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ELABORAZIONI I.A.T. Consulenza e progetti S.r.l. con socio unico - Via Santa Margherita 4, 09124 Cagliari Tel./Fax +39.070.658297 Web www.iatprogetti.it	PAGINA 1 di 34		

IMPIANTO EOLICO "SU SASSITTU" POTENZA IN IMMISSIONE 90 MW

- COMUNI DI CHIARAMONTI, PLOAGHE E CODRONGIANOS (SS) -



OGGETTO STUDIO DI IMPATTO AMBIENTALE	TITOLO ANALISI DEGLI EFFETTI DI SHADOW FLICKERING
PROGETTAZIONE I.A.T. CONSULENZA E PROGETTI S.R.L. ING. GIUSEPPE FRONGIA	GRUPPO DI LAVORO Ing. Giuseppe Frongia (coordinatore e responsabile) Ing. Marianna Barbarino Ing. Enrica Batzella Dott. Andrea Cappai Ing. Gianfranco Corda Ing. Antonio Dedoni Ing. Gianluca Melis Ing. Emanuela Spiga Agr. Dott. Nat. Fabio Schirru Dott. Maurizio Medda Dott. Maria Antonietta Demurtas Dott. Enrico Petruzzi Dott. Geol. Mauro Pompei Dott. Geol. Maria Francesca Lobina Agr. Dott. Nat. Nicola Manis

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1 CRITERI GENERALI DI ANALISI E VALUTAZIONE

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

A tal fine, nel seguito, si farà riferimento alla ricognizione sugli edifici esistenti eseguita nell'ambito della definizione del layout di impianto e dell'analisi ambientale, i cui risultati sono riepilogati in opportune "schede fabbricati e siti sensibili" all'interno di apposito report allegato allo SIA (Elaborato WPD-CH-TA14). Avuto riguardo della presenza, nel territorio interessato dal progetto, delle permanenze di interesse storico-archeologico segnalate nell'ambito degli studi specialistici eseguiti (cfr. Elaborato WPD-CH-RC2 - Relazione archeologica), la valutazione della potenziale incidenza del fenomeno del SF è estesa ai potenziali "ricettori" identificabili beni e siti culturali (architettonici e archeologici).

Considerata, la presenza di alcuni impianti minieolici nel settore di studio, saranno opportunamente valutati gli effetti cumulativi indotti dal progetto in relazione allo specifico fattore di impatto.

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

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2 DESCRIZIONE DEL FENOMENO

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

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

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



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

Per le ragioni anzidette, a distanze turbine-ricettore superiori a circa 300 metri solitamente il fenomeno di *shadow flickering* si manifesta all'alba o al tramonto, 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

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



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

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

Nel caso specifico, considerando un rotore del diametro indicativo di 170 metri con una velocità massima nominale di rotazione di circa 11 RPM si avrà una frequenza di passo pari a circa 0,6 Hz. Tali frequenze di oscillazione luminosa sono prive di rischi significativi per la salute.

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

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

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3 INDIVIDUAZIONE DEI RICETTORI

3.1 Ricettori abitativi

Al fine di procedere all'individuazione di potenziali ricettori nelle aree più direttamente interessate dalle installazioni eoliche, ricomprese entro una distanza massima di 1000 m dalle postazioni di macchina, si è proceduto ad una individuazione complessiva dei fabbricati con l'ausilio della cartografia ufficiale di riferimento (Carta Tecnica Regionale in scala 1:10.000). Successivamente si è proceduto a verificarne l'effettiva esistenza e consistenza dall'esame di foto aeree e satellitari nonché attraverso specifici sopralluoghi sul campo e interviste ai fruitori dell'area. In tal modo sono state acquisite le necessarie informazioni preliminari sulle caratteristiche tipologico-costruttive e le condizioni di utilizzo degli edifici. Per completezza di analisi sono stati inclusi nel censimento anche quei fabbricati che, in modo manifesto, non presentavano caratteristiche di potenziali 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 WPD-CH-RA14-1 (*Carta con individuazione dei fabbricati e siti sensibili*) riporta l'individuazione dei fabbricati censiti in accordo con la metodologia precedentemente indicata. Lo stralcio della ripresa aerea zenitale, la categoria catastale di appartenenza ed una fotografia prospettica degli edifici sono riportati nell'Elaborato WPD-CH-TA14 allegato alla documentazione progettuale.

Nel caso specifico, ai fini dei calcoli di esposizione all'ombra intermittente, sono stati individuati come ricettori n. 6 fabbricati, con destinazione abitativa accertata (edifici con categoria catastale "A"), 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 3.1 riporta, per ciascun ricettore individuato, le relative coordinate secondo il sistema Gauss Boaga, la categoria Catastale e la distanza dal più prossimo aerogeneratore.



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

Fabbricato	Comune	GB Est	GB Nord	Distanza dal più prossimo WTG [m]	WTG più prossimo [m]	Categoria Catasto Fabbricati
F03	Ploaghe	1481076	4504562	646	CH12	A4 - Abitazioni di tipo popolare
F37	Ardara	1482784	4499804	926	CH18	A3 – Abitazioni di tipo economico
F44	Chiaramonti	1485029	4503783	816	CH01	A4 - Abitazioni di tipo popolare
F48	Ozieri	1488239	4503407	766	CH05	A4 - Abitazioni di tipo popolare
F54	Chiaramonti	1487304	4501873	514	CH11	A6 - Abitazioni di tipo rurale
F61	Ozieri	1488060	4504213	551	CH05	A3 - Abitazioni di tipo economico

Lo stralcio della ripresa aerea, la categoria catastale di appartenenza (laddove disponibile) ed una fotografia dei fabbricati censiti sono riportati nell'Elaborato WPD-CH-TA14 allegato allo SIA.

3.2 Ricettori catalogabili come siti e beni culturali

Oltre ai fabbricati con destinazione abitativa, ai fini delle verifiche di esposizione all'ombra intermittente, sono stati assunti come riferimento n. 20 beni archeologici e culturali, ricadenti entro un buffer di 1.000 dagli aerogeneratori in progetto ed individuati planimetricamente nell'Elaborato WPD-CH-RA12-1 - *Carta delle ore/anno di ombreggiamento intermittente*. La Tabella 3.2 riporta per ciascun bene individuato le relative coordinate, secondo il sistema Gauss Boaga, e la distanza dagli aerogeneratori più prossimi.





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Tabella 3.2: Elenco dei ricettori catalogabili come siti e beni culturali entro 1.000 m dalle postazioni eoliche

Ricettore	GB Est	GB Nord	Comune	Distanza dal più prossimo WTG [m]	Descrizione
BP01	1485639	4504317	Chiaramonti	243 (CH01)	Nuraghe Conca de fossu
BP02	1481731	4501536	Ploaghe	280 (CH13)	NURAGHE MANDRAS
BP03	1481683	4501240	Ploaghe	329 (CH17)	NURAGHE CORVUS MIGOSOS
BP04	1487046	4502822	Chiaramonti	360 (CH07)	Nuraghe Paule Udas
BP05	1486145	4503944	Chiaramonti	410 (CH01)	NURAGHE
BP06	1482372	4502243	Ploaghe	418 (CH14)	NURAGHE TRUVINE
BP07	1481492	4502435	Ploaghe	427 (CH15)	NURAGHE SA PALA DE SOS LADROS
BP08	1481243	4501348	Ploaghe	461 (CH13)	NURAGHE
BP09	1485506	4503730	Chiaramonti	469 (CH01)	NURAGHE
BP10	1482046	4503059	Ploaghe	471 (CH14)	NURAGHE MARTINE
BP11	1486393	4503304	Chiaramonti	531 (CH07)	NURAGHE SCOBERTU
BP12	1481406	4503778	Ploaghe	540 (CH12)	NURAGHE BADDE TETTI
BP13	1486351	4503756	Chiaramonti	588 (CH02)	Temio Nuragico Serra Porchileddos
BP14	1481238	4503459	Ploaghe	596 (CH12)	NURAGHE
BP15	1485872	4503508	Chiaramonti	615 (CH01)	Menhirs Meddaris
BP16	1485786	4502372	Chiaramonti	744 (CH08)	NURAGHE
BP17	1485293	4503425	Chiaramonti	841 (CH01)	Circoli Massidda
BP18	1482752	4499839	Chiaramonti	888 (CH18)	-
BP19	1483627	4500882	Ploaghe	953 (CH18)	NURAGHE PENTUMA
BP20	1485518	4503166	Chiaramonti	982 (CH01)	NURAGHE MASSEDDA

I principali riferimenti dei beni di interesse, comprensivi di uno stralcio della ripresa aerea, sono riportati nell'Elaborato WPD-CH-RA12-1 *Carta delle ore/anno di ombreggiamento intermittente*.

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4 IPOTESI ALLA BASE DEL CALCOLO E SOGLIE DI RIFERIMENTO

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

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



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

- il vento deve soffiare ad una velocità superiore a 3 m/s (velocità di *cut-in* del rotore);
- presenza di luminosità solare diretta;
- l'osservatore deve risultare sufficientemente vicino alla sorgente di *shadow flickering*;
- il ricettore deve essere effettivamente esposto al campo di luce tremolante;
- l'illuminazione dell'ambiente residenziale deve essere bassa;
- il contrasto tra luci ed ombre deve essere alto;
- non devono essere presenti schermature che 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 sull'argomento, si è fatto riferimento alle linee guida elaborate dal Gruppo Federale tedesco di Controllo delle Emissioni (*Bund-/Länder-Arbeitsgemeinschaft für Immissionsschutz - LAI*) – aggiornamento 2020.

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

Secondo le richiamate linee guida, affinché il fenomeno di ombreggiamento sia significativo dovrebbero essere simultaneamente verificate le seguenti circostanze

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

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

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

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

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

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

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

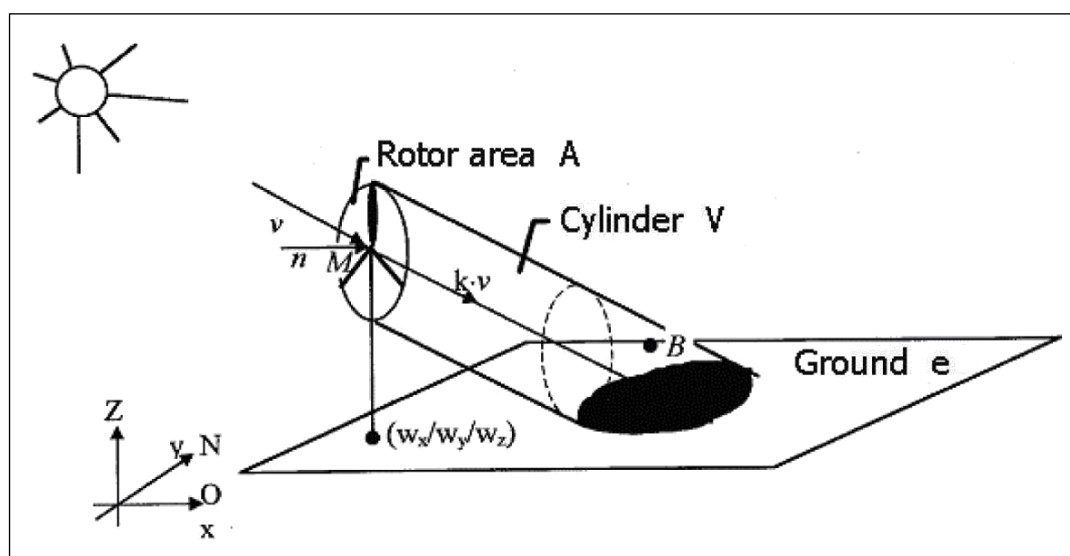




Figura 4.1: Rappresentazione schematica della proiezione dell'ombra del rotore.

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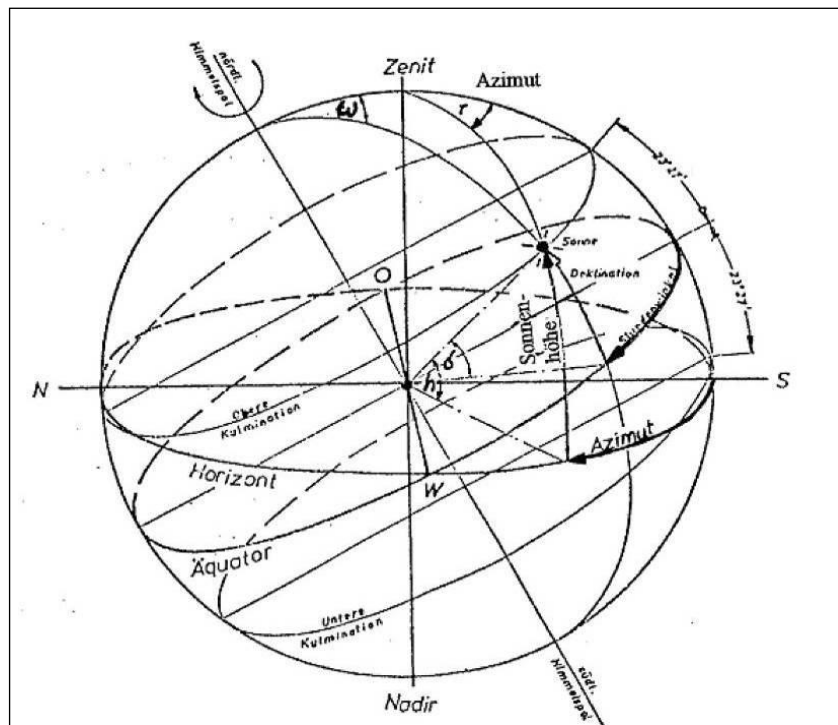




Figura 4.2: Schema dei moti terrestri e parametri di calcolo.

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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.

Considerata la presenza, nel settore in esame, di alcuni impianti minieolici, ai fini di un'opportuna valutazione degli effetti cumulativi, lo scenario di calcolo valuta gli effetti associati all'entrata in esercizio del proposto impianto eolico della wpd in sovrapposizione alla situazione delineata dallo scenario esistente rappresentato dal funzionamento dei soli impianti minieolici.

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



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

Nello specifico, all'interno 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.

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

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

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

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6 ANALISI E POST-ELABORAZIONE DEI RISULTATI

6.1 Edifici con destinazione abitativa

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

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

ID	Ricettore	SF_P [h/anno]	SF_P [gg/anno]	SF_P [max h/giorno]
1	F03	0:00:00	0	00:00
2	F37	0:00:00	0	00:00
3	F44	70:04:00	159	00:46
4	F48	57:59:00	90	00:44
5	F54	120:52:00	152	01:12
6	F61	170:14:00	200	01:05

Dall'esame della Tabella 6.1 si evince quanto segue:

- tra i n. 6 edifici individuati come potenziali ricettori del fenomeno di *shadow flickering* entro l'areale di interesse, n. 2 fabbricati (F03 e F37) non risulteranno esposti ad alcun impatto potenziale da SF;
- stanti le ipotesi estremamente cautelative alla base della simulazione modellistica, l'incidenza del *shadow flickering* indotto dal progetto, assunta la soglia di $SF_P=30$ h/anno come valore di riferimento per una valutazione di significatività, si manifesterà in modo più avvertibile su n. 4 edifici abitativi (F44, F48, F54 e F61), riportati in Tabella 6.2);



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

Ricettore	Scenario 1 SF_P [h/anno]	WTG interessati
F44	70:04:00	CH7, CH6, CH2, CH1
F48	57:59:00	CH9
F54	120:52:00	CH11, CH8
F61	170:14:00	CH5, CH4

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

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

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

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

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



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

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

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

Copertura totale >7 ottavi (*overcast*).

La Tabella 6.3 riporta, per la stazione A.M. più prossima al sito in esame (Capo Frasca - OR), il

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numero medio di giorni al mese con copertura nuvolosa > 4/8 alle ore 06:00 ed alle ore 18:00, ossia con presenza di cielo "coperto" (Ng h6 Nuv>4 e Ngh18 Nuv>4 rispettivamente).

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

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

Dove:

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

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

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

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



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

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

Ng h6Nuv>4: Numero medio di giorni al mese con copertura nuvolosa > 4/8 alle ore 6

Ngh18Nuv>4: Numero medio di giorni al mese con copertura nuvolosa > 4/8 alle ore 18

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

L'esame della Tabella 6.4 mostra come l'incidenza del fenomeno del *shadow flickering*, al netto delle giornate con cielo coperto (SF_{NC}), si presenti superiore alla soglia di riferimento di 30 h/anno in corrispondenza dei seguenti n. 3 ricettori: F44 (~43 h/anno), F54 (~69 h/anno) e F61 (~98 h/anno).



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

Ricettore	SF_P [h/anno]	SF_{NC} [h/anno]	WTG interessati
F44	70:04:00	43:31:33	CH7, CH6, CH2, CH1
F48	57:59:00	28:46:14	CH9
F54	120:52:00	69:03:46	CH11, CH8
F61	170:14:00	98:22:34	CH5, CH4



Da quanto precede si può concludere con ragionevole certezza che l'entità effettiva del fenomeno risulterà inferiore alla soglia di riferimento in corrispondenza dell'edificio F48, presentando un'incidenza al netto delle giornate di cielo coperto (SF_{NC}) di circa 29 h/anno.

Analizzando singolarmente i segnalati potenziali superamenti della soglia di 30 h/anno assunta come riferimento per il SF in corrispondenza dei ricettori possono formularsi le seguenti considerazioni.

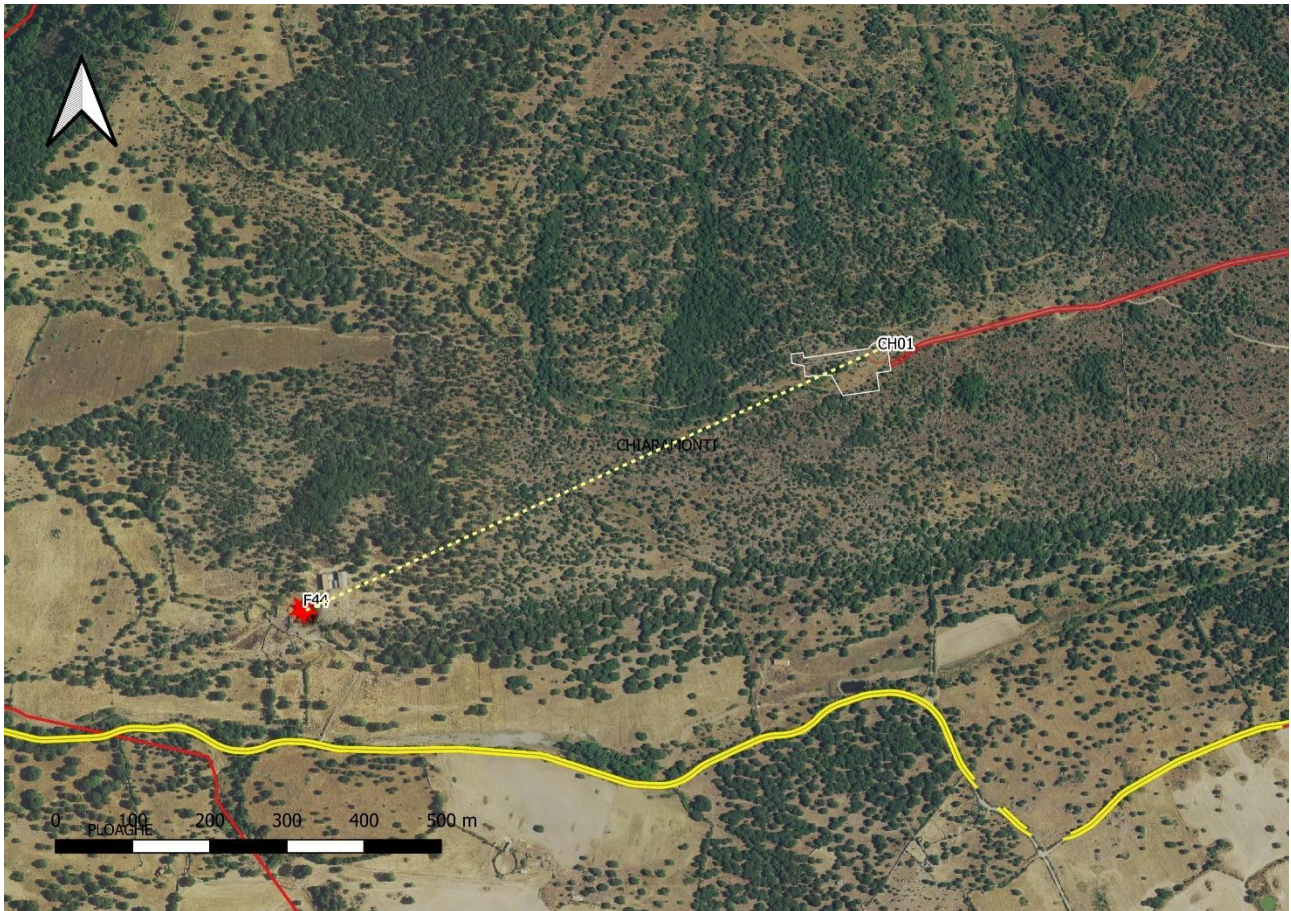
Ricettore F44

Il report del programma di simulazione mostra come il potenziale impatto da SF per il ricettore F44 sia attribuibile principalmente agli aerogeneratori CH1 e CH2, posizionati ad est rispetto all'edificio (Figura 6.1); stante la significativa distanza che separa il fabbricato dalla postazione eolica CH2 - pari a circa 1.600 metri - per quanto espresso in precedenza può ritenersi poco apprezzabile il contributo di tale turbina rispetto al fenomeno in esame; l'effetto della turbina CH1, ancorché non del tutto trascurabile, sarà circoscritto a ristretti periodi temporali (indicativamente 60 min/giorno nei mesi di giugno e luglio al sorgere del sole) e può ritenersi anch'esso, pertanto, poco avvertibile.



Esaminando le ulteriori circostanze che possono influire sulla significatività del fenomeno, vale la pena di soffermarsi sulle prevedibili condizioni di funzionamento dell'impianto e, in particolare, sulla frequenza delle condizioni più sfavorevoli alla proiezione dell'ombra intermittente, ossia quella rappresentate dal piano del rotore in posizione ortogonale rispetto alla congiungente sole-ricettore. A questo riguardo, i dati di frequenza della direzione di provenienza del vento massimo pubblicati dall'ARPAS (Tabella 6.5) indicano per la stazione di Alghero (la più prossima al sito in esame), una frequenza dei venti provenienti da N e S per circa il 25% delle occorrenze. In tali circostanze è stimabile, per il ricettore in esame, un impatto da SF del tutto trascurabile, avendosi il piano del rotore pressoché allineato con la congiungente sole-ricettore (Figura 6.1). Nel 75% delle possibili situazioni di provenienza del vento, viceversa, il fenomeno potrà presentarsi in modo potenzialmente avvertibile (incidenza di circa 32 h/anno), ma in ogni caso rientrante

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sostanzialmente nello standard di riferimento.



*Figura 6.1 – Posizionamento dell'edificio F44 rispetto all'aerogeneratore CH1
 La turbina CH01 non proietterà ombra intermittente sull'edificio allorquando il piano del rotore sarà indicativamente allineato con direttrice E-W, ossia in concomitanza con venti provenienti da nord o sud (vedasi anche il calendario dell'ombra in Figura 6.2)*

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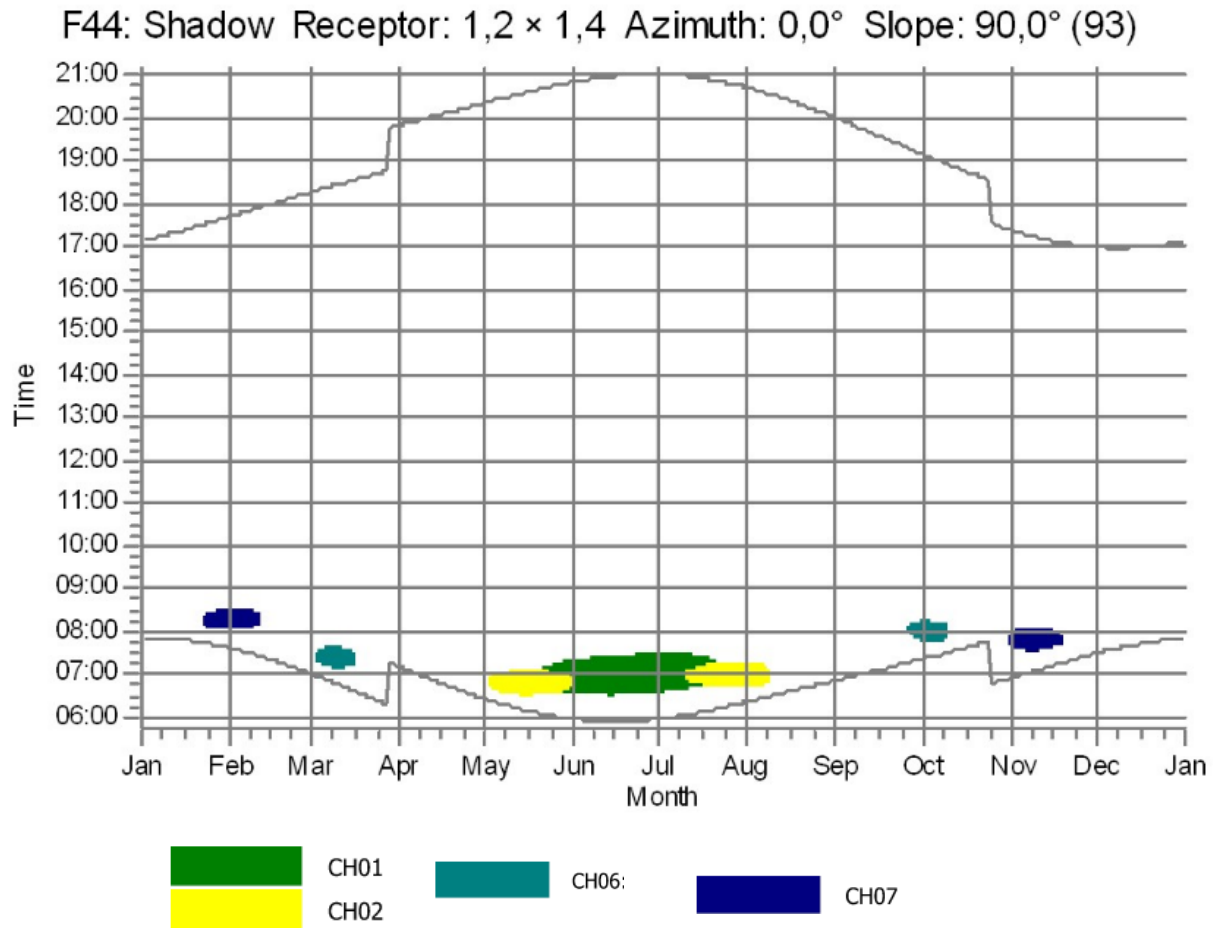


Figura 6.2 – Calendario dell'ombra per il ricettore F44



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Tabella 6.5 - Direzione di provenienza del vento massimo¹ - percentuali sul totale dei dati disponibili (Anni 1951÷1993 - Fonte ARPAS)

Stazione	N	NE	E	SE	S	SW	W	NW	direzione variabile
									o calma di vento
Capo Frasca (Arbus)	10,41	3,97	9,62	15,94	2	9,72	19,83	28,26	0,26
Decimomannu	10,94	2,1	2,78	23,17	14,71	3,62	9,1	32,97	0,62
Elmas	14,68	0,84	4,35	17,68	20,85	2,36	11,98	27,11	0,15
Spalmatoreddu (Carloforte)	15,02	3,83	6,42	10,62	8,98	6,68	10,31	38,14	0
Fonni	6,79	6,6	7,94	6,58	5,4	16	33,6	16,41	0,67
Capo Bellavista (Arbatax)	8,34	15,07	10,94	7,98	15,45	5,23	15,7	21,19	0,1
Perdasdefogu	2,05	6,28	22,53	11,63	1,2	10,13	39,1	6,44	0,63
Guardiavecchia (La Maddalena)	4,41	10,53	15,95	5,51	0,72	6,64	51,07	4,99	0,19
Asinara	3,07	3,02	22,68	4,29	3,77	9,16	40,84	13,03	0,13
Alghero	6,85	11,57	4,24	0,73	16,65	12,05	27,76	19,97	0,19

Ricettore F54

Il calendario dell'ombra diagrammato in Figura 6.3 mostra come il potenziale impatto da SF per il ricettore F54 (~69 h/anno al netto delle giornate con cielo coperto) sia attribuibile agli aerogeneratori CH08 e CH11, posizionati a circa 850 m a nordovest e 500 m ad ovest rispettivamente in rapporto all'edificio.



Il fenomeno di SF potrà essere avvertito nei mesi primaverili e autunnali per effetto dell'ombreggiamento esercitato dall'aerogeneratore CH11 (fascia oraria 16.30-18.30) e nella stagione estiva ad opera dell'aerogeneratore CH08 (fascia oraria 19.30-20.30).

Il report di simulazione evidenzia come il contributo all'ombreggiamento dei segnalati aerogeneratori sul ricettore F54 sia prevalentemente attribuibile all'aerogeneratore CH11 (73% circa)

Anche in questo caso, avuto riguardo dei dati di frequenza della direzione di provenienza del vento massimo pubblicati dall'ARPAS (Tabella 6.5) per la stazione di Alghero, si evince una frequenza dei venti provenienti da N e S di circa il 25% delle occorrenze. In tali circostanze è stimabile, per il ricettore in esame, un impatto da SF per effetto dell'aerogeneratore CH11, ridotto del 25%. Con tali approssimazioni il contributo all'ombreggiamento di tale aerogeneratore può valutarsi in circa 38 h/anno (69 h/anno x 73% x (1-25%)).

Allo stesso modo, valutato che la frequenza dei venti provenienti da NW e SE è di circa il 21% e che in tali circostanze l'aerogeneratore CH8 non determinerebbe ombreggiamento intermittente sul ricettore, può stimarsi per detta turbina un contributo effettivo di circa 15 h/anno di SF. Con tali



¹ I dati utilizzati sono relativi al vento di massima intensità misurato nell'arco delle 24 ore e rappresentano l'istante della giornata in cui tale fenomeno ha raggiunto il suo massimo. Ne discende che la statistica ottenuta si riferisce al comportamento del vento dominante in una giornata, ma non a quello misurato istante per istante.

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presupposti l'incidenza del fenomeno sull'edificio in esame è complessivamente stimabile in circa 53 h/anno.

Peraltro, considerate le ipotesi oltremodo conservative alla base del modello di calcolo (cielo sereno, rotore ortogonale alla congiungente sole-ricettore, rotori in movimento e dunque velocità del vento superiore a 3m/s, effettiva presenza degli occupanti l'edificio, sufficiente contrasto luci-ombre, assenza di elementi schermanti) è altamente verosimile che gli effettivi impatti da *shadow flickering* risulteranno estremamente più contenuti di quelli prospettati dal software di simulazione, tali da potersi ricondurre ai predetti "valori guida" e da non arrecare apprezzabili disturbi agli occupanti l'edificio.

Ad ogni buon conto, laddove in fase di esercizio dell'impianto dovesse manifestarsi un effettivo disturbo sugli occupanti l'edificio, l'aspetto in esame sarebbe efficacemente mitigabile rafforzando l'esistente presenza di alberature sui terreni ad ovest del fabbricato (Figura 6.5). Di tali interventi di mitigazione, ove richiesti, si farà carico la società proponente.

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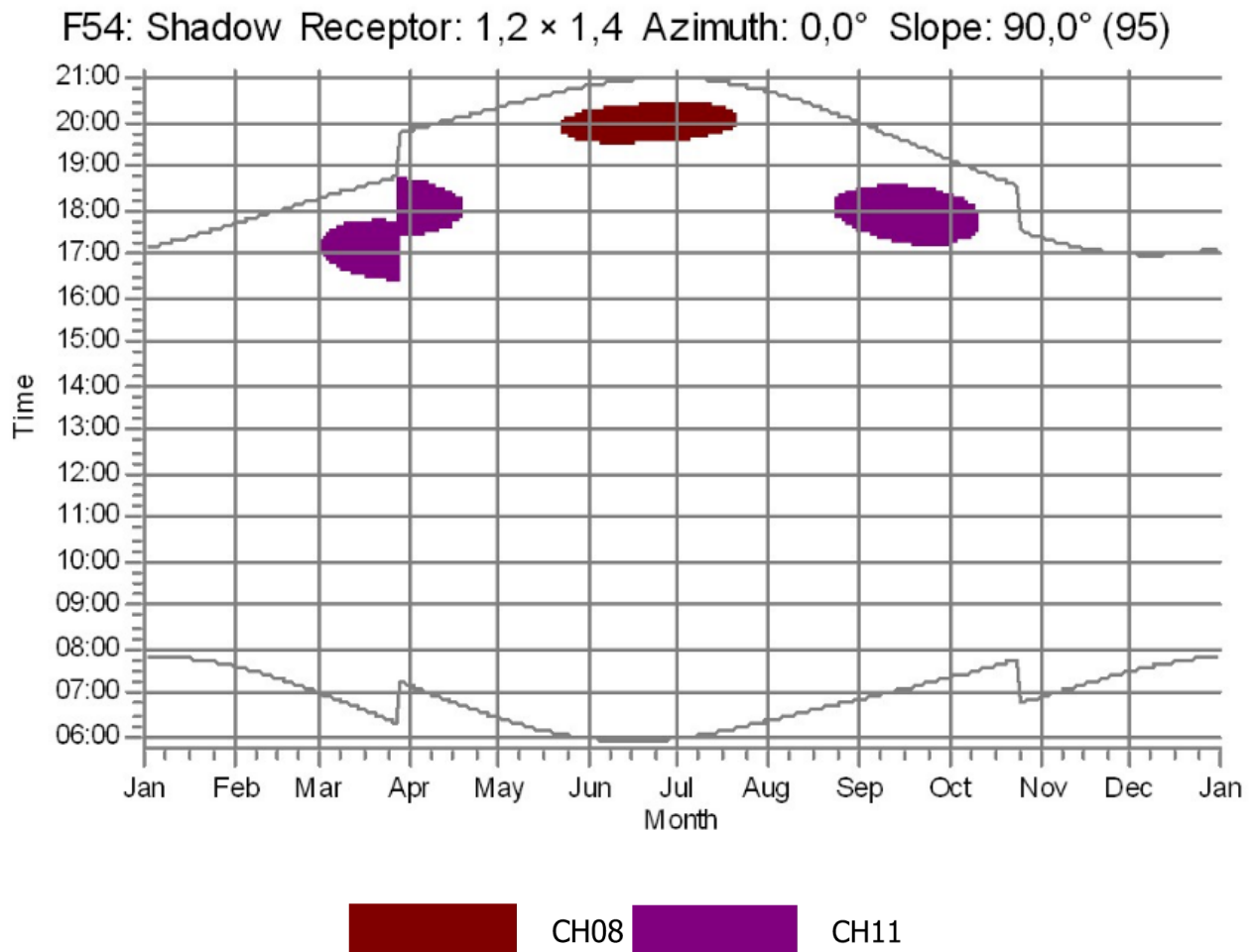

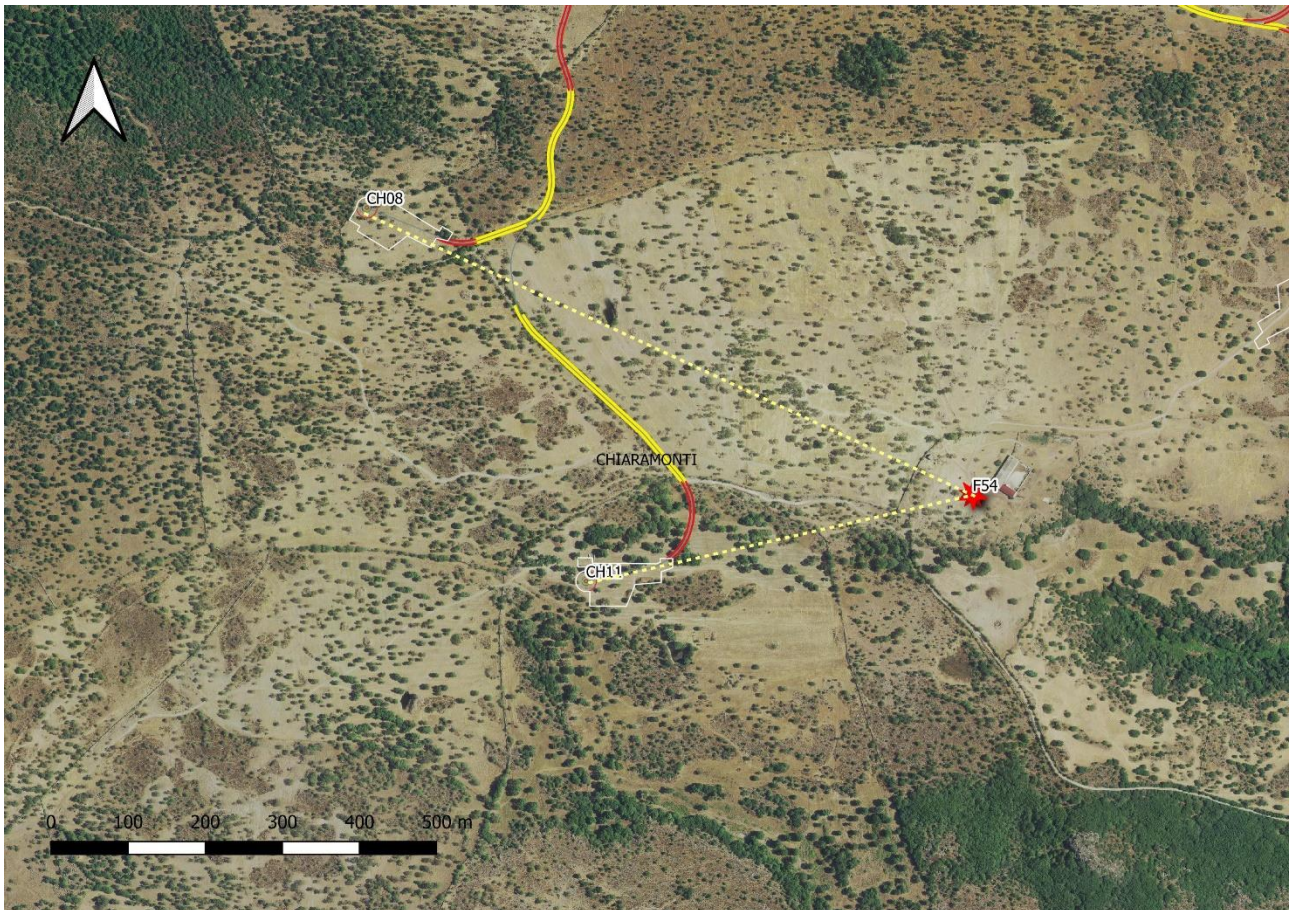


Figura 6.3 - Calendario dell'ombra per il ricettore F54 (ombreggiamento riferibile agli aerogeneratori CH8 e CH11)

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*Figura 6.4 – Posizionamento dell'edificio F54 rispetto agli aerogeneratori CH11 e CH8
 Le turbine non proietteranno ombra intermittente sull'edificio allorquando il piano del rotore sarà indicativamente allineato con direttrice E-W, ossia in concomitanza con venti provenienti da nord o sud (vedasi anche il calendario dell'ombra in Figura 6.2)*



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Figura 6.5 – Diffusa presenza di alberature sui terreni limitrofi al ricettore F54, capaci di esercitare una azione schermante rispetto al fenomeno del shadow-flickering



Ricettore F61

Il calendario dell'ombra diagrammato in Figura 6.6 mostra come il potenziale impatto da SF per il ricettore F61 (~98 h/anno al netto delle giornate con cielo coperto) sia attribuibile agli aerogeneratori CH4 e CH5, posizionati a circa 660 m a nordovest e 550 m a sudovest rispettivamente in rapporto all'edificio.

Il fenomeno di SF potrà essere avvertito nei mesi primaverili e autunnali per effetto dell'ombreggiamento esercitato dall'aerogeneratore CH5 (fascia oraria 15.00-17.00 indicativamente) e nella stagione estiva ad opera dell'aerogeneratore CH4 (fascia oraria 18.30-19.30).

Il report di simulazione evidenzia come il contributo all'ombreggiamento dei segnalati aerogeneratori sul ricettore F61 sia sostanzialmente bilanciato, con una leggera prevalenza del contributo dell'aerogeneratore CH4 (55% circa sul totale).

L'analisi dell'edificio abitativo in esame, peraltro, mette in luce come lo stesso sia sostanzialmente

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schermato dall'azione di ombreggiamento esercitata dall'aerogeneratore CH4 in virtù della presenza di un fabbricato (verosimilmente adibito a deposito) posto in contiguità con l'edificio abitativo (Figura 6.7), immediatamente ad ovest di questo. Il suddetto fabbricato, peraltro, realizzerà verosimilmente una parziale azione schermante anche sull'ombreggiamento esercitato dall'aerogeneratore CH5, in concomitanza con le ore del tardo pomeriggio nel periodo autunnale.

Conseguentemente, anche in ragione delle considerazioni più sopra accennate circa la bassa probabilità del simultaneo verificarsi di tutte le circostanze che concorrono all'effettivo manifestarsi del fenomeno, può ragionevolmente ritenersi che il potenziale effetto di disturbo sugli occupanti l'edificio F61 sia riconducibile ai predetti valori guida.

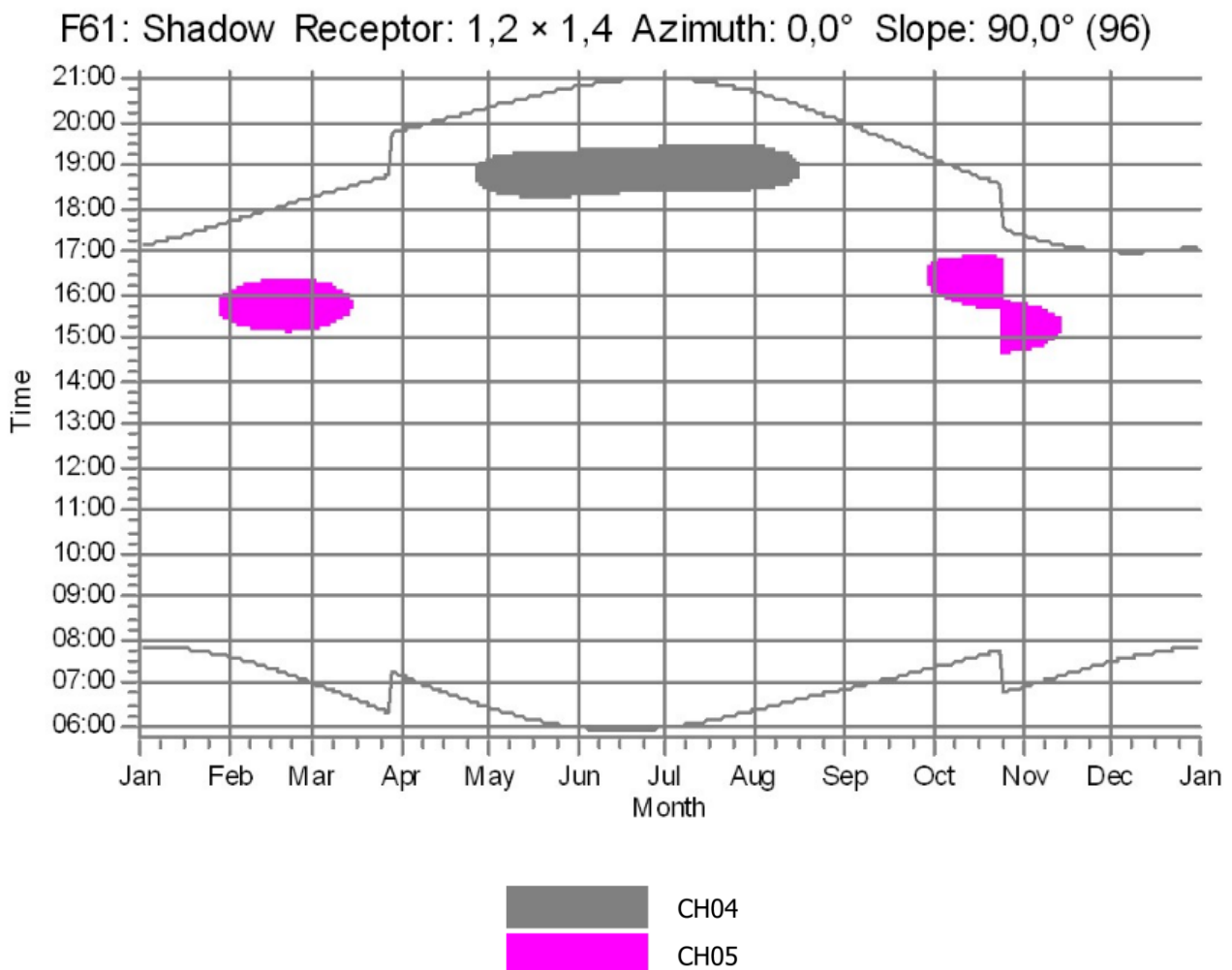




Figura 6.6 - Calendario dell'ombra per il ricettore F61 (ombreggiamento riferibile agli aerogeneratori CH4 e CH5)

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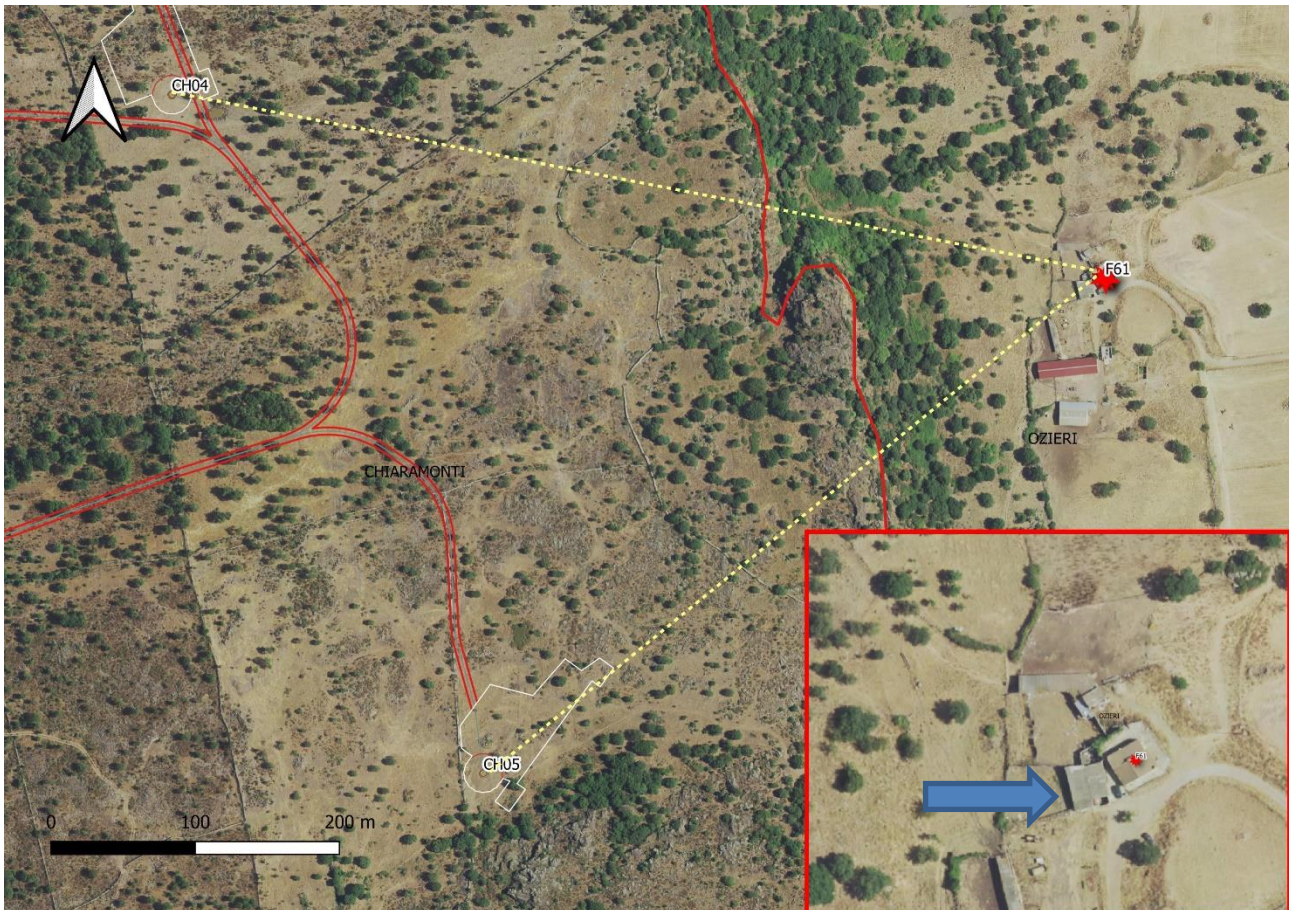


Figura 6.7 – Posizionamento dell'edificio F61 (contrassegnato con il punto rosso) rispetto agli aerogeneratori CH4 e CH5. Si noti la presenza del fabbricato con azione schermante sul prospetto ovest dell'edificio

6.2 Resti di interesse storico-archeologico

Con riferimento allo scenario di progetto, la Tabella 6.6 riepiloga, per ciascun ricettore rappresentativo dei beni archeologici e architettonici individuati entro un areale di 1.000 m dagli aerogeneratori, le risultanze del calcolo modellistico espresse come: valori totali di interferenza teorica (o potenziale) da *shadow flickering* (SF_P) in h/anno, numero di giorni in cui si verifica l'interferenza potenziale ed infine durata massima per singolo giorno.



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Tabella 6.6: Durata massima del fenomeno di shadow flickering potenziale (SF_p) in corrispondenza dei beni archeologici e culturali individuati entro i 1000 metri dalle postazioni eoliche

ID	Ricettore - Beni archeologici e culturali	[h/anno]	[giorni/anno]	[h/giorno]
1	BP01-NURAGHE CONCA DE FOSSU	319:03:00	264	02:06
2	BP02-NURAGHE MANDRAS	111:41:00	155	01:01
3	BP03-NURAGHE CORVUS MIGOSOS	208:52:00	145	02:14
4	BP04-Nuraghe Paule Udas	390:58:00	286	01:43
5	BP05-NURAGHE	141:12:00	260	1:09:00
6	BP06-NURAGHE TRUVINE	123:27:00	195	1:06:00
7	BP07-NURAGHE SA PALA DE SOS LADROS	238:35:00	279	01:26
8	BP08-NURAGHE	99:27:00	172	00:57
9	BP09-NURAGHE	48:25:00	154	00:29
10	BP10-NURAGHE MARTINE	99:53:00	86	01:24
11	BP11-NURAGHE SCOBERTU	290:32:00	262	01:37
12	BP12-NURAGHE BADDE TETTI	105:05:00	100	01:14
13	BP13-Tempio Nuragico Serra Porchileddos	92:48:00	183	0:53:00
14	BP14-NURAGHE	32:37:00	68	0:32:00
15	BP15-Menhirs Meddaris	89:51:00	232	00:39
16	BP16-NURAGHE	94:04:00	190	1:05:00
17	BP17-Circoli Massidda	30:25:00	101	00:26
18	BP18-0	0:00:00	0	0:00:00
19	BP19-NURAGHE PENTUMA	35:50:00	75	00:40
20	BP20-NURAGHE MASSEDDA	58:38:00	144	0:32:00

Ai fini di una appropriata lettura dei valori di h/anno riportati in Tabella 6.6, è opportuno richiamare, così come evidenziato in precedenza (cfr. par. 6.1), le ipotesi estremamente conservative alla base del calcolo modellistico (cielo sereno, sufficiente contrasto luci-ombre, velocità del vento al mozzo degli aerogeneratori superiore ai 3 m/s - V_{CUT-IN} , piano del rotore frapposto alla congiungente sole-ricettore).

Muovendo dai risultati della simulazione, la stima dei valori di effettiva esposizione all'ombra intermittente può condursi, pertanto, introducendo quantomeno un opportuno coefficiente di riduzione che tenga conto delle condizioni medie di copertura del cielo.

Valutato che, in base ai dati copertura del cielo richiamati in Tabella 6.3, il numero medio di giorni al mese con copertura nuvolosa superiore ai 4/8 è approssimativamente pari al 50%, è possibile pervenire alla stima dei valori di SF al netto delle giornate con presenza di cielo coperto (SF_{NC})





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Tabella 6.7: Incidenza del fenomeno del shadow flickering al netto delle giornate con cielo coperto in corrispondenza dei beni archeologici e culturali riconosciuti all'interno dell'areale di interesse

ID	Ricettore - Beni archeologici e culturali	[h/anno]	[giorni/anno]	[h/giorno]
1	BP01-NURAGHE CONCA DE FOSSU	159:31:30	132	01:15
2	BP02-NURAGHE MANDRAS	55:50:30	78	00:36
3	BP03-NURAGHE CORVUS MIGOSOS	104:26:00	73	01:20
4	BP04-Nuraghe Paule Udas	195:29:00	143	01:01
5	BP05-NURAGHE	70:36:00	130	00:41
6	BP06-NURAGHE TRUVINE	61:43:30	98	00:39
7	BP07-NURAGHE SA PALA DE SOS LADROS	119:17:30	140	00:51
8	BP08-NURAGHE	49:43:30	86	00:34
9	BP09-NURAGHE	24:12:30	77	00:17
10	BP10-NURAGHE MARTINE	49:56:30	43	00:50
11	BP11-NURAGHE SCOBERTU	145:16:00	131	00:58
12	BP12-NURAGHE BADDE TETTI	52:32:30	50	00:44
13	BP13-Temio Nuragico Serra Porchileddos	46:24:00	92	00:31
14	BP14-NURAGHE	16:18:30	34	00:19
15	BP15-Menhirs Meddaris	44:55:30	116	00:23
16	BP16-NURAGHE	47:02:00	95	00:39
17	BP17-Circoli Massidda	15:12:30	51	00:15
18	BP18-0	0:00:00	0	00:00
19	BP19-NURAGHE PENTUMA	17:55:00	38	00:24
20	BP20-NURAGHE MASSEDDA	29:19:00	72	00:19

Relativamente alle situazioni potenzialmente più sfavorevoli riscontrate (incidenza stimata SF>150 h/anno) riferibili ai beni classificati come "Nuraghe Paule Udas" (BP04) e Nuraghe Conca de Fossu (BP01) raffigurati planimetricamente in Figura 6.8, la presenza di alberi di alto fusto ai margini delle emergenze archeologiche contribuirà ad attenuare drasticamente l'entità del fenomeno.

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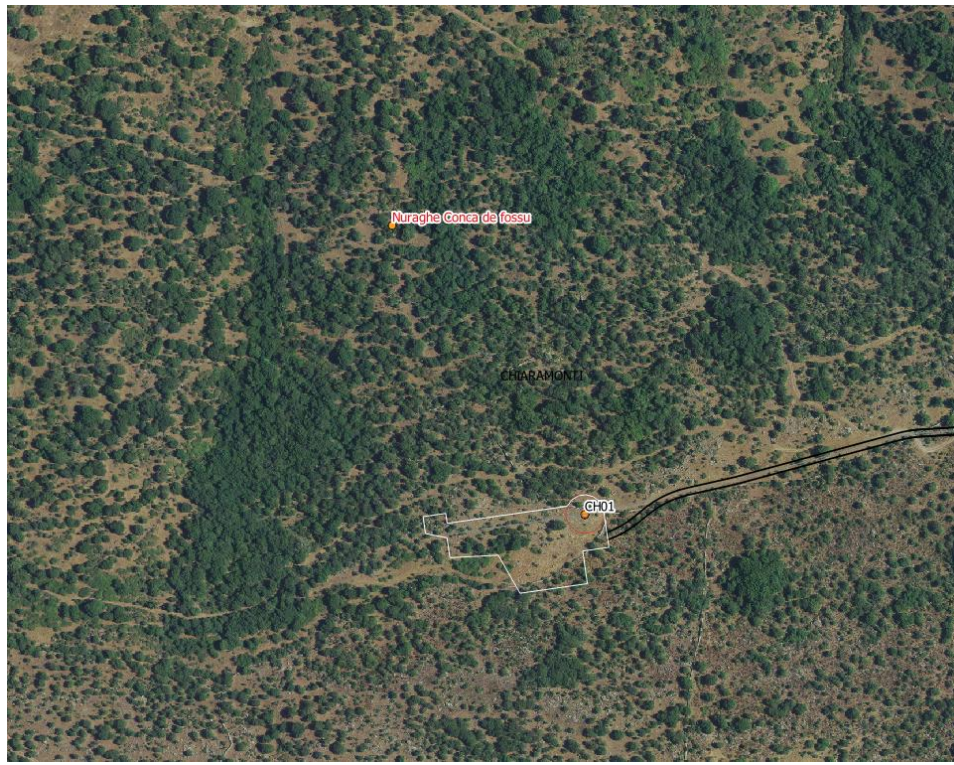






Figura 6.8 – Beni archeologici e culturali maggiormente esposti al fenomeno dello shadow-flickering

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Ad ogni buon conto, considerato che:

- non esiste una disciplina regolatoria a livello nazionale né le attuali buone pratiche in materia, a livello internazionale, contemplanò l'opportunità di considerare, tra i potenziali ricettori, siti e beni culturali che non siano riconducibili ad ambienti abitativi;
- non esistono conseguentemente soglie di riferimento circa l'incidenza del fenomeno che possano essere ragionevolmente assunte come indicatrici dell'entità di un potenziale disturbo a carico di eventuali possibili visitatori dei suddetti beni;
- l'incidenza massima del fenomeno di *shadow-flickering* in corrispondenza dei ricettori considerati (riferibile al bene identificato come RBP_1 Fontanile) è temporalmente valutabile in appena il 4% delle ore di luce in un anno per il sito di Chiaramonti (stimabili in circa 4400 ore);

si può ragionevolmente affermare che gli effetti associati al fenomeno dello *shadow-flickering* sulla godibilità del patrimonio archeologico e culturale riconosciuto in un areale di 1000 metri dal parco eolico in progetto saranno di natura transitoria e scarsamente significativa.

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7 CONCLUSIONI

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

Ai fini dei calcoli di esposizione all'ombra intermittente sono stati sottoposti a verifica n. 6 fabbricati, con destinazione abitativa accertata, ubicati entro una distanza di 1000 m dalle postazioni eoliche. Avuto riguardo della presenza, nel territorio interessato dal progetto, delle permanenze di interesse storico-archeologico segnalate nell'ambito degli studi specialistici eseguiti, la valutazione della potenziale incidenza del fenomeno del SF è stata estesa ai potenziali "ricettori" identificabili beni e siti culturali (architettonici e archeologici).



Considerata, la presenza di alcuni impianti minieolici nel settore di studio, sono stati valutati gli effetti cumulativi indotti dal progetto in relazione allo specifico fattore di impatto.

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

Relativamente allo Scenario di progetto si è evidenziato come l'incidenza del fenomeno del *shadow flickering*, al netto delle giornate con cielo coperto, si presenti potenzialmente superiore alla soglia di riferimento di 30 h/anno presso n. 3 edifici abitativi.



In corrispondenza di un ricettore (F44), peraltro, sono state stimate incidenze debolmente superiori alle 30 h/anno al netto delle giornate con cielo coperto e di condizioni di vento sfavorevoli al verificarsi del fenomeno, ossia che presuppongano l'orientamento del piano del rotore lungo la congiungente sole-ricettore. In corrispondenza di un ulteriore fabbricato, inoltre, la presenza di manufatti schermanti rispetto all'ombreggiamento esercitato dagli aerogeneratori contribuirà a ridurre drasticamente l'effettiva incidenza del SF, riconducendolo al disotto delle soglie di riferimento.

Relativamente all'edificio identificato con la sigla F54, laddove è stata stima un'incidenza del fenomeno di circa 53 h/anno, considerate le ipotesi oltremodo conservative alla base del modello di calcolo (cielo sereno, rotore ortogonale alla congiungente sole-ricettore, rotori in movimento e dunque velocità del vento superiore a 3m/s, effettiva presenza degli occupanti l'edificio, sufficiente contrasto luci-ombre, assenza di elementi schermanti) è comunque altamente verosimile che gli effettivi impatti da *shadow flickering* risulteranno estremamente più contenuti di quelli prospettati

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dal software di simulazione, tali da potersi ricondurre ai predetti "valori guida" e da non arrecare apprezzabili disturbi agli occupanti l'edificio.

Con riferimento ai potenziali effetti del fenomeno sul patrimonio archeologico e culturale, nel sottolineare come non esistano né una disciplina regolatoria né buone pratiche in materia - a livello nazionale o internazionale - rispetto alla valutazione di rilevanza del fenomeno su siti e beni culturali che non siano riconducibili ad ambienti abitativi, si può ragionevolmente concludere che gli effetti associati al manifestarsi dello *shadow-flickering* saranno di natura transitoria e scarsamente significativa (incidenza massima stimata in appena il 4% delle ore di luce in un anno per il sito di Chiaramonti nel caso più sfavorevole).

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**APPENDICE 1 - REPORT DEI RISULTATI DEL CALCOLO MODELLISTICO –
SCENARIO DI PROGETTO (ABITAZIONI)**

SHADOW - Main Result

Calculation: Shadow_cumulativo_abitazioni_2021_12_08

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_Impianto_WPD_Chiaramonti

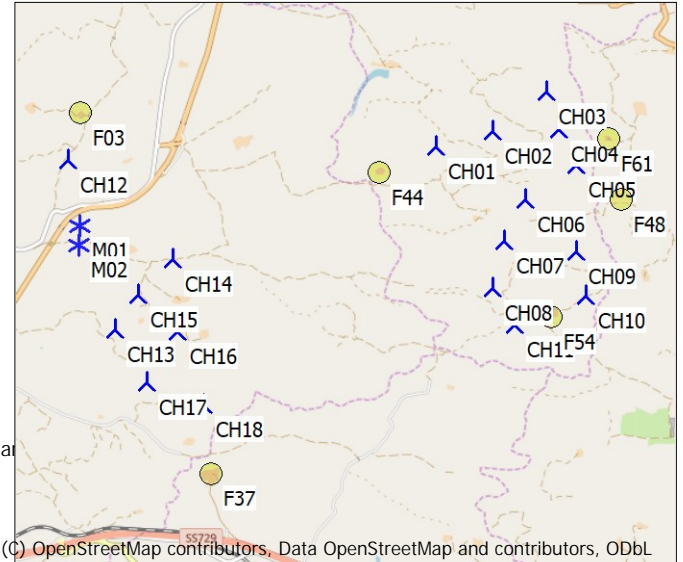
Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

Italian Gauss-Boaga west-ROMA40 (IT-peninsular $\leq \pm 4m$)



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

Scale 1:100.000
 ▲ New WTG * Existing WTG ● Shadow receptor

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]									
CH01	1.485.773	4.504.115	390,4	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH02	1.486.530	4.504.316	392,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH03	1.487.229	4.504.830	397,2	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH04	1.487.413	4.504.340	406,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH05	1.487.629	4.503.870	410,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH06	1.486.963	4.503.408	433,6	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH07	1.486.688	4.502.863	438,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH08	1.486.518	4.502.245	464,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH09	1.487.623	4.502.732	453,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH10	1.487.760	4.502.139	460,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH11	1.486.803	4.501.761	460,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH12	1.480.892	4.503.943	450,4	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH13	1.481.518	4.501.717	383,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH14	1.482.281	4.502.650	399,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH15	1.481.825	4.502.169	450,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH16	1.482.347	4.501.691	450,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH17	1.481.926	4.501.017	346,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH18	1.482.688	4.500.725	380,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
M01	1.481.058	4.503.074	420,0	WINDWORLD 150 2...	No	WINDWORLD	-150	150	23,2	30,0	2.500	41,5
M02	1.481.034	4.502.834	386,9	WINDWORLD 150 2...	No	WINDWORLD	-150	150	23,2	30,0	2.500	41,5

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
			[m]	[m]	[m]	a.g.l. [m]	[°]		(ZVI) a.g.l. [m]
F03	1.481.076	4.504.562	423,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F37	1.482.784	4.499.804	290,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F44	1.485.029	4.503.783	380,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F48	1.488.239	4.503.407	356,8	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F54	1.487.304	4.501.873	460,0	1,2	1,4	1,2	90,0	"Green house mode"	2,6
F61	1.488.060	4.504.213	335,4	1,2	1,4	1,2	90,0	"Green house mode"	2,6

SHADOW - Main Result

Calculation: Shadow_cumulativo_abitazioni_2021_12_08

Calculation Results

Shadow receptor

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
F03	0:00	0	0:00
F37	0:00	0	0:00
F44	70:04	159	0:46
F48	57:59	90	0:44
F54	120:52	152	1:12
F61	170:14	200	1:05

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

No.	Name	Worst case [h/year]
CH01	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (7)	39:21
CH02	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (6)	18:43
CH03	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (2)	0:00
CH04	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (3)	94:32
CH05	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (4)	75:42
CH06	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (5)	6:38
CH07	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (8)	10:02
CH08	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (9)	33:38
CH09	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (10)	57:59
CH10	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (11)	0:00
CH11	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (17)	87:14
CH12	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (16)	0:00
CH13	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (18)	0:00
CH14	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (15)	0:00
CH15	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (19)	0:00
CH16	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (14)	0:00
CH17	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (13)	0:00
CH18	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (12)	0:00
M01	WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (2)	0:00
M02	WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (3)	0:00

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

SHADOW - Calendar

Calculation: Shadow_cumulativo_abitazioni_2021_12_08 Shadow receptor: F03 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (91)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:21	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
2	07:50 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:22	05:56 20:50	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	05:59 21:00	06:24 20:39	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58
6	07:50 17:13	07:31 17:48	06:53 18:21	07:03 19:54	06:19 20:26	05:55 20:53	06:00 21:00	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:50 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 16:58
8	07:50 17:14	07:29 17:51	06:50 18:24	06:59 19:57	06:17 20:28	05:54 20:54	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58
9	07:49 17:15	07:28 17:52	06:48 18:25	06:58 19:58	06:16 20:29	05:54 20:55	06:02 20:59	06:29 20:33	06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:59	06:15 20:30	05:54 20:56	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:38 16:58
11	07:49 17:18	07:26 17:54	06:45 18:27	06:55 20:00	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:57	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:08 17:11	07:39 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:58
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	06:06 20:56	06:35 20:25	07:05 19:36	07:36 18:47	07:11 17:08	07:42 16:59
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	06:07 20:55	06:36 20:23	07:06 19:34	07:37 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 20:37	05:54 20:59	06:08 20:55	06:37 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:38	05:54 20:59	06:09 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:15 17:06	07:44 17:00
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:06 20:39	05:54 20:59	06:10 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00
20	07:45 17:28	07:14 18:05	06:31 18:37	06:41 20:09	06:05 20:39	05:54 21:00	06:10 20:53	06:40 20:18	07:10 19:28	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:29	07:13 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:44 17:31	07:10 18:09	06:26 18:40	06:36 20:12	06:02 20:42	05:55 21:00	06:13 20:50	06:43 20:13	07:13 19:23	07:44 18:35	07:20 17:03	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:15 20:49	06:45 20:10	07:15 19:19	07:46 19:19	07:23 17:01	07:47 17:03
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:55 21:01	06:16 20:48	06:46 20:09	07:16 19:17	07:47 17:31	07:24 17:01	07:48 17:04
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:46	05:56 21:01	06:16 20:47	06:47 20:07	07:17 19:16	07:48 17:29	07:25 17:01	07:48 17:04
28	07:40 17:37	07:02 18:15	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:01	06:17 20:46	06:48 20:06	07:18 19:14	07:49 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38		07:16 19:46	06:28 20:18	05:58 20:47	05:57 21:01	06:18 20:45	06:48 20:04	07:19 19:12	07:50 17:27	07:27 17:00	07:49 17:06
30	07:38 17:40		07:14 19:47	06:27 20:19	05:58 20:48	05:57 21:01	06:19 20:44	06:49 20:02	07:20 19:11	07:51 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41		07:12 19:48		05:57 20:49		06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Total, worst case												

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

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

Calculation: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F37 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (92)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:49	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:57	07:22 19:07	06:56 17:22	07:30 16:59
3	07:49 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:59 21:00	06:23 20:39	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:49 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:23	05:56 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:49 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:02	06:59 17:18	07:33 16:58
6	07:49 17:13	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:26	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:49 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	07:49 17:15	07:29 17:51	06:50 18:23	06:59 19:56	06:17 20:28	05:55 20:54	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58
9	07:49 17:16	07:28 17:52	06:48 18:25	06:58 19:57	06:16 20:29	05:54 20:55	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:58	06:15 20:30	05:54 20:55	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	07:49 17:18	07:25 17:54	06:45 18:27	06:54 20:00	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:56	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	06:06 20:56	06:35 20:25	07:05 19:36	07:35 18:47	07:11 17:08	07:41 16:59
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	06:07 20:55	06:36 20:23	07:06 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 20:36	05:54 20:58	06:08 20:54	06:37 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:37	05:54 20:59	06:09 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:14 17:06	07:43 17:00
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:06 20:38	05:54 20:59	06:10 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00
20	07:45 17:28	07:14 18:05	06:30 18:36	06:41 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:40 20:17	07:10 19:28	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:29	07:12 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:43 17:31	07:10 18:09	06:25 18:40	06:36 20:12	06:02 20:42	05:55 21:00	06:13 20:50	06:43 20:13	07:13 19:22	07:44 18:35	07:20 17:03	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:15 20:48	06:45 20:10	07:15 19:19	07:46 19:19	07:22 17:32	07:47 17:03
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:56 21:00	06:16 20:48	06:46 20:08	07:16 19:17	07:47 17:31	07:23 17:01	07:48 17:04
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:45	05:56 21:00	06:17 20:47	06:46 20:07	07:17 19:16	07:48 17:29	07:25 17:01	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00	06:17 20:46	06:47 20:05	07:18 19:14	07:49 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38		07:16 19:46	06:28 20:18	05:59 20:47	05:57 21:00	06:18 20:45	06:48 20:04	07:19 19:12	06:51 17:27	07:27 17:00	07:48 17:06
30	07:38 17:40		07:14 19:47	06:27 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:11	06:52 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41		07:12 19:48		05:57 20:49		06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07
Potential sun hours	299	298	370	398	447	451	458	427	375	346	299	289
Total, worst case												

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

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

Calculation: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F44 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (93)
 Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	
1	07:49	07:36	08:06 (CH07)	07:01	07:10	06:25	05:57
	17:08	17:42	21 08:27 (CH07)	18:15	19:49	20:20	20:49
2	07:49	07:35	08:06 (CH07)	06:59	07:09	06:24	05:56
	17:09	17:43	21 08:27 (CH07)	18:17	19:50	20:21	20:50
3	07:49	07:34	08:06 (CH07)	06:58	07:07	06:23	05:56
	17:10	17:44	21 08:27 (CH07)	18:18	19:51	20:22	20:51
4	07:49	07:33	08:06 (CH07)	06:56	07:22 (CH06)	07:06	06:21
	17:11	17:46	21 08:27 (CH07)	18:19	4 07:26 (CH06)	19:52	20:23
5	07:50	07:32	08:07 (CH07)	06:55	07:18 (CH06)	07:04	06:20
	17:11	17:47	20 08:27 (CH07)	18:20	11 07:29 (CH06)	19:53	20:24
6	07:49	07:31	08:08 (CH07)	06:53	07:16 (CH06)	07:02	06:19
	17:12	17:48	19 08:27 (CH07)	18:21	15 07:31 (CH06)	19:54	20:26
7	07:49	07:30	08:09 (CH07)	06:51	07:15 (CH06)	07:01	06:18
	17:13	17:49	17 08:26 (CH07)	18:22	17 07:32 (CH06)	19:55	20:27
8	07:49	07:29	08:10 (CH07)	06:50	07:14 (CH06)	06:59	06:17
	17:14	17:51	15 08:25 (CH07)	18:23	19 07:33 (CH06)	19:56	20:28
9	07:49	07:28	08:11 (CH07)	06:48	07:13 (CH06)	06:58	06:16
	17:15	17:52	12 08:23 (CH07)	18:24	20 07:33 (CH06)	19:57	20:29
10	07:49	07:27	08:13 (CH07)	06:47	07:12 (CH06)	06:56	06:14
	17:16	17:53	8 08:21 (CH07)	18:26	20 07:32 (CH06)	19:58	20:30
11	07:49	07:25	07:13 (CH06)	06:45	07:13 (CH06)	06:54	06:13
	17:17	17:54	19 07:32 (CH06)	19:59	20:31	24 06:59 (CH02)	20:56
12	07:49	07:24	06:43	06:43	06:12	06:35 (CH02)	05:54
	17:18	17:55	18:28	19 07:31 (CH06)	20:00	20:32	25 07:00 (CH02)
13	07:48	07:23	06:42	06:11	06:11	06:35 (CH02)	05:54
	17:20	17:57	18:29	17 07:30 (CH06)	20:02	20:33	25 07:00 (CH02)
14	07:48	07:22	06:40	07:14 (CH06)	06:50	06:10	06:34 (CH02)
	17:21	17:58	18:30	16 07:30 (CH06)	20:03	20:34	26 07:00 (CH02)
15	07:48	07:20	06:39	07:15 (CH06)	06:48	06:09	06:34 (CH02)
	17:22	17:59	18:31	12 07:27 (CH06)	20:04	20:35	26 07:00 (CH02)
16	07:47	07:19	06:37	07:17 (CH06)	06:47	06:08	06:34 (CH02)
	17:23	18:00	18:32	7 07:24 (CH06)	20:05	20:36	26 07:00 (CH02)
17	07:47	07:18	06:35	06:45	06:07	06:35 (CH02)	05:54
	17:24	18:01	18:33	20:06	20:36	26 07:01 (CH02)	20:58
18	07:46	07:17	06:34	06:44	06:06	06:35 (CH02)	05:54
	17:25	18:03	18:34	20:07	20:37	26 07:01 (CH02)	20:59
19	07:46	07:15	06:32	06:42	06:06	06:35 (CH02)	05:54
	17:26	18:04	18:35	20:08	20:38	25 07:00 (CH02)	20:59
20	07:45	07:14	06:30	06:41	06:05	06:35 (CH02)	05:54
	17:27	18:05	18:36	20:09	20:39	25 07:00 (CH02)	20:59
21	07:45	07:12	06:29	06:39	06:04	06:35 (CH02)	05:54
	17:29	18:06	18:37	20:10	20:40	24 06:59 (CH02)	21:00
22	07:44	07:11	06:27	06:38	06:03	06:36 (CH02)	05:54
	17:30	18:07	18:38	20:11	20:41	25 07:01 (CH01)	21:00
23	07:43	07:10	06:25	06:36	06:02	06:37 (CH02)	05:54
	17:31	18:09	18:40	20:12	20:42	27 07:04 (CH01)	21:00
24	07:43	08:11 (CH07)	07:08	06:35	06:02	06:37 (CH02)	05:55
	17:32	7 08:18 (CH07)	18:10	20:13	20:43	28 07:05 (CH01)	21:00
25	07:42	08:09 (CH07)	07:07	06:33	06:01	06:38 (CH02)	05:55
	17:33	11 08:20 (CH07)	18:11	20:14	20:44	29 07:07 (CH01)	21:00
26	07:41	08:09 (CH07)	07:05	06:32	06:00	06:39 (CH02)	05:55
	17:35	13 08:22 (CH07)	18:12	20:15	20:45	29 07:08 (CH01)	21:00
27	07:40	08:08 (CH07)	07:04	06:31	06:00	06:39 (CH02)	05:56
	17:36	16 08:24 (CH07)	18:13	20:16	20:45	30 07:09 (CH01)	21:00
28	07:40	08:07 (CH07)	07:02	06:29	05:59	06:39 (CH01)	05:56
	17:37	18 08:25 (CH07)	18:14	20:17	20:46	32 07:11 (CH01)	21:00
29	07:39	08:06 (CH07)	07:15	06:28	05:58	06:38 (CH01)	05:56
	17:38	19 08:25 (CH07)	19:46	20:18	20:47	33 07:11 (CH01)	21:00
30	07:38	08:06 (CH07)	07:14	06:27	05:58	06:38 (CH01)	05:57
	17:39	20 08:26 (CH07)	19:47	20:19	20:48	35 07:13 (CH01)	21:00
31	07:37	08:06 (CH07)	07:12	06:26	05:57	06:36 (CH01)	05:57
	17:41	20 08:26 (CH07)	19:48	20:20	20:49	37 07:13 (CH01)	21:00
Potential sun hours	298	298	370	398	447	451	1330
Total, worst case	124	175	196	696			

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: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F44 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (93)
 Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July		August		September		October		November		December	
1	05:57	06:39 (CH01)	06:21	06:46 (CH02)	06:51	07:21	07:52 (CH06)	06:54	07:42 (CH07)	07:29		
	21:00	45 07:24 (CH01)	20:42	24 07:10 (CH02)	19:59	19:09	19 08:11 (CH06)	17:23	9 07:51 (CH07)	16:59		
2	05:58	06:39 (CH01)	06:22	06:46 (CH02)	06:52	07:22	07:51 (CH06)	06:56	07:40 (CH07)	07:30		
	21:00	44 07:23 (CH01)	20:41	24 07:10 (CH02)	19:57	19:07	20 08:11 (CH06)	17:22	13 07:53 (CH07)	16:59		
3	05:58	06:40 (CH01)	06:23	06:47 (CH02)	06:53	07:23	07:51 (CH06)	06:57	07:38 (CH07)	07:31		
	21:00	44 07:24 (CH01)	20:39	22 07:09 (CH02)	19:56	19:06	20 08:11 (CH06)	17:20	16 07:54 (CH07)	16:58		
4	05:59	06:40 (CH01)	06:24	06:47 (CH02)	06:54	07:24	07:51 (CH06)	06:58	07:38 (CH07)	07:32		
	21:00	43 07:23 (CH01)	20:38	22 07:09 (CH02)	19:54	19:04	19 08:10 (CH06)	17:19	18 07:56 (CH07)	16:58		
5	05:59	06:41 (CH01)	06:25	06:48 (CH02)	06:55	07:25	07:51 (CH06)	06:59	07:37 (CH07)	07:33		
	21:00	43 07:24 (CH01)	20:37	20 07:08 (CH02)	19:53	19:02	19 08:10 (CH06)	17:18	20 07:57 (CH07)	16:58		
6	06:00	06:41 (CH01)	06:26	06:49 (CH02)	06:56	07:26	07:51 (CH06)	07:00	07:37 (CH07)	07:34		
	20:59	42 07:23 (CH01)	20:36	18 07:07 (CH02)	19:51	19:01	18 08:09 (CH06)	17:17	20 07:57 (CH07)	16:58		
7	06:01	06:42 (CH01)	06:27	06:50 (CH02)	06:57	07:27	07:51 (CH06)	07:01	07:36 (CH07)	07:35		
	20:59	41 07:23 (CH01)	20:35	14 07:04 (CH02)	19:49	18:59	17 08:08 (CH06)	17:16	21 07:57 (CH07)	16:58		
8	06:01	06:43 (CH01)	06:28	06:52 (CH02)	06:58	07:28	07:52 (CH06)	07:03	07:37 (CH07)	07:36		
	20:59	40 07:23 (CH01)	20:34	10 07:02 (CH02)	19:48	18:58	14 08:06 (CH06)	17:15	21 07:58 (CH07)	16:58		
9	06:02	06:42 (CH01)	06:29		06:59	07:29	07:54 (CH06)	07:04	07:37 (CH07)	07:37		
	20:58	41 07:23 (CH01)	20:32		19:46	18:56	9 08:03 (CH06)	17:14	21 07:58 (CH07)	16:58		
10	06:03	06:43 (CH01)	06:30		07:00	07:30		07:05	07:36 (CH07)	07:37		
	20:58	40 07:23 (CH01)	20:31		19:44	18:54		17:13	22 07:58 (CH07)	16:58		
11	06:03	06:44 (CH01)	06:31		07:01	07:31		07:06	07:37 (CH07)	07:38		
	20:58	39 07:23 (CH01)	20:30		19:43	18:53		17:12	20 07:57 (CH07)	16:58		
12	06:04	06:44 (CH01)	06:32		07:02	07:32		07:07	07:38 (CH07)	07:39		
	20:57	37 07:21 (CH01)	20:28		19:41	18:51		17:11	20 07:58 (CH07)	16:58		
13	06:05	06:45 (CH01)	06:33		07:03	07:33		07:09	07:38 (CH07)	07:40		
	20:57	36 07:21 (CH01)	20:27		19:39	18:50		17:10	19 07:57 (CH07)	16:58		
14	06:05	06:47 (CH01)	06:34		07:04	07:34		07:10	07:39 (CH07)	07:41		
	20:56	34 07:21 (CH01)	20:26		19:38	18:48		17:09	17 07:56 (CH07)	16:58		
15	06:06	06:48 (CH01)	06:35		07:05	07:35		07:11	07:40 (CH07)	07:41		
	20:56	33 07:21 (CH01)	20:24		19:36	18:46		17:08	16 07:56 (CH07)	16:59		
16	06:07	06:48 (CH01)	06:36		07:06	07:36		07:12	07:42 (CH07)	07:42		
	20:55	31 07:19 (CH01)	20:23		19:34	18:45		17:07	13 07:55 (CH07)	16:59		
17	06:08	06:48 (CH02)	06:37		07:07	07:37		07:13	07:43 (CH07)	07:43		
	20:54	30 07:18 (CH01)	20:22		19:32	18:43		17:07	11 07:54 (CH07)	16:59		
18	06:09	06:48 (CH02)	06:37		07:08	07:39		07:14	07:45 (CH07)	07:43		
	20:54	29 07:17 (CH01)	20:20		19:31	18:42		17:06	6 07:51 (CH07)	16:59		
19	06:09	06:48 (CH02)	06:38		07:09	07:40		07:16		07:44		
	20:53	28 07:16 (CH01)	20:19		19:29	18:40		17:05		17:00		
20	06:10	06:46 (CH02)	06:39		07:10	07:41		07:17		07:45		
	20:52	28 07:14 (CH01)	20:17		19:27	18:39		17:04		17:00		
21	06:11	06:46 (CH02)	06:40		07:11	07:42		07:18		07:45		
	20:52	26 07:12 (CH01)	20:16		19:26	18:38		17:04		17:01		
22	06:12	06:46 (CH02)	06:41		07:12	07:43		07:19		07:46		
	20:51	23 07:09 (CH02)	20:14		19:24	18:36		17:03		17:01		
23	06:13	06:46 (CH02)	06:42		07:13	07:44		07:20		07:46		
	20:50	24 07:10 (CH02)	20:13		19:22	18:35		17:02		17:02		
24	06:14	06:46 (CH02)	06:43		07:14	07:45		07:21		07:47		
	20:49	24 07:10 (CH02)	20:11		19:21	18:33		17:02		17:02		
25	06:14	06:46 (CH02)	06:44		07:15	06:46		07:22		07:47		
	20:48	25 07:11 (CH02)	20:10		19:19	17:32		17:01		17:03		
26	06:15	06:46 (CH02)	06:45		07:16	06:47		07:23		07:48		
	20:48	25 07:11 (CH02)	20:08		19:17	17:31		17:01		17:03		
27	06:16	06:45 (CH02)	06:46		07:17	06:49	08:01 (CH06)	07:25		07:48		
	20:47	25 07:10 (CH02)	20:07		19:16	4 08:05 (CH06)	07:29	17:00		17:04		
28	06:17	06:45 (CH02)	06:47		07:18	07:57 (CH06)	06:50	07:26		07:48		
	20:46	26 07:11 (CH02)	20:05		19:14	11 08:08 (CH06)	17:28	17:00		17:05		
29	06:18	06:45 (CH02)	06:48		07:19	07:55 (CH06)	06:51	07:27		07:48		
	20:45	26 07:11 (CH02)	20:04		19:12	15 08:10 (CH06)	17:27	17:00		17:05		
30	06:19	06:45 (CH02)	06:49		07:20	07:53 (CH06)	06:52	07:28		07:49		
	20:44	26 07:11 (CH02)	20:02		19:11	17 08:10 (CH06)	17:25	16:59		17:06		
31	06:20	06:45 (CH02)	06:50			06:53				07:49		
	20:43	26 07:11 (CH02)	20:01			17:24				17:07		
Potential sun hours	458		427		375		346		299		289	
Total, worst case	1024		154		47		155		303			

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: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F48 - Shadow Receptor: 1,2 x 1,4 Azimuth: 0,0° Slope: 90,0° (94)
Assumptions for shadow calculations

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

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains a time range (e.g., 07:49 - 17:08) and a shadow status (e.g., 15:02 (CH09)). A summary row at the bottom shows 'Potential sun hours Total, worst case' for each month.

Potential sun hours

Total, worst case

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

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

SHADOW - Calendar

Calculation: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F54 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (95)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June		
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	17:30 (CH11) 18:38 (CH11)	06:25 20:20	05:57 20:49	19:38 (CH08) 20:11 (CH08)
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	17:30 (CH11) 18:37 (CH11)	06:24 20:21	05:56 20:50	19:38 (CH08) 20:12 (CH08)
3	07:49 17:10	07:34 17:44	06:58 18:18	17:07 (CH11) 17:13 (CH11)	07:07 19:51	06:23 20:22	05:56 20:51	19:37 (CH08) 20:12 (CH08)
4	07:49 17:11	07:33 17:46	06:56 18:19	16:59 (CH11) 17:21 (CH11)	07:05 19:52	06:21 20:23	05:55 20:51	19:37 (CH08) 20:13 (CH08)
5	07:49 17:11	07:32 17:47	06:54 18:20	16:55 (CH11) 17:25 (CH11)	07:04 19:53	06:20 20:24	05:55 20:52	19:37 (CH08) 20:14 (CH08)
6	07:49 17:12	07:31 17:48	06:53 18:21	16:52 (CH11) 17:28 (CH11)	07:02 19:54	06:19 20:25	05:55 20:53	19:36 (CH08) 20:14 (CH08)
7	07:49 17:13	07:30 17:49	06:51 18:22	16:49 (CH11) 17:30 (CH11)	07:01 19:55	06:18 20:26	05:55 20:53	19:36 (CH08) 20:15 (CH08)
8	07:49 17:14	07:29 17:50	06:50 18:23	16:46 (CH11) 17:32 (CH11)	06:59 19:56	06:17 20:27	05:54 20:54	19:36 (CH08) 20:15 (CH08)
9	07:49 17:15	07:28 17:52	06:48 18:24	16:45 (CH11) 17:34 (CH11)	06:57 19:57	06:15 20:28	05:54 20:55	19:36 (CH08) 20:16 (CH08)
10	07:49 17:16	07:26 17:53	06:47 18:25	16:43 (CH11) 17:35 (CH11)	06:56 19:58	06:14 20:29	05:54 20:55	19:37 (CH08) 20:17 (CH08)
11	07:49 17:17	07:25 17:54	06:45 18:27	16:42 (CH11) 17:37 (CH11)	06:54 19:59	06:13 20:30	05:54 20:56	19:37 (CH08) 20:17 (CH08)
12	07:48 17:18	07:24 17:55	06:43 18:28	16:40 (CH11) 17:37 (CH11)	06:53 20:00	06:12 20:31	05:54 20:56	19:36 (CH08) 20:17 (CH08)
13	07:48 17:19	07:23 17:57	06:42 18:29	16:38 (CH11) 17:38 (CH11)	06:51 20:01	06:11 20:32	05:54 20:57	19:36 (CH08) 20:17 (CH08)
14	07:48 17:21	07:22 17:58	06:40 18:30	16:37 (CH11) 17:39 (CH11)	06:50 20:02	06:10 20:33	05:53 20:57	19:36 (CH08) 20:18 (CH08)
15	07:47 17:22	07:20 17:59	06:38 18:31	16:36 (CH11) 17:40 (CH11)	06:48 20:04	06:09 20:34	05:53 20:58	19:36 (CH08) 20:18 (CH08)
16	07:47 17:23	07:19 18:00	06:37 18:32	16:34 (CH11) 17:40 (CH11)	06:46 20:05	06:08 20:35	05:53 20:58	19:37 (CH08) 20:19 (CH08)
17	07:47 17:24	07:18 18:01	06:35 18:33	16:34 (CH11) 17:41 (CH11)	06:45 20:06	06:07 20:36	05:53 20:58	19:37 (CH08) 20:19 (CH08)
18	07:46 17:25	07:16 18:03	06:34 18:34	16:33 (CH11) 17:41 (CH11)	06:43 20:07	06:06 20:37	05:54 20:59	19:37 (CH08) 20:19 (CH08)
19	07:46 17:26	07:15 18:04	06:32 18:35	16:32 (CH11) 17:41 (CH11)	06:42 20:08	06:05 20:38	05:54 20:59	19:37 (CH08) 20:20 (CH08)
20	07:45 17:27	07:14 18:05	06:30 18:36	16:32 (CH11) 17:42 (CH11)	06:40 20:09	06:05 20:39	05:54 20:59	19:37 (CH08) 20:20 (CH08)
21	07:45 17:28	07:12 18:06	06:29 18:37	16:31 (CH11) 17:41 (CH11)	06:39 20:10	06:04 20:40	05:54 20:59	19:37 (CH08) 20:20 (CH08)
22	07:44 17:30	07:11 18:07	06:27 18:38	16:30 (CH11) 17:41 (CH11)	06:38 20:11	06:03 20:41	05:54 21:00	19:37 (CH08) 20:20 (CH08)
23	07:43 17:31	07:09 18:08	06:25 18:39	16:31 (CH11) 17:42 (CH11)	06:36 20:12	06:02 20:42	05:54 21:00	19:38 (CH08) 20:21 (CH08)
24	07:43 17:32	07:08 18:10	06:24 18:40	16:30 (CH11) 17:41 (CH11)	06:35 20:13	06:01 20:43	05:55 21:00	19:38 (CH08) 20:21 (CH08)
25	07:42 17:33	07:07 18:11	06:22 18:42	16:29 (CH11) 17:41 (CH11)	06:33 20:14	06:01 20:44	05:55 21:00	19:38 (CH08) 20:20 (CH08)
26	07:41 17:34	07:05 18:12	06:20 18:43	16:30 (CH11) 17:41 (CH11)	06:32 20:15	06:00 20:44	05:55 21:00	19:39 (CH08) 20:21 (CH08)
27	07:40 17:36	07:04 18:13	06:19 18:44	16:29 (CH11) 17:40 (CH11)	06:30 20:16	05:59 20:45	05:56 21:00	19:39 (CH08) 20:21 (CH08)
28	07:40 17:37	07:02 18:14	06:17 18:45	16:29 (CH11) 17:40 (CH11)	06:29 20:17	05:59 20:46	05:56 21:00	19:39 (CH08) 20:21 (CH08)
29	07:39 17:38		07:15 19:46	17:30 (CH11) 18:40 (CH11)	06:28 20:18	05:58 20:47	05:56 21:00	19:40 (CH08) 20:21 (CH08)
30	07:38 17:39		07:14 19:47	17:29 (CH11) 18:39 (CH11)	06:26 20:19	05:58 20:48	05:57 21:00	19:40 (CH08) 20:21 (CH08)
31	07:37 17:41		07:12 19:48	17:29 (CH11) 18:38 (CH11)		05:57 20:49	19:39 (CH08) 20:10 (CH08)	
Potential sun hours	298	298	370	398	447	451	1211	
Total, worst case			1697	904	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: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F54 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (95)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July		August		September		October		November		December	
1	05:57	19:41 (CH08)	06:21	06:51	17:36 (CH11)	07:21	17:18 (CH11)	06:54	07:29			
	21:00	40 20:21 (CH08)	20:41	19:59	50 18:26 (CH11)	19:09	58 18:16 (CH11)	17:23	16:59			
2	05:58	19:41 (CH08)	06:22	06:52	17:35 (CH11)	07:22	17:20 (CH11)	06:55	07:30			
	21:00	40 20:21 (CH08)	20:40	19:57	52 18:27 (CH11)	19:07	56 18:16 (CH11)	17:22	16:59			
3	05:58	19:41 (CH08)	06:23	06:53	17:33 (CH11)	07:23	17:21 (CH11)	06:57	07:31			
	21:00	40 20:21 (CH08)	20:39	19:56	55 18:28 (CH11)	19:06	53 18:14 (CH11)	17:20	16:58			
4	05:59	19:41 (CH08)	06:24	06:54	17:32 (CH11)	07:24	17:22 (CH11)	06:58	07:32			
	21:00	40 20:21 (CH08)	20:38	19:54	57 18:29 (CH11)	19:04	50 18:12 (CH11)	17:19	16:58			
5	05:59	19:42 (CH08)	06:25	06:55	17:30 (CH11)	07:25	17:23 (CH11)	06:59	07:33			
	20:59	39 20:21 (CH08)	20:37	19:52	59 18:29 (CH11)	19:02	47 18:10 (CH11)	17:18	16:58			
6	06:00	19:42 (CH08)	06:26	06:56	17:28 (CH11)	07:26	17:25 (CH11)	07:00	07:34			
	20:59	38 20:20 (CH08)	20:36	19:51	61 18:29 (CH11)	19:01	43 18:08 (CH11)	17:17	16:58			
7	06:01	19:43 (CH08)	06:27	06:57	17:27 (CH11)	07:27	17:26 (CH11)	07:01	07:35			
	20:59	38 20:21 (CH08)	20:35	19:49	62 18:29 (CH11)	18:59	39 18:05 (CH11)	17:16	16:58			
8	06:01	19:44 (CH08)	06:28	06:58	17:25 (CH11)	07:28	17:29 (CH11)	07:02	07:36			
	20:59	37 20:21 (CH08)	20:33	19:47	65 18:30 (CH11)	18:57	33 18:02 (CH11)	17:15	16:58			
9	06:02	19:44 (CH08)	06:29	06:59	17:24 (CH11)	07:29	17:32 (CH11)	07:04	07:36			
	20:58	36 20:20 (CH08)	20:32	19:46	66 18:30 (CH11)	18:56	26 17:58 (CH11)	17:14	16:58			
10	06:02	19:45 (CH08)	06:30	07:00	17:23 (CH11)	07:30	17:36 (CH11)	07:05	07:37			
	20:58	35 20:20 (CH08)	20:31	19:44	67 18:30 (CH11)	18:54	17 17:53 (CH11)	17:13	16:58			
11	06:03	19:46 (CH08)	06:31	07:01	17:22 (CH11)	07:31		07:06	07:38			
	20:57	34 20:20 (CH08)	20:30	19:42	68 18:30 (CH11)	18:53		17:12	16:58			
12	06:04	19:46 (CH08)	06:32	07:02	17:21 (CH11)	07:32		07:07	07:39			
	20:57	32 20:18 (CH08)	20:28	19:41	69 18:30 (CH11)	18:51		17:11	16:58			
13	06:05	19:48 (CH08)	06:33	07:03	17:21 (CH11)	07:33		07:08	07:40			
	20:57	30 20:18 (CH08)	20:27	19:39	69 18:30 (CH11)	18:49		17:10	16:58			
14	06:05	19:49 (CH08)	06:33	07:04	17:20 (CH11)	07:34		07:10	07:40			
	20:56	29 20:18 (CH08)	20:26	19:37	70 18:30 (CH11)	18:48		17:09	16:58			
15	06:06	19:49 (CH08)	06:34	07:05	17:19 (CH11)	07:35		07:11	07:41			
	20:55	27 20:16 (CH08)	20:24	19:36	71 18:30 (CH11)	18:46		17:08	16:58			
16	06:07	19:51 (CH08)	06:35	07:06	17:19 (CH11)	07:36		07:12	07:42			
	20:55	24 20:15 (CH08)	20:23	19:34	71 18:30 (CH11)	18:45		17:07	16:59			
17	06:08	19:52 (CH08)	06:36	07:07	17:18 (CH11)	07:37		07:13	07:43			
	20:54	22 20:14 (CH08)	20:22	19:32	71 18:29 (CH11)	18:43		17:06	16:59			
18	06:08	19:54 (CH08)	06:37	07:08	17:18 (CH11)	07:38		07:14	07:43			
	20:54	19 20:13 (CH08)	20:20	19:31	71 18:29 (CH11)	18:42		17:06	16:59			
19	06:09	19:57 (CH08)	06:38	07:09	17:17 (CH11)	07:40		07:15	07:44			
	20:53	14 20:11 (CH08)	20:19	19:29	72 18:29 (CH11)	18:40		17:05	17:00			
20	06:10	19:59 (CH08)	06:39	07:10	17:17 (CH11)	07:41		07:17	07:44			
	20:52	8 20:07 (CH08)	20:17	19:27	71 18:28 (CH11)	18:39		17:04	17:00			
21	06:11		06:40	07:11	17:17 (CH11)	07:42		07:18	07:45			
	20:51		20:16	19:26	71 18:28 (CH11)	18:37		17:04	17:01			
22	06:12		06:41	07:12	17:16 (CH11)	07:43		07:19	07:46			
	20:51		20:14	19:24	71 18:27 (CH11)	18:36		17:03	17:01			
23	06:13		06:42	07:13	17:16 (CH11)	07:44		07:20	07:46			
	20:50		20:13	19:22	70 18:26 (CH11)	18:35		17:02	17:02			
24	06:14		06:43	07:14	17:16 (CH11)	07:45		07:21	07:47			
	20:49		20:11	19:21	69 18:25 (CH11)	18:33		17:02	17:02			
25	06:14		06:44	17:55 (CH11)	07:15	17:16 (CH11)	06:46	07:22	07:47			
	20:48		20:10	18:13 (CH11)	19:19	69 18:25 (CH11)	17:32	17:01	17:03			
26	06:15		06:45	17:51 (CH11)	07:16	17:15 (CH11)	06:47	07:23	07:47			
	20:47		20:08	18:16 (CH11)	19:17	68 18:23 (CH11)	17:30	17:01	17:03			
27	06:16		06:46	17:47 (CH11)	07:17	17:16 (CH11)	06:48	07:24	07:48			
	20:46		20:07	18:19 (CH11)	19:16	66 18:22 (CH11)	17:29	17:00	17:04			
28	06:17		06:47	17:45 (CH11)	07:18	17:16 (CH11)	06:50	07:26	07:48			
	20:45		20:05	18:21 (CH11)	19:14	64 18:20 (CH11)	17:28	17:00	17:05			
29	06:18		06:48	17:42 (CH11)	07:19	17:16 (CH11)	06:51	07:27	07:48			
	20:45		20:04	18:22 (CH11)	19:12	63 18:19 (CH11)	17:27	16:59	17:05			
30	06:19		06:49	17:40 (CH11)	07:20	17:17 (CH11)	06:52	07:28	07:49			
	20:44		20:02	18:24 (CH11)	19:11	61 18:18 (CH11)	17:25	16:59	17:06			
31	06:20		06:50	17:38 (CH11)		06:53			07:49			
	20:43		20:00	18:25 (CH11)		17:24			17:07			
Potential sun hours	458		427		375		346		299		289	
Total, worst case		622		242		1969		422				

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: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F61 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (96)
 Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June					
1	07:49	07:36	15:27 (CH05)	07:01	15:15 (CH05)	07:10	06:25	18:30 (CH04)	05:57	18:21 (CH04)	
	17:08	17:42	33 16:00 (CH05)	18:15	60 16:15 (CH05)	19:49	20:20	33 19:03 (CH04)	20:49	56 19:17 (CH04)	
2	07:49	07:35	15:25 (CH05)	06:59	15:16 (CH05)	07:09	06:24	18:29 (CH04)	05:56	18:21 (CH04)	
	17:09	17:43	37 16:02 (CH05)	18:16	59 16:15 (CH05)	19:50	20:21	36 19:05 (CH04)	20:50	57 19:18 (CH04)	
3	07:49	07:34	15:24 (CH05)	06:58	15:17 (CH05)	07:07	06:23	18:27 (CH04)	05:56	18:21 (CH04)	
	17:10	17:44	40 16:04 (CH05)	18:18	57 16:14 (CH05)	19:51	20:22	40 19:07 (CH04)	20:51	56 19:17 (CH04)	
4	07:49	07:33	15:23 (CH05)	06:56	15:18 (CH05)	07:05	06:21	18:26 (CH04)	05:55	18:22 (CH04)	
	17:10	17:45	43 16:06 (CH05)	18:19	55 16:13 (CH05)	19:52	20:23	42 19:08 (CH04)	20:51	56 19:18 (CH04)	
5	07:49	07:32	15:21 (CH05)	06:54	15:19 (CH05)	07:04	06:20	18:24 (CH04)	05:55	18:22 (CH04)	
	17:11	17:47	46 16:07 (CH05)	18:20	53 16:12 (CH05)	19:53	20:24	44 19:08 (CH04)	20:52	56 19:18 (CH04)	
6	07:49	07:31	15:20 (CH05)	06:53	15:21 (CH05)	07:02	06:19	18:23 (CH04)	05:55	18:22 (CH04)	
	17:12	17:48	49 16:09 (CH05)	18:21	50 16:11 (CH05)	19:54	20:25	46 19:09 (CH04)	20:53	55 19:17 (CH04)	
7	07:49	07:30	15:20 (CH05)	06:51	15:22 (CH05)	07:01	06:18	18:22 (CH04)	05:54	18:22 (CH04)	
	17:13	17:49	50 16:10 (CH05)	18:22	48 16:10 (CH05)	19:55	20:26	48 19:10 (CH04)	20:53	56 19:18 (CH04)	
8	07:49	07:29	15:18 (CH05)	06:50	15:23 (CH05)	06:59	06:16	18:22 (CH04)	05:54	18:23 (CH04)	
	17:14	17:50	53 16:11 (CH05)	18:23	45 16:08 (CH05)	19:56	20:27	49 19:11 (CH04)	20:54	55 19:18 (CH04)	
9	07:49	07:28	15:17 (CH05)	06:48	15:25 (CH05)	06:57	06:15	18:21 (CH04)	05:54	18:23 (CH04)	
	17:15	17:52	55 16:12 (CH05)	18:24	42 16:07 (CH05)	19:57	20:28	51 19:12 (CH04)	20:55	55 19:18 (CH04)	
10	07:49	07:26	15:17 (CH05)	06:47	15:27 (CH05)	06:56	06:14	18:21 (CH04)	05:54	18:24 (CH04)	
	17:16	17:53	56 16:13 (CH05)	18:25	38 16:05 (CH05)	19:58	20:29	51 19:12 (CH04)	20:55	54 19:18 (CH04)	
11	07:49	07:25	15:16 (CH05)	06:45	15:30 (CH05)	06:54	06:13	18:20 (CH04)	05:54	18:23 (CH04)	
	17:17	17:54	58 16:14 (CH05)	18:27	33 16:03 (CH05)	19:59	20:30	53 19:13 (CH04)	20:56	55 19:18 (CH04)	
12	07:48	07:24	15:15 (CH05)	06:43	15:32 (CH05)	06:53	06:12	18:20 (CH04)	05:53	18:24 (CH04)	
	17:18	17:55	59 16:14 (CH05)	18:28	28 16:00 (CH05)	20:00	20:31	53 19:13 (CH04)	20:56	54 19:18 (CH04)	
13	07:48	07:23	15:14 (CH05)	06:42	15:35 (CH05)	06:51	06:11	18:19 (CH04)	05:53	18:24 (CH04)	
	17:19	17:56	61 16:15 (CH05)	18:29	21 15:56 (CH05)	20:01	20:32	55 19:14 (CH04)	20:57	54 19:18 (CH04)	
14	07:48	07:22	15:14 (CH05)	06:40	15:42 (CH05)	06:49	06:10	18:19 (CH04)	05:53	18:24 (CH04)	
	17:20	17:58	62 16:16 (CH05)	18:30	8 15:50 (CH05)	20:02	20:33	55 19:14 (CH04)	20:57	54 19:18 (CH04)	
15	07:47	07:20	15:14 (CH05)	06:38		06:48	06:09	18:19 (CH04)	05:53	18:25 (CH04)	
	17:22	17:59	63 16:17 (CH05)	18:31		20:03	20:34	55 19:14 (CH04)	20:58	53 19:18 (CH04)	
16	07:47	07:19	15:13 (CH05)	06:37		06:46	06:08	18:18 (CH04)	05:53	18:25 (CH04)	
	17:23	18:00	63 16:16 (CH05)	18:32		20:05	20:35	57 19:15 (CH04)	20:58	53 19:18 (CH04)	
17	07:47	07:18	15:13 (CH05)	06:35		06:45	06:07	18:18 (CH04)	05:53	18:25 (CH04)	
	17:24	18:01	64 16:17 (CH05)	18:33		20:06	20:36	57 19:15 (CH04)	20:58	53 19:18 (CH04)	
18	07:46	07:16	15:13 (CH05)	06:33		06:43	06:06	18:19 (CH04)	05:53	18:26 (CH04)	
	17:25	18:03	65 16:18 (CH05)	18:34		20:07	20:37	57 19:16 (CH04)	20:59	53 19:19 (CH04)	
19	07:46	07:15	15:13 (CH05)	06:32		06:42	06:05	18:18 (CH04)	05:54	18:26 (CH04)	
	17:26	18:04	64 16:17 (CH05)	18:35		20:08	20:38	58 19:16 (CH04)	20:59	53 19:19 (CH04)	
20	07:45	07:14	15:13 (CH05)	06:30		06:40	06:04	18:18 (CH04)	05:54	18:27 (CH04)	
	17:27	18:05	65 16:18 (CH05)	18:36		20:09	20:39	58 19:16 (CH04)	20:59	53 19:20 (CH04)	
21	07:45	07:12	15:12 (CH05)	06:29		06:39	06:04	18:18 (CH04)	05:54	18:27 (CH04)	
	17:28	18:06	65 16:17 (CH05)	18:37		20:10	20:40	58 19:16 (CH04)	20:59	53 19:20 (CH04)	
22	07:44	07:11	15:13 (CH05)	06:27		06:37	06:03	18:18 (CH04)	05:54	18:27 (CH04)	
	17:30	18:07	65 16:18 (CH05)	18:38		20:11	20:41	58 19:16 (CH04)	21:00	53 19:20 (CH04)	
23	07:43	07:09	15:13 (CH05)	06:25		06:36	06:02	18:19 (CH04)	05:54	18:28 (CH04)	
	17:31	18:08	64 16:17 (CH05)	18:39		20:12	20:42	58 19:17 (CH04)	21:00	52 19:20 (CH04)	
24	07:43	07:08	15:13 (CH05)	06:24		06:35	06:01	18:18 (CH04)	05:55	18:27 (CH04)	
	17:32	18:10	65 16:18 (CH05)	18:40		20:13	20:43	58 19:16 (CH04)	21:00	53 19:20 (CH04)	
25	07:42	07:07	15:14 (CH05)	06:22		06:33	06:01	18:18 (CH04)	05:55	18:27 (CH04)	
	17:33	18:11	64 16:18 (CH05)	18:42		20:14	20:44	58 19:16 (CH04)	21:00	53 19:20 (CH04)	
26	07:41	07:05	15:14 (CH05)	06:20		06:32	06:00	18:19 (CH04)	05:55	18:28 (CH04)	
	17:34	18:12	63 16:17 (CH05)	18:43		20:15	20:44	58 19:17 (CH04)	21:00	53 19:21 (CH04)	
27	07:40	07:04	15:15 (CH05)	06:19		06:30	05:59	18:19 (CH04)	05:56	18:28 (CH04)	
	17:36	18:13	62 16:17 (CH05)	18:44		20:16	20:45	57 19:16 (CH04)	21:00	53 19:21 (CH04)	
28	07:40	07:02	15:15 (CH05)	06:17		06:29	05:59	18:20 (CH04)	05:56	18:28 (CH04)	
	17:37	18:14	61 16:16 (CH05)	18:45		20:17	20:46	57 19:17 (CH04)	21:00	53 19:21 (CH04)	
29	07:39	15:36 (CH05)		07:15		06:28	18:35 (CH04)	05:58	18:19 (CH04)	05:56	18:28 (CH04)
	17:38	14 15:50 (CH05)		19:46		20:18	24 18:59 (CH04)	20:47	58 19:17 (CH04)	21:00	54 19:22 (CH04)
30	07:38	15:32 (CH05)		07:14		06:26	18:32 (CH04)	05:58	18:20 (CH04)	05:57	18:28 (CH04)
	17:39	22 15:54 (CH05)		19:47		20:19	29 19:01 (CH04)	20:48	57 19:17 (CH04)	21:00	54 19:22 (CH04)
31	07:37	15:29 (CH05)		07:12				05:57	18:20 (CH04)		
	17:40	28 15:57 (CH05)		19:48				20:49	57 19:17 (CH04)		
Potential sun hours	298	298	370	398	447	451					
Total, worst case	64	1595	597	69	1632	1622					

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: Shadow_cumulativo_abitazioni_2021_12_08Shadow receptor: F61 - Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (96)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

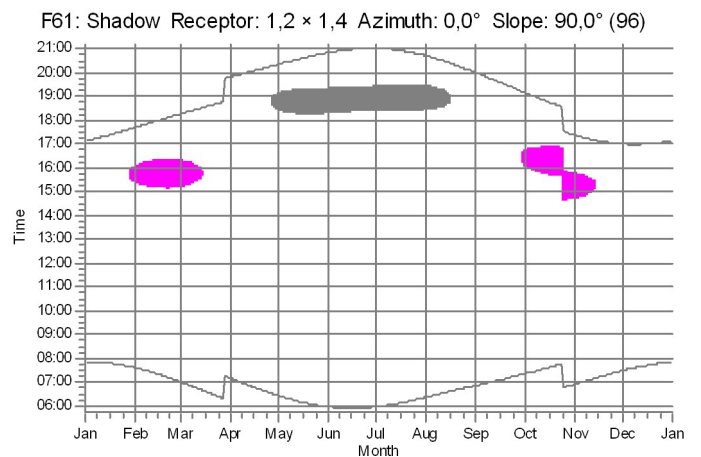
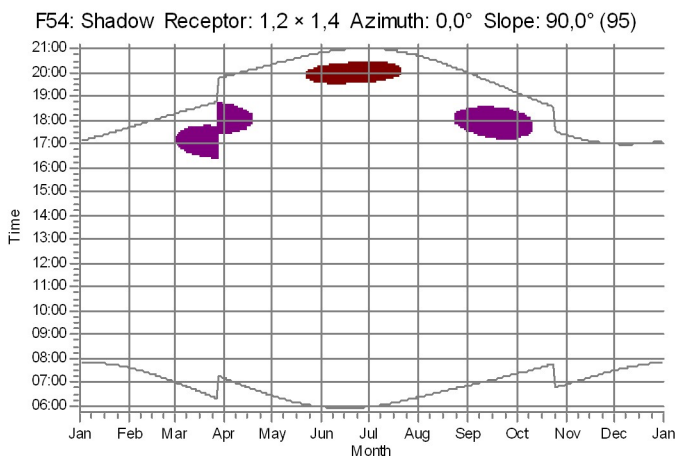
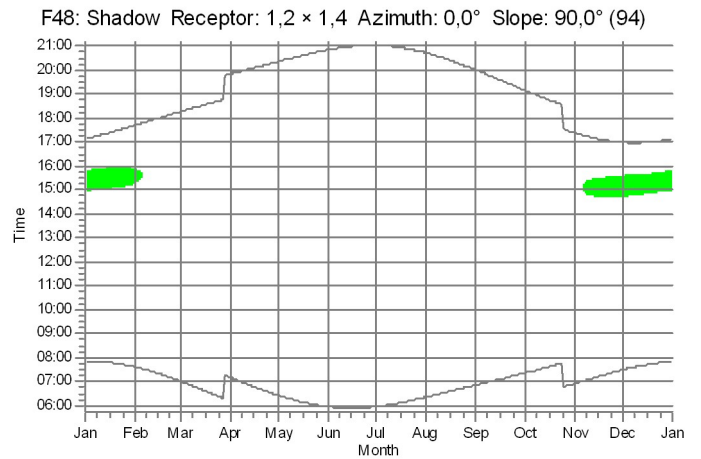
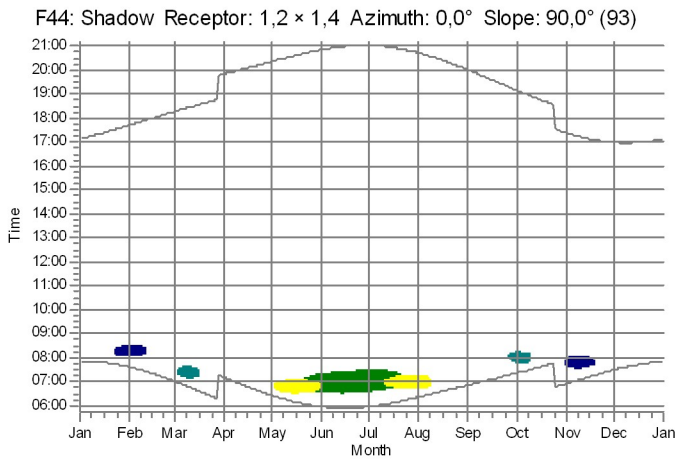
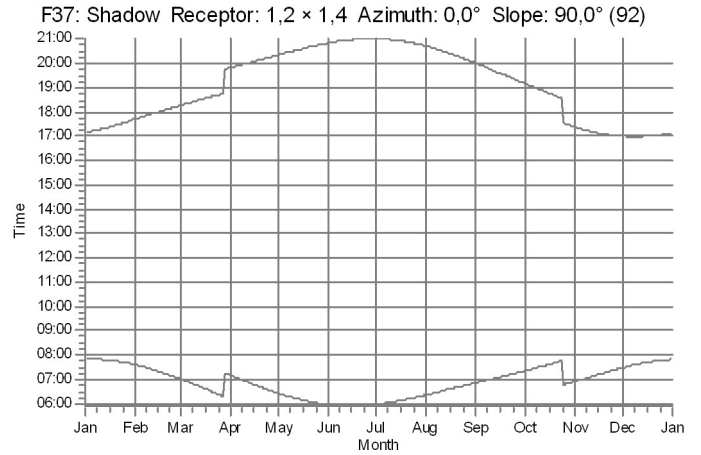
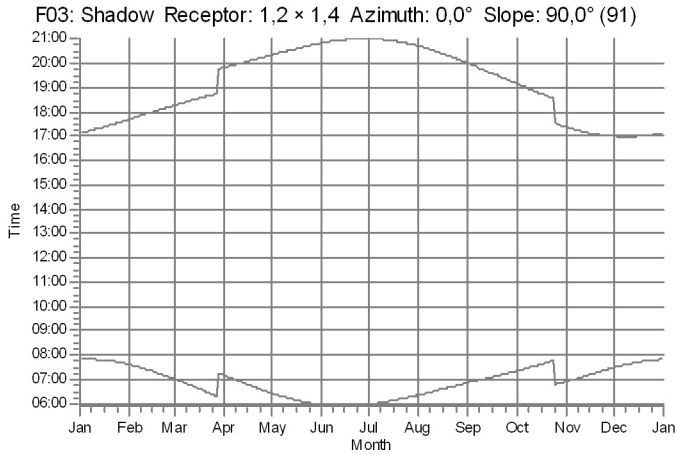
	July		August		September		October		November		December	
1	05:57		18:29 (CH04)	06:21	18:30 (CH04)	06:51	07:21	16:12 (CH05)	06:54	14:47 (CH05)	07:29	
	21:00	54	19:23 (CH04)	20:41	54	19:24 (CH04)	19:59	19:09	25	16:37 (CH05)	17:23	56
2	05:58		18:28 (CH04)	06:22	18:31 (CH04)	06:52	07:22	16:09 (CH05)	06:55	14:47 (CH05)	07:30	
	21:00	54	19:22 (CH04)	20:40	52	19:23 (CH04)	19:57	19:07	31	16:40 (CH05)	17:21	54
3	05:58		18:29 (CH04)	06:23	18:31 (CH04)	06:53	07:23	16:07 (CH05)	06:57	14:48 (CH05)	07:31	
	21:00	54	19:23 (CH04)	20:39	52	19:23 (CH04)	19:56	19:06	35	16:42 (CH05)	17:20	52
4	05:59		18:28 (CH04)	06:24	18:31 (CH04)	06:54	07:24	16:04 (CH05)	06:58	14:49 (CH05)	07:32	
	21:00	55	19:23 (CH04)	20:38	50	19:21 (CH04)	19:54	19:04	40	16:44 (CH05)	17:19	50
5	05:59		18:29 (CH04)	06:25	18:32 (CH04)	06:55	07:25	16:01 (CH05)	06:59	14:50 (CH05)	07:33	
	21:00	55	19:24 (CH04)	20:37	48	19:20 (CH04)	19:52	19:02	44	16:45 (CH05)	17:18	49
6	06:00		18:28 (CH04)	06:26	18:32 (CH04)	06:56	07:26	15:59 (CH05)	07:00	14:51 (CH05)	07:34	
	20:59	55	19:23 (CH04)	20:36	48	19:20 (CH04)	19:51	19:01	47	16:46 (CH05)	17:17	46
7	06:00		18:29 (CH04)	06:27	18:33 (CH04)	06:57	07:27	15:57 (CH05)	07:01	14:53 (CH05)	07:35	
	20:59	55	19:24 (CH04)	20:35	46	19:19 (CH04)	19:49	18:59	50	16:47 (CH05)	17:16	42
8	06:01		18:29 (CH04)	06:28	18:34 (CH04)	06:58	07:28	15:55 (CH05)	07:02	14:54 (CH05)	07:36	
	20:59	56	19:25 (CH04)	20:33	43	19:17 (CH04)	19:47	18:57	52	16:47 (CH05)	17:15	40
9	06:02		18:28 (CH04)	06:29	18:35 (CH04)	06:59	07:29	15:54 (CH05)	07:04	14:56 (CH05)	07:36	
	20:58	56	19:24 (CH04)	20:32	41	19:16 (CH04)	19:46	18:56	54	16:48 (CH05)	17:14	37
10	06:02		18:29 (CH04)	06:29	18:36 (CH04)	07:00	07:30	15:52 (CH05)	07:05	14:58 (CH05)	07:37	
	20:58	56	19:25 (CH04)	20:31	39	19:15 (CH04)	19:44	18:54	56	16:48 (CH05)	17:13	33
11	06:03		18:28 (CH04)	06:30	18:38 (CH04)	07:01	07:31	15:51 (CH05)	07:06	15:00 (CH05)	07:38	
	20:58	56	19:24 (CH04)	20:30	35	19:13 (CH04)	19:42	18:53	57	16:48 (CH05)	17:12	28
12	06:04		18:28 (CH04)	06:31	18:39 (CH04)	07:02	07:32	15:49 (CH05)	07:07	15:04 (CH05)	07:39	
	20:57	57	19:25 (CH04)	20:28	32	19:11 (CH04)	19:41	18:51	60	16:49 (CH05)	17:11	22
13	06:05		18:28 (CH04)	06:32	18:41 (CH04)	07:03	07:33	15:48 (CH05)	07:08	15:08 (CH05)	07:40	
	20:57	58	19:26 (CH04)	20:27	28	19:09 (CH04)	19:39	18:49	61	16:49 (CH05)	17:10	14
14	06:05		18:29 (CH04)	06:33	18:44 (CH04)	07:04	07:34	15:47 (CH05)	07:10		07:41	
	20:56	57	19:26 (CH04)	20:26	22	19:06 (CH04)	19:37	18:48	62	16:49 (CH05)	17:09	
15	06:06		18:28 (CH04)	06:34	18:48 (CH04)	07:05	07:35	15:46 (CH05)	07:11		07:41	
	20:55	57	19:25 (CH04)	20:24	14	19:02 (CH04)	19:36	18:46	63	16:49 (CH05)	17:08	
16	06:07		18:28 (CH04)	06:35		07:06	07:36	15:46 (CH05)	07:12		07:42	
	20:55	58	19:26 (CH04)	20:23		19:34	18:45	16:50 (CH05)	17:07		16:59	
17	06:08		18:28 (CH04)	06:36		07:07	07:37	15:45 (CH05)	07:13		07:43	
	20:54	58	19:26 (CH04)	20:22		19:32	18:43	16:49 (CH05)	17:06		16:59	
18	06:08		18:29 (CH04)	06:37		07:08	07:38	15:45 (CH05)	07:14		07:43	
	20:54	57	19:26 (CH04)	20:20		19:31	18:42	16:49 (CH05)	17:06		16:59	
19	06:09		18:28 (CH04)	06:38		07:09	07:40	15:44 (CH05)	07:15		07:44	
	20:53	58	19:26 (CH04)	20:19		19:29	18:40	16:49 (CH05)	17:05		17:00	
20	06:10		18:28 (CH04)	06:39		07:10	07:41	15:43 (CH05)	07:17		07:45	
	20:52	58	19:26 (CH04)	20:17		19:27	18:39	16:48 (CH05)	17:04		17:00	
21	06:11		18:28 (CH04)	06:40		07:11	07:42	15:43 (CH05)	07:18		07:45	
	20:52	58	19:26 (CH04)	20:16		19:26	18:37	16:48 (CH05)	17:03		17:00	
22	06:12		18:28 (CH04)	06:41		07:12	07:43	15:44 (CH05)	07:19		07:46	
	20:51	58	19:26 (CH04)	20:14		19:24	18:36	16:49 (CH05)	17:03		17:01	
23	06:13		18:29 (CH04)	06:42		07:13	07:44	15:43 (CH05)	07:20		07:46	
	20:50	57	19:26 (CH04)	20:13		19:22	18:35	16:48 (CH05)	17:02		17:01	
24	06:13		18:29 (CH04)	06:43		07:14	07:45	15:43 (CH05)	07:21		07:47	
	20:49	57	19:26 (CH04)	20:11		19:21	18:33	16:47 (CH05)	17:02		17:02	
25	06:14		18:28 (CH04)	06:44		07:15	06:46	14:43 (CH05)	07:22		07:47	
	20:48	57	19:25 (CH04)	20:10		19:19	17:32	15:47 (CH05)	17:01		17:03	
26	06:15		18:28 (CH04)	06:45		07:16	06:47	14:43 (CH05)	07:23		07:47	
	20:47	57	19:25 (CH04)	20:08		19:17	17:30	15:46 (CH05)	17:01		17:03	
27	06:16		18:29 (CH04)	06:46		07:17	06:48	14:44 (CH05)	07:24		07:48	
	20:46	56	19:25 (CH04)	20:07		19:15	17:29	15:46 (CH05)	17:00		17:04	
28	06:17		18:29 (CH04)	06:47		07:18	06:50	14:44 (CH05)	07:26		07:48	
	20:46	56	19:25 (CH04)	20:05		19:14	17:28	15:45 (CH05)	17:00		17:05	
29	06:18		18:29 (CH04)	06:48		07:19	06:51	14:44 (CH05)	07:27		07:48	
	20:45	56	19:25 (CH04)	20:04		19:12	17:26	15:45 (CH05)	16:59		17:05	
30	06:19		18:30 (CH04)	06:49		07:20	16:17 (CH05)	14:45 (CH05)	07:28		07:49	
	20:44	55	19:25 (CH04)	20:02		19:10	17:25	15:44 (CH05)	16:59		17:06	
31	06:20		18:30 (CH04)	06:50			06:53	14:45 (CH05)			07:49	
	20:43	54	19:24 (CH04)	20:00			17:24	15:43 (CH05)			17:07	
Potential sun hours	458			427		375		346		299		289
Total, worst case		1745		604		17		1746		523		

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

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

SHADOW - Calendar, graphical

Calculation: Shadow_cumulativo_abitazioni_2021_12_08



WTGs

- CH01: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (7)
- CH02: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (6)
- CH04: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (3)
- CH05: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (4)
- CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (5)

- CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (8)
- CH08: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (9)
- CH09: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (10)
- CH11: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (17)

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH01 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (7)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	06:36-07:14/38 21:00	05:57 20:42	06:39-07:24/45 20:38	06:21 19:59	06:51 19:09	07:21 17:23	06:54 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	06:36-07:15/39 21:00	05:58 20:41	06:39-07:23/44 20:39	06:22 19:57	06:52 19:07	07:22 17:22	06:56 16:59
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	06:35-07:15/40 21:00	05:58 20:40	06:40-07:24/44 20:39	06:23 19:56	06:53 19:06	07:23 17:20	06:57 16:58
4	07:49 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:21 20:23	05:55 20:52	06:35-07:16/41 21:00	05:59 20:38	06:40-07:23/43 20:38	06:24 19:54	06:54 19:04	07:24 17:19	06:58 16:58
5	07:49 17:11	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:24	05:55 20:52	06:36-07:17/41 21:00	05:59 20:37	06:41-07:24/43 20:37	06:25 19:52	06:55 19:02	07:25 17:18	06:59 16:58
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:25	05:55 20:53	06:35-07:17/42 21:00	06:00 20:59	06:41-07:23/42 20:36	06:26 19:51	06:56 19:01	07:26 17:17	07:00 16:58
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:35-07:17/42 21:00	06:01 20:59	06:42-07:23/41 20:35	06:27 19:49	06:57 18:59	07:27 17:16	07:01 16:58
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 19:56	06:17 20:28	05:54 20:54	06:35-07:18/43 21:00	06:01 20:59	06:43-07:23/40 20:34	06:28 19:48	06:58 18:57	07:28 17:15	07:03 16:58
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	06:15 20:29	05:54 20:55	06:35-07:19/44 21:00	06:02 20:58	06:42-07:23/41 20:32	06:29 19:46	06:59 18:56	07:29 17:14	07:04 16:58
10	07:49 17:16	07:27 17:53	06:47 18:26	06:56 19:58	06:14 20:30	05:54 20:55	06:35-07:19/44 21:00	06:03 20:58	06:43-07:23/40 20:31	06:30 19:44	07:00 18:54	07:30 17:13	07:05 16:58
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	06:13 20:31	05:54 20:56	06:35-07:20/45 21:00	06:03 20:58	06:44-07:23/39 20:30	06:31 19:43	07:01 18:53	07:31 17:12	07:06 16:58
12	07:49 17:18	07:24 17:55	06:43 18:28	06:53 20:00	06:12 20:32	05:54 20:56	06:35-07:20/45 21:00	06:04 20:57	06:44-07:21/37 20:28	06:32 19:41	07:02 18:51	07:32 17:11	07:07 16:58
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:35-07:21/46 21:00	06:05 20:57	06:45-07:21/36 20:27	06:33 19:39	07:03 18:50	07:33 17:10	07:08 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:53 20:57	06:34-07:20/46 21:00	06:05 20:56	06:47-07:21/34 20:26	06:34 19:38	07:04 18:48	07:34 17:09	07:10 16:58
15	07:48 17:22	07:20 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:53 20:58	06:35-07:21/46 21:00	06:06 20:56	06:48-07:21/33 20:24	06:35 19:36	07:05 18:46	07:35 17:08	07:11 16:58
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:35	05:53 20:58	06:36-07:21/45 21:00	06:07 20:55	06:48-07:19/31 20:23	06:35 19:34	07:06 18:45	07:36 17:07	07:12 16:59
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	06:07 20:36	05:53 20:58	06:36-07:22/46 21:00	06:08 20:54	06:49-07:18/29 20:22	06:36 19:32	07:07 18:43	07:37 17:06	07:13 16:59
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	06:06 20:37	05:54 20:59	06:36-07:22/46 21:00	06:08 20:54	06:51-07:17/26 20:20	06:37 19:31	07:08 18:42	07:39 17:06	07:14 16:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59	06:36-07:22/46 21:00	06:09 20:53	06:53-07:16/23 20:19	06:38 19:29	07:09 18:40	07:40 17:05	07:16 17:00
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 20:09	06:05 20:39	05:54 20:59	06:36-07:22/46 21:00	06:10 20:52	06:53-07:14/21 20:17	06:39 19:27	07:10 18:39	07:41 17:04	07:17 17:00
21	07:45 17:29	07:12 18:06	06:29 18:37	06:39 20:10	06:04 20:40	05:54 21:00	06:36-07:22/46 21:00	06:11 20:52	06:56-07:12/16 20:16	06:40 19:26	07:11 18:38	07:42 17:04	07:18 17:05
22	07:44 17:30	07:11 18:07	06:27 18:38	06:38 20:11	06:03 20:41	05:54 21:00	06:36-07:22/46 21:00	06:12 20:51	06:59-07:09/10 20:14	06:41 19:24	07:12 18:36	07:43 17:03	07:19 17:01
23	07:43 17:31	07:10 18:09	06:25 18:40	06:36 20:12	06:02 20:42	05:54 21:00	06:37-07:23/46 21:00	06:13 20:50	06:42 19:22	06:42 18:35	07:13 18:35	07:44 17:02	07:20 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:01 20:43	05:55 21:00	06:37-07:23/46 21:00	06:14 20:49	06:43 19:21	06:43 18:33	07:14 18:33	07:45 17:02	07:21 17:02
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:37-07:23/46 21:00	06:14 20:48	06:44 19:19	06:44 17:32	07:15 18:32	07:46 17:01	07:22 17:03
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:00 20:45	05:55 21:00	06:38-07:24/46 21:00	06:15 20:47	06:45 19:17	06:45 17:31	07:16 18:31	07:47 17:01	07:23 17:03
27	07:40 17:36	07:04 18:13	06:19 18:44	06:31 20:16	05:59 20:45	05:56 21:00	06:37-07:23/46 21:00	06:16 20:47	06:46 19:16	06:46 17:29	07:17 18:30	07:49 17:00	07:25 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00	06:37-07:23/46 21:00	06:17 20:46	06:47 19:14	06:47 17:28	07:18 18:31	07:50 17:00	07:26 17:05
29	07:39 17:38	07:01 18:14	06:15 18:46	06:28 20:18	05:58 20:47	05:56 21:00	06:38-07:24/46 21:00	06:18 20:45	06:48 19:12	06:48 17:27	07:19 18:32	07:51 17:00	07:27 17:05
30	07:38 17:39	07:00 18:14	06:14 18:46	06:26 20:19	05:58 20:48	05:57 21:00	06:38-07:23/45 21:00	06:19 20:44	06:49 19:11	06:49 17:25	07:20 18:33	07:52 17:00	07:28 17:06
31	07:37 17:41	07:01 18:14	06:13 18:48	06:25 20:19	05:57 20:49	05:57 20:49	06:36-07:13/37 21:00	06:20 20:43	06:50 20:01	06:51 17:24	07:21 18:34	07:53 17:00	07:49 17:07
Potential sun hours	298	298	370	398	447	451	451	427	375	346	299	289	
Sum of minutes with flicker	0	0	0	0	273	1330	758	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH02 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (6)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:42	06:46-07:10/24	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	05:58 21:00	06:22 20:40	06:46-07:10/24	06:52 19:57	07:22 19:07	06:56 17:22	07:30 16:59
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:58 21:00	06:23 20:39	06:47-07:09/22	06:53 19:56	07:23 19:06	06:57 17:20	07:31 16:58
4	07:49 17:10	07:33 17:46	06:56 18:19	07:05 19:52	06:21 20:23	05:55 20:52	05:59 21:00	06:24 20:38	06:47-07:09/22	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 19:53	06:20 20:24	05:55 20:52	05:59 21:00	06:25 20:37	06:48-07:08/20	06:55 19:52	07:25 19:02	06:59 17:18	07:33 16:58
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:25	05:55 20:53	06:00 20:59	06:26 20:36	06:49-07:07/18	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 19:55	06:18 20:26	05:54 20:53	06:01 20:59	06:27 20:35	06:50-07:04/14	06:57 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 19:56	06:17 20:27	05:54 20:54	06:01 20:59	06:28 20:34	06:52-07:02/10	06:58 19:48	07:28 18:57	07:03 17:15	07:36 16:58
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	06:15 20:29	05:54 20:55	06:02 20:58	06:29 20:32		06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:16	07:27 17:53	06:47 18:26	06:56 19:58	06:14 20:30	05:54 20:55	06:02 20:58	06:30 20:31		07:00 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30		07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 20:00	06:12 20:32	05:54 20:56	06:04 20:57	06:54-06:59/5	06:32	07:02 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:01	06:11 20:33	05:53 20:57	06:05 20:57	06:52-07:01/9	06:33	07:03 19:39	07:33 18:50	07:08 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:53 20:57	06:05 20:56	06:51-07:03/12	06:33	07:04 19:37	07:34 18:48	07:10 17:09	07:41 16:58
15	07:48 17:22	07:20 17:59	06:38 18:31	06:48 20:04	06:09 20:34	05:53 20:58	06:06 20:56	06:50-07:05/15	06:34	07:05 19:36	07:35 18:46	07:11 17:08	07:41 16:58
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 20:05	06:08 20:35	05:53 20:58	06:07 20:55	06:49-07:05/16	06:35	07:06 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	06:07 20:36	05:53 20:58	06:08 20:54	06:48-07:06/18	06:36	07:07 19:32	07:37 18:43	07:13 17:06	07:43 16:59
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	06:06 20:37	05:54 20:59	06:08 20:54	06:48-07:07/19	06:37	07:08 19:31	07:38 18:42	07:14 17:06	07:43 16:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59	06:09 20:53	06:48-07:08/20	06:38	07:09 19:29	07:40 18:40	07:15 17:05	07:44 17:00
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:46-07:08/22	06:39	07:10 19:27	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:28	07:12 18:06	06:29 18:37	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:46-07:09/23	06:40	07:11 19:26	07:42 18:37	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:07	06:27 18:38	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:46-07:09/23	06:41	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:43 17:31	07:09 18:08	06:25 18:39	06:36 20:12	06:02 20:42	05:54 21:00	06:13 20:50	06:46-07:10/24	06:42	07:13 19:22	07:44 18:35	07:20 17:02	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:01 20:43	05:55 21:00	06:14 20:49	06:46-07:10/24	06:43	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:14 20:48	06:46-07:11/25	06:44	07:15 19:19	06:46 17:32	07:22 17:01	07:47 17:03
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:00 20:45	05:55 21:00	06:15 20:47	06:46-07:11/25	06:45	07:16 19:17	06:47 17:30	07:23 17:01	07:47 17:03
27	07:40 17:36	07:04 18:13	06:19 18:44	06:30 20:16	05:59 20:45	05:56 21:00	06:16 20:47	06:45-07:10/25	06:46	07:17 19:16	06:49 17:29	07:25 17:00	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00	06:17 20:46	06:45-07:11/26	06:47	07:18 19:14	06:50 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38	07:01 18:15	06:15 18:46	06:28 20:18	05:58 20:47	05:56 21:00	06:18 20:45	06:45-07:11/26	06:48	07:19 19:12	06:51 17:27	07:27 16:59	07:48 17:05
30	07:38 17:39	07:00 18:14	06:14 18:47	06:26 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:45-07:11/26	06:49	07:20 19:11	06:52 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41	07:02 18:14	06:17 18:48	06:29 20:19	05:57 20:49	05:57 20:43	06:20 20:43	06:45-07:11/26	06:50	07:21 19:11	06:53 17:24	07:29 17:07	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289	0
Sum of minutes with flicker	0	0	0	0	560	0	409	154	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH03 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (2)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	05:58 21:00	06:22 20:40	06:52 19:57	07:22 19:07	06:55 17:21	07:30 16:58
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:58 21:00	06:23 20:39	06:53 19:56	07:23 19:06	06:57 17:20	07:31 16:58
4	07:49 17:10	07:33 17:45	06:56 18:19	07:05 19:52	06:21 20:23	05:55 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 19:53	06:20 20:24	05:55 20:52	05:59 21:00	06:25 20:37	06:55 19:52	07:25 19:02	06:59 17:18	07:33 16:58
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:25	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 19:55	06:18 20:26	05:54 20:53	06:00 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 19:56	06:17 20:27	05:54 20:54	06:01 20:59	06:28 20:34	06:58 19:47	07:28 18:57	07:03 17:15	07:36 16:58
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	06:15 20:28	05:54 20:55	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:04 17:14	07:36 16:58
10	07:49 17:16	07:27 17:53	06:47 18:25	06:56 19:58	06:14 20:30	05:54 20:55	06:02 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:42	07:31 18:53	07:06 17:12	07:38 16:58
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 20:00	06:12 20:32	05:54 20:56	06:04 20:57	06:31 20:28	07:02 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:01	06:11 20:32	05:53 20:57	06:05 20:57	06:32 20:27	07:03 19:39	07:33 18:49	07:08 17:10	07:40 16:58
14	07:48 17:20	07:22 17:58	06:40 18:30	06:50 20:02	06:10 20:33	05:53 20:57	06:05 20:56	06:33 20:26	07:04 19:37	07:34 18:48	07:10 17:09	07:41 16:58
15	07:48 17:22	07:20 17:59	06:38 18:31	06:48 20:04	06:09 20:34	05:53 20:58	06:06 20:56	06:34 20:24	07:05 19:36	07:35 18:46	07:11 17:08	07:41 16:58
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 20:05	06:08 20:35	05:53 20:58	06:07 20:55	06:35 20:23	07:06 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	06:07 20:36	05:53 20:58	06:08 20:54	06:36 20:22	07:07 19:32	07:37 18:43	07:13 17:06	07:43 16:59
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	06:06 20:37	05:53 20:59	06:08 20:54	06:37 20:20	07:08 19:31	07:38 18:42	07:14 17:06	07:43 16:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59	06:09 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:15 17:05	07:44 17:00
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:39 20:17	07:10 19:27	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:28	07:12 18:06	06:29 18:37	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:40 20:16	07:11 19:26	07:42 18:37	07:18 17:03	07:45 17:01
22	07:44 17:30	07:11 18:07	06:27 18:38	06:37 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:41 20:14	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:43 17:31	07:09 18:08	06:25 18:39	06:36 20:12	06:02 20:42	05:54 21:00	06:13 20:50	06:42 20:13	07:13 19:22	07:44 18:35	07:20 17:02	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:01 20:43	05:55 21:00	06:13 20:49	06:43 20:11	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:14 20:48	06:44 20:10	07:15 19:19	07:46 17:32	07:22 17:01	07:47 17:03
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:00 20:45	05:55 21:00	06:15 20:47	06:45 20:08	07:16 19:17	07:47 17:30	07:23 17:01	07:47 17:03
27	07:40 17:36	07:04 18:13	06:19 18:44	06:30 20:16	06:05 20:45	05:56 21:00	06:16 20:47	06:46 20:07	07:17 19:16	07:48 17:29	07:25 17:00	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	06:09 20:46	05:56 21:00	06:17 20:46	06:47 20:05	07:18 19:14	07:49 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38		07:15 19:46	06:28 20:18	05:58 20:47	05:56 21:00	06:18 20:45	06:48 20:04	07:19 19:12	07:51 17:26	07:27 16:59	07:48 17:05
30	07:38 17:39		07:14 19:47	06:26 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:11	07:52 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41		07:12 19:48	06:25 20:19	05:57 20:49	05:57 20:49	06:19 20:43	06:49 20:01	07:21 19:11	07:53 17:24	07:29 16:59	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Project:

Impianto_WPD_Chiaramonti

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:

08/12/2021 09:38/3.4.415

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH04 - Siemens Gamesa SG 6.6-170! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (3)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December				
1	07:49	07:36	07:01	07:10	06:25	18:30-19:03/33	05:57	18:21-19:17/56	05:57	18:29-19:23/54	06:21	18:30-19:24/54	06:51	07:21	06:54	07:29
2	07:49	07:35	06:59	07:09	06:24	18:29-19:05/36	05:56	18:21-19:18/57	05:58	18:28-19:22/54	06:22	18:31-19:23/52	06:52	07:22	06:55	07:30
3	07:49	07:34	06:58	07:07	06:23	18:27-19:07/40	05:56	18:21-19:17/56	05:58	18:29-19:23/54	06:23	18:31-19:23/52	06:53	07:23	06:57	07:31
4	07:49	07:33	06:56	07:05	06:21	18:26-19:08/42	05:55	18:22-19:18/56	05:59	18:28-19:23/55	06:24	18:31-19:21/50	06:54	07:24	06:58	07:32
5	07:49	07:32	06:54	07:04	06:20	18:24-19:08/44	05:55	18:22-19:18/56	05:59	18:29-19:24/55	06:25	18:32-19:20/48	06:55	07:25	06:59	07:33
6	07:49	07:31	06:53	07:02	06:19	18:23-19:09/46	05:55	18:22-19:17/55	06:00	18:28-19:23/55	06:26	18:32-19:20/48	06:56	07:26	07:00	07:34
7	07:49	07:30	06:51	07:01	06:18	18:22-19:10/48	05:54	18:22-19:18/56	06:00	18:29-19:24/55	06:27	18:33-19:19/46	06:57	07:27	07:01	07:35
8	07:49	07:29	06:50	06:59	06:17	18:22-19:11/49	05:54	18:23-19:18/55	06:01	18:29-19:25/56	06:28	18:34-19:17/43	06:58	07:28	07:03	07:36
9	07:49	07:28	06:48	06:57	06:15	18:21-19:12/51	05:54	18:23-19:18/55	06:02	18:28-19:24/56	06:29	18:35-19:16/41	06:59	07:29	07:04	07:36
10	07:49	07:27	06:47	06:56	06:14	18:21-19:12/51	05:54	18:24-19:18/54	06:02	18:29-19:25/56	06:30	18:36-19:15/39	07:00	07:30	07:05	07:37
11	07:49	07:25	06:45	06:54	06:13	18:20-19:13/53	05:54	18:23-19:18/55	06:03	18:28-19:24/56	06:31	18:38-19:13/35	07:01	07:31	07:06	07:38
12	07:48	07:24	06:43	06:53	06:12	18:20-19:13/53	05:54	18:24-19:18/54	06:04	18:28-19:25/57	06:31	18:39-19:11/32	07:02	07:32	07:07	07:39
13	07:48	07:23	06:42	06:51	06:11	18:19-19:14/55	05:53	18:24-19:18/54	06:05	18:28-19:26/58	06:32	18:41-19:09/28	07:03	07:33	07:08	07:40
14	07:48	07:22	06:40	06:50	06:10	18:19-19:14/55	05:53	18:24-19:18/54	06:05	18:29-19:26/57	06:33	18:44-19:06/22	07:04	07:34	07:10	07:41
15	07:47	07:20	06:38	06:48	06:09	18:19-19:14/55	05:53	18:25-19:18/53	06:06	18:28-19:25/57	06:34	18:48-19:02/14	07:05	07:35	07:11	07:41
16	07:47	07:19	06:37	06:46	06:08	18:18-19:15/57	05:53	18:25-19:18/53	06:07	18:28-19:26/58	06:35		07:06	07:36	07:12	07:42
17	07:47	07:18	06:35	06:45	06:07	18:18-19:15/57	05:53	18:25-19:18/53	06:08	18:28-19:26/58	06:36		07:07	07:37	07:13	07:43
18	07:46	07:16	06:34	06:43	06:06	18:19-19:16/57	05:53	18:26-19:19/53	06:08	18:29-19:26/57	06:37		07:08	07:38	07:14	07:43
19	07:46	07:15	06:32	06:42	06:05	18:18-19:16/58	05:54	18:26-19:19/53	06:09	18:28-19:26/58	06:38		07:09	07:40	07:15	07:44
20	07:45	07:14	06:30	06:40	06:04	18:18-19:16/58	05:54	18:27-19:20/53	06:10	18:28-19:26/58	06:39		07:10	07:41	07:17	07:45
21	07:45	07:12	06:29	06:39	06:04	18:18-19:16/58	05:54	18:27-19:20/53	06:11	18:28-19:26/58	06:40		07:11	07:42	07:18	07:45
22	07:44	07:11	06:27	06:37	06:03	18:18-19:16/58	05:54	18:27-19:20/53	06:12	18:28-19:26/58	06:41		07:12	07:43	07:19	07:46
23	07:43	07:09	06:25	06:36	06:02	18:19-19:17/58	05:54	18:28-19:20/52	06:13	18:29-19:26/57	06:42		07:13	07:44	07:20	07:46
24	07:43	07:08	06:24	06:35	06:01	18:18-19:16/58	05:55	18:27-19:20/53	06:13	18:29-19:26/57	06:43		07:14	07:45	07:21	07:47
25	07:42	07:07	06:22	06:33	06:01	18:18-19:16/58	05:55	18:27-19:20/53	06:14	18:28-19:25/57	06:44		07:15	07:46	07:22	07:47
26	07:41	07:05	06:20	06:32	06:00	18:19-19:17/58	05:55	18:28-19:21/53	06:15	18:28-19:25/57	06:45		07:16	07:47	07:23	07:47
27	07:40	07:04	06:19	06:30	06:05	18:19-19:16/57	05:56	18:28-19:21/53	06:16	18:29-19:25/56	06:46		07:17	07:48	07:24	07:48
28	07:40	07:02	06:17	06:29	06:04	18:19-19:16/57	05:56	18:28-19:21/53	06:17	18:29-19:25/56	06:47		07:18	07:49	07:26	07:48
29	07:39	07:01	06:15	06:28	06:03	18:19-19:17/58	05:56	18:28-19:22/54	06:18	18:29-19:25/56	06:48		07:19	07:50	07:27	07:48
30	07:38	07:00	06:14	06:26	06:02	18:19-19:17/57	05:57	18:28-19:22/54	06:19	18:30-19:25/55	06:49		07:20	07:51	07:28	07:49
31	07:37	07:00	06:13	06:25	06:01	18:19-19:17/57	05:57	18:28-19:22/54	06:20	18:30-19:24/54	06:50		07:21	07:52	07:29	07:49
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289				
Sum of minutes with flicker	0	0	0	69	1632	1622	1745	604	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: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH05 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (4)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:49 17:08	07:36 15:27-16:00/33 17:42	07:01 15:15-16:15/60 18:15	07:10 19:49	06:25 20:20	05:57 20:49
2	07:49 17:09	07:35 15:25-16:02/37 17:43	06:59 15:16-16:15/59 18:17	07:09 19:50	06:24 20:21	05:56 20:50
3	07:49 17:10	07:34 15:24-16:04/40 17:44	06:58 15:17-16:14/57 18:18	07:07 19:51	06:23 20:22	05:56 20:51
4	07:49 17:10	07:33 15:23-16:06/43 17:45	06:56 15:18-16:13/55 18:19	07:05 19:52	06:21 20:23	05:55 20:51
5	07:49 17:11	07:32 15:21-16:07/46 17:47	06:54 15:19-16:12/53 18:20	07:04 19:53	06:20 20:24	05:55 20:52
6	07:49 17:12	07:31 15:20-16:09/49 17:48	06:53 15:21-16:11/50 18:21	07:02 19:54	06:19 20:25	05:55 20:53
7	07:49 17:13	07:30 15:20-16:10/50 17:49	06:51 15:22-16:10/48 18:22	07:01 19:55	06:18 20:26	05:54 20:53
8	07:49 17:14	07:29 15:18-16:11/53 17:50	06:50 15:23-16:08/45 18:23	06:59 19:56	06:17 20:27	05:54 20:54
9	07:49 17:15	07:28 15:17-16:12/55 17:52	06:48 15:25-16:07/42 18:24	06:57 19:57	06:15 20:28	05:54 20:55
10	07:49 17:16	07:26 15:17-16:13/56 17:53	06:47 15:27-16:05/38 18:25	06:56 19:58	06:14 20:29	05:54 20:55
11	07:49 17:17	07:25 15:16-16:14/58 17:54	06:45 15:30-16:03/33 18:27	06:54 19:59	06:13 20:30	05:54 20:56
12	07:48 17:18	07:24 15:15-16:14/59 17:55	06:43 15:32-16:00/28 18:28	06:53 20:00	06:12 20:31	05:54 20:56
13	07:48 17:19	07:23 15:14-16:15/61 17:57	06:42 15:35-15:56/21 18:29	06:51 20:01	06:11 20:32	05:53 20:57
14	07:48 17:20	07:22 15:14-16:16/62 17:58	06:40 15:42-15:50/8 18:30	06:50 20:02	06:10 20:33	05:53 20:57
15	07:47 17:22	07:20 15:14-16:17/63 17:59	06:38 18:31	06:48 20:04	06:09 20:34	05:53 20:58
16	07:47 17:23	07:19 15:13-16:16/63 18:00	06:37 18:32	06:46 20:05	06:08 20:35	05:53 20:58
17	07:47 17:24	07:18 15:13-16:17/64 18:01	06:35 18:33	06:45 20:06	06:07 20:36	05:53 20:58
18	07:46 17:25	07:16 15:13-16:18/65 18:03	06:34 18:34	06:43 20:07	06:06 20:37	05:53 20:59
19	07:46 17:26	07:15 15:13-16:17/64 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59
20	07:45 17:27	07:14 15:13-16:18/65 18:05	06:30 18:36	06:40 20:09	06:05 20:39	05:54 20:59
21	07:45 17:28	07:12 15:12-16:17/65 18:06	06:29 18:37	06:39 20:10	06:04 20:40	05:54 20:59
22	07:44 17:30	07:11 15:13-16:18/65 18:07	06:27 18:38	06:37 20:11	06:03 20:41	05:54 21:00
23	07:43 17:31	07:09 15:13-16:17/64 18:08	06:25 18:39	06:36 20:12	06:02 20:42	05:54 21:00
24	07:43 17:32	07:08 15:13-16:18/65 18:10	06:24 18:40	06:35 20:13	06:01 20:43	05:55 21:00
25	07:42 17:33	07:07 15:14-16:18/64 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00
26	07:41 17:34	07:05 15:14-16:17/63 18:12	06:20 18:43	06:32 20:15	06:00 20:45	05:55 21:00
27	07:40 17:36	07:04 15:15-16:17/62 18:13	06:19 18:44	06:30 20:16	05:59 20:45	05:56 21:00
28	07:40 17:37	07:02 15:15-16:16/61 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00
29	07:39 15:36-15:50/14 17:38		07:15 19:46	06:28 20:18	05:58 20:47	05:56 21:00
30	07:38 15:32-15:54/22 17:39		07:14 19:47	06:26 20:19	05:58 20:48	05:57 21:00
31	07:37 15:29-15:57/28 17:41		07:12 19:48		05:57 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	64	1595	597	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: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH05 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (4)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 21:00	06:21 20:41	06:51 19:59	07:21 16:12-16:37/25 19:09	06:54 14:47-15:43/56 17:23	07:29 16:59
2	05:58 21:00	06:22 20:40	06:52 19:57	07:22 16:09-16:40/31 19:07	06:55 14:47-15:41/54 17:21	07:30 16:58
3	05:58 21:00	06:23 20:39	06:53 19:56	07:23 16:07-16:42/35 19:06	06:57 14:48-15:40/52 17:20	07:31 16:58
4	05:59 21:00	06:24 20:38	06:54 19:54	07:24 16:04-16:44/40 19:04	06:58 14:49-15:39/50 17:19	07:32 16:58
5	05:59 21:00	06:25 20:37	06:55 19:52	07:25 16:01-16:45/44 19:02	06:59 14:50-15:39/49 17:18	07:33 16:58
6	06:00 20:59	06:26 20:36	06:56 19:51	07:26 15:59-16:46/47 19:01	07:00 14:51-15:37/46 17:17	07:34 16:58
7	06:00 20:59	06:27 20:35	06:57 19:49	07:27 15:57-16:47/50 18:59	07:01 14:53-15:35/42 17:16	07:35 16:58
8	06:01 20:59	06:28 20:33	06:58 19:47	07:28 15:55-16:47/52 18:57	07:02 14:54-15:34/40 17:15	07:36 16:58
9	06:02 20:58	06:29 20:32	06:59 19:46	07:29 15:54-16:48/54 18:56	07:04 14:56-15:33/37 17:14	07:36 16:58
10	06:02 20:58	06:30 20:31	07:00 19:44	07:30 15:52-16:48/56 18:54	07:05 14:58-15:31/33 17:13	07:37 16:58
11	06:03 20:58	06:31 20:30	07:01 19:42	07:31 15:51-16:48/57 18:53	07:06 15:00-15:28/28 17:12	07:38 16:58
12	06:04 20:57	06:31 20:28	07:02 19:41	07:32 15:49-16:49/60 18:51	07:07 15:04-15:26/22 17:11	07:39 16:58
13	06:05 20:57	06:32 20:27	07:03 19:39	07:33 15:48-16:49/61 18:49	07:08 15:08-15:22/14 17:10	07:40 16:58
14	06:05 20:56	06:33 20:26	07:04 19:37	07:34 15:47-16:49/62 18:48	07:10 17:09	07:41 16:58
15	06:06 20:56	06:34 20:24	07:05 19:36	07:35 15:46-16:49/63 18:46	07:11 17:08	07:41 16:58
16	06:07 20:55	06:35 20:23	07:06 19:34	07:36 15:46-16:50/64 18:45	07:12 17:07	07:42 16:59
17	06:08 20:54	06:36 20:22	07:07 19:32	07:37 15:45-16:49/64 18:43	07:13 17:06	07:43 16:59
18	06:08 20:54	06:37 20:20	07:08 19:31	07:38 15:45-16:49/64 18:42	07:14 17:06	07:43 16:59
19	06:09 20:53	06:38 20:19	07:09 19:29	07:40 15:44-16:49/65 18:40	07:15 17:05	07:44 17:00
20	06:10 20:52	06:39 20:17	07:10 19:27	07:41 15:43-16:48/65 18:39	07:17 17:04	07:45 17:00
21	06:11 20:52	06:40 20:16	07:11 19:26	07:42 15:43-16:48/65 18:37	07:18 17:04	07:45 17:01
22	06:12 20:51	06:41 20:14	07:12 19:24	07:43 15:44-16:49/65 18:36	07:19 17:03	07:46 17:01
23	06:13 20:50	06:42 20:13	07:13 19:22	07:44 15:43-16:48/65 18:35	07:20 17:02	07:46 17:02
24	06:13 20:49	06:43 20:11	07:14 19:21	07:45 15:43-16:47/64 18:33	07:21 17:02	07:47 17:02
25	06:14 20:48	06:44 20:10	07:15 19:19	06:46 14:43-15:47/64 17:32	07:22 17:01	07:47 17:03
26	06:15 20:47	06:45 20:08	07:16 19:17	06:47 14:43-15:46/63 17:30	07:23 17:01	07:47 17:03
27	06:16 20:46	06:46 20:07	07:17 19:16	06:49 14:44-15:46/62 17:29	07:24 17:00	07:48 17:04
28	06:17 20:46	06:47 20:05	07:18 19:14	06:50 14:44-15:45/61 17:28	07:26 17:00	07:48 17:05
29	06:18 20:45	06:48 20:04	07:19 19:12	06:51 14:44-15:45/61 17:26	07:27 16:59	07:48 17:05
30	06:19 20:44	06:49 20:02	07:20 16:17-16:34/17 19:10	06:52 14:45-15:44/59 17:25	07:28 16:59	07:49 17:06
31	06:20 20:43	06:50 20:00		06:53 14:45-15:43/58 17:24		07:49 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	0	0	17	1746	523	0

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

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

Project:

Impianto_WPD_Chiaramonti

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:

08/12/2021 09:38/3.4.415

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH06 - Siemens Gamesa SG 6.6-170! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (5)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:42	06:51 19:59	07:21 19:09	07:52-08:11/19	06:54 17:23	07:29 16:59	
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	05:58 21:00	06:22 20:40	06:52 19:57	07:22 19:07	07:51-08:11/20	06:55 17:22	07:30 16:59	
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:58 21:00	06:23 20:39	06:53 19:56	07:23 19:06	07:51-08:11/20	06:57 17:20	07:31 16:58	
4	07:49 17:10	07:33 17:45	06:56 18:19	07:22-07:26/4	07:05 19:52	06:21 20:23	05:55 20:51	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	07:51-08:10/19	06:58 17:19	07:32 16:58
5	07:49 17:11	07:32 17:47	06:54 18:20	07:18-07:29/11	07:04 19:53	06:20 20:24	05:55 20:52	05:59 21:00	06:25 20:37	06:55 19:52	07:25 19:02	07:51-08:10/19	06:59 17:18	07:33 16:58
6	07:49 17:12	07:31 17:48	06:53 18:21	07:16-07:31/15	07:02 19:54	06:19 20:25	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:51-08:09/18	07:00 17:17	07:34 16:58
7	07:49 17:13	07:30 17:49	06:51 18:22	07:15-07:32/17	07:01 19:55	06:18 20:26	05:54 20:53	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:51-08:08/17	07:01 17:16	07:35 16:58
8	07:49 17:14	07:29 17:50	06:50 18:23	07:14-07:33/19	06:59 19:56	06:17 20:27	05:54 20:54	06:01 20:59	06:28 20:33	06:58 19:47	07:28 18:57	07:52-08:06/14	07:03 17:15	07:36 16:58
9	07:49 17:15	07:28 17:52	06:48 18:24	07:13-07:33/20	06:57 19:57	06:15 20:28	05:54 20:55	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:54-08:03/9	07:04 17:14	07:36 16:58
10	07:49 17:16	07:27 17:53	06:47 18:25	07:12-07:32/20	06:56 19:58	06:14 20:29	05:54 20:55	06:02 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:37 16:58	
11	07:49 17:17	07:25 17:54	06:45 18:27	07:13-07:32/19	06:54 19:59	06:13 20:30	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:42	07:31 18:53	07:06 17:12	07:38 16:58	
12	07:48 17:18	07:24 17:55	06:43 18:28	07:12-07:31/19	06:53 20:00	06:12 20:31	05:54 20:56	06:04 20:57	06:32 20:28	07:02 19:41	07:32 18:51	07:07 17:11	07:39 16:58	
13	07:48 17:19	07:23 17:57	06:42 18:29	07:13-07:30/17	06:51 20:01	06:11 20:32	05:53 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:49	07:08 17:10	07:40 16:58	
14	07:48 17:21	07:22 17:58	06:40 18:30	07:14-07:30/16	06:50 20:02	06:10 20:33	05:53 20:57	06:05 20:56	06:33 20:26	07:04 19:37	07:34 18:48	07:10 17:09	07:41 16:58	
15	07:47 17:22	07:20 17:59	06:38 18:31	07:15-07:27/12	06:48 20:04	06:09 20:34	05:53 20:58	06:06 20:56	06:34 20:24	07:05 19:36	07:35 18:46	07:11 17:08	07:41 16:58	
16	07:47 17:23	07:19 18:00	06:37 18:32	07:17-07:24/7	06:46 20:05	06:08 20:35	05:53 20:58	06:07 20:55	06:35 20:23	07:06 19:34	07:36 18:45	07:12 17:07	07:42 16:59	
17	07:47 17:24	07:18 18:01	06:35 18:33		06:45 20:06	06:07 20:36	05:53 20:58	06:08 20:54	06:26 20:22	07:07 19:32	07:37 18:43	07:13 17:06	07:43 16:59	
18	07:46 17:25	07:16 18:03	06:34 18:34		06:43 20:07	06:06 20:37	05:54 20:59	06:08 20:54	06:37 20:20	07:08 19:31	07:38 18:42	07:14 17:06	07:43 16:59	
19	07:46 17:26	07:15 18:04	06:32 18:35		06:42 20:08	06:05 20:38	05:54 20:59	06:09 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:15 17:05	07:44 17:00	
20	07:45 17:27	07:14 18:05	06:30 18:36		06:40 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:39 20:17	07:10 19:27	07:41 18:39	07:17 17:04	07:45 17:00	
21	07:45 17:28	07:12 18:06	06:29 18:37		06:39 20:10	06:04 20:40	05:54 20:59	06:11 20:52	06:40 20:16	07:11 19:26	07:42 18:37	07:18 17:04	07:45 17:01	
22	07:44 17:30	07:11 18:07	06:27 18:38		06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:41 20:14	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01	
23	07:43 17:31	07:09 18:08	06:25 18:39		06:36 20:12	06:02 20:42	05:54 21:00	06:13 20:50	06:42 20:13	07:13 19:22	07:44 18:35	07:20 17:02	07:46 17:02	
24	07:43 17:32	07:08 18:10	06:24 18:41		06:35 20:13	06:01 20:43	05:55 21:00	06:14 20:49	06:43 20:11	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02	
25	07:42 17:33	07:07 18:11	06:22 18:42		06:33 20:14	06:01 20:44	05:55 21:00	06:14 20:48	06:44 20:10	07:15 19:19	06:46 17:32	07:22 17:01	07:47 17:03	
26	07:41 17:34	07:05 18:12	06:20 18:43		06:32 20:15	06:00 20:45	05:55 21:00	06:15 20:47	06:45 20:08	07:16 19:17	06:47 17:30	07:23 17:01	07:47 17:03	
27	07:40 17:36	07:04 18:13	06:19 18:44		06:30 20:16	05:59 20:45	05:56 21:00	06:16 20:46	06:46 20:07	07:17 19:16	06:49 17:29	07:24 17:00	07:48 17:04	
28	07:40 17:37	07:02 18:14	06:17 18:45		06:29 20:17	05:59 20:46	05:56 21:00	06:17 20:46	06:47 20:05	07:18 19:14	06:50 17:28	07:26 17:00	07:48 17:05	
29	07:39 17:38		07:15 19:46		06:28 20:18	05:58 20:47	05:56 21:00	06:18 20:45	06:48 20:04	07:19 19:12	07:55-08:10/15	06:51 17:27	07:48 17:05	
30	07:38 17:39		07:14 19:47		06:26 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:11	07:53-08:10/17	06:52 17:25	07:49 17:06	
31	07:37 17:41		07:12 19:48			05:57 20:49		06:20 20:43	06:50 20:01			06:53 17:24	07:49 17:07	
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289		
Sum of minutes with flicker	0	0	196	0	0	0	0	0	47	155	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: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH07 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !OI! hub: 165,0 m (TOT: 250,0 m) (8)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:49 17:08	07:36 08:06-08:27/21 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 07:42-07:51/9 17:23	07:29 16:59		
2	07:49 17:09	07:35 08:06-08:27/21 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	05:58 21:00	06:22 20:40	06:52 19:57	07:22 19:07	06:55 07:40-07:53/13 17:22	07:30 16:59		
3	07:49 17:10	07:34 08:06-08:27/21 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:58 21:00	06:23 20:39	06:53 19:56	07:23 19:06	06:57 07:38-07:54/16 17:20	07:31 16:58		
4	07:49 17:11	07:33 08:06-08:27/21 17:46	06:56 18:19	07:05 19:52	06:21 20:23	05:55 20:51	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 07:38-07:56/18 17:19	07:32 16:58		
5	07:49 17:11	07:32 08:07-08:27/20 17:47	06:54 18:20	07:04 19:53	06:20 20:24	05:55 20:52	05:59 21:00	06:25 20:37	06:55 19:52	07:25 19:02	06:59 07:37-07:57/20 17:18	07:33 16:58		
6	07:49 17:12	07:31 08:08-08:27/19 17:48	06:53 18:21	07:02 19:54	06:19 20:25	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 07:37-07:57/20 17:17	07:34 16:58		
7	07:49 17:13	07:30 08:09-08:26/17 17:49	06:51 18:22	07:01 19:55	06:18 20:26	05:55 20:53	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 07:36-07:57/21 17:16	07:35 16:58		
8	07:49 17:14	07:29 08:10-08:25/15 17:50	06:50 18:23	06:59 19:56	06:17 20:27	05:54 20:54	06:01 20:59	06:28 20:33	06:58 19:48	07:28 18:57	07:03 07:37-07:58/21 17:15	07:36 16:58		
9	07:49 17:15	07:28 08:11-08:23/12 17:52	06:48 18:24	06:57 19:57	06:15 20:28	05:54 20:55	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:04 07:37-07:58/21 17:14	07:36 16:58		
10	07:49 17:16	07:27 08:13-08:21/8 17:53	06:47 18:26	06:56 19:58	06:14 20:29	05:54 20:55	06:02 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 07:36-07:58/22 17:13	07:37 16:58		
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	06:13 20:30	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 07:37-07:57/20 17:12	07:38 16:58		
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 20:00	06:12 20:31	05:54 20:56	06:04 20:57	06:32 20:28	07:02 19:41	07:32 18:51	07:07 07:38-07:58/20 17:11	07:39 16:58		
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:01	06:11 20:32	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:08 07:38-07:57/19 17:10	07:40 16:58		
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:02	06:10 20:33	05:53 20:57	06:05 20:56	06:34 20:26	07:04 19:37	07:34 18:48	07:10 07:39-07:56/17 17:09	07:41 16:58		
15	07:47 17:22	07:20 17:59	06:38 18:31	06:48 20:04	06:09 20:34	05:53 20:58	06:06 20:56	06:34 20:24	07:05 19:36	07:35 18:46	07:11 07:40-07:56/16 17:08	07:41 16:58		
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19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59	06:09 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:15 17:05 17:05	07:44 17:00		
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	Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	303	289
	Sum of minutes with flicker	124	175	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH08 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (9)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	19:38-20:11/33 21:00	05:57 20:42	19:41-20:21/40 20:20	06:21 19:59	06:51 19:09	07:21 17:23	06:54 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	19:38-20:12/34 21:00	05:58 20:40	19:41-20:21/40 20:20	06:22 19:57	06:52 19:07	07:22 17:22	06:55 16:59
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	19:37-20:12/35 21:00	05:58 20:39	19:41-20:21/40 20:20	06:23 19:56	06:53 19:06	07:23 17:20	06:57 16:58
4	07:49 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:21 20:23	05:56 20:51	19:37-20:13/36 21:00	05:59 20:38	19:41-20:21/40 20:20	06:24 19:54	06:54 19:04	07:24 17:19	06:58 16:58
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 19:53	06:20 20:24	05:55 20:52	19:37-20:14/37 21:00	05:59 20:37	19:42-20:21/39 20:20	06:25 19:52	06:55 19:02	07:25 17:18	06:59 16:58
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9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	06:15 20:28	05:54 20:55	19:36-20:16/40 20:58	06:02 20:32	19:44-20:20/36 20:20	06:29 19:46	06:59 18:56	07:29 17:14	07:04 16:58
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17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	06:07 20:36	05:54 20:58	19:37-20:19/42 20:58	06:08 20:22	19:52-20:14/22 20:20	06:36 19:32	07:07 18:43	07:37 17:06	07:13 16:59
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	06:06 20:37	05:54 20:59	19:37-20:19/42 20:54	06:08 20:20	19:54-20:13/19 20:20	06:37 19:31	07:08 18:42	07:38 17:06	07:14 16:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59	19:37-20:20/43 20:53	06:09 20:19	19:57-20:11/14 20:20	06:38 19:29	07:09 18:40	07:40 17:05	07:15 17:00
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Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289	
Sum of minutes with flicker	0	0	0	0	185	1211	622	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH10 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (11)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:41	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
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25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:14 20:48	06:44 20:10	07:15 19:19	07:46 17:32	07:22 17:01	07:47 17:03
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:00 20:44	05:55 21:00	06:15 20:47	06:45 20:08	07:16 19:17	07:47 17:30	07:23 17:01	07:47 17:03
27	07:40 17:36	07:04 18:13	06:19 18:44	06:30 20:16	05:59 20:45	05:56 21:00	06:16 20:46	06:46 20:07	07:17 19:16	07:48 17:29	07:24 17:00	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00	06:17 20:45	06:47 20:05	07:18 19:14	07:49 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38		07:15 19:46	06:28 20:18	05:58 20:47	05:56 21:00	06:18 20:45	06:48 20:04	07:19 19:12	07:51 17:26	07:27 16:59	07:48 17:05
30	07:38 17:39		07:14 19:47	06:26 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:10	07:52 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41		07:12 19:48	06:25 20:18	05:57 20:48	05:57 20:48	06:19 20:42	06:49 20:00	07:21 17:24	07:53 17:24	07:29 16:59	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH11 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (17)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:49	07:36	07:01	07:10 17:30-18:38/68	06:25	05:57	05:57	06:21	06:51 17:36-18:26/50	07:21 17:18-18:16/58	06:54	07:29		
	17:08	17:42	18:15	19:49	20:20	20:49	21:00	20:41	19:59	19:09	17:23	16:59		
2	07:49	07:35	06:59	07:09 17:30-18:37/67	06:24	05:56	05:58	06:22	06:52 17:35-18:27/52	07:22 17:20-18:16/56	06:55	07:30		
	17:09	17:43	18:17	19:50	20:21	20:50	21:00	20:40	19:57	19:07	17:22	16:59		
3	07:49	07:34	06:58	17:07-17:13/6	07:07 17:30-18:36/66	06:23	05:56	05:58	06:23	06:53 17:33-18:28/55	07:23 17:21-18:14/53	06:57	07:31	
	17:10	17:44	18:18	19:51	20:22	20:51	21:00	20:39	19:56	19:06	17:20	16:58		
4	07:49	07:33	06:56	16:59-17:21/22	07:06 17:31-18:36/65	06:21	05:56	05:59	06:24	06:54 17:32-18:29/57	07:24 17:22-18:12/50	06:58	07:32	
	17:11	17:46	18:19	19:52	20:23	20:51	21:00	20:38	19:54	19:04	17:19	16:58		
5	07:49	07:32	06:54	16:55-17:25/30	07:04 17:31-18:34/63	06:20	05:55	05:59	06:25	06:55 17:30-18:29/59	07:25 17:23-18:10/47	06:59	07:33	
	17:11	17:47	18:20	19:53	20:24	20:52	20:59	20:37	19:52	19:02	17:18	16:58		
6	07:49	07:31	06:53	16:52-17:28/36	07:02 17:33-18:34/61	06:19	05:55	06:00	06:26	06:56 17:28-18:29/61	07:26 17:25-18:08/43	07:00	07:34	
	17:12	17:48	18:21	19:54	20:25	20:53	20:59	20:36	19:51	19:01	17:17	16:58		
7	07:49	07:30	06:51	16:49-17:30/41	07:01 17:33-18:32/59	06:18	05:55	06:01	06:27	06:57 17:27-18:29/62	07:27 17:26-18:05/39	07:01	07:35	
	17:13	17:49	18:22	19:55	20:26	20:53	20:59	20:35	19:49	18:59	17:16	16:58		
8	07:49	07:29	06:50	16:46-17:32/46	06:59 17:34-18:31/57	06:17	05:54	06:01	06:28	06:58 17:25-18:30/65	07:28 17:29-18:02/33	07:02	07:36	
	17:14	17:50	18:23	19:56	20:27	20:54	20:59	20:33	19:47	18:57	17:15	16:58		
9	07:49	07:28	06:48	16:45-17:34/49	06:57 17:35-18:30/55	06:15	05:54	06:02	06:29	06:59 17:24-18:30/66	07:29 17:32-17:58/26	07:04	07:36	
	17:15	17:52	18:24	19:57	20:28	20:55	20:58	20:32	19:46	18:56	17:14	16:58		
10	07:49	07:26	06:47	16:43-17:35/52	06:56 17:36-18:28/52	06:14	05:54	06:03	06:30	07:00 17:23-18:30/67	07:30 17:36-17:53/17	07:05	07:37	
	17:16	17:53	18:25	19:58	20:29	20:55	20:58	20:31	19:44	18:54	17:13	16:58		
11	07:49	07:25	06:45	16:42-17:37/55	06:54 17:37-18:27/50	06:13	05:54	06:03	06:31	07:01 17:22-18:30/68	07:31	07:06	07:38	
	17:17	17:54	18:27	19:59	20:30	20:56	20:57	20:30	19:42	18:53	17:12	16:58		
12	07:48	07:24	06:43	16:40-17:37/57	06:53 17:38-18:25/47	06:12	05:54	06:04	06:32	07:02 17:21-18:30/69	07:32	07:07	07:39	
	17:18	17:55	18:28	20:00	20:31	20:56	20:57	20:28	19:41	18:51	17:11	16:58		
13	07:48	07:23	06:42	16:38-17:38/60	06:51 17:40-18:24/44	06:11	05:54	06:05	06:33	07:03 17:21-18:30/69	07:33	07:08	07:40	
	17:19	17:57	18:29	20:01	20:32	20:57	20:57	20:27	19:39	18:50	17:10	16:58		
14	07:48	07:22	06:40	16:37-17:39/62	06:50 17:41-18:21/40	06:10	05:53	06:05	06:34	07:04 17:20-18:30/70	07:34	07:10	07:41	
	17:21	17:58	18:30	20:02	20:33	20:57	20:56	20:26	19:37	18:48	17:09	16:58		
15	07:47	07:20	06:38	16:36-17:40/64	06:48 17:44-18:20/36	06:09	05:53	06:06	06:35	07:05 17:19-18:30/71	07:35	07:11	07:41	
	17:22	17:59	18:31	20:04	20:34	20:58	20:55	20:24	19:36	18:46	17:08	16:59		
16	07:47	07:19	06:37	16:34-17:40/66	06:46 17:46-18:17/31	06:08	05:53	06:07	06:35	07:06 17:19-18:30/71	07:36	07:12	07:42	
	17:23	18:00	18:32	20:05	20:35	20:58	20:55	20:23	19:34	18:45	17:07	16:59		
17	07:47	07:18	06:35	16:34-17:41/67	06:45 17:49-18:14/25	06:07	05:54	06:08	06:36	07:07 17:18-18:29/71	07:37	07:13	07:43	
	17:24	18:01	18:33	20:06	20:36	20:58	20:54	20:22	19:32	18:43	17:06	16:59		
18	07:46	07:16	06:34	16:33-17:41/68	06:43 17:52-18:10/18	06:06	05:54	06:08	06:37	07:08 17:18-18:29/71	07:38	07:14	07:43	
	17:25	18:03	18:34	20:07	20:37	20:59	20:54	20:20	19:31	18:42	17:06	16:59		
19	07:46	07:15	06:32	16:32-17:41/69	06:42	06:05	05:54	06:09	06:38	07:09 17:17-18:29/72	07:40	07:15	07:44	
	17:26	18:04	18:35	20:08	20:38	20:59	20:53	20:19	19:29	18:40	17:05	17:00		
20	07:45	07:14	06:30	16:32-17:42/70	06:40	06:05	05:54	06:10	06:39	07:10 17:17-18:28/71	07:41	07:17	07:45	
	17:27	18:05	18:36	20:09	20:39	20:59	20:52	20:17	19:27	18:39	17:04	17:00		
21	07:45	07:12	06:29	16:31-17:41/70	06:39	06:04	05:54	06:11	06:40	07:11 17:17-18:28/71	07:42	07:18	07:45	
	17:29	18:06	18:37	20:10	20:40	20:59	20:52	20:16	19:26	18:38	17:04	17:01		
22	07:44	07:11	06:27	16:30-17:41/71	06:38	06:03	05:54	06:12	06:41	07:12 17:16-18:27/71	07:43	07:19	07:46	
	17:30	18:07	18:38	20:11	20:41	21:00	20:51	20:14	19:24	18:36	17:03	17:01		
23	07:43	07:09	06:25	16:31-17:42/71	06:36	06:02	05:54	06:13	06:42	07:13 17:16-18:26/70	07:44	07:20	07:46	
	17:31	18:08	18:39	20:12	20:42	21:00	20:50	20:13	19:22	18:35	17:02	17:02		
24	07:43	07:08	06:24	16:30-17:41/71	06:35	06:02	05:55	06:14	06:43	07:14 17:16-18:25/69	07:45	07:21	07:47	
	17:32	18:10	18:41	20:13	20:43	21:00	20:49	20:11	19:21	18:33	17:02	17:02		
25	07:42	07:07	06:22	16:29-17:41/72	06:33	06:01	05:55	06:14	06:44	17:55-18:13/18	07:15 17:16-18:25/69	06:46	07:22	07:47
	17:33	18:11	18:42	20:14	20:44	21:00	20:48	20:10	19:19	18:32	17:01	17:03		
26	07:41	07:05	06:20	16:30-17:41/71	06:32	06:00	05:55	06:15	06:45	17:51-18:16/25	07:16 17:15-18:23/68	06:47	07:23	07:47
	17:34	18:12	18:43	20:15	20:44	21:00	20:47	20:08	19:17	18:31	17:01	17:03		
27	07:40	07:04	06:19	16:29-17:40/71	06:30	05:59	05:56	06:16	06:46	17:47-18:19/32	07:17 17:16-18:22/66	06:49	07:24	07:48
	17:36	18:13	18:44	20:16	20:45	21:00	20:46	20:07	19:16	18:30	17:29	17:00	17:04	
28	07:40	07:02	06:17	16:29-17:40/71	06:29	05:59	05:56	06:17	06:47	17:45-18:21/36	07:18 17:16-18:20/64	06:50	07:26	07:48
	17:37	18:14	18:45	20:17	20:46	21:00	20:46	20:05	19:14	18:28	17:28	17:00	17:05	
29	07:39		07:15	17:30-18:40/70	06:28	05:58	05:56	06:18	06:48	17:42-18:22/40	07:19 17:16-18:19/63	06:51	07:27	07:48
	17:38		19:46	20:18	20:47	21:00	20:45	20:04	19:12	18:27	17:27	17:00	17:05	
30	07:38		07:14	17:29-18:39/70	06:26	05:58	05:57	06:19	06:49	17:40-18:24/44	07:20 17:17-18:18/61	06:52	07:28	07:49
	17:39		19:47	20:19	20:48	21:00	20:44	20:02	19:11	18:26	17:25	16:59	17:06	
31	07:37		07:12	17:29-18:38/69		05:57		06:20	06:50	17:38-18:25/47		06:53	07:49	
	17:41		19:48			20:49		20:43	20:00		17:24		17:07	
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289		
Sum of minutes with flicker	0	0	1697	904	0	0	0	242	1969	422	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: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH12 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (16)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 19:21	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
2	07:50 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:22	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	05:59 21:00	06:24 20:39	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58
6	07:49 17:13	07:31 17:48	06:53 18:21	07:03 19:54	06:19 20:26	05:55 20:53	06:00 21:00	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:50 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 16:58
8	07:50 17:15	07:29 17:51	06:50 18:24	06:59 19:57	06:17 20:28	05:55 20:54	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58
9	07:49 17:16	07:28 17:52	06:48 18:25	06:58 19:58	06:16 20:29	05:54 20:55	06:02 20:59	06:29 20:33	06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:59	06:15 20:30	05:54 20:55	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:55	07:05 17:13	07:38 16:58
11	07:49 17:18	07:26 17:54	06:45 18:27	06:55 20:00	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:57	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:08 17:11	07:39 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	06:06 20:56	06:35 20:25	07:05 19:36	07:36 18:47	07:11 17:08	07:42 16:59
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	06:07 20:55	06:36 20:23	07:06 19:34	07:37 18:45	07:12 17:08	07:42 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 20:37	05:54 20:59	06:08 20:55	06:37 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:38	05:54 20:59	06:09 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:15 17:06	07:44 17:00
19	07:46 17:26	07:15 18:04	06:32 18:36	06:42 20:08	06:06 20:39	05:54 20:59	06:10 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00
20	07:45 17:28	07:14 18:05	06:31 18:37	06:41 20:09	06:05 20:39	05:54 21:00	06:10 20:53	06:40 20:18	07:10 19:28	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:29	07:13 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:44 17:31	07:10 18:09	06:26 18:40	06:36 20:12	06:02 20:42	05:55 21:00	06:13 20:50	06:43 20:13	07:13 19:23	07:44 18:35	07:20 17:03	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:34	07:21 17:02	07:47 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:34 20:14	06:01 20:44	05:55 21:00	06:15 20:49	06:45 20:10	07:15 19:19	07:46 17:32	07:23 17:01	07:47 17:03
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:56 21:01	06:16 20:48	06:46 20:09	07:16 19:18	07:48 17:31	07:24 17:01	07:48 17:04
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:46	05:56 21:01	06:16 20:47	06:47 20:07	07:17 19:16	07:49 17:29	07:25 17:01	07:48 17:04
28	07:40 17:37	07:02 18:15	06:17 18:45	06:29 20:17	06:09 20:46	05:56 21:01	06:17 20:46	06:48 20:06	07:18 19:14	07:50 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38	07:01 18:06	06:16 18:36	06:28 20:08	06:08 20:38	05:57 21:00	06:18 20:46	06:49 20:06	07:19 19:14	07:51 17:31	07:27 17:01	07:49 17:04
30	07:38 17:40	06:59 17:57	06:15 18:35	06:27 20:07	06:07 20:37	05:58 21:01	06:19 20:44	06:49 20:02	07:20 19:11	07:52 17:26	07:28 16:59	07:49 17:06
31	07:37 17:41	06:58 17:56	06:14 18:34	06:26 20:06	06:06 20:36	05:58 21:02	06:19 20:43	06:49 20:01	07:21 19:12	07:53 17:24	07:29 17:02	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH13 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (18)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:22	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58
6	07:49 17:13	07:31 17:48	06:53 18:21	07:03 19:54	06:19 20:26	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:50 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 16:58
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31	07:37 17:41		07:12 19:48		05:57 20:49		06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH14 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (15)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
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Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH15 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (19)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
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24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:15 20:49	06:45 20:10	07:15 19:19	07:46 17:32	07:22 17:01	07:47 17:03
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30	07:38 17:40		07:14 19:47	06:27 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:11	07:52 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41		07:12 19:48		05:57 20:49		06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH16 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (14)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:49	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58
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31	07:37 17:41		07:12 19:48		05:57 20:49		06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH17 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (13)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:49	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
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Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: CH18 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (12)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:49	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
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14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59
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Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: M01 - WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (2)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:21	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
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Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_abitazioni_2021_12_08WTG: M02 - WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (3)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:21	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
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Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

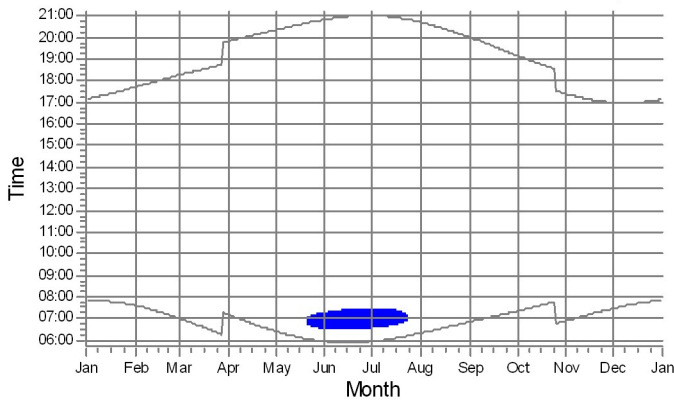
Table layout: For each day in each month the following matrix apply

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

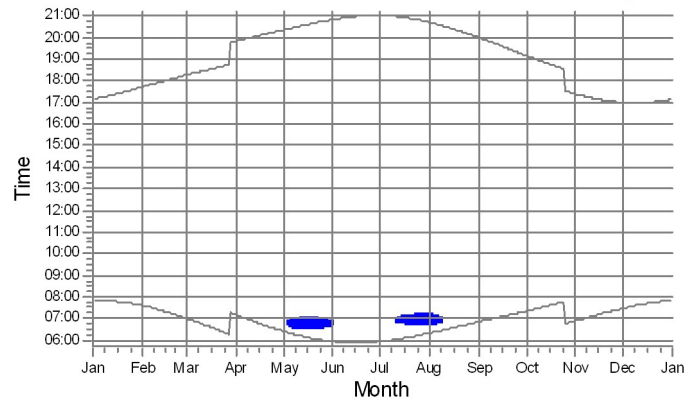
SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_abitazioni_2021_12_08

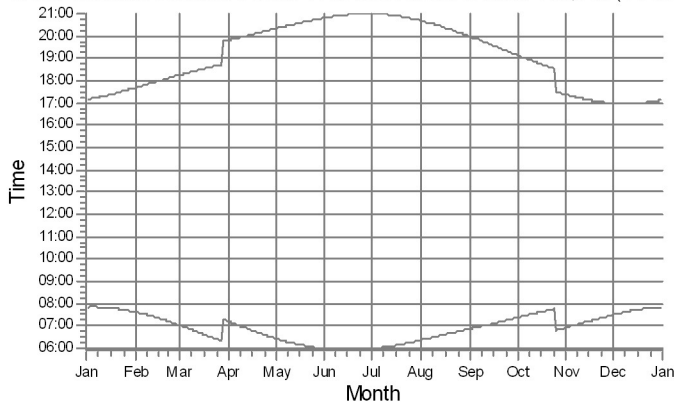
CH01: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



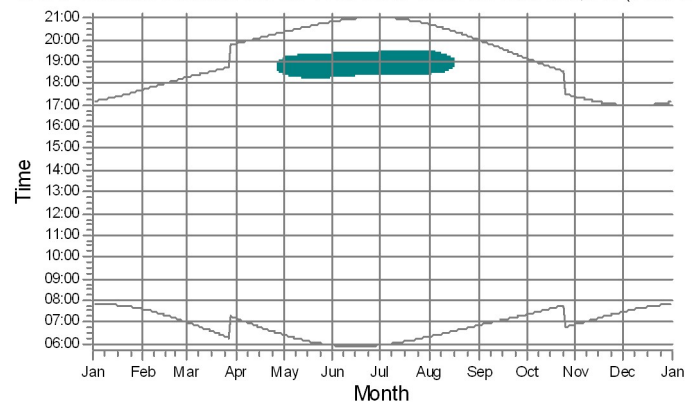
CH02: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



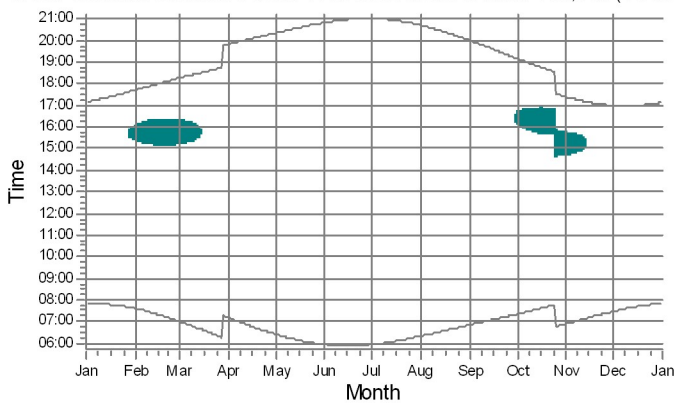
CH03: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



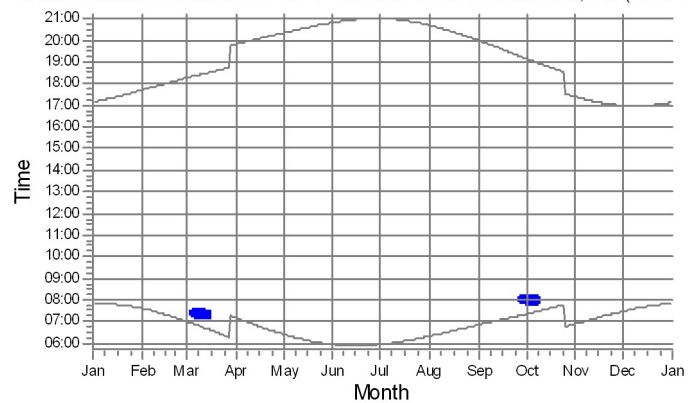
CH04: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH05: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



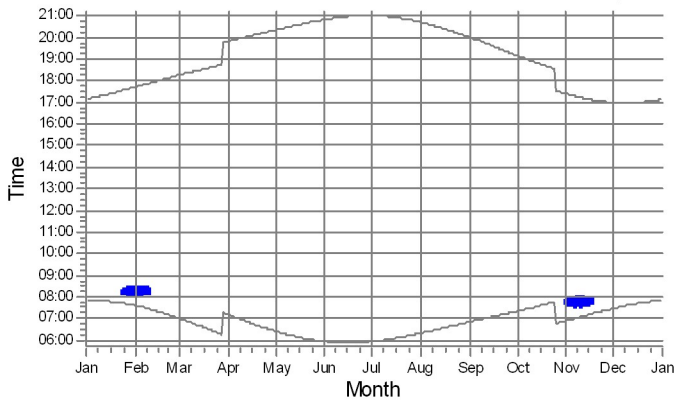
Shadow receptors

- F44: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (93)
- F61: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (96)

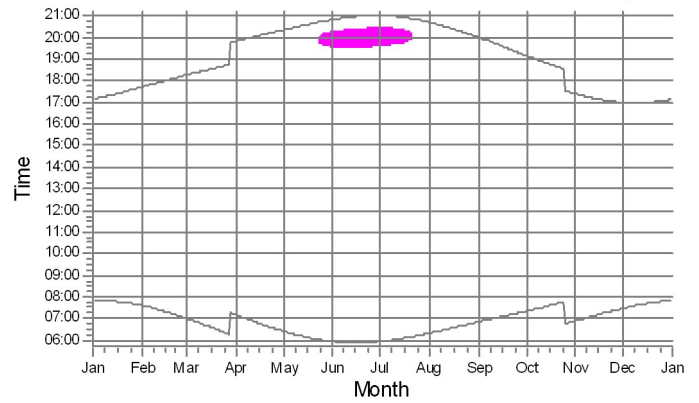
SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_abitazioni_2021_12_08

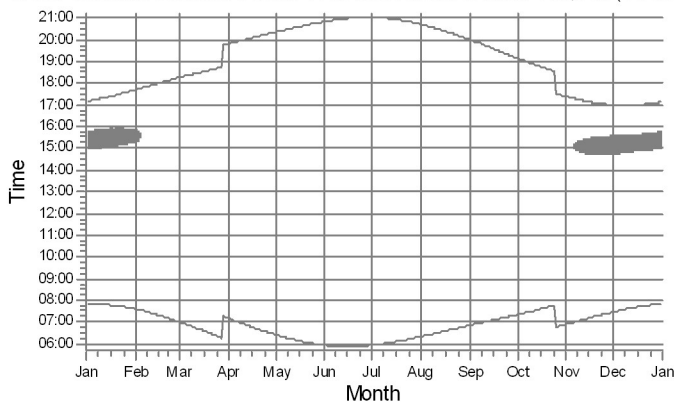
CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



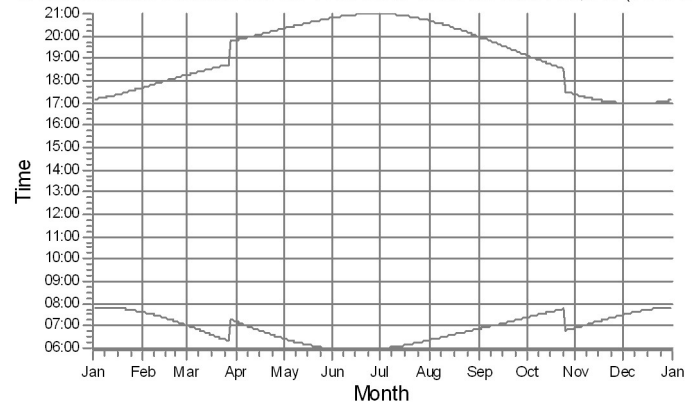
CH08: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



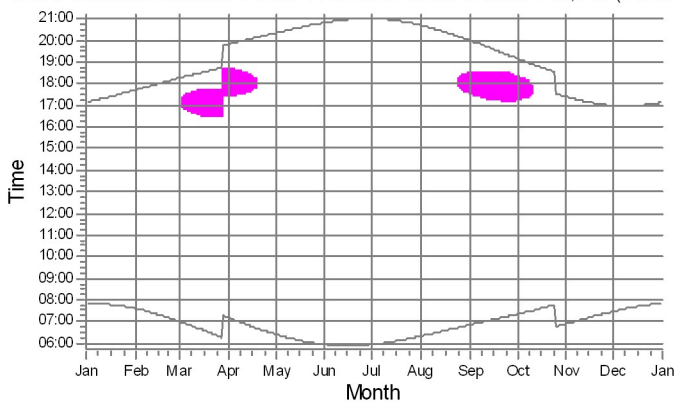
CH09: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



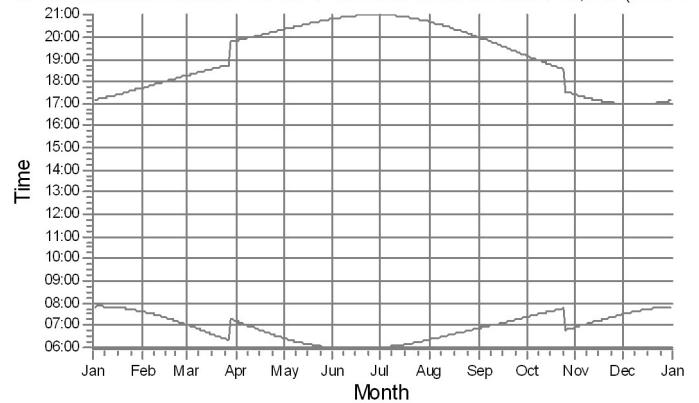
CH10: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH11: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH12: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



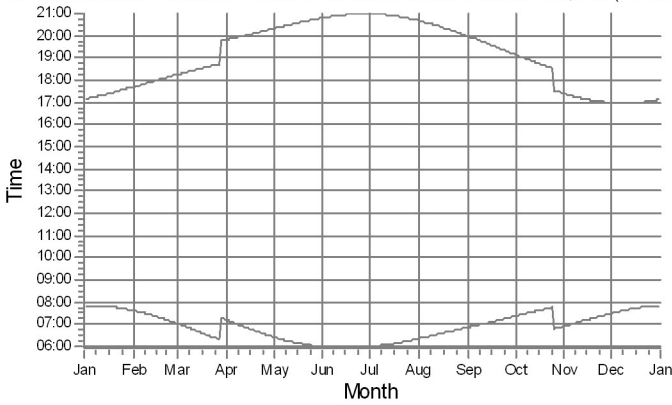
Shadow receptors

- F44: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (93)
- F48: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (94)
- F54: Shadow Receptor: 1,2 × 1,4 Azimuth: 0,0° Slope: 90,0° (95)

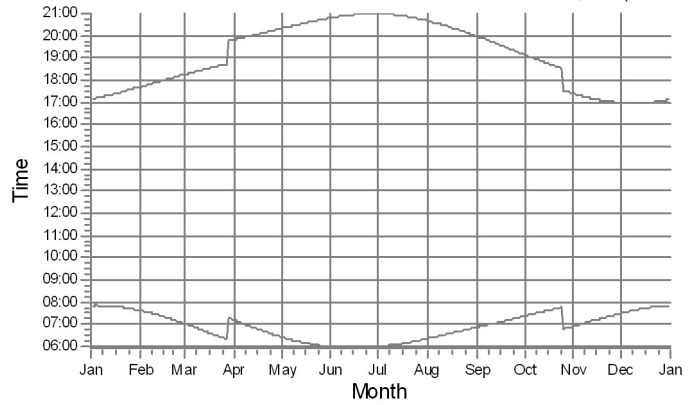
SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_abitazioni_2021_12_08

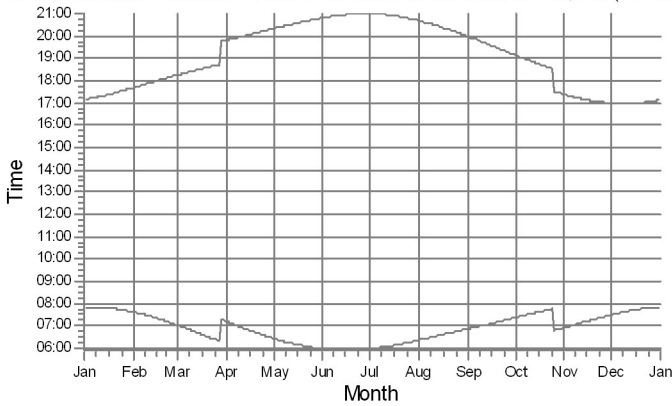
CH13: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



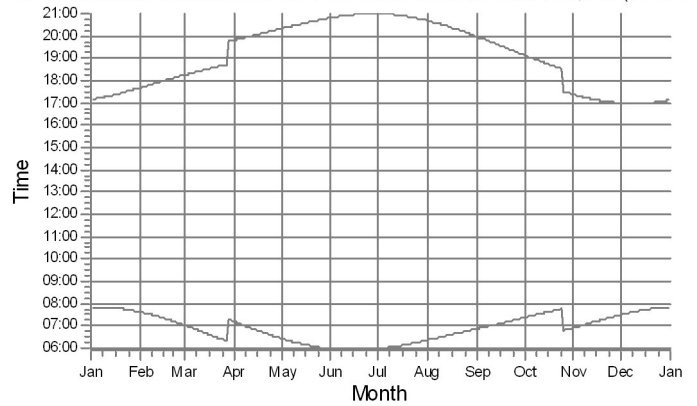
CH14: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



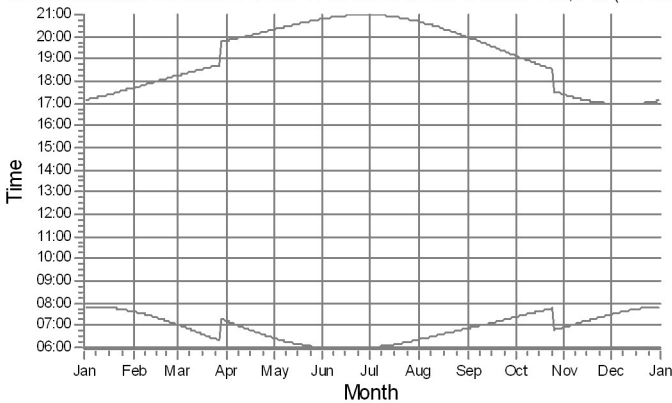
CH15: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



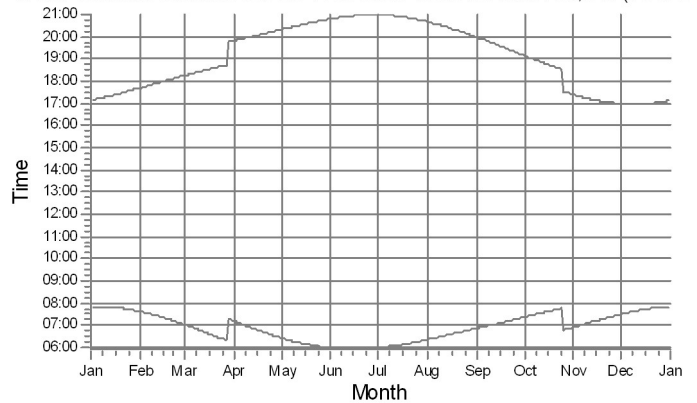
CH16: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH17: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH18: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



Shadow receptors

Project:

Impianto_WPD_Chiaramonti

Licensed user:

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

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

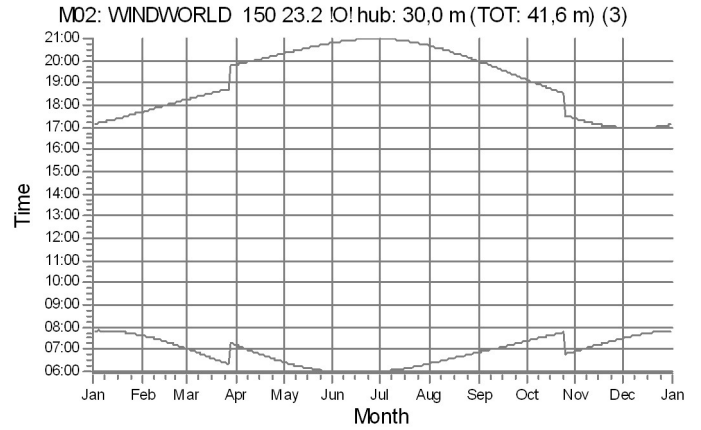
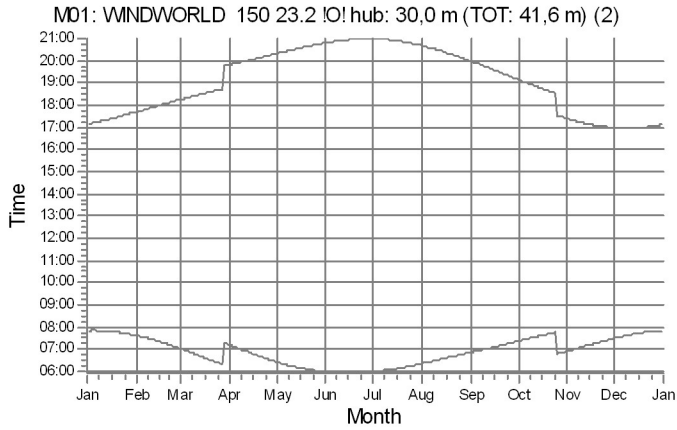
Giuseppe Frongia / direttore@iatprogetti.it

Calculated:



08/12/2021 09:38/3.4.415

SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_abitazioni_2021_12_08



Shadow receptors

COMMITTENTE wpd Su Sassittu S.r.l. Corso d'Italia, 83 - Roma (RM)	 <i>think energy</i>	OGGETTO PARCO EOLICO "SU SASSITTU" STUDIO DI IMPATTO AMBIENTALE	COD. ELABORATO WPD-CH-RA12
 iat CONSULENZA E PROGETTI www.iatprogetti.it	TITOLO ANALISI DEGLI EFFETTI DI SHADOW FLICKERING	PAGINA 34 di 34	

**APPENDICE 2 - REPORT DEI RISULTATI DEL CALCOLO MODELLISTICO –
 SCENARIO DI PROGETTO (BENI E SITI CULTURALI DI CUI ALLA PARTE II DEL
 D.LGS 42/2004)**

SHADOW - Main Result

Calculation: Shadow_cumulativo_beni_2021_12_13

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_Impianto_WPD_Chiaramonti

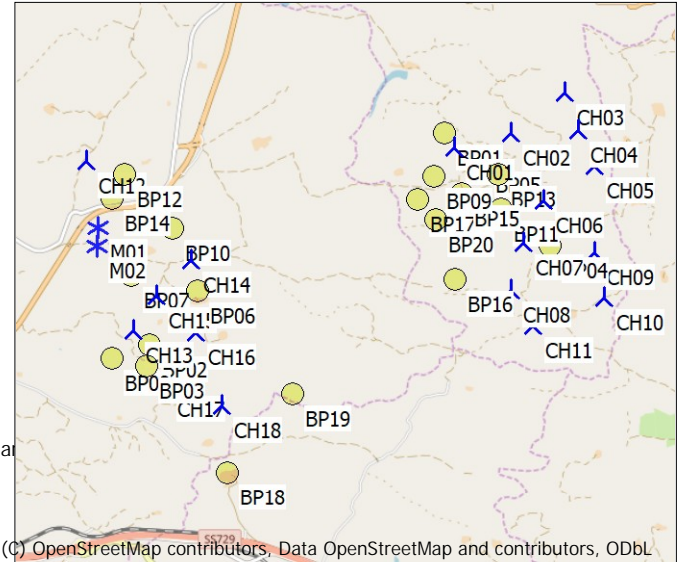
Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

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



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

Scale 1:100.000
 ▲ New WTG * Existing WTG ● Shadow receptor

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]									
CH01	1.485.773	4.504.115	390,4	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH02	1.486.530	4.504.316	392,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH03	1.487.229	4.504.830	397,2	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH04	1.487.413	4.504.340	406,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH05	1.487.629	4.503.870	410,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH06	1.486.963	4.503.408	433,6	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH07	1.486.688	4.502.863	438,5	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH08	1.486.518	4.502.245	464,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH09	1.487.623	4.502.732	453,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH10	1.487.760	4.502.139	460,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH11	1.486.803	4.501.761	460,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH12	1.480.892	4.503.943	450,4	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH13	1.481.518	4.501.717	383,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH14	1.482.281	4.502.650	399,9	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH15	1.481.825	4.502.169	450,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH16	1.482.347	4.501.691	450,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH17	1.481.926	4.501.017	346,1	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
CH18	1.482.688	4.500.725	380,0	Siemens Gamesa SG ...	Yes	Siemens Gamesa	SG 6.6-170!!-6.600	6.600	170,0	165,0	2.037	8,8
M01	1.481.058	4.503.074	420,0	WINDWORLD 150 2...	No	WINDWORLD	-150	150	23,2	30,0	2.500	41,5
M02	1.481.034	4.502.834	386,9	WINDWORLD 150 2...	No	WINDWORLD	-150	150	23,2	30,0	2.500	41,5

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]
BP01	Nuraghe Conca de fossu	1.485.639	4.504.317	364,6	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP02	NURAGHE MANDRAS	1.481.731	4.501.536	378,2	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP03	NURAGHE CORVUS MIGOSOS	1.481.683	4.501.240	330,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP04	Nuraghe Paule Udas	1.487.046	4.502.822	440,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP05	NURAGHE	1.486.145	4.503.944	400,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP06	NURAGHE TRUVINE	1.482.372	4.502.243	430,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP07	NURAGHE SA PALA DE SOS LADROS	1.481.492	4.502.435	440,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP08	NURAGHE	1.481.243	4.501.348	385,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP09	NURAGHE	1.485.506	4.503.730	380,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP10	NURAGHE MARTINE	1.482.046	4.503.059	418,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP11	NURAGHE SCOBERTU	1.486.393	4.503.304	427,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0

To be continued on next page...

SHADOW - Main Result

Calculation: Shadow_cumulativo_beni_2021_12_13

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of windrow	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
BP12	NURAGHE BADDE TETTI	1.481.406	4.503.778	450,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP13	Temio Nuragico Serra Porchileddos	1.486.351	4.503.756	380,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP14	NURAGHE	1.481.238	4.503.459	410,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP15	Menhirs Meddaris	1.485.872	4.503.508	380,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP16	NURAGHE	1.485.786	4.502.372	443,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP17	Circoli Massidda	1.485.293	4.503.425	378,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP18		1.482.752	4.499.839	290,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP19	NURAGHE PENTUMA	1.483.627	4.500.882	341,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
BP20	NURAGHE MASSEDDA	1.485.518	4.503.166	397,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0

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]
BP01	Nuraghe Conca de fossu	319:03	264	2:06
BP02	NURAGHE MANDRAS	111:41	155	1:01
BP03	NURAGHE CORVUS MIGOSOS	208:52	145	2:14
BP04	Nuraghe Paule Udas	390:58	286	1:43
BP05	NURAGHE	141:12	260	1:09
BP06	NURAGHE TRUVINE	123:27	195	1:06
BP07	NURAGHE SA PALA DE SOS LADROS	238:35	279	1:26
BP08	NURAGHE	99:27	172	0:57
BP09	NURAGHE	48:25	154	0:29
BP10	NURAGHE MARTINE	99:53	86	1:24
BP11	NURAGHE SCOBERTU	290:32	262	1:37
BP12	NURAGHE BADDE TETTI	105:05	100	1:14
BP13	Temio Nuragico Serra Porchileddos	92:48	183	0:53
BP14	NURAGHE	32:37	68	0:32
BP15	Menhirs Meddaris	89:51	232	0:39
BP16	NURAGHE	94:04	190	1:05
BP17	Circoli Massidda	30:25	101	0:26
BP18		0:00	0	0:00
BP19	NURAGHE PENTUMA	35:50	75	0:40
BP20	NURAGHE MASSEDDA	58:38	144	0:32

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

No.	Name	Worst case [h/year]
CH01	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (7)	302:24
CH02	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (6)	32:59
CH03	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (2)	14:59
CH04	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (3)	40:37
CH05	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (4)	71:05
CH06	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (5)	253:25
CH07	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (8)	419:05
CH08	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (9)	133:23
CH09	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (10)	120:42
CH10	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (11)	57:22
CH11	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (17)	25:55
CH12	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (16)	105:05
CH13	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (18)	43:45
CH14	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (15)	196:34
CH15	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (19)	216:13
CH16	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (14)	161:11
CH17	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (13)	247:29
CH18	Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (12)	90:38
M01	WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (2)	0:00
M02	WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (3)	0:00

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

SHADOW - Calendar

Calculation: Shadow_cumulativo_beni_2021_12_13 Shadow receptor: BP01 - Nuraghe Conca de fossu

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June			
1	07:49	07:36	08:29 (CH06)	07:01	09:53 (CH01)	07:10	07:36 (CH04)	06:25	05:57
	17:08	17:42	11:34 (CH01)	18:15	11:57 (CH01)	19:49	11:59 (CH01)	20:20	20:49
2	07:49	07:35	08:30 (CH06)	06:59	09:52 (CH01)	07:09	07:35 (CH04)	06:24	05:56
	17:09	17:43	11:35 (CH01)	18:17	11:57 (CH01)	19:50	11:55 (CH01)	20:21	20:50
3	07:49	07:34	08:32 (CH06)	06:58	09:51 (CH01)	07:07	07:35 (CH04)	06:23	05:56
	17:10	17:44	11:37 (CH01)	18:18	11:56 (CH01)	19:51	11:52 (CH01)	20:22	20:51
4	07:49	07:33	10:12 (CH01)	06:56	09:51 (CH01)	07:06	07:35 (CH04)	06:21	05:55
	17:11	17:46	11:39 (CH01)	18:19	11:57 (CH01)	19:52	11:47 (CH01)	20:23	20:52
5	07:49	07:32	10:11 (CH01)	06:55	09:50 (CH01)	07:04	07:35 (CH04)	06:20	05:55
	17:11	17:47	11:40 (CH01)	18:20	11:56 (CH01)	19:53	11:43 (CH01)	20:24	20:52
6	07:49	07:31	10:10 (CH01)	06:53	09:50 (CH01)	07:02	07:36 (CH04)	06:19	05:55
	17:12	17:48	11:42 (CH01)	18:21	11:56 (CH01)	19:54	11:39 (CH01)	20:25	20:53
7	07:49	07:30	10:09 (CH01)	06:51	09:50 (CH01)	07:01	07:36 (CH04)	06:18	05:55
	17:13	17:49	11:43 (CH01)	18:22	11:55 (CH01)	19:55	11:34 (CH01)	20:27	20:54
8	07:49	07:29	10:07 (CH01)	06:50	09:50 (CH01)	06:59	07:37 (CH04)	06:17	05:54
	17:14	08:28 (CH06)	17:50	11:44 (CH01)	18:23	12:5	11:28 (CH01)	20:28	20:54
9	07:49	08:32 (CH06)	07:28	10:06 (CH01)	06:48	09:49 (CH01)	06:57	07:41 (CH04)	05:54
	17:15	08:35 (CH06)	17:52	11:45 (CH01)	18:24	12:5	11:54 (CH01)	19:57	20:55
10	07:49	08:26 (CH06)	07:27	10:05 (CH01)	06:47	09:49 (CH01)	06:56	07:41 (CH02)	05:54
	17:16	11 08:37 (CH06)	17:53	11:46 (CH01)	18:26	12:4	11:53 (CH01)	19:58	20:55
11	07:49	08:24 (CH06)	07:25	10:05 (CH01)	06:45	09:49 (CH01)	06:54	07:41 (CH02)	05:54
	17:17	14 08:38 (CH06)	17:54	11:48 (CH01)	18:27	12:3	11:52 (CH01)	19:59	20:56
12	07:49	08:24 (CH06)	07:24	10:04 (CH01)	06:43	09:49 (CH01)	06:53	07:40 (CH02)	05:54
	17:18	16 08:40 (CH06)	17:55	11:49 (CH01)	18:28	12:2	11:51 (CH01)	20:00	20:56
13	07:48	08:24 (CH06)	07:23	10:02 (CH01)	06:42	09:48 (CH01)	06:51	07:41 (CH02)	05:54
	17:19	17 08:41 (CH06)	17:57	11:49 (CH01)	18:29	12:1	11:49 (CH01)	20:02	20:57
14	07:48	08:23 (CH06)	07:22	10:02 (CH01)	06:40	09:49 (CH01)	06:50	07:41 (CH02)	05:53
	17:21	19 08:42 (CH06)	17:58	11:51 (CH01)	18:30	12:0	11:49 (CH01)	20:03	20:57
15	07:48	08:23 (CH06)	07:20	10:01 (CH01)	06:39	09:48 (CH01)	06:48	07:41 (CH02)	05:53
	17:22	20 08:43 (CH06)	17:59	11:52 (CH01)	18:31	11:9	11:47 (CH01)	20:04	20:58
16	07:47	08:22 (CH06)	07:19	10:00 (CH01)	06:37	09:48 (CH01)	06:47	07:41 (CH02)	05:53
	17:23	22 08:44 (CH06)	18:00	11:52 (CH01)	18:32	11:7	11:45 (CH01)	20:05	20:58
17	07:47	08:23 (CH06)	07:18	09:59 (CH01)	06:35	09:48 (CH01)	06:45	07:42 (CH02)	05:53
	17:24	22 08:45 (CH06)	18:01	11:53 (CH01)	18:33	11:6	11:44 (CH01)	20:06	20:58
18	07:46	08:22 (CH06)	07:16	09:59 (CH01)	06:34	09:48 (CH01)	06:43	07:42 (CH02)	05:54
	17:25	24 08:46 (CH06)	18:03	11:54 (CH01)	18:34	11:3	11:41 (CH01)	20:07	20:59
19	07:46	08:23 (CH06)	07:15	09:58 (CH01)	06:32	09:48 (CH01)	06:42	07:43 (CH02)	05:54
	17:26	24 08:47 (CH06)	18:04	11:54 (CH01)	18:35	11:1	11:39 (CH01)	20:08	20:59
20	07:45	08:22 (CH06)	07:14	09:57 (CH01)	06:30	09:48 (CH01)	06:40	07:44 (CH02)	05:54
	17:27	46 11:02 (CH01)	18:05	11:55 (CH01)	18:36	10:9	11:37 (CH01)	20:09	20:59
21	07:45	08:22 (CH06)	07:12	09:56 (CH01)	06:29	09:48 (CH01)	06:39	07:45 (CH02)	05:54
	17:29	54 11:06 (CH01)	18:06	11:55 (CH01)	18:37	10:6	11:34 (CH01)	20:10	21:00
22	07:44	08:23 (CH06)	07:11	09:56 (CH01)	06:27	09:48 (CH01)	06:38	07:46 (CH02)	05:54
	17:30	62 11:11 (CH01)	18:07	11:56 (CH01)	18:38	10:3	11:31 (CH01)	20:11	21:00
23	07:43	08:23 (CH06)	07:10	09:56 (CH01)	06:25	09:49 (CH01)	06:36	07:48 (CH02)	05:54
	17:31	68 11:14 (CH01)	18:09	11:57 (CH01)	18:40	10:0	11:29 (CH01)	20:12	21:00
24	07:43	08:23 (CH06)	07:08	09:55 (CH01)	06:24	09:49 (CH01)	06:35	07:51 (CH02)	05:55
	17:32	72 11:16 (CH01)	18:10	11:56 (CH01)	18:41	9:7	11:26 (CH01)	20:13	21:00
25	07:42	08:23 (CH06)	07:07	09:55 (CH01)	06:22	09:49 (CH01)	06:33	07:54 (CH02)	05:55
	17:33	78 11:19 (CH01)	18:11	11:57 (CH01)	18:42	9:4	11:23 (CH01)	20:14	21:00
26	07:41	08:24 (CH06)	07:05	09:54 (CH01)	06:20	09:50 (CH01)	06:32	06:00	05:55
	17:34	82 11:22 (CH01)	18:12	11:57 (CH01)	18:43	9:0	11:20 (CH01)	20:15	21:00
27	07:40	08:24 (CH06)	07:04	09:54 (CH01)	06:19	06:42 (CH04)	06:31	05:59	05:56
	17:36	86 11:24 (CH01)	18:13	11:57 (CH01)	18:44	10:0	11:17 (CH01)	20:16	21:00
28	07:40	08:25 (CH06)	07:02	09:53 (CH01)	06:17	06:40 (CH04)	06:29	05:59	05:56
	17:37	88 11:26 (CH01)	18:14	11:57 (CH01)	18:45	11:5	11:13 (CH01)	20:17	21:00
29	07:39	08:26 (CH06)	07:01	07:15	07:39 (CH04)	06:28	05:58	05:56	05:56
	17:38	90 11:28 (CH01)	18:15	19:46	12:10 (CH01)	20:18	20:47	21:00	21:00
30	07:38	08:26 (CH06)	07:00	07:14	07:37 (CH04)	06:26	05:58	05:57	05:57
	17:39	94 11:30 (CH01)	18:16	19:47	12:06 (CH01)	20:19	20:48	21:00	21:00
31	07:37	08:27 (CH06)	06:59	07:12	07:36 (CH04)	06:25	05:57	05:57	21:00
	17:41	95 11:32 (CH01)	18:17	19:48	12:02 (CH01)	20:19	20:49	20:49	20:49
Potential sun hours	298	298	370	398	447	451			
Total, worst case	1116	3029	3577	1335	446				

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: Shadow_cumulativo_beni_2021_12_13 Shadow receptor: BP01 - Nuraghe Conca de fossu

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:57 21:00	06:21 20:42	06:52 (CH03) 19:59	07:40 (CH02) 19:09	10:28 (CH01) 17:23	09:35 (CH01) 16:59
2	05:58 21:00	06:22 20:41	06:52 (CH03) 19:57	07:40 (CH02) 19:07	10:28 (CH01) 17:22	09:36 (CH01) 16:59
3	05:58 21:00	06:23 20:39	06:52 (CH03) 19:56	07:39 (CH04) 19:06	10:27 (CH01) 17:20	09:37 (CH01) 16:58
4	05:59 21:00	06:24 20:38	06:52 (CH03) 19:54	07:35 (CH04) 19:04	10:27 (CH01) 17:19	09:39 (CH01) 16:58
5	05:59 21:00	06:25 20:37	06:52 (CH03) 19:53	07:33 (CH04) 19:02	10:27 (CH01) 17:18	09:40 (CH01) 16:58
6	06:00 20:59	06:26 20:36	06:52 (CH03) 19:51	07:32 (CH04) 19:01	10:26 (CH01) 17:17	09:41 (CH01) 16:58
7	06:01 20:59	06:27 20:35	06:53 (CH03) 19:49	07:30 (CH04) 18:59	10:26 (CH01) 17:16	08:07 (CH06) 16:58
8	06:01 20:59	06:28 20:34	06:53 (CH03) 19:48	07:29 (CH04) 18:57	10:26 (CH01) 17:15	08:08 (CH06) 16:58
9	06:02 20:58	06:29 20:32	06:54 (CH03) 19:46	07:28 (CH04) 18:56	10:26 (CH01) 17:14	08:01 (CH06) 16:58
10	06:03 20:58	06:30 20:31	06:56 (CH03) 19:44	07:28 (CH04) 18:54	10:25 (CH01) 17:13	07:59 (CH06) 16:58
11	06:03 20:58	06:31 20:30	06:58 (CH03) 19:43	07:28 (CH04) 18:53	10:25 (CH01) 17:12	07:58 (CH06) 16:58
12	06:04 20:57	06:32 20:28	07:02 19:41	07:28 (CH04) 18:51	10:25 (CH01) 17:11	07:58 (CH06) 16:58
13	06:05 20:57	06:33 20:27	07:03 19:39	07:28 (CH04) 18:50	10:25 (CH01) 17:10	07:57 (CH06) 16:58
14	06:05 20:56	06:34 20:26	07:04 19:38	07:29 (CH04) 18:48	10:25 (CH01) 17:09	07:57 (CH06) 16:58
15	06:06 20:56	06:35 20:24	07:05 19:36	07:30 (CH04) 18:46	10:26 (CH01) 17:08	07:56 (CH06) 16:58
16	06:07 20:55	06:35 20:23	07:06 19:34	07:31 (CH04) 18:45	10:26 (CH01) 17:07	07:57 (CH06) 16:59
17	06:08 20:54	06:36 20:22	07:07 19:32	07:35 (CH04) 18:43	10:26 (CH01) 17:06	07:57 (CH06) 16:59
18	06:08 20:54	06:37 20:20	08:00 (CH02) 19:31	10:37 (CH01) 18:42	10:26 (CH01) 17:06	07:57 (CH06) 16:59
19	06:09 20:53	07:02 (CH03) 06:38	07:56 (CH02) 07:09	10:36 (CH01) 18:40	10:27 (CH01) 17:05	07:57 (CH06) 17:00
20	06:10 20:52	07:06 (CH03) 06:39	08:13 (CH02) 07:10	10:35 (CH01) 18:39	10:27 (CH01) 17:04	07:58 (CH06) 17:00
21	06:11 20:52	07:08 (CH03) 06:40	08:16 (CH02) 07:11	10:35 (CH01) 18:38	10:27 (CH01) 17:04	07:58 (CH06) 17:01
22	06:12 20:51	06:56 (CH03) 06:41	08:17 (CH02) 07:12	10:34 (CH01) 18:38	10:28 (CH01) 17:04	07:58 (CH06) 17:01
23	06:13 20:50	07:11 (CH03) 06:42	08:19 (CH02) 07:13	10:33 (CH01) 18:35	10:29 (CH01) 17:03	07:59 (CH06) 17:02
24	06:14 20:49	06:55 (CH03) 06:43	07:46 (CH02) 07:14	10:32 (CH01) 18:33	10:29 (CH01) 17:02	07:59 (CH06) 17:02
25	06:14 20:48	07:13 (CH03) 06:44	08:20 (CH02) 07:15	10:31 (CH01) 18:32	10:29 (CH01) 17:01	08:01 (CH06) 17:03
26	06:15 20:47	06:54 (CH03) 06:45	07:45 (CH02) 07:16	10:31 (CH01) 18:31	09:30 (CH01) 17:01	08:01 (CH06) 17:03
27	06:16 20:47	07:14 (CH03) 06:46	08:21 (CH02) 07:17	10:30 (CH01) 18:30	11:21 (CH01) 17:01	08:02 (CH06) 17:04
28	06:17 20:46	06:52 (CH03) 06:47	07:43 (CH02) 07:18	10:30 (CH01) 18:29	09:31 (CH01) 17:01	08:03 (CH06) 17:05
29	06:18 20:45	07:14 (CH03) 06:48	08:22 (CH02) 07:19	10:29 (CH01) 18:28	11:21 (CH01) 17:00	08:04 (CH06) 17:05
30	06:19 20:44	06:52 (CH03) 06:49	08:23 (CH02) 07:20	10:29 (CH01) 18:27	09:32 (CH01) 17:00	08:05 (CH06) 17:06
31	06:20 20:43	07:16 (CH03) 06:50	08:23 (CH02) 07:21	10:29 (CH01) 18:26	11:19 (CH01) 16:59	08:05 (CH06) 17:07
Potential sun hours	458	427	375	346	299	289
Total, worst case	233	670	2977	3695	2026	39

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP02 - NURAGHE MANDRAS

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June		
1	07:49 17:08 33	08:28 (CH18) 09:01 (CH18)	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:50 59	07:20 (CH16) 08:19 (CH16)
2	07:49 17:09 33	08:28 (CH18) 09:01 (CH18)	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:57 20:50 60	07:20 (CH16) 08:20 (CH16)
3	07:50 17:10 33	08:29 (CH18) 09:02 (CH18)	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51 59	07:21 (CH16) 08:20 (CH16)
4	07:50 17:11 33	08:29 (CH18) 09:02 (CH18)	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52 60	07:20 (CH16) 08:20 (CH16)
5	07:50 17:12 32	08:30 (CH18) 09:02 (CH18)	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52 60	07:20 (CH16) 08:20 (CH16)
6	07:50 17:13 32	08:30 (CH18) 09:02 (CH18)	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:26	05:55 20:53 3	07:21 (CH16) 08:21 (CH16)
7	07:50 17:14 32	08:30 (CH18) 09:02 (CH18)	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54 17	07:20 (CH16) 08:20 (CH16)
8	07:49 17:15 32	08:31 (CH18) 09:03 (CH18)	07:29 17:51	06:50 18:24	06:59 19:56	06:17 20:28	05:55 20:54 24	07:20 (CH16) 08:21 (CH16)
9	07:49 17:16 31	08:32 (CH18) 09:03 (CH18)	07:28 17:52	06:48 18:25	06:58 19:58	06:16 20:29	05:54 20:55 29	07:21 (CH16) 08:21 (CH16)
10	07:49 17:17 30	08:33 (CH18) 09:03 (CH18)	07:27 17:53	06:47 18:26	06:56 19:59	06:15 20:30	05:54 20:55 32	07:21 (CH16) 08:21 (CH16)
11	07:49 17:18 30	08:33 (CH18) 09:03 (CH18)	07:26 17:54	06:45 18:27	06:55 20:00	06:14 20:31	05:54 20:56 36	07:21 (CH16) 08:22 (CH16)
12	07:49 17:19 29	08:34 (CH18) 09:03 (CH18)	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:56 38	07:21 (CH16) 08:22 (CH16)
13	07:48 17:20 28	08:35 (CH18) 09:03 (CH18)	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57 42	07:22 (CH16) 08:22 (CH16)
14	07:48 17:21 27	08:36 (CH18) 09:03 (CH18)	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57 44	07:22 (CH16) 08:22 (CH16)
15	07:48 17:22 26	08:37 (CH18) 09:03 (CH18)	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58 45	07:22 (CH16) 08:23 (CH16)
16	07:47 17:23 25	08:37 (CH18) 09:02 (CH18)	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58 47	07:22 (CH16) 08:23 (CH16)
17	07:47 17:24 23	08:39 (CH18) 09:02 (CH18)	07:18 18:02	06:35 18:33	06:45 20:06	06:08 20:37	05:54 20:59 49	07:22 (CH16) 08:23 (CH16)
18	07:46 17:25 21	08:40 (CH18) 09:01 (CH18)	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:38	05:54 20:59 50	07:22 (CH16) 08:23 (CH16)
19	07:46 17:26 18	08:42 (CH18) 09:00 (CH18)	07:15 18:04	06:32 18:35	06:42 20:08	06:06 20:38	05:54 20:59 52	07:23 (CH16) 08:23 (CH16)
20	07:45 17:28 15	08:44 (CH18) 08:59 (CH18)	07:14 18:05	06:30 18:37	06:41 20:09	06:05 20:39	05:54 20:59 52	07:22 (CH16) 08:23 (CH16)
21	07:45 17:29 10	08:46 (CH18) 08:56 (CH18)	07:13 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00 53	07:22 (CH16) 08:23 (CH16)
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	06:03 20:41	05:54 21:00 54	07:23 (CH16) 08:24 (CH16)
23	07:44 17:31	07:10 18:09	06:26 18:40	06:36 20:12	06:02 20:42	06:02 20:42	05:55 21:00 56	07:23 (CH16) 08:24 (CH16)
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	06:02 20:43	05:55 21:00 56	07:23 (CH16) 08:24 (CH16)
25	07:42 17:34	07:07 18:11	06:22 18:42	06:34 20:14	06:01 20:44	06:01 20:44	05:55 21:00 57	07:24 (CH16) 08:25 (CH16)
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	06:00 20:45	05:56 21:00 57	07:24 (CH16) 08:25 (CH16)
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:46	06:00 20:46	05:56 21:00 57	07:24 (CH16) 08:25 (CH16)
28	07:40 17:37	07:02 18:15	06:17 18:45	06:29 20:17	05:59 20:46	05:59 20:46	05:56 21:01 58	07:25 (CH16) 08:25 (CH16)
29	07:39 17:38		07:16 19:46	06:28 20:18	05:59 20:47	05:59 20:47	05:57 21:00 58	07:25 (CH16) 08:25 (CH16)
30	07:38 17:40		07:14 19:47	06:27 20:19	05:58 20:48	05:58 20:48	05:57 21:00 59	07:25 (CH16) 08:26 (CH16)
31	07:37 17:41		07:12 19:48		05:57 20:49	05:57 20:49	05:57 08:20 (CH16) 60	
Potential sun hours	298	298	370	398	447	451	1815	
Total, worst case	573				1185			

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP02 - NURAGHE MANDRAS

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December				
1	05:58 21:00	07:25 (CH16) 08:26 (CH16)	06:21 20:42	07:41 (CH16) 08:19 (CH16)	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59	30	08:15 (CH18) 08:45 (CH18)
2	05:58 21:00	07:25 (CH16) 08:26 (CH16)	06:22 20:41	07:42 (CH16) 08:17 (CH16)	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59	30	08:15 (CH18) 08:45 (CH18)
3	05:59 21:00	07:26 (CH16) 08:26 (CH16)	06:23 20:40	07:44 (CH16) 08:15 (CH16)	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59	31	08:15 (CH18) 08:46 (CH18)
4	05:59 21:00	07:26 (CH16) 08:27 (CH16)	06:24 20:38	07:46 (CH16) 08:13 (CH16)	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58	32	08:15 (CH18) 08:47 (CH18)
5	06:00 21:00	07:26 (CH16) 08:26 (CH16)	06:25 20:37	07:49 (CH16) 08:11 (CH16)	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58	32	08:15 (CH18) 08:47 (CH18)
6	06:00 20:59	07:27 (CH16) 08:27 (CH16)	06:26 20:36	07:53 (CH16) 08:07 (CH16)	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58	32	08:16 (CH18) 08:48 (CH18)
7	06:01 20:59	07:26 (CH16) 08:27 (CH16)	06:27 20:35		06:57 19:49	07:27 18:59	07:02 17:16	07:35 16:58	33	08:16 (CH18) 08:49 (CH18)
8	06:01 20:59	07:27 (CH16) 08:27 (CH16)	06:28 20:34		06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58	33	08:16 (CH18) 08:49 (CH18)
9	06:02 20:59	07:28 (CH16) 08:28 (CH16)	06:29 20:32		06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58	33	08:17 (CH18) 08:50 (CH18)
10	06:03 20:58	07:27 (CH16) 08:27 (CH16)	06:30 20:31		07:00 19:44	07:30 18:54	07:05 17:13	07:38 16:58	33	08:17 (CH18) 08:50 (CH18)
11	06:03 20:58	07:28 (CH16) 08:27 (CH16)	06:31 20:30		07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58	33	08:18 (CH18) 08:51 (CH18)
12	06:04 20:57	07:29 (CH16) 08:28 (CH16)	06:32 20:29		07:02 19:41	07:32 18:51	07:07 17:11	07:39 16:58	34	08:18 (CH18) 08:52 (CH18)
13	06:05 20:57	07:28 (CH16) 08:27 (CH16)	06:33 20:27		07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58	34	08:18 (CH18) 08:52 (CH18)
14	06:06 20:56	07:29 (CH16) 08:27 (CH16)	06:34 20:26		07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59	33	08:19 (CH18) 08:52 (CH18)
15	06:06 20:56	07:29 (CH16) 08:28 (CH16)	06:35 20:25		07:05 19:36	07:35 18:47	07:11 17:08	07:41 16:59	34	08:19 (CH18) 08:53 (CH18)
16	06:07 20:55	07:29 (CH16) 08:27 (CH16)	06:36 20:23		07:06 19:34	07:37 18:45	07:12 17:08	07:42 16:59	34	08:20 (CH18) 08:54 (CH18)
17	06:08 20:55	07:30 (CH16) 08:27 (CH16)	06:37 20:22		07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59	34	08:20 (CH18) 08:54 (CH18)
18	06:09 20:54	07:30 (CH16) 08:27 (CH16)	06:38 20:20		07:08 19:31	07:39 18:42	07:14 17:06	07:44 17:00	34	08:21 (CH18) 08:55 (CH18)
19	06:10 20:53	07:31 (CH16) 08:27 (CH16)	06:39 20:19		07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00	33	08:21 (CH18) 08:54 (CH18)
20	06:10 20:52	07:32 (CH16) 08:27 (CH16)	06:40 20:18		07:10 19:28	07:41 18:39	07:17 17:05	07:45 17:00	33	08:22 (CH18) 08:55 (CH18)
21	06:11 20:52	07:31 (CH16) 08:26 (CH16)	06:41 20:16		07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01	33	08:22 (CH18) 08:55 (CH18)
22	06:12 20:51	07:32 (CH16) 08:26 (CH16)	06:42 20:15		07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01	33	08:23 (CH18) 08:56 (CH18)
23	06:13 20:50	07:33 (CH16) 08:26 (CH16)	06:43 20:13		07:13 19:23	07:44 18:35	07:20 17:03	07:46 17:02	33	08:23 (CH18) 08:56 (CH18)
24	06:14 20:49	07:34 (CH16) 08:25 (CH16)	06:44 20:12		07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02	33	08:24 (CH18) 08:57 (CH18)
25	06:15 20:48	07:34 (CH16) 08:25 (CH16)	06:45 20:10		07:15 19:19	06:46 17:32	07:22 17:02	07:47 17:03	33	08:24 (CH18) 08:57 (CH18)
26	06:16 20:48	07:35 (CH16) 08:25 (CH16)	06:46 20:09		07:16 19:17	06:48 17:31	07:24 17:01	07:48 17:04	34	08:24 (CH18) 08:58 (CH18)
27	06:17 20:47	07:36 (CH16) 08:24 (CH16)	06:47 20:07		07:17 19:16	06:49 17:29	07:25 17:01	07:48 17:04	34	08:25 (CH18) 08:59 (CH18)
28	06:17 20:46	07:36 (CH16) 08:22 (CH16)	06:48 20:05		07:18 19:14	06:50 17:28	07:26 17:00	07:48 17:05	34	08:25 (CH18) 08:59 (CH18)
29	06:18 20:45	07:37 (CH16) 08:22 (CH16)	06:48 20:04		07:19 19:12	06:51 17:27	07:27 17:00	07:49 17:06	33	08:26 (CH18) 08:59 (CH18)
30	06:19 20:44	07:38 (CH16) 08:21 (CH16)	06:49 20:02		07:20 19:11	06:52 17:26	07:28 16:59	07:49 17:06	33	08:26 (CH18) 08:59 (CH18)
31	06:20 20:43	07:39 (CH16) 08:20 (CH16)	06:50 20:01			06:53 17:24		07:49 17:07	34	08:26 (CH18) 09:00 (CH18)
Potential sun hours	458		427		375	346	299	289		
Total, worst case	1718		167				221		1022	

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP03 - NURAGHE CORVUS MIGOSOS

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June			
1	07:49 17:08	07:36 17:42	09:18 (CH17) 10:32 (CH17)	07:01 18:16	09:02 (CH17) 10:44 (CH17)	07:11 19:49	06:25 20:20	05:57 20:50	
2	07:49 17:09	07:35 17:43	09:17 (CH17) 10:33 (CH17)	06:59 18:17	09:02 (CH17) 10:43 (CH17)	07:09 19:50	06:24 20:21	05:57 20:50	
3	07:50 17:10	07:34 17:45	08:17 (CH18) 10:34 (CH17)	06:58 18:18	09:02 (CH17) 10:43 (CH17)	07:07 19:51	06:23 20:23	05:56 20:51	
4	07:50 17:11	07:33 17:46	08:14 (CH18) 10:36 (CH17)	06:56 18:19	09:01 (CH17) 10:42 (CH17)	07:06 19:52	06:22 20:24	05:56 20:54	
5	07:50 17:12	07:32 17:47	08:12 (CH18) 10:37 (CH17)	06:55 18:20	09:01 (CH17) 10:41 (CH17)	07:04 19:53	06:20 20:25	05:55 20:52	
6	07:50 17:13	07:31 17:48	08:11 (CH18) 10:38 (CH17)	06:53 18:21	09:02 (CH17) 10:40 (CH17)	07:03 19:54	06:19 20:26	05:55 20:53	
7	07:50 17:14	07:30 17:49	08:10 (CH18) 10:39 (CH17)	06:52 18:22	09:01 (CH17) 10:39 (CH17)	07:01 19:55	06:18 20:27	05:55 20:54	
8	07:49 17:15	07:29 17:51	08:09 (CH18) 10:40 (CH17)	06:50 18:24	09:02 (CH17) 10:38 (CH17)	06:59 19:56	06:17 20:28	05:55 20:54	
9	07:49 17:16	07:28 17:52	08:08 (CH18) 10:40 (CH17)	06:48 18:25	09:02 (CH17) 10:36 (CH17)	06:58 19:58	06:16 20:29	05:54 20:55	
10	07:49 17:17	07:27 17:53	08:07 (CH18) 10:41 (CH17)	06:47 18:26	09:01 (CH17) 10:35 (CH17)	06:56 19:59	06:15 20:30	05:54 20:55	
11	07:49 17:18	07:26 17:54	08:07 (CH18) 10:42 (CH17)	06:45 18:27	09:02 (CH17) 10:34 (CH17)	06:55 20:00	06:14 20:31	05:54 20:56	
12	07:49 17:19	07:24 17:56	08:07 (CH18) 10:43 (CH17)	06:44 18:28	09:02 (CH17) 10:32 (CH17)	06:53 20:01	06:12 20:32	05:54 20:56	
13	07:48 17:20	07:23 17:57	08:06 (CH18) 10:43 (CH17)	06:42 18:29	09:03 (CH17) 10:31 (CH17)	06:51 20:02	06:11 20:33	05:54 20:57	
14	07:48 17:21	07:22 17:58	08:06 (CH18) 10:44 (CH17)	06:40 18:30	09:03 (CH17) 10:29 (CH17)	06:50 20:03	06:10 20:34	05:54 20:57	
15	07:48 17:22	07:21 17:59	08:06 (CH18) 10:45 (CH17)	06:39 18:31	09:03 (CH17) 10:27 (CH17)	06:48 20:04	06:09 20:35	05:54 20:58	
16	07:47 17:23	07:19 18:00	08:07 (CH18) 10:46 (CH17)	06:37 18:32	09:04 (CH17) 10:25 (CH17)	06:47 20:05	06:08 20:36	05:54 20:58	
17	07:47 17:24	07:18 18:02	08:06 (CH18) 10:45 (CH17)	06:35 18:33	09:04 (CH17) 10:23 (CH17)	06:45 20:06	06:08 20:37	05:54 20:59	
18	07:46 17:25	09:46 (CH17) 09:56 (CH17)	07:17 18:03	08:07 (CH18) 10:46 (CH17)	06:34 18:34	09:04 (CH17) 10:21 (CH17)	06:44 20:07	06:07 20:38	05:54 20:59
19	07:46 17:26	09:41 (CH17) 10:03 (CH17)	07:15 18:04	08:06 (CH18) 10:46 (CH17)	06:32 18:35	09:06 (CH17) 10:19 (CH17)	06:42 20:08	06:06 20:38	05:54 20:59
20	07:45 17:28	09:37 (CH17) 10:06 (CH17)	07:14 18:05	08:07 (CH18) 10:46 (CH17)	06:30 18:37	09:06 (CH17) 10:16 (CH17)	06:41 20:09	06:05 20:39	05:54 20:59
21	07:45 17:29	09:34 (CH17) 10:09 (CH17)	07:13 18:06	08:08 (CH18) 10:47 (CH17)	06:29 18:38	09:07 (CH17) 10:13 (CH17)	06:39 20:10	06:04 20:40	05:54 21:00
22	07:44 17:30	09:33 (CH17) 10:13 (CH17)	07:11 18:08	08:08 (CH18) 10:46 (CH17)	06:27 18:39	09:08 (CH17) 10:12 (CH17)	06:38 20:11	06:03 20:41	05:54 21:00
23	07:44 17:31	09:31 (CH17) 10:15 (CH17)	07:10 18:09	08:10 (CH18) 10:47 (CH17)	06:26 18:40	09:09 (CH17) 10:09 (CH17)	06:36 20:12	06:02 20:42	05:55 21:00
24	07:43 17:32	09:29 (CH17) 10:17 (CH17)	07:08 18:10	08:11 (CH18) 10:46 (CH17)	06:24 18:41	09:10 (CH17) 10:05 (CH17)	06:35 20:13	06:02 20:43	05:55 21:00
25	07:42 17:34	09:27 (CH17) 10:19 (CH17)	07:07 18:11	08:13 (CH18) 10:46 (CH17)	06:22 18:42	09:12 (CH17) 10:03 (CH17)	06:34 20:14	06:01 20:44	05:55 21:00
26	07:41 17:35	09:26 (CH17) 10:22 (CH17)	07:05 18:12	08:15 (CH18) 10:45 (CH17)	06:21 18:43	09:13 (CH17) 09:59 (CH17)	06:32 20:15	06:00 20:45	05:56 21:00
27	07:41 17:36	09:25 (CH17) 10:24 (CH17)	07:04 18:13	08:20 (CH18) 10:45 (CH17)	06:19 18:44	09:15 (CH17) 09:55 (CH17)	06:31 20:16	06:00 20:46	05:56 21:00
28	07:40 17:37	09:23 (CH17) 10:26 (CH17)	07:02 18:15	09:02 (CH17) 10:44 (CH17)	06:17 18:45	09:18 (CH17) 09:52 (CH17)	06:29 20:17	05:59 20:46	05:56 21:01
29	07:39 17:38	09:22 (CH17) 10:27 (CH17)	07:01 18:16	07:16 19:46	06:16 26	10:21 (CH17) 10:47 (CH17)	06:28 20:18	05:59 20:47	05:57 21:00
30	07:38 17:40	09:20 (CH17) 10:29 (CH17)	07:00 18:17	07:14 19:47	13	10:26 (CH17) 10:39 (CH17)	06:27 20:19	05:58 20:48	05:57 21:00
31	07:37 17:41	09:19 (CH17) 10:30 (CH17)	06:59 18:18	07:12 19:48			05:57 20:49		
Potential sun hours	298	298	370	398	447	451			
Total, worst case	663	3302	2260						

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP03 - NURAGHE CORVUS MIGOSOS

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December		
1	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	89 09:42 (CH17) 11:11 (CH17)	06:55 17:23	123 07:37 (CH18) 10:11 (CH17)	07:29 16:59
2	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	91 09:41 (CH17) 11:12 (CH17)	06:56 17:22	119 07:38 (CH18) 10:10 (CH17)	07:30 16:59
3	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	93 09:40 (CH17) 11:13 (CH17)	06:57 17:21	117 07:38 (CH18) 10:09 (CH17)	07:31 16:59
4	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	95 09:39 (CH17) 11:14 (CH17)	06:58 17:19	112 07:40 (CH18) 10:09 (CH17)	07:32 16:58
5	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	95 09:39 (CH17) 11:14 (CH17)	06:59 17:18	108 07:41 (CH18) 10:08 (CH17)	07:33 16:58
6	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	97 09:38 (CH17) 11:15 (CH17)	07:00 17:17	103 07:43 (CH18) 10:07 (CH17)	07:34 16:58
7	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	98 09:37 (CH17) 11:15 (CH17)	07:02 17:16	97 07:44 (CH18) 10:05 (CH17)	07:35 16:58
8	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	99 09:37 (CH17) 11:16 (CH17)	07:03 17:15	89 07:48 (CH18) 10:05 (CH17)	07:36 16:58
9	06:02 20:59	06:29 20:32	06:59 19:46	07:29 18:56	100 09:36 (CH17) 11:16 (CH17)	07:04 17:14	76 08:48 (CH17) 10:04 (CH17)	07:37 16:58
10	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:54	101 09:36 (CH17) 11:17 (CH17)	07:05 17:13	73 08:49 (CH17) 10:02 (CH17)	07:38 16:58
11	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	102 09:35 (CH17) 11:17 (CH17)	07:06 17:12	71 08:50 (CH17) 10:01 (CH17)	07:38 16:58
12	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	102 09:35 (CH17) 11:17 (CH17)	07:07 17:11	69 08:52 (CH17) 10:01 (CH17)	07:39 16:58
13	06:05 20:57	06:33 20:27	07:03 19:39	10:18 (CH17) 10:29 (CH17)	102 07:33 18:50	07:09 17:10	65 08:54 (CH17) 09:59 (CH17)	07:40 16:58
14	06:06 20:56	06:34 20:26	07:04 19:38	10:12 (CH17) 10:36 (CH17)	103 07:34 18:48	07:10 17:09	62 08:55 (CH17) 09:57 (CH17)	07:41 16:59
15	06:06 20:56	06:35 20:25	07:05 19:36	10:08 (CH17) 10:40 (CH17)	113 07:35 18:47	07:11 17:08	59 08:58 (CH17) 09:57 (CH17)	07:41 16:59
16	06:07 20:55	06:36 20:23	07:06 19:34	10:05 (CH17) 10:44 (CH17)	120 07:37 18:45	07:12 17:08	56 08:59 (CH17) 09:55 (CH17)	07:42 16:59
17	06:08 20:55	06:37 20:22	07:07 19:33	10:02 (CH17) 10:47 (CH17)	124 07:38 18:44	07:13 17:07	52 09:01 (CH17) 09:53 (CH17)	07:43 16:59
18	06:09 20:54	06:38 20:20	07:08 19:31	10:00 (CH17) 10:50 (CH17)	127 07:39 18:42	07:14 17:06	48 09:03 (CH17) 09:51 (CH17)	07:44 17:00
19	06:10 20:53	06:39 20:19	07:09 19:29	09:58 (CH17) 10:52 (CH17)	130 07:40 18:41	07:16 17:05	44 09:05 (CH17) 09:49 (CH17)	07:44 17:00
20	06:10 20:52	06:40 20:18	07:10 19:28	09:56 (CH17) 10:54 (CH17)	132 07:41 18:39	07:17 17:05	40 09:08 (CH17) 09:48 (CH17)	07:45 17:00
21	06:11 20:52	06:41 20:16	07:11 19:26	09:54 (CH17) 10:56 (CH17)	132 07:42 18:38	07:18 17:04	35 09:10 (CH17) 09:45 (CH17)	07:45 17:01
22	06:12 20:51	06:42 20:15	07:12 19:24	09:52 (CH17) 10:58 (CH17)	134 07:43 18:36	07:19 17:03	29 09:13 (CH17) 09:42 (CH17)	07:46 17:01
23	06:13 20:50	06:43 20:13	07:13 19:23	09:51 (CH17) 11:00 (CH17)	134 07:44 18:35	07:20 17:03	22 09:17 (CH17) 09:39 (CH17)	07:46 17:02
24	06:14 20:49	06:44 20:12	07:14 19:21	09:50 (CH17) 11:02 (CH17)	134 07:45 18:34	07:21 17:02	10 09:23 (CH17) 09:33 (CH17)	07:47 17:02
25	06:15 20:48	06:45 20:10	07:15 19:19	09:48 (CH17) 11:03 (CH17)	133 06:46 17:32	07:22 17:02	07:47 17:03	07:47 17:03
26	06:16 20:48	06:46 20:09	07:16 19:17	09:47 (CH17) 11:05 (CH17)	133 06:48 17:31	07:24 17:01	07:48 17:04	07:48 17:04
27	06:17 20:47	06:47 20:07	07:17 19:16	09:46 (CH17) 11:06 (CH17)	133 06:49 17:29	07:25 17:01	07:48 17:04	07:48 17:04
28	06:17 20:46	06:48 20:05	07:18 19:14	09:45 (CH17) 11:08 (CH17)	131 06:50 17:28	07:26 17:00	07:48 17:05	07:48 17:05
29	06:18 20:45	06:48 20:04	07:19 19:12	09:44 (CH17) 11:09 (CH17)	129 06:51 17:27	07:27 17:00	07:49 17:06	07:49 17:06
30	06:19 20:44	06:49 20:02	07:20 19:11	09:43 (CH17) 11:10 (CH17)	127 06:52 17:26	07:28 16:59	07:49 17:06	07:49 17:06
31	06:20 20:43	06:50 20:01		06:53 17:24	125 07:37 (CH18) 10:12 (CH17)		07:49 17:07	07:49 17:07
Potential sun hours	458	427	375	346	299	289		
Total, worst case			1070	3558	1679	289		

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: Shadow_cumulativo_beni_2021_12_13 Shadow receptor: BP04 - Nuraghe Paule Udas

Assumptions for shadow calculations

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

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

	January		February		March		April		May		June	
1	07:49	08:42 (CH10)	07:36	07:01	07:10	08:10 (CH09)	06:25	17:34 (CH07)	05:57	17:36 (CH07)		
	17:08	95 15:55 (CH08)	17:42	18:15	19:49	63 09:13 (CH09)	20:20	93 19:07 (CH07)	20:49	97 19:13 (CH07)		
2	07:49	08:43 (CH10)	07:35	06:59	07:09	08:10 (CH09)	06:24	94 17:34 (CH07)	05:56	17:37 (CH07)		
	17:09	94 15:55 (CH08)	17:43	18:17	19:50	62 09:12 (CH09)	20:21	94 19:08 (CH07)	20:50	97 19:14 (CH07)		
3	07:49	08:43 (CH10)	07:34	06:58	07:07	08:10 (CH09)	06:23	95 17:34 (CH07)	05:56	17:36 (CH07)		
	17:10	95 15:56 (CH08)	17:44	18:18	19:51	63 09:13 (CH09)	20:22	95 19:09 (CH07)	20:51	97 19:13 (CH07)		
4	07:49	08:44 (CH10)	07:33	06:56	07:05	08:10 (CH09)	06:21	96 17:33 (CH07)	05:55	17:37 (CH07)		
	17:10	94 15:56 (CH08)	17:46	18:19	19:52	62 09:12 (CH09)	20:23	96 19:09 (CH07)	20:51	97 19:14 (CH07)		
5	07:49	08:44 (CH10)	07:32	06:54	07:04	08:09 (CH09)	06:20	97 17:33 (CH07)	05:55	17:38 (CH07)		
	17:11	95 15:57 (CH08)	17:47	18:20	19:53	61 09:10 (CH09)	20:24	97 19:10 (CH07)	20:52	96 19:14 (CH07)		
6	07:49	08:45 (CH10)	07:31	06:53	07:02	08:10 (CH09)	06:19	97 17:32 (CH07)	05:55	17:37 (CH07)		
	17:12	93 15:57 (CH08)	17:48	18:21	19:54	60 09:10 (CH09)	20:25	97 19:09 (CH07)	20:53	97 19:14 (CH07)		
7	07:49	08:45 (CH10)	07:30	06:51	07:01	08:09 (CH09)	06:18	97 17:32 (CH07)	05:55	17:38 (CH07)		
	17:13	95 15:58 (CH08)	17:49	18:22	19:55	60 09:09 (CH09)	20:26	98 19:10 (CH07)	20:53	96 19:14 (CH07)		
8	07:49	08:46 (CH10)	07:29	06:50	06:59	08:09 (CH09)	06:17	98 17:32 (CH07)	05:54	17:38 (CH07)		
	17:14	93 15:58 (CH08)	17:50	18:23	19:56	59 09:08 (CH09)	20:27	98 19:10 (CH07)	20:54	96 19:14 (CH07)		
9	07:49	08:47 (CH10)	07:28	06:48	06:57	08:10 (CH09)	06:15	98 17:32 (CH07)	05:54	17:39 (CH07)		
	17:15	93 15:59 (CH08)	17:52	18:24	19:57	57 09:07 (CH09)	20:28	98 19:10 (CH07)	20:55	96 19:15 (CH07)		
10	07:49	08:47 (CH10)	07:27	06:47	06:56	08:10 (CH09)	06:14	99 17:32 (CH07)	05:54	17:39 (CH07)		
	17:16	91 15:58 (CH08)	17:53	18:25	19:58	62 18:27 (CH07)	20:29	99 19:11 (CH07)	20:55	96 19:15 (CH07)		
11	07:49	08:48 (CH10)	07:25	06:45	06:54	08:11 (CH09)	06:13	99 17:32 (CH07)	05:54	17:40 (CH07)		
	17:17	91 15:59 (CH08)	17:54	18:27	19:59	79 18:37 (CH07)	20:30	99 19:11 (CH07)	20:56	95 19:15 (CH07)		
12	07:48	08:49 (CH10)	07:24	06:43	06:53	08:11 (CH09)	06:12	99 17:32 (CH07)	05:54	17:39 (CH07)		
	17:18	89 15:59 (CH08)	17:55	18:28	11 07:54 (CH09)	20:00	88 18:42 (CH07)	20:31	99 19:11 (CH07)	20:56	95 19:14 (CH07)	
13	07:48	08:49 (CH10)	07:23	06:42	06:51	07:37 (CH09)	06:11	99 17:32 (CH07)	05:53	17:39 (CH07)		
	17:19	88 15:59 (CH08)	17:57	18:29	22 07:59 (CH09)	20:01	94 18:46 (CH07)	20:32	99 19:11 (CH07)	20:57	95 19:14 (CH07)	
14	07:48	08:50 (CH10)	07:22	06:40	06:50	07:34 (CH09)	06:10	99 17:32 (CH07)	05:53	17:40 (CH07)		
	17:21	87 15:59 (CH08)	17:58	18:30	29 08:03 (CH09)	20:02	97 18:48 (CH07)	20:33	99 19:11 (CH07)	20:57	95 19:15 (CH07)	
15	07:47	08:51 (CH10)	07:20	06:38	06:48	07:30 (CH09)	06:09	99 17:32 (CH07)	05:53	17:40 (CH07)		
	17:22	86 16:00 (CH08)	17:59	18:31	35 08:05 (CH09)	20:04	100 18:51 (CH07)	20:34	99 19:11 (CH07)	20:58	95 19:15 (CH07)	
16	07:47	08:51 (CH10)	07:19	06:37	06:46	07:27 (CH09)	06:08	99 17:32 (CH07)	05:53	17:40 (CH07)		
	17:23	85 15:59 (CH08)	18:00	18:32	40 08:07 (CH09)	20:05	102 18:52 (CH07)	20:35	100 19:12 (CH07)	20:58	95 19:15 (CH07)	
17	07:47	08:53 (CH10)	07:18	06:35	06:45	07:26 (CH09)	06:07	100 17:31 (CH07)	05:53	17:41 (CH07)		
	17:24	83 16:00 (CH08)	18:01	18:33	43 08:09 (CH09)	20:06	103 18:55 (CH07)	20:36	101 19:12 (CH07)	20:58	95 19:16 (CH07)	
18	07:46	08:53 (CH10)	07:16	06:34	06:43	07:24 (CH09)	06:06	100 17:32 (CH07)	05:54	17:42 (CH07)		
	17:25	80 15:59 (CH08)	18:03	18:34	46 08:10 (CH09)	20:07	103 18:56 (CH07)	20:37	100 19:12 (CH07)	20:59	94 19:16 (CH07)	
19	07:46	08:54 (CH10)	07:15	06:32	06:42	07:22 (CH09)	06:05	100 17:32 (CH07)	05:54	17:42 (CH07)		
	17:26	78 15:59 (CH08)	18:04	18:35	49 08:11 (CH09)	20:08	102 18:58 (CH07)	20:38	100 19:12 (CH07)	20:59	94 19:16 (CH07)	
20	07:45	08:55 (CH10)	07:14	06:30	06:40	07:21 (CH09)	06:05	100 17:32 (CH07)	05:54	17:42 (CH07)		
	17:27	75 15:59 (CH08)	18:05	18:36	51 08:12 (CH09)	20:09	101 18:58 (CH07)	20:39	100 19:12 (CH07)	20:59	94 19:16 (CH07)	
21	07:45	08:56 (CH10)	07:12	06:29	06:39	07:19 (CH09)	06:04	100 17:32 (CH07)	05:54	17:42 (CH07)		
	17:28	73 15:59 (CH08)	18:06	18:37	54 08:13 (CH09)	20:10	98 19:00 (CH07)	20:40	100 19:12 (CH07)	20:59	94 19:16 (CH07)	
22	07:44	08:58 (CH10)	07:11	06:27	06:38	07:17 (CH09)	06:03	100 17:33 (CH07)	05:54	17:42 (CH07)		
	17:30	69 15:59 (CH08)	18:07	18:38	56 08:13 (CH09)	20:11	92 19:01 (CH07)	20:41	100 19:13 (CH07)	21:00	94 19:16 (CH07)	
23	07:43	08:59 (CH10)	07:09	06:25	06:36	07:17 (CH09)	06:02	100 17:33 (CH07)	05:54	17:43 (CH07)		
	17:31	65 15:58 (CH08)	18:08	18:39	57 08:14 (CH09)	20:12	81 19:42 (CH07)	20:42	100 19:13 (CH07)	21:00	94 19:17 (CH07)	
24	07:43	09:01 (CH10)	07:08	06:24	06:35	07:15 (CH09)	06:01	100 17:33 (CH07)	05:55	17:43 (CH07)		
	17:32	59 15:57 (CH08)	18:10	18:41	59 08:14 (CH09)	20:13	82 19:02 (CH07)	20:43	100 19:13 (CH07)	21:00	94 19:17 (CH07)	
25	07:42	09:03 (CH10)	07:07	06:22	06:33	07:14 (CH09)	06:01	100 17:34 (CH07)	05:55	17:43 (CH07)		
	17:33	54 15:56 (CH08)	18:11	18:42	60 08:14 (CH09)	20:14	84 19:03 (CH07)	20:44	99 19:13 (CH07)	21:00	94 19:17 (CH07)	
26	07:41	09:05 (CH10)	07:05	06:20	06:32	07:14 (CH09)	06:00	99 17:34 (CH07)	05:55	17:43 (CH07)		
	17:34	47 15:55 (CH08)	18:12	18:43	61 08:15 (CH09)	20:15	87 19:05 (CH07)	20:44	99 19:13 (CH07)	21:00	95 19:18 (CH07)	
27	07:40	15:24 (CH08)	07:04	06:19	06:30	07:13 (CH09)	05:59	99 17:34 (CH07)	05:56	17:43 (CH07)		
	17:36	31 15:55 (CH08)	18:13	18:44	61 08:14 (CH09)	20:16	88 19:05 (CH07)	20:45	99 19:13 (CH07)	21:00	95 19:18 (CH07)	
28	07:40	15:26 (CH08)	07:02	06:17	06:29	07:12 (CH09)	05:59	99 17:35 (CH07)	05:56	17:43 (CH07)		
	17:37	28 15:54 (CH08)	18:14	18:45	62 08:14 (CH09)	20:17	90 19:06 (CH07)	20:46	98 19:13 (CH07)	21:00	95 19:18 (CH07)	
29	07:39	15:28 (CH08)		07:15	06:28	08:12 (CH09)	05:58	98 17:35 (CH07)	05:56	17:44 (CH07)		
	17:38	24 15:52 (CH08)		19:46	62 09:14 (CH09)	20:18	91 19:07 (CH07)	20:47	98 19:13 (CH07)	21:00	95 19:19 (CH07)	
30	07:38	15:31 (CH08)		07:14	06:26	08:11 (CH09)	05:58	98 17:35 (CH07)	05:57	17:43 (CH07)		
	17:39	19 15:50 (CH08)		19:47	63 09:14 (CH09)	20:19	91 19:07 (CH07)	20:48	98 19:13 (CH07)	21:00	95 19:18 (CH07)	
31	07:37	15:34 (CH08)		07:12	06:26	08:10 (CH09)		98 17:35 (CH07)				
	17:41	12 15:46 (CH08)		19:48	63 09:13 (CH09)			98 19:13 (CH07)				
Potential sun hours	298		298	370	984	398	2462	447	3050	451	2857	
Total, worst case	2261											

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: Shadow_cumulativo_beni_2021_12_13 Shadow receptor: BP04 - Nuraghe Paule Udas

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 21:00	17:44 (CH07) 19:19 (CH07)	06:21 20:41	17:42 (CH07) 19:59	06:51 19:09	08:10 (CH09) 16
2	05:58 21:00	17:43 (CH07) 19:19 (CH07)	06:22 20:40	17:42 (CH07) 19:57	06:52 19:07	08:09 (CH09) 16
3	05:58 21:00	17:44 (CH07) 19:20 (CH07)	06:23 20:39	17:42 (CH07) 19:56	06:53 19:06	08:08 (CH09) 16
4	05:59 21:00	17:44 (CH07) 19:19 (CH07)	06:24 20:38	17:42 (CH07) 19:54	06:54 19:04	08:07 (CH09) 16
5	05:59 21:00	17:44 (CH07) 19:20 (CH07)	06:25 20:37	17:42 (CH07) 19:52	06:55 19:02	08:06 (CH09) 16
6	06:00 20:59	17:43 (CH07) 19:20 (CH07)	06:26 20:36	17:42 (CH07) 19:51	06:56 19:01	08:05 (CH09) 16
7	06:01 20:59	17:44 (CH07) 19:20 (CH07)	06:27 20:35	17:42 (CH07) 19:49	06:57 18:59	08:04 (CH09) 16
8	06:01 20:59	17:44 (CH07) 19:21 (CH07)	06:28 20:33	17:42 (CH07) 19:47	06:58 18:57	08:04 (CH09) 16
9	06:02 20:58	17:44 (CH07) 19:21 (CH07)	06:29 20:32	17:42 (CH07) 19:46	06:59 18:56	08:03 (CH09) 16
10	06:02 20:58	17:44 (CH07) 19:21 (CH07)	06:30 20:31	17:42 (CH07) 19:44	07:00 18:54	08:03 (CH09) 16
11	06:03 20:58	17:44 (CH07) 19:22 (CH07)	06:31 20:30	17:43 (CH07) 19:42	07:01 18:53	08:03 (CH09) 16
12	06:04 20:57	17:43 (CH07) 19:21 (CH07)	06:32 20:28	17:43 (CH07) 19:41	07:02 18:51	08:02 (CH09) 16
13	06:05 20:57	17:44 (CH07) 19:22 (CH07)	06:33 20:27	17:43 (CH07) 19:39	07:03 18:49	08:02 (CH09) 16
14	06:05 20:56	17:44 (CH07) 19:22 (CH07)	06:33 20:26	17:44 (CH07) 19:37	07:04 18:48	08:02 (CH09) 16
15	06:06 20:56	17:43 (CH07) 19:22 (CH07)	06:34 20:24	17:44 (CH07) 19:36	07:05 18:46	08:02 (CH09) 16
16	06:07 20:55	17:43 (CH07) 19:22 (CH07)	06:35 20:23	17:45 (CH07) 19:34	07:06 18:45	08:02 (CH09) 16
17	06:08 20:54	17:43 (CH07) 19:22 (CH07)	06:36 20:22	17:45 (CH07) 19:32	07:07 18:43	08:02 (CH09) 16
18	06:08 20:54	17:44 (CH07) 19:23 (CH07)	06:37 20:20	17:46 (CH07) 19:31	07:08 18:42	08:02 (CH09) 16
19	06:09 20:53	17:44 (CH07) 19:23 (CH07)	06:38 20:19	17:47 (CH07) 19:29	07:09 18:40	08:03 (CH09) 16
20	06:10 20:52	17:43 (CH07) 19:22 (CH07)	06:39 20:17	17:47 (CH07) 19:27	07:10 18:39	08:03 (CH09) 16
21	06:11 20:52	17:43 (CH07) 19:22 (CH07)	06:40 20:16	08:32 (CH09) 19:26	07:11 18:37	08:03 (CH09) 16
22	06:12 20:51	17:43 (CH07) 19:23 (CH07)	06:41 20:14	08:27 (CH09) 19:24	07:12 18:36	08:04 (CH09) 16
23	06:13 20:50	17:43 (CH07) 19:23 (CH07)	06:42 20:13	08:24 (CH09) 19:22	07:13 18:35	08:05 (CH09) 16
24	06:14 20:49	17:43 (CH07) 19:23 (CH07)	06:43 20:11	08:21 (CH09) 19:21	07:14 18:33	08:06 (CH09) 16
25	06:14 20:48	17:43 (CH07) 19:23 (CH07)	06:44 20:10	08:19 (CH09) 19:19	07:15 18:32	08:07 (CH09) 16
26	06:15 20:47	17:42 (CH07) 19:22 (CH07)	06:45 20:08	08:18 (CH09) 19:17	07:16 18:30	08:08 (CH09) 16
27	06:16 20:46	17:42 (CH07) 19:22 (CH07)	06:46 20:07	08:16 (CH09) 19:16	07:17 18:29	08:08 (CH09) 16
28	06:17 20:46	17:42 (CH07) 19:22 (CH07)	06:47 20:05	08:15 (CH09) 19:14	07:18 18:28	08:09 (CH09) 16
29	06:18 20:45	17:42 (CH07) 19:22 (CH07)	06:48 20:04	08:13 (CH09) 19:12	07:19 18:27	08:12 (CH09) 16
30	06:19 20:44	17:42 (CH07) 19:22 (CH07)	06:49 20:02	08:12 (CH09) 19:11	07:20 18:25	08:11 (CH09) 16
31	06:20 20:43	17:42 (CH07) 19:22 (CH07)	06:50 20:00	08:11 (CH09) 18:42 (CH07)	07:21 17:24	08:11 (CH09) 16
Potential sun hours	458	427	375	346	299	289
Total, worst case	3047	2934	1678	16	1235	2934

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP05 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January		February		March		April		May		June	
1	07:49	08:27 (CH09)	07:36	08:22 (CH06)	07:01	07:10	07:47 (CH05)	06:25	06:48 (CH04)	05:57	18:52 (CH01)	
	17:08	21 08:48 (CH09)	17:42	40 09:02 (CH06)	18:15	19:49	18 08:05 (CH05)	20:20	18 07:06 (CH04)	20:49	51 19:43 (CH01)	
2	07:49	08:29 (CH09)	07:35	08:22 (CH06)	06:59	07:09	07:48 (CH05)	06:24	06:47 (CH04)	05:56	18:51 (CH01)	
	17:09	21 08:50 (CH09)	17:43	41 09:03 (CH06)	18:17	19:50	15 08:03 (CH05)	20:21	21 07:08 (CH04)	20:50	54 19:45 (CH01)	
3	07:49	08:29 (CH09)	07:34	08:22 (CH06)	06:58	07:07	07:51 (CH05)	06:23	06:46 (CH04)	05:56	18:50 (CH01)	
	17:10	21 08:50 (CH09)	17:44	41 09:03 (CH06)	18:18	19:51	9 08:00 (CH05)	20:22	23 07:09 (CH04)	20:51	55 19:45 (CH01)	
4	07:49	08:29 (CH09)	07:33	08:23 (CH06)	06:56	07:06		06:21	06:45 (CH04)	05:55	18:50 (CH01)	
	17:11	20 08:49 (CH09)	17:46	40 09:03 (CH06)	18:19	19:52		20:23	25 07:10 (CH04)	20:52	57 19:47 (CH01)	
5	07:49	08:30 (CH09)	07:32	08:23 (CH06)	06:55	07:04		06:20	06:44 (CH04)	05:55	18:49 (CH01)	
	17:11	19 08:49 (CH09)	17:47	40 09:03 (CH06)	18:20	19:53		20:24	27 07:11 (CH04)	20:52	59 19:48 (CH01)	
6	07:49	08:30 (CH09)	07:31	08:23 (CH06)	06:53	07:02		06:19	06:43 (CH04)	05:55	18:48 (CH01)	
	17:12	20 08:50 (CH09)	17:48	40 09:03 (CH06)	18:21	19:54		20:25	28 07:11 (CH04)	20:53	60 19:48 (CH01)	
7	07:49	08:31 (CH09)	07:30	08:24 (CH06)	06:51	07:01		06:18	06:42 (CH04)	05:55	18:48 (CH01)	
	17:13	19 08:50 (CH09)	17:49	39 09:03 (CH06)	18:22	19:55		20:26	29 07:11 (CH04)	20:53	61 19:49 (CH01)	
8	07:49	08:32 (CH09)	07:29	08:23 (CH06)	06:50	06:59		06:17	06:42 (CH04)	05:54	18:48 (CH01)	
	17:14	18 08:50 (CH09)	17:50	39 09:02 (CH06)	18:23	19:56		20:28	30 07:12 (CH04)	20:54	62 19:50 (CH01)	
9	07:49	08:33 (CH09)	07:28	08:24 (CH06)	06:48	06:57		06:15	06:42 (CH04)	05:54	18:48 (CH01)	
	17:15	17 08:50 (CH09)	17:52	38 09:02 (CH06)	18:24	19:57		20:29	30 07:12 (CH04)	20:55	63 19:51 (CH01)	
10	07:49	08:35 (CH09)	07:27	08:24 (CH06)	06:47	06:56		06:14	06:41 (CH04)	05:54	18:48 (CH01)	
	17:16	15 08:50 (CH09)	17:53	38 09:02 (CH06)	18:26	19:58		20:30	31 07:12 (CH04)	20:55	64 19:52 (CH01)	
11	07:49	08:35 (CH09)	07:25	08:25 (CH06)	06:45	06:54		06:13	06:41 (CH04)	05:54	18:47 (CH01)	
	17:17	14 08:49 (CH09)	17:54	37 09:02 (CH06)	18:27	19:59		20:31	31 07:12 (CH04)	20:56	65 19:52 (CH01)	
12	07:49	08:37 (CH09)	07:24	08:26 (CH06)	06:43	06:53		06:12	06:41 (CH04)	05:54	18:46 (CH01)	
	17:18	12 08:49 (CH09)	17:55	35 09:01 (CH06)	18:28	20:00		20:32	31 07:12 (CH04)	20:56	66 19:52 (CH01)	
13	07:48	08:39 (CH09)	07:23	08:26 (CH06)	06:42	06:51		06:11	06:41 (CH04)	05:54	18:46 (CH01)	
	17:19	9 08:48 (CH09)	17:57	33 08:59 (CH06)	18:29	20:01		20:33	31 07:12 (CH04)	20:57	67 19:53 (CH01)	
14	07:48	08:40 (CH09)	07:22	08:28 (CH06)	06:40	06:50		06:10	06:41 (CH04)	05:53	18:46 (CH01)	
	17:21	6 08:46 (CH09)	17:58	30 08:58 (CH06)	18:30	20:03		20:34	31 07:12 (CH04)	20:57	67 19:53 (CH01)	
15	07:48		07:20	08:29 (CH06)	06:38	06:48		06:09	06:41 (CH04)	05:53	18:46 (CH01)	
	17:22		17:59	28 08:57 (CH06)	18:31	20:04		20:34	30 07:11 (CH04)	20:58	67 19:53 (CH01)	
16	07:47	08:35 (CH06)	07:19	08:30 (CH06)	06:37	06:47		06:08	06:42 (CH04)	05:53	18:47 (CH01)	
	17:23	7 08:42 (CH06)	18:00	25 08:55 (CH06)	18:32	20:05		20:35	29 07:11 (CH04)	20:58	68 19:55 (CH01)	
17	07:47	08:32 (CH06)	07:18	08:32 (CH06)	06:35	06:45		06:07	06:42 (CH04)	05:53	18:47 (CH01)	
	17:24	14 08:46 (CH06)	18:01	21 08:53 (CH06)	18:33	20:06		20:36	28 07:10 (CH04)	20:58	68 19:55 (CH01)	
18	07:46	08:30 (CH06)	07:16	08:35 (CH06)	06:34	06:43	06:58 (CH05)	06:43	06:43 (CH04)	05:54	18:47 (CH01)	
	17:25	18 08:48 (CH06)	18:03	16 08:51 (CH06)	18:34	4 07:02 (CH05)	20:07	20:37	28 07:11 (CH04)	20:59	68 19:55 (CH01)	
19	07:46	08:30 (CH06)	07:15	08:40 (CH06)	06:32	06:42	06:53 (CH05)	06:42	06:05	06:43 (CH04)	05:54	18:47 (CH01)
	17:26	20 08:50 (CH06)	18:04	4 08:44 (CH06)	18:35	13 07:06 (CH05)	20:08	20:38	27 07:10 (CH04)	20:59	69 19:56 (CH01)	
20	07:45	08:28 (CH06)	07:14	06:30	06:51 (CH05)	06:40		06:05	06:44 (CH04)	05:54	18:47 (CH01)	
	17:27	24 08:52 (CH06)	18:05	18:36	18 07:09 (CH05)	20:09		20:39	25 07:09 (CH04)	20:59	69 19:56 (CH01)	
21	07:45	08:27 (CH06)	07:12	06:29	06:49 (CH05)	06:39		06:04	06:44 (CH04)	05:54	18:47 (CH01)	
	17:28	26 08:53 (CH06)	18:06	18:37	20 07:09 (CH05)	20:10		20:40	25 07:09 (CH04)	21:00	69 19:56 (CH01)	
22	07:44	08:27 (CH06)	07:11	06:27	06:47 (CH05)	06:38		06:03	06:46 (CH04)	05:54	18:47 (CH01)	
	17:30	28 08:55 (CH06)	18:07	18:38	23 07:10 (CH05)	20:11		20:41	23 07:09 (CH04)	21:00	69 19:56 (CH01)	
23	07:43	08:26 (CH06)	07:10	06:25	06:47 (CH05)	06:36		06:02	06:46 (CH04)	05:54	18:48 (CH01)	
	17:31	30 08:56 (CH06)	18:09	18:39	24 07:11 (CH05)	20:12		20:42	34 19:23 (CH01)	21:00	69 19:57 (CH01)	
24	07:43	08:25 (CH06)	07:08	06:24	06:46 (CH05)	06:35		06:01	06:47 (CH04)	05:55	18:48 (CH01)	
	17:32	32 08:57 (CH06)	18:10	18:41	25 07:11 (CH05)	20:13		20:43	42 19:27 (CH01)	21:00	68 19:56 (CH01)	
25	07:42	08:24 (CH06)	07:07	06:22	06:45 (CH05)	06:33		06:01	06:48 (CH04)	05:55	18:48 (CH01)	
	17:33	33 08:57 (CH06)	18:11	18:42	26 07:11 (CH05)	20:14		20:44	46 19:31 (CH01)	21:00	68 19:56 (CH01)	
26	07:41	08:24 (CH06)	07:05	06:20	06:45 (CH05)	06:32		06:00	06:49 (CH04)	05:55	18:49 (CH01)	
	17:34	35 08:59 (CH06)	18:12	18:43	26 07:11 (CH05)	20:15		20:45	50 19:34 (CH01)	21:00	68 19:57 (CH01)	
27	07:40	08:24 (CH06)	07:04	06:19	06:44 (CH05)	06:30		05:59	06:50 (CH04)	05:56	18:49 (CH01)	
	17:36	36 09:00 (CH06)	18:13	18:44	26 07:10 (CH05)	20:16		20:45	50 19:35 (CH01)	21:00	68 19:57 (CH01)	
28	07:40	08:23 (CH06)	07:02	06:17	06:44 (CH05)	06:29		05:59	06:53 (CH04)	05:56	18:49 (CH01)	
	17:37	38 09:01 (CH06)	18:14	18:45	25 07:09 (CH05)	20:17		20:46	50 19:38 (CH01)	21:00	67 19:56 (CH01)	
29	07:39	08:23 (CH06)		07:15	07:45 (CH05)	06:28		06:54 (CH04)	05:58	05:56	18:50 (CH01)	
	17:38	38 09:01 (CH06)		19:46	24 08:09 (CH05)	20:18	8 07:02 (CH04)	20:47	48 19:39 (CH01)	21:00	67 19:57 (CH01)	
30	07:38	08:23 (CH06)		07:14	07:45 (CH05)	06:26		06:51 (CH04)	05:58	18:54 (CH01)	05:57	18:50 (CH01)
	17:39	39 09:02 (CH06)		19:47	23 08:08 (CH05)	20:19	14 07:05 (CH04)	20:48	47 19:41 (CH01)	21:00	66 19:56 (CH01)	
31	07:37	08:23 (CH06)		07:12	07:45 (CH05)			05:57	18:52 (CH01)			
	17:41	39 09:02 (CH06)		19:48	21 08:06 (CH05)			20:49	50 19:42 (CH01)			
Potential sun hours	298		298		370		398		447		451	
Total, worst case	689		625		298		64		1018		1939	

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP05 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December				
1	05:57	18:51 (CH01)	06:21	06:52 (CH04)	06:51	07:21	06:54	07:54 (CH06)	07:29	08:17 (CH09)
	21:00	66 19:57 (CH01)	20:42	31 07:23 (CH04)	19:59		17:23	38 08:32 (CH06)	16:59	14 08:31 (CH09)
2	05:58	18:52 (CH01)	06:22	06:52 (CH04)	06:52	07:22	06:56	07:53 (CH06)	07:30	08:17 (CH09)
	21:00	64 19:56 (CH01)	20:40	31 07:23 (CH04)	19:57		17:22	39 08:32 (CH06)	16:59	15 08:32 (CH09)
3	05:58	18:53 (CH01)	06:23	06:52 (CH04)	06:53	07:23	06:57	07:53 (CH06)	07:31	08:17 (CH09)
	21:00	63 19:56 (CH01)	20:39	31 07:23 (CH04)	19:56		17:20	39 08:32 (CH06)	16:58	16 08:33 (CH09)
4	05:59	18:53 (CH01)	06:24	06:52 (CH04)	06:54	07:24	06:58	07:52 (CH06)	07:32	08:16 (CH09)
	21:00	62 19:55 (CH01)	20:38	30 07:22 (CH04)	19:54		17:19	40 08:32 (CH06)	16:58	18 08:34 (CH09)
5	05:59	18:54 (CH01)	06:25	06:53 (CH04)	06:55	07:25	06:59	07:53 (CH06)	07:33	08:16 (CH09)
	21:00	61 19:55 (CH01)	20:37	29 07:22 (CH04)	19:52		17:18	40 08:33 (CH06)	16:58	19 08:35 (CH09)
6	06:00	18:54 (CH01)	06:26	06:52 (CH04)	06:56	07:26	07:00	07:53 (CH06)	07:34	08:16 (CH09)
	20:59	60 19:54 (CH01)	20:36	29 07:21 (CH04)	19:51		17:17	40 08:33 (CH06)	16:58	20 08:36 (CH09)
7	06:01	18:55 (CH01)	06:27	06:52 (CH04)	06:57	07:27	07:01	07:52 (CH06)	07:35	08:17 (CH09)
	20:59	59 19:54 (CH01)	20:35	28 07:20 (CH04)	19:49		17:16	41 08:33 (CH06)	16:58	19 08:36 (CH09)
8	06:01	18:57 (CH01)	06:28	06:53 (CH04)	06:58	07:28	07:03	07:53 (CH06)	07:36	08:17 (CH09)
	20:59	57 19:54 (CH01)	20:34	27 07:20 (CH04)	19:48		17:15	41 08:34 (CH06)	16:58	20 08:37 (CH09)
9	06:02	18:57 (CH01)	06:29	06:54 (CH04)	06:59	07:29	07:04	07:53 (CH06)	07:37	08:17 (CH09)
	20:58	56 19:53 (CH01)	20:32	25 07:19 (CH04)	19:46	9 07:44 (CH05)	17:14	41 08:34 (CH06)	16:58	21 08:38 (CH09)
10	06:02	18:58 (CH01)	06:30	06:55 (CH04)	07:00	07:41 (CH05)	07:05	07:53 (CH06)	07:37	08:18 (CH09)
	20:58	55 19:53 (CH01)	20:31	23 07:18 (CH04)	19:44	15 07:56 (CH05)	17:13	40 08:33 (CH06)	16:58	21 08:39 (CH09)
11	06:03	19:00 (CH01)	06:31	06:56 (CH04)	07:01	07:39 (CH05)	07:06	07:53 (CH06)	07:38	08:18 (CH09)
	20:58	52 19:52 (CH01)	20:30	20 07:16 (CH04)	19:43	18 07:57 (CH05)	17:12	40 08:33 (CH06)	16:58	21 08:39 (CH09)
12	06:04	19:00 (CH01)	06:32	06:57 (CH04)	07:02	07:37 (CH05)	07:07	07:55 (CH06)	07:39	08:19 (CH09)
	20:57	51 19:51 (CH01)	20:28	18 07:15 (CH04)	19:41	21 07:58 (CH05)	17:11	39 08:34 (CH06)	16:58	21 08:40 (CH09)
13	06:05	19:02 (CH01)	06:33	06:59 (CH04)	07:03	07:36 (CH05)	07:08	07:55 (CH06)	07:40	08:18 (CH09)
	20:57	48 19:50 (CH01)	20:27	13 07:12 (CH04)	19:39	23 07:59 (CH05)	17:10	38 08:33 (CH06)	16:58	22 08:40 (CH09)
14	06:05	19:03 (CH01)	06:34	07:03 (CH04)	07:04	07:35 (CH05)	07:10	07:55 (CH06)	07:41	08:19 (CH09)
	20:56	46 19:49 (CH01)	20:26	5 07:08 (CH04)	19:38	24 07:59 (CH05)	17:09	37 08:32 (CH06)	16:58	22 08:41 (CH09)
15	06:06	07:02 (CH04)	06:34		07:05	07:34 (CH05)	07:11	07:56 (CH06)	07:41	08:20 (CH09)
	20:56	50 19:47 (CH01)	20:24		19:36	26 08:00 (CH05)	17:08	36 08:32 (CH06)	16:58	21 08:41 (CH09)
16	06:07	07:00 (CH04)	06:35		07:06	07:34 (CH05)	07:12	07:57 (CH06)	07:42	08:19 (CH09)
	20:55	52 19:46 (CH01)	20:23		19:34	26 08:00 (CH05)	17:07	35 08:32 (CH06)	16:59	22 08:41 (CH09)
17	06:08	06:59 (CH04)	06:36		07:07	07:33 (CH05)	07:13	07:58 (CH06)	07:43	08:20 (CH09)
	20:54	51 19:44 (CH01)	20:22		19:32	26 07:59 (CH05)	17:06	33 08:31 (CH06)	16:59	22 08:42 (CH09)
18	06:08	06:58 (CH04)	06:37		07:08	07:33 (CH05)	07:14	07:59 (CH06)	07:43	08:21 (CH09)
	20:54	48 19:42 (CH01)	20:20		19:31	26 07:59 (CH05)	17:06	32 08:31 (CH06)	16:59	22 08:43 (CH09)
19	06:09	06:58 (CH04)	06:38		07:09	07:33 (CH05)	07:15	08:00 (CH06)	07:44	08:21 (CH09)
	20:53	44 19:40 (CH01)	20:19		19:29	25 07:58 (CH05)	17:05	30 08:30 (CH06)	17:00	22 08:43 (CH09)
20	06:10	06:56 (CH04)	06:39		07:10	07:33 (CH05)	07:17	08:02 (CH06)	07:45	08:22 (CH09)
	20:52	39 19:35 (CH01)	20:17		19:27	25 07:58 (CH05)	17:04	28 08:30 (CH06)	17:00	22 08:44 (CH09)
21	06:11	06:55 (CH04)	06:40		07:11	07:33 (CH05)	07:18	08:03 (CH06)	07:45	08:22 (CH09)
	20:52	23 07:18 (CH04)	20:16		19:26	24 07:57 (CH05)	17:04	26 08:29 (CH06)	17:01	22 08:44 (CH09)
22	06:12	06:55 (CH04)	06:41		07:12	07:34 (CH05)	07:19	08:04 (CH06)	07:46	08:23 (CH09)
	20:51	24 07:19 (CH04)	20:14		19:24	21 07:55 (CH05)	17:03	24 08:28 (CH06)	17:01	22 08:45 (CH09)
23	06:13	06:54 (CH04)	06:42		07:13	07:35 (CH05)	07:20	08:05 (CH06)	07:46	08:23 (CH09)
	20:50	26 07:20 (CH04)	20:13		19:22	19 07:54 (CH05)	17:02	21 08:26 (CH06)	17:02	22 08:45 (CH09)
24	06:14	06:54 (CH04)	06:43		07:14	07:37 (CH05)	07:21	08:07 (CH06)	07:47	08:24 (CH09)
	20:49	26 07:20 (CH04)	20:11		19:21	14 07:51 (CH05)	17:02	18 08:25 (CH06)	17:02	22 08:46 (CH09)
25	06:14	06:54 (CH04)	06:44		07:15	07:39 (CH05)	07:22	08:01 (CH06)	07:47	08:24 (CH09)
	20:48	27 07:21 (CH04)	20:10		19:19	9 07:48 (CH05)	17:01	14 08:24 (CH06)	17:03	22 08:46 (CH09)
26	06:15	06:53 (CH04)	06:45		07:16		07:23	08:14 (CH06)	07:47	08:24 (CH09)
	20:47	28 07:21 (CH04)	20:08		19:17		17:01	7 08:21 (CH06)	17:03	22 08:46 (CH09)
27	06:16	06:52 (CH04)	06:46		07:17		07:25		07:48	08:25 (CH09)
	20:47	29 07:21 (CH04)	20:07		19:16		17:00		17:04	22 08:47 (CH09)
28	06:17	06:52 (CH04)	06:47		07:18		07:26		07:48	08:25 (CH09)
	20:46	30 07:22 (CH04)	20:05		19:14		17:00	5 08:21 (CH09)	17:05	22 08:47 (CH09)
29	06:18	06:52 (CH04)	06:48		07:19		07:27		07:48	08:26 (CH09)
	20:45	30 07:22 (CH04)	20:04		19:12		16:59	9 08:28 (CH09)	17:05	21 08:47 (CH09)
30	06:19	06:52 (CH04)	06:49		07:20		07:28		07:49	08:26 (CH09)
	20:44	30 07:22 (CH04)	20:02		19:11		16:59	12 08:30 (CH09)	17:06	22 08:48 (CH09)
31	06:20	06:52 (CH04)	06:50				07:29		07:49	08:27 (CH09)
	20:43	30 07:22 (CH04)	20:01				17:04	36 08:31 (CH06)	17:07	21 08:48 (CH09)
Potential sun hours	458	427	375	346	299	289				
Total, worst case	1387	340	351	238	883	640				

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP06 - NURAGHE TRUVINE

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:49 17:08	16:30 (CH13) 16:43 (CH13)	07:36 17:42	16:31 (CH13) 17:09 (CH13)	07:01 18:16	
2	07:49 17:09	16:30 (CH13) 16:44 (CH13)	07:35 17:43	16:31 (CH13) 17:09 (CH13)	06:59 18:17	
3	07:50 17:10	16:30 (CH13) 16:44 (CH13)	07:34 17:45	16:32 (CH13) 17:08 (CH13)	06:58 18:18	
4	07:50 17:11	16:29 (CH13) 16:45 (CH13)	07:33 17:46	16:33 (CH13) 17:08 (CH13)	06:56 18:19	
5	07:50 17:12	16:29 (CH13) 16:46 (CH13)	07:32 17:47	16:34 (CH13) 17:07 (CH13)	06:55 18:20	
6	07:50 17:13	16:28 (CH13) 16:46 (CH13)	07:31 17:48	16:36 (CH13) 17:06 (CH13)	06:53 18:21	
7	07:50 17:14	16:28 (CH13) 16:48 (CH13)	07:30 17:49	16:37 (CH13) 17:05 (CH13)	06:52 18:22	
8	07:49 17:14	16:28 (CH13) 16:49 (CH13)	07:29 17:51	16:39 (CH13) 17:04 (CH13)	06:50 18:23	
9	07:49 17:15	16:28 (CH13) 16:50 (CH13)	07:28 17:52	16:40 (CH13) 17:02 (CH13)	06:48 18:25	
10	07:49 17:17	16:28 (CH13) 16:51 (CH13)	07:27 17:53	16:43 (CH13) 16:59 (CH13)	06:47 18:26	
11	07:49 17:18	16:27 (CH13) 16:52 (CH13)	07:26 17:54	16:47 (CH13) 16:56 (CH13)	06:45 18:27	
12	07:49 17:19	16:28 (CH13) 16:53 (CH13)	07:24 17:56	06:44 18:28	06:53 20:01	17:40 (CH15) 18:41 (CH15)
13	07:48 17:20	16:28 (CH13) 16:55 (CH13)	07:23 17:57	06:42 18:29	06:51 20:02	17:40 (CH15) 18:41 (CH15)
14	07:48 17:21	16:27 (CH13) 16:55 (CH13)	07:22 17:58	06:40 18:30	06:50 20:03	17:40 (CH15) 18:40 (CH15)
15	07:48 17:22	16:28 (CH13) 16:57 (CH13)	07:21 17:59	06:39 18:31	06:48 20:04	17:41 (CH15) 18:40 (CH15)
16	07:47 17:23	16:27 (CH13) 16:58 (CH13)	07:19 18:00	06:37 18:32	06:47 20:05	17:42 (CH15) 18:38 (CH15)
17	07:47 17:24	16:27 (CH13) 16:59 (CH13)	07:18 18:02	06:35 18:33	06:45 20:06	17:43 (CH15) 18:38 (CH15)
18	07:46 17:25	16:27 (CH13) 17:00 (CH13)	07:17 18:03	06:34 18:34	06:44 20:07	17:43 (CH15) 18:36 (CH15)
19	07:46 17:26	16:28 (CH13) 17:02 (CH13)	07:15 18:04	06:32 18:35	06:42 20:08	17:45 (CH15) 18:35 (CH15)
20	07:45 17:28	16:27 (CH13) 17:03 (CH13)	07:14 18:05	06:30 18:36	06:41 20:09	17:45 (CH15) 18:34 (CH15)
21	07:45 17:29	16:27 (CH13) 17:04 (CH13)	07:12 18:06	06:29 18:38	06:39 20:10	17:47 (CH15) 18:33 (CH15)
22	07:44 17:30	16:28 (CH13) 17:06 (CH13)	07:11 18:08	06:27 18:39	06:38 20:11	17:48 (CH15) 18:32 (CH15)
23	07:43 17:31	16:28 (CH13) 17:07 (CH13)	07:10 18:09	06:25 18:40	06:36 20:12	17:49 (CH15) 18:29 (CH15)
24	07:43 17:32	16:28 (CH13) 17:08 (CH13)	07:08 18:10	06:24 18:41	06:35 20:13	17:51 (CH15) 18:28 (CH15)
25	07:42 17:33	16:28 (CH13) 17:09 (CH13)	07:07 18:11	06:22 18:42	06:33 20:14	17:52 (CH15) 18:25 (CH15)
26	07:41 17:35	16:29 (CH13) 17:10 (CH13)	07:05 18:12	06:21 18:43	06:32 20:15	17:55 (CH15) 18:23 (CH15)
27	07:41 17:36	16:29 (CH13) 17:10 (CH13)	07:04 18:13	06:19 18:44	06:31 20:16	17:58 (CH15) 18:21 (CH15)
28	07:40 17:37	16:29 (CH13) 17:10 (CH13)	07:02 18:14	06:17 18:45	06:29 20:17	18:00 (CH15) 18:17 (CH15)
29	07:39 17:38	16:29 (CH13) 17:10 (CH13)		07:16 19:46	06:28 20:18	
30	07:38 17:40	16:30 (CH13) 17:09 (CH13)		07:14 19:47	06:27 20:19	
31	07:37 17:41	16:30 (CH13) 17:09 (CH13)		07:12 19:48	06:27 20:19	
Potential sun hours	298		298	370	398	447
Total, worst case	915	310	811	1490		451

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP06 - NURAGHE TRUVINE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:58 21:00	06:21 20:42	06:51 19:59	17:39 (CH15) 18:42 (CH15)	07:21 19:09	06:55 17:23
2	05:58 21:00	06:22 20:41	06:52 19:58	17:38 (CH15) 18:42 (CH15)	07:22 19:07	06:56 17:22
3	05:59 21:00	06:23 20:40	06:53 19:56	17:37 (CH15) 18:42 (CH15)	07:23 19:06	06:57 17:21
4	05:59 21:00	06:24 20:38	06:54 19:54	17:36 (CH15) 18:41 (CH15)	07:24 19:04	06:58 17:19
5	06:00 21:00	06:25 20:37	06:55 19:53	17:36 (CH15) 18:41 (CH15)	07:25 19:03	06:59 17:18
6	06:00 20:59	06:26 20:36	06:56 19:51	17:35 (CH15) 18:41 (CH15)	07:26 19:01	07:00 17:17
7	06:01 20:59	06:27 20:35	06:57 19:49	17:35 (CH15) 18:41 (CH15)	07:27 18:59	07:02 17:16
8	06:01 20:59	06:28 20:34	06:58 19:48	17:34 (CH15) 18:40 (CH15)	07:28 18:58	07:03 17:15
9	06:02 20:59	06:29 20:32	06:59 19:46	17:33 (CH15) 18:39 (CH15)	07:29 18:56	07:04 17:14
10	06:03 20:58	06:30 20:31	07:00 19:44	17:33 (CH15) 18:38 (CH15)	07:30 18:54	07:05 17:13
11	06:03 20:58	06:31 20:30	07:01 19:43	17:33 (CH15) 18:38 (CH15)	07:31 18:53	07:06 17:12
12	06:04 20:57	06:32 20:29	07:02 19:41	17:32 (CH15) 18:37 (CH15)	07:32 18:51	07:07 17:11
13	06:05 20:57	06:33 20:27	07:03 19:39	17:32 (CH15) 18:36 (CH15)	07:33 18:50	07:09 17:10
14	06:06 20:56	06:34 20:26	7 18:13 (CH15) 07:04 19:38	17:32 (CH15) 18:36 (CH15)	07:34 18:48	07:10 17:09
15	06:06 20:56	06:35 20:25	18 18:07 (CH15) 07:05 19:36	17:33 (CH15) 18:35 (CH15)	07:35 18:47	07:11 17:08
16	06:07 20:55	06:36 20:23	24 18:04 (CH15) 07:06 19:34	17:33 (CH15) 18:34 (CH15)	07:37 18:45	07:12 17:07
17	06:08 20:55	06:37 20:22	30 18:01 (CH15) 07:07 19:33	17:33 (CH15) 18:33 (CH15)	07:38 18:44	07:13 17:07
18	06:09 20:54	06:38 20:20	35 17:58 (CH15) 07:08 19:31	17:34 (CH15) 18:31 (CH15)	07:39 18:42	07:14 17:06
19	06:10 20:53	06:39 20:19	38 17:56 (CH15) 07:09 19:29	17:34 (CH15) 18:30 (CH15)	07:40 18:41	07:16 17:05
20	06:10 20:52	06:40 20:18	42 17:54 (CH15) 07:10 19:28	17:35 (CH15) 18:28 (CH15)	07:41 18:39	07:17 17:04
21	06:11 20:52	06:41 20:16	44 17:53 (CH15) 07:11 19:26	17:36 (CH15) 18:27 (CH15)	07:42 18:38	07:18 17:04
22	06:12 20:51	06:42 20:15	47 17:51 (CH15) 07:12 19:24	17:37 (CH15) 18:25 (CH15)	07:43 18:36	07:19 17:03
23	06:13 20:50	06:43 20:13	49 17:50 (CH15) 07:13 19:22	17:38 (CH15) 18:23 (CH15)	07:44 18:35	07:20 17:03
24	06:14 20:49	06:44 20:12	51 17:48 (CH15) 07:14 19:21	17:40 (CH15) 18:21 (CH15)	07:45 18:33	07:21 17:02
25	06:15 20:48	06:45 20:10	53 17:46 (CH15) 07:15 19:19	17:42 (CH15) 18:18 (CH15)	06:46 17:32	07:22 17:01
26	06:16 20:48	06:46 20:09	55 17:45 (CH15) 07:16 19:17	17:44 (CH15) 18:15 (CH15)	06:48 17:31	07:24 17:01
27	06:16 20:47	06:46 20:07	57 17:43 (CH15) 07:17 19:16	17:47 (CH15) 18:11 (CH15)	06:49 17:29	07:25 17:01
28	06:17 20:46	06:47 20:05	59 17:42 (CH15) 07:18 19:14	17:52 (CH15) 18:06 (CH15)	06:50 17:28	07:26 17:00
29	06:18 20:45	06:48 20:04	60 17:41 (CH15) 07:19 19:12	17:51 (CH15) 17:27	06:51 17:27	07:27 17:00
30	06:19 20:44	06:49 20:02	61 17:40 (CH15) 07:20 19:11	17:50 (CH15) 17:25	06:52 17:25	07:28 16:59
31	06:20 20:43	06:50 20:01	62 17:39 (CH15) 18:41 (CH15)	17:24 16:16 (CH13)	06:53 16:27 (CH13)	07:29 17:07
Potential sun hours	458	427	375	346	299	289
Total, worst case		792	1548	11	1017	513

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

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

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP07 - NURAGHE SA PALA DE SOS LADROS
Assumptions for shadow calculations

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

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

	January		February		March		April		May		June	
1	07:49	08:32 (CH16)	07:36	08:51 (CH15)	07:01	08:46 (CH15)	07:11	06:25	06:45 (CH14)	05:57	06:53 (CH14)	
	17:08	37 09:09 (CH16)	17:42	72 10:03 (CH15)	18:16	78 10:04 (CH15)	19:49	20:20	46 07:31 (CH14)	20:50	28 07:21 (CH14)	
2	07:49	08:32 (CH16)	07:35	08:51 (CH15)	06:59	08:46 (CH15)	07:09	06:24	06:44 (CH14)	05:57	06:54 (CH14)	
	17:09	37 09:09 (CH16)	17:43	73 10:04 (CH15)	18:17	76 10:02 (CH15)	19:50	20:22	46 07:30 (CH14)	20:50	27 07:21 (CH14)	
3	07:50	08:33 (CH16)	07:34	08:50 (CH15)	06:58	08:47 (CH15)	07:07	06:23	06:43 (CH14)	05:56	06:56 (CH14)	
	17:10	37 09:10 (CH16)	17:45	75 10:05 (CH15)	18:18	74 10:01 (CH15)	19:51	20:23	48 07:31 (CH14)	20:51	24 07:20 (CH14)	
4	07:50	08:33 (CH16)	07:33	08:50 (CH15)	06:56	08:47 (CH15)	07:06	06:22	06:43 (CH14)	05:56	06:56 (CH14)	
	17:11	37 09:10 (CH16)	17:46	76 10:06 (CH15)	18:19	73 10:00 (CH15)	19:52	20:24	48 07:31 (CH14)	20:52	23 07:19 (CH14)	
5	07:50	08:34 (CH16)	07:32	08:49 (CH15)	06:55	08:48 (CH15)	07:04	06:20	06:43 (CH14)	05:55	06:58 (CH14)	
	17:12	36 09:10 (CH16)	17:47	78 10:07 (CH15)	18:20	71 09:59 (CH15)	19:53	20:25	49 07:32 (CH14)	20:52	21 07:19 (CH14)	
6	07:50	08:33 (CH16)	07:31	08:49 (CH15)	06:53	08:49 (CH15)	07:03	06:19	06:43 (CH14)	05:55	06:59 (CH14)	
	17:13	37 09:10 (CH16)	17:48	79 10:08 (CH15)	18:21	68 09:57 (CH15)	19:54	20:26	49 07:32 (CH14)	20:53	19 07:18 (CH14)	
7	07:50	08:34 (CH16)	07:30	08:49 (CH15)	06:52	08:49 (CH15)	07:01	06:18	06:43 (CH14)	05:55	06:59 (CH14)	
	17:14	36 09:10 (CH16)	17:49	79 10:08 (CH15)	18:22	66 09:55 (CH15)	19:55	20:27	49 07:32 (CH14)	20:54	17 07:16 (CH14)	
8	07:49	08:35 (CH16)	07:29	08:48 (CH15)	06:50	08:50 (CH15)	06:59	06:17	06:42 (CH14)	05:55	07:01 (CH14)	
	17:15	36 09:11 (CH16)	17:51	81 10:09 (CH15)	18:24	63 09:53 (CH15)	19:56	20:28	49 07:31 (CH14)	20:54	15 07:16 (CH14)	
9	07:49	08:35 (CH16)	07:28	08:47 (CH15)	06:48	08:51 (CH15)	06:58	06:16	06:42 (CH14)	05:54	07:03 (CH14)	
	17:16	36 09:11 (CH16)	17:52	82 10:09 (CH15)	18:25	60 09:47 (CH15)	19:58	20:29	49 07:31 (CH14)	20:55	12 07:15 (CH14)	
10	07:49	08:36 (CH16)	07:27	08:47 (CH15)	06:47	08:52 (CH15)	06:56	06:15	06:42 (CH14)	05:54	07:04 (CH14)	
	17:17	36 09:12 (CH16)	17:53	82 10:09 (CH15)	18:26	57 09:49 (CH15)	19:59	20:30	49 07:31 (CH14)	20:55	9 07:13 (CH14)	
11	07:49	08:36 (CH16)	07:26	08:47 (CH15)	06:45	08:53 (CH15)	06:55	06:13	06:42 (CH14)	05:54	07:07 (CH14)	
	17:18	35 09:11 (CH16)	17:54	83 10:10 (CH15)	18:27	54 09:47 (CH15)	20:00	20:31	49 07:31 (CH14)	20:56	5 07:12 (CH14)	
12	07:49	08:37 (CH16)	07:24	08:47 (CH15)	06:44	08:54 (CH15)	06:53	06:12	06:42 (CH14)	05:54		
	17:19	35 09:12 (CH16)	17:56	84 10:11 (CH15)	18:28	50 09:44 (CH15)	20:01	20:32	49 07:31 (CH14)	20:56		
13	07:48	08:38 (CH16)	07:23	08:47 (CH15)	06:42	08:57 (CH15)	06:51	06:11	06:42 (CH14)	05:54		
	17:20	46 09:29 (CH15)	17:57	84 10:11 (CH15)	18:29	45 09:42 (CH15)	20:02	20:33	48 07:30 (CH14)	20:57		
14	07:48	08:38 (CH16)	07:22	08:46 (CH15)	06:40	08:58 (CH15)	06:50	06:10	06:42 (CH14)	05:54		
	17:21	54 09:32 (CH15)	17:58	84 10:10 (CH15)	18:30	41 09:39 (CH15)	20:03	20:34	48 07:30 (CH14)	20:57		
15	07:48	08:39 (CH16)	07:21	08:46 (CH15)	06:39	09:00 (CH15)	06:48	06:09	06:42 (CH14)	05:54		
	17:22	57 09:36 (CH15)	17:59	85 10:11 (CH15)	18:31	35 09:35 (CH15)	20:04	20:35	48 07:30 (CH14)	20:58		
16	07:47	08:40 (CH16)	07:19	08:46 (CH15)	06:37	09:03 (CH15)	06:47	06:08	06:43 (CH14)	05:54		
	17:23	58 09:38 (CH15)	18:00	85 10:11 (CH15)	18:32	28 09:31 (CH15)	20:05	20:36	47 07:30 (CH14)	20:58		
17	07:47	08:41 (CH16)	07:18	08:45 (CH15)	06:35	09:07 (CH15)	06:45	06:07	06:44 (CH14)	05:54		
	17:24	60 09:41 (CH15)	18:02	85 10:10 (CH15)	18:33	18 09:25 (CH15)	20:06	20:37	46 07:30 (CH14)	20:59		
18	07:46	08:42 (CH16)	07:17	08:45 (CH15)	06:34		06:44	06:07	06:44 (CH14)	05:54		
	17:25	61 09:43 (CH15)	18:03	86 10:11 (CH15)	18:34		20:07	20:38	45 07:29 (CH14)	20:59		
19	07:46	08:43 (CH16)	07:15	08:45 (CH15)	06:32		06:42	06:06	06:44 (CH14)	05:54		
	17:26	63 09:46 (CH15)	18:04	85 10:10 (CH15)	18:35		20:08	20:38	44 07:28 (CH14)	20:59		
20	07:45	08:44 (CH16)	07:14	08:45 (CH15)	06:30		06:41	06:05	06:44 (CH14)	05:54		
	17:28	63 09:47 (CH15)	18:05	85 10:10 (CH15)	18:37		20:09	14 07:16 (CH14)	20:39	44 07:28 (CH14)	20:59	
21	07:45	08:45 (CH16)	07:13	08:45 (CH15)	06:29		06:39	06:04	06:59 (CH14)	05:54		
	17:29	64 09:49 (CH15)	18:06	85 10:10 (CH15)	18:38		20:10	21 07:20 (CH14)	20:40	42 07:28 (CH14)	21:00	
22	07:44	08:47 (CH16)	07:11	08:45 (CH15)	06:27		06:38	06:03	06:57 (CH14)	05:54		
	17:30	64 09:51 (CH15)	18:08	84 10:09 (CH15)	18:39		20:11	26 07:23 (CH14)	20:41	41 07:27 (CH14)	21:00	
23	07:44	08:49 (CH16)	07:10	08:45 (CH15)	06:26		06:36	06:02	06:55 (CH14)	05:55		
	17:31	63 09:52 (CH15)	18:09	84 10:09 (CH15)	18:40		20:12	29 07:24 (CH14)	20:42	41 07:27 (CH14)	21:00	
24	07:43	08:51 (CH16)	07:08	08:45 (CH15)	06:24		06:35	06:02	06:54 (CH14)	05:55		
	17:32	63 09:54 (CH15)	18:10	83 10:08 (CH15)	18:41		20:13	32 07:26 (CH14)	20:43	40 07:26 (CH14)	21:00	
25	07:42	08:55 (CH16)	07:07	08:45 (CH15)	06:22		06:34	06:01	06:52 (CH14)	05:55		
	17:34	61 09:56 (CH15)	18:11	82 10:07 (CH15)	18:42		20:14	34 07:26 (CH14)	20:44	38 07:26 (CH14)	21:00	
26	07:41	08:57 (CH16)	07:05	08:45 (CH15)	06:21		06:32	06:00	06:51 (CH14)	05:56		
	17:35	60 09:57 (CH15)	18:12	81 10:06 (CH15)	18:43		20:15	37 07:28 (CH14)	20:45	37 07:25 (CH14)	21:00	
27	07:41	08:56 (CH16)	07:04	08:46 (CH15)	06:19		06:31	06:00	06:50 (CH14)	05:56		
	17:36	62 09:58 (CH15)	18:13	80 10:06 (CH15)	18:44		20:16	39 07:29 (CH14)	20:46	36 07:25 (CH14)	21:01	
28	07:40	08:55 (CH16)	07:02	08:45 (CH15)	06:17		06:29	06:00	06:48 (CH14)	05:59		
	17:37	64 09:59 (CH15)	18:15	79 10:04 (CH15)	18:45		20:17	41 07:29 (CH14)	20:46	34 07:24 (CH14)	21:01	
29	07:39	08:54 (CH16)			07:16		06:28	06:00	06:47 (CH14)	05:59		
	17:38	66 10:00 (CH15)			19:46		20:18	43 07:30 (CH14)	20:47	33 07:24 (CH14)	21:01	
30	07:38	08:53 (CH16)			07:14		06:27	06:00	06:46 (CH14)	05:58		
	17:40	68 10:01 (CH15)			19:47		20:19	44 07:30 (CH14)	20:48	32 07:23 (CH14)	21:00	
31	07:37	08:52 (CH16)			07:12			05:57		06:53 (CH14)		
	17:41	70 10:02 (CH15)			19:48			20:49	29 07:22 (CH14)			
Potential sun hours	298		298		370		398		447		451	
Total, worst case	1602		2281		957		360		1353		200	

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP07 - NURAGHE SA PALA DE SOS LADROS

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:58 21:00	06:21 20:42	06:52 (CH14) 06:51	07:21 19:09	09:35 (CH15) 17:23	06:55 08:17 (CH15)
2	05:58 21:00	07:09 (CH14) 20:41	06:22 06:52 (CH14)	06:52 19:59	09:33 (CH15) 17:22	06:56 08:17 (CH15)
3	05:59 21:00	07:08 (CH14) 20:40	06:23 06:52 (CH14)	06:53 19:58	09:31 (CH15) 17:22	06:57 08:17 (CH15)
4	05:59 21:00	07:19 (CH14) 20:40	06:24 06:52 (CH14)	06:54 19:56	09:29 (CH15) 17:21	06:58 08:19 (CH15)
5	06:00 21:00	07:06 (CH14) 20:38	06:25 06:52 (CH14)	06:55 19:54	09:28 (CH15) 17:19	06:59 08:19 (CH15)
6	06:00 21:00	07:22 (CH14) 20:37	06:26 06:52 (CH14)	06:56 19:53	09:26 (CH15) 17:18	07:00 08:19 (CH15)
7	06:01 20:59	07:24 (CH14) 20:36	06:27 06:52 (CH14)	06:57 19:51	09:25 (CH15) 17:17	07:02 08:20 (CH15)
8	06:01 20:59	07:27 (CH14) 20:35	06:28 06:52 (CH14)	06:58 19:49	09:24 (CH15) 17:16	07:03 08:21 (CH15)
9	06:02 20:59	07:04 (CH14) 20:34	06:29 06:53 (CH14)	06:58 19:48	09:22 (CH15) 17:15	07:04 08:21 (CH15)
10	06:03 20:58	07:27 (CH14) 20:32	06:30 06:52 (CH14)	06:59 19:46	09:22 (CH15) 17:14	07:04 08:22 (CH15)
11	06:03 20:58	07:02 (CH14) 20:31	06:31 06:52 (CH14)	07:00 19:44	09:21 (CH15) 17:13	07:05 08:22 (CH15)
12	06:04 20:57	07:29 (CH14) 20:30	06:32 06:52 (CH14)	07:01 19:43	09:20 (CH15) 17:12	07:06 08:24 (CH15)
13	06:05 20:57	07:01 (CH14) 20:29	06:33 06:53 (CH14)	07:02 19:41	09:19 (CH15) 17:11	07:07 08:25 (CH15)
14	06:06 20:56	07:30 (CH14) 20:29	06:34 06:54 (CH14)	07:03 19:39	09:18 (CH15) 17:10	07:08 08:26 (CH15)
15	06:06 20:56	07:31 (CH14) 20:27	06:35 06:55 (CH14)	07:04 19:38	09:17 (CH15) 17:09	07:09 08:27 (CH15)
16	06:07 20:55	07:00 (CH14) 20:26	06:36 06:56 (CH14)	07:05 19:36	09:16 (CH15) 17:08	07:10 08:28 (CH15)
17	06:08 20:55	07:33 (CH14) 20:25	06:37 06:57 (CH14)	07:06 19:34	09:15 (CH15) 17:07	07:11 08:29 (CH15)
18	06:09 20:54	06:58 (CH14) 20:23	06:38 06:58 (CH14)	07:07 19:33	09:14 (CH15) 17:06	07:12 08:30 (CH15)
19	06:10 20:53	07:34 (CH14) 20:22	06:39 06:59 (CH14)	07:08 19:31	09:13 (CH15) 17:05	07:13 08:31 (CH15)
20	06:10 20:53	07:35 (CH14) 20:20	06:40 07:00 (CH14)	07:09 19:29	09:12 (CH15) 17:04	07:14 08:32 (CH15)
21	06:11 20:52	06:57 (CH14) 20:19	06:41 07:01 (CH14)	07:10 19:28	09:11 (CH15) 17:03	07:15 08:33 (CH15)
22	06:12 20:51	07:37 (CH14) 20:18	06:42 07:02 (CH14)	07:11 19:26	09:10 (CH15) 17:02	07:16 08:34 (CH15)
23	06:13 20:50	06:55 (CH14) 20:16	06:43 07:04 (CH14)	07:12 19:24	09:09 (CH15) 17:01	07:17 08:35 (CH15)
24	06:14 20:49	07:37 (CH14) 20:15	06:44 07:08 (CH14)	07:13 19:23	09:08 (CH15) 17:00	07:18 08:36 (CH15)
25	06:15 20:49	07:38 (CH14) 20:13	06:45 07:14	07:14 19:21	09:07 (CH15) 16:59	07:19 08:37 (CH15)
26	06:16 20:48	06:54 (CH14) 20:12	06:46 07:15	07:15 19:19	09:06 (CH15) 16:58	07:20 08:38 (CH15)
27	06:16 20:47	07:39 (CH14) 20:10	06:47 07:16	07:16 19:17	09:05 (CH15) 16:57	07:21 08:39 (CH15)
28	06:17 20:46	06:54 (CH14) 20:09	06:48 07:17	07:17 19:15	09:04 (CH15) 16:56	07:22 08:40 (CH15)
29	06:18 20:45	07:40 (CH14) 20:07	06:49 07:18	07:18 19:14	09:03 (CH15) 16:55	07:23 08:41 (CH15)
30	06:19 20:44	06:53 (CH14) 20:05	06:50 07:19	07:19 19:12	09:02 (CH15) 16:54	07:24 08:42 (CH15)
31	06:20 20:43	07:40 (CH14) 20:04	06:51 07:20	07:20 19:11	09:01 (CH15) 16:53	07:25 08:43 (CH15)
Potential sun hours	458	427	375	346	299	289
Total, worst case	997	934	153	2358	1978	1142

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP08 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June			
1	07:49	07:36	07:56 (CH17)	07:01	07:59 (CH17)	07:11	06:25	05:57	06:54 (CH16)
	17:08	17:42	37 08:33 (CH17)	18:16	30 08:29 (CH17)	19:49	20:20	20:50	32 07:26 (CH16)
2	07:49	07:35	07:55 (CH17)	06:59	08:01 (CH17)	07:09	06:24	05:57	06:55 (CH16)
	17:09	17:43	40 08:35 (CH17)	18:17	25 08:26 (CH17)	19:50	20:22	20:50	32 07:27 (CH16)
3	07:50	07:34	07:54 (CH17)	06:58	08:04 (CH17)	07:07	06:23	05:56	06:56 (CH16)
	17:10	17:45	42 08:36 (CH17)	18:18	19 08:23 (CH17)	19:51	20:23	20:51	31 07:27 (CH16)
4	07:50	07:33	07:53 (CH17)	06:56	08:09 (CH17)	07:06	06:22	05:56	06:55 (CH16)
	17:11	17:46	44 08:37 (CH17)	18:19	8 08:17 (CH17)	19:52	20:24	20:52	31 07:26 (CH16)
5	07:50	07:32	07:52 (CH18)	06:55		07:04	06:20	05:55	06:56 (CH16)
	17:12	17:47	46 08:38 (CH17)	18:20		19:53	20:25	20:52	30 07:26 (CH16)
6	07:50	07:31	07:51 (CH18)	06:53		07:03	06:19	05:55	06:57 (CH16)
	17:13	17:48	48 08:39 (CH17)	18:21		19:54	20:26	20:53	29 07:26 (CH16)
7	07:50	07:30	07:50 (CH18)	06:52		07:01	06:18	05:55	06:57 (CH16)
	17:14	17:50	50 08:40 (CH17)	18:22		19:55	20:27	20:54	29 07:26 (CH16)
8	07:49	07:29	07:49 (CH18)	06:50		06:59	06:17	05:55	06:57 (CH16)
	17:15	17:51	51 08:40 (CH17)	18:24		19:56	20:28	20:54	29 07:26 (CH16)
9	07:49	07:28	07:47 (CH18)	06:48		06:58	06:16	05:54	06:58 (CH16)
	17:16	17:52	53 08:40 (CH17)	18:25		19:58	20:29	20:55	28 07:26 (CH16)
10	07:49	07:27	07:46 (CH18)	06:47		06:56	06:15	05:54	06:58 (CH16)
	17:17	17:53	55 08:41 (CH17)	18:26		19:59	20:30	20:55	28 07:26 (CH16)
11	07:49	07:26	07:46 (CH18)	06:45		06:55	06:14	05:54	06:59 (CH16)
	17:18	17:54	55 08:41 (CH17)	18:27		20:00	20:31	20:56	27 07:26 (CH16)
12	07:49	07:24	07:46 (CH18)	06:44		06:53	06:12	05:54	07:00 (CH16)
	17:19	17:56	56 08:42 (CH17)	18:28		20:01	20:32	20:56	26 07:26 (CH16)
13	07:48	07:23	07:45 (CH18)	06:42		06:51	06:11	05:54	07:00 (CH16)
	17:20	17:57	56 08:41 (CH17)	18:29		20:02	20:33	20:57	26 07:26 (CH16)
14	07:48	07:22	07:45 (CH18)	06:40		06:50	06:10	05:54	07:00 (CH16)
	17:21	17:58	57 08:42 (CH17)	18:30		20:03	20:34	20:57	26 07:26 (CH16)
15	07:48	07:21	07:46 (CH18)	06:39		06:48	06:09	05:54	07:01 (CH16)
	17:22	17:59	56 08:42 (CH17)	18:31		20:04	20:35	20:58	25 07:26 (CH16)
16	07:47	07:19	07:47 (CH18)	06:37		06:47	06:08	05:54	07:01 (CH16)
	17:23	18:00	55 08:42 (CH17)	18:32		20:05	20:36	20:58	25 07:26 (CH16)
17	07:47	07:18	07:47 (CH18)	06:35		06:45	06:08	05:54	07:01 (CH16)
	17:24	18:02	54 08:41 (CH17)	18:33		20:06	20:37	20:59	25 07:26 (CH16)
18	07:46	07:17	07:48 (CH18)	06:34		06:44	06:07	05:54	07:02 (CH16)
	17:25	18:03	53 08:41 (CH17)	18:34		20:07	20:38	20:59	24 07:26 (CH16)
19	07:46	07:15	07:48 (CH18)	06:32		06:42	06:06	05:54	07:02 (CH16)
	17:26	18:04	52 08:40 (CH17)	18:35		20:08	20:38	20:59	24 07:26 (CH16)
20	07:45	07:14	07:50 (CH17)	06:31		06:41	06:05	05:54	07:02 (CH16)
	17:28	18:05	50 08:40 (CH17)	18:37		20:09	20:39	20:59	24 07:26 (CH16)
21	07:45	07:13	07:51 (CH17)	06:29		06:39	06:04	05:54	07:03 (CH16)
	17:29	18:06	49 08:40 (CH17)	18:38		20:10	20:40	21:00	24 07:27 (CH16)
22	07:44	07:11	07:51 (CH17)	06:27		06:38	06:03	05:54	07:03 (CH16)
	17:30	18:08	47 08:38 (CH17)	18:39		20:11	20:41	21:00	24 07:27 (CH16)
23	07:44	07:10	07:52 (CH17)	06:26		06:36	06:03	05:55	07:03 (CH16)
	17:31	18:09	46 08:38 (CH17)	18:40		20:12	20:42	21:00	24 07:27 (CH16)
24	07:43	07:08	07:52 (CH17)	06:24		06:35	06:02	05:55	07:03 (CH16)
	17:32	18:10	44 08:36 (CH17)	18:41		20:13	20:43	21:00	24 07:27 (CH16)
25	07:42	08:09 (CH17)	07:07	06:22		06:34	06:01	05:55	07:03 (CH16)
	17:34	9 08:18 (CH17)	18:11	18:42		20:14	20:44	21:00	25 07:28 (CH16)
26	07:41	08:05 (CH17)	07:05	06:21		06:32	06:00	05:56	07:03 (CH16)
	17:35	17 08:22 (CH17)	18:12	18:43		20:15	20:45	21:00	25 07:28 (CH16)
27	07:41	08:03 (CH17)	07:04	06:19		06:31	06:00	05:56	07:03 (CH16)
	17:36	22 08:25 (CH17)	18:13	18:44		20:16	20:46	21:01	25 07:28 (CH16)
28	07:40	08:01 (CH17)	07:02	06:17		06:29	05:59	05:56	07:04 (CH16)
	17:37	26 08:27 (CH17)	18:15	18:45		20:17	20:46	21:01	25 07:29 (CH16)
29	07:39	07:59 (CH17)		07:16		06:28	05:59	05:57	07:03 (CH16)
	17:38	30 08:29 (CH17)		19:46		20:18	20:47	21:01	26 07:29 (CH16)
30	07:38	07:58 (CH17)		07:14		06:27	05:58	05:57	07:04 (CH16)
	17:40	33 08:31 (CH17)		19:47		20:19	20:48	21:00	26 07:30 (CH16)
31	07:37	07:57 (CH17)		07:12			05:58	06:54 (CH16)	
	17:41	35 08:32 (CH17)		19:48			20:49	07:27 (CH16)	
Potential sun hours	298	298	370	398	447	451			
Total, worst case	172	1349	82	398	447	800	799		

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP08 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July		August		September		October		November		December		
1	05:58		07:03 (CH16)	06:21	07:06 (CH16)	06:51	07:21		06:55	07:16 (CH18)	07:29		
	21:00	27	07:30 (CH16)	20:42	07:34 (CH16)	19:59	19:09		17:23	54	08:10 (CH17)	16:59	
2	05:58		07:03 (CH16)	06:22	07:06 (CH16)	06:52	07:22		06:56		07:17 (CH18)	07:30	
	21:00	27	07:30 (CH16)	20:41	07:34 (CH16)	19:58	19:07		17:22	53	08:10 (CH17)	16:59	
3	05:59		07:03 (CH16)	06:23	07:08 (CH16)	06:53	07:23		06:57		07:18 (CH18)	07:31	
	21:00	28	07:31 (CH16)	20:40	07:33 (CH16)	19:56	19:06		17:21	51	08:09 (CH17)	16:59	
4	05:59		07:04 (CH16)	06:24	07:09 (CH16)	06:54	07:24		06:58		07:20 (CH18)	07:32	
	21:00	28	07:32 (CH16)	20:38	07:31 (CH16)	19:54	19:04		17:19	49	08:09 (CH17)	16:58	
5	06:00		07:03 (CH16)	06:25	07:10 (CH16)	06:55	07:25		06:59		07:21 (CH18)	07:33	
	21:00	29	07:32 (CH16)	20:37	07:30 (CH16)	19:53	19:03		17:18	48	08:09 (CH17)	16:58	
6	06:00		07:03 (CH16)	06:26	07:12 (CH16)	06:56	07:26		07:00		07:22 (CH18)	07:34	
	20:59	29	07:32 (CH16)	20:36	07:28 (CH16)	19:51	19:01		17:17	46	08:08 (CH17)	16:58	
7	06:01		07:03 (CH16)	06:27	07:15 (CH16)	06:57	07:27		07:02		07:23 (CH17)	07:35	
	20:59	29	07:32 (CH16)	20:35	07:25 (CH16)	19:49	18:59		17:16	44	08:07 (CH17)	16:58	
8	06:01		07:03 (CH16)	06:28		06:58	07:28		07:03		07:25 (CH17)	07:36	
	20:59	30	07:33 (CH16)	20:34		19:48	18:58		17:15	42	08:07 (CH17)	16:58	
9	06:02		07:03 (CH16)	06:29		06:59	07:29		07:04		07:26 (CH17)	07:37	
	20:59	31	07:34 (CH16)	20:32		19:46	18:56		17:14	40	08:06 (CH17)	16:58	
10	06:03		07:02 (CH16)	06:30		07:00	07:30		08:40 (CH17)	07:05	07:27 (CH17)	07:38	
	20:58	32	07:34 (CH16)	20:31		19:44	18:55	14	08:54 (CH17)	17:13	37	08:04 (CH17)	16:58
11	06:03		07:03 (CH16)	06:31		07:01	07:31		08:36 (CH17)	07:06		07:28 (CH17)	07:38
	20:58	32	07:35 (CH16)	20:30		19:43	18:53	22	08:58 (CH17)	17:12	35	08:03 (CH17)	16:58
12	06:04		07:03 (CH16)	06:32		07:02	07:32		08:33 (CH17)	07:07		07:30 (CH17)	07:39
	20:57	32	07:35 (CH16)	20:29		19:41	18:51	27	09:00 (CH17)	17:11	33	08:03 (CH17)	16:58
13	06:05		07:02 (CH16)	06:33		07:03	07:33		08:32 (CH17)	07:09		07:31 (CH17)	07:40
	20:57	33	07:35 (CH16)	20:27		19:39	18:50	31	09:03 (CH17)	17:10	30	08:01 (CH17)	16:58
14	06:06		07:02 (CH16)	06:34		07:04	07:34		08:30 (CH17)	07:10		07:33 (CH17)	07:41
	20:56	34	07:36 (CH16)	20:26		19:38	18:48	35	09:05 (CH17)	17:09	26	07:59 (CH17)	16:59
15	06:06		07:02 (CH16)	06:35		07:05	07:35		08:28 (CH17)	07:11		07:36 (CH17)	07:42
	20:56	34	07:36 (CH16)	20:25		19:36	18:47	38	09:06 (CH17)	17:08	22	07:58 (CH17)	16:59
16	06:07		07:03 (CH16)	06:36		07:06	07:37		08:26 (CH17)	07:12		07:38 (CH17)	07:42
	20:55	34	07:37 (CH16)	20:23		19:34	18:45	41	09:07 (CH17)	17:08	17	07:55 (CH17)	16:59
17	06:08		07:02 (CH16)	06:37		07:07	07:38		08:25 (CH17)	07:13		07:42 (CH17)	07:43
	20:55	34	07:36 (CH16)	20:22		19:33	18:44	43	09:08 (CH17)	17:07	9	07:51 (CH17)	16:59
18	06:09		07:02 (CH16)	06:38		07:08	07:39		08:24 (CH17)	07:15			07:44
	20:54	35	07:37 (CH16)	20:20		19:31	18:42	44	09:08 (CH17)	17:06			17:00
19	06:10		07:02 (CH16)	06:39		07:09	07:40		08:22 (CH17)	07:16			07:44
	20:53	35	07:37 (CH16)	20:19		19:29	18:41	47	09:09 (CH17)	17:05			17:00
20	06:10		07:02 (CH16)	06:40		07:10	07:41		08:22 (CH17)	07:17			07:45
	20:53	35	07:37 (CH16)	20:18		19:28	18:39	47	09:09 (CH17)	17:05			17:00
21	06:11		07:02 (CH16)	06:41		07:11	07:42		08:22 (CH17)	07:18			07:45
	20:52	35	07:37 (CH16)	20:16		19:26	18:38	49	09:11 (CH17)	17:04			17:01
22	06:12		07:02 (CH16)	06:42		07:12	07:43		08:20 (CH18)	07:19			07:46
	20:51	35	07:37 (CH16)	20:15		19:24	18:36	51	09:11 (CH17)	17:03			17:01
23	06:13		07:02 (CH16)	06:43		07:13	07:44		08:19 (CH18)	07:20			07:46
	20:50	35	07:37 (CH16)	20:13		19:23	18:35	52	09:11 (CH17)	17:03			17:02
24	06:14		07:02 (CH16)	06:44		07:14	07:45		08:17 (CH18)	07:21			07:47
	20:49	35	07:37 (CH16)	20:12		19:21	18:34	54	09:11 (CH17)	17:02			17:02
25	06:15		07:03 (CH16)	06:45		07:15	06:47		07:16 (CH18)	07:23			07:47
	20:49	34	07:37 (CH16)	20:10		19:19	17:32	55	08:11 (CH17)	17:02			17:03
26	06:16		07:03 (CH16)	06:46		07:16	06:48		07:16 (CH18)	07:24			07:48
	20:48	34	07:37 (CH16)	20:09		19:17	17:31	56	08:12 (CH17)	17:01			17:04
27	06:17		07:04 (CH16)	06:47		07:17	06:49		07:16 (CH18)	07:25			07:48
	20:47	33	07:37 (CH16)	20:07		19:16	17:29	55	08:11 (CH17)	17:01			17:04
28	06:17		07:04 (CH16)	06:48		07:18	06:50		07:15 (CH18)	07:26			07:48
	20:46	33	07:37 (CH16)	20:05		19:14	17:28	56	08:11 (CH17)	17:00			17:05
29	06:18		07:04 (CH16)	06:49		07:19	06:51		07:15 (CH18)	07:27			07:49
	20:45	32	07:36 (CH16)	20:04		19:12	17:27	56	08:11 (CH17)	17:00			17:06
30	06:19		07:04 (CH16)	06:49		07:20	06:52		07:14 (CH18)	07:28			07:49
	20:44	31	07:35 (CH16)	20:02		19:11	17:26	56	08:10 (CH17)	16:59			17:06
31	06:20		07:05 (CH16)	06:50			06:53		07:15 (CH18)				07:49
	20:43	30	07:35 (CH16)	20:01			17:24	56	08:11 (CH17)				17:07
Potential sun hours	458			427		375	346	985	299	636		289	
Total, worst case		995		149									

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

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

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP09 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January		February		March		April		May		June	
1	07:49	08:27 (CH07)	07:36	08:39 (CH07)	07:01		07:10		06:25	06:44 (CH04)	05:57	
	17:08	15 08:42 (CH07)	17:42	10 08:49 (CH07)	18:15		19:49		20:20	12 06:56 (CH04)	20:49	
2	07:49	08:27 (CH07)	07:35		06:59		07:09		06:24	06:43 (CH04)	05:56	
	17:09	16 08:43 (CH07)	17:43		18:17		19:50		20:21	15 06:58 (CH04)	20:50	
3	07:49	08:27 (CH07)	07:34		06:58	07:29 (CH06)	07:07		06:23	06:42 (CH04)	05:56	
	17:10	17 08:44 (CH07)	17:44		18:18	10 07:39 (CH06)	19:51		20:22	17 06:59 (CH04)	20:51	
4	07:49	08:27 (CH07)	07:33		06:56	07:26 (CH06)	07:06		06:21	06:41 (CH04)	05:56	
	17:11	18 08:45 (CH07)	17:46		18:19	16 07:42 (CH06)	19:52		20:23	19 07:00 (CH04)	20:52	
5	07:49	08:26 (CH07)	07:32		06:55	07:24 (CH06)	07:04		06:20	06:41 (CH04)	05:55	
	17:11	19 08:45 (CH07)	17:47		18:20	19 07:43 (CH06)	19:53		20:24	19 07:00 (CH04)	20:52	
6	07:49	08:26 (CH07)	07:31		06:53	07:23 (CH06)	07:02		06:19	06:40 (CH04)	05:55	
	17:12	20 08:46 (CH07)	17:48		18:21	21 07:44 (CH06)	19:54		20:25	20 07:00 (CH04)	20:53	
7	07:49	08:26 (CH07)	07:30		06:51	07:21 (CH06)	07:01		06:18	06:39 (CH04)	05:55	
	17:13	21 08:47 (CH07)	17:49		18:22	24 07:45 (CH06)	19:55		20:27	21 07:00 (CH04)	20:54	
8	07:49	08:26 (CH07)	07:29		06:50	07:21 (CH06)	06:59		06:17	06:39 (CH04)	05:54	
	17:14	22 08:48 (CH07)	17:50		18:23	25 07:46 (CH06)	19:56		20:28	21 07:00 (CH04)	20:54	
9	07:49	08:26 (CH07)	07:28		06:48	07:20 (CH06)	06:57		06:15	06:39 (CH04)	05:54	
	17:15	23 08:49 (CH07)	17:52		18:24	26 07:46 (CH06)	19:57		20:29	21 07:00 (CH04)	20:55	
10	07:49	08:26 (CH07)	07:27		06:47	07:19 (CH06)	06:56		06:14	06:40 (CH04)	05:54	
	17:16	24 08:50 (CH07)	17:53		18:26	26 07:45 (CH06)	19:58		20:30	20 07:00 (CH04)	20:55	
11	07:49	08:26 (CH07)	07:25		06:45	07:20 (CH06)	06:54		06:13	06:40 (CH04)	05:54	
	17:17	24 08:50 (CH07)	17:54		18:27	25 07:45 (CH06)	19:59		20:31	19 06:59 (CH04)	20:56	
12	07:49	08:26 (CH07)	07:24		06:43	07:19 (CH06)	06:53		06:12	06:40 (CH04)	05:54	
	17:18	25 08:51 (CH07)	17:55		18:28	26 07:45 (CH06)	20:00		20:32	19 06:59 (CH04)	20:56	
13	07:48	08:26 (CH07)	07:23		06:42	07:19 (CH06)	06:51		06:11	06:41 (CH04)	05:54	
	17:19	26 08:52 (CH07)	17:57		18:29	25 07:44 (CH06)	20:02		20:33	17 06:58 (CH04)	20:57	
14	07:48	08:26 (CH07)	07:22		06:40	07:20 (CH06)	06:50		06:10	06:42 (CH04)	05:53	
	17:21	27 08:53 (CH07)	17:58		18:30	23 07:43 (CH06)	20:03		20:34	15 06:57 (CH04)	20:57	
15	07:48	08:27 (CH07)	07:20		06:39	07:20 (CH06)	06:48		06:09	06:43 (CH04)	05:53	
	17:22	27 08:54 (CH07)	17:59		18:31	22 07:42 (CH06)	20:04		20:35	13 06:56 (CH04)	20:58	
16	07:47	08:26 (CH07)	07:19		06:37	07:20 (CH06)	06:47		06:08	06:44 (CH04)	05:53	
	17:23	28 08:54 (CH07)	18:00		18:32	20 07:40 (CH06)	20:05		20:35	11 06:55 (CH04)	20:58	
17	07:47	08:27 (CH07)	07:18		06:35	07:22 (CH06)	06:45		06:07	06:45 (CH04)	05:54	
	17:24	28 08:55 (CH07)	18:01		18:33	17 07:39 (CH06)	20:06		20:36	8 06:53 (CH04)	20:58	
18	07:46	08:27 (CH07)	07:16		06:34	07:24 (CH06)	06:43		06:06		05:54	
	17:25	28 08:55 (CH07)	18:03		18:34	12 07:36 (CH06)	20:07		20:37		20:59	
19	07:46	08:27 (CH07)	07:15		06:32		06:42		06:05		05:54	
	17:26	29 08:56 (CH07)	18:04		18:35		20:08		20:38		20:59	
20	07:45	08:27 (CH07)	07:14		06:30		06:41		06:05		05:54	
	17:27	28 08:55 (CH07)	18:05		18:36		20:09		20:39		20:59	
21	07:45	08:27 (CH07)	07:12		06:29		06:39		06:04		05:54	
	17:29	28 08:55 (CH07)	18:06		18:37		20:10		20:40		21:00	
22	07:44	08:28 (CH07)	07:11		06:27		06:38		06:03		05:54	
	17:30	28 08:56 (CH07)	18:07		18:38		20:11		20:41		21:00	
23	07:43	08:29 (CH07)	07:10		06:25		06:36		06:02		05:54	
	17:31	27 08:56 (CH07)	18:09		18:40		20:12		20:42		21:00	
24	07:43	08:29 (CH07)	07:08		06:24		06:35		06:02		05:55	
	17:32	27 08:56 (CH07)	18:10		18:41		20:13		20:43		21:00	
25	07:42	08:29 (CH07)	07:07		06:22		06:33		06:01		05:55	
	17:33	26 08:55 (CH07)	18:11		18:42		20:14		20:44		21:00	
26	07:41	08:31 (CH07)	07:05		06:20		06:32		06:00		05:55	
	17:35	25 08:56 (CH07)	18:12		18:43		20:15		20:45		21:00	
27	07:40	08:32 (CH07)	07:04		06:19		06:31		05:59		05:56	
	17:36	23 08:55 (CH07)	18:13		18:44		20:16		20:45		21:00	
28	07:40	08:32 (CH07)	07:02		06:17		06:29		05:59		05:56	
	17:37	23 08:55 (CH07)	18:14		18:45		20:17		20:46		21:00	
29	07:39	08:33 (CH07)			07:15		06:28		05:58		05:56	
	17:38	21 08:54 (CH07)			19:46		20:18		20:47		21:00	
30	07:38	08:35 (CH07)			07:14		06:26	06:48 (CH04)	05:58		05:57	
	17:39	18 08:53 (CH07)			19:47		20:19	7 06:55 (CH04)	20:48		21:00	
31	07:37	08:36 (CH07)			07:12				05:57			
	17:41	15 08:51 (CH07)			19:48				20:49			
Potential sun hours	298		298		370		398		447		451	
Total, worst case	726		10		337		7		287			

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP09 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December				
1	05:57	06:21	06:51 (CH04)	06:51	07:21	07:59 (CH06)	06:54	07:29	08:08 (CH07)	
	21:00	20:42	18 07:09 (CH04)	19:59	19:09	25 08:24 (CH06)	17:23	16:59	24 08:32 (CH07)	
2	05:58	06:22	06:50 (CH04)	06:52	07:22	07:58 (CH06)	06:56	07:30	08:08 (CH07)	
	21:00	20:41	20 07:10 (CH04)	19:57	19:07	26 08:24 (CH06)	17:22	16:59	24 08:32 (CH07)	
3	05:58	06:23	06:50 (CH04)	06:53	07:23	07:58 (CH06)	06:57	07:31	08:09 (CH07)	
	21:00	20:39	20 07:10 (CH04)	19:56	19:06	26 08:24 (CH06)	17:20	16:58	23 08:32 (CH07)	
4	05:59	06:24	06:50 (CH04)	06:54	07:24	07:58 (CH06)	06:58	07:32	08:10 (CH07)	
	21:00	20:38	20 07:10 (CH04)	19:54	19:04	25 08:23 (CH06)	17:19	16:58	22 08:32 (CH07)	
5	05:59	06:25	06:50 (CH04)	06:55	07:25	07:58 (CH06)	06:59	07:33	08:11 (CH07)	
	21:00	20:37	20 07:10 (CH04)	19:53	19:02	25 08:23 (CH06)	17:18	16:58	21 08:32 (CH07)	
6	06:00	06:26	06:49 (CH04)	06:56	07:26	07:58 (CH06)	07:00	07:34	08:12 (CH07)	
	20:59	20:36	20 07:09 (CH04)	19:51	19:01	24 08:22 (CH06)	17:17	16:58	20 08:32 (CH07)	
7	06:01	06:27	06:49 (CH04)	06:57	07:27	07:58 (CH06)	07:01	07:35	08:13 (CH07)	
	20:59	20:35	20 07:09 (CH04)	19:49	18:59	23 08:21 (CH06)	17:16	16:58	19 08:32 (CH07)	
8	06:01	06:28	06:50 (CH04)	06:58	07:28	07:59 (CH06)	07:03	07:36	08:14 (CH07)	
	20:59	20:34	19 07:09 (CH04)	19:48	18:57	20 08:19 (CH06)	17:15	16:58	18 08:32 (CH07)	
9	06:02	06:29	06:50 (CH04)	06:59	07:29	08:00 (CH06)	07:04	07:37	08:15 (CH07)	
	20:58	20:32	18 07:08 (CH04)	19:46	18:56	17 08:17 (CH06)	17:14	16:58	17 08:32 (CH07)	
10	06:03	06:30	06:51 (CH04)	07:00	07:30	08:02 (CH06)	07:05	07:37	08:16 (CH07)	
	20:58	20:31	16 07:07 (CH04)	19:44	18:54	13 08:15 (CH06)	17:13	10 08:10 (CH07)	16 08:32 (CH07)	
11	06:03	06:31	06:52 (CH04)	07:01	07:31	08:05 (CH06)	07:06	08:07 (CH07)	07:38	08:17 (CH07)
	20:58	20:30	14 07:06 (CH04)	19:43	18:53	6 08:11 (CH06)	17:12	15 08:07 (CH07)	16:58	15 08:32 (CH07)
12	06:04	06:32	06:53 (CH04)	07:02	07:32		07:07	18 08:07 (CH07)	17:39	08:18 (CH07)
	20:57	20:28	11 07:04 (CH04)	19:41	18:51		17:11	18 08:25 (CH07)	16:58	14 08:32 (CH07)
13	06:05	06:33	06:56 (CH04)	07:03	07:33		07:08	21 08:05 (CH07)	17:40	08:19 (CH07)
	20:57	20:27	5 07:01 (CH04)	19:39	18:50		17:10	21 08:26 (CH07)	16:58	12 08:31 (CH07)
14	06:05	06:34		07:04	07:34		07:10	23 08:04 (CH07)	17:41	08:20 (CH07)
	20:56	20:26		19:38	18:48		17:09	23 08:27 (CH07)	16:58	11 08:31 (CH07)
15	06:06	06:35		07:05	07:35		07:11	24 08:03 (CH07)	17:41	08:21 (CH07)
	20:56	20:24		19:36	18:46		17:08	24 08:27 (CH07)	16:59	10 08:31 (CH07)
16	06:07	06:36		07:06	07:36		07:12	25 08:04 (CH07)	17:42	08:22 (CH07)
	20:55	20:23		19:34	18:45		17:07	25 08:29 (CH07)	16:59	8 08:30 (CH07)
17	06:08	06:36		07:07	07:37		07:13	26 08:03 (CH07)	17:43	08:23 (CH07)
	20:54	20:22		19:32	18:43		17:06	26 08:29 (CH07)	16:59	8 08:31 (CH07)
18	06:08	06:37		07:08	07:39		07:14	27 08:03 (CH07)	17:43	08:25 (CH07)
	20:54	20:20		19:31	18:42		17:06	27 08:30 (CH07)	16:59	6 08:31 (CH07)
19	06:09	06:38		07:09	07:40		07:16	27 08:03 (CH07)	17:44	08:25 (CH07)
	20:53	20:19		19:29	18:40		17:05	27 08:30 (CH07)	17:00	5 08:30 (CH07)
20	06:10	06:39		07:10	07:41		07:17	28 08:03 (CH07)	17:45	08:26 (CH07)
	20:52	20:17		19:27	18:39		17:04	28 08:31 (CH07)	17:00	5 08:31 (CH07)
21	06:11	06:40		07:11	07:42		07:18	28 08:03 (CH07)	17:45	08:26 (CH07)
	20:52	20:16		19:26	18:38		17:04	28 08:31 (CH07)	17:01	5 08:31 (CH07)
22	06:12	06:41		07:12	07:43		07:19	28 08:03 (CH07)	17:46	08:28 (CH07)
	20:51	20:14		19:24	18:36		17:03	28 08:31 (CH07)	17:01	3 08:31 (CH07)
23	06:13	06:42		07:13	07:44		07:20	29 08:03 (CH07)	17:46	08:27 (CH07)
	20:50	20:13		19:22	18:35		17:02	29 08:32 (CH07)	17:02	5 08:32 (CH07)
24	06:14	06:43		07:14	07:45		07:21	28 08:04 (CH07)	17:47	08:28 (CH07)
	20:49	20:11		19:21	18:33		17:02	28 08:32 (CH07)	17:02	5 08:33 (CH07)
25	06:14	06:44		07:15	07:46		07:22	28 08:05 (CH07)	17:47	08:28 (CH07)
	20:48	20:10		19:19	10 08:18 (CH06)		17:01	28 08:33 (CH07)	17:03	6 08:34 (CH07)
26	06:15	06:45		07:16	08:05 (CH06)		07:23	28 08:05 (CH07)	17:47	08:27 (CH07)
	20:47	3 07:01 (CH04)		20:08	16 08:21 (CH06)		17:01	28 08:33 (CH07)	17:03	7 08:34 (CH07)
27	06:16	06:55 (CH04)		06:46	07:17		07:25	27 08:06 (CH07)	17:48	08:28 (CH07)
	20:47	9 07:04 (CH04)		20:07	19 08:22 (CH06)		17:00	27 08:33 (CH07)	17:04	8 08:36 (CH07)
28	06:17	06:54 (CH04)		06:47	07:18		07:26	27 08:06 (CH07)	17:48	08:28 (CH07)
	20:46	12 07:06 (CH04)		20:05	19:14		17:00	27 08:33 (CH07)	17:05	9 08:37 (CH07)
29	06:18	06:53 (CH04)		06:48	07:19		07:27	26 08:07 (CH07)	17:48	08:27 (CH07)
	20:45	14 07:07 (CH04)		20:04	19:12		17:00	26 08:33 (CH07)	17:05	11 08:38 (CH07)
30	06:19	06:52 (CH04)		06:49	07:20		07:28	25 08:07 (CH07)	17:49	08:27 (CH07)
	20:44	16 07:08 (CH04)		20:02	19:11		16:59	25 08:32 (CH07)	17:06	12 08:39 (CH07)
31	06:20	06:51 (CH04)		06:50					07:49	08:27 (CH07)
	20:43	18 07:09 (CH04)		20:01					17:07	13 08:40 (CH07)
Potential sun hours	458	427	375	346	299	289				
Total, worst case	72	221	115	230	518	382				

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP10 - NURAGHE MARTINE

Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:49	09:37 (CH14)	07:36	10:11 (CH14)	07:01	07:11	06:25	05:57	05:58	06:21	06:51	07:21	06:55	07:29	09:25 (CH14)
2	07:49	09:38 (CH14)	07:35	10:10 (CH14)	06:59	07:09	06:24	05:56	05:58	06:22	06:52	07:22	06:56	07:30	09:25 (CH14)
3	07:50	09:38 (CH14)	07:34	10:09 (CH14)	06:58	07:07	06:23	05:56	05:58	06:23	06:53	07:23	06:57	07:31	09:25 (CH14)
4	07:50	09:39 (CH14)	07:33	10:08 (CH14)	06:56	07:06	06:22	05:56	05:59	06:24	06:54	07:24	06:58	07:32	09:25 (CH14)
5	07:50	09:40 (CH14)	07:32	10:07 (CH14)	06:55	07:04	06:20	05:55	06:00	06:25	06:55	07:25	06:59	07:33	09:25 (CH14)
6	07:50	09:41 (CH14)	07:31	10:06 (CH14)	06:53	07:02	06:19	05:55	06:00	06:26	06:56	07:26	07:00	07:34	09:25 (CH14)
7	07:50	09:42 (CH14)	07:30	10:05 (CH14)	06:52	07:01	06:18	05:55	06:01	06:27	06:57	07:27	07:02	07:35	09:26 (CH14)
8	07:49	09:41 (CH14)	07:29	10:04 (CH14)	06:50	06:59	06:17	05:54	06:01	06:28	06:58	07:28	07:03	07:36	09:26 (CH14)
9	07:49	09:42 (CH14)	07:28	10:03 (CH14)	06:48	06:58	06:16	05:54	06:02	06:29	06:59	07:29	07:04	07:37	09:26 (CH14)
10	07:49	09:43 (CH14)	07:27	10:02 (CH14)	06:47	06:56	06:15	05:54	06:03	06:30	07:00	07:30	07:05	07:38	09:27 (CH14)
11	07:49	09:44 (CH14)	07:26	10:01 (CH14)	06:45	06:54	06:13	05:54	06:03	06:31	07:01	07:31	07:06	07:39	09:27 (CH14)
12	07:49	09:45 (CH14)	07:25	10:00 (CH14)	06:44	06:53	06:12	05:54	06:04	06:32	07:02	07:32	07:07	07:40	09:28 (CH14)
13	07:48	09:46 (CH14)	07:24	09:59 (CH14)	06:42	06:51	06:11	05:54	06:05	06:33	07:03	07:33	07:09	07:41	09:28 (CH14)
14	07:48	09:47 (CH14)	07:23	09:58 (CH14)	06:40	06:50	06:10	05:54	06:06	06:34	07:04	07:34	07:10	07:42	09:28 (CH14)
15	07:48	09:48 (CH14)	07:22	09:57 (CH14)	06:39	06:48	06:09	05:54	06:06	06:35	07:05	07:35	07:11	07:43	09:29 (CH14)
16	07:47	09:47 (CH14)	07:21	09:56 (CH14)	06:37	06:47	06:08	05:54	06:07	06:36	07:06	07:37	07:12	07:44	09:29 (CH14)
17	07:47	09:48 (CH14)	07:20	09:55 (CH14)	06:35	06:45	06:07	05:54	06:08	06:37	07:07	07:38	07:13	07:45	09:29 (CH14)
18	07:46	09:49 (CH14)	07:19	09:54 (CH14)	06:34	06:44	06:06	05:54	06:09	06:38	07:08	07:39	07:15	07:46	09:30 (CH14)
19	07:46	09:50 (CH14)	07:18	09:53 (CH14)	06:32	06:42	06:06	05:54	06:09	06:39	07:09	07:40	07:16	07:47	09:30 (CH14)
20	07:45	09:51 (CH14)	07:17	09:52 (CH14)	06:30	06:41	06:05	05:54	06:10	06:40	07:10	07:41	07:17	07:48	09:31 (CH14)
21	07:45	09:52 (CH14)	07:16	09:51 (CH14)	06:29	06:39	06:04	05:54	06:11	06:41	07:11	07:42	07:18	07:49	09:31 (CH14)
22	07:44	09:53 (CH14)	07:15	09:50 (CH14)	06:27	06:38	06:03	05:54	06:12	06:42	07:12	07:43	07:19	07:50	09:32 (CH14)
23	07:44	09:54 (CH14)	07:14	09:49 (CH14)	06:25	06:36	06:02	05:55	06:13	06:43	07:13	07:44	07:20	07:51	09:32 (CH14)
24	07:43	09:55 (CH14)	07:13	09:48 (CH14)	06:24	06:35	06:02	05:55	06:14	06:44	07:14	07:45	07:21	07:52	09:33 (CH14)
25	07:42	09:56 (CH14)	07:12	09:47 (CH14)	06:22	06:33	06:01	05:55	06:15	06:45	07:15	07:46	07:23	07:53	09:33 (CH14)
26	07:41	09:57 (CH14)	07:11	09:46 (CH14)	06:21	06:32	06:00	05:55	06:16	06:46	07:16	07:47	07:24	07:54	09:34 (CH14)
27	07:41	09:58 (CH14)	07:10	09:45 (CH14)	06:19	06:31	06:00	05:56	06:16	06:46	07:17	07:48	07:25	07:55	09:34 (CH14)
28	07:40	09:59 (CH14)	07:09	09:44 (CH14)	06:17	06:29	06:00	05:56	06:17	06:47	07:18	07:49	07:26	07:56	09:35 (CH14)
29	07:39	09:59 (CH14)	07:08	09:43 (CH14)	06:15	06:27	06:00	05:56	06:18	06:48	07:19	07:50	07:27	07:57	09:35 (CH14)
30	07:38	09:59 (CH14)	07:07	09:42 (CH14)	06:14	06:26	06:00	05:57	06:19	06:49	07:20	07:51	07:28	07:58	09:36 (CH14)
31	07:37	09:59 (CH14)	07:06	09:41 (CH14)	06:13	06:25	06:00	05:57	06:20	06:50	07:21	07:52	07:29	07:59	09:37 (CH14)
Potential sun hours	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
Total, worst case	2113	2113	2113	2113	2113	2113	2113	2113	2113	2113	2113	2113	2113	2113	2113

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP11 - NURAGHE SCOBERTU

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January		February		March		April		May		June	
1	07:49	08:31 (CH10)	07:36	09:50 (CH07)	07:01	07:10	06:25	07:14 (CH06)	05:57	06:19 (CH05)		
	17:08	95 10:44 (CH07)	17:42	48 10:38 (CH07)	18:15	19:49	20:20	62 08:16 (CH06)	20:49	88 08:13 (CH06)		
2	07:49	08:32 (CH10)	07:35	09:51 (CH07)	06:59	07:09	06:24	07:14 (CH06)	05:56	06:19 (CH05)		
	17:09	94 10:44 (CH07)	17:43	46 10:37 (CH07)	18:17	19:50	20:21	62 08:16 (CH06)	20:50	89 08:14 (CH06)		
3	07:49	08:33 (CH10)	07:34	08:06 (CH09)	06:58	07:07	06:23	07:13 (CH06)	05:56	06:19 (CH05)		
	17:10	92 10:44 (CH07)	17:44	47 10:35 (CH07)	18:18	19:51	20:22	64 08:17 (CH06)	20:51	89 08:13 (CH06)		
4	07:49	08:34 (CH10)	07:33	08:02 (CH09)	06:56	07:06	06:21	07:13 (CH06)	05:55	06:19 (CH05)		
	17:11	92 10:45 (CH07)	17:46	51 10:33 (CH07)	18:19	19:52	20:23	64 08:17 (CH06)	20:52	88 08:13 (CH06)		
5	07:49	08:35 (CH10)	07:32	08:00 (CH09)	06:54	07:04	06:20	07:13 (CH06)	05:55	06:19 (CH05)		
	17:11	90 10:45 (CH07)	17:47	50 10:30 (CH07)	18:20	19:53	20:24	64 08:17 (CH06)	20:52	88 08:13 (CH06)		
6	07:49	08:36 (CH10)	07:31	07:59 (CH09)	06:53	07:02	06:19	07:11 (CH06)	05:55	06:19 (CH05)		
	17:12	90 10:46 (CH07)	17:48	47 10:27 (CH07)	18:21	19:54	20:25	66 08:17 (CH06)	20:53	86 08:12 (CH06)		
7	07:49	08:37 (CH10)	07:30	07:58 (CH09)	06:51	07:01	06:18	07:11 (CH06)	05:55	06:19 (CH05)		
	17:13	88 10:46 (CH07)	17:49	42 10:23 (CH07)	18:22	19:55	20:26	66 08:17 (CH06)	20:53	86 08:12 (CH06)		
8	07:49	08:39 (CH10)	07:29	07:56 (CH09)	06:50	06:59	06:17	07:11 (CH06)	05:54	06:20 (CH05)		
	17:14	85 10:47 (CH07)	17:50	25 08:21 (CH09)	18:23	19:56	20:27	66 08:17 (CH06)	20:54	85 08:12 (CH06)		
9	07:49	08:41 (CH10)	07:28	07:56 (CH09)	06:48	06:57	06:15	07:11 (CH06)	05:54	06:20 (CH05)		
	17:15	82 10:47 (CH07)	17:52	26 08:22 (CH09)	18:24	19:57	20:28	66 08:17 (CH06)	20:55	85 08:12 (CH06)		
10	07:49	08:44 (CH10)	07:27	07:56 (CH09)	06:47	06:56	06:14	07:11 (CH06)	05:54	06:20 (CH05)		
	17:16	76 10:47 (CH07)	17:53	27 08:23 (CH09)	18:26	19:58	20:30	66 08:17 (CH06)	20:55	84 08:12 (CH06)		
11	07:49	09:33 (CH07)	07:25	07:55 (CH09)	06:45	06:54	06:13	07:10 (CH06)	05:54	06:21 (CH05)		
	17:17	74 10:47 (CH07)	17:54	29 08:24 (CH09)	18:27	19:59	20:31	67 08:17 (CH06)	20:56	84 08:13 (CH06)		
12	07:48	09:34 (CH07)	07:24	07:55 (CH09)	06:43	06:53	06:12	07:10 (CH06)	05:54	06:20 (CH05)		
	17:18	74 10:48 (CH07)	17:55	29 08:24 (CH09)	18:28	20:00	20:32	67 08:17 (CH06)	20:56	84 08:12 (CH06)		
13	07:48	09:34 (CH07)	07:23	07:54 (CH09)	06:42	06:51	06:11	07:10 (CH06)	05:54	06:20 (CH05)		
	17:19	73 10:47 (CH07)	17:57	30 08:24 (CH09)	18:29	20:01	20:33	67 08:17 (CH06)	20:57	84 08:12 (CH06)		
14	07:48	09:35 (CH07)	07:22	07:55 (CH09)	06:40	06:50	06:10	07:10 (CH06)	05:53	06:21 (CH05)		
	17:21	73 10:48 (CH07)	17:58	29 08:24 (CH09)	18:30	20:03	20:33	67 08:17 (CH06)	20:57	82 08:12 (CH06)		
15	07:48	09:36 (CH07)	07:20	07:55 (CH09)	06:38	06:48	06:09	07:10 (CH06)	05:53	06:21 (CH05)		
	17:22	72 10:48 (CH07)	17:59	29 08:24 (CH09)	18:31	20:04	20:34	67 08:17 (CH06)	20:58	82 08:12 (CH06)		
16	07:47	09:36 (CH07)	07:19	07:54 (CH09)	06:37	06:46	06:08	06:30 (CH05)	05:53	06:22 (CH05)		
	17:23	72 10:48 (CH07)	18:00	29 08:23 (CH09)	18:32	20:05	20:35	71 08:16 (CH06)	20:58	82 08:13 (CH06)		
17	07:47	09:37 (CH07)	07:18	07:55 (CH09)	06:35	06:45	06:07	06:27 (CH05)	05:53	06:22 (CH05)		
	17:24	71 10:48 (CH07)	18:01	28 08:23 (CH09)	18:33	20:06	20:36	77 08:16 (CH06)	20:58	82 08:13 (CH06)		
18	07:46	09:37 (CH07)	07:16	07:56 (CH09)	06:34	06:43	06:06	06:27 (CH05)	05:54	06:22 (CH05)		
	17:25	71 10:48 (CH07)	18:03	27 08:23 (CH09)	18:34	20:07	20:37	80 08:17 (CH06)	20:59	82 08:13 (CH06)		
19	07:46	09:38 (CH07)	07:15	07:56 (CH09)	06:32	06:42	06:05	06:26 (CH05)	05:54	06:22 (CH05)		
	17:26	70 10:48 (CH07)	18:04	25 08:21 (CH09)	18:35	20:08	31 08:04 (CH06)	20:38	81 08:16 (CH06)	20:59	82 08:13 (CH06)	
20	07:45	09:38 (CH07)	07:14	07:57 (CH09)	06:30	06:40	06:05	07:29 (CH06)	06:05	06:23 (CH05)		
	17:27	69 10:47 (CH07)	18:05	24 08:21 (CH09)	18:36	20:09	36 08:05 (CH06)	20:39	83 08:16 (CH06)	20:59	81 08:13 (CH06)	
21	07:45	09:39 (CH07)	07:12	07:58 (CH09)	06:29	06:39	06:04	07:28 (CH06)	06:04	06:24 (CH05)	05:54	06:23 (CH05)
	17:28	68 10:47 (CH07)	18:06	21 08:19 (CH09)	18:37	20:10	40 08:08 (CH06)	20:40	84 08:15 (CH06)	21:00	81 08:13 (CH06)	
22	07:44	09:40 (CH07)	07:11	08:00 (CH09)	06:27	06:38	06:03	07:25 (CH06)	06:03	06:24 (CH05)	05:54	06:23 (CH05)
	17:30	67 10:47 (CH07)	18:07	18 08:18 (CH09)	18:38	20:11	44 08:09 (CH06)	20:41	85 08:16 (CH06)	21:00	81 08:13 (CH06)	
23	07:43	09:41 (CH07)	07:09	08:02 (CH09)	06:25	06:36	06:02	07:24 (CH06)	06:02	06:23 (CH05)	05:54	06:23 (CH05)
	17:31	65 10:46 (CH07)	18:09	14 08:16 (CH09)	18:39	20:12	46 08:10 (CH06)	20:42	86 08:15 (CH06)	21:00	82 08:14 (CH06)	
24	07:43	09:41 (CH07)	07:08	08:07 (CH09)	06:24	06:35	06:01	07:22 (CH06)	06:01	06:22 (CH05)	05:55	06:23 (CH05)
	17:32	65 10:46 (CH07)	18:10	3 08:10 (CH09)	18:41	20:13	50 08:12 (CH06)	20:43	87 08:15 (CH06)	21:00	82 08:14 (CH06)	
25	07:42	09:42 (CH07)	07:07	06:22	06:33	06:01	07:20 (CH06)	06:01	06:22 (CH05)	05:55	06:23 (CH05)	
	17:33	63 10:45 (CH07)	18:11	18:42	20:14	52 08:12 (CH06)	20:44	87 08:15 (CH06)	21:00	82 08:14 (CH06)		
26	07:41	09:43 (CH07)	07:05	06:20	06:32	06:00	07:19 (CH06)	06:00	06:21 (CH05)	05:55	06:24 (CH05)	
	17:34	62 10:45 (CH07)	18:12	18:43	20:15	54 08:13 (CH06)	20:45	88 08:15 (CH06)	21:00	82 08:15 (CH06)		
27	07:40	09:44 (CH07)	07:04	06:19	06:30	06:00	07:18 (CH06)	05:59	06:20 (CH05)	05:56	06:24 (CH05)	
	17:36	60 10:44 (CH07)	18:13	18:44	20:16	55 08:13 (CH06)	20:45	89 08:14 (CH06)	21:00	82 08:15 (CH06)		
28	07:40	09:45 (CH07)	07:02	06:17	06:29	06:00	07:17 (CH06)	05:59	06:20 (CH05)	05:56	06:24 (CH05)	
	17:37	58 10:43 (CH07)	18:14	18:45	20:17	57 08:14 (CH06)	20:46	89 08:14 (CH06)	21:00	82 08:15 (CH06)		
29	07:39	09:46 (CH07)		06:15	06:28	06:00	07:16 (CH06)	05:58	06:19 (CH05)	05:56	06:24 (CH05)	
	17:38	56 10:42 (CH07)		19:46	20:18	59 08:15 (CH06)	20:47	90 08:14 (CH06)	21:00	83 08:16 (CH06)		
30	07:38	09:47 (CH07)		06:14	06:26	06:00	07:16 (CH06)	05:58	06:19 (CH05)	05:57	06:24 (CH05)	
	17:39	54 10:41 (CH07)		19:47	20:19	60 08:16 (CH06)	20:48	90 08:14 (CH06)	21:00	84 08:16 (CH06)		
31	07:37	09:48 (CH07)		07:12			05:57		06:18 (CH05)			
	17:41	52 10:40 (CH07)		19:48			20:49	90 08:13 (CH06)				
Potential sun hours	298		298		370	398	447		451			
Total, worst case	2273		744		623		2338		2514			

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: Shadow_cumulativo_beni_2021_12_13 Shadow receptor: BP11 - NURAGHE SCOBERTU

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July		August		September		October		November		December	
1	05:57	06:25 (CH05)	06:21	07:21 (CH06)	06:51	07:21	06:54	07:25 (CH09)	07:29	09:15 (CH07)		
	21:00	84 08:17 (CH06)	20:42	67 08:28 (CH06)	19:59	19:09	17:23	27 07:52 (CH09)	16:59	74 10:29 (CH07)		
2	05:58	06:25 (CH05)	06:22	07:21 (CH06)	06:52	07:22	06:55	07:26 (CH09)	07:30	09:15 (CH07)		
	21:00	83 08:16 (CH06)	20:40	67 08:28 (CH06)	19:57	19:07	17:22	26 07:52 (CH09)	16:59	75 10:30 (CH07)		
3	05:58	06:25 (CH05)	06:23	07:21 (CH06)	06:53	07:23	06:57	07:26 (CH09)	07:31	08:24 (CH10)		
	21:00	84 08:17 (CH06)	20:39	67 08:28 (CH06)	19:56	19:06	17:20	30 09:45 (CH07)	16:58	82 10:30 (CH07)		
4	05:59	06:25 (CH05)	06:24	07:21 (CH06)	06:54	07:24	06:58	07:27 (CH09)	07:32	08:23 (CH10)		
	21:00	85 08:17 (CH06)	20:38	67 08:28 (CH06)	19:54	19:04	17:19	42 09:53 (CH07)	16:58	85 10:31 (CH07)		
5	05:59	06:26 (CH05)	06:25	07:22 (CH06)	06:55	07:25	06:59	07:29 (CH09)	07:33	08:22 (CH10)		
	21:00	85 08:18 (CH06)	20:37	66 08:28 (CH06)	19:52	19:02	17:18	47 09:57 (CH07)	16:58	88 10:31 (CH07)		
6	06:00	06:25 (CH05)	06:26	07:21 (CH06)	06:56	07:26	07:00	07:31 (CH09)	07:34	08:22 (CH10)		
	20:59	86 08:18 (CH06)	20:36	66 08:27 (CH06)	19:51	19:01	17:17	49 10:00 (CH07)	16:58	90 10:32 (CH07)		
7	06:01	06:26 (CH05)	06:27	07:21 (CH06)	06:57	07:27	07:01	07:32 (CH09)	07:35	08:22 (CH10)		
	20:59	87 08:19 (CH06)	20:35	65 08:26 (CH06)	19:49	18:59	17:16	51 10:03 (CH07)	16:58	90 10:32 (CH07)		
8	06:01	06:26 (CH05)	06:28	07:21 (CH06)	06:58	07:28	07:03	07:38 (CH09)	07:36	08:22 (CH10)		
	20:59	87 08:20 (CH06)	20:34	65 08:26 (CH06)	19:48	18:57	17:15	45 10:06 (CH07)	16:58	92 10:33 (CH07)		
9	06:02	06:26 (CH05)	06:29	07:22 (CH06)	06:59	07:29	07:04	09:22 (CH07)	07:36	08:22 (CH10)		
	20:58	88 08:20 (CH06)	20:32	64 08:26 (CH06)	19:46	18:56	17:14	46 10:08 (CH07)	16:58	92 10:33 (CH07)		
10	06:02	06:26 (CH05)	06:30	07:22 (CH06)	07:00	07:30	07:05	09:20 (CH07)	07:37	08:22 (CH10)		
	20:58	89 08:21 (CH06)	20:31	63 08:25 (CH06)	19:44	18:54	17:13	49 10:09 (CH07)	16:58	94 10:34 (CH07)		
11	06:03	06:27 (CH05)	06:31	07:23 (CH06)	07:01	07:31	07:06	09:19 (CH07)	07:38	08:22 (CH10)		
	20:58	89 08:21 (CH06)	20:30	62 08:25 (CH06)	19:43	18:53	17:12	52 10:11 (CH07)	16:58	95 10:35 (CH07)		
12	06:04	06:26 (CH05)	06:32	07:23 (CH06)	07:02	07:32	07:07	09:19 (CH07)	07:39	08:22 (CH10)		
	20:57	90 08:21 (CH06)	20:28	61 08:24 (CH06)	19:41	18:51	17:11	54 10:13 (CH07)	16:58	95 10:34 (CH07)		
13	06:05	06:27 (CH05)	06:33	07:24 (CH06)	07:03	07:33	07:08	09:18 (CH07)	07:40	08:22 (CH10)		
	20:57	89 08:22 (CH06)	20:27	60 08:24 (CH06)	19:39	18:50	17:10	56 10:14 (CH07)	16:58	96 10:35 (CH07)		
14	06:05	06:28 (CH05)	06:34	07:24 (CH06)	07:04	07:34	07:10	09:17 (CH07)	07:41	08:23 (CH10)		
	20:56	90 08:23 (CH06)	20:26	59 08:23 (CH06)	19:37	18:48	17:09	58 10:15 (CH07)	16:58	96 10:36 (CH07)		
15	06:06	06:28 (CH05)	06:34	07:25 (CH06)	07:05	07:35	07:11	09:16 (CH07)	07:41	08:23 (CH10)		
	20:56	89 08:22 (CH06)	20:24	57 08:22 (CH06)	19:36	18:46	17:08	60 10:16 (CH07)	16:58	96 10:37 (CH07)		
16	06:07	06:29 (CH05)	06:35	07:26 (CH06)	07:06	07:36	07:12	09:16 (CH07)	07:42	08:23 (CH10)		
	20:55	89 08:23 (CH06)	20:23	55 08:21 (CH06)	19:34	18:45	17:07	62 10:18 (CH07)	16:59	96 10:36 (CH07)		
17	06:08	06:30 (CH05)	06:36	07:26 (CH06)	07:07	07:37	07:13	09:16 (CH07)	07:43	08:24 (CH10)		
	20:54	89 08:24 (CH06)	20:22	54 08:20 (CH06)	19:32	18:43	17:06	63 10:19 (CH07)	16:59	96 10:37 (CH07)		
18	06:08	06:31 (CH05)	06:37	07:27 (CH06)	07:08	07:38	07:14	09:15 (CH07)	07:43	08:24 (CH10)		
	20:54	88 08:24 (CH06)	20:20	52 08:19 (CH06)	19:31	18:42	8 08:36 (CH09)	07:14	07:06	65 10:20 (CH07)		
19	06:09	06:32 (CH05)	06:38	07:28 (CH06)	07:09	07:40	15 08:32 (CH09)	07:15	09:15 (CH07)	07:44	08:24 (CH10)	
	20:53	88 08:25 (CH06)	20:19	49 08:17 (CH06)	19:29	18:40	15 08:47 (CH09)	17:05	65 10:20 (CH07)	17:00	97 10:38 (CH07)	
20	06:10	06:32 (CH05)	06:39	07:30 (CH06)	07:10	07:41	19 08:30 (CH09)	07:17	09:15 (CH07)	07:45	08:25 (CH10)	
	20:52	87 08:25 (CH06)	20:17	46 08:16 (CH06)	19:27	18:39	19 08:49 (CH09)	17:04	67 10:22 (CH07)	17:00	97 10:39 (CH07)	
21	06:11	06:33 (CH05)	06:40	07:31 (CH06)	07:11	07:42	22 08:28 (CH09)	07:18	09:15 (CH07)	07:45	08:25 (CH10)	
	20:52	86 08:25 (CH06)	20:16	43 08:14 (CH06)	19:26	18:38	22 08:50 (CH09)	17:04	68 10:23 (CH07)	17:01	97 10:39 (CH07)	
22	06:12	06:34 (CH05)	06:41	07:32 (CH06)	07:12	07:43	24 08:28 (CH09)	07:19	09:14 (CH07)	07:46	08:26 (CH10)	
	20:51	86 08:26 (CH06)	20:14	39 08:11 (CH06)	19:24	18:36	24 08:52 (CH09)	17:03	69 10:23 (CH07)	17:01	97 10:40 (CH07)	
23	06:13	06:35 (CH05)	06:42	07:34 (CH06)	07:13	07:44	26 08:26 (CH09)	07:20	09:14 (CH07)	07:46	08:26 (CH10)	
	20:50	84 08:26 (CH06)	20:13	35 08:09 (CH06)	19:22	18:35	26 08:52 (CH09)	17:02	70 10:24 (CH07)	17:02	97 10:40 (CH07)	
24	06:14	06:36 (CH05)	06:43	07:36 (CH06)	07:14	07:45	28 08:25 (CH09)	07:21	09:14 (CH07)	07:47	08:27 (CH10)	
	20:49	83 08:27 (CH06)	20:11	30 08:06 (CH06)	19:21	18:33	28 08:53 (CH09)	17:02	71 10:25 (CH07)	17:02	97 10:41 (CH07)	
25	06:14	06:37 (CH05)	06:44	07:39 (CH06)	07:15	06:46	28 07:25 (CH09)	07:22	09:14 (CH07)	07:47	08:27 (CH10)	
	20:48	81 08:27 (CH06)	20:10	24 08:03 (CH06)	19:19	17:32	28 07:53 (CH09)	17:01	71 10:25 (CH07)	17:03	97 10:41 (CH07)	
26	06:15	06:37 (CH05)	06:45	07:44 (CH06)	07:16	06:47	29 07:24 (CH09)	07:23	09:15 (CH07)	07:47	08:27 (CH10)	
	20:47	79 08:26 (CH06)	20:08	13 07:57 (CH06)	19:17	17:31	29 07:53 (CH09)	17:01	72 10:27 (CH07)	17:03	97 10:41 (CH07)	
27	06:16	06:38 (CH05)	06:46	07:47 (CH06)	07:17	06:49	29 07:25 (CH09)	07:25	09:15 (CH07)	07:48	08:29 (CH10)	
	20:47	76 08:27 (CH06)	20:07	07:18	17:29	29 07:54 (CH09)	17:00	72 10:27 (CH07)	17:04	96 10:42 (CH07)		
28	06:17	07:21 (CH06)	06:47	07:18	06:50	07:22	30 07:24 (CH09)	07:26	09:15 (CH07)	07:48	08:29 (CH10)	
	20:46	66 08:27 (CH06)	20:05	19:14	17:28	30 07:54 (CH09)	17:00	73 10:28 (CH07)	17:05	97 10:43 (CH07)		
29	06:18	07:21 (CH06)	06:48	07:19	06:51	07:24	30 07:24 (CH09)	07:27	09:15 (CH07)	07:48	08:29 (CH10)	
	20:45	66 08:27 (CH06)	20:04	19:12	17:27	29 07:53 (CH09)	16:59	73 10:28 (CH07)	17:05	97 10:43 (CH07)		
30	06:19	07:21 (CH06)	06:49	07:20	06:52	07:24	74 10:29 (CH07)	07:28	09:15 (CH07)	07:49	08:30 (CH10)	
	20:44	66 08:27 (CH06)	20:02	19:11	17:25	29 07:53 (CH09)	16:59	74 10:29 (CH07)	17:06	96 10:43 (CH07)		
31	06:20	07:21 (CH06)	06:50	07:21	06:53	07:24	28 07:52 (CH09)	07:29	09:15 (CH07)	07:49	08:30 (CH10)	
	20:43	67 08:28 (CH06)	20:01	17:24	28 07:52 (CH09)	07:29	07:29	07:29	17:07	96 10:43 (CH07)		
Potential sun hours	458		427		375	346		299	1727		289	2887
Total, worst case	2586		1396			344						

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:

Impianto_WPD_Chiaramonti

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:
13/12/2021 10:15/3.4.415

SHADOW - Calendar

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP12 - NURAGHE BADDE TETTI

Assumptions for shadow calculations

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

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

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains a time range (e.g., 07:49 - 17:08) and a shadow duration (e.g., 18:38 (CH12) 05:58). Summary rows at the bottom show 'Potential sun hours' and 'Total, worst case' for each month.

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

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



SHADOW - Calendar

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP13 - Temio Nuragico Serra Porchileddos
 Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:49 17:08	08:29 (CH09) 17:42	07:36 17:42	07:01 18:15	08:22 (CH06) 19:49	06:25 20:49
2	07:49 17:09	08:30 (CH09) 17:43	07:35 17:43	06:59 18:17	08:22 (CH06) 09:11 (CH06)	06:24 20:50
3	07:49 17:10	08:30 (CH09) 17:44	07:34 17:44	06:58 18:18	08:22 (CH06) 09:09 (CH06)	06:23 20:51
4	07:49 17:11	08:30 (CH09) 17:46	07:33 17:46	06:56 18:19	08:23 (CH06) 09:09 (CH06)	06:21 20:52
5	07:49 17:11	08:30 (CH09) 17:47	07:32 17:47	08:43 (CH06) 08:55 (CH06)	06:54 18:20	07:34 (CH05) 20:24
6	07:49 17:12	08:31 (CH09) 17:48	07:31 17:48	08:39 (CH06) 08:59 (CH06)	06:53 18:21	07:31 (CH05) 20:25
7	07:49 17:13	08:31 (CH09) 17:49	07:30 17:49	08:36 (CH06) 09:02 (CH06)	06:51 18:22	07:29 (CH05) 20:26
8	07:49 17:14	08:32 (CH09) 17:50	07:29 17:50	08:33 (CH06) 09:03 (CH06)	06:50 18:23	07:27 (CH05) 20:27
9	07:49 17:15	08:32 (CH09) 17:52	07:28 17:52	08:32 (CH06) 09:05 (CH06)	06:48 18:24	07:26 (CH05) 20:29
10	07:49 17:16	08:32 (CH09) 17:53	07:27 17:53	08:30 (CH06) 09:07 (CH06)	06:47 18:26	07:24 (CH05) 20:30
11	07:49 17:17	08:33 (CH09) 17:54	07:25 17:54	08:29 (CH06) 09:09 (CH06)	06:45 18:27	07:24 (CH05) 20:31
12	07:48 17:18	08:34 (CH09) 17:55	07:24 17:55	08:28 (CH06) 09:10 (CH06)	06:43 18:28	07:23 (CH05) 20:32
13	07:48 17:19	08:34 (CH09) 17:57	07:23 17:57	08:27 (CH06) 09:10 (CH06)	06:42 18:29	07:23 (CH05) 20:33
14	07:48 17:21	08:34 (CH09) 17:58	07:22 17:58	08:26 (CH06) 09:12 (CH06)	06:40 18:30	07:22 (CH05) 20:33
15	07:48 17:22	08:35 (CH09) 17:59	07:20 17:59	08:25 (CH06) 09:13 (CH06)	06:38 18:31	07:22 (CH05) 20:34
16	07:47 17:23	08:36 (CH09) 18:00	07:19 18:00	08:24 (CH06) 09:13 (CH06)	06:37 18:32	07:22 (CH05) 20:35
17	07:47 17:24	08:37 (CH09) 18:01	07:18 18:01	08:24 (CH06) 09:14 (CH06)	06:35 18:33	07:22 (CH05) 20:36
18	07:46 17:25	08:37 (CH09) 18:03	07:16 18:03	08:24 (CH06) 09:14 (CH06)	06:34 18:34	07:22 (CH05) 20:37
19	07:46 17:26	08:39 (CH09) 18:04	07:15 18:04	08:22 (CH06) 09:14 (CH06)	06:32 18:35	07:23 (CH05) 20:38
20	07:45 17:27	08:39 (CH09) 18:05	07:14 18:05	08:22 (CH06) 09:15 (CH06)	06:30 18:36	07:23 (CH05) 20:39
21	07:45 17:28	08:40 (CH09) 18:06	07:12 18:06	08:21 (CH06) 09:14 (CH06)	06:29 18:37	07:24 (CH05) 20:40
22	07:44 17:30	08:42 (CH09) 18:07	07:11 18:07	08:22 (CH06) 09:15 (CH06)	06:27 18:38	07:24 (CH05) 20:41
23	07:43 17:31	08:44 (CH09) 18:08	07:09 18:08	08:22 (CH06) 09:15 (CH06)	06:25 18:39	07:26 (CH05) 20:42
24	07:43 17:32	08:47 (CH09) 18:10	07:08 18:10	08:21 (CH06) 09:14 (CH06)	06:24 18:41	07:28 (CH05) 20:43
25	07:42 17:33	08:53 (CH09) 18:11	07:07 18:11	08:21 (CH06) 09:14 (CH06)	06:22 18:42	07:31 (CH05) 20:44
26	07:41 17:34	08:53 (CH09) 18:12	07:05 18:12	08:21 (CH06) 09:13 (CH06)	06:20 18:43	07:31 (CH05) 20:45
27	07:40 17:36	08:53 (CH09) 18:13	07:04 18:13	08:22 (CH06) 09:13 (CH06)	06:19 18:44	07:31 (CH05) 20:46
28	07:40 17:37	08:53 (CH09) 18:14	07:02 18:14	08:21 (CH06) 09:12 (CH06)	06:17 18:45	07:31 (CH05) 20:47
29	07:39 17:38	08:53 (CH09) 18:14	07:01 18:14	08:21 (CH06) 09:12 (CH06)	06:15 18:46	07:31 (CH05) 20:48
30	07:38 17:39	08:53 (CH09) 18:14	06:59 18:14	08:21 (CH06) 09:12 (CH06)	06:14 18:47	07:31 (CH05) 20:49
31	07:37 17:41	08:53 (CH09) 18:14	06:58 18:14	08:21 (CH06) 09:12 (CH06)	06:13 18:48	07:31 (CH05) 20:50
Potential sun hours	298	298	370	398	447	451
Total, worst case	532	1050	450	504		

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP13 - Temio Nuragico Serra Porchileddos
 Assumptions for shadow calculations

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

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

	July	August	September	October	November	December				
1	05:57 21:00	06:21 20:42	06:51 19:59	07:23 (CH05) 29 07:52 (CH05)	07:21 19:09	09:17 (CH06) 10 09:27 (CH06)	06:54 17:23	08:00 (CH06) 37 08:37 (CH06)	07:29 16:59	08:15 (CH09) 25 08:40 (CH09)
2	05:58 21:00	06:22 20:40	06:52 19:57	07:23 (CH05) 28 07:51 (CH05)	07:22 19:07	09:12 (CH06) 20 09:32 (CH06)	06:56 17:22	08:02 (CH06) 33 08:35 (CH06)	07:30 16:59	08:15 (CH09) 26 08:41 (CH09)
3	05:58 21:00	06:23 20:39	06:53 19:56	07:24 (CH05) 26 07:50 (CH05)	07:23 19:06	09:09 (CH06) 26 09:35 (CH06)	06:57 17:20	08:03 (CH06) 30 08:33 (CH06)	07:31 16:58	08:15 (CH09) 26 08:41 (CH09)
4	05:59 21:00	06:24 20:38	06:54 19:54	07:25 (CH05) 24 07:49 (CH05)	07:24 19:04	09:06 (CH06) 31 09:37 (CH06)	06:58 17:19	08:05 (CH06) 25 08:30 (CH06)	07:32 16:58	08:16 (CH09) 25 08:41 (CH09)
5	05:59 21:00	06:25 20:37	06:55 19:52	07:26 (CH05) 21 07:47 (CH05)	07:25 19:02	09:04 (CH06) 34 09:38 (CH06)	06:59 17:18	08:09 (CH06) 19 08:28 (CH06)	07:33 16:58	08:16 (CH09) 26 08:42 (CH09)
6	06:00 20:59	06:26 20:36	06:56 19:51	07:26 (CH05) 18 07:44 (CH05)	07:26 19:01	09:02 (CH06) 38 09:40 (CH06)	07:00 17:17	08:13 (CH06) 11 08:24 (CH06)	07:34 16:58	08:17 (CH09) 25 08:42 (CH09)
7	06:01 20:59	06:27 20:35	06:57 19:49	07:28 (CH05) 13 07:41 (CH05)	07:27 18:59	09:01 (CH06) 40 09:41 (CH06)	07:01 17:16		07:35 16:58	08:17 (CH09) 25 08:42 (CH09)
8	06:01 20:59	06:28 20:34	06:58 19:48		07:28 18:57	08:59 (CH06) 43 09:42 (CH06)	07:03 17:15		07:36 16:58	08:18 (CH09) 25 08:43 (CH09)
9	06:02 20:58	06:29 20:32	06:59 19:46		07:29 18:56	08:58 (CH06) 45 09:43 (CH06)	07:04 17:14		07:36 16:58	08:18 (CH09) 25 08:43 (CH09)
10	06:02 20:58	06:30 20:31	07:00 19:44		07:30 18:54	08:57 (CH06) 46 09:43 (CH06)	07:05 17:13		07:37 16:58	08:19 (CH09) 25 08:44 (CH09)
11	06:03 20:58	06:31 20:30	07:01 19:43		07:31 18:53	08:56 (CH06) 48 09:44 (CH06)	07:06 17:12		07:38 16:58	08:20 (CH09) 24 08:44 (CH09)
12	06:04 20:57	06:32 20:28	07:02 19:41		07:32 18:51	08:55 (CH06) 49 09:44 (CH06)	07:07 17:11		07:39 16:58	08:21 (CH09) 24 08:45 (CH09)
13	06:05 20:57	06:33 20:27	07:03 19:39		07:33 18:50	08:54 (CH06) 51 09:45 (CH06)	07:08 17:10		07:40 16:58	08:20 (CH09) 24 08:44 (CH09)
14	06:05 20:56	06:34 20:26	07:04 19:37		07:34 18:48	08:54 (CH06) 51 09:45 (CH06)	07:10 17:09		07:41 16:58	08:21 (CH09) 24 08:45 (CH09)
15	06:06 20:56	06:34 20:24	07:05 19:36		07:35 18:46	08:54 (CH06) 52 09:46 (CH06)	07:11 17:08		07:41 16:58	08:22 (CH09) 24 08:46 (CH09)
16	06:07 20:55	06:35 20:23	07:06 19:34		07:36 18:45	08:53 (CH06) 53 09:46 (CH06)	07:12 17:07		07:42 16:59	08:22 (CH09) 23 08:45 (CH09)
17	06:08 20:54	06:36 20:22	07:07 19:32		07:37 18:43	08:53 (CH06) 53 09:46 (CH06)	07:13 17:06		07:43 16:59	08:23 (CH09) 23 08:46 (CH09)
18	06:08 20:54	06:37 20:20	07:08 19:31	07:37 (CH05) 8 07:45 (CH05)	07:08 18:42	08:53 (CH06) 53 09:46 (CH06)	07:14 17:06	08:20 (CH09) 7 08:27 (CH09)	07:43 16:59	08:24 (CH09) 23 08:47 (CH09)
19	06:09 20:53	06:38 20:19	07:09 19:29	07:34 (CH05) 14 07:48 (CH05)	07:09 18:40	08:52 (CH06) 53 09:45 (CH06)	07:15 17:05	08:18 (CH09) 11 08:29 (CH09)	07:44 17:00	08:24 (CH09) 23 08:47 (CH09)
20	06:10 20:52	06:39 20:17	07:10 19:27	07:31 (CH05) 19 07:50 (CH05)	07:10 18:39	08:52 (CH06) 53 09:45 (CH06)	07:17 17:04	08:17 (CH09) 15 08:32 (CH09)	07:45 17:00	08:25 (CH09) 22 08:47 (CH09)
21	06:11 20:52	06:40 20:16	07:11 19:26	07:30 (CH05) 22 07:52 (CH05)	07:11 18:38	08:52 (CH06) 53 09:45 (CH06)	07:18 17:04	08:16 (CH09) 17 08:33 (CH09)	07:45 17:01	08:25 (CH09) 22 08:47 (CH09)
22	06:12 20:51	06:41 20:14	07:12 19:24	07:27 (CH05) 25 07:52 (CH05)	07:12 18:36	08:53 (CH06) 52 09:45 (CH06)	07:19 17:03	08:15 (CH09) 19 08:34 (CH09)	07:46 17:01	08:26 (CH09) 22 08:48 (CH09)
23	06:13 20:50	06:42 20:13	07:13 19:22	07:26 (CH05) 26 07:52 (CH05)	07:13 18:35	08:53 (CH06) 52 09:45 (CH06)	07:20 17:02	08:15 (CH09) 20 08:35 (CH09)	07:46 17:02	08:26 (CH09) 22 08:48 (CH09)
24	06:14 20:49	06:43 20:11	07:14 19:21	07:25 (CH05) 28 07:53 (CH05)	07:14 18:33	08:53 (CH06) 51 09:44 (CH06)	07:21 17:02	08:14 (CH09) 22 08:36 (CH09)	07:47 17:02	08:27 (CH09) 23 08:50 (CH09)
25	06:14 20:48	06:44 20:10	07:15 19:19	07:25 (CH05) 28 07:53 (CH05)	07:15 17:32	08:54 (CH06) 49 08:43 (CH06)	07:22 17:01	08:15 (CH09) 22 08:37 (CH09)	07:47 17:03	08:27 (CH09) 23 08:50 (CH09)
26	06:15 20:47	06:45 20:08	07:16 19:17	07:24 (CH05) 30 07:54 (CH05)	07:16 17:31	08:54 (CH06) 48 08:42 (CH06)	07:23 17:01	08:15 (CH09) 23 08:38 (CH09)	07:47 17:03	08:27 (CH09) 23 08:50 (CH09)
27	06:16 20:47	06:46 20:07	07:17 19:16	07:24 (CH05) 30 07:54 (CH05)	07:17 17:29	08:54 (CH06) 47 08:42 (CH06)	07:25 17:00	08:14 (CH09) 25 08:39 (CH09)	07:48 17:04	08:28 (CH09) 23 08:51 (CH09)
28	06:17 20:46	06:47 20:05	07:18 19:14	07:23 (CH05) 31 07:54 (CH05)	07:18 17:28	08:54 (CH06) 45 08:41 (CH06)	07:26 17:00	08:14 (CH09) 25 08:39 (CH09)	07:48 17:05	08:28 (CH09) 23 08:51 (CH09)
29	06:18 20:45	06:48 20:04	07:19 19:12	07:23 (CH05) 30 07:53 (CH05)	07:19 17:27	08:54 (CH06) 43 08:40 (CH06)	07:27 16:59	08:14 (CH09) 25 08:39 (CH09)	07:48 17:05	08:28 (CH09) 24 08:52 (CH09)
30	06:19 20:44	06:49 20:02	07:20 19:11	07:23 (CH05) 30 07:53 (CH05)	07:20 17:25	08:54 (CH06) 42 08:39 (CH06)	07:28 16:59	08:15 (CH09) 25 08:40 (CH09)	07:49 17:06	08:28 (CH09) 24 08:52 (CH09)
31	06:20 20:43	06:50 20:01	07:21 19:10	07:23 (CH05) 30 07:53 (CH05)	07:21 17:24	08:54 (CH06) 39 08:37 (CH06)	07:29 16:58		07:49 17:07	08:28 (CH09) 25 08:53 (CH09)
Potential sun hours	458	427	375		346	299			289	
Total, worst case		351	159		1370	411			741	

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:

Impianto_WPD_Chiaramonti

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:
13/12/2021 10:15/3.4.415

SHADOW - Calendar

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP14 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:49	08:18 (CH14)	07:36	07:01	07:11	06:25	05:57	05:58	06:21	06:51	07:21	06:55	07:29	08:04 (CH14)	
	17:08	32 08:50 (CH14)	17:42	18:16	19:49	20:21	20:50	21:00	20:42	19:59	19:09	17:23	16:59	31 08:35 (CH14)	
2	07:50	08:18 (CH14)	07:35	06:59	07:09	06:24	05:57	05:58	06:22	06:52	07:22	06:56	07:30	08:04 (CH14)	
	17:09	32 08:50 (CH14)	17:43	18:17	19:50	20:22	20:50	21:00	20:41	19:58	19:07	17:22	16:59	31 08:35 (CH14)	
3	07:50	08:19 (CH14)	07:34	06:58	07:07	06:23	05:56	05:59	06:23	06:53	07:23	06:57	07:31	08:05 (CH14)	
	17:10	32 08:51 (CH14)	17:45	18:18	19:51	20:23	20:51	21:00	20:40	19:56	19:06	17:21	16:59	32 08:37 (CH14)	
4	07:50	08:19 (CH14)	07:33	06:56	07:06	06:22	05:56	05:59	06:24	06:54	07:24	06:58	07:32	08:05 (CH14)	
	17:11	32 08:51 (CH14)	17:46	18:19	19:52	20:24	20:52	21:00	20:38	19:54	19:04	17:19	16:58	32 08:37 (CH14)	
5	07:50	08:20 (CH14)	07:32	06:55	07:04	06:20	05:55	06:00	06:25	06:55	07:25	06:59	07:33	08:06 (CH14)	
	17:12	32 08:52 (CH14)	17:47	18:20	19:53	20:25	20:52	21:00	20:37	19:53	19:03	17:18	16:58	32 08:38 (CH14)	
6	07:50	08:20 (CH14)	07:31	06:53	07:03	06:19	05:55	06:00	06:26	06:56	07:26	07:00	07:34	08:05 (CH14)	
	17:13	32 08:52 (CH14)	17:48	18:21	19:54	20:26	20:53	21:00	20:36	19:51	19:01	17:17	16:58	32 08:37 (CH14)	
7	07:50	08:20 (CH14)	07:30	06:52	07:01	06:18	05:55	06:01	06:27	06:57	07:27	07:02	07:35	08:06 (CH14)	
	17:14	32 08:52 (CH14)	17:49	18:22	19:55	20:27	20:54	20:59	20:35	19:49	18:59	17:16	16:58	32 08:38 (CH14)	
8	07:49	08:20 (CH14)	07:29	06:50	06:59	06:17	05:55	06:01	06:28	06:58	07:28	07:03	07:36	08:06 (CH14)	
	17:15	32 08:52 (CH14)	17:51	18:24	19:56	20:28	20:54	20:59	20:34	19:48	18:58	17:15	16:58	32 08:38 (CH14)	
9	07:49	08:21 (CH14)	07:28	06:48	06:58	06:16	05:54	06:02	06:29	06:59	07:29	07:04	07:37	08:07 (CH14)	
	17:16	32 08:53 (CH14)	17:52	18:25	19:58	20:29	20:55	20:59	20:33	19:46	18:56	17:14	16:58	32 08:39 (CH14)	
10	07:49	08:22 (CH14)	07:27	06:47	06:56	06:15	05:54	06:03	06:30	07:00	07:30	07:05	07:38	08:07 (CH14)	
	17:17	31 08:53 (CH14)	17:53	18:26	19:59	20:30	20:55	20:58	20:31	19:44	18:54	17:13	16:58	32 08:39 (CH14)	
11	07:49	08:22 (CH14)	07:26	06:45	06:55	06:13	05:54	06:03	06:31	07:01	07:31	07:06	07:38	08:08 (CH14)	
	17:18	31 08:53 (CH14)	17:54	18:27	20:00	20:31	20:56	20:58	20:30	19:43	18:53	17:12	16:58	32 08:40 (CH14)	
12	07:49	08:23 (CH14)	07:24	06:44	06:53	06:12	05:54	06:04	06:32	07:02	07:32	07:08	07:39	08:09 (CH14)	
	17:19	30 08:53 (CH14)	17:56	18:28	20:01	20:32	20:56	20:57	20:29	19:41	18:51	17:11	16:58	31 08:40 (CH14)	
13	07:48	08:24 (CH14)	07:23	06:42	06:51	06:11	05:54	06:05	06:33	07:03	07:33	07:09	07:40	08:09 (CH14)	
	17:20	30 08:54 (CH14)	17:57	18:29	20:02	20:33	20:57	20:57	20:27	19:39	18:50	17:10	16:58	32 08:41 (CH14)	
14	07:48	08:24 (CH14)	07:22	06:40	06:50	06:10	05:54	06:06	06:34	07:04	07:34	07:10	07:41	08:09 (CH14)	
	17:21	29 08:53 (CH14)	17:58	18:30	20:03	20:34	20:57	20:56	20:26	19:38	18:48	17:09	16:58	32 08:41 (CH14)	
15	07:48	08:25 (CH14)	07:21	06:39	06:48	06:09	05:54	06:06	06:35	07:05	07:35	07:11	07:42	08:10 (CH14)	
	17:22	29 08:54 (CH14)	17:59	18:31	20:04	20:35	20:58	20:56	20:25	19:36	18:47	17:08	16:59	31 08:41 (CH14)	
16	07:47	08:25 (CH14)	07:19	06:37	06:47	06:08	05:54	06:07	06:36	07:06	07:37	07:12	07:42	08:11 (CH14)	
	17:23	28 08:53 (CH14)	18:00	18:32	20:05	20:36	20:58	20:55	20:23	19:34	18:45	17:07	16:59	31 08:42 (CH14)	
17	07:47	08:26 (CH14)	07:18	06:35	06:45	06:07	05:54	06:08	06:37	07:07	07:38	07:13	07:43	08:10 (CH14)	
	17:24	27 08:53 (CH14)	18:02	18:33	20:06	20:37	20:59	20:55	20:22	19:33	18:44	17:07	16:59	32 08:42 (CH14)	
18	07:46	08:27 (CH14)	07:17	06:34	06:44	06:07	05:54	06:09	06:38	07:08	07:39	07:15	07:44	08:11 (CH14)	
	17:25	26 08:53 (CH14)	18:03	18:34	20:07	20:38	20:59	20:54	20:20	19:31	18:42	17:06	17:00	32 08:43 (CH14)	
19	07:46	08:28 (CH14)	07:15	06:32	06:42	06:06	05:54	06:10	06:39	07:09	07:40	07:16	07:44	08:11 (CH14)	
	17:26	25 08:53 (CH14)	18:04	18:35	20:08	20:39	20:59	20:53	20:19	19:29	18:41	17:05	15 08:24 (CH14)	17:00	32 08:43 (CH14)
20	07:45	08:29 (CH14)	07:14	06:31	06:41	06:05	05:54	06:10	06:40	07:10	07:41	07:17	07:45	08:12 (CH14)	
	17:28	23 08:52 (CH14)	18:05	18:37	20:09	20:39	21:00	20:53	20:18	19:28	18:39	17:04	19 08:26 (CH14)	17:00	31 08:43 (CH14)
21	07:45	08:30 (CH14)	07:13	06:29	06:39	06:04	05:54	06:11	06:41	07:11	07:42	07:18	07:45	08:13 (CH14)	
	17:29	21 08:51 (CH14)	18:06	18:38	20:10	20:40	21:00	20:52	20:16	19:26	18:38	17:04	21 08:27 (CH14)	17:01	31 08:44 (CH14)
22	07:44	08:32 (CH14)	07:11	06:27	06:38	06:03	05:54	06:12	06:42	07:12	07:43	07:19	07:46	08:13 (CH14)	
	17:30	19 08:51 (CH14)	18:08	18:39	20:11	20:41	21:00	20:51	20:15	19:24	18:36	17:03	23 08:28 (CH14)	17:01	31 08:44 (CH14)
23	07:44	08:34 (CH14)	07:10	06:26	06:36	06:02	05:55	06:13	06:43	07:13	07:44	07:20	07:46	08:13 (CH14)	
	17:31	15 08:49 (CH14)	18:09	18:40	20:12	20:42	21:00	20:50	20:13	19:23	18:35	17:03	25 08:29 (CH14)	17:02	31 08:44 (CH14)
24	07:43	08:36 (CH14)	07:08	06:24	06:35	06:02	05:55	06:14	06:44	07:14	07:45	07:21	07:47	08:14 (CH14)	
	17:32	11 08:47 (CH14)	18:10	18:41	20:13	20:43	21:00	20:49	20:12	19:21	18:33	17:02	26 08:31 (CH14)	17:02	32 08:46 (CH14)
25	07:42		07:07	06:22	06:34	06:01	05:55	06:15	06:45	07:15	06:47	07:23	07:47	08:14 (CH14)	
	17:34		18:11	18:42	20:14	20:44	21:00	20:49	20:10	19:19	17:32	17:01	27 08:31 (CH14)	17:03	32 08:46 (CH14)
26	07:41		07:05	06:21	06:32	06:00	05:56	06:16	06:46	07:16	06:48	07:24	07:48	08:15 (CH14)	
	17:35		18:12	18:43	20:15	20:45	21:01	20:48	20:09	19:17	17:31	17:01	28 08:32 (CH14)	17:04	32 08:47 (CH14)
27	07:41		07:04	06:19	06:31	06:00	05:56	06:16	06:47	07:17	06:49	07:25	07:48	08:16 (CH14)	
	17:36		18:13	18:44	20:16	20:46	21:01	20:47	20:07	19:16	17:29	17:01	29 08:33 (CH14)	17:04	31 08:47 (CH14)
28	07:40		07:02	06:17	06:29	05:59	05:56	06:17	06:48	07:18	06:50	07:26	07:48	08:16 (CH14)	
	17:37		18:15	18:45	20:17	20:46	21:01	20:46	20:06	19:14	17:28	17:00	29 08:33 (CH14)	17:05	31 08:47 (CH14)
29	07:39			07:16	06:28	05:59	05:57	06:18	06:48	07:19	06:51	07:27	07:49	08:16 (CH14)	
	17:38			19:46	20:18	20:47	21:01	20:45	20:04	19:12	17:27	17:00	30 08:34 (CH14)	17:06	32 08:48 (CH14)
30	07:38			07:14	06:27	05:58	05:57	06:19	06:49	07:20	06:52	07:28	07:49	08:16 (CH14)	
	17:40			19:47	20:19	20:48	21:01	20:44	20:02	19:11	17:26	16:59	30 08:34 (CH14)	17:06	32 08:48 (CH14)
31	07:37			07:12	06:25	05:57		06:20	06:50		06:53		07:49	08:17 (CH14)	
	17:41			19:48	20:49			20:43	20:01		17:24		17:07	32 08:49 (CH14)	
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	313	289	981	
Total, worst case	663														

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP15 - Menhirs Meddaris

Assumptions for shadow calculations

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

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

	January		February		March		April		May		June			
1	07:49	08:41 (CH07)	07:36	08:42 (CH07)	07:01	07:10	07:59 (CH06)	06:25	07:02 (CH05)	05:57				
	17:08	17	08:58 (CH07)	17:42	35	09:17 (CH07)	18:15	19:49	33	08:32 (CH06)	20:20	13	07:15 (CH05)	20:49
2	07:49	08:42 (CH07)	07:35	08:43 (CH07)	06:59	07:09	07:59 (CH06)	06:24	07:04 (CH05)	05:56				
	17:09	18	09:00 (CH07)	17:43	34	09:17 (CH07)	18:17	19:50	32	08:31 (CH06)	20:21	9	07:13 (CH05)	20:50
3	07:49	08:41 (CH07)	07:34	08:44 (CH07)	06:58	07:07	08:00 (CH06)	06:23		05:56				
	17:10	20	09:01 (CH07)	17:44	32	09:16 (CH07)	18:18	19:51	31	08:31 (CH06)	20:22		20:51	
4	07:49	08:40 (CH07)	07:33	08:45 (CH07)	06:56	07:06	08:00 (CH06)	06:21		05:56				
	17:11	21	09:01 (CH07)	17:46	31	09:16 (CH07)	18:19	19:52	29	08:29 (CH06)	20:23		20:52	
5	07:49	08:40 (CH07)	07:32	08:46 (CH07)	06:55	07:04	08:00 (CH06)	06:20		05:55				
	17:11	23	09:03 (CH07)	17:47	29	09:15 (CH07)	18:20	19:53	28	08:28 (CH06)	20:24		20:52	
6	07:49	08:40 (CH07)	07:31	08:47 (CH07)	06:53	07:02	08:02 (CH06)	06:19		05:55				
	17:12	24	09:04 (CH07)	17:48	27	09:14 (CH07)	18:21	19:54	24	08:26 (CH06)	20:25		20:53	
7	07:49	08:40 (CH07)	07:30	08:00 (CH09)	06:51	07:01	08:03 (CH06)	06:18		05:55				
	17:13	25	09:05 (CH07)	17:49	30	09:12 (CH07)	18:22	19:55	21	08:24 (CH06)	20:26		20:53	
8	07:49	08:40 (CH07)	07:29	07:57 (CH09)	06:50	06:59	08:04 (CH06)	06:17		05:54				
	17:14	26	09:06 (CH07)	17:50	32	09:10 (CH07)	18:23	19:56	17	08:21 (CH06)	20:28		20:54	
9	07:49	08:40 (CH07)	07:28	07:56 (CH09)	06:48	06:57	08:07 (CH06)	06:15		05:54				
	17:15	28	09:08 (CH07)	17:52	29	09:07 (CH07)	18:24	19:57	11	08:18 (CH06)	20:29		20:55	
10	07:49	08:40 (CH07)	07:27	07:55 (CH09)	06:47	06:56		06:14		05:54				
	17:16	29	09:09 (CH07)	17:53	21	09:02 (CH07)	18:26	19:58		20:30				
11	07:49	08:39 (CH07)	07:25	07:54 (CH09)	06:45	06:54		06:13		05:54				
	17:17	30	09:09 (CH07)	17:54	19	08:13 (CH09)	18:27	19:59		20:31				
12	07:49	08:39 (CH07)	07:24	07:54 (CH09)	06:43	06:53		06:12		05:54				
	17:18	31	09:10 (CH07)	17:55	20	08:14 (CH09)	18:28	20:00		20:32				
13	07:48	08:39 (CH07)	07:23	07:53 (CH09)	06:42	06:51		06:11		05:54				
	17:19	33	09:12 (CH07)	17:57	21	08:14 (CH09)	18:29	20:02		20:33				
14	07:48	08:39 (CH07)	07:22	07:53 (CH09)	06:40	06:50		06:10		05:53				
	17:21	33	09:12 (CH07)	17:58	21	08:14 (CH09)	18:30	20:03		20:34				
15	07:48	08:39 (CH07)	07:20	07:54 (CH09)	06:39	06:48		06:09		05:53				
	17:22	34	09:13 (CH07)	17:59	20	08:14 (CH09)	18:31	20:04		20:34				
16	07:47	08:38 (CH07)	07:19	07:53 (CH09)	06:37	06:47		06:08		05:53				
	17:23	35	09:13 (CH07)	18:00	20	08:13 (CH09)	18:32	20:05		20:35				
17	07:47	08:39 (CH07)	07:18	07:54 (CH09)	06:35	06:45		06:07		05:54				
	17:24	36	09:15 (CH07)	18:01	19	08:13 (CH09)	18:33	20:06	10	07:17 (CH05)	20:36		20:58	
18	07:46	08:38 (CH07)	07:16	07:55 (CH09)	06:34	06:43		06:06		05:54				
	17:25	37	09:15 (CH07)	18:03	18	08:13 (CH09)	18:34	20:07	15	07:19 (CH05)	20:37		20:59	
19	07:46	08:39 (CH07)	07:15	07:55 (CH09)	06:32	06:42		06:05		05:54				
	17:26	37	09:16 (CH07)	18:04	16	08:11 (CH09)	18:35	20:08	17	07:20 (CH05)	20:38		20:59	
20	07:45	08:39 (CH07)	07:14	07:57 (CH09)	06:30	06:40		06:05		05:54				
	17:27	37	09:16 (CH07)	18:05	13	08:10 (CH09)	18:36	20:09	20	07:21 (CH05)	20:39		20:59	
21	07:45	08:38 (CH07)	07:12	07:59 (CH09)	06:29	06:39		06:04		05:54				
	17:29	38	09:16 (CH07)	18:06	7	08:06 (CH09)	18:37	20:10	20	07:21 (CH05)	20:40		21:00	
22	07:44	08:39 (CH07)	07:11	06:27		07:05 (CH06)	06:38	07:00 (CH05)		06:03				
	17:30	38	09:17 (CH07)	18:07		18:38	27	07:32 (CH06)	20:11	21	07:21 (CH05)	20:41		21:00
23	07:43	08:39 (CH07)	07:10	06:25		06:25	27	07:04 (CH06)	06:36		06:02		05:54	
	17:31	39	09:18 (CH07)	18:09		18:40	29	07:33 (CH06)	06:35	22	07:22 (CH05)	20:42		21:00
24	07:43	08:39 (CH07)	07:08	06:24		06:24	29	07:03 (CH06)	06:35		06:02		05:55	
	17:32	39	09:18 (CH07)	18:10		18:41	31	07:34 (CH06)	06:32	22	07:22 (CH05)	20:43		21:00
25	07:42	08:39 (CH07)	07:07	06:22		06:22	31	07:01 (CH06)	06:33		06:59 (CH05)	06:01		05:55
	17:33	39	09:18 (CH07)	18:11		18:42	33	07:34 (CH06)	06:34	22	07:21 (CH05)	20:44		21:00
26	07:41	08:40 (CH07)	07:05	06:20		06:20		06:32			06:59 (CH05)	06:00		05:55
	17:34	39	09:19 (CH07)	18:12		18:43	34	07:35 (CH06)	06:31	22	07:21 (CH05)	20:45		21:00
27	07:40	08:40 (CH07)	07:04	06:19		06:19		06:31			06:59 (CH05)	05:59		05:56
	17:36	39	09:19 (CH07)	18:13		18:44	34	07:34 (CH06)	06:30	21	07:20 (CH05)	20:45		21:00
28	07:40	08:40 (CH07)	07:02	06:17		06:17		06:29			06:59 (CH05)	05:59		05:56
	17:37	38	09:18 (CH07)	18:14		18:45	35	07:34 (CH06)	06:27	20	07:19 (CH05)	20:46		21:00
29	07:39	08:41 (CH07)		07:15		07:15		06:28			07:00 (CH05)	05:58		05:56
	17:38	37	09:18 (CH07)	18:14		19:46	35	08:34 (CH06)	20:18	19	07:19 (CH05)	20:47		21:00
30	07:38	08:41 (CH07)		07:14		07:14		06:26			07:02 (CH05)	05:58		05:57
	17:39	37	09:18 (CH07)	18:13		19:47	34	08:33 (CH06)	20:19	16	07:18 (CH05)	20:48		21:00
31	07:37	08:42 (CH07)		07:12		07:12		06:24			05:57			05:57
	17:41	36	09:18 (CH07)	18:11		19:48	35	08:33 (CH06)	20:19		20:49			20:49
Potential sun hours	298		298		370		398		447		451			
Total, worst case	993		494		386		493		22		353			

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP15 - Menhirs Meddaris

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December							
1	05:57	06:23 (CH04)	06:21	06:51	07:21	06:54	07:25 (CH09)	07:29	08:21 (CH07)				
	21:00	13 06:36 (CH04)	20:42	19:59	19:09	17:23	25 08:34 (CH07)	16:59	30 08:51 (CH07)				
2	05:58	06:23 (CH04)	06:22	06:52	07:22	06:56	07:26 (CH09)	07:30	08:22 (CH07)				
	21:00	12 06:35 (CH04)	20:40	19:57	19:07	17:22	30 08:38 (CH07)	16:59	29 08:51 (CH07)				
3	05:58	06:24 (CH04)	06:23	06:53	07:23	06:57	07:27 (CH09)	07:31	08:23 (CH07)				
	21:00	11 06:35 (CH04)	20:39	19:56	11 08:16 (CH06)	19:06	17:20	32 08:40 (CH07)	16:58	28 08:51 (CH07)			
4	05:59	06:25 (CH04)	06:24	06:54	07:24	06:58	07:31 (CH09)	07:32	08:24 (CH07)				
	21:00	9 06:34 (CH04)	20:38	19:54	17 08:19 (CH06)	19:04	17:19	28 08:42 (CH07)	16:58	26 08:50 (CH07)			
5	05:59	06:27 (CH04)	06:25	06:55	07:25	06:59	08:17 (CH07)	07:33	08:25 (CH07)				
	21:00	7 06:34 (CH04)	20:37	19:52	21 08:21 (CH06)	19:02	17:18	27 08:44 (CH07)	16:58	25 08:50 (CH07)			
6	06:00	06:28 (CH04)	06:26	06:56	07:26	07:00	08:16 (CH07)	07:34	08:26 (CH07)				
	20:59	4 06:32 (CH04)	20:36	19:51	24 08:22 (CH06)	19:01	17:17	29 08:45 (CH07)	16:58	24 08:50 (CH07)			
7	06:01		06:27	06:57	07:27	07:01	08:14 (CH07)	07:35	08:27 (CH07)				
	20:59		20:35	19:49	28 08:23 (CH06)	18:59	17:16	32 08:46 (CH07)	16:58	23 08:50 (CH07)			
8	06:01		06:28	06:58	07:28	07:03	08:14 (CH07)	07:36	08:28 (CH07)				
	20:59		20:34	19:48	29 08:23 (CH06)	18:57	17:15	33 08:47 (CH07)	16:58	22 08:50 (CH07)			
9	06:02		06:29	06:59	07:29	07:04	08:14 (CH07)	07:37	08:29 (CH07)				
	20:58		20:32	19:46	31 08:24 (CH06)	18:56	17:14	34 08:48 (CH07)	16:58	20 08:49 (CH07)			
10	06:03		06:30	07:00	07:30	07:05	08:13 (CH07)	07:37	08:31 (CH07)				
	20:58		20:31	3 07:19 (CH05)	19:44	32 08:24 (CH06)	18:54	17:13	35 08:48 (CH07)	16:58	18 08:49 (CH07)		
11	06:03		06:31	07:01	07:31	07:06	08:12 (CH07)	07:38	08:32 (CH07)				
	20:58		20:30	11 07:23 (CH05)	19:43	34 08:25 (CH06)	18:53	17:12	37 08:49 (CH07)	16:58	17 08:49 (CH07)		
12	06:04		06:32	07:02	07:32	07:07	08:13 (CH07)	07:39	08:33 (CH07)				
	20:57		20:28	15 07:25 (CH05)	19:41	35 08:25 (CH06)	18:51	17:11	37 08:50 (CH07)	16:58	16 08:49 (CH07)		
13	06:05		06:33	07:03	07:33	07:08	08:13 (CH07)	07:40	08:34 (CH07)				
	20:57		20:27	17 07:26 (CH05)	19:39	35 08:25 (CH06)	18:50	17:10	37 08:50 (CH07)	16:58	14 08:48 (CH07)		
14	06:05		06:34	07:04	07:34	07:10	08:12 (CH07)	07:41	08:35 (CH07)				
	20:56		20:26	19 07:27 (CH05)	19:38	34 08:24 (CH06)	18:48	17:09	38 08:50 (CH07)	16:58	13 08:48 (CH07)		
15	06:06		06:35	07:05	07:35	07:11	08:12 (CH07)	07:41	08:37 (CH07)				
	20:56		20:24	20 07:27 (CH05)	19:36	35 08:24 (CH06)	18:46	17:08	39 08:51 (CH07)	16:59	11 08:48 (CH07)		
16	06:07		06:35	07:06	07:36	07:12	08:13 (CH07)	07:42	08:38 (CH07)				
	20:55		20:23	22 07:28 (CH05)	19:34	35 08:24 (CH06)	18:45	17:07	39 08:52 (CH07)	16:59	10 08:47 (CH07)		
17	06:08		06:36	07:07	07:37	07:13	08:13 (CH07)	07:43	08:39 (CH07)				
	20:54		20:22	22 07:28 (CH05)	19:32	34 08:23 (CH06)	18:43	17:06	39 08:52 (CH07)	16:59	8 08:47 (CH07)		
18	06:08		06:37	07:08	07:39	07:14	08:13 (CH07)	07:43	08:41 (CH07)				
	20:54		20:20	22 07:28 (CH05)	19:31	33 08:22 (CH06)	18:42	17:06	39 08:52 (CH07)	16:59	6 08:47 (CH07)		
19	06:09		06:38	07:09	07:40	07:15	08:13 (CH07)	07:44	08:41 (CH07)				
	20:53		20:19	23 07:28 (CH05)	19:29	31 08:21 (CH06)	18:40	17:05	39 08:52 (CH07)	17:00	5 08:46 (CH07)		
20	06:10		06:39	07:10	07:41	07:17	08:14 (CH07)	07:45	08:43 (CH07)				
	20:52		20:17	22 07:27 (CH05)	19:27	30 08:20 (CH06)	18:39	17:04	38 08:52 (CH07)	17:00	3 08:46 (CH07)		
21	06:11		06:40	07:11	07:42	07:18	08:14 (CH07)	07:45	08:43 (CH07)				
	20:52		20:16	21 07:27 (CH05)	19:26	28 08:19 (CH06)	18:38	9 08:38 (CH09)	17:04	38 08:52 (CH07)	17:01	3 08:46 (CH07)	
22	06:12		06:41	07:12	07:43	07:19	08:15 (CH07)	07:46	08:44 (CH07)				
	20:51		20:14	20 07:25 (CH05)	19:24	25 08:17 (CH06)	18:36	14 08:41 (CH09)	17:03	37 08:52 (CH07)	17:01	3 08:47 (CH07)	
23	06:13		06:42	07:13	07:44	07:20	08:15 (CH07)	07:46	08:44 (CH07)				
	20:50		20:13	19 07:24 (CH05)	19:22	21 08:15 (CH06)	18:35	16 08:42 (CH09)	17:02	37 08:52 (CH07)	17:02	3 08:47 (CH07)	
24	06:14		06:43	07:14	07:45	07:21	08:15 (CH07)	07:47	08:44 (CH07)				
	20:49		20:11	17 07:23 (CH05)	19:21	16 08:12 (CH06)	18:33	19 08:43 (CH09)	17:02	37 08:52 (CH07)	17:02	5 08:49 (CH07)	
25	06:14		06:44	07:15	07:46	07:22	08:17 (CH07)	07:47	08:44 (CH07)				
	20:48		20:10	13 07:21 (CH05)	19:19	8 08:08 (CH06)	17:32	20 07:43 (CH09)	17:01	36 08:53 (CH07)	17:03	6 08:50 (CH07)	
26	06:15		06:45	07:16	07:47	07:23	08:17 (CH07)	07:47	08:43 (CH07)				
	20:47		20:08	9 07:19 (CH05)	19:17	17:31	20 07:43 (CH09)	17:01	35 08:52 (CH07)	17:03	8 08:51 (CH07)		
27	06:16		06:46	07:17	07:48	07:24	08:18 (CH07)	07:48	08:44 (CH07)				
	20:47		20:07	19:16	17:29	21 07:44 (CH09)	17:00	34 08:52 (CH07)	17:04	8 08:52 (CH07)			
28	06:17		06:47	07:18	07:49	07:25	08:19 (CH07)	07:48	08:43 (CH07)				
	20:46		20:05	19:14	17:28	21 07:44 (CH09)	17:00	33 08:52 (CH07)	17:05	10 08:53 (CH07)			
29	06:18		06:48	07:19	07:50	07:26	08:19 (CH07)	07:48	08:42 (CH07)				
	20:45		20:04	19:12	17:27	20 07:43 (CH09)	17:00	33 08:52 (CH07)	17:05	12 08:54 (CH07)			
30	06:19		06:49	07:20	07:51	07:27	08:20 (CH07)	07:49	08:42 (CH07)				
	20:44		20:02	19:11	17:25	20 07:43 (CH09)	16:59	31 08:51 (CH07)	17:06	14 08:56 (CH07)			
31	06:20		06:50		07:52	07:28		07:49	08:42 (CH07)				
	20:43		20:01		17:24	19 07:43 (CH09)		17:07	15 08:57 (CH07)				
Potential sun hours	458		427		375		346		299		289		435
Total, worst case		56		295		627		199		1038			

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP16 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June					
1	07:49	07:36	08:11 (CH11)	07:01	07:10	08:13 (CH08)	06:25	05:57			
	17:08	17:42	34 08:45 (CH11)	18:15	19:49	45 08:58 (CH08)	20:20	20:49			
2	07:49	07:35	08:11 (CH11)	06:59	07:09	08:13 (CH08)	06:24	05:56			
	17:09	17:43	34 08:45 (CH11)	18:17	19:50	43 08:56 (CH08)	20:21	20:50			
3	07:49	07:34	08:11 (CH11)	06:58	07:07	08:14 (CH08)	06:23	05:56			
	17:10	17:44	34 08:45 (CH11)	18:18	19:51	41 08:55 (CH08)	20:22	20:51			
4	07:49	07:33	08:12 (CH11)	06:56	07:06	08:14 (CH08)	06:21	05:56			
	17:11	17:46	33 08:45 (CH11)	18:19	19:52	40 08:54 (CH08)	20:23	20:52			
5	07:49	07:32	08:12 (CH11)	06:55	07:04	08:15 (CH08)	06:20	05:55			
	17:11	17:47	33 08:45 (CH11)	18:20	19:53	36 08:51 (CH08)	20:24	20:52			
6	07:49	07:31	08:12 (CH11)	06:53	07:02	08:17 (CH08)	06:19	05:55	06:28 (CH07)		
	17:12	17:48	33 08:45 (CH11)	18:21	19:54	33 08:50 (CH08)	20:25	20:53	7 06:35 (CH07)		
7	07:49	07:30	08:13 (CH11)	06:51	07:01	08:18 (CH08)	06:18	05:55	06:27 (CH07)		
	17:13	17:49	32 08:45 (CH11)	18:22	19:55	30 08:48 (CH08)	20:26	20:53	10 06:37 (CH07)		
8	07:49	07:29	08:13 (CH11)	06:50	06:59	08:19 (CH08)	06:17	05:54	06:26 (CH07)		
	17:14	17:51	30 08:43 (CH11)	18:23	19:56	26 08:45 (CH08)	20:27	20:54	13 06:39 (CH07)		
9	07:49	07:28	08:14 (CH11)	06:48	06:57	08:22 (CH08)	06:15	05:54	06:25 (CH07)		
	17:15	17:52	29 08:43 (CH11)	18:24	19:57	20 08:42 (CH08)	20:29	20:55	16 06:41 (CH07)		
10	07:49	07:27	08:15 (CH11)	06:47	07:33 (CH08)	06:56	08:25 (CH08)	06:14	05:54	06:25 (CH07)	
	17:16	17:53	27 08:42 (CH11)	18:26	19 07:52 (CH08)	19:58	12 08:37 (CH08)	20:30	20:55	17 06:42 (CH07)	
11	07:49	07:25	08:16 (CH11)	06:45	07:04 (CH10)	06:54		06:13	05:54	06:24 (CH07)	
	17:17	17:54	25 08:41 (CH11)	18:27	34 07:55 (CH08)	19:59		20:31	20:56	19 06:43 (CH07)	
12	07:48	07:24	08:18 (CH11)	06:43	07:02 (CH10)	06:53		06:12	05:54	06:24 (CH07)	
	17:18	17:55	22 08:40 (CH11)	18:28	43 07:57 (CH08)	20:00		20:32	20:56	20 06:44 (CH07)	
13	07:48	07:23	08:19 (CH11)	06:42	07:00 (CH10)	06:51		06:11	05:54	06:24 (CH07)	
	17:20	17:57	19 08:38 (CH11)	18:29	49 07:58 (CH08)	20:01		20:33	20:57	20 06:44 (CH07)	
14	07:48	07:22	08:22 (CH11)	06:40	06:59 (CH10)	06:50		07:09 (CH09)	06:10	05:54	06:22 (CH07)
	17:21	17:58	14 08:36 (CH11)	18:30	54 08:00 (CH08)	20:03	5	07:14 (CH09)	20:33	20:57	22 06:44 (CH07)
15	07:48	07:20	08:27 (CH11)	06:39	06:57 (CH10)	06:48		07:07 (CH09)	06:09	05:53	06:23 (CH07)
	17:22	17:59	4 08:31 (CH11)	18:31	59 08:01 (CH08)	20:04	11	07:18 (CH09)	20:34	20:58	22 06:45 (CH07)
16	07:47	07:19		06:37	06:56 (CH10)	06:47		07:05 (CH09)	06:08	05:54	06:23 (CH07)
	17:23	18:00		18:32	63 08:02 (CH08)	20:05	14	07:19 (CH09)	20:35	20:58	23 06:46 (CH07)
17	07:47	07:18	08:22 (CH11)	06:35	06:57 (CH10)	06:45		07:04 (CH09)	06:07	05:54	06:23 (CH07)
	17:24	18:01	5 08:27 (CH11)	18:33	63 08:03 (CH08)	20:06	16	07:20 (CH09)	20:36	20:58	23 06:46 (CH07)
18	07:46	07:16	08:19 (CH11)	06:34	06:56 (CH10)	06:44		07:02 (CH09)	06:06	05:54	06:23 (CH07)
	17:25	18:03	11 08:30 (CH11)	18:34	65 08:03 (CH08)	20:07	18	07:20 (CH09)	20:37	20:59	23 06:46 (CH07)
19	07:46	07:15	08:17 (CH11)	06:32	06:56 (CH10)	06:42		07:01 (CH09)	06:06	05:54	06:23 (CH07)
	17:26	18:04	16 08:33 (CH11)	18:35	65 08:03 (CH08)	20:08	20	07:21 (CH09)	20:38	20:59	24 06:47 (CH07)
20	07:45	07:14	08:16 (CH11)	06:30	06:58 (CH10)	06:41		06:59 (CH09)	06:05	05:54	06:23 (CH07)
	17:27	18:05	19 08:35 (CH11)	18:36	63 08:04 (CH08)	20:09	21	07:20 (CH09)	20:39	20:59	24 06:47 (CH07)
21	07:45	07:12	08:15 (CH11)	06:29	06:58 (CH10)	06:39		06:59 (CH09)	06:04	05:54	06:23 (CH07)
	17:29	18:06	21 08:36 (CH11)	18:37	62 08:04 (CH08)	20:10	22	07:21 (CH09)	20:40	21:00	24 06:47 (CH07)
22	07:44	07:11	08:14 (CH11)	06:27	07:00 (CH10)	06:38		06:59 (CH09)	06:03	05:54	06:24 (CH07)
	17:30	18:07	24 08:38 (CH11)	18:38	57 08:03 (CH08)	20:11	21	07:20 (CH09)	20:41	21:00	24 06:48 (CH07)
23	07:43	07:10	08:13 (CH11)	06:25	07:14 (CH08)	06:36		06:59 (CH09)	06:02	05:54	06:24 (CH07)
	17:31	18:09	26 08:39 (CH11)	18:40	50 08:04 (CH08)	20:12	21	07:20 (CH09)	20:42	21:00	24 06:48 (CH07)
24	07:43	07:08	08:13 (CH11)	06:24	07:13 (CH08)	06:35		07:00 (CH09)	06:02	05:55	06:24 (CH07)
	17:32	18:10	27 08:40 (CH11)	18:41	50 08:03 (CH08)	20:13	20	07:20 (CH09)	20:43	21:00	24 06:48 (CH07)
25	07:42	07:07	08:12 (CH11)	06:22	07:12 (CH08)	06:33		06:59 (CH09)	06:01	05:55	06:24 (CH07)
	17:33	18:11	28 08:40 (CH11)	18:42	51 08:03 (CH08)	20:14	19	07:18 (CH09)	20:44	21:00	23 06:47 (CH07)
26	07:41	07:05	08:12 (CH11)	06:20	07:12 (CH08)	06:32		07:00 (CH09)	06:00	05:55	06:25 (CH07)
	17:35	18:12	30 08:42 (CH11)	18:43	51 08:03 (CH08)	20:15	17	07:17 (CH09)	20:45	21:00	23 06:48 (CH07)
27	07:40	07:04	08:12 (CH11)	06:19	07:12 (CH08)	06:31		07:02 (CH09)	06:00	05:56	06:25 (CH07)
	17:36	18:13	31 08:43 (CH11)	18:44	50 08:02 (CH08)	20:16	14	07:16 (CH09)	20:45	21:00	23 06:48 (CH07)
28	07:40	07:02	08:11 (CH11)	06:17	07:11 (CH08)	06:29		07:03 (CH09)	05:59	05:56	06:25 (CH07)
	17:37	18:14	32 08:43 (CH11)	18:45	50 08:01 (CH08)	20:17	11	07:14 (CH09)	20:46	21:00	22 06:47 (CH07)
29	07:39		08:11 (CH11)	07:15	08:12 (CH08)	06:28		07:06 (CH09)	05:58	05:56	06:27 (CH07)
	17:38		33 08:44 (CH11)	19:46	49 09:01 (CH08)	20:18	5	07:11 (CH09)	20:47	21:00	21 06:48 (CH07)
30	07:38		08:11 (CH11)	07:14	08:12 (CH08)	06:27			05:58	05:57	06:27 (CH07)
	17:39		33 08:44 (CH11)	19:47	48 09:00 (CH08)	20:19			20:48	21:00	20 06:47 (CH07)
31	07:37		08:11 (CH11)	07:12	08:12 (CH08)				05:57		
	17:41		34 08:45 (CH11)	19:48	46 08:58 (CH08)				20:49		
Potential sun hours	298	298	370	370	398	398	581	447	451	511	
Total, worst case											

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

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

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP16 - NURAGHE

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December				
1	05:57	06:28 (CH07)	06:21	06:51	07:21	07:41 (CH10)	06:54	07:45 (CH11)	07:29	
	21:00	19 06:47 (CH07)	20:42	19:59	19:09	46 08:38 (CH08)	17:23	27 08:12 (CH11)	16:59	
2	05:58	06:28 (CH07)	06:22	06:52	08:24 (CH08)	07:22	06:56	07:43 (CH11)	07:30	
	21:00	18 06:46 (CH07)	20:40	19:57	12 08:36 (CH08)	19:07	39 08:35 (CH08)	17:22	30 08:13 (CH11)	16:59
3	05:58	06:30 (CH07)	06:23	06:53	08:20 (CH08)	07:23	06:57	07:43 (CH11)	07:31	
	21:00	16 06:46 (CH07)	20:39	19:56	20 08:40 (CH08)	19:06	29 08:32 (CH08)	17:20	30 08:13 (CH11)	16:58
4	05:59	06:30 (CH07)	06:24	06:54	08:17 (CH08)	07:24	06:58	07:42 (CH11)	07:32	
	21:00	15 06:45 (CH07)	20:38	19:54	26 08:43 (CH08)	19:04	13 08:27 (CH08)	17:19	32 08:14 (CH11)	16:58
5	05:59	06:32 (CH07)	06:25	06:55	08:15 (CH08)	07:25	06:59	07:42 (CH11)	07:33	
	21:00	12 06:44 (CH07)	20:37	19:52	30 08:45 (CH08)	19:02	17:18	33 08:15 (CH11)	16:58	
6	06:00	06:33 (CH07)	06:26	06:56	08:13 (CH08)	07:26	07:00	07:42 (CH11)	07:34	
	20:59	9 06:42 (CH07)	20:36	19:51	33 08:46 (CH08)	19:01	17:17	33 08:15 (CH11)	16:58	
7	06:01	06:38 (CH07)	06:27	06:57	08:10 (CH08)	07:27	07:01	07:41 (CH11)	07:35	
	20:59	1 06:39 (CH07)	20:35	19:49	36 08:46 (CH08)	18:59	17:16	34 08:15 (CH11)	16:58	
8	06:01		06:28	06:58	08:09 (CH08)	07:28	07:03	07:42 (CH11)	07:36	
	20:59		20:34	19:48	39 08:48 (CH08)	18:57	17:15	34 08:16 (CH11)	16:58	
9	06:02		06:29	06:59	08:07 (CH08)	07:29	07:04	07:42 (CH11)	07:36	
	20:58		20:32	19:46	41 08:48 (CH08)	18:56	17:14	34 08:16 (CH11)	16:58	
10	06:03		06:30	07:00	08:06 (CH08)	07:30	07:05	07:42 (CH11)	07:37	
	20:58		20:31	19:44	43 08:49 (CH08)	18:54	17:13	34 08:16 (CH11)	16:58	
11	06:03		06:31	07:01	08:05 (CH08)	07:31	07:06	07:42 (CH11)	07:38	
	20:58		20:30	19:43	45 08:50 (CH08)	18:53	17:12	33 08:15 (CH11)	16:58	
12	06:04		06:32	07:02	08:04 (CH08)	07:32	07:07	07:43 (CH11)	07:39	
	20:57		20:28	19:41	46 08:50 (CH08)	18:51	17:11	33 08:16 (CH11)	16:58	
13	06:05		06:33	07:03	08:03 (CH08)	07:33	07:08	07:43 (CH11)	07:40	
	20:57		20:27	19:39	48 08:51 (CH08)	18:50	17:10	33 08:16 (CH11)	16:58	
14	06:05		06:34	07:04	08:02 (CH08)	07:34	07:10	07:43 (CH11)	07:41	
	20:56		20:26	8 07:20 (CH09)	19:38	49 08:51 (CH08)	18:48	17:09	32 08:15 (CH11)	16:58
15	06:06		06:35	07:05	08:02 (CH08)	07:35	07:11	07:44 (CH11)	07:41	
	20:56		20:24	12 07:22 (CH09)	19:36	49 08:51 (CH08)	18:46	17:08	31 08:15 (CH11)	16:59
16	06:07		06:36	07:06	08:01 (CH08)	07:36	07:12	07:45 (CH11)	07:42	
	20:55		20:23	15 07:23 (CH09)	19:34	50 08:51 (CH08)	18:45	17:07	30 08:15 (CH11)	16:59
17	06:08		06:37	07:07	08:01 (CH08)	07:37	07:13	07:46 (CH11)	07:43	
	20:54		20:22	17 07:24 (CH09)	19:32	50 08:51 (CH08)	18:43	17:07	28 08:14 (CH11)	16:59
18	06:09		06:37	07:08	08:00 (CH08)	07:39	07:14	07:47 (CH11)	07:43	
	20:54		20:20	19 07:25 (CH09)	19:31	51 08:51 (CH08)	18:42	17:06	27 08:14 (CH11)	16:59
19	06:09		06:38	07:09	08:00 (CH08)	07:40	07:15	07:47 (CH11)	07:44	
	20:53		20:19	20 07:25 (CH09)	19:29	51 08:51 (CH08)	18:40	17:05	26 08:13 (CH11)	17:00
20	06:10		06:39	07:10	08:00 (CH08)	07:41	07:17	07:49 (CH11)	07:45	
	20:52		20:17	21 07:26 (CH09)	19:27	50 08:50 (CH08)	18:39	17:04	24 08:13 (CH11)	17:00
21	06:11		06:40	07:11	07:48 (CH10)	07:42	07:18	07:51 (CH11)	07:45	
	20:52		20:16	22 07:26 (CH09)	19:26	55 08:50 (CH08)	18:38	17:04	21 08:12 (CH11)	17:01
22	06:12		06:41	07:12	07:44 (CH10)	07:43	07:19	07:52 (CH11)	07:46	
	20:51		20:14	22 07:26 (CH09)	19:24	61 08:49 (CH08)	18:36	17:03	19 08:11 (CH11)	17:01
23	06:13		06:42	07:13	07:42 (CH10)	07:44	07:20	07:53 (CH11)	07:46	
	20:50		20:13	21 07:24 (CH09)	19:22	64 08:49 (CH08)	18:35	17:02	16 08:09 (CH11)	17:02
24	06:14		06:43	07:14	07:41 (CH10)	07:45	07:21	07:55 (CH11)	07:47	
	20:49		20:11	20 07:24 (CH09)	19:21	65 08:48 (CH08)	18:33	17:02	12 08:07 (CH11)	17:02
25	06:14		06:44	07:15	07:40 (CH10)	06:46	07:22	07:59 (CH11)	07:47	
	20:48		20:10	18 07:23 (CH09)	19:19	65 08:47 (CH08)	17:32	17:01	5 08:04 (CH11)	17:03
26	06:15		06:45	07:16	07:39 (CH10)	06:47	07:23		07:47	
	20:47		20:08	16 07:22 (CH09)	19:17	65 08:46 (CH08)	17:31	17:01		17:03
27	06:16		06:46	07:17	07:39 (CH10)	06:49	07:25	07:55 (CH11)	07:48	
	20:47		20:07	13 07:20 (CH09)	19:16	62 08:44 (CH08)	17:29	8 08:03 (CH11)	17:00	
28	06:17		06:47	07:18	07:38 (CH10)	06:50	07:26	07:51 (CH11)	07:48	
	20:46		20:05	10 07:18 (CH09)	19:14	61 08:43 (CH08)	17:28	15 08:06 (CH11)	17:00	
29	06:18		06:48	07:19	07:39 (CH10)	06:51	07:27	07:48 (CH11)	07:48	
	20:45		20:04	4 07:14 (CH09)	19:12	56 08:41 (CH08)	17:27	20 08:08 (CH11)	17:00	
30	06:19		06:49	07:20	07:40 (CH10)	06:52	07:28	07:46 (CH11)	07:49	
	20:44		20:02	19:11	52 08:40 (CH08)	17:25	23 08:09 (CH11)	16:59	17:06	
31	06:20		06:50			06:53	07:45 (CH11)		07:49	
	20:43		20:01			17:24	25 08:10 (CH11)		17:07	
Potential sun hours	458		427	375	346	218	299	691	289	
Total, worst case	90		258	1375	218	691				

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP17 - Circoli Massidda

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June			
1	07:49 17:08	08:51 (CH08) 09:07 (CH08)	07:36 17:42	07:01 18:15	07:56 (CH07) 08:06 (CH07)	07:10 19:49	07:41 (CH06) 08:04 (CH06)	06:25 20:20	05:57 20:49
2	07:49 17:09	08:52 (CH08) 09:07 (CH08)	07:35 17:43	06:59 18:17	07:09 19:50	07:09 19:50	07:40 (CH06) 08:03 (CH06)	06:24 20:21	05:56 20:50
3	07:49 17:10	08:53 (CH08) 09:07 (CH08)	07:34 17:44	06:58 18:18	07:07 19:51	07:07 19:51	07:41 (CH06) 08:03 (CH06)	06:23 20:22	05:56 20:51
4	07:49 17:11	08:54 (CH08) 09:07 (CH08)	07:33 17:46	06:56 18:19	07:06 19:52	07:06 19:52	07:41 (CH06) 08:02 (CH06)	06:21 20:23	05:56 20:52
5	07:49 17:11	08:55 (CH08) 09:05 (CH08)	07:32 17:47	06:55 18:20	07:04 19:53	07:04 19:53	07:41 (CH06) 08:00 (CH06)	06:20 20:24	05:55 20:52
6	07:49 17:12	08:56 (CH08) 09:04 (CH08)	07:31 17:48	06:53 18:21	07:02 19:54	07:02 19:54	07:42 (CH06) 08:00 (CH06)	06:19 20:25	05:55 20:53
7	07:49 17:13	08:59 (CH08) 09:03 (CH08)	07:30 17:49	06:51 18:22	07:01 19:55	07:01 19:55	07:43 (CH06) 07:57 (CH06)	06:18 20:27	05:55 20:54
8	07:49 17:14		07:29 17:51	06:50 18:23	06:59 19:56	06:59 19:56	07:46 (CH06) 07:55 (CH06)	06:17 20:28	05:54 20:54
9	07:49 17:15		07:28 17:52	06:48 18:24	06:57 19:57	06:57 19:57		06:15 20:29	05:54 20:55
10	07:49 17:16		07:27 17:53	06:47 18:26	06:56 19:58	06:56 19:58		06:14 20:30	05:54 20:55
11	07:49 17:17		07:25 17:54	06:45 18:27	06:54 19:59	06:54 19:59		06:13 20:31	05:54 20:56
12	07:49 17:18		07:24 17:55	06:43 18:28	06:53 20:00	06:53 20:00	08:00 (CH07) 08:06 (CH07)	06:12 20:32	05:54 20:56
13	07:48 17:19		07:23 17:57	06:42 18:29	06:51 20:02	06:51 20:02	07:55 (CH07) 08:08 (CH07)	06:11 20:33	05:54 20:57
14	07:48 17:21		07:22 17:58	06:40 18:30	06:50 20:03	06:50 20:03	07:54 (CH07) 08:11 (CH07)	06:10 20:34	05:54 20:57
15	07:48 17:22		07:20 17:59	06:39 18:31	06:48 20:04	06:48 20:04	07:53 (CH07) 08:12 (CH07)	06:09 20:35	05:53 20:58
16	07:47 17:23		07:19 18:00	06:37 18:32	06:47 20:05	06:47 20:05	07:51 (CH07) 08:13 (CH07)	06:08 20:35	05:53 20:58
17	07:47 17:24		07:18 18:01	06:35 18:33	06:45 20:06	06:45 20:06	07:50 (CH07) 08:14 (CH07)	06:07 20:36	05:54 20:58
18	07:46 17:25		07:16 18:03	06:34 18:34	06:44 20:07	06:44 20:07	07:50 (CH07) 08:15 (CH07)	06:06 20:37	05:54 20:59
19	07:46 17:26		07:15 18:04	06:32 18:35	06:42 20:08	06:42 20:08	07:49 (CH07) 08:14 (CH07)	06:05 20:38	05:54 20:59
20	07:45 17:27		07:14 18:05	06:30 18:36	06:41 20:09	06:41 20:09	07:49 (CH07) 08:15 (CH07)	06:05 20:39	05:54 20:59
21	07:45 17:29		07:12 18:06	06:29 18:37	06:39 20:10	06:39 20:10	07:48 (CH07) 08:14 (CH07)	06:04 20:40	05:54 21:00
22	07:44 17:30		07:11 18:07	06:27 18:38	06:38 20:11	06:38 20:11	07:49 (CH07) 08:15 (CH07)	06:03 20:41	05:54 21:00
23	07:43 17:31		07:10 18:09	06:25 18:40	06:36 20:12	06:36 20:12	07:49 (CH07) 08:15 (CH07)	06:02 20:42	05:54 21:00
24	07:43 17:32		07:08 18:10	06:24 18:41	06:35 20:13	06:35 20:13	07:49 (CH07) 08:14 (CH07)	06:02 20:43	05:55 21:00
25	07:42 17:33		07:07 18:11	06:22 18:42	06:33 20:14	06:33 20:14	07:50 (CH07) 08:13 (CH07)	06:01 20:44	05:55 21:00
26	07:41 17:35		07:05 18:12	06:20 18:43	06:32 20:15	06:32 20:15	07:50 (CH07) 08:12 (CH07)	06:00 20:45	05:55 21:00
27	07:40 17:36		07:04 18:13	06:19 18:44	06:31 20:16	06:31 20:16	07:52 (CH07) 08:11 (CH07)	06:00 20:45	05:56 21:00
28	07:40 17:37		07:02 18:14	06:17 18:45	06:29 20:17	06:29 20:17	07:53 (CH07) 08:08 (CH07)	05:59 20:46	05:56 21:00
29	07:39 17:38			07:15 19:46	06:28 20:18	06:28 20:18	07:03 (CH06) 08:04 (CH06)	05:58 20:47	05:56 21:00
30	07:38 17:39			07:14 19:47	06:27 20:19	06:27 20:19	07:42 (CH06) 08:04 (CH06)	05:58 20:48	05:57 21:00
31	07:37 17:41			07:12 19:48	06:27 20:19	06:27 20:19	07:42 (CH06) 08:05 (CH06)	05:57 20:49	
Potential sun hours	298	298	370	398	447	451			
Total, worst case	80	359	138	149					

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

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

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP17 - Circoli Massidda

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December	
1	05:57 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59	
2	05:58 21:00	06:22 20:41	06:52 19:57	07:22 19:07	06:56 17:22	07:30 16:59	
3	05:58 21:00	06:23 20:39	06:53 19:56	07:23 19:06	06:57 17:20	07:31 16:58	
4	05:59 21:00	06:24 20:38	06:54 19:54	07:24 (CH06) 19:04	06:58 17:19	07:32 16:58	
5	05:59 21:00	06:25 20:37	06:55 19:53	07:25 (CH06) 19:02	06:59 17:18	07:33 16:58	08:44 (CH08) 08:48 (CH08)
6	06:00 20:59	06:26 20:36	06:56 19:51	07:26 (CH06) 19:01	07:00 17:17	07:34 16:58	08:42 (CH08) 08:50 (CH08)
7	06:01 20:59	06:27 20:35	06:57 19:49	07:27 (CH06) 18:59	07:01 17:16	07:35 16:58	08:42 (CH08) 08:52 (CH08)
8	06:01 20:59	06:28 20:34	06:58 19:48	07:28 (CH06) 18:57	07:03 17:15	07:36 16:58	08:41 (CH08) 08:54 (CH08)
9	06:02 20:58	06:29 20:32	06:59 19:46	07:29 (CH06) 18:56	07:04 17:14	07:37 16:58	08:41 (CH08) 08:55 (CH08)
10	06:03 20:58	06:30 20:31	07:00 19:44	07:30 (CH06) 18:54	07:05 17:13	07:37 16:58	08:41 (CH08) 08:56 (CH08)
11	06:03 20:58	06:31 20:30	07:01 19:43	07:31 (CH06) 18:53	07:06 17:12	07:38 16:58	08:41 (CH08) 08:57 (CH08)
12	06:04 20:57	06:32 20:28	07:02 19:41	07:32 (CH06) 18:51	07:32 08:32 (CH07) 3 08:35 (CH07)	07:39 17:11	08:41 (CH08) 08:58 (CH08)
13	06:05 20:57	06:33 20:27	07:03 19:39	07:33 (CH06) 18:50	07:33 08:27 (CH07) 13 08:40 (CH07)	07:08 17:10	08:41 (CH08) 08:58 (CH08)
14	06:05 20:56	06:34 20:26	07:04 19:38	07:34 (CH06) 18:48	07:34 08:25 (CH07) 16 08:41 (CH07)	07:10 17:09	08:41 (CH08) 08:59 (CH08)
15	06:06 20:56	06:35 20:24	07:05 19:36	07:35 (CH06) 18:46	07:35 08:24 (CH07) 20 08:44 (CH07)	07:11 17:08	08:42 (CH08) 09:00 (CH08)
16	06:07 20:55	06:36 20:23	07:06 19:34	07:36 (CH06) 18:45	07:36 08:22 (CH07) 22 08:44 (CH07)	07:12 17:07	08:41 (CH08) 09:00 (CH08)
17	06:08 20:54	06:37 20:22	07:07 19:32	07:37 (CH06) 18:43	07:37 08:21 (CH07) 24 08:45 (CH07)	07:13 17:07	08:42 (CH08) 09:01 (CH08)
18	06:09 20:54	06:38 20:20	07:08 19:31	07:38 (CH06) 18:42	07:39 08:20 (CH07) 25 08:45 (CH07)	07:14 17:06	08:43 (CH08) 09:02 (CH08)
19	06:09 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:40 08:20 (CH07) 25 08:45 (CH07)	07:16 17:05	08:42 (CH08) 09:02 (CH08)
20	06:10 20:52	06:39 20:17	07:10 19:27	07:41 18:39	07:41 08:19 (CH07) 26 08:45 (CH07)	07:17 17:04	08:43 (CH08) 09:03 (CH08)
21	06:11 20:52	06:40 20:16	07:11 19:26	07:42 18:38	07:42 08:19 (CH07) 26 08:45 (CH07)	07:18 17:04	08:43 (CH08) 09:03 (CH08)
22	06:12 20:51	06:41 20:14	07:12 19:24	07:43 18:36	07:43 08:20 (CH07) 26 08:46 (CH07)	07:19 17:03	08:44 (CH08) 09:04 (CH08)
23	06:13 20:50	06:42 20:13	07:13 19:22	07:44 18:35	07:44 08:20 (CH07) 25 08:45 (CH07)	07:20 17:02	08:44 (CH08) 09:04 (CH08)
24	06:14 20:49	06:43 20:11	07:14 19:21	07:45 18:33	07:45 08:20 (CH07) 24 08:44 (CH07)	07:21 17:02	08:45 (CH08) 09:05 (CH08)
25	06:14 20:48	06:44 20:10	07:15 19:19	06:46 17:32	06:46 07:20 (CH07) 23 07:43 (CH07)	07:22 17:01	08:46 (CH08) 09:05 (CH08)
26	06:15 20:47	06:45 20:08	07:16 19:17	06:47 17:31	06:47 07:21 (CH07) 21 07:42 (CH07)	07:23 17:01	08:46 (CH08) 09:05 (CH08)
27	06:16 20:47	06:46 20:07	07:17 19:16	06:49 17:29	06:49 07:23 (CH07) 19 07:42 (CH07)	07:25 17:00	08:47 (CH08) 09:06 (CH08)
28	06:17 20:46	06:47 20:05	07:18 19:14	06:50 17:28	06:50 07:24 (CH07) 16 07:40 (CH07)	07:26 17:00	08:48 (CH08) 09:06 (CH08)
29	06:18 20:45	06:48 20:04	07:19 19:12	06:51 17:27	06:51 07:26 (CH07) 11 07:37 (CH07)	07:27 17:00	08:48 (CH08) 09:06 (CH08)
30	06:19 20:44	06:49 20:02	07:20 19:11	06:52 17:25	06:52 07:30 (CH07) 3 07:33 (CH07)	07:28 16:59	08:49 (CH08) 09:06 (CH08)
31	06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07	08:49 (CH08) 09:06 (CH08)
Potential sun hours	458	427	375	346	299	289	454
Total, worst case			277	368			

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: Shadow_cumulativo_beni_2021_12_13 Shadow receptor: BP18 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (233)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 20:49	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:57	07:22 19:07	06:56 17:22	07:30 16:59
3	07:49 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:59 21:00	06:23 20:39	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:49 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:23	05:56 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:02	06:59 17:18	07:33 16:58
6	07:49 17:13	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:26	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:49 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	07:49 17:15	07:29 17:51	06:50 18:23	06:59 19:56	06:17 20:28	05:55 20:54	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58
9	07:49 17:16	07:28 17:52	06:48 18:25	06:58 19:57	06:16 20:29	05:54 20:55	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:58	06:15 20:30	05:54 20:55	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	07:49 17:18	07:25 17:54	06:45 18:27	06:54 20:00	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:56	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	06:06 20:56	06:35 20:25	07:05 19:36	07:35 18:47	07:11 17:08	07:41 16:59
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	06:07 20:55	06:36 20:23	07:06 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 20:36	05:54 20:58	06:08 20:54	06:37 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:37	05:54 20:59	06:09 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:14 17:06	07:43 17:00
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:06 20:38	05:54 20:59	06:10 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00
20	07:45 17:28	07:14 18:05	06:30 18:36	06:41 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:40 20:17	07:10 19:28	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:29	07:12 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:43 17:31	07:10 18:09	06:25 18:40	06:36 20:12	06:02 20:42	05:55 21:00	06:13 20:50	06:43 20:13	07:13 19:22	07:44 18:35	07:20 17:03	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:15 20:48	06:45 20:10	07:15 19:19	07:46 17:32	07:22 17:01	07:47 17:03
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:56 21:00	06:16 20:48	06:46 20:08	07:16 19:17	07:47 17:31	07:23 17:01	07:48 17:04
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:45	05:56 21:00	06:17 20:47	06:47 20:07	07:17 19:16	07:48 17:29	07:24 17:01	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00	06:17 20:46	06:47 20:05	07:18 19:14	07:49 17:28	07:25 17:00	07:48 17:05
29	07:39 17:38		07:16 19:46	06:28 20:18	05:59 20:47	05:57 21:00	06:18 20:45	06:48 20:04	07:19 19:12	07:50 17:27	07:26 17:00	07:48 17:06
30	07:38 17:40		07:14 19:47	06:27 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:11	07:51 17:25	07:27 16:59	07:49 17:06
31	07:37 17:41		07:12 19:48		05:57 20:49		06:20 20:43	06:50 20:01		06:53 17:24		07:49 17:07
Potential sun hours	299	298	370	398	447	451	458	427	375	346	299	289
Total, worst case												

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

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

Calculation: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP19 - NURAGHE PENTUMA

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March		April		May	June	
1	07:49 17:08	07:36 17:42	07:01 18:16		07:11 19:49	35	18:16 (CH18) 19:28 (CH17)	06:25 20:20	05:57 20:49
2	07:49 17:09	07:35 17:43	06:59 18:17		07:09 19:50	34	18:18 (CH18) 19:29 (CH17)	06:24 20:21	05:56 20:50
3	07:49 17:10	07:34 17:44	06:58 18:18		07:07 19:51	31	18:21 (CH18) 19:30 (CH17)	06:23 20:22	05:56 20:51
4	07:49 17:11	07:33 17:46	06:56 18:19		07:06 19:52	19	19:12 (CH17) 19:31 (CH17)	06:22 20:23	05:56 20:52
5	07:49 17:12	07:32 17:47	06:55 18:20		07:04 19:53	21	19:10 (CH17) 19:31 (CH17)	06:20 20:24	05:55 20:52
6	07:49 17:13	07:31 17:48	06:53 18:21		07:02 19:54	23	19:10 (CH17) 19:33 (CH17)	06:19 20:26	05:55 20:53
7	07:49 17:13	07:30 17:49	06:51 18:22		07:01 19:55	22	19:10 (CH17) 19:32 (CH17)	06:18 20:27	05:55 20:54
8	07:49 17:14	07:29 17:51	06:50 18:23		06:59 19:56	23	19:10 (CH17) 19:33 (CH17)	06:17 20:28	05:54 20:54
9	07:49 17:15	07:28 17:52	06:48 18:25		06:58 19:57	23	19:09 (CH17) 19:32 (CH17)	06:16 20:29	05:54 20:55
10	07:49 17:16	07:27 17:53	06:47 18:26	13	17:27 (CH18) 17:40 (CH18)	06:56 19:58	19:09 (CH17) 19:31 (CH17)	06:15 20:30	05:54 20:55
11	07:49 17:18	07:25 17:54	06:45 18:27	20	17:24 (CH18) 17:44 (CH18)	06:54 19:59	19:10 (CH17) 19:30 (CH17)	06:13 20:31	05:54 20:56
12	07:49 17:19	07:24 17:56	06:43 18:28	25	17:21 (CH18) 17:46 (CH18)	06:53 20:01	19:10 (CH17) 19:29 (CH17)	06:12 20:32	05:54 20:56
13	07:48 17:20	07:23 17:57	06:42 18:29	28	17:19 (CH18) 17:47 (CH18)	06:51 20:02	19:12 (CH17) 19:28 (CH17)	06:11 20:33	05:54 20:57
14	07:48 17:21	07:22 17:58	06:40 18:30	31	17:18 (CH18) 17:49 (CH18)	06:50 20:03	19:13 (CH17) 19:25 (CH17)	06:10 20:34	05:54 20:57
15	07:48 17:22	07:20 17:59	06:39 18:31	33	17:16 (CH18) 17:49 (CH18)	06:48 20:04	19:16 (CH17) 19:22 (CH17)	06:09 20:35	05:54 20:58
16	07:47 17:23	07:19 18:00	06:37 18:32	36	17:15 (CH18) 17:51 (CH18)	06:47 20:05		06:08 20:36	05:54 20:58
17	07:47 17:24	07:18 18:02	06:35 18:33	37	17:14 (CH18) 17:51 (CH18)	06:45 20:06		06:07 20:36	05:54 20:58
18	07:46 17:25	07:17 18:03	06:34 18:34	38	17:13 (CH18) 17:51 (CH18)	06:44 20:07		06:07 20:37	05:54 20:59
19	07:46 17:26	07:15 18:04	06:32 18:35	39	17:13 (CH18) 17:52 (CH18)	06:42 20:08		06:06 20:38	05:54 20:59
20	07:45 17:28	07:14 18:05	06:30 18:36	39	17:12 (CH18) 17:51 (CH18)	06:41 20:09		06:05 20:39	05:54 20:59
21	07:45 17:29	07:12 18:06	06:29 18:37	40	17:11 (CH18) 17:51 (CH18)	06:39 20:10		06:04 20:40	05:54 21:00
22	07:44 17:30	07:11 18:07	06:27 18:39	40	17:11 (CH18) 17:51 (CH18)	06:38 20:11		06:03 20:41	05:54 21:00
23	07:43 17:31	07:10 18:09	06:25 18:40	40	17:11 (CH18) 17:51 (CH18)	06:36 20:12		06:02 20:42	05:55 21:00
24	07:43 17:32	07:08 18:10	06:24 18:41	40	17:10 (CH18) 17:50 (CH18)	06:35 20:13		06:02 20:43	05:55 21:00
25	07:42 17:33	07:07 18:11	06:22 18:42	39	17:11 (CH18) 17:50 (CH18)	06:33 20:14		06:01 20:44	05:55 21:00
26	07:41 17:35	07:05 18:12	06:20 18:43	38	17:11 (CH18) 17:49 (CH18)	06:32 20:15		06:00 20:45	05:55 21:00
27	07:41 17:36	07:04 18:13	06:19 18:44	36	17:11 (CH18) 17:47 (CH18)	06:31 20:16		06:00 20:45	05:56 21:00
28	07:40 17:37	07:02 18:14	06:17 18:45	35	17:12 (CH18) 17:47 (CH18)	06:29 20:17		05:59 20:46	05:56 21:00
29	07:39 17:38		07:15 19:46	33	18:13 (CH18) 18:46 (CH18)	06:28 20:18		05:58 20:47	05:57 21:00
30	07:38 17:40		07:14 19:47	31	18:13 (CH18) 18:44 (CH18)	06:27 20:19		05:58 20:48	05:57 21:00
31	07:37 17:41		07:12 19:48	30	18:15 (CH18) 19:25 (CH17)			05:57 20:49	
Potential sun hours	298	298	370		398	326		447	451
Total, worst case			741						

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP19 - NURAGHE PENTUMA

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December	
1	05:57 21:00	06:21 20:42	06:51 19:59	19:09 (CH17) 19:29 (CH17)	07:21 19:09	18:00 (CH18) 17:23	06:54 16:59
2	05:58 21:00	06:22 20:41	06:52 19:57	19:08 (CH17) 19:30 (CH17)	07:22 19:07	18:01 (CH18) 18:24 (CH18)	06:56 16:59
3	05:58 21:00	06:23 20:39	06:53 19:56	19:07 (CH17) 19:30 (CH17)	07:23 19:06	18:04 (CH18) 18:21 (CH18)	06:57 16:59
4	05:59 21:00	06:24 20:38	06:54 19:54	19:07 (CH17) 19:30 (CH17)	07:24 19:04	18:09 (CH18) 18:15 (CH18)	06:58 16:58
5	06:00 21:00	06:25 20:37	06:55 19:53	19:07 (CH17) 19:30 (CH17)	07:25 19:02	18:15 (CH18)	06:59 16:58
6	06:00 20:59	06:26 20:36	06:56 19:51	19:06 (CH17) 19:29 (CH17)	07:26 19:01	18:15 (CH18)	07:00 16:58
7	06:01 20:59	06:27 20:35	06:57 19:49	19:07 (CH17) 19:28 (CH17)	07:27 18:59	18:15 (CH18)	07:01 16:58
8	06:01 20:59	06:28 20:34	06:58 19:48	19:07 (CH17) 19:26 (CH17)	07:28 18:58	18:15 (CH18)	07:03 16:58
9	06:02 20:58	06:29 20:32	06:59 19:46	18:15 (CH18) 19:23 (CH17)	07:29 18:56	18:15 (CH18)	07:04 16:58
10	06:03 20:58	06:30 20:31	07:00 19:44	18:11 (CH18) 19:22 (CH17)	07:30 18:54	18:15 (CH18)	07:05 16:58
11	06:03 20:58	06:31 20:30	07:01 19:43	18:08 (CH18) 19:20 (CH17)	07:31 18:53	18:15 (CH18)	07:06 16:58
12	06:04 20:57	06:32 20:29	07:02 19:41	18:06 (CH18) 19:17 (CH17)	07:32 18:51	18:15 (CH18)	07:07 16:58
13	06:05 20:57	06:33 20:27	07:03 19:39	18:05 (CH18) 18:35 (CH18)	07:33 18:50	18:15 (CH18)	07:09 16:58
14	06:06 20:56	06:34 20:26	07:04 19:38	18:03 (CH18) 18:36 (CH18)	07:34 18:48	18:15 (CH18)	07:10 16:58
15	06:06 20:56	06:35 20:24	07:05 19:36	18:02 (CH18) 18:36 (CH18)	07:35 18:47	18:15 (CH18)	07:11 16:59
16	06:07 20:55	06:36 20:23	07:06 19:34	18:00 (CH18) 18:37 (CH18)	07:36 18:45	18:15 (CH18)	07:12 16:59
17	06:08 20:54	06:37 20:22	07:07 19:33	17:59 (CH18) 18:37 (CH18)	07:38 18:44	18:15 (CH18)	07:13 16:59
18	06:09 20:54	06:38 20:20	07:08 19:31	17:59 (CH18) 18:37 (CH18)	07:39 18:42	18:15 (CH18)	07:14 17:00
19	06:09 20:53	06:39 20:19	07:09 19:29	17:58 (CH18) 18:37 (CH18)	07:40 18:41	18:15 (CH18)	07:16 17:00
20	06:10 20:52	06:40 20:17	07:10 19:27	17:57 (CH18) 18:37 (CH18)	07:41 18:39	18:15 (CH18)	07:17 17:00
21	06:11 20:52	06:41 20:16	07:11 19:26	17:57 (CH18) 18:37 (CH18)	07:42 18:38	18:15 (CH18)	07:18 17:01
22	06:12 20:51	06:42 20:14	07:12 19:24	17:56 (CH18) 18:36 (CH18)	07:43 18:36	18:15 (CH18)	07:19 17:01
23	06:13 20:50	06:43 20:13	07:13 19:22	17:56 (CH18) 18:36 (CH18)	07:44 18:35	18:15 (CH18)	07:20 17:02
24	06:14 20:49	06:44 20:12	07:14 19:21	17:56 (CH18) 18:35 (CH18)	07:45 18:33	18:15 (CH18)	07:21 17:02
25	06:15 20:48	06:44 20:10	07:15 19:19	17:56 (CH18) 18:34 (CH18)	06:46 17:32	18:15 (CH18)	07:22 17:03
26	06:16 20:48	06:45 20:08	07:16 19:17	17:56 (CH18) 17:56 (CH18)	06:48 17:31	18:15 (CH18)	07:23 17:04
27	06:16 20:47	06:46 20:07	07:17 19:16	17:56 (CH18) 18:32 (CH18)	06:49 17:29	18:15 (CH18)	07:25 17:04
28	06:17 20:46	06:47 20:05	19:17 (CH17) 19:14 (CH17)	07:18 19:14	06:50 17:28	18:15 (CH18)	07:26 17:05
29	06:18 20:45	06:48 20:04	19:14 (CH17) 19:26 (CH17)	07:19 19:12	06:51 17:27	18:15 (CH18)	07:27 17:06
30	06:19 20:44	06:49 20:02	19:12 (CH17) 19:28 (CH17)	07:20 19:11	06:52 17:25	18:15 (CH18)	07:28 17:06
31	06:20 20:43	06:50 20:01	19:10 (CH17) 19:29 (CH17)		06:53 17:24		07:49 17:07
Potential sun hours	458	427	375	346	299	289	
Total, worst case		54	957	72			

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP20 - NURAGHE MASSEDDA

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January		February		March		April		May		June	
1	07:49	08:42 (CH08)	07:36		07:01	07:34 (CH07)	07:10		06:25	07:12 (CH06)	05:57	
	17:08	31 09:13 (CH08)	17:42		18:15	20 07:54 (CH07)	19:49		20:20	15 07:27 (CH06)	20:49	
2	07:49	08:43 (CH08)	07:35		06:59	07:32 (CH07)	07:09		06:24	07:14 (CH06)	05:56	
	17:09	31 09:14 (CH08)	17:43		18:17	23 07:55 (CH07)	19:50		20:21	11 07:25 (CH06)	20:50	
3	07:49	08:44 (CH08)	07:34		06:58	07:30 (CH07)	07:07		06:23		05:56	
	17:10	30 09:14 (CH08)	17:44		18:18	26 07:56 (CH07)	19:51		20:22		20:51	
4	07:49	08:44 (CH08)	07:33		06:56	07:30 (CH07)	07:06		06:21		05:56	
	17:11	31 09:15 (CH08)	17:46		18:19	27 07:57 (CH07)	19:52		20:23		20:52	
5	07:49	08:44 (CH08)	07:32		06:55	07:28 (CH07)	07:04		06:20		05:55	
	17:11	30 09:14 (CH08)	17:47		18:20	29 07:57 (CH07)	19:53		20:24		20:52	
6	07:49	08:45 (CH08)	07:31		06:53	07:28 (CH07)	07:02		06:19		05:55	
	17:12	29 09:14 (CH08)	17:48		18:21	30 07:58 (CH07)	19:54		20:25		20:53	
7	07:49	08:45 (CH08)	07:30		06:51	07:27 (CH07)	07:01		06:18		05:55	
	17:13	30 09:15 (CH08)	17:49		18:22	31 07:58 (CH07)	19:55		20:27		20:54	
8	07:49	08:46 (CH08)	07:29		06:50	07:27 (CH07)	06:59		06:17		05:54	
	17:14	29 09:15 (CH08)	17:51		18:23	32 07:59 (CH07)	19:56		20:28		20:54	
9	07:49	08:47 (CH08)	07:28		06:48	07:26 (CH07)	06:57		06:15		05:54	
	17:15	29 09:16 (CH08)	17:52		18:24	32 07:58 (CH07)	19:57		20:29		20:55	
10	07:49	08:48 (CH08)	07:27		06:47	07:26 (CH07)	06:56		06:14		05:54	
	17:16	28 09:16 (CH08)	17:53		18:26	31 07:57 (CH07)	19:58		20:30		20:55	
11	07:49	08:48 (CH08)	07:25		06:45	07:26 (CH07)	06:54		06:13		05:54	
	17:17	27 09:15 (CH08)	17:54		18:27	32 07:58 (CH07)	19:59		20:31		20:56	
12	07:49	08:49 (CH08)	07:24		06:43	07:26 (CH07)	06:53		06:12		05:54	
	17:18	27 09:16 (CH08)	17:55		18:28	30 07:56 (CH07)	20:00		20:32		20:56	
13	07:48	08:50 (CH08)	07:23		06:42	07:26 (CH07)	06:51		07:22 (CH06)	06:11	05:54	
	17:19	26 09:16 (CH08)	17:57		18:29	29 07:55 (CH07)	20:02	4	07:26 (CH06)	20:33	20:57	
14	07:48	08:51 (CH08)	07:22		06:40	07:27 (CH07)	06:50		07:17 (CH06)	06:10	05:54	
	17:21	24 09:15 (CH08)	17:58		18:30	28 07:55 (CH07)	20:03	13	07:30 (CH06)	20:34	20:57	
15	07:48	08:52 (CH08)	07:20		06:39	07:27 (CH07)	06:48		07:15 (CH06)	06:09	05:53	
	17:22	23 09:15 (CH08)	17:59		18:31	26 07:53 (CH07)	20:04	17	07:32 (CH06)	20:35	20:58	
16	07:47	08:53 (CH08)	07:19		06:37	07:28 (CH07)	06:47		07:13 (CH06)	06:08	05:53	
	17:23	21 09:14 (CH08)	18:00		18:32	23 07:51 (CH07)	20:05	20	07:33 (CH06)	20:35	20:58	
17	07:47	08:54 (CH08)	07:18		06:35	07:30 (CH07)	06:45		07:12 (CH06)	06:07	05:54	
	17:24	20 09:14 (CH08)	18:01		18:33	20 07:50 (CH07)	20:06	22	07:34 (CH06)	20:36	20:58	
18	07:46	08:55 (CH08)	07:16		06:34	07:32 (CH07)	06:44		07:10 (CH06)	06:06	05:54	
	17:25	18 09:13 (CH08)	18:03		18:34	15 07:47 (CH07)	20:07	24	07:34 (CH06)	20:37	20:59	
19	07:46	08:58 (CH08)	07:15		06:32	07:35 (CH07)	06:42		07:10 (CH06)	06:05	05:54	
	17:26	14 09:12 (CH08)	18:04		18:35	7 07:42 (CH07)	20:08	25	07:35 (CH06)	20:38	20:59	
20	07:45	08:59 (CH08)	07:14		06:30		06:41		07:09 (CH06)	06:05	05:54	
	17:27	11 09:10 (CH08)	18:05		18:36		20:09	26	07:35 (CH06)	20:39	20:59	
21	07:45	09:03 (CH08)	07:12		06:29		06:39		07:08 (CH06)	06:04	05:54	
	17:29	3 09:06 (CH08)	18:06		18:37		20:10	27	07:35 (CH06)	20:40	21:00	
22	07:44		07:11		06:27		06:38		07:08 (CH06)	06:03	05:54	
	17:30		18:07		18:38		20:11	27	07:35 (CH06)	20:41	21:00	
23	07:43		07:10		06:25		06:36		07:08 (CH06)	06:02	05:54	
	17:31		18:09		18:40		20:12	27	07:35 (CH06)	20:42	21:00	
24	07:43		07:08		06:24		06:35		07:08 (CH06)	06:02	05:55	
	17:32		18:10		18:41		20:13	27	07:35 (CH06)	20:43	21:00	
25	07:42		07:07		06:22		06:33		07:08 (CH06)	06:01	05:55	
	17:33		18:11		18:42		20:14	26	07:34 (CH06)	20:44	21:00	
26	07:41		07:05		06:20		06:32		07:08 (CH06)	06:00	05:55	
	17:35		18:12		18:43		20:15	25	07:33 (CH06)	20:45	21:00	
27	07:40		07:04	07:41 (CH07)	06:19		06:31		07:09 (CH06)	06:00	05:56	
	17:36		18:13	7 07:48 (CH07)	18:44		20:16	24	07:33 (CH06)	20:45	21:00	
28	07:40		07:02	07:36 (CH07)	06:17		06:29		07:09 (CH06)	05:59	05:56	
	17:37		18:14	16 07:52 (CH07)	18:45		20:17	22	07:31 (CH06)	20:46	21:00	
29	07:39				07:15		06:28		07:10 (CH06)	05:58	05:56	
	17:38				19:46		20:18	20	07:30 (CH06)	20:47	21:00	
30	07:38				07:14		06:26		07:11 (CH06)	05:58	05:57	
	17:39				19:47		20:19	18	07:29 (CH06)	20:48	21:00	
31	07:37				07:12				05:57			
	17:41				19:48				20:49			
Potential sun hours	298		298		370		398		447		451	
Total, worst case	512		23		491		394		26			

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: Shadow_cumulativo_beni_2021_12_13Shadow receptor: BP20 - NURAGHE MASSEDDA

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December				
1	05:57	06:21	06:51	07:21	08:06 (CH07)	06:54	07:29	08:30 (CH08)		
	21:00	20:42	19:59	19:09	30 08:36 (CH07)	17:23	16:59	27 08:57 (CH08)		
2	05:58	06:22	06:52	07:22	08:05 (CH07)	06:56	07:30	08:30 (CH08)		
	21:00	20:41	19:57	19:07	31 08:36 (CH07)	17:22	16:59	28 08:58 (CH08)		
3	05:58	06:23	06:53	07:23	08:04 (CH07)	06:57	07:31	08:30 (CH08)		
	21:00	20:39	19:56	19:06	32 08:36 (CH07)	17:20	16:58	29 08:59 (CH08)		
4	05:59	06:24	06:54	07:24	08:04 (CH07)	06:58	07:32	08:30 (CH08)		
	21:00	20:38	19:54	19:04	32 08:36 (CH07)	17:19	16:58	29 08:59 (CH08)		
5	05:59	06:25	06:55	07:25	08:04 (CH07)	06:59	07:33	08:30 (CH08)		
	21:00	20:37	19:52	19:02	31 08:35 (CH07)	17:18	16:58	30 09:00 (CH08)		
6	06:00	06:26	06:56	07:26	08:03 (CH07)	07:00	07:34	08:31 (CH08)		
	20:59	20:36	19:51	19:01	32 08:35 (CH07)	17:17	16:58	29 09:00 (CH08)		
7	06:01	06:27	06:57	07:27	08:03 (CH07)	07:01	07:35	08:31 (CH08)		
	20:59	20:35	19:49	18:59	31 08:34 (CH07)	17:16	16:58	30 09:01 (CH08)		
8	06:01	06:28	06:58	07:28	08:03 (CH07)	07:03	07:36	08:31 (CH08)		
	20:59	20:34	19:48	18:57	30 08:33 (CH07)	17:15	16:58	31 09:02 (CH08)		
9	06:02	06:29	06:59	07:29	08:04 (CH07)	07:04	07:37	08:32 (CH08)		
	20:58	20:32	19:46	18:56	28 08:32 (CH07)	17:14	16:58	30 09:02 (CH08)		
10	06:03	06:30	07:00	07:30	08:04 (CH07)	07:05	07:37	08:32 (CH08)		
	20:58	20:31	4 07:30 (CH06)	19:44	18:54	27 08:31 (CH07)	17:13	16:58	31 09:03 (CH08)	
11	06:03	06:31	07:01	07:31	08:05 (CH07)	07:06	07:38	08:33 (CH08)		
	20:58	20:30	12 07:34 (CH06)	19:43	18:53	25 08:30 (CH07)	17:12	16:58	31 09:04 (CH08)	
12	06:04	06:32	07:02	07:32	08:06 (CH07)	07:07	07:39	08:34 (CH08)		
	20:57	20:28	16 07:36 (CH06)	19:41	18:51	22 08:28 (CH07)	17:11	16:58	30 09:04 (CH08)	
13	06:05	06:33	07:03	07:33	08:08 (CH07)	07:08	07:40	08:33 (CH08)		
	20:57	20:27	18 07:37 (CH06)	19:39	18:50	18 08:26 (CH07)	17:10	16:58	31 09:04 (CH08)	
14	06:05	06:34	07:04	07:34	08:10 (CH07)	07:10	07:41	08:34 (CH08)		
	20:56	20:26	21 07:38 (CH06)	19:38	18:48	13 08:23 (CH07)	17:09	16:58	31 09:05 (CH08)	
15	06:06	06:35	07:05	07:35	07:11	07:11	07:41	08:35 (CH08)		
	20:56	20:24	23 07:39 (CH06)	19:36	18:46	17:08	16:59	30 09:05 (CH08)		
16	06:07	06:36	07:06	07:36	07:12	07:12	07:42	08:34 (CH08)		
	20:55	20:23	25 07:40 (CH06)	19:34	18:45	17:07	16:59	31 09:05 (CH08)		
17	06:08	06:37	07:07	07:37	07:13	07:13	07:43	08:35 (CH08)		
	20:54	20:22	25 07:40 (CH06)	19:32	18:43	17:06	16:59	31 09:06 (CH08)		
18	06:09	06:37	07:08	07:39	07:14	07:14	07:43	08:36 (CH08)		
	20:54	20:20	26 07:40 (CH06)	19:31	18:42	17:06	16:59	31 09:07 (CH08)		
19	06:09	06:38	07:09	07:40	07:16	07:16	07:44	08:36 (CH08)		
	20:53	20:19	27 07:41 (CH06)	19:29	18:40	17:05	17:00	31 09:07 (CH08)		
20	06:10	06:39	07:10	07:41	07:17	07:17	07:45	08:37 (CH08)		
	20:52	20:17	27 07:41 (CH06)	19:27	18:39	17:04	17:00	31 09:08 (CH08)		
21	06:11	06:40	07:11	07:42	07:18	07:18	07:45	08:37 (CH08)		
	20:52	20:16	27 07:40 (CH06)	19:26	18:38	17:04	3 08:42 (CH08)	17:01	31 09:08 (CH08)	
22	06:12	06:41	07:12	07:43	07:19	07:19	07:46	08:38 (CH08)		
	20:51	20:14	27 07:40 (CH06)	19:24	18:36	17:03	11 08:46 (CH08)	17:01	31 09:09 (CH08)	
23	06:13	06:42	07:13	07:44	07:20	07:20	07:46	08:38 (CH08)		
	20:50	20:13	27 07:39 (CH06)	19:22	18:35	17:02	14 08:48 (CH08)	17:02	31 09:09 (CH08)	
24	06:14	06:43	07:14	07:45	07:21	07:21	07:47	08:39 (CH08)		
	20:49	20:11	25 07:38 (CH06)	19:21	18:33	17:02	18 08:50 (CH08)	17:02	31 09:10 (CH08)	
25	06:14	06:44	07:15	07:46	07:22	07:22	07:47	08:39 (CH08)		
	20:48	20:10	24 07:37 (CH06)	19:19	13 08:29 (CH07)	17:32	17:01	20 08:52 (CH08)	17:03	31 09:10 (CH08)
26	06:15	06:45	07:16	07:47	07:23	07:23	07:47	08:39 (CH08)		
	20:47	20:08	22 07:36 (CH06)	19:17	18 08:31 (CH07)	17:31	17:01	21 08:53 (CH08)	17:03	31 09:10 (CH08)
27	06:16	06:46	07:17	07:48	07:24	07:24	07:48	08:40 (CH08)		
	20:47	20:07	20 07:35 (CH06)	19:16	22 08:33 (CH07)	17:29	17:00	23 08:54 (CH08)	17:04	31 09:11 (CH08)
28	06:17	06:47	07:18	07:49	07:25	07:25	07:48	08:41 (CH08)		
	20:46	20:05	17 07:33 (CH06)	19:14	25 08:34 (CH07)	17:28	17:00	24 08:55 (CH08)	17:05	30 09:11 (CH08)
29	06:18	06:48	07:19	07:50	07:26	07:26	07:48	08:41 (CH08)		
	20:45	20:04	12 07:30 (CH06)	19:12	27 08:35 (CH07)	17:27	17:00	26 08:56 (CH08)	17:05	31 09:12 (CH08)
30	06:19	06:49	07:20	07:51	07:27	07:27	07:49	08:41 (CH08)		
	20:44	20:02	3 07:25 (CH06)	19:11	28 08:35 (CH07)	17:25	16:59	27 08:57 (CH08)	17:06	31 09:12 (CH08)
31	06:20	06:50		07:52	07:28	07:28	07:49	08:41 (CH08)		
	20:43	20:01		17:24	06:53		17:07	31 09:12 (CH08)		
Potential sun hours	458	427	375	346	299	187	289	942		
Total, worst case		428	133	382		187				

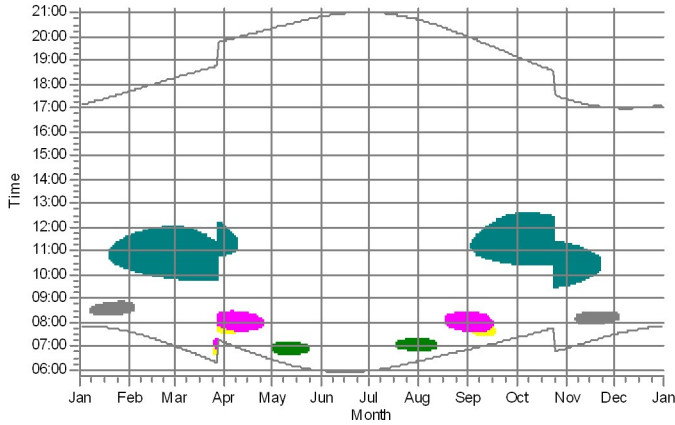
Table layout: For each day in each month the following matrix apply

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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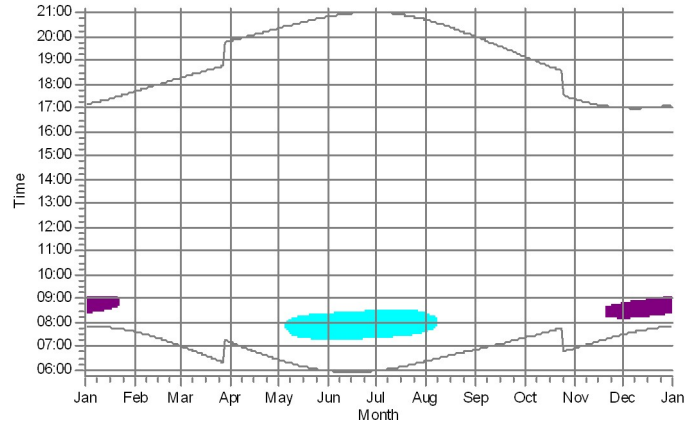
SHADOW - Calendar, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13

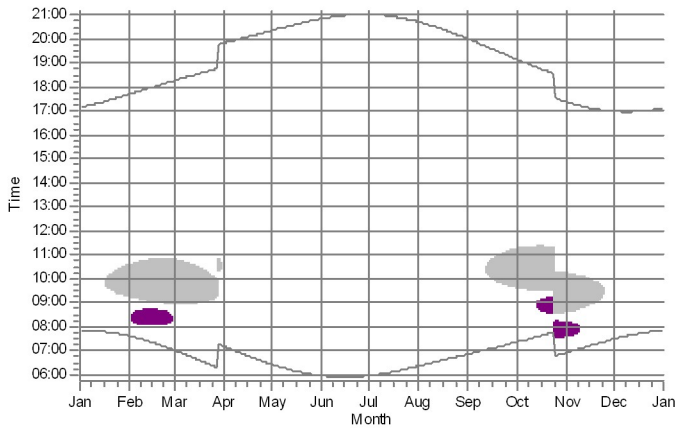
BP01: Nuraghe Conca de fossu



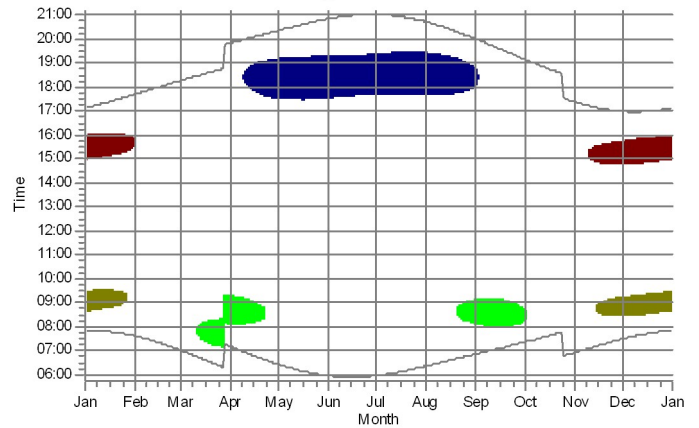
BP02: NURAGHE MANDRAS



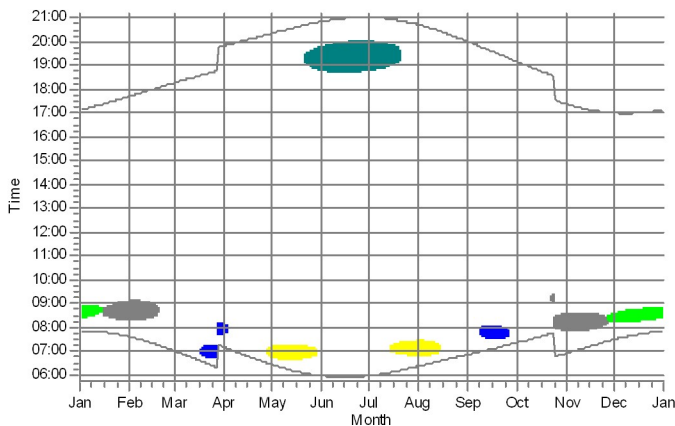
BP03: NURAGHE CORVUS MIGOSOS



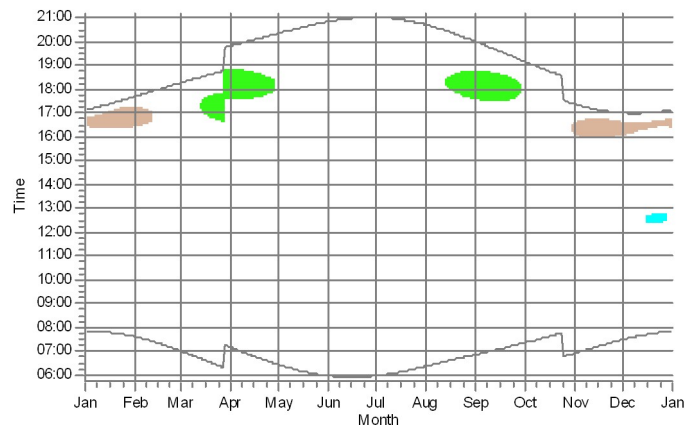
BP04: Nuraghe Paule Udas



BP05: NURAGHE



BP06: NURAGHE TRUVINE



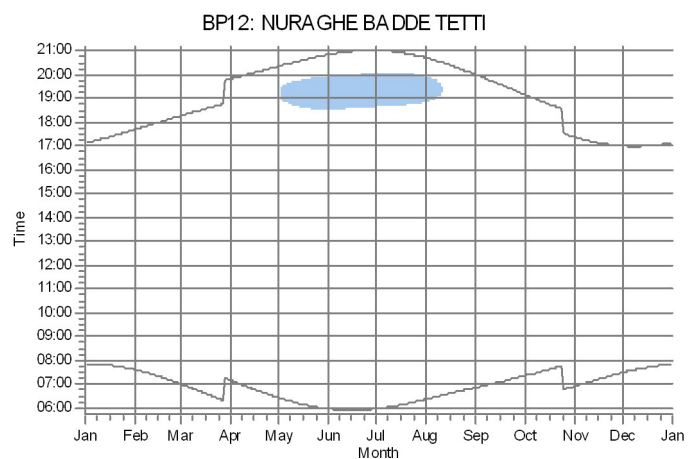
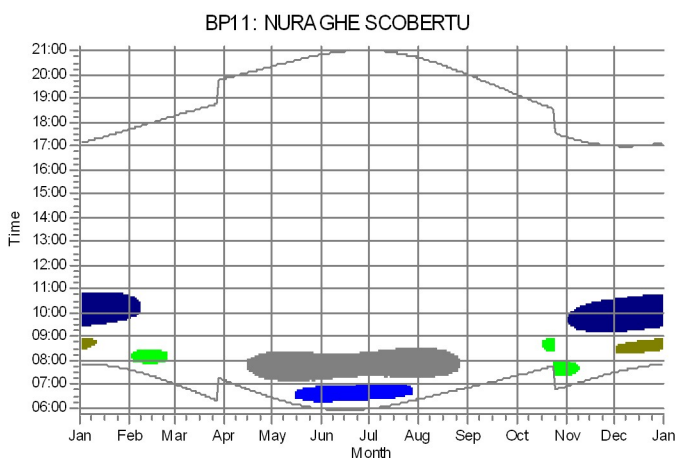
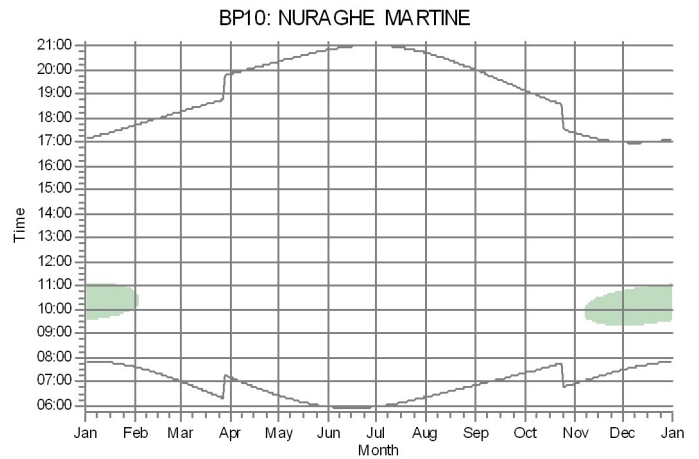
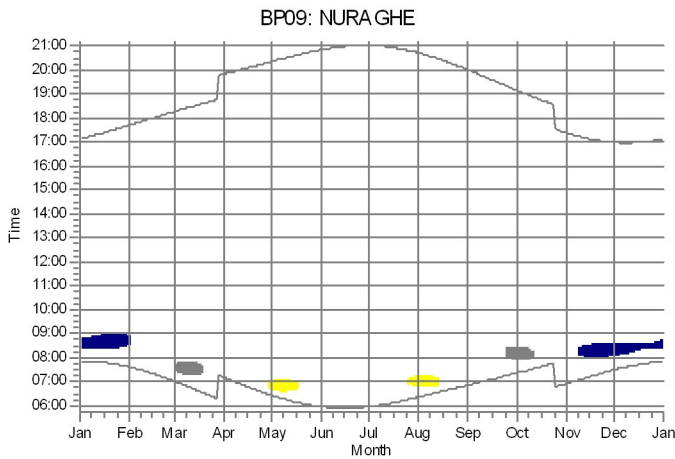
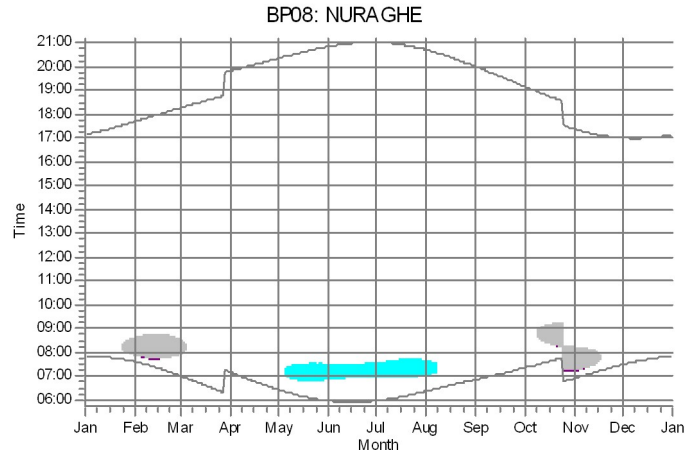
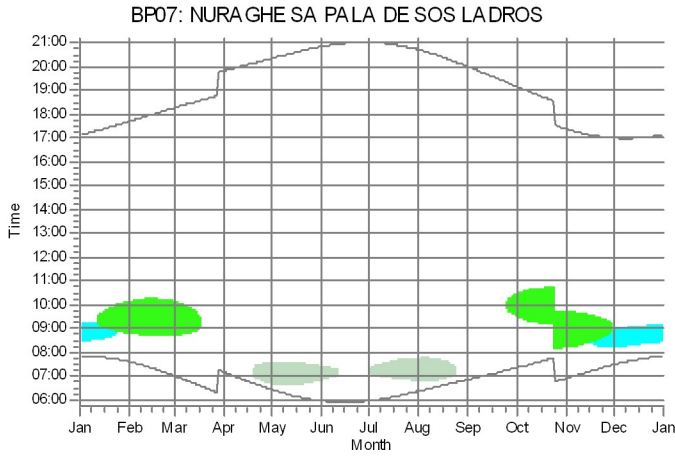
WTGs

- CH03: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (2)
- CH04: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (3)
- CH05: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (4)
- CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (5)
- CH02: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (6)
- CH01: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (7)
- CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (8)
- CH08: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (9)

- CH09: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (10)
- CH10: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (11)
- CH18: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (12)
- CH17: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (13)
- CH16: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (14)
- CH13: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (18)
- CH15: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (19)

SHADOW - Calendar, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13



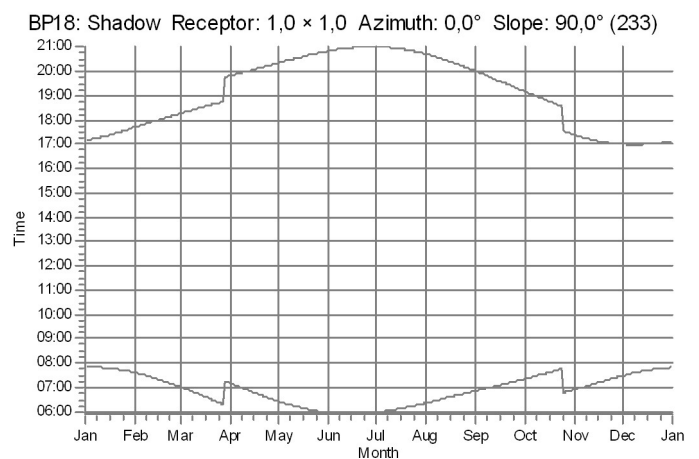
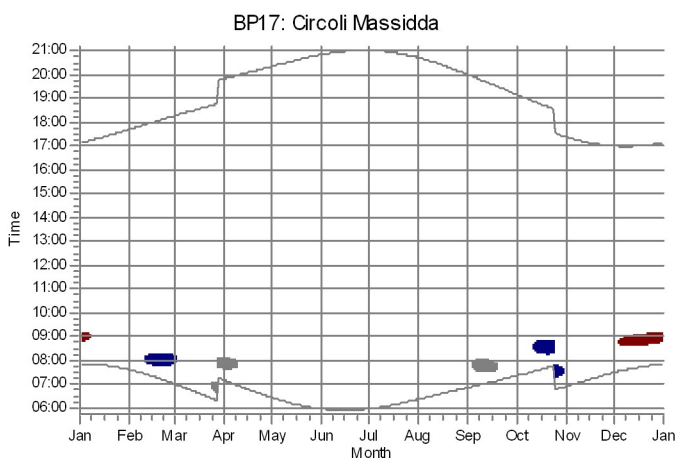
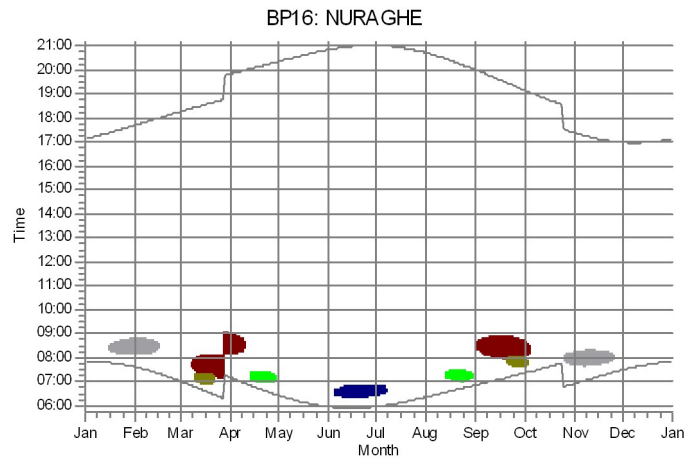
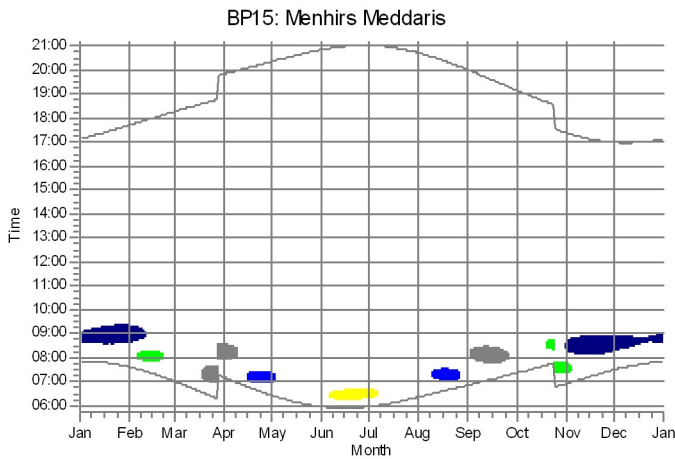
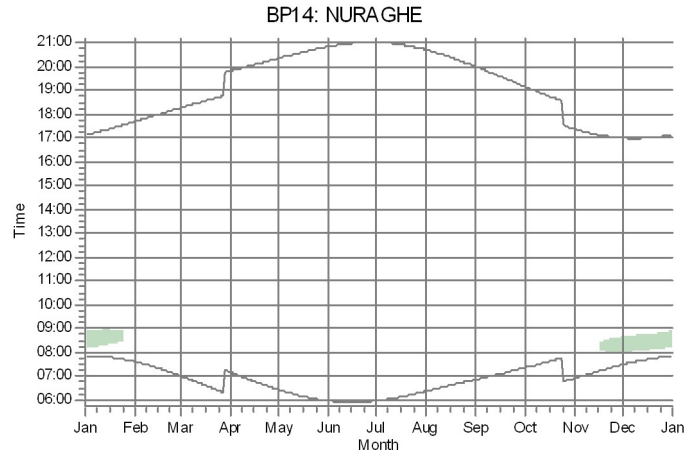
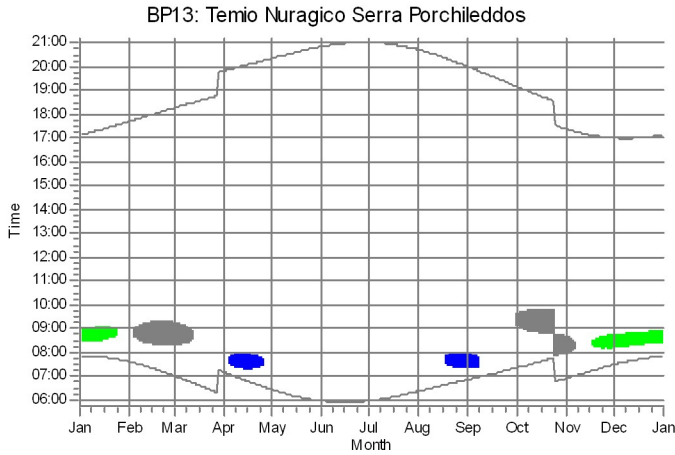
WTGs

	CH04: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (3)
	CH05: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (4)
	CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (5)
	CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (8)
	CH09: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (10)
	CH10: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (11)

	CH18: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (12)
	CH17: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (13)
	CH16: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (14)
	CH14: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (15)
	CH12: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (16)
	CH15: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (19)

SHADOW - Calendar, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13



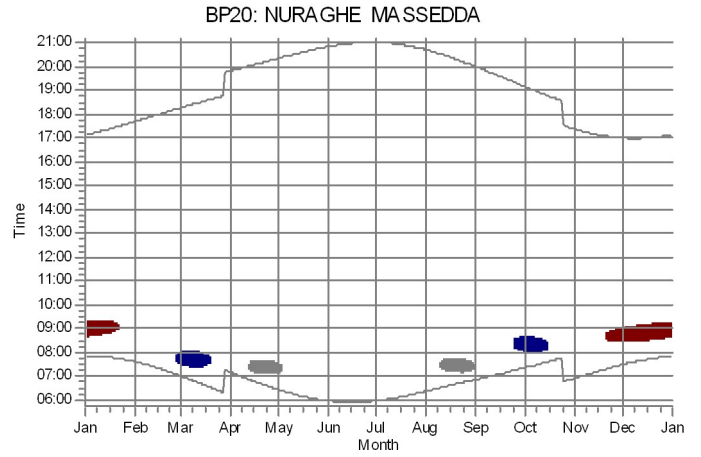
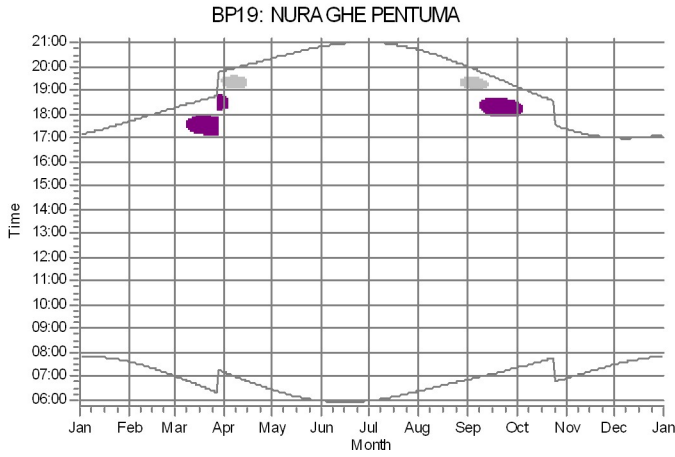
WTGs

- CH04: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (3)
- CH05: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (4)
- CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (5)
- CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (8)
- CH08: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (9)




- CH09: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (10)
- CH10: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (11)
- CH14: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (15)
- CH11: Siemens Gamesa SG 6.6-170!! 6600 170.0 IOI hub: 165,0 m (TOT: 250,0 m) (17)



SHADOW - Calendar, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13



WTGs

	CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 IO! hub: 165,0 m (TOT: 250,0 m) (5)
	CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 IO! hub: 165,0 m (TOT: 250,0 m) (8)
	CH08: Siemens Gamesa SG 6.6-170!! 6600 170.0 IO! hub: 165,0 m (TOT: 250,0 m) (9)

	CH18: Siemens Gamesa SG 6.6-170!! 6600 170.0 IO! hub: 165,0 m (TOT: 250,0 m) (12)
	CH17: Siemens Gamesa SG 6.6-170!! 6600 170.0 IO! hub: 165,0 m (TOT: 250,0 m) (13)

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_beni_2021_12_13WTG: CH01 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (7)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 17:08	07:36 10:15-11:34/79 17:42	07:01 09:53-11:57/124 18:15	07:10 10:53-11:59/66 19:49	06:25 20:20	05:57 18:52-19:43/51 20:49
2	07:49 17:09	07:35 10:14-11:35/81 17:43	06:59 09:52-11:57/125 18:17	07:09 10:54-11:55/61 19:50	06:24 20:21	05:56 18:51-19:45/54 20:50
3	07:49 17:10	07:34 10:13-11:37/84 17:44	06:58 09:51-11:56/125 18:18	07:07 10:56-11:52/56 19:51	06:23 20:22	05:56 18:50-19:45/55 20:51
4	07:49 17:11	07:33 10:12-11:39/87 17:46	06:56 09:51-11:57/126 18:19	07:06 10:57-11:47/50 19:52	06:21 20:23	05:55 18:50-19:47/57 20:52
5	07:49 17:11	07:32 10:11-11:40/89 17:47	06:55 09:50-11:56/126 18:20	07:04 10:58-11:43/45 19:53	06:20 20:24	05:55 18:49-19:48/59 20:52
6	07:49 17:12	07:31 10:10-11:42/92 17:48	06:53 09:50-11:56/126 18:21	07:02 11:00-11:39/39 19:54	06:19 20:25	05:55 18:48-19:48/60 20:53
7	07:49 17:13	07:30 10:09-11:43/94 17:49	06:51 09:50-11:55/125 18:22	07:01 11:02-11:34/32 19:55	06:18 20:27	05:55 18:48-19:49/61 20:54
8	07:49 17:14	07:29 10:07-11:44/97 17:50	06:50 09:50-11:55/125 18:23	06:59 11:05-11:28/23 19:56	06:17 20:28	05:54 18:48-19:50/62 20:54
9	07:49 17:15	07:28 10:06-11:45/99 17:52	06:48 09:49-11:54/125 18:24	06:57 11:12-11:19/7 19:57	06:15 20:29	05:54 18:48-19:51/63 20:55
10	07:49 17:16	07:27 10:05-11:46/101 17:53	06:47 09:49-11:53/124 18:26	06:56 19:58	06:14 20:30	05:54 18:48-19:52/64 20:55
11	07:49 17:17	07:25 10:05-11:48/103 17:54	06:45 09:49-11:52/123 18:27	06:54 19:59	06:13 20:31	05:54 18:47-19:52/65 20:56
12	07:49 17:18	07:24 10:04-11:49/105 17:55	06:43 09:49-11:51/122 18:28	06:53 20:00	06:12 20:32	05:54 18:46-19:52/66 20:56
13	07:48 17:19	07:23 10:02-11:49/107 17:57	06:42 09:48-11:49/121 18:29	06:51 20:02	06:11 20:33	05:54 18:46-19:53/67 20:57
14	07:48 17:21	07:22 10:02-11:51/109 17:58	06:40 09:49-11:49/120 18:30	06:50 20:03	06:10 20:34	05:53 18:46-19:53/67 20:57
15	07:48 17:22	07:20 10:01-11:52/111 17:59	06:39 09:48-11:47/119 18:31	06:48 20:04	06:09 20:35	05:53 18:46-19:53/67 20:58
16	07:47 17:23	07:19 10:00-11:52/112 18:00	06:37 09:48-11:45/117 18:32	06:47 20:05	06:08 20:35	05:53 18:47-19:55/68 20:58
17	07:47 17:24	07:18 09:59-11:53/114 18:01	06:35 09:48-11:44/116 18:33	06:45 20:06	06:07 20:36	05:53 18:47-19:55/68 20:58
18	07:46 17:25	07:16 09:59-11:54/115 18:03	06:34 09:48-11:41/113 18:34	06:43 20:07	06:06 20:37	05:54 18:47-19:55/68 20:59
19	07:46 17:26	07:15 09:58-11:54/116 18:04	06:32 09:48-11:39/111 18:35	06:42 20:08	06:05 20:38	05:54 18:47-19:56/69 20:59
20	07:45 10:41-11:02/21 17:27	07:14 09:57-11:55/118 18:05	06:30 09:48-11:37/109 18:36	06:40 20:09	06:05 20:39	05:54 18:47-19:56/69 20:59
21	07:45 10:37-11:06/29 17:29	07:12 09:56-11:55/119 18:06	06:29 09:48-11:34/106 18:37	06:39 20:10	06:04 20:40	05:54 18:47-19:56/69 21:00
22	07:44 10:34-11:11/37 17:30	07:11 09:56-11:56/120 18:07	06:27 09:48-11:31/103 18:38	06:38 20:11	06:03 20:41	05:54 18:47-19:56/69 21:00
23	07:43 10:31-11:14/43 17:31	07:10 09:56-11:57/121 18:09	06:25 09:49-11:29/100 18:40	06:36 20:12	06:02 19:11-19:23/12 20:42	05:54 18:48-19:57/69 21:00
24	07:43 10:29-11:16/47 17:32	07:08 09:55-11:56/121 18:10	06:24 09:49-11:26/97 18:41	06:35 20:13	06:01 19:05-19:27/22 20:43	05:55 18:48-19:56/68 21:00
25	07:42 10:26-11:19/53 17:33	07:07 09:55-11:57/122 18:11	06:22 09:49-11:23/94 18:42	06:33 20:14	06:01 19:03-19:31/28 20:44	05:55 18:48-19:56/68 21:00
26	07:41 10:25-11:22/57 17:34	07:05 09:54-11:57/123 18:12	06:20 09:50-11:20/90 18:43	06:32 20:15	06:00 19:00-19:34/34 20:45	05:55 18:49-19:57/68 21:00
27	07:40 10:23-11:24/61 17:36	07:04 09:54-11:57/123 18:13	06:19 09:50-11:17/87 18:44	06:31 20:16	05:59 18:58-19:35/37 20:45	05:56 18:49-19:57/68 21:00
28	07:40 10:22-11:26/64 17:37	07:02 09:53-11:57/124 18:14	06:17 09:50-11:13/83 18:45	06:29 20:17	05:59 18:57-19:38/41 20:46	05:56 18:49-19:56/67 21:00
29	07:39 10:20-11:28/68 17:38		07:15 10:51-12:10/79 19:46	06:28 20:18	05:58 18:55-19:39/44 20:47	05:56 18:50-19:57/67 21:00
30	07:38 10:18-11:30/72 17:39		07:14 10:52-12:06/74 19:47	06:26 20:19	05:58 18:54-19:41/47 20:48	05:57 18:50-19:56/66 21:00
31	07:37 10:17-11:32/75 17:41		07:12 10:52-12:02/70 19:48		05:57 18:52-19:42/50 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	627	2986	3405	379	315	1939

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: Shadow_cumulativo_beni_2021_12_13WTG: CH01 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (7)

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:57 18:51-19:57/66 21:00	06:21 20:42	06:51 19:59	07:21 10:28-12:30/122 19:09	06:54 09:35-11:16/101 17:23	07:29 16:59
2	05:58 18:52-19:56/64 21:00	06:22 20:41	06:52 19:57	07:22 10:28-12:31/123 19:07	06:56 09:36-11:15/99 17:22	07:30 16:59
3	05:58 18:53-19:56/63 21:00	06:23 20:39	06:53 11:10-11:17/7 19:56	07:23 10:27-12:31/124 19:06	06:57 09:37-11:13/96 17:20	07:31 16:58
4	05:59 18:53-19:55/62 21:00	06:24 20:38	06:54 11:03-11:26/23 19:54	07:24 10:27-12:31/124 19:04	06:58 09:39-11:13/94 17:19	07:32 16:58
5	05:59 18:54-19:55/61 21:00	06:25 20:37	06:55 10:59-11:31/32 19:52	07:25 10:27-12:31/124 19:02	06:59 09:40-11:11/91 17:18	07:33 16:58
6	06:00 18:54-19:54/60 20:59	06:26 20:36	06:56 10:56-11:35/39 19:51	07:26 10:26-12:32/126 19:01	07:00 09:41-11:10/89 17:17	07:34 16:58
7	06:01 18:55-19:54/59 20:59	06:27 20:35	06:57 10:53-11:38/45 19:49	07:27 10:26-12:32/126 18:59	07:01 09:42-11:08/86 17:16	07:35 16:58
8	06:01 18:57-19:54/57 20:59	06:28 20:34	06:58 10:51-11:41/50 19:48	07:28 10:26-12:31/125 18:57	07:03 09:44-11:08/84 17:15	07:36 16:58
9	06:02 18:57-19:53/56 20:58	06:29 20:32	06:59 10:49-11:45/56 19:46	07:29 10:26-12:31/125 18:56	07:04 09:45-11:06/81 17:14	07:37 16:58
10	06:03 18:58-19:53/55 20:58	06:30 20:31	07:00 10:47-11:48/61 19:44	07:30 10:25-12:31/126 18:54	07:05 09:46-11:04/78 17:13	07:37 16:58
11	06:03 19:00-19:52/52 20:58	06:31 20:30	07:01 10:46-11:51/65 19:43	07:31 10:25-12:31/126 18:53	07:06 09:48-11:03/75 17:12	07:38 16:58
12	06:04 19:00-19:51/51 20:57	06:32 20:28	07:02 10:44-11:54/70 19:41	07:32 10:25-12:30/125 18:51	07:07 09:50-11:02/72 17:11	07:39 16:58
13	06:05 19:02-19:50/48 20:57	06:33 20:27	07:03 10:43-11:57/74 19:39	07:33 10:25-12:30/125 18:50	07:08 09:52-11:00/68 17:10	07:40 16:58
14	06:05 19:03-19:49/46 20:56	06:34 20:26	07:04 10:42-12:00/78 19:38	07:34 10:25-12:29/124 18:48	07:10 09:54-10:58/64 17:09	07:41 16:58
15	06:06 19:04-19:47/43 20:56	06:35 20:24	07:05 10:40-12:03/83 19:36	07:35 10:26-12:30/124 18:46	07:11 09:55-10:56/61 17:08	07:41 16:58
16	06:07 19:06-19:46/40 20:55	06:35 20:23	07:06 10:39-12:05/86 19:34	07:36 10:26-12:29/123 18:45	07:12 09:58-10:55/57 17:07	07:42 16:59
17	06:08 19:08-19:44/36 20:54	06:36 20:22	07:07 10:38-12:08/90 19:32	07:37 10:26-12:28/122 18:43	07:13 10:00-10:53/53 17:06	07:43 16:59
18	06:08 19:11-19:42/31 20:54	06:37 20:20	07:08 10:37-12:10/93 19:31	07:39 10:26-12:28/122 18:42	07:14 10:03-10:50/47 17:06	07:43 16:59
19	06:09 19:14-19:40/26 20:53	06:38 20:19	07:09 10:36-12:13/97 19:29	07:40 10:27-12:27/120 18:40	07:16 10:05-10:48/43 17:05	07:44 17:00
20	06:10 19:17-19:35/18 20:52	06:39 20:17	07:10 10:35-12:15/100 19:27	07:41 10:27-12:26/119 18:39	07:17 10:09-10:46/37 17:04	07:45 17:00
21	06:11 20:52	06:40 20:16	07:11 10:35-12:17/102 19:26	07:42 10:27-12:25/118 18:38	07:18 10:13-10:42/29 17:04	07:45 17:01
22	06:12 20:51	06:41 20:14	07:12 10:34-12:19/105 19:24	07:43 10:28-12:25/117 18:36	07:19 10:17-10:38/21 17:03	07:46 17:01
23	06:13 20:50	06:42 20:13	07:13 10:33-12:21/108 19:22	07:44 10:29-12:24/115 18:35	07:20 17:02	07:46 17:02
24	06:14 20:49	06:43 20:11	07:14 10:32-12:23/111 19:21	07:45 10:29-12:23/114 18:33	07:21 17:02	07:47 17:02
25	06:14 20:48	06:44 20:10	07:15 10:31-12:24/113 19:19	06:46 09:29-11:22/113 17:32	07:22 17:01	07:47 17:03
26	06:15 20:47	06:45 20:08	07:16 10:31-12:26/115 19:17	06:47 09:30-11:21/111 17:31	07:23 17:01	07:47 17:03
27	06:16 20:47	06:46 20:07	07:17 10:30-12:27/117 19:16	06:49 09:31-11:21/110 17:29	07:25 17:00	07:48 17:04
28	06:17 20:46	06:47 20:05	07:18 10:30-12:28/118 19:14	06:50 09:32-11:20/108 17:28	07:26 17:00	07:48 17:05
29	06:18 20:45	06:48 20:04	07:19 10:29-12:29/120 19:12	06:51 09:32-11:19/107 17:27	07:27 16:59	07:48 17:05
30	06:19 20:44	06:49 20:02	07:20 10:29-12:29/120 19:11	06:52 09:33-11:18/105 17:25	07:28 16:59	07:49 17:06
31	06:20 20:43	06:50 20:01		06:53 09:35-11:17/102 17:24		07:49 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	994	0	2278	3695	1526	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:

Impianto_WPD_Chiaramonti

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:

13/12/2021 10:15/3.4.415

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_beni_2021_12_13WTG: CH02 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (6)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 07:49-08:22/33 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:42	06:51 07:40-08:23/43 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 07:47-08:23/36 19:50	06:24 20:21	05:56 20:50	05:58 21:00	06:22 20:40	06:52 07:40-08:23/43 19:57	07:22 19:07	06:56 17:22	07:30 16:59
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 07:47-08:24/37 19:51	06:23 20:22	05:56 20:51	05:58 21:00	06:23 20:39	06:53 07:40-08:22/42 19:56	07:23 19:06	06:57 17:20	07:31 16:58
4	07:49 17:10	07:33 17:46	06:56 18:19	07:05 07:45-08:24/39 19:52	06:21 20:23	05:55 20:52	05:59 21:00	06:24 20:38	06:54 07:39-08:22/43 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 07:44-08:24/40 19:53	06:20 20:24	05:55 20:52	05:59 21:00	06:25 20:37	06:55 07:39-08:22/43 19:52	07:25 19:02	06:59 17:18	07:33 16:58
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 07:43-08:25/42 19:54	06:19 20:25	05:55 20:53	06:00 20:59	06:26 20:36	06:56 07:40-08:21/41 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 07:42-08:24/42 19:55	06:18 20:26	05:54 20:53	06:01 20:59	06:27 20:35	06:57 07:39-08:19/40 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 07:41-08:24/43 19:56	06:17 20:27	05:54 20:54	06:01 20:59	06:28 20:34	06:58 07:39-08:18/39 19:48	07:28 18:57	07:03 17:15	07:36 16:58
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 07:42-08:24/42 19:57	06:15 20:29	05:54 20:55	06:02 20:58	06:29 20:32	06:59 07:40-08:17/37 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:16	07:27 17:53	06:47 18:26	06:56 07:41-08:24/43 19:58	06:14 20:30	05:54 20:55	06:02 20:58	06:30 20:31	07:00 07:40-08:16/36 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 07:41-08:24/43 19:59	06:13 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 07:41-08:15/34 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 07:40-08:23/43 20:00	06:12 20:32	05:54 20:56	06:04 20:57	06:32 20:28	07:02 07:42-08:13/31 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 07:41-08:23/42 20:01	06:11 20:33	05:53 20:57	06:05 20:57	06:33 20:27	07:03 07:44-08:11/27 19:39	07:33 18:50	07:08 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 07:41-08:22/41 20:03	06:10 20:34	05:53 20:57	06:05 20:56	06:33 20:26	07:04 07:45-08-09/24 19:37	07:34 18:48	07:10 17:09	07:41 16:58
15	07:48 17:22	07:20 17:59	06:38 18:31	06:48 07:41-08:21/40 20:04	06:09 20:34	05:53 20:58	06:06 20:56	06:34 20:24	07:05 07:48-08-05/17 19:36	07:35 18:46	07:11 17:08	07:41 16:58
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 07:41-08-20/39 20:05	06:08 20:35	05:53 20:58	06:07 20:55	06:35 20:23	07:06 07:53-08-00/7 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 07:42-08-19/37 20:06	06:07 20:36	05:53 20:58	06:08 20:54	06:36 20:22	07:07 19:32	07:37 18:43	07:13 17:06	07:43 16:59
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 07:42-08-18/36 20:07	06:06 20:37	05:54 20:59	06:08 20:54	06:37 08:00-08-10/10 20:20	07:08 19:31	07:38 18:42	07:14 17:06	07:43 16:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 07:43-08-17/34 20:08	06:05 20:38	05:54 20:59	06:09 20:53	06:38 07:56-08-13/17 20:19	07:09 19:29	07:40 18:40	07:15 17:05	07:44 17:00
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 07:44-08-15/31 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:39 07:53-08-16/23 20:17	07:10 19:27	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:28	07:12 18:06	06:29 18:37	06:39 07:45-08-14/29 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:40 07:51-08-17/26 20:16	07:11 19:26	07:42 18:37	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:07	06:27 18:38	06:38 07:46-08-11/25 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:41 07:50-08-19/29 20:14	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:43 17:31	07:09 18:08	06:25 18:39	06:36 07:48-08-09/21 20:12	06:02 20:42	05:54 21:00	06:13 20:50	06:42 07:47-08-19/32 20:13	07:13 19:22	07:44 18:35	07:20 17:02	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 07:51-08-07/16 20:13	06:01 20:43	05:55 21:00	06:14 20:49	06:43 07:46-08-20/34 20:11	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 07:54-08-02/8 20:14	06:01 20:44	05:55 21:00	06:14 20:48	06:44 07:45-08-21/36 20:10	07:15 19:19	07:46 17:32	07:22 17:01	07:47 17:03
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:00 20:45	05:55 21:00	06:15 20:47	06:45 07:44-08-21/37 20:08	07:16 19:17	07:47 17:30	07:23 17:01	07:47 17:03
27	07:40 17:36	07:04 18:13	06:19 18:44	07:06-07-08/2 06:30	06:00 20:16	05:59 20:45	06:16 21:00	06:46 07:43-08-22/39 20:07	07:17 19:16	07:48 17:29	07:25 17:00	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:58-07-15/17 06:29	06:00 20:17	05:59 20:46	06:17 21:00	06:47 07:42-08-22/40 20:05	07:18 19:14	07:49 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38	07:01 18:16	06:15 19:46	07:55-08-18/23 06:28	06:00 20:18	05:58 20:47	06:18 21:00	06:48 07:41-08-23/42 20:04	07:19 19:12	07:50 17:27	07:27 16:59	07:48 17:05
30	07:38 17:39	07:00 18:17	06:14 19:47	07:53-08-20/27 06:26	06:00 20:19	05:58 20:48	06:19 21:00	06:49 07:41-08-23/42 20:02	07:20 19:11	07:51 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41	07:00 18:18	06:12 19:48	07:50-08-21/31 06:25	06:00 20:19	05:57 20:49	06:20 20:43	06:50 07:40-08-23/43 20:01	07:21 19:10	07:52 17:24	07:29 17:07	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	100	882	0	0	0	450	547	0	0	0

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

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

Project:

Impianto_WPD_Chiaramonti

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:

13/12/2021 10:15/3.4.415

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_beni_2021_12_13WTG: CH03 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (2)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:42	06:52-07:16/24 19:59	06:51 19:09	07:21 19:09	06:54 17:23	07:29 16:59
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	06:49-06:59/10 20:50	05:56 21:00	06:22 20:40	06:52-07:16/24 19:57	06:52 19:07	07:22 19:07	06:55 17:21	07:30 16:58
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	06:47-07:01/14 20:51	05:56 21:00	06:23 20:39	06:52-07:16/24 19:56	06:53 19:06	07:23 19:06	06:57 17:20	07:31 16:58
4	07:49 17:10	07:33 17:45	06:56 18:19	07:05 19:52	06:21 20:23	06:45-07:03/18 20:52	05:55 21:00	06:24 20:38	06:52-07:16/24 19:54	06:54 19:04	07:24 19:04	06:58 17:19	07:32 16:58
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 19:53	06:20 20:24	06:44-07:04/20 20:52	05:55 21:00	06:25 20:37	06:52-07:15/23 19:52	06:55 19:02	07:25 19:02	06:59 17:18	07:33 16:58
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 19:54	06:19 20:25	06:43-07:04/21 20:53	05:55 20:59	06:26 20:36	06:52-07:14/22 19:51	06:56 19:01	07:26 19:01	07:00 17:17	07:34 16:58
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 19:55	06:18 20:26	06:42-07:04/22 20:53	05:54 20:59	06:27 20:35	06:53-07:13/20 19:49	06:57 18:59	07:27 18:59	07:01 17:16	07:35 16:58
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 19:56	06:17 20:27	06:42-07:05/23 20:54	05:54 20:59	06:28 20:34	06:53-07:12/19 19:47	06:58 18:57	07:28 18:57	07:03 17:15	07:36 16:58
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	06:15 20:28	06:41-07:05/24 20:55	05:54 20:58	06:29 20:32	06:54-07:11/17 19:46	06:59 18:56	07:29 18:56	07:04 17:14	07:36 16:58
10	07:49 17:16	07:27 17:53	06:47 18:25	06:56 19:58	06:14 20:30	06:41-07:05/24 20:55	05:54 20:58	06:30 20:31	06:56-07:10/14 19:44	07:00 18:54	07:30 18:54	07:05 17:13	07:37 16:58
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	06:13 20:31	06:41-07:05/24 20:56	05:54 20:58	06:31 20:30	06:58-07:07/9 19:42	07:01 18:53	07:31 18:53	07:06 17:12	07:38 16:58
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 20:00	06:12 20:32	06:41-07:05/24 20:56	05:54 20:57	06:31 20:28	07:02 19:41	07:02 18:51	07:32 18:51	07:07 17:11	07:39 16:58
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:01	06:11 20:32	06:41-07:05/24 20:57	05:53 20:57	06:32 20:27	07:03 19:39	07:03 18:49	07:33 18:49	07:08 17:10	07:40 16:58
14	07:48 17:20	07:22 17:58	06:40 18:30	06:50 20:02	06:10 20:33	06:41-07:05/24 20:57	05:53 20:56	06:33 20:26	07:04 19:37	07:04 18:48	07:34 18:48	07:10 17:09	07:41 16:58
15	07:48 17:22	07:20 17:59	06:38 18:31	06:48 20:04	06:09 20:34	06:41-07:05/24 20:58	05:53 20:56	06:34 20:24	07:05 19:36	07:05 18:46	07:35 18:46	07:11 17:08	07:41 16:58
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 20:05	06:08 20:35	06:42-07:04/22 20:58	05:53 20:55	06:35 20:23	07:06 19:34	07:06 18:45	07:36 18:45	07:12 17:07	07:42 16:59
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	06:07 20:36	06:42-07:04/22 20:58	05:53 20:54	06:36 20:22	07:07 19:32	07:07 18:43	07:37 18:43	07:13 17:06	07:43 16:59
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	06:06 20:37	06:43-07:04/21 20:59	05:53 20:54	06:37 20:20	07:08 19:31	07:08 18:42	07:38 18:42	07:14 17:06	07:43 16:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:05 20:38	06:44-07:03/19 20:59	05:54 20:53	06:38 20:19	07:09 19:29	07:09 18:40	07:40 18:40	07:15 17:05	07:44 17:00
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 20:09	06:05 20:39	06:44-07:02/18 20:59	05:54 20:52	06:39 20:17	07:10 19:27	07:10 18:39	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:28	07:12 18:06	06:29 18:37	06:39 20:10	06:04 20:40	06:45-07:01/16 21:00	05:54 20:52	06:40 20:16	07:11 19:26	07:11 18:37	07:42 18:37	07:18 17:03	07:45 17:01
22	07:44 17:30	07:11 18:07	06:27 18:38	06:37 20:11	06:03 20:41	06:47-07:01/14 21:00	05:54 20:51	06:41 20:14	07:12 19:24	07:12 18:36	07:43 18:36	07:19 17:03	07:46 17:01
23	07:43 17:31	07:09 18:08	06:25 18:39	06:36 20:12	06:02 20:42	06:48-06:59/11 21:00	05:54 20:50	06:42 20:13	07:13 19:22	07:13 18:35	07:44 18:35	07:20 17:02	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:01 20:43	06:50-06:57/7 21:00	05:55 20:49	06:43 20:11	07:14 19:21	07:14 18:33	07:45 18:33	07:21 17:02	07:47 17:02
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 20:44	06:54-07:14/20 21:00	05:55 20:48	06:44 20:10	07:15 19:19	07:15 17:32	07:46 17:32	07:22 17:01	07:47 17:03
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:00 20:45	06:53-07:14/21 21:00	05:55 20:47	06:45 20:08	07:16 19:17	07:16 17:30	07:47 17:30	07:23 17:01	07:47 17:03
27	07:40 17:36	07:04 18:13	06:19 18:44	06:30 20:16	05:59 20:45	06:52-07:14/22 21:00	05:56 20:47	06:46 20:07	07:17 19:16	07:17 17:29	07:49 17:29	07:25 17:00	07:48 17:04
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 20:46	06:52-07:15/23 21:00	05:56 20:46	06:47 20:05	07:18 19:14	07:18 17:28	07:50 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38	07:01 18:14	06:15 18:46	06:28 20:18	05:58 20:47	06:52-07:15/23 21:00	05:56 20:45	06:48 20:04	07:19 19:12	07:19 17:26	07:51 17:26	07:27 16:59	07:48 17:05
30	07:38 17:39	07:00 18:14	06:14 18:47	06:26 20:19	05:58 20:48	06:52-07:16/24 21:00	05:57 20:44	06:49 20:02	07:20 19:11	07:20 17:25	07:52 17:25	07:28 16:59	07:49 17:06
31	07:37 17:41	07:00 18:14	06:13 18:48	06:25 20:19	05:57 20:49	06:52-07:16/24 21:00	05:56 20:43	06:49 20:01	07:21 19:11	07:21 17:24	07:53 17:24	07:29 17:07	07:49 17:07
Potential sun hours	298	298	370	398	447	446	451	427	375	346	299	289	0
Sum of minutes with flicker	0	0	0	0	0	446	0	233	220	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: Shadow_cumulativo_beni_2021_12_13WTG: CH04 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (3)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	07:36-07:57/21 19:49	06:25 20:20	06:44-07:06/22 20:49
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	07:35-07:57/22 19:50	06:24 20:21	06:43-07:08/25 20:50
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	07:35-07:57/22 19:51	06:23 20:22	06:42-07:09/27 20:51
4	07:49 17:10	07:33 17:45	06:56 18:19	07:05 19:52	07:35-07:56/21 19:52	06:21 20:23	06:41-07:10/29 20:51
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 19:53	07:35-07:55/20 19:53	06:20 20:24	06:41-07:11/30 20:52
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 19:54	07:36-07:54/18 19:54	06:19 20:25	06:40-07:11/31 20:53
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 19:55	07:36-07:52/16 19:55	06:18 20:26	06:39-07:11/32 20:53
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 19:56	07:37-07:50/13 19:56	06:17 20:27	06:39-07:12/33 20:54
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	07:41-07:47/6 19:57	06:15 20:28	06:39-07:12/33 20:55
10	07:49 17:16	07:27 17:53	06:47 18:25	06:56 19:58	06:56 19:58	06:14 20:29	06:40-07:12/32 20:55
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	06:54 19:59	06:13 20:30	06:40-07:12/32 20:56
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 20:00	06:53 20:00	06:12 20:31	06:40-07:12/32 20:56
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:01	06:51 20:01	06:11 20:32	06:41-07:12/31 20:57
14	07:48 17:20	07:22 17:58	06:40 18:30	06:50 20:02	06:50 20:02	06:10 20:33	06:41-07:12/31 20:57
15	07:47 17:22	07:20 17:59	06:38 18:31	06:48 20:04	06:48 20:04	06:09 20:34	06:41-07:11/30 20:58
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 20:05	06:46 20:05	06:08 20:35	06:42-07:11/29 20:58
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	06:45 20:06	06:07 20:36	06:42-07:10/28 20:58
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	06:43 20:07	06:06 20:37	06:43-07:11/28 20:59
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:42 20:08	06:05 20:38	06:43-07:10/27 20:59
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 20:09	06:40 20:09	06:05 20:39	06:44-07:09/25 20:59
21	07:45 17:28	07:12 18:06	06:29 18:37	06:39 20:10	06:39 20:10	06:04 20:40	06:44-07:09/25 21:00
22	07:44 17:30	07:11 18:07	06:27 18:38	06:37 20:11	06:37 20:11	06:03 20:41	06:46-07:09/23 21:00
23	07:43 17:31	07:09 18:08	06:25 18:39	06:36 20:12	06:36 20:12	06:02 20:42	06:46-07:08/22 21:00
24	07:43 17:32	07:08 18:10	06:24 18:40	06:35 20:13	06:35 20:13	06:01 20:43	06:47-07:07/20 21:00
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:33 20:14	06:01 20:44	06:48-07:06/18 21:00
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:32 20:15	06:00 20:45	06:49-07:05/16 21:00
27	07:40 17:36	07:04 18:13	06:19 18:44	06:30 20:16	06:30 20:16	05:59 20:45	06:50-07:03/13 21:00
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	06:29 20:17	05:59 20:46	06:53-07:02/9 21:00
29	07:39 17:38		07:15 19:46	07:39-07:57/18 20:18	06:28 20:18	06:54-07:02/8 20:47	06:55-06:59/4 21:00
30	07:38 17:39		07:14 19:47	07:37-07:57/20 20:19	06:26 20:19	06:48-07:05/17 20:48	05:58 21:00
31	07:37 17:41		07:12 19:48	07:36-07:57/21 19:48			
Potential sun hours	298	298	370	398	447	451	353
Sum of minutes with flicker	0	0	85	184	737		

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: Shadow_cumulativo_beni_2021_12_13WTG: CH04 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (3)

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:57 06:23-06:36/13 21:00	06:21 06:51-07:23/32 20:42	06:51 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	05:58 06:23-06:35/12 21:00	06:22 06:50-07:23/33 20:40	06:52 19:57	07:22 19:07	06:55 17:21	07:30 16:58
3	05:58 06:24-06:35/11 21:00	06:23 06:50-07:23/33 20:39	06:53 07:39-07:45/6 19:56	07:23 19:06	06:57 17:20	07:31 16:58
4	05:59 06:25-06:34/9 21:00	06:24 06:50-07:22/32 20:38	06:54 07:35-07:48/13 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	05:59 06:27-06:34/7 21:00	06:25 06:50-07:22/32 20:37	06:55 07:33-07:49/16 19:52	07:25 19:02	06:59 17:18	07:33 16:58
6	06:00 06:28-06:32/4 20:59	06:26 06:49-07:21/32 20:36	06:56 07:32-07:50/18 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	06:00 20:59	06:27 06:49-07:20/31 20:35	06:57 07:30-07:50/20 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	06:01 20:59	06:28 06:50-07:20/30 20:33	06:58 07:29-07:50/21 19:47	07:28 18:57	07:03 17:15	07:36 16:58
9	06:02 20:58	06:29 06:50-07:19/29 20:32	06:59 07:28-07:50/22 19:46	07:29 18:56	07:04 17:14	07:36 16:58
10	06:02 20:58	06:30 06:51-07:18/27 20:31	07:00 07:28-07:50/22 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	06:03 20:58	06:31 06:52-07:16/24 20:30	07:01 07:28-07:50/22 19:42	07:31 18:53	07:06 17:12	07:38 16:58
12	06:04 20:57	06:31 06:53-07:15/22 20:28	07:02 07:28-07:49/21 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	06:05 20:57	06:32 06:56-07:12/16 20:27	07:03 07:28-07:48/20 19:39	07:33 18:49	07:08 17:10	07:40 16:58
14	06:05 20:56	06:33 07:03-07:08/5 20:26	07:04 07:29-07:47/18 19:37	07:34 18:48	07:10 17:09	07:41 16:58
15	06:06 07:02-07:09/7 20:56	06:34 20:24	07:05 07:30-07:45/15 19:36	07:35 18:46	07:11 17:08	07:41 16:58
16	06:07 07:00-07:12/12 20:55	06:35 20:23	07:06 07:31-07:43/12 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	06:08 06:59-07:14/15 20:54	06:36 20:22	07:07 07:35-07:39/4 19:32	07:37 18:43	07:13 17:06	07:43 16:59
18	06:08 06:58-07:15/17 20:54	06:37 20:20	07:08 19:31	07:38 18:42	07:14 17:06	07:43 16:59
19	06:09 06:58-07:16/18 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:15 17:05	07:44 17:00
20	06:10 06:56-07:17/21 20:52	06:39 20:17	07:10 19:27	07:41 18:39	07:17 17:04	07:45 17:00
21	06:11 06:55-07:18/23 20:52	06:40 20:16	07:11 19:26	07:42 18:37	07:18 17:04	07:45 17:01
22	06:12 06:55-07:19/24 20:51	06:41 20:14	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	06:13 06:54-07:20/26 20:50	06:42 20:13	07:13 19:22	07:44 18:35	07:20 17:02	07:46 17:02
24	06:13 06:54-07:20/26 20:49	06:43 20:11	07:14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	06:14 06:54-07:21/27 20:48	06:44 20:10	07:15 19:19	06:46 17:32	07:22 17:01	07:47 17:03
26	06:15 06:53-07:21/28 20:47	06:45 20:08	07:16 19:17	06:47 17:30	07:23 17:01	07:47 17:03
27	06:16 06:52-07:21/29 20:46	06:46 20:07	07:17 19:16	06:49 17:29	07:24 17:00	07:48 17:04
28	06:17 06:52-07:22/30 20:46	06:47 20:05	07:18 19:14	06:50 17:28	07:26 17:00	07:48 17:05
29	06:18 06:52-07:22/30 20:45	06:48 20:04	07:19 19:12	06:51 17:26	07:27 16:59	07:48 17:05
30	06:19 06:52-07:22/30 20:44	06:49 20:02	07:20 19:11	06:52 17:25	07:28 16:59	07:49 17:06
31	06:20 06:51-07:22/31 20:43	06:50 20:00		06:53 17:24		07:49 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	450	378	250	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: Shadow_cumulativo_beni_2021_12_13WTG: CH05 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (4)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June			
1	07:49 17:08	07:36 17:42	07:01 18:15	07:10 19:49	07:47-08:05/18 19:49	06:25 20:20	07:02-07:15/13 20:49	05:57 20:49	06:19-06:49/30
2	07:49 17:09	07:35 17:43	06:59 18:17	07:09 19:50	07:48-08:03/15 19:50	06:24 20:21	07:04-07:13/9 20:21	05:56 20:50	06:19-06:50/31
3	07:49 17:10	07:34 17:44	06:58 18:18	07:07 19:51	07:51-08:00/9 19:51	06:23 20:22		05:56 20:51	06:19-06:50/31
4	07:49 17:10	07:33 17:45	06:56 18:19	07:05 19:52		06:21 20:23		05:55 20:51	06:19-06:50/31
5	07:49 17:11	07:32 17:47	06:54 18:20	07:04 19:53	07:34-07:46/12 19:53	06:20 20:24		05:55 20:52	06:19-06:51/32
6	07:49 17:12	07:31 17:48	06:53 18:21	07:02 19:54	07:31-07:49/18 19:54	06:19 20:25		05:55 20:53	06:19-06:50/31
7	07:49 17:13	07:30 17:49	06:51 18:22	07:01 19:55	07:29-07:50/21 19:55	06:18 20:26		05:54 20:53	06:19-06:50/31
8	07:49 17:14	07:29 17:50	06:50 18:23	06:59 19:56	07:27-07:51/24 19:56	06:17 20:27		05:54 20:54	06:20-06:51/31
9	07:49 17:15	07:28 17:52	06:48 18:24	06:57 19:57	07:26-07:52/26 19:57	06:15 20:28		05:54 20:55	06:20-06:51/31
10	07:49 17:16	07:26 17:53	06:47 18:25	06:56 19:58	07:24-07:52/28 19:58	06:14 20:29		05:54 20:55	06:20-06:51/31
11	07:49 17:17	07:25 17:54	06:45 18:27	06:54 19:59	07:24-07:53/29 19:59	06:13 20:30		05:54 20:56	06:21-06:52/31
12	07:48 17:18	07:24 17:55	06:43 18:28	06:53 20:00	07:23-07:53/30 20:00	06:12 20:31		05:54 20:56	06:20-06:51/31
13	07:48 17:19	07:23 17:57	06:42 18:29	06:51 20:01	07:23-07:53/30 20:01	06:11 20:32		05:53 20:57	06:20-06:51/31
14	07:48 17:20	07:22 17:58	06:40 18:30	06:50 20:02	07:22-07:52/30 20:02	06:10 20:33		05:53 20:57	06:21-06:51/30
15	07:47 17:22	07:20 17:59	06:38 18:31	06:48 20:04	07:22-07:53/31 20:04	06:09 20:34		05:53 20:58	06:21-06:51/30
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 20:05	07:22-07:52/30 20:05	06:08 20:35	06:30-06:35/5	05:53 20:58	06:22-06:52/30
17	07:47 17:24	07:18 18:01	06:35 18:33	06:45 20:06	07:07-07:17/10 07:22-07:52/30	06:07 20:36	06:27-06:38/11	05:53 20:58	06:22-06:53/31
18	07:46 17:25	07:16 18:03	06:34 18:34	06:43 20:07	07:04-07:19/15 07:22-07:50/28	06:06 20:37	06:27-06:41/14	05:53 20:59	06:22-06:53/31
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	07:03-07:20/17 07:23-07:50/27	06:05 20:38	06:26-06:42/16	05:54 20:59	06:22-06:53/31
20	07:45 17:27	07:14 18:05	06:30 18:36	06:40 20:09	07:01-07:21/20 07:23-07:48/25	06:05 20:39	06:25-06:43/18	05:54 20:59	06:23-06:53/30
21	07:45 17:28	07:12 18:06	06:29 18:37	06:39 20:10	07:01-07:21/20 07:24-07:48/24	06:04 20:40	06:24-06:44/20	05:54 20:59	06:23-06:53/30
22	07:44 17:30	07:11 18:07	06:27 18:38	06:37 20:11	07:00-07:21/21 07:24-07:46/22	06:03 20:41	06:24-06:45/21	05:54 21:00	06:23-06:53/30
23	07:43 17:31	07:09 18:08	06:25 18:39	06:36 20:12	07:00-07:22/22 07:26-07:44/18	06:02 20:42	06:23-06:46/23	05:54 21:00	06:23-06:54/31
24	07:43 17:32	07:08 18:10	06:24 18:40	06:35 20:13	07:00-07:22/22 07:28-07:42/14	06:01 20:43	06:22-06:46/24	05:55 21:00	06:23-06:54/31
25	07:42 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:59-07:21/22 07:31-07:38/7	06:01 20:44	06:22-06:47/25	05:55 21:00	06:23-06:54/31
26	07:41 17:34	07:05 18:12	06:20 18:43	06:32 20:15	06:59-07:21/22 20:15	06:00 20:45	06:21-06:47/26	05:55 21:00	06:24-06:55/31
27	07:40 17:36	07:04 18:13	06:19 18:44	06:30 20:16	06:59-07:20/21 20:16	05:59 20:45	06:20-06:47/27	05:56 21:00	06:24-06:54/30
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	06:59-07:19/20 20:17	05:59 20:46	06:20-06:48/28	05:56 21:00	06:24-06:54/30
29	07:39 17:38		07:15 19:46	06:28 20:18	07:00-07:19/19 20:18	05:58 20:47	06:19-06:48/29	05:56 21:00	06:24-06:55/31
30	07:38 17:39		07:14 19:47	06:26 20:19	07:02-07:18/16 20:19	05:58 20:48	06:19-06:49/30	05:57 21:00	06:24-06:55/31
31	07:37 17:41		07:12 19:48			05:57 20:49	06:18-06:49/31		
Potential sun hours	298	298	370	398	447	451			
Sum of minutes with flicker	0	0	298	813	370	922			

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: Shadow_cumulativo_beni_2021_12_13WTG: CH05 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (4)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 06:25-06:56/31 21:00	06:21 20:41	06:51 07:23-07:52/29 19:59	07:21 19:09	06:54 17:23	07:29 16:59
2	05:58 06:25-06:55/30 21:00	06:22 20:40	06:52 07:23-07:51/28 19:57	07:22 19:07	06:55 17:21	07:30 16:58
3	05:58 06:25-06:56/31 21:00	06:23 20:39	06:53 07:24-07:50/26 19:56	07:23 19:06	06:57 17:20	07:31 16:58
4	05:59 06:25-06:56/31 21:00	06:24 20:38	06:54 07:25-07:49/24 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	05:59 06:26-06:57/31 21:00	06:25 20:37	06:55 07:26-07:47/21 19:52	07:25 19:02	06:59 17:18	07:33 16:58
6	06:00 06:25-06:56/31 20:59	06:26 20:36	06:56 07:26-07:44/18 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	06:00 06:26-06:57/31 20:59	06:27 20:35	06:57 07:28-07:41/13 19:49	07:27 18:59	07:01 17:16	07:35 16:58
8	06:01 06:26-06:57/31 20:59	06:28 20:33	06:58 19:47	07:28 18:57	07:02 17:15	07:36 16:58
9	06:02 06:26-06:57/31 20:58	06:29 20:32	06:59 07:44-07:53/9 19:46	07:29 18:56	07:04 17:14	07:36 16:58
10	06:02 06:26-06:57/31 20:58	06:30 07:16-07:19/3 20:31	07:00 07:41-07:56/15 19:44	07:30 18:54	07:05 17:13	07:37 16:58
11	06:03 06:27-06:58/31 20:58	06:31 07:12-07:23/11 20:30	07:01 07:39-07:57/18 19:42	07:31 18:53	07:06 17:12	07:38 16:58
12	06:04 06:26-06:57/31 20:57	06:31 07:10-07:25/15 20:28	07:02 07:37-07:58/21 19:41	07:32 18:51	07:07 17:11	07:39 16:58
13	06:05 06:27-06:57/30 20:57	06:32 07:09-07:26/17 20:27	07:03 07:36-07:59/23 19:39	07:33 18:49	07:08 17:10	07:40 16:58
14	06:05 06:28-06:58/30 20:56	06:33 07:08-07:27/19 20:26	07:04 07:35-07:59/24 19:37	07:34 18:48	07:10 17:09	07:41 16:58
15	06:06 06:28-06:57/29 20:56	06:34 07:07-07:27/20 20:24	07:05 07:34-08:00/26 19:36	07:35 18:46	07:11 17:08	07:41 16:58
16	06:07 06:29-06:57/28 20:55	06:35 07:06-07:28/22 20:23	07:06 07:34-08:00/26 19:34	07:36 18:45	07:12 17:07	07:42 16:59
17	06:08 06:30-06:57/27 20:54	06:36 07:06-07:28/22 20:22	07:07 07:33-07:59/26 19:32	07:37 18:43	07:13 17:06	07:43 16:59
18	06:08 06:31-06:57/26 20:54	06:37 07:06-07:28/22 20:20	07:08 07:33-07:59/26 19:31	07:38 18:42	07:14 17:06	07:43 16:59
19	06:09 06:32-06:57/25 20:53	06:38 07:05-07:28/23 20:19	07:09 07:33-07:58/25 19:29	07:40 18:40	07:15 17:05	07:44 17:00
20	06:10 06:32-06:55/23 20:52	06:39 07:05-07:27/22 20:17	07:10 07:33-07:58/25 19:27	07:41 18:39	07:17 17:04	07:45 17:00
21	06:11 06:33-06:55/22 20:52	06:40 07:06-07:27/21 20:16	07:11 07:33-07:57/24 19:26	07:42 18:37	07:18 17:04	07:45 17:01
22	06:12 06:34-06:55/21 20:51	06:41 07:05-07:25/20 20:14	07:12 07:34-07:55/21 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	06:13 06:35-06:54/19 20:50	06:42 07:05-07:24/19 20:13	07:13 07:35-07:54/19 19:22	07:44 18:35	07:20 17:02	07:46 17:02
24	06:13 06:36-06:53/17 20:49	06:43 07:06-07:23/17 20:11	07:14 07:37-07:51/14 19:21	07:45 18:33	07:21 17:02	07:47 17:02
25	06:14 06:37-06:52/15 20:48	06:44 07:08-07:21/13 20:10	07:15 07:39-07:48/9 19:19	06:46 17:32	07:22 17:01	07:47 17:03
26	06:15 06:37-06:50/13 20:47	06:45 07:10-07:19/9 20:08	07:16 19:17	06:47 17:30	07:23 17:01	07:47 17:03
27	06:16 06:38-06:48/10 20:46	06:46 07:24-07:54/30 20:07	07:17 19:16	06:49 17:29	07:24 17:00	07:48 17:04
28	06:17 20:46	06:47 07:23-07:54/31 20:05	07:18 19:14	06:50 17:28	07:26 17:00	07:48 17:05
29	06:18 20:45	06:48 07:23-07:53/30 20:04	07:19 19:12	06:51 17:26	07:27 16:59	07:48 17:05
30	06:19 20:44	06:49 07:23-07:53/30 20:02	07:20 19:10	06:52 17:25	07:28 16:59	07:49 17:06
31	06:20 20:43	06:50 07:23-07:53/30 20:00		06:53 17:24		07:49 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	706	646	510	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: Shadow_cumulativo_beni_2021_12_13WTG: CH06 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (5)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 17:08	07:36 08:22-09:02/40 17:42	07:01 08:22-09:12/50 18:15	07:10 07:41-08:32/51 19:49	06:25 07:12-08:16/64 20:20	05:57 07:15-08:13/58 20:49
2	07:49 17:09	07:35 08:22-09:03/41 17:43	06:59 08:22-09:11/49 18:17	07:09 07:40-08:31/51 19:50	06:24 07:14-08:16/62 20:21	05:56 07:16-08:14/58 20:50
3	07:49 17:10	07:34 08:22-09:03/41 17:44	06:58 08:22-09:09/47 18:18 07:29-07:39/10	07:07 07:41-08:31/50 19:51	06:23 07:13-08:17/64 20:22	05:56 07:15-08:13/58 20:51
4	07:49 17:10	07:33 08:23-09:03/40 17:45	06:56 08:23-09:09/46 18:19 07:26-07:42/16	07:05 07:41-08:29/48 19:52	06:21 07:13-08:17/64 20:23	05:55 07:16-08:13/57 20:51
5	07:49 17:11	07:32 08:23-09:03/40 17:47	06:54 08:23-09:07/44 18:20 07:24-07:43/19	07:04 07:41-08:28/47 19:53	06:20 07:13-08:17/64 20:24	05:55 07:17-08:13/56 20:52
6	07:49 17:12	07:31 08:23-09:03/40 17:48	06:53 08:25-09:06/41 18:21 07:23-07:44/21	07:02 07:42-08:00/18 19:54 08:02-08:26/24	06:19 07:11-08:17/66 20:25	05:55 07:17-08:12/55 20:53
7	07:49 17:13	07:30 08:24-09:03/39 17:49	06:51 08:25-09:04/39 18:22 07:21-07:45/24	07:01 07:43-07:57/14 19:55 08:03-08:24/21	06:18 07:11-08:17/66 20:26	05:54 07:17-08:12/55 20:53
8	07:49 08:28-08:32/4 17:14	07:29 08:23-09:03/40 17:50	06:50 08:26-09:02/36 18:23 07:21-07:46/25	06:59 07:46-07:55/9 19:56 08:04-08:21/17	06:17 07:11-08:17/66 20:27	05:54 07:18-08:12/54 20:54
9	07:49 08:27-08:35/8 17:15	07:28 08:24-09:05/41 17:52	06:48 08:28-09:00/32 18:24 07:20-07:46/26	06:57 08:07-08:18/11 19:57	06:15 07:11-08:17/66 20:28	05:54 07:18-08:12/54 20:55
10	07:49 08:26-08:37/11 17:16	07:27 08:24-09:07/43 17:53	06:47 08:29-08:57/28 18:25 07:19-07:45/26	06:56 08:08-08:19/11 19:58	06:14 07:11-08:17/66 20:29	05:54 07:19-08:12/53 20:55
11	07:49 08:24-08:38/14 17:17	07:25 08:25-09:09/44 17:54	06:45 08:32-08:55/23 18:27 07:20-07:45/25	06:54 08:09-08:20/11 19:59	06:13 07:10-08:17/67 20:30	05:54 07:20-08:13/53 20:56
12	07:48 08:24-08:40/16 17:18	07:24 08:26-09:10/44 17:55	06:43 08:35-08:50/15 18:28 07:19-07:45/26	06:53 08:00-08:11/11 20:00	06:12 07:10-08:17/67 20:31	05:54 07:19-08:12/53 20:56
13	07:48 08:24-08:41/17 17:19	07:23 08:26-09:10/44 17:57	06:42 07:19-07:44/25 18:29	06:51 07:22-07:26/4 20:01	06:11 07:10-08:17/67 20:32	05:53 07:19-08:12/53 20:57
14	07:48 08:23-08:42/19 17:21	07:22 08:26-09:12/46 17:58	06:40 07:20-07:43/23 18:30	06:50 07:17-07:30/13 20:02	06:10 07:10-08:17/67 20:33	05:53 07:20-08:12/52 20:57
15	07:47 08:23-08:43/20 17:22	07:20 08:25-09:13/48 17:59	06:38 07:20-07:42/22 18:31	06:48 07:15-07:32/17 20:04	06:09 07:10-08:17/67 20:34	05:53 07:20-08:12/52 20:58
16	07:47 08:22-08:44/22 17:23	07:19 08:24-09:13/49 18:00	06:37 07:20-07:40/20 18:32	06:46 07:13-07:33/20 20:05	06:08 07:10-08:16/66 20:35	05:53 07:21-08:13/52 20:58
17	07:47 08:23-08:46/23 17:24	07:18 08:24-09:14/50 18:01	06:35 07:22-07:39/17 18:33	06:45 07:12-07:34/22 20:06 07:41-07:56/15	06:07 07:10-08:16/66 20:36	05:53 07:22-08:13/51 20:58
18	07:46 08:22-08:48/26 17:25	07:16 08:24-09:14/50 18:03	06:34 07:24-07:36/12 18:34	06:43 07:10-07:34/24 20:07 07:36-08:00/24	06:06 07:11-08:17/66 20:37	05:54 07:22-08:13/51 20:59
19	07:46 08:23-08:50/27 17:26	07:15 08:22-09:14/52 18:04	06:32 07:12-07:27/15 18:35	06:42 07:10-08:04/54 20:08	06:05 07:11-08:16/65 20:38	05:54 07:22-08:13/51 20:59
20	07:45 08:22-08:52/30 17:27	07:14 08:22-09:15/53 18:05	06:30 07:10-07:30/20 18:36	06:40 07:09-08:05/56 20:09	06:05 07:11-08:16/65 20:39	05:54 07:22-08:13/51 20:59
21	07:45 08:22-08:53/31 17:28	07:12 08:21-09:14/53 18:06	06:29 07:07-07:31/24 18:37	06:39 07:08-08:08/60 20:10	06:04 07:11-08:15/64 20:40	05:54 07:22-08:13/51 20:59
22	07:44 08:23-08:55/32 17:30	07:11 08:22-09:15/53 18:07	06:27 07:05-07:32/27 18:38	06:38 07:08-08:09/61 20:11	06:03 07:12-08:16/64 20:41	05:54 07:22-08:13/51 21:00
23	07:43 08:23-08:56/33 17:31	07:09 08:22-09:15/53 18:08	06:25 07:04-07:33/29 18:39	06:36 07:08-08:10/62 20:12	06:02 07:12-08:15/63 20:42	05:54 07:23-08:14/51 21:00
24	07:43 08:23-08:57/34 17:32	07:08 08:21-09:14/53 18:10	06:24 07:03-07:34/31 18:41	06:35 07:08-08:12/64 20:13	06:01 07:12-08:15/63 20:43	05:55 07:23-08:14/51 21:00
25	07:42 08:23-08:57/34 17:33	07:07 08:21-09:14/53 18:11	06:22 06:50-06:59/9 18:42 07:01-07:34/33	06:33 07:08-08:12/64 20:14	06:01 07:13-08:15/62 20:44	05:55 07:23-08:14/51 21:00
26	07:41 08:24-08:59/35 17:34	07:05 08:21-09:13/52 18:12	06:20 06:47-07:35/48 18:43	06:32 07:08-08:13/65 20:15	06:00 07:13-08:15/62 20:45	05:55 07:24-08:15/51 21:00
27	07:40 08:24-09:00/36 17:36	07:04 08:22-09:13/51 18:13	06:19 06:45-07:34/49 18:44	06:30 07:09-08:13/64 20:16	05:59 07:12-08:14/62 20:45	05:56 07:23-08:15/52 21:00
28	07:40 08:23-09:01/38 17:37	07:02 08:21-09:12/51 18:14	06:17 06:43-07:34/51 18:45	06:29 07:09-08:14/65 20:17	05:59 07:13-08:14/61 20:46	05:56 07:23-08:15/52 21:00
29	07:39 08:23-09:01/38 17:38		07:15 07:43-08:34/51 19:46	06:28 07:10-08:15/65 20:18	05:58 07:13-08:14/61 20:47	05:56 07:24-08:16/52 21:00
30	07:38 08:23-09:02/39 17:39		07:14 07:42-08:33/51 19:47	06:26 07:11-08:16/65 20:19	05:58 07:14-08:14/60 20:48	05:57 07:23-08:16/53 21:00
31	07:37 08:23-09:02/39 17:41		07:12 07:42-08:33/51 19:48		05:57 07:14-08:13/59 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	626	1304	1276	1245	1992	1592

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: Shadow_cumulativo_beni_2021_12_13WTG: CH06 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (5)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 07:24-08:17/53 21:00	06:21 07:21-08:28/67 20:42	06:51 19:59	07:21 09:17-09:27/10 19:09 07:59-08:24/25	06:54 07:54-08:37/43 17:23	07:29 08:06-08:20/14 16:59
2	05:58 07:23-08:16/53 21:00	06:22 07:21-08:28/67 20:40	06:52 19:57	07:22 09:12-09:32/20 19:07 07:58-08:24/26	06:55 07:53-08:35/42 17:22	07:30 08:08-08:20/12 16:59
3	05:58 07:24-08:17/53 21:00	06:23 07:21-08:28/67 20:39	06:53 08:05-08:16/11 19:56	07:23 09:09-09:35/26 19:06 07:58-08:24/26	06:57 07:53-08:33/40 17:20	07:31 08:10-08:18/8 16:58
4	05:59 07:23-08:17/54 21:00	06:24 07:21-08:28/67 20:38	06:54 07:44-07:52/8 19:54 08:02-08:19/17	07:24 09:06-09:37/31 19:04 07:58-08:23/25	06:58 07:52-08:32/40 17:19	07:32 08:12-08:17/5 16:58
5	05:59 07:24-08:18/54 21:00	06:25 07:22-08:28/66 20:37	06:55 07:41-07:54/13 19:52 08:00-08:21/21	07:25 09:04-09:38/34 19:02 07:58-08:23/25	06:59 07:53-08:33/40 17:18	07:33 16:58
6	06:00 07:23-08:18/55 20:59	06:26 07:21-08:27/66 20:36	06:56 07:39-07:56/17 19:51 07:58-08:22/24	07:26 09:02-09:40/38 19:01 07:58-08:22/24	07:00 07:53-08:33/40 17:17	07:34 16:58
7	06:01 07:23-08:19/56 20:59	06:27 07:21-08:26/65 20:35	06:57 07:36-08:23/47 19:49	07:27 09:01-09:41/40 18:59 07:58-08:21/23	07:01 07:52-08:33/41 17:16	07:35 16:58
8	06:01 07:24-08:20/56 20:59	06:28 07:21-08:26/65 20:33	06:58 07:35-08:23/48 19:47	07:28 08:59-09:42/43 18:57 07:59-08:19/20	07:03 07:53-08:34/41 17:15	07:36 16:58
9	06:02 07:23-08:20/57 20:58	06:29 07:22-08:26/64 20:32	06:59 07:34-08:24/50 19:46	07:29 08:58-09:43/45 18:56 08:00-08:17/17	07:04 07:53-08:34/41 17:14	07:36 16:58
10	06:02 07:23-08:21/58 20:58	06:30 07:22-08:25/63 20:31	07:00 07:34-08:24/50 19:44	07:30 08:57-09:43/46 18:54 08:02-08:15/13	07:05 07:53-08:33/40 17:13	07:37 16:58
11	06:03 07:23-08:21/58 20:58	06:31 07:22-08:25/63 20:30	07:01 07:33-08:25/52 19:42	07:31 08:56-09:44/48 18:53 08:05-08:11/6	07:06 07:53-08:33/40 17:12	07:38 16:58
12	06:04 07:22-08:21/59 20:57	06:32 07:20-08:24/64 20:28	07:02 07:33-08:25/52 19:41	07:32 08:55-09:44/49 18:51	07:07 07:55-08:34/39 17:11	07:39 16:58
13	06:05 07:23-08:22/59 20:57	06:33 07:19-08:24/65 20:27	07:03 07:33-08:25/52 19:39	07:33 08:54-09:45/51 18:49	07:08 07:55-08:33/38 17:10	07:40 16:58
14	06:05 07:23-08:23/60 20:56	06:33 07:17-08:23/66 20:26	07:04 07:33-08:24/51 19:37	07:34 08:54-09:45/51 18:48	07:10 07:55-08:32/37 17:09	07:41 16:58
15	06:06 07:22-08:22/60 20:56	06:34 07:16-08:22/66 20:24	07:05 07:33-08:24/51 19:36	07:35 08:54-09:46/52 18:46	07:11 07:56-08:32/36 17:08	07:41 16:58
16	06:07 07:22-08:23/61 20:55	06:35 07:15-08:21/66 20:23	07:06 07:34-08:24/50 19:34	07:36 08:53-09:46/53 18:45	07:12 07:57-08:32/35 17:07	07:42 16:59
17	06:08 07:22-08:24/62 20:54	06:36 07:15-08:20/65 20:22	07:07 07:35-08:23/48 19:32	07:37 08:53-09:46/53 18:43	07:13 07:57-08:31/34 17:06	07:43 16:59
18	06:08 07:22-08:24/62 20:54	06:37 07:14-08:19/65 20:20	07:08 07:37-07:48/11 19:31 07:49-08:22/33	07:38 08:53-09:46/53 18:42	07:14 07:57-08:31/34 17:06	07:43 16:59
19	06:09 07:22-08:25/63 20:53	06:38 07:14-08:17/63 20:19	07:09 07:50-08:21/31 19:29	07:40 08:52-09:45/53 18:40	07:15 07:57-08:30/33 17:05	07:44 17:00
20	06:10 07:21-08:25/64 20:52	06:39 07:14-08:16/62 20:17	07:10 07:50-08:20/30 19:27	07:41 08:52-09:45/53 18:39	07:17 07:58-08:30/32 17:04	07:45 17:00
21	06:11 07:21-08:25/64 20:52	06:40 07:13-08:14/61 20:16	07:11 07:51-08:19/28 19:26	07:42 08:52-09:45/53 18:37	07:18 07:58-08:29/31 17:04	07:45 17:01
22	06:12 07:21-08:26/65 20:51	06:41 07:13-08:11/58 20:14	07:12 07:52-08:17/25 19:24	07:43 08:53-09:45/52 18:36	07:19 07:58-08:28/30 17:03	07:46 17:01
23	06:13 07:21-08:26/65 20:50	06:42 07:12-08:09/57 20:13	07:13 07:54-08:15/21 19:22	07:44 08:53-09:45/52 18:35	07:20 07:59-08:26/27 17:02	07:46 17:02
24	06:14 07:21-08:27/66 20:49	06:43 07:13-08:06/53 20:11	07:14 07:56-08:12/16 19:21	07:45 08:53-09:44/51 18:33	07:21 07:59-08:25/26 17:02	07:47 17:02
25	06:14 07:21-08:27/66 20:48	06:44 07:13-07:37/24 20:10 07:39-08:03/24	07:15 08:00-08:18/18 19:19	06:46 07:54-08:43/49 17:32	07:22 08:01-08:24/23 17:01	07:47 17:03
26	06:15 07:20-08:26/66 20:47	06:45 07:14-07:36/22 20:08 07:44-07:57/13	07:16 08:05-08:21/16 19:17	06:47 07:54-08:42/48 17:30	07:23 08:01-08:23/22 17:01	07:47 17:03
27	06:16 07:21-08:27/66 20:46	06:46 07:15-07:35/20 20:07	07:17 08:03-08:22/19 19:16	06:49 07:55-08:42/47 17:29	07:24 08:02-08:23/21 17:00	07:48 17:04
28	06:17 07:21-08:27/66 20:46	06:47 07:16-07:33/17 20:05	07:18 08:02-08:23/21 19:14	06:50 07:56-08:41/45 17:28	07:26 08:03-08:22/19 17:00	07:48 17:05
29	06:18 07:21-08:27/66 20:45	06:48 07:18-07:30/12 20:04	07:19 08:00-08:24/24 19:12	06:51 07:56-08:40/44 17:27	07:27 08:04-08:22/18 16:59	07:48 17:05
30	06:19 07:21-08:27/66 20:44	06:49 07:22-07:25/3 20:02	07:20 07:59-08:24/25 19:11	06:52 07:55-08:39/44 17:25	07:28 08:05-08:21/16 16:59	07:49 17:06
31	06:20 07:21-08:28/67 20:43	06:50 20:01		06:53 07:55-08:37/42 17:24		07:49 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	1880	1666	980	1606	999	39

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: Shadow_cumulativo_beni_2021_12_13WTG: CH07 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (8)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 08:27-08:58/31 17:08 09:28-10:44/76	07:36 08:39-09:17/38 17:42 09:50-10:38/48	07:01 07:34-07:54/20 18:15 07:56-08:06/10	07:10 19:49	06:25 17:34-19:07/93 20:20	05:57 17:36-19:13/97 20:49
2	07:49 08:27-09:00/33 17:09 09:28-10:44/76	07:35 08:43-09:17/34 17:43 09:51-10:37/46	06:59 07:32-07:55/23 18:17	07:09 19:50	06:24 17:34-19:08/94 20:21	05:56 17:37-19:14/97 20:50
3	07:49 08:27-09:01/34 17:10 09:29-10:44/75	07:34 08:44-09:16/32 17:44 09:53-10:35/42	06:58 07:30-07:56/26 18:18	07:07 19:51	06:23 17:34-19:09/95 20:22	05:56 17:36-19:13/97 20:51
4	07:49 08:27-09:01/34 17:11 09:29-10:45/76	07:33 08:45-09:16/31 17:46 09:55-10:33/38	06:56 07:30-07:57/27 18:19	07:05 19:52	06:21 17:33-19:09/96 20:23	05:55 17:37-19:14/97 20:51
5	07:49 08:26-09:03/37 17:11 09:30-10:45/75	07:32 08:46-09:15/29 17:47 09:57-10:30/33	06:54 07:28-07:57/29 18:20	07:04 19:53	06:20 17:33-19:10/97 20:24	05:55 17:38-19:14/96 20:52
6	07:49 08:26-09:04/38 17:12 09:30-10:46/76	07:31 08:47-09:14/27 17:48 10:00-10:27/27	06:53 07:28-07:58/30 18:21	07:02 19:54	06:19 17:32-19:09/97 20:25	05:55 06:28-06:35/7 20:53 17:37-19:14/97
7	07:49 08:26-09:05/39 17:13 09:31-10:46/75	07:30 08:49-09:12/23 17:49 10:04-10:23/19	06:51 07:27-07:58/31 18:22	07:01 19:55	06:18 17:32-19:10/98 20:26	05:55 06:27-06:37/10 20:53 17:38-19:14/96
8	07:49 08:26-09:06/40 17:14 09:32-10:47/75	07:29 08:50-09:10/20 17:50	06:50 07:27-07:59/32 18:23	06:59 19:56	06:17 17:32-19:10/98 20:27	05:54 06:26-06:39/13 20:54 17:38-19:14/96
9	07:49 08:26-09:08/42 17:15 09:32-10:47/75	07:28 08:53-09:07/14 17:52	06:48 07:26-07:58/32 18:24	06:57 19:57	06:15 17:32-19:10/98 20:28	05:54 06:25-06:41/16 20:55 17:39-19:15/96
10	07:49 08:26-09:09/43 17:16 09:32-10:47/75	07:27 08:58-09:02/4 17:53	06:47 07:26-07:57/31 18:26	06:56 18:21-18:27/6 19:58	06:14 17:32-19:11/99 20:29	05:54 06:25-06:42/17 20:55 17:39-19:15/96
11	07:49 08:26-09:09/43 17:17 09:33-10:47/74	07:25 17:54	06:45 07:26-07:58/32 18:27	06:54 18:12-18:37/25 19:59	06:13 17:32-19:11/99 20:30	05:54 06:24-06:43/19 20:56 17:40-19:15/95
12	07:48 08:26-09:10/44 17:18 09:34-10:48/74	07:24 08:00-08:06/6 17:55	06:43 07:26-07:56/30 18:28	06:53 18:06-18:42/36 20:00	06:12 17:32-19:11/99 20:31	05:54 06:24-06:44/20 20:57 17:39-19:14/95
13	07:48 08:26-09:12/46 17:19 09:34-10:47/73	07:23 07:55-08:08/13 17:57	06:42 07:26-07:55/29 18:29	06:51 18:02-18:46/44 20:01	06:11 17:32-19:11/99 20:32	05:54 06:24-06:44/20 20:57 17:39-19:14/95
14	07:48 08:26-09:12/46 17:21 09:35-10:48/73	07:22 07:54-08:11/17 17:58	06:40 07:27-07:55/28 18:30	06:50 17:59-18:48/49 20:02	06:10 17:32-19:11/99 20:33	05:53 06:22-06:44/22 20:57 17:40-19:15/95
15	07:47 08:27-09:13/46 17:22 09:36-10:48/72	07:20 07:53-08:12/19 17:59	06:38 07:27-07:53/26 18:31	06:48 17:56-18:51/55 20:04	06:09 17:32-19:11/99 20:34	05:53 06:23-06:45/22 20:58 17:40-19:15/95
16	07:47 08:26-09:13/47 17:23 09:36-10:48/72	07:19 07:51-08:13/22 18:00	06:37 07:28-07:51/23 18:32	06:46 17:53-18:52/59 20:05	06:08 17:32-19:12/100 20:35	05:53 06:23-06:46/23 20:58 17:40-19:15/95
17	07:47 08:27-09:15/48 17:24 09:37-10:48/71	07:18 07:50-08:14/24 18:01	06:35 07:30-07:50/20 18:33	06:45 17:52-18:55/63 20:06	06:07 17:31-19:12/101 20:36	05:53 06:23-06:46/23 20:58 17:41-19:16/95
18	07:46 08:27-09:15/48 17:25 09:37-10:48/71	07:16 07:50-08:15/25 18:03	06:34 07:32-07:47/15 18:34	06:43 17:49-18:56/67 20:07	06:06 17:32-19:12/100 20:37	05:54 06:23-06:46/23 20:59 17:42-19:16/94
19	07:46 08:27-09:16/49 17:26 09:38-10:48/70	07:15 07:49-08:14/25 18:04	06:32 07:35-07:42/7 18:35	06:42 17:48-18:58/70 20:08	06:05 17:32-19:12/100 20:38	05:54 06:23-06:47/24 20:59 17:42-19:16/94
20	07:45 08:27-09:16/49 17:27 09:38-10:47/69	07:14 07:49-08:15/26 18:05	06:30 18:36	06:40 17:45-18:58/73 20:09	06:05 17:32-19:12/100 20:39	05:54 06:23-06:47/24 20:59 17:42-19:16/94
21	07:45 08:27-09:16/49 17:28 09:39-10:47/68	07:12 07:48-08:14/26 18:06	06:29 18:37	06:39 17:44-19:00/76 20:10	06:04 17:32-19:12/100 20:40	05:54 06:23-06:47/24 20:59 17:42-19:16/94
22	07:44 08:28-09:17/49 17:30 09:40-10:47/67	07:11 07:49-08:15/26 18:07	06:27 18:38	06:38 17:42-19:01/79 20:11	06:03 17:33-19:13/100 20:41	05:54 06:24-06:48/24 21:00 17:42-19:16/94
23	07:43 08:29-09:18/49 17:31 09:41-10:46/65	07:09 07:49-08:15/26 18:08	06:25 18:39	06:36 17:41-19:02/81 20:12	06:02 17:33-19:13/100 20:42	05:54 06:24-06:48/24 21:00 17:43-19:17/94
24	07:43 08:29-09:18/49 17:32 09:41-10:46/65	07:08 07:49-08:14/25 18:10	06:24 18:41	06:35 17:40-19:02/82 20:13	06:01 17:33-19:13/100 20:43	05:55 06:24-06:48/24 21:00 17:43-19:17/94
25	07:42 08:29-09:18/49 17:33 09:42-10:45/63	07:07 07:50-08:13/23 18:11	06:22 18:42	06:33 17:39-19:03/84 20:14	06:01 17:34-19:13/99 20:44	05:55 06:24-06:47/23 21:00 17:43-19:17/94
26	07:41 08:31-09:19/48 17:34 09:43-10:45/62	07:05 07:50-08:12/22 18:12	06:20 18:43	06:32 17:38-19:05/87 20:15	06:00 17:34-19:13/99 20:45	05:55 06:25-06:48/23 21:00 17:43-19:18/95
27	07:40 08:32-09:19/47 17:36 09:44-10:44/60	07:04 07:41-07:48/7 18:13 07:52-08:11/19	06:19 18:44	06:30 17:37-19:05/88 20:16	05:59 17:34-19:13/99 20:45	05:56 06:25-06:48/23 21:00 17:43-19:18/95
28	07:40 08:32-09:18/46 17:37 09:45-10:43/58	07:02 07:36-07:52/16 18:14 07:53-08:08/15	06:17 18:45	06:29 17:36-19:06/90 20:17	05:59 17:35-19:13/98 20:46	05:56 06:25-06:47/22 21:00 17:43-19:18/95
29	07:39 08:33-09:18/45 17:38 09:46-10:42/56	 19:46	 19:46	06:28 17:36-19:07/91 20:18	05:58 17:35-19:13/98 20:47	05:56 06:27-06:48/21 21:00 17:44-19:19/95
30	07:38 08:35-09:18/43 17:39 09:47-10:41/54	 19:47	 19:47	06:26 17:36-19:07/91 20:19	05:58 17:35-19:13/98 20:48	05:57 06:27-06:47/20 21:00 17:43-19:18/95
31	07:37 08:36-09:18/42 17:41 09:48-10:40/52	 19:48	 19:48	 20:19	05:57 17:35-19:13/98 20:49	 21:00 17:43-19:18/95
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	3496	887	501	1396	3050	3368

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: Shadow_cumulativo_beni_2021_12_13WTG: CH07 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (8)

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:57 06:28-06:47/19 21:00 17:44-19:19/95	06:21 17:42-19:22/100 20:42	06:51 18:11-18:36/25 19:59	07:21 08:06-08:36/30 19:09	06:54 08:26-08:34/8 17:23	07:29 08:08-08:51/43 16:59 09:15-10:29/74
2	05:58 06:28-06:46/18 21:00 17:43-19:19/96	06:22 17:42-19:21/99 20:40	06:52 18:20-18:26/6 19:57	07:22 08:05-08:36/31 19:07	06:55 08:22-08:38/16 17:22	07:30 08:08-08:51/43 16:59 09:15-10:30/75
3	05:58 06:30-06:46/16 21:00 17:44-19:20/96	06:23 17:42-19:21/99 20:39	06:53 19:56	07:23 08:04-08:36/32 19:06	06:57 08:19-08:40/21 17:20	07:31 08:09-08:51/42 16:58 09:15-10:30/75
4	05:59 06:30-06:45/15 21:00 17:44-19:19/95	06:24 17:42-19:21/99 20:38	06:54 19:54	07:24 08:04-08:36/32 19:04	06:58 08:19-08:42/23 17:19	07:32 08:10-08:50/40 16:58 09:16-10:31/75
5	05:59 06:32-06:44/12 21:00 17:44-19:20/96	06:25 17:42-19:20/98 20:37	06:55 19:52	07:25 08:04-08:35/31 19:02	06:59 08:17-08:44/27 17:18	07:33 08:11-08:50/39 16:58 09:16-10:31/75
6	06:00 06:33-06:42/9 20:59 17:43-19:20/97	06:26 17:42-19:19/97 20:36	06:56 19:51	07:26 08:03-08:35/32 19:01	07:00 08:16-08:45/29 17:17	07:34 08:12-08:50/38 16:58 09:16-10:32/76
7	06:01 06:38-06:39/1 20:59 17:44-19:20/96	06:27 17:42-19:19/97 20:35	06:57 19:49	07:27 08:03-08:34/31 18:59	07:01 08:14-08:46/32 17:16	07:35 08:13-08:50/37 16:58 09:17-10:32/75
8	06:01 17:44-19:21/97 20:59	06:28 17:42-19:18/96 20:33	06:58 19:48	07:28 08:03-08:33/30 18:57	07:03 08:14-08:47/33 17:15	07:36 08:14-08:50/36 16:58 09:17-10:33/76
9	06:02 17:44-19:21/97 20:58	06:29 17:42-19:18/96 20:32	06:59 19:46	07:29 08:04-08:32/28 18:56	07:04 08:14-08:48/34 17:14	07:36 08:15-08:49/34 16:58 09:18-10:33/75
10	06:02 17:44-19:21/97 20:58	06:30 17:42-19:17/95 20:31	07:00 19:44	07:30 08:04-08:31/27 18:54	07:05 08:10-08:48/38 17:13	07:37 08:16-08:49/33 16:58 09:18-10:34/76
11	06:03 17:44-19:22/98 20:58	06:31 17:43-19:16/93 20:30	07:01 19:43	07:31 08:05-08:30/25 18:53	07:06 08:07-08:49/42 17:12	07:38 08:17-08:49/32 16:58 09:19-10:35/76
12	06:04 17:43-19:21/98 20:57	06:32 17:43-19:16/93 20:28	07:02 19:41	07:32 08:06-08:28/22 18:51	07:07 08:07-08:50/43 17:11	07:39 08:33-08:49/16 08:18-08:32/14 16:58 09:18-10:34/76
13	06:05 17:44-19:22/98 20:57	06:33 17:43-19:15/92 20:27	07:03 19:39	07:33 08:08-08:26/18 18:50	07:08 08:05-08:50/45 17:10	07:40 08:34-08:48/14 08:19-08:31/12 16:58 09:19-10:35/76
14	06:05 17:44-19:22/98 20:56	06:34 17:44-19:14/90 20:26	07:04 19:37	07:34 08:10-08:23/13 18:48	07:10 08:04-08:50/46 17:09	07:41 08:35-08:48/13 08:20-08:31/11 16:58 09:20-10:36/76
15	06:06 17:43-19:22/99 20:56	06:34 17:44-19:13/89 20:24	07:05 19:36	07:35 08:24-08:44/20 18:46	07:11 08:03-08:51/48 17:08	07:41 08:37-08:48/11 08:21-08:31/10 16:58 09:21-10:37/76
16	06:07 17:43-19:22/99 20:55	06:35 17:45-19:12/87 20:23	07:06 19:34	07:36 08:22-08:44/22 18:45	07:12 08:04-08:52/48 17:07	07:42 08:37-08:47/10 08:22-08:30/8 16:59 09:20-10:36/76
17	06:08 17:43-19:22/99 20:54	06:36 17:45-19:11/86 20:22	07:07 19:32	07:37 08:21-08:45/24 18:43	07:13 08:03-08:52/49 17:06	07:43 08:39-08:47/8 08:23-08:31/8 16:59 09:21-10:37/76
18	06:08 17:44-19:23/99 20:54	06:37 17:46-19:10/84 20:20	07:08 19:31	07:38 08:20-08:45/25 18:42	07:14 08:03-08:52/49 17:06	07:43 08:41-08:47/6 08:25-08:31/6 16:59 09:22-10:38/76
19	06:09 17:44-19:23/99 20:53	06:38 17:47-19:09/82 20:19	07:09 19:29	07:40 08:20-08:45/25 18:40	07:15 08:03-08:52/49 17:05	07:44 08:41-08:46/5 08:25-08:30/5 17:00 09:22-10:38/76
20	06:10 17:43-19:22/99 20:52	06:39 17:47-19:08/81 20:17	07:10 19:27	07:41 08:19-08:45/26 18:39	07:17 08:03-08:52/49 17:04	07:45 08:43-08:46/3 08:26-08:31/5 17:00 09:23-10:39/76
21	06:11 17:43-19:22/99 20:52	06:40 17:48-19:06/78 20:16	07:11 19:26	07:42 08:19-08:45/26 18:37	07:18 08:03-08:52/49 17:04	07:45 08:43-08:46/3 08:26-08:31/5 17:01 09:23-10:39/76
22	06:12 17:43-19:23/100 20:51	06:41 17:48-19:04/76 20:14	07:12 19:24	07:43 08:20-08:46/26 18:36	07:19 08:03-08:52/49 17:03	07:46 08:44-08:47/3 08:28-08:31/3 17:01 09:24-10:40/76
23	06:13 17:43-19:23/100 20:50	06:42 17:49-19:02/73 20:13	07:13 19:22	07:44 08:20-08:45/25 18:35	07:20 08:03-08:52/49 17:02	07:46 08:44-08:47/3 08:27-08:32/5 17:02 09:24-10:40/76
24	06:14 17:43-19:23/100 20:49	06:43 17:51-19:00/69 20:11	07:14 19:21	07:45 08:20-08:44/24 18:33	07:21 08:04-08:52/48 17:02	07:47 08:44-08:49/5 08:28-08:33/5 17:02 09:25-10:41/76
25	06:14 17:43-19:23/100 20:48	06:44 17:52-18:58/66 20:10	07:15 08:16-08:29/13 19:19	06:46 07:20-07:43/23 17:32	07:22 08:05-08:53/48 17:01	07:47 08:44-08:50/6 08:28-08:34/6 17:03 09:25-10:41/76
26	06:15 17:42-19:22/100 20:47	06:45 17:54-18:56/62 20:08	07:16 08:13-08:31/18 19:17	06:47 07:21-07:42/21 17:31	07:23 08:05-08:52/47 17:01	07:47 08:43-08:51/8 08:27-08:34/7 17:03 09:25-10:41/76
27	06:16 17:42-19:22/100 20:46	06:46 17:55-18:54/59 20:07	07:17 08:11-08:33/22 19:16	06:49 07:23-07:42/19 17:29	07:24 08:06-08:52/46 17:00	07:48 08:44-08:52/8 08:28-08:36/8 17:04 09:26-10:42/76
28	06:17 17:42-19:22/100 20:46	06:47 17:57-18:52/55 20:05	07:18 08:09-08:34/25 19:14	06:50 07:24-07:40/16 17:28	07:26 08:06-08:52/46 17:00	07:48 08:43-08:53/10 08:28-08:37/9 17:05 09:26-10:43/77
29	06:18 17:42-19:22/100 20:45	06:48 18:00-18:49/49 20:04	07:19 08:08-08:35/27 19:12	06:51 07:26-07:37/11 17:27	07:27 08:07-08:52/45 16:59	07:48 08:42-08:54/12 08:27-08:38/11 17:05 09:27-10:43/76
30	06:19 17:42-19:22/100 20:44	06:49 18:02-18:45/43 20:02	07:20 08:07-08:35/28 19:11	06:52 07:30-07:33/3 17:25	07:28 08:07-08:51/44 16:59	07:49 08:42-08:56/14 08:27-08:39/12 17:06 09:27-10:43/76
31	06:20 17:42-19:22/100 20:43	06:50 18:06-18:42/36 20:01	06:53 17:24	06:53 17:24	16:59 09:15-10:29/74 	07:49 08:42-08:57/15 08:27-08:40/13 17:07 09:27-10:43/76
	Potential sun hours 458	427	375	346	299	289
	Sum of minutes with flicker 3137	2519	164	750	2775	3102

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: Shadow_cumulativo_beni_2021_12_13WTG: CH08 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (9)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 08:42-09:13/31 17:08 15:02-15:55/53	07:36 07:01 17:42 18:15		07:10 08:13-08:58/45 19:49 20:20	06:25 06:20 20:20 20:49	05:57 05:56 20:49 20:56
2	07:49 08:43-09:14/31 17:09 15:03-15:55/52	07:35 06:59 17:43 18:17		07:09 08:13-08:56/43 19:50 20:21	06:24 06:23 20:21 20:50	05:56 05:56 20:50 20:51
3	07:49 08:44-09:14/30 17:10 15:03-15:56/53	07:34 06:58 17:44 18:18		07:07 08:14-08:55/41 19:51 20:22	06:23 06:19 20:22 20:53	05:56 05:55 20:51 20:52
4	07:49 08:44-09:15/31 17:11 15:04-15:56/52	07:33 06:56 17:46 18:19		07:06 08:14-08:54/40 19:52 20:23	06:21 06:20 20:23 20:52	05:56 05:55 20:52 20:53
5	07:49 08:44-09:14/30 17:11 15:04-15:57/53	07:32 06:54 17:47 18:20		07:04 08:15-08:51/36 19:53 20:24	06:20 06:19 20:24 20:55	05:55 05:55 20:53 20:54
6	07:49 08:45-09:14/29 17:12 15:05-15:57/52	07:31 06:53 17:48 18:21		07:02 08:17-08:50/33 19:54 20:25	06:19 06:18 20:25 20:55	05:55 05:55 20:54 20:53
7	07:49 08:45-09:15/30 17:13 15:05-15:58/53	07:30 06:51 17:49 18:22		07:01 08:18-08:48/30 19:55 20:26	06:18 06:17 20:26 20:54	05:55 05:54 20:53 20:54
8	07:49 08:46-09:15/29 17:14 15:06-15:58/52	07:29 06:50 17:50 18:23		06:59 08:19-08:45/26 19:56 20:27	06:17 06:15 20:27 20:54	05:54 05:54 20:54 20:55
9	07:49 08:47-09:16/29 17:15 15:07-15:59/52	07:28 06:48 17:52 18:24	07:40-07:46/6	06:57 08:22-08:42/20 19:57 20:28	06:15 06:14 20:28 20:55	05:54 05:54 20:55 20:56
10	07:49 08:48-09:16/28 17:16 15:07-15:58/51	07:27 06:47 17:53 18:26	07:33-07:52/19	06:56 08:25-08:37/12 19:58 20:29	06:14 06:13 20:29 20:55	05:54 05:54 20:55 20:56
11	07:49 08:48-09:15/27 17:17 15:08-15:59/51	07:25 06:45 17:54 18:27	07:30-07:55/25	06:54 06:53 19:59 20:30	06:13 06:12 20:30 20:56	05:54 05:54 20:56 20:57
12	07:48 08:49-09:16/27 17:18 15:09-15:59/50	07:24 06:43 17:55 18:28	07:27-07:57/30	06:53 06:51 20:00 20:31	06:12 06:11 20:31 20:56	05:54 05:54 20:56 20:57
13	07:48 08:50-09:16/26 17:19 15:09-15:59/50	07:23 06:42 17:57 18:29	07:24-07:58/34	06:51 06:50 20:01 20:32	06:11 06:10 20:32 20:57	05:54 05:53 20:57 20:58
14	07:48 08:51-09:15/24 17:21 15:10-15:59/49	07:22 06:40 17:58 18:30	07:23-08:00/37	06:50 06:48 20:03 20:34	06:10 06:09 20:33 20:58	05:53 05:53 20:58 20:59
15	07:47 08:52-09:15/23 17:22 15:11-16:00/49	07:20 06:38 17:59 18:31	07:21-08:01/40	06:48 06:47 20:04 20:35	06:09 06:08 20:34 20:58	05:53 05:53 20:59 20:54
16	07:47 08:53-09:14/21 17:23 15:11-15:59/48	07:19 06:37 18:00 18:32	07:19-08:02/43	06:47 06:45 20:05 20:36	06:08 06:07 20:35 20:58	05:53 05:54 20:58 20:59
17	07:47 08:54-09:14/20 17:24 15:12-16:00/48	07:18 06:35 18:01 18:33	07:19-08:03/44	06:45 06:43 20:06 20:37	06:07 06:06 20:36 20:59	05:54 05:54 20:59 20:54
18	07:46 08:55-09:13/18 17:25 15:13-15:59/46	07:16 06:34 18:03 18:34	07:17-08:03/46	06:43 06:42 20:07 20:38	06:06 06:05 20:37 20:59	05:54 05:54 20:59 20:54
19	07:46 08:58-09:12/14 17:26 15:13-15:59/46	07:15 06:32 18:04 18:35	07:16-08:03/47	06:42 06:40 20:08 20:39	06:05 06:04 20:38 20:59	05:54 05:54 20:59 20:54
20	07:45 08:59-09:10/11 17:27 15:15-15:59/44	07:14 06:30 18:05 18:36	07:16-08:04/48	06:40 06:39 20:09 20:40	06:05 06:04 20:39 20:59	05:54 05:54 20:59 20:54
21	07:45 09:03-09:06/3 17:29 15:15-15:59/44	07:12 06:29 18:06 18:37	07:15-08:04/49	06:39 06:38 20:10 20:41	06:04 06:03 20:40 20:59	05:54 05:54 20:59 20:54
22	07:44 15:17-15:59/42 17:30 18:07	07:11 06:27 18:07 18:38	07:14-08:03/49	06:38 06:36 20:11 20:42	06:03 06:02 20:41 20:59	05:54 05:54 21:00 20:54
23	07:43 15:18-15:58/40 17:31 18:09	07:09 06:25 18:09 18:39	07:14-08:04/50	06:36 06:35 20:12 20:43	06:02 06:02 20:42 20:59	05:54 05:55 21:00 20:55
24	07:43 15:19-15:57/38 17:32 18:10	07:08 06:24 18:10 18:41	07:13-08:03/50	06:35 06:33 20:13 20:44	06:02 06:01 20:43 20:59	05:55 05:55 21:00 20:55
25	07:42 15:20-15:56/36 17:33 18:11	07:07 06:22 18:11 18:42	07:12-08:03/51	06:33 06:32 20:14 20:45	06:01 06:00 20:44 20:59	05:55 05:55 21:00 20:55
26	07:41 15:21-15:55/34 17:34 18:12	07:05 06:20 18:12 18:43	07:12-08:03/51	06:32 06:30 20:15 20:46	06:00 05:59 20:45 20:59	05:55 05:56 21:00 20:56
27	07:40 15:24-15:55/31 17:36 18:13	07:04 06:19 18:13 18:44	07:12-08:02/50	06:30 06:28 20:16 20:47	05:59 05:58 20:46 20:59	05:56 05:56 21:00 20:56
28	07:40 15:26-15:54/28 17:37 18:14	07:02 06:17 18:14 18:45	07:11-08:01/50	06:29 06:27 20:17 20:48	05:59 05:58 20:47 20:59	05:56 05:56 21:00 20:56
29	07:39 15:28-15:52/24 17:38 18:15	07:01 06:15 18:15 18:46	08:12-09:01/49	06:28 06:26 20:18 20:49	05:58 05:57 20:48 20:59	05:56 05:57 21:00 20:57
30	07:38 15:31-15:50/19 17:39 18:16	07:00 06:14 18:16 18:47	08:12-09:00/48	06:26 06:24 20:19 20:50	05:58 05:57 20:49 20:59	05:57 05:57 21:00 20:57
31	07:37 15:34-15:46/12 17:41 18:17	07:00 06:13 18:17 18:48	08:12-08:58/46	06:25 06:23 20:20 20:51	05:57 05:56 20:50 20:59	05:57 05:57 21:00 20:57
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	1864	0	962	326	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: Shadow_cumulativo_beni_2021_12_13WTG: CH08 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (9)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 21:00	06:21 20:42	06:51 19:59	07:21 08:06-08:38/32 19:09	06:54 17:23	07:29 08:30-08:57/27 16:59 14:50-15:41/51
2	05:58 21:00	06:22 20:40	06:52 08:24-08:36/12 19:57	07:22 08:07-08:35/28 19:07	06:55 17:22	07:30 08:30-08:58/28 16:59 14:50-15:41/51
3	05:58 21:00	06:23 20:39	06:53 08:20-08:40/20 19:56	07:23 08:10-08:32/22 19:06	06:57 17:20	07:31 08:30-08:59/29 16:58 14:50-15:42/52
4	05:59 21:00	06:24 20:38	06:54 08:17-08:43/26 19:54	07:24 08:14-08:27/13 19:04	06:58 17:19	07:32 08:30-08:59/29 16:58 14:50-15:42/52
5	05:59 21:00	06:25 20:37	06:55 08:15-08:45/30 19:52	07:25 19:02	06:59 17:18	07:33 08:30-09:00/30 16:58 14:50-15:43/53
6	06:00 20:59	06:26 20:36	06:56 08:13-08:46/33 19:51	07:26 19:01	07:00 17:17	07:34 08:31-09:00/29 16:58 14:51-15:43/52
7	06:01 20:59	06:27 20:35	06:57 08:10-08:46/36 19:49	07:27 18:59	07:01 17:16	07:35 08:31-09:01/30 16:58 14:51-15:44/53
8	06:01 20:59	06:28 20:33	06:58 08:09-08:48/39 19:48	07:28 18:57	07:03 17:15	07:36 08:31-09:02/31 16:58 14:52-15:44/52
9	06:02 20:58	06:29 20:32	06:59 08:07-08:48/41 19:46	07:29 18:56	07:04 17:14	07:36 08:32-09:02/30 16:58 14:52-15:45/53
10	06:03 20:58	06:30 20:31	07:00 08:06-08:49/43 19:44	07:30 18:54	07:05 17:13	07:37 08:32-09:03/31 16:58 14:53-15:46/52
11	06:03 20:58	06:31 20:30	07:01 08:05-08:50/45 19:43	07:31 18:53	07:06 15:05-15:18/13 17:12	07:38 08:33-09:04/31 16:58 14:53-15:46/53
12	06:04 20:57	06:32 20:28	07:02 08:04-08:50/46 19:41	07:32 18:51	07:07 15:02-15:22/20 17:11	07:39 08:34-09:04/30 16:58 14:53-15:46/53
13	06:05 20:57	06:33 20:27	07:03 08:03-08:51/48 19:39	07:33 18:50	07:08 15:00-15:24/24 17:10	07:40 08:33-09:04/31 16:58 14:53-15:46/53
14	06:05 20:56	06:34 20:26	07:04 08:02-08:51/49 19:37	07:34 18:48	07:10 14:58-15:26/28 17:09	07:41 08:34-09:05/31 16:58 14:54-15:47/53
15	06:06 20:56	06:35 20:24	07:05 08:02-08:51/49 19:36	07:35 18:46	07:11 14:56-15:27/31 17:08	07:41 08:35-09:05/30 16:59 14:55-15:48/53
16	06:07 20:55	06:35 20:23	07:06 08:01-08:51/50 19:34	07:36 18:45	07:12 14:55-15:29/34 17:07	07:42 08:34-09:05/31 16:59 14:55-15:47/52
17	06:08 20:54	06:36 20:22	07:07 08:01-08:51/50 19:32	07:37 18:43	07:13 14:54-15:30/36 17:06	07:43 08:35-09:06/31 16:59 14:55-15:48/53
18	06:08 20:54	06:37 20:20	07:08 08:00-08:51/51 19:31	07:38 18:42	07:14 14:53-15:31/38 17:06	07:43 08:36-09:07/31 16:59 14:56-15:49/53
19	06:09 20:53	06:38 20:19	07:09 08:00-08:51/51 19:29	07:40 18:40	07:15 14:52-15:32/40 17:05	07:44 08:36-09:07/31 17:00 14:56-15:49/53
20	06:10 20:52	06:39 20:17	07:10 08:00-08:50/50 19:27	07:41 18:39	07:17 14:51-15:33/42 17:04	07:45 08:37-09:08/31 17:00 14:57-15:50/53
21	06:11 20:52	06:40 20:16	07:11 08:00-08:50/50 19:26	07:42 18:38	07:18 08:39-08:42/3 17:04 14:51-15:35/44	07:45 08:37-09:08/31 17:01 14:57-15:50/53
22	06:12 20:51	06:41 20:14	07:12 08:00-08:49/49 19:24	07:43 18:36	07:19 08:35-08:46/11 17:03 14:51-15:35/44	07:46 08:38-09:09/31 17:01 14:58-15:51/53
23	06:13 20:50	06:42 20:13	07:13 08:00-08:49/49 19:22	07:44 18:35	07:20 08:34-08:48/14 17:02 14:50-15:36/46	07:46 08:38-09:09/31 17:02 14:58-15:51/53
24	06:14 20:49	06:43 20:11	07:14 08:00-08:48/48 19:21	07:45 18:33	07:21 08:32-08:50/18 17:02 14:50-15:36/46	07:47 08:39-09:10/31 17:02 14:59-15:52/53
25	06:14 20:48	06:44 20:10	07:15 08:00-08:47/47 19:19	06:46 17:32	07:22 08:32-08:52/20 17:01 14:49-15:37/48	07:47 08:39-09:10/31 17:03 14:59-15:52/53
26	06:15 20:47	06:45 20:08	07:16 08:01-08:46/45 19:17	06:47 17:31	07:23 08:32-08:53/21 17:01 14:50-15:38/48	07:47 08:39-09:10/31 17:03 14:59-15:52/53
27	06:16 20:46	06:46 20:07	07:17 08:01-08:44/43 19:16	06:49 17:29	07:24 08:31-08:54/23 17:00 14:50-15:39/49	07:48 08:40-09:11/31 17:04 15:00-15:53/53
28	06:17 20:46	06:47 20:05	07:18 08:02-08:43/41 19:14	06:50 17:28	07:26 08:31-08:55/24 17:00 14:50-15:39/49	07:48 08:41-09:11/30 17:05 15:01-15:54/53
29	06:18 20:45	06:48 20:04	07:19 08:03-08:41/38 19:12	06:51 17:27	07:27 08:30-08:56/26 17:00 14:50-15:40/50	07:48 08:41-09:12/31 17:05 15:01-15:54/53
30	06:19 20:44	06:49 20:02	07:20 08:04-08:40/36 19:11	06:52 17:25	07:28 08:30-08:57/27 16:59 14:50-15:40/50	07:49 08:41-09:12/31 17:06 15:01-15:54/53
31	06:20 20:43	06:50 20:01	 	06:53 17:24	 	07:49 08:41-09:12/31 17:07 15:02-15:54/52
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	0	0	1215	95	967	2574

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: Shadow_cumulativo_beni_2021_12_13WTG: CH09 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (10)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 08:27-08:53/26 17:08	07:36 17:42	07:01 18:15	07:10 08:10-09:13/63 19:49	06:25 20:20	05:57 20:49
2	07:49 08:29-08:55/26 17:09	07:35 17:43	06:59 18:17	07:09 08:10-09:12/62 19:50	06:24 20:21	05:56 20:50
3	07:49 08:29-08:55/26 17:10	07:34 08:06-08:11/5 17:44	06:58 18:18	07:07 08:10-09:13/63 19:51	06:23 20:22	05:56 20:51
4	07:49 08:29-08:55/26 17:10	07:33 08:02-08:15/13 17:45	06:56 18:19	07:05 08:10-09:12/62 19:52	06:21 20:23	05:55 20:51
5	07:49 08:30-08:55/25 17:11	07:32 08:00-08:17/17 17:47	06:54 18:20	07:04 08:09-09:10/61 19:53	06:20 20:24	05:55 20:52
6	07:49 08:30-08:56/26 17:12	07:31 07:59-08:19/20 17:48	06:53 18:21	07:02 08:10-09:10/60 19:54	06:19 20:25	05:55 20:53
7	07:49 08:31-08:57/26 17:13	07:30 07:58-08:21/23 17:49	06:51 18:22	07:01 08:09-09:09/60 19:55	06:18 20:26	05:54 20:53
8	07:49 08:32-08:57/25 17:14	07:29 07:56-08:21/25 17:50	06:50 18:23	06:59 08:09-09:08/59 19:56	06:17 20:27	05:54 20:54
9	07:49 08:32-08:58/26 17:15	07:28 07:56-08:22/26 17:52	06:48 18:24	06:57 08:10-09:07/57 19:57	06:15 20:28	05:54 20:55
10	07:49 08:32-08:58/26 17:16	07:26 07:55-08:23/28 17:53	06:47 18:25	06:56 08:10-09:06/56 19:58	06:14 20:29	05:54 20:55
11	07:49 08:33-08:58/25 17:17	07:25 07:54-08:24/30 17:54	06:45 18:27	06:54 08:11-09:05/54 19:59	06:13 20:30	05:54 20:56
12	07:48 08:34-08:59/25 17:18	07:24 07:54-08:24/30 17:55	06:43 07:43-07:54/11 18:28	06:53 08:11-09:03/52 20:00	06:12 20:31	05:54 20:56
13	07:48 08:33-08:58/25 17:19	07:23 07:53-08:24/31 17:57	06:42 07:37-07:59/22 18:29	06:51 08:12-09:02/50 20:01	06:11 20:32	05:53 20:57
14	07:48 08:34-08:59/25 17:20	07:22 07:53-08:24/31 17:58	06:40 07:34-08:03/29 18:30	06:50 07:09-07:14/5 20:02	06:10 20:33	05:53 20:57
15	07:47 08:35-09:00/25 17:22	07:20 07:54-08:24/30 17:59	06:38 07:30-08:05/35 18:31	06:48 07:07-07:18/11 20:03	06:09 20:34	05:53 20:58
16	07:47 08:36-08:59/23 17:23	07:19 07:53-08:23/30 18:00	06:37 07:27-08:07/40 18:32	06:46 07:05-07:19/14 20:05	06:08 20:35	05:53 20:58
17	07:47 08:37-08:59/22 17:24	07:18 07:54-08:23/29 18:01	06:35 07:26-08:09/43 18:33	06:45 07:04-07:20/16 20:06	06:07 20:36	05:53 20:58
18	07:46 08:37-08:59/22 17:25	07:16 07:55-08:23/28 18:03	06:34 07:24-08:10/46 18:34	06:43 07:02-07:20/18 20:07	06:06 20:37	05:54 20:59
19	07:46 08:39-08:59/20 17:26	07:15 07:55-08:21/26 18:04	06:32 07:22-08:11/49 18:35	06:42 07:01-07:21/20 20:08	06:05 20:38	05:54 20:59
20	07:45 08:39-08:58/19 17:27	07:14 07:57-08:21/24 18:05	06:30 07:21-08:12/51 18:36	06:40 06:59-07:20/21 20:09	06:05 20:39	05:54 20:59
21	07:45 08:40-08:57/17 17:28	07:12 07:58-08:19/21 18:06	06:29 07:19-08:13/54 18:37	06:39 06:59-07:21/22 20:10	06:04 20:40	05:54 20:59
22	07:44 08:42-08:57/15 17:30	07:11 08:00-08:18/18 18:07	06:27 07:17-08:13/56 18:38	06:37 06:59-07:20/21 20:11	06:03 20:41	05:54 21:00
23	07:43 08:44-08:55/11 17:31	07:09 08:02-08:16/14 18:08	06:25 07:17-08:14/57 18:39	06:36 06:59-07:20/21 20:12	06:02 20:42	05:54 21:00
24	07:43 08:47-08:53/6 17:32	07:08 08:07-08:10/3 18:10	06:24 07:15-08:14/59 18:40	06:35 07:00-07:20/20 20:13	06:01 20:43	05:55 21:00
25	07:42 17:33	07:07 18:11	06:22 07:14-08:14/60 18:42	06:33 06:59-07:18/19 20:14	06:01 20:44	05:55 21:00
26	07:41 17:34	07:05 18:12	06:20 07:14-08:15/61 18:43	06:32 07:00-07:17/17 20:15	06:00 20:44	05:55 21:00
27	07:40 17:36	07:04 18:13	06:19 07:13-08:14/61 18:44	06:30 07:02-07:16/14 20:16	05:59 20:45	05:56 21:00
28	07:40 17:37	07:02 18:14	06:17 07:12-08:14/62 18:45	06:29 07:03-07:14/11 20:17	05:59 20:46	05:56 21:00
29	07:39 17:38		07:15 08:12-09:14/62 19:46	06:28 07:06-07:11/5 20:18	05:58 20:47	05:56 21:00
30	07:38 17:39		07:14 08:11-09:14/63 19:47	06:26 20:19	05:57 20:48	05:57 21:00
31	07:37 17:41		07:12 08:10-09:13/63 19:48		05:57 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	538	502	984	1321	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: Shadow_cumulativo_beni_2021_12_13WTG: CH09 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (10)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 21:00	06:21 20:41	06:51 08:10-09:04/54 19:59	07:21 08:20-08:36/16 19:09	06:54 07:25-07:52/27 17:23	07:29 08:15-08:40/25 16:59
2	05:58 21:00	06:22 20:40	06:52 08:09-09:05/56 19:57	07:22 19:07	06:55 07:26-07:52/26 17:21	07:30 08:15-08:41/26 16:59
3	05:58 21:00	06:23 20:39	06:53 08:08-09:05/57 19:56	07:23 19:06	06:57 07:26-07:51/25 17:20	07:31 08:15-08:41/26 16:58
4	05:59 21:00	06:24 20:38	06:54 08:07-09:06/59 19:54	07:24 19:04	06:58 07:27-07:49/22 17:19	07:32 08:16-08:41/25 16:58
5	05:59 20:59	06:25 20:37	06:55 08:06-09:06/60 19:52	07:25 19:02	06:59 07:29-07:49/20 17:18	07:33 08:16-08:42/26 16:58
6	06:00 20:59	06:26 20:36	06:56 08:05-09:05/60 19:51	07:26 19:01	07:00 07:31-07:47/16 17:17	07:34 08:16-08:42/26 16:58
7	06:01 20:59	06:27 20:35	06:57 08:04-09:05/61 19:49	07:27 18:59	07:01 07:32-07:45/13 17:16	07:35 08:17-08:42/25 16:58
8	06:01 20:59	06:28 20:33	06:58 08:04-09:06/62 19:47	07:28 18:57	07:02 07:38-07:41/3 17:15	07:36 08:17-08:43/26 16:58
9	06:02 20:58	06:29 20:32	06:59 08:03-09:06/63 19:46	07:29 18:56	07:04 17:14	07:36 08:17-08:43/26 16:58
10	06:02 20:58	06:30 20:31	07:00 08:03-09:06/63 19:44	07:30 18:54	07:05 17:13	07:37 08:18-08:44/26 16:58
11	06:03 20:57	06:31 20:30	07:01 08:03-09:05/62 19:42	07:31 18:53	07:06 17:12	07:38 08:18-08:44/26 16:58
12	06:04 20:57	06:32 20:28	07:02 08:02-09:05/63 19:41	07:32 18:51	07:07 17:11	07:39 08:19-08:45/26 16:58
13	06:05 20:57	06:32 20:27	07:03 08:02-09:05/63 19:39	07:33 18:49	07:08 17:10	07:40 08:18-08:44/26 16:58
14	06:05 20:56	06:33 07:12-07:20/8 20:26	07:04 08:02-09:05/63 19:37	07:34 18:48	07:10 17:09	07:40 08:19-08:45/26 16:58
15	06:06 20:55	06:34 07:10-07:22/12 20:24	07:05 08:02-09:04/62 19:36	07:35 18:46	07:11 17:08	07:41 08:20-08:46/26 16:58
16	06:07 20:55	06:35 07:08-07:23/15 20:23	07:06 08:02-09:04/62 19:34	07:36 18:45	07:12 17:07	07:42 08:19-08:45/26 16:59
17	06:08 20:54	06:36 07:07-07:24/17 20:22	07:07 08:02-09:03/61 19:32	07:37 18:43	07:13 17:06	07:43 08:20-08:46/26 16:59
18	06:08 20:54	06:37 07:06-07:25/19 20:20	07:08 08:02-09:02/60 19:31	07:38 08:36-08:44/8 18:42	07:14 08:20-08:27/7 17:06	07:43 08:21-08:47/26 16:59
19	06:09 20:53	06:38 07:05-07:25/20 20:19	07:09 08:03-09:02/59 19:29	07:40 08:32-08:47/15 18:40	07:15 08:18-08:29/11 17:05	07:44 08:21-08:47/26 17:00
20	06:10 20:52	06:39 07:05-07:26/21 20:17	07:10 08:03-09:01/58 19:27	07:41 08:30-08:49/19 18:39	07:17 08:17-08:32/15 17:04	07:45 08:22-08:47/25 17:00
21	06:11 20:52	06:40 07:04-07:26/22 08:32-08:47/15	07:11 08:03-09:00/57 19:26	07:42 08:28-08:50/22 18:37	07:18 08:16-08:33/17 17:04	07:45 08:22-08:47/25 17:01
22	06:12 20:51	06:41 07:04-07:26/22 08:27-08:50/23	07:12 08:04-08:58/54 19:24	07:43 08:27-08:52/25 18:36	07:19 08:15-08:34/19 17:03	07:46 08:23-08:48/25 17:01
23	06:13 20:50	06:42 07:03-07:24/21 08:24-08:52/28	07:13 08:05-08:57/52 19:22	07:44 08:26-08:52/26 18:35	07:20 08:15-08:35/20 17:02	07:46 08:23-08:48/25 17:02
24	06:14 20:49	06:43 07:04-07:24/20 08:21-08:55/34	07:14 08:06-08:56/50 19:21	07:45 08:24-08:53/29 18:33	07:21 08:14-08:36/22 17:02	07:47 08:24-08:50/26 17:02
25	06:14 20:48	06:44 07:05-07:23/18 08:19-08:56/37	07:15 08:07-08:54/47 19:19	07:46 07:23-07:53/30 17:32	07:22 08:15-08:37/22 17:01	07:47 08:24-08:50/26 17:03
26	06:15 20:47	06:45 07:06-07:22/16 08:18-08:58/40	07:16 08:08-08:52/44 19:17	07:47 07:23-07:53/30 17:30	07:23 08:15-08:38/23 17:01	07:47 08:24-08:50/26 17:03
27	06:16 20:46	06:46 07:07-07:20/13 08:16-08:59/43	07:17 08:08-08:49/41 19:16	07:48 07:23-07:54/31 17:29	07:24 08:14-08:39/25 17:00	07:48 08:25-08:51/26 17:04
28	06:17 20:46	06:47 07:08-07:18/10 08:15-09:00/45	07:18 08:10-08:47/37 19:14	07:49 07:23-07:54/31 17:28	07:26 08:14-08:39/25 17:00	07:48 08:25-08:51/26 17:05
29	06:18 20:45	06:48 07:10-07:14/4 08:13-09:01/48	07:19 08:12-08:44/32 19:12	07:51 07:23-07:53/30 17:26	07:27 08:14-08:39/25 16:59	07:48 08:26-08:52/26 17:05
30	06:19 20:44	06:49 08:12-09:02/50 20:02	07:20 08:16-08:41/25 19:10	07:52 07:23-07:53/30 17:25	07:28 08:15-08:40/25 16:59	07:49 08:26-08:52/26 17:06
31	06:20 20:43	06:50 08:11-09:03/52 20:00		06:53 07:24-07:52/28 17:24		07:49 08:27-08:53/26 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	0	673	1647	370	408	799

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: Shadow_cumulativo_beni_2021_12_13WTG: CH10 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (11)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 08:31-09:24/53 17:08	07:36 17:42 18:15	07:01 18:15	07:10 19:49 20:20	06:25 20:20	05:57 20:49
2	07:49 08:32-09:25/53 17:09	07:35 17:43 18:17	06:59 18:17	07:09 19:50 20:21	06:24 20:21	05:56 20:50
3	07:49 08:33-09:25/52 17:10	07:34 17:44 18:18	06:58 18:18	07:07 19:51 20:22	06:23 20:22	05:56 20:51
4	07:49 08:34-09:26/52 17:10	07:33 17:45 18:19	06:56 18:19	07:05 19:52 20:23	06:21 20:23	05:55 20:51
5	07:49 08:35-09:26/51 17:11	07:32 17:47 18:20	06:54 18:20	07:04 19:53 20:24	06:20 20:24	05:55 20:52
6	07:49 08:36-09:26/50 17:12	07:31 17:48 18:21	06:53 18:21	07:02 19:54 20:25	06:19 20:25	05:55 20:53
7	07:49 08:37-09:27/50 17:13	07:30 17:49 18:22	06:51 18:22	07:01 19:55 20:26	06:18 20:26	05:54 20:53
8	07:49 08:39-09:27/48 17:14	07:29 17:50 18:23	06:50 18:23	06:59 19:56 20:27	06:17 20:27	05:54 20:54
9	07:49 08:41-09:28/47 17:15	07:28 17:52 18:24	06:48 18:24	06:57 19:57 20:28	06:15 20:28	05:54 20:55
10	07:49 08:44-08:45/1 17:16	07:26 07:26 17:53	06:47 18:25	06:56 19:58 20:29	06:14 20:29	05:54 20:55
11	07:49 08:48-09:28/40 17:17	07:25 17:54 18:27	06:45 18:27	06:54 19:59 20:30	06:13 20:30	05:54 20:56
12	07:48 08:49-09:28/39 17:18	07:24 17:55 18:28	06:43 18:28	07:02-07:15/13 20:00	06:12 20:31	05:54 20:56
13	07:48 08:49-09:27/38 17:19	07:23 17:57 18:29	06:42 18:29	07:00-07:15/15 20:01	06:11 20:32	05:53 20:57
14	07:48 08:50-09:28/38 17:20	07:22 17:58 18:30	06:40 18:30	06:59-07:16/17 20:02	06:10 20:33	05:53 20:57
15	07:47 08:51-09:28/37 17:22	07:20 17:59 18:31	06:38 18:31	06:57-07:16/19 20:03	06:09 20:34	05:53 20:58
16	07:47 08:51-09:28/37 17:23	07:19 18:00 18:32	06:37 18:32	06:56-07:16/20 20:05	06:08 20:35	05:53 20:58
17	07:47 08:53-09:28/35 17:24	07:18 18:01 18:33	06:35 18:33	06:57-07:16/19 20:06	06:07 20:36	05:53 20:58
18	07:46 08:53-09:27/34 17:25	07:16 18:03 18:34	06:33 18:34	06:56-07:15/19 20:07	06:06 20:37	05:54 20:59
19	07:46 08:54-09:26/32 17:26	07:15 18:04 18:35	06:32 18:35	06:56-07:14/18 20:08	06:05 20:38	05:54 20:59
20	07:45 08:55-09:26/31 17:27	07:14 18:05 18:36	06:30 18:36	06:58-07:13/15 20:09	06:05 20:39	05:54 20:59
21	07:44 08:56-09:25/29 17:28	07:12 18:06 18:37	06:29 18:37	06:58-07:11/13 20:10	06:04 20:40	05:54 20:59
22	07:44 08:58-09:25/27 17:30	07:11 18:07 18:38	06:27 18:38	07:00-07:08/8 20:11	06:03 20:41	05:54 21:00
23	07:43 08:59-09:24/25 17:31	07:09 18:08 18:39	06:25 18:39	20:12	06:02 20:42	05:54 21:00
24	07:43 09:01-09:22/21 17:32	07:08 18:10 18:40	06:24 18:40	06:35 20:13	06:01 20:43	05:55 21:00
25	07:42 09:03-09:21/18 17:33	07:07 18:11 18:42	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00
26	07:41 09:05-09:18/13 17:34	07:05 18:12 18:43	06:20 18:43	06:32 20:15	06:00 20:44	05:55 21:00
27	07:40 17:34 17:36	07:04 18:13 18:44	06:19 18:44	06:30 20:16	05:59 20:45	05:56 21:00
28	07:40 17:37 17:39	07:02 18:14 18:45	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00
29	07:39 17:38 17:38	07:01 18:15 19:46	07:15 19:46	06:28 20:18	05:58 20:47	05:56 21:00
30	07:38 17:39 17:41	07:00 18:16 19:47	07:14 19:47	06:26 20:19	05:58 20:48	05:57 21:00
31	07:37 17:41	07:00 18:17 19:48	07:12 19:48	06:25 20:20	05:57 20:49	05:57 21:00
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	991	0	185	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: Shadow_cumulativo_beni_2021_12_13WTG: CH10 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (11)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:57 21:00	06:21 20:41	06:51 19:59	07:21 07:41-07:55/14 19:09	06:54 17:23	07:29 08:30-09:10/40 16:59
2	05:58 21:00	06:22 20:40	06:52 19:57	07:22 07:42-07:53/11 19:07	06:55 17:22	07:30 08:30-09:10/40 16:59
3	05:58 21:00	06:23 20:39	06:53 19:56	07:23 07:43-07:50/7 19:06	06:57 17:20	07:31 08:24-09:11/47 16:58
4	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 08:23-09:11/48 16:58
5	05:59 20:59	06:25 20:37	06:55 19:52	07:25 19:02	06:59 17:18	07:33 08:22-09:12/50 16:58
6	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 08:22-09:12/50 16:58
7	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 17:16	07:35 08:22-09:13/51 16:58
8	06:01 20:59	06:28 20:33	06:58 19:47	07:28 18:57	07:02 17:15	07:35 08:22-09:14/52 16:58
9	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:04 17:14	07:36 08:22-09:14/52 16:58
10	06:02 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:37 08:22-09:15/53 16:58
11	06:03 20:57	06:31 20:30	07:01 19:42	07:31 18:53	07:06 17:12	07:38 08:22-09:15/53 16:58
12	06:04 20:57	06:32 20:28	07:02 19:41	07:32 18:51	07:07 17:11	07:39 08:22-09:15/53 16:58
13	06:05 20:57	06:32 20:27	07:03 19:39	07:33 18:49	07:08 17:10	07:40 08:22-09:16/54 16:58
14	06:05 20:56	06:33 20:26	07:04 19:37	07:34 18:48	07:10 17:09	07:40 08:23-09:16/53 16:58
15	06:06 20:55	06:34 20:24	07:05 19:36	07:35 18:46	07:11 17:08	07:41 08:23-09:17/54 16:58
16	06:07 20:55	06:35 20:23	07:06 19:34	07:36 18:45	07:12 08:39-08:52/13 17:07	07:42 08:23-09:17/54 16:59
17	06:08 20:54	06:36 20:22	07:07 19:32	07:37 18:43	07:13 08:36-08:55/19 17:06	07:43 08:24-09:18/54 16:59
18	06:08 20:54	06:37 20:20	07:08 19:31	07:38 18:42	07:14 08:35-08:56/21 17:06	07:43 08:24-09:19/55 16:59
19	06:09 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:15 08:33-08:58/25 17:05	07:44 08:24-09:19/55 17:00
20	06:10 20:52	06:39 20:17	07:10 19:27	07:41 18:39	07:17 08:32-08:59/27 17:04	07:44 08:25-09:19/54 17:00
21	06:11 20:51	06:40 20:16	07:11 07:48-07:53/5 19:26	07:42 18:37	07:18 08:32-09:01/29 17:04	07:45 08:25-09:19/54 17:01
22	06:12 20:51	06:41 20:14	07:12 07:44-07:56/12 19:24	07:43 18:36	07:19 08:31-09:02/31 17:03	07:46 08:26-09:20/54 17:01
23	06:13 20:50	06:42 20:13	07:13 07:42-07:57/15 19:22	07:44 18:35	07:20 08:31-09:03/32 17:02	07:46 08:26-09:20/54 17:02
24	06:14 20:49	06:43 20:11	07:14 07:41-07:58/17 19:21	07:45 18:33	07:21 08:30-09:04/34 17:02	07:47 08:27-09:22/55 17:02
25	06:14 20:48	06:44 20:10	07:15 07:40-07:58/18 19:19	06:46 17:32	07:22 08:30-09:05/35 17:01	07:47 08:27-09:22/55 17:03
26	06:15 20:47	06:45 20:08	07:16 07:39-07:59/20 19:17	06:47 17:30	07:23 08:30-09:07/37 17:01	07:47 08:27-09:22/55 17:03
27	06:16 20:46	06:46 20:07	07:17 07:39-07:58/19 19:16	06:48 17:29	07:24 08:30-09:07/37 17:00	07:48 08:29-09:23/54 17:04
28	06:17 20:45	06:47 20:05	07:18 07:38-07:58/20 19:14	06:50 17:28	07:26 08:30-09:08/38 17:00	07:48 08:29-09:23/54 17:05
29	06:18 20:45	06:48 20:04	07:19 07:39-07:57/18 19:12	06:51 17:26	07:27 08:30-09:08/38 16:59	07:48 08:29-09:23/54 17:05
30	06:19 20:44	06:49 20:02	07:20 07:40-07:56/16 19:10	06:52 17:25	07:28 08:30-09:09/39 16:59	07:49 08:30-09:24/54 17:06
31	06:20 20:42	06:50 20:00		06:53 17:24		07:49 08:30-09:24/54 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	0	0	160	32	455	1619

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:

Impianto_WPD_Chiaramonti

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:

13/12/2021 10:15/3.4.415

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_beni_2021_12_13WTG: CH11 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (17)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:49 17:08	07:36 08:11-08:45/34 17:42	07:01 18:15	07:10 19:49	06:25 20:20	05:57 20:49	05:57 21:00	06:21 20:41	06:51 19:59	07:21 19:09	06:54 07:45-08:12/27 17:23	07:29 16:59	
2	07:49 17:09	07:35 08:11-08:45/34 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:56 20:50	05:58 21:00	06:22 20:40	06:52 19:57	07:22 19:07	06:55 07:43-08:13/30 17:22	07:30 16:59	
3	07:49 17:10	07:34 08:11-08:45/34 17:44	06:58 18:18	07:07 19:51	06:23 20:22	05:56 20:51	05:58 21:00	06:23 20:39	06:53 19:56	07:23 19:06	06:57 07:43-08:13/30 17:20	07:31 16:58	
4	07:49 17:11	07:33 08:12-08:45/33 17:46	06:56 18:19	07:06 19:52	06:21 20:23	05:56 20:51	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 07:42-08:14/32 17:19	07:32 16:58	
5	07:49 17:11	07:32 08:12-08:45/33 17:47	06:54 18:20	07:04 19:53	06:20 20:24	05:55 20:52	05:59 20:59	06:25 20:37	06:55 19:52	07:25 19:02	06:59 07:42-08:15/33 17:18	07:33 16:58	
6	07:49 17:12	07:31 08:12-08:45/33 17:48	06:53 18:21	07:02 19:54	06:19 20:25	05:55 20:53	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 07:42-08:15/33 17:17	07:34 16:58	
7	07:49 17:13	07:30 08:13-08:45/32 17:49	06:51 18:22	07:01 19:55	06:18 20:26	05:55 20:53	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 07:41-08:15/34 17:16	07:35 16:58	
8	07:49 17:14	07:29 08:13-08:43/30 17:50	06:50 18:23	06:59 19:56	06:17 20:27	05:54 20:54	06:01 20:59	06:28 20:33	06:58 19:47	07:28 18:57	07:02 07:42-08:16/34 17:15	07:36 16:58	
9	07:49 17:15	07:28 08:14-08:43/29 17:52	06:48 18:24	06:57 19:57	06:15 20:28	05:54 20:55	06:02 20:58	06:29 20:32	06:59 19:46	07:29 18:56	07:04 07:42-08:16/34 17:14	07:36 16:58	
10	07:49 17:16	07:26 08:15-08:42/27 17:53	06:47 18:25	06:56 19:58	06:14 20:29	05:54 20:55	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 07:42-08:16/34 17:13	07:37 16:58	
11	07:49 17:17	07:25 08:16-08:41/25 17:54	06:45 18:27	06:54 19:59	06:13 20:30	05:54 20:56	06:03 20:57	06:31 20:30	07:01 19:42	07:31 18:53	07:06 07:42-08:15/33 17:12	07:38 16:58	
12	07:48 17:18	07:24 08:18-08:40/22 17:55	06:43 18:28	06:53 20:00	06:12 20:31	05:54 20:56	06:04 20:57	06:32 20:28	07:02 19:41	07:32 18:51	07:07 07:43-08:16/33 17:11	07:39 16:58	
13	07:48 17:19	07:23 08:19-08:38/19 17:57	06:42 18:29	06:51 20:01	06:11 20:32	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:08 07:43-08:16/33 17:10	07:40 16:58	
14	07:48 17:21	07:22 08:22-08:36/14 17:58	06:40 18:30	06:50 20:02	06:10 20:33	05:53 20:57	06:05 20:56	06:34 20:26	07:04 19:37	07:34 18:48	07:10 07:43-08:15/32 17:09	07:41 16:58	
15	07:47 17:22	07:20 08:27-08:31/4 17:59	06:38 18:31	06:48 20:04	06:09 20:34	05:53 20:58	06:06 20:55	06:35 20:24	07:05 19:36	07:35 18:46	07:11 07:44-08:15/31 17:08	07:42 16:59	
16	07:47 17:23	07:19 18:00	06:37 18:32	06:46 20:05	06:08 20:35	05:53 20:58	06:07 20:55	06:35 20:23	07:06 19:34	07:36 18:45	07:12 07:45-08:15/30 17:07	07:42 16:59	
17	07:47 17:24	08:22-08:27/5 18:01	06:35 18:33	06:45 20:06	06:07 20:36	05:54 20:58	06:08 20:54	06:36 20:22	07:07 19:32	07:37 18:43	07:13 07:46-08:14/28 17:06	07:43 16:59	
18	07:46 17:25	08:19-08:30/11 18:03	06:34 18:34	06:43 20:07	06:06 20:37	05:54 20:59	06:08 20:54	06:37 20:20	07:08 19:31	07:38 18:42	07:14 07:47-08:14/27 17:06	07:43 16:59	
19	07:46 17:26	08:17-08:33/16 18:04	06:32 18:35	06:42 20:08	06:05 20:38	05:54 20:59	06:09 20:53	06:38 20:19	07:09 19:29	07:40 18:40	07:15 07:47-08:13/26 17:05	07:44 17:00	
20	07:45 17:27	08:16-08:35/19 18:05	06:30 18:36	06:40 20:09	06:05 20:39	05:54 20:59	06:10 20:52	06:39 20:17	07:10 19:27	07:41 18:39	07:17 07:49-08:13/24 17:04	07:45 17:00	
21	07:45 17:29	08:15-08:36/21 18:06	06:29 18:37	06:39 20:10	06:04 20:40	05:54 20:59	06:11 20:52	06:40 20:16	07:11 19:26	07:42 18:38	07:18 07:51-08:12/21 17:04	07:45 17:01	
22	07:44 17:30	08:14-08:38/24 18:07	06:27 18:38	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:41 20:14	07:12 19:24	07:43 18:36	07:19 07:52-08:11/19 17:03	07:46 17:01	
23	07:43 17:31	08:13-08:39/26 18:08	06:25 18:39	06:36 20:12	06:02 20:42	05:54 21:00	06:13 20:50	06:42 20:13	07:13 19:22	07:44 18:35	07:20 07:53-08:09/16 17:02	07:46 17:02	
24	07:43 17:32	08:13-08:40/27 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:43 20:11	07:14 19:21	07:45 18:33	07:21 07:55-08:07/12 17:02	07:47 17:02	
25	07:42 17:33	08:12-08:40/28 18:11	06:22 18:42	06:33 20:14	06:01 20:44	05:55 21:00	06:14 20:48	06:44 20:10	07:15 19:19	07:46 17:32	07:22 07:59-08:04/5 17:01	07:47 17:03	
26	07:41 17:34	08:12-08:42/30 18:12	06:20 18:43	06:32 20:15	06:00 20:44	05:55 21:00	06:15 20:47	06:45 20:08	07:16 19:17	07:47 17:31	07:23 17:01	07:47 17:03	
27	07:40 17:36	08:12-08:43/31 18:13	06:19 18:44	06:30 20:16	05:59 20:45	05:56 21:00	06:16 20:46	06:46 20:07	07:17 19:16	07:48 17:29	07:24 07:55-08:03/8 17:00	07:48 17:04	
28	07:40 17:37	08:11-08:43/32 18:14	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:00	06:17 20:46	06:47 20:05	07:18 19:14	07:49 17:28	06:50 07:51-08:06/15 17:00	07:48 17:05	
29	07:39 17:38	08:11-08:44/33 18:15	07:15 19:46	06:28 20:18	05:58 20:47	05:56 21:00	06:18 20:45	06:48 20:04	07:19 19:12	07:50 17:27	06:51 07:48-08:08/20 17:00	07:48 17:05	
30	07:38 17:39	08:11-08:44/33 18:16	07:14 19:47	06:26 20:19	05:58 20:48	05:57 21:00	06:19 20:44	06:49 20:02	07:20 19:11	07:51 17:25	06:52 07:46-08:09/23 16:59	07:49 17:06	
31	07:37 17:41	08:11-08:45/34 18:17	07:12 19:48	06:25 20:19	05:57 20:49	05:56 21:00	06:20 20:43	06:50 20:00	07:21 17:24	07:52 17:24	06:53 07:45-08:10/25 17:00	07:49 17:07	
	Potential sun hours Sum of minutes with flicker	298 370	298 403	370 0	398 0	447 0	451 0	458 0	427 0	375 0	346 91	299 691	289 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: Shadow_cumulativo_beni_2021_12_13WTG: CH12 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (16)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:21	05:57 20:50	18:38-19:50/72 21:00	05:58 20:42	18:44-19:58/74 20:42	06:21 19:59	18:57-19:49/52 19:09	06:51 17:23	07:21 16:59
2	07:50 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:22	05:57 20:50	18:39-19:51/72 21:00	05:58 20:41	18:44-19:57/73 20:41	06:22 19:58	18:58-19:48/50 19:07	06:52 17:22	07:22 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	18:39-19:52/73 21:00	05:59 20:40	18:44-19:58/74 20:40	06:23 19:56	18:59-19:47/48 19:06	06:53 17:21	07:23 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	18:38-19:51/73 21:00	05:59 20:39	18:44-19:57/73 20:39	06:24 19:54	19:01-19:45/44 19:04	06:54 17:19	07:24 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	18:39-19:52/73 21:00	06:00 20:37	18:45-19:58/73 20:37	06:25 19:53	19:02-19:43/41 19:03	06:55 17:18	07:25 16:58
6	07:50 17:13	07:31 17:48	06:53 18:21	07:03 19:54	06:19 20:26	05:55 20:53	18:39-19:52/73 21:00	06:00 20:36	18:45-19:59/74 20:36	06:26 19:51	19:04-19:42/38 19:01	06:56 17:17	07:26 16:58
7	07:50 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	18:39-19:52/73 20:59	06:01 20:59	18:45-19:58/73 20:59	06:27 20:35	19:06-19:39/33 19:49	06:57 17:16	07:27 16:58
8	07:50 17:15	07:29 17:51	06:50 18:24	06:59 19:57	06:17 20:28	05:55 20:54	18:39-19:52/73 20:59	06:01 20:59	18:46-19:58/72 20:59	06:28 20:34	19:09-19:36/27 19:48	06:58 17:15	07:28 16:58
9	07:49 17:16	07:28 17:52	06:48 18:25	06:48 19:58	06:16 20:29	05:54 20:55	18:39-19:53/74 20:59	06:02 20:59	18:45-19:58/73 20:59	06:29 20:33	19:12-19:32/20 19:46	06:59 17:14	07:29 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:59	06:15 20:30	05:54 20:55	18:39-19:53/74 20:58	06:03 20:58	18:46-19:58/72 20:58	06:30 20:31	19:18-19:25/7 19:44	07:00 17:13	07:30 16:58
11	07:49 17:18	07:26 17:54	06:45 18:27	06:55 20:00	06:13 20:31	05:54 20:56	18:47-19:38/51 20:56	06:03 20:58	18:46-19:59/73 20:58	06:31 20:30	19:01 18:53	07:31 17:12	07:06 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:57	18:46-19:39/53 20:57	06:04 20:57	18:47-19:59/72 20:57	06:32 20:29	19:02 18:51	07:32 17:11	07:08 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	18:45-19:40/55 20:57	06:05 20:57	18:46-19:58/72 20:57	06:33 20:27	19:03 19:39	07:33 18:50	07:09 17:10
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	18:44-19:41/57 20:57	06:06 20:56	18:47-19:58/71 20:56	06:34 20:26	19:04 18:48	07:34 17:09	07:10 16:59
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	18:43-19:41/58 20:58	06:06 20:56	18:48-19:58/70 20:56	06:35 20:25	19:05 19:36	07:36 18:47	07:11 17:08
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	18:43-19:43/60 20:58	06:07 20:55	18:47-19:58/71 20:55	06:36 20:23	19:06 18:45	07:37 17:08	07:12 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 20:37	05:54 20:59	18:42-19:44/62 20:59	06:08 20:55	18:48-19:58/70 20:55	06:37 20:22	19:07 19:33	07:38 18:44	07:13 17:07
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:38	05:54 20:59	18:41-19:44/63 20:59	06:09 20:54	18:48-19:58/70 20:54	06:38 20:20	19:08 19:31	07:39 18:42	07:15 17:06
19	07:46 17:26	07:15 18:04	06:32 18:36	06:42 20:08	06:06 20:39	05:54 20:59	18:41-19:45/64 20:59	06:10 20:53	18:49-19:58/69 20:53	06:39 20:19	19:09 19:29	07:40 18:41	07:16 17:05
20	07:45 17:28	07:14 18:05	06:31 18:37	06:41 20:09	06:05 20:39	05:54 21:00	18:40-19:45/65 21:00	06:10 20:53	18:49-19:57/68 20:53	06:40 20:18	19:10 19:28	07:41 18:39	07:17 17:04
21	07:45 17:29	07:13 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	18:40-19:46/66 21:00	06:11 20:52	18:49-19:56/67 20:52	06:41 20:16	19:11 19:26	07:42 18:38	07:18 17:04
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	18:40-19:47/67 21:00	06:12 20:51	18:50-19:56/66 20:51	06:42 20:15	19:12 19:24	07:43 18:36	07:19 17:03
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24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	18:39-19:47/68 21:00	06:14 20:49	18:51-19:55/64 20:49	06:44 20:12	19:14 19:24	07:45 18:34	07:21 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:34 20:14	06:01 20:44	05:55 21:00	18:39-19:48/69 21:00	06:15 20:49	18:52-19:55/63 20:49	06:45 20:10	19:15 19:19	07:46 17:32	07:22 17:01
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:56 21:01	18:38-19:48/70 21:01	06:16 20:48	18:52-19:55/63 20:48	06:46 20:09	19:16 19:18	07:47 17:31	07:23 17:01
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:46	05:56 21:01	18:39-19:49/70 21:01	06:16 20:47	18:53-19:54/61 20:47	06:47 20:07	19:17 19:16	07:48 17:29	07:24 17:01
28	07:40 17:37	07:02 18:15	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:01	18:38-19:49/71 21:01	06:17 20:46	18:53-19:52/59 20:46	06:48 20:06	19:18 19:14	07:49 17:28	07:25 17:00
29	07:39 17:38	07:01 18:16	06:16 18:46	06:28 20:18	05:59 20:47	05:57 21:01	18:39-19:50/71 21:01	06:18 20:45	18:54-19:52/58 20:45	06:49 20:04	19:19 19:12	07:50 17:27	07:26 17:00
30	07:38 17:40	07:00 18:17	06:14 18:47	06:27 20:19	05:58 20:48	05:57 21:01	18:38-19:50/72 21:01	06:19 20:44	18:55-19:51/56 20:44	06:49 20:02	19:20 19:11	07:51 17:26	07:27 17:00
31	07:37 17:41	07:00 18:18	06:12 18:48	06:25 20:20	05:57 20:49	05:57 20:49	18:39-19:50/71 20:49	06:20 20:43	18:56-19:50/54 20:43	06:50 20:01	19:21 17:24	07:52 17:25	07:28 17:01
Potential sun hours	298	298	370	398	447	451	458	427	360	375	346	299	289
Sum of minutes with flicker	0	0	0	0	1623	2208	2114	427	360	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: Shadow_cumulativo_beni_2021_12_13WTG: CH13 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (18)
Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 16:30-16:43/13	07:36 16:31-17:09/38	07:01 17:11	06:25 07:07	05:57 06:25	05:58 06:25	06:21 07:01	06:51 07:21	07:21 07:51	06:55 16:12-16:30/18	07:29 16:09-16:34/25	
2	07:49 16:30-16:44/14	07:35 16:31-17:09/38	06:59 17:43	06:59 07:09	06:24 05:57	05:58 06:22	06:22 06:52	07:22 07:52	08:22 08:52	06:56 16:09-16:32/23	07:30 16:10-16:33/23	
3	07:50 16:30-16:44/14	07:34 16:32-17:08/36	06:58 17:45	06:58 07:07	06:23 05:56	05:59 06:23	06:53 07:23	07:23 07:53	08:23 08:53	06:57 16:07-16:32/26	07:31 16:11-16:33/22	
4	07:50 16:29-16:45/16	07:33 16:33-17:08/35	06:56 17:46	06:56 07:06	06:22 05:56	05:59 06:24	06:54 07:24	07:24 07:54	08:24 08:54	06:58 16:07-16:35/28	07:32 16:12-16:33/21	
5	07:50 16:29-16:46/17	07:32 16:34-17:07/33	06:55 17:47	06:55 07:04	06:20 05:55	06:00 06:25	06:55 07:25	07:25 07:55	08:25 08:55	06:59 16:05-16:36/31	07:33 16:13-16:33/20	
6	07:50 16:28-16:46/18	07:31 16:36-17:06/30	06:53 17:48	06:53 07:03	06:19 05:55	06:00 06:26	06:56 07:26	07:26 07:56	08:26 08:56	07:00 16:04-16:37/33	07:34 16:14-16:33/19	
7	07:50 16:28-16:48/20	07:30 16:37-17:05/28	06:52 17:49	06:52 07:01	06:18 05:55	06:01 06:27	06:57 07:27	07:27 07:57	08:27 08:57	07:02 16:03-16:38/35	07:35 16:15-16:32/17	
8	07:49 16:28-16:49/21	07:29 16:39-17:04/25	06:50 17:51	06:50 06:59	06:17 05:55	06:01 06:28	06:58 07:28	07:28 07:58	08:28 08:58	07:03 16:03-16:39/36	07:36 16:16-16:32/16	
9	07:49 16:28-16:50/22	07:28 16:40-17:02/22	06:48 17:52	06:48 06:58	06:16 05:54	06:02 06:29	06:59 07:29	07:29 07:59	08:29 08:59	07:04 16:02-16:40/38	07:37 16:18-16:33/15	
10	07:49 16:28-16:51/23	07:27 16:43-16:59/16	06:47 17:53	06:47 06:56	06:15 05:54	06:03 06:30	07:00 07:30	08:00 08:30	09:00 09:30	07:05 16:02-16:40/38	07:38 16:19-16:33/14	
11	07:49 16:27-16:52/25	07:26 16:47-16:56/9	06:45 18:27	06:45 06:55	06:14 05:54	06:03 06:31	07:01 07:31	08:01 08:31	09:01 09:31	07:06 16:01-16:40/39	07:38 16:20-16:33/13	
12	07:49 16:28-16:53/25	07:24 17:54	06:44 18:28	06:44 06:53	06:12 05:54	06:04 06:32	07:02 07:32	08:02 08:32	09:02 09:32	07:07 16:02-16:41/39	07:39 16:21-16:33/12	
13	07:48 16:28-16:55/27	07:23 17:56	06:42 18:29	06:42 06:51	06:11 05:54	06:05 06:33	07:03 07:33	08:03 08:33	09:03 09:33	07:09 16:01-16:41/40	07:40 16:22-16:32/10	
14	07:48 16:27-16:55/28	07:22 17:57	06:40 18:30	06:40 06:50	06:10 05:54	06:06 06:34	07:04 07:34	08:04 08:34	09:04 09:34	07:10 16:01-16:42/41	07:41 16:23-16:33/10	
15	07:48 16:28-16:57/29	07:21 17:58	06:39 18:31	06:39 06:48	06:09 05:54	06:06 06:35	07:05 07:35	08:05 08:35	09:05 09:35	07:11 16:01-16:42/41	07:41 16:24-16:33/9	
16	07:47 16:27-16:58/31	07:19 18:00	06:37 18:32	06:37 06:47	06:08 05:54	06:07 06:36	07:06 07:36	08:06 08:36	09:06 09:36	07:12 16:02-16:43/41	07:42 16:25-16:34/9	
17	07:47 16:27-16:59/32	07:18 18:02	06:35 18:33	06:35 06:45	06:08 05:54	06:08 06:37	07:07 07:37	08:07 08:37	09:07 09:37	07:13 16:02-16:43/41	07:43 16:26-16:34/8	
18	07:46 16:27-17:00/33	07:17 18:03	06:34 18:34	06:34 06:44	06:07 05:54	06:09 06:38	07:08 07:38	08:08 08:38	09:08 09:38	07:15 16:02-16:42/40	07:44 16:27-16:34/7	
19	07:46 16:28-17:02/34	07:15 18:04	06:32 18:35	06:32 06:42	06:06 05:54	06:10 06:39	07:09 07:39	08:09 08:39	09:09 09:39	07:16 16:02-16:41/39	07:44 16:27-16:34/7	
20	07:45 16:27-17:03/36	07:14 18:05	06:30 18:37	06:30 06:41	06:05 05:54	06:10 06:40	07:10 07:41	08:10 08:41	09:10 09:41	07:17 16:03-16:41/38	07:45 16:28-16:35/7	
21	07:45 16:27-17:04/37	07:13 18:06	06:29 18:38	06:29 06:39	06:04 05:54	06:11 06:41	07:11 07:42	08:11 08:42	09:11 09:42	07:18 16:03-16:40/37	07:45 16:29-16:35/6	
22	07:44 16:28-17:06/38	07:11 18:08	06:27 18:39	06:27 06:38	06:03 05:54	06:12 06:42	07:12 07:43	08:12 08:43	09:12 09:43	07:19 16:03-16:39/36	07:46 16:30-16:36/6	
23	07:44 16:28-17:07/39	07:10 18:09	06:26 18:40	06:26 06:36	06:02 05:55	06:13 06:43	07:13 07:44	08:13 08:44	09:13 09:44	07:20 16:04-16:38/34	07:46 16:30-16:36/6	
24	07:43 16:28-17:08/40	07:08 18:10	06:24 18:41	06:24 06:35	06:02 05:55	06:14 06:44	07:14 07:45	08:14 08:45	09:14 09:45	07:21 16:04-16:37/33	07:47 16:30-16:37/7	
25	07:42 16:28-17:09/41	07:07 18:11	06:22 18:42	06:22 06:34	06:01 05:55	06:15 06:45	07:15 07:46	08:15 08:46	09:15 09:46	07:22 16:05-16:37/32	07:47 16:30-16:37/7	
26	07:41 16:29-17:10/41	07:05 18:12	06:21 18:43	06:21 06:32	06:00 05:56	06:16 06:46	07:16 07:47	08:16 08:47	09:16 09:47	07:24 16:06-16:37/31	07:48 16:30-16:37/7	
27	07:41 16:29-17:10/41	07:04 18:13	06:19 18:44	06:19 06:31	06:00 05:56	06:17 06:47	07:17 07:48	08:17 08:48	09:17 09:48	07:25 16:07-16:36/29	07:48 16:31-16:39/8	
28	07:40 16:29-17:10/41	07:02 18:15	06:17 18:45	06:17 06:29	05:59 05:56	06:17 06:48	07:18 07:49	08:18 08:49	09:18 09:49	07:26 16:07-16:35/28	07:48 16:30-16:39/9	
29	07:39 16:29-17:10/41	07:01 18:16	06:16 18:46	06:16 06:28	05:59 05:57	06:18 06:48	07:19 07:50	08:19 08:50	09:19 09:50	07:27 16:08-16:35/27	07:49 16:30-16:40/10	
30	07:38 16:30-17:09/39	07:00 18:17	06:14 18:47	06:14 06:27	05:58 05:57	06:19 06:49	07:20 07:51	08:20 08:51	09:20 09:51	07:28 16:09-16:34/25	07:49 16:30-16:40/10	
31	07:37 16:30-17:09/39	07:00 18:17	06:14 18:47	06:14 06:27	05:58 05:57	06:19 06:49	07:20 07:51	08:20 08:51	09:20 09:51	07:28 16:09-16:34/25	07:49 16:30-16:40/10	
	Potential sun hours	298	298	370	398	447	451	458	427	375	346	299
	Sum of minutes with flicker	915	310	0	0	0	0	0	0	0	11	1017
												372

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: Shadow_cumulativo_beni_2021_12_13WTG: CH14 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (15)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 08:18-08:50/32 17:08 09:37-11:00/83	07:36 10:11-10:38/27 17:42	07:01 18:16	07:11 19:49	06:25 06:45-07:31/46 20:20	05:57 06:53-07:21/28 20:50
2	07:49 08:18-08:50/32 17:09 09:38-11:00/82	07:35 10:15-10:33/18 17:43	06:59 18:17	07:09 19:50	06:24 06:44-07:30/46 20:21	05:56 06:54-07:21/27 20:50
3	07:50 08:19-08:51/32 17:10 09:38-11:00/82	07:34 17:44	06:58 18:18	07:07 19:51	06:23 06:43-07:31/48 20:23	05:56 06:56-07:20/24 20:51
4	07:50 08:19-08:51/32 17:11 09:39-11:01/82	07:33 17:46	06:56 18:19	07:06 19:52	06:22 06:43-07:31/48 20:24	05:56 06:56-07:19/23 20:52
5	07:50 08:20-08:52/32 17:12 09:40-11:01/81	07:32 17:47	06:55 18:20	07:04 19:53	06:20 06:43-07:32/49 20:25	05:55 06:58-07:19/21 20:52
6	07:50 08:20-08:52/32 17:13 09:39-11:00/81	07:31 17:48	06:53 18:21	07:02 19:54	06:19 06:43-07:32/49 20:26	05:55 06:59-07:18/19 20:53
7	07:50 08:20-08:52/32 17:14 09:40-11:00/80	07:30 17:49	06:52 18:22	07:01 19:55	06:18 06:43-07:32/49 20:27	05:55 06:59-07:16/17 20:54
8	07:49 08:20-08:52/32 17:14 09:41-11:01/80	07:29 17:51	06:50 18:24	06:59 19:56	06:17 06:42-07:31/49 20:28	05:54 07:01-07:16/15 20:54
9	07:49 08:21-08:53/32 17:15 09:42-11:01/79	07:28 17:52	06:48 18:25	06:58 19:57	06:16 06:42-07:31/49 20:29	05:54 07:03-07:15/12 20:55
10	07:49 08:22-08:53/31 17:17 09:43-11:01/78	07:27 17:53	06:47 18:26	06:56 19:59	06:15 06:42-07:31/49 20:30	05:54 07:04-07:13/9 20:55
11	07:49 08:22-08:53/31 17:18 09:43-11:00/77	07:26 17:54	06:45 18:27	06:54 20:00	06:13 06:42-07:31/49 20:31	05:54 07:07-07:12/5 20:56
12	07:49 08:23-08:53/30 17:19 09:44-11:01/77	07:24 17:56	06:44 18:28	06:53 20:01	06:12 06:42-07:31/49 20:32	05:54 20:56
13	07:48 08:24-08:54/30 17:20 09:45-11:01/76	07:23 17:57	06:42 18:29	06:51 20:02	06:11 06:42-07:30/48 20:33	05:54 20:57
14	07:48 08:24-08:53/29 17:21 09:45-11:00/75	07:22 17:58	06:40 18:30	06:50 20:03	06:10 06:42-07:30/48 20:34	05:54 20:57
15	07:48 08:25-08:54/29 17:22 09:46-11:00/74	07:21 17:59	06:39 18:31	06:48 20:04	06:09 06:42-07:30/48 20:35	05:54 20:58
16	07:47 08:25-08:53/28 17:23 09:47-10:59/72	07:19 18:00	06:37 18:32	06:47 20:05	06:08 06:43-07:30/47 20:36	05:54 20:58
17	07:47 08:26-08:53/27 17:24 09:48-11:00/72	07:18 18:02	06:35 18:33	06:45 20:06	06:07 06:44-07:30/46 20:37	05:54 20:59
18	07:46 08:27-08:53/26 17:25 09:49-10:59/70	07:17 18:03	06:34 18:34	06:44 20:07	06:07 06:44-07:29/45 20:38	05:54 20:59
19	07:46 08:28-08:53/25 17:26 09:50-10:59/69	07:15 18:04	06:32 18:35	06:42 20:08	06:06 06:44-07:28/44 20:38	05:54 20:59
20	07:45 08:29-08:52/23 17:28 09:51-10:58/67	07:14 18:05	06:30 18:37	06:41 07:02-07:16/14 20:09	06:05 06:44-07:28/44 20:39	05:54 20:59
21	07:45 08:30-08:51/21 17:29 09:51-10:57/66	07:13 18:06	06:29 18:38	06:39 06:59-07:20/21 20:10	06:04 06:46-07:28/42 20:40	05:54 21:00
22	07:44 08:32-08:51/19 17:30 09:53-10:57/64	07:11 18:08	06:27 18:39	06:38 06:57-07:23/26 20:11	06:03 06:46-07:27/41 20:41	05:54 21:00
23	07:44 08:34-08:49/15 17:31 09:54-10:55/61	07:10 18:09	06:25 18:40	06:36 06:55-07:24/29 20:12	06:02 06:46-07:27/41 20:42	05:55 21:00
24	07:43 08:36-08:47/11 17:32 09:55-10:54/59	07:08 18:10	06:24 18:41	06:35 06:54-07:26/32 20:13	06:02 06:46-07:26/40 20:43	05:55 21:00
25	07:42 09:57-10:54/57 17:33	07:07 18:11	06:22 18:42	06:33 06:52-07:26/34 20:14	06:01 06:48-07:26/38 20:44	05:55 21:00
26	07:41 09:58-10:52/54 17:35	07:05 18:12	06:21 18:43	06:32 06:51-07:28/37 20:15	06:00 06:48-07:25/37 20:45	05:55 21:00
27	07:41 10:00-10:51/51 17:36	07:04 18:13	06:19 18:44	06:31 06:50-07:29/39 20:16	06:00 06:49-07:25/36 20:46	05:56 21:00
28	07:40 10:01-10:49/48 17:37	07:02 18:14	06:17 18:45	06:29 06:48-07:29/41 20:17	05:59 06:50-07:24/34 20:46	05:56 21:01
29	07:39 10:03-10:47/44 17:38		06:16 19:46	06:28 06:47-07:30/43 20:18	05:58 06:51-07:24/33 20:47	05:57 21:01
30	07:38 10:05-10:44/39 17:40		06:14 19:47	06:27 06:46-07:30/44 20:19	05:58 06:51-07:23/32 20:48	05:57 21:00
31	07:37 10:08-10:41/33 17:41		06:12 19:48		05:57 06:53-07:22/29 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	2776	45	0	360	1353	200

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: Shadow_cumulativo_beni_2021_12_13WTG: CH14 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (15)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:58 21:00	06:21 06:52-07:41/49 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 08:04-08:35/31 16:59 09:25-10:42/77
2	05:58 07:09-07:17/8 21:00	06:22 06:52-07:41/49 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 08:04-08:35/31 16:59 09:25-10:43/78
3	05:59 07:08-07:19/11 21:00	06:23 06:52-07:42/50 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 08:05-08:37/32 16:59 09:25-10:44/79
4	05:59 07:08-07:21/13 21:00	06:24 06:52-07:42/50 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 08:05-08:37/32 16:58 09:25-10:45/80
5	06:00 07:06-07:22/16 21:00	06:25 06:52-07:42/50 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 08:06-08:38/32 16:58 09:25-10:45/80
6	06:00 07:06-07:24/18 20:59	06:26 06:52-07:42/50 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 08:05-08:37/32 16:58 09:25-10:46/81
7	06:01 07:04-07:24/20 20:59	06:27 06:52-07:41/49 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 08:06-08:38/32 16:58 09:26-10:47/81
8	06:01 07:04-07:26/22 20:59	06:28 06:53-07:41/48 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 08:06-08:38/32 16:58 09:26-10:48/82
9	06:02 07:03-07:27/24 20:59	06:29 06:52-07:40/48 20:32	06:59 19:46	07:29 18:56	07:04 17:14	07:37 08:07-08:39/32 16:58 09:26-10:48/82
10	06:03 07:02-07:28/26 20:58	06:30 06:52-07:40/48 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:38 08:07-08:39/32 16:58 09:27-10:49/82
11	06:03 07:02-07:29/27 20:58	06:31 06:52-07:39/47 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 08:08-08:40/32 16:58 09:27-10:50/83
12	06:04 07:01-07:30/29 20:57	06:32 06:53-07:39/46 20:29	07:02 19:41	07:32 18:51	07:07 17:11	07:39 08:09-08:40/31 16:58 09:28-10:51/83
13	06:05 07:00-07:31/31 20:57	06:33 06:54-07:38/44 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 08:09-08:41/32 16:58 09:27-10:51/84
14	06:06 07:00-07:32/32 20:56	06:34 06:55-07:37/42 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 08:09-08:41/32 16:58 09:28-10:51/83
15	06:06 06:59-07:33/34 20:56	06:35 06:56-07:36/40 20:25	07:05 19:36	07:35 18:47	07:11 17:08	07:41 08:10-08:41/31 16:59 09:29-10:52/83
16	06:07 06:58-07:33/35 20:55	06:36 06:57-07:35/38 20:23	07:06 19:34	07:37 18:45	07:12 17:07	07:42 08:11-08:42/31 16:59 09:29-10:53/84
17	06:08 06:58-07:34/36 20:55	06:37 06:58-07:34/36 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 08:10-08:42/32 16:59 09:29-10:53/84
18	06:09 06:57-07:35/38 20:54	06:38 06:59-07:33/34 20:20	07:08 19:31	07:39 18:42	07:14 17:06	07:44 08:11-08:43/32 17:00 09:30-10:54/84
19	06:09 06:57-07:36/39 20:53	06:39 07:00-07:31/31 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 08:11-08:43/32 17:00 09:30-10:54/84
20	06:10 06:57-07:37/40 20:52	06:40 07:01-07:29/28 20:18	07:10 19:28	07:41 18:39	07:17 17:04	07:45 08:12-08:43/31 17:00 09:31-10:55/84
21	06:11 06:55-07:36/41 20:52	06:41 07:02-07:27/25 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 08:13-08:44/31 17:01 09:31-10:55/84
22	06:12 06:55-07:37/42 20:51	06:42 07:04-07:24/20 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 08:13-08:44/31 17:01 09:32-10:56/84
23	06:13 06:55-07:38/43 20:50	06:43 07:08-07:20/12 20:13	07:13 19:22	07:44 18:35	07:20 17:03	07:46 08:13-08:44/31 17:02 09:32-10:56/84
24	06:14 06:55-07:39/44 20:49	06:44 20:12	07:14 19:21	07:45 18:33	07:21 17:02	07:47 08:14-08:46/32 17:02 09:33-10:57/84
25	06:15 06:54-07:39/45 20:48	06:45 20:10	07:15 19:19	07:46 18:32	07:22 17:01	07:47 08:14-08:46/32 17:03 09:33-10:57/84
26	06:16 06:54-07:40/46 20:48	06:46 20:09	07:16 19:17	07:48 18:31	07:24 17:01	07:48 08:15-08:47/32 17:04 09:33-10:57/84
27	06:16 06:54-07:40/46 20:47	06:46 20:07	07:17 19:16	07:49 18:29	07:25 17:01	07:48 08:16-08:47/31 17:04 09:34-10:58/84
28	06:17 06:53-07:40/47 20:46	06:47 20:05	07:18 19:14	07:50 18:28	07:26 17:00	07:48 08:16-08:47/31 17:05 09:35-10:58/83
29	06:18 06:53-07:40/47 20:45	06:48 20:04	07:19 19:12	07:51 18:27	07:27 17:00	07:49 08:16-08:48/32 17:06 09:35-10:58/83
30	06:19 06:53-07:41/48 20:44	06:49 20:02	07:20 19:11	07:52 18:25	07:28 16:59	07:49 08:16-08:48/32 17:06 09:35-10:58/83
31	06:20 06:52-07:41/49 20:43	06:50 20:01		06:53 17:24		07:49 08:17-08:49/32 17:07 09:37-11:00/83
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	997	934	0	0	1590	3539

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: Shadow_cumulativo_beni_2021_12_13WTG: CH15 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (19)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 17:08	07:36 08:51-10:03/72 17:42	07:01 08:46-10:04/78 18:16	07:11 17:40-18:46/66 19:49	06:25 20:20	05:57 20:50
2	07:49 17:09	07:35 08:51-10:04/73 17:43	06:59 08:46-10:02/76 18:17	07:09 17:40-18:45/65 19:50	06:24 20:22	05:57 20:50
3	07:50 17:10	07:34 08:50-10:05/75 17:45	06:58 08:47-10:01/74 18:18	07:07 17:40-18:46/66 19:51	06:23 20:23	05:56 20:51
4	07:50 17:11	07:33 08:50-10:06/76 17:46	06:56 08:47-10:00/73 18:19	07:06 17:39-18:45/66 19:52	06:22 20:24	05:56 20:52
5	07:50 17:12	07:32 08:49-10:07/78 17:47	06:55 08:48-09:59/71 18:20	07:04 17:39-18:45/66 19:53	06:20 20:25	05:55 20:52
6	07:50 17:13	07:31 08:49-10:08/79 17:48	06:53 08:49-09:57/68 18:21	07:02 17:39-18:45/66 19:54	06:19 20:26	05:55 20:53
7	07:50 17:14	07:30 08:49-10:08/79 17:49	06:52 08:49-09:55/66 18:22	07:01 17:39-18:44/65 19:55	06:18 20:27	05:55 20:54
8	07:49 17:15	07:29 08:48-10:09/81 17:51	06:50 08:50-09:53/63 18:24	06:59 17:39-18:44/65 19:56	06:17 20:28	05:55 20:54
9	07:49 17:16	07:28 08:47-10:09/82 17:52	06:48 08:51-09:51/60 18:25	06:58 17:39-18:44/65 19:58	06:16 20:29	05:54 20:55
10	07:49 17:17	07:27 08:47-10:09/82 17:53	06:47 08:52-09:49/57 18:26	06:56 17:39-18:43/64 19:59	06:15 20:30	05:54 20:55
11	07:49 17:18	07:26 08:47-10:10/83 17:54	06:45 08:53-09:47/54 18:27	06:54 17:40-18:43/63 20:00	06:13 20:31	05:54 20:56
12	07:49 17:19	07:24 08:47-10:11/84 17:56	06:44 08:54-09:44/50 18:28	06:53 17:39-18:41/62 20:01	06:12 20:32	05:54 20:56
13	07:48 09:17-09:29/12 17:20	07:23 08:47-10:11/84 17:57	06:42 08:57-09:42/45 18:29	06:51 17:40-18:41/61 20:02	06:11 20:33	05:54 20:57
14	07:48 09:12-09:32/20 17:21	07:22 08:46-10:10/84 17:58	06:40 08:58-09:39/41 18:30	06:50 17:40-18:40/60 20:03	06:10 20:34	05:54 20:57
15	07:48 09:10-09:36/26 17:22	07:21 08:46-10:11/85 17:59	06:39 09:00-09:35/35 18:31 17:14-17:20/6	06:48 17:41-18:40/59 20:04	06:09 20:35	05:54 20:58
16	07:47 09:08-09:38/30 17:23	07:19 08:46-10:11/85 18:00	06:37 09:03-09:31/28 18:32 17:07-17:28/21	06:47 17:42-18:38/56 20:05	06:08 20:36	05:54 20:58
17	07:47 09:07-09:41/34 17:24	07:18 08:45-10:10/85 18:02	06:35 09:07-09:25/18 18:33 17:02-17:32/30	06:45 17:43-18:38/55 20:06	06:07 20:37	05:54 20:59
18	07:46 09:05-09:43/38 17:25	07:17 08:45-10:11/86 18:03	06:34 16:59-17:34/35 18:34	06:44 17:43-18:36/53 20:07	06:07 20:38	05:54 20:59
19	07:46 09:04-09:46/42 17:26	07:15 08:45-10:10/85 18:04	06:32 16:57-17:37/40 18:35	06:42 17:45-18:35/50 20:08	06:06 20:38	05:54 20:59
20	07:45 09:02-09:47/45 17:28	07:14 08:45-10:10/85 18:05	06:30 16:54-17:38/44 18:37	06:41 17:45-18:34/49 20:09	06:05 20:39	05:54 20:59
21	07:45 09:01-09:49/48 17:29	07:13 08:45-10:10/85 18:06	06:29 16:52-17:39/47 18:38	06:39 17:47-18:33/46 20:10	06:04 20:40	05:54 21:00
22	07:44 09:00-09:51/51 17:30	07:11 08:45-10:09/84 18:08	06:27 16:51-17:41/50 18:39	06:38 17:48-18:32/44 20:11	06:03 20:41	05:54 21:00
23	07:44 08:59-09:52/53 17:31	07:10 08:45-10:09/84 18:09	06:26 16:49-17:42/53 18:40	06:36 17:49-18:29/40 20:12	06:02 20:42	05:55 21:00
24	07:43 08:58-09:54/56 17:32	07:08 08:45-10:08/83 18:10	06:24 16:47-17:42/55 18:41	06:35 17:51-18:28/37 20:13	06:02 20:43	05:55 21:00
25	07:42 08:58-09:56/58 17:34	07:07 08:45-10:07/82 18:11	06:22 16:47-17:44/57 18:42	06:33 17:52-18:25/33 20:14	06:01 20:44	05:55 21:00
26	07:41 08:57-09:57/60 17:35	07:05 08:45-10:06/81 18:12	06:21 16:45-17:44/59 18:43	06:32 17:55-18:23/28 20:15	06:00 20:45	05:56 21:00
27	07:41 08:56-09:58/62 17:36	07:04 08:46-10:06/80 18:13	06:19 16:44-17:44/60 18:44	06:31 17:58-18:21/23 20:16	06:00 20:46	05:56 21:01
28	07:40 08:55-09:59/64 17:37	07:02 08:45-10:04/79 18:15	06:17 16:43-17:45/62 18:45	06:29 18:00-18:17/17 20:17	05:59 20:46	05:56 21:01
29	07:39 08:54-10:00/66 17:38		07:16 17:42-18:45/63 19:46	06:28 20:18	05:59 20:47	05:57 21:01
30	07:38 08:53-10:01/68 17:40		07:14 17:41-18:45/64 19:47	06:27 20:19	05:58 20:48	05:57 21:00
31	07:37 08:52-10:02/70 17:41		07:12 17:41-18:46/65 19:48		05:57 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	903	2281	1768	1490	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: Shadow_cumulativo_beni_2021_12_13WTG: CH15 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (19)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December	
1	05:58 21:00	06:21 20:42	06:51 19:59	17:39-18:42/63 09:35-10:23/48	07:21 19:09	06:55 17:23	08:17-09:39/82 16:59
2	05:58 21:00	06:22 20:41	06:52 19:58	17:38-18:42/64 09:33-10:24/51	07:22 19:07	06:56 17:22	08:17-09:38/81 16:59
3	05:59 21:00	06:23 20:40	06:53 19:56	17:37-18:42/65 09:31-10:26/55	07:23 19:06	06:57 17:21	08:17-09:38/81 16:59
4	05:59 21:00	06:24 20:38	06:54 19:54	17:36-18:41/65 09:29-10:28/59	07:24 19:04	06:58 17:19	08:19-09:38/79 16:58
5	06:00 21:00	06:25 20:37	06:55 19:53	17:36-18:41/65 09:28-10:29/61	07:25 19:03	06:59 17:18	08:19-09:37/78 16:58
6	06:00 20:59	06:26 20:36	06:56 19:51	17:35-18:41/66 09:26-10:31/65	07:26 19:01	07:00 17:17	08:19-09:37/78 16:58
7	06:01 20:59	06:27 20:35	06:57 19:49	17:35-18:41/66 09:25-10:32/67	07:27 18:59	07:02 17:16	08:20-09:36/76 16:58
8	06:01 20:59	06:28 20:34	06:58 19:48	17:34-18:40/66 09:24-10:33/69	07:28 18:58	07:03 17:15	08:21-09:36/75 16:58
9	06:02 20:59	06:29 20:32	06:59 19:46	17:33-18:39/66 09:22-10:34/72	07:29 18:56	07:04 17:14	08:22-09:35/73 16:58
10	06:03 20:58	06:30 20:31	07:00 19:44	17:33-18:38/65 09:21-10:35/74	07:30 18:54	07:05 17:13	08:22-09:34/72 16:58
11	06:03 20:58	06:31 20:30	07:01 19:43	17:33-18:38/65 09:20-10:35/75	07:31 18:53	07:06 17:12	08:24-09:34/70 16:58
12	06:04 20:57	06:32 20:29	07:02 19:41	17:32-18:37/65 09:19-10:36/77	07:32 18:51	07:07 17:11	08:25-09:33/68 16:58
13	06:05 20:57	06:33 20:27	07:03 19:39	17:32-18:36/64 09:19-10:38/78	07:33 18:50	07:09 17:10	08:26-09:32/66 16:58
14	06:06 20:56	06:34 20:26	07:04 19:38	17:32-18:36/64 09:19-10:38/79	07:34 18:48	07:10 17:09	08:27-09:31/64 16:59
15	06:06 20:56	06:35 20:25	07:05 19:36	17:33-18:35/62 09:18-10:39/81	07:35 18:47	07:11 17:08	08:29-09:31/62 16:59
16	06:07 20:55	06:36 20:23	07:06 19:34	17:33-18:34/61 09:17-10:39/82	07:37 18:45	07:12 17:07	08:30-09:30/60 16:59
17	06:08 20:55	06:37 20:22	07:07 19:33	17:33-18:33/60 09:17-10:39/82	07:38 18:44	07:13 17:07	08:31-09:29/58 16:59
18	06:09 20:54	06:38 20:20	07:08 19:31	17:34-18:31/57 09:16-10:39/83	07:39 18:42	07:14 17:06	08:32-09:28/56 17:00
19	06:10 20:53	06:39 20:19	07:09 19:29	17:34-18:30/56 09:16-10:40/84	07:40 18:41	07:16 17:05	08:34-09:27/53 17:00
20	06:10 20:53	06:40 20:18	07:10 19:28	17:35-18:28/53 09:15-10:40/85	07:41 18:39	07:17 17:04	08:35-09:26/51 17:00
21	06:11 20:52	06:41 20:16	07:11 19:26	17:36-18:27/51 09:16-10:41/85	07:42 18:38	07:18 17:04	08:37-09:25/48 17:01
22	06:12 20:51	06:42 20:15	07:12 19:24	17:37-18:25/48 09:15-10:41/86	07:43 18:36	07:19 17:03	08:38-09:23/45 17:01
23	06:13 20:50	06:43 20:13	07:13 19:23	17:38-18:23/45 09:15-10:40/85	07:44 18:35	07:20 17:03	08:40-09:22/42 17:02
24	06:14 20:49	06:44 20:12	07:14 19:21	17:40-18:21/41 09:15-10:40/85	07:45 18:33	07:21 17:02	08:43-09:21/38 17:02
25	06:15 20:49	06:45 20:10	07:15 19:19	17:42-18:18/36 08:15-09:40/85	06:46 17:32	07:22 17:01	08:45-09:19/34 17:03
26	06:16 20:48	06:46 20:09	07:16 19:17	09:52-10:05/13 17:44-18:15/31	06:48 17:31	07:24 17:01	08:47-09:17/30 17:04
27	06:16 20:47	06:47 20:07	07:17 19:16	09:46-10:11/25 17:47-18:11/24	06:49 17:29	07:25 17:01	08:49-09:15/26 17:04
28	06:17 20:46	06:47 20:05	07:18 19:14	09:42-10:15/33 17:52-18:06/14	06:50 17:28	07:26 17:00	08:52-09:13/21 17:05
29	06:18 20:45	06:48 20:04	07:19 19:12	09:39-10:18/39 09:37-10:20/43	06:51 17:27	07:27 17:00	08:56-09:09/13 17:06
30	06:19 20:44	06:49 20:02	07:20 19:11	09:37-10:20/43 17:25	06:52 17:25	07:28 16:59	08:16-09:39/83 17:06
31	06:20 20:43	06:50 20:01	17:39-18:41/62	06:53 17:24	08:17-09:40/83		17:07 17:07
Potential sun hours	458	427	375	346	299	289	0
Sum of minutes with flicker	0	792	1701	2358	1680	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: Shadow_cumulativo_beni_2021_12_13WTG: CH16 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (14)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:49 08:32-09:09/37 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:20	05:57 06:54-08:19/85 20:49
2	07:49 08:32-09:09/37 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:21	05:57 06:55-08:20/85 20:50
3	07:50 08:33-09:10/37 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 06:56-08:20/84 20:51
4	07:50 08:33-09:10/37 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 06:55-08:20/85 20:52
5	07:50 08:34-09:10/36 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 06:56-08:20/84 20:52
6	07:50 08:33-09:10/37 17:13	07:31 17:48	06:53 18:21	07:02 19:54	06:19 07:04-07:16/12 20:26 07:49-07:52/3	05:55 06:57-08:21/84 20:53
7	07:49 08:34-09:10/36 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 07:02-07:19/17 20:27 07:42-07:59/17	05:55 06:57-08:20/83 20:54
8	07:49 08:35-09:11/36 17:15	07:29 17:51	06:50 18:24	06:59 19:56	06:17 06:59-07:20/21 20:28 07:37-08:01/24	05:55 06:57-08:21/84 20:54
9	07:49 08:35-09:11/36 17:16	07:28 17:52	06:48 18:25	06:58 19:57	06:16 06:58-07:21/23 20:29 07:35-08:04/29	05:54 06:58-08:21/83 20:55
10	07:49 08:36-09:12/36 17:17	07:27 17:53	06:47 18:26	06:56 19:59	06:15 06:56-07:22/26 20:30 07:33-08:05/32	05:54 06:58-08:21/83 20:55
11	07:49 08:36-09:11/35 17:18	07:26 17:54	06:45 18:27	06:54 20:00	06:13 06:56-07:23/27 20:31 07:31-08:07/36	05:54 06:59-08:22/83 20:56
12	07:49 08:37-09:12/35 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 06:55-07:24/29 20:32 07:30-08:08/38	05:54 07:00-08:22/82 20:56
13	07:48 08:38-09:12/34 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 06:54-07:25/31 20:33 07:28-08:10/42	05:54 07:00-08:22/82 20:57
14	07:48 08:38-09:12/34 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 06:53-07:25/32 20:34 07:27-08:11/44	05:54 07:00-08:22/82 20:57
15	07:48 08:39-09:12/33 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 06:53-07:25/32 20:35 07:26-08:11/45	05:54 07:01-08:23/82 20:58
16	07:47 08:40-09:11/31 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 06:53-08:13/80 20:36	05:54 07:01-08:23/82 20:58
17	07:47 08:41-09:12/31 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 06:53-08:14/81 20:37	05:54 07:01-08:23/82 20:59
18	07:46 08:42-09:11/29 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 06:52-08:14/82 20:37	05:54 07:02-08:23/81 20:59
19	07:46 08:43-09:11/28 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:06 06:52-08:15/83 20:38	05:54 07:02-08:23/81 20:59
20	07:45 08:44-09:10/26 17:28	07:14 18:05	06:30 18:36	06:41 20:09	06:05 06:52-08:15/83 20:39	05:54 07:02-08:23/81 20:59
21	07:45 08:45-09:09/24 17:29	07:12 18:06	06:29 18:38	06:39 20:10	06:04 06:53-08:16/83 20:40	05:54 07:03-08:23/80 21:00
22	07:44 08:47-09:09/22 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 06:52-08:16/84 20:41	05:54 07:03-08:24/81 21:00
23	07:43 08:49-09:07/18 17:31	07:10 18:09	06:25 18:40	06:36 20:12	06:02 06:52-08:17/85 20:42	05:55 07:03-08:24/81 21:00
24	07:43 08:51-09:05/14 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 06:53-08:17/84 20:43	05:55 07:03-08:24/81 21:00
25	07:42 08:55-09:03/8 17:33	07:07 18:11	06:22 18:42	06:33 20:14	06:01 06:53-08:18/85 20:44	05:55 07:03-08:25/82 21:00
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 06:52-08:18/86 20:45	05:56 07:03-08:25/82 21:00
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 06:53-08:18/85 20:46	05:56 07:03-08:25/82 21:00
28	07:40 17:37	07:02 18:14	06:17 18:45	06:29 20:17	05:59 06:53-08:18/85 20:46	05:56 07:04-08:25/81 21:00
29	07:39 17:38	07:01 19:46	06:16 19:46	06:28 20:18	05:59 06:54-08:19/85 20:47	05:57 07:03-08:25/82 21:00
30	07:38 17:40	07:00 19:47	06:14 19:47	06:27 20:19	05:58 06:54-08:19/85 20:48	05:57 07:04-08:26/82 21:00
31	07:37 17:41	07:00 19:48	06:13 19:48	06:26 20:19	05:57 06:54-08:20/86 20:49	05:57 07:04-08:26/82 21:00
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	767	0	0	0	1902	2472

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: Shadow_cumulativo_beni_2021_12_13WTG: CH16 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (14)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:58 07:03-08:26/83 21:00	06:21 07:06-07:34/28 20:42 07:41-08:19/38	06:51 19:59	07:21 19:09	06:54 17:23	07:29 08:18-08:53/35 16:59
2	05:58 07:03-08:26/83 21:00	06:22 07:06-07:34/28 20:41 07:42-08:17/35	06:52 19:58	07:22 19:07	06:56 17:22	07:30 08:18-08:54/36 16:59
3	05:59 07:03-08:26/83 21:00	06:23 07:08-07:33/25 20:40 07:44-08:15/31	06:53 19:56	07:23 19:06	06:57 17:21	07:31 08:19-08:54/35 16:59
4	05:59 07:04-08:27/83 21:00	06:24 07:09-07:31/22 20:38 07:46-08:13/27	06:54 19:54	07:24 19:04	06:58 17:19	07:32 08:20-08:56/36 16:58
5	06:00 07:03-08:26/83 21:00	06:25 07:10-07:30/20 20:37 07:49-08:11/22	06:55 19:53	07:25 19:03	06:59 17:18	07:33 08:19-08:55/36 16:58
6	06:00 07:03-08:27/84 20:59	06:26 07:12-07:28/16 20:36 07:53-08:07/14	06:56 19:51	07:26 19:01	07:00 17:17	07:34 08:19-08:56/37 16:58
7	06:01 07:03-08:27/84 20:59	06:27 07:15-07:25/10 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 08:20-08:57/37 16:58
8	06:01 07:03-08:27/84 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 08:20-08:57/37 16:58
9	06:02 07:03-08:28/85 20:59	06:29 20:32	06:59 19:46	07:29 18:56	07:04 17:14	07:37 08:21-08:58/37 16:58
10	06:03 07:02-08:27/85 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:37 08:21-08:58/37 16:58
11	06:03 07:03-08:27/84 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 08:22-08:59/37 16:58
12	06:04 07:03-08:28/85 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:07 17:11	07:39 08:22-09:00/38 16:58
13	06:05 07:02-08:27/85 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 08:22-08:59/37 16:58
14	06:06 07:02-08:27/85 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 08:23-09:00/37 16:58
15	06:06 07:02-08:28/86 20:56	06:35 20:25	07:05 19:36	07:35 18:47	07:11 17:08	07:41 08:24-09:01/37 16:59
16	06:07 07:03-08:27/84 20:55	06:36 20:23	07:06 19:34	07:36 18:45	07:12 17:07	07:42 08:24-09:01/37 16:59 12:30-12:33/3
17	06:08 07:02-08:27/85 20:54	06:37 20:22	07:07 19:33	07:38 18:44	07:13 08:28-08:36/8 17:07	07:43 08:24-09:01/37 16:59 12:27-12:36/9
18	06:09 07:02-08:27/85 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:14 08:25-08:39/14 17:06	07:44 08:25-09:02/37 17:00 12:26-12:38/12
19	06:10 07:02-08:27/85 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 08:24-08:42/18 17:05	07:44 08:25-09:02/37 17:00 12:25-12:39/14
20	06:10 07:02-08:27/85 20:52	06:40 20:18	07:10 19:28	07:41 18:39	07:17 08:22-08:44/22 17:04	07:45 08:26-09:03/37 17:00 12:25-12:40/15
21	06:11 07:02-08:26/84 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 08:21-08:45/24 17:04	07:45 08:26-09:03/37 17:01 12:25-12:40/15
22	06:12 07:02-08:26/84 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 08:20-08:46/26 17:03	07:46 08:27-09:04/37 17:01 12:26-12:41/15
23	06:13 07:02-08:26/84 20:50	06:43 20:13	07:13 19:22	07:44 18:35	07:20 08:19-08:47/28 17:03	07:46 08:27-09:04/37 17:02 12:26-12:41/15
24	06:14 07:02-08:25/83 20:49	06:44 20:12	07:14 19:21	07:45 18:33	07:21 08:20-08:49/29 17:02	07:47 08:28-09:05/37 17:02 12:28-12:42/14
25	06:15 07:03-08:25/82 20:48	06:45 20:10	07:15 19:19	06:46 17:32	07:22 08:19-08:50/31 17:01	07:47 08:28-09:05/37 17:03 12:29-12:41/12
26	06:16 07:03-08:25/82 20:48	06:46 20:09	07:16 19:17	06:48 17:31	07:24 08:19-08:50/31 17:01	07:48 08:28-09:05/37 17:04 12:30-12:40/10
27	06:16 07:04-08:24/80 20:47	06:46 20:07	07:17 19:16	06:49 17:29	07:25 08:19-08:51/32 17:01	07:48 08:29-09:06/37 17:04 12:33-12:40/7
28	06:17 07:04-08:22/78 20:46	06:47 20:05	07:18 19:14	06:50 17:28	07:26 08:18-08:52/34 17:00	07:48 08:29-09:07/38 17:05
29	06:18 07:04-07:36/32 20:45	06:48 20:04	07:19 19:12	06:51 17:27	07:27 08:18-08:52/34 17:00	07:49 08:30-09:07/37 17:06
30	06:19 07:04-07:35/31 20:44	06:49 20:02	07:20 19:11	06:52 17:25	07:28 08:18-08:53/35 16:59	07:49 08:30-09:07/37 17:06
31	06:20 07:05-07:35/30 20:43	06:50 20:01		06:53 17:24		07:49 08:31-09:08/37 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	2565	316	0	0	366	1283

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: Shadow_cumulativo_beni_2021_12_13WTG: CH17 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (13)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 17:08	07:36 07:56-08:33/37 17:42 09:18-10:32/74	07:01 07:59-08:29/30 18:16 09:02-10:44/102	07:11 19:17-19:28/11 19:49	06:25 20:20	05:57 20:49
2	07:49 17:09	07:35 07:55-08:35/40 17:43 09:17-10:33/76	06:59 08:01-08:26/25 18:17 09:02-10:43/101	07:09 19:15-19:29/14 19:50	06:24 20:21	05:57 20:50
3	07:50 17:10	07:34 07:54-08:36/42 17:45 09:16-10:34/78	06:58 08:04-08:23/19 18:19 09:01-10:42/101	07:07 19:13-19:30/17 19:51	06:23 20:23	05:56 20:51
4	07:50 17:12	07:33 07:53-08:37/44 17:46 09:15-10:36/81	06:56 08:09-08:17/8 18:20	07:06 19:12-19:31/19 19:52	06:22 20:24	05:56 20:52
5	07:50 17:12	07:32 07:53-08:38/45 17:47 09:14-10:37/83	06:55 09:01-10:41/100 18:20	07:04 19:10-19:31/21 19:53	06:20 20:25	05:55 20:52
6	07:50 17:13	07:31 07:52-08:39/47 17:48 09:14-10:38/84	06:53 09:02-10:40/98 18:21	07:02 19:10-19:33/23 19:54	06:19 20:26	05:55 20:53
7	07:49 17:14	07:30 07:52-08:40/48 17:49 09:13-10:39/86	06:52 09:01-10:39/98 18:22	07:01 19:10-19:32/22 19:55	06:18 20:27	05:55 20:54
8	07:49 17:15	07:29 07:51-08:40/49 17:51 09:12-10:40/88	06:50 09:02-10:38/96 18:24	06:59 19:10-19:33/23 19:56	06:17 20:28	05:55 20:54
9	07:49 17:16	07:28 07:50-08:40/50 17:52 09:11-10:40/89	06:48 09:02-10:36/94 18:25	06:58 19:09-19:32/23 19:57	06:16 20:29	05:54 20:55
10	07:49 17:17	07:27 07:50-08:41/51 17:53 09:10-10:41/91	06:47 09:01-10:35/94 18:26	06:56 19:09-19:31/22 19:59	06:15 20:30	05:54 20:55
11	07:49 17:18	07:26 07:50-08:41/51 17:54 09:10-10:42/92	06:45 09:02-10:34/92 18:27	06:55 19:10-19:30/20 20:00	06:14 20:31	05:54 20:56
12	07:49 17:19	07:24 07:50-08:42/52 17:56 09:09-10:43/94	06:44 09:02-10:32/90 18:28	06:53 19:10-19:29/19 20:01	06:12 20:32	05:54 20:56
13	07:48 17:20	07:23 07:49-08:41/52 17:57 09:08-10:43/95	06:42 09:03-10:31/88 18:29	06:51 19:12-19:28/16 20:02	06:11 20:33	05:54 20:57
14	07:48 17:21	07:22 07:49-08:42/53 17:58 09:08-10:44/96	06:40 09:03-10:29/86 18:30	06:50 19:13-19:25/12 20:03	06:10 20:34	05:54 20:57
15	07:48 17:22	07:21 07:50-08:42/52 17:59 09:07-10:45/98	06:39 09:03-10:27/84 18:31	06:48 19:16-19:22/6 20:04	06:09 20:35	05:54 20:58
16	07:47 17:23	07:19 07:50-08:42/52 18:00 09:07-10:46/99	06:37 09:04-10:25/81 18:32	06:47 20:05	06:08 20:36	05:54 20:58
17	07:47 17:24	07:18 07:50-08:41/51 18:02 09:06-10:45/99	06:35 09:04-10:23/79 18:33	06:45 20:06	06:08 20:37	05:54 20:59
18	07:46 09:46-09:56/10 17:25	07:17 07:50-08:41/51 18:03 09:06-10:46/100	06:34 09:04-10:21/77 18:34	06:44 20:07	06:07 20:37	05:54 20:59
19	07:46 09:41-10:03/22 17:26	07:15 07:50-08:40/50 18:04 09:05-10:46/101	06:32 09:06-10:19/73 18:35	06:42 20:08	06:06 20:38	05:54 20:59
20	07:45 09:37-10:06/29 17:28	07:14 07:50-08:40/50 18:05 09:05-10:46/101	06:30 09:06-10:16/70 18:37	06:41 20:09	06:05 20:39	05:54 20:59
21	07:45 09:34-10:09/35 17:29	07:13 07:51-08:40/49 18:06 09:05-10:47/102	06:29 09:07-10:13/66 18:38	06:39 20:10	06:04 20:40	05:54 21:00
22	07:44 09:33-10:13/40 17:30	07:11 07:51-08:38/47 18:08 09:04-10:46/102	06:27 09:08-10:12/64 18:39	06:38 20:11	06:03 20:41	05:54 21:00
23	07:43 09:31-10:15/44 17:31	07:10 07:52-08:38/46 18:09 09:04-10:47/103	06:26 09:09-10:09/60 18:40	06:36 20:12	06:02 20:42	05:55 21:00
24	07:43 09:29-10:17/48 17:32	07:08 07:52-08:36/44 18:10 09:03-10:46/103	06:24 09:10-10:05/55 18:41	06:35 20:13	06:02 20:43	05:55 21:00
25	07:42 08:09-08:18/9 17:34 09:27-10:19/52	07:07 07:54-08:36/42 18:11 09:03-10:46/103	06:22 09:12-10:03/51 18:42	06:34 20:14	06:01 20:44	05:55 21:00
26	07:41 08:05-08:22/17 17:35 09:26-10:22/56	07:05 07:54-08:34/40 18:12 09:02-10:45/103	06:21 09:13-09:59/46 18:43	06:32 20:15	06:00 20:45	05:56 21:00
27	07:41 08:03-08:25/22 17:36 09:25-10:24/59	07:04 07:56-08:33/37 18:13 09:03-10:45/102	06:19 09:15-09:55/40 18:44	06:31 20:16	06:00 20:46	05:56 21:00
28	07:40 08:01-08:27/26 17:37 09:23-10:26/63	07:02 07:57-08:31/34 18:15 09:02-10:44/102	06:17 09:18-09:52/34 18:45	06:29 20:17	05:59 20:46	05:56 21:00
29	07:39 07:59-08:29/30 17:38 09:22-10:27/65		07:16 10:21-10:47/26 19:46	06:28 20:18	05:59 20:47	05:57 21:00
30	07:38 07:58-08:31/33 17:40 09:20-10:29/69		07:14 10:26-10:39/13 19:47	06:27 20:19	05:58 20:48	05:57 21:00
31	07:37 07:57-08:32/35 17:41 09:19-10:30/71		07:12 19:23-19:25/2 19:48		05:57 20:49	
Potential sun hours	298	298	370	398	268	451
Sum of minutes with flicker	835	3931	2344	268	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: Shadow_cumulativo_beni_2021_12_13WTG: CH17 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (13)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:58 21:00	06:21 20:42	06:51 19:09-19:29/20 19:59	07:21 09:42-11:11/89 19:09	06:55 07:20-08:10/50 17:23 08:40-10:11/91	07:29 16:59
2	05:58 21:00	06:22 20:41	06:52 19:08-19:30/22 19:58	07:22 09:41-11:12/91 19:07	06:56 07:20-08:10/50 17:22 08:41-10:10/89	07:30 16:59
3	05:59 21:00	06:23 20:40	06:53 19:07-19:30/23 19:56	07:23 09:40-11:13/93 19:06	06:57 07:20-08:09/49 17:21 08:41-10:09/88	07:31 16:59
4	05:59 21:00	06:24 20:38	06:54 19:07-19:30/23 19:54	07:24 09:39-11:14/95 19:04	06:58 07:22-08:09/47 17:19 08:43-10:09/86	07:32 16:58
5	06:00 21:00	06:25 20:37	06:55 19:07-19:30/23 19:53	07:25 09:39-11:14/95 19:03	06:59 07:22-08:09/47 17:18 08:44-10:08/84	07:33 16:58
6	06:00 20:59	06:26 20:36	06:56 19:06-19:29/23 19:51	07:26 09:38-11:15/97 19:01	07:00 07:23-08:08/45 17:17 08:44-10:07/83	07:34 16:58
7	06:01 20:59	06:27 20:35	06:57 19:07-19:28/21 19:49	07:27 09:37-11:15/98 18:59	07:02 07:23-08:07/44 17:16 08:45-10:05/80	07:35 16:58
8	06:01 20:59	06:28 20:34	06:58 19:07-19:26/19 19:48	07:28 09:37-11:16/99 18:58	07:03 07:25-08:07/42 17:15 08:47-10:05/78	07:36 16:58
9	06:02 20:59	06:29 20:32	06:59 19:07-19:23/16 19:46	07:29 09:36-11:16/100 18:56	07:04 07:26-08:06/40 17:14 08:48-10:04/76	07:37 16:58
10	06:03 20:58	06:30 20:31	07:00 19:08-19:22/14 19:44	07:30 08:40-08:54/14 18:54 09:36-11:17/101	07:05 07:27-08:04/37 17:13 08:49-10:02/73	07:38 16:58
11	06:03 20:58	06:31 20:30	07:01 19:09-19:20/11 19:43	07:31 08:36-08:58/22 18:53 09:35-11:17/102	07:06 07:28-08:03/35 17:12 08:50-10:01/71	07:38 16:58
12	06:04 20:57	06:32 20:29	07:02 19:13-19:17/4 19:41	07:32 08:33-09:00/27 18:51 09:35-11:17/102	07:07 07:30-08:03/33 17:11 08:52-10:01/69	07:39 16:58
13	06:05 20:57	06:33 20:27	07:03 10:18-10:29/11 19:39	07:33 08:32-09:03/31 18:50 09:35-11:17/102	07:09 07:31-08:01/30 17:10 08:54-09:59/65	07:40 16:58
14	06:06 20:56	06:34 20:26	07:04 10:12-10:36/24 19:38	07:34 08:30-09:05/35 18:48 09:35-11:18/103	07:10 07:33-07:59/26 17:09 08:55-09:57/62	07:41 16:59
15	06:06 20:56	06:35 20:25	07:05 10:08-10:40/32 19:36	07:35 08:28-09:06/38 18:47 09:35-11:18/103	07:11 07:36-07:58/22 17:08 08:58-09:57/59	07:41 16:59
16	06:07 20:55	06:36 20:23	07:06 10:05-10:44/39 19:34	07:37 08:26-09:07/41 18:45 09:35-11:18/103	07:12 07:38-07:55/17 17:08 08:59-09:55/56	07:42 16:59
17	06:08 20:55	06:37 20:22	07:07 10:02-10:47/45 19:33	07:38 08:25-09:08/43 18:44 09:35-11:18/103	07:13 07:42-07:51/9 17:07 09:01-09:53/52	07:43 16:59
18	06:09 20:54	06:38 20:20	07:08 10:00-10:50/50 19:31	07:39 08:24-09:08/44 18:42 09:34-11:17/103	07:14 09:03-09:51/48 17:06	07:44 17:00
19	06:10 20:53	06:39 20:19	07:09 09:58-10:52/54 19:29	07:40 08:22-09:09/47 18:41 09:34-11:17/103	07:16 09:05-09:49/44 17:05	07:44 17:00
20	06:10 20:52	06:40 20:18	07:10 09:56-10:54/58 19:28	07:41 08:22-09:09/47 18:39 09:34-11:17/103	07:17 09:08-09:48/40 17:05	07:45 17:00
21	06:11 20:52	06:41 20:16	07:11 09:54-10:56/62 19:26	07:42 08:22-09:11/49 18:38 09:35-11:17/102	07:18 09:10-09:45/35 17:04	07:45 17:01
22	06:12 20:51	06:42 20:15	07:12 09:52-10:58/66 19:24	07:43 08:21-09:11/50 18:36 09:35-11:17/102	07:19 09:13-09:42/29 17:03	07:46 17:01
23	06:13 20:50	06:43 20:13	07:13 09:51-11:00/69 19:23	07:44 08:20-09:11/51 18:35 09:35-11:16/101	07:20 09:17-09:39/22 17:03	07:46 17:02
24	06:14 20:49	06:44 20:12	07:14 09:50-11:02/72 19:21	07:45 08:20-09:11/51 18:33 09:36-11:16/100	07:21 09:23-09:33/10 17:02	07:47 17:02
25	06:15 20:48	06:45 20:10	07:15 09:48-11:03/75 19:19	06:46 07:19-08:11/52 17:32 08:36-10:15/99	07:22 07:22 17:02	07:47 17:03
26	06:16 20:48	06:46 20:09	07:16 09:47-11:05/78 19:17	06:48 07:20-08:12/52 17:31 08:37-10:15/98	07:24 07:24 17:01	07:48 17:04
27	06:17 20:47	06:47 20:07	07:17 09:46-11:06/80 19:16	06:49 07:19-08:11/52 17:29 08:37-10:15/98	07:25 07:25 17:01	07:48 17:04
28	06:17 20:46	06:48 19:17-19:24/7 20:05	07:18 09:45-11:08/83 19:14	06:50 07:19-08:11/52 17:28 08:37-10:14/97	07:26 07:26 17:00	07:48 17:05
29	06:18 20:45	06:48 19:14-19:26/12 20:04	07:19 09:44-11:09/85 19:12	06:51 07:19-08:11/52 17:27 08:38-10:13/95	07:27 07:27 17:00	07:49 17:06
30	06:19 20:44	06:49 19:12-19:28/16 20:02	07:20 09:43-11:10/87 19:11	06:52 07:19-08:10/51 17:26 08:38-10:12/94	07:28 07:28 16:59	07:49 17:06
31	06:20 20:43	06:50 19:10-19:29/19 20:01		06:53 07:20-08:11/51 17:24 08:40-10:12/92		07:49 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	0	54	1289	4015	2113	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: Shadow_cumulativo_beni_2021_12_13WTG: CH18 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !0! hub: 165,0 m (TOT: 250,0 m) (12)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June
1	07:49 08:28-09:01/33 17:08	07:36 17:42	07:01 18:16	07:11 18:16-18:40/24 19:49	06:25 20:20	05:57 20:49
2	07:49 08:28-09:01/33 17:09	07:35 17:43	06:59 18:17	07:09 18:18-18:38/20 19:50	06:24 20:21	05:57 20:50
3	07:49 08:29-09:02/33 17:10	07:34 08:17-08:29/12 17:45	06:58 18:18	07:07 18:21-18:35/14 19:51	06:23 20:22	05:56 20:51
4	07:50 08:29-09:02/33 17:11	07:33 07:53-08:03/10 17:46 08:14-08:32/18	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52
5	07:50 08:30-09:02/32 17:12	07:32 07:52-08:05/13 17:47 08:12-08:34/22	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52
6	07:50 08:30-09:02/32 17:13	07:31 07:51-08:07/16 17:48 08:11-08:35/24	06:53 18:21	07:02 19:54	06:19 20:26	05:55 20:53
7	07:49 08:30-09:02/32 17:14	07:30 07:50-08:08/18 17:49 08:10-08:37/27	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54
8	07:49 08:31-09:03/32 17:15	07:29 07:49-08:38/49 17:51	06:50 18:23	06:59 19:56	06:17 20:28	05:55 20:54
9	07:49 08:32-09:03/31 17:16	07:28 07:47-08:38/51 17:52	06:48 18:25	06:58 19:57	06:16 20:29	05:54 20:55
10	07:49 08:33-09:03/30 17:17	07:27 07:46-08:39/53 17:53	06:47 17:27-17:40/13 18:26	06:56 19:58	06:15 20:30	05:54 20:55
11	07:49 08:33-09:03/30 17:18	07:25 07:46-08:40/54 17:54	06:45 17:24-17:44/20 18:27	06:54 20:00	06:13 20:31	05:54 20:56
12	07:49 08:34-09:03/29 17:19	07:24 07:46-08:41/55 17:56	06:44 17:21-17:46/25 18:28	06:53 20:01	06:12 20:32	05:54 20:56
13	07:48 08:35-09:03/28 17:20	07:23 07:45-08:40/55 17:57	06:42 17:19-17:47/28 18:29	06:51 20:02	06:11 20:33	05:54 20:57
14	07:48 08:36-09:03/27 17:21	07:22 07:45-08:41/56 17:58	06:40 17:18-17:49/31 18:30	06:50 20:03	06:10 20:34	05:54 20:57
15	07:48 08:37-09:03/26 17:22	07:21 07:46-08:41/55 17:59	06:39 17:16-17:49/33 18:31	06:48 20:04	06:09 20:35	05:54 20:58
16	07:47 08:37-09:02/25 17:23	07:19 07:47-08:41/54 18:00	06:37 17:15-17:51/36 18:32	06:47 20:05	06:08 20:36	05:54 20:58
17	07:47 08:39-09:02/23 17:24	07:18 07:47-08:40/53 18:02	06:35 17:14-17:51/37 18:33	06:45 20:06	06:07 20:37	05:54 20:58
18	07:46 08:40-09:01/21 17:25	07:17 07:48-08:40/52 18:03	06:34 17:13-17:51/38 18:34	06:44 20:07	06:07 20:37	05:54 20:59
19	07:46 08:42-09:00/18 17:26	07:15 07:48-08:39/51 18:04	06:32 17:13-17:52/39 18:35	06:42 20:08	06:06 20:38	05:54 20:59
20	07:45 08:44-08:59/15 17:28	07:14 07:50-08:05/15 18:05 08:07-08:39/32	06:30 17:12-17:51/39 18:36	06:41 20:09	06:05 20:39	05:54 20:59
21	07:45 08:46-08:56/10 17:29	07:12 07:53-08:03/10 18:06 08:08-08:39/31	06:29 17:11-17:51/40 18:38	06:39 20:10	06:04 20:40	05:54 21:00
22	07:44 17:30	07:11 08:08-08:37/29 18:08	06:27 17:11-17:51/40 18:39	06:38 20:11	06:03 20:41	05:54 21:00
23	07:43 17:31	07:10 08:10-08:36/26 18:09	06:25 17:11-17:51/40 18:40	06:36 20:12	06:02 20:42	05:55 21:00
24	07:43 17:32	07:08 08:11-08:34/23 18:10	06:24 17:10-17:50/40 18:41	06:35 20:13	06:02 20:43	05:55 21:00
25	07:42 17:33	07:07 08:13-08:32/19 18:11	06:22 17:11-17:50/39 18:42	06:33 20:14	06:01 20:44	05:55 21:00
26	07:41 17:35	07:05 08:15-08:29/14 18:12	06:21 17:11-17:49/38 18:43	06:32 20:15	06:00 20:45	05:56 21:00
27	07:41 17:36	07:04 08:20-08:24/4 18:13	06:19 17:11-17:47/36 18:44	06:31 20:16	06:00 20:45	05:56 21:00
28	07:40 17:37	07:02 18:14	06:17 17:12-17:47/35 18:45	06:29 20:17	05:59 20:46	05:56 21:00
29	07:39 17:38		07:16 18:13-18:46/33 19:46	06:28 20:18	05:59 20:47	05:57 21:00
30	07:38 17:40		07:14 18:13-18:44/31 19:47	06:27 20:19	05:58 20:48	05:57 21:00
31	07:37 17:41		07:12 18:15-18:43/28 19:48		05:57 20:49	
Potential sun hours	298	298	370	398	447	451
Sum of minutes with flicker	573	1001	739	58	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: Shadow_cumulativo_beni_2021_12_13WTG: CH18 - Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 250,0 m) (12)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July	August	September	October	November	December
1	05:58 21:00	06:21 20:42	06:51 19:59	07:21 18:00-18:26/26 19:09	06:54 07:16-08:09/53 17:23	07:29 08:15-08:45/30 16:59
2	05:58 21:00	06:22 20:41	06:52 19:57	07:22 18:01-18:24/23 19:07	06:56 07:17-08:08/51 17:22	07:30 08:15-08:45/30 16:59
3	05:59 21:00	06:23 20:39	06:53 19:56	07:23 18:04-18:21/17 19:06	06:57 07:18-08:07/49 17:21	07:31 08:15-08:46/31 16:59
4	05:59 21:00	06:24 20:38	06:54 19:54	07:24 18:09-18:15/6 19:04	06:58 07:20-07:38/18 17:19	07:32 08:15-08:47/32 16:58
5	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:02	06:59 07:21-07:36/15 17:18	07:33 08:15-08:47/32 16:58
6	06:00 20:59	06:26 20:36	06:56 19:51	07:26 19:01	07:00 07:22-07:35/13 17:17	07:34 08:16-08:48/32 16:58
7	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:01 07:23-07:32/9 17:16	07:35 08:16-08:49/33 16:58
8	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 07:48-07:59/11 17:15	07:36 08:16-08:49/33 16:58
9	06:02 20:58	06:29 20:32	06:59 18:15-18:28/13 19:46	07:29 18:56	07:04 17:14	07:37 08:17-08:50/33 16:58
10	06:03 20:58	06:30 20:31	07:00 18:11-18:30/19 19:44	07:30 18:54	07:05 17:13	07:37 08:17-08:50/33 16:58
11	06:03 20:58	06:31 20:30	07:01 18:08-18:32/24 19:43	07:31 18:53	07:06 17:12	07:38 08:18-08:51/33 16:58
12	06:04 20:57	06:32 20:29	07:02 18:06-18:34/28 19:41	07:32 18:51	07:07 17:11	07:39 08:18-08:52/34 16:58
13	06:05 20:57	06:33 20:27	07:03 18:05-18:35/30 19:39	07:33 18:50	07:09 17:10	07:40 08:18-08:52/34 16:58
14	06:06 20:56	06:34 20:26	07:04 18:03-18:36/33 19:38	07:34 18:48	07:10 17:09	07:41 08:19-08:52/33 16:59
15	06:06 20:56	06:35 20:25	07:05 18:02-18:36/34 19:36	07:35 08:50-09:00/10 18:47	07:11 17:08	07:41 08:19-08:53/34 16:59
16	06:07 20:55	06:36 20:23	07:06 18:00-18:37/37 19:34	07:36 08:46-09:03/17 18:45	07:12 17:07	07:42 08:20-08:54/34 16:59
17	06:08 20:54	06:37 20:22	07:07 17:59-18:37/38 19:33	07:38 08:44-09:05/21 18:44	07:13 17:07	07:43 08:20-08:54/34 16:59
18	06:09 20:54	06:38 20:20	07:08 17:59-18:37/38 19:31	07:39 08:42-09:06/24 18:42	07:14 17:06	07:43 08:21-08:55/34 17:00
19	06:10 20:53	06:39 20:19	07:09 17:58-18:37/39 19:29	07:40 08:40-09:07/27 18:41	07:16 17:05	07:44 08:21-08:54/33 17:00
20	06:10 20:52	06:40 20:17	07:10 17:57-18:37/40 19:28	07:41 08:27-08:29/2 18:39	07:17 17:04	07:45 08:22-08:55/33 17:00
21	06:11 20:52	06:41 20:16	07:11 17:57-18:37/40 19:26	07:42 08:23-08:35/12 18:38	07:18 08:22-08:32/10 17:04	07:45 08:22-08:55/33 17:01
22	06:12 20:51	06:42 20:15	07:12 17:56-18:36/40 19:24	07:43 08:20-08:36/16 18:36	07:19 08:20-08:35/15 17:03	07:46 08:23-08:56/33 17:01
23	06:13 20:50	06:43 20:13	07:13 17:56-18:36/40 19:22	07:44 08:19-09:10/51 18:35	07:20 08:18-08:36/18 17:03	07:46 08:23-08:56/33 17:02
24	06:14 20:49	06:44 20:12	07:14 17:56-18:35/39 19:21	07:45 08:17-09:10/53 18:33	07:21 08:17-08:38/21 17:02	07:47 08:24-08:57/33 17:02
25	06:15 20:48	06:45 20:10	07:15 17:56-18:34/38 19:19	07:46 07:16-08:10/54 17:32	07:22 08:17-08:40/23 17:01	07:47 08:24-08:57/33 17:03
26	06:16 20:48	06:46 20:08	07:16 17:56-18:33/37 19:17	07:48 07:16-08:11/55 17:31	07:24 08:17-08:41/24 17:01	07:48 08:24-08:58/34 17:04
27	06:16 20:47	06:46 20:07	07:17 17:56-18:32/36 19:16	07:49 07:16-08:11/55 17:29	07:25 08:16-08:42/26 17:01	07:48 08:25-08:59/34 17:04
28	06:17 20:46	06:47 20:05	07:18 17:57-18:31/34 19:14	07:50 07:15-08:10/55 17:28	07:26 08:16-08:43/27 17:00	07:48 08:25-08:59/34 17:05
29	06:18 20:45	06:48 20:04	07:19 17:58-18:30/32 19:12	07:51 07:15-08:10/55 17:27	07:27 08:15-08:43/28 17:00	07:49 08:26-08:59/33 17:06
30	06:19 20:44	06:49 20:02	07:20 17:59-18:28/29 19:11	07:52 07:14-08:09/55 17:25	07:28 08:15-08:44/29 16:59	07:49 08:26-08:59/33 17:06
31	06:20 20:43	06:50 20:01		07:53 07:15-08:10/55 17:24		07:49 08:26-09:00/34 17:07
Potential sun hours	458	427	375	346	299	289
Sum of minutes with flicker	0	0	738	780	527	1022

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: Shadow_cumulativo_beni_2021_12_13WTG: M01 - WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (2)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 19:21	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
2	07:50 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:22	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58
6	07:49 17:13	07:31 17:48	06:53 18:21	07:03 19:54	06:19 20:26	05:55 20:53	06:00 21:00	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:50 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 16:58
8	07:49 17:15	07:29 17:51	06:50 18:24	06:59 19:57	06:17 20:28	05:55 20:54	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58
9	07:49 17:16	07:28 17:52	06:48 18:25	06:58 19:58	06:16 20:29	05:54 20:55	06:02 20:59	06:29 20:33	06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:59	06:15 20:30	05:54 20:55	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:54	07:05 17:13	07:38 16:58
11	07:49 17:18	07:26 17:54	06:45 18:27	06:55 20:00	06:14 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:56	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:08 17:11	07:39 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	06:06 20:56	06:35 20:25	07:05 19:36	07:35 18:47	07:11 17:08	07:42 16:59
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	06:07 20:55	06:36 20:23	07:06 19:34	07:37 18:45	07:12 17:08	07:42 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:07 20:37	05:54 20:59	06:08 20:55	06:37 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:38	05:54 20:59	06:09 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:15 17:06	07:44 17:00
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:06 20:39	05:54 20:59	06:10 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00
20	07:45 17:28	07:14 18:05	06:31 18:37	06:41 20:09	06:05 20:39	05:54 21:00	06:10 20:53	06:40 20:18	07:10 19:28	07:41 18:39	07:17 17:04	07:45 17:00
21	07:45 17:29	07:13 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:44 17:31	07:10 18:09	06:26 18:40	06:36 20:12	06:02 20:42	05:55 21:00	06:13 20:50	06:43 20:13	07:13 19:23	07:44 18:35	07:20 17:03	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:34	07:21 17:02	07:47 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:34 20:14	06:01 20:44	05:55 21:00	06:15 20:49	06:45 20:10	07:15 19:19	07:47 17:32	07:23 17:01	07:47 17:03
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:56 21:01	06:16 20:48	06:46 20:09	07:16 19:17	07:48 17:31	07:24 17:01	07:48 17:04
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:46	05:56 21:01	06:17 20:47	06:47 20:07	07:17 19:16	07:49 17:29	07:25 17:01	07:48 17:04
28	07:40 17:37	07:02 18:15	06:17 18:45	06:29 20:17	06:09 20:46	05:56 21:01	06:17 20:46	06:48 20:06	07:18 19:14	07:50 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38	07:01 18:09	06:16 18:39	06:28 20:18	06:08 20:47	05:57 21:01	06:18 20:45	06:49 20:04	07:19 19:12	07:51 17:27	07:27 17:00	07:49 17:06
30	07:38 17:40	07:00 18:14	06:14 18:46	06:27 20:19	06:07 20:48	05:58 21:01	06:19 20:44	06:49 20:02	07:20 19:11	07:52 17:26	07:28 16:59	07:49 17:06
31	07:37 17:41	07:00 18:17	06:13 18:47	06:26 20:20	06:06 20:49	05:57 21:01	06:18 20:43	06:48 20:01	07:21 19:10	07:53 17:24	07:29 17:00	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Shadow_cumulativo_beni_2021_12_13WTG: M02 - WINDWORLD 150 23.2 !O! hub: 30,0 m (TOT: 41,6 m) (3)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:49 17:08	07:36 17:42	07:01 18:16	07:11 19:49	06:25 20:21	05:57 20:50	05:58 21:00	06:21 20:42	06:51 19:59	07:21 19:09	06:55 17:23	07:29 16:59
2	07:50 17:09	07:35 17:43	06:59 18:17	07:09 19:50	06:24 20:22	05:57 20:50	05:58 21:00	06:22 20:41	06:52 19:58	07:22 19:07	06:56 17:22	07:30 16:59
3	07:50 17:10	07:34 17:45	06:58 18:18	07:07 19:51	06:23 20:23	05:56 20:51	05:59 21:00	06:23 20:40	06:53 19:56	07:23 19:06	06:57 17:21	07:31 16:59
4	07:50 17:11	07:33 17:46	06:56 18:19	07:06 19:52	06:22 20:24	05:56 20:52	05:59 21:00	06:24 20:38	06:54 19:54	07:24 19:04	06:58 17:19	07:32 16:58
5	07:50 17:12	07:32 17:47	06:55 18:20	07:04 19:53	06:20 20:25	05:55 20:52	06:00 21:00	06:25 20:37	06:55 19:53	07:25 19:03	06:59 17:18	07:33 16:58
6	07:49 17:13	07:31 17:48	06:53 18:21	07:03 19:54	06:19 20:26	05:55 20:53	06:00 21:00	06:26 20:36	06:56 19:51	07:26 19:01	07:00 17:17	07:34 16:58
7	07:50 17:14	07:30 17:49	06:52 18:22	07:01 19:55	06:18 20:27	05:55 20:54	06:01 20:59	06:27 20:35	06:57 19:49	07:27 18:59	07:02 17:16	07:35 16:58
8	07:49 17:15	07:29 17:51	06:50 18:24	06:59 19:57	06:17 20:28	05:55 20:54	06:01 20:59	06:28 20:34	06:58 19:48	07:28 18:58	07:03 17:15	07:36 16:58
9	07:49 17:16	07:28 17:52	06:48 18:25	06:58 19:58	06:16 20:29	05:54 20:55	06:02 20:59	06:29 20:33	06:59 19:46	07:29 18:56	07:04 17:14	07:37 16:58
10	07:49 17:17	07:27 17:53	06:47 18:26	06:56 19:59	06:15 20:30	05:54 20:55	06:03 20:58	06:30 20:31	07:00 19:44	07:30 18:55	07:05 17:13	07:38 16:58
11	07:49 17:18	07:26 17:54	06:45 18:27	06:55 20:00	06:14 20:31	05:54 20:56	06:03 20:58	06:31 20:30	07:01 19:43	07:31 18:53	07:06 17:12	07:38 16:58
12	07:49 17:19	07:24 17:56	06:44 18:28	06:53 20:01	06:12 20:32	05:54 20:56	06:04 20:57	06:32 20:29	07:02 19:41	07:32 18:51	07:08 17:11	07:39 16:58
13	07:48 17:20	07:23 17:57	06:42 18:29	06:51 20:02	06:11 20:33	05:54 20:57	06:05 20:57	06:33 20:27	07:03 19:39	07:33 18:50	07:09 17:10	07:40 16:58
14	07:48 17:21	07:22 17:58	06:40 18:30	06:50 20:03	06:10 20:34	05:54 20:57	06:06 20:56	06:34 20:26	07:04 19:38	07:34 18:48	07:10 17:09	07:41 16:59
15	07:48 17:22	07:21 17:59	06:39 18:31	06:48 20:04	06:09 20:35	05:54 20:58	06:06 20:56	06:35 20:25	07:05 19:36	07:35 18:47	07:11 17:08	07:42 16:59
16	07:47 17:23	07:19 18:00	06:37 18:32	06:47 20:05	06:08 20:36	05:54 20:58	06:07 20:55	06:36 20:23	07:06 19:34	07:37 18:45	07:12 17:08	07:42 16:59
17	07:47 17:24	07:18 18:02	06:35 18:33	06:45 20:06	06:08 20:37	05:54 20:59	06:08 20:55	06:37 20:22	07:07 19:33	07:38 18:44	07:13 17:07	07:43 16:59
18	07:46 17:25	07:17 18:03	06:34 18:34	06:44 20:07	06:07 20:38	05:54 20:59	06:09 20:54	06:38 20:20	07:08 19:31	07:39 18:42	07:15 17:06	07:44 17:00
19	07:46 17:26	07:15 18:04	06:32 18:35	06:42 20:08	06:06 20:39	05:54 20:59	06:10 20:53	06:39 20:19	07:09 19:29	07:40 18:41	07:16 17:05	07:44 17:00
20	07:45 17:28	07:14 18:05	06:31 18:37	06:41 20:09	06:05 20:39	05:54 21:00	06:10 20:53	06:40 20:18	07:10 19:28	07:41 18:39	07:17 17:05	07:45 17:00
21	07:45 17:29	07:13 18:06	06:29 18:38	06:39 20:10	06:04 20:40	05:54 21:00	06:11 20:52	06:41 20:16	07:11 19:26	07:42 18:38	07:18 17:04	07:45 17:01
22	07:44 17:30	07:11 18:08	06:27 18:39	06:38 20:11	06:03 20:41	05:54 21:00	06:12 20:51	06:42 20:15	07:12 19:24	07:43 18:36	07:19 17:03	07:46 17:01
23	07:44 17:31	07:10 18:09	06:26 18:40	06:36 20:12	06:02 20:42	05:55 21:00	06:13 20:50	06:43 20:13	07:13 19:23	07:44 18:35	07:20 17:03	07:46 17:02
24	07:43 17:32	07:08 18:10	06:24 18:41	06:35 20:13	06:02 20:43	05:55 21:00	06:14 20:49	06:44 20:12	07:14 19:21	07:45 18:34	07:21 17:02	07:47 17:02
25	07:42 17:34	07:07 18:11	06:22 18:42	06:34 20:14	06:01 20:44	05:55 21:00	06:15 20:49	06:45 20:10	07:15 19:19	07:46 17:32	07:23 17:02	07:47 17:03
26	07:41 17:35	07:05 18:12	06:21 18:43	06:32 20:15	06:00 20:45	05:56 21:01	06:16 20:48	06:46 20:09	07:16 19:17	07:47 17:31	07:24 17:01	07:48 17:04
27	07:41 17:36	07:04 18:13	06:19 18:44	06:31 20:16	06:00 20:46	05:56 21:01	06:17 20:47	06:47 20:07	07:17 19:16	07:48 17:29	07:25 17:01	07:48 17:04
28	07:40 17:37	07:02 18:15	06:17 18:45	06:29 20:17	05:59 20:46	05:56 21:01	06:17 20:46	06:48 20:06	07:18 19:14	07:49 17:28	07:26 17:00	07:48 17:05
29	07:39 17:38	07:01 18:04	06:16 18:35	06:28 20:08	05:59 20:37	05:57 20:54	06:18 20:51	06:49 20:18	07:19 19:12	07:50 17:27	07:27 17:00	07:49 17:06
30	07:38 17:40	06:59 17:55	06:15 18:34	06:27 20:07	05:58 20:36	05:57 21:01	06:19 20:44	06:49 20:02	07:20 19:11	07:51 17:26	07:28 16:59	07:49 17:06
31	07:37 17:41	06:58 17:54	06:14 18:33	06:26 20:06	05:57 20:35	05:57 20:54	06:19 20:43	06:49 20:01	07:21 19:10	07:52 17:24	07:29 17:00	07:49 17:07
Potential sun hours	298	298	370	398	447	451	458	427	375	346	299	289
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

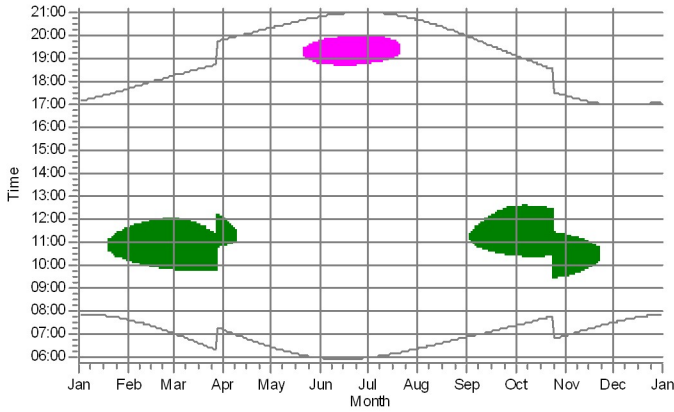
Table layout: For each day in each month the following matrix apply

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

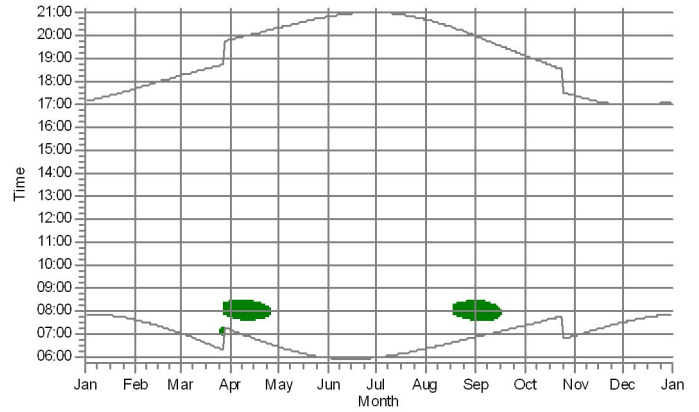
SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13

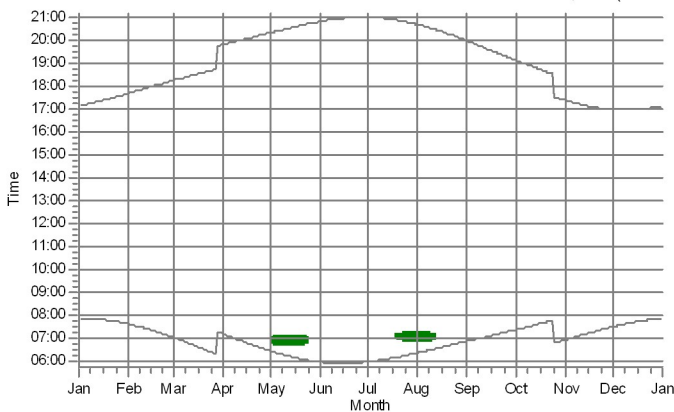
CH01: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



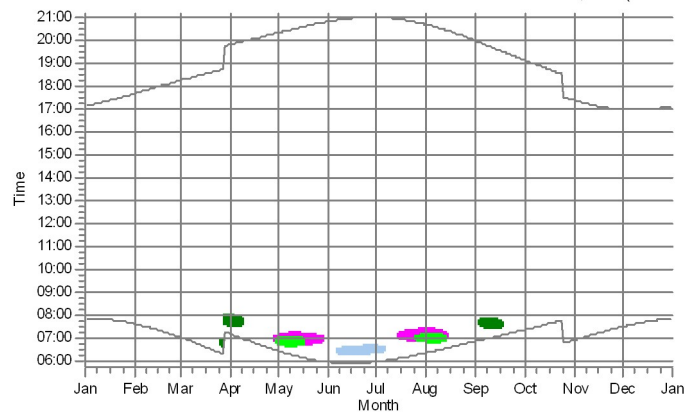
CH02: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



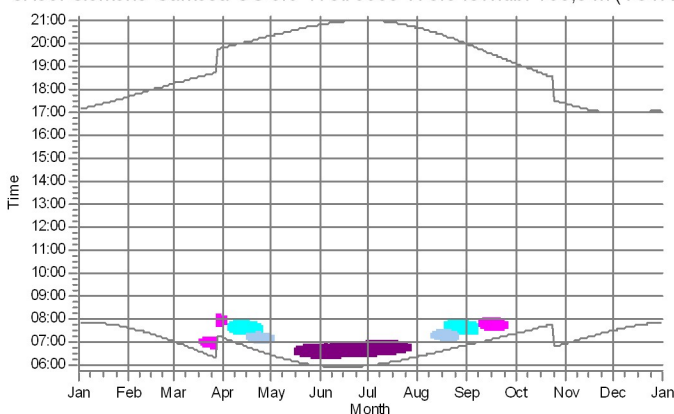
CH03: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



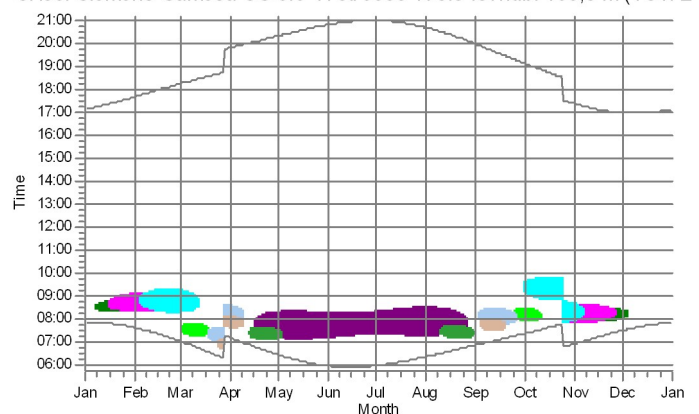
CH04: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH05: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH06: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



Shadow receptors

- BP01: Nuraghe Conca de fossu
- BP05: NURAGHE
- BP09: NURAGHE
- BP11: NURAGHE SCOBERTU

- BP13: Temio Nuragico Serra Porchilledos
- BP15: Menhirs Meddaris
- BP17: Circoli Massidda
- BP20: NURAGHE MASSEDDA

Project:

Impianto_WPD_Chiaramonti

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

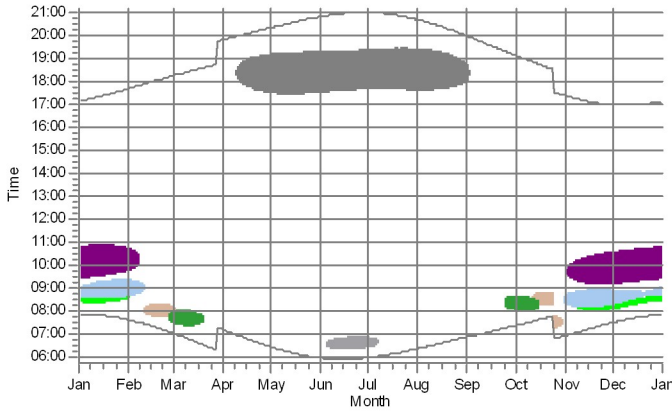
Calculated:

13/12/2021 10:15/3.4.415

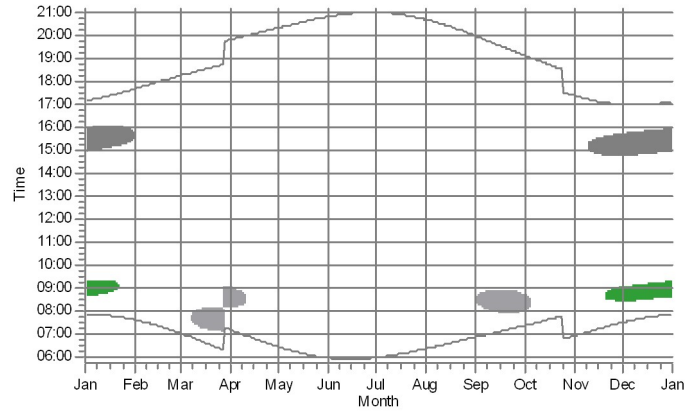
SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13

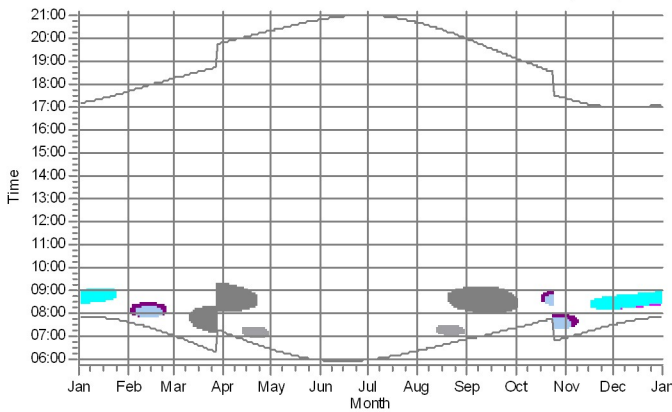
CH07: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



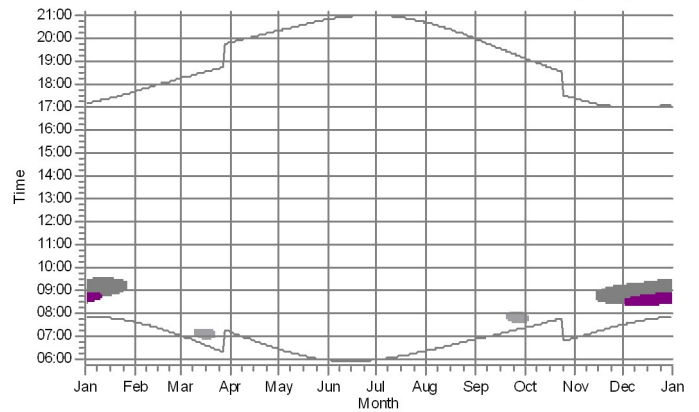
CH08: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



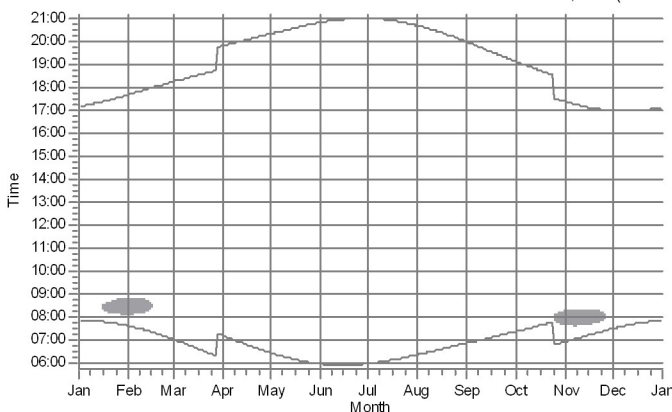
CH09: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



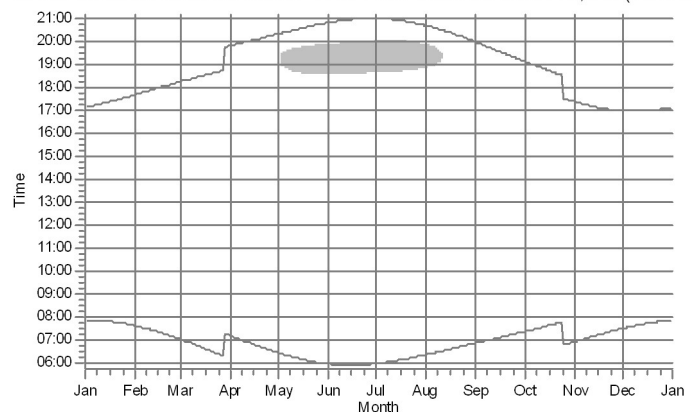
CH10: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH11: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH12: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



Shadow receptors

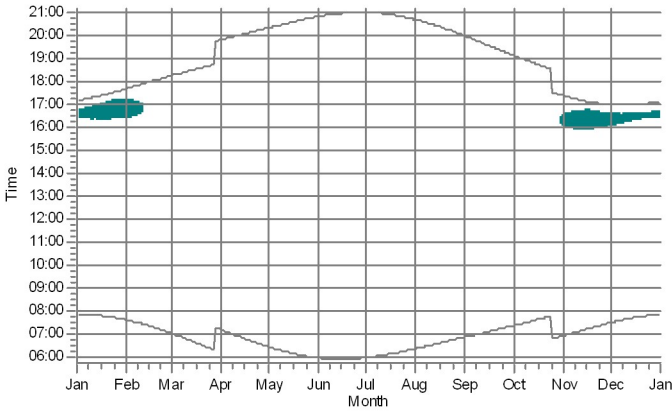
- BP04: Nuraghe Paule Udas
- BP05: NURAGHE
- BP09: NURAGHE
- BP11: NURAGHE SCOBERTU
- BP12: NURAGHE BADDE TETTI

- BP13: Temio Nuragico Serra Porchileddos
- BP15: Menhirs Meddaris
- BP16: NURAGHE
- BP17: Circoli Massidda
- BP20: NURAGHE MASSEDDA

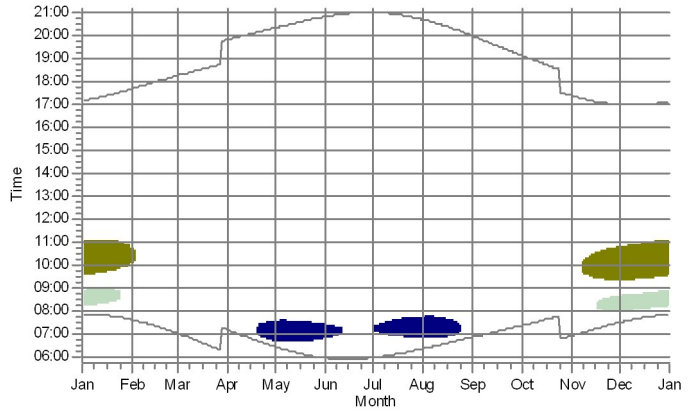
SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13

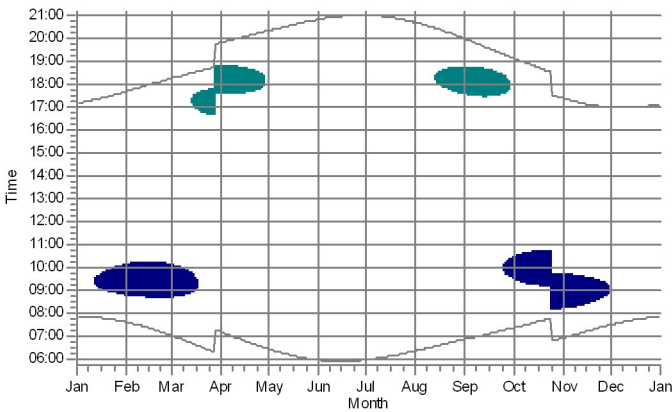
CH13: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



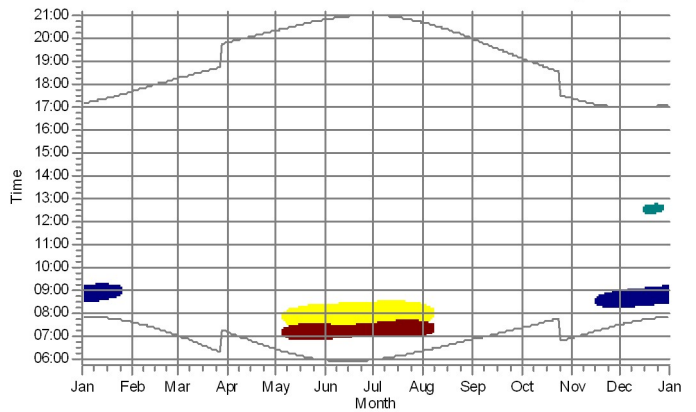
CH14: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



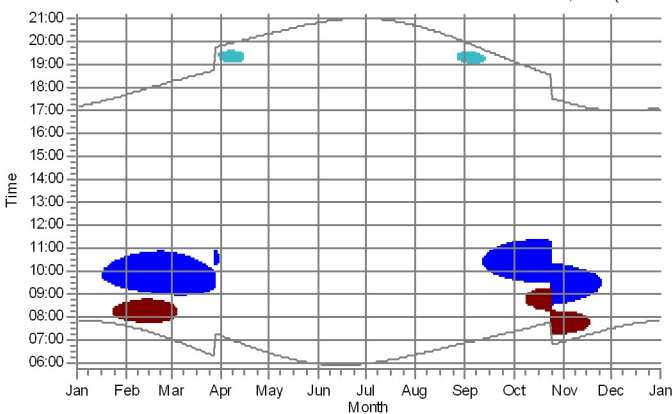
CH15: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



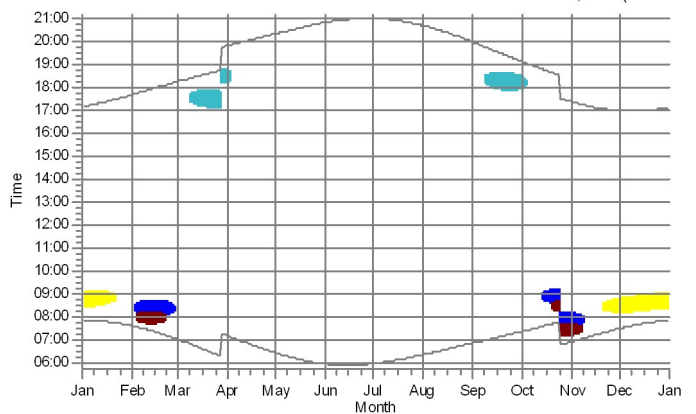
CH16: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH17: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



CH18: Siemens Gamesa SG 6.6-170!! 6600 170.0 !O! hub: 165,0 m (TOT: 2



Shadow receptors

- BP02: NURAGHE MANDRAS
- BP03: NURAGHE CORVUS MIGOSOS
- BP06: NURAGHE TRUVINE
- BP07: NURAGHE SA PALA DE SOS LADROS

- BP08: NURAGHE
- BP10: NURAGHE MARTINE
- BP14: NURAGHE
- BP19: NURAGHE PENTUMA

Project:

Impianto_WPD_Chiaramonti

Licensed user:

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

Via Santa Margherita 4

IT-09124 Cagliari

+39 070 658297

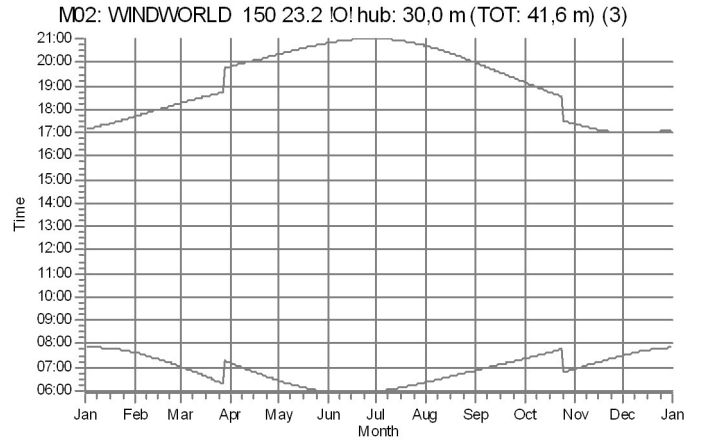
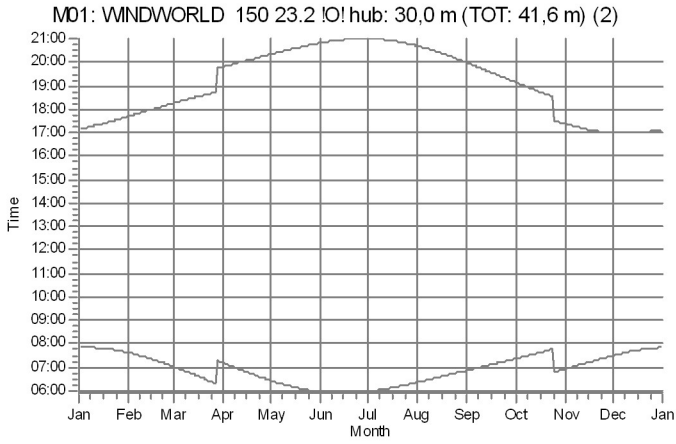
Giuseppe Frongia / direttore@iatprogetti.it

Calculated:

13/12/2021 10:15/3.4.415

SHADOW - Calendar per WTG, graphical

Calculation: Shadow_cumulativo_beni_2021_12_13



Shadow receptors