

AUTORIZZAZIONE UNICA Ex D. LGS. N. 387/2003



PROGETTO DEFINITIVO PARCO EOLICO MONTENERO

Titolo elaborato:

STUDIO SUGLI EFFETTI DELLO SHADOW FLICKERING

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1. PREMESSA

Nella presente trattazione si descrive l'evoluzione giornaliera delle ombre generate dalle pale eoliche facenti parte dell'impianto eolico denominato "Parco Eolico Montenero" al fine di verificare che l'alternanza ciclica dell'ombra non arrechi danni alla salute su un possibile ricettore.

2. DESCRIZIONE DEL PROGETTO

L'impianto eolico presenta una potenza nominale totale pari a 36 MWp ed è costituito da 6 aerogeneratori di potenza pari a 6.0 MWp, altezza torre pari a 135 m e rotore pari a 170 m, collegati tra loro mediante un sistema di cavidotti interrati da 36 kV, opportunamente dimensionati, che si collega alla stazione elettrica di trasformazione (SE) della RTN 380/36 kV di Montecilfone prevista in realizzazione.

L'impianto si colloca in Molise, provincia di Campobasso, all'interno di un'area di circa 1.400 ettari ed interessa prevalentemente il Comune di Montenero di Bisaccia, ove ricadono 2 aerogeneratori, il Comune di Guglionesi, ove ricadono 2 aerogeneratori, e il Comune di Montecilfone, dove ricadono 2 aerogeneratori e le opere di connessione alla RTN.

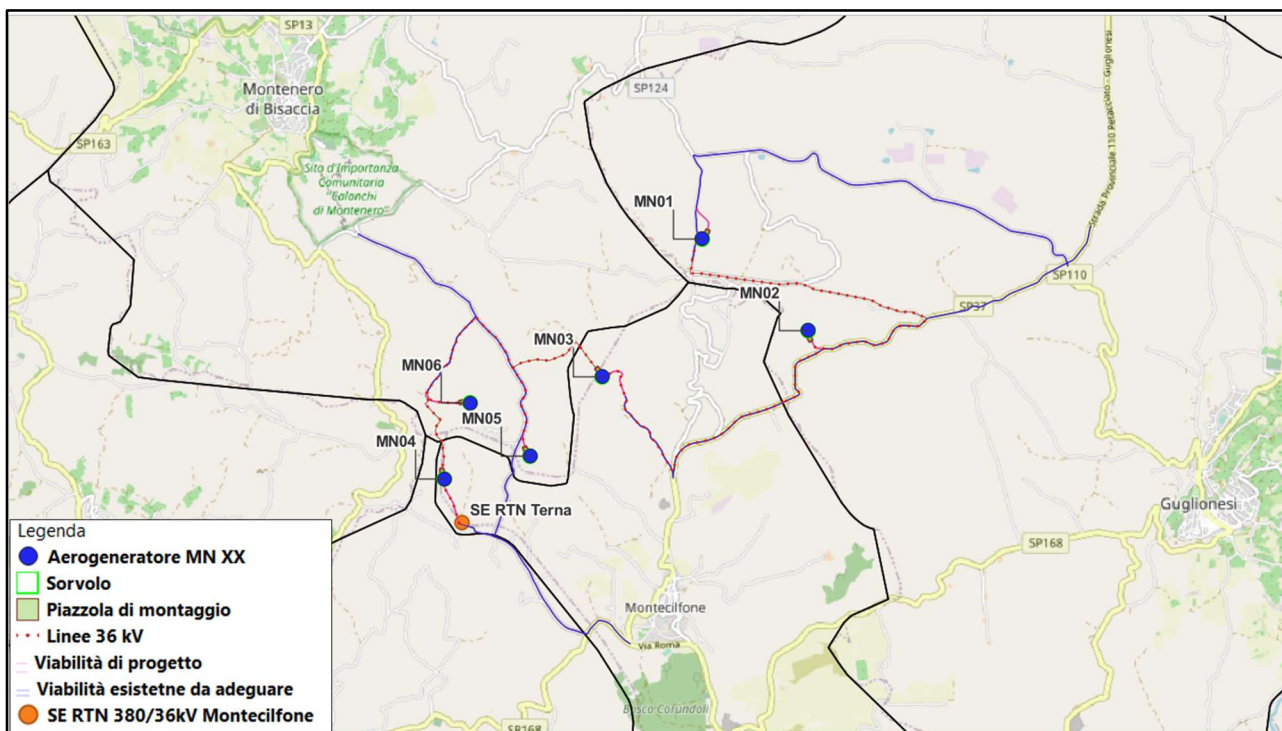


Figura 2.1: Inquadramento territoriale - Limiti amministrativi comuni interessati

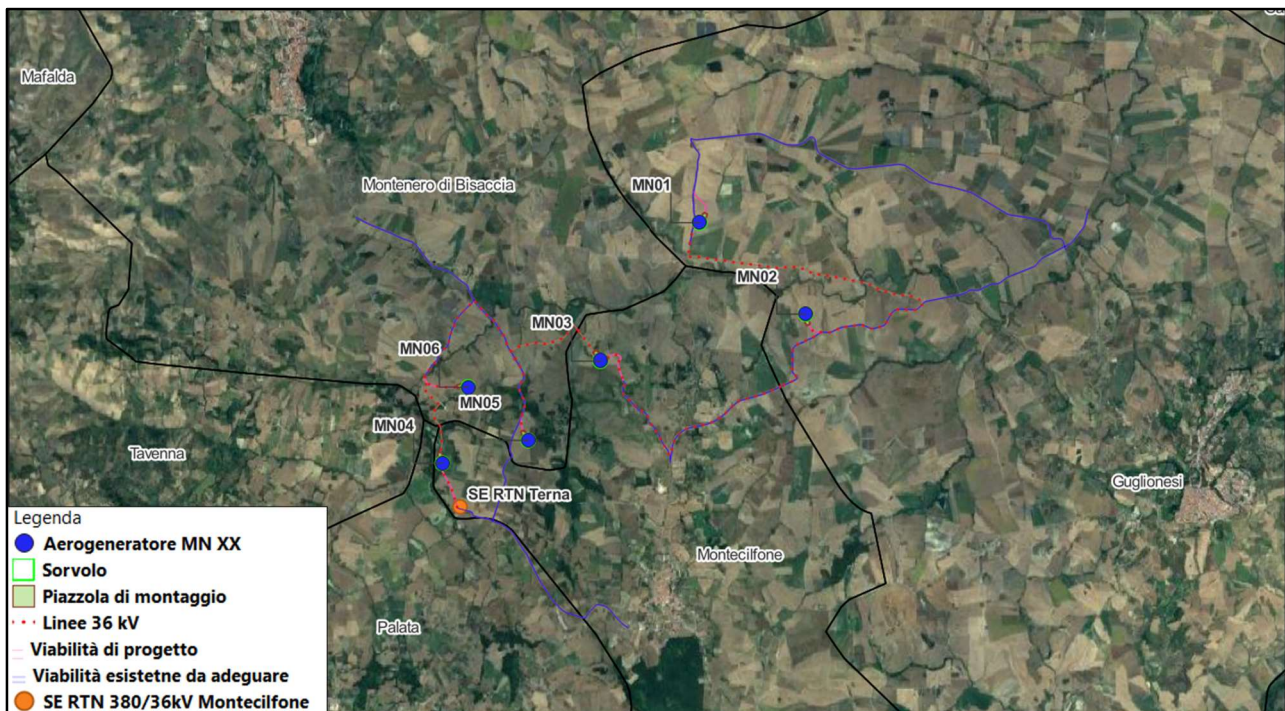


Figura 2.2: Layout d’impianto su immagine satellitare

Lo schema di allacciamento alla RTN prevede che l’impianto eolico venga collegato in antenna a 36 kV con una nuova stazione di trasformazione 380/150/36 kV della RTN da inserire in entra - esce sulla linea RTN a 380 kV “Larino - Gissi” nel Comune di Montecifone, in accordo alla STMG (Soluzione Tecnica Minima Generale) CP 202102693 Terna.

Ai sensi dell’allegato A alla deliberazione Arg/elt 99/08 e s.m.i. dell’Autorità di Regolazione per Energia, Reti e Ambiente, il nuovo elettrodotto in antenna a 36 kV per il collegamento della centrale alla citata SE costituisce impianto di utenza per la connessione, mentre lo stallo arrivo produttore a 36 kV nella suddetta stazione costituisce impianto di rete per la connessione.

Le turbine eoliche verranno collegate alla suddetta SE di trasformazione della RTN attraverso un sistema di linee elettriche interrate a 36 kV allocate prevalentemente in corrispondenza del sistema di viabilità interna che servirà per la costruzione e la gestione futura dell’impianto. Tale sistema di viabilità verrà realizzato prevalentemente adeguando il sistema viario esistente e, nei casi necessari anche per evitare di interessare aree vincolate, realizzando nuovi tratti di viabilità.

L’area di progetto è servita dalle seguenti strade E55, SS 87, SS 709, SP 113, che consentiranno l’accesso all’area di progetto, e da un sistema di viabilità provinciale, comunale ed interpodereale, che opportunamente adeguato, consentirà il transito dei mezzi eccezionali da utilizzare al fine di consegnare in sito i componenti degli aerogeneratori.

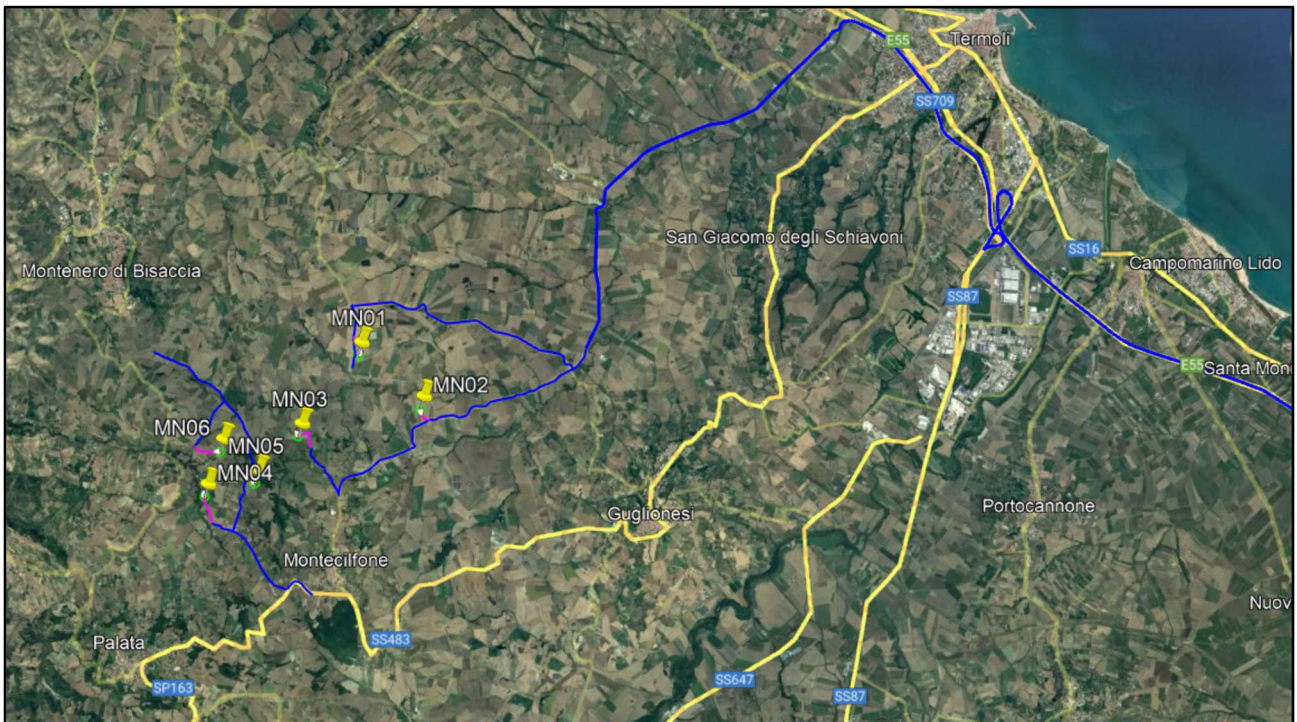


Figura 2.3: Layout d'impianto con sistema di viabilità esistente (linee blu) e di progetto (linee magenta) su immagine satellitare

2.1 Caratteristiche tecniche dell'aerogeneratore

L'aerogeneratore è una macchina rotante che trasforma l'energia cinetica del vento in energia elettrica ed è essenzialmente costituito da una torre (suddivisa in più parti), dalla navicella, dal Drive Train, dall'Hub e tre pale che costituiscono il rotore.

Per il presente progetto una delle possibili macchine che verrà installata è il modello Siemens Gamesa SG 170 di potenza nominale pari a 6.0 MW, altezza torre all'hub pari a 135 m e diametro del rotore 170 m (**Figura 2.1.1**).

Oltre ai componenti su elencati, vi è un sistema di controllo che esegue, il controllo della potenza ruotando le pale intorno al loro asse principale, ed il controllo dell'orientamento della navicella, detto controllo dell'imbardata, che permette l'allineamento della macchina rispetto alla direzione del vento.

Il rotore è a passo variabile in resina epossidica rinforzata con fibra di vetro di diametro pari a 170 metri, posto sopravvento al sostegno, con mozzo rigido in acciaio. Altre caratteristiche salienti sono riassunte nella **Tabella 2.1.1**.

Le caratteristiche dell'aerogeneratore su descritto sono quelle ritenute idonee in base a quanto disponibile oggi sul mercato, in futuro potrà essere possibile cambiare il modello dell'aerogeneratore senza modificare in maniera sostanziale l'impatto ambientale e i limiti di sicurezza previsti.

In accordo alle disposizioni dell'ENAC (Ente Nazionale per l'Aviazione Civile), ognuna delle macchine è dotata di un sistema di segnalazione notturna per la segnalazione aerea, che prevede l'utilizzo di una luce rossa sull'estradosso della navicella.

Una segnalazione diurna, consistente nella verniciatura della parte estrema della pala con tre bande di colore rosso ciascuna di 6 m per un totale di 18 m, è prevista per gli aerogeneratori di inizio e fine tratto.

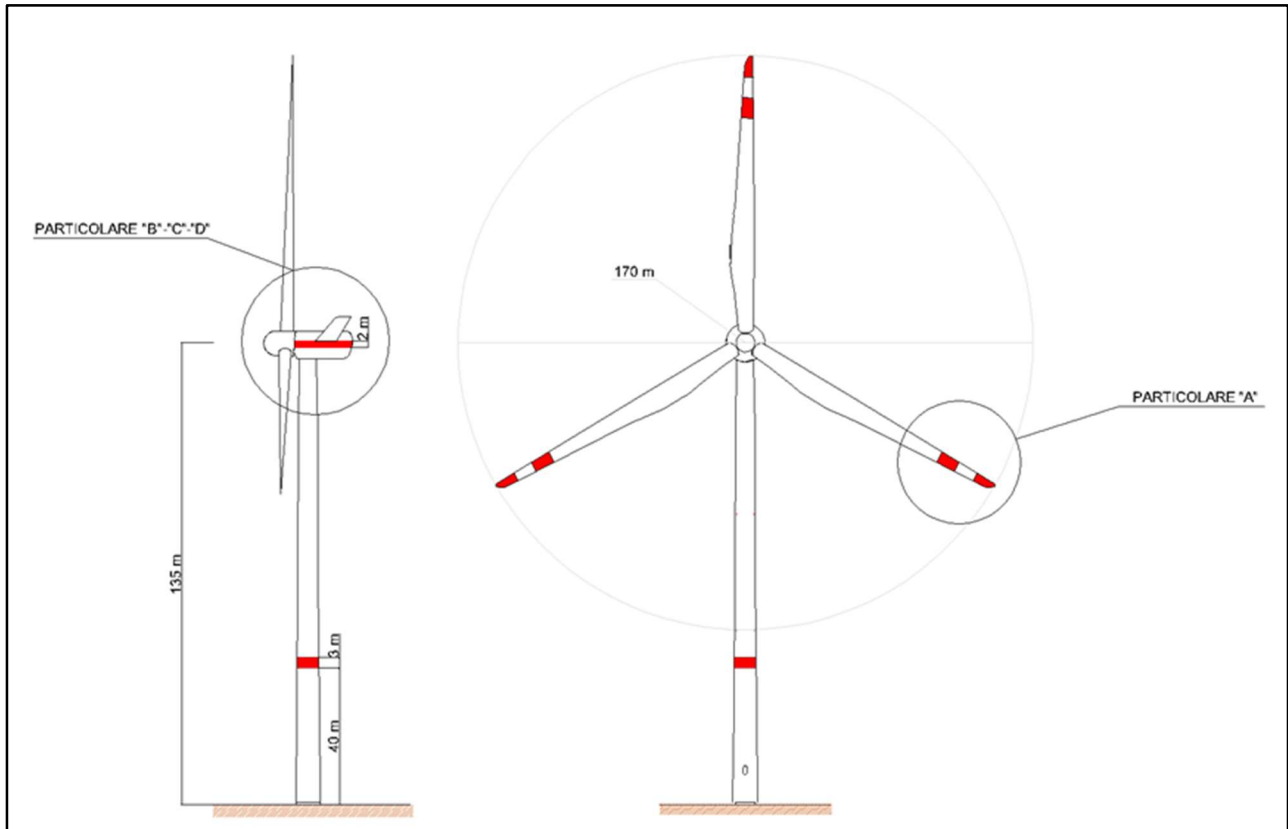


Figura 2.1.1: Profilo aerogeneratore SG170 – 6.0 MW

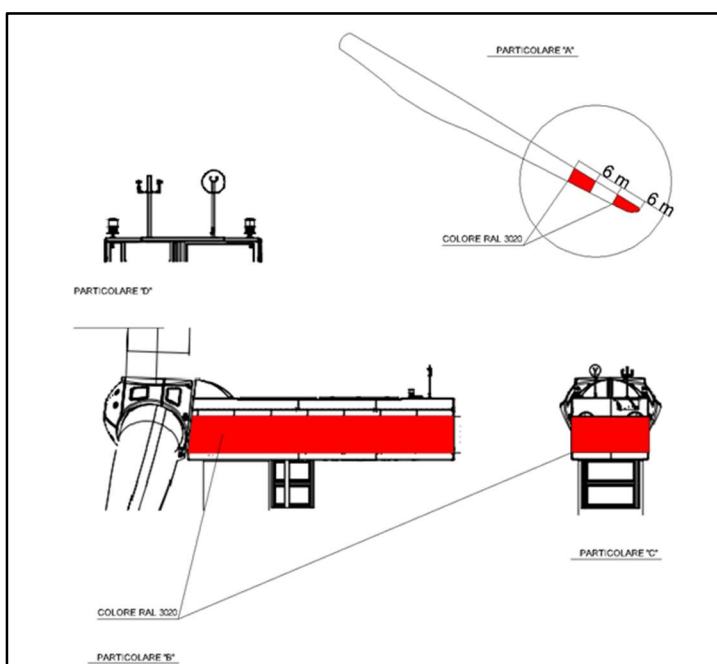


Figura 2.1.2: Particolari aerogeneratore SG170 – 6.0 MW di cui alla Figura 2.1.1

Rotor		Grid Terminals (LV)	
Type	3-bladed, horizontal axis	Baseline nominal power..	6.0MW/6.2 MW
Position	Upwind	Voltage.....	690 V
Diameter	170 m	Frequency.....	50 Hz or 60 Hz
Swept area	22,698 m ²	Yaw System	
Power regulation.....	Pitch & torque regulation with variable speed	Type.....	Active
Rotor tilt	6 degrees	Yaw bearing.....	Externally geared
Blade		Yaw drive.....	Electric gear motors
Type.....	Self-supporting	Yaw brake.....	Active friction brake
Single piece blade length	83,3 m	Controller	
Segmented blade length:		Type	Siemens Integrated Control System (SICS)
Inboard module.....	68,33 m	SCADA system	Consolidated SCADA (CSSS)
Outboard module.....	15,04 m	Tower	
Max chord.....	4.5 m	Type	Tubular steel / Hybrid
Aerodynamic profile.....	Siemens Gamesa proprietary airfoils	Hub height	100m to 165 m and site- specific
Material	G (Glassfiber) – CRP (Carbon Reinforced Plastic)	Corrosion protection	
Surface gloss.....	Semi-gloss, < 30 / ISO2813	Surface gloss	Painted
Surface color	White, RAL 9018	Color	Semi-gloss, <30 / ISO-2813 Light grey, RAL 7035 or White, RAL 9018
Aerodynamic Brake		Operational Data	
Type.....	Full span pitching	Cut-in wind speed	3 m/s
Activation	Active, hydraulic	Rated wind speed	11.0 m/s (steady wind without turbulence, as defined by IEC61400-1)
Load-Supporting Parts		Cut-out wind speed	25 m/s
Hub	Nodular cast iron	Restart wind speed.....	22 m/s
Main shaft.....	Nodular cast iron	Weight	
Nacelle bed frame	Nodular cast iron	Modular approach.....	Different modules depending on restriction
Mechanical Brake			
Type.....	Hydraulic disc brake		
Position.....	Gearbox rear end		
Nacelle Cover			
Type.....	Totally enclosed		
Surface gloss.....	Semi-gloss, <30 / ISO2813		
Color	Light Grey, RAL 7035 or White, RAL 9018		
Generator			
Type.....	Asynchronous, DFIG		

Tabella 2.1.1: Specifiche tecniche aerogeneratore

2.2 Viabilità e piazzole

La viabilità e le piazzole del parco eolico sono elementi progettati considerando la fase di costruzione e la fase di esercizio dell'impianto eolico.

In merito alla viabilità, come anticipato sopra, si è cercato di utilizzare il sistema viario esistente adeguandolo al passaggio dei mezzi eccezionali. Tale indirizzo progettuale ha consentito di minimizzare l'impatto sul territorio e di ripristinare tratti di viabilità comunale che si trovano in stato di dissesto migliorando l'accessibilità dei luoghi anche alla popolazione locale.

Nel caso questo non sia stato possibile, sono stati progettati tratti di nuova viabilità seguendo il profilo naturale del terreno senza interferire con il reticolo idrografico presente in sito.

Nella **Figura 2.2.1** è riportata una sezione stradale tipo di riferimento per i tratti di viabilità da adeguare e quelli di nuova realizzazione.

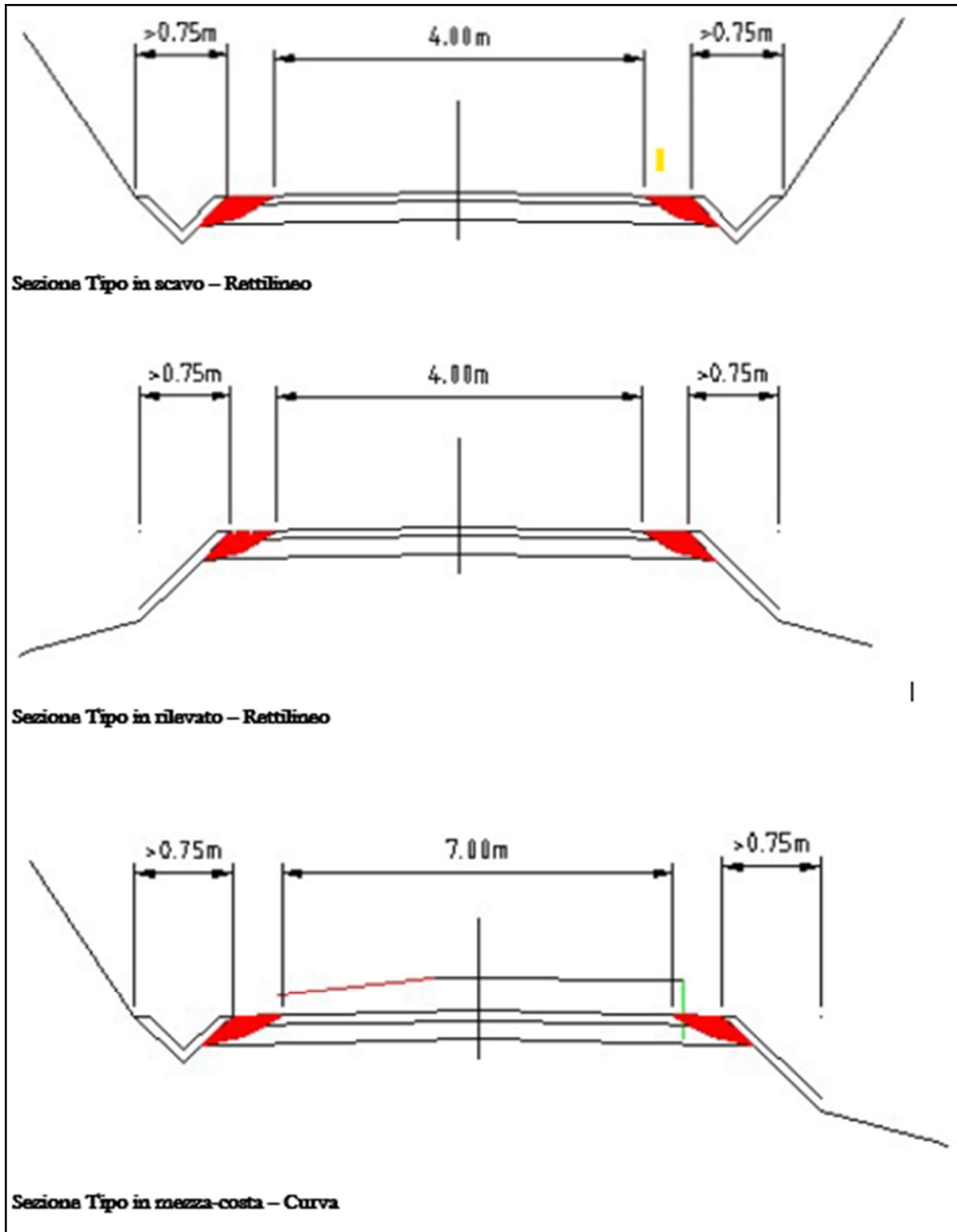


Figura 2.2.1: Sezioni tipo viabilità parco eolico

La progettazione delle piazzole da realizzare per l'installazione di ogni aerogeneratore prevede due configurazioni, la prima necessaria all'installazione dell'aerogeneratore e la seconda, a seguito di opere di dismissione parziale, per la fase di esercizio e manutenzione dell'impianto (**Figura 2.2.2**).

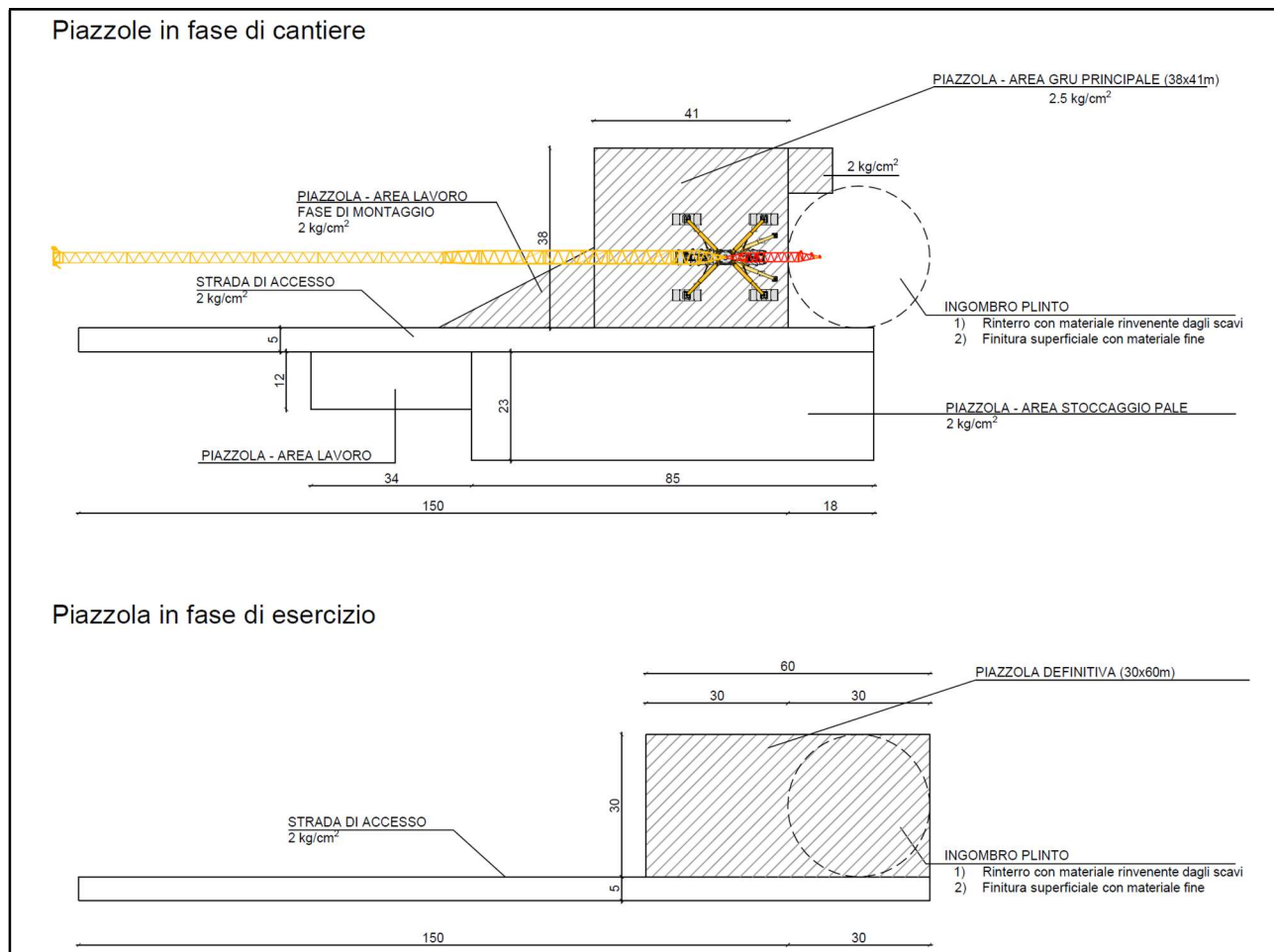


Figura 2.2.2: Planimetria piazzola tipo per la fase di installazione e fase di esercizio e manutenzione

2.3 Descrizione opere elettriche

2.3.1 Aerogeneratori

L'impianto eolico è composto da 6 aerogeneratori di potenza nominale pari a 6,0 MWp, opportunamente disposti e collegati in relazione alla disposizione dell'impianto, dotati di generatori asincroni trifasi. Ogni generatore è topograficamente, strutturalmente ed elettricamente indipendente dagli altri anche dal punto di vista delle funzioni di controllo e protezione.

Gli aerogeneratori sono collegati fra loro e a loro volta si connettono alla stazione elettrica di trasformazione 380/150/36 kV della RTN, ancora da realizzare, nel Comune di Montecilfone.

All'interno della torre saranno installati:

- l'arrivo cavo BT (690 V) dal generatore eolico al trasformatore;
- il trasformatore MT-BT (0,69/36 kV);

- il sistema di rifasamento del trasformatore;
- la cella a 36 kV di arrivo linea e di protezione del trasformatore;
- il quadro di BT (690 V) di alimentazione dei servizi ausiliari;
- quadro di controllo locale.

2.3.2 Linee elettriche di collegamento a 36 KV

Il parco eolico avrà una potenza complessiva di 36 MWp, data dalla somma delle potenze elettriche di 6 aerogeneratori da 6 MWp ciascuno. Dal punto di vista elettrico, gli aerogeneratori sono collegati fra loro in n. 2 gruppi (sottocampi) da 3 aerogeneratori ciascuno, come riportato nella tabella sottostante.

Sottocampo o Circuito	Aerogeneratori	Potenza totale [MW]
CIRCUITO A	MN01-MN02-MN03	18
CIRCUITO B	MN04-MN05-MN06	18

Tabella 2.3.2.1: Sottocampi degli aerogeneratori

Coerentemente con la suddivisione in sottocampi di cui sopra, l'intero sistema di distribuzione dell'energia dagli aerogeneratori verso la nuova stazione elettrica di trasformazione 380/150/36 kV nel Comune di Montecilfone è articolato in 2 distinte linee elettriche, una per ciascun sottocampo, con un livello di tensione pari a 36 kV e che confluiscono sui quadri generali dell'edificio a 36 kV in prossimità della stazione di cui sopra.

Dall'aerogeneratore capofila di ciascun sottocampo, infatti, si diparte una linea elettrica di vettoriamento in cavo interrato a 36 kV di sezione pari a 500 mm². Analogamente, gli aerogeneratori di ciascun sottocampo sono collegati fra loro in entra-esce o fine linea mediante una linea elettrica in cavo interrato a 36 kV di sezione 185 mm². Tutti i cavi di cui si farà utilizzo, sia per il collegamento interno dei sottocampi che per la connessione alla stazione elettrica di trasformazione della RTN 380/150/36 kV di Montecilfone, saranno del tipo schermato a filo di rame rosso, con conduttore a corda rotonda compatta di rame rosso, semiconduttore esterno elastomerico estruso e guaina in PVC.

In generale, per tutte le linee elettriche, si prevede la posa a trifoglio direttamente interrata dei cavi, ad una profondità di 1,50 m dal piano del suolo e l'utilizzo di una lastra protettiva che ne assicuri la protezione meccanica. In caso di particolari attraversamenti o di risoluzione puntuale di interferenze, le modalità di posa potranno essere modificate in conformità a quanto previsto dalla norma CEI 11-17 e dagli eventuali regolamenti vigenti relativi alle opere interferite, mantenendo comunque un grado di protezione delle linee non inferiore a quanto garantito dalle normali condizioni di posa.

La figura seguente, nella quale le misure sono espresse in mm, mostra la modalità di posa sopra indicate.

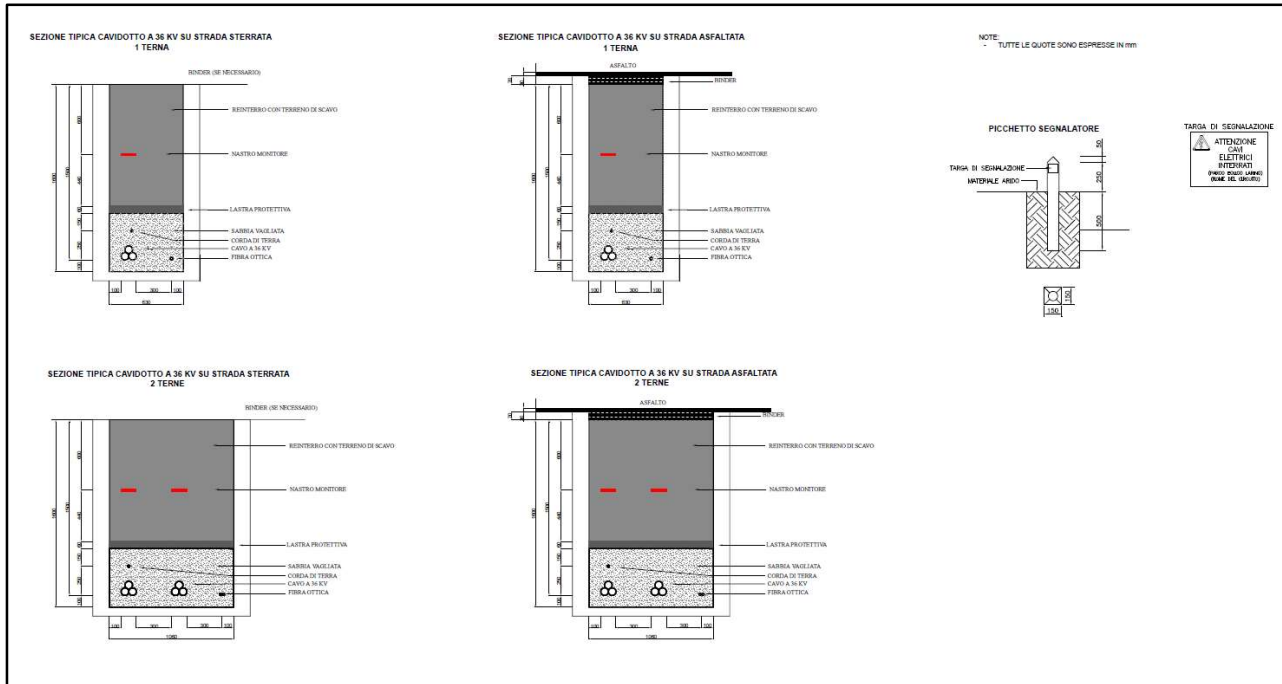


Figura 2.3.2.1: Sezioni tipiche delle trincee caavidotto per una o due terne di cavi in parallelo

2.3.3 Opere di connessione alla RTN

Lo schema di allacciamento alla RTN prevede che la centrale eolica venga collegata in antenna a 36 kV con una nuova sezione a 36 kV della stazione elettrica di trasformazione (SE) della RTN 380/150/36 kV di Montecilfone, previo ampliamento della stessa che prevede la realizzazione di un edificio, ove verranno collocati i quadri di attestazione cavi a 36 kV dei produttori e da cui si dipartono 3 linee a 36 kV verso rispettivamente 3 Trasformatori 380/36 kV per un totale di 250 MVA.

Tale ampliamento sarà esterno alla sottostazione Terna SE RTN 380/150 kV Montecilfone di futura realizzazione e verrà utilizzato da diversi produttori di energia elettrica.

2.3.4 Sistema di terra

Il sistema di terra del parco eolico è costituito da una maglia di terra formata dai sistemi di dispersori dei singoli aerogeneratori e dal conduttore di corda nuda che li collega. La maglia complessiva che si viene così a creare consente di ottenere un valore di resistenza di terra tale da garantire un sufficiente margine di sicurezza, adeguato alla normativa vigente. Il sistema di terra di ciascun aerogeneratore consisterà in più anelli dispersori concentrici, collegati radialmente fra loro, e collegati in più punti anche all'armatura del plinto di fondazione.

3. CARATTERISTICHE PRINCIPALI DEL PARCO EOLICO

L'impianto eolico sarà costituito essenzialmente da 6 aerogeneratori la cui posizione è stata stabilita a seguito di valutazioni che riguardano diversi aspetti quali l'esposizione a tutti i settori della rosa dei venti, la morfologia del territorio, la distanza da fabbricati e strade esistenti ed utilizzate da un elevato numero di veicoli, distanza dal centro abitato e da beni monumentali presenti nell'area oltre agli aspetti legati alla sicurezza e volti a minimizzare l'impatto sull'ambiente:

- ottemperare alle previsioni della normativa vigente e delle linee guida sia nazionali che regionali;
- minimizzare l'impatto visivo;
- migliorare in sistema viario esistente al fine di migliorare l'accessibilità ai terreni per lo sviluppo dell'agricoltura e dell'allevamento di animali;
- disposizione delle macchine ad una distanza reciproca minima pari ad almeno 530 m, atta a minimizzare l'effetto scia, l'effetto selva e l'impatto sull'avifauna;
- condizioni di massima sicurezza, sia in fase di installazione che di esercizio.

La disposizione finale del parco è stata verificata e confermata a seguito di uno studio di fattibilità condotto sulla base delle informazioni sugli aspetti vincolistici dal punto di vista ambientale e paesaggistico e sulla base dei sopralluoghi svolti sul posto per verificare le interferenze presenti in sito e la fattibilità di realizzazione delle opere.

Si riportano di seguito le coordinate delle posizioni scelte per l'installazione degli aerogeneratori con il relativo inquadramento catastale.

ID	Comune	Lat. [°]	Long. [°]	Foglio	Particella	D rotore [m]	H _{hub} [m]	H _{tot} [m]
MN01	Guglionesi	41.942314	14.841643	35	28	170	135	220
MN02	Guglionesi	41.932449	14.857005	51	18	170	135	220
MN03	Montecilfone	41.927420	14.827177	2	11	170	135	220
MN04	Montecilfone	41.916357	14.804344	8	25	170	135	220
MN05	Montenero di Bisaccia	41.918844	14.816757	80	130	170	135	220
MN06	Montenero di Bisaccia	41.924586	14.808045	79	107	170	135	220

Tabella 3.1: Localizzazione planimetrica e catastale degli aerogeneratori di progetto

Il progetto prevede l'adeguamento di tratti di strada esistenti, in particolare strade comunali, e la realizzazione di una nuova viabilità a servizio degli aerogeneratori di progetto, ossia di una rete viaria interna al parco che si snoderà seguendo lo sviluppo degli esistenti tratturi non vincolati dalla Soprintendenza.

La disponibilità delle aree, necessaria per l'installazione degli aerogeneratori e le relative opere connesse, è garantita grazie alla Dichiarazione di Pubblica utilità ai sensi degli artt. 52-quater "Disposizioni generali

in materia di conformità urbanistica, apposizione del vincolo preordinato all'esproprio e pubblica utilità" e 52-quinquies "Disposizioni particolari per le infrastrutture lineari energetiche facenti parte delle reti energetiche nazionali" D.P.R. 327/2001 a conclusione del procedimento autorizzatorio di cui all'art.12, d.lgs. 387/2003 e gli effetti dell'Autorizzazione Unica ottenuta dopo opportuna conferenza di servizi. Tutte le aree oggetto interessate dal progetto sono riportate nello specifico elaborato di progetto "MNEG011 Piano Particellare di esproprio descrittivo".

4. FENOMENO DI SHADOW FLIKERING

La presenza delle turbine eoliche provoca la proiezione dell'ombra sulle aree ad esse adiacenti in presenza di luce solare diretta.

Il fenomeno causa effetti quasi statici dovuti alla presenza della torre fissa ed effetti dinamici legati alla rotazione del rotore delle tre pale della turbina.

Gli effetti statici possono aumentare, nelle prime ed ultime ore del giorno, la probabilità di formazione di ghiaccio su eventuali strade asfaltate soggette a traffico.

Gli effetti dinamici si traducono in una variazione alternata di intensità luminosa che, a lungo andare, può provocare fastidio agli occupanti le abitazioni le cui finestre risultano esposte al fenomeno stesso.

Lo "**shadow flickering**" descrive appunto l'effetto stroboscopico delle ombre proiettate dalle pale rotanti degli aerogeneratori allorquando il sole si trova alle loro spalle, come si evince dalla **Figura 4.1**.



Figura 4.1: Ombre proiettate dalle pale in rotazione di una turbina

Il conseguente effetto sugli individui è simile a quello che si sperimenterebbe in seguito alle variazioni di intensità luminosa di una lampada ad incandescenza a causa di continui sbalzi della tensione della rete di alimentazione elettrica.

Lo shadow flickering risulta assente nei casi di presenza di nuvole e nebbia che oscurano il sole e nei casi in cui le pale dell'aerogeneratore sono a riposo (per esempio in assenza del vento).

Per effettuare l'analisi del fenomeno vengono considerati alcuni parametri che ne influenzano la rilevanza.

Il primo di essi da tenere in conto è la frequenza di rotazione delle pale; in particolare, le frequenze che possono provocare un senso di fastidio sono comprese tra i 2,5 ed i 20 Hz.

Solitamente gli aerogeneratori tripala operano ad una velocità di rotazione inferiore ai 35 giri al minuto, corrispondente ad una frequenza di passaggio delle pale sulla verticale inferiore a 1,75 Hz, minore, quindi, della frequenza critica di 2,5 Hz.

Inoltre, i generatori di grande potenza (dal MW in su) raramente superano la velocità di rotazione di 20 giri al minuto, corrispondente a frequenze di passaggio delle pale ampiamente minori di quelle ritenute fastidiose per la maggioranza degli individui.

Un ulteriore aspetto da considerare per l'analisi della durata del fenomeno è la relazione spaziale tra un aerogeneratore ed un ricettore (abitazione), così come la direzione del vento.

Per distanze dell'ordine dei 300 m il fenomeno è più rilevante all'alba oppure al tramonto, ovvero in quelle ore in cui le ombre risultano molto lunghe per effetto della piccola elevazione solare. Al di là di una certa distanza l'effetto delle ombre è meno consistente perché il diametro del sole risulta essere di gran lunga superiore rispetto allo spessore della singola pala.

In questo scenario la condizione più penalizzante corrisponde al caso in cui il piano del rotore risulta essere ortogonale alla congiungente tra sole e ricettore; infatti, in tali condizioni, l'ombra proiettata darà origine ad un cerchio di diametro pari al rotore dell'aerogeneratore.

L'effetto dello shadow flickering risulta evidente e fastidioso in quegli ambienti con finestrate rivolte verso le ombre.

In linea di massima, si può ritenere che l'area soggetta al fenomeno in questione non si estenda oltre i 500 ÷ 1000 m dall'aerogeneratore e le zone a maggiore impatto ricadono entro i 300 m di distanza dalle turbine.

Al fine di analizzare qualitativamente e quantitativamente il fenomeno, risulta necessario individuare la posizione occupata dal sole in maniera univoca tramite due coordinate angolari, azimut ed altezza.

L'azimut per convenzione è l'angolo valutato sul piano orizzontale ed in senso orario, a partire dal nord geografico fino alla proiezione della congiungente (origine del sistema) - sole sul piano orizzontale stesso, ovvero il punto direttamente sotto al sole.

L'altezza o elevazione è misurata sul piano verticale, partendo da tale punto sino ad arrivare in corrispondenza del sole.

Tali coordinate variano con continuità grazie al moto della Terra intorno al sole e la traiettoria descritta nel cielo dal sole è assimilabile ad un arco; ogni giorno si caratterizza per un proprio arco, il quale si discosta, se pur di poco, da quello del giorno immediatamente precedente e successivo.

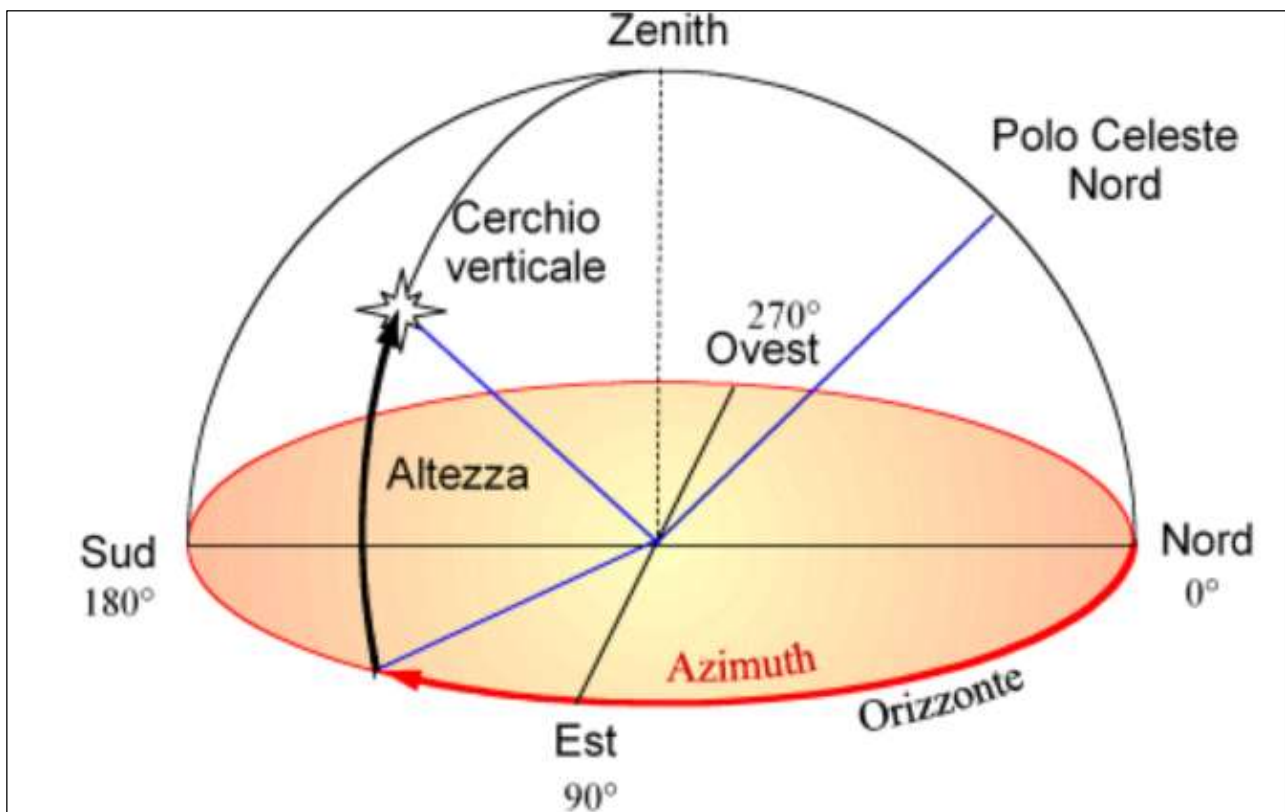


Figura 4.2: Coordinate azimut ed altezza per identificare la posizione del sole

La durata del giorno non coincide con la durata della luce naturale in quanto prima dell'alba e dopo il tramonto sono individuabili due periodi, detti crepuscolo (rispettivamente crepuscolo mattutino e crepuscolo serale o serotino), durante i quali giunge a terra una luce diffusa naturale fornita dai livelli più esterni dell'atmosfera, i quali, trovandosi a quote più elevate, ricevono luce solare diretta per un tempo più lungo riflettendola in parte verso la terra.

Pertanto, la durata dell'illuminazione del sole è pari alla somma della durata del giorno e della durata del crepuscolo mattutino e serale.

5. RIFERIMENTI NORMATIVI

L'effetto Shadow – Flickering è più pronunciato alle latitudini settentrionali durante i mesi invernali; infatti, soprattutto nel Nord Europa, l'effetto della minore altezza del sole all'orizzonte è più rilevante. Pertanto, alcuni paesi hanno adottato dei limiti di legge relativi all'esposizione all'effetto in questione. In Italia non esistono specifiche norme o linee guida che regolamentino il fenomeno e definiscano i limiti di esposizione in termini di ore o giorni all'anno.

Tuttavia, al fine di fornire una valutazione dell'impatto del fenomeno anche in termini quantitativi, si è cercato di mantenere l'esposizione allo shadow – flickering di ogni ricettore al di sotto delle 30 ore annue, parametro considerato di qualità a livello internazionale.

In particolare, la seguente trattazione fa riferimento alle norme e linee guida tedesche, in base alle quali il fenomeno in questione deve essere valutato nei casi seguenti:

- Fino alle distanze in corrispondenza delle quali il rotore dell'aerogeneratore copre il 20 % del disco solare (per distanze superiori a quella menzionata lo shadow-flickering arreca danni considerati trascurabili);
- per angoli del sole sull'orizzonte superiori a 3°;
- ad un'altezza di 2 m dal suolo.

Inoltre, come anticipato, le linee guida tedesche stabiliscono i limiti di esposizione al fenomeno di:

- 30 ore all'anno;
- 30 minuti al giorno.

6. IPOTESI E METODO DI CALCOLO

L'obiettivo della trattazione è la stima quantitativa dell'effetto shadow flickering prodotto dall'impianto eolico, fenomeno per cui si genera una intermittenza dell'ombra a seguito del movimento del rotore dell'aerogeneratore quando in esercizio (in particolare quando il piano del rotore risulta perpendicolare alla congiungente tra l'osservatore e il sole) e che potrebbe risultare fastidioso per un osservatore.

Nell'analisi condotta sono stati considerati 6 aerogeneratori di nuova realizzazione e relativi al progetto del Parco Eolico Montenero.

Gli aerogeneratori di progetto hanno un'altezza al mozzo di 135 m, diametro del rotore di 170 m, potenza nominale di 6,0 MWp e 8,8 giri al minuto (RPM nominale).

La verifica è stata effettuata in corrispondenza di 15 ricettori, rappresentativi di fabbricati di "civile abitazione", riportati nella **Tabella 6.1**, sui quali l'effetto trattato potrebbe avere una certa rilevanza:

Ricettore	Comune	Buffer	Distanza WTG più vicina [m]	WTG più vicina	Informazioni catastali			Tipologia
					Foglio	Particella	Categoria	
R01	Montenero di Bisaccia	500	925	MN06	73	320	A/4	Abitazione
R03	Tavenna	500	1199	MN06	11	33	A/3	Abitazione
R06	Montecilfone	500	560	MN05	8	233	A/4	Abitazione
R13	Montecilfone	500	693	MN05	8	238		Abitazione
R14	Palata	500	934	MN04	3	328	A/4	Abitazione
R15	Montecilfone	500	620	MN04	8	224	A/4	Abitazione
R16	Montecilfone	500	764	MN02	4	145	A/4	Abitazione
R18	Guglionesi	500	862	MN02	38	150	A/4	Abitazione
R19	Guglionesi	500	836	MN01	36	93	A/4	Abitazione
R20	Guglionesi	500	1046	MN02	38	148	A/4	Abitazione
R22	Montenero di Bisaccia	500	759	MN06	80	151	A/4	Abitazione
R23	Guglionesi	500	894	MN01	36	80	A/4	Abitazione
R28	Tavenna	500	574	MN04	11	175	A/4	Abitazione
R34	Guglionesi	500	1149	MN01	34	120	A/7	Abitazione
R35	Guglionesi	500	1023	MN01	34	122	A/7	Abitazione

Tabella 6.1: Ricettori oggetto di verifica

La distribuzione dei suddetti ricettori rispetto agli aerogeneratori è riportata nella figura seguente:

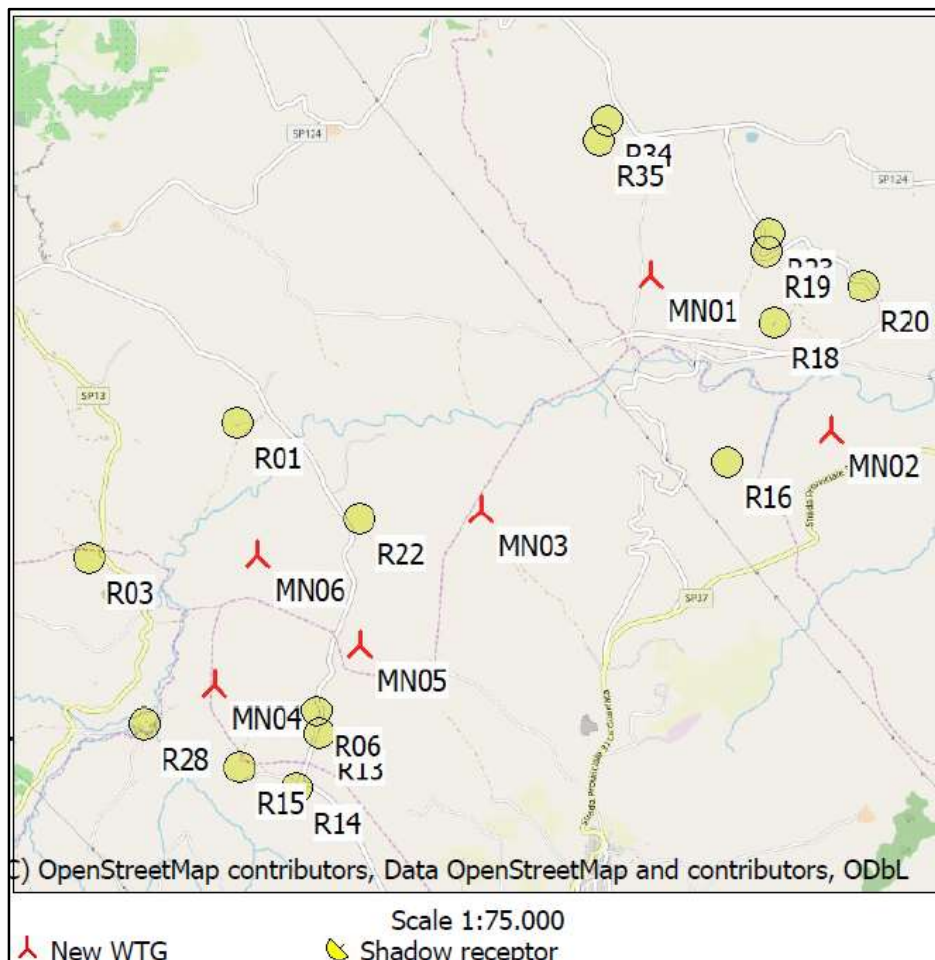


Figura 6.1: Localizzazione dei ricettori rispetto agli aerogeneratori

Il software impiegato per effettuare la verifica di sicurezza all'effetto shadow flickering è il WindPRO versione 3.4.

Tale software esegue la valutazione di zone di influenza degli aerogeneratori (ZVI), considerando l'orografia del terreno e altezza dell'osservatore (nel caso specifico altezza della finestra di un'abitazione) pari a 2 m, prima di effettuare il calcolo flicker in modo da escludere il contributo di quegli aerogeneratori che non sono visibili dal ricettore.

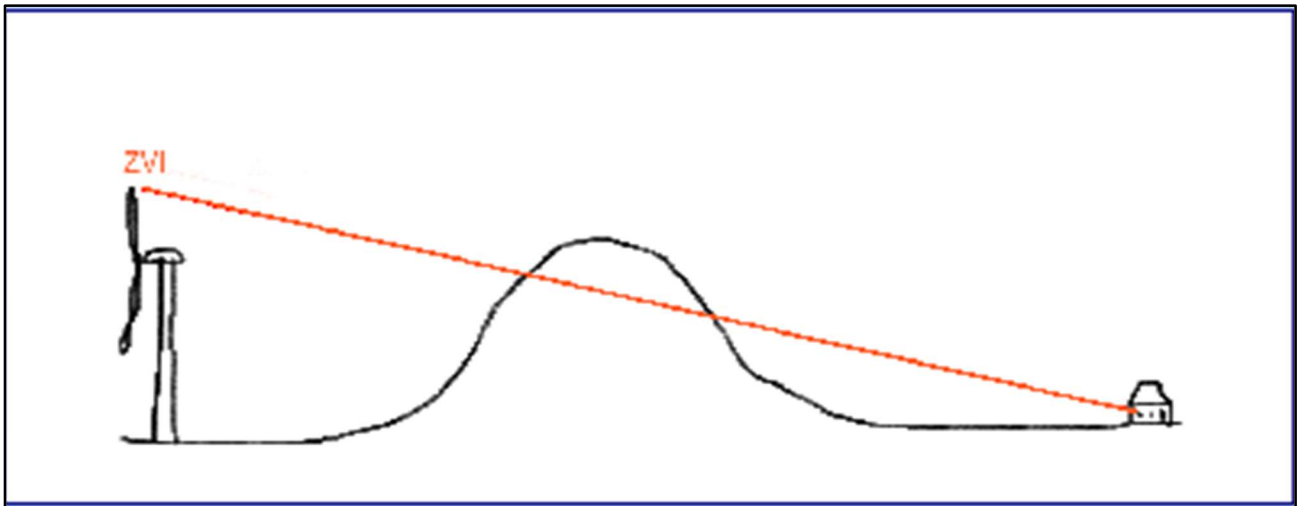


Figura 6.2: Impatto della ZVI, l'orografica del territorio può rendere non visibile l'aerogeneratore al ricettore

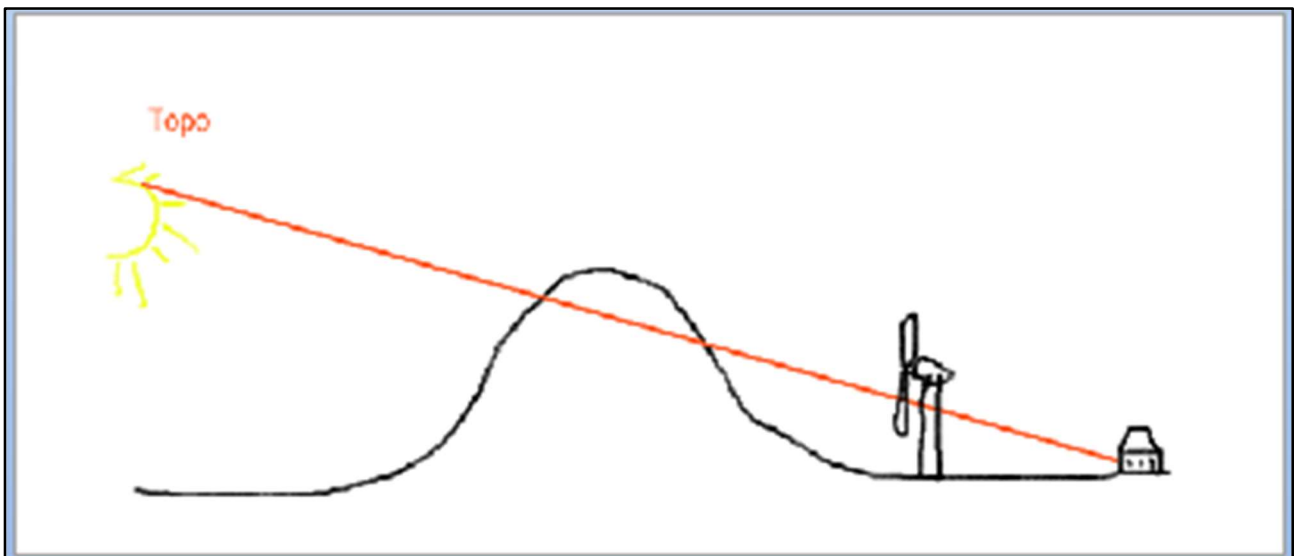


Figura 6.3: Impatto dell'orografia del territorio sull'ombreggiamento

Nella stima effettuata si assumono le seguenti ipotesi restrittive:

- altezza minima del sole sull'orizzonte pari a 3° ;
- piano del rotore sempre ortogonale alla congiungente tra l'osservatore e il sole;
- totale assenza di ostacoli o schermi vegetazionali presenti negli spazi circostanti i possibili ricettori e che potrebbero inficiare il fenomeno;

- ricettori in modalità “green house”, ovvero le finestre delle abitazioni attenzionate non orientate in una particolare direzione ma omnidirezionali.

Inoltre, allo scopo di pervenire a valori più realistici di impatto (**expected values**), si è impiegato il valore di eliofania, che tiene in conto del numero medio di ore di cielo libero da nubi durante il giorno, e le ore di funzionamento degli aerogeneratori in presenza del sole.

Per l’area in esame, con riferimento all’anno 2021 ed alla zona di Campobasso, i valori delle probabilità medie di eliofania per ognuno dei mesi e le ore di funzionamento degli aerogeneratori in presenza del sole in funzione della direzione del vento sono riportati nelle tabelle seguenti:

MESE	gen	feb	mar	apr	mag	giu	lug	ago	set	ott	nov	dic
GIORNI	31	28	31	30	31	30	31	31	30	31	30	31
PROB. MEDIA ELIOFANIA	4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Tabella 6.2: Probabilità medie di eliofania

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Somma
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

Tabella 6.3: Ore di funzionamento degli aerogeneratori in presenza del sole in funzione della direzione del vento (ipotesi di funzione dell’impianto 80% del totale ore annue)

Il modello numerico utilizzato, al pari degli altri presenti sul mercato, produce statisticamente un output relativo al valore atteso delle ore d’ombra per anno relativo ai ricettori.

7. CONCLUSIONI

Nella **Figura 7.1** sono rappresentate le aree circostanti le posizioni degli aerogeneratori di progetto caratterizzate dal numero di ore d'ombra intermittente attese per anno dovute al fenomeno di shadow flickering nelle ipotesi precedentemente elencate.

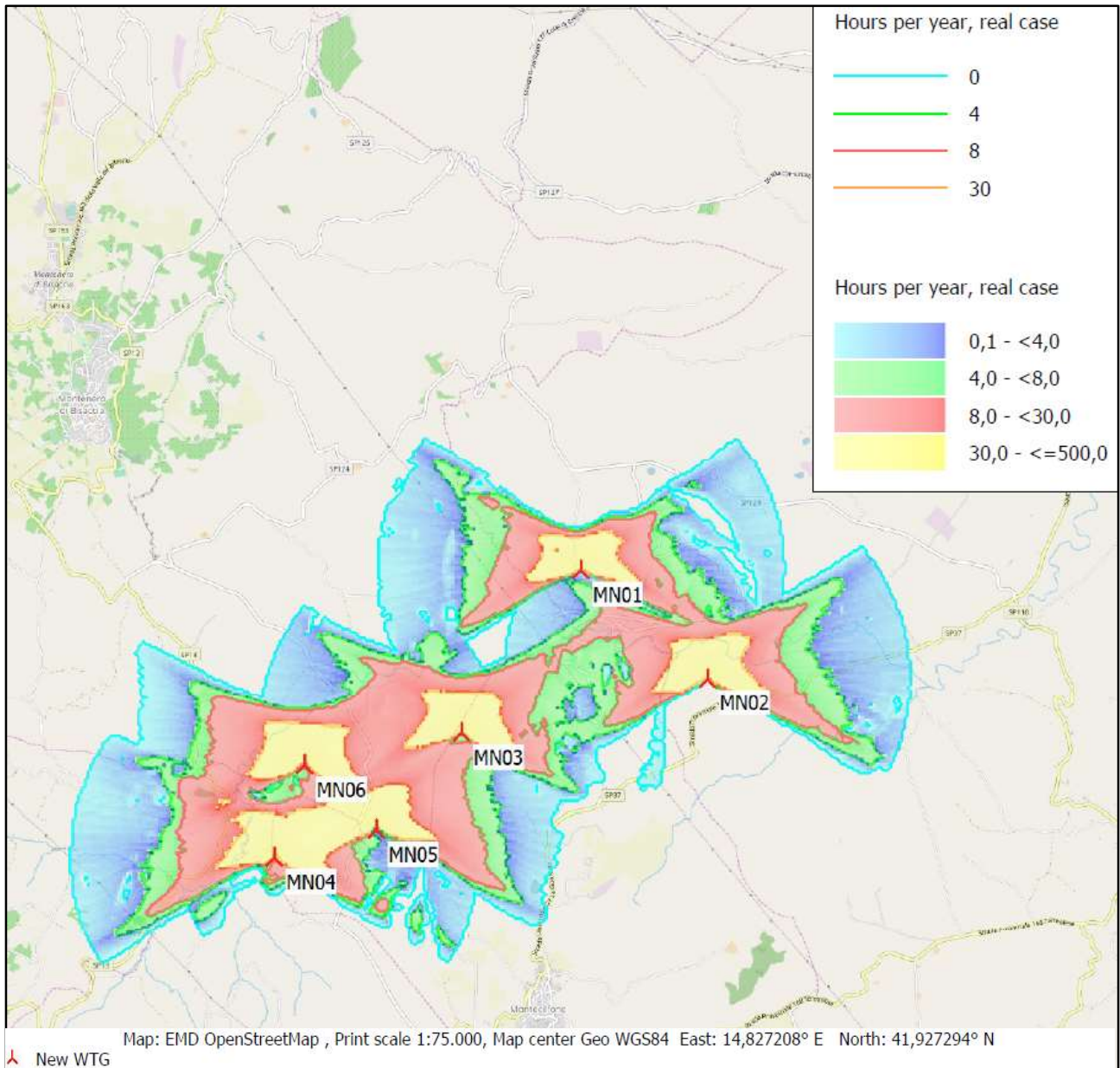


Figura 7.1: Mappe dello shadow flickering con distribuzione delle ore d'ombra per anno rispetto agli aerogeneratori di progetto.

Effettuando un confronto tra la **Figura 6.1**, nella quale sono evidenziate le posizioni dei ricettori attenzionati e degli aerogeneratori e la **Figura 7.1**, in cui ciascuna delle zone rappresentate è caratterizzata da un intervallo di valori entro cui è compreso il valore delle ore d'ombra attese per anno calcolato dal modello sopra citato, si osserva che nessuno dei ricettori considerati appartiene alla zona corrispondente ad almeno 30 ore d'ombra per anno, alcuni di essi (R06, R13, R16, R18, R22) appartengono alla zona

corrispondente ad un numero di ore d'ombra per anno compreso tra 8 e 30 h/anno e i restanti appartengono alle zone corrispondenti ad un numero di ore d'ombra per anno inferiore a 8 h/anno.

Nella **Tabella 7.1** si riportano i valori attesi delle ore d'ombra intermittente per anno relativamente ai ricettori considerati nelle ipotesi precedentemente indicate:

Ricettore	Stima ore d'ombra all'anno [h/anno]
R01	1:33
R03	4:23
R06	17:24
R13	14:30
R14	0:00
R15	0:00
R16	21:19
R18	15:52
R19	7:04
R20	2:52
R22	18:22
R23	5:58
R28	1:28
R34	0:00
R35	0:00

Tabella 7.1: Ore d'ombra intermittente per anno sui ricettori nelle ipotesi sopra riportate

Dai risultati riportati nella **Tabella 7.1** si evince che, nelle ipotesi precedentemente elencate, per i ricettori attenzionati, il valore atteso delle ore d'ombra intermittente per anno è inferiore al valore di 30 ore/anno, parametro considerato di qualità a livello internazionale e per molti di essi il valore è notevolmente più basso.

In particolare, eccetto che per i ricettori R06, R13, R16, R18 e R22, per cui comunque il numero di ore d'ombra intermittente per anno è inferiore a 30 h/anno di almeno 9 h/anno, per i restanti ricettori il valore delle ore d'ombra intermittente per anno è inferiore a 8 h/anno e in qualche caso addirittura nullo (R14, R15, R34, R35).

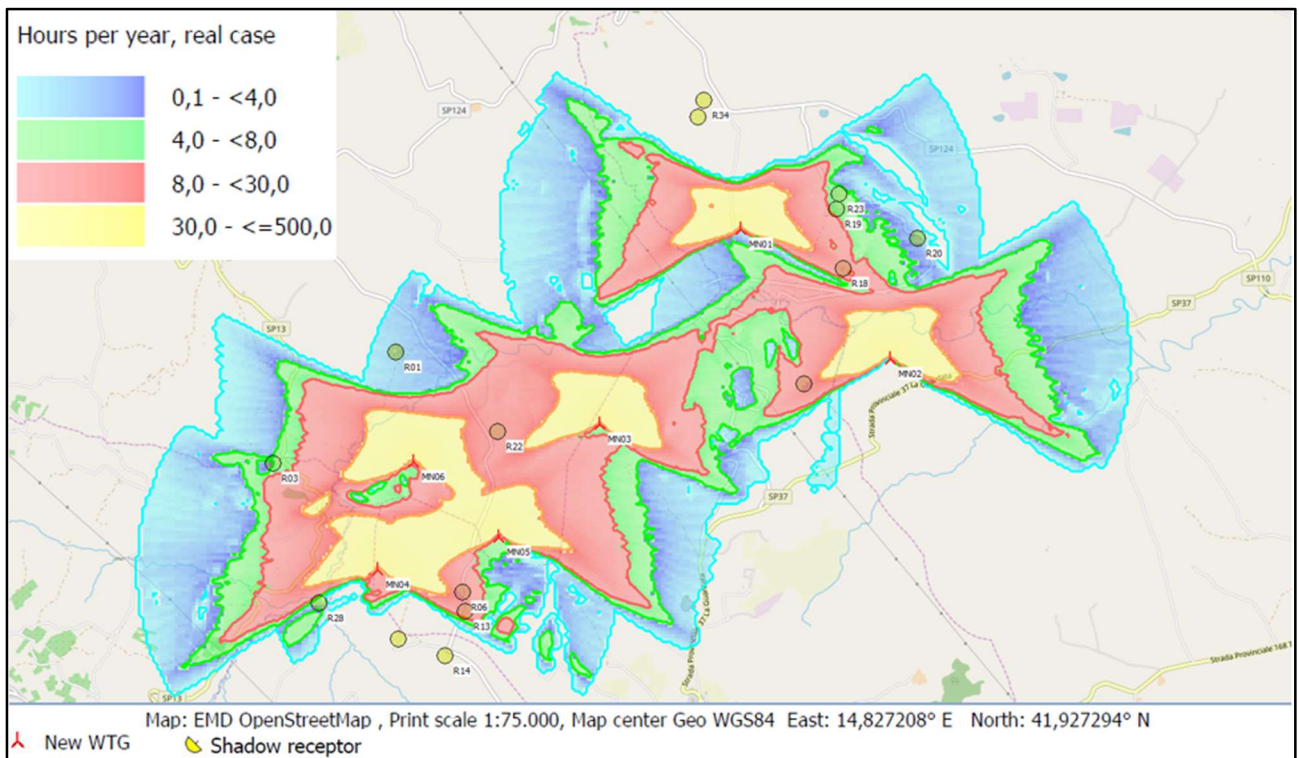


Figura 7.1: Mappe dello shadow flickering con distribuzione delle ore d'ombra per anno rispetto agli aerogeneratori di progetto e posizione dei recettori individuati

Come detto, nell'analisi condotta sono state adottate ipotesi molto restrittive, tra le quali quella secondo cui il piano del rotore sia sempre ortogonale alla congiungente tra l'osservatore e il sole e ci sia totale assenza di ostacoli o schermi vegetazionali presenti negli spazi circostanti i possibili ricettori e che potrebbero attenuare il fenomeno.

Nella stima effettuata è stata considerata l'ulteriore ipotesi conservativa secondo la quale i ricettori siano in modalità "green house", ovvero le finestre delle abitazioni attenzionate siano omnidirezionali, situazione non sempre verificata nella realtà.

Nello scenario reale ci si aspetta che il fenomeno, quindi, risulti ulteriormente meno rilevante di quello a cui ha condotto la stima effettuata.

Pertanto, si può ragionevolmente affermare che l'effetto shadow flickering non abbia un impatto negativo sul territorio circostante, in particolare sui fabbricati adibiti a "civile abitazione".

8. **ALLEGATO 1: SHADOW – MAIN RESULT – ELABORAZIONE MEDIANTE IL SOFTWARE WINDPRO 3.4**

SHADOW - Main Result

Assumptions for shadow calculations

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

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

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

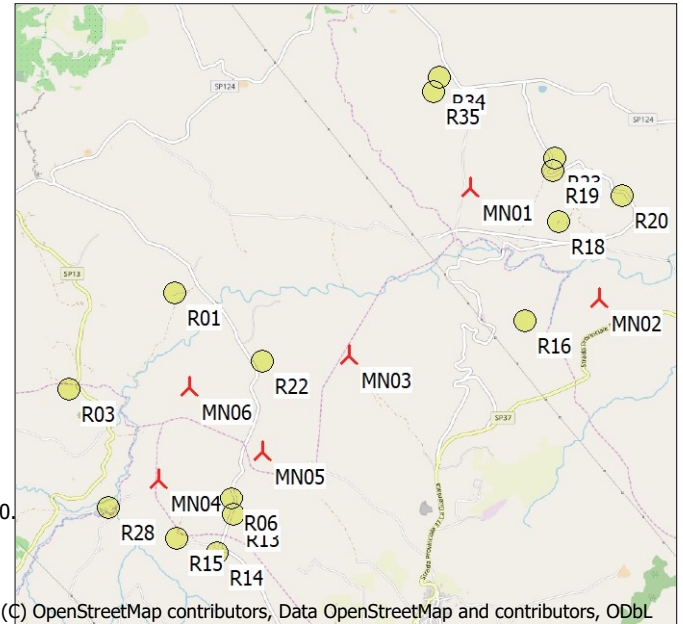
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Elevation Grid Data Object: WF Montenero_EMDGrid_0.
Obstacles used in calculation
Receptor grid resolution: 1,0 m
Topographic shadow included in calculation

All coordinates are in
Geo [deg]-WGS84



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

Scale 1:75.000

▲ New WTG

● Shadow receptor

WTGs

	Longitude	Latitude	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
			[m]									
MN01	14,841643° E	41,942314° N	167,7	Siemens Gamesa SG 6...	Yes	Siemens Gamesa	SG 6.0-170-6.200	6.200	170,0	135,0	2.040	8,8
MN02	14,857005° E	41,932449° N	129,4	Siemens Gamesa SG 6...	Yes	Siemens Gamesa	SG 6.0-170-6.200	6.200	170,0	135,0	2.040	8,8
MN03	14,827177° E	41,927420° N	194,7	Siemens Gamesa SG 6...	Yes	Siemens Gamesa	SG 6.0-170-6.200	6.200	170,0	135,0	2.040	8,8
MN04	14,804344° E	41,916357° N	263,5	Siemens Gamesa SG 6...	Yes	Siemens Gamesa	SG 6.0-170-6.200	6.200	170,0	135,0	2.040	8,8
MN05	14,816757° E	41,918844° N	279,5	Siemens Gamesa SG 6...	Yes	Siemens Gamesa	SG 6.0-170-6.200	6.200	170,0	135,0	2.040	8,8
MN06	14,808045° E	41,924586° N	215,8	Siemens Gamesa SG 6...	Yes	Siemens Gamesa	SG 6.0-170-6.200	6.200	170,0	135,0	2.040	8,8

Shadow receptor-Input

No.	Longitude	Latitude	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
R01	14,806259° E	41,932915° N	182,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R03	14,793597° E	41,924444° N	236,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R06	14,813128° E	41,914597° N	294,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R13	14,813313° E	41,913156° N	299,3	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R14	14,811321° E	41,909749° N	324,7	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R15	14,806518° E	41,911029° N	299,6	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R16	14,848181° E	41,930501° N	155,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R18	14,852189° E	41,939324° N	130,8	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R19	14,851515° E	41,943835° N	202,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R20	14,859832° E	41,941612° N	150,9	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R22	14,816674° E	41,926861° N	222,1	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R23	14,851765° E	41,945024° N	210,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R28	14,798358° E	41,913798° N	215,5	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R34	14,837873° E	41,952166° N	259,4	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R35	14,837321° E	41,950904° N	259,6	1,0	1,0	1,0	90,0	"Green house mode"	2,0

SHADOW - Main Result

Calculation Results

Shadow receptor

Shadow, expected values

No.	Shadow hours per year [h/year]
R01	1:33
R03	4:23
R06	17:24
R13	14:30
R14	0:00
R15	0:00
R16	21:19
R18	15:52
R19	7:04
R20	2:52
R22	18:22
R23	5:58
R28	1:28
R34	0:00
R35	0:00

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

No.	Name	Expected [h/year]
MN01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (1)	30:31
MN02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (2)	20:44
MN03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (3)	10:50
MN04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (4)	30:52
MN05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (5)	1:55
MN06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (6)	13:38

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

SHADOW - Calendar

Shadow receptor: R01 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	05:29 20:29	05:29 20:41	05:54 20:21	06:26 19:36	06:57 18:45	06:33 16:57	07:09 16:31
2	07:29 16:41	07:14 17:16	06:36 17:52	06:44 19:27	05:57 20:00	05:28 20:30	05:30 20:40	05:55 20:20	06:27 19:35	06:58 18:43	06:34 16:55	07:10 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	05:28 20:31	05:30 20:40	05:56 20:19	06:28 19:33	06:59 18:41	06:35 16:54	07:11 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	05:28 20:32	05:31 20:40	05:57 20:17	06:29 19:31	07:00 18:40	06:36 16:53	07:12 16:31
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	05:54 20:03	05:27 20:32	05:31 20:40	05:58 20:16	06:30 19:30	07:01 18:38	06:38 16:52	07:13 16:30
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 20:04	05:27 20:33	05:32 20:40	05:59 20:15	06:31 19:28	07:03 18:36	06:39 16:51	07:14 16:30
7	07:29 16:46	07:09 17:23	06:28 17:58	06:36 19:32	05:51 20:05	05:27 20:34	05:33 20:39	06:00 20:14	06:32 19:26	07:04 18:34	06:40 16:49	07:15 16:30
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	05:50 20:07	05:26 20:34	05:33 20:39	06:01 20:12	06:33 19:25	07:05 18:33	06:41 16:48	07:16 16:30
9	07:29 16:48	07:06 17:25	06:25 18:00	06:32 19:35	05:49 20:08	05:26 20:35	05:34 20:39	06:02 20:11	06:34 19:23	07:06 18:31	06:42 16:47	07:16 16:30
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:47 20:09	05:26 20:36	05:35 20:38	06:03 20:10	06:35 19:21	07:07 18:29	06:44 16:46	07:17 16:30
11	07:29 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	05:26 20:36	05:35 20:38	06:04 20:08	06:36 19:19	07:08 18:28	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	07:22 (MN03) 07:23 (MN03)	06:20 18:03	06:27 19:38	05:45 20:11	05:26 20:37	06:05 20:07	06:37 19:18	07:09 18:26	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:31	07:21 (MN03) 07:27 (MN03)	06:18 18:05	06:26 19:39	05:44 20:12	05:25 20:37	06:06 20:06	06:38 19:16	07:10 18:25	06:47 16:43	07:20 16:30
14	07:28 16:53	07:00 17:32	07:20 (MN03) 07:29 (MN03)	06:17 18:06	06:24 19:40	05:43 20:13	05:25 20:38	06:07 20:36	06:39 20:04	07:11 18:23	06:49 16:42	07:21 16:30
15	07:27 16:54	06:59 17:33	07:18 (MN03) 07:29 (MN03)	06:15 18:07	06:23 19:41	05:42 20:14	05:25 20:38	06:08 20:36	06:40 19:13	07:13 18:21	07:51 (MN03) 16:41	06:50 16:31
16	07:27 16:55	06:57 17:34	07:17 (MN03) 07:31 (MN03)	06:13 18:08	06:21 19:42	05:41 20:15	05:25 20:38	06:09 20:35	06:41 19:11	07:14 18:20	07:47 (MN03) 16:40	06:51 16:31
17	07:26 16:56	06:56 17:36	07:15 (MN03) 07:31 (MN03)	06:12 18:09	06:19 19:44	05:40 20:16	05:25 20:39	06:10 20:34	06:42 19:09	07:15 18:18	07:45 (MN03) 16:40	06:52 16:31
18	07:26 16:58	06:54 17:37	07:14 (MN03) 07:31 (MN03)	06:10 18:10	06:18 19:45	05:39 20:17	05:25 20:39	06:11 20:34	06:43 19:59	07:16 18:17	07:43 (MN03) 16:39	06:54 16:31
19	07:25 16:59	06:53 17:38	07:13 (MN03) 07:32 (MN03)	06:08 18:11	06:16 19:46	05:38 20:18	05:25 20:39	06:12 20:33	06:44 19:57	07:17 18:15	07:42 (MN03) 16:38	06:55 16:32
20	07:25 17:00	06:52 17:39	07:11 (MN03) 07:31 (MN03)	06:06 18:12	06:15 19:47	05:37 20:19	05:26 20:40	06:13 20:32	06:46 19:56	07:18 18:14	07:41 (MN03) 16:37	06:56 16:32
21	07:24 17:01	06:50 17:41	07:10 (MN03) 07:31 (MN03)	06:05 18:14	06:13 19:48	05:36 20:20	05:26 20:40	06:14 20:31	06:47 19:54	07:19 18:12	07:41 (MN03) 16:36	06:57 16:33
22	07:23 17:03	06:49 17:42	07:10 (MN03) 07:30 (MN03)	06:03 18:15	06:12 19:49	05:36 20:21	05:26 20:40	06:15 20:31	06:48 19:53	07:21 19:00	07:42 (MN03) 16:36	06:58 16:33
23	07:23 17:04	06:47 17:43	07:11 (MN03) 07:30 (MN03)	06:01 18:16	06:10 19:50	05:35 20:22	05:26 20:40	06:16 20:30	06:49 19:51	07:22 18:59	07:43 (MN03) 16:35	06:59 16:34
24	07:22 17:05	06:46 17:44	07:12 (MN03) 07:28 (MN03)	06:00 18:17	06:09 19:51	05:34 20:23	05:26 20:40	06:18 20:29	06:50 19:49	07:23 18:57	07:44 (MN03) 16:35	07:01 16:34
25	07:21 17:06	06:44 17:46	07:14 (MN03) 07:27 (MN03)	05:58 18:18	06:07 19:52	05:33 20:24	05:27 20:41	06:19 20:28	06:51 19:48	06:24 18:55	06:46 (MN03) 16:34	07:02 16:35
26	07:20 17:08	06:43 17:47	07:15 (MN03) 07:24 (MN03)	05:56 18:19	06:06 19:53	05:33 20:24	05:27 20:41	06:20 20:27	06:52 19:46	06:25 17:05	06:47 (MN03) 16:33	07:03 16:35
27	07:20 17:09	06:41 17:48	07:15 (MN03) 07:24 (MN03)	05:54 18:20	06:04 19:55	05:32 20:25	05:27 20:41	06:21 20:26	06:53 19:45	06:27 18:52	06:48 (MN03) 16:33	07:04 16:36
28	07:19 17:10	06:40 17:49	07:15 (MN03) 07:24 (MN03)	05:53 18:21	06:03 19:56	05:31 20:26	05:28 20:41	06:22 20:25	06:54 19:43	06:28 18:50	06:49 (MN03) 16:32	07:05 16:37
29	07:18 17:11	06:39 17:48	07:15 (MN03) 07:24 (MN03)	05:52 18:22	06:02 19:57	05:31 20:27	05:28 20:41	06:23 20:24	06:55 19:41	06:29 18:48	06:51 (MN03) 16:32	07:06 16:38
30	07:17 17:13	06:38 17:47	07:15 (MN03) 07:24 (MN03)	05:51 18:23	06:01 19:58	05:30 20:28	05:27 20:41	06:24 20:23	06:56 19:40	06:30 18:46	06:52 (MN03) 16:32	07:07 16:38
31	07:16 17:14	06:37 17:46	07:15 (MN03) 07:24 (MN03)	05:50 18:24	06:00 19:59	05:29 20:29	05:26 20:41	06:25 20:22	06:57 19:38	06:31 16:58	06:53 (MN03) 16:32	07:08 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Total, worst case		211								212		
Sun reduction		0,46								0,44		
Oper. time red.		0,82								0,82		
Wind dir. red.		0,60								0,60		
Total reduction		0,23								0,22		
Total, real		48								46		

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

Shadow receptor: R03 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June
1	07:29 16:40	07:15 17:15	06:38 17:50	07:12 (MN05) 06:46 07:21 (MN05)	06:46 07:05 (MN06) 07:35 (MN06)	05:59 19:59 20:29
2	07:29 16:41	07:14 17:17	06:36 17:52	06:44 19:27	07:03 (MN06) 32 07:35 (MN06)	05:58 20:00 05:29 20:30
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	07:02 (MN06) 32 07:34 (MN06)	05:56 20:01 05:28 20:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	07:03 (MN06) 30 07:33 (MN06)	05:55 20:02 05:27 20:32
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	07:03 (MN06) 29 07:32 (MN06)	05:54 20:03 05:26 20:32
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	07:03 (MN06) 27 07:30 (MN06)	05:52 20:04 05:25 20:33
7	07:29 16:46	07:09 17:23	06:28 17:58	06:36 19:33	07:04 (MN06) 25 07:29 (MN06)	05:51 20:05 05:24 20:34
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	07:06 (MN06) 21 07:27 (MN06)	05:50 20:07 05:23 20:34
9	07:29 16:48	07:06 17:26	06:25 18:00	06:32 19:35	07:07 (MN06) 18 07:25 (MN06)	05:49 20:08 05:22 20:35
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	07:10 (MN06) 12 07:22 (MN06)	05:48 20:09 05:21 20:36
11	07:29 16:50	07:04 17:28	06:22 18:02	06:29 19:37	06:29 19:37	05:46 20:10 05:20 20:36
12	07:28 16:51	07:02 17:29	06:20 18:03	06:28 19:38	06:28 19:38	05:45 20:11 05:19 20:37
13	07:28 16:52	07:01 17:31	06:18 18:05	06:26 19:39	06:26 19:39	05:44 20:12 05:18 20:37
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	06:24 19:40	05:43 20:13 05:17 20:38
15	07:27 16:54	06:59 17:33	06:15 18:07	06:23 19:41	06:23 19:41	05:42 20:14 05:16 20:38
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	06:21 19:42	05:41 20:15 05:15 20:38
17	07:26 16:57	06:56 17:36	06:12 18:09	06:19 19:44	06:19 19:44	05:40 20:16 05:14 20:39
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	06:18 19:45	05:39 20:17 05:13 20:39
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	06:16 19:46	05:38 20:18 05:12 20:39
20	07:25 17:00	06:52 17:39	06:06 18:13	06:15 19:47	06:15 19:47	05:37 20:19 05:11 20:40
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 06:24 (MN06) 3 06:27 (MN06)	06:13 06:13 19:48	05:36 20:20 20:40
22	07:23 17:03	06:49 17:42	06:03 18:15	06:22 (MN06) 8 06:30 (MN06)	06:12 19:49	05:36 20:21 05:10 20:40
23	07:23 17:04	06:47 17:43	06:01 18:16	06:20 (MN06) 12 06:32 (MN06)	06:10 19:50	05:35 20:22 05:09 20:40
24	07:22 17:05	06:46 17:44	06:00 07:25 (MN05) 2 07:27 (MN05)	06:18 (MN06) 15 06:33 (MN06)	06:09 19:51	05:34 20:23 05:08 20:41
25	07:21 17:06	06:44 17:46	05:58 07:19 (MN05) 8 07:27 (MN05)	06:17 (MN06) 18 06:35 (MN06)	06:07 19:52	05:33 20:24 05:07 20:41
26	07:20 17:08	06:43 17:47	05:56 07:13 (MN05) 13 07:26 (MN05)	06:15 (MN06) 20 06:35 (MN06)	06:06 19:53	05:33 20:24 05:06 20:41
27	07:20 17:09	06:41 17:48	05:54 07:09 (MN05) 16 07:25 (MN05)	06:13 (MN06) 22 06:35 (MN06)	06:04 19:55	05:32 20:25 05:05 20:41
28	07:19 17:10	06:40 17:49	05:53 07:11 (MN05) 13 07:24 (MN05)	06:11 (MN06) 24 06:35 (MN06)	06:03 19:56	05:31 20:26 05:04 20:41
29	07:18 17:11		06:51 19:23	07:10 (MN06) 26 07:36 (MN06)	06:02 19:57	05:31 20:27 05:03 20:41
30	07:17 17:13		06:49 19:24	07:08 (MN06) 28 07:36 (MN06)	06:00 19:58	05:30 20:28 05:02 20:41
31	07:16 17:14		06:48 19:25	07:06 (MN06) 29 07:35 (MN06)		05:30 20:29
Potential sun hours	295	296	369	400	451	455
Total, worst case			214		256	
Sun reduction		0,46	0,44		0,48	
Oper. time red.		0,82	0,82		0,82	
Wind dir. red.		0,59	0,59		0,59	
Total reduction		0,22	0,22		0,23	
Total, real		12	46		60	

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

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

Shadow receptor: R03 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July	August	September	October	November	December
1	05:29	05:54	06:26	06:57	06:33	07:09
	20:41	20:21	19:37	18:45	16:57	16:31
2	05:30	05:55	06:27	07:08 (MN06)	06:58	06:34
	20:40	20:20	19:35	18:43	16:55	16:31
3	05:30	05:56	06:28	07:05 (MN06)	06:59	06:35
	20:40	20:19	19:33	18:41	16:54	16:31
4	05:31	05:57	06:29	07:03 (MN06)	07:00	06:36
	20:40	20:17	19:32	18:40	16:53	16:31
5	05:31	05:58	06:30	07:01 (MN06)	07:01	06:38
	20:40	20:16	19:30	18:38	16:52	16:30
6	05:32	05:59	06:31	07:00 (MN06)	07:03	06:39
	20:40	20:15	19:28	18:36	16:51	16:30
7	05:33	06:00	06:32	06:58 (MN06)	07:04	06:40
	20:39	20:14	19:26	18:35	16:49	16:30
8	05:33	06:01	06:33	06:57 (MN06)	07:05	06:41
	20:39	20:12	19:25	18:33	16:48	16:30
9	05:34	06:02	06:34	06:56 (MN06)	07:06	06:43
	20:39	20:11	19:23	18:31	16:47	16:30
10	05:35	06:03	06:35	06:56 (MN06)	07:07	06:44
	20:38	20:10	19:21	18:30	16:46	16:30
11	05:35	06:04	06:36	06:57 (MN06)	07:08	06:45
	20:38	20:09	19:20	18:28	16:45	16:30
12	05:36	06:05	06:37	06:58 (MN06)	07:09	07:49 (MN05)
	20:37	20:07	19:18	18:26	16:44	16:30
13	05:37	06:06	06:38	06:59 (MN06)	07:10	07:45 (MN05)
	20:37	20:06	19:16	18:25	16:43	16:30
14	05:38	06:07	06:39	07:00 (MN06)	07:11	07:42 (MN05)
	20:36	20:04	19:14	18:23	16:42	16:30
15	05:38	06:08	06:40	07:01 (MN06)	07:13	07:41 (MN05)
	20:36	20:03	19:13	18:21	16:41	16:31
16	05:39	06:09	06:41	07:02 (MN06)	07:14	07:48 (MN05)
	20:35	20:02	19:11	18:20	16:40	16:31
17	05:40	06:10	06:42	07:03 (MN06)	07:15	07:53 (MN05)
	20:34	20:00	19:09	18:18	16:40	16:31
18	05:41	06:11	06:43	07:04 (MN06)	07:16	07:58 (MN05)
	20:34	19:59	19:07	18:17	16:39	16:32
19	05:42	06:12	06:45	07:05 (MN06)	07:17	07:59 (MN05)
	20:33	19:57	19:06	18:15	16:38	16:32
20	05:43	06:13	06:46	07:06 (MN06)	07:18	06:56
	20:32	19:56	19:04	18:14	16:37	16:32
21	05:43	06:14	06:47	07:07 (MN06)	07:20	06:57
	20:31	19:54	19:02	18:12	16:37	16:33
22	05:44	06:16	06:48	07:08 (MN06)	07:21	06:58
	20:31	19:53	19:00	18:11	16:36	16:33
23	05:45	06:17	06:49	07:10	07:22	07:00
	20:30	19:51	18:59	18:09	16:35	16:34
24	05:46	06:18	06:50	07:11	07:23	07:01
	20:29	19:49	18:57	18:08	16:35	16:34
25	05:47	06:19	06:51	07:12	06:24	07:02
	20:28	19:48	18:55	17:06	16:34	16:35
26	05:48	06:20	06:52	07:13	06:25	07:03
	20:27	19:46	18:53	17:05	16:33	16:36
27	05:49	06:21	06:53	07:14	06:27	07:04
	20:26	19:45	18:52	17:03	16:33	16:36
28	05:50	06:22	06:54	07:15	06:28	07:05
	20:25	19:43	18:50	17:02	16:33	16:37
29	05:51	06:23	06:55	07:16	06:29	07:06
	20:24	19:41	18:48	17:01	16:32	16:38
30	05:52	06:24	06:56	07:17	06:30	07:07
	20:23	19:40	18:46	16:59	16:32	16:38
31	05:53	06:25		06:31		07:29
	20:22	19:38		16:58		16:39
Potential sun hours	462	430	375	344	296	285
Total, worst case			469		62	
Sun reduction			0,58		0,44	
Oper. time red.			0,82		0,82	
Wind dir. red.			0,59		0,59	
Total reduction			0,28		0,21	
Total, real			133		13	

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

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

Shadow receptor: R06 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	18:48 (MN04) 19:04 (MN04)
2	07:29 16:41	07:14 17:16	06:36 17:52	06:44 19:27	05:57 20:00	18:48 (MN04) 19:37 (MN04)
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	18:48 (MN04) 19:38 (MN04)
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	18:48 (MN04) 19:39 (MN04)
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	05:54 20:03	18:47 (MN04) 19:39 (MN04)
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 20:04	18:47 (MN04) 19:40 (MN04)
7	07:29 16:46	07:08 17:23	06:28 17:58	06:36 19:32	05:51 20:05	18:47 (MN04) 19:41 (MN04)
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:33	05:50 20:06	18:47 (MN04) 19:41 (MN04)
9	07:29 16:48	07:06 17:25	06:25 18:00	06:32 19:35	05:49 20:08	18:48 (MN04) 19:40 (MN04)
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:47 20:09	18:48 (MN04) 19:40 (MN04)
11	07:28 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	18:48 (MN04) 19:40 (MN04)
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 20:11	18:49 (MN04) 19:40 (MN04)
13	07:28 16:52	07:01 17:31	06:18 18:04	06:26 19:39	05:44 20:12	18:49 (MN04) 19:40 (MN04)
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 20:13	18:49 (MN04) 19:39 (MN04)
15	07:27 16:54	06:58 17:33	06:15 18:07	06:23 19:41	05:42 20:14	18:50 (MN04) 19:39 (MN04)
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 20:15	18:50 (MN04) 19:38 (MN04)
17	07:26 16:57	06:56 17:36	06:12 18:09	06:19 19:43	05:40 20:16	18:50 (MN04) 19:38 (MN04)
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	05:39 20:17	18:51 (MN04) 19:37 (MN04)
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 20:18	18:51 (MN04) 19:36 (MN04)
20	07:25 17:00	06:51 17:39	06:06 18:12	06:15 19:47	05:37 20:19	18:52 (MN04) 19:36 (MN04)
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 19:48	05:36 20:20	18:52 (MN04) 19:35 (MN04)
22	07:23 17:03	06:49 17:42	06:03 18:15	06:12 19:49	05:36 20:21	18:54 (MN04) 19:35 (MN04)
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	18:54 (MN04) 19:34 (MN04)
24	07:22 17:05	06:46 17:44	06:00 18:17	06:09 19:51	05:34 20:23	18:55 (MN04) 19:33 (MN04)
25	07:21 17:06	06:44 17:46	05:58 18:18	06:07 19:52	05:33 20:23	18:56 (MN04) 19:33 (MN04)
26	07:20 17:08	06:43 17:47	05:56 18:19	06:06 19:53	05:33 20:24	18:57 (MN04) 19:32 (MN04)
27	07:20 17:09	06:41 17:48	05:54 18:20	06:04 19:54	05:32 20:25	18:58 (MN04) 19:31 (MN04)
28	07:19 17:10	06:39 17:49	05:53 18:21	06:03 19:56	05:31 20:26	18:59 (MN04) 19:31 (MN04)
29	07:18 17:11		06:51 19:22	06:02 19:57	05:31 20:27	19:00 (MN04) 19:30 (MN04)
30	07:17 17:13		06:49 19:24	06:00 19:58	05:30 20:28	19:01 (MN04) 19:29 (MN04)
31	07:16 17:14		06:48 19:25		05:29 20:29	19:02 (MN04) 19:28 (MN04)
Potential sun hours	295	296	369	400	451	455
Total, worst case				471	1381	102
Sun reduction				0,48	0,46	0,54
Oper. time red.				0,82	0,82	0,82
Wind dir. red.				0,58	0,58	0,58
Total reduction				0,23	0,22	0,26
Total, real				108	307	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

Shadow receptor: R06 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

July		August		September		October		November		December	
1	05:29		05:54	18:58 (MN04)	06:26	06:57	06:33	07:08			
	20:40		20:21	52	19:50 (MN04)	19:36	18:45	16:57	16:31		
2	05:30		05:55		18:58 (MN04)	06:27	06:58	06:34	07:10		
	20:40		20:20	52	19:50 (MN04)	19:35	18:43	16:55	16:31		
3	05:30		05:56		18:57 (MN04)	06:28	06:59	06:35	07:11		
	20:40		20:18	53	19:50 (MN04)	19:33	18:41	16:54	16:31		
4	05:31		05:57		18:57 (MN04)	06:29	07:00	06:36	07:12		
	20:40		20:17	53	19:50 (MN04)	19:31	18:40	16:53	16:31		
5	05:31		05:58		18:57 (MN04)	06:30	07:01	06:37	07:13		
	20:40		20:16	53	19:50 (MN04)	19:30	18:38	16:52	16:30		
6	05:32		05:59		18:57 (MN04)	06:31	07:02	06:39	07:14		
	20:39	5	19:25 (MN04)	20:15	53	19:50 (MN04)	19:28	18:36	16:51	16:30	
7	05:33		06:00		18:57 (MN04)	06:32	07:04	06:40	07:15		
	20:39	11	19:28 (MN04)	20:14	53	19:50 (MN04)	19:26	18:34	16:49	16:30	
8	05:33		06:01		18:57 (MN04)	06:33	07:05	06:41	07:15		
	20:39	15	19:30 (MN04)	20:12	52	19:49 (MN04)	19:25	18:33	16:48	16:30	
9	05:34		06:02		18:56 (MN04)	06:34	07:06	06:42	07:16		
	20:38	18	19:32 (MN04)	20:11	51	19:47 (MN04)	19:23	18:31	16:47	16:30	
10	05:35		06:03		18:56 (MN04)	06:35	07:07	06:44	07:17		
	20:38	21	19:34 (MN04)	20:10	50	19:46 (MN04)	19:21	18:29	16:46	16:30	
11	05:35		06:04		18:56 (MN04)	06:36	07:08	06:45	07:18		
	20:38	23	19:34 (MN04)	20:08	49	19:45 (MN04)	19:19	18:28	16:45	16:30	
12	05:36		06:05		18:57 (MN04)	06:37	07:09	06:46	07:19		
	20:37	25	19:36 (MN04)	20:07	47	19:44 (MN04)	19:18	18:26	16:44	16:30	
13	05:37		06:06		18:57 (MN04)	06:38	07:10	06:47	07:20		
	20:37	27	19:37 (MN04)	20:06	45	19:42 (MN04)	19:16	18:25	16:43	16:30	
14	05:38		06:07		18:57 (MN04)	06:39	07:11	06:49	07:21		
	20:36	30	19:39 (MN04)	20:04	44	19:41 (MN04)	19:14	18:23	16:42	16:30	
15	05:38		06:08		18:57 (MN04)	06:40	07:13	06:50	07:21		
	20:35	31	19:39 (MN04)	20:03	43	19:40 (MN04)	19:13	18:21	16:41	16:31	
16	05:39		06:09		18:57 (MN04)	06:41	07:14	06:51	07:22		
	20:35	33	19:40 (MN04)	20:01	41	19:38 (MN04)	19:11	18:20	16:40	16:31	
17	05:40		06:10		18:58 (MN04)	06:42	07:15	06:52	07:23		
	20:34	34	19:41 (MN04)	20:00	39	19:37 (MN04)	19:09	18:18	16:40	16:31	
18	05:41		06:11		18:58 (MN04)	06:43	07:16	06:53	07:23		
	20:34	36	19:42 (MN04)	19:59	37	19:35 (MN04)	19:07	18:17	16:39	16:32	
19	05:42		06:12		18:59 (MN04)	06:44	07:17	06:55	07:24		
	20:33	37	19:43 (MN04)	19:57	35	19:34 (MN04)	19:06	18:15	16:38	16:32	
20	05:43		06:13		19:00 (MN04)	06:45	07:18	06:56	07:25		
	20:32	39	19:43 (MN04)	19:56	33	19:33 (MN04)	19:04	18:14	16:37	16:32	
21	05:43		06:14		19:01 (MN04)	06:47	07:19	06:57	07:25		
	20:31	40	19:44 (MN04)	19:54	30	19:31 (MN04)	19:02	18:12	16:36	16:33	
22	05:44		06:15		19:02 (MN04)	06:48	07:21	06:58	07:26		
	20:30	42	19:45 (MN04)	19:52	28	19:30 (MN04)	19:00	18:11	16:36	16:33	
23	05:45		06:16		19:03 (MN04)	06:49	07:22	06:59	07:26		
	20:30	43	19:46 (MN04)	19:51	25	19:28 (MN04)	18:59	18:09	16:35	16:34	
24	05:46		06:18		19:04 (MN04)	06:50	07:23	07:01	07:27		
	20:29	45	19:47 (MN04)	19:49	23	19:27 (MN04)	18:57	18:08	16:35	16:34	
25	05:47		06:19		19:06 (MN04)	06:51	06:24	07:02	07:27		
	20:28	45	19:47 (MN04)	19:48	19	19:25 (MN04)	18:55	17:06	16:34	16:35	
26	05:48		06:20		19:09 (MN04)	06:52	06:25	07:03	07:27		
	20:27	47	19:48 (MN04)	19:46	15	19:24 (MN04)	18:53	17:05	16:33	16:35	
27	05:49		06:21		19:12 (MN04)	06:53	06:27	07:04	07:28		
	20:26	47	19:48 (MN04)	19:45	10	19:22 (MN04)	18:52	17:03	16:33	16:36	
28	05:50		06:22		19:00 (MN04)	06:54	06:28	07:05	07:28		
	20:25	49	19:49 (MN04)	19:43		18:50	17:02	16:32	16:37		
29	05:51		06:23		18:59 (MN04)	06:55	06:29	07:06	07:28		
	20:24	49	19:48 (MN04)	19:41		18:48	17:01	16:32	16:38		
30	05:52		06:24		18:59 (MN04)	06:56	06:30	07:07	07:29		
	20:23	50	19:49 (MN04)	19:40		18:46	16:59	16:32	16:38		
31	05:53		06:25		18:58 (MN04)	06:57	06:31	07:08	07:29		
	20:22	51	19:49 (MN04)	19:38			16:58	16:32	16:39		
Potential sun hours	462		430		375		344		296		285
Total, worst case	893		1085								
Sun reduction	0,60		0,67								
Oper. time red.	0,82		0,82								
Wind dir. red.	0,58		0,58								
Total reduction	0,29		0,32								
Total, real	258		346								

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

Shadow receptor: R13 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	05:29 20:29	19:23 (MN04) 41 20:04 (MN04)
2	07:29 16:41	07:14 17:16	06:36 17:52	06:44 19:27	05:57 20:00	05:28 20:30	19:22 (MN04) 42 20:04 (MN04)
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	05:28 20:31	19:23 (MN04) 42 20:05 (MN04)
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	05:28 20:32	19:23 (MN04) 43 20:06 (MN04)
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	05:54 20:03	05:27 20:32	19:23 (MN04) 43 20:06 (MN04)
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 20:04	05:27 20:33	19:23 (MN04) 44 20:07 (MN04)
7	07:29 16:46	07:08 17:23	06:28 17:58	06:36 19:32	05:51 20:05	05:27 20:34	19:23 (MN04) 45 20:08 (MN04)
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	05:50 20:06	05:26 20:34	19:24 (MN04) 45 20:09 (MN04)
9	07:29 16:48	07:06 17:25	06:25 18:00	06:32 19:35	05:49 20:08	05:26 20:35	19:23 (MN04) 46 20:09 (MN04)
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:47 20:09	19:41 (MN04) 4 19:45 (MN04)	05:26 20:35
11	07:28 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	19:38 (MN04) 8 19:46 (MN04)	05:26 20:36
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 20:11	19:35 (MN04) 12 19:47 (MN04)	05:26 20:37
13	07:28 16:52	07:01 17:31	06:18 18:04	06:26 19:39	05:44 20:12	19:33 (MN04) 15 19:48 (MN04)	05:25 20:37
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 20:13	19:32 (MN04) 17 19:49 (MN04)	05:25 20:37
15	07:27 16:54	06:58 17:33	06:15 18:07	06:23 19:41	05:42 20:14	19:30 (MN04) 20 19:50 (MN04)	05:25 20:38
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 20:15	19:29 (MN04) 22 19:51 (MN04)	05:25 20:38
17	07:26 16:57	06:56 17:36	06:12 18:09	06:19 19:43	05:40 20:16	19:28 (MN04) 24 19:52 (MN04)	05:25 20:39
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	05:39 20:17	19:27 (MN04) 25 19:52 (MN04)	05:25 20:39
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 20:18	19:26 (MN04) 27 19:53 (MN04)	05:26 20:39
20	07:25 17:00	06:51 17:39	06:06 18:12	06:15 19:47	05:37 20:19	19:25 (MN04) 29 19:54 (MN04)	05:26 20:40
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 19:48	05:36 20:20	19:25 (MN04) 30 19:55 (MN04)	05:26 20:40
22	07:23 17:03	06:49 17:42	06:03 18:15	06:12 19:49	05:36 20:21	19:25 (MN04) 31 19:56 (MN04)	05:26 20:40
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	19:24 (MN04) 33 19:57 (MN04)	05:26 20:40
24	07:22 17:05	06:46 17:44	06:00 18:17	06:09 19:51	05:34 20:23	19:24 (MN04) 33 19:57 (MN04)	05:27 20:40
25	07:21 17:06	06:44 17:46	05:58 18:18	06:07 19:52	05:33 20:23	19:24 (MN04) 35 19:59 (MN04)	05:27 20:41
26	07:20 17:08	06:43 17:47	05:56 18:19	06:06 19:53	05:33 20:24	19:23 (MN04) 36 19:59 (MN04)	05:27 20:41
27	07:20 17:09	06:41 17:48	05:54 18:20	06:04 19:54	05:32 20:25	19:23 (MN04) 37 20:00 (MN04)	05:27 20:41
28	07:19 17:10	06:39 17:49	05:53 18:21	06:03 19:56	05:31 20:26	19:23 (MN04) 38 20:01 (MN04)	05:28 20:41
29	07:18 17:11	06:38 17:50	05:52 18:22	06:02 19:57	05:31 20:27	19:23 (MN04) 39 20:02 (MN04)	05:28 20:41
30	07:17 17:13	06:37 17:51	05:51 18:23	06:01 19:58	05:30 20:28	19:23 (MN04) 40 20:03 (MN04)	05:29 20:41
31	07:16 17:14	06:36 17:52	05:50 18:24	06:00 19:59	05:29 20:29	19:23 (MN04) 40 20:03 (MN04)	05:29 20:41
Potential sun hours	295	296	369	400	451	455	
Total, worst case					595		1387
Sun reduction					0,46		0,54
Oper. time red.					0,82		0,82
Wind dir. red.					0,62		0,62
Total reduction					0,24		0,28
Total, real					142		384

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

Shadow receptor: R13 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July		August		September		October		November		December	
1	05:29	19:28 (MN04)	05:54	19:46 (MN04)	06:26	06:57	06:33	07:08				
	20:40	46 20:14 (MN04)	20:21	10 19:56 (MN04)	19:36	18:45	16:57	16:31				
2	05:30	19:29 (MN04)	05:55	19:49 (MN04)	06:27	06:58	06:34	07:10				
	20:40	46 20:15 (MN04)	20:20	6 19:55 (MN04)	19:35	18:43	16:55	16:31				
3	05:30	19:28 (MN04)	05:56		06:28	06:59	06:35	07:11				
	20:40	46 20:14 (MN04)	20:18		19:33	18:41	16:54	16:31				
4	05:31	19:29 (MN04)	05:57		06:29	07:00	06:36	07:12				
	20:40	45 20:14 (MN04)	20:17		19:31	18:40	16:53	16:31				
5	05:31	19:29 (MN04)	05:58		06:30	07:01	06:37	07:13				
	20:40	45 20:14 (MN04)	20:16		19:30	18:38	16:52	16:30				
6	05:32	19:29 (MN04)	05:59		06:31	07:02	06:39	07:14				
	20:39	45 20:14 (MN04)	20:15		19:28	18:36	16:51	16:30				
7	05:33	19:30 (MN04)	06:00		06:32	07:04	06:40	07:15				
	20:39	44 20:14 (MN04)	20:14		19:26	18:34	16:49	16:30				
8	05:33	19:29 (MN04)	06:01		06:33	07:05	06:41	07:15				
	20:39	44 20:13 (MN04)	20:12		19:25	18:33	16:48	16:30				
9	05:34	19:30 (MN04)	06:02		06:34	07:06	06:42	07:16				
	20:38	43 20:13 (MN04)	20:11		19:23	18:31	16:47	16:30				
10	05:35	19:31 (MN04)	06:03		06:35	07:07	06:44	07:17				
	20:38	42 20:13 (MN04)	20:10		19:21	18:29	16:46	16:30				
11	05:35	19:30 (MN04)	06:04		06:36	07:08	06:45	07:18				
	20:38	42 20:12 (MN04)	20:08		19:19	18:28	16:45	16:30				
12	05:36	19:31 (MN04)	06:05		06:37	07:09	06:46	07:19				
	20:37	41 20:12 (MN04)	20:07		19:18	18:26	16:44	16:30				
13	05:37	19:31 (MN04)	06:06		06:38	07:10	06:47	07:20				
	20:37	40 20:11 (MN04)	20:06		19:16	18:25	16:43	16:30				
14	05:38	19:32 (MN04)	06:07		06:39	07:11	06:49	07:21				
	20:36	39 20:11 (MN04)	20:04		19:14	18:23	16:42	16:30				
15	05:38	19:31 (MN04)	06:08		06:40	07:13	06:50	07:21				
	20:35	39 20:10 (MN04)	20:03		19:13	18:21	16:41	16:31				
16	05:39	19:32 (MN04)	06:09		06:41	07:14	06:51	07:22				
	20:35	38 20:10 (MN04)	20:01		19:11	18:20	16:40	16:31				
17	05:40	19:33 (MN04)	06:10		06:42	07:15	06:52	07:23				
	20:34	36 20:09 (MN04)	20:00		19:09	18:18	16:40	16:31				
18	05:41	19:33 (MN04)	06:11		06:43	07:16	06:53	07:23				
	20:34	36 20:09 (MN04)	19:59		19:07	18:17	16:39	16:32				
19	05:42	19:34 (MN04)	06:12		06:44	07:17	06:55	07:24				
	20:33	34 20:08 (MN04)	19:57		19:06	18:15	16:38	16:32				
20	05:43	19:33 (MN04)	06:13		06:45	07:18	06:56	07:25				
	20:32	34 20:07 (MN04)	19:56		19:04	18:14	16:37	16:32				
21	05:43	19:34 (MN04)	06:14		06:47	07:19	06:57	07:25				
	20:31	32 20:06 (MN04)	19:54		19:02	18:12	16:36	16:33				
22	05:44	19:35 (MN04)	06:15		06:48	07:21	06:58	07:26				
	20:30	31 20:06 (MN04)	19:52		19:00	18:11	16:36	16:33				
23	05:45	19:36 (MN04)	06:17		06:49	07:22	06:59	07:26				
	20:30	29 20:05 (MN04)	19:51		18:59	18:09	16:35	16:34				
24	05:46	19:36 (MN04)	06:18		06:50	07:23	07:01	07:27				
	20:29	28 20:04 (MN04)	19:49		18:57	18:08	16:35	16:34				
25	05:47	19:37 (MN04)	06:19		06:51	06:24	07:02	07:27				
	20:28	26 20:03 (MN04)	19:48		18:55	17:06	16:34	16:35				
26	05:48	19:38 (MN04)	06:20		06:52	06:25	07:03	07:27				
	20:27	25 20:03 (MN04)	19:46		18:53	17:05	16:33	16:35				
27	05:49	19:39 (MN04)	06:21		06:53	06:27	07:04	07:28				
	20:26	23 20:02 (MN04)	19:45		18:52	17:03	16:33	16:36				
28	05:50	19:40 (MN04)	06:22		06:54	06:28	07:05	07:28				
	20:25	21 20:01 (MN04)	19:43		18:50	17:02	16:32	16:37				
29	05:51	19:42 (MN04)	06:23		06:55	06:29	07:06	07:28				
	20:24	18 20:00 (MN04)	19:41		18:48	17:01	16:32	16:38				
30	05:52	19:42 (MN04)	06:24		06:56	06:30	07:07	07:29				
	20:23	16 19:58 (MN04)	19:40		18:46	16:59	16:32	16:38				
31	05:53	19:44 (MN04)	06:25			06:31		07:29				
	20:22	13 19:57 (MN04)	19:38			16:58		16:39				
Potential sun hours	462		430		375	344	296	285				
Total, worst case	1087		16									
Sun reduction	0,60		0,67									
Oper. time red.	0,82		0,82									
Wind dir. red.	0,62		0,62									
Total reduction	0,31		0,34									
Total, real	338		5									

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

Shadow receptor: R14 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	05:29 20:29	05:29 20:40	05:54 20:21	06:26 19:36	06:57 18:45	06:33 16:57	07:08 16:31
2	07:29 16:41	07:14 17:16	06:36 17:52	06:44 19:27	05:57 20:00	05:28 20:30	05:30 20:40	05:55 20:20	06:27 19:35	06:58 18:43	06:34 16:55	07:10 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	05:28 20:31	05:30 20:40	05:56 20:18	06:28 19:33	06:59 18:41	06:35 16:54	07:11 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	05:28 20:32	05:31 20:40	05:57 20:17	06:29 19:31	07:00 18:40	06:36 16:53	07:12 16:31
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	05:54 20:03	05:27 20:32	05:31 20:40	05:58 20:16	06:30 19:30	07:01 18:38	06:37 16:52	07:13 16:30
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 20:04	05:27 20:33	05:32 20:39	05:59 20:15	06:31 19:28	07:03 18:36	06:39 16:51	07:14 16:30
7	07:29 16:46	07:08 17:23	06:28 17:58	06:36 19:32	05:51 20:05	05:27 20:34	05:33 20:39	06:00 20:14	06:32 19:26	07:04 18:34	06:40 16:49	07:15 16:30
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	05:50 20:06	05:26 20:34	05:33 20:39	06:01 20:12	06:33 19:25	07:05 18:33	06:41 16:48	07:15 16:30
9	07:29 16:48	07:06 17:26	06:25 18:00	06:32 19:35	05:49 20:08	05:26 20:35	05:34 20:38	06:02 20:11	06:34 19:23	07:06 18:31	06:42 16:47	07:16 16:30
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:48 20:09	05:26 20:35	05:35 20:38	06:03 20:10	06:35 19:21	07:07 18:29	06:44 16:46	07:17 16:30
11	07:28 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	05:26 20:36	05:35 20:38	06:04 20:08	06:36 19:19	07:08 18:28	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 20:11	05:26 20:37	05:36 20:37	06:05 20:07	06:37 19:18	07:09 18:26	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:31	06:18 18:05	06:26 19:39	05:44 20:12	05:25 20:37	05:37 20:37	06:06 20:06	06:38 19:16	07:10 18:25	06:47 16:43	07:20 16:30
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 20:13	05:25 20:37	05:38 20:36	06:07 20:04	06:39 19:14	07:11 18:23	06:49 16:42	07:21 16:30
15	07:27 16:54	06:58 17:33	06:15 18:07	06:23 19:41	05:42 20:14	05:25 20:38	05:38 20:35	06:08 20:03	06:40 19:13	07:13 18:21	06:50 16:41	07:21 16:31
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 20:15	05:25 20:38	05:39 20:35	06:09 20:01	06:41 19:11	07:14 18:20	06:51 16:40	07:22 16:31
17	07:26 16:57	06:56 17:36	06:12 18:09	06:19 19:43	05:40 20:16	05:25 20:39	05:40 20:34	06:10 20:00	06:42 19:09	07:15 18:18	06:52 16:40	07:23 16:31
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	05:39 20:17	05:25 20:39	05:41 20:34	06:11 19:59	06:43 19:07	07:16 18:17	06:53 16:39	07:23 16:32
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 20:18	05:26 20:39	05:42 20:33	06:12 19:57	06:44 18:15	07:17 18:15	06:55 16:38	07:24 16:32
20	07:25 17:00	06:51 17:39	06:06 18:12	06:15 19:47	05:37 20:19	05:26 20:40	05:43 20:32	06:13 19:56	06:45 19:04	07:18 18:14	06:56 16:37	07:25 16:32
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 19:48	05:36 20:20	05:26 20:40	05:43 20:31	06:14 19:54	06:47 19:02	07:19 18:12	06:57 16:36	07:25 16:33
22	07:23 17:03	06:49 17:42	06:03 18:15	06:12 19:49	05:36 20:21	05:26 20:40	05:44 20:30	06:15 19:52	06:48 19:00	07:21 18:11	06:58 16:36	07:26 16:33
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	05:26 20:40	05:45 20:30	06:17 19:51	06:49 18:59	07:22 18:09	06:59 16:35	07:26 16:34
24	07:22 17:05	06:46 17:44	06:00 18:17	06:09 19:51	05:34 20:23	05:27 20:40	05:46 20:29	06:18 19:49	06:50 18:57	07:23 18:08	07:01 16:35	07:27 16:34
25	07:21 17:06	06:44 17:46	05:58 18:18	06:07 19:52	05:33 20:23	05:27 20:41	05:47 20:28	06:19 19:48	06:51 18:55	06:24 17:06	07:02 16:34	07:27 16:35
26	07:20 17:08	06:43 17:47	05:56 18:19	06:06 19:53	05:33 20:24	05:27 20:41	05:48 20:27	06:20 19:46	06:52 18:53	06:25 17:05	07:03 16:33	07:27 16:36
27	07:20 17:09	06:41 17:48	05:54 18:20	06:04 19:54	05:32 20:25	05:28 20:41	05:49 20:26	06:21 19:45	06:53 18:52	06:27 17:03	07:04 16:33	07:28 16:36
28	07:19 17:10	06:39 17:49	05:53 18:21	06:03 19:56	05:31 20:26	05:28 20:41	05:50 20:25	06:22 19:43	06:54 18:50	06:28 17:02	07:05 16:33	07:28 16:37
29	07:18 17:11	06:38 17:49	05:52 18:22	06:02 19:57	05:31 20:27	05:28 20:41	05:51 20:24	06:23 19:41	06:55 18:48	06:29 17:01	07:06 16:32	07:28 16:38
30	07:17 17:13	06:37 17:49	05:51 18:23	06:01 19:58	05:30 20:28	05:29 20:41	05:52 20:23	06:24 19:40	06:56 18:46	06:30 16:59	07:07 16:32	07:29 16:38
31	07:16 17:14	06:36 17:49	05:50 18:24	06:00 19:59	05:29 20:29	05:29 20:41	05:53 20:22	06:25 19:38	06:57 16:58	06:31 16:58	07:08 16:39	07:29 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Shadow receptor: R15 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (6)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29	07:15	06:38	06:46	05:59	05:29	05:29	05:54	06:26	06:57	06:33	07:08
	16:40	17:15	17:50	19:26	19:59	20:29	20:40	20:21	19:36	18:45	16:57	16:31
2	07:29	07:14	06:36	06:44	05:57	05:29	05:30	05:55	06:27	06:58	06:34	07:10
	16:41	17:17	17:52	19:27	20:00	20:30	20:40	20:20	19:35	18:43	16:55	16:31
3	07:29	07:13	06:35	06:42	05:56	05:28	05:30	05:56	06:28	06:59	06:35	07:11
	16:42	17:18	17:53	19:28	20:01	20:31	20:40	20:18	19:33	18:41	16:54	16:31
4	07:29	07:12	06:33	06:41	05:55	05:28	05:31	05:57	06:29	07:00	06:36	07:12
	16:43	17:19	17:54	19:29	20:02	20:32	20:40	20:17	19:31	18:40	16:53	16:31
5	07:29	07:11	06:32	06:39	05:54	05:27	05:31	05:58	06:30	07:01	06:38	07:13
	16:44	17:20	17:55	19:30	20:03	20:32	20:40	20:16	19:30	18:38	16:52	16:30
6	07:29	07:10	06:30	06:37	05:52	05:27	05:32	05:59	06:31	07:03	06:39	07:14
	16:45	17:22	17:56	19:31	20:04	20:33	20:40	20:15	19:28	18:36	16:51	16:30
7	07:29	07:09	06:28	06:36	05:51	05:27	05:33	06:00	06:32	07:04	06:40	07:15
	16:46	17:23	17:58	19:32	20:05	20:34	20:39	20:14	19:26	18:34	16:49	16:30
8	07:29	07:07	06:27	06:34	05:50	05:26	05:33	06:01	06:33	07:05	06:41	07:15
	16:47	17:24	17:59	19:34	20:06	20:34	20:39	20:12	19:25	18:33	16:48	16:30
9	07:29	07:06	06:25	06:32	05:49	05:26	05:34	06:02	06:34	07:06	06:42	07:16
	16:48	17:26	18:00	19:35	20:08	20:35	20:38	20:11	19:23	18:31	16:47	16:30
10	07:29	07:05	06:23	06:31	05:48	05:26	05:35	06:03	06:35	07:07	06:44	07:17
	16:49	17:27	18:01	19:36	20:09	20:35	20:38	20:10	19:21	18:29	16:46	16:30
11	07:28	07:04	06:22	06:29	05:46	05:26	05:35	06:04	06:36	07:08	06:45	07:18
	16:50	17:28	18:02	19:37	20:10	20:36	20:38	20:08	19:19	18:28	16:45	16:30
12	07:28	07:02	06:20	06:27	05:45	05:26	05:36	06:05	06:37	07:09	06:46	07:19
	16:51	17:29	18:03	19:38	20:11	20:37	20:37	20:07	19:18	18:26	16:44	16:30
13	07:28	07:01	06:18	06:26	05:44	05:25	05:37	06:06	06:38	07:10	06:47	07:20
	16:52	17:31	18:05	19:39	20:12	20:37	20:37	20:06	19:16	18:25	16:43	16:30
14	07:28	07:00	06:17	06:24	05:43	05:25	05:38	06:07	06:39	07:11	06:49	07:21
	16:53	17:32	18:06	19:40	20:13	20:37	20:36	20:04	19:14	18:23	16:42	16:30
15	07:27	06:58	06:15	06:23	05:42	05:25	05:38	06:08	06:40	07:13	06:50	07:21
	16:54	17:33	18:07	19:41	20:14	20:38	20:35	20:03	19:13	18:21	16:41	16:31
16	07:27	06:57	06:13	06:21	05:41	05:25	05:39	06:09	06:41	07:14	06:51	07:22
	16:55	17:34	18:08	19:42	20:15	20:38	20:35	20:01	19:11	18:20	16:40	16:31
17	07:26	06:56	06:12	06:19	05:40	05:25	05:40	06:10	06:42	07:15	06:52	07:23
	16:57	17:36	18:09	19:43	20:16	20:39	20:34	20:00	19:09	18:18	16:40	16:31
18	07:26	06:54	06:10	06:18	05:39	05:25	05:41	06:11	06:43	07:16	06:53	07:23
	16:58	17:37	18:10	19:45	20:17	20:39	20:34	19:59	19:07	18:17	16:39	16:32
19	07:25	06:53	06:08	06:16	05:38	05:26	05:42	06:12	06:44	07:17	06:55	07:24
	16:59	17:38	18:11	19:46	20:18	20:39	20:33	19:57	19:06	18:15	16:38	16:32
20	07:25	06:52	06:06	06:15	05:37	05:26	05:43	06:13	06:46	07:18	06:56	07:25
	17:00	17:39	18:12	19:47	20:19	20:40	20:32	19:56	19:04	18:14	16:37	16:32
21	07:24	06:50	06:05	06:13	05:36	05:26	05:43	06:14	06:47	07:19	06:57	07:25
	17:01	17:41	18:14	19:48	20:20	20:40	20:31	19:54	19:02	18:12	16:37	16:33
22	07:23	06:49	06:03	06:12	05:36	05:26	05:44	06:15	06:48	07:21	06:58	07:26
	17:03	17:42	18:15	19:49	20:21	20:40	20:30	19:53	19:00	18:11	16:36	16:33
23	07:23	06:47	06:01	06:10	05:35	05:26	05:45	06:17	06:49	07:22	06:59	07:26
	17:04	17:43	18:16	19:50	20:22	20:40	20:30	19:51	18:59	18:09	16:35	16:34
24	07:22	06:46	06:00	06:09	05:34	05:27	05:46	06:18	06:50	07:23	07:01	07:27
	17:05	17:44	18:17	19:51	20:23	20:40	20:29	19:49	18:57	18:08	16:35	16:34
25	07:21	06:44	05:58	06:07	05:33	05:27	05:47	06:19	06:51	06:24	07:02	07:27
	17:06	17:46	18:18	19:52	20:23	20:41	20:28	19:48	18:55	17:06	16:34	16:35
26	07:20	06:43	05:56	06:06	05:33	05:27	05:48	06:20	06:52	06:25	07:03	07:28
	17:08	17:47	18:19	19:53	20:24	20:41	20:27	19:46	18:53	17:05	16:33	16:36
27	07:20	06:41	05:54	06:04	05:32	05:28	05:49	06:21	06:53	06:27	07:04	07:28
	17:09	17:48	18:20	19:54	20:25	20:41	20:26	19:45	18:52	17:03	16:33	16:36
28	07:19	06:39	05:53	06:03	05:31	05:28	05:50	06:22	06:54	06:28	07:05	07:28
	17:10	17:49	18:21	19:56	20:26	20:41	20:25	19:43	18:50	17:02	16:33	16:37
29	07:18		06:51	06:02	05:31	05:28	05:51	06:23	06:55	06:29	07:06	07:28
	17:11		19:22	19:57	20:27	20:41	20:24	19:41	18:48	17:01	16:32	16:38
30	07:17		06:49	06:00	05:30	05:29	05:52	06:24	06:56	06:30	07:07	07:29
	17:13		19:24	19:58	20:28	20:41	20:23	19:40	18:46	16:59	16:32	16:38
31	07:16		06:48		05:29		05:53	06:25		06:31		07:29
	17:14		19:25		20:29		20:22	19:38		16:58		16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Shadow receptor: R16 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	06:18 (MN02) 20:29
2	07:29 16:41	07:14 17:16	06:36 17:51	06:44 19:27	05:57 20:00	06:17 (MN02) 20:30
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	06:16 (MN02) 20:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	06:14 (MN02) 20:32
5	07:29 16:44	07:11 17:20	06:31 17:55	06:39 19:30	05:53 20:03	06:13 (MN02) 20:32
6	07:29 16:44	07:10 17:21	06:30 17:56	06:37 19:31	05:52 20:04	06:12 (MN02) 20:33
7	07:29 16:45	07:08 17:23	06:28 17:57	17:15 (MN03) 19:32	05:51 20:05	06:11 (MN02) 20:34
8	07:29 16:46	07:07 17:24	06:26 17:59	17:15 (MN03) 19:33	05:50 20:06	06:10 (MN02) 20:34
9	07:29 16:47	07:06 17:25	06:25 18:00	17:14 (MN03) 19:34	05:48 20:07	06:10 (MN02) 20:35
10	07:29 16:49	07:05 17:27	06:23 18:01	17:14 (MN03) 19:36	05:47 20:08	06:09 (MN02) 20:35
11	07:28 16:50	07:04 17:28	06:22 18:02	17:13 (MN03) 19:37	05:46 20:10	06:09 (MN02) 20:36
12	07:28 16:51	07:02 17:29	06:20 18:03	17:15 (MN03) 19:38	05:45 20:11	06:09 (MN02) 20:36
13	07:28 16:52	07:01 17:30	06:18 18:04	17:15 (MN03) 19:39	05:44 20:12	06:09 (MN02) 20:37
14	07:27 16:53	07:00 17:32	06:16 18:05	17:16 (MN03) 19:40	05:43 20:13	06:09 (MN02) 20:37
15	07:27 16:54	06:58 17:33	06:15 18:07	17:18 (MN03) 19:41	05:42 20:14	06:09 (MN02) 20:38
16	07:27 16:55	06:57 17:34	06:13 18:08	17:22 (MN03) 19:42	05:41 20:15	06:09 (MN02) 20:38
17	07:26 16:56	06:56 17:36	06:11 18:09	17:25 (MN03) 19:43	05:40 20:16	06:11 (MN02) 20:39
18	07:26 16:58	06:54 17:37	06:10 18:10	19:44	05:39 20:17	06:11 (MN02) 20:39
19	07:25 16:59	06:53 17:38	06:08 18:11	19:46	05:38 20:18	06:11 (MN02) 20:39
20	07:24 17:00	06:51 17:39	06:06 18:12	19:47	05:37 20:19	06:11 (MN02) 20:40
21	07:24 17:01	06:50 17:40	06:05 18:13	06:13 19:48	05:36 20:20	06:11 (MN02) 20:40
22	07:23 17:02	06:48 17:42	06:03 18:15	06:12 19:49	05:35 20:21	06:11 (MN02) 20:40
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	06:13 (MN02) 20:40
24	07:22 17:05	06:45 17:44	05:59 18:17	06:09 19:51	05:34 20:22	06:13 (MN02) 20:40
25	07:21 17:06	06:44 17:45	05:58 18:18	06:07 19:52	05:33 20:23	06:13 (MN02) 20:40
26	07:20 17:07	06:42 17:47	05:56 18:19	06:06 19:53	05:32 20:24	06:14 (MN02) 20:41
27	07:19 17:09	06:41 17:48	05:54 18:20	06:04 19:54	05:32 20:25	06:15 (MN02) 20:41
28	07:19 17:10	06:39 17:49	05:53 18:21	06:03 19:55	05:31 20:26	06:16 (MN02) 20:41
29	07:18 17:11	06:38 19:22	05:51 19:22	06:01 19:57	05:30 20:27	06:16 (MN02) 20:41
30	07:17 17:12	06:37 19:23	05:50 19:23	06:00 19:58	05:30 20:28	06:17 (MN02) 20:40
31	07:16 17:14	06:47 19:25	06:47 19:25	06:00 19:58	05:29 20:28	06:17 (MN02) 20:40
Potential sun hours	295	296	369	400	451	455
Total, worst case			78	322	1492	762
Sun reduction			0,44	0,48	0,46	0,54
Oper. time red.			0,82	0,82	0,82	0,82
Wind dir. red.			0,58	0,57	0,57	0,57
Total reduction			0,21	0,23	0,22	0,25
Total, real			16	72	327	193

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

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

SHADOW - Calendar

Shadow receptor: R16 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July	August	September	October	November	December
1	05:29	06:30 (MN02)	05:54	06:20 (MN02)	06:26	06:57
	20:40	25 06:55 (MN02)	20:21	53 07:13 (MN02)	19:36	18:44
2	05:30	06:30 (MN02)	05:55	06:19 (MN02)	06:27	06:58
	20:40	27 06:57 (MN02)	20:20	54 07:13 (MN02)	19:35	18:43
3	05:30	06:29 (MN02)	05:56	06:19 (MN02)	06:28	06:59
	20:40	28 06:57 (MN02)	20:18	54 07:13 (MN02)	19:33	18:41
4	05:31	06:29 (MN02)	05:57	06:19 (MN02)	06:29	07:00
	20:40	29 06:58 (MN02)	20:17	54 07:13 (MN02)	19:31	18:39
5	05:31	06:28 (MN02)	05:58	06:20 (MN02)	06:30	07:01
	20:40	30 06:58 (MN02)	20:16	52 07:12 (MN02)	19:30	18:38
6	05:32	06:28 (MN02)	05:59	06:21 (MN02)	06:31	07:02
	20:39	31 06:59 (MN02)	20:15	51 07:12 (MN02)	19:28	18:36
7	05:32	06:27 (MN02)	06:00	06:22 (MN02)	06:32	07:03
	20:39	33 07:00 (MN02)	20:14	50 07:12 (MN02)	19:26	18:34
8	05:33	06:27 (MN02)	06:01	06:23 (MN02)	06:33	07:05
	20:39	34 07:01 (MN02)	20:12	49 07:12 (MN02)	19:24	18:33
9	05:34	06:27 (MN02)	06:02	06:24 (MN02)	06:34	07:06
	20:38	35 07:02 (MN02)	20:11	47 07:11 (MN02)	19:23	18:31
10	05:34	06:26 (MN02)	06:03	06:25 (MN02)	06:35	07:07
	20:38	36 07:02 (MN02)	20:10	46 07:11 (MN02)	19:21	18:29
11	05:35	06:26 (MN02)	06:04	06:26 (MN02)	06:36	07:08
	20:38	37 07:03 (MN02)	20:08	44 07:10 (MN02)	19:19	18:28
12	05:36	06:26 (MN02)	06:05	06:27 (MN02)	06:37	07:09
	20:37	38 07:04 (MN02)	20:07	43 07:10 (MN02)	19:18	18:26
13	05:37	06:26 (MN02)	06:06	06:28 (MN02)	06:38	07:10
	20:37	39 07:05 (MN02)	20:06	41 07:09 (MN02)	19:16	18:24
14	05:37	06:24 (MN02)	06:07	06:29 (MN02)	06:39	07:11
	20:36	41 07:05 (MN02)	20:04	39 07:08 (MN02)	19:14	18:23
15	05:38	06:24 (MN02)	06:08	06:30 (MN02)	06:40	07:12
	20:35	42 07:06 (MN02)	20:03	37 07:07 (MN02)	19:12	18:21
16	05:39	06:24 (MN02)	06:09	06:31 (MN02)	06:41	07:14
	20:35	43 07:07 (MN02)	20:01	35 07:06 (MN02)	19:11	18:20
17	05:40	06:24 (MN02)	06:10	06:32 (MN02)	06:42	07:15
	20:34	43 07:07 (MN02)	20:00	33 07:05 (MN02)	19:09	18:18
18	05:41	06:24 (MN02)	06:11	06:33 (MN02)	06:43	07:16
	20:33	44 07:08 (MN02)	19:58	30 07:03 (MN02)	19:07	18:16
19	05:41	06:23 (MN02)	06:12	06:34 (MN02)	06:44	07:17
	20:33	45 07:08 (MN02)	19:57	27 07:01 (MN02)	19:05	18:15
20	05:42	06:22 (MN02)	06:13	06:35 (MN02)	06:45	07:18
	20:32	47 07:09 (MN02)	19:55	25 07:00 (MN02)	19:04	18:13
21	05:43	06:22 (MN02)	06:14	06:36 (MN02)	06:46	07:19
	20:31	47 07:09 (MN02)	19:54	21 06:57 (MN02)	19:02	18:12
22	05:44	06:22 (MN02)	06:15	06:37 (MN02)	06:47	07:20
	20:30	48 07:10 (MN02)	19:52	17 06:54 (MN02)	19:00	18:10
23	05:45	06:22 (MN02)	06:16	06:38 (MN02)	06:48	07:22
	20:30	49 07:11 (MN02)	19:51	13 06:51 (MN02)	18:58	18:09
24	05:46	06:22 (MN02)	06:17	06:50	06:50	07:23
	20:29	49 07:11 (MN02)	19:49	18:57	18:07	18:07
25	05:47	06:21 (MN02)	06:18	06:51	06:51	07:24
	20:28	51 07:12 (MN02)	19:48	18:55	17:06	17:06
26	05:48	06:21 (MN02)	06:19	06:52	06:52	07:25
	20:27	51 07:12 (MN02)	19:46	18:53	17:05	17:05
27	05:49	06:20 (MN02)	06:20	06:53	06:53	07:26
	20:26	51 07:11 (MN02)	19:45	18:51	17:03	17:03
28	05:50	06:20 (MN02)	06:22	06:54	06:54	07:27
	20:25	52 07:12 (MN02)	19:43	18:50	9 18:09 (MN03)	17:02
29	05:51	06:20 (MN02)	06:23	06:55	06:55	07:28
	20:24	52 07:12 (MN02)	19:41	18:48	12 18:09 (MN03)	17:00
30	05:52	06:20 (MN02)	06:24	06:56	06:56	07:29
	20:23	52 07:12 (MN02)	19:40	18:46	11 18:06 (MN03)	16:59
31	05:53	06:20 (MN02)	06:25	06:57	06:57	07:30
	20:22	52 07:12 (MN02)	19:38	18:44	06:31	16:58
Potential sun hours	462	430	375	344	296	285
Total, worst case	1281	915	32	49		
Sun reduction	0,60	0,67	0,58	0,44		
Oper. time red.	0,82	0,82	0,82	0,82		
Wind dir. red.	0,57	0,57	0,58	0,58		
Total reduction	0,28	0,31	0,28	0,21		
Total, real	365	287	9	10		

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

Shadow receptor: R18 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	
1	07:29	07:15	06:38	06:46	05:59	05:29	19:01 (MN01)
	16:40	17:15	17:50	19:26	19:59	20:29	44 19:45 (MN01)
2	07:29	07:14	06:36	06:44	05:57	05:28	19:00 (MN01)
	16:41	17:16	17:51	19:27	20:00	20:30	45 19:45 (MN01)
3	07:29	07:13	06:35	06:42	05:56	05:28	19:01 (MN01)
	16:42	17:18	17:53	19:28	20:01	20:31	44 19:45 (MN01)
4	07:29	07:12	06:33	06:41	05:55	05:27	19:00 (MN01)
	16:43	17:19	17:54	19:29	20:02	20:32	45 19:45 (MN01)
5	07:29	07:11	06:31	06:39	05:53	05:27	19:01 (MN01)
	16:43	17:20	17:55	19:30	20:03	20:32	44 19:45 (MN01)
6	07:29	07:10	06:30	06:37	05:52	05:27	19:01 (MN01)
	16:44	17:21	17:56	19:31	20:04	20:33	45 19:46 (MN01)
7	07:29	07:08	06:28	06:36	05:51	05:26	19:02 (MN01)
	16:45	17:23	17:57	19:32	20:05	20:34	44 19:46 (MN01)
8	07:29	07:07	06:26	06:34	05:50	05:26	19:01 (MN01)
	16:46	17:24	17:59	19:33	20:06	20:34	44 19:45 (MN01)
9	07:29	07:06	06:25	06:32	05:48	19:16 (MN01)	05:26 19:02 (MN01)
	16:47	17:25	18:00	19:34	20:07	12 19:28 (MN01)	20:35 44 19:46 (MN01)
10	07:29	07:05	06:23	06:31	05:47	19:12 (MN01)	05:26 19:02 (MN01)
	16:48	17:27	18:01	19:36	20:08	18 19:30 (MN01)	20:35 44 19:46 (MN01)
11	07:28	07:04	06:21	06:29	05:46	19:09 (MN01)	05:25 19:03 (MN01)
	16:50	17:28	18:02	19:37	20:10	23 19:32 (MN01)	20:36 43 19:46 (MN01)
12	07:28	07:02	06:20	06:27	05:45	19:08 (MN01)	05:25 19:03 (MN01)
	16:51	17:29	18:03	19:38	20:11	25 19:33 (MN01)	20:36 44 19:47 (MN01)
13	07:28	07:01	06:18	06:26	05:44	19:06 (MN01)	05:25 19:03 (MN01)
	16:52	17:30	18:04	19:39	20:12	29 19:35 (MN01)	20:37 44 19:47 (MN01)
14	07:27	07:00	06:16	06:24	05:43	19:05 (MN01)	05:25 19:04 (MN01)
	16:53	17:32	18:05	19:40	20:13	31 19:36 (MN01)	20:37 43 19:47 (MN01)
15	07:27	06:58	06:15	06:22	05:42	19:04 (MN01)	05:25 19:04 (MN01)
	16:54	17:33	18:07	19:41	20:14	33 19:37 (MN01)	20:38 43 19:47 (MN01)
16	07:27	06:57	06:13	06:21	05:41	19:03 (MN01)	05:25 19:04 (MN01)
	16:55	17:34	18:08	19:42	20:15	35 19:38 (MN01)	20:38 43 19:47 (MN01)
17	07:26	06:56	06:11	06:19	05:40	19:04 (MN01)	05:25 19:04 (MN01)
	16:56	17:35	18:09	19:43	20:16	35 19:39 (MN01)	20:39 43 19:47 (MN01)
18	07:26	06:54	06:10	06:18	05:39	19:03 (MN01)	05:25 19:04 (MN01)
	16:58	17:37	18:10	19:44	20:17	37 19:40 (MN01)	20:39 44 19:48 (MN01)
19	07:25	06:53	06:08	06:16	05:38	19:02 (MN01)	05:25 19:04 (MN01)
	16:59	17:38	18:11	19:46	20:18	38 19:40 (MN01)	20:39 44 19:48 (MN01)
20	07:24	06:51	06:06	06:15	05:37	19:01 (MN01)	05:25 19:04 (MN01)
	17:00	17:39	18:12	19:47	20:19	40 19:41 (MN01)	20:40 44 19:48 (MN01)
21	07:24	06:50	06:05	06:13	05:36	19:01 (MN01)	05:26 19:04 (MN01)
	17:01	17:40	18:13	19:48	20:20	40 19:41 (MN01)	20:40 44 19:48 (MN01)
22	07:23	06:48	06:03	06:12	05:35	19:00 (MN01)	05:26 19:05 (MN01)
	17:02	17:42	18:15	19:49	20:21	41 19:41 (MN01)	20:40 44 19:49 (MN01)
23	07:23	06:47	06:01	06:10	05:35	19:01 (MN01)	05:26 19:05 (MN01)
	17:04	17:43	18:16	19:50	20:22	41 19:42 (MN01)	20:40 44 19:49 (MN01)
24	07:22	06:45	05:59	06:09	05:34	19:00 (MN01)	05:26 19:05 (MN01)
	17:05	17:44	18:17	19:51	20:22	43 19:43 (MN01)	20:40 44 19:49 (MN01)
25	07:21	06:44	05:58	06:07	05:33	19:00 (MN01)	05:27 19:06 (MN01)
	17:06	17:45	18:18	19:52	20:23	43 19:43 (MN01)	20:40 43 19:49 (MN01)
26	07:20	06:42	05:56	06:06	05:32	19:00 (MN01)	05:27 19:06 (MN01)
	17:07	17:47	18:19	19:53	20:24	43 19:43 (MN01)	20:41 43 19:49 (MN01)
27	07:19	06:41	05:54	06:04	05:32	19:00 (MN01)	05:27 19:06 (MN01)
	17:09	17:48	18:20	19:54	20:25	43 19:43 (MN01)	20:41 43 19:49 (MN01)
28	07:19	06:39	05:52	06:03	05:31	19:01 (MN01)	05:28 19:07 (MN01)
	17:10	17:49	18:21	19:55	20:26	43 19:44 (MN01)	20:41 43 19:50 (MN01)
29	07:18		06:51	06:01	05:30	19:00 (MN01)	05:28 19:06 (MN01)
	17:11		19:22	19:57	20:27	44 19:44 (MN01)	20:41 44 19:50 (MN01)
30	07:17		06:49	06:00	05:30	19:00 (MN01)	05:28 19:07 (MN01)
	17:12		19:23	19:58	20:28	44 19:44 (MN01)	20:41 44 19:51 (MN01)
31	07:16		06:47		05:29	19:00 (MN01)	
	17:14		19:25		20:28	44 19:44 (MN01)	
Potential sun hours	295	296	369	400	451	455	
Total, worst case					825		1314
Sun reduction					0,46		0,54
Oper. time red.					0,82		0,82
Wind dir. red.					0,61		0,61
Total reduction					0,23		0,27
Total, real					192		354

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

Shadow receptor: R18 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

July		August		September		October		November		December	
1	05:29	19:07 (MN01)	05:54	19:19 (MN01)	06:26	06:57	06:32	07:08			
	20:40	43 19:50 (MN01)	20:21	25 19:44 (MN01)	19:36	18:44	16:56	16:31			
2	05:29	19:07 (MN01)	05:55	19:21 (MN01)	06:27	06:58	06:34	07:09			
	20:40	44 19:51 (MN01)	20:20	21 19:42 (MN01)	19:35	18:43	16:55	16:31			
3	05:30	19:07 (MN01)	05:56	19:23 (MN01)	06:28	06:59	06:35	07:10			
	20:40	44 19:51 (MN01)	20:18	16 19:39 (MN01)	19:33	18:41	16:54	16:31			
4	05:31	19:08 (MN01)	05:57	19:27 (MN01)	06:29	07:00	06:36	07:12			
	20:40	44 19:52 (MN01)	20:17	8 19:35 (MN01)	19:31	18:39	16:53	16:30			
5	05:31	19:07 (MN01)	05:58		06:30	07:01	06:37	07:13			
	20:40	44 19:51 (MN01)	20:16		19:30	18:38	16:52	16:30			
6	05:32	19:08 (MN01)	05:59		06:31	07:02	06:39	07:13			
	20:39	44 19:52 (MN01)	20:15		19:28	18:36	16:50	16:30			
7	05:32	19:07 (MN01)	06:00		06:32	07:03	06:40	07:14			
	20:39	44 19:51 (MN01)	20:14		19:26	18:34	16:49	16:30			
8	05:33	19:08 (MN01)	06:01		06:33	07:05	06:41	07:15			
	20:39	44 19:52 (MN01)	20:12		19:24	18:33	16:48	16:30			
9	05:34	19:08 (MN01)	06:02		06:34	07:06	06:42	07:16			
	20:38	44 19:52 (MN01)	20:11		19:23	18:31	16:47	16:30			
10	05:34	19:08 (MN01)	06:03		06:35	07:07	06:44	07:17			
	20:38	44 19:52 (MN01)	20:10		19:21	18:29	16:46	16:30			
11	05:35	19:08 (MN01)	06:04		06:36	07:08	06:45	07:18			
	20:38	44 19:52 (MN01)	20:08		19:19	18:28	16:45	16:30			
12	05:36	19:09 (MN01)	06:05		06:37	07:09	06:46	07:19			
	20:37	44 19:53 (MN01)	20:07		19:18	18:26	16:44	16:30			
13	05:37	19:09 (MN01)	06:06		06:38	07:10	06:47	07:20			
	20:37	44 19:53 (MN01)	20:06		19:16	18:24	16:43	16:30			
14	05:37	19:08 (MN01)	06:07		06:39	07:11	06:48	07:20			
	20:36	44 19:52 (MN01)	20:04		19:14	18:23	16:42	16:30			
15	05:38	19:09 (MN01)	06:08		06:40	07:12	06:50	07:21			
	20:35	44 19:53 (MN01)	20:03		19:12	18:21	16:41	16:30			
16	05:39	19:09 (MN01)	06:09		06:41	07:14	06:51	07:22			
	20:35	44 19:53 (MN01)	20:01		19:11	18:20	16:40	16:31			
17	05:40	19:10 (MN01)	06:10		06:42	07:15	06:52	07:23			
	20:34	43 19:53 (MN01)	20:00		19:09	18:18	16:39	16:31			
18	05:41	19:10 (MN01)	06:11		06:43	07:16	06:53	07:23			
	20:33	43 19:53 (MN01)	19:58		19:07	18:16	16:39	16:31			
19	05:41	19:10 (MN01)	06:12		06:44	07:17	06:55	07:24			
	20:33	42 19:52 (MN01)	19:57		19:05	18:15	16:38	16:32			
20	05:42	19:10 (MN01)	06:13		06:45	07:18	06:56	07:25			
	20:32	42 19:52 (MN01)	19:55		19:04	18:13	16:37	16:32			
21	05:43	19:11 (MN01)	06:14		06:46	07:19	06:57	07:25			
	20:31	41 19:52 (MN01)	19:54		19:02	18:12	16:36	16:32			
22	05:44	19:11 (MN01)	06:15		06:47	07:20	06:58	07:26			
	20:30	41 19:52 (MN01)	19:52		19:00	18:10	16:36	16:33			
23	05:45	19:12 (MN01)	06:16		06:48	07:22	06:59	07:26			
	20:30	40 19:52 (MN01)	19:51		18:58	18:09	16:35	16:33			
24	05:46	19:12 (MN01)	06:17		06:50	07:23	07:01	07:27			
	20:29	39 19:51 (MN01)	19:49		18:57	18:07	16:34	16:34			
25	05:47	19:13 (MN01)	06:18		06:51	06:24	07:02	07:27			
	20:28	38 19:51 (MN01)	19:48		18:55	17:06	16:34	16:35			
26	05:48	19:14 (MN01)	06:19		06:52	06:25	07:03	07:27			
	20:27	36 19:50 (MN01)	19:46		18:53	17:05	16:33	16:35			
27	05:49	19:13 (MN01)	06:20		06:53	06:26	07:04	07:28			
	20:26	36 19:49 (MN01)	19:44		18:51	17:03	16:33	16:36			
28	05:50	19:14 (MN01)	06:22		06:54	06:28	07:05	07:28			
	20:25	34 19:48 (MN01)	19:43		18:50	17:02	16:32	16:37			
29	05:51	19:15 (MN01)	06:23		06:55	06:29	07:06	07:28			
	20:24	32 19:47 (MN01)	19:41		18:48	17:00	16:32	16:37			
30	05:52	19:16 (MN01)	06:24		06:56	06:30	07:07	07:29			
	20:23	30 19:46 (MN01)	19:40		18:46	16:59	16:31	16:38			
31	05:53	19:18 (MN01)	06:25			06:31		07:29			
	20:22	27 19:45 (MN01)	19:38			16:58		16:39			
Potential sun hours	462		430		375	344	296	285			
Total, worst case	1267		70								
Sun reduction	0,60		0,67								
Oper. time red.	0,82		0,82								
Wind dir. red.	0,61		0,61								
Total reduction	0,30		0,33								
Total, real	383		23								

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

Shadow receptor: R19 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)

Assumptions for shadow calculations

Sunshine probability *S* (Average daily sunshine hours) [CAMPOBASSO]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,21 4,83 5,24 6,37 6,76 8,17 9,01 9,23 7,23 4,84 4,00 3,35

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
738 408 381 216 154 236 479 1.142 793 317 938 1.420 7.222

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:29 16:40	07:15 17:15	06:38 17:50	17:03 (MNO1) 19:26	06:46 19:59	05:29 20:29	05:29 20:40	05:54 20:21	06:26 19:36	06:57 18:44	17:35 (MNO1) 18:21 (MNO1)	06:32 16:56	07:08 16:31
2	07:29 16:41	07:14 17:16	06:36 17:51	17:01 (MNO1) 19:27	06:44 20:00	05:57 20:30	05:28 20:40	05:55 20:20	06:27 19:35	06:58 18:43	17:35 (MNO1) 18:19 (MNO1)	06:34 16:55	07:09 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	17:01 (MNO1) 19:28	06:42 20:01	05:56 20:31	05:28 20:40	05:56 20:18	06:28 19:33	06:59 18:41	17:34 (MNO1) 18:18 (MNO1)	06:35 16:54	07:10 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	17:00 (MNO1) 19:29	06:41 20:02	05:55 20:32	05:31 20:40	05:57 20:17	06:29 19:31	07:00 18:39	17:35 (MNO1) 18:17 (MNO1)	06:36 16:53	07:12 16:30
5	07:29 16:43	07:11 17:20	06:31 17:55	16:59 (MNO1) 19:30	06:39 20:03	05:53 20:32	05:31 20:40	05:58 20:16	06:30 19:30	07:01 18:38	17:34 (MNO1) 18:15 (MNO1)	06:37 16:52	07:13 16:30
6	07:29 16:44	07:10 17:21	06:30 17:56	16:58 (MNO1) 19:31	06:37 20:04	05:52 20:33	05:32 20:39	05:59 20:15	06:31 19:28	07:02 18:36	17:34 (MNO1) 18:14 (MNO1)	06:39 16:50	07:14 16:30
7	07:29 16:45	07:08 17:23	06:28 17:57	16:57 (MNO1) 19:32	06:36 20:05	05:51 20:34	05:32 20:39	06:00 20:14	06:32 19:26	07:03 18:34	17:34 (MNO1) 18:13 (MNO1)	06:40 16:49	07:14 16:30
8	07:29 16:46	07:07 17:24	06:26 17:59	16:58 (MNO1) 19:33	06:34 20:06	05:50 20:34	05:33 20:39	06:01 20:12	06:33 19:24	07:05 18:33	17:34 (MNO1) 18:12 (MNO1)	06:41 16:48	07:15 16:30
9	07:29 16:47	07:06 17:25	06:25 18:00	16:57 (MNO1) 19:35	06:32 20:07	05:48 20:35	05:34 20:38	06:02 20:11	06:34 19:23	07:06 18:31	17:34 (MNO1) 18:11 (MNO1)	06:42 16:47	07:16 16:30
10	07:29 16:48	07:05 17:27	06:23 18:01	16:56 (MNO1) 19:36	06:31 20:09	05:47 20:35	05:34 20:38	06:03 20:10	06:35 19:21	07:07 18:29	17:34 (MNO1) 18:10 (MNO1)	06:44 16:46	07:17 16:30
11	07:28 16:50	07:04 17:28	06:21 18:02	16:56 (MNO1) 19:37	06:29 20:10	05:46 20:36	05:35 20:38	06:04 20:08	06:36 19:19	07:08 18:28	17:35 (MNO1) 18:09 (MNO1)	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	16:57 (MNO1) 19:38	06:27 20:11	05:45 20:36	05:36 20:37	06:05 20:07	06:37 19:18	07:09 18:26	17:36 (MNO1) 18:08 (MNO1)	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:30	06:18 18:04	16:56 (MNO1) 19:39	06:26 20:12	05:44 20:37	05:37 20:37	06:06 20:06	06:38 19:16	07:10 18:24	17:37 (MNO1) 18:07 (MNO1)	06:47 16:43	07:20 16:30
14	07:27 16:53	07:00 17:32	06:16 18:05	16:56 (MNO1) 19:40	06:24 20:13	05:43 20:37	05:37 20:36	06:07 20:04	06:39 19:14	07:11 18:23	17:38 (MNO1) 18:06 (MNO1)	06:48 16:42	07:21 16:30
15	07:27 16:54	06:58 17:33	06:15 18:07	16:57 (MNO1) 19:41	06:22 20:14	05:42 20:38	05:38 20:35	06:08 20:03	06:40 19:12	07:12 18:21	17:39 (MNO1) 18:05 (MNO1)	06:50 16:41	07:21 16:30
16	07:27 16:55	06:57 17:34	06:13 18:08	16:57 (MNO1) 19:42	06:21 20:15	05:41 20:38	05:39 20:35	06:09 20:01	06:41 19:11	07:14 18:20	17:41 (MNO1) 18:04 (MNO1)	06:51 16:40	07:22 16:31
17	07:26 16:56	06:56 17:35	06:11 18:09	16:57 (MNO1) 19:43	06:19 20:16	05:40 20:39	05:40 20:34	06:10 20:00	06:42 19:09	07:15 18:18	17:44 (MNO1) 18:03 (MNO1)	06:52 16:39	07:23 16:31
18	07:26 16:57	06:54 17:37	06:10 18:10	16:58 (MNO1) 19:44	06:18 20:17	05:39 20:39	05:41 20:33	06:11 19:58	06:43 19:07	07:16 18:16	17:47 (MNO1) 18:02 (MNO1)	06:53 16:38	07:23 16:31
19	07:25 16:59	06:53 17:38	06:08 18:11	16:59 (MNO1) 19:46	06:16 20:18	05:38 20:39	05:41 20:33	06:12 19:57	06:44 19:05	07:17 18:10	17:57 (MNO1) 18:10 (MNO1)	06:55 16:38	07:24 16:32
20	07:24 17:00	06:51 17:39	06:06 18:12	17:00 (MNO1) 19:47	06:15 20:19	05:37 20:40	05:42 20:32	06:13 19:55	06:45 19:04	07:18 18:13	17:53 (MNO1) 18:13 (MNO1)	06:56 16:37	07:25 16:32
21	07:24 17:01	06:50 17:40	06:05 18:13	17:01 (MNO1) 19:48	06:13 20:20	05:36 20:40	05:43 20:31	06:14 19:54	06:46 19:02	07:19 18:12	17:50 (MNO1) 18:16 (MNO1)	06:57 16:36	07:25 16:32
22	07:23 17:02	06:48 17:42	06:03 18:15	17:04 (MNO1) 19:49	06:12 20:21	05:35 20:40	05:44 20:30	06:15 19:52	06:47 19:00	07:20 18:10	17:47 (MNO1) 18:17 (MNO1)	06:58 16:36	07:26 16:33
23	07:23 17:04	06:47 17:43	06:01 17:19 (MNO1)	17:06 (MNO1) 19:50	06:10 20:22	05:35 20:40	05:45 20:30	06:16 19:51	06:48 18:58	07:22 18:11	17:45 (MNO1) 18:18 (MNO1)	06:59 16:35	07:26 16:33
24	07:22 17:05	06:45 17:44	06:00 17:14 (MNO1)	17:08 (MNO1) 19:51	06:09 20:23	05:34 20:40	05:46 20:29	06:17 19:49	06:50 18:57	07:23 18:11	17:43 (MNO1) 18:19 (MNO1)	07:01 16:34	07:27 16:34
25	07:21 17:06	06:44 17:45	06:00 17:10 (MNO1)	17:24 (MNO1) 19:52	06:07 20:23	05:33 20:40	05:47 20:28	06:18 19:48	06:51 18:55	07:24 18:08	17:42 (MNO1) 18:20 (MNO1)	07:02 16:34	07:27 16:35
26	07:20 17:07	06:42 17:46	06:00 17:23 (MNO1)	17:24 (MNO1) 19:53	06:06 20:24	05:32 20:41	05:48 20:27	06:19 19:46	06:52 18:53	07:25 18:01	17:40 (MNO1) 18:21 (MNO1)	07:03 16:33	07:27 16:35
27	07:19 17:09	06:41 17:48	06:00 17:26 (MNO1)	17:26 (MNO1) 19:54	06:04 20:25	05:32 20:41	05:49 20:26	06:20 19:45	06:53 18:51	07:26 18:02	17:39 (MNO1) 18:22 (MNO1)	07:04 16:33	07:28 16:36
28	07:19 17:10	06:39 17:49	06:00 17:28 (MNO1)	17:28 (MNO1) 19:55	06:03 20:26	05:31 20:41	05:50 20:25	06:22 19:43	06:54 18:50	07:27 18:03	17:38 (MNO1) 18:23 (MNO1)	07:05 16:32	07:28 16:37
29	07:18 17:11	06:38 17:50	06:00 17:30 (MNO1)	17:30 (MNO1) 19:56	06:02 20:27	05:30 20:42	05:51 20:24	06:23 19:41	06:55 18:48	07:28 18:04	17:37 (MNO1) 18:24 (MNO1)	07:06 16:32	07:28 16:37
30	07:17 17:12	06:37 17:51	06:00 17:32 (MNO1)	17:32 (MNO1) 19:57	06:01 20:28	05:29 20:43	05:52 20:23	06:24 19:40	06:56 18:46	07:29 18:05	17:36 (MNO1) 18:25 (MNO1)	07:07 16:31	07:29 16:38
31	07:16 17:14	06:36 17:52	06:00 17:34 (MNO1)	17:34 (MNO1) 19:58	06:00 20:29	05:28 20:44	05:53 20:22	06:25 19:38	06:57 18:47	07:30 18:06	17:35 (MNO1) 18:26 (MNO1)	07:08 16:30	07:30 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285	
Total, worst case			864						411		546		
Sun reduction		0,46			0,44				0,58		0,44		
Oper. time red.		0,82			0,82				0,82		0,82		
Wind dir. red.		0,58			0,58				0,58		0,58		
Total reduction		0,22			0,21				0,27		0,21		
Total, real		18			181				113		113		

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

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

Shadow receptor: R20 - Shadow Receptor: 1,0 x 1,0 **Azimuth:** 0,0° **Slope:** 90,0° (10)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	18:44 (MN01) 05:59 05:29	05:29 05:29	05:29 05:29	05:54 20:21	06:26 19:36	18:43 (MN01) 06:57 18:44	06:32 16:56	07:08 16:31
2	07:29 16:41	07:14 17:16	06:36 17:51	06:44 19:27	18:43 (MN01) 05:57 05:28	05:28 05:29	05:55 20:20	06:27 19:35	18:41 (MN01) 06:58 18:43	06:34 16:55	07:09 16:31	
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	18:42 (MN01) 05:56 05:28	05:30 05:30	05:56 20:18	06:28 19:33	18:40 (MN01) 06:59 18:41	06:35 16:54	07:10 16:30	
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	18:41 (MN01) 05:55 05:27	05:31 05:31	05:57 20:17	06:29 19:31	18:39 (MN01) 07:00 18:39	06:36 16:53	07:11 16:30	
5	07:29 16:43	07:11 17:20	06:31 17:55	06:39 19:30	18:42 (MN01) 05:53 05:27	05:31 05:31	05:58 20:16	06:30 19:30	18:38 (MN01) 07:01 18:38	06:37 16:52	07:12 16:30	
6	07:29 16:44	07:09 17:21	06:30 17:56	06:37 19:31	18:41 (MN01) 05:52 05:27	05:32 05:32	05:59 20:15	06:31 19:28	18:37 (MN01) 07:02 18:37	06:39 16:50	07:13 16:30	
7	07:29 16:45	07:08 17:23	06:28 17:57	06:35 19:32	18:41 (MN01) 05:51 05:26	05:32 05:32	06:00 20:14	06:32 19:26	18:37 (MN01) 07:03 18:34	06:40 16:49	07:14 16:30	
8	07:29 16:46	07:07 17:24	06:26 17:59	06:34 19:33	18:42 (MN01) 05:50 05:26	05:33 05:33	06:01 20:12	06:33 19:24	18:36 (MN01) 07:05 18:33	06:41 16:48	07:15 16:30	
9	07:29 16:47	07:06 17:25	06:25 18:00	06:32 19:34	18:42 (MN01) 05:48 05:26	05:34 05:34	06:02 20:11	06:34 19:23	18:36 (MN01) 07:06 18:31	06:42 16:47	07:16 16:30	
10	07:29 16:48	07:05 17:27	06:23 18:01	06:31 19:36	18:42 (MN01) 05:47 05:26	05:34 05:34	06:03 20:10	06:35 19:21	18:36 (MN01) 07:07 18:29	06:44 16:46	07:17 16:30	
11	07:28 16:50	07:04 17:28	06:21 18:02	06:29 19:37	18:44 (MN01) 05:46 05:25	05:35 05:35	06:04 20:08	06:36 19:19	18:37 (MN01) 07:08 18:28	06:45 16:45	07:18 16:30	
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	18:45 (MN01) 05:45 05:25	05:36 05:36	06:05 20:07	06:37 19:18	18:37 (MN01) 07:09 18:26	06:46 16:44	07:19 16:30	
13	07:28 16:52	07:01 17:30	06:18 18:04	06:26 19:39	18:59 (MN01) 05:44 05:25	05:37 05:37	06:06 20:06	06:38 19:16	18:55 (MN01) 07:10 18:24	06:47 16:43	07:20 16:30	
14	07:27 16:53	07:00 17:32	06:16 18:05	06:24 19:40	18:47 (MN01) 05:43 05:25	05:37 05:37	06:07 20:04	06:39 19:14	18:54 (MN01) 07:11 18:23	06:48 16:42	07:21 16:30	
15	07:27 16:54	06:58 17:33	06:15 18:07	06:22 19:41	18:56 (MN01) 05:42 05:25	05:38 05:38	06:08 20:03	06:40 19:12	18:52 (MN01) 07:12 18:21	06:50 16:41	07:22 16:30	
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	18:56 (MN01) 05:41 05:25	05:39 05:39	06:09 20:01	06:41 19:11	18:50 (MN01) 07:13 18:20	06:51 16:40	07:23 16:31	
17	07:26 16:56	06:56 17:35	06:11 18:09	06:19 19:43	19:04 (MN01) 05:40 05:25	05:40 05:40	06:10 20:00	06:42 19:09	19:01 (MN01) 07:14 18:18	06:52 16:39	07:24 16:31	
18	07:26 16:57	06:54 17:37	06:10 18:10	06:18 19:44	19:02 (MN01) 05:39 05:25	05:41 05:41	06:11 19:58	06:43 19:07	18:59 (MN01) 07:15 18:16	06:53 16:38	07:25 16:31	
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	19:02 (MN01) 05:38 05:25	05:41 05:41	06:12 19:57	06:44 19:05	18:57 (MN01) 07:16 18:15	06:54 16:37	07:26 16:32	
20	07:24 17:00	06:51 17:39	06:06 18:12	06:15 19:47	19:03 (MN01) 05:37 05:25	05:42 05:42	06:13 19:55	06:45 19:04	18:56 (MN01) 07:17 18:13	06:55 16:36	07:27 16:32	
21	07:24 17:01	06:50 17:40	06:04 18:13	06:13 19:48	19:04 (MN01) 05:36 05:26	05:43 05:43	06:14 19:54	06:46 19:02	18:55 (MN01) 07:18 18:12	06:56 16:35	07:28 16:32	
22	07:23 17:02	06:48 17:42	06:03 18:14	06:11 19:49	19:05 (MN01) 05:35 05:26	05:44 05:44	06:15 19:52	06:47 19:00	18:54 (MN01) 07:19 18:10	06:57 16:34	07:29 16:33	
23	07:22 17:04	06:47 17:43	06:01 18:16	06:10 19:50	19:06 (MN01) 05:34 05:26	05:45 05:45	06:16 19:51	06:48 18:58	18:53 (MN01) 07:20 18:09	06:58 16:33	07:30 16:33	
24	07:22 17:05	06:45 17:44	05:59 18:17	06:08 19:51	19:07 (MN01) 05:34 05:26	05:46 05:46	06:17 19:49	06:49 18:57	18:52 (MN01) 07:21 18:07	06:59 16:32	07:31 16:34	
25	07:21 16:56	06:44 17:45	05:58 18:18	06:07 19:52	19:08 (MN01) 05:33 05:27	05:47 05:47	06:18 19:48	06:51 18:55	18:51 (MN01) 07:22 18:06	06:59 16:31	07:32 16:35	
26	07:20 17:07	06:42 17:45	05:56 18:18	06:06 19:53	19:09 (MN01) 05:32 05:27	05:48 05:48	06:19 19:46	06:52 18:53	18:50 (MN01) 07:23 18:05	06:59 16:30	07:33 16:35	
27	07:19 17:09	06:41 17:48	05:54 18:19	06:04 19:54	19:10 (MN01) 05:32 05:27	05:49 05:49	06:20 19:44	06:53 18:51	18:49 (MN01) 07:24 18:03	06:59 16:29	07:34 16:36	
28	07:19 17:10	06:39 17:49	05:52 18:20	06:03 19:55	19:11 (MN01) 05:31 05:28	05:50 05:50	06:21 19:41	06:54 18:50	18:48 (MN01) 07:25 18:02	06:59 16:28	07:35 16:37	
29	07:18 17:11	06:38 17:49	05:51 18:21	06:01 19:56	19:12 (MN01) 05:30 05:28	05:51 05:51	06:22 19:41	06:55 18:49	18:47 (MN01) 07:26 18:01	06:59 16:27	07:36 16:38	
30	07:17 17:12	06:37 17:49	05:50 18:22	06:00 19:57	19:13 (MN01) 05:30 05:28	05:52 05:52	06:23 19:41	06:56 18:48	18:46 (MN01) 07:27 18:00	06:59 16:26	07:37 16:39	
31	07:16 17:14	06:36 17:50	05:49 18:23	06:00 19:58	19:14 (MN01) 05:29 05:29	05:53 05:53	06:24 19:40	06:57 18:46	18:45 (MN01) 07:28 18:00	06:59 16:25	07:38 16:40	
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Total, worst case			53		278			23	312			
Sun reduction			0,44		0,48			0,67	0,58			
Oper. time red.			0,82		0,82			1,34	1,16			
Wind dir. red.			0,59		0,59			0,59	0,59			
Total reduction			0,22		0,23			0,33	0,28			
Total, real			11		65			8	88			

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 (WTG causing flicker first time)	Last time (hh:mm) with flicker (WTG causing flicker last time)
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SHADOW - Calendar

Shadow receptor: R22 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June
1	07:29 16:40	07:15 17:15	06:38 17:50	16:27 (MN06) 17:18 (MN06)	06:46 19:26	07:05 (MN03) 19:59
2	07:29 16:41	07:14 17:16	06:36 17:52	16:27 (MN06) 17:18 (MN06)	06:44 19:27	07:03 (MN03) 20:00
3	07:29 16:42	07:13 17:18	06:35 17:53	16:27 (MN06) 17:18 (MN06)	06:42 19:28	07:01 (MN03) 20:01
4	07:29 16:43	07:12 17:19	06:33 17:54	16:27 (MN06) 17:17 (MN06)	06:41 19:29	06:59 (MN03) 20:02
5	07:29 16:44	07:11 17:20	06:32 17:55	16:28 (MN06) 17:17 (MN06)	06:39 19:30	06:58 (MN03) 20:03
6	07:29 16:45	07:10 17:22	06:30 17:56	16:28 (MN06) 17:16 (MN06)	06:37 19:31	06:56 (MN03) 20:04
7	07:29 16:46	07:08 17:23	06:28 17:58	16:28 (MN06) 17:15 (MN06)	06:36 19:32	06:54 (MN03) 20:05
8	07:29 16:47	07:07 17:24	06:27 17:59	16:29 (MN06) 17:14 (MN06)	06:34 19:34	06:53 (MN03) 20:06
9	07:29 16:48	07:06 17:25	06:25 18:00	16:29 (MN06) 17:13 (MN06)	06:32 19:35	06:51 (MN03) 20:08
10	07:29 16:49	07:05 17:27	06:23 18:01	16:30 (MN06) 17:11 (MN06)	06:31 19:36	06:49 (MN03) 20:09
11	07:28 16:50	07:04 17:28	16:51 (MN06) 16:57 (MN06)	06:22 18:02	16:32 (MN06) 17:11 (MN06)	06:29 19:37
12	07:28 16:51	07:02 17:29	16:45 (MN06) 17:02 (MN06)	06:20 18:03	16:33 (MN06) 17:09 (MN06)	06:27 19:38
13	07:28 16:52	07:01 17:31	16:42 (MN06) 17:06 (MN06)	06:18 18:04	16:34 (MN06) 17:07 (MN06)	06:26 19:39
14	07:28 16:53	07:00 17:32	16:40 (MN06) 17:08 (MN06)	06:17 18:06	16:35 (MN06) 17:04 (MN06)	06:24 19:40
15	07:27 16:54	06:58 17:33	16:37 (MN06) 17:09 (MN06)	06:15 18:07	16:38 (MN06) 17:02 (MN06)	06:23 19:41
16	07:27 16:55	06:57 17:34	16:36 (MN06) 17:11 (MN06)	06:13 18:08	16:41 (MN06) 17:02 (MN06)	06:21 19:42
17	07:26 16:57	06:56 17:36	16:34 (MN06) 17:12 (MN06)	06:11 18:09	16:58 (MN06) 19:43	06:19 19:43
18	07:26 16:58	06:54 17:37	16:33 (MN06) 17:14 (MN06)	06:10 18:10	19:44	06:18 19:45
19	07:25 16:59	06:53 17:38	16:32 (MN06) 17:14 (MN06)	06:08 18:11	19:45	06:16 19:46
20	07:25 17:00	06:51 17:39	16:31 (MN06) 17:16 (MN06)	06:06 18:12	19:46	06:15 19:47
21	07:24 17:01	06:50 17:41	16:31 (MN06) 17:17 (MN06)	06:05 18:14	19:47	06:13 19:48
22	07:23 17:03	06:49 17:42	16:30 (MN06) 17:17 (MN06)	06:03 18:15	19:48	06:12 19:49
23	07:23 17:04	06:47 17:43	16:29 (MN06) 17:18 (MN06)	06:01 18:16	19:49	06:10 19:50
24	07:22 17:05	06:46 17:44	16:28 (MN06) 17:18 (MN06)	05:59 18:17	19:50	06:09 19:51
25	07:21 17:06	06:44 17:46	16:27 (MN06) 17:18 (MN06)	05:58 18:18	19:51	06:07 19:52
26	07:20 17:08	06:43 17:47	16:28 (MN06) 17:18 (MN06)	05:56 18:19	19:52	06:06 19:53
27	07:20 17:09	06:41 17:48	16:27 (MN06) 17:18 (MN06)	05:54 18:20	19:53	06:04 19:54
28	07:19 17:10	06:39 17:49	16:27 (MN06) 17:18 (MN06)	05:53 18:21	19:54	06:03 19:55
29	07:18 17:11	06:38 17:50	16:28 (MN06) 17:19 (MN06)	05:52 18:22	19:55	06:02 19:56
30	07:17 17:13	06:37 17:51	16:29 (MN06) 17:20 (MN06)	05:51 18:23	19:56	06:01 19:57
31	07:16 17:14	06:36 17:52	16:30 (MN06) 17:21 (MN06)	05:50 18:24	19:57	06:00 19:58
Potential sun hours	295	296	369	400	451	455
Total, worst case		703	759	868		
Sun reduction		0,46	0,44	0,48		
Oper. time red.		0,82	0,82	0,82		
Wind dir. red.		0,58	0,58	0,59		
Total reduction		0,22	0,21	0,23		
Total, real		153	159	202		

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

Shadow receptor: R22 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July	August	September	October	November	December
1	05:29 20:41	05:54 20:21	06:26 19:36	06:48 (MN03) 18:45	06:57 17:12 (MN06)	06:33 07:08
2	05:30 20:40	05:55 20:20	06:27 19:35	06:48 (MN03) 18:43	06:58 17:11 (MN06)	06:34 07:10
3	05:30 20:40	05:56 20:18	06:28 19:33	06:49 (MN03) 18:41	06:59 17:09 (MN06)	06:35 07:11
4	05:31 20:40	05:57 20:17	06:29 19:31	06:50 (MN03) 18:39	07:00 17:50 (MN06)	06:36 16:30
5	05:31 20:40	05:58 20:16	06:30 19:30	06:51 (MN03) 18:38	07:01 17:06 (MN06)	06:37 07:13
6	05:32 20:40	05:59 20:15	06:31 19:28	06:52 (MN03) 18:36	07:02 17:51 (MN06)	06:39 16:30
7	05:33 20:39	06:00 20:14	06:32 19:26	06:53 (MN03) 18:34	07:04 17:51 (MN06)	06:40 16:30
8	05:33 20:39	06:01 20:12	06:33 19:25	06:54 (MN03) 18:33	07:05 17:51 (MN06)	06:41 16:30
9	05:34 20:38	06:02 20:11	06:34 19:23	06:55 (MN03) 18:31	07:06 17:51 (MN06)	06:42 16:30
10	05:35 20:38	06:03 20:10	06:35 19:21	06:56 (MN03) 18:29	07:07 17:51 (MN06)	06:44 16:30
11	05:35 20:38	06:04 20:08	06:36 19:19	06:57 (MN03) 18:28	07:08 17:52 (MN06)	06:45 16:30
12	05:36 20:37	06:05 20:07	06:37 19:18	06:58 (MN03) 18:26	07:09 17:52 (MN06)	06:46 16:30
13	05:37 20:37	06:06 20:06	06:38 19:16	06:59 (MN03) 18:25	07:10 17:51 (MN06)	06:47 16:30
14	05:38 20:36	06:07 20:04	06:39 19:14	07:00 (MN03) 18:23	07:11 17:51 (MN06)	06:49 16:30
15	05:38 20:36	06:08 20:03	06:40 19:12	07:01 (MN03) 18:21	07:13 17:50 (MN06)	06:50 16:31
16	05:39 20:35	06:09 20:01	06:41 19:11	07:02 (MN03) 18:20	07:14 17:50 (MN06)	06:51 16:31
17	05:40 20:34	06:10 20:00	06:42 19:09	07:03 (MN03) 18:18	07:15 17:50 (MN06)	06:52 16:31
18	05:41 20:34	06:11 19:59	07:10 (MN03) 19:07	06:43 18:17	07:16 17:00 (MN06)	06:53 16:31
19	05:42 20:33	06:12 19:57	07:05 (MN03) 19:06	06:44 18:15	07:17 17:00 (MN06)	06:55 16:32
20	05:42 20:32	06:13 19:56	07:02 (MN03) 19:04	06:45 18:14	07:18 17:47 (MN06)	06:56 16:32
21	05:43 20:31	06:14 19:54	07:00 (MN03) 19:02	06:47 18:12	07:19 17:02 (MN06)	06:57 16:33
22	05:44 20:30	06:15 19:52	06:58 (MN03) 19:00	06:48 18:11	07:21 17:02 (MN06)	06:58 16:33
23	05:45 20:30	06:16 19:51	06:57 (MN03) 18:59	06:49 18:09	07:22 17:03 (MN06)	06:59 16:34
24	05:46 20:29	06:18 19:49	06:55 (MN03) 18:57	06:50 18:08	07:23 17:43 (MN06)	07:01 16:34
25	05:47 20:28	06:19 19:48	06:54 (MN03) 18:55	06:51 18:06	06:24 17:06	07:02 16:34
26	05:48 20:27	06:20 19:46	06:53 (MN03) 18:53	06:52 18:05	06:25 17:05	07:03 16:35
27	05:49 20:26	06:21 19:45	06:52 (MN03) 18:52	06:53 17:24 (MN06)	06:27 17:03	07:04 16:33
28	05:50 20:25	06:22 19:43	06:51 (MN03) 18:50	06:54 17:20 (MN06)	06:28 17:02	07:05 16:32
29	05:51 20:24	06:23 19:41	06:50 (MN03) 18:48	06:55 17:17 (MN06)	06:29 17:01	07:06 16:32
30	05:52 20:23	06:24 19:40	06:49 (MN03) 18:46	06:56 17:14 (MN06)	06:30 16:59	07:07 16:32
31	05:53 20:22	06:25 19:38	06:49 (MN03) 18:44	06:57 17:11 (MN06)	06:31 16:58	07:08 16:33
Potential sun hours	462	430	375	344	296	285
Total, worst case		458	621		1281	
Sun reduction		0,67	0,58		0,44	
Oper. time red.		0,82	0,82		0,82	
Wind dir. red.		0,59	0,59		0,58	
Total reduction		0,32	0,28		0,21	
Total, real		148	174		266	

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

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

Shadow receptor: R23 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (12)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,21 4,83 5,24 6,37 6,76 8,17 9,01 9,23 7,23 4,84 4,00 3,35

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
738 408 381 216 154 236 479 1.142 793 317 938 1.420 7.222

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:29 16:40	07:15 17:15	06:38 17:50	16:43 (MNO1) 17:21 (MNO1)	06:46 19:26	05:59 19:59	05:29 20:29	05:29 20:40	05:54 20:21	06:26 19:36	06:57 18:44	06:32 16:56	16:17 (MNO1) 16:32 (MNO1)	07:08 16:31
2	07:29 16:41	07:14 17:16	06:36 17:51	16:44 (MNO1) 17:19 (MNO1)	06:44 19:27	05:57 20:00	05:28 20:30	05:29 20:40	05:55 20:20	06:27 19:35	06:58 18:43	06:34 16:55	16:19 (MNO1) 16:31 (MNO1)	07:09 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	16:46 (MNO1) 17:18 (MNO1)	06:42 19:28	05:56 20:01	05:28 20:31	05:30 20:40	05:56 20:18	06:28 19:33	06:59 18:41	06:35 16:54	16:20 (MNO1) 16:30 (MNO1)	07:10 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	16:47 (MNO1) 17:16 (MNO1)	06:41 19:29	05:55 20:02	05:27 20:32	05:31 20:40	05:57 20:17	06:29 19:31	07:00 18:39	06:36 16:53	16:22 (MNO1) 16:28 (MNO1)	07:12 16:30
5	07:29 16:43	07:11 17:20	06:31 17:55	16:49 (MNO1) 17:15 (MNO1)	06:39 19:30	05:53 20:03	05:27 20:32	05:31 20:40	05:58 20:16	06:30 19:30	07:01 18:38	06:37 16:52	16:26 (MNO1) 16:28 (MNO1)	07:13 16:30
6	07:29 16:44	07:10 17:21	06:30 17:56	16:51 (MNO1) 17:12 (MNO1)	06:37 19:31	05:52 20:04	05:27 20:33	05:32 20:39	05:59 20:15	06:31 19:28	07:02 18:36	06:39 16:50	16:24 (MNO1) 16:28 (MNO1)	07:14 16:30
7	07:29 16:45	07:08 17:23	06:28 17:57	16:52 (MNO1) 17:08 (MNO1)	06:28 19:32	05:51 20:05	05:26 20:34	05:32 20:39	06:00 20:14	06:32 19:26	07:03 18:34	06:40 16:49	16:26 (MNO1) 16:28 (MNO1)	07:14 16:30
8	07:29 16:46	07:07 17:24	06:26 17:59	16:50 (MNO1) 17:00 (MNO1)	06:26 19:33	05:50 20:06	05:26 20:34	05:33 20:39	06:01 20:12	06:33 19:24	07:05 18:33	06:41 16:48	16:26 (MNO1) 16:28 (MNO1)	07:15 16:30
9	07:29 16:47	07:06 17:25	06:25 18:00	16:49 (MNO1) 17:02 (MNO1)	06:25 19:35	05:48 20:07	05:26 20:35	05:34 20:38	06:02 20:11	06:34 19:23	07:06 18:31	06:42 16:47	16:26 (MNO1) 16:28 (MNO1)	07:16 16:30
10	07:29 16:48	07:05 17:27	06:23 18:01	16:48 (MNO1) 17:04 (MNO1)	06:23 19:36	05:47 20:09	05:26 20:35	05:34 20:38	06:03 20:10	06:35 19:21	07:07 18:29	06:44 16:46	16:26 (MNO1) 16:28 (MNO1)	07:17 16:30
11	07:28 16:50	07:04 17:28	06:21 18:02	16:46 (MNO1) 17:04 (MNO1)	06:21 19:37	05:46 20:10	05:25 20:36	05:35 20:38	06:04 20:08	06:36 19:19	07:08 18:28	06:45 16:45	16:26 (MNO1) 16:28 (MNO1)	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	16:45 (MNO1) 17:06 (MNO1)	06:20 19:38	05:45 20:11	05:25 20:36	05:36 20:37	06:05 20:07	06:37 19:18	07:09 18:26	06:46 16:44	16:26 (MNO1) 16:28 (MNO1)	07:19 16:30
13	07:28 16:52	07:01 17:30	06:18 18:04	16:44 (MNO1) 17:08 (MNO1)	06:18 19:39	05:44 20:12	05:25 20:37	05:37 20:37	06:06 20:06	06:38 19:16	07:10 18:24	06:47 16:43	16:26 (MNO1) 16:28 (MNO1)	07:20 16:30
14	07:27 16:53	07:00 17:32	06:16 18:05	16:43 (MNO1) 17:08 (MNO1)	06:16 19:40	05:43 20:13	05:25 20:37	05:37 20:36	06:07 20:04	06:39 19:14	07:11 18:23	06:48 16:42	16:26 (MNO1) 16:28 (MNO1)	07:21 16:30
15	07:27 16:54	06:58 17:33	06:15 18:07	16:43 (MNO1) 17:10 (MNO1)	06:15 19:41	05:42 20:14	05:25 20:38	05:38 20:35	06:08 20:03	06:40 19:12	07:12 18:21	06:50 16:41	16:26 (MNO1) 16:28 (MNO1)	07:21 16:30
16	07:27 16:55	06:57 17:34	06:13 18:08	16:43 (MNO1) 17:12 (MNO1)	06:13 19:42	05:41 20:15	05:25 20:38	05:39 20:35	06:09 20:01	06:41 19:11	07:14 18:20	06:51 16:40	16:26 (MNO1) 16:28 (MNO1)	07:22 16:31
17	07:26 16:56	06:56 17:35	06:11 18:09	16:42 (MNO1) 17:13 (MNO1)	06:11 19:43	05:40 20:16	05:25 20:39	05:40 20:34	06:10 20:00	06:42 19:09	07:15 18:18	06:52 16:39	16:26 (MNO1) 16:28 (MNO1)	07:23 16:31
18	07:26 16:57	06:54 17:37	06:10 18:10	16:42 (MNO1) 17:14 (MNO1)	06:10 19:44	05:39 20:17	05:25 20:39	05:41 20:33	06:11 19:58	06:43 19:07	07:16 18:16	06:53 16:38	16:26 (MNO1) 16:28 (MNO1)	07:23 16:31
19	07:25 16:59	06:53 17:38	06:08 18:11	16:41 (MNO1) 17:15 (MNO1)	06:08 19:46	05:38 20:18	05:25 20:39	05:41 20:33	06:12 19:57	06:44 19:05	07:17 18:15	06:55 16:38	16:26 (MNO1) 16:28 (MNO1)	07:24 16:31
20	07:24 17:00	06:51 17:39	06:06 18:12	16:41 (MNO1) 17:17 (MNO1)	06:06 19:47	05:37 20:19	05:25 20:40	05:42 20:32	06:13 19:55	06:45 19:04	07:18 18:13	06:56 16:37	16:26 (MNO1) 16:28 (MNO1)	07:25 16:32
21	07:24 17:01	06:50 17:40	06:05 18:13	16:40 (MNO1) 17:18 (MNO1)	06:05 19:48	05:36 20:20	05:26 20:40	05:43 20:31	06:14 19:54	06:46 19:02	07:19 18:12	06:57 16:36	16:26 (MNO1) 16:28 (MNO1)	07:25 16:32
22	07:23 17:02	06:48 17:42	06:03 18:15	16:41 (MNO1) 17:20 (MNO1)	06:03 19:49	05:35 20:21	05:26 20:40	05:44 20:30	06:15 19:52	06:47 19:00	07:20 18:10	06:58 16:36	16:26 (MNO1) 16:28 (MNO1)	07:26 16:33
23	07:23 17:04	06:47 17:43	06:01 18:16	16:40 (MNO1) 17:20 (MNO1)	06:01 19:50	05:34 20:22	05:26 20:40	05:45 20:30	06:16 19:51	06:48 18:58	07:22 18:09	06:59 16:35	16:26 (MNO1) 16:28 (MNO1)	07:26 16:33
24	07:22 17:05	06:45 17:44	05:59 18:17	16:41 (MNO1) 17:22 (MNO1)	05:59 19:51	05:34 20:22	05:26 20:40	05:46 20:29	06:17 19:49	06:50 18:57	07:23 18:07	07:01 16:34	16:26 (MNO1) 16:28 (MNO1)	07:27 16:34
25	07:21 17:06	06:44 17:45	05:58 18:18	16:41 (MNO1) 17:23 (MNO1)	05:58 19:52	05:33 20:23	05:27 20:40	05:47 20:28	06:18 19:48	06:51 18:55	07:24 17:06	07:02 16:34	16:26 (MNO1) 16:28 (MNO1)	07:27 16:35
26	07:20 17:07	06:42 17:46	05:56 18:19	16:42 (MNO1) 17:24 (MNO1)	05:56 19:53	05:32 20:24	05:27 20:41	05:48 20:27	06:19 19:46	06:52 18:53	07:25 17:05	07:03 16:33	16:26 (MNO1) 16:28 (MNO1)	07:27 16:35
27	07:19 17:09	06:41 17:48	05:54 18:20	16:42 (MNO1) 17:23 (MNO1)	05:54 19:54	05:32 20:25	05:27 20:41	05:49 20:26	06:20 19:45	06:53 18:51	07:26 17:03	07:04 16:33	16:26 (MNO1) 16:28 (MNO1)	07:28 16:36
28	07:19 17:10	06:39 17:49	05:52 18:21	16:43 (MNO1) 17:22 (MNO1)	05:52 19:55	05:31 20:26	05:28 20:41	05:50 20:25	06:22 19:43	06:54 18:50	07:27 17:02	07:05 16:32	16:26 (MNO1) 16:28 (MNO1)	07:28 16:37
29	07:18 17:11	06:38 17:50	05:51 18:22	16:44 (MNO1) 17:23 (MNO1)	05:51 19:56	05:30 20:27	05:28 20:42	05:51 20:26	06:23 19:44	06:55 18:48	07:28 17:00	07:06 16:32	16:26 (MNO1) 16:28 (MNO1)	07:28 16:37
30	07:17 17:12	06:37 17:51	05:50 18:23	16:45 (MNO1) 17:24 (MNO1)	05:50 19:57	05:29 20:28	05:28 20:43	05:52 20:27	06:24 19:45	06:56 18:46	07:29 16:59	07:07 16:31	16:26 (MNO1) 16:28 (MNO1)	07:29 16:38
31	07:16 17:14	06:36 17:52	05:49 18:24	16:46 (MNO1) 17:25 (MNO1)	05:49 19:58	05:28 20:29	05:28 20:44	05:53 20:22	06:25 19:38	06:31 18:46	07:30 16:58	07:08 16:34	16:26 (MNO1) 16:28 (MNO1)	07:29 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285		
Total, worst case		648	195											
Sun reduction		0,46	0,44											
Oper. time red.		0,82	0,82											
Wind dir. red.		0,58	0,58											
Total reduction		0,22	0,21											
Total, real		141	41											

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

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

Shadow receptor: R28 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (13)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	05:29 20:29	06:23 (MN05) 20:41	05:54 20:21	06:42 (MN05) 19:37	06:26 18:45	06:57 16:57	06:33 16:31	07:09 16:31
2	07:29 16:41	07:14 17:17	06:36 17:52	06:44 19:27	05:58 20:00	05:29 20:30	06:22 (MN05) 20:40	05:55 20:20	06:43 (MN05) 19:35	06:27 18:43	06:58 16:55	06:34 16:31	07:10 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	05:28 20:31	06:22 (MN05) 20:40	05:56 20:19	06:28 19:33	06:59 18:41	06:35 16:54	06:31 16:31	07:11 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	05:28 20:32	06:23 (MN05) 20:40	05:57 20:17	06:29 19:31	07:00 18:40	06:36 16:53	06:32 16:31	07:12 16:31
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	05:54 20:03	05:27 20:32	06:22 (MN05) 20:40	05:58 20:16	06:30 19:30	07:01 18:38	06:38 16:52	06:33 16:30	07:13 16:30
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 20:04	05:27 20:33	06:26 (MN05) 20:40	05:59 20:15	06:31 19:28	07:03 18:36	06:39 16:51	06:34 16:30	07:14 16:30
7	07:29 16:46	07:09 17:23	06:28 17:58	06:36 19:32	05:51 20:05	05:27 20:34	06:26 (MN05) 20:40	06:00 20:14	06:32 19:26	07:04 18:35	06:40 16:49	06:35 16:30	07:15 16:30
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	05:50 20:07	05:26 20:34	06:26 (MN05) 20:40	06:01 20:12	06:33 19:25	07:05 18:33	06:41 16:48	06:36 16:30	07:16 16:30
9	07:29 16:48	07:06 17:26	06:25 18:00	06:32 19:35	05:49 20:08	05:26 20:35	06:26 (MN05) 20:40	06:02 20:09	06:34 19:23	07:06 18:31	06:42 16:47	06:37 16:30	07:17 16:30
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:48 20:09	05:26 20:36	06:26 (MN05) 20:40	06:03 20:10	06:35 19:21	07:07 18:30	06:44 16:46	06:38 16:30	07:18 16:30
11	07:29 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	05:26 20:36	06:26 (MN05) 20:40	06:04 20:08	06:36 19:20	07:08 18:28	06:45 16:45	06:39 16:30	07:19 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 20:11	06:33 (MN05) 20:37	06:26 (MN05) 20:40	06:05 20:07	06:37 19:18	07:09 18:26	06:46 16:44	06:40 16:30	07:20 16:30
13	07:28 16:52	07:01 17:31	06:18 18:05	06:26 19:39	05:44 20:12	06:32 (MN05) 20:37	06:26 (MN05) 20:40	06:06 20:06	06:38 19:16	07:10 18:25	06:47 16:43	06:41 16:30	07:21 16:30
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 20:13	06:31 (MN05) 20:38	06:26 (MN05) 20:40	06:07 20:04	06:39 19:14	07:11 18:23	06:49 16:42	06:42 16:31	07:22 16:31
15	07:27 16:54	06:59 17:33	06:15 18:07	06:23 19:41	05:42 20:14	06:31 (MN05) 20:38	06:26 (MN05) 20:40	06:08 20:03	06:41 19:13	07:12 18:21	06:50 16:41	06:43 16:31	07:23 16:31
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 20:15	06:30 (MN05) 20:38	06:26 (MN05) 20:40	06:09 20:02	06:42 19:11	07:14 18:20	06:51 16:40	06:44 16:31	07:24 16:31
17	07:26 16:57	06:56 17:36	06:12 18:09	06:19 19:44	05:40 20:16	06:29 (MN05) 20:39	06:26 (MN05) 20:40	06:10 20:00	06:43 19:09	07:15 18:18	06:52 16:40	06:45 16:31	07:25 16:31
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	05:39 20:17	06:29 (MN05) 20:39	06:26 (MN05) 20:40	06:11 19:59	06:44 19:07	07:16 18:17	06:54 16:39	06:46 16:32	07:26 16:32
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 20:18	06:28 (MN05) 20:39	06:26 (MN05) 20:40	06:12 19:57	06:45 19:06	07:17 18:15	06:55 16:38	06:47 16:32	07:27 16:32
20	07:25 17:00	06:52 17:39	06:06 18:12	06:15 19:47	05:37 20:19	06:27 (MN05) 20:40	06:26 (MN05) 20:40	06:13 19:56	06:46 19:04	07:18 18:14	06:56 16:37	06:48 16:32	07:28 16:32
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 19:48	05:36 20:20	06:27 (MN05) 20:40	06:26 (MN05) 20:40	06:14 19:54	06:47 19:02	07:19 18:12	06:57 16:37	06:49 16:33	07:29 16:33
22	07:23 17:03	06:49 17:42	06:03 18:15	06:12 19:49	05:36 20:21	06:27 (MN05) 20:40	06:26 (MN05) 20:40	06:16 19:53	06:48 19:00	07:21 18:11	06:58 16:36	06:50 16:33	07:30 16:33
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	06:26 (MN05) 20:40	06:26 (MN05) 20:40	06:17 19:51	06:49 18:59	07:22 18:09	06:59 16:35	06:51 16:34	07:31 16:34
24	07:22 17:05	06:46 17:44	06:00 18:17	06:09 19:51	05:34 20:23	06:25 (MN05) 20:40	06:26 (MN05) 20:40	06:18 19:49	06:50 18:57	07:23 18:08	07:01 16:35	06:52 16:34	07:32 16:34
25	07:21 17:06	06:44 17:46	05:58 18:18	06:07 19:52	05:33 20:24	06:25 (MN05) 20:41	06:26 (MN05) 20:41	06:19 19:48	06:51 18:55	07:24 17:06	07:02 16:34	06:53 16:35	07:33 16:35
26	07:20 17:08	06:43 17:47	05:56 18:19	06:06 19:53	05:33 20:24	06:25 (MN05) 20:41	06:26 (MN05) 20:41	06:20 19:46	06:52 18:53	07:25 17:05	07:03 16:34	06:54 16:36	07:34 16:36
27	07:20 17:09	06:41 17:48	05:54 18:20	06:04 19:55	05:32 20:25	06:24 (MN05) 20:41	06:26 (MN05) 20:41	06:21 19:45	06:53 18:52	07:26 17:03	07:04 16:33	06:55 16:36	07:35 16:36
28	07:19 17:10	06:40 17:49	05:53 18:21	06:03 19:56	05:31 20:26	06:24 (MN05) 20:41	06:26 (MN05) 20:41	06:22 19:43	06:54 18:50	07:28 17:02	07:05 16:33	06:56 16:37	07:36 16:37
29	07:18 17:11	06:44 17:50	05:52 18:22	06:02 19:57	05:30 20:27	06:23 (MN05) 20:41	06:26 (MN05) 20:41	06:23 19:43	06:55 18:48	07:29 17:01	07:06 16:32	06:57 16:38	07:37 16:38
30	07:17 17:13	06:49 17:51	06:00 18:23	06:00 19:58	05:30 20:28	06:24 (MN05) 20:41	06:26 (MN05) 20:41	06:24 19:43	06:56 18:46	07:30 17:01	07:07 16:32	06:58 16:39	07:38 16:39
31	07:16 17:14	06:48 17:52	05:59 18:24	06:00 19:59	05:30 20:29	06:23 (MN05) 20:41	06:26 (MN05) 20:41	06:25 19:38	06:57 18:47	07:31 17:02	07:08 16:33	06:59 16:40	07:39 16:40
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285	285
Total, worst case					138		170		1				
Sun reduction					0,46		0,60		0,67				
Oper. time red.					0,82		0,82		0,82				
Wind dir. red.					0,58		0,58		0,58				
Total reduction					0,22		0,29		0,32				
Total, real					31		49		0				

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

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

Shadow receptor: R34 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (14)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,21 4,83 5,24 6,37 6,76 8,17 9,01 9,23 7,23 4,84 4,00 3,35

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
738 408 381 216 154 236 479 1.142 793 317 938 1.420 7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 19:59	05:29 20:29	05:29 20:41	05:54 20:21	06:26 19:36	06:57 18:45	06:33 16:57	07:08 16:31
2	07:29 16:41	07:14 17:16	06:36 17:51	06:44 19:27	05:57 20:00	05:28 20:30	05:29 20:40	05:55 20:20	06:27 19:35	06:58 18:43	06:34 16:55	07:10 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	05:28 20:31	05:30 20:40	05:56 20:18	06:28 19:33	06:59 18:41	06:35 16:54	07:11 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	05:27 20:32	05:31 20:40	05:57 20:17	06:29 19:31	07:00 18:39	06:36 16:53	07:12 16:30
5	07:29 16:43	07:11 17:20	06:31 17:55	06:39 19:30	05:53 20:03	05:27 20:32	05:31 20:40	05:58 20:16	06:30 19:30	07:01 18:38	06:37 16:52	07:13 16:30
6	07:29 16:44	07:10 17:21	06:30 17:56	06:37 19:31	05:52 20:04	05:27 20:33	05:32 20:40	05:59 20:15	06:31 19:28	07:02 18:36	06:39 16:50	07:14 16:30
7	07:29 16:45	07:08 17:23	06:28 17:57	06:36 19:32	05:51 20:05	05:26 20:34	05:32 20:39	06:00 20:14	06:32 19:26	07:04 18:34	06:40 16:49	07:15 16:30
8	07:29 16:46	07:07 17:24	06:27 17:59	06:34 19:33	05:50 20:06	05:26 20:34	05:33 20:39	06:01 20:12	06:33 19:25	07:05 18:33	06:41 16:48	07:15 16:30
9	07:29 16:47	07:06 17:25	06:25 18:00	06:32 19:35	05:48 20:08	05:26 20:35	05:34 20:38	06:02 20:11	06:34 19:23	07:06 18:31	06:42 16:47	07:16 16:30
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:47 20:09	05:26 20:35	05:34 20:38	06:03 20:10	06:35 19:21	07:07 18:29	06:44 16:46	07:17 16:30
11	07:28 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	05:25 20:36	05:35 20:38	06:04 20:08	06:36 19:19	07:08 18:28	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 20:11	05:25 20:37	05:36 20:37	06:05 20:07	06:37 19:18	07:09 18:26	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:30	06:18 18:04	06:26 19:39	05:44 20:12	05:25 20:37	05:37 20:37	06:06 20:06	06:38 19:16	07:10 18:24	06:47 16:43	07:20 16:30
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 20:13	05:25 20:38	05:37 20:36	06:07 20:04	06:39 19:14	07:11 18:23	06:49 16:42	07:21 16:30
15	07:27 16:54	06:58 17:33	06:15 18:07	06:22 19:41	05:42 20:14	05:25 20:38	05:38 20:35	06:08 20:03	06:40 19:12	07:12 18:21	06:50 16:41	07:21 16:30
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 20:15	05:25 20:38	05:39 20:35	06:09 20:01	06:41 19:11	07:14 18:20	06:51 16:40	07:22 16:31
17	07:26 16:56	06:56 17:36	06:11 18:09	06:19 19:43	05:40 20:16	05:25 20:39	05:40 20:34	06:10 20:00	06:42 19:09	07:15 18:18	06:52 16:39	07:23 16:31
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	05:39 20:17	05:25 20:39	05:41 20:34	06:11 19:58	06:43 19:07	07:16 18:17	06:53 16:39	07:23 16:31
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 20:18	05:25 20:39	05:41 20:33	06:12 19:57	06:44 19:05	07:17 18:15	06:55 16:38	07:24 16:32
20	07:25 17:00	06:51 17:39	06:06 18:12	06:15 19:47	05:37 20:19	05:25 20:40	05:42 20:32	06:13 19:56	06:45 19:04	07:18 18:13	06:56 16:37	07:25 16:32
21	07:24 17:01	06:50 17:41	06:05 18:13	06:13 19:48	05:36 20:20	05:26 20:40	05:43 20:31	06:14 19:54	06:46 19:02	07:19 18:12	06:57 16:36	07:25 16:33
22	07:23 17:02	06:49 17:42	06:03 18:15	06:12 19:49	05:35 20:21	05:26 20:40	05:44 20:30	06:15 19:52	06:47 19:00	07:21 18:10	06:58 16:36	07:26 16:33
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	05:26 20:40	05:45 20:30	06:16 19:51	06:49 18:58	07:22 18:09	06:59 16:35	07:26 16:34
24	07:22 17:05	06:46 17:44	05:59 18:17	06:09 19:51	05:34 20:23	05:26 20:40	05:46 20:29	06:17 19:49	06:50 18:57	07:23 18:07	07:01 16:34	07:27 16:34
25	07:21 17:06	06:44 17:45	05:58 18:18	06:07 19:52	05:33 20:23	05:27 20:41	05:47 20:28	06:18 19:48	06:51 18:55	07:24 17:06	07:02 16:34	07:27 16:35
26	07:20 17:07	06:43 17:47	05:56 18:19	06:06 19:53	05:32 20:24	05:27 20:41	05:48 20:27	06:19 19:46	06:52 18:53	07:25 17:05	07:03 16:33	07:28 16:35
27	07:20 17:09	06:41 17:48	05:54 18:20	06:04 19:54	05:32 20:25	05:27 20:41	05:49 20:26	06:21 19:45	06:53 18:51	07:26 17:03	07:04 16:33	07:28 16:36
28	07:19 17:10	06:39 17:49	05:53 18:21	06:03 19:56	05:31 20:26	05:28 20:41	05:50 20:25	06:22 19:43	06:54 18:50	07:28 17:02	07:05 16:32	07:28 16:37
29	07:18 17:11	06:38 17:49	05:52 18:22	06:02 19:57	05:30 20:27	05:28 20:41	05:51 20:24	06:23 19:41	06:55 18:48	07:29 17:00	07:06 16:32	07:28 16:37
30	07:17 17:12	06:37 17:49	05:51 18:23	06:01 19:58	05:30 20:28	05:29 20:41	05:52 20:23	06:24 19:40	06:56 18:46	07:30 16:59	07:07 16:31	07:29 16:38
31	07:16 17:14	06:36 17:49	05:50 18:24	06:00 19:59	05:29 20:29	05:29 20:41	05:53 20:22	06:25 19:38	06:57 16:58	07:31 16:58	07:08 16:31	07:29 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Shadow receptor: R35 - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (15)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

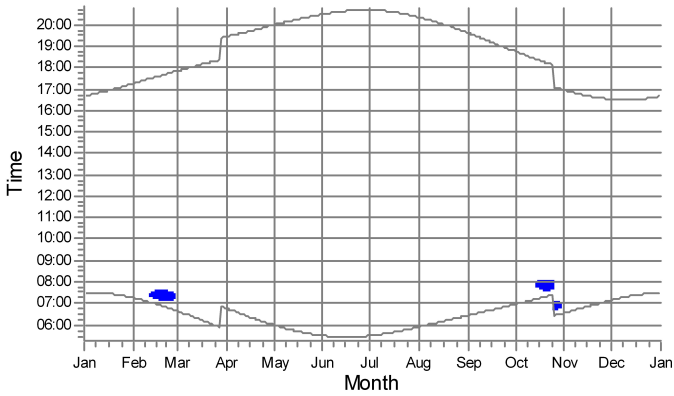
	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29	07:15	06:38	06:46	05:59	05:29	05:29	05:54	06:26	06:57	06:33	07:08
	16:40	17:15	17:50	19:26	19:59	20:29	20:41	20:21	19:36	18:45	16:57	16:31
2	07:29	07:14	06:36	06:44	05:57	05:28	05:29	05:55	06:27	06:58	06:34	07:10
	16:41	17:16	17:51	19:27	20:00	20:30	20:40	20:20	19:35	18:43	16:55	16:31
3	07:29	07:13	06:35	06:42	05:56	05:28	05:30	05:56	06:28	06:59	06:35	07:11
	16:42	17:18	17:53	19:28	20:01	20:31	20:40	20:18	19:33	18:41	16:54	16:31
4	07:29	07:12	06:33	06:41	05:55	05:27	05:31	05:57	06:29	07:00	06:36	07:12
	16:43	17:19	17:54	19:29	20:02	20:32	20:40	20:17	19:31	18:39	16:53	16:30
5	07:29	07:11	06:31	06:39	05:53	05:27	05:31	05:58	06:30	07:01	06:37	07:13
	16:43	17:20	17:55	19:30	20:03	20:32	20:40	20:16	19:30	18:38	16:52	16:30
6	07:29	07:10	06:30	06:37	05:52	05:27	05:32	05:59	06:31	07:02	06:39	07:14
	16:44	17:21	17:56	19:31	20:04	20:33	20:40	20:15	19:28	18:36	16:50	16:30
7	07:29	07:08	06:28	06:36	05:51	05:26	05:32	06:00	06:32	07:04	06:40	07:15
	16:45	17:23	17:57	19:32	20:05	20:34	20:39	20:14	19:26	18:34	16:49	16:30
8	07:29	07:07	06:27	06:34	05:50	05:26	05:33	06:01	06:33	07:05	06:41	07:15
	16:46	17:24	17:59	19:33	20:06	20:34	20:39	20:12	19:25	18:33	16:48	16:30
9	07:29	07:06	06:25	06:32	05:48	05:26	05:34	06:02	06:34	07:06	06:42	07:16
	16:47	17:25	18:00	19:35	20:08	20:35	20:38	20:11	19:23	18:31	16:47	16:30
10	07:29	07:05	06:23	06:31	05:47	05:26	05:34	06:03	06:35	07:07	06:44	07:17
	16:49	17:27	18:01	19:36	20:09	20:35	20:38	20:10	19:21	18:29	16:46	16:30
11	07:28	07:04	06:22	06:29	05:46	05:25	05:35	06:04	06:36	07:08	06:45	07:18
	16:50	17:28	18:02	19:37	20:10	20:36	20:38	20:08	19:19	18:28	16:45	16:30
12	07:28	07:02	06:20	06:27	05:45	05:25	05:36	06:05	06:37	07:09	06:46	07:19
	16:51	17:29	18:03	19:38	20:11	20:37	20:37	20:07	19:18	18:26	16:44	16:30
13	07:28	07:01	06:18	06:26	05:44	05:25	05:37	06:06	06:38	07:10	06:47	07:20
	16:52	17:30	18:04	19:39	20:12	20:37	20:37	20:06	19:16	18:24	16:43	16:30
14	07:28	07:00	06:17	06:24	05:43	05:25	05:37	06:07	06:39	07:11	06:49	07:21
	16:53	17:32	18:06	19:40	20:13	20:38	20:36	20:04	19:14	18:23	16:42	16:30
15	07:27	06:58	06:15	06:22	05:42	05:25	05:38	06:08	06:40	07:12	06:50	07:21
	16:54	17:33	18:07	19:41	20:14	20:38	20:35	20:03	19:12	18:21	16:41	16:30
16	07:27	06:57	06:13	06:21	05:41	05:25	05:39	06:09	06:41	07:14	06:51	07:22
	16:55	17:34	18:08	19:42	20:15	20:38	20:35	20:01	19:11	18:20	16:40	16:31
17	07:26	06:56	06:11	06:19	05:40	05:25	05:40	06:10	06:42	07:15	06:52	07:23
	16:56	17:36	18:09	19:43	20:16	20:39	20:34	20:00	19:09	18:18	16:39	16:31
18	07:26	06:54	06:10	06:18	05:39	05:25	05:41	06:11	06:43	07:16	06:53	07:23
	16:58	17:37	18:10	19:45	20:17	20:39	20:34	19:58	19:07	18:17	16:39	16:31
19	07:25	06:53	06:08	06:16	05:38	05:25	05:41	06:12	06:44	07:17	06:55	07:24
	16:59	17:38	18:11	19:46	20:18	20:39	20:33	19:57	19:05	18:15	16:38	16:32
20	07:25	06:51	06:06	06:15	05:37	05:25	05:42	06:13	06:45	07:18	06:56	07:25
	17:00	17:39	18:12	19:47	20:19	20:40	20:32	19:56	19:04	18:13	16:37	16:32
21	07:24	06:50	06:05	06:13	05:36	05:26	05:43	06:14	06:46	07:19	06:57	07:25
	17:01	17:41	18:13	19:48	20:20	20:40	20:31	19:54	19:02	18:12	16:36	16:33
22	07:23	06:49	06:03	06:12	05:35	05:26	05:44	06:15	06:47	07:21	06:58	07:26
	17:02	17:42	18:15	19:49	20:21	20:40	20:30	19:52	19:00	18:10	16:36	16:33
23	07:23	06:47	06:01	06:10	05:35	05:26	05:45	06:16	06:49	07:22	06:59	07:26
	17:04	17:43	18:16	19:50	20:22	20:40	20:30	19:51	18:58	18:09	16:35	16:34
24	07:22	06:46	05:59	06:09	05:34	05:26	05:46	06:17	06:50	07:23	07:01	07:27
	17:05	17:44	18:17	19:51	20:23	20:40	20:29	19:49	18:57	18:07	16:34	16:34
25	07:21	06:44	05:58	06:07	05:33	05:27	05:47	06:18	06:51	06:24	07:02	07:27
	17:06	17:45	18:18	19:52	20:23	20:41	20:28	19:48	18:55	17:06	16:34	16:35
26	07:20	06:43	05:56	06:06	05:32	05:27	05:48	06:19	06:52	06:25	07:03	07:28
	17:07	17:47	18:19	19:53	20:24	20:41	20:27	19:46	18:53	17:05	16:33	16:35
27	07:20	06:41	05:54	06:04	05:32	05:27	05:49	06:21	06:53	06:26	07:04	07:28
	17:09	17:48	18:20	19:54	20:25	20:41	20:26	19:45	18:51	17:03	16:33	16:36
28	07:19	06:39	05:53	06:03	05:31	05:28	05:50	06:22	06:54	06:28	07:05	07:28
	17:10	17:49	18:21	19:56	20:26	20:41	20:25	19:43	18:50	17:02	16:32	16:37
29	07:18		06:51	06:01	05:30	05:28	05:51	06:23	06:55	06:29	07:06	07:28
	17:11		19:22	19:57	20:27	20:41	20:24	19:41	18:48	17:00	16:32	16:37
30	07:17		06:49	06:00	05:30	05:29	05:52	06:24	06:56	06:30	07:07	07:29
	17:12		19:23	19:58	20:28	20:41	20:23	19:40	18:46	16:59	16:31	16:38
31	07:16		06:47		05:29		05:53	06:25		06:31		07:29
	17:14		19:25		20:29		20:22	19:38		16:58		16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

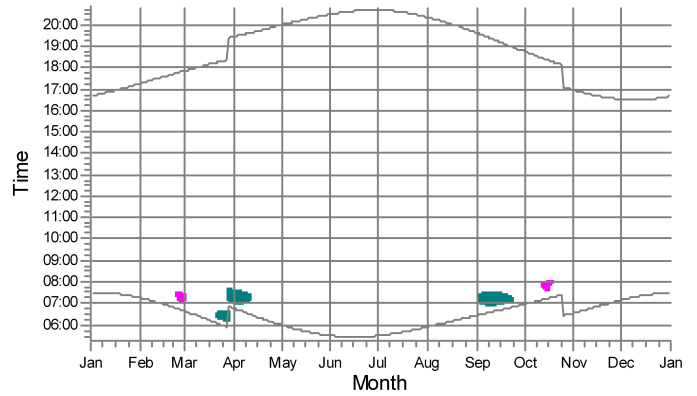
Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar, graphical

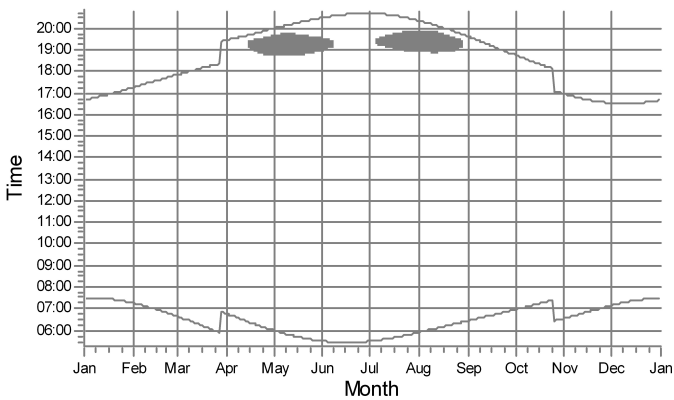
R01: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)



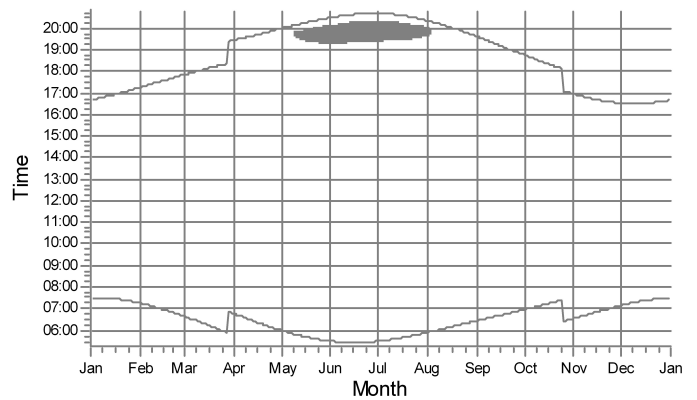
R03: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)



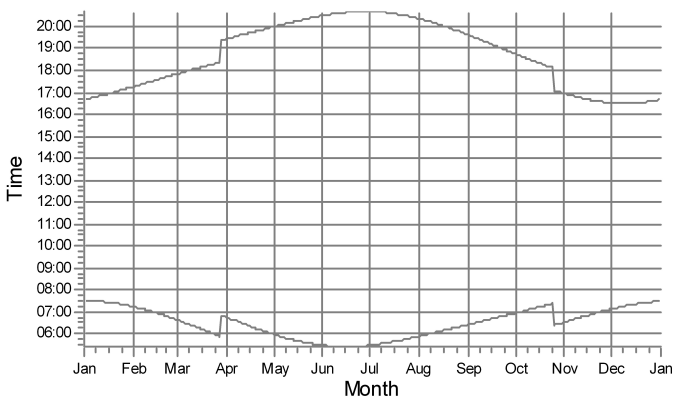
R06: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)



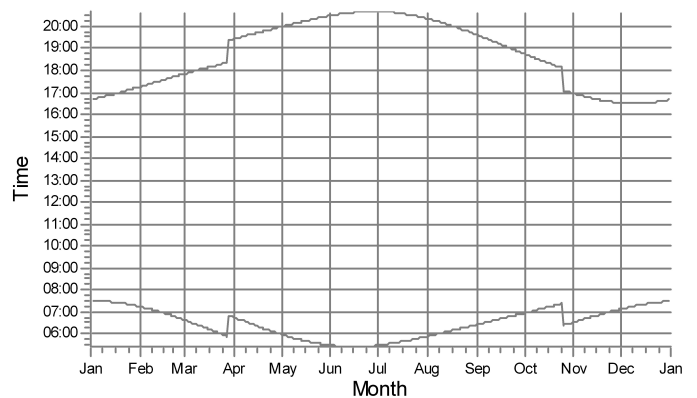
R13: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)



R14: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)



R15: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (6)

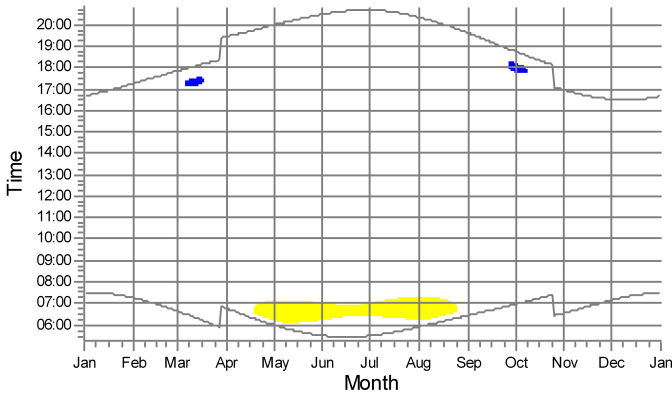


WTGs

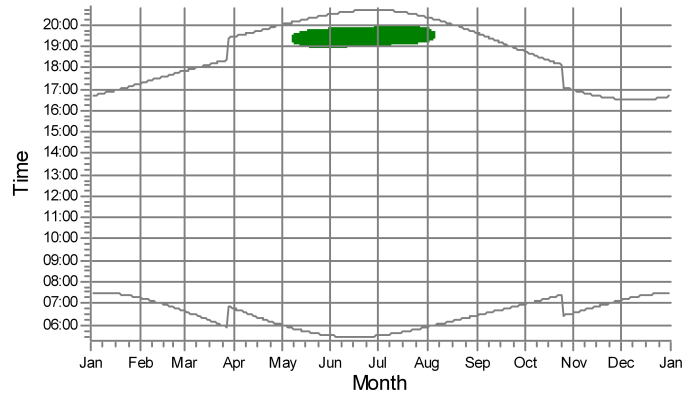
- MN03: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (3)
- MN04: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (4)
- MN05: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (5)
- MN06: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (6)

SHADOW - Calendar, graphical

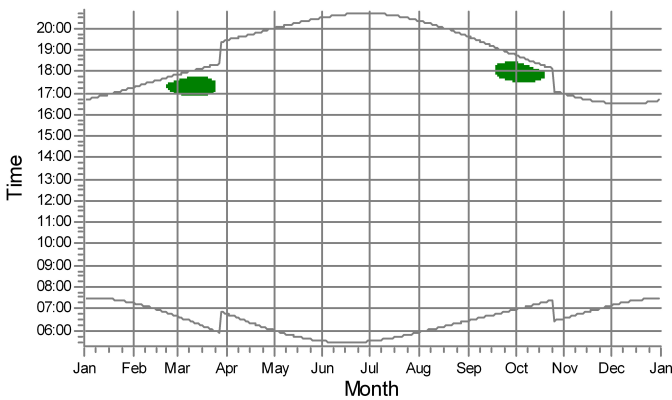
R16: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)



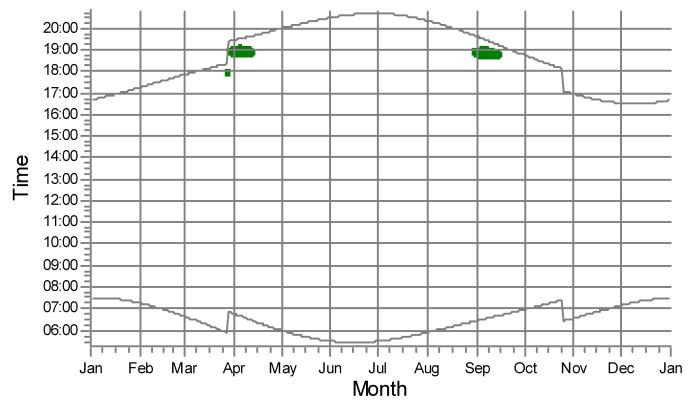
R18: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)



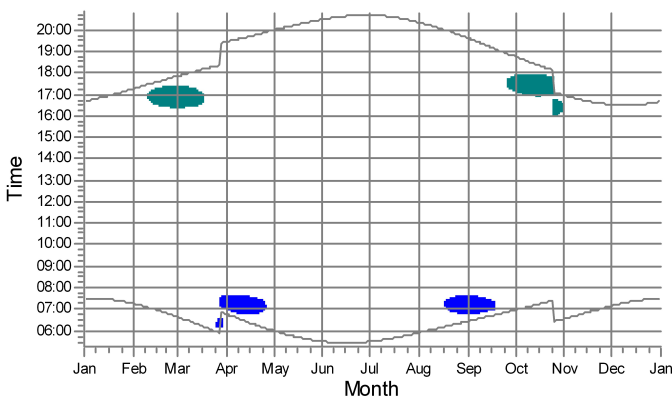
R19: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)



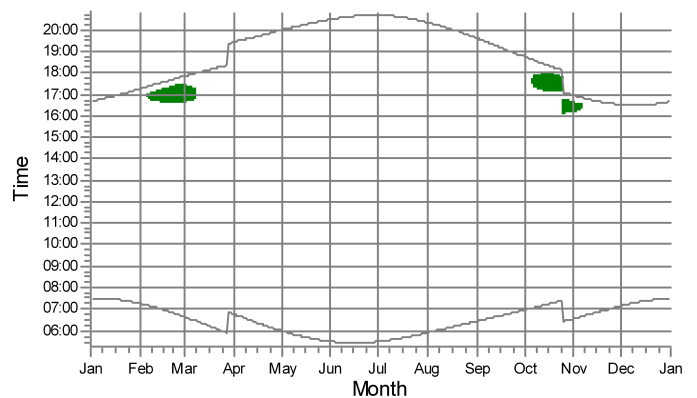
R20: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)



R22: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)



R23: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (12)

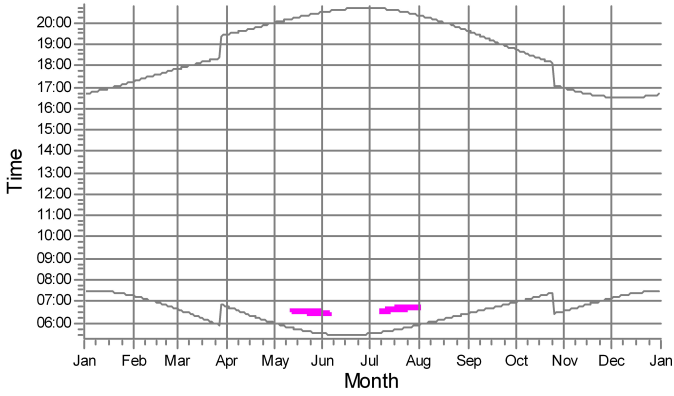


WTGs

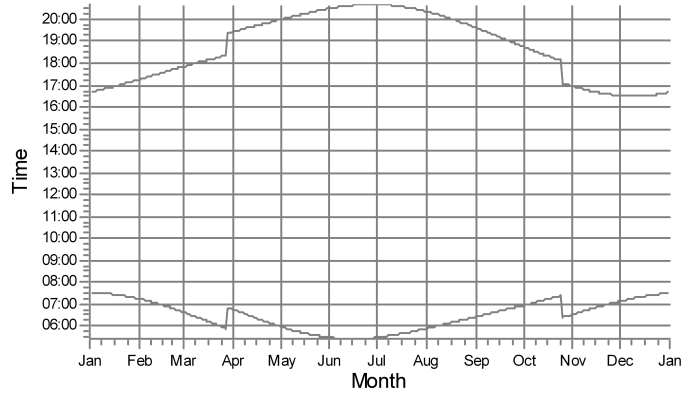
- MN01: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (1)
- MN02: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (2)
- MN03: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (3)
- MN06: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (6)

SHADOW - Calendar, graphical

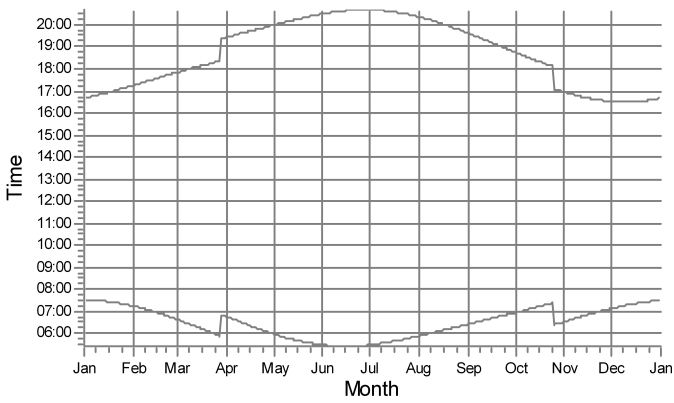
R28: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (13)



R34: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (14)



R35: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (15)



WTGs

MN05: Siemens Gamesa SG 6.0-170 6200 170.0 !0! hub: 135,0 m (TOT: 220,0 m) (5)

SHADOW - Calendar per WTG

WTG: MN01 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (1)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,21 4,83 5,24 6,37 6,76 8,17 9,01 9,23 7,23 4,84 4,00 3,35

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
738 408 381 216 154 236 479 1.142 793 317 938 1.420 7.222

	January	February	March	April	May	June
1	07:29 16:40	07:15 17:15	06:38 16:43-17:28/45 17:50	06:46 18:44-19:04/20 19:26	05:59 19:59	05:29 19:01-19:45/44 20:29
2	07:29 16:41	07:14 17:16	06:36 16:44-17:29/45 17:51	06:44 18:43-19:06/23 19:27	05:57 20:00	05:28 19:00-19:45/45 20:30
3	07:29 16:42	07:13 17:18	06:35 16:46-17:31/45 17:53	06:42 18:42-19:06/24 19:28	05:56 20:01	05:28 19:01-19:45/44 20:31
4	07:29 16:43	07:12 17:19	06:33 16:47-17:32/45 17:54	06:41 18:41-19:07/26 19:29	05:55 20:02	05:27 19:00-19:45/45 20:32
5	07:29 16:44	07:11 17:20	06:31 16:49-17:34/45 17:55	06:39 18:42-19:08/26 19:30	05:53 20:03	05:27 19:01-19:45/44 20:32
6	07:29 16:44	07:10 16:55-16:58/3 17:21	06:30 16:51-17:35/44 17:56	06:37 18:41-19:07/26 19:31	05:52 20:04	05:27 19:01-19:46/45 20:33
7	07:29 16:45	07:08 16:52-16:59/7 17:23	06:28 16:54-17:36/42 17:57	06:36 18:41-19:06/25 19:32	05:51 20:05	05:26 19:02-19:46/44 20:34
8	07:29 16:46	07:07 16:50-17:00/10 17:24	06:27 16:58-17:38/40 17:59	06:34 18:42-19:06/24 19:33	05:50 20:06	05:26 19:01-19:45/44 20:34
9	07:29 16:47	07:06 16:49-17:02/13 17:25	06:25 16:57-17:38/41 18:00	06:32 18:42-19:04/22 19:35	05:48 19:16-19:28/12 20:07	05:26 19:02-19:46/44 20:35
10	07:29 16:49	07:05 16:48-17:04/16 17:27	06:23 16:56-17:39/43 18:01	06:31 18:42-19:03/21 19:36	05:47 19:12-19:30/18 20:09	05:26 19:02-19:46/44 20:35
11	07:28 16:50	07:04 16:46-17:04/18 17:28	06:22 16:56-17:40/44 18:02	06:29 18:44-19:02/18 19:37	05:46 19:09-19:32/23 20:10	05:25 19:03-19:46/43 20:36
12	07:28 16:51	07:02 16:45-17:06/21 17:29	06:20 16:57-17:42/45 18:03	06:27 18:45-18:59/14 19:38	05:45 19:08-19:33/25 20:11	05:25 19:03-19:47/44 20:36
13	07:28 16:52	07:01 16:44-17:08/24 17:30	06:18 16:56-17:42/46 18:04	06:26 18:47-18:56/9 19:39	05:44 19:06-19:35/29 20:12	05:25 19:03-19:47/44 20:37
14	07:27 16:53	07:00 16:43-17:08/25 17:32	06:16 16:56-17:41/45 18:06	06:24 19:40 19:40	05:43 19:05-19:36/31 20:13	05:25 19:04-19:47/43 20:37
15	07:27 16:54	06:58 16:43-17:10/27 17:33	06:15 16:57-17:41/44 18:07	06:22 19:41 19:41	05:42 19:04-19:37/33 20:14	05:25 19:04-19:47/43 20:38
16	07:27 16:55	06:57 16:43-17:12/29 17:34	06:13 16:57-17:40/43 18:08	06:21 19:42 19:42	05:41 19:03-19:38/35 20:15	05:25 19:04-19:47/43 20:38
17	07:26 16:56	06:56 16:42-17:13/31 17:36	06:11 16:57-17:38/41 18:09	06:19 19:43 19:43	05:40 19:04-19:39/35 20:16	05:25 19:04-19:47/43 20:39
18	07:26 16:58	06:54 16:42-17:14/32 17:37	06:10 16:58-17:37/39 18:10	06:18 19:44 19:44	05:39 19:03-19:40/37 20:17	05:25 19:04-19:48/44 20:39
19	07:25 16:59	06:53 16:41-17:15/34 17:38	06:08 16:59-17:36/37 18:11	06:16 19:46 19:46	05:38 19:02-19:40/38 20:18	05:25 19:04-19:48/44 20:39
20	07:25 17:00	06:51 16:41-17:17/36 17:39	06:06 17:00-17:34/34 18:12	06:15 19:47 19:47	05:37 19:01-19:41/40 20:19	05:25 19:04-19:48/44 20:40
21	07:24 17:01	06:50 16:40-17:18/38 17:41	06:05 17:01-17:32/31 18:13	06:13 19:48 19:48	05:36 19:01-19:41/40 20:20	05:26 19:04-19:48/44 20:40
22	07:23 17:02	06:49 16:41-17:20/39 17:42	06:03 17:04-17:31/27 18:15	06:12 19:49 19:49	05:35 19:00-19:41/41 20:21	05:26 19:05-19:49/44 20:40
23	07:23 17:04	06:47 16:40-17:20/40 17:43	06:01 17:06-17:28/22 18:16	06:10 19:50 19:50	05:35 19:01-19:42/41 20:22	05:26 19:05-19:49/44 20:40
24	07:22 17:05	06:46 16:41-17:22/41 17:44	05:59 17:08-17:24/16 18:17	06:09 19:51 19:51	05:34 19:00-19:43/43 20:23	05:26 19:05-19:49/44 20:40
25	07:21 17:06	06:44 16:41-17:23/42 17:45	05:58 18:18 18:18	06:07 19:52 19:52	05:33 19:00-19:43/43 20:23	05:27 19:06-19:49/43 20:40
26	07:20 17:07	06:42 16:42-17:25/43 17:47	05:56 18:19 18:19	06:06 19:53 19:53	05:32 19:00-19:43/43 20:24	05:27 19:06-19:49/43 20:41
27	07:19 17:09	06:41 16:42-17:26/44 17:48	05:54 18:20 18:20	06:04 19:54 19:54	05:32 19:00-19:43/43 20:25	05:27 19:06-19:49/43 20:41
28	07:19 17:10	06:39 16:43-17:28/45 17:49	05:53 17:52-18:00/8 18:21	06:03 19:56 19:56	05:31 19:01-19:44/43 20:26	05:28 19:07-19:50/43 20:41
29	07:18 17:11		06:51 18:48-19:00/12 19:22	06:01 19:57 19:57	05:30 19:00-19:44/44 20:27	05:28 19:06-19:50/44 20:41
30	07:17 17:12		06:49 18:47-19:02/15 19:23	06:00 19:58 19:58	05:30 19:00-19:44/44 20:28	05:29 19:07-19:51/44 20:41
31	07:16 17:14		06:47 18:45-19:03/18 19:25		05:29 19:00-19:44/44 20:29	
Potential sun hours	295	296	369	400	451	455
Sum of minutes with flicker	0	658	1002	278	825	1314

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

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

SHADOW - Calendar per WTG

WTG: MN01 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (1)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July	August	September	October	November	December
1	05:29 19:07-19:50/43 20:40	05:54 19:19-19:44/25 20:21	06:26 18:43-19:01/18 19:36	06:57 17:35-18:21/46 18:45	06:33 16:17-16:32/15 16:57	07:08 16:31
2	05:29 19:07-19:51/44 20:40	05:55 19:21-19:42/21 20:20	06:27 18:41-19:02/21 19:35	06:58 17:35-18:19/44 18:43	06:34 16:19-16:31/12 16:55	07:09 16:31
3	05:30 19:07-19:51/44 20:40	05:56 19:23-19:39/16 20:18	06:28 18:40-19:02/22 19:33	06:59 17:34-18:18/44 18:41	06:35 16:20-16:30/10 16:54	07:11 16:31
4	05:31 19:08-19:52/44 20:40	05:57 19:27-19:35/8 20:17	06:29 18:39-19:03/24 19:31	07:00 17:35-18:17/42 18:39	06:36 16:22-16:28/6 16:53	07:12 16:30
5	05:31 19:07-19:51/44 20:40	05:58 20:16 05:59	06:30 18:38-19:03/25 19:30	07:01 17:34-18:15/41 18:38	06:37 16:26-16:28/2 16:52	07:13 16:30
6	05:32 19:08-19:52/44 20:39	05:59 20:15 06:00	06:31 18:37-19:03/26 19:28	07:02 17:34-18:13/39 18:36	06:39 16:30 16:50	07:14 16:30
7	05:32 19:07-19:51/44 20:39	06:00 20:14 06:03	06:32 18:37-19:03/26 19:26	07:03 17:28-18:11/43 18:34	06:40 16:49 16:47	07:15 16:30
8	05:33 19:08-19:52/44 20:39	06:01 20:12 06:02	06:33 18:36-19:02/26 19:25	07:05 17:25-18:09/44 18:33	06:41 16:48 16:42	07:15 16:30
9	05:34 19:08-19:52/44 20:38	06:02 20:11 06:03	06:34 18:36-19:01/25 19:23	07:06 17:23-18:08/45 18:31	06:42 16:47 16:44	07:16 16:30
10	05:34 19:08-19:52/44 20:38	06:03 20:10 06:04	06:35 18:36-18:59/23 19:21	07:07 17:20-18:06/46 18:29	06:44 16:46 16:45	07:17 16:30
11	05:35 19:08-19:52/44 20:38	06:04 20:08 06:05	06:36 18:37-18:57/20 19:19	07:08 17:19-18:04/45 18:28	06:45 16:45 16:44	07:18 16:30
12	05:36 19:09-19:53/44 20:37	06:05 20:07 06:06	06:37 18:37-18:55/18 19:18	07:09 17:18-18:03/45 18:26	06:46 16:44 16:47	07:19 16:30
13	05:37 19:09-19:53/44 20:37	06:06 20:06 06:07	06:38 18:38-18:54/16 19:16	07:10 17:16-18:01/45 18:24	06:47 16:43 16:49	07:20 16:30
14	05:37 19:08-19:52/44 20:36	06:07 20:04 06:08	06:39 18:39-18:52/13 19:14	07:11 17:15-17:59/44 18:23	06:49 16:42 16:41	07:21 16:30
15	05:38 19:09-19:53/44 20:35	06:08 20:03 06:09	06:40 18:41-18:50/9 19:12	07:12 17:14-17:58/44 18:21	06:50 16:41 16:40	07:21 16:30
16	05:39 19:09-19:53/44 20:35	06:09 20:01 06:10	06:41 18:41-18:50/9 19:11	07:14 17:13-17:56/43 18:20	06:51 16:41 16:40	07:22 16:31
17	05:40 19:10-19:53/43 20:34	06:10 20:00 06:11	06:42 18:41-18:50/9 19:09	07:15 17:13-17:55/42 18:18	06:52 16:39 16:39	07:23 16:31
18	05:41 19:10-19:53/43 20:33	06:11 19:58 06:12	06:43 18:41-18:50/9 19:07	07:16 17:13-17:53/40 18:16	06:53 16:39 16:39	07:23 16:31
19	05:41 19:10-19:52/42 20:33	06:12 19:57 06:13	06:44 17:57-18:10/13 19:05	07:17 17:12-17:51/39 18:15	06:55 16:38 16:38	07:24 16:32
20	05:42 19:10-19:52/42 20:32	06:13 19:55 06:14	06:45 17:53-18:13/20 19:04	07:18 17:11-17:50/39 18:13	06:56 16:37 16:37	07:25 16:32
21	05:43 19:11-19:52/41 20:31	06:14 19:54 06:15	06:46 17:50-18:16/26 19:02	07:19 17:11-17:48/37 18:12	06:57 16:36 16:36	07:25 16:33
22	05:44 19:11-19:52/41 20:30	06:15 19:52 06:16	06:47 17:47-18:17/30 19:00	07:21 17:12-17:47/35 18:10	06:58 16:36 16:36	07:26 16:33
23	05:45 19:12-19:52/40 20:30	06:16 19:51 06:17	06:48 17:45-18:18/33 18:58	07:22 17:11-17:45/34 18:09	06:59 16:35 16:35	07:26 16:34
24	05:46 19:12-19:51/39 20:29	06:17 19:49 06:18	06:50 17:43-18:19/36 18:57	07:23 17:11-17:44/33 18:07	07:01 16:34 16:34	07:27 16:34
25	05:47 19:13-19:51/38 20:28	06:18 19:48 06:19	06:51 17:42-18:20/38 18:55	06:24 16:11-16:42/31 17:06	07:02 16:34 16:34	07:27 16:35
26	05:48 19:14-19:50/36 20:27	06:19 19:46 06:20	06:52 17:40-18:21/41 18:53	06:25 16:12-16:41/29 17:05	07:03 16:33 16:33	07:27 16:35
27	05:49 19:13-19:49/36 20:26	06:21 19:45 06:22	06:53 17:39-18:21/42 18:51	06:26 16:13-16:39/26 17:03	07:04 16:33 16:33	07:28 16:36
28	05:50 19:14-19:48/34 20:25	06:22 19:43 06:23	06:54 17:38-18:21/43 18:50	06:28 16:13-16:38/25 17:02	07:05 16:32 16:32	07:28 16:37
29	05:51 19:15-19:47/32 20:24	06:23 19:41 06:24	06:55 17:37-18:21/44 18:48	06:29 16:14-16:37/23 17:00	07:06 16:32 16:32	07:28 16:37
30	05:52 19:16-19:46/30 20:23	06:24 19:40 06:25	06:56 17:36-18:21/45 18:46	06:30 16:15-16:35/20 16:59	07:07 16:31 16:31	07:29 16:38
31	05:53 19:18-19:45/27 20:22	06:25 19:38 06:26	06:57 18:45-18:59/14 19:40	06:31 16:16-16:34/18 16:58	07:08 16:30 16:30	07:29 16:39
Potential sun hours	462	430	375	344	296	285
Sum of minutes with flicker	1267	93	723	1171	45	0

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

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

SHADOW - Calendar per WTG

WTG: MN02 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (2)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 06:18-07:01/43 19:59	05:29 06:18-06:56/38 20:29	05:29 06:30-06:55/25 20:40	05:54 06:20-07:13/53 20:21	06:26 19:36	06:57 18:44	06:32 16:56	07:08 16:31
2	07:29 16:41	07:14 17:16	06:36 17:51	06:44 19:27	05:57 06:17-07:02/45 20:00	05:28 06:19-06:55/36 20:30	05:29 06:30-06:57/27 20:40	05:55 06:19-07:13/54 20:19	06:27 19:35	06:58 18:43	06:34 16:55	07:09 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 06:16-07:02/46 20:01	05:28 06:20-06:55/35 20:31	05:30 06:29-06:57/28 20:40	05:56 06:19-07:13/54 20:18	06:28 19:33	06:59 18:41	06:35 16:54	07:10 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 06:14-07:02/48 20:02	05:27 06:20-06:54/34 20:31	05:31 06:29-06:58/29 20:40	05:57 06:19-07:13/54 20:17	06:29 19:31	07:00 18:39	06:36 16:53	07:11 16:30
5	07:29 16:43	07:11 17:20	06:31 17:55	06:39 19:30	05:53 06:13-07:02/49 20:03	05:27 06:21-06:54/33 20:32	05:31 06:28-06:58/30 20:40	05:58 06:20-07:12/52 20:16	06:30 19:30	07:01 18:38	06:37 16:52	07:12 16:30
6	07:29 16:44	07:09 17:21	06:30 17:56	06:37 19:31	05:52 06:12-07:02/50 20:04	05:27 06:22-06:54/32 20:33	05:32 06:28-06:59/31 20:39	05:59 06:21-07:12/51 20:15	06:31 19:28	07:02 18:36	06:39 16:50	07:13 16:30
7	07:29 16:45	07:08 17:23	06:28 17:57	06:36 19:32	05:51 06:11-07:03/52 20:05	05:26 06:23-06:53/30 20:34	05:32 06:27-07:00/33 20:39	06:00 06:22-07:12/50 20:14	06:32 19:26	07:03 18:34	06:40 16:49	07:14 16:30
8	07:29 16:46	07:07 17:24	06:26 17:59	06:34 19:33	05:50 06:10-07:03/53 20:06	05:26 06:23-06:52/29 20:34	05:33 06:27-07:01/34 20:39	06:01 06:23-07:12/49 20:12	06:33 19:24	07:05 18:33	06:41 16:48	07:15 16:30
9	07:29 16:47	07:06 17:25	06:25 18:00	06:32 19:34	05:48 06:10-07:03/53 20:07	05:26 06:24-06:52/28 20:35	05:34 06:27-07:02/35 20:38	06:02 06:24-07:11/47 20:11	06:34 19:23	07:06 18:31	06:42 16:47	07:16 16:30
10	07:29 16:48	07:05 17:27	06:23 18:01	06:31 19:36	05:47 06:09-07:02/53 20:08	05:26 06:25-06:52/27 20:35	05:34 06:26-07:02/36 20:38	06:03 06:25-07:11/46 20:10	06:35 19:21	07:07 18:29	06:44 16:46	07:17 16:30
11	07:28 16:50	07:04 17:28	06:21 18:02	06:29 19:37	05:46 06:09-07:02/53 20:10	05:25 06:25-06:52/27 20:36	05:35 06:26-07:03/37 20:37	06:04 06:26-07:10/44 20:08	06:36 19:19	07:08 18:28	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 06:09-07:02/53 20:11	05:25 06:26-06:51/25 20:36	05:36 06:26-07:04/38 20:37	06:05 06:27-07:10/43 20:07	06:37 19:18	07:09 18:26	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:30	06:18 18:04	06:26 19:39	05:44 06:09-07:02/53 20:12	05:25 06:27-06:51/24 20:37	05:37 06:26-07:05/39 20:36	06:06 06:28-07:09/41 20:06	06:38 19:16	07:10 18:24	06:47 16:43	07:20 16:30
14	07:27 16:53	07:00 17:32	06:16 18:05	06:24 19:40	05:43 06:09-07:02/53 20:13	05:26 06:28-06:51/23 20:37	05:37 06:24-07:05/41 20:36	06:07 06:29-07:08/39 20:04	06:39 19:14	07:11 18:23	06:48 16:42	07:20 16:30
15	07:27 16:54	06:58 17:33	06:15 18:07	06:22 19:41	05:42 06:09-07:01/52 20:14	05:25 06:28-06:51/23 20:37	05:38 06:24-07:06/42 20:35	06:08 06:30-07:07/37 20:03	06:40 19:12	07:12 18:21	06:50 16:41	07:21 16:30
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 06:09-07:01/52 20:15	05:25 06:29-06:50/21 20:38	05:39 06:24-07:07/43 20:35	06:09 06:31-07:06/35 20:01	06:41 19:11	07:13 18:20	06:51 16:40	07:22 16:31
17	07:26 16:56	06:56 17:35	06:11 18:09	06:19 19:43	05:40 06:11-07:02/51 20:16	05:25 06:29-06:50/21 20:39	05:40 06:24-07:07/43 20:34	06:10 06:32-07:05/33 20:00	06:42 19:09	07:15 18:18	06:52 16:39	07:23 16:31
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:44	05:39 06:11-07:01/50 20:17	05:25 06:30-06:50/20 20:39	05:41 06:24-07:08/44 20:33	06:11 06:33-07:03/30 19:07	06:43 19:07	07:16 18:16	06:53 16:39	07:23 16:31
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 06:11-07:01/50 20:18	05:25 06:30-06:50/20 20:39	05:41 06:23-07:08/45 20:33	06:12 06:34-07:01/27 19:57	06:44 19:05	07:17 18:15	06:55 16:38	07:24 16:32
20	07:24 17:00	06:51 17:39	06:06 18:12	06:15 06:34-06:47/13 19:47	05:37 06:11-07:00/49 20:19	05:25 06:30-06:50/20 20:40	05:42 06:22-07:09/47 20:32	06:13 06:35-07:00/25 19:55	06:45 19:04	07:18 18:13	06:56 16:37	07:25 16:32
21	07:24 17:01	06:50 17:40	06:04 18:13	06:13 06:32-06:50/18 19:48	05:36 06:11-07:00/49 20:20	05:26 06:30-06:50/20 20:40	05:43 06:22-07:09/47 20:31	06:14 06:36-06:57/21 19:54	06:46 19:02	07:19 18:12	06:57 16:36	07:25 16:32
22	07:23 17:02	06:48 17:42	06:03 18:14	06:11 06:31-06:53/22 19:49	05:35 06:11-06:59/48 20:21	05:26 06:31-06:51/20 20:40	05:44 06:22-07:10/48 20:30	06:15 06:37-06:54/17 19:52	06:47 19:00	07:20 18:10	06:58 16:36	07:26 16:33
23	07:22 17:04	06:47 17:43	06:01 18:16	06:10 06:29-06:54/25 19:50	05:35 06:13-07:00/47 20:21	05:26 06:31-06:51/20 20:40	05:45 06:22-07:11/49 20:30	06:16 06:38-06:51/13 19:51	06:48 18:58	07:22 18:09	06:59 16:35	07:26 16:33
24	07:22 17:05	06:45 17:44	05:59 18:17	06:09 06:28-06:56/28 19:51	05:34 06:13-06:59/46 20:22	05:26 06:31-06:51/20 20:40	05:46 06:22-07:11/49 20:29	06:17 06:49 18:57	06:49 18:07	07:23 16:34	07:27 16:34	
25	07:21 17:06	06:44 17:45	05:58 18:18	06:07 06:26-06:57/31 19:52	05:33 06:13-06:58/45 20:23	05:27 06:31-06:52/21 20:40	05:47 06:21-07:12/51 20:28	06:18 06:51 18:55	06:51 18:55	06:24 17:06	07:02 16:34	07:27 16:35
26	07:20 17:07	06:42 17:47	05:56 18:19	06:06 06:25-06:58/33 19:53	05:32 06:14-06:58/44 20:24	05:27 06:31-06:52/21 20:40	05:48 06:21-07:12/51 20:27	06:19 06:52 18:53	06:52 18:53	06:25 17:05	07:03 16:33	07:27 16:35
27	07:19 17:09	06:41 17:48	05:54 18:20	06:04 06:24-06:59/35 19:54	05:32 06:15-06:58/43 20:25	05:27 06:30-06:53/23 20:41	05:49 06:20-07:11/51 20:26	06:20 06:54 18:51	06:53 18:51	06:26 17:03	07:04 16:33	07:28 16:36
28	07:19 17:10	06:39 17:49	05:52 18:21	06:03 06:22-06:59/37 19:55	05:31 06:16-06:58/42 20:26	05:28 06:31-06:54/23 20:41	05:50 06:20-07:12/52 20:25	06:21 06:54 18:50	06:54 18:50	06:28 17:02	07:05 16:32	07:28 16:37
29	07:18 17:11	06:39 17:49	05:51 18:21	06:01 06:21-07:00/39 19:57	05:30 06:16-06:57/41 20:27	05:28 06:30-06:54/24 20:41	05:51 06:20-07:12/52 20:24	06:23 06:55 18:48	06:55 18:48	06:29 17:00	07:06 16:32	07:28 16:37
30	07:17 17:12	06:39 17:49	05:50 18:21	06:00 06:20-07:01/41 19:58	05:30 06:17-06:57/40 20:28	05:28 06:31-06:55/24 20:40	05:52 06:20-07:12/52 20:23	06:24 06:56 18:46	06:56 18:46	06:30 17:00	07:07 16:32	07:29 16:38
31	07:16 17:14	06:39 17:49	05:50 18:21	06:00 06:20-07:01/41 19:58	05:29 06:17-06:56/39 20:28	05:27 06:31-06:55/24 20:40	05:53 06:20-07:12/52 20:22	06:25 06:57 19:38	06:57 18:46	07:06 17:00	07:07 16:32	07:29 16:38
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Sum of minutes with flicker	0	0	0	322	1492	762	1281	915	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: MN03 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (3)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	07:05-07:34/29 19:59	05:59 20:29
2	07:29 16:41	07:14 17:16	06:36 17:52	06:44 19:27	07:03-07:34/31 20:00	05:58 20:30
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	07:01-07:34/33 20:01	05:56 20:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	06:59-07:34/35 20:02	05:55 20:32
5	07:29 16:44	07:11 17:20	06:31 17:55	06:39 19:30	06:58-07:35/37 20:03	05:53 20:32
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	06:56-07:35/39 20:04	05:52 20:33
7	07:29 16:46	07:08 17:23	06:28 17:57	06:36 19:32	06:54-07:34/40 20:05	05:51 20:34
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:33	06:53-07:35/42 20:06	05:50 20:34
9	07:29 16:48	07:06 17:25	06:25 18:00	06:32 19:35	06:51-07:34/43 20:07	05:49 20:35
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	06:49-07:34/45 20:09	05:47 20:35
11	07:28 16:50	07:04 17:28	06:22 18:02	06:29 19:37	06:49-07:34/45 20:10	05:46 20:36
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	06:49-07:33/44 20:11	05:45 20:37
13	07:28 16:52	07:01 17:31	06:18 18:04	06:26 19:39	06:49-07:33/44 20:12	05:44 20:37
14	07:27 16:53	07:00 17:32	06:17 18:06	06:24 19:40	06:49-07:32/43 20:13	05:43 20:37
15	07:27 16:54	06:58 17:33	06:15 18:07	06:23 19:41	06:49-07:30/41 20:14	05:42 20:38
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	06:50-07:30/40 20:15	05:41 20:38
17	07:26 16:56	06:56 17:36	06:11 18:09	06:19 19:43	06:50-07:28/38 20:16	05:40 20:39
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	06:51-07:28/37 20:17	05:39 20:39
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	06:51-07:26/35 20:18	05:38 20:39
20	07:25 17:00	06:51 17:39	06:06 18:12	06:15 19:47	06:53-07:25/32 20:19	05:37 20:40
21	07:24 17:01	06:50 17:41	06:05 18:13	06:13 19:48	06:54-07:23/29 20:20	05:36 20:40
22	07:23 17:02	06:49 17:42	06:03 18:15	06:12 19:49	06:56-07:21/25 20:21	05:35 20:40
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	06:57-07:18/21 20:22	05:35 20:40
24	07:22 17:05	06:46 17:44	05:59 18:17	06:09 19:51	07:00-07:16/16 20:23	05:34 20:40
25	07:21 17:06	06:44 17:45	05:58 18:18	06:07 19:52	07:05-07:09/4 20:23	05:33 20:41
26	07:20 17:07	06:43 17:47	05:56 18:19	06:06 19:53	06:15-06:21/6 20:24	05:32 20:41
27	07:19 17:09	06:41 17:48	05:54 18:20	06:04 19:54	06:13-06:25/12 20:25	05:32 20:41
28	07:19 17:10	06:39 17:49	05:53 18:21	06:03 19:56	06:11-06:28/17 20:26	05:31 20:41
29	07:18 17:11		06:51 19:22	06:01 19:57	07:10-07:30/20 20:27	05:30 20:41
30	07:17 17:13		06:49 19:24	06:00 19:58	07:08-07:31/23 20:28	05:30 20:41
31	07:16 17:14		06:47 19:25		07:06-07:32/26 20:29	05:29 20:41
Potential sun hours	295	296	369	400	451	455
Sum of minutes with flicker	0	211	182	868	0	0

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

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

SHADOW - Calendar per WTG

WTG: MN03 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (3)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July	August	September	October	November	December
1	05:29 20:40	05:54 20:21	06:26 19:36	06:48-07:33/45 18:45	06:57 17:53-18:04/11 18:45	06:33 16:57 16:31
2	05:30 20:40	05:55 20:20	06:27 19:35	06:48-07:33/45 18:43	06:58 17:52-18:02/10 18:43	06:34 16:55 16:31
3	05:30 20:40	05:56 20:18	06:28 19:33	06:49-07:32/43 19:31	06:59 17:51-18:00/9 18:39	06:35 16:54 16:31
4	05:31 20:40	05:57 20:17	06:29 19:30	06:50-07:32/42 19:31	07:00 17:52-18:00/8 18:39	06:36 16:53 16:30
5	05:31 20:40	05:58 20:16	06:30 19:30	06:51-07:31/40 19:30	07:01 17:51-17:57/6 18:38	06:37 16:52 16:30
6	05:32 20:39	05:59 20:15	06:31 19:28	06:52-07:31/39 19:28	07:02 17:51-17:55/4 18:36	06:39 16:51 16:30
7	05:32 20:39	06:00 20:14	06:32 19:26	06:53-07:30/37 19:26	07:04 17:51-17:52/1 18:34	06:40 16:49 16:30
8	05:33 20:39	06:01 20:12	06:33 19:25	06:54-07:29/35 19:25	07:05 18:33	06:41 16:48 16:30
9	05:34 20:38	06:02 20:11	06:34 19:23	06:55-07:28/33 19:23	07:06 18:31	06:42 16:47 16:30
10	05:34 20:38	06:03 20:10	06:35 19:21	06:56-07:27/31 19:21	07:07 18:29	06:44 16:46 16:30
11	05:35 20:38	06:04 20:08	06:36 19:19	06:57-07:26/29 19:19	07:08 18:28	06:45 16:45 16:30
12	05:36 20:37	06:05 20:07	06:37 19:18	06:58-07:24/26 19:18	07:09 18:26	06:46 16:44 16:30
13	05:37 20:37	06:06 20:06	06:38 19:16	06:59-07:23/24 19:16	07:10 18:24	06:47 16:43 16:30
14	05:37 20:36	06:07 20:04	06:39 19:14	07:00-07:21/21 19:14	07:11 18:23	06:49 16:42 16:30
15	05:38 20:35	06:08 20:03	06:40 19:12	07:01-07:18/17 19:12	07:12 07:51-07:53/2 18:21	06:50 16:41 16:31
16	05:39 20:35	06:09 20:01	06:41 19:11	07:02-07:15/13 19:11	07:14 07:47-07:58/11 18:20	06:51 16:40 16:31
17	05:40 20:34	06:10 20:00	06:42 19:09	07:03-07:11/8 19:09	07:15 07:45-07:59/14 18:18	06:52 16:39 16:31
18	05:41 20:34	06:11 19:58	06:43 19:07	07:10-07:18/8 19:07	07:16 07:43-08:00/17 18:17	06:53 16:39 16:31
19	05:42 20:33	06:12 19:57	06:44 19:05	07:05-07:22/17 19:05	07:17 07:42-08:01/19 18:15	06:55 16:38 16:32
20	05:42 20:32	06:13 19:56	06:45 19:04	07:07-07:25/23 19:04	07:18 07:41-08:01/20 18:14	06:56 16:37 16:32
21	05:43 20:31	06:14 19:54	06:46 19:02	07:09-07:26/26 19:02	07:19 07:41-08:02/21 18:12	06:57 16:36 16:33
22	05:44 20:30	06:15 19:52	06:48 19:00	06:58-07:28/30 19:00	07:21 07:42-08:02/20 18:11	06:58 16:36 16:33
23	05:45 20:30	06:16 19:51	06:49 18:58	06:57-07:29/32 18:58	07:22 07:43-08:02/19 18:09	06:59 16:35 16:34
24	05:46 20:29	06:17 19:49	06:50 18:57	06:55-07:30/35 18:57	07:23 07:44-08:01/17 18:08	07:01 16:34 16:34
25	05:47 20:28	06:19 19:48	06:51 18:55	06:54-07:31/37 18:55	06:24 06:46-07:01/15 17:06	07:02 16:34 16:35
26	05:48 20:27	06:20 19:46	06:52 18:53	06:53-07:31/38 18:53	06:25 06:47-07:00/13 17:05	07:03 16:33 16:35
27	05:49 20:26	06:21 19:45	06:53 18:51	06:52-07:32/40 18:51	06:26 06:48-06:59/11 17:03	07:04 16:33 16:36
28	05:50 20:25	06:22 19:43	06:54 18:50	06:51-07:32/41 18:50	06:28 06:49-06:57/8 17:02	07:05 16:32 16:37
29	05:51 20:24	06:23 19:41	06:55 18:48	06:50-07:33/43 18:48	06:29 06:51-06:56/5 17:01	07:06 16:32 16:37
30	05:52 20:23	06:24 19:40	06:56 18:46	06:49-07:33/44 18:46	06:30 16:59 16:32	07:07 16:32 16:38
31	05:53 20:22	06:25 19:38	06:49-07:33/44 19:38		06:31 16:58	07:29 16:39
Potential sun hours	462	430	375	344	296	285
Sum of minutes with flicker	0	458	560	261	0	0

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

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

SHADOW - Calendar per WTG

WTG: MN04 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (4)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,21 4,83 5,24 6,37 6,76 8,17 9,01 9,23 7,23 4,84 4,00 3,35

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
738 408 381 216 154 236 479 1.142 793 317 938 1.420 7.222

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 17:50	06:46 19:26	05:59 18:48-19:35/47 19:59	05:29 19:04-20:04/60 20:29	05:29 19:28-20:14/46 20:41	05:54 18:58-19:56/58 20:21	06:26 19:36	06:57 18:45	06:33 16:57	07:08 16:31
2	07:29 16:41	07:14 17:17	06:36 17:52	06:44 19:27	05:57 18:48-19:37/49 20:00	05:28 19:04-20:04/60 20:30	05:30 19:29-20:15/46 20:40	05:55 18:58-19:55/57 20:20	06:27 19:35	06:58 18:43	06:34 16:55	07:10 16:31
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 18:48-19:38/50 20:01	05:28 19:06-20:05/59 20:31	05:30 19:28-20:14/46 20:40	05:56 18:57-19:50/53 20:19	06:28 19:33	06:59 18:41	06:35 16:54	07:11 16:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 18:48-19:39/51 20:02	05:28 19:08-20:06/58 20:32	05:31 19:29-20:14/45 20:40	05:57 18:57-19:50/53 20:17	06:29 19:31	07:00 18:40	06:36 16:53	07:12 16:31
5	07:29 16:44	07:11 17:20	06:32 17:55	06:39 19:30	05:54 18:47-19:39/52 20:03	05:27 19:23-20:06/43 20:32	05:31 19:29-20:14/45 20:40	05:58 18:57-19:50/53 20:16	06:30 19:30	07:01 18:38	06:38 16:52	07:13 16:30
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 18:47-19:40/53 20:04	05:27 19:23-20:07/44 20:33	05:32 19:29-20:14/45 20:40	05:59 18:57-19:50/53 20:15	06:31 19:28	07:03 18:36	06:39 16:51	07:14 16:30
7	07:29 16:46	07:09 17:23	06:28 17:58	06:36 19:32	05:51 18:47-19:41/54 20:05	05:27 19:23-20:08/45 20:34	05:33 19:30-20:14/44 20:39	06:00 18:57-19:50/53 20:14	06:32 19:26	07:04 18:34	06:40 16:49	07:15 16:30
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	05:50 18:47-19:41/54 20:06	05:26 19:24-20:09/45 20:34	05:33 19:15-20:13/58 20:39	06:01 18:57-19:49/52 20:12	06:33 19:25	07:05 18:33	06:41 16:48	07:16 16:30
9	07:29 16:48	07:06 17:26	06:25 18:00	06:32 19:35	05:49 18:48-19:40/52 20:08	05:26 19:23-20:09/46 20:35	05:34 19:14-20:13/59 20:39	06:02 18:56-19:47/51 20:11	06:34 19:23	07:06 18:31	06:42 16:47	07:16 16:30
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:48 19:41-19:45/4 20:09	05:26 19:23-20:09/46 20:35	05:35 19:13-20:13/60 20:38	06:03 18:56-19:46/50 20:10	06:35 19:21	07:07 18:29	06:44 16:46	07:17 16:30
11	07:29 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 18:48-19:46/58 20:10	05:26 19:24-20:10/46 20:36	05:35 19:11-20:12/61 20:38	06:04 18:56-19:45/49 20:08	06:36 19:19	07:08 18:28	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 18:49-19:47/58 20:11	05:25 19:24-20:11/47 20:37	05:36 19:11-20:12/61 20:37	06:05 18:57-19:44/47 20:07	06:37 19:18	07:09 18:26	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:31	06:18 18:05	06:26 19:39	05:44 18:49-19:48/59 20:12	05:25 19:24-20:11/47 20:37	05:37 19:10-20:11/61 20:37	06:06 18:57-19:42/45 20:06	06:38 19:16	07:10 18:25	06:47 16:43	07:20 16:30
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 18:49-19:49/60 20:13	05:25 19:24-20:12/48 20:38	05:38 19:09-20:11/62 20:36	06:07 18:57-19:41/44 20:04	06:39 19:14	07:11 18:23	06:49 16:42	07:21 16:30
15	07:27 16:54	06:58 17:33	06:15 18:07	06:23 19:41	05:42 18:50-19:50/60 20:14	05:23 19:25-20:12/47 20:38	05:38 19:08-20:10/62 20:36	06:08 18:57-19:40/43 20:03	06:40 19:13	07:13 18:21	06:50 16:41	07:21 16:31
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:10-19:20/10 19:42	05:41 18:50-19:51/61 20:15	05:23 19:25-20:12/47 20:38	05:39 19:07-20:10/63 20:35	06:09 18:57-19:38/41 20:01	06:41 19:11	07:14 18:20	06:51 16:40	07:22 16:31
17	07:26 16:57	06:56 17:36	06:12 18:09	06:19 19:06-19:21/15 19:43	05:40 18:50-19:52/62 20:16	05:25 19:25-20:13/48 20:39	05:40 19:07-20:09/62 20:34	06:10 18:58-19:37/39 20:00	06:42 19:09	07:15 18:18	06:52 16:40	07:23 16:31
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:03-19:22/19 19:45	05:39 18:51-19:52/61 20:17	05:25 19:25-20:13/48 20:39	05:41 19:06-20:09/63 20:34	06:11 18:58-19:35/37 19:59	06:43 19:07	07:16 18:17	06:53 16:39	07:23 16:32
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:00-19:23/23 19:46	05:38 18:51-19:53/62 20:18	05:26 19:25-20:13/48 20:39	05:42 19:06-20:08/62 20:33	06:12 18:59-19:34/35 19:57	06:44 19:06	07:17 18:15	06:55 16:38	07:24 16:32
20	07:25 17:00	06:52 17:39	06:06 18:12	06:15 18:59-19:24/25 19:47	05:37 18:52-19:54/62 20:19	05:26 19:25-20:13/48 20:40	05:43 19:04-20:07/63 20:32	06:13 19:00-19:33/33 19:56	06:46 19:04	07:18 18:14	06:56 16:37	07:25 16:32
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 18:57-19:25/28 19:48	05:36 18:52-19:55/63 20:20	05:26 19:26-20:14/48 20:40	05:43 19:04-20:06/62 20:31	06:14 19:01-19:31/30 19:54	06:47 19:02	07:19 18:12	06:57 16:37	07:25 16:33
22	07:23 17:03	06:49 17:42	06:03 18:15	06:12 18:56-19:27/31 19:49	05:36 18:54-19:56/62 20:21	05:26 19:26-20:14/48 20:40	05:44 19:03-20:06/63 20:31	06:15 19:02-19:30/28 19:53	06:48 19:00	07:21 18:11	06:58 16:36	07:26 16:33
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 18:54-19:27/33 19:50	05:35 18:54-19:57/63 20:22	05:26 19:26-20:14/48 20:40	05:45 19:03-20:05/62 20:30	06:17 19:03-19:28/25 19:51	06:49 18:59	07:22 18:09	06:59 16:35	07:26 16:34
24	07:22 17:05	06:46 17:44	06:00 18:17	06:09 18:53-19:28/35 19:51	05:34 18:55-19:57/62 20:23	05:27 19:26-20:14/48 20:40	05:46 19:02-20:04/62 20:29	06:18 19:04-19:27/23 19:49	06:50 18:57	07:23 18:08	07:01 16:35	07:27 16:34
25	07:21 17:06	06:44 17:46	05:58 18:18	06:07 18:51-19:29/38 19:52	05:33 18:56-19:59/63 20:23	05:27 19:27-20:15/48 20:41	05:47 19:02-20:03/61 20:28	06:19 19:06-19:25/19 19:48	06:51 18:55	07:24 17:06	07:02 16:34	07:27 16:35
26	07:20 17:08	06:43 17:47	05:56 18:19	06:06 18:51-19:30/39 19:53	05:33 18:57-19:59/62 20:24	05:27 19:27-20:15/48 20:41	05:48 19:01-20:03/62 20:27	06:20 19:09-19:24/15 19:46	06:52 18:53	07:25 17:05	07:03 16:33	07:28 16:36
27	07:20 17:09	06:41 17:48	05:54 18:20	06:04 18:51-19:32/41 19:55	05:32 18:58-20:00/62 20:25	05:28 19:27-20:14/47 20:41	05:49 19:01-20:02/61 20:26	06:21 19:12-19:22/10 19:45	06:53 18:52	07:27 17:03	07:04 16:33	07:28 16:36
28	07:19 17:10	06:40 17:49	05:53 18:21	06:03 18:49-19:32/43 19:56	05:31 18:59-20:01/62 20:26	05:28 19:28-20:15/47 20:41	05:50 19:00-20:01/61 20:25	06:22 19:12-19:22/10 19:45	06:54 18:50	07:28 17:02	07:05 16:33	07:28 16:36
29	07:18 17:11		06:02 19:22	06:02 18:49-19:34/45 19:57	05:31 19:00-20:02/62 20:27	05:28 19:27-20:14/47 20:41	05:51 18:59-20:00/61 20:24	06:23 19:12-19:22/10 19:45	06:55 18:48	07:29 17:01	07:06 16:32	07:28 16:38
30	07:17 17:13		06:49 19:24	06:00 18:49-19:35/46 19:58	05:30 19:01-20:03/62 20:28	05:29 19:28-20:15/47 20:41	05:52 18:59-19:58/59 20:23	06:24 19:12-19:22/10 19:46	06:56 18:46	07:30 16:59	07:07 16:32	07:29 16:38
31	07:16 17:14		06:48 19:25		05:29 19:02-20:03/61 20:29		05:53 18:58-19:57/59 20:22	06:25 19:12-19:22/10 19:46	06:57 18:46	07:31 16:58		07:29 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Sum of minutes with flicker	0	0	0	471	1805	1477	1803	1096	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: MN05 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (5)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	January	February	March	April	May	June	
1	07:29 16:40	07:15 17:15	06:38 17:50	07:12-07:21/9 17:50	06:46 19:26	05:59 19:59	05:29 06:23-06:31/8 20:29
2	07:29 16:41	07:14 17:16	06:36 17:52	06:44 19:27	05:57 20:00	05:28 20:30	06:22-06:30/8 20:30
3	07:29 16:42	07:13 17:18	06:35 17:53	06:42 19:28	05:56 20:01	05:28 20:31	06:22-06:29/7 20:31
4	07:29 16:43	07:12 17:19	06:33 17:54	06:41 19:29	05:55 20:02	05:28 20:32	06:23-06:28/5 20:32
5	07:29 16:44	07:11 17:20	06:31 17:55	06:39 19:30	05:54 20:03	05:27 20:32	06:22-06:26/4 20:32
6	07:29 16:45	07:10 17:22	06:30 17:56	06:37 19:31	05:52 20:04	05:27 20:33	20:33
7	07:29 16:46	07:08 17:23	06:28 17:58	06:36 19:32	05:51 20:05	05:27 20:34	20:34
8	07:29 16:47	07:07 17:24	06:27 17:59	06:34 19:34	05:50 20:06	05:26 20:34	20:34
9	07:29 16:48	07:06 17:25	06:25 18:00	06:32 19:35	05:49 20:08	05:26 20:35	20:35
10	07:29 16:49	07:05 17:27	06:23 18:01	06:31 19:36	05:47 20:09	05:26 20:35	20:35
11	07:28 16:50	07:04 17:28	06:22 18:02	06:29 19:37	05:46 20:10	05:26 20:36	20:36
12	07:28 16:51	07:02 17:29	06:20 18:03	06:27 19:38	05:45 20:11	05:26 20:37	06:33-06:34/1 20:37
13	07:28 16:52	07:01 17:31	06:18 18:04	06:26 19:39	05:44 20:12	05:25 20:37	06:32-06:34/2 20:37
14	07:28 16:53	07:00 17:32	06:17 18:06	06:24 19:40	05:43 20:13	05:25 20:37	06:31-06:35/4 20:37
15	07:27 16:54	06:58 17:33	06:15 18:07	06:23 19:41	05:42 20:14	05:25 20:38	06:31-06:35/4 20:38
16	07:27 16:55	06:57 17:34	06:13 18:08	06:21 19:42	05:41 20:15	05:25 20:38	06:30-06:35/5 20:38
17	07:26 16:57	06:56 17:36	06:11 18:09	06:19 19:43	05:40 20:16	05:25 20:39	06:29-06:35/6 20:39
18	07:26 16:58	06:54 17:37	06:10 18:10	06:18 19:45	05:39 20:17	05:25 20:39	06:29-06:35/6 20:39
19	07:25 16:59	06:53 17:38	06:08 18:11	06:16 19:46	05:38 20:18	05:26 20:39	06:28-06:35/7 20:39
20	07:25 17:00	06:51 17:39	06:06 18:12	06:15 19:47	05:37 20:19	05:26 20:40	06:27-06:35/8 20:40
21	07:24 17:01	06:50 17:41	06:05 18:14	06:13 19:48	05:36 20:20	05:26 20:40	06:27-06:35/8 20:40
22	07:23 17:03	06:49 17:42	06:03 18:15	06:12 19:49	05:36 20:21	05:26 20:40	06:27-06:35/8 20:40
23	07:23 17:04	06:47 17:43	06:01 18:16	06:10 19:50	05:35 20:22	05:26 20:40	06:26-06:35/9 20:40
24	07:22 17:05	06:46 17:44	07:25-07:27/2 18:17	06:09 19:51	05:34 20:23	05:26 20:40	06:25-06:34/9 20:40
25	07:21 17:06	06:44 17:46	07:19-07:27/8 18:18	06:07 19:52	05:33 20:23	05:27 20:41	06:26-06:35/9 20:41
26	07:20 17:08	06:43 17:47	07:13-07:26/13 18:19	06:06 19:53	05:33 20:24	05:27 20:41	06:25-06:34/9 20:41
27	07:20 17:09	06:41 17:48	07:09-07:25/16 18:20	06:04 19:54	05:32 20:25	05:27 20:41	06:24-06:33/9 20:41
28	07:19 17:10	06:39 17:49	07:11-07:24/13 18:21	06:03 19:56	05:31 20:26	05:28 20:41	06:24-06:33/9 20:41
29	07:18 17:11		06:51 19:22	06:02 19:57	05:31 20:27	05:28 20:41	06:23-06:32/9 20:41
30	07:17 17:13		06:49 19:24	06:00 19:58	05:30 20:28	05:29 20:41	06:24-06:32/8 20:41
31	07:16 17:14		06:48 19:25		05:29 20:29		06:23-06:31/8 20:41
Potential sun hours	295	296	369	400	451	455	
Sum of minutes with flicker	0	52	9	0	138	32	

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

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

SHADOW - Calendar per WTG

WTG: MN05 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (5)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

	July	August	September	October	November	December
1	05:29 20:40	05:54 06:42-06:43/1 20:21	06:26 19:36	06:57 18:45	06:33 16:57	07:08 16:31
2	05:30 20:40	05:55 20:20	06:27 19:35	06:58 18:43	06:34 16:55	07:10 16:31
3	05:30 20:40	05:56 20:18	06:28 19:33	06:59 18:41	06:35 16:54	07:11 16:31
4	05:31 20:40	05:57 20:17	06:29 19:31	07:00 18:39	06:36 16:53	07:12 16:31
5	05:31 20:40	05:58 20:16	06:30 19:30	07:01 18:38	06:37 16:52	07:13 16:30
6	05:32 20:39	05:59 20:15	06:31 19:28	07:02 18:36	06:39 16:51	07:14 16:30
7	05:33 20:39	06:00 20:14	06:32 19:26	07:04 18:34	06:40 16:49	07:15 16:30
8	05:33 06:29-06:34/5 20:39	06:01 20:12	06:33 19:25	07:05 18:33	06:41 16:48	07:15 16:30
9	05:34 06:29-06:36/7 20:38	06:02 20:11	06:34 19:23	07:06 18:31	06:42 16:47	07:16 16:30
10	05:35 06:30-06:37/7 20:38	06:03 20:10	06:35 19:21	07:07 18:29	06:44 16:46	07:17 16:30
11	05:35 06:30-06:38/8 20:38	06:04 20:08	06:36 19:19	07:08 18:28	06:45 16:45	07:18 16:30
12	05:36 06:31-06:39/8 20:37	06:05 20:07	06:37 19:18	07:09 07:49-07:52/3 18:26	06:46 16:44	07:19 16:30
13	05:37 06:32-06:40/8 20:37	06:06 20:06	06:38 19:16	07:10 07:45-07:55/10 18:25	06:47 16:43	07:20 16:30
14	05:38 06:33-06:41/8 20:36	06:07 20:04	06:39 19:14	07:11 07:42-07:57/15 18:23	06:49 16:42	07:21 16:30
15	05:38 06:32-06:41/9 20:35	06:08 20:03	06:40 19:12	07:13 07:41-07:57/16 18:21	06:50 16:41	07:21 16:31
16	05:39 06:33-06:42/9 20:35	06:09 20:01	06:41 19:11	07:14 07:48-07:59/11 18:20	06:51 16:40	07:22 16:31
17	05:40 06:34-06:43/9 20:34	06:10 20:00	06:42 19:09	07:15 07:53-07:59/6 18:18	06:52 16:40	07:23 16:31
18	05:41 06:35-06:44/9 20:34	06:11 19:59	06:43 19:07	07:16 07:58-07:59/1 18:17	06:53 16:39	07:23 16:31
19	05:42 06:35-06:44/9 20:33	06:12 19:57	06:44 19:06	07:17 18:15	06:55 16:38	07:24 16:32
20	05:43 06:35-06:44/9 20:32	06:13 19:56	06:45 19:04	07:18 18:14	06:56 16:37	07:25 16:32
21	05:43 06:36-06:44/8 20:31	06:14 19:54	06:47 19:02	07:19 18:12	06:57 16:36	07:25 16:33
22	05:44 06:37-06:45/8 20:30	06:15 19:52	06:48 19:00	07:21 18:11	06:58 16:36	07:26 16:33
23	05:45 06:37-06:45/8 20:30	06:16 19:51	06:49 18:59	07:22 18:09	06:59 16:35	07:26 16:34
24	05:46 06:38-06:46/8 20:29	06:18 19:49	06:50 18:57	07:23 18:08	07:01 16:35	07:27 16:34
25	05:47 06:39-06:46/7 20:28	06:19 19:48	06:51 18:55	07:24 17:06	07:02 16:34	07:27 16:35
26	05:48 06:40-06:46/6 20:27	06:20 19:46	06:52 18:53	07:25 17:05	07:03 16:33	07:27 16:35
27	05:49 06:40-06:46/6 20:26	06:21 19:45	06:53 18:52	07:27 17:03	07:04 16:33	07:28 16:36
28	05:50 06:41-06:46/5 20:25	06:22 19:43	06:54 18:50	07:28 17:02	07:05 16:32	07:28 16:37
29	05:51 06:42-06:46/4 20:24	06:23 19:41	06:55 18:48	07:29 17:01	07:06 16:32	07:28 16:38
30	05:52 06:42-06:45/3 20:23	06:24 19:40	06:56 18:46	07:30 16:59	07:07 16:32	07:29 16:38
31	05:53 06:42-06:44/2 20:22	06:25 19:38		06:31 16:58		07:29 16:39
Potential sun hours	462	430	375	344	296	285
Sum of minutes with flicker	170	1	0	62	0	0

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

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

SHADOW - Calendar per WTG

WTG: MN06 - Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 220,0 m) (6)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAMPOBASSO]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4,21	4,83	5,24	6,37	6,76	8,17	9,01	9,23	7,23	4,84	4,00	3,35

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
738	408	381	216	154	236	479	1.142	793	317	938	1.420	7.222

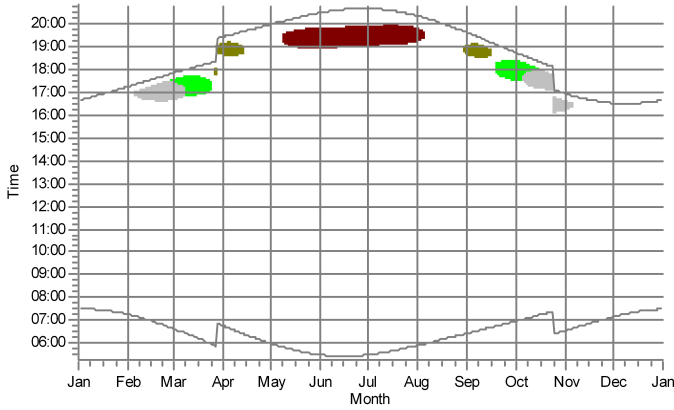
	January	February	March	April	May	June	July	August	September	October	November	December
1	07:29 16:40	07:15 17:15	06:38 16:27-17:18/51 17:50	06:46 07:05-07:35/30 19:26	05:59 19:29	05:29 20:29	05:29 20:41	05:54 20:21	06:26 19:36	06:57 17:12-17:47/35 18:45	06:33 16:57	07:09 16:31
2	07:29 16:41	07:14 17:16	06:36 16:27-17:18/51 17:52	06:44 07:03-07:35/32 19:27	05:57 20:00	05:28 20:30	05:30 20:40	05:55 20:20	06:27 07:08-07:20/12 19:35	06:58 17:11-17:49/38 18:43	06:34 16:55	07:10 16:31
3	07:29 16:42	07:13 17:18	06:35 16:27-17:18/51 17:53	06:42 07:02-07:34/32 19:28	05:56 20:01	05:28 20:31	05:30 20:40	05:56 20:19	06:28 07:05-07:23/18 19:33	06:59 17:09-17:50/41 18:41	06:35 16:54	07:11 16:31
4	07:29 16:43	07:12 17:19	06:33 16:27-17:17/50 17:54	06:41 07:03-07:33/30 19:29	05:55 20:02	05:28 20:32	05:31 20:40	05:57 20:17	06:29 07:03-07:24/21 19:31	07:00 17:07-17:50/43 18:40	06:36 16:53	07:12 16:31
5	07:29 16:44	07:11 17:20	06:32 16:28-17:17/49 17:55	06:39 07:03-07:32/29 19:30	05:54 20:03	05:27 20:32	05:31 20:40	05:58 20:16	06:30 07:01-07:26/25 19:30	07:01 17:06-17:51/45 18:38	06:38 16:52	07:13 16:30
6	07:29 16:45	07:10 17:22	06:30 16:28-17:16/48 17:56	06:37 07:03-07:30/27 19:31	05:52 20:04	05:27 20:33	05:32 20:40	05:59 20:15	06:31 07:00-07:26/26 19:28	07:03 17:05-17:51/46 18:36	06:39 16:51	07:14 16:30
7	07:29 16:46	07:09 17:23	06:28 16:28-17:15/47 17:58	06:36 07:04-07:29/25 19:32	05:51 20:05	05:27 20:34	05:33 20:39	06:00 20:14	06:32 06:58-07:27/29 19:26	07:04 17:04-17:51/47 18:34	06:40 16:49	07:15 16:30
8	07:29 16:47	07:07 17:24	06:27 16:29-17:14/45 17:59	06:34 07:06-07:27/21 19:34	05:50 20:07	05:26 20:34	05:33 20:39	06:01 20:12	06:33 06:57-07:27/30 19:25	07:05 17:03-17:51/48 18:33	06:41 16:48	07:16 16:30
9	07:29 16:48	07:06 17:25	06:25 16:29-17:13/44 18:00	06:32 07:07-07:25/18 19:35	05:49 20:08	05:26 20:35	05:34 20:39	06:02 20:11	06:34 06:56-07:28/32 19:23	07:06 17:02-17:51/49 18:31	06:42 16:47	07:16 16:30
10	07:29 16:49	07:05 17:27	06:23 16:30-17:11/41 18:01	06:31 07:10-07:22/12 19:36	05:47 20:09	05:26 20:35	05:35 20:38	06:03 20:10	06:35 06:56-07:28/32 19:21	07:07 17:01-17:51/50 18:29	06:44 16:46	07:17 16:30
11	07:29 16:50	07:04 17:28	06:22 16:32-17:11/39 18:02	06:29 19:37	05:46 20:10	05:26 20:36	05:35 20:38	06:04 20:08	06:36 06:57-07:28/31 19:19	07:08 17:01-17:52/51 18:28	06:45 16:45	07:18 16:30
12	07:28 16:51	07:02 17:29	06:20 16:33-17:09/36 18:03	06:27 19:38	05:45 20:11	05:26 20:37	05:36 20:07	06:05 19:18	06:37 06:58-07:27/29 19:18	07:09 17:01-17:52/51 18:26	06:46 16:44	07:19 16:30
13	07:28 16:52	07:01 17:31	06:18 16:34-17:07/33 18:05	06:26 19:39	05:44 20:12	05:25 20:37	05:37 20:06	06:06 19:16	06:38 06:59-07:27/28 19:16	07:10 17:00-17:51/51 18:25	06:47 16:43	07:20 16:30
14	07:28 16:53	07:00 17:32	06:17 16:35-17:04/29 18:06	06:24 19:40	05:43 20:13	05:25 20:38	05:38 20:04	06:07 19:14	06:39 07:00-07:26/26 19:14	07:11 17:00-17:51/51 18:23	06:49 16:42	07:21 16:30
15	07:27 16:54	06:58 17:33	06:16 16:38-17:02/24 18:07	06:23 19:41	05:42 20:14	05:25 20:38	05:38 20:03	06:08 20:03	06:40 07:01-07:26/25 19:13	07:13 16:59-17:50/51 18:21	06:50 16:41	07:22 16:31
16	07:27 16:55	06:57 17:34	06:13 16:41-16:58/17 18:08	06:21 19:42	05:41 20:15	05:25 20:38	05:39 20:01	06:09 19:11	06:41 07:02-07:25/23 19:11	07:14 16:59-17:50/51 18:20	06:51 16:40	07:22 16:31
17	07:26 16:57	06:56 17:36	06:14 16:34-17:12/38 18:09	06:19 19:43	05:40 20:16	05:25 20:39	05:40 20:00	06:10 19:09	06:42 07:03-07:24/21 19:09	07:15 17:00-17:50/50 18:18	06:52 16:40	07:23 16:31
18	07:26 16:58	06:54 17:37	06:13 16:33-17:14/41 18:10	06:18 19:45	05:39 20:17	05:25 20:39	05:41 20:34	06:11 19:59	06:43 07:04-07:22/18 19:07	07:16 17:00-17:49/49 18:17	06:53 16:39	07:23 16:32
19	07:25 16:59	06:53 17:38	06:12 16:32-17:14/42 18:11	06:16 19:46	05:38 20:18	05:26 20:39	05:42 20:33	06:12 19:57	06:44 07:05-07:21/16 19:06	07:17 17:00-17:48/48 18:15	06:55 16:38	07:24 16:32
20	07:25 17:00	06:52 17:39	06:11 16:31-17:16/45 18:12	06:15 19:47	05:37 20:19	05:26 20:40	05:43 20:32	06:13 19:56	06:45 07:06-07:19/13 19:04	07:18 17:00-17:47/47 18:14	06:56 16:37	07:25 16:32
21	07:24 17:01	06:50 17:41	06:10 16:31-17:17/46 18:14	06:13 19:48	05:36 20:20	05:26 20:40	05:43 20:31	06:14 19:54	06:47 07:07-07:16/9 19:02	07:19 17:02-17:47/45 18:12	06:57 16:36	07:25 16:33
22	07:23 17:03	06:49 17:42	06:09 16:30-17:17/47 18:15	06:12 19:49	05:36 20:21	05:26 20:40	05:44 20:31	06:15 19:53	06:48 07:08-07:13/5 19:00	07:21 17:02-17:46/44 18:11	06:58 16:36	07:26 16:33
23	07:23 17:04	06:47 17:43	06:08 16:29-17:18/49 18:16	06:10 19:50	05:35 20:22	05:26 20:40	05:45 20:30	06:17 19:51	06:49 18:59	07:22 17:03-17:45/42 18:09	06:59 16:35	07:26 16:34
24	07:22 17:05	06:46 17:44	06:07 16:28-17:18/50 18:17	06:09 19:51	05:34 20:23	05:27 20:40	05:46 20:29	06:18 19:49	06:50 18:57	07:23 17:03-17:43/40 18:08	07:01 16:35	07:27 16:34
25	07:21 17:06	06:44 17:46	06:06 16:27-17:18/51 18:18	06:07 19:52	05:33 20:24	05:27 20:41	05:47 20:28	06:19 19:48	06:51 18:55	06:24 16:05-16:42/37 17:06	07:02 16:34	07:27 16:35
26	07:20 17:08	06:43 17:47	06:05 16:28-17:18/50 18:19	06:06 19:53	05:32 20:24	05:27 20:41	05:48 20:27	06:20 19:46	06:52 18:53	06:25 16:06-16:40/34 17:05	07:03 16:33	07:28 16:35
27	07:20 17:09	06:41 17:48	06:04 16:27-17:18/51 18:20	06:04 19:55	05:31 20:25	05:27 20:41	05:49 20:26	06:21 19:45	06:53 17:24-17:38/14 18:52	06:27 16:07-16:38/31 17:03	07:04 16:33	07:28 16:36
28	07:19 17:10	06:39 17:49	06:03 16:27-17:18/51 18:21	06:03 19:56	05:31 20:26	05:28 20:41	05:50 20:25	06:22 19:43	06:54 17:20-17:41/21 18:50	06:28 16:09-16:36/27 17:02	07:05 16:32	07:28 16:37
29	07:18 17:11		06:02 07:10-07:36/26 19:22	06:02 19:57	05:31 20:27	05:28 20:41	05:51 20:24	06:23 19:41	06:55 17:17-17:44/27 18:48	06:29 16:12-16:35/23 17:01	07:06 16:32	07:28 16:38
30	07:17 17:13		06:00 07:08-07:36/28 19:24	06:00 19:58	05:30 20:28	05:29 20:41	05:52 20:23	06:24 19:40	06:56 17:14-17:45/31 18:46	06:30 16:15-16:31/16 16:59	07:07 16:32	07:29 16:38
31	07:16 17:14		06:48 07:06-07:35/29 19:25		05:29 20:29		05:53 20:22	06:25 19:38		06:31 16:58		07:29 16:39
Potential sun hours	295	296	369	400	451	455	462	430	375	344	296	285
Sum of minutes with flicker	0	703	860	256	0	0	0	0	562	1281	0	0

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

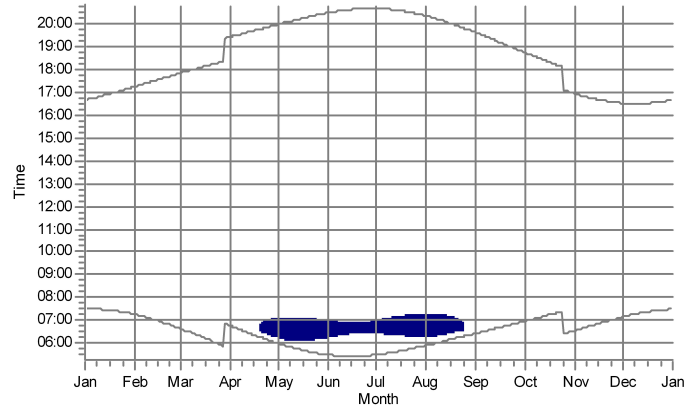
Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG, graphical

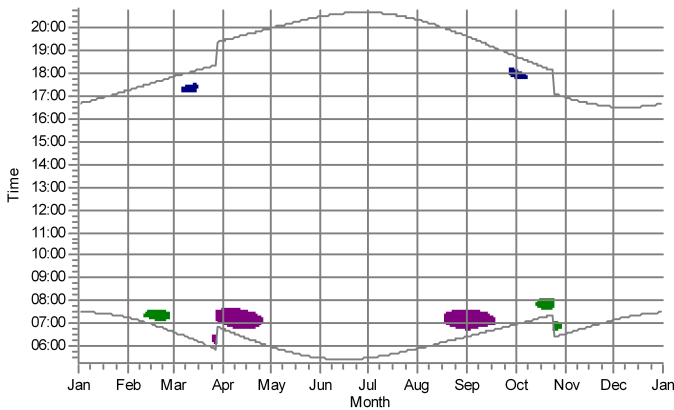
MN01: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 2:



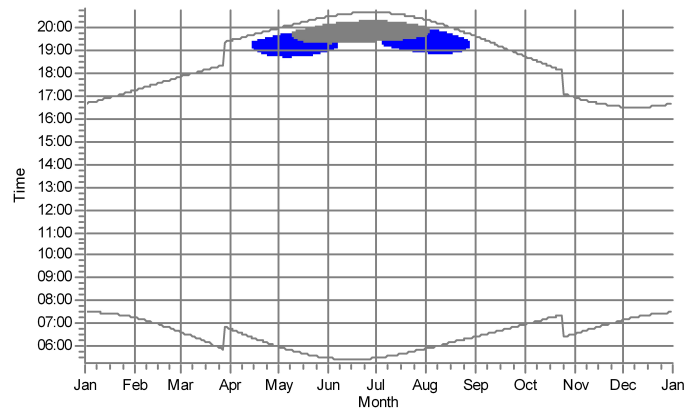
MN02: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 2:



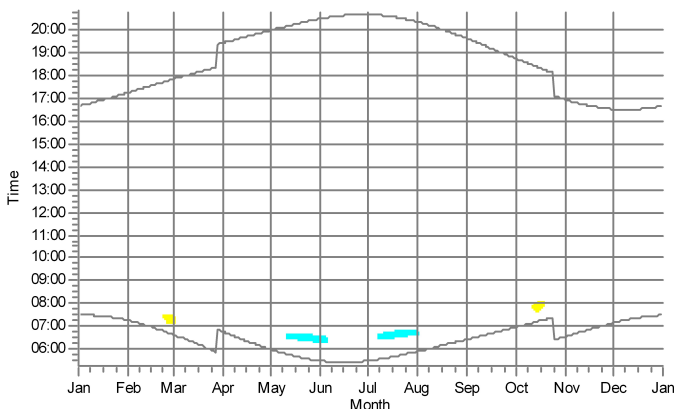
MN03: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 2:



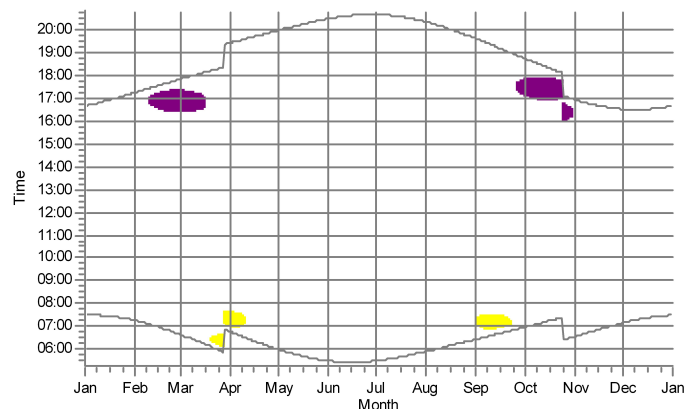
MN04: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 2:



MN05: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 2:



MN06: Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 135,0 m (TOT: 2:

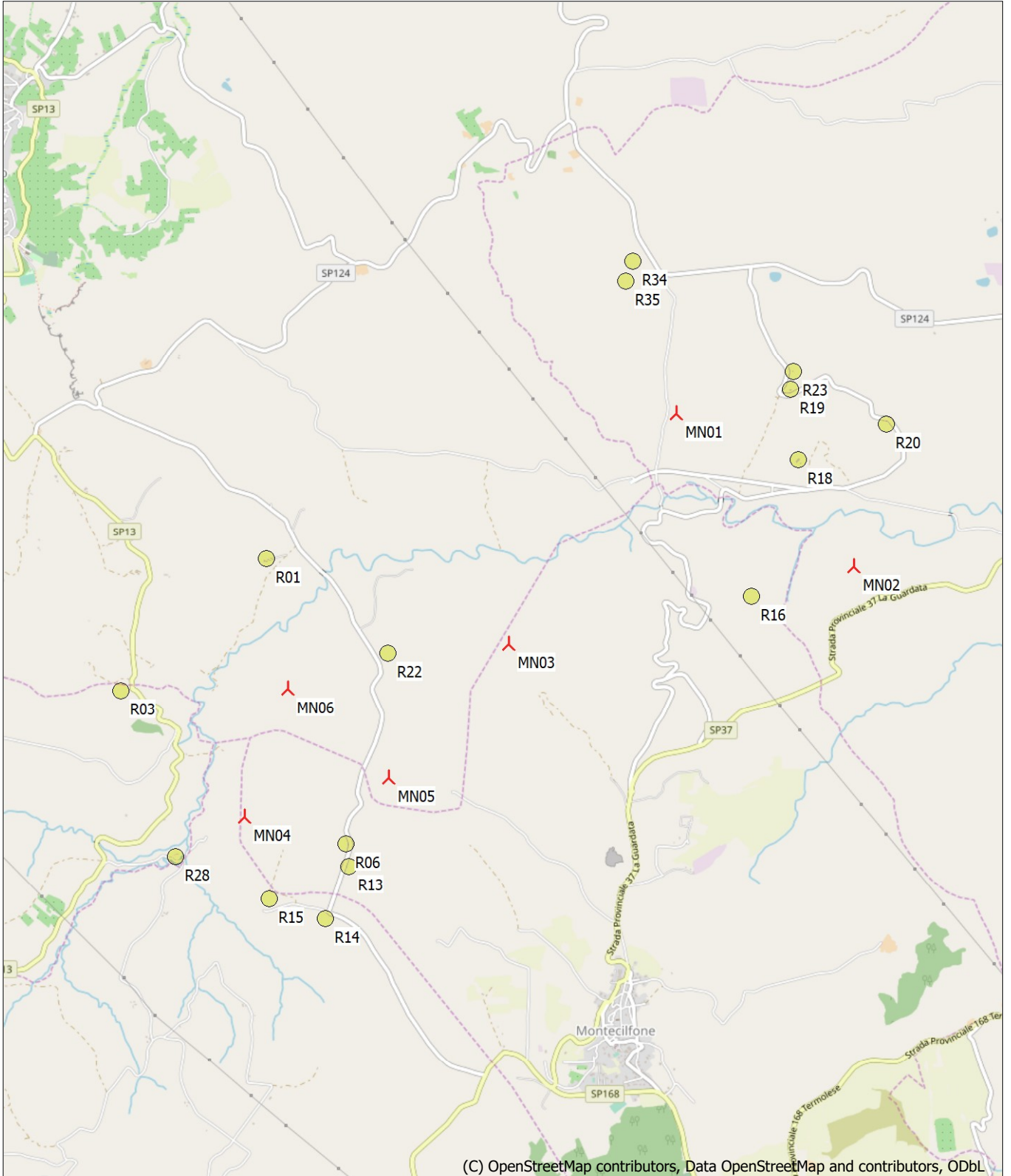


Shadow receptors

- R01: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)
- R03: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)
- R06: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)
- R13: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)
- R16: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)
- R18: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)

- R19: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)
- R20: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)
- R22: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)
- R23: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (12)
- R28: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (13)

SHADOW - Map



0 500 1000 1500 2000 m

Map: EMD OpenStreetMap , Print scale 1:40.000, Map center Geo WGS84 East: 14,826715° E North: 41,930957° N

New WTG

Shadow receptor

Flicker map level: Elevation Grid Data Object: WF Montenero_EMDGrid_0.wpg (1)