34 17:41		07:13 19:45	06:28 18:45-19:36/51 20:16	06:01 20:43	06:00 20:55
31	07:33 17:42		07:12 19:46	19:02-19:14/12	06:00 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	0	0	12	1478	535	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_20240628WTG: WTG11 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (43)
 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	06:23 19:08-19:35/27 20:38	06:52 18:40-19:29/49 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	06:01 20:55	06:24 19:06-19:37/31 20:37	06:53 18:40-19:28/48 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	06:01 20:55	06:25 19:05-19:38/33 20:36	06:54 18:41-19:27/46 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	06:02 20:55	06:26 19:04-19:39/35 20:34	06:54 18:40-19:24/44 19:52	07:22 19:04	06:55 17:21	07:27 17:01
5	06:02 20:55	06:27 19:03-19:40/37 20:33	06:55 18:41-19:23/42 19:50	07:23 19:02	06:56 17:20	07:28 17:01
6	06:03 20:54	06:28 19:02-19:41/39 20:32	06:56 18:42-19:22/40 19:49	07:24 19:00	06:57 17:18	07:29 17:01
7	06:04 20:54	06:29 19:01-19:42/41 20:31	06:57 18:42-19:20/38 19:47	07:25 18:59	06:58 17:17	07:30 17:01
8	06:04 20:54	06:29 18:59-19:42/43 20:30	06:58 18:44-19:19/35 19:46	07:26 18:57	06:59 17:16	07:31 17:01
9	06:05 20:54	06:30 18:57-19:42/45 20:29	06:59 18:45-19:17/32 19:44	07:27 18:56	07:00 17:15	07:32 17:01
10	06:05 20:53	06:31 18:56-19:43/47 20:28	07:00 18:47-19:14/27 19:42	07:28 18:54	07:01 17:14	07:33 17:01
11	06:06 20:53	06:32 18:55-19:43/48 20:26	07:01 18:49-19:11/22 19:41	07:29 18:53	07:03 17:14	07:34 17:01
12	06:07 20:52	06:33 18:54-19:43/49 20:25	07:02 18:53-19:07/14 19:39	07:30 18:51	07:04 17:13	07:34 17:01
13	06:08 20:52	06:34 18:52-19:44/52 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	06:08 20:51	06:35 18:51-19:44/53 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	06:09 20:51	06:36 18:50-19:44/54 20:21	07:05 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	06:10 20:50	06:37 18:49-19:44/55 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:02
17	06:10 20:50	06:38 18:48-19:44/56 20:19	07:06 19:31	07:35 18:44	07:09 17:09	07:38 17:02
18	06:11 20:49	06:39 18:47-19:44/57 20:17	07:07 19:29	07:36 18:42	07:10 17:08	07:39 17:02
19	06:12 20:49	06:40 18:45-19:43/58 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	06:13 20:48	06:41 18:44-19:42/58 20:14	07:09 19:26	07:38 18:40	07:13 17:06	07:40 17:03
21	06:14 20:47	06:42 18:44-19:42/58 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:40 17:04
22	06:14 20:46	06:42 18:43-19:41/58 20:12	07:11 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	06:15 20:46	06:43 18:42-19:41/59 20:10	07:12 19:21	07:42 18:35	07:16 17:05	07:41 17:05
24	06:16 20:45	06:44 18:42-19:40/58 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	06:17 20:44	06:45 18:42-19:39/57 20:07	07:14 19:18	06:44 17:33	07:18 17:04	07:42 17:06
26	06:18 20:43	06:46 18:41-19:38/57 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	06:19 20:42	06:47 18:40-19:36/56 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	06:19 19:17-19:27/10 20:41	06:48 18:40-19:35/55 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:43 17:08
29	06:20 19:14-19:31/17 20:41	06:49 18:40-19:34/54 20:01	07:18 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	06:21 19:12-19:33/21 20:40	06:50 18:40-19:32/52 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	06:22 19:10-19:35/25 20:39	06:51 18:40-19:30/50 19:58		06:50 17:25		07:44 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	73	1532	437	0	0	0

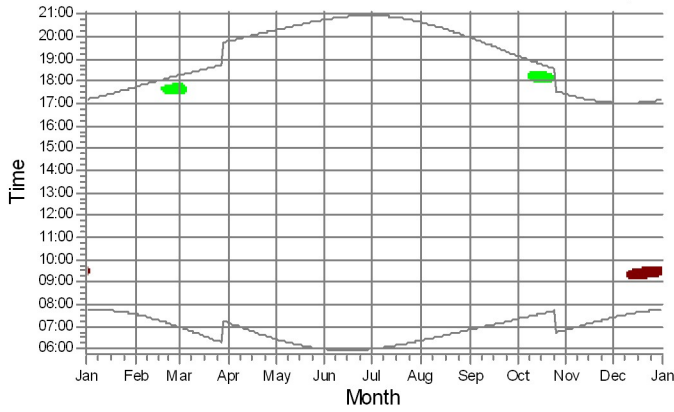
Table layout: For each day in each month the following matrix apply

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

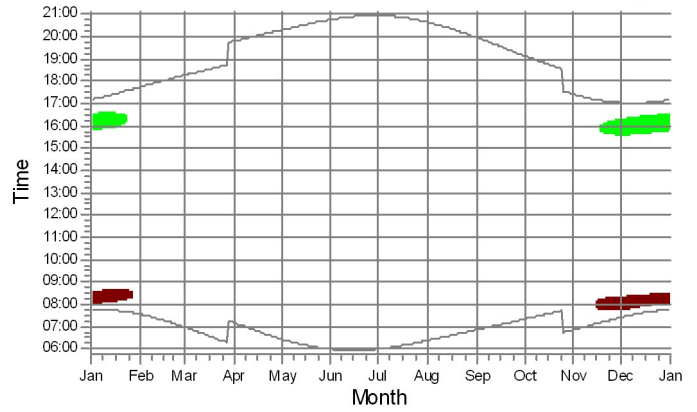
SHADOW - Calendar per WTG, graphical

Calculation: Real_case_Progetto_20240628

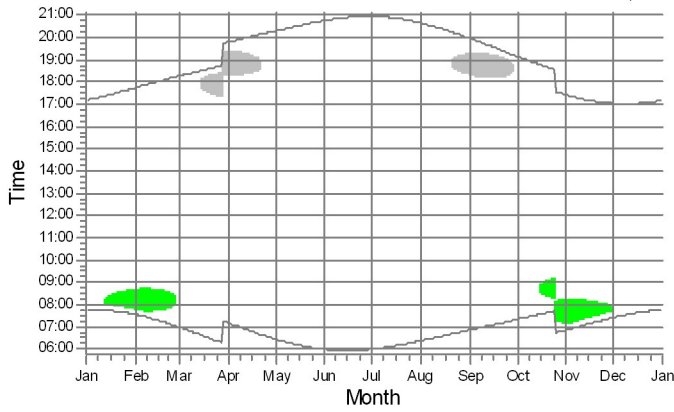
WTG01: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



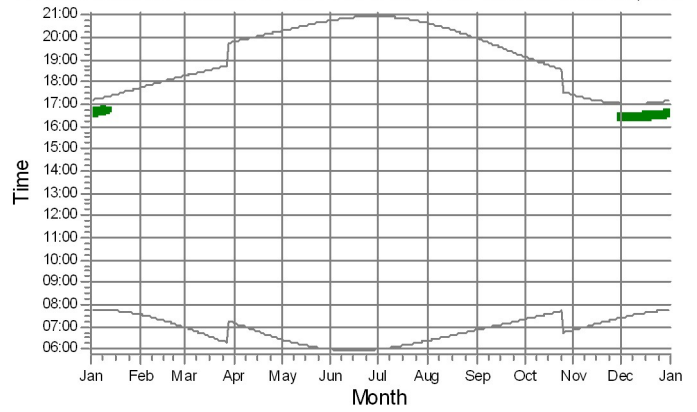
WTG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



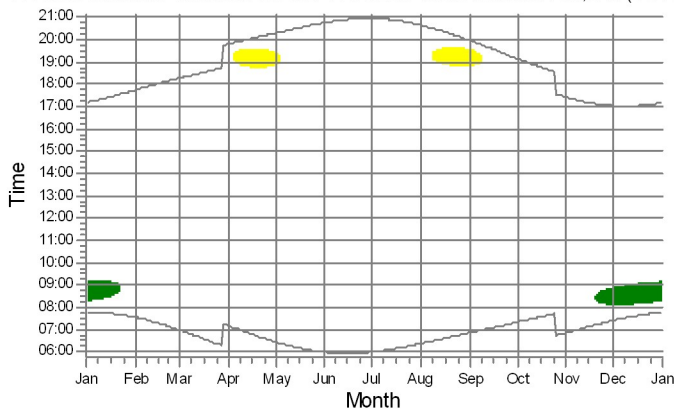
WTG03: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



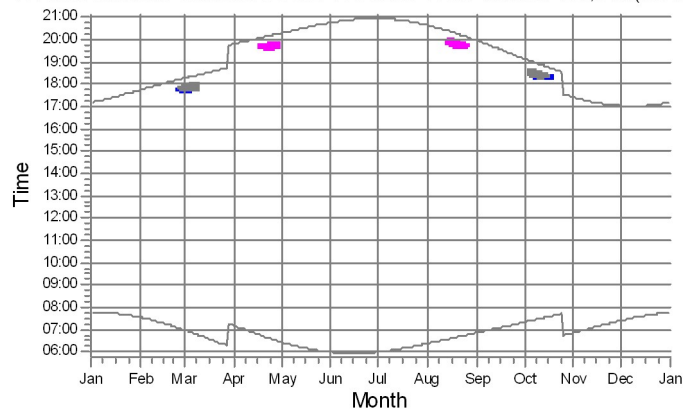
WTG04: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:











WTG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



WTG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



Shadow receptors

	F023: A4		F030: A2 - D7		F083: A3
	F028: A3 - D10		F034: A2		F108: A2
	F029: A3		F065: A3-C6		

Project:

Progetto_Baltex Nuraminis

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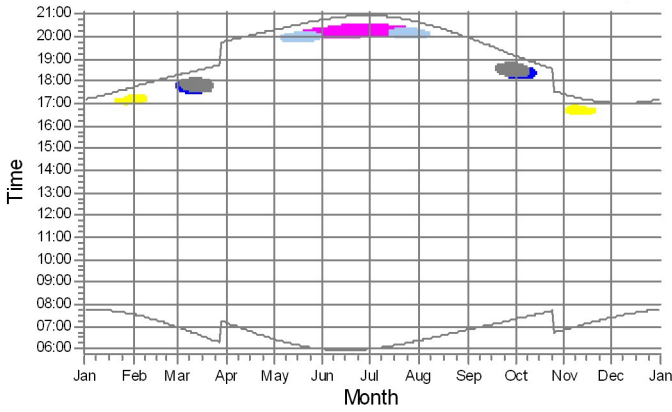
Calculated:

28/06/2024 12:34/3.4.415

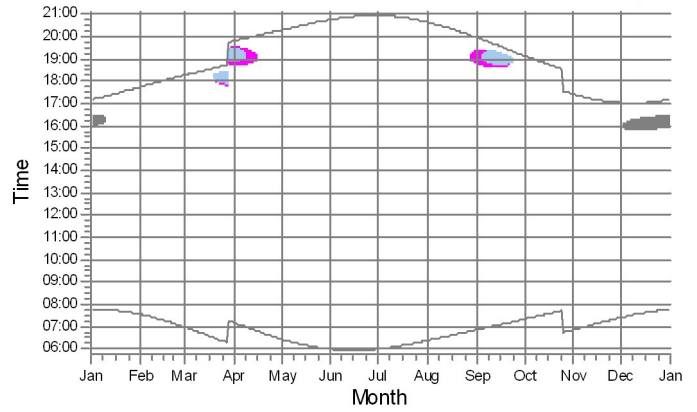
SHADOW - Calendar per WTG, graphical

Calculation: Real_case_Progetto_20240628

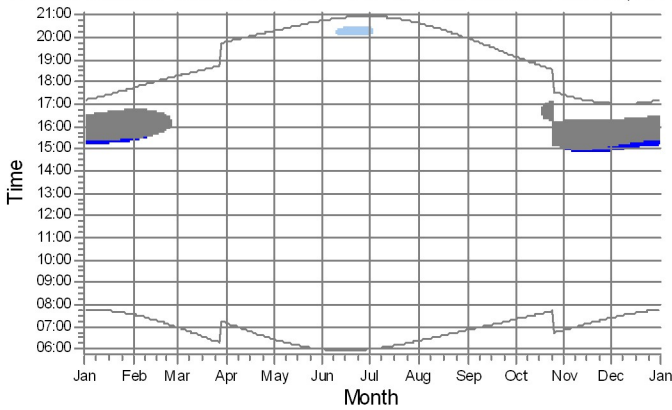
WTG07: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



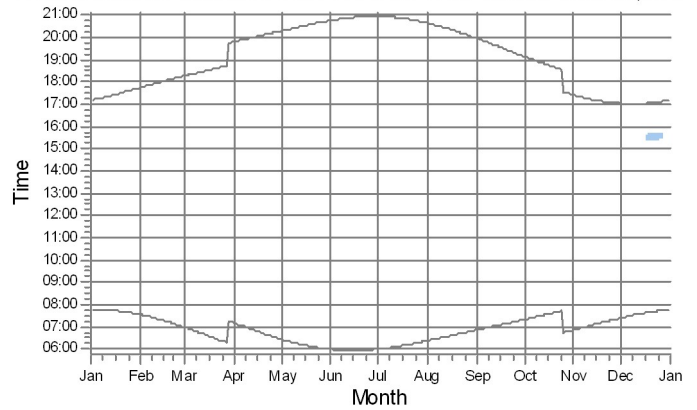
WTG08: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



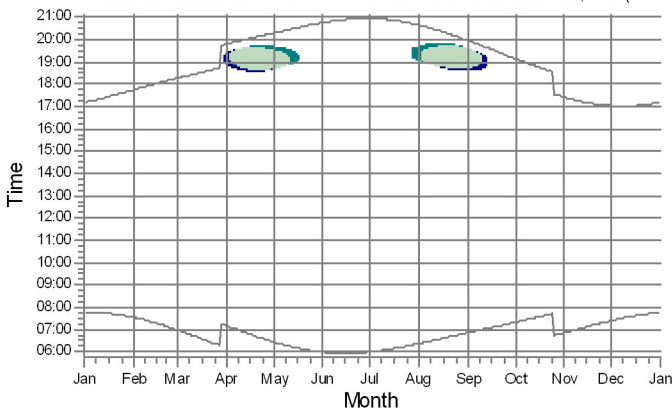
WTG09: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



WTG10: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



Shadow receptors



F028: A3 - D10



F034: A2



F145: SEMINATIVO



F029: A3



F038: D10



F153: A4



F030: A2 - D7



F039: A3 - D10

SHADOW - Main Result

Calculation: Worst_case_Progetto_20240628

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 Nuraminis

Obstacles used in calculation

Eye height for map: 1,5 m

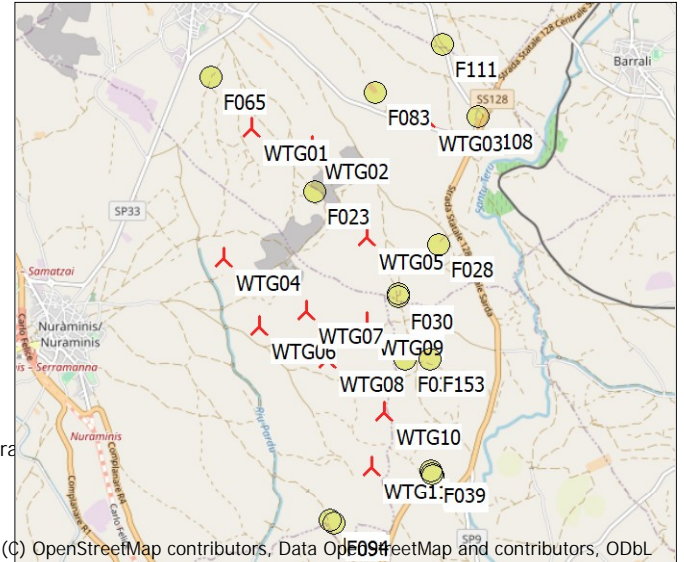
Grid resolution: 1,0 m

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]									
WTG01	1.503.692	4.368.653	179,7	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG02	1.504.493	4.368.417	181,2	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG03	1.506.007	4.368.780	130,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG04	1.503.325	4.366.944	119,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG05	1.505.208	4.367.227	158,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG06	1.503.792	4.366.047	120,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG07	1.504.411	4.366.234	143,3	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG08	1.504.701	4.365.608	130,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG09	1.505.211	4.366.086	142,6	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG10	1.505.444	4.364.912	146,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8
WTG11	1.505.287	4.364.197	128,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.2-170-6.200	6.200	170,0	135,0	2.040	8,8



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

Scale 1:100.000

▲ New WTG

● Shadow receptor

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]
F023	A4	1.504.537	4.367.811	180,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F028	A3 - D10	1.506.168	4.367.122	130,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F029	A3	1.505.637	4.366.465	130,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F030	A2 - D7	1.505.646	4.366.432	130,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F034	A2	1.505.728	4.365.598	138,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F038	D10	1.506.100	4.364.068	116,3	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F039	A3 - D10	1.506.066	4.364.133	119,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F065	A3-C6	1.503.162	4.369.323	149,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F083	A3	1.505.332	4.369.123	158,7	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F094	D1	1.504.788	4.363.442	102,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F095	A3	1.504.736	4.363.486	101,5	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F108	A2	1.506.686	4.368.804	139,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F111	A2 - C6	1.506.219	4.369.757	143,9	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F145	SEMINATIVO	1.506.079	4.364.104	117,6	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F153	A4	1.506.049	4.365.610	134,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6

Project:

Progetto_Baltex Nuraminis

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Calculated:

28/06/2024 12:41/3.4.415

SHADOW - Main Result

Calculation: Worst_case_Progetto_20240628

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]
F023	A4	52:23	64	1:04
F028	A3 - D10	38:38	94	0:41
F029	A3	138:16	167	1:11
F030	A2 - D7	148:15	183	1:12
F034	A2	52:18	142	0:38
F038	D10	46:55	76	0:48
F039	A3 - D10	46:24	72	0:50
F065	A3-C6	33:31	72	0:41
F083	A3	99:42	148	0:53
F094	D1	0:00	0	0:00
F095	A3	0:00	0	0:00
F108	A2	55:44	75	0:57
F111	A2 - C6	0:00	0	0:00
F145	SEMINATIVO	46:48	74	0:50
F153	A4	32:26	121	0:28

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

No.	Name	Worst case [h/year]
WTG01	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (33)	15:26
WTG02	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (34)	62:50
WTG03	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (35)	110:41
WTG04	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (36)	12:57
WTG05	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (37)	70:25
WTG06	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (38)	10:30
WTG07	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (39)	63:10
WTG08	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (40)	36:52
WTG09	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (41)	152:30
WTG10	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (42)	1:11
WTG11	Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (43)	67:47

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

Project:

Progetto_Baltex Nuraminis

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+39 070 658297
Giuseppe Frongia / direttore@iatprogetti.it
Calculated:
28/06/2024 12:41/3.4.415

SHADOW - Calendar

Calculation: Worst_case_Progetto_20240628Shadow receptor: F023 - A4
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 17:11	08:21 (WTG05) 16:45 (WTG04)	07:33 17:44	06:59 18:16	07:10 19:47	06:27 20:17	06:00 20:45	06:00 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 17:24	07:25 17:01	08:10 (WTG05) 16:33 (WTG04)
2	07:45 17:12	08:21 (WTG05) 16:46 (WTG04)	07:32 17:45	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:45	05:59 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:53 17:23	07:26 17:01	08:10 (WTG05) 16:34 (WTG04)
3	07:45 17:12	08:22 (WTG05) 16:47 (WTG04)	07:31 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:59 20:46	06:01 20:55	06:25 20:36	06:54 19:54	07:21 19:05	06:54 17:22	07:26 17:01	08:10 (WTG05) 16:35 (WTG04)
4	07:45 17:13	08:23 (WTG05) 16:48 (WTG04)	07:30 17:47	06:54 18:19	07:06 19:50	06:23 20:20	05:58 20:47	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04	06:55 17:21	07:27 17:01	08:10 (WTG05) 16:36 (WTG04)
5	07:45 17:14	08:23 (WTG05) 16:49 (WTG04)	07:29 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:48	06:02 20:55	06:27 20:33	06:55 19:51	07:23 19:02	06:56 17:19	07:28 17:01	08:10 (WTG05) 16:36 (WTG04)
6	07:45 17:15	08:24 (WTG05) 16:50 (WTG04)	07:28 17:49	06:51 18:21	07:02 19:52	06:21 20:22	05:58 20:48	06:03 20:55	06:28 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:01	08:10 (WTG05) 16:36 (WTG04)
7	07:45 17:16	08:25 (WTG05) 16:51 (WTG04)	07:27 17:51	06:50 18:22	07:01 19:53	06:20 20:23	05:58 20:49	06:04 20:54	06:28 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:30 17:00	08:10 (WTG05) 16:36 (WTG04)
8	07:45 17:17	08:26 (WTG05) 16:52 (WTG04)	07:26 17:52	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:00	08:11 (WTG05) 16:36 (WTG04)
9	07:45 17:18	08:27 (WTG05) 16:52 (WTG04)	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 17:15	07:32 17:00	08:11 (WTG05) 16:36 (WTG04)
10	07:45 17:19	08:28 (WTG05) 16:52 (WTG04)	07:24 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 20:50	06:05 20:53	06:31 20:28	07:00 19:43	07:28 18:54	07:02 17:14	07:33 17:01	08:11 (WTG05) 16:36 (WTG04)
11	07:44 17:20	08:28 (WTG05) 16:51 (WTG04)	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	07:03 17:13	07:34 17:01	08:12 (WTG05) 16:36 (WTG04)
12	07:44 17:21	08:29 (WTG05) 16:50 (WTG04)	07:21 17:57	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51	06:07 20:53	06:33 20:25	07:02 19:39	07:30 18:51	07:04 17:13	07:34 17:01	08:11 (WTG05) 16:36 (WTG04)
13	07:44 17:22	08:31 (WTG05) 16:49 (WTG04)	07:20 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:57 20:52	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01	08:12 (WTG05) 16:36 (WTG04)
14	07:44 17:23	08:31 (WTG05) 09:05 (WTG05)	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:30	05:57 20:52	06:08 20:23	06:35 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01	08:13 (WTG05) 16:36 (WTG04)
15	07:43 17:24	08:33 (WTG05) 09:05 (WTG05)	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:31	05:57 20:53	06:09 20:51	06:36 20:21	07:05 19:34	07:33 18:47	07:07 17:10	07:37 17:01	08:13 (WTG05) 16:37 (WTG04)
16	07:43 17:25	08:33 (WTG05) 09:03 (WTG05)	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:53	06:10 20:51	06:37 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:02	08:13 (WTG05) 16:36 (WTG04)
17	07:43 17:26	08:35 (WTG05) 09:03 (WTG05)	07:15 18:02	06:34 18:32	06:46 20:03	06:10 20:32	05:57 20:54	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 17:08	07:38 17:02	08:14 (WTG05) 16:37 (WTG04)
18	07:42 17:27	08:37 (WTG05) 09:03 (WTG05)	07:14 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:54	06:11 20:49	06:39 20:17	07:07 19:30	07:36 18:42	07:11 17:08	07:39 17:02	08:13 (WTG05) 16:37 (WTG04)
19	07:42 17:28	08:39 (WTG05) 09:01 (WTG05)	07:13 18:05	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:54	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03	08:14 (WTG05) 16:38 (WTG04)
20	07:41 17:30	08:40 (WTG05) 08:59 (WTG05)	07:11 18:06	06:29 18:35	06:41 20:06	06:07 20:35	05:57 20:54	06:13 20:48	06:41 20:15	07:09 19:26	07:38 18:40	07:13 17:06	07:40 17:03	08:15 (WTG05) 16:38 (WTG04)
21	07:41 17:31	08:44 (WTG05) 08:57 (WTG05)	07:10 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:55	06:14 20:47	06:41 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:41 17:04	08:15 (WTG05) 16:38 (WTG04)
22	07:40 17:32	08:50 (WTG05) 08:51 (WTG05)	07:09 18:08	06:26 18:37	06:39 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:41 18:37	07:15 17:05	07:41 17:05	08:16 (WTG05) 16:39 (WTG04)
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	06:05 20:38	05:58 20:55	06:15 20:46	06:43 20:10	06:43 19:21	07:12 19:21	07:42 18:35	07:16 17:05	07:42 17:05	08:16 (WTG05) 16:39 (WTG04)
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 20:39	05:58 20:55	06:16 20:45	06:44 20:09	06:44 19:20	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05	08:16 (WTG05) 16:40 (WTG04)
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:58 20:55	06:17 20:44	06:45 20:07	06:45 19:18	07:14 19:18	07:44 17:33	07:18 17:04	07:42 17:06	08:17 (WTG05) 16:41 (WTG04)
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	06:03 20:40	05:58 20:55	06:18 20:43	06:46 20:06	06:46 19:16	07:15 19:16	07:45 17:31	07:19 17:03	07:43 17:06	08:18 (WTG05) 16:41 (WTG04)
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 20:41	05:59 20:55	06:19 20:43	06:47 20:04	06:47 19:15	07:16 19:15	07:46 17:30	07:20 17:03	07:43 17:07	08:18 (WTG05) 16:41 (WTG04)
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 20:14	06:02 20:42	05:59 20:56	06:19 20:42	06:48 20:03	06:48 19:13	07:17 19:13	07:47 17:29	07:21 17:02	07:44 17:08	08:19 (WTG05) 16:43 (WTG04)
29	07:35 17:40	07:00 19:44	06:15 20:15	06:29 20:43	06:01 20:43	06:00 20:56	06:20 20:41	06:49 20:01	06:49 19:12	07:18 19:12	07:48 17:28	07:22 17:02	07:44 17:08	08:19 (WTG05) 16:43 (WTG04)
30	07:34 17:41	07:00 19:45	06:13 20:16	06:28 20:43	06:00 20:43	06:00 20:55	06:21 20:40	06:50 20:00	06:50 19:10	07:18 17:26	07:49 17:02	07:24 17:02	07:44 17:09	08:20 (WTG05) 16:44 (WTG04)
31	07:34 17:42	07:00 19:46	06:12 20:17	06:27 20:44	06:00 20:44	06:00 20:55	06:22 20:39	06:51 19:58	06:51 19:58	07:19 17:25	07:50 17:25	07:25 17:02	07:44 17:10	08:20 (WTG05) 16:44 (WTG04)
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	292	293	1904
Total, worst case		947												

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: Worst_case_Progetto_20240628Shadow receptor: F028 - A3 - 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
1	07:45 17:11	07:33 17:43	17:02 (WTG07) 17:20 (WTG07)	06:59 18:16	07:10 19:47	06:27 18:56 (WTG05) 19:17 (WTG05)
2	07:45 17:12	07:32 17:45	17:02 (WTG07) 17:21 (WTG07)	06:57 18:17	07:09 19:48	06:25 18:58 (WTG05) 19:15 (WTG05)
3	07:45 17:12	07:31 17:46	17:03 (WTG07) 17:22 (WTG07)	06:56 18:18	07:07 19:49	06:24 19:02 (WTG05) 19:12 (WTG05)
4	07:45 17:13	07:30 17:47	17:03 (WTG07) 17:22 (WTG07)	06:54 18:19	07:05 19:50	06:23 20:20
5	07:45 17:14	07:29 17:48	17:04 (WTG07) 17:21 (WTG07)	06:53 18:20	07:04 19:51	19:06 (WTG05) 19:19 (WTG05)
6	07:45 17:15	07:28 17:49	17:06 (WTG07) 17:20 (WTG07)	06:51 18:21	07:02 19:52	18:58 (WTG05) 19:22 (WTG05)
7	07:45 17:16	07:27 17:51	17:08 (WTG07) 17:18 (WTG07)	06:50 18:22	07:01 19:53	19:00 (WTG05) 19:24 (WTG05)
8	07:45 17:17	07:26 17:52	17:11 (WTG07) 17:15 (WTG07)	06:48 18:23	06:59 19:54	18:58 (WTG05) 19:25 (WTG05)
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	31	18:56 (WTG05) 19:27 (WTG05)
10	07:45 17:19	07:23 17:54	06:45 18:25	06:56 19:56	34	18:54 (WTG05) 19:28 (WTG05)
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	35	18:54 (WTG05) 19:29 (WTG05)
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	37	18:52 (WTG05) 19:29 (WTG05)
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	38	18:52 (WTG05) 19:30 (WTG05)
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	39	18:50 (WTG05) 19:29 (WTG05)
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	40	18:50 (WTG05) 19:30 (WTG05)
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	40	18:49 (WTG05) 19:29 (WTG05)
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	41	18:49 (WTG05) 19:30 (WTG05)
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	41	18:48 (WTG05) 19:29 (WTG05)
19	07:42 17:28	07:12 18:04	06:31 18:34	06:43 20:05	40	18:49 (WTG05) 19:29 (WTG05)
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	40	18:49 (WTG05) 19:29 (WTG05)
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	40	18:48 (WTG05) 19:28 (WTG05)
22	07:40 17:32	17:05 (WTG07) 18:08	06:26 18:37	06:38 20:08	39	18:49 (WTG05) 19:28 (WTG05)
23	07:39 17:33	17:04 (WTG07) 18:09	06:25 18:38	06:37 20:09	38	18:50 (WTG05) 19:28 (WTG05)
24	07:39 17:34	17:03 (WTG07) 18:10	06:23 18:39	06:36 20:10	37	18:49 (WTG05) 19:26 (WTG05)
25	07:38 17:35	17:02 (WTG07) 18:11	06:21 18:40	06:34 20:11	36	18:50 (WTG05) 19:26 (WTG05)
26	07:37 17:36	17:02 (WTG07) 18:12	06:20 18:41	06:33 20:12	34	18:51 (WTG05) 19:25 (WTG05)
27	07:37 17:38	17:01 (WTG07) 18:13	06:18 18:42	06:32 20:13	32	18:51 (WTG05) 19:23 (WTG05)
28	07:36 17:39	17:02 (WTG07) 18:14	06:17 18:43	06:30 20:14	30	18:52 (WTG05) 19:22 (WTG05)
29	07:35 17:40	17:02 (WTG07) 18:15	06:15 18:44	06:29 20:15	27	18:54 (WTG05) 19:21 (WTG05)
30	07:34 17:41	17:02 (WTG07) 18:16	06:13 18:45	06:28 20:16	25	18:55 (WTG05) 19:20 (WTG05)
31	07:33 17:42	17:02 (WTG07) 18:17	06:12 18:46	06:28 19:46	25	18:55 (WTG05) 19:20 (WTG05)
Potential sun hours	302	299	370	397	444	447
Total, worst case	107	120		878	444	487

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: Worst_case_Progetto_20240628Shadow receptor: F028 - A3 - 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

	July	August	September	October	November	December
1	06:00 20:55	06:23 20:38	06:52 19:57	18:53 (WTG05) 19:28 (WTG05)	07:19 19:08	06:51 17:24
2	06:01 20:55	06:24 20:37	06:53 19:55	18:53 (WTG05) 19:26 (WTG05)	07:20 19:07	06:52 17:23
3	06:01 20:55	06:25 20:36	06:53 19:54	18:54 (WTG05) 19:25 (WTG05)	07:21 19:05	06:54 17:22
4	06:02 20:55	06:26 20:35	06:54 19:52	18:55 (WTG05) 19:22 (WTG05)	07:22 19:04	06:55 17:21
5	06:02 20:55	06:27 20:33	06:55 19:50	18:56 (WTG05) 19:20 (WTG05)	07:23 19:02	06:56 17:19
6	06:03 20:55	06:28 20:32	06:56 19:49	18:58 (WTG05) 19:18 (WTG05)	07:24 19:00	06:57 17:18
7	06:03 20:54	06:28 20:31	06:57 19:47	19:01 (WTG05) 19:14 (WTG05)	07:25 18:59	06:58 17:17
8	06:04 20:54	06:29 20:30	06:58 19:46		07:26 18:57	06:59 17:16
9	06:05 20:54	06:30 20:29	06:59 19:44		07:27 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	19:09 (WTG05) 19:22 (WTG05)	07:00 19:42	07:28 18:54	07:01 17:14
11	06:06 20:53	06:32 20:26	19:06 (WTG05) 19:24 (WTG05)	07:01 19:41	07:29 18:53	07:03 17:13
12	06:07 20:52	06:33 20:25	19:04 (WTG05) 19:26 (WTG05)	07:02 19:39	07:30 18:51	07:04 17:13
13	06:07 20:52	06:34 20:24	19:02 (WTG05) 19:28 (WTG05)	07:03 19:38	07:31 18:50	07:05 17:12
14	06:08 20:52	06:35 20:23	19:01 (WTG05) 19:29 (WTG05)	07:04 19:36	07:32 18:48	07:06 17:11
15	06:09 20:51	06:36 20:21	19:00 (WTG05) 19:30 (WTG05)	07:04 19:34	07:33 18:47	07:07 17:10
16	06:10 20:50	06:37 20:20	18:59 (WTG05) 19:31 (WTG05)	07:05 19:33	07:34 18:45	07:08 17:09
17	06:10 20:50	06:38 20:19	18:58 (WTG05) 19:32 (WTG05)	07:06 19:31	07:35 18:44	07:09 17:08
18	06:11 20:49	06:39 20:17	18:56 (WTG05) 19:32 (WTG05)	07:07 19:29	07:36 18:42	07:10 17:08
19	06:12 20:49	06:40 20:16	18:55 (WTG05) 19:32 (WTG05)	07:08 19:28	07:37 18:41	07:12 17:07
20	06:13 20:48	06:40 20:14	18:54 (WTG05) 19:33 (WTG05)	07:09 19:26	07:38 18:39	07:13 17:06
21	06:13 20:47	06:41 20:13	18:54 (WTG05) 19:33 (WTG05)	07:10 19:25	07:39 18:38	07:14 17:06
22	06:14 20:46	06:42 20:12	18:53 (WTG05) 19:33 (WTG05)	07:11 19:23	07:40 18:37	07:15 17:05
23	06:15 20:46	06:43 20:10	18:53 (WTG05) 19:33 (WTG05)	07:12 19:21	07:42 18:35	07:16 17:05
24	06:16 20:45	06:44 20:09	18:53 (WTG05) 19:33 (WTG05)	07:13 19:20	07:43 18:34	07:17 17:04
25	06:17 20:44	06:45 20:07	18:52 (WTG05) 19:33 (WTG05)	07:14 19:18	06:44 17:33	07:18 17:04
26	06:18 20:43	06:46 20:06	18:52 (WTG05) 19:33 (WTG05)	07:15 19:16	06:45 17:31	07:19 17:03
27	06:19 20:42	06:47 20:04	18:51 (WTG05) 19:31 (WTG05)	07:16 19:15	06:46 17:30	07:20 17:03
28	06:19 20:42	06:48 20:03	18:51 (WTG05) 19:31 (WTG05)	07:17 19:13	06:47 17:29	07:21 17:02
29	06:20 20:41	06:49 20:01	18:51 (WTG05) 19:30 (WTG05)	07:17 19:12	06:48 17:28	07:22 17:02
30	06:21 20:40	06:50 20:00	18:52 (WTG05) 19:30 (WTG05)	07:18 19:10	06:49 17:26	07:23 17:02
31	06:22 20:39	06:51 19:58	18:52 (WTG05) 19:29 (WTG05)		06:50 17:25	
Potential sun hours	454	425	374	347	302	293
Total, worst case		750	183		232	

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: Worst_case_Progetto_20240628Shadow receptor: F029 - A3

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 17:11 67	15:14 (WTG09) 17:44 65	07:33 15:26 (WTG09) 06:59	16:31 (WTG09) 18:16 13	17:41 (WTG06) 07:10	06:27 20:17
2	07:45 17:12 67	15:14 (WTG09) 17:45 64	07:32 15:27 (WTG09) 06:57	16:31 (WTG09) 18:17 16	17:40 (WTG07) 07:09	06:25 20:18
3	07:45 17:12 67	15:15 (WTG09) 17:46 62	07:31 15:28 (WTG09) 06:56	16:30 (WTG09) 18:18 19	17:38 (WTG07) 07:07	06:24 20:19
4	07:45 17:13 67	15:15 (WTG09) 17:47 61	07:30 15:29 (WTG09) 06:54	16:30 (WTG09) 18:19 22	17:36 (WTG07) 07:05	06:23 20:20
5	07:45 17:14 68	15:15 (WTG09) 17:48 59	07:29 15:30 (WTG09) 06:53	16:29 (WTG09) 18:20 25	17:34 (WTG07) 07:04	06:22 20:21
6	07:45 17:15 68	15:16 (WTG09) 17:49 58	07:28 15:31 (WTG09) 06:51	16:28 (WTG09) 18:21 27	17:34 (WTG07) 07:02	06:21 20:22
7	07:45 17:16 68	15:16 (WTG09) 17:51 56	07:27 15:32 (WTG09) 06:50	16:28 (WTG09) 18:22 29	17:32 (WTG07) 07:01	06:20 20:23
8	07:45 17:17 69	15:16 (WTG09) 17:52 54	07:26 15:33 (WTG09) 06:48	16:27 (WTG09) 18:23 31	17:32 (WTG07) 06:59	06:18 20:24
9	07:45 17:18 69	15:17 (WTG09) 17:53 52	07:25 15:35 (WTG09) 06:47	16:27 (WTG09) 18:24 31	17:31 (WTG07) 06:58	06:17 20:25
10	07:45 17:19 69	15:17 (WTG09) 17:54 50	07:23 15:36 (WTG09) 06:45	16:26 (WTG09) 18:25 32	17:30 (WTG07) 06:56	06:16 20:26
11	07:44 17:20 69	15:17 (WTG09) 17:55 47	07:22 15:37 (WTG09) 06:44	16:24 (WTG09) 18:26 31	17:31 (WTG07) 06:55	06:15 20:27
12	07:44 17:21 70	15:17 (WTG09) 17:56 43	07:21 15:39 (WTG09) 06:42	16:24 (WTG09) 18:26 31	17:30 (WTG07) 06:53	06:14 20:28
13	07:44 17:22 70	15:18 (WTG09) 17:58 40	07:20 15:41 (WTG09) 06:40	16:21 (WTG09) 18:28 30	17:31 (WTG07) 06:52	06:13 20:29
14	07:44 17:23 70	15:18 (WTG09) 17:59 35	07:19 15:44 (WTG09) 06:39	16:19 (WTG09) 18:29 29	17:31 (WTG07) 06:50	06:12 20:30
15	07:43 17:24 71	15:18 (WTG09) 18:00 31	07:18 15:46 (WTG09) 06:37	16:17 (WTG09) 18:30 28	17:32 (WTG07) 06:49	06:11 20:30
16	07:43 17:25 71	15:18 (WTG09) 18:01 25	07:16 15:49 (WTG09) 06:36	16:14 (WTG09) 18:31 26	17:32 (WTG07) 06:47	06:10 20:31
17	07:42 17:26 70	15:19 (WTG09) 18:02 16	07:15 15:54 (WTG09) 06:34	16:10 (WTG09) 18:32 23	17:33 (WTG07) 06:46	06:09 20:32
18	07:42 17:27 70	15:19 (WTG09) 18:03 16	07:14 16:10 (WTG09) 06:33	18:33 21	17:34 (WTG07) 06:44	06:09 20:33
19	07:42 17:28 70	15:20 (WTG09) 18:05 16	07:13 16:11 (WTG09) 06:31	18:34 16	17:35 (WTG07) 06:43	06:08 20:34
20	07:41 17:30 70	15:20 (WTG09) 18:06 16	07:11 16:12 (WTG09) 06:29	18:35 10	17:36 (WTG07) 06:41	06:07 20:35
21	07:41 17:31 70	15:21 (WTG09) 18:07 16	07:10 16:13 (WTG09) 06:28	18:36 10	17:37 (WTG07) 06:40	06:06 20:36
22	07:40 17:32 70	15:21 (WTG09) 18:08 16	07:09 16:14 (WTG09) 06:26	18:37 10	17:38 (WTG07) 06:39	06:05 20:37
23	07:39 17:33 70	15:21 (WTG09) 18:09 16	07:07 16:15 (WTG09) 06:25	18:38 10	17:39 (WTG07) 06:37	06:05 20:38
24	07:39 17:34 70	15:22 (WTG09) 18:10 2	07:06 17:46 (WTG06) 06:23	18:39 10	17:40 (WTG07) 06:36	06:04 20:39
25	07:38 17:35 70	15:22 (WTG09) 18:11 5	07:04 17:48 (WTG06) 06:21	18:40 10	17:41 (WTG07) 06:34	06:03 20:40
26	07:37 17:36 69	15:22 (WTG09) 18:12 8	07:03 17:50 (WTG06) 06:20	18:41 10	17:42 (WTG07) 06:33	06:03 20:41
27	07:37 17:38 68	15:23 (WTG09) 18:13 10	07:02 17:44 (WTG06) 06:18	18:42 10	17:43 (WTG07) 06:32	06:02 20:42
28	07:36 17:39 68	15:24 (WTG09) 18:15 12	07:00 17:52 (WTG06) 06:17	18:43 10	17:44 (WTG07) 06:30	06:02 20:43
29	07:35 17:40 68	15:24 (WTG09) 18:16 12	06:59 17:54 (WTG06) 06:15	18:44 10	17:45 (WTG07) 06:29	06:01 20:44
30	07:34 17:41 67	15:25 (WTG09) 18:17 12	06:58 17:55 (WTG06) 06:14	18:45 10	17:46 (WTG07) 06:28	06:00 20:45
31	07:33 17:42 66	15:25 (WTG09) 18:18 12	06:57 17:56 (WTG06) 06:13	18:46 10	17:47 (WTG07) 06:27	06:00 20:46
Potential sun hours	302	299	370	490	397	447
Total, worst case	2136	855	370	490	444	447

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: Worst_case_Progetto_20240628Shadow receptor: F029 - A3

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	06:23	06:52	07:19	18:10 (WTG07)	06:51	15:05 (WTG09)	07:24	14:59 (WTG09)					
	20:55	20:38	19:57	19:08	31	18:41 (WTG07)	17:24	50	15:55 (WTG09)	17:01	69	16:08 (WTG09)		
2	06:01	06:24	06:53	07:20	18:09 (WTG07)	06:52	15:03 (WTG09)	07:25	14:59 (WTG09)					
	20:55	20:37	19:55	19:07	32	18:41 (WTG07)	17:23	53	15:56 (WTG09)	17:01	70	16:09 (WTG09)		
3	06:01	06:25	06:53	07:21	18:09 (WTG07)	06:54	15:03 (WTG09)	07:26	15:00 (WTG09)					
	20:55	20:36	19:54	19:05	31	18:40 (WTG07)	17:22	54	15:57 (WTG09)	17:01	69	16:09 (WTG09)		
4	06:02	06:26	06:54	07:22	18:09 (WTG07)	06:55	15:01 (WTG09)	07:27	15:00 (WTG09)					
	20:55	20:35	19:52	19:04	31	18:40 (WTG07)	17:21	57	15:58 (WTG09)	17:01	69	16:09 (WTG09)		
5	06:02	06:27	06:55	07:23	18:09 (WTG07)	06:56	15:00 (WTG09)	07:28	15:01 (WTG09)					
	20:55	20:33	19:50	19:02	30	18:39 (WTG07)	17:19	59	15:59 (WTG09)	17:01	68	16:09 (WTG09)		
6	06:03	06:28	06:56	07:24	18:09 (WTG07)	06:57	14:59 (WTG09)	07:29	15:02 (WTG09)					
	20:55	20:32	19:49	19:00	29	18:38 (WTG07)	17:18	60	15:59 (WTG09)	17:01	68	16:10 (WTG09)		
7	06:04	06:28	06:57	07:25	18:09 (WTG07)	06:58	14:58 (WTG09)	07:30	15:02 (WTG09)					
	20:54	20:31	19:47	18:59	28	18:37 (WTG07)	17:17	62	16:00 (WTG09)	17:00	68	16:10 (WTG09)		
8	06:04	06:29	06:58	07:26	18:10 (WTG07)	06:59	14:58 (WTG09)	07:31	15:03 (WTG09)					
	20:54	20:30	19:46	18:57	25	18:35 (WTG07)	17:16	63	16:01 (WTG09)	17:00	67	16:10 (WTG09)		
9	06:05	06:30	06:59	07:27	18:10 (WTG07)	07:00	14:58 (WTG09)	07:32	15:04 (WTG09)					
	20:54	20:29	19:44	18:56	24	18:34 (WTG07)	17:15	64	16:02 (WTG09)	17:00	67	16:11 (WTG09)		
10	06:05	06:31	07:00	07:28	18:11 (WTG07)	07:01	14:57 (WTG09)	07:33	15:04 (WTG09)					
	20:53	20:28	19:42	18:54	21	18:32 (WTG07)	17:14	65	16:02 (WTG09)	17:01	67	16:11 (WTG09)		
11	06:06	06:32	07:01	07:29	18:13 (WTG07)	07:03	14:56 (WTG09)	07:34	15:04 (WTG09)					
	20:53	20:26	19:41	18:53	17	18:30 (WTG07)	17:13	66	16:02 (WTG09)	17:01	67	16:11 (WTG09)		
12	06:07	06:33	07:02	07:30	18:15 (WTG07)	07:04	14:56 (WTG09)	07:34	15:05 (WTG09)					
	20:52	20:25	19:39	18:51	14	18:29 (WTG07)	17:13	67	16:03 (WTG09)	17:01	66	16:11 (WTG09)		
13	06:07	06:34	07:03	07:31	18:15 (WTG06)	07:05	14:56 (WTG09)	07:35	15:06 (WTG09)					
	20:52	20:24	19:38	18:50	12	18:27 (WTG06)	17:12	68	16:04 (WTG09)	17:01	66	16:12 (WTG09)		
14	06:08	06:35	07:04	07:32	18:15 (WTG06)	07:06	14:56 (WTG09)	07:36	15:06 (WTG09)					
	20:52	20:23	19:36	18:48	11	18:26 (WTG06)	17:11	68	16:04 (WTG09)	17:01	66	16:12 (WTG09)		
15	06:09	06:36	07:04	07:33	18:15 (WTG06)	07:07	14:55 (WTG09)	07:37	15:06 (WTG09)					
	20:51	20:21	19:34	18:47	9	18:24 (WTG06)	17:10	69	16:04 (WTG09)	17:01	66	16:12 (WTG09)		
16	06:10	06:37	07:05	07:34	18:16 (WTG06)	07:08	14:55 (WTG09)	07:37	15:07 (WTG09)					
	20:50	20:20	19:33	18:45	7	18:23 (WTG06)	17:09	69	16:04 (WTG09)	17:02	66	16:13 (WTG09)		
17	06:10	06:38	07:06	07:35	18:17 (WTG06)	07:09	14:55 (WTG09)	07:38	15:08 (WTG09)					
	20:50	20:19	19:31	18:44	4	18:21 (WTG06)	17:08	70	16:05 (WTG09)	17:02	65	16:13 (WTG09)		
18	06:11	06:39	07:07	07:36	18:18 (WTG06)	07:10	14:56 (WTG09)	07:39	15:08 (WTG09)					
	20:49	20:17	19:29	18:42	1	18:19 (WTG06)	17:08	70	16:06 (WTG09)	17:02	65	16:13 (WTG09)		
19	06:12	06:40	07:08	07:37	18:19 (WTG06)	07:12	14:56 (WTG09)	07:39	15:09 (WTG09)					
	20:49	20:16	19:28	18:41	17:07	70	16:06 (WTG09)	17:03	65	16:14 (WTG09)				
20	06:13	06:41	07:09	07:38	18:19 (WTG06)	07:13	14:56 (WTG09)	07:40	15:09 (WTG09)					
	20:48	20:14	19:26	18:39	17:06	70	16:06 (WTG09)	17:03	65	16:14 (WTG09)				
21	06:14	06:41	07:10	07:39	18:19 (WTG06)	07:14	14:56 (WTG09)	07:40	15:10 (WTG09)					
	20:47	20:13	19:25	18:38	17:06	70	16:06 (WTG09)	17:03	65	16:15 (WTG09)				
22	06:14	06:42	07:11	07:40	18:19 (WTG06)	07:15	14:56 (WTG09)	07:41	15:10 (WTG09)					
	20:47	20:12	19:23	18:37	17:05	70	16:06 (WTG09)	17:04	65	16:15 (WTG09)				
23	06:15	06:43	07:12	18:24 (WTG07)	07:42	17:06	14:57 (WTG09)	07:41	15:11 (WTG09)					
	20:46	20:10	19:21	7	18:31 (WTG07)	18:35	17:05	70	16:07 (WTG09)	17:04	65	16:16 (WTG09)		
24	06:16	06:44	07:13	18:20 (WTG07)	07:43	17:07	14:57 (WTG09)	07:42	15:11 (WTG09)					
	20:45	20:09	19:20	15	18:35 (WTG07)	18:34	17:04	70	16:07 (WTG09)	17:05	65	16:16 (WTG09)		
25	06:17	06:45	07:14	18:17 (WTG07)	06:44	15:22 (WTG09)	07:18	07:42	15:12 (WTG09)					
	20:44	20:07	19:18	20	18:37 (WTG07)	17:33	19	15:41 (WTG09)	17:04	71	16:08 (WTG09)	17:06	65	16:17 (WTG09)
26	06:18	06:46	07:15	18:15 (WTG07)	06:45	15:18 (WTG09)	07:19	07:43	15:12 (WTG09)					
	20:43	20:06	19:16	23	18:38 (WTG07)	17:31	26	15:44 (WTG09)	17:03	71	16:08 (WTG09)	17:06	65	16:17 (WTG09)
27	06:19	06:47	07:16	18:14 (WTG07)	06:46	15:14 (WTG09)	07:20	07:43	15:12 (WTG09)					
	20:42	20:04	19:15	25	18:39 (WTG07)	17:30	33	15:47 (WTG09)	17:03	71	16:08 (WTG09)	17:07	66	16:18 (WTG09)
28	06:19	06:48	07:17	18:13 (WTG07)	06:47	15:13 (WTG09)	07:21	07:43	15:13 (WTG09)					
	20:42	20:03	19:13	27	18:40 (WTG07)	17:29	36	15:49 (WTG09)	17:02	70	16:08 (WTG09)	17:08	66	16:19 (WTG09)
29	06:20	06:49	07:17	18:11 (WTG07)	06:48	15:10 (WTG09)	07:22	07:44	15:13 (WTG09)					
	20:41	20:01	19:12	29	18:40 (WTG07)	17:28	41	15:51 (WTG09)	17:02	70	16:08 (WTG09)	17:08	66	16:19 (WTG09)
30	06:21	06:50	07:18	18:11 (WTG07)	06:49	15:08 (WTG09)	07:23	07:44	15:14 (WTG09)					
	20:40	20:00	19:10	30	18:41 (WTG07)	17:26	44	15:52 (WTG09)	17:02	69	16:08 (WTG09)	17:09	66	16:20 (WTG09)
31	06:22	06:51	07:19	06:50	15:06 (WTG09)	07:24	69	16:08 (WTG09)	17:09	66	16:20 (WTG09)			
	20:39	19:58	17:25	48	15:54 (WTG09)	17:10	66	16:20 (WTG09)						
Potential sun hours	454	425	374	347	604	302	1976	293	2059					
Total, worst case			176											

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: Worst_case_Progetto_20240628Shadow receptor: F030 - A2 - D7

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 17:11 57	15:28 (WTG09) 16:25 (WTG09) 17:44	07:33 17:44 71	15:32 (WTG09) 16:43 (WTG09) 18:16	06:59 17:54 (WTG06) 19:47	06:00 20:17 20:45
2	07:45 17:12 58	15:28 (WTG09) 16:26 (WTG09) 17:45	07:32 17:45 71	15:32 (WTG09) 16:43 (WTG09) 18:17	06:57 17:45 (WTG06) 19:48	05:59 20:18 20:45
3	07:45 17:12 58	15:28 (WTG09) 16:26 (WTG09) 17:46	07:31 17:46 70	15:33 (WTG09) 16:43 (WTG09) 18:18	06:56 17:44 (WTG06) 19:49	05:59 20:19 20:46
4	07:45 17:13 59	15:28 (WTG09) 16:27 (WTG09) 17:47	07:30 17:47 70	15:33 (WTG09) 16:43 (WTG09) 18:19	06:54 17:44 (WTG06) 19:50	05:58 20:20 20:47
5	07:45 17:14 60	15:28 (WTG09) 16:28 (WTG09) 17:48	07:29 17:48 69	15:34 (WTG09) 16:43 (WTG09) 18:20	06:53 17:44 (WTG07) 19:51	05:58 20:21 20:47
6	07:45 17:15 60	15:29 (WTG09) 16:29 (WTG09) 17:49	07:28 17:49 68	15:34 (WTG09) 16:42 (WTG09) 18:21	06:51 17:42 (WTG07) 19:52	05:58 20:22 20:48
7	07:45 17:16 61	15:29 (WTG09) 16:30 (WTG09) 17:51	07:27 17:51 67	15:35 (WTG09) 16:42 (WTG09) 18:22	06:50 17:39 (WTG07) 19:53	05:58 20:23 20:49
8	07:45 17:17 62	15:29 (WTG09) 16:31 (WTG09) 17:52	07:26 17:52 66	15:36 (WTG09) 16:42 (WTG09) 18:23	06:48 17:39 (WTG07) 19:54	05:57 20:24 20:49
9	07:45 17:18 62	15:29 (WTG09) 16:31 (WTG09) 17:53	07:25 17:53 65	15:37 (WTG09) 16:42 (WTG09) 18:24	06:47 17:37 (WTG07) 19:55	05:57 20:25 20:50
10	07:45 17:19 62	15:30 (WTG09) 16:32 (WTG09) 17:54	07:23 17:54 63	15:38 (WTG09) 16:41 (WTG09) 18:25	06:45 17:36 (WTG07) 19:56	05:57 20:26 20:50
11	07:44 17:20 63	15:29 (WTG09) 16:32 (WTG09) 17:55	07:22 17:55 62	15:38 (WTG09) 16:40 (WTG09) 18:26	06:44 17:35 (WTG07) 19:57	05:57 20:27 20:51
12	07:44 17:21 65	15:29 (WTG09) 16:34 (WTG09) 17:56	07:21 17:56 60	15:39 (WTG09) 16:39 (WTG09) 18:27	06:42 17:34 (WTG07) 19:58	05:57 20:28 20:51
13	07:44 17:22 65	15:30 (WTG09) 16:35 (WTG09) 17:58	07:20 17:58 59	15:40 (WTG09) 16:39 (WTG09) 18:28	06:40 17:35 (WTG07) 19:59	05:57 20:29 20:52
14	07:44 17:23 66	15:29 (WTG09) 16:35 (WTG09) 17:59	07:19 17:59 57	15:41 (WTG09) 16:38 (WTG09) 18:29	06:39 17:34 (WTG07) 20:00	05:57 20:30 20:52
15	07:43 17:24 67	15:29 (WTG09) 16:36 (WTG09) 18:00	07:18 18:00 55	15:43 (WTG09) 16:38 (WTG09) 18:30	06:37 17:34 (WTG07) 20:01	05:57 20:30 20:53
16	07:43 17:25 67	15:29 (WTG09) 16:36 (WTG09) 18:01	07:16 18:01 53	15:43 (WTG09) 16:36 (WTG09) 18:31	06:36 17:34 (WTG07) 20:02	05:57 20:31 20:53
17	07:42 17:26 68	15:29 (WTG09) 16:37 (WTG09) 18:02	07:15 18:02 50	15:45 (WTG09) 16:35 (WTG09) 18:32	06:34 17:34 (WTG07) 20:03	05:57 20:32 20:53
18	07:42 17:27 68	15:29 (WTG09) 16:37 (WTG09) 18:03	07:14 18:03 47	15:47 (WTG09) 16:34 (WTG09) 18:33	06:33 17:35 (WTG07) 20:04	05:57 20:33 20:54
19	07:42 17:28 68	15:30 (WTG09) 16:38 (WTG09) 18:05	07:13 18:05 43	15:48 (WTG09) 16:31 (WTG09) 18:34	06:31 17:35 (WTG07) 20:05	05:57 20:34 20:54
20	07:41 17:30 69	15:29 (WTG09) 16:38 (WTG09) 18:06	07:11 18:06 39	15:51 (WTG09) 16:30 (WTG09) 18:35	06:29 17:37 (WTG07) 20:06	05:57 20:35 20:54
21	07:41 17:31 70	15:30 (WTG09) 16:40 (WTG09) 18:07	07:10 18:07 35	15:53 (WTG09) 16:28 (WTG09) 18:36	06:28 17:37 (WTG07) 20:07	05:57 20:36 20:55
22	07:40 17:32 70	15:30 (WTG09) 16:40 (WTG09) 18:08	07:09 18:08 30	15:55 (WTG09) 16:25 (WTG09) 18:37	06:26 17:39 (WTG07) 20:08	05:57 20:37 20:55
23	07:39 17:33 71	15:29 (WTG09) 16:40 (WTG09) 18:09	07:07 18:09 22	16:00 (WTG09) 16:22 (WTG09) 18:38	06:25 17:43 (WTG07) 20:09	05:58 20:38 20:55
24	07:39 17:34 71	15:30 (WTG09) 16:41 (WTG09) 18:10	07:06 18:10 10	16:05 (WTG09) 16:15 (WTG09) 18:39	06:23 20:10 20:38	05:58 20:38 20:55
25	07:38 17:35 71	15:30 (WTG09) 16:41 (WTG09) 18:11	07:04 18:11	06:21 18:40	06:34 20:11 20:39	05:58 20:39 20:55
26	07:37 17:36 71	15:30 (WTG09) 16:41 (WTG09) 18:12	07:03 18:12 2	17:50 (WTG06) 17:52 (WTG06) 18:41	06:20 20:12 20:40	05:58 20:39 20:55
27	07:37 17:38 71	15:30 (WTG09) 16:41 (WTG09) 18:13	07:02 18:13 5	17:47 (WTG06) 17:52 (WTG06) 18:42	06:18 20:13 20:41	05:59 20:40 20:55
28	07:36 17:39 71	15:31 (WTG09) 16:42 (WTG09) 18:15	07:00 18:15 8	17:46 (WTG06) 17:54 (WTG06) 18:43	06:17 20:14 20:42	05:59 20:42 20:55
29	07:35 17:40 72	15:31 (WTG09) 16:43 (WTG09)	06:59 19:44	07:15 19:44	06:29 20:15 20:42	06:00 20:42 20:55
30	07:34 17:41 72	15:31 (WTG09) 16:43 (WTG09)	07:13 19:45	07:13 19:45	06:28 20:16 20:43	06:00 20:43 20:55
31	07:33 17:42 71	15:32 (WTG09) 16:43 (WTG09)	07:12 19:46	07:12 19:46	06:00 20:44	06:00 20:44
Potential sun hours	302	299	370	397	444	447
Total, worst case	2046	1317	517			

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: Worst_case_Progetto_20240628Shadow receptor: F030 - A2 - D7

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	06:23	06:52	07:19	18:14 (WTG07)	06:51	15:06 (WTG09)	07:24	15:11 (WTG09)					
	20:55	20:38	19:57	19:08	31	18:45 (WTG07)	17:24	64	16:10 (WTG09)	17:01	64	16:15 (WTG09)		
2	06:01	06:24	06:53	07:20	18:14 (WTG07)	06:52	15:05 (WTG09)	07:25	15:12 (WTG09)					
	20:55	20:37	19:55	19:07	30	18:44 (WTG07)	17:23	66	16:11 (WTG09)	17:01	63	16:15 (WTG09)		
3	06:01	06:25	06:53	07:21	18:14 (WTG07)	06:54	15:06 (WTG09)	07:26	15:12 (WTG09)					
	20:55	20:36	19:54	19:05	29	18:43 (WTG07)	17:22	66	16:12 (WTG09)	17:01	63	16:15 (WTG09)		
4	06:02	06:26	06:54	07:22	18:14 (WTG07)	06:55	15:05 (WTG09)	07:27	15:13 (WTG09)					
	20:55	20:35	19:52	19:04	28	18:42 (WTG07)	17:21	67	16:12 (WTG09)	17:01	62	16:15 (WTG09)		
5	06:02	06:27	06:55	07:23	18:15 (WTG07)	06:56	15:04 (WTG09)	07:28	15:14 (WTG09)					
	20:55	20:33	19:50	19:02	25	18:40 (WTG07)	17:19	68	16:12 (WTG09)	17:01	61	16:15 (WTG09)		
6	06:03	06:28	06:56	07:24	18:15 (WTG07)	06:57	15:04 (WTG09)	07:29	15:15 (WTG09)					
	20:55	20:32	19:49	19:00	23	18:38 (WTG07)	17:18	68	16:12 (WTG09)	17:01	60	16:15 (WTG09)		
7	06:04	06:28	06:57	07:25	18:17 (WTG07)	06:58	15:03 (WTG09)	07:30	15:15 (WTG09)					
	20:54	20:31	19:47	18:59	20	18:37 (WTG07)	17:17	70	16:13 (WTG09)	17:00	60	16:15 (WTG09)		
8	06:04	06:29	06:58	07:26	18:18 (WTG07)	06:59	15:04 (WTG09)	07:31	15:16 (WTG09)					
	20:54	20:30	19:46	18:57	17	18:35 (WTG07)	17:16	70	16:14 (WTG09)	17:00	59	16:15 (WTG09)		
9	06:05	06:30	06:59	07:27	18:19 (WTG06)	07:00	15:03 (WTG09)	07:32	15:17 (WTG09)					
	20:54	20:29	19:44	18:56	15	18:34 (WTG06)	17:15	71	16:14 (WTG09)	17:00	58	16:15 (WTG09)		
10	06:05	06:31	07:00	07:28	18:18 (WTG06)	07:01	15:03 (WTG09)	07:33	15:18 (WTG09)					
	20:53	20:28	19:42	18:54	14	18:32 (WTG06)	17:14	71	16:14 (WTG09)	17:01	58	16:16 (WTG09)		
11	06:06	06:32	07:01	07:29	18:18 (WTG06)	07:03	15:03 (WTG09)	07:34	15:18 (WTG09)					
	20:53	20:26	19:41	18:53	12	18:30 (WTG06)	17:13	71	16:14 (WTG09)	17:01	57	16:15 (WTG09)		
12	06:07	06:33	07:02	07:30	18:18 (WTG06)	07:04	15:02 (WTG09)	07:34	15:19 (WTG09)					
	20:52	20:25	19:39	18:51	11	18:29 (WTG06)	17:13	72	16:14 (WTG09)	17:01	56	16:15 (WTG09)		
13	06:07	06:34	07:03	07:31	18:19 (WTG06)	07:05	15:03 (WTG09)	07:35	15:20 (WTG09)					
	20:52	20:24	19:38	18:50	8	18:27 (WTG06)	17:12	72	16:15 (WTG09)	17:01	56	16:16 (WTG09)		
14	06:08	06:35	07:04	07:32	18:19 (WTG06)	07:06	15:03 (WTG09)	07:36	15:21 (WTG09)					
	20:52	20:23	19:36	18:48	7	18:26 (WTG06)	17:11	71	16:14 (WTG09)	17:01	55	16:16 (WTG08)		
15	06:09	06:36	07:04	07:33	18:20 (WTG06)	07:07	15:03 (WTG09)	07:37	15:21 (WTG09)					
	20:51	20:21	19:34	18:47	4	18:24 (WTG06)	17:10	71	16:14 (WTG09)	17:01	55	16:16 (WTG08)		
16	06:10	06:37	07:05	07:34	18:22 (WTG06)	07:08	15:03 (WTG09)	07:37	15:22 (WTG09)					
	20:50	20:20	19:33	18:45	1	18:23 (WTG06)	17:09	71	16:14 (WTG09)	17:02	55	16:17 (WTG08)		
17	06:10	06:38	07:06	07:35	18:19 (WTG06)	07:09	15:03 (WTG09)	07:38	15:23 (WTG09)					
	20:50	20:19	19:31	18:44			17:08	71	16:14 (WTG09)	17:02	55	16:18 (WTG08)		
18	06:11	06:39	07:07	07:36	16:34 (WTG09)	07:10	15:04 (WTG09)	07:39	15:23 (WTG09)					
	20:49	20:17	19:29	18:42	15	16:49 (WTG09)	17:08	71	16:15 (WTG09)	17:02	55	16:18 (WTG08)		
19	06:12	06:40	07:08	07:37	16:29 (WTG09)	07:12	15:04 (WTG09)	07:39	15:24 (WTG09)					
	20:49	20:16	19:28	18:41	24	16:53 (WTG09)	17:07	71	16:15 (WTG09)	17:03	55	16:19 (WTG08)		
20	06:13	06:41	07:09	07:38	16:25 (WTG09)	07:13	15:05 (WTG09)	07:40	15:24 (WTG09)					
	20:48	20:14	19:26	7	18:37 (WTG07)	18:39	31	16:56 (WTG09)	17:06	70	16:15 (WTG09)	17:03	55	16:19 (WTG08)
21	06:14	06:41	07:10	07:39	18:26 (WTG07)	07:39	16:23 (WTG09)	07:14	15:05 (WTG09)	07:40	15:25 (WTG09)			
	20:47	20:13	19:25	15	18:41 (WTG07)	18:38	36	16:59 (WTG09)	17:06	70	16:15 (WTG09)	17:03	55	16:20 (WTG08)
22	06:14	06:42	07:11	07:40	18:22 (WTG07)	07:40	16:21 (WTG09)	07:15	15:05 (WTG09)	07:41	15:25 (WTG09)			
	20:47	20:12	19:23	20	18:42 (WTG07)	18:37	40	17:01 (WTG09)	17:05	69	16:14 (WTG09)	17:04	55	16:20 (WTG08)
23	06:15	06:43	07:12	07:42	18:20 (WTG07)	07:42	16:18 (WTG09)	07:16	15:07 (WTG09)	07:41	15:26 (WTG09)			
	20:46	20:10	19:21	23	18:43 (WTG07)	18:35	44	17:02 (WTG09)	17:05	68	16:15 (WTG09)	17:04	55	16:21 (WTG08)
24	06:16	06:44	07:13	07:43	18:19 (WTG07)	07:43	16:16 (WTG09)	07:17	15:07 (WTG09)	07:42	15:26 (WTG09)			
	20:45	20:09	19:20	25	18:44 (WTG07)	18:34	48	17:04 (WTG09)	17:04	68	16:15 (WTG09)	17:05	55	16:21 (WTG08)
25	06:17	06:45	07:14	06:44	18:18 (WTG07)	06:44	15:14 (WTG09)	07:18	15:07 (WTG09)	07:42	15:27 (WTG09)			
	20:44	20:07	19:18	27	18:45 (WTG07)	17:33	51	16:05 (WTG09)	17:04	68	16:15 (WTG09)	17:06	55	16:22 (WTG08)
26	06:18	06:46	07:15	06:45	18:16 (WTG07)	06:45	15:13 (WTG09)	07:19	15:08 (WTG09)	07:43	15:27 (WTG09)			
	20:43	20:06	19:16	29	18:45 (WTG07)	17:31	53	16:06 (WTG09)	17:03	67	16:15 (WTG09)	17:06	55	16:22 (WTG08)
27	06:19	06:47	07:16	06:46	18:16 (WTG07)	06:46	15:11 (WTG09)	07:20	15:08 (WTG09)	07:43	15:27 (WTG09)			
	20:42	20:04	19:15	29	18:45 (WTG07)	17:30	55	16:06 (WTG09)	17:03	67	16:15 (WTG09)	17:07	55	16:22 (WTG08)
28	06:19	06:48	07:17	06:47	18:15 (WTG07)	06:47	15:11 (WTG09)	07:21	15:09 (WTG09)	07:43	15:28 (WTG09)			
	20:42	20:03	19:13	31	18:46 (WTG07)	17:29	57	16:08 (WTG09)	17:02	66	16:15 (WTG09)	17:08	55	16:23 (WTG08)
29	06:20	06:49	07:17	06:48	18:14 (WTG07)	06:48	15:09 (WTG09)	07:22	15:10 (WTG09)	07:44	15:28 (WTG09)			
	20:41	20:01	19:12	31	18:45 (WTG07)	17:28	60	16:09 (WTG09)	17:02	65	16:15 (WTG09)	17:08	55	16:23 (WTG08)
30	06:21	06:50	07:18	06:49	18:14 (WTG07)	06:49	15:08 (WTG09)	07:23	15:10 (WTG09)	07:44	15:28 (WTG09)			
	20:40	20:00	19:10	31	18:45 (WTG07)	17:26	61	16:09 (WTG09)	17:02	65	16:15 (WTG09)	17:09	56	16:24 (WTG09)
31	06:22	06:51		06:50			15:07 (WTG09)			07:44	15:28 (WTG09)			
	20:39	19:58		17:25	63	16:10 (WTG09)				17:10	56	16:24 (WTG09)		
Potential sun hours	454	425	374	347			302			293		1769		
Total, worst case			268	913			2065							

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: Worst_case_Progetto_20240628Shadow receptor: F034 - A2

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	07:44	07:33	06:59	07:10	18:49 (WTG08)	06:27
	17:11	17:44	18:16	19:47	37 19:26 (WTG08)	20:17
2	07:45	07:32	06:57	07:09	18:49 (WTG08)	06:25
	17:12	17:45	18:17	19:48	38 19:27 (WTG08)	20:18
3	07:45	07:31	06:56	07:07	18:48 (WTG08)	06:24
	17:12	17:46	18:18	19:49	38 19:26 (WTG08)	20:19
4	07:45	07:30	06:54	07:05	18:49 (WTG08)	06:23
	17:13	17:47	18:19	19:50	37 19:26 (WTG08)	20:20
5	07:45	07:29	06:53	07:04	18:48 (WTG08)	06:22
	17:14	17:48	18:20	19:51	37 19:25 (WTG08)	20:21
6	07:45	07:28	06:51	07:02	18:48 (WTG08)	06:21
	17:15	17:49	18:21	19:52	36 19:24 (WTG08)	20:22
7	07:45	07:27	06:50	07:01	18:49 (WTG08)	06:20
	17:16	17:51	18:22	19:53	34 19:23 (WTG08)	20:23
8	07:45	07:26	06:48	06:59	18:49 (WTG08)	06:18
	17:17	17:52	18:23	19:54	33 19:22 (WTG08)	20:24
9	07:45	07:25	06:47	06:58	18:50 (WTG08)	06:17
	17:18	17:53	18:24	19:55	31 19:21 (WTG08)	20:25
10	07:44	07:23	06:45	06:56	18:51 (WTG08)	06:16
	17:19	17:54	18:25	19:56	28 19:19 (WTG08)	20:26
11	07:44	07:22	06:44	06:55	18:52 (WTG08)	06:15
	17:20	17:55	18:26	19:57	26 19:18 (WTG08)	20:27
12	07:44	07:21	06:42	06:53	18:53 (WTG08)	06:14
	17:21	17:56	18:27	19:58	22 19:15 (WTG08)	20:28
13	07:44	07:20	06:40	06:52	18:56 (WTG08)	06:13
	17:22	17:58	18:28	19:59	17 19:13 (WTG08)	20:29
14	07:44	07:19	06:39	06:50	18:59 (WTG08)	06:12
	17:23	17:59	18:29	20:00	10 19:09 (WTG08)	20:30
15	07:43	07:18	06:37	06:49		06:11
	17:24	18:00	18:30	20:01		20:30
16	07:43	07:16	06:36	06:47		06:10
	17:25	18:01	18:31	20:02		20:31
17	07:42	07:15	06:34	06:46	19:39 (WTG06)	06:10
	17:26	18:02	18:32	20:03	3 19:42 (WTG06)	20:32
18	07:42	07:14	06:33	06:44	19:37 (WTG06)	06:09
	17:27	18:03	18:33	20:04	5 19:42 (WTG06)	20:33
19	07:42	07:13	06:31	06:43	19:37 (WTG06)	06:08
	17:28	18:05	18:34	20:05	6 19:43 (WTG06)	20:34
20	07:41	07:11	06:29	06:41	19:36 (WTG06)	06:07
	17:30	18:06	18:35	20:06	9 19:45 (WTG06)	20:35
21	07:41	07:10	06:28	06:40	18:07 (WTG08)	06:06
	17:31	18:07	18:36	20:07	9 18:16 (WTG08)	20:07
22	07:40	07:09	06:26	06:39	18:02 (WTG08)	06:05
	17:32	18:08	18:37	20:08	11 18:16 (WTG08)	20:08
23	07:39	07:07	06:25	06:37	18:00 (WTG08)	06:05
	17:33	18:09	18:38	20:09	13 18:18 (WTG08)	20:09
24	07:39	07:06	06:23	06:36	17:57 (WTG08)	06:04
	17:34	18:10	18:39	20:10	22 18:19 (WTG08)	20:10
25	07:38	07:04	06:21	06:34	17:55 (WTG08)	06:03
	17:35	18:11	18:40	20:11	24 18:19 (WTG08)	20:11
26	07:37	07:03	06:20	06:33	17:54 (WTG08)	06:03
	17:36	18:12	18:41	20:12	27 18:21 (WTG08)	20:12
27	07:37	07:02	06:18	06:32	17:52 (WTG08)	06:02
	17:38	18:13	18:42	20:13	29 18:21 (WTG08)	20:13
28	07:36	07:00	06:17	06:30	17:52 (WTG08)	06:02
	17:39	18:15	18:43	20:14	31 18:23 (WTG08)	20:14
29	07:35		07:15	06:29	18:51 (WTG08)	06:01
	17:40		19:44	20:15	8 19:48 (WTG06)	20:42
30	07:34		07:13	06:28	18:49 (WTG08)	06:01
	17:41		19:45	20:16		20:43
31	07:33		07:12	06:28	18:49 (WTG08)	06:00
	17:42		19:46	20:16		20:44
Potential sun hours	302	299	370	397	444	447
Total, worst case			279	556	176	817

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: Worst_case_Progetto_20240628Shadow receptor: F034 - A2

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	20:03 (WTG07)	06:23	06:52	18:51 (WTG08)	07:19	06:51	07:24	
	20:55	20:30 (WTG07)	20:38	19:57	19:17 (WTG08)	19:08	17:24	17:01	
2	06:01	20:04 (WTG07)	06:24	06:53	18:50 (WTG08)	07:20	06:52	07:25	
	20:55	20:31 (WTG07)	20:37	19:55	19:18 (WTG08)	19:07	17:23	17:01	
3	06:01	20:03 (WTG07)	06:25	06:53	18:48 (WTG08)	07:21	06:54	07:26	
	20:55	20:30 (WTG07)	20:36	19:54	19:19 (WTG08)	19:05	17:22	17:01	
4	06:02	20:04 (WTG07)	06:26	06:54	18:47 (WTG08)	07:22	06:55	07:27	
	20:55	20:31 (WTG07)	20:34	19:52	19:20 (WTG08)	19:04	17:21	17:01	
5	06:02	20:04 (WTG07)	06:27	06:55	18:45 (WTG08)	07:23	06:56	07:28	
	20:55	20:30 (WTG07)	20:33	19:50	19:19 (WTG08)	19:02	17:19	17:01	
6	06:03	20:04 (WTG07)	06:28	06:56	18:44 (WTG08)	07:24	06:57	07:29	
	20:54	20:30 (WTG07)	20:32	19:49	19:20 (WTG08)	19:00	17:18	17:01	
7	06:04	20:04 (WTG07)	06:28	06:57	18:43 (WTG08)	07:25	06:58	07:30	
	20:54	20:29 (WTG07)	20:31	19:47	19:20 (WTG08)	18:59	17:17	17:00	
8	06:04	20:05 (WTG07)	06:29	06:58	18:43 (WTG08)	07:26	06:59	07:31	
	20:54	20:29 (WTG07)	20:30	19:46	19:20 (WTG08)	18:57	17:16	17:00	
9	06:05	20:06 (WTG07)	06:30	06:59	18:42 (WTG08)	07:27	07:00	07:32	
	20:54	20:30 (WTG07)	20:29	19:44	19:20 (WTG08)	18:56	17:15	17:00	
10	06:05	20:05 (WTG07)	06:31	07:00	18:42 (WTG08)	07:28	07:01	07:33	
	20:53	20:29 (WTG07)	20:28	19:42	19:20 (WTG08)	18:54	17:14	17:01	
11	06:06	20:06 (WTG07)	06:32	07:01	18:42 (WTG08)	07:29	07:03	07:34	
	20:53	20:29 (WTG07)	20:26	19:41	19:20 (WTG08)	18:53	17:13	17:01	
12	06:07	20:07 (WTG07)	06:33	07:02	18:42 (WTG08)	07:30	07:04	07:34	
	20:52	20:29 (WTG07)	20:25	19:39	19:18 (WTG08)	18:51	17:13	17:01	
13	06:07	20:06 (WTG07)	06:34	19:51 (WTG06)	07:03	18:41 (WTG08)	07:31	07:35	
	20:52	20:27 (WTG07)	20:24	19:52 (WTG06)	19:38	19:15 (WTG08)	18:50	17:12	17:01
14	06:08	20:07 (WTG07)	06:35	19:47 (WTG06)	07:04	18:41 (WTG08)	07:32	07:06	07:36
	20:51	20:27 (WTG07)	20:23	19:57 (WTG06)	19:36	19:14 (WTG08)	18:48	17:11	17:01
15	06:09	20:08 (WTG07)	06:36	19:45 (WTG06)	07:04	18:41 (WTG08)	07:33	07:07	07:37
	20:51	20:27 (WTG07)	20:21	19:58 (WTG06)	19:34	19:12 (WTG08)	18:47	17:10	17:01
16	06:10	20:08 (WTG07)	06:37	19:44 (WTG06)	07:05	18:41 (WTG08)	07:34	07:08	07:37
	20:50	20:26 (WTG07)	20:20	19:58 (WTG06)	19:33	19:11 (WTG08)	18:45	17:09	17:02
17	06:10	20:09 (WTG07)	06:38	19:43 (WTG06)	07:06	18:42 (WTG08)	07:35	07:09	07:38
	20:50	20:26 (WTG07)	20:19	19:57 (WTG06)	19:31	19:09 (WTG08)	18:44	17:08	17:02
18	06:11	20:10 (WTG07)	06:39	19:41 (WTG06)	07:07	18:43 (WTG08)	07:36	07:10	07:39
	20:49	20:25 (WTG07)	20:17	19:55 (WTG06)	19:29	19:08 (WTG08)	18:42	17:08	17:02
19	06:12	20:11 (WTG07)	06:40	19:40 (WTG06)	07:08	18:44 (WTG08)	07:37	07:12	07:39
	20:49	20:25 (WTG07)	20:16	19:53 (WTG06)	19:28	19:06 (WTG08)	18:41	17:07	17:03
20	06:13	20:11 (WTG07)	06:41	19:40 (WTG06)	07:09	18:45 (WTG08)	07:38	07:13	07:40
	20:48	20:24 (WTG07)	20:14	19:52 (WTG06)	19:26	19:05 (WTG08)	18:40	17:06	17:03
21	06:14	20:12 (WTG07)	06:41	19:40 (WTG06)	07:10	18:48 (WTG08)	07:39	07:14	07:40
	20:47	20:23 (WTG07)	20:13	19:51 (WTG06)	19:25	19:03 (WTG08)	18:38	17:06	17:04
22	06:14	20:14 (WTG07)	06:42	19:40 (WTG06)	07:11	18:50 (WTG08)	07:40	07:15	07:41
	20:46	20:23 (WTG07)	20:12	19:50 (WTG06)	19:23	19:01 (WTG08)	18:37	17:05	17:04
23	06:15	20:16 (WTG07)	06:43	19:40 (WTG06)	07:12		07:42	07:16	07:41
	20:46	20:22 (WTG07)	20:10	19:48 (WTG06)	19:21		18:35	17:05	17:05
24	06:16		06:44	19:40 (WTG06)	07:13		07:43	07:17	07:42
	20:45		20:09	19:47 (WTG06)	19:20		18:34	17:04	17:05
25	06:17		06:45	19:41 (WTG06)	07:14		06:44	07:18	07:42
	20:44		20:07	19:46 (WTG06)	19:18		17:33	17:04	17:06
26	06:18		06:46	19:42 (WTG06)	07:15		06:45	07:19	07:43
	20:43		20:06	19:44 (WTG06)	19:16		17:31	17:03	17:06
27	06:19		06:47		07:16		06:46	07:20	07:43
	20:42		20:04		19:15		17:30	17:03	17:07
28	06:19		06:48		07:17		06:47	07:21	07:43
	20:42		20:03		19:13		17:29	17:02	17:08
29	06:20		06:49	18:59 (WTG08)	07:17		06:48	07:22	07:44
	20:41		20:01	19:10 (WTG08)	19:12		17:28	17:02	17:08
30	06:21		06:50	18:56 (WTG08)	07:18		06:49	07:23	07:44
	20:40		20:00	19:13 (WTG08)	19:10		17:26	17:02	17:09
31	06:22		06:51	18:53 (WTG08)			06:50		07:44
	20:39		19:58	19:16 (WTG08)			17:25		17:10
Potential sun hours	454	425		374	660	347	302	293	
Total, worst case	465	185							

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: Worst_case_Progetto_20240628Shadow receptor: F038 - 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
1	07:44 17:11	07:33 17:44	06:59 18:16	07:10 19:47		06:27 20:17	46	18:49 (WTG11) 20:45
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48		06:25 20:18	45	18:49 (WTG11) 20:45
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49		06:24 20:19	44	18:50 (WTG11) 20:46
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50		06:23 20:20	42	18:51 (WTG11) 20:47
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51		06:22 20:21	42	18:51 (WTG11) 20:47
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52		06:21 20:22	40	18:52 (WTG11) 20:48
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53		06:20 20:23	38	18:53 (WTG11) 20:49
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54		06:18 20:24	36	18:54 (WTG11) 20:49
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	10	19:12 (WTG11) 19:22 (WTG11)	06:17 20:25	18:55 (WTG11) 19:29 (WTG11)
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	20	19:06 (WTG11) 19:26 (WTG11)	06:16 20:26	18:56 (WTG11) 19:28 (WTG11)
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	25	19:04 (WTG11) 19:29 (WTG11)	06:15 20:27	18:57 (WTG11) 19:27 (WTG11)
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	29	19:01 (WTG11) 19:30 (WTG11)	06:14 20:28	18:59 (WTG11) 19:25 (WTG11)
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	33	18:59 (WTG11) 19:32 (WTG11)	06:13 20:29	19:00 (WTG11) 19:24 (WTG11)
14	07:43 17:23	07:19 17:59	06:39 18:29	06:50 20:00	36	18:57 (WTG11) 19:33 (WTG11)	06:12 20:29	19:02 (WTG11) 19:22 (WTG11)
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	38	18:56 (WTG11) 19:34 (WTG11)	06:11 20:30	19:04 (WTG11) 19:19 (WTG11)
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	41	18:54 (WTG11) 19:35 (WTG11)	06:10 20:31	19:08 (WTG11) 19:15 (WTG11)
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	42	18:54 (WTG11) 19:36 (WTG11)	06:10 20:32	05:57 20:53
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	44	18:52 (WTG11) 19:36 (WTG11)	06:09 20:33	05:57 20:54
19	07:42 17:28	07:12 18:05	06:31 18:34	06:43 20:05	44	18:52 (WTG11) 19:36 (WTG11)	06:08 20:34	05:57 20:54
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	46	18:51 (WTG11) 19:37 (WTG11)	06:07 20:35	05:57 20:54
21	07:40 17:31	07:10 18:07	06:28 18:36	06:40 20:07	47	18:50 (WTG11) 19:37 (WTG11)	06:06 20:36	05:57 20:54
22	07:40 17:32	07:08 18:08	06:26 18:37	06:39 20:08	47	18:50 (WTG11) 19:37 (WTG11)	06:05 20:37	05:57 20:55
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	48	18:50 (WTG11) 19:38 (WTG11)	06:05 20:38	05:58 20:55
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	48	18:49 (WTG11) 19:37 (WTG11)	06:04 20:38	05:58 20:55
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	48	18:49 (WTG11) 19:37 (WTG11)	06:03 20:39	05:58 20:55
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	48	18:49 (WTG11) 19:37 (WTG11)	06:03 20:40	05:58 20:55
27	07:37 17:38	07:01 18:13	06:18 18:42	06:32 20:13	48	18:48 (WTG11) 19:36 (WTG11)	06:02 20:41	05:59 20:55
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 20:14	47	18:49 (WTG11) 19:36 (WTG11)	06:02 20:42	05:59 20:55
29	07:35 17:40		07:15 19:44	06:29 20:15	47	18:49 (WTG11) 19:36 (WTG11)	06:01 20:42	06:00 20:55
30	07:34 17:41		07:13 19:45	06:28 20:16	46	18:50 (WTG11) 19:36 (WTG11)	06:01 20:43	06:00 20:55
31	07:33 17:42		07:12 19:46				06:00 20:44	
Potential sun hours	302	299	370	397		444		447
Total, worst case				882		521		

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: Worst_case_Progetto_20240628Shadow receptor: F038 - 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

	July	August	September	October	November	December
1	06:00 20:55	06:23 20:38	19:08 (WTG11) 06:52 19:35 (WTG11) 19:57	19:03 (WTG11) 07:19 19:28 (WTG11) 19:08	06:51 17:24	07:24 17:01
2	06:01 20:55	06:24 20:37	19:06 (WTG11) 06:53 19:37 (WTG11) 19:55	19:05 (WTG11) 07:20 19:25 (WTG11) 19:07	06:52 17:23	07:25 17:01
3	06:01 20:55	06:25 20:36	19:05 (WTG11) 06:53 19:38 (WTG11) 19:54	19:10 (WTG11) 07:21 19:20 (WTG11) 19:05	06:54 17:22	07:26 17:01
4	06:02 20:55	06:26 20:34	19:04 (WTG11) 06:54 19:39 (WTG11) 19:52	07:22 19:04	06:55 17:21	07:27 17:01
5	06:02 20:55	06:27 20:33	19:03 (WTG11) 06:55 19:40 (WTG11) 19:50	07:23 19:02	06:56 17:19	07:28 17:01
6	06:03 20:54	06:28 20:32	19:02 (WTG11) 06:56 19:41 (WTG11) 19:49	07:24 19:00	06:57 17:18	07:29 17:01
7	06:04 20:54	06:28 20:31	19:02 (WTG11) 06:57 19:42 (WTG11) 19:47	07:25 18:59	06:58 17:17	07:30 17:01
8	06:04 20:54	06:29 20:30	19:01 (WTG11) 06:58 19:42 (WTG11) 19:46	07:26 18:57	06:59 17:16	07:31 17:00
9	06:05 20:54	06:30 20:29	18:59 (WTG11) 06:59 19:42 (WTG11) 19:44	07:27 18:56	07:00 17:15	07:32 17:01
10	06:05 20:53	06:31 20:28	18:59 (WTG11) 07:00 19:43 (WTG11) 19:42	07:28 18:54	07:01 17:14	07:33 17:01
11	06:06 20:53	06:32 20:26	18:58 (WTG11) 07:01 19:43 (WTG11) 19:41	07:29 18:53	07:03 17:13	07:34 17:01
12	06:07 20:52	06:33 20:25	18:58 (WTG11) 07:02 19:43 (WTG11) 19:39	07:30 18:51	07:04 17:13	07:34 17:01
13	06:07 20:52	06:34 20:24	18:57 (WTG11) 07:03 19:44 (WTG11) 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	06:08 20:51	06:35 20:22	18:57 (WTG11) 07:04 19:44 (WTG11) 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	06:09 20:51	06:36 20:21	18:56 (WTG11) 07:04 19:44 (WTG11) 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	06:10 20:50	06:37 20:20	18:56 (WTG11) 07:05 19:44 (WTG11) 19:33	07:34 18:45	07:08 17:09	07:37 17:02
17	06:10 20:50	06:38 20:19	18:56 (WTG11) 07:06 19:44 (WTG11) 19:31	07:35 18:44	07:09 17:08	07:38 17:02
18	06:11 20:49	06:39 20:17	18:56 (WTG11) 07:07 19:44 (WTG11) 19:29	07:36 18:42	07:10 17:08	07:39 17:02
19	06:12 20:49	06:40 20:16	18:55 (WTG11) 07:08 19:43 (WTG11) 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	06:13 20:48	06:41 20:14	18:55 (WTG11) 07:09 19:42 (WTG11) 19:26	07:38 18:40	07:13 17:06	07:40 17:03
21	06:14 20:47	06:41 20:13	18:55 (WTG11) 07:10 19:42 (WTG11) 19:25	07:39 18:38	07:14 17:06	07:40 17:04
22	06:14 20:46	06:42 20:12	18:55 (WTG11) 07:11 19:41 (WTG11) 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	06:15 20:46	06:43 20:10	18:55 (WTG11) 07:12 19:41 (WTG11) 19:21	07:41 18:35	07:16 17:05	07:41 17:05
24	06:16 20:45	06:44 20:09	18:56 (WTG11) 07:13 19:40 (WTG11) 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	06:17 20:44	06:45 20:07	18:56 (WTG11) 07:14 19:39 (WTG11) 19:18	06:44 17:33	07:18 17:04	07:42 17:06
26	06:18 20:43	06:46 20:06	18:57 (WTG11) 07:15 19:38 (WTG11) 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	06:19 20:42	06:47 20:04	18:56 (WTG11) 07:16 19:36 (WTG11) 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	06:19 20:41	19:17 (WTG11) 06:48 19:27 (WTG11) 20:03	18:57 (WTG11) 07:17 19:35 (WTG11) 19:13	06:47 17:29	07:21 17:02	07:43 17:08
29	06:20 20:41	19:14 (WTG11) 06:49 19:31 (WTG11) 20:01	18:58 (WTG11) 07:17 19:34 (WTG11) 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	06:21 20:40	19:12 (WTG11) 06:50 19:33 (WTG11) 20:00	18:59 (WTG11) 07:18 19:32 (WTG11) 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	06:22 20:39	19:10 (WTG11) 06:51 19:35 (WTG11) 19:58	19:01 (WTG11) 19:30 (WTG11) 19:08	06:50 17:25		07:44 17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case	73	1284	55			

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: Worst_case_Progetto_20240628Shadow receptor: F039 - A3 - 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	
1	07:44	07:33	06:59		07:10		18:57 (WTG11)	06:27	18:46 (WTG11)	06:00
	17:11	17:44	18:16		19:47	21	19:18 (WTG11)	20:17	19:15 (WTG11)	20:45
2	07:45	07:32	06:57		07:09		18:54 (WTG11)	06:25	18:48 (WTG11)	05:59
	17:12	17:45	18:17		19:48	27	19:21 (WTG11)	20:18	19:13 (WTG11)	20:45
3	07:45	07:31	06:56		07:07		18:51 (WTG11)	06:24	18:50 (WTG11)	05:59
	17:12	17:46	18:18		19:49	31	19:22 (WTG11)	20:19	19:11 (WTG11)	20:46
4	07:45	07:30	06:54		07:05		18:50 (WTG11)	06:23	18:53 (WTG11)	05:58
	17:13	17:47	18:19		19:50	34	19:24 (WTG11)	20:20	19:09 (WTG11)	20:47
5	07:45	07:29	06:53		07:04		18:48 (WTG11)	06:22	18:58 (WTG11)	05:58
	17:14	17:48	18:20		19:51	37	19:25 (WTG11)	20:21	19:03 (WTG11)	20:47
6	07:45	07:28	06:51		07:02		18:46 (WTG11)	06:21		05:58
	17:15	17:49	18:21		19:52	40	19:26 (WTG11)	20:22		20:48
7	07:45	07:27	06:50		07:01		18:45 (WTG11)	06:20		05:58
	17:16	17:51	18:22		19:53	42	19:27 (WTG11)	20:23		20:49
8	07:45	07:26	06:48		06:59		18:43 (WTG11)	06:18		05:57
	17:17	17:52	18:23		19:54	44	19:27 (WTG11)	20:24		20:49
9	07:45	07:25	06:47		06:58		18:43 (WTG11)	06:17		05:57
	17:18	17:53	18:24		19:55	45	19:28 (WTG11)	20:25		20:50
10	07:44	07:23	06:45		06:56		18:41 (WTG11)	06:16		05:57
	17:19	17:54	18:25		19:56	47	19:28 (WTG11)	20:26		20:50
11	07:44	07:22	06:44		06:55		18:41 (WTG11)	06:15		05:57
	17:20	17:55	18:26		19:57	48	19:29 (WTG11)	20:27		20:51
12	07:44	07:21	06:42		06:53		18:40 (WTG11)	06:14		05:57
	17:21	17:56	18:27		19:58	48	19:28 (WTG11)	20:28		20:51
13	07:44	07:20	06:40		06:52		18:40 (WTG11)	06:13		05:57
	17:22	17:58	18:28		19:59	49	19:29 (WTG11)	20:29		20:52
14	07:44	07:19	06:39		06:50		18:39 (WTG11)	06:12		05:57
	17:23	17:59	18:29		20:00	49	19:28 (WTG11)	20:29		20:52
15	07:43	07:18	06:37		06:49		18:39 (WTG11)	06:11		05:57
	17:24	18:00	18:30		20:01	50	19:29 (WTG11)	20:30		20:53
16	07:43	07:16	06:36		06:47		18:38 (WTG11)	06:10		05:57
	17:25	18:01	18:31		20:02	50	19:28 (WTG11)	20:31		20:53
17	07:42	07:15	06:34		06:46		18:38 (WTG11)	06:10		05:57
	17:26	18:02	18:32		20:03	50	19:28 (WTG11)	20:32		20:53
18	07:42	07:14	06:33		06:44		18:38 (WTG11)	06:09		05:57
	17:27	18:03	18:33		20:04	49	19:27 (WTG11)	20:33		20:54
19	07:42	07:12	06:31		06:43		18:38 (WTG11)	06:08		05:57
	17:28	18:05	18:34		20:05	49	19:27 (WTG11)	20:34		20:54
20	07:41	07:11	06:29		06:41		18:39 (WTG11)	06:07		05:57
	17:30	18:06	18:35		20:06	48	19:27 (WTG11)	20:35		20:54
21	07:40	07:10	06:28		06:40		18:38 (WTG11)	06:06		05:57
	17:31	18:07	18:36		20:07	48	19:26 (WTG11)	20:36		20:54
22	07:40	07:08	06:26		06:39		18:39 (WTG11)	06:05		05:57
	17:32	18:08	18:37		20:08	47	19:26 (WTG11)	20:37		20:55
23	07:39	07:07	06:25		06:37		18:40 (WTG11)	06:05		05:58
	17:33	18:09	18:38		20:09	45	19:25 (WTG11)	20:38		20:55
24	07:39	07:06	06:23		06:36		18:39 (WTG11)	06:04		05:58
	17:34	18:10	18:39		20:10	45	19:24 (WTG11)	20:38		20:55
25	07:38	07:04	06:21		06:34		18:40 (WTG11)	06:03		05:58
	17:35	18:11	18:40		20:11	43	19:23 (WTG11)	20:39		20:55
26	07:37	07:03	06:20		06:33		18:41 (WTG11)	06:03		05:58
	17:36	18:12	18:41		20:12	42	19:23 (WTG11)	20:40		20:55
27	07:37	07:01	06:18		06:32		18:41 (WTG11)	06:02		05:59
	17:38	18:13	18:42		20:13	40	19:21 (WTG11)	20:41		20:55
28	07:36	07:00	06:17		06:30		18:42 (WTG11)	06:02		05:59
	17:39	18:15	18:43		20:14	38	19:20 (WTG11)	20:42		20:55
29	07:35		07:15		06:29		18:44 (WTG11)	06:01		06:00
	17:40		19:44		20:15	35	19:19 (WTG11)	20:42		20:55
30	07:34		07:13		06:28		18:45 (WTG11)	06:01		06:00
	17:41		19:45		20:16	33	19:18 (WTG11)	20:43		20:55
31	07:33		07:12	19:02 (WTG11)				06:00		
	17:42		19:46	12 19:14 (WTG11)				20:44		
Potential sun hours	302	299	370		397		444			447
Total, worst case				12		1274		96		

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: Worst_case_Progetto_20240628Shadow receptor: F039 - A3 - 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

	July	August	September	October	November	December
1	06:00 20:55	06:23 20:38	06:52 19:57	18:40 (WTG11) 19:28 (WTG11)	07:19 19:08	06:51 17:24
2	06:01 20:55	06:24 20:37	06:53 19:55	18:40 (WTG11) 19:27 (WTG11)	07:20 19:07	06:52 17:23
3	06:01 20:55	06:25 20:36	06:53 19:54	18:41 (WTG11) 19:26 (WTG11)	07:21 19:05	06:54 17:22
4	06:02 20:55	06:26 20:31	06:54 19:52	18:40 (WTG11) 19:24 (WTG11)	07:22 19:04	06:55 17:21
5	06:02 20:55	06:27 20:33	06:55 19:50	18:41 (WTG11) 19:23 (WTG11)	07:23 19:02	06:56 17:19
6	06:03 20:54	06:28 20:32	06:56 19:49	18:42 (WTG11) 19:22 (WTG11)	07:24 19:00	06:57 17:18
7	06:04 20:54	06:28 20:31	06:57 19:47	18:42 (WTG11) 19:20 (WTG11)	07:25 18:59	06:58 17:17
8	06:04 20:54	06:29 20:30	06:58 19:46	18:44 (WTG11) 19:19 (WTG11)	07:26 18:57	06:59 17:16
9	06:05 20:54	06:30 20:29	06:59 19:44	18:45 (WTG11) 19:17 (WTG11)	07:27 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	07:00 19:42	18:47 (WTG11) 19:14 (WTG11)	07:28 18:54	07:01 17:14
11	06:06 20:53	06:32 20:26	07:01 19:41	18:49 (WTG11) 19:11 (WTG11)	07:29 18:53	07:03 17:13
12	06:07 20:52	06:33 20:25	07:02 19:39	18:53 (WTG11) 19:07 (WTG11)	07:30 18:51	07:04 17:13
13	06:07 20:52	06:34 20:24	07:03 19:38	18:52 (WTG11) 19:26 (WTG11)	07:31 18:50	07:05 17:12
14	06:08 20:51	06:35 20:22	07:04 19:36	18:51 (WTG11) 19:27 (WTG11)	07:32 18:48	07:06 17:11
15	06:09 20:51	06:36 20:21	07:04 19:34	18:50 (WTG11) 19:28 (WTG11)	07:33 18:47	07:07 17:10
16	06:10 20:50	06:37 20:20	07:05 19:33	18:49 (WTG11) 19:29 (WTG11)	07:34 18:45	07:08 17:09
17	06:10 20:50	06:38 20:19	07:06 19:31	18:48 (WTG11) 19:29 (WTG11)	07:35 18:44	07:09 17:08
18	06:11 20:49	06:39 20:17	07:07 19:29	18:47 (WTG11) 19:30 (WTG11)	07:36 18:42	07:10 17:08
19	06:12 20:49	06:40 20:16	07:08 19:28	18:45 (WTG11) 19:30 (WTG11)	07:37 18:41	07:39 17:07
20	06:13 20:48	06:41 20:14	07:09 19:26	18:44 (WTG11) 19:30 (WTG11)	07:38 18:40	07:40 17:06
21	06:14 20:47	06:41 20:13	07:10 19:25	18:44 (WTG11) 19:30 (WTG11)	07:39 18:38	07:40 17:06
22	06:14 20:46	06:42 20:12	07:11 19:23	18:43 (WTG11) 19:31 (WTG11)	07:40 18:37	07:41 17:05
23	06:15 20:46	06:43 20:10	07:12 19:21	18:42 (WTG11) 19:31 (WTG11)	07:41 18:35	07:41 17:05
24	06:16 20:45	06:44 20:09	07:13 19:20	18:42 (WTG11) 19:31 (WTG11)	07:43 18:34	07:42 17:04
25	06:17 20:44	06:45 20:07	07:14 19:18	18:42 (WTG11) 19:31 (WTG11)	07:44 17:33	07:42 17:04
26	06:18 20:43	06:46 20:06	07:15 19:16	18:41 (WTG11) 19:31 (WTG11)	06:45 17:31	07:19 17:03
27	06:19 20:42	06:47 20:04	07:16 19:15	18:40 (WTG11) 19:30 (WTG11)	06:46 17:30	07:20 17:03
28	06:19 20:41	06:48 20:03	07:17 19:13	18:40 (WTG11) 19:30 (WTG11)	06:47 17:29	07:21 17:02
29	06:20 20:41	06:49 20:01	07:17 19:12	18:40 (WTG11) 19:29 (WTG11)	06:48 17:28	07:22 17:02
30	06:21 20:40	06:50 20:00	07:18 19:10	18:40 (WTG11) 19:29 (WTG11)	06:49 17:26	07:23 17:02
31	06:22 20:39	06:51 19:58	07:18 19:08	18:40 (WTG11) 19:28 (WTG11)	06:50 17:25	07:44 17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case		968	434			

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 Nuraminis

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:
28/06/2024 12:41/3.4.415

SHADOW - Calendar

Calculation: Worst_case_Progetto_20240628Shadow receptor: F065 - A3-C6

Assumptions for shadow calculations

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

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

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains time intervals and WTG status (e.g., 07:45 08:06 (WTG02) 07:33 06:59 07:10 06:27 06:00 06:00 06:23 06:52 07:20 06:51 07:25 07:50 (WTG02)).

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

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



SHADOW - Calendar

Calculation: Worst_case_Progetto_20240628Shadow receptor: F083 - A3

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 17:11 38	15:50 (WTG02) 16:28 (WTG02) 17:43	07:33 17:43 45	07:52 (WTG03) 08:37 (WTG03) 18:16	17:29 (WTG01) 17:49 (WTG01) 19:47	06:27 20:17 20:45
2	07:45 17:12 38	15:51 (WTG02) 16:29 (WTG02) 17:45	07:32 17:45 47	07:51 (WTG03) 08:38 (WTG03) 18:17	17:30 (WTG01) 17:49 (WTG01) 19:48	06:25 20:18 20:45
3	07:45 17:12 38	15:51 (WTG02) 16:29 (WTG02) 17:46	07:31 17:46 48	07:50 (WTG03) 08:38 (WTG03) 18:18	17:30 (WTG01) 17:47 (WTG01) 19:49	06:24 20:19 20:46
4	07:45 17:13 37	15:52 (WTG02) 16:29 (WTG02) 17:47	07:30 17:47 49	07:49 (WTG03) 08:39 (WTG03) 18:19	17:33 (WTG01) 17:45 (WTG01) 19:50	06:23 20:20 20:47
5	07:45 17:14 37	15:53 (WTG02) 16:30 (WTG02) 17:48	07:29 17:48 51	07:48 (WTG03) 08:39 (WTG03) 18:20	17:36 (WTG01) 17:41 (WTG01) 19:51	06:22 20:21 20:48
6	07:45 17:15 37	15:53 (WTG02) 16:30 (WTG02) 17:49	07:28 17:49 52	07:47 (WTG03) 08:39 (WTG03) 18:21	07:02 19:52 20:22	06:21 20:48 20:48
7	07:45 17:16 37	15:54 (WTG02) 16:31 (WTG02) 17:51	07:27 17:51 53	07:46 (WTG03) 08:39 (WTG03) 18:22	07:01 19:53 20:23	06:19 20:49 20:49
8	07:45 17:17 36	15:55 (WTG02) 16:31 (WTG02) 17:52	07:26 17:52 53	07:46 (WTG03) 08:39 (WTG03) 18:23	06:59 19:54 20:24	06:18 20:49 20:49
9	07:45 17:18 35	15:56 (WTG02) 16:31 (WTG02) 17:53	07:25 17:53 53	07:46 (WTG03) 08:39 (WTG03) 18:24	06:58 19:55 20:25	06:17 20:50 20:50
10	07:45 17:19 35	15:57 (WTG02) 16:32 (WTG02) 17:54	07:24 17:54 52	07:47 (WTG03) 08:39 (WTG03) 18:25	06:56 19:56 20:26	06:16 20:50 20:50
11	07:44 17:20 34	15:57 (WTG02) 16:31 (WTG02) 17:55	07:22 17:55 52	07:46 (WTG03) 08:38 (WTG03) 18:26	06:55 19:57 20:27	06:15 20:51 20:51
12	07:44 17:21 33	15:58 (WTG02) 16:31 (WTG02) 17:56	07:21 17:56 51	07:47 (WTG03) 08:38 (WTG03) 18:27	06:53 19:58 20:28	06:14 20:51 20:51
13	07:44 17:22 38	08:05 (WTG03) 16:32 (WTG02) 17:58	07:20 17:58 51	07:47 (WTG03) 08:38 (WTG03) 18:28	06:52 19:59 20:29	06:13 20:52 20:52
14	07:44 17:23 42	08:04 (WTG03) 16:31 (WTG02) 17:59	07:19 17:59 50	07:48 (WTG03) 08:38 (WTG03) 18:29	06:50 20:00 20:30	06:12 20:52 20:52
15	07:43 17:24 44	08:04 (WTG03) 16:31 (WTG02) 18:00	07:18 18:00 49	07:49 (WTG03) 08:38 (WTG03) 18:30	06:49 20:01 20:31	06:11 20:53 20:53
16	07:43 17:25 45	08:03 (WTG03) 16:30 (WTG02) 18:01	07:16 18:01 47	07:49 (WTG03) 08:36 (WTG03) 18:31	06:47 20:02 20:31	06:10 20:53 20:53
17	07:43 17:26 46	08:03 (WTG03) 16:30 (WTG02) 18:02	07:15 18:02 45	07:50 (WTG03) 08:35 (WTG03) 18:32	06:46 20:03 20:32	06:09 20:54 20:54
18	07:42 17:27 46	08:03 (WTG03) 16:30 (WTG02) 18:03	07:14 18:03 48	07:51 (WTG03) 17:42 (WTG01) 18:33	06:44 20:04 20:33	06:09 20:54 20:54
19	07:42 17:28 46	08:02 (WTG03) 16:29 (WTG02) 18:04	07:13 18:04 50	07:51 (WTG03) 17:42 (WTG01) 18:34	06:43 20:05 20:34	06:08 20:54 20:54
20	07:41 17:30 46	08:01 (WTG03) 16:28 (WTG02) 18:06	07:11 18:06 51	07:53 (WTG03) 17:44 (WTG01) 18:35	06:41 20:06 20:35	06:07 20:54 20:54
21	07:41 17:31 44	08:01 (WTG03) 16:27 (WTG02) 18:07	07:10 18:07 52	07:54 (WTG03) 17:46 (WTG01) 18:36	06:40 20:07 20:36	06:06 20:55 20:55
22	07:40 17:32 42	08:00 (WTG03) 16:25 (WTG02) 18:08	07:09 18:08 50	07:55 (WTG03) 17:46 (WTG01) 18:37	06:39 20:08 20:37	06:05 20:55 20:55
23	07:39 17:33 38	07:59 (WTG03) 16:22 (WTG02) 18:09	07:07 18:09 49	07:57 (WTG03) 17:48 (WTG01) 18:38	06:37 20:09 20:38	06:05 20:55 20:55
24	07:39 17:34 32	07:59 (WTG03) 08:31 (WTG03) 18:10	07:06 18:10 45	07:59 (WTG03) 17:48 (WTG01) 18:39	06:36 20:10 20:39	06:04 20:55 20:55
25	07:38 17:35 34	07:58 (WTG03) 08:32 (WTG03) 18:11	07:04 18:11 40	08:03 (WTG03) 17:50 (WTG01) 18:40	06:34 20:11 20:39	06:03 20:55 20:55
26	07:37 17:36 36	07:57 (WTG03) 08:33 (WTG03) 18:12	07:03 18:12 30	08:09 (WTG03) 17:52 (WTG01) 18:41	06:33 20:12 20:40	06:03 20:55 20:55
27	07:37 17:38 37	07:57 (WTG03) 08:34 (WTG03) 18:13	07:02 18:13 23	17:28 (WTG01) 17:51 (WTG01) 18:42	06:32 20:13 20:41	06:02 20:55 20:55
28	07:36 17:39 39	07:56 (WTG03) 08:35 (WTG03) 18:14	07:00 18:14 22	17:29 (WTG01) 17:51 (WTG01) 18:43	06:30 20:14 20:42	06:01 20:56 20:56
29	07:35 17:40 41	07:55 (WTG03) 08:36 (WTG03)		07:15 19:44	06:29 20:15 20:43	06:01 20:56 20:56
30	07:34 17:41 42	07:54 (WTG03) 08:36 (WTG03)		07:13 19:45	06:28 20:16 20:43	06:00 20:55 20:55
31	07:34 17:42 44	07:53 (WTG03) 08:37 (WTG03)		07:12 19:46	06:00 20:44	06:00 20:44
Potential sun hours	302	299	370	397	444	447
Total, worst case	1217	1308	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: Worst_case_Progetto_20240628Shadow receptor: F083 - A3

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	06:23 20:38	06:52 19:57	07:19 19:08		06:51 17:24	52	07:16 (WTG03) 08:08 (WTG03)	07:25 17:01	34	15:39 (WTG02) 16:13 (WTG02)
2	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07		06:53 17:23	53	07:16 (WTG03) 08:09 (WTG03)	07:26 17:01	35	15:39 (WTG02) 16:14 (WTG02)
3	06:01 20:55	06:25 20:36	06:53 19:54	07:21 19:05		06:54 17:22	53	07:16 (WTG03) 08:09 (WTG03)	07:26 17:01	35	15:39 (WTG02) 16:14 (WTG02)
4	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04		06:55 17:21	53	07:16 (WTG03) 08:09 (WTG03)	07:27 17:01	36	15:39 (WTG02) 16:15 (WTG02)
5	06:02 20:55	06:27 20:33	06:55 19:50	07:23 19:02		06:56 17:19	52	07:17 (WTG03) 08:09 (WTG03)	07:28 17:01	37	15:39 (WTG02) 16:16 (WTG02)
6	06:03 20:55	06:28 20:32	06:56 19:49	07:24 19:00		06:57 17:18	51	07:18 (WTG03) 08:09 (WTG03)	07:29 17:00	37	15:39 (WTG02) 16:16 (WTG02)
7	06:03 20:54	06:28 20:31	06:57 19:47	07:25 18:59		06:58 17:17	49	07:20 (WTG03) 08:09 (WTG03)	07:30 17:00	37	15:40 (WTG02) 16:17 (WTG02)
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57		06:59 17:16	48	07:21 (WTG03) 08:09 (WTG03)	07:31 17:00	38	15:40 (WTG02) 16:18 (WTG02)
9	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	9	18:09 (WTG01) 18:18 (WTG01)	07:00 17:15	07:22 (WTG03) 08:09 (WTG03)	07:32 17:00	37	15:41 (WTG02) 16:18 (WTG02)
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	14	18:06 (WTG01) 18:20 (WTG01)	07:02 17:14	07:23 (WTG03) 08:08 (WTG03)	07:33 17:00	38	15:41 (WTG02) 16:19 (WTG02)
11	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	18	18:04 (WTG01) 18:22 (WTG01)	07:03 17:13	07:24 (WTG03) 08:08 (WTG03)	07:34 17:01	38	15:42 (WTG02) 16:20 (WTG02)
12	06:07 20:53	06:33 20:25	07:02 19:39	07:30 18:51	20	18:03 (WTG01) 18:23 (WTG01)	07:04 17:13	07:26 (WTG03) 08:08 (WTG03)	07:34 17:01	38	15:41 (WTG02) 16:19 (WTG02)
13	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	21	18:02 (WTG01) 18:23 (WTG01)	07:05 17:12	07:27 (WTG03) 08:08 (WTG03)	07:35 17:01	38	15:42 (WTG02) 16:20 (WTG02)
14	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:48	22	18:01 (WTG01) 18:23 (WTG01)	07:06 17:11	07:28 (WTG03) 08:07 (WTG03)	07:36 17:01	39	15:42 (WTG02) 16:21 (WTG02)
15	06:09 20:51	06:36 20:21	07:04 19:34	07:33 18:47	23	18:00 (WTG01) 18:23 (WTG01)	07:07 17:10	07:29 (WTG03) 08:06 (WTG03)	07:37 17:01	39	15:43 (WTG02) 16:22 (WTG02)
16	06:10 20:51	06:37 20:20	07:05 19:33	07:34 18:45	35	08:37 (WTG03) 18:23 (WTG01)	07:08 17:09	07:30 (WTG03) 08:06 (WTG03)	07:37 17:02	38	15:43 (WTG02) 16:21 (WTG02)
17	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	41	08:33 (WTG03) 18:21 (WTG01)	07:09 17:08	07:32 (WTG03) 08:06 (WTG03)	07:38 17:02	38	15:44 (WTG02) 16:22 (WTG02)
18	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	45	08:30 (WTG03) 18:19 (WTG01)	07:11 17:08	07:33 (WTG03) 08:05 (WTG03)	07:39 17:02	38	15:44 (WTG02) 16:22 (WTG02)
19	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	49	08:27 (WTG03) 18:18 (WTG01)	07:12 17:07	07:34 (WTG03) 15:57 (WTG02)	07:39 17:03	39	15:44 (WTG02) 16:23 (WTG02)
20	06:13 20:48	06:41 20:14	07:09 19:26	07:38 18:39	51	08:26 (WTG03) 18:17 (WTG01)	07:13 17:06	07:35 (WTG03) 16:00 (WTG02)	07:40 17:03	39	15:45 (WTG02) 16:24 (WTG02)
21	06:13 20:47	06:41 20:13	07:10 19:25	07:39 18:38	52	08:24 (WTG03) 18:16 (WTG01)	07:14 17:06	07:36 (WTG03) 16:02 (WTG02)	07:41 17:03	39	15:45 (WTG02) 16:24 (WTG02)
22	06:14 20:47	06:42 20:12	07:11 19:23	07:41 18:37	51	08:23 (WTG03) 18:14 (WTG01)	07:15 17:05	07:37 (WTG03) 16:04 (WTG02)	07:41 17:04	39	15:46 (WTG02) 16:25 (WTG02)
23	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	50	08:22 (WTG03) 18:13 (WTG01)	07:16 17:05	07:39 (WTG03) 16:06 (WTG02)	07:42 17:04	39	15:46 (WTG02) 16:25 (WTG02)
24	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	46	08:20 (WTG03) 18:11 (WTG01)	07:17 17:04	07:40 (WTG03) 16:07 (WTG02)	07:42 17:05	39	15:46 (WTG02) 16:25 (WTG02)
25	06:17 20:44	06:45 20:07	07:14 19:18	07:44 17:33	46	07:19 (WTG03) 08:05 (WTG03)	07:18 17:04	07:41 (WTG03) 16:08 (WTG02)	07:42 17:06	39	15:47 (WTG02) 16:26 (WTG02)
26	06:18 20:43	06:46 20:06	07:15 19:16	07:45 17:31	48	07:18 (WTG03) 08:06 (WTG03)	07:19 17:03	07:42 (WTG03) 16:09 (WTG02)	07:43 17:06	38	15:48 (WTG02) 16:26 (WTG02)
27	06:19 20:42	06:47 20:04	07:16 19:15	07:46 17:30	49	07:17 (WTG03) 08:06 (WTG03)	07:20 17:03	07:43 (WTG03) 16:10 (WTG02)	07:43 17:07	38	15:48 (WTG02) 16:26 (WTG02)
28	06:19 20:42	06:48 20:03	07:17 19:13	07:47 17:29	50	07:18 (WTG03) 08:08 (WTG03)	07:21 17:02	07:44 (WTG03) 16:11 (WTG02)	07:44 17:07	38	15:49 (WTG02) 16:27 (WTG02)
29	06:20 20:41	06:49 20:01	07:18 19:12	07:48 17:28	51	07:17 (WTG03) 08:08 (WTG03)	07:22 17:02	07:45 (WTG03) 16:12 (WTG02)	07:44 17:08	39	15:49 (WTG02) 16:28 (WTG02)
30	06:21 20:40	06:50 20:00	07:18 19:10	07:49 17:26	52	07:16 (WTG03) 08:08 (WTG03)	07:23 17:02	15:39 (WTG02) 16:12 (WTG02)	07:44 17:09	38	15:50 (WTG02) 16:28 (WTG02)
31	06:22 20:39	06:51 19:58		07:50 17:25	52	07:16 (WTG03) 08:08 (WTG03)			07:44 17:10	38	15:50 (WTG02) 16:28 (WTG02)
Potential sun hours	454	425	374	347		302			293		1172
Total, worst case					895		1317				

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: Worst_case_Progetto_20240628Shadow receptor: F094 - D1

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 17:11	07:33 17:44	06:59 18:16	07:10 19:47	06:27 20:17	06:00 20:45	06:01 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:45	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	07:45 17:13	07:31 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:59 20:46	06:01 20:55	06:25 20:36	06:54 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	07:45 17:13	07:30 17:47	06:54 18:19	07:06 19:50	06:23 20:20	05:59 20:47	06:02 20:55	06:26 20:34	06:54 19:52	07:22 19:04	06:55 17:21	07:27 17:01
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:47	06:03 20:55	06:27 20:33	06:55 19:50	07:23 19:02	06:56 17:20	07:28 17:01
6	07:45 17:15	07:28 17:50	06:51 18:21	07:02 19:52	06:21 20:22	05:58 20:48	06:03 20:54	06:28 20:32	06:56 19:49	07:24 19:00	06:57 17:18	07:29 17:01
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	06:20 20:23	05:58 20:49	06:04 20:54	06:29 20:31	06:57 19:47	07:25 18:59	06:58 17:17	07:30 17:01
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	06:19 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:01
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 17:15	07:32 17:01
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 20:50	06:06 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:01 17:14	07:33 17:01
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	07:03 17:14	07:34 17:01
12	07:44 17:21	07:21 17:57	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51	06:07 20:52	06:33 20:25	07:02 19:39	07:30 18:51	07:04 17:13	07:34 17:01
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:57 20:52	06:08 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:29	05:57 20:52	06:08 20:51	06:35 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:30	05:57 20:53	06:09 20:51	06:36 20:21	07:05 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:53	06:10 20:50	06:37 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:02
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	06:10 20:32	05:57 20:53	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 17:09	07:38 17:02
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:54	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	07:10 17:08	07:39 17:02
19	07:42 17:29	07:13 18:05	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:54	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	06:07 20:35	05:57 20:54	06:13 20:48	06:41 20:14	07:09 19:26	07:38 18:40	07:13 17:06	07:40 17:03
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:55	06:14 20:47	06:42 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:40 17:04
22	07:40 17:32	07:09 18:08	06:26 18:37	06:39 20:08	06:06 20:37	05:57 20:55	06:14 20:46	06:42 20:12	07:11 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	06:05 20:38	05:58 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	07:16 17:05	07:41 17:05
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 20:38	05:58 20:55	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:58 20:55	06:17 20:44	06:45 20:07	07:14 19:18	06:44 17:33	07:18 17:04	07:42 17:06
26	07:37 17:37	07:03 18:12	06:20 18:41	06:33 20:12	06:03 20:40	05:59 20:55	06:18 20:43	06:46 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 20:41	05:59 20:55	06:19 20:42	06:47 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	07:36 17:39	07:00 18:15	06:17 18:43	06:31 20:14	06:02 20:42	05:59 20:55	06:20 20:41	06:48 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:43 17:08
29	07:35 17:40		07:15 19:44	06:29 20:15	06:01 20:42	06:00 20:55	06:20 20:41	06:49 20:01	07:18 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	07:34 17:41		07:13 19:45	06:28 20:16	06:01 20:43	06:00 20:55	06:21 20:40	06:50 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	07:33 17:42		07:12 19:46		06:00 20:44		06:22 20:39	06:51 19:58		06:50 17:25		07:44 17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
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: Worst_case_Progetto_20240628Shadow receptor: F095 - A3

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	07:33	06:59	07:10	06:27	06:00	06:01	06:23	06:52	07:19	06:51	07:24
	17:11	17:44	18:16	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:52	07:25
	17:12	17:45	18:17	19:48	20:18	20:45	20:55	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:26
	17:13	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:22	17:01
4	07:45	07:30	06:54	07:06	06:23	05:59	06:02	06:26	06:54	07:22	06:55	07:27
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:34	19:52	19:04	17:21	17:01
5	07:45	07:29	06:53	07:04	06:22	05:58	06:03	06:27	06:55	07:23	06:56	07:28
	17:14	17:48	18:20	19:51	20:21	20:47	20:55	20:33	19:50	19:02	17:20	17:01
6	07:45	07:28	06:51	07:02	06:21	05:58	06:03	06:28	06:56	07:24	06:57	07:29
	17:15	17:50	18:21	19:52	20:22	20:48	20:54	20:32	19:49	19:00	17:18	17:01
7	07:45	07:27	06:50	07:01	06:20	05:58	06:04	06:29	06:57	07:25	06:58	07:30
	17:16	17:51	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:01
8	07:45	07:26	06:48	06:59	06:19	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:01
9	07:45	07:25	06:47	06:58	06:17	05:57	06:05	06:30	06:59	07:27	07:00	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:01
10	07:44	07:23	06:45	06:56	06:16	05:57	06:06	06:31	07:00	07:28	07:01	07:33
	17:19	17:54	18:25	19:56	20:26	20:50	20:53	20:28	19:42	18:54	17:14	17:01
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:53	17:14	17:01
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30	07:04	07:34
	17:21	17:57	18:27	19:58	20:28	20:51	20:52	20:25	19:39	18:51	17:13	17:01
13	07:44	07:20	06:40	06:52	06:13	05:57	06:08	06:34	07:03	07:31	07:05	07:35
	17:22	17:58	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:12	17:01
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35	07:04	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:52	20:51	20:23	19:36	18:48	17:11	17:01
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36	07:05	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:30	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37	07:05	07:34	07:08	07:37
	17:25	18:01	18:31	20:02	20:31	20:53	20:50	20:20	19:33	18:45	17:09	17:02
17	07:42	07:15	06:34	06:46	06:10	05:57	06:10	06:38	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:53	20:50	20:19	19:31	18:44	17:09	17:02
18	07:42	07:14	06:33	06:44	06:09	05:57	06:11	06:39	07:07	07:36	07:10	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:30	18:42	17:08	17:02
19	07:42	07:13	06:31	06:43	06:08	05:57	06:12	06:40	07:08	07:37	07:12	07:39
	17:29	18:05	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:03
20	07:41	07:11	06:29	06:41	06:07	05:57	06:13	06:41	07:09	07:38	07:13	07:40
	17:30	18:06	18:35	20:06	20:35	20:54	20:48	20:14	19:26	18:40	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:14	06:42	07:10	07:39	07:14	07:40
	17:31	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:25	18:38	17:06	17:04
22	07:40	07:09	06:26	06:39	06:06	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:46	20:12	19:23	18:37	17:05	17:04
23	07:39	07:07	06:25	06:37	06:05	05:58	06:15	06:43	07:12	07:42	07:16	07:41
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:05	17:05
24	07:39	07:06	06:23	06:36	06:04	05:58	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:38	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:17	06:45	07:14	06:44	07:18	07:42
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:33	17:04	17:06
26	07:37	07:03	06:20	06:33	06:03	05:59	06:18	06:46	07:15	06:45	07:19	07:43
	17:37	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:32	06:02	05:59	06:19	06:47	07:16	06:46	07:20	07:43
	17:38	18:13	18:42	20:13	20:41	20:55	20:42	20:04	19:15	17:30	17:03	17:07
28	07:36	07:00	06:17	06:31	06:02	05:59	06:20	06:48	07:17	06:47	07:21	07:43
	17:39	18:15	18:43	20:14	20:42	20:55	20:42	20:03	19:13	17:29	17:02	17:08
29	07:35		07:15	06:29	06:01	06:00	06:20	06:49	07:18	06:48	07:22	07:44
	17:40		19:44	20:15	20:42	20:55	20:41	20:01	19:12	17:28	17:02	17:08
30	07:34		07:13	06:28	06:01	06:00	06:21	06:50	07:18	06:49	07:23	07:44
	17:41		19:45	20:16	20:43	20:55	20:40	20:00	19:10	17:26	17:02	17:09
31	07:33		07:12		06:00		06:22	06:51		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
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: Worst_case_Progetto_20240628Shadow receptor: F108 - A2

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 17:11	07:33 17:43	06:59 18:16		07:10 19:47		18:22 (WTG03) 19:19 (WTG03)	06:27 20:17	05:59 20:45
2	07:45 17:11	07:32 17:45	06:57 18:17		07:09 19:48	57	18:23 (WTG03) 19:19 (WTG03)	06:25 20:18	05:59 20:45
3	07:45 17:12	07:31 17:46	06:56 18:18		07:07 19:49	56	18:22 (WTG03) 19:19 (WTG03)	06:24 20:19	05:59 20:46
4	07:45 17:13	07:30 17:47	06:54 18:19		07:05 19:50	57	18:22 (WTG03) 19:18 (WTG03)	06:23 20:20	05:58 20:47
5	07:45 17:14	07:29 17:48	06:53 18:20		07:04 19:51	56	18:22 (WTG03) 19:18 (WTG03)	06:22 20:21	05:58 20:47
6	07:45 17:15	07:28 17:49	06:51 18:21		07:02 19:52	56	18:22 (WTG03) 19:17 (WTG03)	06:21 20:22	05:58 20:48
7	07:45 17:16	07:27 17:51	06:50 18:22		07:01 19:53	55	18:22 (WTG03) 19:17 (WTG03)	06:19 20:23	05:57 20:49
8	07:45 17:17	07:26 17:52	06:48 18:23		06:59 19:54	54	18:22 (WTG03) 19:16 (WTG03)	06:18 20:24	05:57 20:49
9	07:45 17:18	07:25 17:53	06:47 18:24		06:58 19:55	54	18:23 (WTG03) 19:15 (WTG03)	06:17 20:25	05:57 20:50
10	07:45 17:19	07:23 17:54	06:45 18:25		06:56 19:56	53	18:23 (WTG03) 19:14 (WTG03)	06:16 20:26	05:57 20:50
11	07:44 17:20	07:22 17:55	06:44 18:26		06:55 19:57	52	18:24 (WTG03) 19:14 (WTG03)	06:15 20:27	05:57 20:51
12	07:44 17:21	07:21 17:56	06:42 18:27		06:53 19:58	51	18:24 (WTG03) 19:12 (WTG03)	06:14 20:28	05:57 20:51
13	07:44 17:22	07:20 17:58	06:40 18:28		06:52 19:59	50	18:25 (WTG03) 19:11 (WTG03)	06:13 20:29	05:56 20:52
14	07:44 17:23	07:19 17:59	06:39 18:29		06:50 20:00	49	18:26 (WTG03) 19:09 (WTG03)	06:12 20:30	05:56 20:52
15	07:43 17:24	07:18 18:00	06:37 18:30		06:49 20:01	48	18:27 (WTG03) 19:08 (WTG03)	06:11 20:30	05:56 20:53
16	07:43 17:25	07:16 18:01	06:36 18:31	17:47 (WTG03)	06:47 20:02	47	18:28 (WTG03) 19:06 (WTG03)	06:10 20:31	05:56 20:53
17	07:42 17:26	07:15 18:02	06:34 18:32	18 17:42 (WTG03)	06:46 20:03	46	18:30 (WTG03) 19:05 (WTG03)	06:09 20:32	05:56 20:53
18	07:42 17:27	07:14 18:03	06:32 18:33	26 18:08 (WTG03)	06:44 20:04	45	18:31 (WTG03) 19:02 (WTG03)	06:09 20:33	05:57 20:54
19	07:42 17:28	07:12 18:04	06:31 18:34	31 18:11 (WTG03)	06:43 20:05	44	18:33 (WTG03) 19:00 (WTG03)	06:08 20:34	05:57 20:54
20	07:41 17:29	07:11 18:06	06:29 18:35	36 18:13 (WTG03)	06:41 20:06	43	18:36 (WTG03) 18:58 (WTG03)	06:07 20:35	05:57 20:54
21	07:41 17:31	07:10 18:07	06:28 18:36	40 18:14 (WTG03)	06:40 20:07	42	18:39 (WTG03) 18:53 (WTG03)	06:06 20:36	05:57 20:55
22	07:40 17:32	07:08 18:08	06:26 18:37	43 18:16 (WTG03)	06:38 20:08	41	18:39 (WTG03) 18:53 (WTG03)	06:05 20:37	05:57 20:55
23	07:39 17:33	07:07 18:09	06:25 18:38	45 18:16 (WTG03)	06:37 20:09	40	18:39 (WTG03) 18:53 (WTG03)	06:05 20:38	05:57 20:55
24	07:39 17:34	07:06 18:10	06:23 18:39	48 18:18 (WTG03)	06:36 20:10	39	18:39 (WTG03) 18:53 (WTG03)	06:04 20:38	05:58 20:55
25	07:38 17:35	07:04 18:11	06:21 18:40	26 18:08 (WTG03)	06:34 20:11	38	18:39 (WTG03) 18:53 (WTG03)	06:03 20:39	05:58 20:55
26	07:37 17:36	07:03 18:12	06:20 18:41	31 18:11 (WTG03)	06:33 20:12	37	18:39 (WTG03) 18:53 (WTG03)	06:03 20:40	05:58 20:55
27	07:37 17:38	07:02 18:13	06:18 18:42	36 18:13 (WTG03)	06:32 20:13	36	18:39 (WTG03) 18:53 (WTG03)	06:02 20:41	05:59 20:55
28	07:36 17:39	07:00 18:14	06:17 18:43	40 18:14 (WTG03)	06:30 20:14	35	18:39 (WTG03) 18:53 (WTG03)	06:01 20:42	05:59 20:55
29	07:35 17:40		07:15 19:44	43 18:16 (WTG03)	06:29 20:15	34	18:39 (WTG03) 18:53 (WTG03)	06:01 20:42	05:59 20:55
30	07:34 17:41		07:13 19:45	45 18:18 (WTG03)	06:28 20:16	33	18:39 (WTG03) 18:53 (WTG03)	06:00 20:43	06:00 20:55
31	07:33 17:42		07:12 19:46	48 18:18 (WTG03)	06:28 19:20 (WTG03)	32	18:39 (WTG03) 18:53 (WTG03)	06:00 20:44	06:00 20:55
Potential sun hours	302	299	370		397		444	447	
Total, worst case				717		944			

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: Worst_case_Progetto_20240628Shadow receptor: F108 - A2

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	06:23 20:38	06:52 19:57	18:23 (WTG03) 19:12 (WTG03)	07:19 19:08	06:51 17:24	07:24 17:01
2	06:01 20:55	06:24 20:37	06:52 19:55	18:22 (WTG03) 19:13 (WTG03)	07:20 19:07	06:52 17:23	07:25 17:01
3	06:01 20:55	06:25 20:36	06:53 19:54	18:21 (WTG03) 19:13 (WTG03)	07:21 19:05	06:54 17:22	07:26 17:01
4	06:02 20:55	06:26 20:35	06:54 19:52	18:19 (WTG03) 19:13 (WTG03)	07:22 19:04	06:55 17:20	07:27 17:01
5	06:02 20:55	06:27 20:33	06:55 19:50	18:18 (WTG03) 19:13 (WTG03)	07:23 19:02	06:56 17:19	07:28 17:01
6	06:03 20:55	06:27 20:32	06:56 19:49	18:18 (WTG03) 19:13 (WTG03)	07:24 19:00	06:57 17:18	07:29 17:00
7	06:03 20:54	06:28 20:31	06:57 19:47	18:17 (WTG03) 19:13 (WTG03)	07:25 18:59	06:58 17:17	07:30 17:00
8	06:04 20:54	06:29 20:30	06:58 19:46	18:17 (WTG03) 19:13 (WTG03)	07:26 18:57	06:59 17:16	07:31 17:00
9	06:05 20:54	06:30 20:29	06:59 19:44	18:16 (WTG03) 19:13 (WTG03)	07:27 18:56	07:00 17:15	07:32 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	18:16 (WTG03) 19:13 (WTG03)	07:28 18:54	07:01 17:14	07:33 17:00
11	06:06 20:53	06:32 20:26	07:01 19:41	18:16 (WTG03) 19:12 (WTG03)	07:29 18:53	07:03 17:13	07:34 17:00
12	06:07 20:52	06:33 20:25	07:02 19:39	18:14 (WTG03) 19:11 (WTG03)	07:30 18:51	07:04 17:12	07:34 17:01
13	06:07 20:52	06:34 20:24	07:03 19:38	18:14 (WTG03) 19:10 (WTG03)	07:31 18:50	07:05 17:12	07:35 17:01
14	06:08 20:52	06:35 20:23	07:04 19:36	18:14 (WTG03) 19:10 (WTG03)	07:32 18:48	07:06 17:11	07:36 17:01
15	06:09 20:51	06:36 20:21	07:04 19:34	18:14 (WTG03) 19:09 (WTG03)	07:33 18:47	07:07 17:10	07:37 17:01
16	06:09 20:50	06:37 20:20	07:05 19:33	18:15 (WTG03) 19:08 (WTG03)	07:34 18:45	07:08 17:09	07:37 17:01
17	06:10 20:50	06:38 20:19	07:06 19:31	18:15 (WTG03) 19:08 (WTG03)	07:35 18:44	07:09 17:08	07:38 17:02
18	06:11 20:49	06:39 20:17	07:07 19:29	18:15 (WTG03) 19:07 (WTG03)	07:36 18:42	07:10 17:08	07:39 17:02
19	06:12 20:49	06:40 20:16	07:08 19:28	18:16 (WTG03) 19:05 (WTG03)	07:37 18:41	07:12 17:07	07:39 17:03
20	06:13 20:48	06:40 20:14	07:09 19:26	18:16 (WTG03) 19:04 (WTG03)	07:38 18:39	07:13 17:06	07:40 17:03
21	06:13 20:47	06:41 20:13	07:10 19:25	18:17 (WTG03) 19:03 (WTG03)	07:39 18:38	07:14 17:06	07:40 17:03
22	06:14 20:47	06:42 20:12	07:11 19:23	18:17 (WTG03) 19:00 (WTG03)	07:40 18:37	07:15 17:05	07:41 17:04
23	06:15 20:46	06:43 20:10	15 18:43 (WTG03) 18:39 (WTG03)	07:12 19:21	18:18 (WTG03) 18:59 (WTG03)	07:16 17:04	07:41 17:04
24	06:16 20:45	06:44 20:09	23 19:02 (WTG03) 18:37 (WTG03)	07:13 19:20	18:20 (WTG03) 18:57 (WTG03)	07:17 17:04	07:42 17:05
25	06:17 20:44	06:45 20:07	27 19:04 (WTG03) 18:34 (WTG03)	07:14 19:18	18:22 (WTG03) 18:54 (WTG03)	07:18 17:03	07:42 17:06
26	06:18 20:43	06:46 20:06	32 19:06 (WTG03) 18:32 (WTG03)	07:15 19:16	18:24 (WTG03) 18:51 (WTG03)	07:19 17:03	07:43 17:06
27	06:18 20:42	06:47 20:04	36 19:08 (WTG03) 18:30 (WTG03)	07:16 19:15	18:27 (WTG03) 18:48 (WTG03)	07:20 17:03	07:43 17:07
28	06:19 20:42	06:48 20:03	38 19:08 (WTG03) 18:28 (WTG03)	07:17 19:13	18:32 (WTG03) 18:42 (WTG03)	07:21 17:02	07:43 17:07
29	06:20 20:41	06:49 20:01	41 19:09 (WTG03) 18:27 (WTG03)	07:17 19:12	06:48 17:27	07:22 17:02	07:44 17:08
30	06:21 20:40	06:50 20:00	43 19:10 (WTG03) 18:25 (WTG03)	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	06:22 20:39	06:51 19:58	46 19:11 (WTG03) 18:24 (WTG03)	07:19 19:12	06:50 17:25	07:24 17:02	07:44 17:10
Potential sun hours	454	425	374	347	302	293	
Total, worst case		349	1334				

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: Worst_case_Progetto_20240628Shadow receptor: F111 - A2 - C6

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 17:11	07:33 17:43	06:59 18:16	07:10 19:47	06:27 20:17	05:59 20:45	06:00 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	07:45 17:11	07:32 17:45	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:45	06:01 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:59 20:46	06:01 20:55	06:25 20:36	06:53 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	07:45 17:13	07:30 17:47	06:54 18:19	07:05 19:50	06:23 20:20	05:58 20:47	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04	06:55 17:20	07:27 17:01
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:47	06:02 20:55	06:27 20:33	06:55 19:50	07:23 19:02	06:56 17:19	07:28 17:01
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	06:21 20:22	05:58 20:48	06:03 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 17:16	07:27 17:51	06:50 18:22	07:01 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 17:17	07:26 17:52	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 17:16	07:31 17:00
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 17:15	07:32 17:00
10	07:45 17:19	07:24 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 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 17:20	07:22 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:51	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	07:03 17:13	07:34 17:00
12	07:44 17:21	07:21 17:56	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:51	06:07 20:53	06:33 20:25	07:02 19:39	07:30 18:51	07:04 17:12	07:34 17:01
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:56 20:52	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	06:12 20:30	05:56 20:52	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	06:11 20:31	05:56 20:53	06:09 20:51	06:36 20:21	07:04 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:56 20:53	06:09 20:51	06:37 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:01
17	07:43 17:26	07:15 18:02	06:34 18:32	06:46 20:03	06:09 20:32	05:56 20:53	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 17:08	07:38 17:02
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:54	06:11 20:49	06:39 20:17	07:07 19:29	07:36 18:42	07:11 17:08	07:39 17:02
19	07:42 17:28	07:13 18:04	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:54	06:12 20:49	06:40 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	07:41 17:29	07:11 18:06	06:29 18:35	06:41 20:06	06:07 20:35	05:57 20:54	06:13 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:06	07:40 17:03
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:55	06:13 20:47	06:41 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:40 17:03
22	07:40 17:32	07:09 18:08	06:26 18:37	06:38 20:08	06:05 20:37	05:57 20:55	06:14 20:47	06:42 20:12	07:11 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	06:05 20:38	05:57 20:55	06:15 20:46	06:43 20:10	07:12 19:21	07:42 18:35	07:16 17:04	07:42 17:04
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 20:38	05:58 20:55	06:16 20:45	06:44 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:58 20:55	06:17 20:44	06:45 20:07	07:14 19:18	06:44 17:33	07:18 17:03	07:42 17:05
26	07:37 17:36	07:03 18:12	06:20 18:41	06:33 20:12	06:03 20:40	05:58 20:55	06:18 20:43	06:46 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 20:41	05:59 20:55	06:18 20:42	06:47 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	07:36 17:39	07:00 18:14	06:17 18:43	06:30 20:14	06:01 20:42	05:59 20:55	06:19 20:42	06:48 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:44 17:07
29	07:35 17:40		07:15 19:44	06:29 20:15	06:01 20:43	05:59 20:55	06:20 20:41	06:49 20:01	07:17 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	07:34 17:41		07:13 19:45	06:28 20:16	06:00 20:43	06:00 20:55	06:21 20:40	06:50 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	07:33 17:42		07:12 19:46		06:00 20:44		06:22 20:39	06:51 19:58		06:50 17:25		07:44 17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
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: Worst_case_Progetto_20240628Shadow receptor: F145 - 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
1	07:44	07:33	06:59	07:10		06:27		18:45 (WTG11) 06:00
	17:11	17:44	18:16	19:47		20:17	40	19:25 (WTG11) 20:45
2	07:45	07:32	06:57	07:09		06:25		18:46 (WTG11) 05:59
	17:12	17:45	18:17	19:48		20:18	39	19:25 (WTG11) 20:45
3	07:45	07:31	06:56	07:07		06:24		18:47 (WTG11) 05:59
	17:12	17:46	18:18	19:49		20:19	37	19:24 (WTG11) 20:46
4	07:45	07:30	06:54	07:05	8	19:08 (WTG11) 06:23		18:49 (WTG11) 05:58
	17:13	17:47	18:19	19:50		20:20	34	19:23 (WTG11) 20:47
5	07:45	07:29	06:53	07:04	19	19:02 (WTG11) 06:22		18:50 (WTG11) 05:58
	17:14	17:48	18:20	19:51		20:21	31	19:21 (WTG11) 20:47
6	07:45	07:28	06:51	07:02	25	18:58 (WTG11) 06:21		18:51 (WTG11) 05:58
	17:15	17:49	18:21	19:52		20:22	29	19:20 (WTG11) 20:48
7	07:45	07:27	06:50	07:01	30	18:56 (WTG11) 06:20		18:53 (WTG11) 05:58
	17:16	17:51	18:22	19:53		20:23	25	19:18 (WTG11) 20:49
8	07:45	07:26	06:48	06:59	33	18:54 (WTG11) 06:18		18:55 (WTG11) 05:57
	17:17	17:52	18:23	19:54		20:24	21	19:16 (WTG11) 20:49
9	07:45	07:25	06:47	06:58	37	18:52 (WTG11) 06:17		18:58 (WTG11) 05:57
	17:18	17:53	18:24	19:55		20:25	16	19:14 (WTG11) 20:50
10	07:44	07:23	06:45	06:56	39	18:50 (WTG11) 06:16		19:02 (WTG11) 05:57
	17:19	17:54	18:25	19:56		20:26	7	19:09 (WTG11) 20:50
11	07:44	07:22	06:44	06:55	41	18:49 (WTG11) 06:15		19:00 (WTG11) 05:57
	17:20	17:55	18:26	19:57		20:27		20:51
12	07:44	07:21	06:42	06:53	43	18:48 (WTG11) 06:14		18:59 (WTG11) 05:57
	17:21	17:56	18:27	19:58		20:28		20:51
13	07:44	07:20	06:40	06:52	45	18:47 (WTG11) 06:13		18:59 (WTG11) 05:57
	17:22	17:58	18:28	19:59		20:29		20:52
14	07:44	07:19	06:39	06:50	45	18:46 (WTG11) 06:12		18:59 (WTG11) 05:57
	17:23	17:59	18:29	20:00		20:29		20:52
15	07:43	07:18	06:37	06:49	47	18:45 (WTG11) 06:11		18:59 (WTG11) 05:57
	17:24	18:00	18:30	20:01		20:30		20:53
16	07:43	07:16	06:36	06:47	48	18:44 (WTG11) 06:10		18:59 (WTG11) 05:57
	17:25	18:01	18:31	20:02		20:31		20:53
17	07:42	07:15	06:34	06:46	48	18:44 (WTG11) 06:10		18:59 (WTG11) 05:57
	17:26	18:02	18:32	20:03		20:32		20:53
18	07:42	07:14	06:33	06:44	49	18:43 (WTG11) 06:09		18:59 (WTG11) 05:57
	17:27	18:03	18:33	20:04		20:33		20:54
19	07:42	07:12	06:31	06:43	49	18:43 (WTG11) 06:08		18:59 (WTG11) 05:57
	17:28	18:05	18:34	20:05		20:34		20:54
20	07:41	07:11	06:29	06:41	49	18:43 (WTG11) 06:07		18:59 (WTG11) 05:57
	17:30	18:06	18:35	20:06		20:35		20:54
21	07:40	07:10	06:28	06:40	50	18:42 (WTG11) 06:06		18:59 (WTG11) 05:57
	17:31	18:07	18:36	20:07		20:36		20:54
22	07:40	07:08	06:26	06:39	49	18:43 (WTG11) 06:05		18:59 (WTG11) 05:57
	17:32	18:08	18:37	20:08		20:37		20:55
23	07:39	07:07	06:25	06:37	49	18:43 (WTG11) 06:05		18:59 (WTG11) 05:58
	17:33	18:09	18:38	20:09		20:38		20:55
24	07:39	07:06	06:23	06:36	49	18:42 (WTG11) 06:04		18:59 (WTG11) 05:58
	17:34	18:10	18:39	20:10		20:38		20:55
25	07:38	07:04	06:21	06:34	47	18:43 (WTG11) 06:03		18:59 (WTG11) 05:58
	17:35	18:11	18:40	20:11		20:39		20:55
26	07:37	07:03	06:20	06:33	46	18:44 (WTG11) 06:03		18:59 (WTG11) 05:58
	17:36	18:12	18:41	20:12		20:40		20:55
27	07:37	07:01	06:18	06:32	46	18:43 (WTG11) 06:02		18:59 (WTG11) 05:59
	17:38	18:13	18:42	20:13		20:41		20:55
28	07:36	07:00	06:17	06:30	44	18:44 (WTG11) 06:02		18:59 (WTG11) 05:59
	17:39	18:15	18:43	20:14		20:42		20:55
29	07:35		07:15	06:29	43	18:45 (WTG11) 06:01		18:59 (WTG11) 06:00
	17:40		19:44	20:15		20:42		20:55
30	07:34		07:13	06:28	42	18:45 (WTG11) 06:01		18:59 (WTG11) 06:00
	17:41		19:45	20:16		20:43		20:55
31	07:33		07:12			06:00		
	17:42		19:46			20:44		
Potential sun hours	302	299	370	397		444		447
Total, worst case				1120		279		

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: Worst_case_Progetto_20240628Shadow receptor: F145 - 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

	July	August	September	October	November	December
1	06:00 20:55	06:23 20:38	06:52 19:57	18:48 (WTG11) 19:29 (WTG11)	07:19 19:08	06:51 17:24
2	06:01 20:55	06:24 20:37	06:53 19:55	18:49 (WTG11) 19:28 (WTG11)	07:20 19:07	06:52 17:23
3	06:01 20:55	06:25 20:36	19:10 (WTG11) 19:21 (WTG11)	06:53 19:54	18:50 (WTG11) 19:27 (WTG11)	07:21 19:05
4	06:02 20:55	06:26 20:34	19:02 (WTG11) 19:24 (WTG11)	06:54 19:52	18:51 (WTG11) 19:24 (WTG11)	07:22 19:04
5	06:02 20:55	06:27 20:33	19:04 (WTG11) 19:27 (WTG11)	06:55 19:50	18:52 (WTG11) 19:22 (WTG11)	07:23 19:02
6	06:03 20:54	06:28 20:32	19:02 (WTG11) 19:28 (WTG11)	06:56 19:49	18:54 (WTG11) 19:19 (WTG11)	07:24 19:00
7	06:04 20:54	06:28 20:31	19:01 (WTG11) 19:30 (WTG11)	06:57 19:47	18:57 (WTG11) 19:16 (WTG11)	07:25 18:59
8	06:04 20:54	06:29 20:30	18:59 (WTG11) 19:31 (WTG11)	06:58 19:46	19:01 (WTG11) 19:11 (WTG11)	07:26 18:57
9	06:05 20:54	06:30 20:29	18:57 (WTG11) 19:32 (WTG11)	06:59 19:44	07:27 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	18:56 (WTG11) 19:33 (WTG11)	07:00 19:42	07:28 18:54	07:01 17:14
11	06:06 20:53	06:32 20:26	18:55 (WTG11) 19:34 (WTG11)	07:01 19:41	07:29 18:53	07:03 17:13
12	06:07 20:52	06:33 20:25	18:54 (WTG11) 19:34 (WTG11)	07:02 19:39	07:30 18:51	07:04 17:13
13	06:07 20:52	06:34 20:24	18:53 (WTG11) 19:35 (WTG11)	07:03 19:38	07:31 18:50	07:05 17:12
14	06:08 20:51	06:35 20:22	18:52 (WTG11) 19:36 (WTG11)	07:04 19:36	07:32 18:48	07:06 17:11
15	06:09 20:51	06:36 20:21	18:51 (WTG11) 19:36 (WTG11)	07:04 19:34	07:33 18:47	07:07 17:10
16	06:10 20:50	06:37 20:20	18:51 (WTG11) 19:37 (WTG11)	07:05 19:33	07:34 18:45	07:08 17:09
17	06:10 20:50	06:38 20:19	18:50 (WTG11) 19:37 (WTG11)	07:06 19:31	07:35 18:44	07:09 17:08
18	06:11 20:49	06:39 20:17	18:50 (WTG11) 19:37 (WTG11)	07:07 19:29	07:36 18:42	07:10 17:08
19	06:12 20:49	06:40 20:16	18:48 (WTG11) 19:36 (WTG11)	07:08 19:28	07:37 18:41	07:12 17:07
20	06:13 20:48	06:41 20:14	18:48 (WTG11) 19:36 (WTG11)	07:09 19:26	07:38 18:40	07:13 17:06
21	06:14 20:47	06:41 20:13	18:48 (WTG11) 19:36 (WTG11)	07:10 19:25	07:39 18:38	07:14 17:06
22	06:14 20:46	06:42 20:12	18:47 (WTG11) 19:36 (WTG11)	07:11 19:23	07:40 18:37	07:15 17:05
23	06:15 20:46	06:43 20:10	18:47 (WTG11) 19:36 (WTG11)	07:12 19:21	07:41 18:35	07:16 17:05
24	06:16 20:45	06:44 20:09	18:47 (WTG11) 19:36 (WTG11)	07:13 19:20	07:43 18:34	07:17 17:04
25	06:17 20:44	06:45 20:07	18:47 (WTG11) 19:36 (WTG11)	07:14 19:18	07:44 17:33	07:18 17:04
26	06:18 20:43	06:46 20:06	18:47 (WTG11) 19:35 (WTG11)	07:15 19:16	07:45 17:31	07:19 17:03
27	06:19 20:42	06:47 20:04	18:46 (WTG11) 19:34 (WTG11)	07:16 19:15	07:46 17:30	07:20 17:03
28	06:19 20:41	06:48 20:03	18:46 (WTG11) 19:33 (WTG11)	07:17 19:13	07:47 17:29	07:21 17:02
29	06:20 20:41	06:49 20:01	18:47 (WTG11) 19:32 (WTG11)	07:17 19:12	07:48 17:28	07:22 17:02
30	06:21 20:40	06:50 20:00	18:47 (WTG11) 19:31 (WTG11)	07:18 19:10	07:49 17:26	07:23 17:02
31	06:22 20:39	06:51 19:58	18:48 (WTG11) 19:30 (WTG11)		07:50 17:25	07:44 17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case		1175	234			

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: Worst_case_Progetto_20240628Shadow receptor: F153 - A4

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	07:44	07:33	06:59	07:10	18:57 (WTG08)	06:27	06:00		
	17:11	17:44	18:16	19:47	27 19:24 (WTG08)	20:17	20:45		
2	07:45	07:32	06:57	07:09	18:57 (WTG08)	06:25	05:59		
	17:12	17:45	18:17	19:48	27 19:24 (WTG08)	20:18	20:45		
3	07:45	07:31	06:56	07:07	18:58 (WTG08)	06:24	05:59		
	17:12	17:46	18:18	19:49	24 19:22 (WTG08)	20:19	20:46		
4	07:45	07:30	06:54	07:05	18:59 (WTG08)	06:23	05:58		
	17:13	17:47	18:19	19:50	23 19:22 (WTG08)	20:20	20:47		
5	07:45	07:29	06:53	07:04	19:00 (WTG08)	06:22	05:58		
	17:14	17:48	18:20	19:51	19 19:19 (WTG08)	20:21	20:47		
6	07:45	07:28	06:51	07:02	19:01 (WTG08)	06:21	19:54 (WTG07)	05:58	
	17:15	17:49	18:21	19:52	16 19:17 (WTG08)	20:22	5 19:59 (WTG07)	20:48	
7	07:45	07:27	06:50	07:01	19:04 (WTG08)	06:20	19:53 (WTG07)	05:58	
	17:16	17:51	18:22	19:53	10 19:14 (WTG08)	20:23	7 20:00 (WTG07)	20:49	
8	07:45	07:26	06:48	06:59	06:18	06:18	19:51 (WTG07)	05:57	
	17:17	17:52	18:23	19:54	20:24	10 20:01 (WTG07)	20:49	20:49	
9	07:45	07:25	06:47	06:58	06:17	19:50 (WTG07)	05:57	05:57	
	17:18	17:53	18:24	19:55	20:25	12 20:02 (WTG07)	20:50	20:50	
10	07:44	07:23	06:45	06:56	06:16	19:49 (WTG07)	05:57	20:13 (WTG09)	
	17:19	17:54	18:25	19:56	20:26	14 20:03 (WTG07)	20:50	2 20:15 (WTG09)	
11	07:44	07:22	06:44	06:55	06:15	19:49 (WTG07)	05:57	20:10 (WTG09)	
	17:20	17:55	18:26	19:57	20:27	15 20:04 (WTG07)	20:51	8 20:18 (WTG09)	
12	07:44	07:21	06:42	06:53	06:14	19:48 (WTG07)	05:57	20:09 (WTG09)	
	17:21	17:56	18:27	19:58	20:28	17 20:05 (WTG07)	20:51	11 20:20 (WTG09)	
13	07:44	07:20	06:40	06:52	06:13	19:48 (WTG07)	05:57	20:08 (WTG09)	
	17:22	17:58	18:28	19:59	20:29	18 20:06 (WTG07)	20:52	13 20:21 (WTG09)	
14	07:44	07:19	06:39	06:50	06:12	19:48 (WTG07)	05:57	20:08 (WTG09)	
	17:23	17:59	18:29	20:00	20:29	18 20:06 (WTG07)	20:52	14 20:22 (WTG09)	
15	07:43	07:18	06:37	06:49	06:11	19:47 (WTG07)	05:57	20:08 (WTG09)	
	17:24	18:00	18:30	20:01	20:30	20 20:07 (WTG07)	20:53	15 20:23 (WTG09)	
16	07:43	07:16	06:36	06:47	06:10	19:47 (WTG07)	05:57	20:07 (WTG09)	
	17:25	18:01	18:31	20:02	20:31	21 20:08 (WTG07)	20:53	16 20:23 (WTG09)	
17	07:42	07:15	06:34	06:46	06:09	19:47 (WTG07)	05:57	20:07 (WTG09)	
	17:26	18:02	18:32	20:03	20:32	22 20:09 (WTG07)	20:53	17 20:24 (WTG09)	
18	07:42	07:14	06:33	06:44	06:09	19:47 (WTG07)	05:57	20:07 (WTG09)	
	17:27	18:03	18:33	20:04	20:33	22 20:09 (WTG07)	20:54	17 20:24 (WTG09)	
19	07:42	07:12	06:31	06:43	06:08	19:48 (WTG07)	05:57	20:07 (WTG09)	
	17:28	18:05	18:34	20:05	20:34	23 20:11 (WTG07)	20:54	18 20:25 (WTG09)	
20	07:41	07:11	06:29	18:13 (WTG08)	06:41	06:07	19:48 (WTG07)	05:57	20:08 (WTG09)
	17:30	18:06	18:35	2 18:15 (WTG08)	20:06	20:35	22 20:10 (WTG07)	20:54	18 20:26 (WTG09)
21	07:41	07:10	06:28	18:07 (WTG08)	06:40	06:06	19:48 (WTG07)	05:57	20:08 (WTG09)
	17:31	18:07	18:36	9 18:16 (WTG08)	20:07	20:36	22 20:10 (WTG07)	20:55	18 20:26 (WTG09)
22	07:40	07:08	06:26	18:04 (WTG08)	06:39	06:05	19:49 (WTG07)	05:57	20:08 (WTG09)
	17:32	18:08	18:37	12 18:16 (WTG08)	20:08	20:37	21 20:10 (WTG07)	20:55	18 20:26 (WTG09)
23	07:39	07:07	06:25	18:03 (WTG08)	06:37	06:05	19:50 (WTG07)	05:58	20:08 (WTG09)
	17:33	18:09	18:38	15 18:18 (WTG08)	20:09	20:38	19 20:09 (WTG07)	20:55	18 20:26 (WTG09)
24	07:39	07:06	06:23	18:01 (WTG08)	06:36	06:04	19:50 (WTG07)	05:58	20:09 (WTG09)
	17:34	18:10	18:39	18 18:19 (WTG08)	20:10	20:38	19 20:09 (WTG07)	20:55	17 20:26 (WTG09)
25	07:38	07:04	06:21	17:59 (WTG08)	06:34	06:03	19:51 (WTG07)	05:58	20:09 (WTG09)
	17:35	18:11	18:40	20 18:19 (WTG08)	20:11	20:39	18 20:09 (WTG07)	20:55	17 20:26 (WTG09)
26	07:37	07:03	06:20	17:59 (WTG08)	06:33	06:03	19:52 (WTG07)	05:58	20:09 (WTG09)
	17:36	18:12	18:41	22 18:21 (WTG08)	20:12	20:40	15 20:07 (WTG07)	20:55	17 20:26 (WTG09)
27	07:37	07:02	06:18	17:58 (WTG08)	06:32	06:02	19:53 (WTG07)	05:59	20:10 (WTG09)
	17:38	18:13	18:42	23 18:21 (WTG08)	20:13	20:41	14 20:07 (WTG07)	20:55	16 20:26 (WTG09)
28	07:36	07:00	06:17	17:58 (WTG08)	06:30	06:02	19:54 (WTG07)	05:59	20:11 (WTG09)
	17:39	18:14	18:43	25 18:23 (WTG08)	20:14	20:42	12 20:06 (WTG07)	20:55	14 20:25 (WTG09)
29	07:35	07:15	06:15	18:57 (WTG08)	06:29	06:01	19:56 (WTG07)	06:00	20:11 (WTG09)
	17:40	19:44	27 19:24 (WTG08)	20:15	20:42	9 20:05 (WTG07)	20:55	14 20:25 (WTG09)	
30	07:34	07:13	06:13	18:56 (WTG08)	06:28	06:00	19:58 (WTG07)	06:00	20:13 (WTG09)
	17:41	19:45	28 19:24 (WTG08)	20:16	20:43	4 20:02 (WTG07)	20:55	11 20:24 (WTG09)	
31	07:33	07:12	06:12	18:57 (WTG08)	06:27	06:00			
	17:42	19:46	28 19:25 (WTG08)	20:17	20:44				
Potential sun hours	302	299	370	397	444	399	447	309	
Total, worst case			229	146					

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: Worst_case_Progetto_20240628Shadow receptor: F153 - A4

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

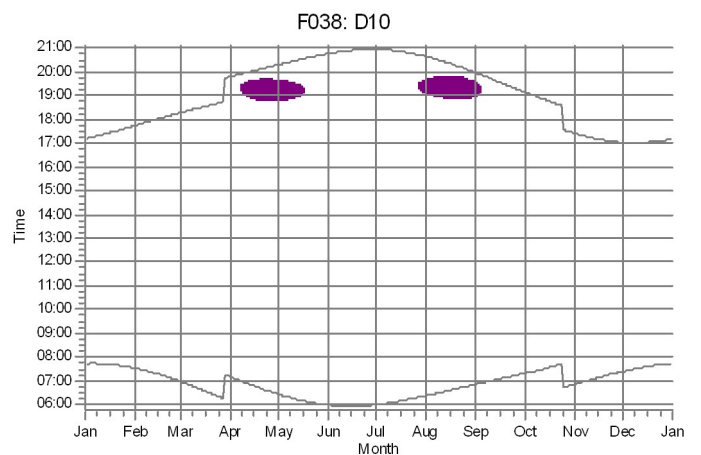
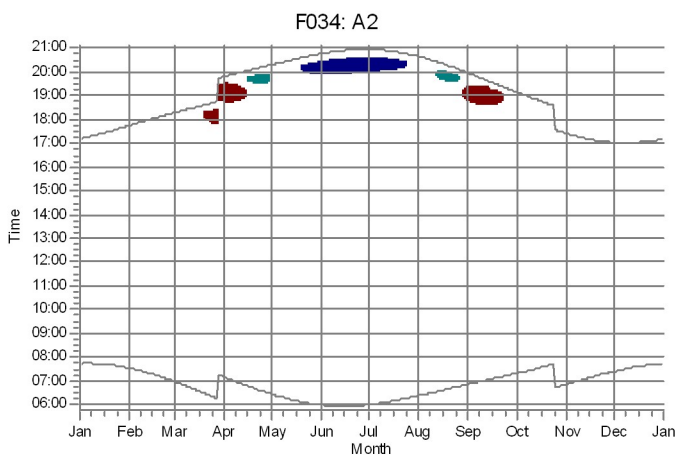
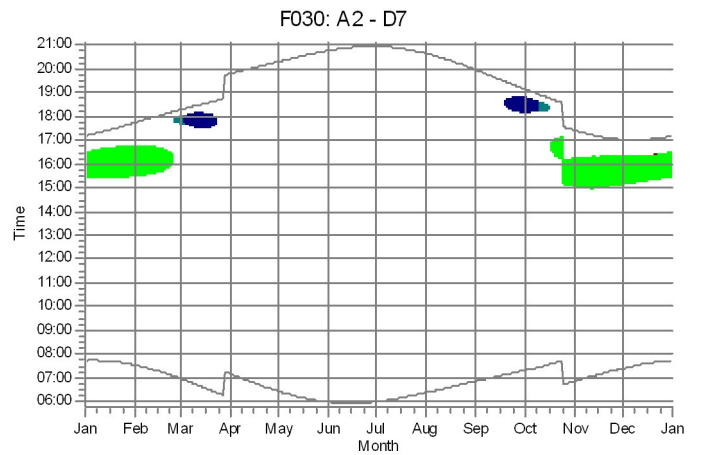
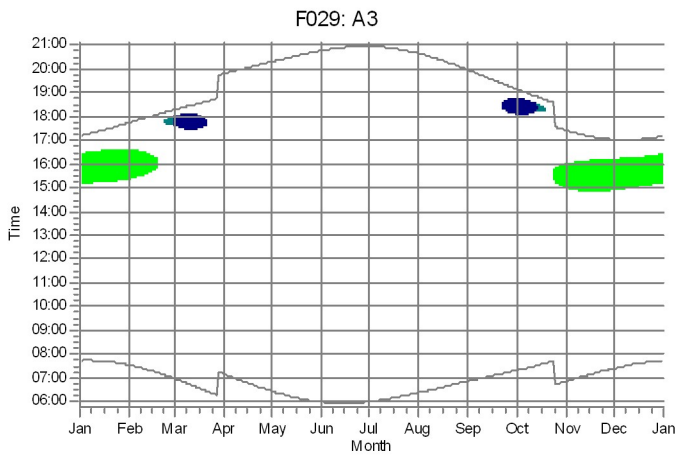
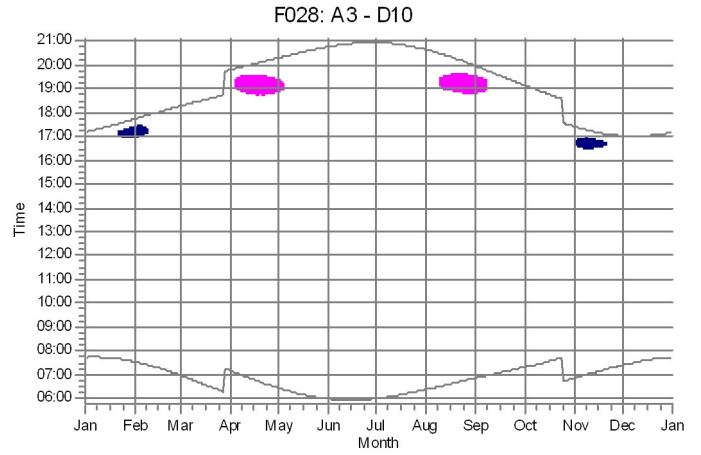
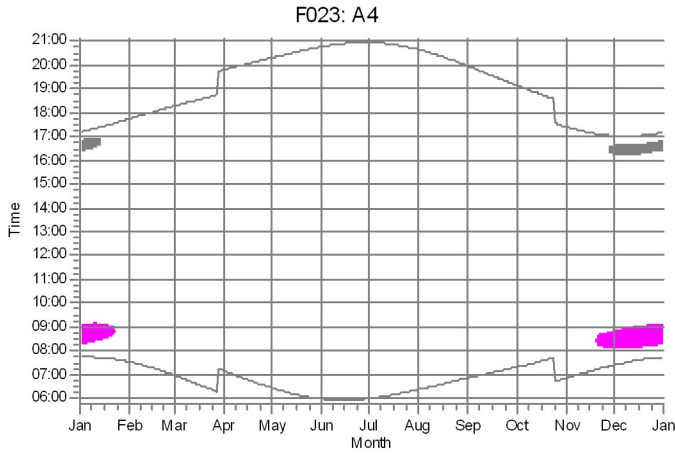
The WTG is always operating

	July	August	September	October	November	December
1	06:00	20:14 (WTG09)	06:23	19:58 (WTG07)	06:52	07:19
	20:55	9 20:23 (WTG09)	20:38	16 20:14 (WTG07)	19:57	19:08
2	06:01	20:16 (WTG09)	06:24	19:59 (WTG07)	06:53	07:20
	20:55	6 20:22 (WTG09)	20:37	14 20:13 (WTG07)	19:55	19:07
3	06:01		06:25	19:59 (WTG07)	06:53	07:21
	20:55		20:36	13 20:12 (WTG07)	19:54	19:05
4	06:02		06:26	20:00 (WTG07)	06:54	07:22
	20:55		20:34	12 20:12 (WTG07)	19:52	19:04
5	06:02		06:27	20:01 (WTG07)	06:55	07:23
	20:55		20:33	10 20:11 (WTG07)	19:50	19:02
6	06:03		06:28	20:03 (WTG07)	06:56	07:24
	20:54		20:32	7 20:10 (WTG07)	19:49	19:00
7	06:04		06:28	20:05 (WTG07)	06:57	07:25
	20:54		20:31	4 20:09 (WTG07)	19:47	19:01
8	06:04		06:29	06:58	18:53 (WTG08)	07:26
	20:54		20:30	19:46	23 19:16 (WTG08)	18:57
9	06:05		06:30	06:59	18:52 (WTG08)	07:27
	20:54		20:29	19:44	24 19:16 (WTG08)	18:56
10	06:05		06:31	07:00	18:51 (WTG08)	07:28
	20:53		20:28	19:42	26 19:17 (WTG08)	18:54
11	06:06		06:32	07:01	18:50 (WTG08)	07:29
	20:53		20:26	19:41	27 19:17 (WTG08)	18:53
12	06:07		06:33	07:02	18:49 (WTG08)	07:30
	20:52		20:25	19:39	28 19:17 (WTG08)	18:51
13	06:07		06:34	07:03	18:48 (WTG08)	07:31
	20:52		20:24	19:38	27 19:15 (WTG08)	18:50
14	06:08	20:05 (WTG07)	06:35	07:04	18:47 (WTG08)	07:32
	20:51	7 20:12 (WTG07)	20:23	19:36	27 19:14 (WTG08)	18:48
15	06:09	20:04 (WTG07)	06:36	07:04	18:47 (WTG08)	07:33
	20:51	10 20:14 (WTG07)	20:21	19:34	25 19:12 (WTG08)	18:47
16	06:10	20:02 (WTG07)	06:37	07:05	18:47 (WTG08)	07:34
	20:50	13 20:15 (WTG07)	20:20	19:33	24 19:11 (WTG08)	18:45
17	06:10	20:02 (WTG07)	06:38	07:06	18:47 (WTG08)	07:35
	20:50	14 20:16 (WTG07)	20:19	19:31	22 19:09 (WTG08)	18:44
18	06:11	20:01 (WTG07)	06:39	07:07	18:48 (WTG08)	07:36
	20:49	16 20:17 (WTG07)	20:17	19:29	20 19:08 (WTG08)	18:42
19	06:12	20:01 (WTG07)	06:40	07:08	18:48 (WTG08)	07:37
	20:49	18 20:19 (WTG07)	20:16	19:28	18 19:06 (WTG08)	18:41
20	06:13	19:59 (WTG07)	06:41	07:09	18:49 (WTG08)	07:38
	20:48	19 20:18 (WTG07)	20:14	19:26	16 19:05 (WTG08)	18:39
21	06:14	19:59 (WTG07)	06:41	07:10	18:50 (WTG08)	07:39
	20:47	20 20:19 (WTG07)	20:13	19:25	13 19:03 (WTG08)	18:38
22	06:14	19:59 (WTG07)	06:42	07:11	18:51 (WTG08)	07:40
	20:46	21 20:20 (WTG07)	20:12	19:23	10 19:01 (WTG08)	18:37
23	06:15	19:59 (WTG07)	06:43	07:12	18:54 (WTG08)	07:42
	20:46	22 20:21 (WTG07)	20:10	19:21	5 18:59 (WTG08)	18:35
24	06:16	19:59 (WTG07)	06:44	07:13	07:43	07:17
	20:45	22 20:21 (WTG07)	20:09	19:20	18:34	17:04
25	06:17	19:58 (WTG07)	06:45	07:14	06:44	07:18
	20:44	22 20:20 (WTG07)	20:07	19:18	17:33	17:04
26	06:18	19:58 (WTG07)	06:46	07:15	06:45	07:19
	20:43	21 20:19 (WTG07)	20:06	19:16	17:31	17:03
27	06:19	19:58 (WTG07)	06:47	07:16	06:46	07:20
	20:42	21 20:19 (WTG07)	20:04	19:15	17:30	17:03
28	06:19	19:58 (WTG07)	06:48	07:17	06:47	07:21
	20:41	20 20:18 (WTG07)	20:03	19:13	17:29	17:02
29	06:20	19:58 (WTG07)	06:49	07:17	06:48	07:22
	20:41	19 20:17 (WTG07)	20:01	19:12	17:28	17:02
30	06:21	19:58 (WTG07)	06:50	07:18	06:49	07:23
	20:40	19 20:17 (WTG07)	20:00	19:10	17:26	17:02
31	06:22	19:59 (WTG07)	06:51		06:50	07:44
	20:39	17 20:16 (WTG07)	19:58		17:25	17:10
Potential sun hours	454	425	374	347	302	293
Total, worst case	336	76	380			71








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)
--------------	------------------	-----------------	----------------------	---------------------------------	--------------------------------	----------------------------------	---------------------------------

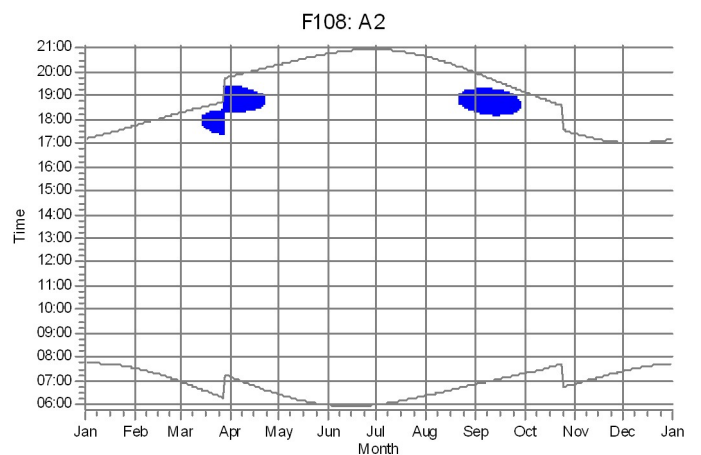
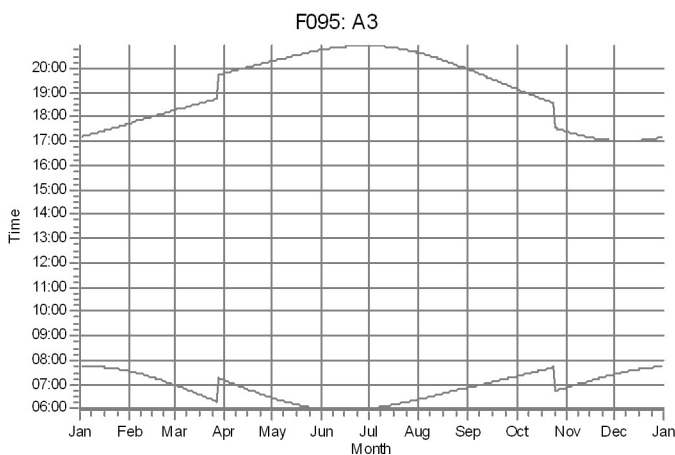
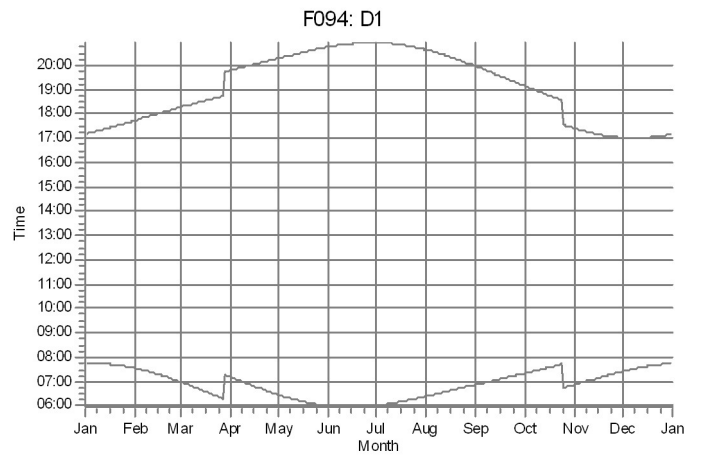
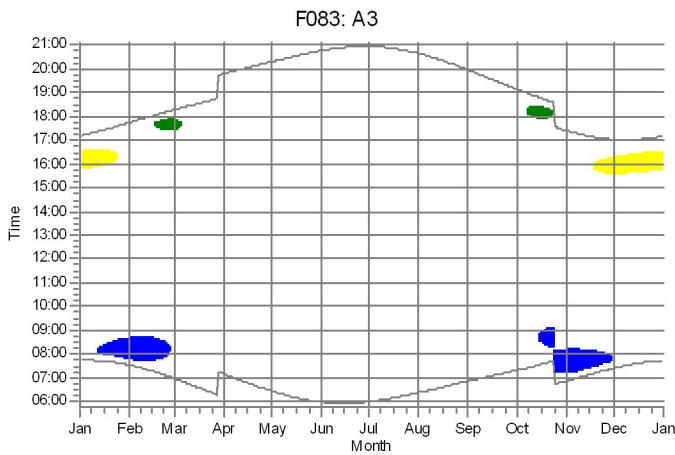
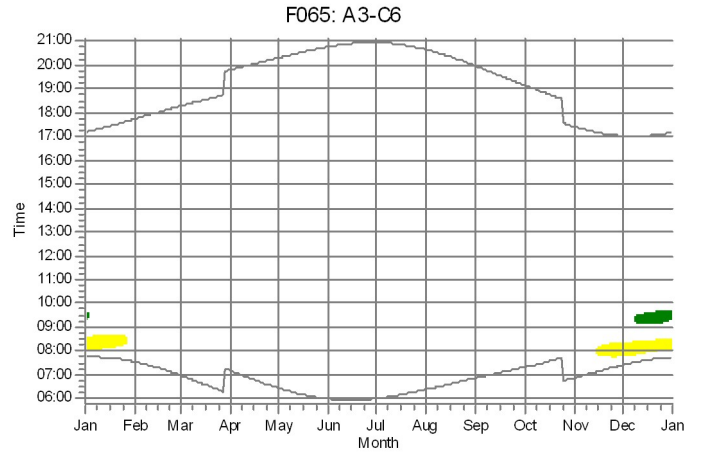
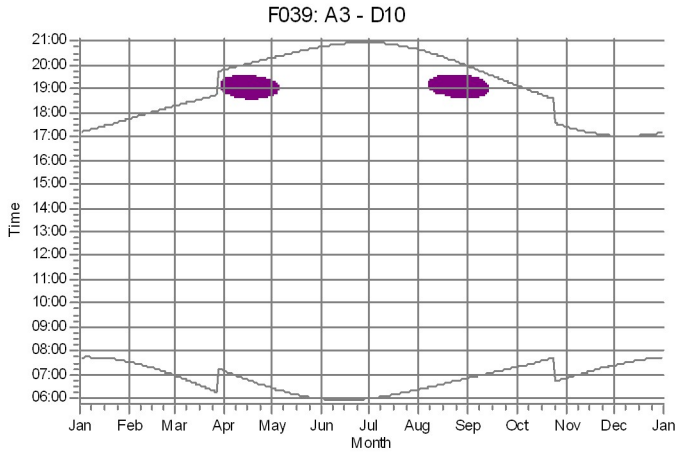
SHADOW - Calendar, graphical
 Calculation: Worst_case_Progetto_20240628



WTGs

- | | | | |
|---|--|---|--|
|  | WTG04: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (36) |  | WTG08: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (40) |
|  | WTG05: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (37) |  | WTG09: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (41) |
|  | WTG06: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (38) |  | WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (43) |
|  | WTG07: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (39) | | |

SHADOW - Calendar, graphical
 Calculation: Worst_case_Progetto_20240628

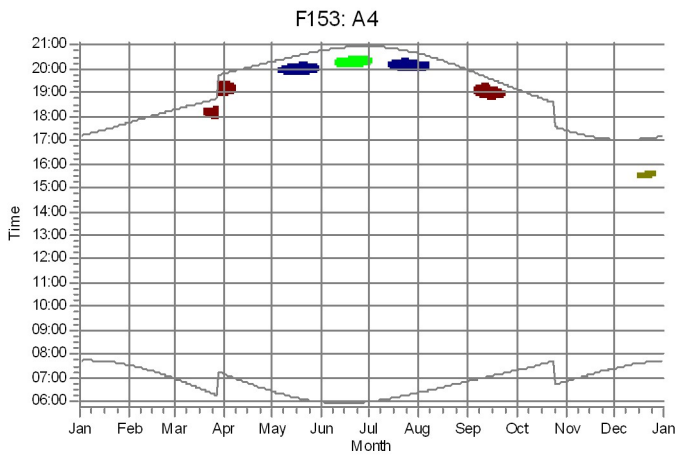
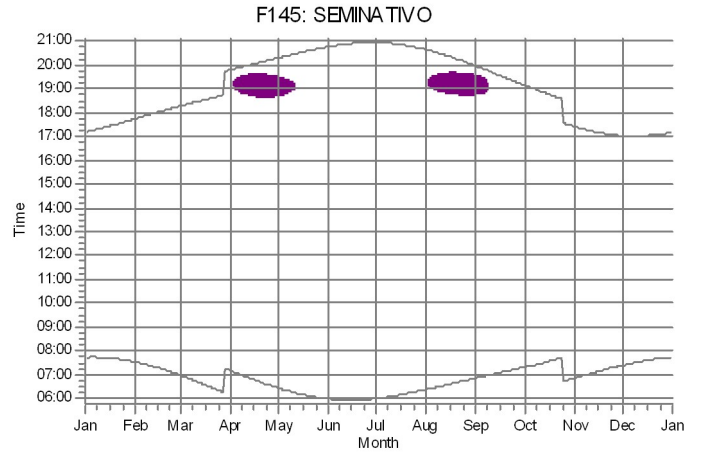
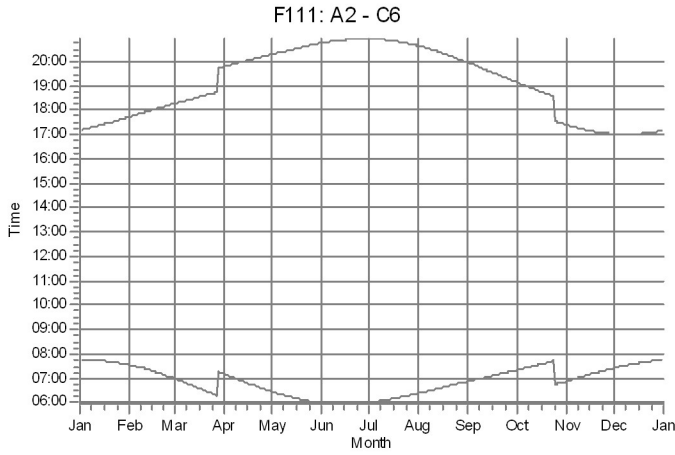


WTGs

- WTG01: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (33)
- WTG02: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (34)

- WTG03: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (35)
- WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (43)

SHADOW - Calendar, graphical
 Calculation: Worst_case_Progetto_20240628



WTGs

- | | |
|---|--|
| <ul style="list-style-type: none"> WTG07: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (39) WTG08: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (40) WTG09: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (41) | <ul style="list-style-type: none"> WTG10: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (42) WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 IOI hub: 135,0 m (TOT: 220,0 m) (43) |
|---|--|

Project:

Progetto_Baltex Nuraminis

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:
28/06/2024 12:41/3.4.415

SHADOW - Calendar per WTG

Calculation: Worst_case_Progetto_20240628WTG: WTG01 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (33)
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 09:24-09:35/11	07:33	06:59 17:29-17:49/20	07:10	06:27	06:00	06:00	06:23	06:52	07:19	06:51	07:25
2	07:45 09:28-09:34/6	07:32	06:57 17:30-17:49/19	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:53	07:26
3	07:45	07:31	06:56 17:30-17:47/17	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:27
4	07:45	07:30	06:54 17:33-17:45/12	07:06	06:23	05:58	06:02	06:26	06:54	07:22	06:55	07:28
5	07:45	07:29	06:53 17:36-17:41/5	07:04	06:22	05:58	06:02	06:27	06:55	07:23	06:56	07:28
6	07:45	07:28	06:51	07:02	06:21	05:58	06:03	06:28	06:56	07:24	06:57	07:29
7	07:45	07:27	06:50	07:01	06:20	05:58	06:04	06:29	06:57	07:25	06:58	07:30
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
9	07:45	07:25	06:47	06:58	06:17	05:57	06:05	06:30	06:59	07:27	18:09-18:18/9	07:00
10	07:45	07:24	06:45	06:56	06:16	05:57	06:05	06:31	07:00	07:28	18:06-18:20/14	07:02
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29	18:04-18:22/18	07:03
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30	18:03-18:23/20	07:04
13	07:44	07:20	06:41	06:52	06:13	05:57	06:07	06:34	07:03	07:31	18:02-18:23/21	07:05
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35	07:04	07:32	18:01-18:23/22	07:06
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36	07:05	07:33	18:00-18:23/23	07:07
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37	07:05	07:34	18:00-18:23/23	07:08
17	07:43	07:15	06:34	06:46	06:10	05:57	06:10	06:38	07:06	07:35	18:00-18:21/21	07:09
18	07:42	07:14	17:38-17:42/4	06:33	06:44	06:09	05:57	06:11	06:39	07:07	07:36	18:00-18:19/19
19	07:42	07:13	17:34-17:42/8	06:31	06:43	06:08	05:57	06:12	06:40	07:08	07:37	18:00-18:18/18
20	07:41	07:11	17:32-17:44/12	06:29	06:41	06:07	05:57	06:13	06:41	07:09	07:38	18:01-18:17/16
21	07:41	07:10	17:31-17:46/15	06:28	06:40	06:06	05:57	06:14	06:42	07:10	07:40	18:02-18:16/14
22	07:40	07:09	17:29-17:46/17	06:26	06:39	06:05	05:57	06:14	06:42	07:11	07:41	18:03-18:14/11
23	07:40	07:07	17:29-17:48/19	06:25	06:37	06:05	05:58	06:15	06:43	07:12	07:42	18:05-18:13/8
24	07:39	07:06	17:28-17:48/20	06:23	06:36	06:04	05:58	06:16	06:44	07:13	07:43	18:10-18:11/1
25	07:38	07:04	17:28-17:50/22	06:21	06:34	06:03	05:58	06:17	06:45	07:14	06:44	
26	07:38	07:03	17:28-17:52/24	06:20	06:33	06:03	05:58	06:18	06:46	07:15	06:45	
27	07:37	07:02	17:28-17:51/23	06:18	06:32	06:02	05:59	06:19	06:47	07:16	06:46	
28	07:36	07:00	17:29-17:51/22	06:17	06:30	06:02	05:59	06:20	06:48	07:17	06:47	
29	07:35	07:15		06:15	06:29	06:01	06:00	06:20	06:49	07:18	06:48	
30	07:34	07:13		06:13	06:28	06:01	06:00	06:21	06:50	07:19	06:49	
31	07:34	07:12		06:11	06:26	06:00	06:00	06:22	06:51	07:20	06:50	
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	17	186	73	0	0	0	0	0	0	258	0	392

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 Nuraminis

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:
28/06/2024 12:41/3.4.415

SHADOW - Calendar per WTG

Calculation: Worst_case_Progetto_20240628WTG: WTG02 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (34)
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 15:50-16:28/38	07:33 06:59	07:10 06:27	06:00 06:00	06:23 06:52	07:19 06:51	07:25 15:39-16:13/34					
2	07:45 15:51-16:29/38	07:32 06:57	07:09 06:25	05:59 06:01	06:24 06:53	07:20 06:53	17:01 07:50-08:17/27					
3	07:45 15:51-16:29/38	07:31 06:56	07:07 06:24	05:59 06:01	06:25 06:54	07:21 06:54	07:26 15:39-16:14/35					
4	07:45 15:52-16:29/37	07:30 06:54	07:06 06:23	05:58 06:02	06:26 06:54	07:22 06:55	17:01 07:51-08:17/26					
5	07:45 15:53-16:30/37	07:29 06:53	07:04 06:22	05:58 06:02	06:27 06:55	07:23 06:56	07:27 15:39-16:16/37					
6	07:45 15:53-16:30/37	07:28 06:51	07:02 06:21	05:58 06:03	06:28 06:56	07:24 06:57	17:01 07:52-08:18/26					
7	07:45 15:54-16:31/37	07:27 06:50	07:01 06:20	05:58 06:04	06:28 06:57	07:25 06:58	07:29 15:39-16:16/37					
8	07:45 15:55-16:31/36	07:26 06:48	06:59 06:18	05:57 06:04	06:29 06:58	07:26 06:59	17:01 07:53-08:18/25					
9	07:45 15:56-16:31/35	07:25 06:47	06:58 06:17	05:57 06:05	06:30 06:59	07:27 07:00	07:30 15:40-16:17/37					
10	07:45 15:57-16:32/35	07:24 06:45	06:56 06:16	05:57 06:05	06:31 07:00	07:28 07:02	17:00 07:54-08:19/25					
11	07:44 15:57-16:31/34	07:22 06:44	06:55 06:15	05:57 06:06	06:32 07:01	07:29 07:03	07:32 15:41-16:19/38					
12	07:44 15:58-16:31/33	07:21 06:42	06:53 06:14	05:57 06:07	06:33 07:02	07:30 07:04	17:01 07:55-08:19/24					
13	07:44 15:59-16:32/33	07:20 06:40	06:52 06:13	05:57 06:07	06:34 07:03	07:31 07:05	07:33 15:41-16:19/38					
14	07:44 15:59-16:32/33	07:19 06:39	06:50 06:12	05:57 06:08	06:35 07:04	07:32 07:06	17:01 07:58-08:20/22					
15	07:43 16:00-16:31/31	07:18 06:37	06:49 06:11	05:57 06:09	06:36 07:05	07:33 07:11	07:36 15:42-16:21/39					
16	07:43 16:01-16:30/29	07:16 06:36	06:47 06:10	05:57 06:10	06:37 07:05	07:34 07:08	17:01 08:00-08:21/21					
17	07:43 16:02-16:30/28	07:15 06:34	06:46 06:10	05:57 06:10	06:38 07:06	07:35 07:09	07:37 15:43-16:21/38					
18	07:42 16:04-16:30/26	07:14 06:33	06:44 06:09	05:57 06:11	06:39 07:07	07:36 07:11	17:02 08:00-08:22/20					
19	07:42 16:05-16:29/24	07:13 06:31	06:43 06:08	05:57 06:12	06:40 07:08	07:37 07:12	07:38 15:44-16:22/39					
20	07:41 16:06-16:28/22	07:11 06:29	06:41 06:07	05:57 06:13	06:41 07:09	07:38 07:13	17:02 08:02-08:22/20					
21	07:41 16:07-16:27/21	07:10 06:28	06:40 06:06	05:57 06:14	06:41 07:10	07:39 07:14	07:39 15:44-16:23/39					
22	07:40 16:11-16:25/14	07:09 06:26	06:39 06:05	05:57 06:14	06:42 07:11	07:41 07:15	07:40 08:03-08:23/20					
23	07:39 16:14-16:22/8	07:07 06:25	06:37 06:05	05:58 06:15	06:43 07:12	07:42 07:16	07:41 15:45-16:24/39					
24	07:38 18:20-08:33/13	07:04 06:21	06:34 06:03	05:58 06:17	06:45 07:14	07:43 07:18	07:42 15:46-16:25/39					
25	07:37 18:22-08:30/8	07:03 06:20	06:33 06:03	05:58 06:18	06:46 07:15	07:44 07:19	17:04 08:04-08:24/20					
26	07:37 18:22-08:30/8	07:02 06:18	06:32 06:02	05:59 06:19	06:47 07:16	07:45 07:20	07:43 15:48-16:26/38					
27	07:36 17:39	07:00 06:17	06:30 06:02	05:59 06:19	06:48 07:17	07:46 07:21	17:06 08:05-08:25/20					
28	07:35 17:40	07:00 06:17	06:30 06:02	05:59 06:19	06:48 07:17	07:47 07:22	07:44 15:49-16:27/38					
29	07:34 17:41	07:00 06:17	06:30 06:02	05:59 06:19	06:48 07:17	07:48 07:23	17:07 08:05-08:26/21					
30	07:34 17:42	07:00 06:17	06:30 06:02	05:59 06:19	06:48 07:17	07:49 07:24	07:44 15:50-16:28/38					
31	07:34 17:42	07:00 06:17	06:30 06:02	05:59 06:19	06:48 07:17	07:50 07:25	17:08 08:06-08:27/21					
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	1294	0	0	0	0	0	0	0	0	0	616	1860

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: Worst_case_Progetto_20240628WTG: WTG03 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (35)

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 17:11	07:33 07:52-08:37/45 17:43	06:59 18:16	07:10 18:22-19:19/57 19:47	06:27 20:17	05:59 20:45
2	07:45 17:11	07:32 07:51-08:38/47 17:45	06:57 18:17	07:09 18:23-19:19/56 19:48	06:25 20:18	05:59 20:45
3	07:45 17:12	07:31 07:50-08:38/48 17:46	06:56 18:18	07:07 18:22-19:19/57 19:49	06:24 20:19	05:59 20:46
4	07:45 17:13	07:30 07:49-08:38/49 17:47	06:54 18:19	07:05 18:22-19:18/56 19:50	06:23 20:20	05:58 20:47
5	07:45 17:14	07:29 07:48-08:39/51 17:48	06:53 18:20	07:04 18:22-19:18/56 19:51	06:22 20:21	05:58 20:47
6	07:45 17:15	07:28 07:47-08:39/52 17:49	06:51 18:21	07:02 18:22-19:17/55 19:52	06:21 20:22	05:58 20:48
7	07:45 17:16	07:27 07:46-08:39/53 17:51	06:50 18:22	07:01 18:22-19:17/55 19:53	06:19 20:23	05:57 20:49
8	07:45 17:17	07:26 07:46-08:39/53 17:52	06:48 18:23	06:59 18:22-19:16/54 19:54	06:18 20:24	05:57 20:49
9	07:45 17:18	07:25 07:46-08:39/53 17:53	06:47 18:24	06:58 18:23-19:15/52 19:55	06:17 20:25	05:57 20:50
10	07:45 17:19	07:24 07:47-08:39/52 17:54	06:45 18:25	06:56 18:23-19:14/51 19:56	06:16 20:26	05:57 20:50
11	07:44 17:20	07:22 07:46-08:38/52 17:55	06:44 18:26	06:55 18:24-19:14/50 19:57	06:15 20:27	05:57 20:51
12	07:44 17:21	07:21 07:47-08:38/51 17:56	06:42 18:27	06:53 18:24-19:12/48 19:58	06:14 20:28	05:57 20:51
13	07:44 08:05-08:10/5 17:22	07:20 07:47-08:38/51 17:58	06:40 18:28	06:52 18:25-19:11/46 19:59	06:13 20:29	05:57 20:52
14	07:44 08:04-08:14/10 17:23	07:19 07:48-08:38/50 17:59	06:39 18:29	06:50 18:26-19:09/43 20:00	06:12 20:30	05:56 20:52
15	07:43 08:04-08:17/13 17:24	07:18 07:49-08:38/49 18:00	06:37 18:30	06:49 18:27-19:08/41 20:01	06:11 20:30	05:56 20:53
16	07:43 08:03-08:19/16 17:25	07:16 07:49-08:36/47 18:01	06:36 17:47-18:05/18 18:31	06:47 18:28-19:06/38 20:02	06:10 20:31	05:56 20:53
17	07:43 08:03-08:21/18 17:26	07:15 07:50-08:35/45 18:02	06:34 17:42-18:08/26 18:32	06:46 18:30-19:05/35 20:03	06:09 20:32	05:57 20:53
18	07:42 08:03-08:23/20 17:27	07:14 07:51-08:35/44 18:03	06:33 17:40-18:11/31 18:33	06:44 18:31-19:02/31 20:04	06:09 20:33	05:57 20:54
19	07:42 08:02-08:24/22 17:28	07:13 07:51-08:33/42 18:04	06:31 17:37-18:13/36 18:34	06:43 18:33-19:00/27 20:05	06:08 20:34	05:57 20:54
20	07:41 08:01-08:25/24 17:29	07:11 07:53-08:32/39 18:06	06:29 17:34-18:14/40 18:35	06:41 18:36-18:58/22 20:06	06:07 20:35	05:57 20:54
21	07:41 08:01-08:27/26 17:31	07:10 07:54-08:31/37 18:07	06:28 17:33-18:16/43 18:36	06:40 18:39-18:53/14 20:07	06:06 20:36	05:57 20:55
22	07:40 08:00-08:28/28 17:32	07:09 07:55-08:28/33 18:08	06:26 17:31-18:16/45 18:37	06:38 20:08	06:05 20:37	05:57 20:55
23	07:39 07:59-08:29/30 17:33	07:07 07:57-08:27/30 18:09	06:25 17:30-18:18/48 18:38	06:37 20:09	06:05 20:38	05:57 20:55
24	07:39 07:59-08:31/32 17:34	07:06 07:59-08:24/25 18:10	06:23 17:29-18:18/49 18:39	06:36 20:10	06:04 20:38	05:58 20:55
25	07:38 07:58-08:32/34 17:35	07:04 08:03-08:21/18 18:11	06:21 17:27-18:18/51 18:40	06:34 20:11	06:03 20:39	05:58 20:55
26	07:37 07:57-08:33/36 17:36	07:03 08:09-08:15/6 18:12	06:20 17:27-18:19/52 18:41	06:33 20:12	06:03 20:40	05:58 20:55
27	07:37 07:57-08:34/37 17:38	07:02 18:13	06:18 17:25-18:19/54 18:42	06:32 20:13	06:02 20:41	05:59 20:55
28	07:36 07:56-08:35/39 17:39	07:00 18:14	06:17 17:25-18:20/55 18:43	06:30 20:14	06:01 20:42	05:59 20:55
29	07:35 07:55-08:36/41 17:40		07:15 18:24-19:20/56 19:44	06:29 20:15	06:01 20:43	05:59 20:55
30	07:34 07:54-08:36/42 17:41		07:13 18:23-19:19/56 19:45	06:28 20:16	06:00 20:43	06:00 20:55
31	07:33 07:53-08:37/44 17:42		07:12 18:23-19:20/57 19:46		06:00 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	517	1122	717	944	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: Worst_case_Progetto_20240628WTG: WTG03 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (35)

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	06:23 20:38	06:52 19:57	18:23-19:12/49 07:19 19:08	06:51 17:24	07:16-08:08/52 17:01
2	06:01 20:55	06:24 20:37	06:53 19:55	18:22-19:13/51 07:20 19:07	06:52 17:23	07:16-08:09/53 17:01
3	06:01 20:55	06:25 20:36	06:53 19:54	18:21-19:13/52 07:21 19:05	06:54 17:22	07:16-08:09/53 17:01
4	06:02 20:55	06:26 20:35	06:54 19:52	18:19-19:13/54 07:22 19:04	06:55 17:20	07:16-08:09/53 17:01
5	06:02 20:55	06:27 20:33	06:55 19:50	18:18-19:13/55 07:23 19:02	06:56 17:19	07:17-08:09/52 17:01
6	06:03 20:55	06:28 20:32	06:56 19:49	18:18-19:13/55 07:24 19:00	06:57 17:18	07:18-08:09/51 17:00
7	06:03 20:54	06:28 20:31	06:57 19:47	18:17-19:13/56 07:25 18:59	06:58 17:17	07:20-08:09/49 17:00
8	06:04 20:54	06:29 20:30	06:58 19:46	18:17-19:13/56 07:26 18:57	06:59 17:16	07:21-08:09/48 17:00
9	06:05 20:54	06:30 20:29	06:59 19:44	18:16-19:13/57 07:27 18:56	07:00 17:15	07:22-08:09/47 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	18:16-19:13/57 07:28 18:54	07:01 17:14	07:23-08:08/45 17:00
11	06:06 20:53	06:32 20:26	07:01 19:41	18:16-19:12/56 07:29 18:53	07:03 17:13	07:24-08:08/44 17:01
12	06:07 20:53	06:33 20:25	07:02 19:39	18:14-19:11/57 07:30 18:51	07:04 17:12	07:26-08:08/42 17:01
13	06:07 20:52	06:34 20:24	07:03 19:38	18:14-19:10/56 07:31 18:50	07:05 17:12	07:27-08:08/41 17:01
14	06:08 20:52	06:35 20:23	07:04 19:36	18:14-19:10/56 07:32 18:48	07:06 17:11	07:28-08:07/39 17:01
15	06:09 20:51	06:36 20:21	07:04 19:34	18:14-19:09/55 07:33 18:47	07:07 17:10	07:29-08:06/37 17:01
16	06:10 20:50	06:37 20:20	07:05 19:33	18:15-19:08/53 07:34 18:45	08:37-08:49/12 07:08 17:09	07:30-08:06/36 17:02
17	06:10 20:50	06:38 20:19	07:06 19:31	18:15-19:08/53 07:35 18:44	08:33-08:53/20 07:09 17:08	07:32-08:06/34 17:02
18	06:11 20:49	06:39 20:17	07:07 19:29	18:15-19:07/52 07:36 18:42	08:30-08:56/26 07:10 17:08	07:33-08:05/32 17:02
19	06:12 20:49	06:40 20:16	07:08 19:28	18:16-19:05/49 07:37 18:41	08:27-08:58/31 07:12 17:07	07:34-08:04/30 17:03
20	06:13 20:48	06:40 20:14	07:09 19:26	18:16-19:04/48 07:38 18:39	08:26-09:01/35 07:13 17:06	07:35-08:03/28 17:03
21	06:13 20:47	06:41 20:13	07:10 19:25	18:17-19:03/46 07:39 18:38	08:24-09:02/38 07:14 17:06	07:36-08:02/26 17:03
22	06:14 20:47	06:42 20:12	07:11 19:23	18:17-19:00/43 07:40 18:37	08:23-09:03/40 07:15 17:05	07:37-08:01/24 17:04
23	06:15 20:46	06:43 20:10	07:12 19:21	18:18-18:59/41 07:42 18:35	08:22-09:04/42 07:16 17:05	07:39-08:01/22 17:04
24	06:16 20:45	06:44 20:09	07:13 19:20	18:20-18:57/37 07:43 18:34	08:20-09:05/45 07:17 17:04	07:40-08:00/20 17:05
25	06:17 20:44	06:45 20:07	07:14 19:18	18:22-18:54/32 07:44 17:33	07:19-08:05/46 07:18 17:04	07:41-07:59/18 17:06
26	06:18 20:43	06:46 20:06	07:15 19:16	18:24-18:51/27 07:45 17:31	07:18-08:06/48 07:19 17:03	07:42-07:58/16 17:06
27	06:18 20:42	06:47 20:04	07:16 19:15	18:27-18:48/21 06:46 17:30	07:17-08:06/49 07:20 17:03	07:43-07:56/13 17:07
28	06:19 20:42	06:48 20:03	07:17 19:13	18:32-18:42/10 06:47 17:29	07:18-08:08/50 07:21 17:02	07:44-07:54/10 17:07
29	06:20 20:41	06:49 20:01	07:17 19:12	06:48 17:28	07:17-08:08/51 07:22 17:02	07:45-07:51/6 17:08
30	06:21 20:40	06:50 20:00	07:18 19:10	06:49 17:26	07:16-08:08/52 07:23 17:02	07:44 17:09
31	06:22 20:39	06:51 19:58	18:24-19:12/48	06:50 17:25	07:16-08:08/52	07:44 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	0	349	1334	637	1021	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: Worst_case_Progetto_20240628WTG: WTG04 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (36)
 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 16:27-16:45/18 17:11	07:33 17:44 18:16	06:59 18:17 19:47	07:10 19:47 20:17	06:27 20:17 20:45	06:00 20:45 20:55	06:00 20:55 20:38	06:23 20:38 19:57	06:52 19:57 19:08	07:20 19:08 17:24	06:51 17:24 17:01	07:25 16:19-16:33/14 17:01	
2	07:45 16:28-16:46/18 17:12	07:32 17:45 18:17	06:57 18:17 19:48	07:09 19:48 20:18	06:25 20:18 20:46	05:59 20:46 20:55	06:01 20:55 20:37	06:24 20:37 19:55	06:53 19:55 19:07	07:20 19:07 17:23	06:53 17:23 17:01	07:26 16:18-16:34/16 17:01	
3	07:45 16:28-16:47/19 17:12	07:31 17:46 18:18	06:56 18:18 19:49	07:07 19:49 20:19	06:24 20:19 20:46	05:59 20:46 20:55	06:01 20:55 20:36	06:25 20:36 19:54	06:54 19:54 19:05	07:21 19:05 17:22	06:54 17:22 17:01	07:27 16:18-16:35/17 17:01	
4	07:45 16:29-16:48/19 17:13	07:30 17:47 18:19	06:54 18:19 19:50	07:06 19:50 20:20	06:23 20:20 20:47	05:58 20:47 20:55	06:02 20:55 20:35	06:26 20:35 19:52	06:55 19:52 19:04	07:22 19:04 17:21	06:55 17:21 17:01	07:27 16:17-16:36/19 17:01	
5	07:45 16:30-16:49/19 17:14	07:29 17:48 18:20	06:53 18:20 19:51	07:04 19:51 20:21	06:22 20:21 20:48	05:58 20:48 20:55	06:02 20:55 20:34	06:27 20:34 19:51	06:55 19:51 19:02	07:23 19:02 17:20	06:56 17:20 17:01	07:28 16:17-16:36/19 17:01	
6	07:45 16:31-16:50/19 17:15	07:28 17:50 18:21	06:51 18:21 19:52	07:02 19:52 20:22	06:21 20:22 20:48	05:58 20:48 20:55	06:03 20:55 20:32	06:28 20:32 19:49	06:56 19:49 19:01	07:24 19:01 17:18	06:57 17:18 17:01	07:29 16:17-16:36/19 17:01	
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9	07:45 16:35-16:52/17 17:18	07:25 17:53 18:24	06:47 18:24 19:55	06:58 19:55 20:25	06:17 20:25 20:50	05:57 20:50 20:54	06:05 20:54 20:29	06:30 19:44 18:56	06:59 19:44 17:15	07:27 19:01 17:18	06:59 17:15 17:01	07:32 16:18-16:36/18 17:01	
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11	07:44 16:37-16:51/14 17:20	07:22 17:55 18:26	06:44 18:26 19:57	06:55 19:57 20:27	06:15 20:27 20:51	05:57 20:51 20:53	06:06 20:53 20:26	06:32 19:41 18:53	07:01 19:41 17:14	07:29 19:01 17:18	07:03 17:14 17:01	07:34 16:18-16:36/18 17:01	
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13	07:44 16:42-16:49/7 17:22	07:20 17:58 18:28	06:41 18:28 19:59	06:52 19:59 20:29	06:13 20:29 20:52	05:57 20:52 20:52	06:08 20:52 20:24	06:34 19:38 18:50	07:03 19:38 17:12	07:31 19:01 17:18	07:05 17:12 17:01	07:35 16:18-16:36/18 17:01	
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21	07:41 17:31 17:31	07:10 18:07 18:36	06:28 18:36 20:07	06:40 20:07 20:36	06:06 20:36 20:55	05:57 20:55 20:47	06:14 20:47 20:13	06:42 19:25 18:38	07:10 19:25 17:06	07:40 19:01 17:18	07:14 17:06 17:01	07:41 16:21-16:38/17 17:04	
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26	07:38 17:37 17:37	07:03 18:12 18:41	06:20 18:41 20:12	06:33 20:12 20:40	06:03 20:40 20:55	05:58 20:55 20:43	06:18 20:43 20:06	06:46 19:17 17:31	07:15 19:17 17:03	07:45 19:01 17:18	07:19 17:03 17:01	07:43 16:24-16:41/17 17:06	
27	07:37 17:38 17:38	07:02 18:14 18:42	06:18 18:42 20:13	06:32 20:13 20:41	06:02 20:41 20:56	05:59 20:56 20:43	06:19 20:43 20:04	06:47 19:15 17:30	07:16 19:15 17:03	07:46 19:01 17:18	07:20 17:03 17:01	07:43 16:24-16:41/17 17:07	
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31	07:34 17:42 17:42	07:00 18:15 18:43	06:17 18:43 20:14	06:31 20:14 20:42	06:02 20:42 20:56	05:59 20:56 20:42	06:20 20:42 20:03	06:48 19:13 17:29	07:17 19:13 17:02	07:47 19:01 17:18	07:21 17:02 17:01	07:44 16:26-16:44/18 17:10	
	Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
	Sum of minutes with flicker	215	0	0	0	0	0	0	0	0	18	544	

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: Worst_case_Progetto_20240628WTG: WTG05 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (37)

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 08:21-09:05/44 17:11	07:33 17:44 17:44	06:59 18:16 18:16	07:10 19:47 19:47	06:27 18:56-19:17/21 20:17	06:00 20:45 20:45
2	07:45 08:21-09:05/44 17:12	07:32 17:45 17:45	06:57 18:17 18:17	07:09 19:48 19:48	06:25 18:58-19:15/17 20:18	05:59 20:45 20:45
3	07:45 08:22-09:05/43 17:12	07:31 17:46 17:46	06:56 18:18 18:18	07:07 19:49 19:49	06:24 19:02-19:12/10 20:19	05:59 20:46 20:46
4	07:45 08:23-09:05/42 17:13	07:30 17:47 17:47	06:54 18:19 18:19	07:05 19:50 19:50	06:23 20:20 20:20	05:58 20:47 20:47
5	07:45 08:23-09:06/43 17:14	07:29 17:48 17:48	06:53 18:20 18:20	07:04 19:51 19:51	19:06-19:19/13 20:21	05:58 20:47 20:47
6	07:45 08:24-09:06/42 17:15	07:28 17:49 17:49	06:51 18:21 18:21	07:02 19:52 19:52	19:02-19:22/20 20:22	05:58 20:48 20:48
7	07:45 08:25-09:06/41 17:16	07:27 17:51 17:51	06:50 18:22 18:22	07:01 19:53 19:53	19:00-19:24/24 20:23	05:58 20:49 20:49
8	07:45 08:26-09:06/40 17:17	07:26 17:52 17:52	06:48 18:23 18:23	06:59 19:54 19:54	18:58-19:25/27 20:24	05:57 20:49 20:49
9	07:45 08:27-09:06/39 17:18	07:25 17:53 17:53	06:47 18:24 18:24	06:58 19:55 19:55	18:56-19:27/31 20:25	05:57 20:50 20:50
10	07:45 08:28-09:07/39 17:19	07:24 17:54 17:54	06:45 18:25 18:25	06:56 19:56 19:56	18:54-19:28/34 20:26	05:57 20:50 20:50
11	07:44 08:28-09:06/38 17:20	07:22 17:55 17:55	06:44 18:26 18:26	06:55 19:57 19:57	18:54-19:29/35 20:27	05:57 20:51 20:51
12	07:44 08:29-09:06/37 17:21	07:21 17:56 17:56	06:42 18:27 18:27	06:53 19:58 19:58	18:52-19:29/37 20:28	05:57 20:51 20:51
13	07:44 08:31-09:06/35 17:22	07:20 17:58 17:58	06:40 18:28 18:28	06:52 19:59 19:59	18:52-19:30/38 20:29	05:57 20:52 20:52
14	07:44 08:31-09:05/34 17:23	07:19 17:59 17:59	06:39 18:29 18:29	06:50 20:00 20:00	18:50-19:29/39 20:30	05:57 20:52 20:52
15	07:43 08:33-09:05/32 17:24	07:18 18:00 18:00	06:37 18:30 18:30	06:49 20:01 20:01	18:50-19:30/40 20:30	05:57 20:53 20:53
16	07:43 08:33-09:03/30 17:25	07:16 18:01 18:01	06:36 18:31 18:31	06:47 20:02 20:02	18:49-19:29/40 20:31	05:57 20:53 20:53
17	07:43 08:35-09:03/28 17:26	07:15 18:02 18:02	06:34 18:32 18:32	06:46 20:03 20:03	18:49-19:30/41 20:32	05:57 20:53 20:53
18	07:42 08:37-09:03/26 17:27	07:14 18:03 18:03	06:33 18:33 18:33	06:44 20:04 20:04	18:48-19:29/41 20:33	05:57 20:54 20:54
19	07:42 08:39-09:01/22 17:28	07:13 18:05 18:05	06:31 18:34 18:34	06:43 20:05 20:05	18:49-19:29/40 20:34	05:57 20:54 20:54
20	07:41 08:40-08:59/19 17:30	07:11 18:06 18:06	06:29 18:35 18:35	06:41 20:06 20:06	18:49-19:29/40 20:35	05:57 20:54 20:54
21	07:41 08:44-08:57/13 17:31	07:10 18:07 18:07	06:28 18:36 18:36	06:40 20:07 20:07	18:48-19:28/40 20:36	05:57 20:55 20:55
22	07:40 08:50-08:51/1 17:32	07:09 18:08 18:08	06:26 18:37 18:37	06:39 20:08 20:08	18:49-19:28/39 20:37	05:57 20:55 20:55
23	07:39 17:33	07:07 18:09 18:09	06:25 18:38 18:38	06:37 20:09 20:09	18:50-19:28/38 20:38	05:58 20:55 20:55
24	07:39 17:34	07:06 18:10 18:10	06:23 18:39 18:39	06:36 20:10 20:10	18:49-19:26/37 20:38	05:58 20:55 20:55
25	07:38 17:35	07:04 18:11 18:11	06:21 18:40 18:40	06:34 20:11 20:11	18:50-19:26/36 20:39	05:58 20:55 20:55
26	07:37 17:36	07:03 18:12 18:12	06:20 18:41 18:41	06:33 20:12 20:12	18:51-19:25/34 20:40	05:58 20:55 20:55
27	07:37 17:38	07:02 18:13 18:13	06:18 18:42 18:42	06:32 20:13 20:13	18:51-19:23/32 20:41	05:59 20:55 20:55
28	07:36 17:39	07:00 18:15 18:15	06:17 18:43 18:43	06:30 20:14 20:14	18:52-19:22/30 20:42	05:59 20:55 20:55
29	07:35 17:40	07:03 19:44 19:44	06:15 20:15 20:15	06:29 20:15 20:15	18:54-19:21/27 20:43	06:00 20:55 20:55
30	07:34 17:41	07:13 19:45 19:45	06:28 20:16 20:16	06:28 20:16 20:16	18:55-19:20/25 20:43	06:00 20:55 20:55
31	07:33 17:42	07:12 19:46 19:46	07:12 19:46 19:46	07:12 19:46 19:46	06:00 20:44 20:44	06:00 20:55 20:55
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	732	0	0	878	48	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: Worst_case_Progetto_20240628WTG: WTG05 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (37)

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	06:23 20:38	06:52 19:57	18:53-19:28/35 19:08	07:19 17:24	06:51 17:01	08:10-08:48/38
2	06:01 20:55	06:24 20:37	06:53 19:55	18:53-19:26/33 19:07	07:20 17:23	06:52 17:01	08:10-08:49/39
3	06:01 20:55	06:25 20:36	06:53 19:54	18:54-19:25/31 19:05	07:21 17:22	06:54 17:01	08:10-08:49/39
4	06:02 20:55	06:26 20:35	06:54 19:52	18:55-19:22/27 19:04	07:22 17:21	06:55 17:01	08:10-08:50/40
5	06:02 20:55	06:27 20:33	06:55 19:50	18:56-19:20/24 19:02	07:23 17:19	06:56 17:01	08:10-08:51/41
6	06:03 20:55	06:28 20:32	06:56 19:49	18:58-19:18/20 19:00	07:24 17:18	06:57 17:01	08:10-08:52/42
7	06:04 20:54	06:28 20:31	06:57 19:47	19:01-19:14/13 19:00	07:25 17:17	06:58 17:01	08:10-08:53/43
8	06:04 20:54	06:29 20:30	06:58 19:46		07:26 17:16	06:59 17:00	08:11-08:53/42
9	06:05 20:54	06:30 20:29	06:59 19:44		07:27 17:15	07:00 17:00	08:11-08:54/43
10	06:05 20:53	06:31 20:28	07:00 19:42	19:09-19:22/13 19:41	07:28 17:14	07:01 17:01	08:11-08:55/44
11	06:06 20:53	06:32 20:26	07:01 19:41	19:06-19:24/18 19:41	07:29 17:13	07:03 17:01	08:12-08:56/44
12	06:07 20:53	06:33 20:25	07:02 19:39	19:04-19:26/22 19:39	07:30 17:13	07:04 17:01	08:11-08:56/45
13	06:07 20:52	06:34 20:24	07:03 19:38	19:02-19:28/26 19:38	07:31 17:12	07:05 17:01	08:12-08:56/44
14	06:08 20:52	06:35 20:23	07:04 19:36	19:01-19:29/28 19:36	07:32 17:11	07:06 17:01	08:13-08:57/44
15	06:09 20:51	06:36 20:21	07:04 19:34	19:00-19:30/30 19:34	07:33 17:10	07:07 17:01	08:13-08:58/45
16	06:10 20:50	06:37 20:20	07:05 19:33	18:59-19:31/32 19:33	07:34 17:09	07:08 17:02	08:13-08:58/45
17	06:10 20:50	06:38 20:19	07:06 19:31	18:58-19:32/34 19:31	07:35 17:08	07:09 17:02	08:14-08:59/45
18	06:11 20:49	06:39 20:17	07:07 19:29	18:56-19:32/36 19:29	07:36 17:08	07:11 17:02	08:13-08:59/46
19	06:12 20:49	06:40 20:16	07:08 19:28	18:55-19:32/37 19:28	07:37 17:07	07:12 17:03	08:14-09:00/46
20	06:13 20:48	06:41 20:14	07:09 19:26	18:54-19:33/39 19:26	07:38 17:06	07:13 17:03	08:15-09:01/46
21	06:14 20:47	06:41 20:13	07:10 19:25	18:54-19:33/39 19:25	07:39 17:06	07:14 17:03	08:15-09:01/46
22	06:14 20:47	06:42 20:12	07:11 19:23	18:53-19:33/40 19:23	07:40 17:05	07:15 17:04	08:16-09:02/46
23	06:15 20:46	06:43 20:10	07:12 19:21	18:53-19:33/40 19:21	07:42 17:05	07:16 17:04	08:16-09:02/46
24	06:16 20:45	06:44 20:09	07:13 19:20	18:53-19:33/40 19:20	07:43 17:04	07:17 17:05	08:16-09:02/46
25	06:17 20:44	06:45 20:07	07:14 19:18	18:52-19:33/41 19:18	07:44 17:04	07:18 17:06	08:17-09:03/46
26	06:18 20:43	06:46 20:06	07:15 19:16	18:52-19:33/41 19:16	07:45 17:03	07:19 17:06	08:18-09:03/45
27	06:19 20:42	06:47 20:04	07:16 19:15	18:51-19:31/40 19:15	07:46 17:03	07:20 17:07	08:18-09:03/45
28	06:19 20:42	06:48 20:03	07:17 19:13	18:51-19:31/40 19:13	07:47 17:02	07:21 17:08	08:19-09:04/45
29	06:20 20:41	06:49 20:01	07:18 19:12	18:51-19:30/39 19:12	07:48 17:02	07:22 17:08	08:19-09:04/45
30	06:21 20:40	06:50 20:00	07:18 19:10	18:52-19:30/38 19:10	07:49 17:02	07:23 17:09	08:20-09:04/44
31	06:22 20:39	06:51 19:58	07:19	18:52-19:29/37	07:50 17:25	07:24 17:10	08:20-09:05/45
Potential sun hours	454	425	374	347	302	293	
Sum of minutes with flicker	0	750	183	0	274	1360	

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: Worst_case_Progetto_20240628WTG: WTG06 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (38)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45	07:33	06:59 17:41-17:54/13	07:10	06:27	06:00	06:00	06:23	06:52	07:19	06:51	07:25
	17:11	17:44	18:16	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57 17:42-17:56/14	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:53	07:26
	17:12	17:45	18:17	19:48	20:18	20:45	20:55	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56 17:41-17:57/16	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:26
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:22	17:01
4	07:45	07:30	06:54 17:42-17:58/16	07:06	06:23	05:58	06:02	06:26	06:54	07:22 18:25-18:36/11	06:55	07:27
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:35	19:52	19:04	17:21	17:01
5	07:45	07:29	06:53 17:42-17:59/17	07:04	06:22	05:58	06:02	06:27	06:55	07:23 18:23-18:37/14	06:56	07:28
	17:14	17:48	18:20	19:51	20:21	20:47	20:55	20:33	19:51	19:02	17:20	17:01
6	07:45	07:28	06:51 17:43-18:01/18	07:02	06:21	05:58	06:03	06:28	06:56	07:24 18:21-18:38/17	06:57	07:29
	17:15	17:50	18:21	19:52	20:22	20:48	20:55	20:32	19:49	19:01	17:18	17:01
7	07:45	07:27	06:50 17:44-18:01/17	07:01	06:20	05:58	06:04	06:29	06:57	07:25 18:20-18:37/17	06:58	07:30
	17:16	17:51	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:01
8	07:45	07:26	06:48 17:46-18:02/16	06:59	06:19	05:57	06:04	06:29	06:58	07:26 18:18-18:35/17	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:01
9	07:45	07:25	06:47 17:47-17:59/12	06:58	06:17	05:57	06:05	06:30	06:59	07:27 18:17-18:34/17	07:00	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:01
10	07:45	07:24	06:45 17:49-17:55/6	06:56	06:16	05:57	06:06	06:31	07:00	07:28 18:16-18:32/16	07:02	07:33
	17:19	17:54	18:25	19:56	20:26	20:50	20:53	20:28	19:43	18:54	17:14	17:01
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29 18:15-18:30/15	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:53	17:14	17:01
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30 18:15-18:29/14	07:04	07:34
	17:21	17:57	18:27	19:58	20:28	20:51	20:53	20:25	19:39	18:51	17:13	17:01
13	07:44	07:20	06:41	06:52	06:13	05:57	06:08	06:34 19:51-19:52/1	07:03	07:31 18:15-18:27/12	07:05	07:35
	17:22	17:58	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:12	17:01
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35 19:47-19:57/10	07:04	07:32 18:15-18:26/11	07:06	07:36
	17:23	17:59	18:29	20:00	20:30	20:52	20:52	20:23	19:36	18:48	17:11	17:01
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36 19:45-19:58/13	07:05	07:33 18:15-18:24/9	07:07	07:37
	17:24	18:00	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37 19:44-19:58/14	07:05	07:34 18:16-18:23/7	07:08	07:37
	17:25	18:01	18:31	20:02	20:31	20:53	20:51	20:20	19:33	18:45	17:09	17:02
17	07:43	07:15	06:34	06:46 19:39-19:42/3	06:10	05:57	06:10	06:38 19:43-19:57/14	07:06	07:35 18:17-18:21/4	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:53	20:50	20:19	19:31	18:44	17:09	17:02
18	07:42	07:14	06:33	06:44 19:37-19:42/5	06:09	05:57	06:11	06:39 19:41-19:55/14	07:07	07:36 18:18-18:19/1	07:11	07:39
	17:27	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:30	18:42	17:08	17:02
19	07:42	07:13	06:31	06:43 19:37-19:43/6	06:08	05:57	06:12	06:40 19:40-19:53/13	07:08	07:37	07:12	07:39
	17:29	18:05	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:03
20	07:41	07:11	06:29	06:41 19:36-19:45/9	06:07	05:57	06:13	06:41 19:40-19:52/12	07:09	07:38	07:13	07:40
	17:30	18:06	18:35	20:06	20:35	20:54	20:48	20:15	19:26	18:40	17:06	17:03
21	07:41	07:10	06:28	06:40 19:35-19:45/10	06:06	05:57	06:14	06:42 19:40-19:51/11	07:10	07:39	07:14	07:41
	17:31	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:25	18:38	17:06	17:04
22	07:40	07:09	06:26	06:39 19:35-19:46/11	06:06	05:57	06:14	06:42 19:40-19:50/10	07:11	07:41	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:47	20:12	19:23	18:37	17:05	17:04
23	07:39	07:07	06:25	06:37 19:35-19:48/13	06:05	05:58	06:15	06:43 19:40-19:48/8	07:12	07:42	07:16	07:42
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:05	17:05
24	07:39	07:06 17:46-17:48/2	06:23	06:36 19:35-19:48/13	06:04	05:58	06:16	06:44 19:40-19:47/7	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:39	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04 17:45-17:50/5	06:21	06:35 19:35-19:49/14	06:03	05:58	06:17	06:45 19:41-19:46/5	07:14	06:44	07:18	07:42
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:33	17:04	17:06
26	07:37	07:03 17:44-17:52/8	06:20	06:33 19:36-19:50/14	06:03	05:59	06:18	06:46 19:42-19:44/2	07:15	06:45	07:19	07:43
	17:37	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:17	17:31	17:03	17:06
27	07:37	07:02 17:42-17:52/10	06:18	06:32 19:36-19:50/14	06:02	05:59	06:19	06:47	07:16	06:46	07:20	07:43
	17:38	18:14	18:42	20:13	20:41	20:55	20:43	20:04	19:15	17:30	17:03	17:07
28	07:36	07:00 17:42-17:54/12	06:17	06:31 19:38-19:50/12	06:02	05:59	06:20	06:48	07:17	06:47	07:21	07:44
	17:39	18:15	18:43	20:14	20:42	20:55	20:42	20:03	19:13	17:29	17:02	17:08
29	07:35		07:15	06:29 19:40-19:48/8	06:01	06:00	06:20	06:49	07:18	06:48	07:22	07:44
	17:40		19:44	20:15	20:43	20:55	20:41	20:01	19:12	17:28	17:02	17:08
30	07:34		07:13	06:28	06:01	06:00	06:21	06:50	07:19	06:49	07:23	07:44
	17:41		19:45	20:16	20:43	20:55	20:40	20:00	19:10	17:26	17:02	17:09
31	07:34		07:12		06:00		06:22	06:51		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	0	37	145	132	0	0	0	134	0	182	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: Worst_case_Progetto_20240628WTG: WTG07 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (39)

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 17:11	07:33 17:02-17:20/18 17:44	06:59 17:43-17:53/10 18:16	07:10 19:47	06:27 20:17	06:00 19:58-20:20/22 20:45
2	07:45 17:12	07:32 17:02-17:21/19 17:45	06:57 17:40-17:56/16 18:17	07:09 19:48	06:25 20:18	05:59 19:58-20:21/23 20:45
3	07:45 17:12	07:31 17:03-17:22/19 17:46	06:56 17:38-17:57/19 18:18	07:07 19:49	06:24 20:19	05:59 19:58-20:22/24 20:46
4	07:45 17:13	07:30 17:03-17:22/19 17:47	06:54 17:36-17:58/22 18:19	07:06 19:50	06:23 20:20	05:58 19:58-20:22/24 20:47
5	07:45 17:14	07:29 17:04-17:21/17 17:48	06:53 17:34-17:59/25 18:20	07:04 19:51	06:22 20:21	05:58 19:58-20:23/25 20:47
6	07:45 17:15	07:28 17:06-17:20/14 17:49	06:51 17:34-18:01/27 18:21	07:02 19:52	06:21 19:54-19:59/5 20:22	05:58 19:58-20:24/26 20:48
7	07:45 17:16	07:27 17:08-17:18/10 17:51	06:50 17:32-18:01/29 18:22	07:01 19:53	06:20 19:53-20:00/7 20:23	05:58 19:59-20:25/26 20:49
8	07:45 17:17	07:26 17:11-17:15/4 17:52	06:48 17:32-18:03/31 18:23	06:59 19:54	06:18 19:51-20:01/10 20:24	05:57 19:58-20:24/26 20:49
9	07:45 17:18	07:25 17:53	06:47 17:31-18:03/32 18:24	06:58 19:55	06:17 19:50-20:02/12 20:25	05:57 19:58-20:25/27 20:50
10	07:45 17:19	07:24 17:54	06:45 17:30-18:04/34 18:25	06:56 19:56	06:16 19:49-20:03/14 20:26	05:57 19:59-20:26/27 20:50
11	07:44 17:20	07:22 17:55	06:44 17:31-18:05/34 18:26	06:55 19:57	06:15 19:49-20:04/15 20:27	05:57 19:59-20:26/27 20:51
12	07:44 17:21	07:21 17:57	06:42 17:30-18:05/35 18:27	06:53 19:58	06:14 19:48-20:05/17 20:28	05:57 19:59-20:27/28 20:51
13	07:44 17:22	07:20 17:58	06:40 17:31-18:06/35 18:28	06:52 19:59	06:13 19:48-20:06/18 20:29	05:57 19:59-20:27/28 20:52
14	07:44 17:23	07:19 17:59	06:39 17:31-18:05/34 18:29	06:50 20:00	06:12 19:48-20:06/18 20:30	05:57 20:00-20:28/28 20:52
15	07:43 17:24	07:18 18:00	06:37 17:32-18:05/33 18:30	06:49 20:01	06:11 19:47-20:07/20 20:31	05:57 20:00-20:28/28 20:53
16	07:43 17:25	07:16 18:01	06:36 17:32-18:04/32 18:31	06:47 20:02	06:10 19:47-20:08/21 20:31	05:57 20:00-20:28/28 20:53
17	07:43 17:26	07:15 18:02	06:34 17:33-18:03/30 18:32	06:46 20:03	06:10 19:47-20:09/22 20:32	05:57 20:00-20:28/28 20:53
18	07:42 17:27	07:14 18:03	06:33 17:34-18:03/29 18:33	06:44 20:04	06:09 19:47-20:09/22 20:33	05:57 20:00-20:29/29 20:54
19	07:42 17:29	07:13 18:05	06:31 17:35-18:01/26 18:34	06:43 20:05	06:08 19:48-20:11/23 20:34	05:57 20:00-20:29/29 20:54
20	07:41 17:30	07:11 18:06	06:29 17:37-18:00/23 18:35	06:41 20:06	06:07 19:48-20:11/23 20:35	05:57 20:01-20:30/29 20:54
21	07:41 17:31	07:10 18:07	06:28 17:37-17:58/21 18:36	06:40 20:07	06:06 19:48-20:12/24 20:36	05:57 20:01-20:30/29 20:55
22	07:40 17:05-17:08/3 17:32	07:09 18:08	06:26 17:39-17:55/16 18:37	06:39 20:08	06:06 19:49-20:13/24 20:37	05:57 20:01-20:30/29 20:55
23	07:39 17:04-17:08/4 17:33	07:07 18:09	06:25 17:43-17:52/9 18:38	06:37 20:09	06:05 19:50-20:14/24 20:38	05:58 20:01-20:30/29 20:55
24	07:39 17:03-17:10/7 17:34	07:06 18:10	06:23 18:39	06:36 20:10	06:04 19:50-20:14/24 20:38	05:58 20:02-20:31/29 20:55
25	07:38 17:02-17:11/9 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 19:51-20:16/25 20:39	05:58 20:02-20:31/29 20:55
26	07:37 17:02-17:12/10 17:37	07:03 18:12	06:20 18:41	06:33 20:12	06:03 19:52-20:16/24 20:40	05:58 20:02-20:30/28 20:55
27	07:37 17:01-17:13/12 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 19:53-20:17/24 20:41	05:59 20:03-20:31/28 20:55
28	07:36 17:02-17:16/14 17:39	07:00 18:15	06:17 18:43	06:30 20:14	06:02 19:54-20:18/24 20:42	05:59 20:03-20:31/28 20:55
29	07:35 17:02-17:17/15 17:40		07:15 19:44	06:29 20:15	06:01 19:56-20:19/23 20:43	06:00 20:02-20:30/28 20:55
30	07:34 17:02-17:18/16 17:41		07:13 19:45	06:28 20:16	06:01 19:58-20:19/21 20:43	06:00 20:03-20:31/28 20:55
31	07:33 17:02-17:19/17 17:42		07:12 19:46		06:00 19:58-20:20/22 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	107	120	602	0	506	817

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

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

Calculation: Worst_case_Progetto_20240628WTG: WTG07 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (39)

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 20:03-20:30/27 20:55	06:23 19:58-20:14/16 20:38	06:52 19:57	07:19 18:10-18:45/35 19:08	06:51 17:24	07:24 17:01
2	06:01 20:04-20:31/27 20:55	06:24 19:59-20:13/14 20:37	06:53 19:55	07:20 18:09-18:44/35 19:07	06:53 17:23	07:25 17:01
3	06:01 20:03-20:30/27 20:55	06:25 19:59-20:12/13 20:36	06:54 19:54	07:21 18:09-18:43/34 19:05	06:54 16:40-16:46/6 17:22	07:26 17:01
4	06:02 20:04-20:31/27 20:55	06:26 20:00-20:12/12 20:35	06:54 19:52	07:22 18:09-18:42/33 19:04	06:55 16:37-16:49/12 17:21	07:27 17:01
5	06:02 20:04-20:30/26 20:55	06:27 20:01-20:11/10 20:33	06:55 19:50	07:23 18:09-18:40/31 19:02	06:56 16:35-16:50/15 17:20	07:28 17:01
6	06:03 20:04-20:30/26 20:55	06:28 20:03-20:10/7 20:32	06:56 19:49	07:24 18:09-18:38/29 19:00	06:57 16:34-16:51/17 17:18	07:29 17:01
7	06:04 20:04-20:29/25 20:54	06:29 20:05-20:09/4 20:31	06:57 19:47	07:25 18:09-18:37/28 18:59	06:58 16:33-16:52/19 17:17	07:30 17:01
8	06:04 20:05-20:29/24 20:54	06:29 20:30 20:30	06:58 19:46	07:26 18:10-18:35/25 18:57	06:59 16:34-16:53/19 17:16	07:31 17:01
9	06:05 20:06-20:30/24 20:54	06:30 20:29 20:29	06:59 19:44	07:27 18:10-18:34/24 18:56	07:00 16:33-16:52/19 17:15	07:32 17:01
10	06:05 20:05-20:29/24 20:53	06:31 20:28 20:28	07:00 19:43	07:28 18:11-18:32/21 18:54	07:01 16:33-16:51/18 17:14	07:33 17:01
11	06:06 20:06-20:29/23 20:53	06:32 20:26 20:26	07:01 19:41	07:29 18:13-18:30/17 18:53	07:03 16:33-16:50/17 17:14	07:34 17:01
12	06:07 20:07-20:29/22 20:53	06:33 20:25 20:25	07:02 19:39	07:30 18:15-18:29/14 18:51	07:04 16:32-16:49/17 17:13	07:34 17:01
13	06:07 20:06-20:27/21 20:52	06:34 20:24 20:24	07:03 19:38	07:31 18:20-18:23/3 18:50	07:05 16:34-16:49/15 17:12	07:35 17:01
14	06:08 20:05-20:27/22 20:52	06:35 20:23 20:23	07:04 19:36	07:32 18:48 18:48	07:06 16:34-16:47/13 17:11	07:36 17:01
15	06:09 20:04-20:27/23 20:51	06:36 20:21 20:21	07:05 19:34	07:33 18:47 18:47	07:07 16:34-16:46/12 17:10	07:37 17:01
16	06:10 20:02-20:26/24 20:50	06:37 20:20 20:20	07:05 19:33	07:34 18:45 18:45	07:08 16:35-16:45/10 17:09	07:37 17:02
17	06:10 20:02-20:26/24 20:50	06:38 20:19 20:19	07:06 19:31	07:35 18:44 18:44	07:09 16:35-16:44/9 17:09	07:38 17:02
18	06:11 20:01-20:25/24 20:49	06:39 20:17 20:17	07:07 19:30	07:36 18:42 18:42	07:11 16:37-16:44/7 17:08	07:39 17:02
19	06:12 20:01-20:25/24 20:49	06:40 20:16 20:16	07:08 19:28	07:37 18:41 18:41	07:12 16:39-16:43/4 17:07	07:39 17:03
20	06:13 19:59-20:24/25 20:48	06:41 20:14 20:14	07:09 18:30-18:37/7 19:26	07:38 18:40 18:40	07:13 16:40-16:43/3 17:06	07:40 17:03
21	06:14 19:59-20:23/24 20:47	06:42 20:13 20:13	07:10 18:26-18:41/15 19:25	07:39 18:38 18:38	07:14 17:06 17:06	07:40 17:04
22	06:14 19:59-20:23/24 20:47	06:42 20:12 20:12	07:11 18:22-18:42/20 19:23	07:41 18:37 18:37	07:15 17:05 17:05	07:41 17:04
23	06:15 19:59-20:22/23 20:46	06:43 20:10 20:10	07:12 18:20-18:43/23 19:21	07:42 18:35 18:35	07:16 17:05 17:05	07:42 17:05
24	06:16 19:59-20:21/22 20:45	06:44 20:09 20:09	07:13 18:19-18:44/25 19:20	07:43 18:34 18:34	07:17 17:04 17:04	07:42 17:05
25	06:17 19:58-20:20/22 20:44	06:45 20:07 20:07	07:14 18:17-18:45/28 19:18	07:44 17:33 17:33	07:18 17:04 17:04	07:42 17:06
26	06:18 19:58-20:19/21 20:43	06:46 20:06 20:06	07:15 18:15-18:45/30 19:16	07:45 17:31 17:31	07:19 17:03 17:03	07:43 17:06
27	06:19 19:58-20:19/21 20:42	06:47 20:04 20:04	07:16 18:14-18:45/31 19:15	07:46 17:30 17:30	07:20 17:03 17:03	07:43 17:07
28	06:19 19:58-20:18/20 20:42	06:48 20:03 20:03	07:17 18:13-18:46/33 19:13	07:47 17:29 17:29	07:21 17:02 17:02	07:43 17:08
29	06:20 19:58-20:17/19 20:41	06:49 20:01 20:01	07:18 18:11-18:45/34 19:12	07:48 17:28 17:28	07:22 17:02 17:02	07:44 17:08
30	06:21 19:58-20:17/19 20:40	06:50 20:00 20:00	07:19 18:11-18:45/34 19:10	07:49 17:26 17:26	07:23 17:02 17:02	07:44 17:09
31	06:22 19:59-20:16/17 20:39	06:51 19:58 19:58		06:50 17:25 17:25		07:44 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	721	76	280	329	232	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: Worst_case_Progetto_20240628WTG: WTG08 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (40)

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 16:01-16:23/22 17:11	07:33 17:44 18:16	06:59 18:16	07:10 18:49-19:26/37 19:47	06:27 20:17 20:45	06:00 20:45
2	07:45 16:02-16:23/21 17:12	07:32 17:45 18:17	06:57 18:17	07:09 18:49-19:27/38 19:48	06:25 20:18 20:45	05:59 20:45
3	07:45 16:03-16:23/20 17:12	07:31 17:46 18:18	06:56 18:18	07:07 18:48-19:26/38 19:49	06:24 20:19 20:46	05:59 20:46
4	07:45 16:04-16:23/19 17:13	07:30 17:47 18:19	06:54 18:19	07:06 18:49-19:26/37 19:50	06:23 20:20 20:47	05:58 20:47
5	07:45 16:05-16:23/18 17:14	07:29 17:48 18:20	06:53 18:20	07:04 18:48-19:25/37 19:51	06:22 20:21 20:47	05:58 20:47
6	07:45 16:06-16:22/16 17:15	07:28 17:49 18:21	06:51 18:21	07:02 18:48-19:24/36 19:52	06:21 20:22 20:48	05:58 20:48
7	07:45 16:08-16:22/14 17:16	07:27 17:51 18:22	06:50 18:22	07:01 18:49-19:23/34 19:53	06:20 20:23 20:49	05:58 20:49
8	07:45 16:10-16:21/11 17:17	07:26 17:52 18:23	06:48 18:23	06:59 18:49-19:22/33 19:54	06:18 20:24 20:49	05:57 20:49
9	07:45 16:13-16:19/6 17:18	07:25 17:53 18:24	06:47 18:24	06:58 18:50-19:21/31 19:55	06:17 20:25 20:50	05:57 20:50
10	07:45 17:19	07:24 17:54 18:25	06:45 18:25	06:56 18:51-19:19/28 19:56	06:16 20:26 20:50	05:57 20:50
11	07:44 17:20	07:22 17:55 18:26	06:44 18:26	06:55 18:52-19:18/26 19:57	06:15 20:27 20:51	05:57 20:51
12	07:44 17:21	07:21 17:57 18:27	06:42 18:27	06:53 18:53-19:15/22 19:58	06:14 20:28 20:51	05:57 20:51
13	07:44 17:22	07:20 17:58 18:28	06:40 18:28	06:52 18:56-19:13/17 19:59	06:13 20:29 20:52	05:57 20:52
14	07:44 17:23	07:19 17:59 18:29	06:39 18:29	06:50 18:59-19:09/10 20:00	06:12 20:30 20:52	05:57 20:52
15	07:43 17:24	07:18 18:00 18:30	06:37 18:30	06:49 20:01 20:30	06:11 20:30 20:53	05:57 20:53
16	07:43 17:25	07:16 18:01 18:31	06:36 18:31	06:47 20:02 20:31	06:10 20:31 20:53	05:57 20:53
17	07:43 17:26	07:15 18:02 18:32	06:34 18:32	06:46 20:03 20:32	06:10 20:32 20:53	05:57 20:53
18	07:42 17:27	07:14 18:03 18:33	06:33 18:33	06:44 20:04 20:33	06:09 20:33 20:54	05:57 20:54
19	07:42 17:29	07:13 18:05 18:34	06:31 18:34	06:43 20:05 20:34	06:08 20:34 20:54	05:57 20:54
20	07:41 17:30	07:11 18:06 18:35	06:29 18:35	06:41 20:06 20:35	06:07 20:35 20:54	05:57 20:54
21	07:41 17:31	07:10 18:07 18:36	06:28 18:36	06:40 20:07 20:36	06:06 20:36 20:55	05:57 20:55
22	07:40 17:32	07:09 18:08 18:37	06:26 18:37	06:39 20:08 20:37	06:06 20:37 20:55	05:57 20:55
23	07:39 17:33	07:07 18:09 18:38	06:25 18:38	06:37 20:09 20:38	06:05 20:38 20:55	05:58 20:55
24	07:39 17:34	07:06 18:10 18:39	06:23 18:39	06:36 20:10 20:39	06:04 20:39 20:55	05:58 20:55
25	07:38 17:35	07:04 18:11 18:40	06:21 18:40	06:34 20:11 20:40	06:03 20:39 20:55	05:58 20:55
26	07:37 17:37	07:03 18:12 18:41	06:20 18:41	06:33 20:12 20:41	06:03 20:40 20:55	05:58 20:55
27	07:37 17:38	07:02 18:13 18:42	06:18 18:42	06:32 20:13 20:42	06:02 20:41 20:55	05:59 20:55
28	07:36 17:39	07:00 18:15 18:43	06:17 18:43	06:30 20:14 20:43	06:02 20:42 20:55	05:59 20:55
29	07:35 17:40	07:15 19:44	07:15 18:51-19:24/33	06:29 20:15 20:44	06:01 20:42 20:55	06:00 20:55
30	07:34 17:41	07:13 19:45	07:13 18:49-19:24/35	06:28 20:16 20:45	06:01 20:43 20:55	06:00 20:55
31	07:33 17:42	07:12 19:46	07:12 18:49-19:26/37	06:28 20:16 20:45	06:00 20:44 20:55	06:00 20:55
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	147	0	281	424	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: Worst_case_Progetto_20240628WTG: WTG08 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (40)

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	06:23 20:38	06:52 19:57	18:51-19:17/26 19:08	07:19 17:24	06:51 17:01
2	06:01 20:55	06:24 20:37	06:53 19:55	18:50-19:18/28 19:07	07:20 17:23	06:52 17:01
3	06:01 20:55	06:25 20:36	06:54 19:54	18:48-19:19/31 19:05	07:21 17:22	06:54 17:01
4	06:02 20:55	06:26 20:35	06:54 19:52	18:47-19:20/33 19:04	07:22 17:21	06:55 17:01
5	06:02 20:55	06:27 20:33	06:55 19:50	18:45-19:19/34 19:02	07:23 17:20	06:56 17:01
6	06:03 20:55	06:28 20:32	06:56 19:49	18:44-19:20/36 19:00	07:24 17:18	06:57 17:01
7	06:04 20:54	06:29 20:31	06:57 19:47	18:43-19:20/37 19:00	07:25 18:59	06:58 17:17
8	06:04 20:54	06:29 20:30	06:58 19:46	18:43-19:20/37 19:00	07:26 18:57	06:59 17:16
9	06:05 20:54	06:30 20:29	06:59 19:44	18:42-19:20/38 19:00	07:27 18:56	07:00 17:15
10	06:05 20:53	06:31 20:28	07:00 19:43	18:42-19:20/38 19:00	07:28 18:54	07:01 17:14
11	06:06 20:53	06:32 20:26	07:01 19:41	18:42-19:20/38 19:00	07:29 18:53	07:03 17:14
12	06:07 20:52	06:33 20:25	07:02 19:39	18:42-19:18/36 19:00	07:30 18:51	07:04 17:13
13	06:07 20:52	06:34 20:24	07:03 19:38	18:41-19:15/34 19:00	07:31 18:50	07:05 17:12
14	06:08 20:52	06:35 20:23	07:04 19:36	18:41-19:14/33 19:00	07:32 18:48	07:06 17:11
15	06:09 20:51	06:36 20:21	07:05 19:34	18:41-19:12/31 19:00	07:33 18:47	07:07 17:10
16	06:10 20:50	06:37 20:20	07:05 19:33	18:41-19:11/30 19:00	07:34 18:45	07:08 17:09
17	06:10 20:50	06:38 20:19	07:06 19:31	18:42-19:09/27 19:00	07:35 18:44	07:09 17:09
18	06:11 20:49	06:39 20:17	07:07 19:30	18:43-19:08/25 19:00	07:36 18:42	07:10 17:08
19	06:12 20:49	06:40 20:16	07:08 19:28	18:44-19:06/22 19:00	07:37 18:41	07:12 17:07
20	06:13 20:48	06:41 20:14	07:09 19:26	18:45-19:05/20 19:00	07:38 18:40	07:13 17:06
21	06:14 20:47	06:42 20:13	07:10 19:25	18:48-19:03/15 19:00	07:39 18:38	07:14 17:06
22	06:14 20:47	06:42 20:12	07:11 19:23	18:50-19:01/11 19:00	07:41 18:37	07:15 17:05
23	06:15 20:46	06:43 20:10	07:12 19:21	18:54-18:59/5 19:00	07:42 18:35	07:16 17:05
24	06:16 20:45	06:44 20:09	07:13 19:20		07:43 18:34	07:17 17:04
25	06:17 20:44	06:45 20:07	07:14 19:18		06:44 17:33	07:18 17:04
26	06:18 20:43	06:46 20:06	07:15 19:16		06:45 17:31	07:19 17:03
27	06:19 20:42	06:47 20:04	07:16 19:15		06:46 17:30	07:20 17:03
28	06:19 20:42	06:48 20:03	07:17 19:13		06:47 17:29	07:21 17:02
29	06:20 20:41	06:49 20:01	07:18 19:12	18:59-19:10/11	06:48 17:28	07:22 17:02
30	06:21 20:40	06:50 20:00	07:18 19:10	18:56-19:13/17	06:49 17:26	07:23 17:02
31	06:22 20:39	06:51 19:58	18:53-19:16/23		06:50 17:25	07:24 17:01
Potential sun hours	454	425	374	665	347	302
Sum of minutes with flicker	0	51	665	0	0	644

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: Worst_case_Progetto_20240628WTG: WTG09 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (41)

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 15:14-16:25/71 17:11	07:33 15:26-16:43/77 17:44	06:59 18:16	07:10 19:47	06:27 20:17	06:00 20:45
2	07:45 15:14-16:26/72 17:12	07:32 15:27-16:43/76 17:45	06:57 18:17	07:09 19:48	06:25 20:18	05:59 20:45
3	07:45 15:15-16:26/71 17:12	07:31 15:28-16:43/75 17:46	06:56 18:18	07:07 19:49	06:24 20:19	05:59 20:46
4	07:45 15:15-16:27/72 17:13	07:30 15:29-16:43/74 17:47	06:54 18:19	07:06 19:50	06:23 20:20	05:58 20:47
5	07:45 15:15-16:28/73 17:14	07:29 15:30-16:43/73 17:48	06:53 18:20	07:04 19:51	06:22 20:21	05:58 20:47
6	07:45 15:16-16:29/73 17:15	07:28 15:31-16:42/71 17:49	06:51 18:21	07:02 19:52	06:21 20:22	05:58 20:48
7	07:45 15:16-16:30/74 17:16	07:27 15:32-16:42/70 17:51	06:50 18:22	07:01 19:53	06:20 20:23	05:58 20:49
8	07:45 15:16-16:31/75 17:17	07:26 15:33-16:42/69 17:52	06:48 18:23	06:59 19:54	06:18 20:24	05:57 20:49
9	07:45 15:17-16:31/74 17:18	07:25 15:35-16:42/67 17:53	06:47 18:24	06:58 19:55	06:17 20:25	05:57 20:50
10	07:45 15:17-16:32/75 17:19	07:23 15:36-16:41/65 17:54	06:45 18:25	06:56 19:56	06:16 20:26	05:57 20:13-20:15/2 20:50
11	07:44 15:17-16:32/75 17:20	07:22 15:37-16:40/63 17:55	06:44 18:26	06:55 19:57	06:15 20:27	05:57 20:10-20:18/8 20:51
12	07:44 15:17-16:34/77 17:21	07:21 15:39-16:39/60 17:57	06:42 18:27	06:53 19:58	06:14 20:28	05:57 20:09-20:20/11 20:51
13	07:44 15:18-16:35/77 17:22	07:20 15:40-16:39/59 17:58	06:40 18:28	06:52 19:59	06:13 20:29	05:57 20:08-20:21/13 20:52
14	07:44 15:18-16:35/77 17:23	07:19 15:41-16:38/57 17:59	06:39 18:29	06:50 20:00	06:12 20:30	05:57 20:08-20:22/14 20:52
15	07:43 15:18-16:36/78 17:24	07:18 15:43-16:38/55 18:00	06:37 18:30	06:49 20:01	06:11 20:30	05:57 20:08-20:23/15 20:53
16	07:43 15:18-16:36/78 17:25	07:16 15:43-16:36/53 18:01	06:36 18:31	06:47 20:02	06:10 20:31	05:57 20:07-20:23/16 20:53
17	07:43 15:19-16:37/78 17:26	07:15 15:45-16:35/50 18:02	06:34 18:32	06:46 20:03	06:10 20:32	05:57 20:07-20:24/17 20:53
18	07:42 15:19-16:37/78 17:27	07:14 15:47-16:34/47 18:03	06:33 18:33	06:44 20:04	06:09 20:33	05:57 20:07-20:24/17 20:54
19	07:42 15:20-16:38/78 17:28	07:13 15:48-16:31/43 18:05	06:31 18:34	06:43 20:05	06:08 20:34	05:57 20:07-20:25/18 20:54
20	07:41 15:20-16:38/78 17:30	07:11 15:51-16:30/39 18:06	06:29 18:35	06:41 20:06	06:07 20:35	05:57 20:08-20:26/18 20:54
21	07:41 15:21-16:40/79 17:31	07:10 15:53-16:28/35 18:07	06:28 18:36	06:40 20:07	06:06 20:36	05:57 20:08-20:26/18 20:55
22	07:40 15:21-16:40/79 17:32	07:09 15:55-16:25/30 18:08	06:26 18:37	06:39 20:08	06:05 20:37	05:57 20:08-20:26/18 20:55
23	07:39 15:21-16:40/79 17:33	07:07 16:00-16:22/22 18:09	06:25 18:38	06:37 20:09	06:05 20:38	05:58 20:08-20:26/18 20:55
24	07:39 15:22-16:41/79 17:34	07:06 16:05-16:15/10 18:10	06:23 18:39	06:36 20:10	06:04 20:38	05:58 20:09-20:26/17 20:55
25	07:38 15:22-16:41/79 17:35	07:04 18:11	06:21 18:40	06:34 20:11	06:03 20:39	05:58 20:09-20:26/17 20:55
26	07:37 15:22-16:41/79 17:36	07:03 18:12	06:20 18:41	06:33 20:12	06:03 20:40	05:58 20:09-20:26/17 20:55
27	07:37 15:23-16:41/78 17:38	07:02 18:13	06:18 18:42	06:32 20:13	06:02 20:41	05:59 20:10-20:26/16 20:55
28	07:36 15:24-16:42/78 17:39	07:00 18:15	06:17 18:43	06:30 20:14	06:02 20:42	05:59 20:11-20:25/14 20:55
29	07:35 15:24-16:43/79 17:40		07:15 19:44	06:29 20:15	06:01 20:42	06:00 20:11-20:25/14 20:55
30	07:34 15:25-16:43/78 17:41		07:13 19:45	06:28 20:16	06:01 20:43	06:00 20:13-20:24/11 20:55
31	07:33 15:25-16:43/78 17:42		07:12 19:46		06:00 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	2369	1340	0	0	0	309

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: Worst_case_Progetto_20240628WTG: WTG09 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (41)

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 20:14-20:23/9 20:55	06:23 20:38	06:52 19:57	07:19 19:08	06:51 15:05-16:10/65 17:24	07:24 14:59-16:15/76 17:01
2	06:01 20:16-20:22/6 20:55	06:24 20:37	06:53 19:55	07:20 19:07	06:52 15:03-16:11/68 17:23	07:25 14:59-16:15/76 17:01
3	06:01 20:55	06:25 20:36	06:54 19:54	07:21 19:05	06:54 15:03-16:12/69 17:22	07:26 15:00-16:15/75 17:01
4	06:02 20:55	06:26 20:35	06:54 19:52	07:22 19:04	06:55 15:01-16:12/71 17:21	07:27 15:00-16:15/75 17:01
5	06:02 20:55	06:27 20:33	06:55 19:50	07:23 19:02	06:56 15:00-16:12/72 17:19	07:28 15:01-16:15/74 17:01
6	06:03 20:55	06:28 20:32	06:56 19:49	07:24 19:00	06:57 14:59-16:12/73 17:18	07:29 15:02-16:15/73 17:01
7	06:04 20:54	06:28 20:31	06:57 19:47	07:25 18:59	06:58 14:58-16:13/75 17:17	07:30 15:02-16:15/73 17:01
8	06:04 20:54	06:29 20:30	06:58 19:46	07:26 18:57	06:59 14:58-16:14/76 17:16	07:31 15:03-16:15/72 17:00
9	06:05 20:54	06:30 20:29	06:59 19:44	07:27 18:56	07:00 14:58-16:14/76 17:15	07:32 15:04-16:15/71 17:00
10	06:05 20:53	06:31 20:28	07:00 19:42	07:28 18:54	07:01 14:57-16:14/77 17:14	07:33 15:04-16:16/72 17:01
11	06:06 20:53	06:32 20:26	07:01 19:41	07:29 18:53	07:03 14:56-16:14/78 17:13	07:34 15:04-16:15/71 17:01
12	06:07 20:52	06:33 20:25	07:02 19:39	07:30 18:51	07:04 14:56-16:14/78 17:13	07:34 15:05-16:15/70 17:01
13	06:07 20:52	06:34 20:24	07:03 19:38	07:31 18:50	07:05 14:56-16:15/79 17:12	07:35 15:06-16:16/70 17:01
14	06:08 20:52	06:35 20:23	07:04 19:36	07:32 18:48	07:06 14:56-16:14/78 17:11	07:36 15:06-16:16/70 17:01
15	06:09 20:51	06:36 20:21	07:05 19:34	07:33 18:47	07:07 14:55-16:14/79 17:10	07:37 15:06-16:16/70 17:01
16	06:10 20:50	06:37 20:20	07:05 19:33	07:34 18:45	07:08 14:55-16:14/79 17:09	07:37 15:07-16:16/69 17:02
17	06:10 20:50	06:38 20:19	07:06 19:31	07:35 18:44	07:09 14:55-16:14/79 17:08	07:38 15:08-16:17/69 17:02
18	06:11 20:49	06:39 20:17	07:07 19:29	07:36 16:34-16:49/15 18:42	07:10 14:56-16:15/79 17:08	07:39 15:08-16:17/69 17:02
19	06:12 20:49	06:40 20:16	07:08 19:28	07:37 16:29-16:53/24 18:41	07:12 14:56-16:15/79 17:07	07:39 15:09-16:18/69 17:03
20	06:13 20:48	06:41 20:14	07:09 19:26	07:38 16:25-16:56/31 18:40	07:13 14:56-16:15/79 17:06	07:40 15:09-16:17/68 17:03
21	06:14 20:47	06:41 20:13	07:10 19:25	07:39 16:23-16:59/36 18:38	07:14 14:56-16:15/79 17:06	07:40 15:10-16:18/68 17:04
22	06:14 20:47	06:42 20:12	07:11 19:23	07:40 16:21-17:01/40 18:37	07:15 14:56-16:14/78 17:05	07:41 15:10-16:18/68 17:04
23	06:15 20:46	06:43 20:10	07:12 19:21	07:42 16:18-17:02/44 18:35	07:16 14:57-16:15/78 17:05	07:41 15:11-16:19/68 17:05
24	06:16 20:45	06:44 20:09	07:13 19:20	07:43 16:16-17:04/48 18:34	07:17 14:57-16:15/78 17:04	07:42 15:11-16:20/69 17:05
25	06:17 20:44	06:45 20:07	07:14 19:18	06:44 15:14-16:05/51 17:33	07:18 14:57-16:15/78 17:04	07:42 15:12-16:21/69 17:06
26	06:18 20:43	06:46 20:06	07:15 19:16	06:45 15:13-16:06/53 17:31	07:19 14:57-16:15/78 17:03	07:43 15:12-16:21/69 17:06
27	06:19 20:42	06:47 20:04	07:16 19:15	06:46 15:11-16:06/55 17:30	07:20 14:57-16:15/78 17:03	07:43 15:12-16:21/69 17:07
28	06:19 20:42	06:48 20:03	07:17 19:13	06:47 15:11-16:08/57 17:29	07:21 14:58-16:15/77 17:02	07:43 15:13-16:23/70 17:08
29	06:20 20:41	06:49 20:01	07:18 19:12	06:48 15:09-16:09/60 17:28	07:22 14:58-16:15/77 17:02	07:44 15:13-16:23/70 17:08
30	06:21 20:40	06:50 20:00	07:18 19:10	06:49 15:08-16:09/61 17:26	07:23 14:59-16:15/76 17:02	07:44 15:14-16:24/70 17:09
31	06:22 20:39	06:51 19:58		06:50 15:06-16:10/64 17:25		07:44 15:14-16:24/70 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	15	0	0	639	2286	2192

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: Worst_case_Progetto_20240628WTG: WTG10 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (42)

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	07:33	06:59	07:10	06:27	06:00	06:00	06:23	06:52	07:19	06:51	07:24
	17:11	17:44	18:16	19:47	20:17	20:45	20:55	20:38	19:57	19:08	17:24	17:01
2	07:45	07:32	06:57	07:09	06:25	05:59	06:01	06:24	06:53	07:20	06:52	07:25
	17:12	17:45	18:17	19:48	20:18	20:45	20:55	20:37	19:55	19:07	17:23	17:01
3	07:45	07:31	06:56	07:07	06:24	05:59	06:01	06:25	06:54	07:21	06:54	07:26
	17:12	17:46	18:18	19:49	20:19	20:46	20:55	20:36	19:54	19:05	17:22	17:01
4	07:45	07:30	06:54	07:05	06:23	05:58	06:02	06:26	06:54	07:22	06:55	07:27
	17:13	17:47	18:19	19:50	20:20	20:47	20:55	20:34	19:52	19:04	17:21	17:01
5	07:45	07:29	06:53	07:04	06:22	05:58	06:02	06:27	06:55	07:23	06:56	07:28
	17:14	17:48	18:20	19:51	20:21	20:47	20:55	20:33	19:50	19:02	17:19	17:01
6	07:45	07:28	06:51	07:02	06:21	05:58	06:03	06:28	06:56	07:24	06:57	07:29
	17:15	17:49	18:21	19:52	20:22	20:48	20:54	20:32	19:49	19:00	17:18	17:01
7	07:45	07:27	06:50	07:01	06:20	05:58	06:04	06:29	06:57	07:25	06:58	07:30
	17:16	17:51	18:22	19:53	20:23	20:49	20:54	20:31	19:47	18:59	17:17	17:01
8	07:45	07:26	06:48	06:59	06:18	05:57	06:04	06:29	06:58	07:26	06:59	07:31
	17:17	17:52	18:23	19:54	20:24	20:49	20:54	20:30	19:46	18:57	17:16	17:00
9	07:45	07:25	06:47	06:58	06:17	05:57	06:05	06:30	06:59	07:27	07:00	07:32
	17:18	17:53	18:24	19:55	20:25	20:50	20:54	20:29	19:44	18:56	17:15	17:01
10	07:44	07:23	06:45	06:56	06:16	05:57	06:05	06:31	07:00	07:28	07:01	07:33
	17:19	17:54	18:25	19:56	20:26	20:50	20:53	20:28	19:42	18:54	17:14	17:01
11	07:44	07:22	06:44	06:55	06:15	05:57	06:06	06:32	07:01	07:29	07:03	07:34
	17:20	17:55	18:26	19:57	20:27	20:51	20:53	20:26	19:41	18:53	17:13	17:01
12	07:44	07:21	06:42	06:53	06:14	05:57	06:07	06:33	07:02	07:30	07:04	07:34
	17:21	17:57	18:27	19:58	20:28	20:51	20:52	20:25	19:39	18:51	17:13	17:01
13	07:44	07:20	06:40	06:52	06:13	05:57	06:07	06:34	07:03	07:31	07:05	07:35
	17:22	17:58	18:28	19:59	20:29	20:52	20:52	20:24	19:38	18:50	17:12	17:01
14	07:44	07:19	06:39	06:50	06:12	05:57	06:08	06:35	07:04	07:32	07:06	07:36
	17:23	17:59	18:29	20:00	20:29	20:52	20:51	20:23	19:36	18:48	17:11	17:01
15	07:43	07:18	06:37	06:49	06:11	05:57	06:09	06:36	07:04	07:33	07:07	07:37
	17:24	18:00	18:30	20:01	20:30	20:53	20:51	20:21	19:34	18:47	17:10	17:01
16	07:43	07:16	06:36	06:47	06:10	05:57	06:10	06:37	07:05	07:34	07:08	07:37
	17:25	18:01	18:31	20:02	20:31	20:53	20:50	20:20	19:33	18:45	17:09	17:02
17	07:42	07:15	06:34	06:46	06:10	05:57	06:10	06:38	07:06	07:35	07:09	07:38
	17:26	18:02	18:32	20:03	20:32	20:53	20:50	20:19	19:31	18:44	17:08	17:02
18	07:42	07:14	06:33	06:44	06:09	05:57	06:11	06:39	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	17:08	17:02
19	07:42	07:13	06:31	06:43	06:08	05:57	06:12	06:40	07:08	07:37	07:12	07:39
	17:28	18:05	18:34	20:05	20:34	20:54	20:49	20:16	19:28	18:41	17:07	17:03
20	07:41	07:11	06:29	06:41	06:07	05:57	06:13	06:41	07:09	07:38	07:13	07:40
	17:30	18:06	18:35	20:06	20:35	20:54	20:48	20:14	19:26	18:40	17:06	17:03
21	07:41	07:10	06:28	06:40	06:06	05:57	06:14	06:41	07:10	07:39	07:14	07:40
	17:31	18:07	18:36	20:07	20:36	20:55	20:47	20:13	19:25	18:38	17:06	17:04
22	07:40	07:09	06:26	06:39	06:05	05:57	06:14	06:42	07:11	07:40	07:15	07:41
	17:32	18:08	18:37	20:08	20:37	20:55	20:46	20:12	19:23	18:37	17:05	17:04
23	07:39	07:07	06:25	06:37	06:05	05:58	06:15	06:43	07:12	07:42	07:16	07:41
	17:33	18:09	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:05	17:05
24	07:39	07:06	06:23	06:36	06:04	05:58	06:16	06:44	07:13	07:43	07:17	07:42
	17:34	18:10	18:39	20:10	20:38	20:55	20:45	20:09	19:20	18:34	17:04	17:05
25	07:38	07:04	06:21	06:34	06:03	05:58	06:17	06:45	07:14	07:44	07:18	07:42
	17:35	18:11	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:33	17:04	17:06
26	07:37	07:03	06:20	06:33	06:03	05:58	06:18	06:46	07:15	07:45	07:19	07:43
	17:36	18:12	18:41	20:12	20:40	20:55	20:43	20:06	19:16	17:31	17:03	17:06
27	07:37	07:02	06:18	06:32	06:02	05:59	06:19	06:47	07:16	07:46	07:20	07:43
	17:38	18:13	18:42	20:13	20:41	20:55	20:42	20:04	19:15	17:30	17:03	17:07
28	07:36	07:00	06:17	06:30	06:02	05:59	06:19	06:48	07:17	07:47	07:21	07:43
	17:39	18:15	18:43	20:14	20:42	20:55	20:41	20:03	19:13	17:29	17:02	17:08
29	07:35		07:15	06:29	06:01	06:00	06:20	06:49	07:17	07:48	07:22	07:44
	17:40		19:44	20:15	20:42	20:55	20:41	20:01	19:12	17:28	17:02	17:08
30	07:34		07:13	06:28	06:01	06:00	06:21	06:50	07:18	07:49	07:23	07:44
	17:41		19:45	20:16	20:43	20:55	20:40	20:00	19:10	17:26	17:02	17:09
31	07:33		07:12		06:00		06:22	06:51		06:50		07:44
	17:42		19:46		20:44		20:39	19:58		17:25		17:10
Potential sun hours	302	299	370	397	444	447	454	425	374	347	302	293
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	71

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: Worst_case_Progetto_20240628WTG: WTG11 - Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (43)

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	07:44 17:11	07:33 17:44	06:59 18:16	07:10 19:47	18:57-19:18/21 20:17	06:00 20:45
2	07:45 17:12	07:32 17:45	06:57 18:17	07:09 19:48	18:54-19:21/27 20:18	05:59 20:45
3	07:45 17:12	07:31 17:46	06:56 18:18	07:07 19:49	18:51-19:22/31 20:19	05:59 20:46
4	07:45 17:13	07:30 17:47	06:54 18:19	07:06 19:50	18:50-19:24/34 20:20	05:58 20:47
5	07:45 17:14	07:29 17:48	06:53 18:20	07:04 19:51	18:48-19:25/37 20:21	05:58 20:47
6	07:45 17:15	07:28 17:49	06:51 18:21	07:02 19:52	18:46-19:26/40 20:22	05:58 20:48
7	07:45 17:16	07:27 17:51	06:50 18:22	07:01 19:53	18:45-19:27/42 20:23	05:58 20:49
8	07:45 17:17	07:26 17:52	06:48 18:23	06:59 19:54	18:43-19:27/44 20:24	05:57 20:49
9	07:45 17:18	07:25 17:53	06:47 18:24	06:58 19:55	18:43-19:29/46 20:25	05:57 20:50
10	07:44 17:19	07:23 17:54	06:45 18:25	06:56 19:56	18:41-19:29/48 20:26	05:57 20:50
11	07:44 17:20	07:22 17:55	06:44 18:26	06:55 19:57	18:41-19:30/49 20:27	05:57 20:51
12	07:44 17:21	07:21 17:57	06:42 18:27	06:53 19:58	18:40-19:31/51 20:28	05:57 20:51
13	07:44 17:22	07:20 17:58	06:40 18:28	06:52 19:59	18:40-19:32/52 20:29	05:57 20:52
14	07:44 17:23	07:19 17:59	06:39 18:29	06:50 20:00	18:39-19:33/54 20:29	05:57 20:52
15	07:43 17:24	07:18 18:00	06:37 18:30	06:49 20:01	18:39-19:34/55 20:30	05:57 20:53
16	07:43 17:25	07:16 18:01	06:36 18:31	06:47 20:02	18:38-19:35/57 20:31	05:57 20:53
17	07:42 17:26	07:15 18:02	06:34 18:32	06:46 20:03	18:38-19:36/58 20:32	05:57 20:53
18	07:42 17:27	07:14 18:03	06:33 18:33	06:44 20:04	18:38-19:36/58 20:33	05:57 20:54
19	07:42 17:29	07:13 18:05	06:31 18:34	06:43 20:05	18:38-19:36/58 20:34	05:57 20:54
20	07:41 17:30	07:11 18:06	06:29 18:35	06:41 20:06	18:39-19:37/58 20:35	05:57 20:54
21	07:41 17:31	07:10 18:07	06:28 18:36	06:40 20:07	18:38-19:37/59 20:36	05:57 20:55
22	07:40 17:32	07:09 18:08	06:26 18:37	06:39 20:08	18:39-19:37/58 20:37	05:57 20:55
23	07:39 17:33	07:07 18:09	06:25 18:38	06:37 20:09	18:40-19:38/58 20:38	05:58 20:55
24	07:39 17:34	07:06 18:10	06:23 18:39	06:36 20:10	18:39-19:37/58 20:38	05:58 20:55
25	07:38 17:35	07:04 18:11	06:21 18:40	06:34 20:11	18:40-19:37/57 20:39	05:58 20:55
26	07:37 17:37	07:03 18:12	06:20 18:41	06:33 20:12	18:41-19:37/56 20:40	05:58 20:55
27	07:37 17:38	07:02 18:13	06:18 18:42	06:32 20:13	18:41-19:36/55 20:41	05:59 20:55
28	07:36 17:39	07:00 18:15	06:17 18:43	06:30 20:14	18:42-19:36/54 20:42	05:59 20:55
29	07:35 17:40		07:15 19:44	06:29 20:15	18:44-19:36/52 20:42	06:00 20:55
30	07:34 17:41		07:13 19:45	06:28 20:16	18:45-19:36/51 20:43	06:00 20:55
31	07:33 17:42		07:12 19:46		19:02-19:14/12 20:44	
Potential sun hours	302	299	370	397	444	447
Sum of minutes with flicker	0	0	12	1478	535	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: Worst_case_Progetto_20240628WTG: WTG11 - Siemens Gamesa SG 6.2-170 6200 170.0 IO! hub: 135,0 m (TOT: 220,0 m) (43)

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	06:23 19:08-19:35/27 20:38	06:52 18:40-19:29/49 19:57	07:19 19:08	06:51 17:24	07:24 17:01
2	06:01 20:55	06:24 19:06-19:37/31 20:37	06:53 18:40-19:28/48 19:55	07:20 19:07	06:52 17:23	07:25 17:01
3	06:01 20:55	06:25 19:05-19:38/33 20:36	06:54 18:41-19:27/46 19:54	07:21 19:05	06:54 17:22	07:26 17:01
4	06:02 20:55	06:26 19:04-19:39/35 20:34	06:54 18:40-19:24/44 19:52	07:22 19:04	06:55 17:21	07:27 17:01
5	06:02 20:55	06:27 19:03-19:40/37 20:33	06:55 18:41-19:23/42 19:50	07:23 19:02	06:56 17:20	07:28 17:01
6	06:03 20:54	06:28 19:02-19:41/39 20:32	06:56 18:42-19:22/40 19:49	07:24 19:00	06:57 17:18	07:29 17:01
7	06:04 20:54	06:29 19:01-19:42/41 20:31	06:57 18:42-19:20/38 19:47	07:25 18:59	06:58 17:17	07:30 17:01
8	06:04 20:54	06:29 18:59-19:42/43 20:30	06:58 18:44-19:19/35 19:46	07:26 18:57	06:59 17:16	07:31 17:01
9	06:05 20:54	06:30 18:57-19:42/45 20:29	06:59 18:45-19:17/32 19:44	07:27 18:56	07:00 17:15	07:32 17:01
10	06:05 20:53	06:31 18:56-19:43/47 20:28	07:00 18:47-19:14/27 19:42	07:28 18:54	07:01 17:14	07:33 17:01
11	06:06 20:53	06:32 18:55-19:43/48 20:26	07:01 18:49-19:11/22 19:41	07:29 18:53	07:03 17:14	07:34 17:01
12	06:07 20:52	06:33 18:54-19:43/49 20:25	07:02 18:53-19:07/14 19:39	07:30 18:51	07:04 17:13	07:34 17:01
13	06:08 20:52	06:34 18:52-19:44/52 20:24	07:03 19:38	07:31 18:50	07:05 17:12	07:35 17:01
14	06:08 20:51	06:35 18:51-19:44/53 20:23	07:04 19:36	07:32 18:48	07:06 17:11	07:36 17:01
15	06:09 20:51	06:36 18:50-19:44/54 20:21	07:05 19:34	07:33 18:47	07:07 17:10	07:37 17:01
16	06:10 20:50	06:37 18:49-19:44/55 20:20	07:05 19:33	07:34 18:45	07:08 17:09	07:37 17:02
17	06:10 20:50	06:38 18:48-19:44/56 20:19	07:06 19:31	07:35 18:44	07:09 17:09	07:38 17:02
18	06:11 20:49	06:39 18:47-19:44/57 20:17	07:07 19:29	07:36 18:42	07:10 17:08	07:39 17:02
19	06:12 20:49	06:40 18:45-19:43/58 20:16	07:08 19:28	07:37 18:41	07:12 17:07	07:39 17:03
20	06:13 20:48	06:41 18:44-19:42/58 20:14	07:09 19:26	07:38 18:40	07:13 17:06	07:40 17:03
21	06:14 20:47	06:42 18:44-19:42/58 20:13	07:10 19:25	07:39 18:38	07:14 17:06	07:40 17:04
22	06:14 20:46	06:42 18:43-19:41/58 20:12	07:11 19:23	07:40 18:37	07:15 17:05	07:41 17:04
23	06:15 20:46	06:43 18:42-19:41/59 20:10	07:12 19:21	07:42 18:35	07:16 17:05	07:41 17:05
24	06:16 20:45	06:44 18:42-19:40/58 20:09	07:13 19:20	07:43 18:34	07:17 17:04	07:42 17:05
25	06:17 20:44	06:45 18:42-19:39/57 20:07	07:14 19:18	06:44 17:33	07:18 17:04	07:42 17:06
26	06:18 20:43	06:46 18:41-19:38/57 20:06	07:15 19:16	06:45 17:31	07:19 17:03	07:43 17:06
27	06:19 20:42	06:47 18:40-19:36/56 20:04	07:16 19:15	06:46 17:30	07:20 17:03	07:43 17:07
28	06:19 19:17-19:27/10 20:41	06:48 18:40-19:35/55 20:03	07:17 19:13	06:47 17:29	07:21 17:02	07:43 17:08
29	06:20 19:14-19:31/17 20:41	06:49 18:40-19:34/54 20:01	07:18 19:12	06:48 17:28	07:22 17:02	07:44 17:08
30	06:21 19:12-19:33/21 20:40	06:50 18:40-19:32/52 20:00	07:18 19:10	06:49 17:26	07:23 17:02	07:44 17:09
31	06:22 19:10-19:35/25 20:39	06:51 18:40-19:30/50 19:58		06:50 17:25		07:44 17:10
Potential sun hours	454	425	374	347	302	293
Sum of minutes with flicker	73	1532	437	0	0	0

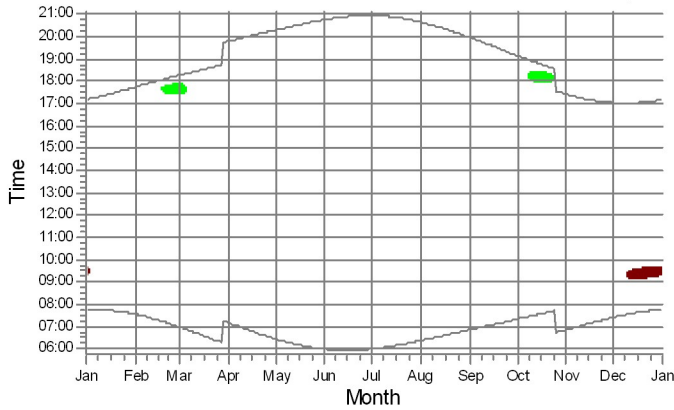
Table layout: For each day in each month the following matrix apply

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

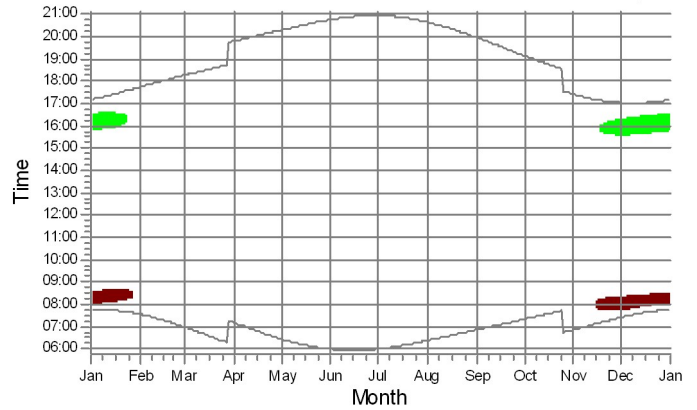
SHADOW - Calendar per WTG, graphical

Calculation: Worst_case_Progetto_20240628

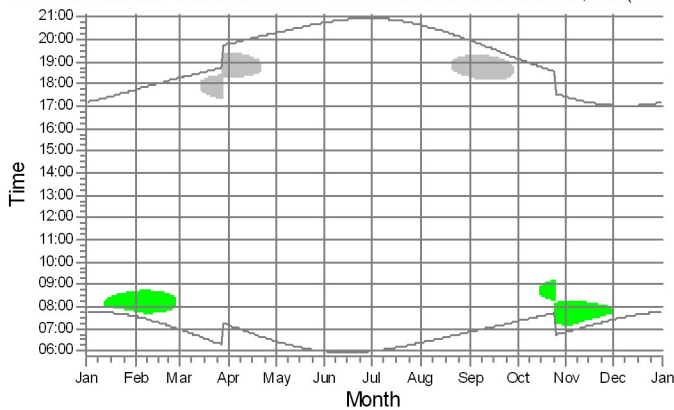
WTG01: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



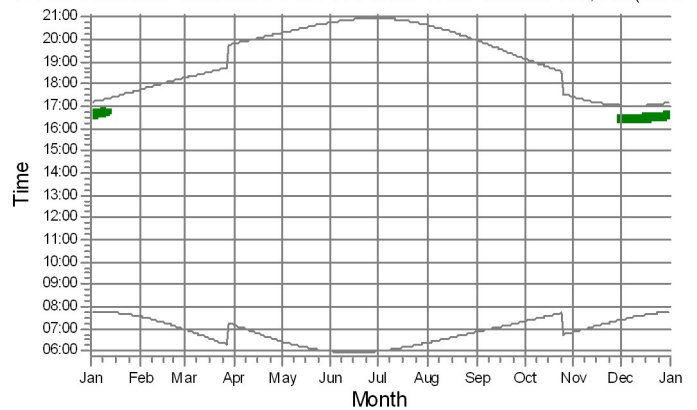
WTG02: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



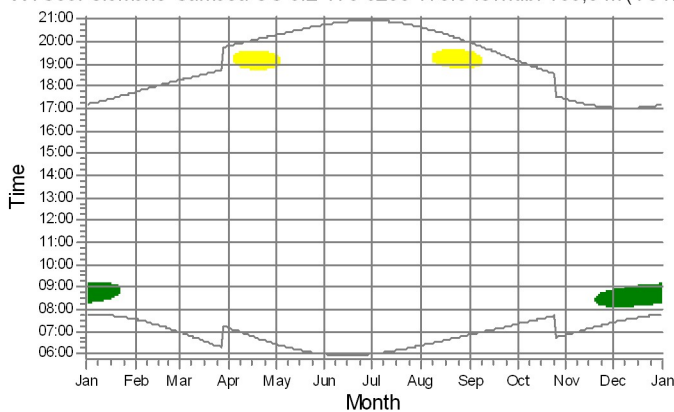
WTG03: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



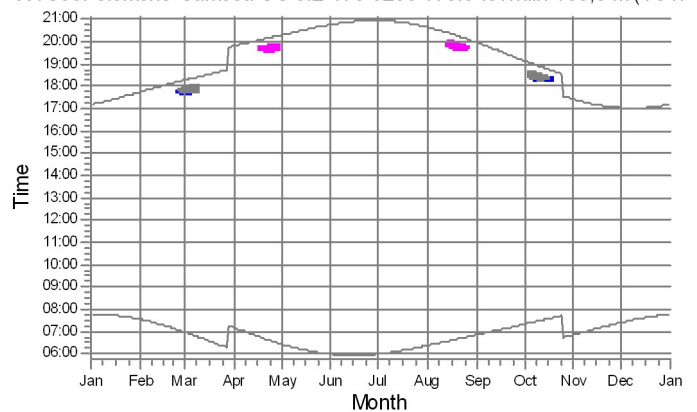
WTG04: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:











WTG05: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



WTG06: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



Shadow receptors

 F023: A4	 F030: A2 - D7	 F083: A3
 F028: A3 - D10	 F034: A2	 F108: A2
 F029: A3	 F065: A3-C6	

Project:

Progetto_Baltex Nuraminis

Licensed user:

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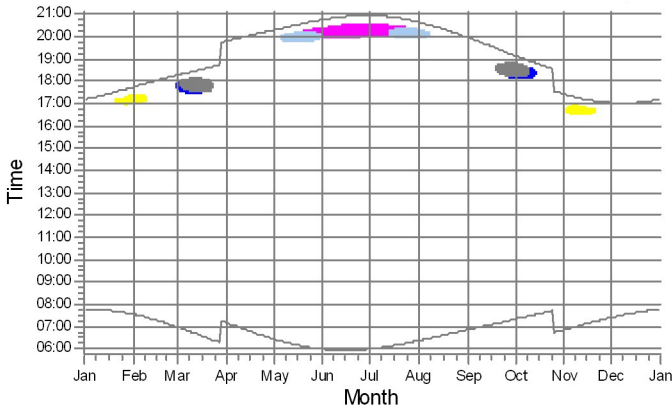
Calculated:

28/06/2024 12:41/3.4.415

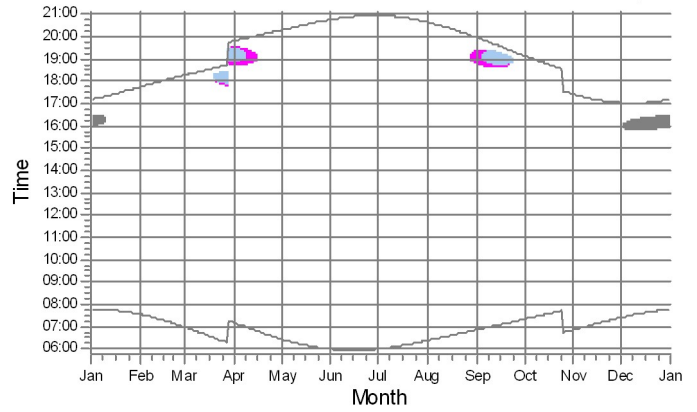
SHADOW - Calendar per WTG, graphical

Calculation: Worst_case_Progetto_20240628

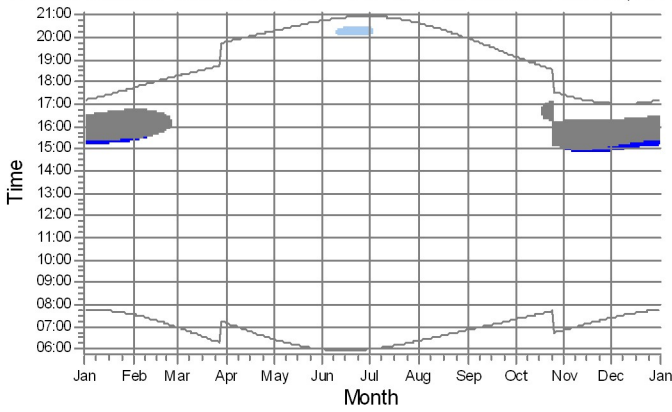
WTG07: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



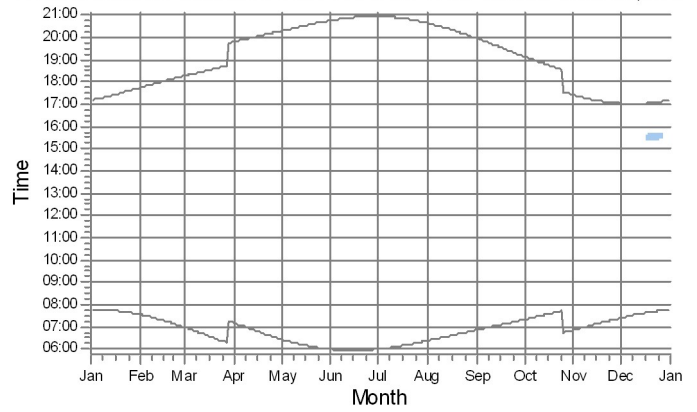
WTG08: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



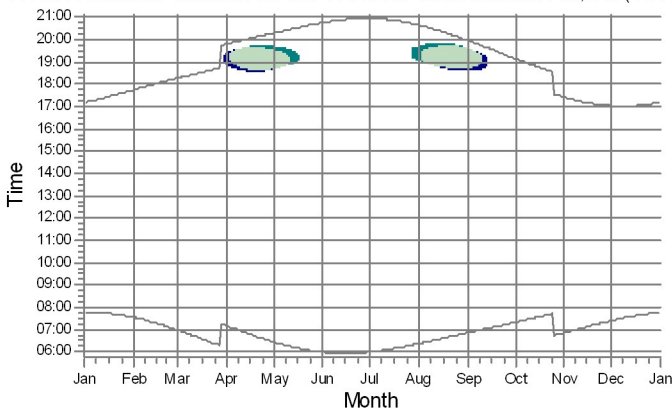
WTG09: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



WTG10: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



WTG11: Siemens Gamesa SG 6.2-170 6200 170.0 !O! hub: 135,0 m (TOT:



Shadow receptors



F028: A3 - D10



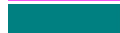
F034: A2



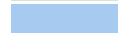
F145: SEMINATIVO



F029: A3



F038: D10



F153: A4



F030: A2 - D7



F039: A3 - D10