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PROVINCIA DI NUORO | COMUNE DI NUORO | COMUNE DI ORANI | COMUNE DI ORGOSOLO | REGIONE SARDEGNA

OGGETTO:

PROGETTO DEFINITIVO DI UN IMPIANTO EOLICO COMPOSTO DA 10 AEROGENERATORI CON POTENZA COMPLESSIVA DI 66 MW, DENOMINATO "CE NUORO SUD", NEI COMUNI DI ORANI (NU), ORGOSOLO (NU) E NUORO (NU) E OPERE CONNESSE NEI COMUNI DI ORANI (NU), ORGOSOLO (NU) E NUORO (NU)

NOME ELABORATO:

RELAZIONE IMPATTO SHADOW FLICKERING

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SCALA:	CODICE ELABORATO	TIPOLOGIA	FASE PROGETTUALE
-	REL24	IMPIANTO EOLICO	DEFINITIVO
FORMATO: -			

REV.	DESCRIZIONE	DATA	REDATTO	CONTROLLATO	APPROVATO
3					
2					
1					
0	Prima emissione	Gennaio 2024	BIA	Agreenpower	Agreenpower

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INTRODUZIONE PARCO EOLICO CE NUORO SUD

La presente Relazione è relativa al progetto definitivo per la realizzazione di un impianto di produzione di energia elettrica da fonte rinnovabile eolica mediante aerogeneratori, di tipo grid-connected. L'impianto, denominato "CE Nuoro Sud", verrà realizzato su terreni privati ubicati nella parte meridionale del Comune di Nuoro (NU), nella parte orientale del Comune di Orani (NU) e nella parte settentrionale del Comune di Orgosolo (NU). Il percorso dell'elettrodotto di connessione alla Stazione Elettrica della RTN è previsto anch'esso in terreni ubicati in parte nel Comune di Nuoro, Orani e Orgosolo.

Il progetto prevede l'installazione di nr. 10 aerogeneratori di potenza pari a 6,6 MW ciascuno, per complessivi 66 MW di potenza ai fini dell'immissione in rete, e relative opere connesse. L'impianto eolico sarà connesso alla Rete di Trasmissione Nazionale (RTN) tramite elettrodotto interrato, necessario al convogliamento dell'energia elettrica prodotta dall'impianto alla nuova Stazione Elettrica (SE) della RTN 150/36 kV. L'impianto eolico sarà connesso alla rete elettrica in Alta Tensione per mezzo di un collegamento in antenna a 36 kV sulla nuova SE di smistamento della RTN a 150 kV, in località Pratosardo, come da STMG allegata al preventivo di connessione ricevuto da Terna S.p.A.

Il progetto, che ricade prevalentemente nelle zone agricole dei comuni di Nuoro, Orani e Orgosolo, ad eccezione della Sottostazione Elettrica Utente, prevista nella zona industriale del Comune di Nuoro in località Pratosardo, è a favore dello sviluppo sostenibile del territorio in cui si inserisce, in modo coerente con l'impegno dell'Italia in ambito internazionale di riduzione delle emissioni di CO2 nell'atmosfera e anche, nella contingenza dell'emergenza energetica, nell'ambito della gestione razionale dell'energia e della riduzione della dipendenza dall'Estero per l'approvvigionamento di materie prime di tipo tradizionale (olio e gas) o direttamente di energia elettrica.

Le fondazioni degli aerogeneratori sono di tipo circolare tronco conica con base molto larga, avente diametro pari a 24,00 m. La superficie occupata è circa 450 m2 e l'altezza della fondazione è 3,45 m dal bordo superiore della base al piano di fondazione della base, con la fossa sfalsata di 30 cm al di sotto della fondazione. La sommità della fondazione, di larghezza 6 m farà da collegamento alla prima sezione della torre.

Le nr. 10 piazzole di esercizio, che durante la vita dell'impianto rimarranno disposizione per la gestione e l'eventuale manutenzione straordinaria dell'aerogeneratore, occupano una superficie media pari a 1.750 m2.

Tutti i cavi elettrici di collegamento tra gli aerogeneratori e la Sottostazione Elettrica Utente (SSEU) sono posati sotto il manto stradale esistente o lungo i tratti delle strade di nuova realizzazione che collegano le strade esistenti alle aree di servizio degli aerogeneratori. Il cavidotto in Alta Tensione di

collegamento tra gli aerogeneratori e la Sottostazione Utente, come riportato negli elaborati di progetto, è totalmente interrato in trincee di profondità pari a 1,5 m rispetto al piano di campagna; pertanto, la posa dei cavi sarà a circa 1,3 m di profondità dal piano di campagna.

1. PREMESSA

La presente relazione espone l'analisi dell'evoluzione dell'ombra giornaliera generata dalla presenza degli aerogeneratori del parco eolico proposto, così come richiesto nell'allegato alla D.G.R n.3/17 del 16/01/09, "Studio per l'individuazione delle aree in cui ubicare gli impianti eolici. Lo studio prende in considerazione la formazione di ghiaccio sulle strade e lo sfarfallio dell'ombra (shadow flicker) sugli edifici presenti nell'ambiente circostante al parco.

La formazione di ghiaccio costituisce un pericolo per gli utilizzatori delle strade, e si presenta tipicamente in zone montane, pedemontane o appenniniche. L'analisi è limitata alle strade statali e provinciali e alle principali strade comunali che attraversano l'area vasta del parco.

Lo sfarfallio dell'ombra si presenta quando la pala di una turbina interposta tra un recettore e il sole "taglia" il fascio luminoso, producendo un alternarsi di ombra e luce. A seconda della frequenza di sfarfallio questo fenomeno può indurre attacchi epilettici su soggetti predisposti. È stato mostrato[1] che frequenze di sfarfallio inferiori a 3 Hz non pongono un rischio su soggetti fotosensibili[2] . Pertanto in questo studio si prenderà tale valore come riferimento.

1 Harding et al doi:10.1111/j.1528-1167.2008.01563.x

2 Ovvero il rischio cumulativo di attacco epilettico è inferiore a 17 persone per milione di soggetti fotosensitivi quando la frequenza di sfarfallio è inferiore a 3 Hz.

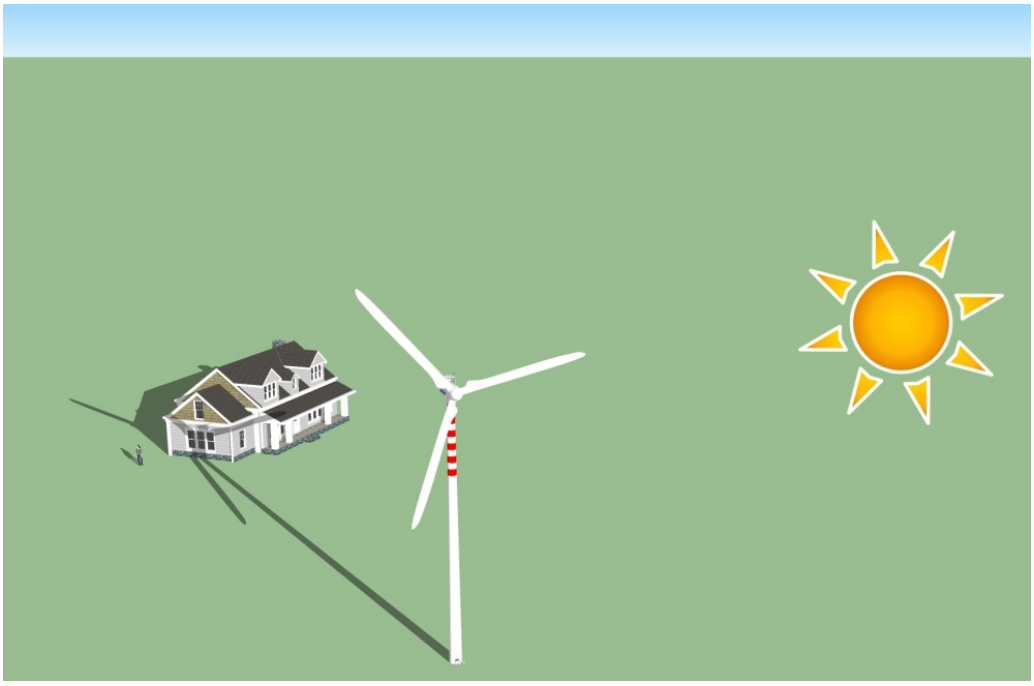

Figura 1: rappresentazione grafica del fenomeno di ombreggiamento.

Allo stato attuale solo la Germania possiede linee-guida dettagliate sui limiti e sulle condizioni per il calcolo dell'impatto dell'ombra e sono consultabili nel documento "Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen" (WEA-Shattenwurf-Hinweise).

Una condizione necessaria affinché si verifichi il fenomeno dello sfarfallio in un dato recettore è che, da quel sito, la dimensione angolare delle pale sia paragonabile alla dimensione angolare del sole, in quanto se la dimensione relativa della pala è piccola rispetto al sole, questa non produce ombra percettibile sul recettore. Seguendo le linee guida tedesche, si pone la soglia di 1/5 come rapporto minimo tra la dimensione angolare della pala e la dimensione angolare del sole perché si possa verificare lo sfarfallio in un certo sito.

I problemi sopra esposti non sussistono qualora (linee guida tedesche):

- Il recettore subisca meno di 30 ore/anno di ombra da parte degli aerogeneratori;
- per ogni giorno dell'anno, il recettore subisca meno di 30 minuti di ombra;
- la frequenza di sfarfallio (flickering) è inferiore ai 3Hz.

Inoltre le linee guida specificano che gli ombreggiamenti diventano rilevanti solamente quando si considerano i recettori comportanti attività residenziali e lavorative stabili: "è auspicabile (che l'effetto flickering) si mantenga al di sotto delle 30 ore/anno in presenza di attività lavorative statiche, tipo ufficio, scuole, ospedali, interessate direttamente da impatto".

Questa indicazione è legata al fatto che all'interno di un edificio adibito a uffici, le postazioni di lavoro sono generalmente fisse, pertanto se l'edificio con pareti finestrate risulta prospiciente l'impianto eolico, chiaramente lo sfarfallio delle ombre oltre certi limiti può costituire un problema per quei lavoratori che si trovino con le loro postazioni proprio davanti alle pareti vetrate. Viceversa, lo sfarfallio diventa irrilevante per tutti gli edifici di tipo non residenziale e dedicati ad attività che non richiedono un'assidua presenza in una stazione fissa, come ad esempio le attività agricole e agropastorali, nelle quali il personale addetto si muove in continuazione all'interno dei terreni per svolgere le proprie mansioni.

Le stesse considerazioni valgono per tutti i beni paesaggistici, manufatti, beni archeologici etc, i quali possono essere frequentati ma le persone devono, per natura dei luoghi, muoversi in continuazione e non stazionare ferme nello stesso punto per quantità considerevoli di tempo. L'unica eccezione vale per quei contesti nei quali delle persone devono svolgere dei lavori e/o passare del tempo in maniera continuativa in una certa posizione fissa rispetto alle turbine. In quel caso si procede ad uno studio approfondito esattamente come nel caso dei recettori residenziali.

2. METODOLOGIA

2.1 Specifiche aerogeneratori

Il modello proposto per gli aerogeneratori è Siemens Gamesa SG6.6-170. Questi hanno altezza al mozzo di 155 m e altezza totale all'apice di 240 m. Le pale sono lunghe 83.5 m e possiedono larghezza massima di 4.5m. La velocità massima di rotazione del rotore è pari a 8.83 rpm.

2.2 Modello digitale di elevazione (DEM)

Il modello digitale di elevazione (DEM) utilizzato per effettuare le simulazioni con il software WindPro è quello fornito dalla Regione Sardegna[3], con risoluzione 10 m. Inoltre si è ipotizzata l'altezza degli occhi di un generico osservatore pari a 1.6 m. L'orografia può determinare l'occlusione della vista degli aerogeneratori da parte dei recettori (Figura 2) ed in questi casi non viene considerato il possibile effetto di ombreggiamento.

3 http://www.sardegnageoportale.it/webgis2/sardegnamappe/

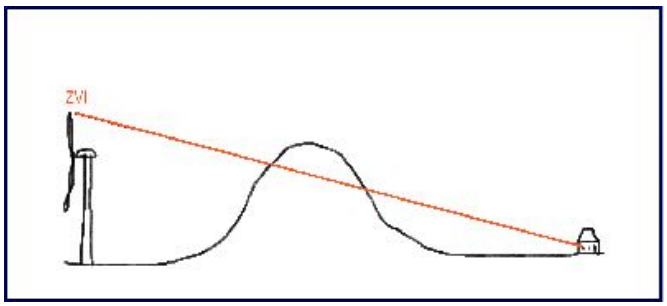

Figura 2: occlusione visiva dell'aerogeneratore rispetto al recettore, a causa dell'andamento orografico.

2.3 Recettori

Sono presenti complessivamente 122 recettori entro un buffer di 1km attorno al parco in proposta. 17 recettori sono classificati come recettori residenziali (categoria catastale A) mentre i restanti sono classificati come recettori non residenziali (categoria catastale diversa da A o catasto terreni); sono tutti riportati in Tabella 1. In via conservativa è stato considerato il caso peggiore, ovvero che tutti i recettori e fabbricati siano delle serre sferiche (green house), ovvero che tutte le pareti siano trasparenti e che siano ortogonali a tutti gli aerogeneratori. In questo modo la simulazione fornisce una sovrastima degli effetti di ombra delle turbine sui recettori.

Per i recettori, se i risultati non indicano superamenti dei limiti indicati nelle linee guida, non si procede oltre, in caso contrario può essere necessario procedere a delle verifiche di dettaglio considerando le reali aperture dei ricettori (dimensioni ed orientazioni di finestre e porte).

Per gli edifici non residenziali non è necessario procedere con ulteriori analisi in quanto lo shadow flickering non è impattante per questi (capitolo 1).

Nome	Tipologia	E GB (m)	N GB (m)	Altitudine (m)	WTG più vicina	Distanza WTG più vicina (m)
R001	Non residenziale	1519783	4458165	641	WT1	774
R002	Non residenziale	1520427	4457592	680	WT1	540
R003	Non residenziale	1520363	4457536	680	WT1	461
R004	Non residenziale	1520862	4457186	582	WT1	966
R005	Non residenziale	1519607	4456513	609	WT1	944
R006	Non residenziale	1519160	4457256	660	WT1	775
R007	Non residenziale	1519198	4457854	640	WT1	852
R010	Residenziale	1521723	4457000	529	WT2	760
R012	Non residenziale	1521682	4457061	524	WT2	722
R013	Non residenziale	1522153	4458067	625	WT2	391
R014	Non residenziale	1522428	4457203	492	WT2	642

Nome	Tipologia	E GB (m)	N GB (m)	Altitudine (m)	WTG più vicina	Distanza WTG più vicina (m)
R015	Non residenziale	1522494	4457069	478	WT2	789
R016	Non residenziale	1519627	4455265	610	WT3	684
R018	Non residenziale	1520402	4454902	612	WT3	804
R019	Non residenziale	1520611	4454895	593	WT3	997
R020	Non residenziale	1520113	4454132	590	WT3	635
R021	Non residenziale	1520052	4454035	580	WT3	670
R022	Non residenziale	1519636	4454266	616	WT3	317
R023	Non residenziale	1519034	4453824	681	WT3	987
R025	Non residenziale	1518847	4454100	670	WT3	950
R026	Non residenziale	1518996	4454252	661	WT3	746
R027	Residenziale	1519122	4454770	711	WT3	575
R029	Non residenziale	1521824	4456487	404	WT4	475
R030	Residenziale	1522658	4455451	543	WT4	873
R031	Non residenziale	1522512	4455529	525	WT4	716
R033	Residenziale	1521920	4455103	550	WT4	964
R035	Residenziale	1521632	4455428	476	WT4	749
R036	Non residenziale	1523357	4458289	459	WT5	697
R038	Non residenziale	1523780	4457449	395	WT5	827
R039	Non residenziale	1522974	4457437	457	WT5	259
R040	Non residenziale	1523429	4456710	475	WT6	700
R044	Non residenziale	1523194	4456154	436	WT6	924
R046	Non residenziale	1523696	4456099	459	WT6	506
R047	Non residenziale	1523807	4456026	463	WT6	490
R048	Non residenziale	1523727	4455893	429	WT6	645
R049	Non residenziale	1523465	4455685	477	WT6	967
R050	Non residenziale	1524109	4455812	500	WT6	626
R051	Non residenziale	1524225	4455557	491	WT6	894
R052	Non residenziale	1524766	4456731	533	WT6	753
R054	Non residenziale	1524539	4457356	455	WT8	857
R055	Non residenziale	1524610	4457413	450	WT8	800
R056	Non residenziale	1524737	4457825	439	WT7	551
R057	Non residenziale	1524589	4457893	439	WT7	594
R058	Non residenziale	1524775	4458732	338	WT7	506
R059	Residenziale	1524554	4458976	402	WT7	829
R060	Non residenziale	1524552	4458995	410	WT7	847
R061	Non residenziale	1524519	4459035	427	WT7	898
R062	Non residenziale	1524725	4459082	411	WT7	844
R063	Non residenziale	1524960	4459171	416	WT7	880
R064	Non residenziale	1525032	4459165	402	WT7	872
R065	Non residenziale	1525075	4459129	396	WT7	836
R066	Non residenziale	1525068	4459044	384	WT7	751
R067	Non residenziale	1524933	4459060	392	WT7	772
R068	Non residenziale	1524961	4459068	390	WT7	777
R069	Non residenziale	1525089	4459246	422	WT7	954

Nome	Tipologia	E GB (m)	N GB (m)	Altitudine (m)	WTG più vicina	Distanza WTG più vicina (m)
R070	Non residenziale	1525066	4459195	410	WT7	903
R071	Residenziale	1525321	4459124	391	WT7	881
R072	Non residenziale	1525515	4459063	396	WT7	911
R073	Non residenziale	1525459	4459047	373	WT7	869
R074	Non residenziale	1525321	4458975	359	WT7	742
R075	Non residenziale	1525144	4458908	351	WT7	626
R076	Non residenziale	1525148	4458886	343	WT7	605
R077	Non residenziale	1525037	4458854	333	WT7	560
R078	Non residenziale	1524901	4458777	330	WT7	499
R079	Non residenziale	1525166	4458841	332	WT7	565
R080	Non residenziale	1525260	4458850	331	WT7	603
R081	Non residenziale	1525340	4458858	326	WT7	645
R082	Non residenziale	1525373	4458846	323	WT7	652
R083	Non residenziale	1525311	4458628	330	WT7	439
R084	Non residenziale	1525547	4458854	328	WT7	764
R085	Non residenziale	1525609	4458827	330	WT7	790
R086	Non residenziale	1525730	4458926	369	WT7	946
R087	Non residenziale	1525849	4458829	334	WT7	982
R088	Non residenziale	1525751	4458782	329	WT7	874
R089	Non residenziale	1525810	4458727	316	WT7	895
R090	Non residenziale	1525142	4457796	518	WT7	512
R091	Non residenziale	1525198	4457770	510	WT7	551
R092	Non residenziale	1525088	4457839	509	WT7	459
R094	Non residenziale	1526288	4458124	381	WT9	733
R095	Non residenziale	1526250	4458048	390	WT9	664
R096	Non residenziale	1526380	4458027	382	WT9	630
R097	Non residenziale	1526655	4458125	373	WT9	778
R099	Non residenziale	1527060	4458126	332	WT9	997
R100	Residenziale	1527264	4457389	360	WT9	885
R103	Non residenziale	1526597	4456873	529	WT9	568
R104	Non residenziale	1526530	4456514	476	WT9	896
R105	Non residenziale	1523578	4459589	575	WT10	250
R106	Non residenziale	1523619	4460202	462	WT10	854
R107	Non residenziale	1523842	4460271	496	WT10	982
R108	Non residenziale	1523763	4459751	538	WT10	484
R109	Non residenziale	1523711	4459661	560	WT10	381
R110	Non residenziale	1523667	4459598	563	WT10	304
R111	Non residenziale	1523128	4458821	563	WT10	643
R112	Residenziale	1522924	4459172	655	WT10	585
R113	Non residenziale	1522652	4459405	593	WT10	827
R114	Non residenziale	1522657	4459488	583	WT10	831
R116	Non residenziale	1522731	4459564	580	WT10	774

Nome	Tipologia	E GB (m)	N GB (m)	Altitudine (m)	WTG più vicina	Distanza WTG più vicina (m)
R117	Residenziale	1522717	4459593	574	WT10	796
R119	Residenziale	1522753	4459642	574	WT10	778
R120	Residenziale	1522837	4459571	598	WT10	675
R121	Non residenziale	1522769	4459680	570	WT10	778
R122	Residenziale	1522778	4459700	569	WT10	778
R123	Non residenziale	1522811	4459733	567	WT10	764
R124	Residenziale	1522751	4459769	556	WT10	834
R125	Non residenziale	1522732	4459814	549	WT10	873
R126	Non residenziale	1522851	4459799	569	WT10	765
R127	Non residenziale	1522878	4459819	574	WT10	756
R128	Non residenziale	1522920	4459844	575	WT10	739
R129	Non residenziale	1522957	4459876	573	WT10	734
R130	Non residenziale	1522988	4459827	581	WT10	677
R131	Residenziale	1523025	4459835	578	WT10	657
R132	Non residenziale	1522954	4459914	568	WT10	763
R133	Residenziale	1522854	4459922	555	WT10	840
R134	Non residenziale	1522817	4459959	545	WT10	892
R136	Non residenziale	1522819	4460069	533	WT10	968
R137	Non residenziale	1522899	4460122	532	WT10	957
R138	Non residenziale	1522886	4460139	530	WT10	979
R139	Residenziale	1522958	4460028	548	WT10	847
R140	Non residenziale	1523028	4460000	556	WT10	782
R141	Non residenziale	1523031	4460032	552	WT10	808
R142	Non residenziale	1522990	4460077	544	WT10	868
R144	Non residenziale	1523181	4460130	543	WT10	826

Tabella 1 Recettori adiacenti al parco in proposta (1km).

2.4 Eliofania e distribuzione dei venti

I problemi dovuti all'ombra degli aerogeneratori sono presenti solamente quando è presente illuminazione diretta del sole (eliofania). I dati rilevanti nelle nostre simulazioni sono la lunghezza del dì (ovvero le ore presenti tra alba e tramonto, che non dipende dalle condizioni meteo) e le ore di illuminazione diretta. La prima varia con continuità nell'arco dell'anno, senza apprezzabili distinzioni tra le varie zone della Sardegna, mentre la seconda è variabile da zona a zona e dipende da fenomeni a grande scala che influenzano in maniera sostanzialmente uniforme l'intera superficie isolana.

Di conseguenza il valore climatologico dell'eliofania è da considerarsi lo stesso su tutta la Sardegna (fonte: ARPA Sardegna), e per questo motivo sono stati utilizzati i valori di eliofania forniti dalla stazione metereologica di Olbia.

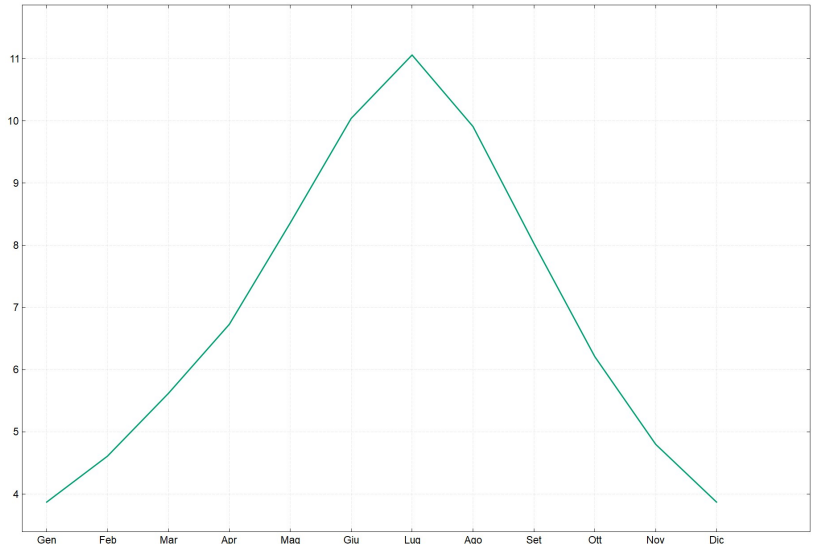

Figura 3: Eliofania media. Dati rilevati nella stazione di Olbia. Nelle ordinate le ore di eliofania giornaliere.

L'ombra che gli aerogeneratori proiettano sui recettori dipende anche dalla direzione del piano di rotazione delle pale; nello specifico, l'ombra è massima quando il piano di rotazione è perpendicolare al recettore. L'orientamento del piano di rotazione è determinato dalla direzione del vento, quindi l'orientamento segue la distribuzione dei venti:

	N	NNE	NE	ENE	E	ESE	SE	SSE
ore di attività annuali	94	141	161	179	189	174	179	139
	S	SSW	SW	WSW	W	WNW	NW	NNW
ore di attività annuali	114	109	203	347	566	412	164	104

Tabella 2 Rosa dei venti. Valori scalati su un anno equivalente di attività, ovvero su un totale di 3275 ore.

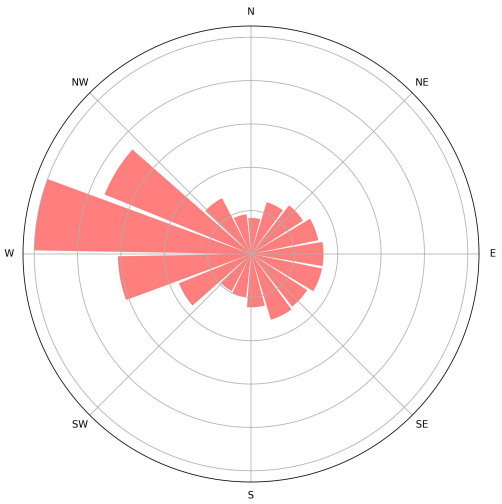

Figura 4: rosa dei venti per la località del parco in proposta in unità arbitrarie.

Nella simulazione questo fattore è preso in considerazione, in modo da diminuire o aumentare l'ombra a seconda dell'orientamento relativo tra il piano di rotazione delle pale e i recettori. In Figura 4 è riportata la rosa dei venti in unità arbitrarie e in Tabella 2. la distribuzione dei venti normalizzata rispetto ad un anno di attività, ovvero al 37% di un anno, che rappresenta il tempo medio di attività del parco. Questo quantitativo di ore è quello che viene inserito come input nella simulazione per determinare la porzione di tempo nella quale una turbina ruota in una specifica direzione.

Tutte le considerazioni esposte tengono conto dei risultati delle simulazioni realistiche, ovvero simulazioni basate sull’eliofania e sulla distribuzione dei venti (a differenza della simulazione rispetto al caso peggiore in cui non se ne tiene conto).

3. RISULTATI

3.1 Recettori

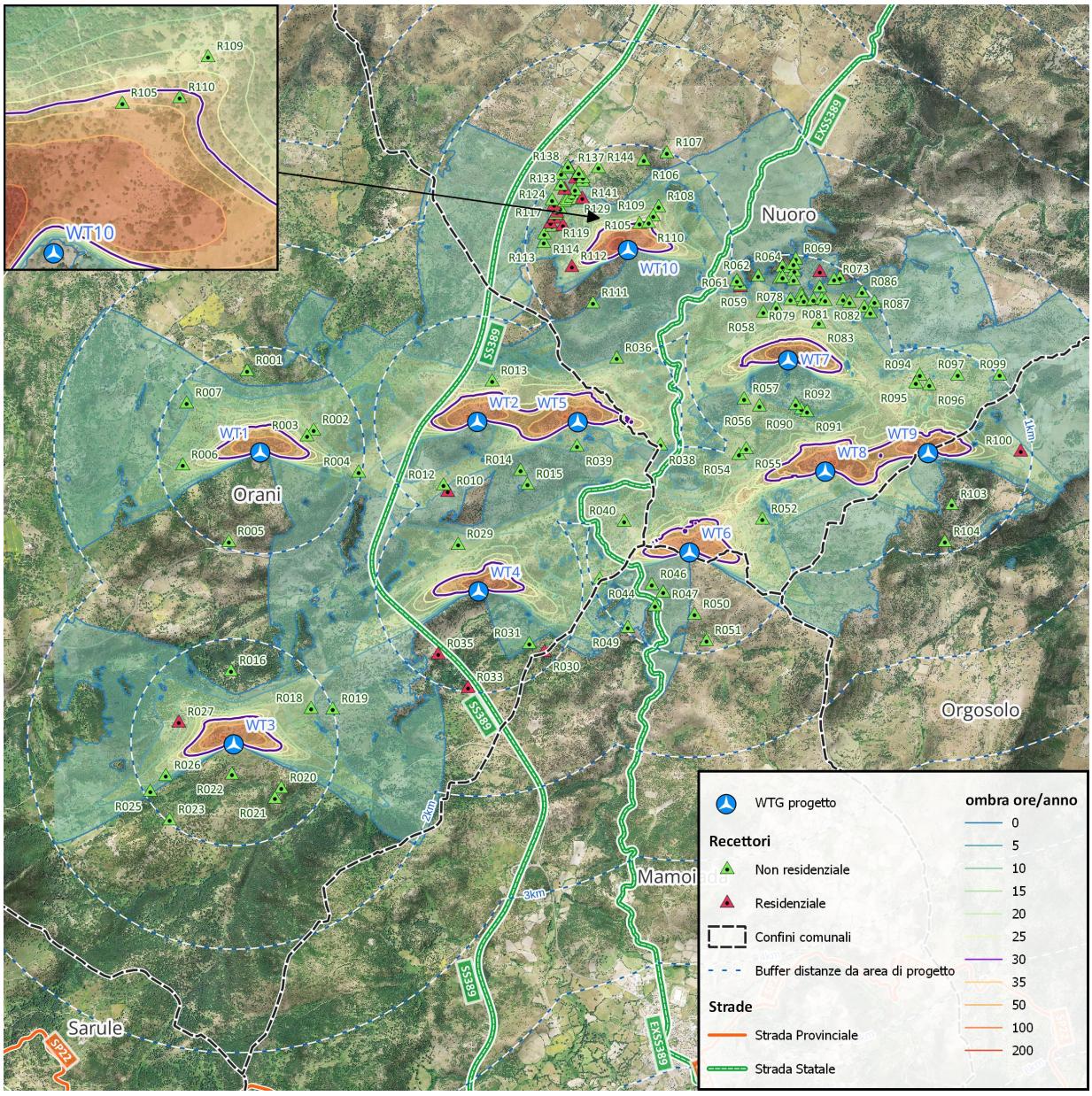

Figura 5: Ore di ombra totale all'anno, caso realistico che tiene conto dell'eliofania e della rosa dei venti. Sono presenti tutti i recettori. L'isolinea viola delimita al suo interno regioni con ombra>30 ore/anno e al suo esterno regioni con ombra<30 ore/anno.

In Figura 5 sono riportati i risultati della simulazione di ore totali di ombra all'anno, la zona ad alto impatto (ombra > 30 ore/anno) è delimitata dalla curva viola. I relativi valori sono tabulati in Tabella 3. Si nota che nell'area considerata nessun recettore di tipo residenziale subisce un ombreggiamento > 30 ore/anno e pertanto non si rilevano impatti negativi ai fini dello studio sulle ombre su di essi. Solamente i recettori non residenziali R105 e R110 rientrano all'interno dell'area con ombreggiatura > 30 ore/anno.

Nome	ombra (ore/anno)	massimo ombra giornaliera (min/giorno)	Giornate di ombra all'anno	Nome	ombra (ore/anno)	massimo ombra giornaliera (min/giorno)	Giornate di ombra all'anno
R001	0	0	0	R076	5.5	4.8	101
R002	12.3	12	99	R077	9.6	6.7	131
R003	16.4	14.7	99	R078	8.5	6.7	95
R004	15.8	14.2	99	R079	9.2	6.4	146
R005	0	0	0	R080	8.6	6.1	122
R006	14.1	10.2	123	R081	9.5	6.7	128
R007	4.4	6.1	66	R082	10.3	6.8	137
R010	4	4.1	81	R083	17.9	10.9	215
R012	6.8	5.7	105	R084	8.2	6.2	101
R013	14.8	9.7	119	R085	7.8	6	113
R014	1.2	3	33	R086	6.2	5.3	89
R015	1.3	3.5	30	R087	4.1	5.9	63
R016	0	0	0	R088	4.8	6.7	69
R018	5.5	7.5	63	R089	4.3	6.4	57
R019	3.5	6.1	48	R090	2	4.4	39
R020	0	0	0	R091	2.8	4.4	62
R021	0	0	0	R092	2.1	4	51
R022	0	0	0	R094	11.1	8.4	116
R023	0	0	0	R095	13.9	9.1	146
R025	2.3	4.4	39	R096	12.4	8.9	146
R026	9.1	10.1	69	R097	9.3	7.5	131
R027	9.1	9.7	93	R099	4.3	7.5	57
R029	11.7	7.3	125	R100	6.3	7.9	66
R030	0	0	0	R103	0	0	0
R031	0.2	1.1	9	R104	0	0	0
R033	0	0	0	R105	34.4	17.1	158
R035	0	0	0	R106	0	0	0
R036	6.7	5.2	122	R107	0	0	0
R038	12.3	9.6	135	R108	13.4	9.4	110
R039	9.6	7.8	125	R109	21.1	11.7	134
R040	9.5	7.8	129	R110	31.9	16.5	170
R044	12.9	9.6	123	R111	0	0	0
R046	1.5	4.4	30	R112	19	12.7	135
R047	1.4	4.3	30	R113	5.5	8.6	60
R048	1.6	4.2	30	R114	5.2	8.4	57
R049	0	0	0	R116	5.9	7.6	66
R050	0	0	0	R117	5.4	7.1	63
R051	0	0	0	R119	5.8	7.4	69
R052	12	8	147	R120	7.3	8.4	78
R054	8.2	9.6	99	R121	5.8	7.3	72
R055	8.2	8.9	108	R122	5.8	7.2	75
R056	7.2	4.9	131	R123	6.5	7	87
R057	7.1	4.4	152	R124	5.4	6.6	78

Nome	ombra (ore/anno)	massimo ombra giornaliera (min/giorno)	Giornate di ombra all'anno	Nome	ombra (ore/anno)	massimo ombra giornaliera (min/giorno)	Giornate di ombra all'anno
R058	10.8	7.2	116	**R125**	5.2	5.7	81
R059	6.7	6.5	107	**R126**	8.4	6.1	113
R060	6.1	7.1	69	**R127**	8.3	6.1	104
R061	8.2	7.8	104	**R128**	7.2	6	89
R062	4.2	6.1	63	**R129**	5.7	5.3	77
R063	0	0	0	**R130**	7.2	6.2	86
R064	2.1	5.4	36	**R131**	6.3	5.8	77
R065	1.9	4.7	36	**R132**	4.1	4.7	65
R066	2.3	4.7	42	**R133**	5.4	4.9	80
R067	2.9	5.2	45	**R134**	5.1	4.6	77
R068	2.8	5.3	48	**R136**	2.4	3.3	53
R069	1.8	4.8	36	**R137**	0	0	0
R070	1.8	4.8	36	**R138**	0	0	0
R071	1.4	4.2	30	**R139**	0.8	2.1	29
R072	0	0	0	**R140**	0	0.5	6
R073	1.3	3.5	30	**R141**	0	0	0
R074	1.7	4.1	36	**R142**	0	0	0
R075	3.8	4.8	83	**R144**	0	0	0

Tabella 3 Ombra proiettata sui recettori. Caso realistico che tiene conto dell'eliofania e della rosa dei venti. In verde sono evidenziati i recettori (non residenziali) che subiscono ombreggiamento >30 ore/anno.

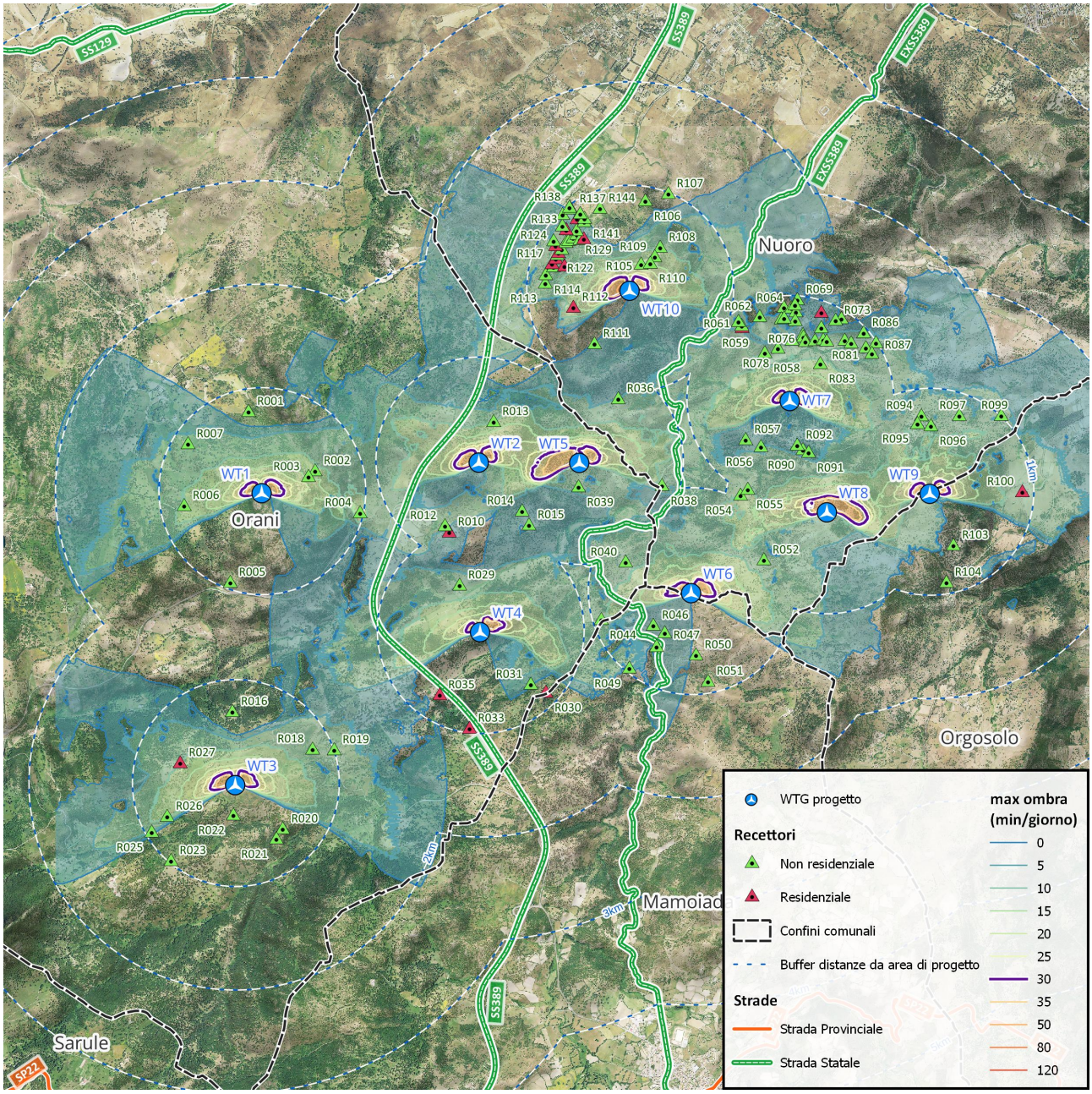

Figura 6: Massimo tempo di ombreggiatura giornaliera (minuti/giorno), caso realistico che tiene conto dell'eliofania e della rosa dei venti. L'isolinea viola delimita le zone a basso impatto (ombra < 30 min/giorno) dalle zone ad alto impatto (ombra > 30 minuti/giorno).

In Figura 6 è riportato il massimo massimo numero di minuti di ombra percepita dai recettori e fabbricati in un singolo giorno realisticamente; nessun recettore ricade nella zona con ombreggiatura massima giornaliera > 30 min/giorno (Tabella 3). Si conclude che le ombre del parco in proposta non determinano un impatto negativo sui recettori considerati.

3.2 Effetti cumulativi

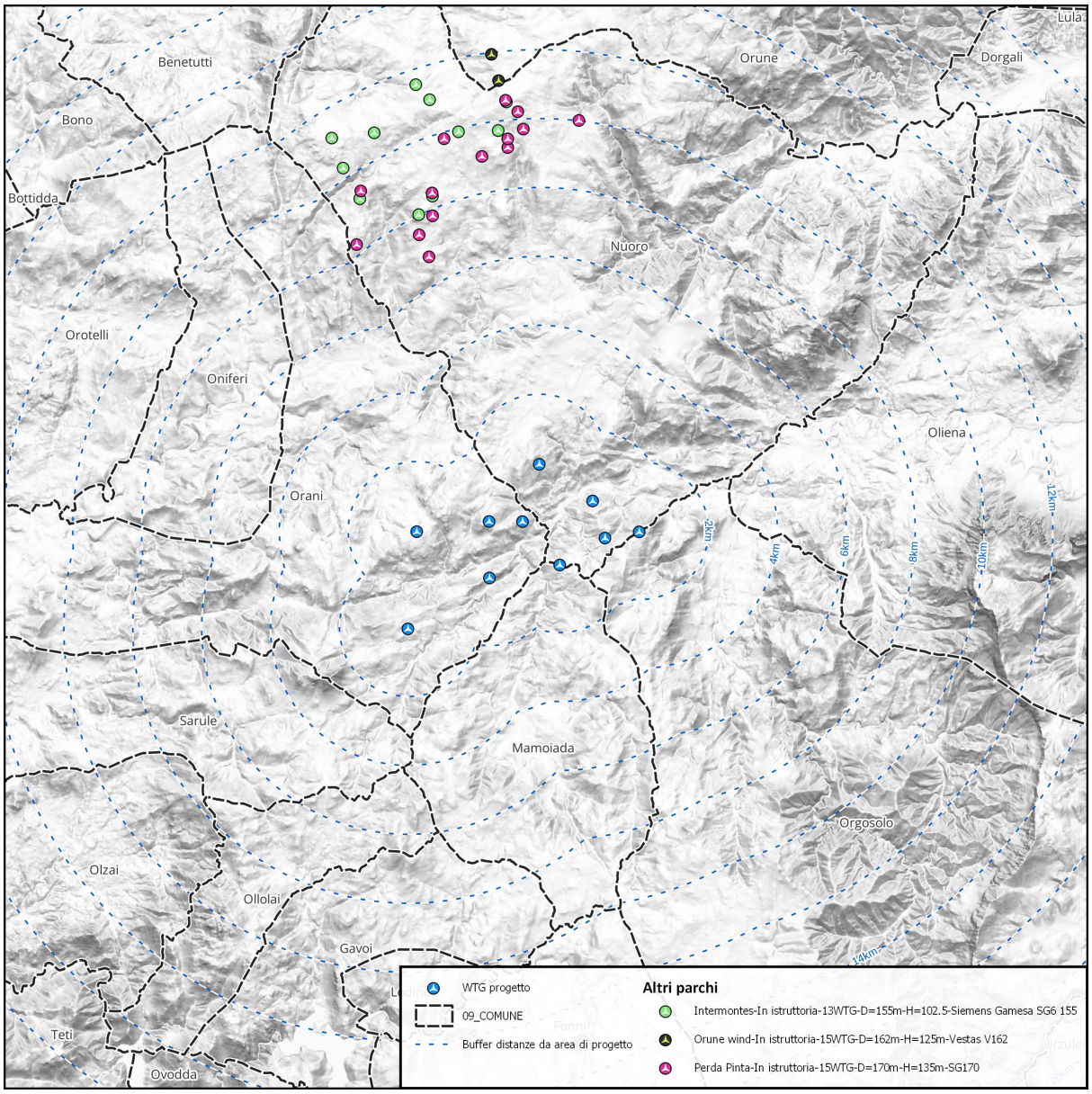

Figura 7 Inquadramento area vasta con altri parchi proposti o esistenti. Il parco in istruttoria o esistente più vicino risulta essere Perda Pinta ad una distanza maggiore di 6 km.

I parchi esistenti o in istruttoria nelle vicinanze del parco in proposta sono riportati in Figura 7. Il parco più vicino a quello in proposta risulta essere Perda Pinta ad una distanza maggiore di 6 km. Nelle analisi di ombreggiamento si considerano recettori limitrofi al parco entro una distanza di 1 km, pertanto nell'analisi cumulativa è necessario analizzare gli effetti complessivi di tutti i parchi esistenti o autorizzati entro 2 km da quello in proposta. Nessun parco esistente o autorizzato ricade entro una distanza da 2 km dal parco in proposta, per cui l'effetto cumulo del parco in proposta con i parchi limitrofi esistenti o in istruttoria risulta trascurabile ai fini dello studio delle ombre.

3.3 Flickering

Le turbine in proposta (SG170) hanno una velocità massima di rotazione pari a 8.83 rpm, ossia 0.15 Hz, che poi diventa una frequenza di taglio di 0.45 Hz (ovvero la frequenza con cui le pale tagliano la luce di una sorgente luminosa) poiché la turbina è composta di 3 pale. Affinché si verifichi il fenomeno di flickering con almeno 3 Hz (soglia minima per soggetti fotosensibili, vedi il paragrafo 3) è necessario dunque che 6 o più turbine siano allineate rispetto ad un recettore; questo non avviene in nessun caso per i recettori considerati. In particolare nessun recettore considerato subisce l'ombra contemporanea di 2 o più aerogeneratori per volta (si rimanda ai calendari grafici in appendice).

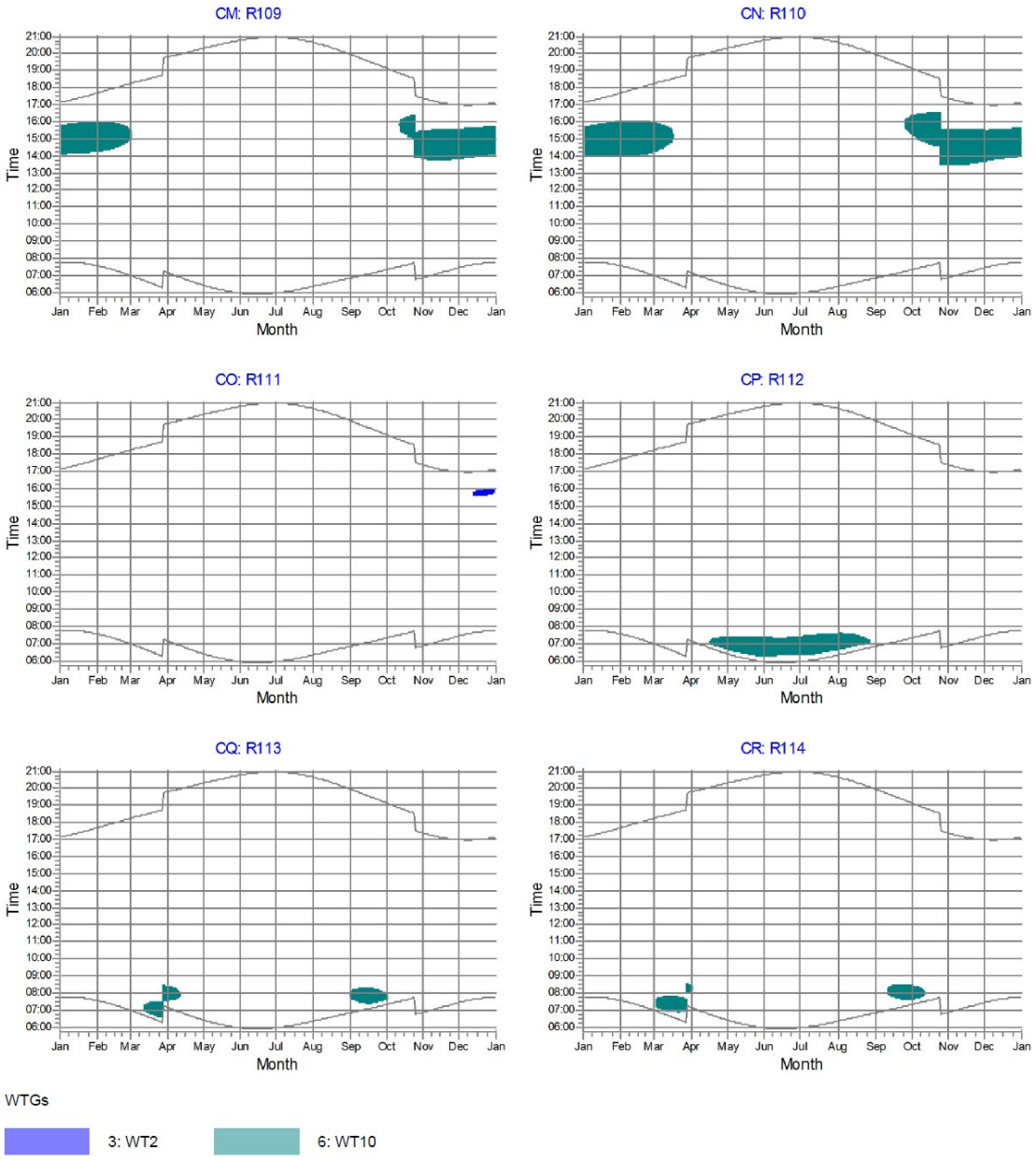

Figura 8: Calendario grafico ombre per ogni recettore nel caso peggiore, senza tenere conto di eliofania e rosa dei venti. Le linee continue indicano l'ora di alba e tramonto. Le macchie colorate indicano il periodo dell'anno e le ore nelle quali i recettori sono interessati dall'ombra di una turbina.

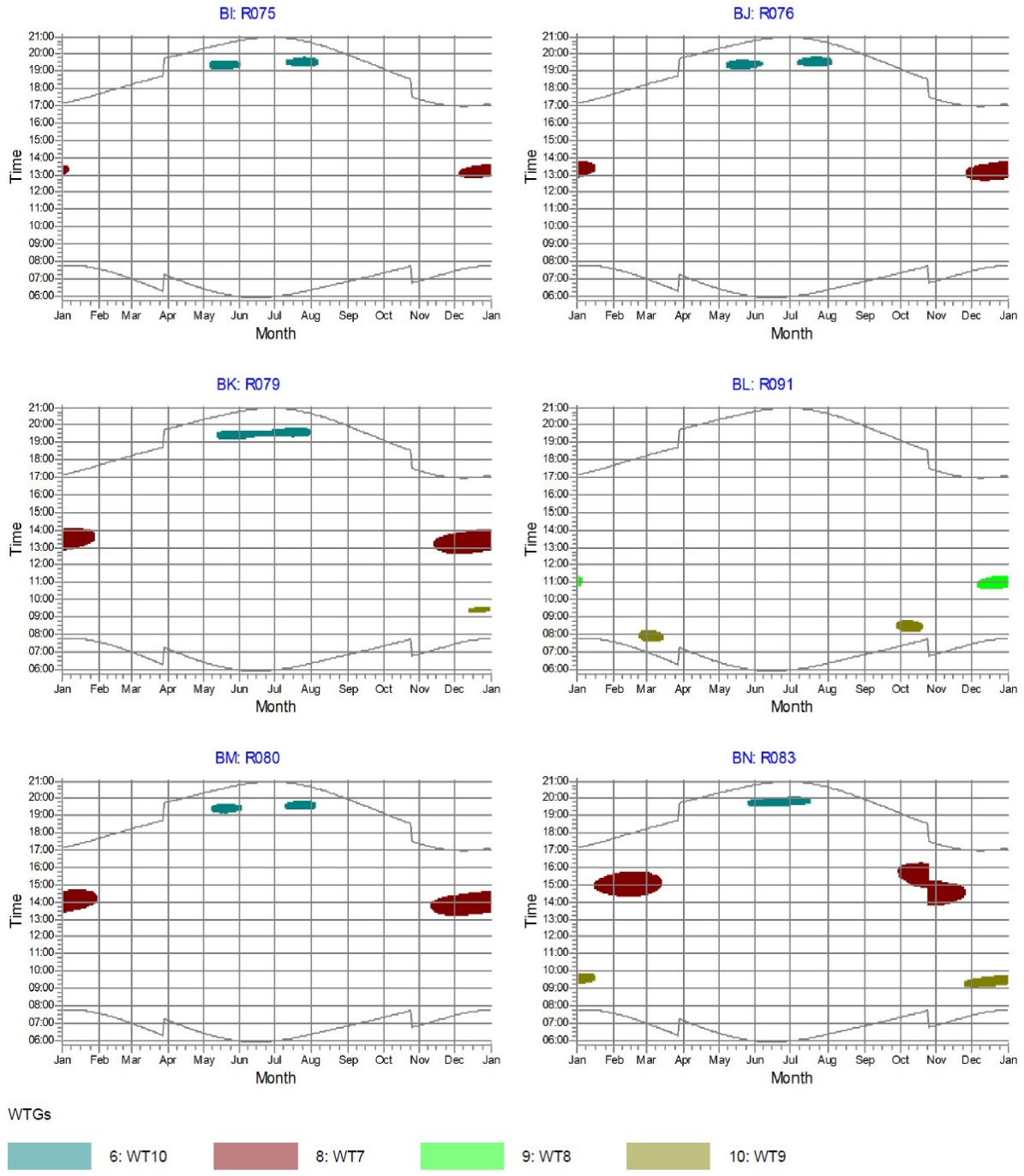

Figura 9: Calendario grafico ombre per ogni recettore nel caso peggiore, senza tenere conto di eliofania e rosa dei venti. Le linee continue indicano l'ora di alba e tramonto. Le macchie colorate indicano il periodo dell'anno e le ore nelle quali i recettori sono interessati dall'ombra di una turbina.

La Figura 8 e Figura 9 riportano i calendari grafici delle ombre subite da alcuni recettori. Da questi è possibile determinare il periodo dell'anno e della giornata nel quale il recettore è interessato dall'ombra di una turbina. Ad esempio è possibile determinare che il recettore R110 subisce l'ombra della turbina

WT10 nei pomeriggi dei mesi Ott-Mar, oppure il recettore R076 subisce l'ombra delle turbine WT7 nei pomeriggi dei mesi Dic-Gen e WT10 nelle sere dei mesi Mag-Lug.

3.4 Strade

Le strade provinciali e statali sono riportate in Figura 6. Le strade più vicine al parco in proposta sono la strada statale SS389 e EXSS389. Nessuna di esse ricade dentro l'area con ombreggiatura massima giornaliera > 30 min/giorno. Di conseguenza gli impatti delle ombre del parco in proposta sulle strade provinciali e statali limitrofe risulta trascurabile.

4. Conclusioni

È stato analizzato l'impatto delle ombre del parco in proposta sui recettori limitrofi (1 km). Sono presenti 122 recettori, dei quali 17 risultano di tipologia residenziale. Nessun recettore residenziale subisce un ombreggiatura annua maggiore di 30 ore anno, per cui l'impatto delle ombre del parco in proposta risulta trascurabile.

Inoltre tutti i recettori subiscono ombreggiamento da parte di una sola turbina per volta generando una frequenza di sfarfallio medio pari a 0.45 Hz (paragrafo 3.3) sconguirando il fenomeno di flickering a 3 Hz o maggiore. Di conseguenza nessun recettore subisce il fenomeno di flickering a 3 Hz o maggiore.

Nessuna strada statale o provinciale ricade dentro l'area di ombra massima giornaliera > 30 min/giorno, per cui gli impatti sulle strade statali e provinciali limitrofe al parco risulta trascurabile.

5. Appendice

Si riporta in appendice il calendario grafico e tabellare per ogni recettore e per ogni turbina. Le metodologie di lettura delle tabelle e dei grafici sono state esposte nei precedenti paragrafi.

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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) [OLBIA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

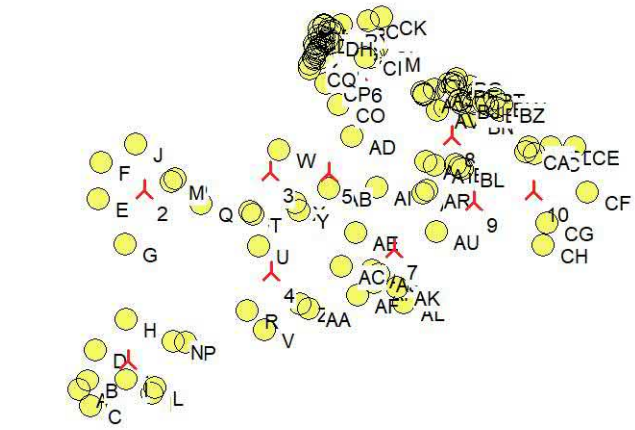
Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
94	141	161	179	189	174	179	139	114	109	203	347

W	WNW	NW	NNW	Sum
566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: lineeLivello rev2.wpo (1)
Obstacles used in calculation
Eye height: 1.5 m
Grid resolution: 10.0 m



Scale 1:125,000

New WTG Shadow receptor

WTGs

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

	East	North	Z	Row data/Description	Valid	WTG type Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	1,519,660	4,454,583	640.5	WT3	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
2	1,519,916	4,457,405	715.7	WT1	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
3	1,522,015	4,457,701	634.5	WT2	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
4	1,522,028	4,456,062	500.0	WT4	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
5	1,522,987	4,457,697	503.4	WT5	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
6	1,523,473	4,459,361	555.7	WT10	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
7	1,524,068	4,456,439	534.8	WT6	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
8	1,525,021	4,458,296	414.8	WT7	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
9	1,525,380	4,457,220	537.9	WT8	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8
10	1,526,375	4,457,399	591.2	WT9	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	155.0	2,038	8.8

Shadow receptor-Input

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

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
A	R025	1,518,847	4,454,100	670.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
B	R026	1,518,996	4,454,252	660.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
C	R023	1,519,034	4,453,824	680.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
D	R027	1,519,122	4,454,770	714.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
E	R006	1,519,160	4,457,256	660.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
F	R007	1,519,198	4,457,854	644.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
G	R005	1,519,607	4,456,513	610.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
H	R016	1,519,627	4,455,265	610.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
I	R022	1,519,636	4,454,266	613.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
J	R001	1,519,783	4,458,165	640.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
K	R021	1,520,052	4,454,035	580.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
L	R020	1,520,113	4,454,132	590.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"

To be continued on next page...

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SHADOW - Main Result

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

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
M	R003	1,520,363	4,457,536	677.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
N	R018	1,520,402	4,454,902	610.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
O	R002	1,520,427	4,457,592	680.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
P	R019	1,520,611	4,454,895	590.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
Q	R004	1,520,862	4,457,186	582.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
R	R035	1,521,632	4,455,428	475.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
S	R012	1,521,682	4,457,061	526.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
T	R010	1,521,723	4,457,000	527.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
U	R029	1,521,824	4,456,487	400.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
V	R033	1,521,920	4,455,103	550.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
W	R013	1,522,153	4,458,067	626.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
X	R014	1,522,428	4,457,203	491.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
Y	R015	1,522,494	4,457,069	476.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
Z	R031	1,522,512	4,455,529	526.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AA	R030	1,522,658	4,455,451	547.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AB	R039	1,522,974	4,457,437	455.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AC	R044	1,523,194	4,456,154	437.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AD	R036	1,523,357	4,458,289	456.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AE	R040	1,523,429	4,456,710	475.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AF	R049	1,523,465	4,455,685	470.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AG	R046	1,523,696	4,456,099	459.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AH	R048	1,523,727	4,455,893	432.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AI	R038	1,523,780	4,457,449	400.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AJ	R047	1,523,807	4,456,026	462.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AK	R050	1,524,109	4,455,812	499.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AL	R051	1,524,225	4,455,557	490.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AM	R061	1,524,519	4,459,035	420.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AN	R054	1,524,539	4,457,356	450.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AO	R060	1,524,552	4,458,995	403.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AP	R059	1,524,554	4,458,976	397.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AQ	R057	1,524,589	4,457,893	440.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AR	R055	1,524,610	4,457,413	450.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AS	R062	1,524,725	4,459,082	408.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AT	R056	1,524,737	4,457,825	441.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AU	R052	1,524,766	4,456,731	530.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AV	R058	1,524,775	4,458,732	331.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AW	R078	1,524,901	4,458,777	327.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AX	R067	1,524,933	4,459,060	388.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AY	R063	1,524,960	4,459,171	407.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
AZ	R068	1,524,961	4,459,068	387.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BA	R064	1,525,032	4,459,165	398.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BB	R077	1,525,037	4,458,854	330.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BC	R070	1,525,066	4,459,195	405.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BD	R066	1,525,068	4,459,044	380.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BE	R065	1,525,075	4,459,129	394.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BF	R092	1,525,088	4,457,839	507.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BG	R069	1,525,089	4,459,246	416.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BH	R090	1,525,142	4,457,796	517.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BI	R075	1,525,144	4,458,908	345.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BJ	R076	1,525,148	4,458,886	338.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BK	R079	1,525,166	4,458,841	328.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BL	R091	1,525,198	4,457,770	510.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BM	R080	1,525,260	4,458,850	330.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BN	R083	1,525,311	4,458,628	331.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BO	R071	1,525,321	4,459,124	392.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BP	R074	1,525,321	4,458,975	351.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BQ	R081	1,525,340	4,458,858	323.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BR	R082	1,525,373	4,458,846	320.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BS	R073	1,525,459	4,459,047	374.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"

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SHADOW - Main Result

...continued from previous page

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

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
BT	R072	1,525,515	4,459,063	395.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BU	R084	1,525,547	4,458,854	326.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BV	R085	1,525,609	4,458,827	331.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BW	R086	1,525,730	4,458,926	364.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BX	R088	1,525,751	4,458,782	326.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BY	R089	1,525,810	4,458,727	312.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
BZ	R087	1,525,849	4,458,829	329.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CA	R095	1,526,250	4,458,048	389.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CB	R094	1,526,288	4,458,124	383.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CC	R096	1,526,380	4,458,027	383.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CD	R097	1,526,655	4,458,125	373.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CE	R099	1,527,060	4,458,126	333.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CF	R100	1,527,264	4,457,389	360.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CG	R103	1,526,597	4,456,873	525.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CH	R104	1,526,530	4,456,514	468.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CI	R105	1,523,578	4,459,589	573.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CJ	R106	1,523,619	4,460,202	460.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CK	R107	1,523,842	4,460,271	498.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CL	R108	1,523,763	4,459,751	538.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CM	R109	1,523,711	4,459,661	556.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CN	R110	1,523,667	4,459,598	559.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CO	R111	1,523,128	4,458,821	560.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CP	R112	1,522,924	4,459,172	653.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CQ	R113	1,522,652	4,459,405	596.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CR	R114	1,522,657	4,459,488	585.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CS	R116	1,522,731	4,459,564	584.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CT	R117	1,522,717	4,459,593	577.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CU	R119	1,522,753	4,459,642	577.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CV	R120	1,522,837	4,459,571	601.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CW	R121	1,522,769	4,459,680	574.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CX	R122	1,522,778	4,459,700	572.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CY	R123	1,522,811	4,459,733	570.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
CZ	R124	1,522,751	4,459,769	560.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DA	R125	1,522,732	4,459,814	551.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DB	R126	1,522,851	4,459,799	572.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DC	R127	1,522,878	4,459,819	576.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DD	R128	1,522,920	4,459,844	577.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DE	R129	1,522,957	4,459,876	575.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DF	R130	1,522,988	4,459,827	583.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DG	R131	1,523,025	4,459,835	579.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DH	R132	1,522,954	4,459,914	570.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DI	R133	1,522,854	4,459,922	558.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DJ	R134	1,522,817	4,459,959	549.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DK	R136	1,522,819	4,460,069	534.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DL	R137	1,522,899	4,460,122	535.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DM	R138	1,522,886	4,460,139	531.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DN	R139	1,522,958	4,460,028	550.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DO	R140	1,523,028	4,460,000	558.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DP	R141	1,523,031	4,460,032	554.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DQ	R142	1,522,990	4,460,077	546.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
DR	R144	1,523,181	4,460,130	544.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"

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SHADOW - Main Result

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values Shadow hours per year [h/year]
A	R025	1:19
B	R026	8:08
C	R023	0:00
D	R027	9:23
E	R006	14:36
F	R007	4:36
G	R005	0:00
H	R016	0:00
I	R022	0:00
J	R001	0:00
K	R021	0:00
L	R020	0:00
M	R003	16:38
N	R018	5:35
O	R002	12:31
P	R019	3:38
Q	R004	15:42
R	R035	0:00
S	R012	6:41
T	R010	3:56
U	R029	12:01
V	R033	0:00
W	R013	15:20
X	R014	1:11
Y	R015	1:17
Z	R031	0:07
AA	R030	0:00
AB	R039	9:27
AC	R044	12:44
AD	R036	7:01
AE	R040	9:43
AF	R049	0:00
AG	R046	1:27
AH	R048	1:35
AI	R038	12:26
AJ	R047	1:19
AK	R050	0:00
AL	R051	0:00
AM	R061	7:40
AN	R054	8:26
AO	R060	5:55
AP	R059	6:35
AQ	R057	7:12
AR	R055	8:31
AS	R062	4:25
AT	R056	8:30
AU	R052	12:19
AV	R058	11:21
AW	R078	8:42
AX	R067	2:52
AY	R063	0:00
AZ	R068	2:40
BA	R064	2:03
BB	R077	9:42
BC	R070	1:55
BD	R066	2:17
BE	R065	1:59
BF	R092	1:51

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SHADOW - Main Result

...continued from previous page

No.	Name	Shadow, expected values Shadow hours per year [h/year]
BG	R069	1:45
BH	R090	2:13
BI	R075	3:51
BJ	R076	5:49
BK	R079	10:14
BL	R091	3:18
BM	R080	9:17
BN	R083	17:52
BO	R071	1:26
BP	R074	1:56
BQ	R081	9:41
BR	R082	10:27
BS	R073	1:16
BT	R072	0:00
BU	R084	8:26
BV	R085	7:37
BW	R086	6:23
BX	R088	4:48
BY	R089	4:19
BZ	R087	3:59
CA	R095	13:50
CB	R094	11:23
CC	R096	12:32
CD	R097	9:23
CE	R099	4:21
CF	R100	6:25
CG	R103	0:00
CH	R104	0:00
CI	R105	35:15
CJ	R106	0:00
CK	R107	0:00
CL	R108	14:17
CM	R109	22:27
CN	R110	32:25
CO	R111	0:15
CP	R112	19:17
CQ	R113	5:39
CR	R114	5:24
CS	R116	6:00
CT	R117	5:37
CU	R119	5:54
CV	R120	7:37
CW	R121	6:00
CX	R122	6:03
CY	R123	6:35
CZ	R124	5:31
DA	R125	5:15
DB	R126	8:31
DC	R127	8:22
DD	R128	7:25
DE	R129	5:45
DF	R130	7:17
DG	R131	6:31
DH	R132	4:18
DI	R133	5:44
DJ	R134	5:09
DK	R136	2:19
DL	R137	0:00
DM	R138	0:00

To be continued on next page...

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SHADOW - Main Result

...continued from previous page

Shadow, expected values

No.	Name	Shadow hours per year [h/year]
DN	R139	0:42
DO	R140	0:00
DP	R141	0:00
DQ	R142	0:00
DR	R144	0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	WT3	167:34	25:18
2	WT1	302:26	49:51
3	WT2	249:29	31:56
4	WT4	188:44	19:57
5	WT5	190:44	28:23
6	WT10	936:59	119:19
7	WT6	182:23	26:50
8	WT7	717:20	72:42
9	WT8	238:28	26:54
10	WT9	359:08	41:03

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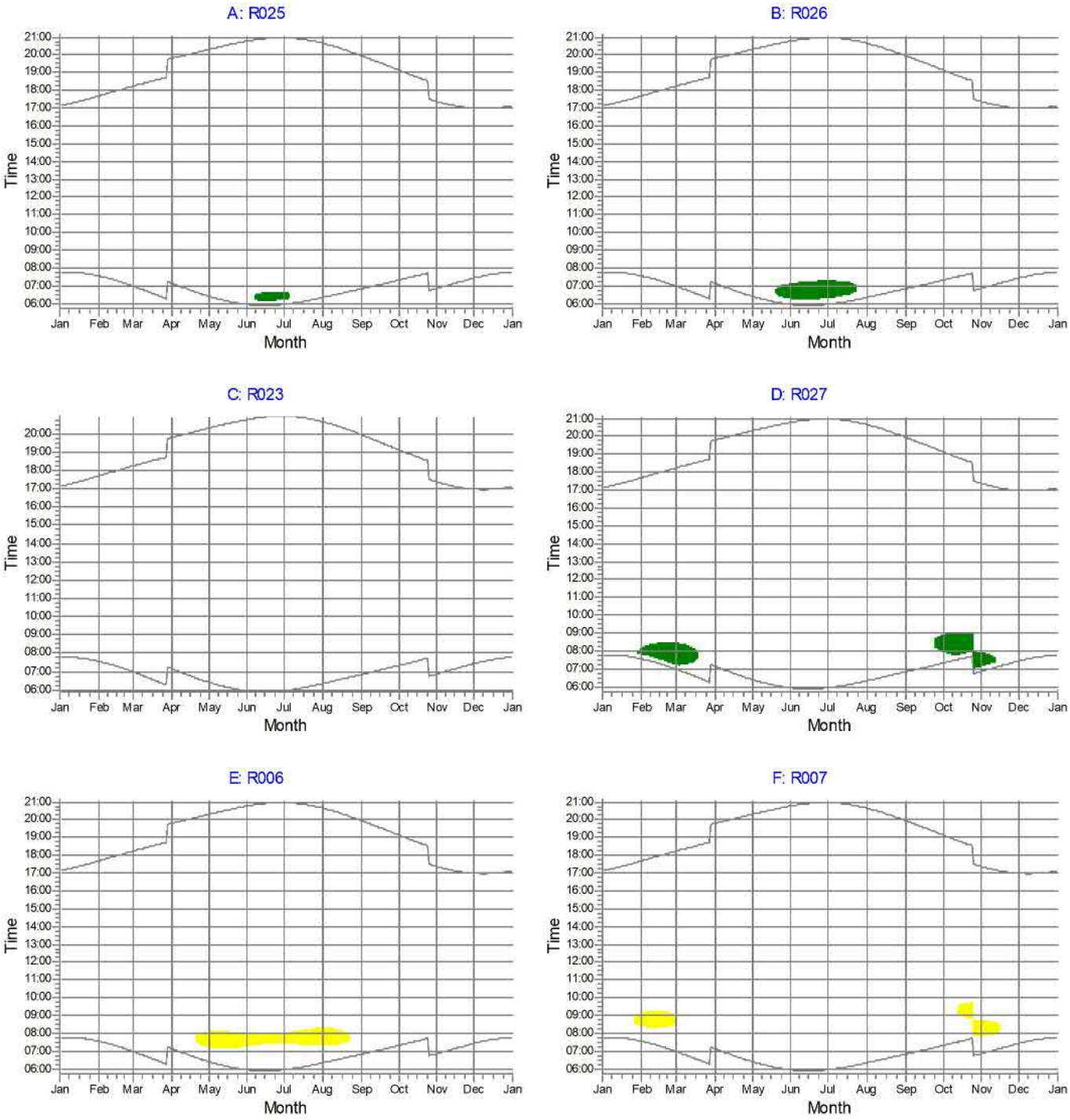
SHADOW - Calendar, graphical



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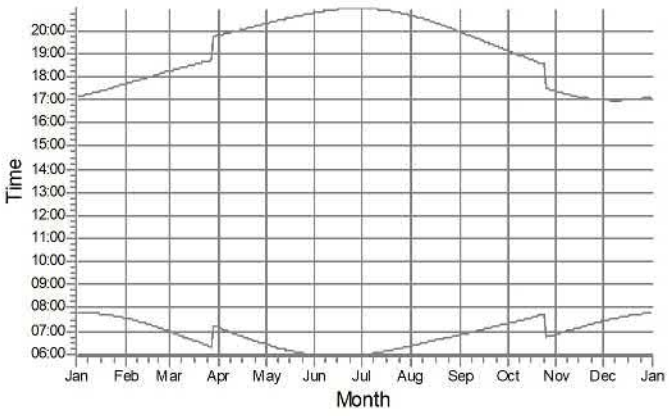
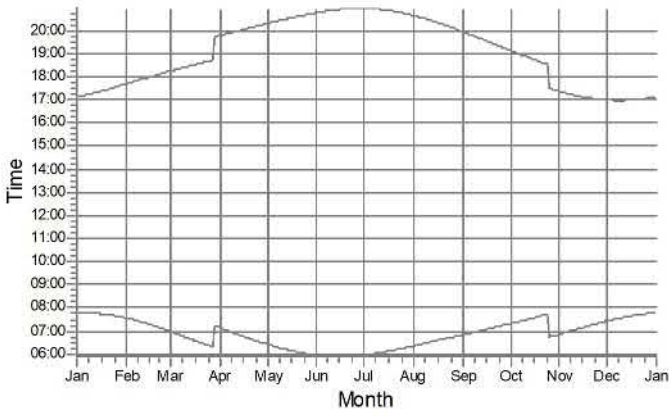
SHADOW - Calendar, graphical

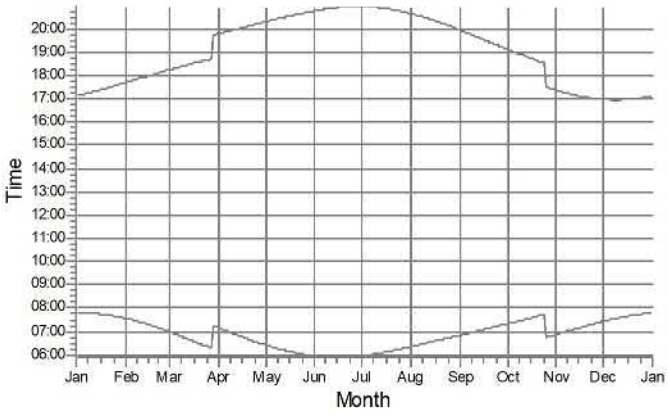
G: R005



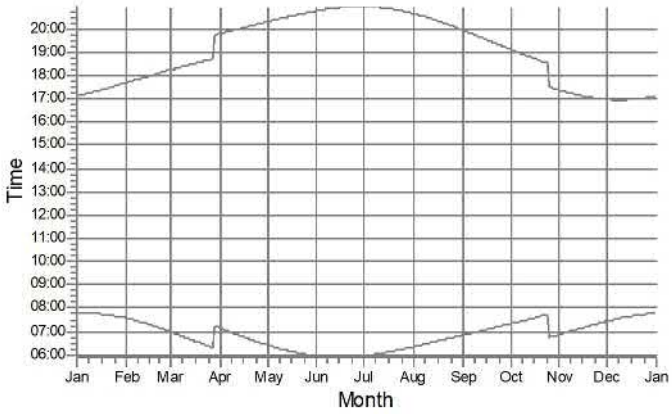
H: R016



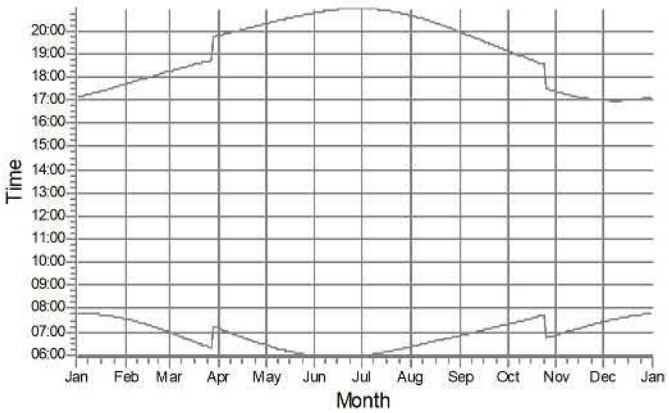
I: R022



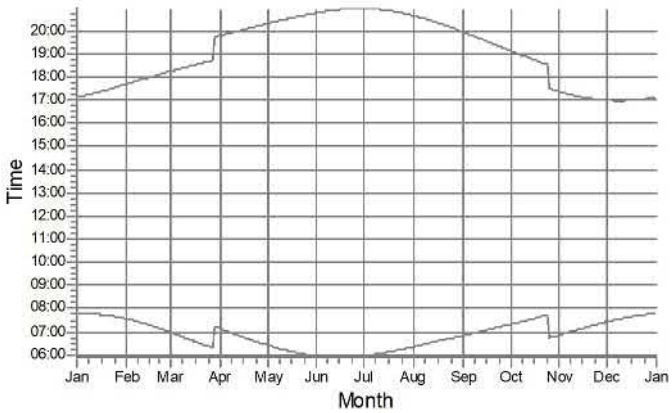
J: R001



K: R021



L: R020



WTGs

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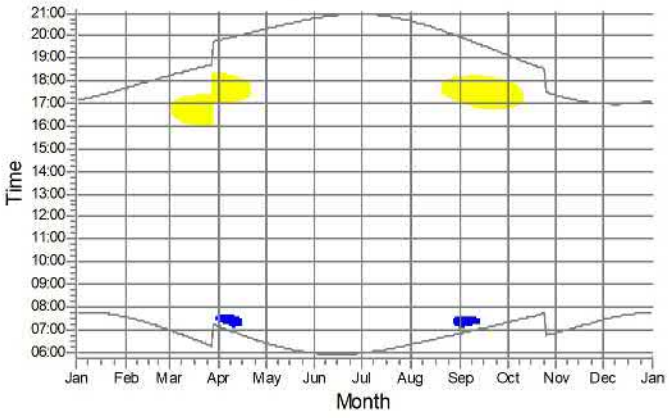
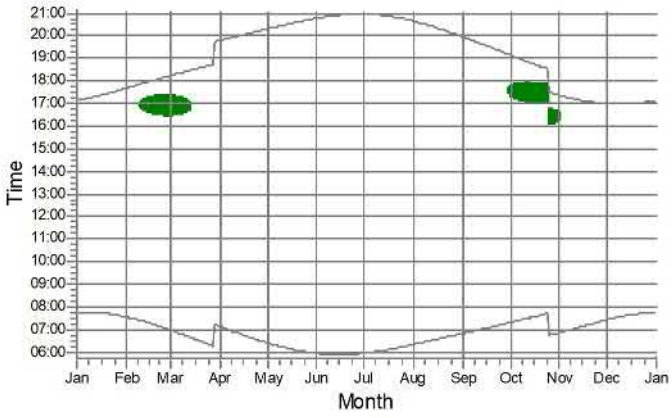
SHADOW - Calendar, graphical

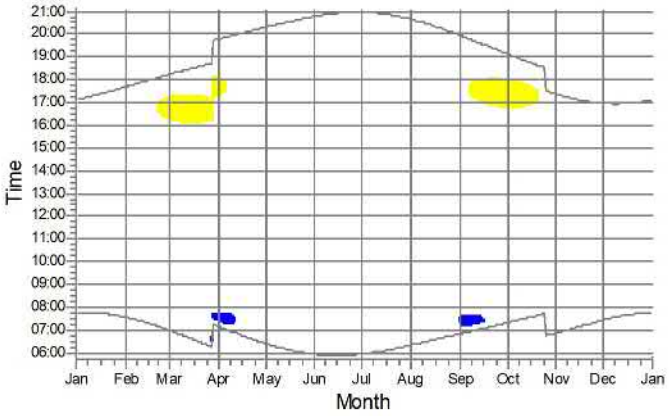
M: R003



N: R018



O: R002



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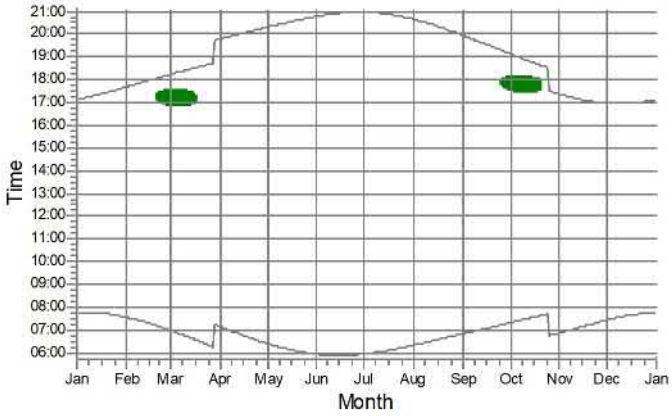
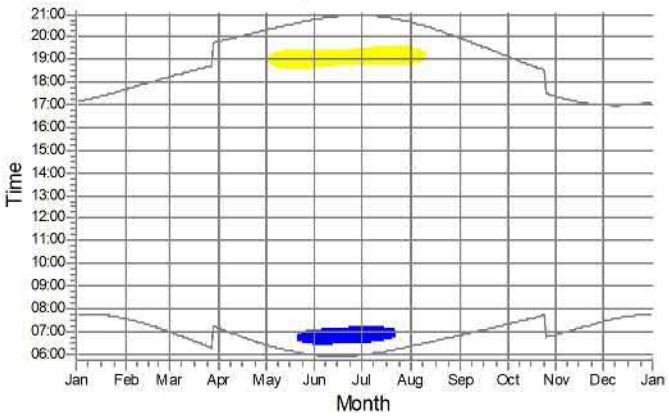


Q: R004



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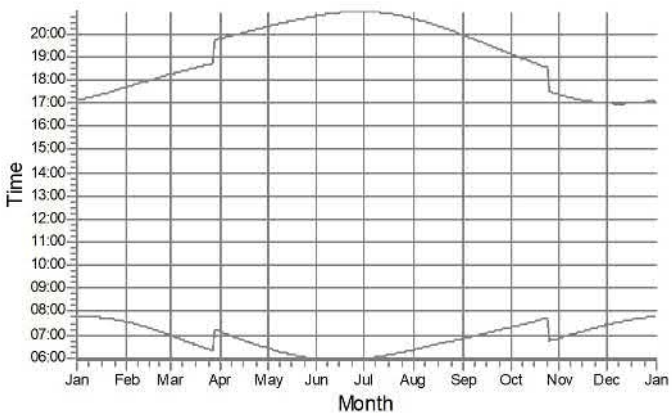

WTGs

1: WT3 2: WT1 3: WT2

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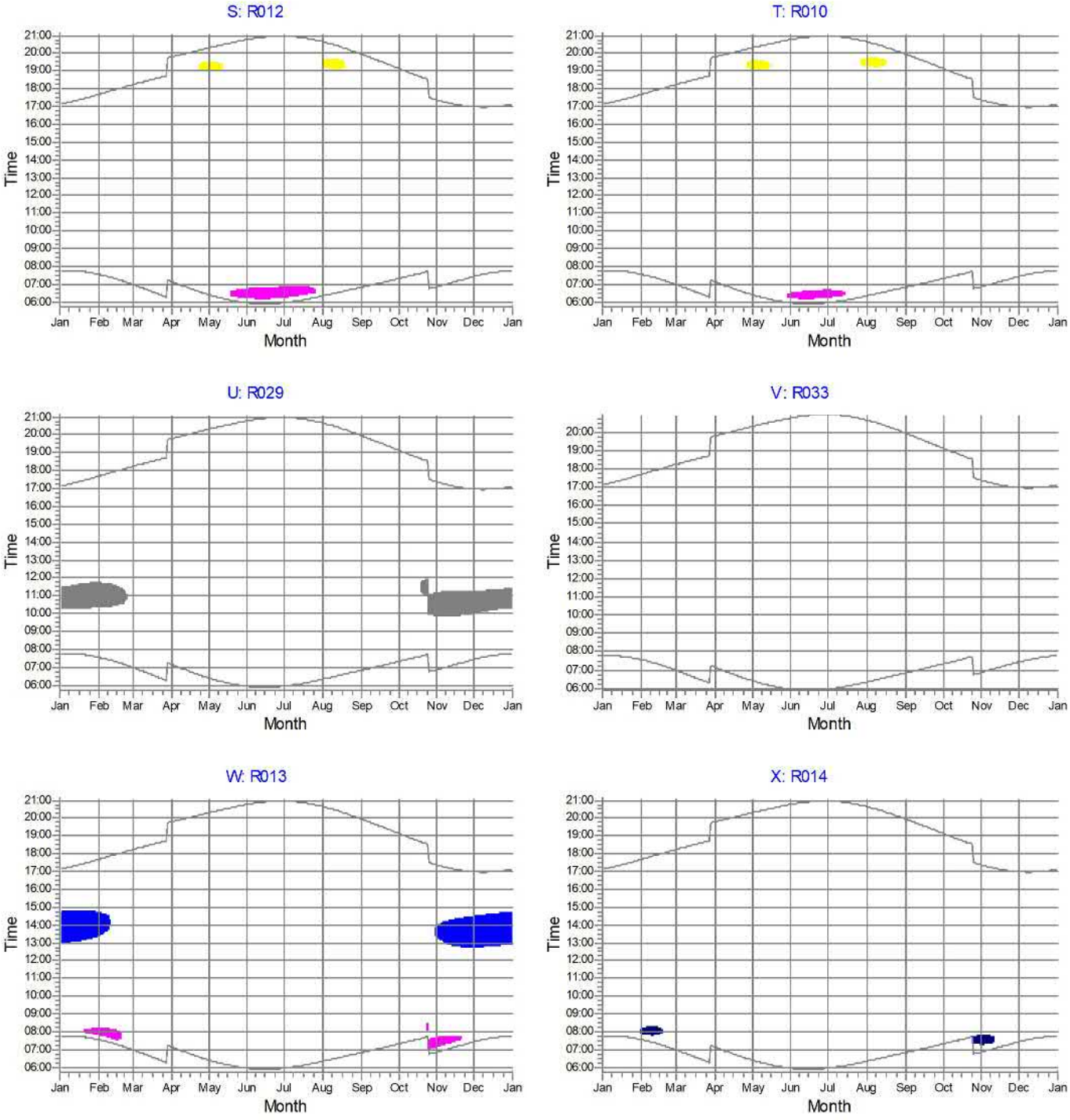
SHADOW - Calendar, graphical



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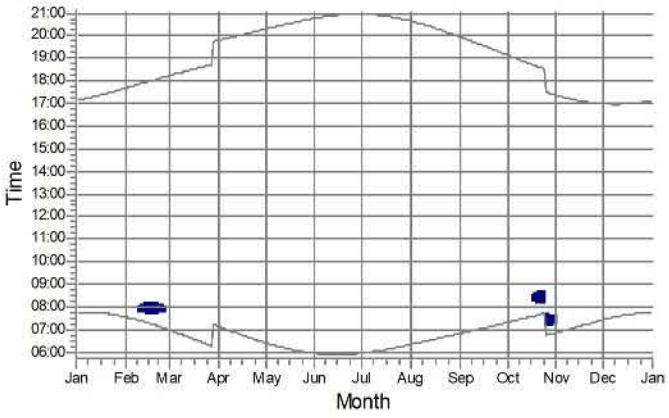
SHADOW - Calendar, graphical

Y: R015



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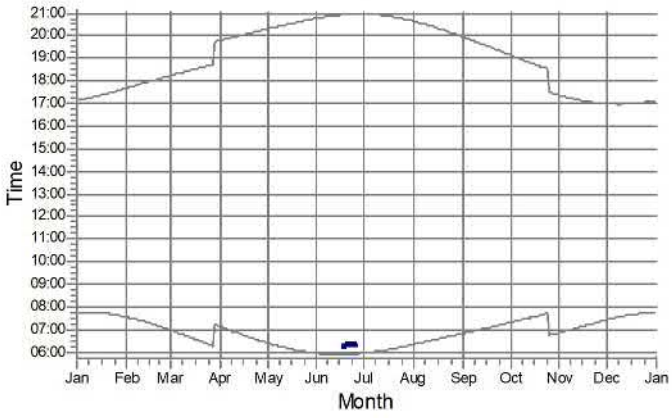

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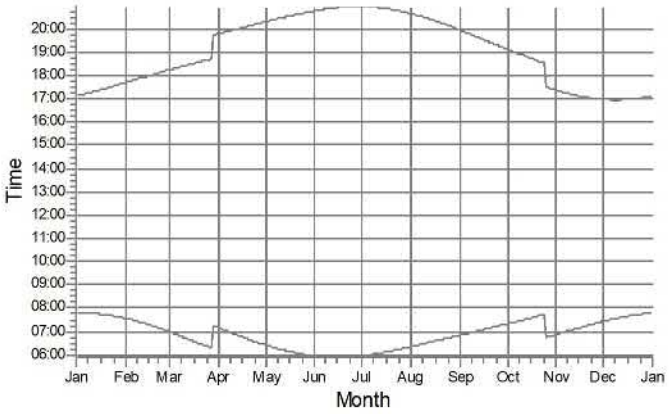

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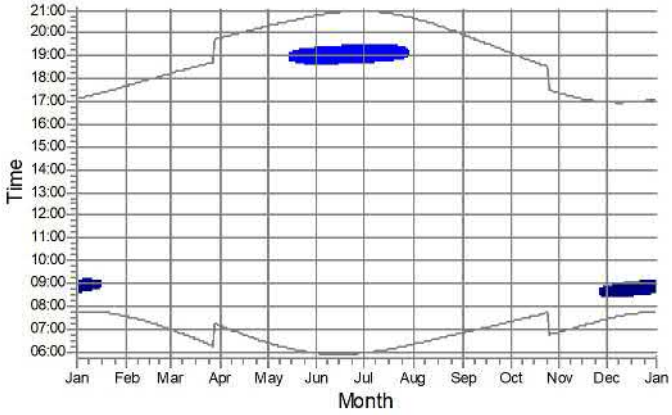

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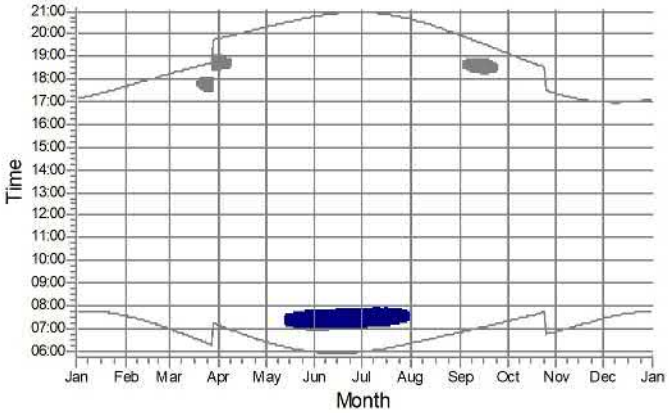

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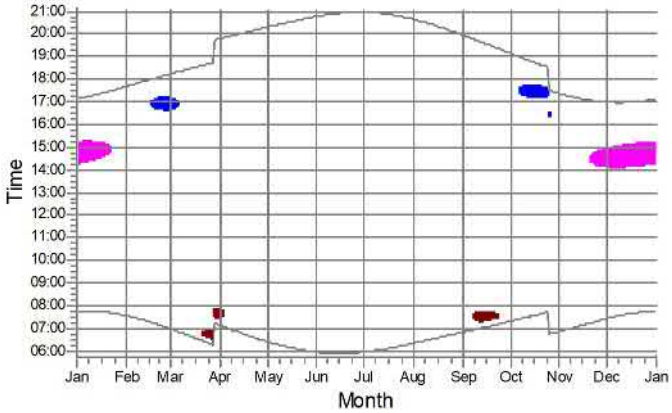

WTGs

3: WT2 4: WT4 5: WT5 7: WT6 8: WT7

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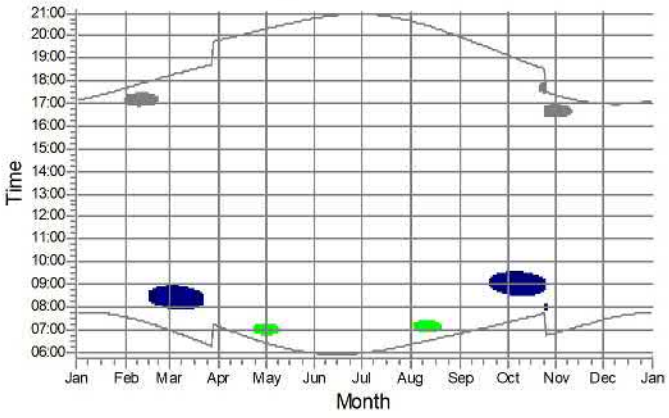
SHADOW - Calendar, graphical

AE: R040



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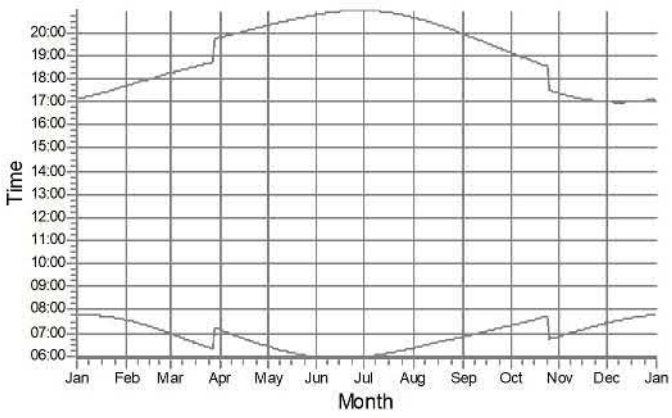

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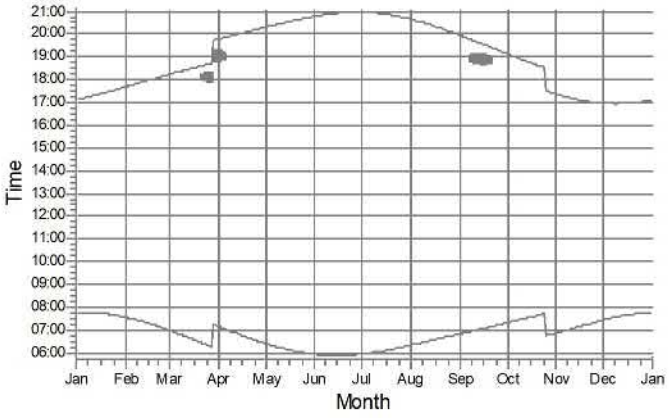

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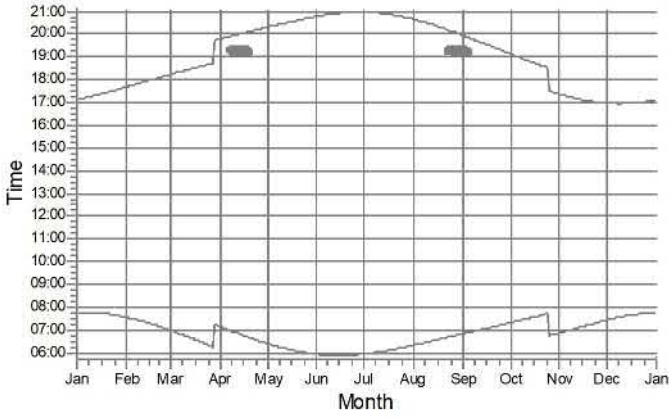
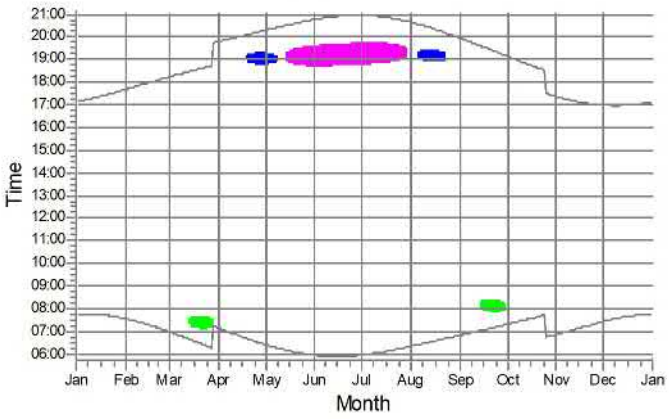


AI: R038



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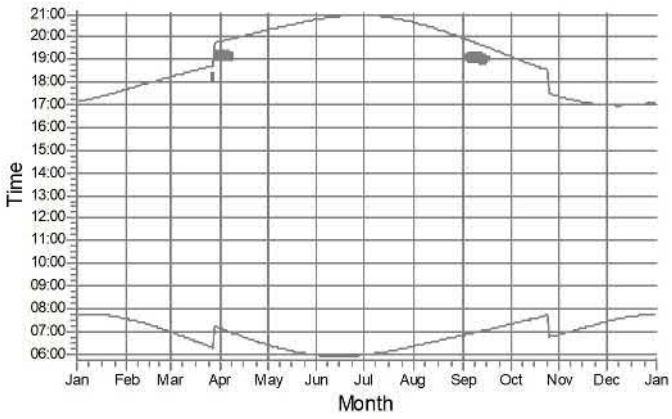

WTGs

3: WT2 4: WT4 5: WT5 7: WT6 9: WT8

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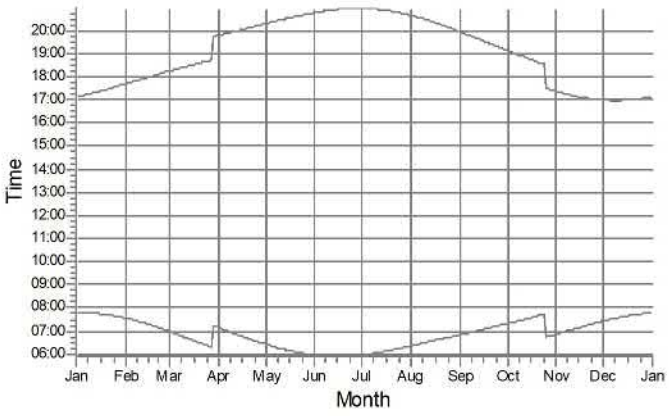
SHADOW - Calendar, graphical

AK: R050



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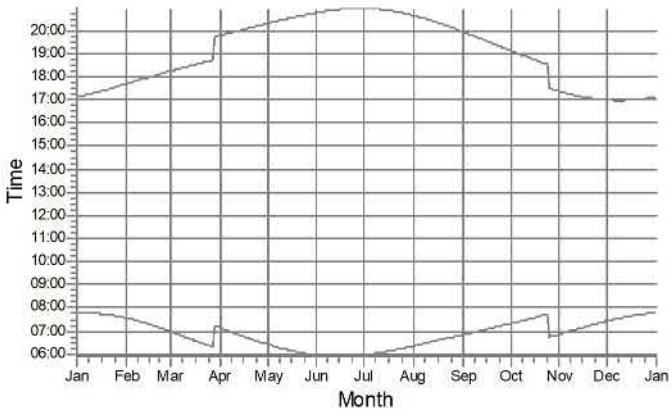

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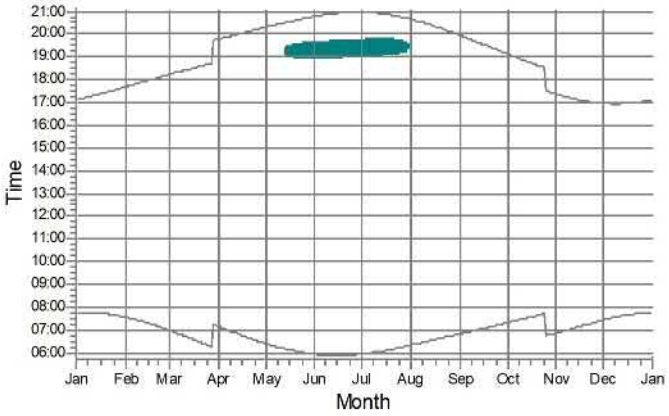

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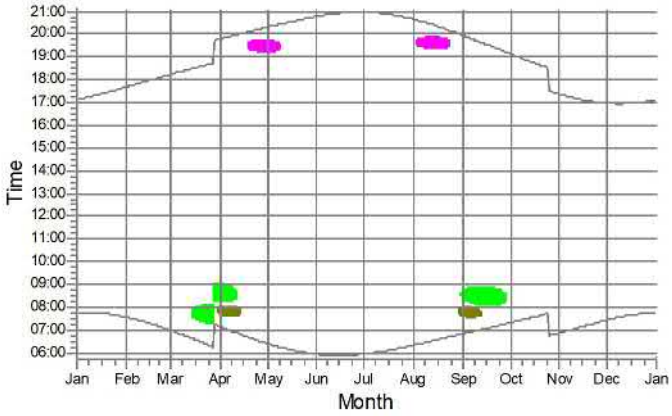

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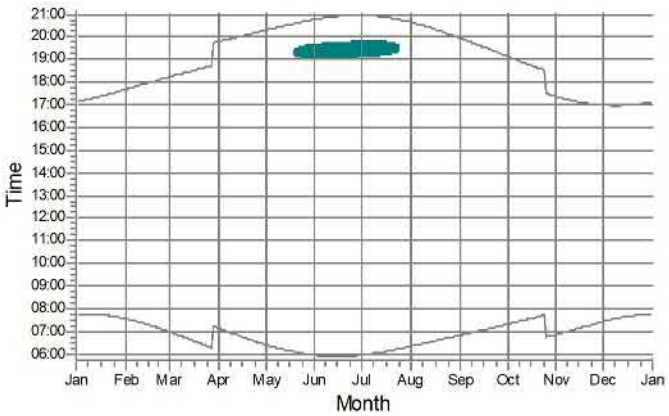

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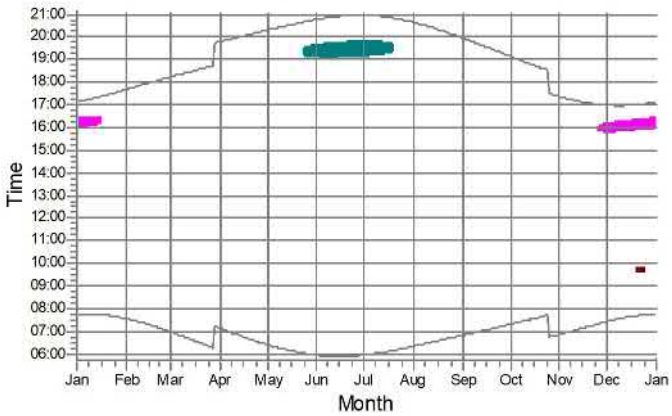

WTGs

5: WT5 6: WT10 8: WT7 9: WT8 10: WT9

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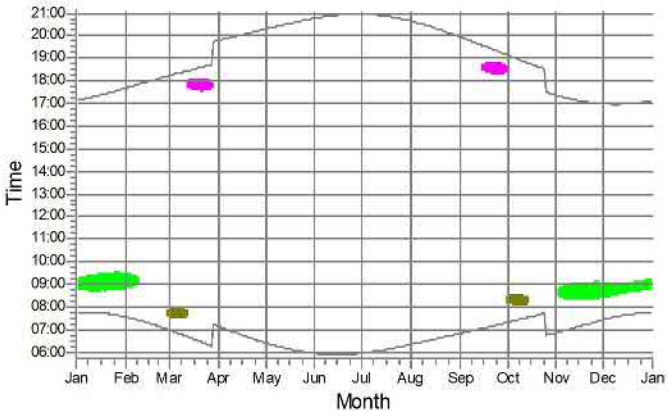
SHADOW - Calendar, graphical

AQ: R057



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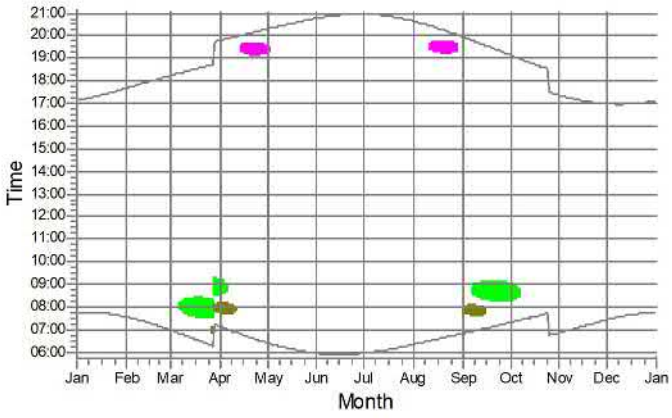

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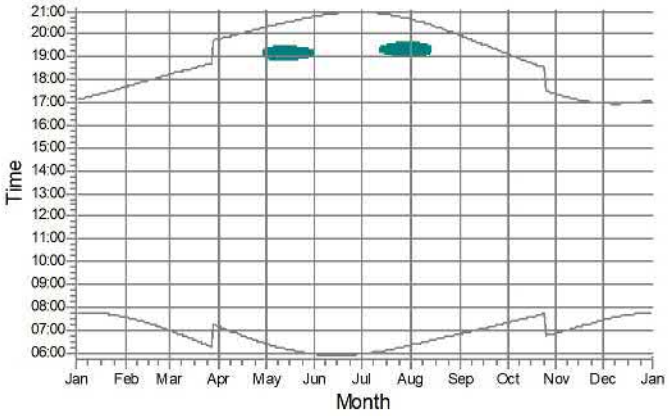
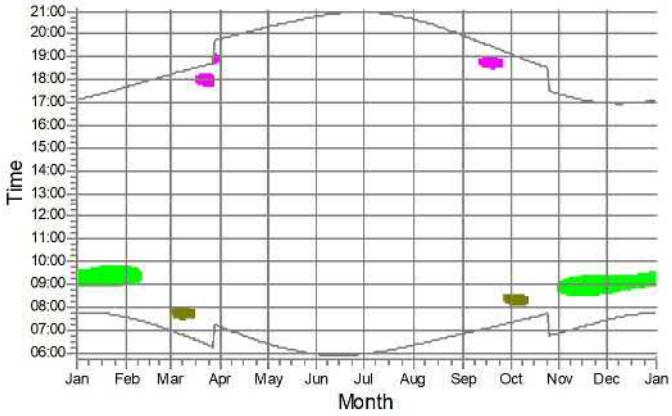


AT: R056



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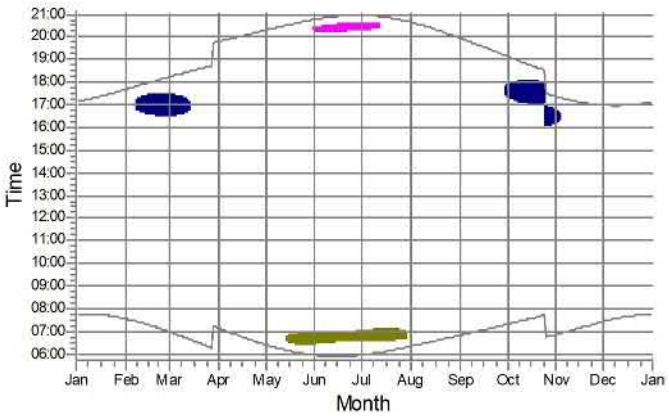
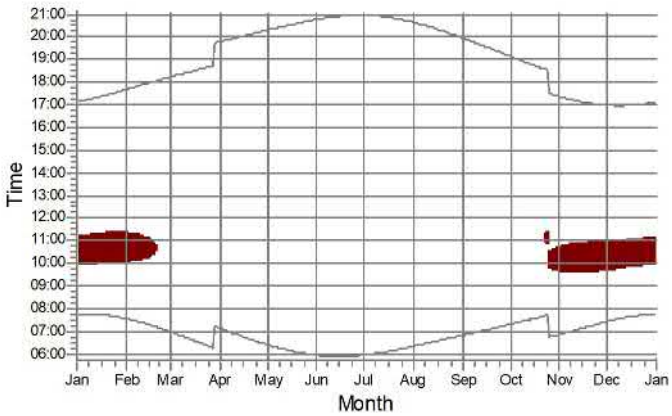


AV: R058



WTGs

5: WT5	7: WT6	9: WT8
6: WT10	8: WT7	10: WT9

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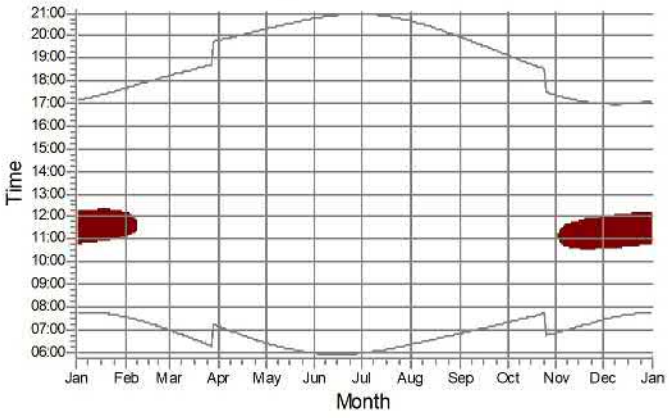
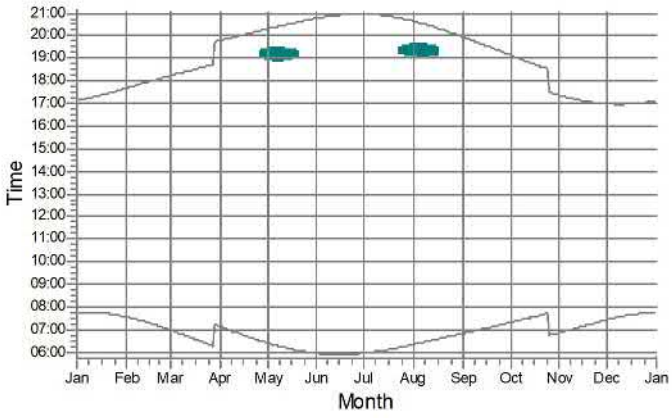
SHADOW - Calendar, graphical

AW: R078



AX: R067



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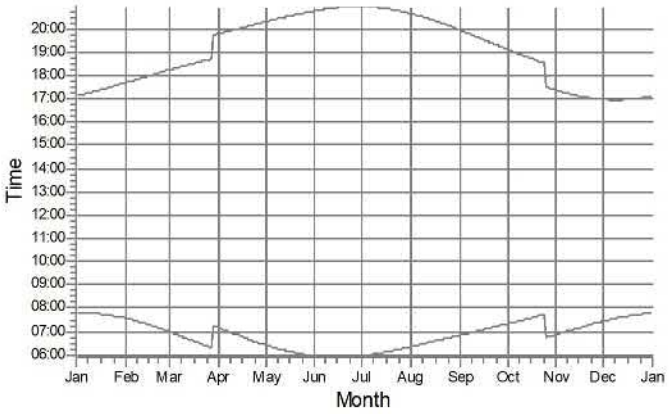

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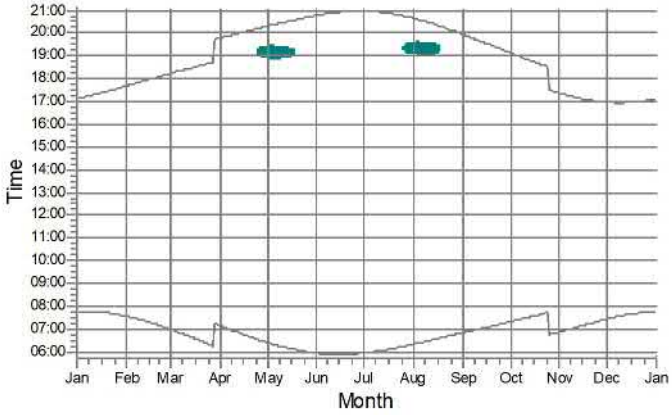

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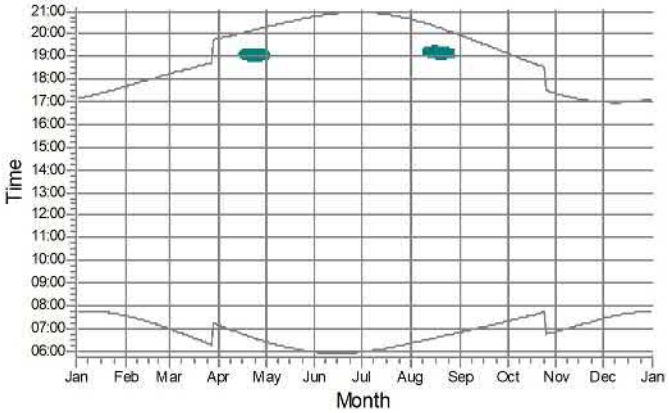
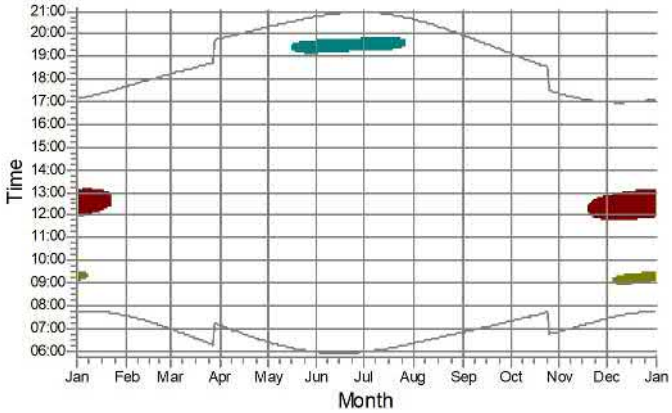


BB: R077



WTGs

6: WT10 8: WT7 10: WT9

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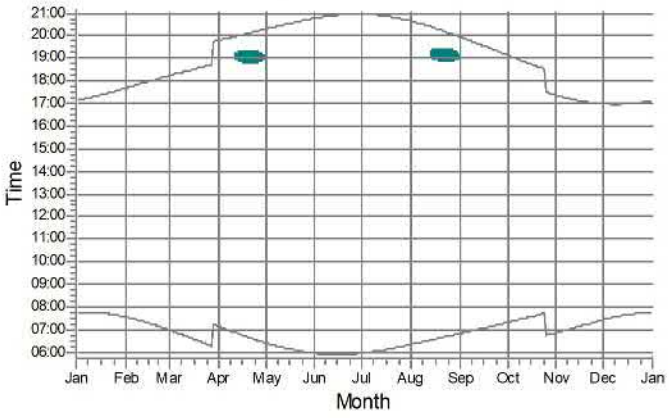
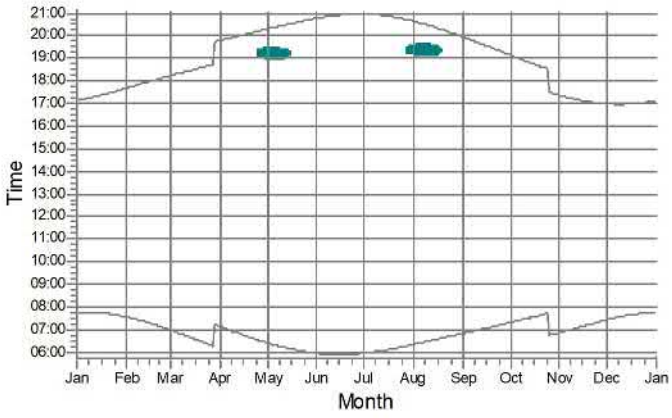
SHADOW - Calendar, graphical

BC: R070



BD: R066



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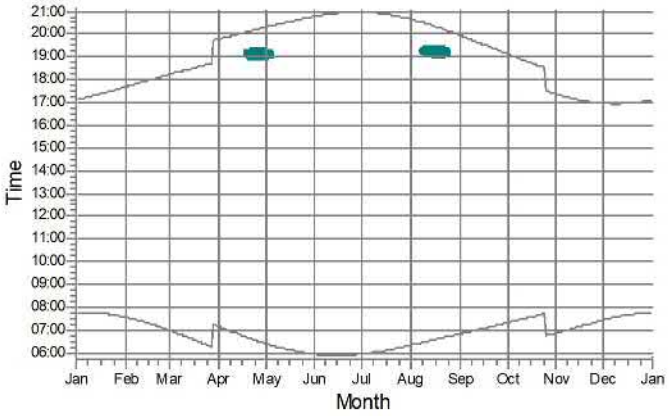
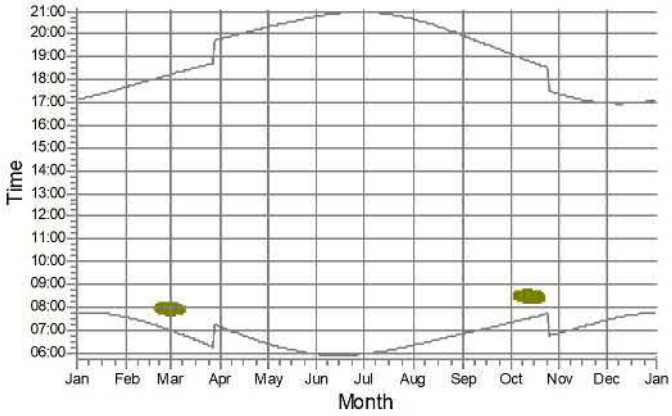


BF: R092



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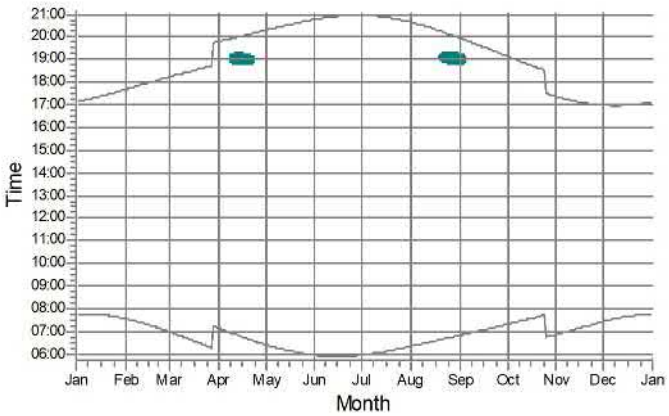
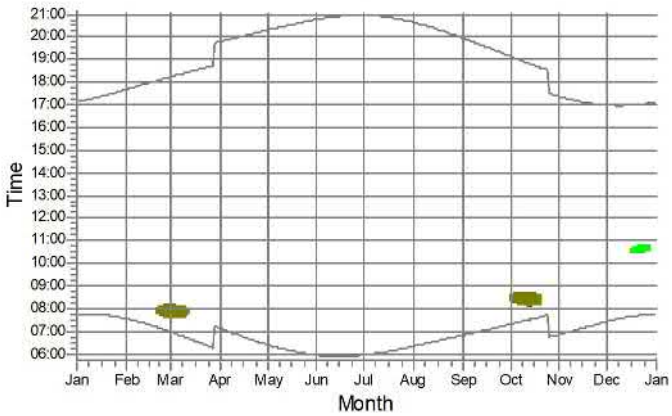


BH: R090



WTGs

6: WT10 9: WT8 10: WT9

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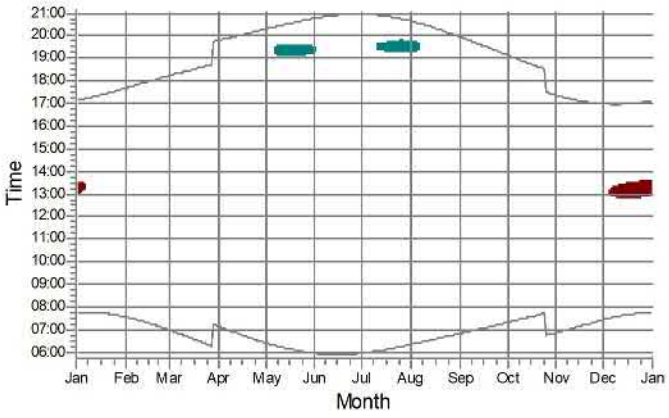
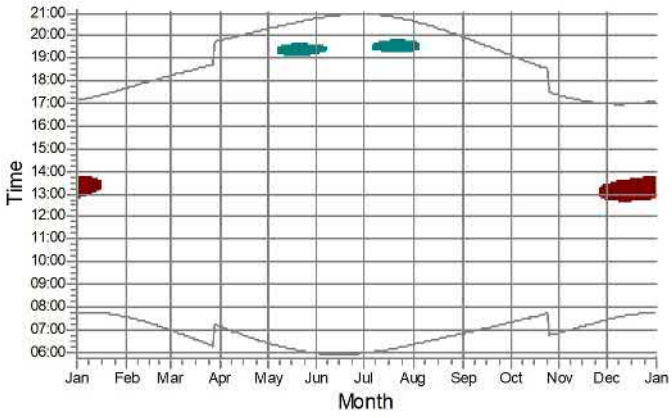
SHADOW - Calendar, graphical

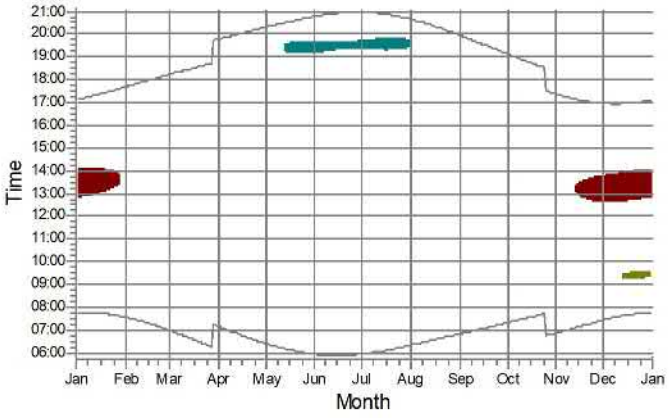
BI: R075



BJ: R076



BK: R079



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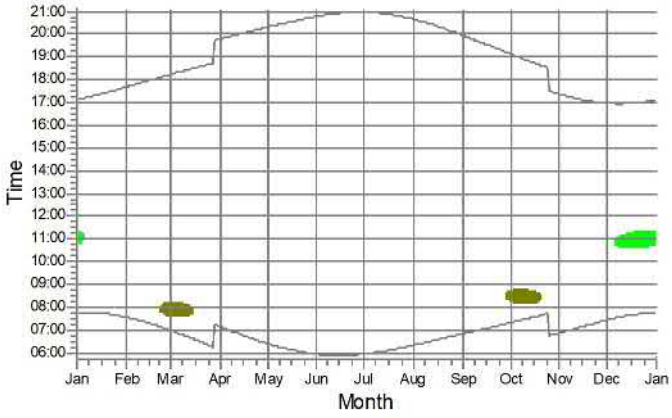

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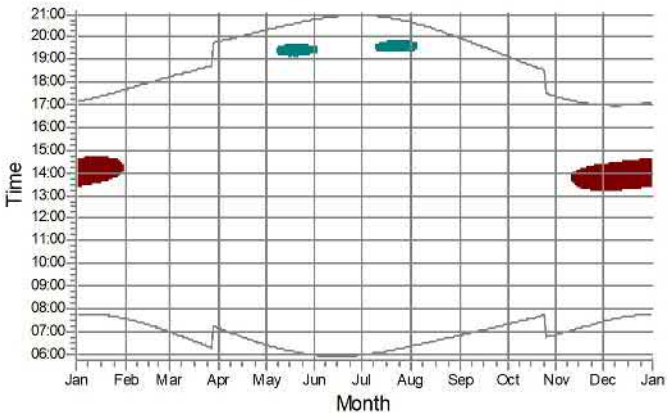
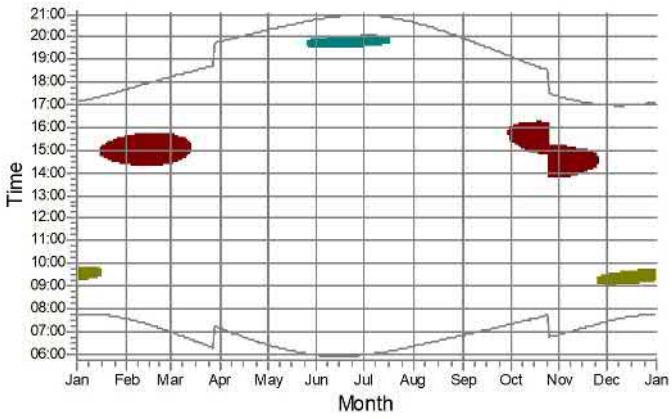


BN: R083



WTGs

6: WT10 8: WT7 9: WT8 10: WT9

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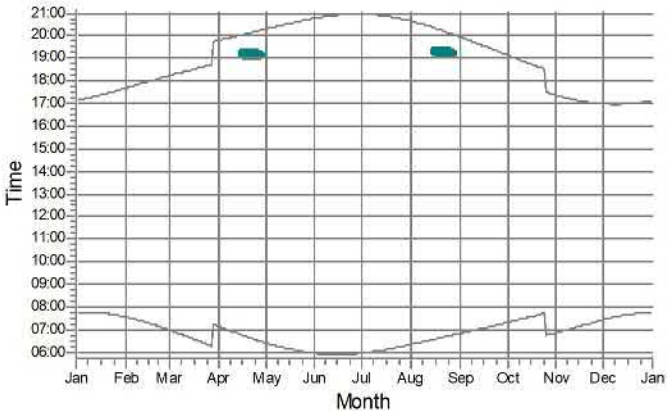
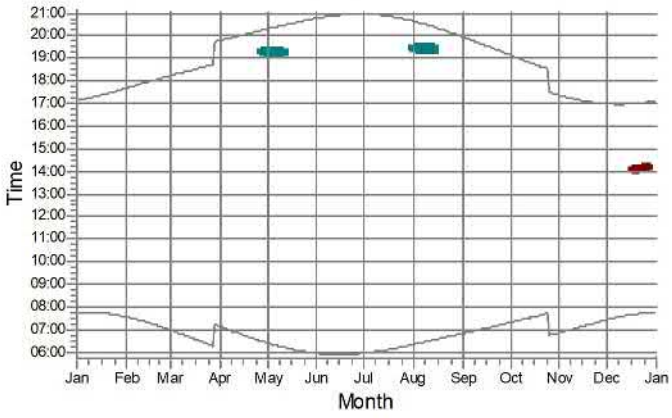
SHADOW - Calendar, graphical

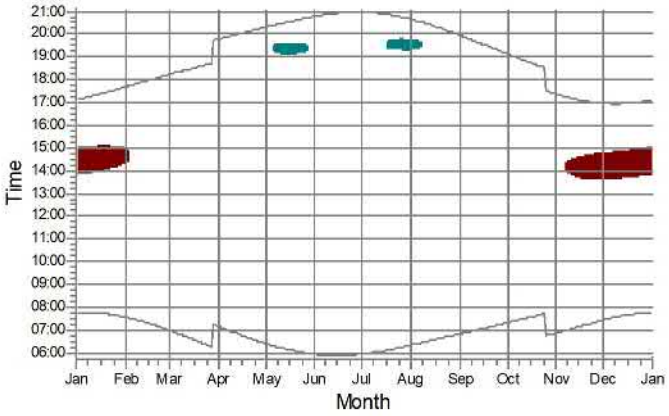
BO: R071



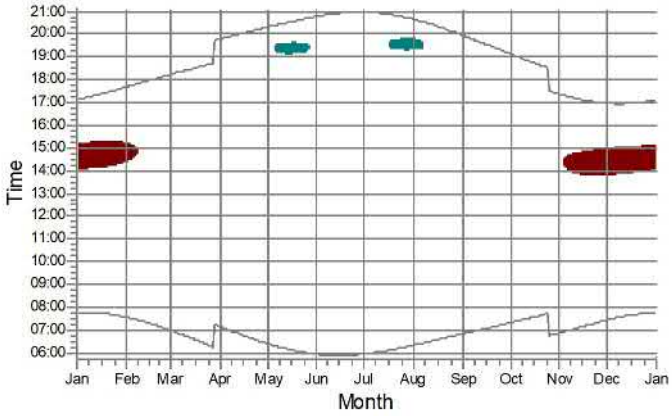
BP: R074



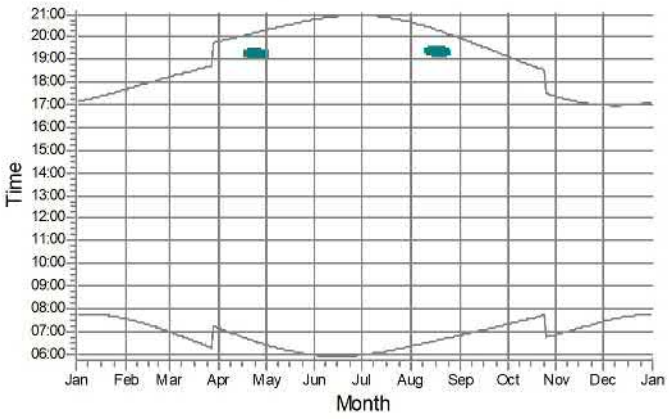
BQ: R081



BR: R082



BS: R073



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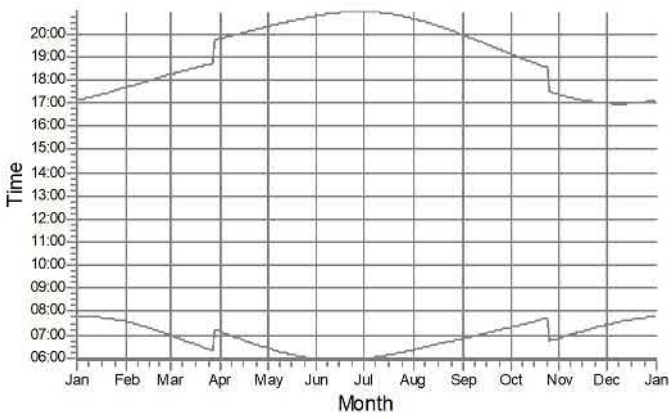

WTGs

6: WT10 8: WT7

Project:
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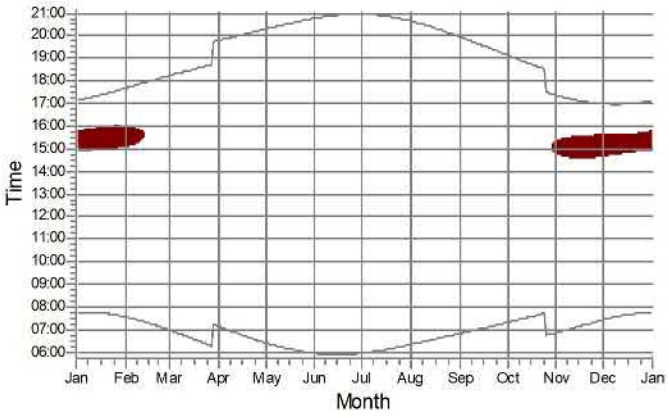
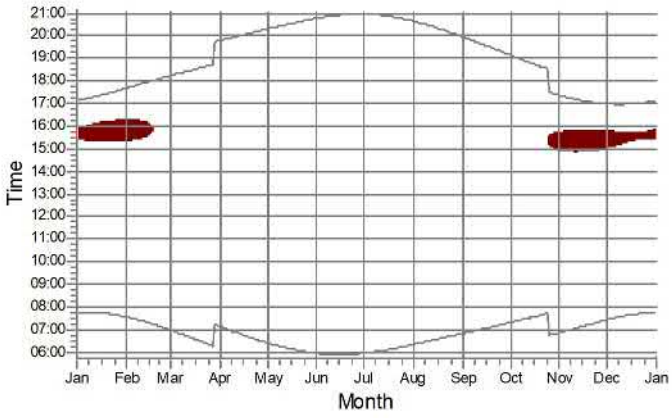
SHADOW - Calendar, graphical

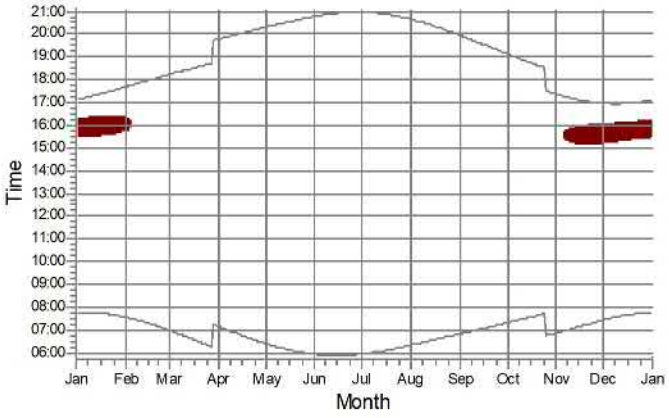
BU: R084



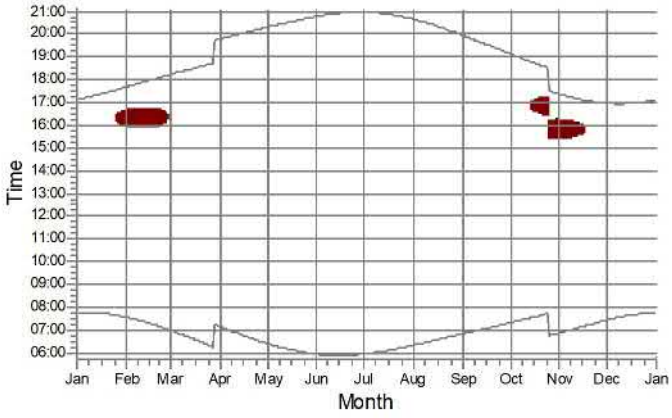
BV: R085



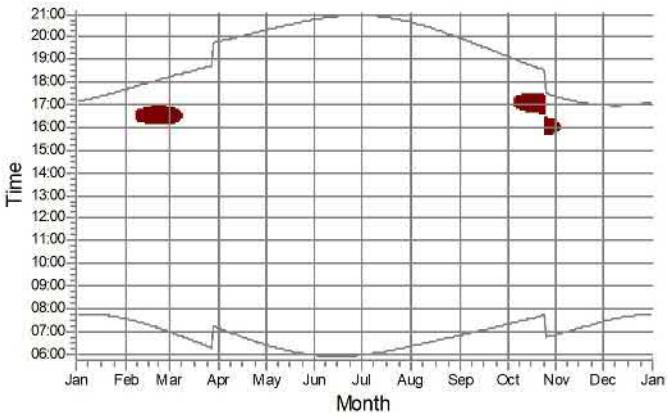
BW: R086



BX: R088



BY: R089



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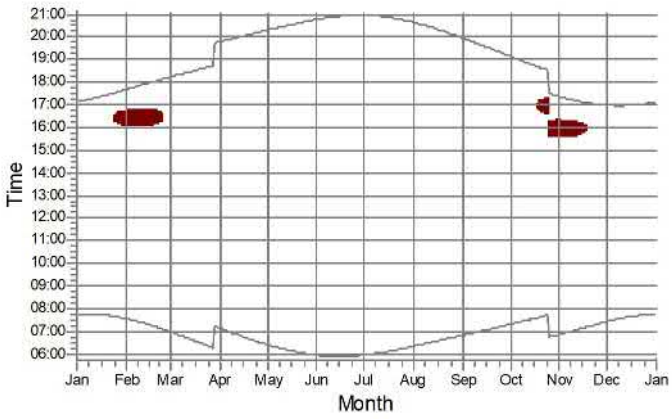

WTGs

8: WT7

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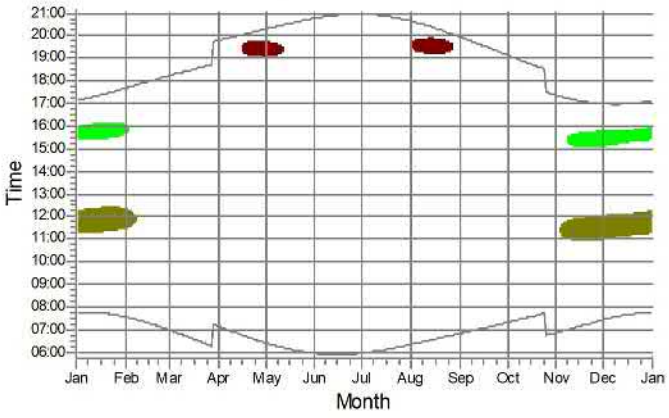
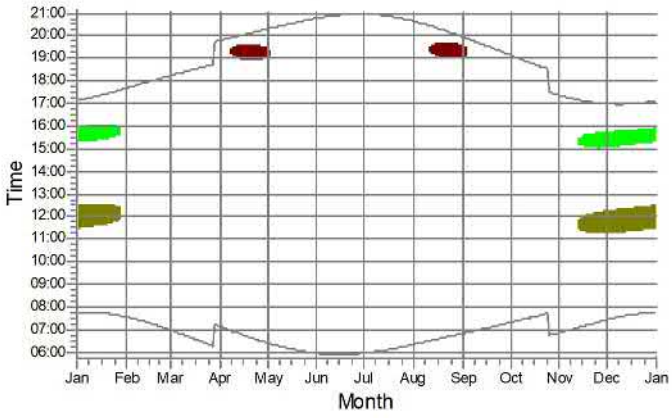
SHADOW - Calendar, graphical

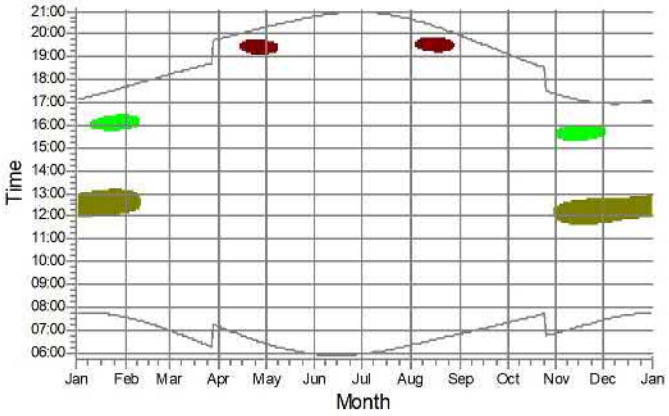
CA: R095



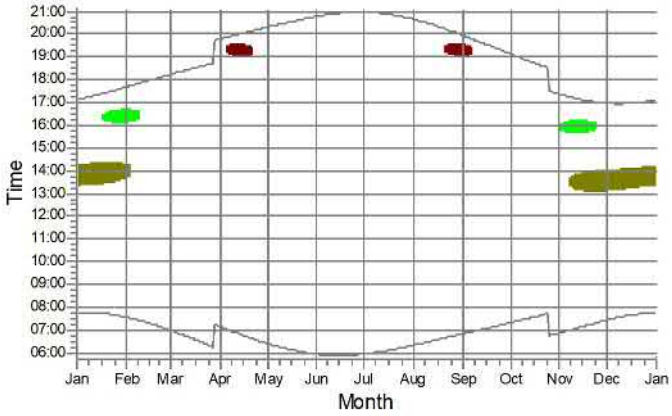
CB: R094



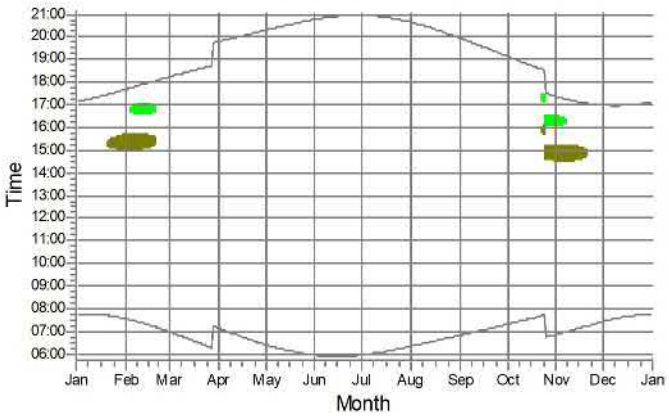
CC: R096



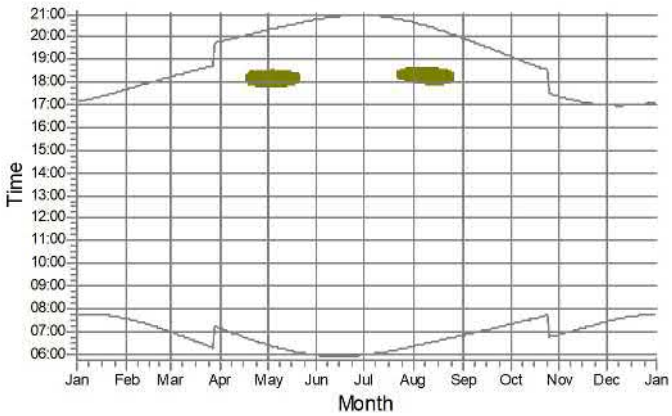
CD: R097



CE: R099



CF: R100



WTGs

8: WT7 9: WT8 10: WT9

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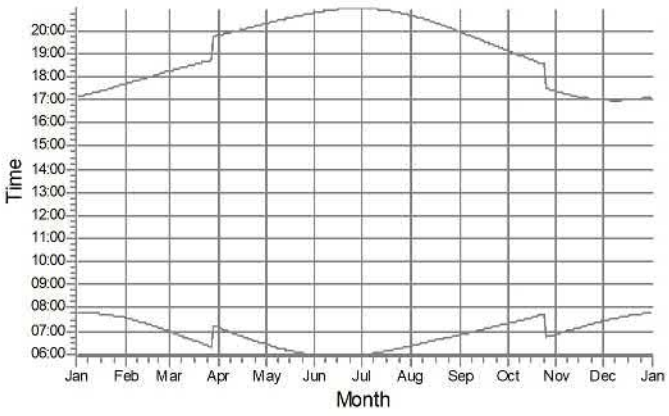
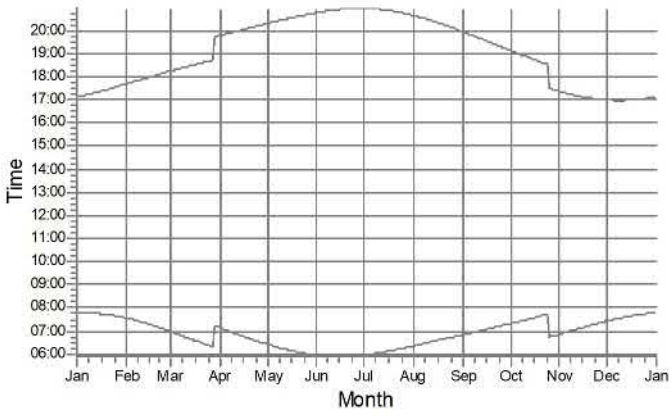
SHADOW - Calendar, graphical

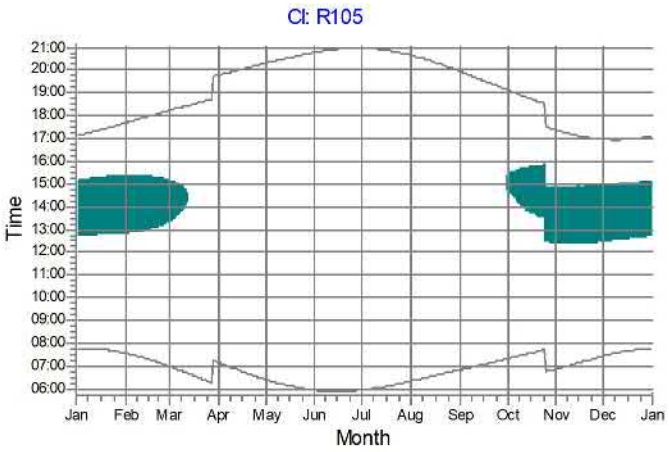
CG: R103



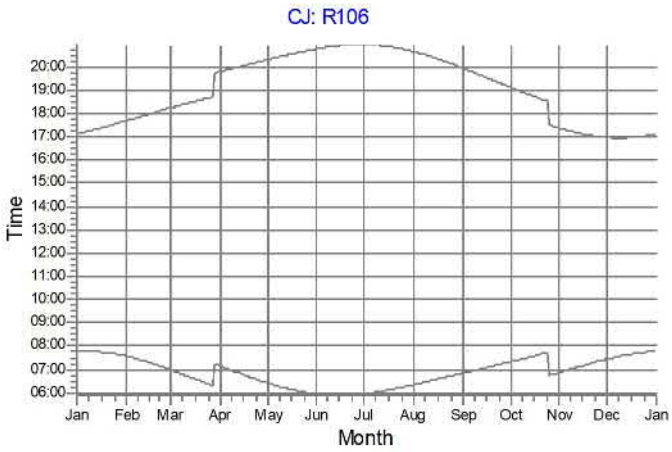
CH: R104



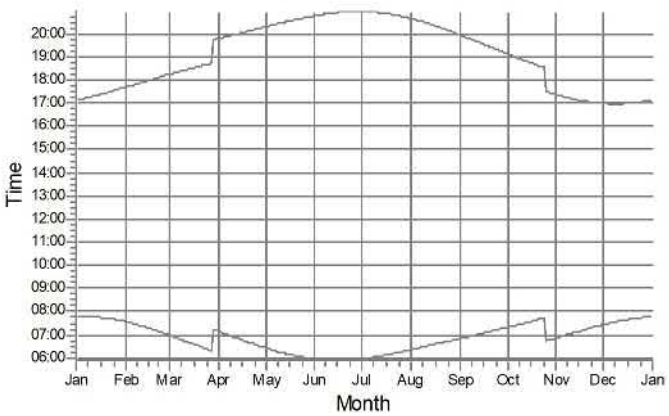
CI: R105



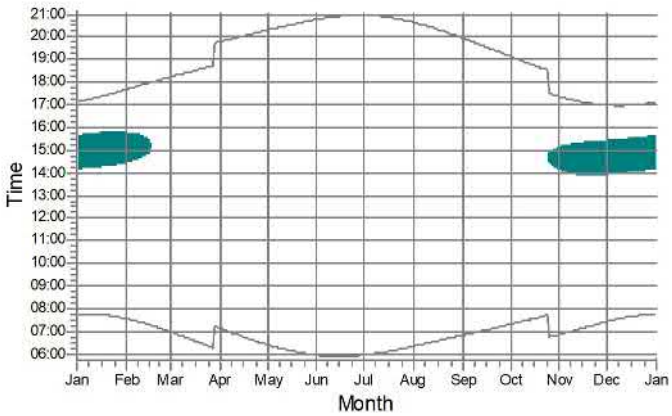
CJ: R106



CK: R107



CL: R108



WTGs

6: WT10

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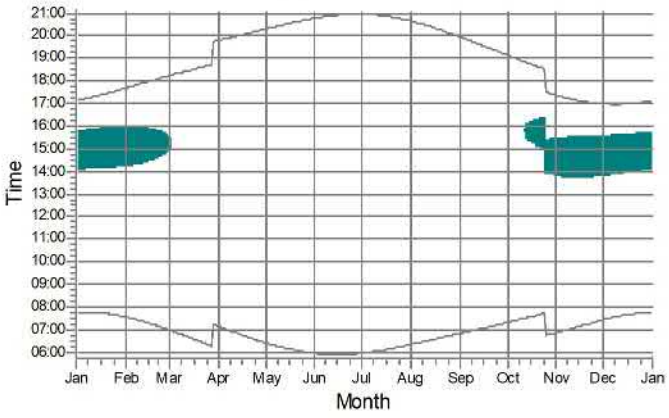
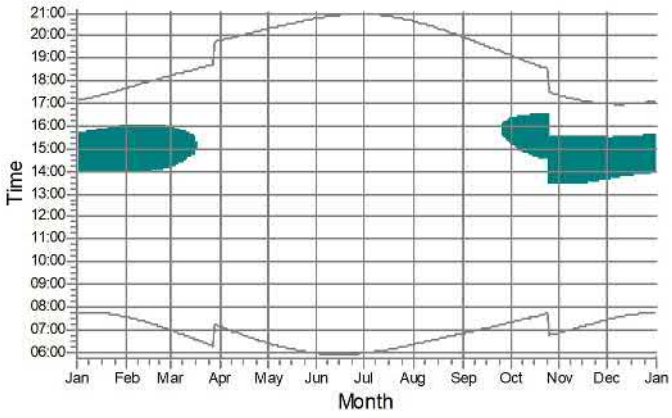
SHADOW - Calendar, graphical

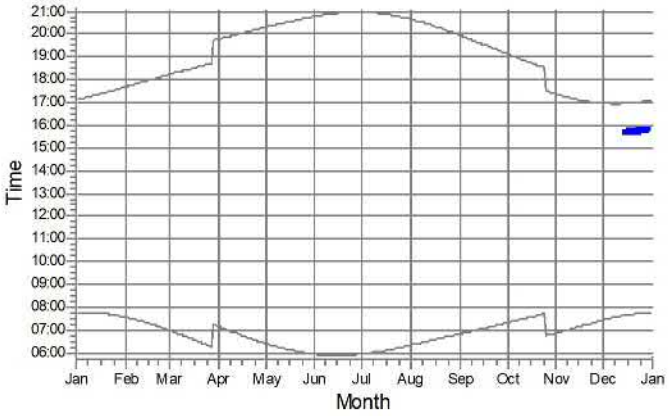
CM: R109



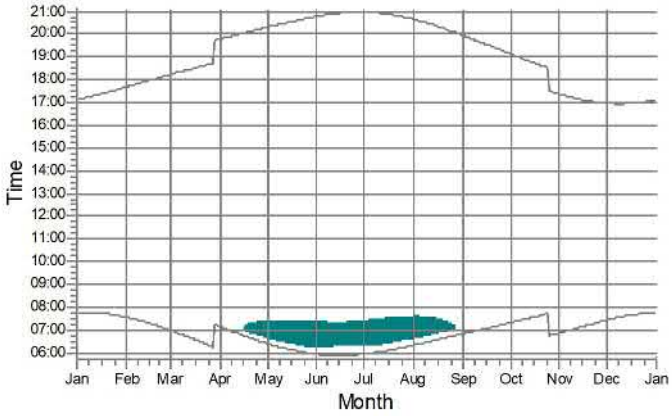
CN: R110



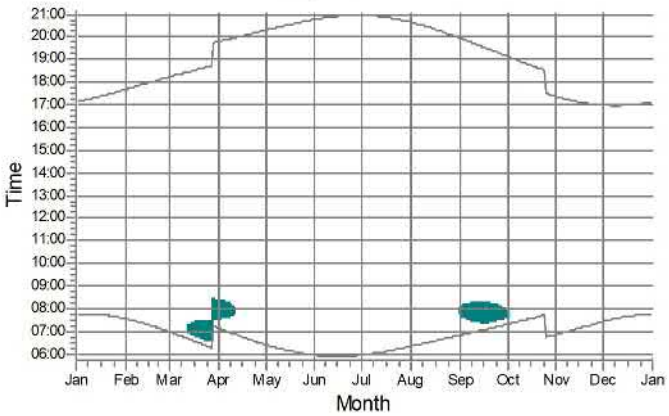
CO: R111



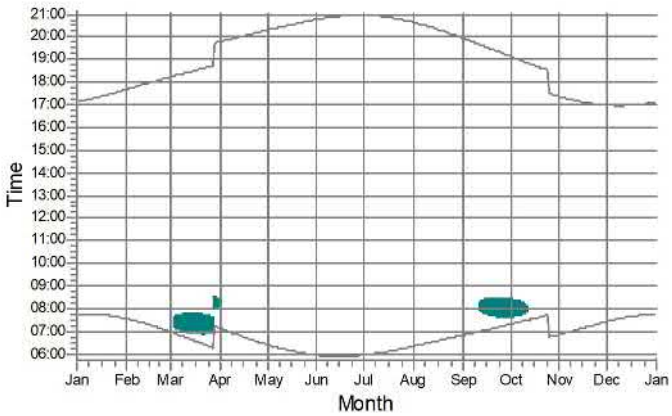
CP: R112



CQ: R113



CR: R114



WTGs

3: WT2 6: WT10

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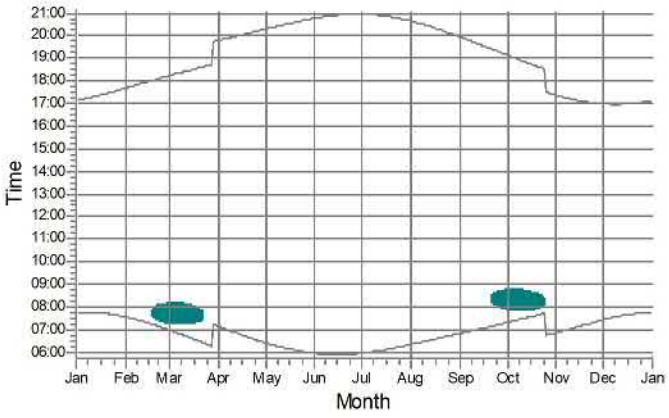
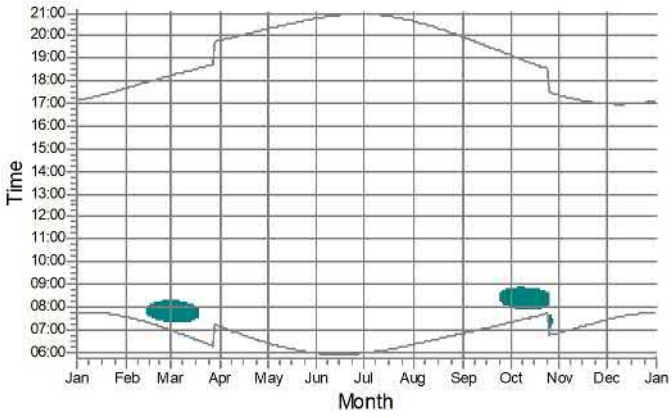
SHADOW - Calendar, graphical

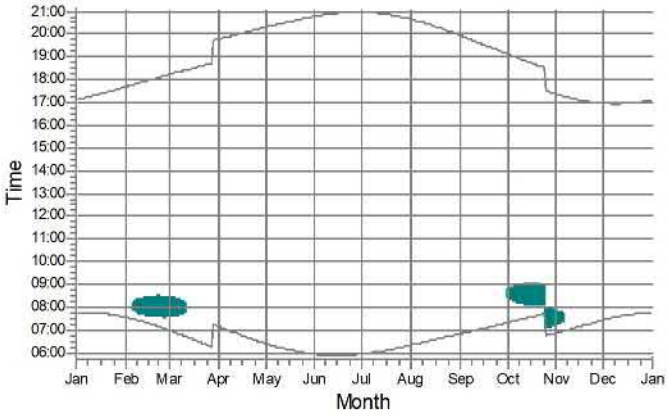
CS: R116



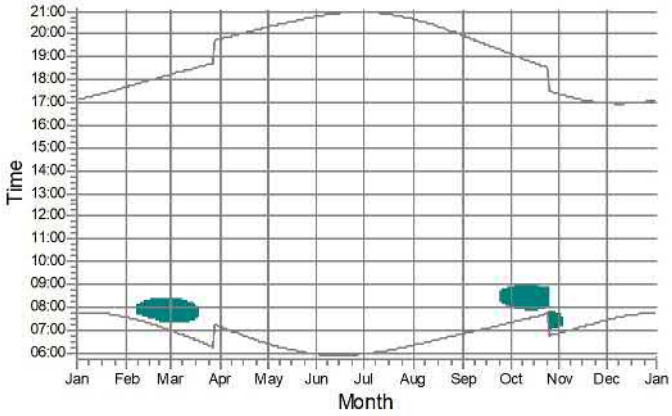
CT: R117



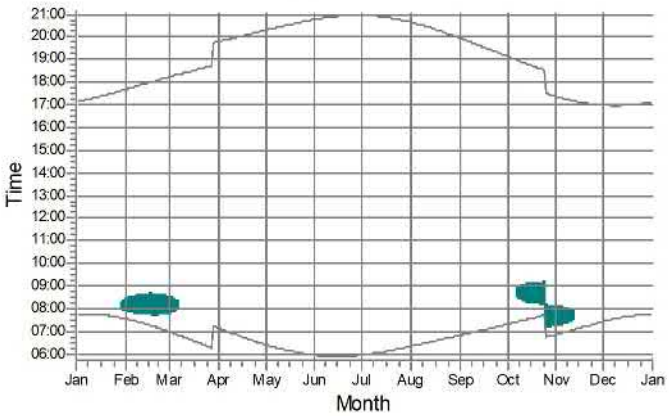
CU: R119



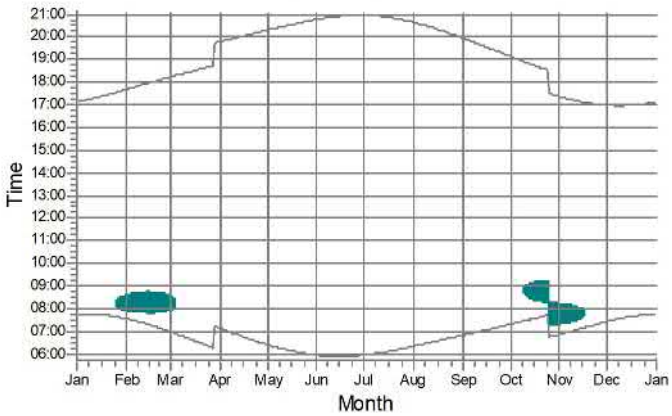
CV: R120



CW: R121



CX: R122



WTGs

6: WT10

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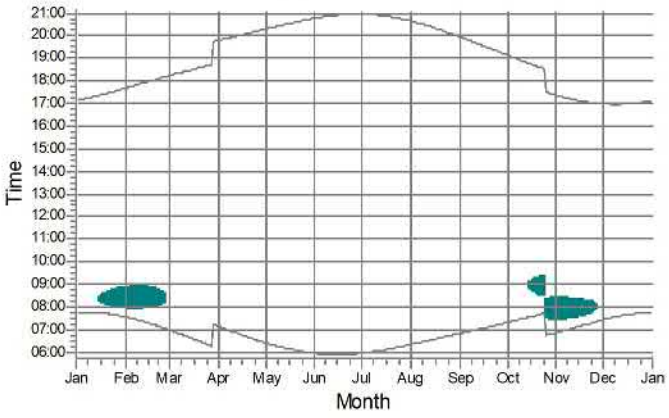
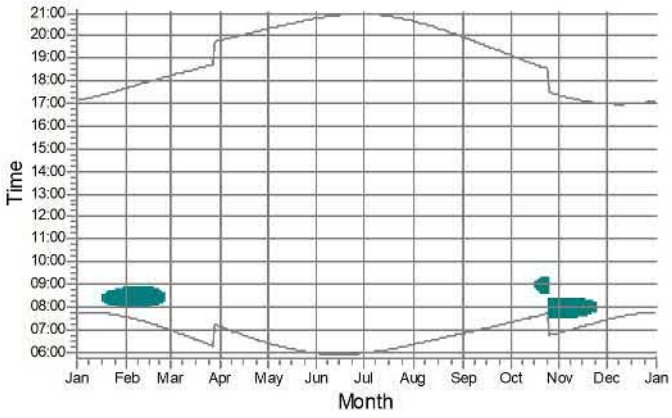
SHADOW - Calendar, graphical

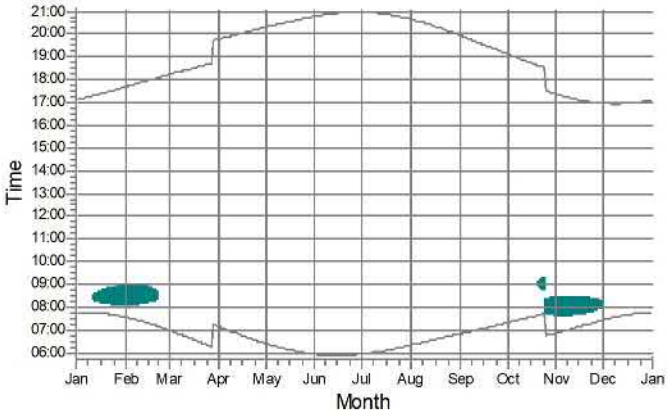
CY: R123



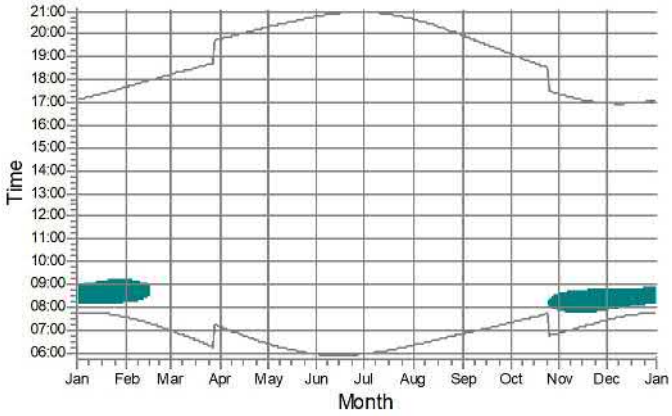
CZ: R124



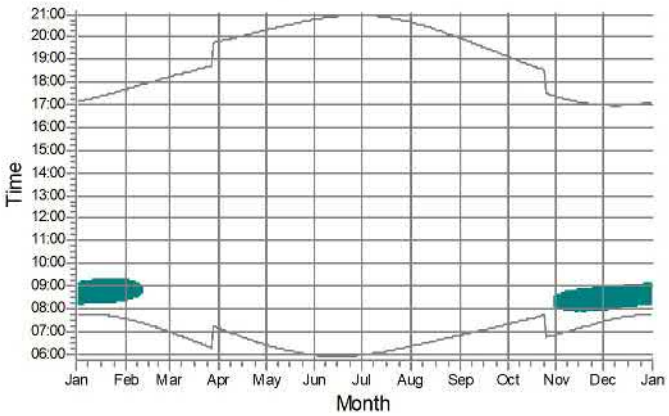
DA: R125



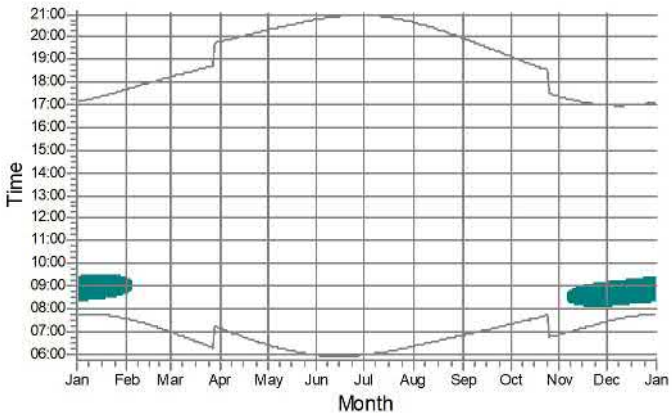
DB: R126



DC: R127



DD: R128



WTGs

6: WT10

Project:
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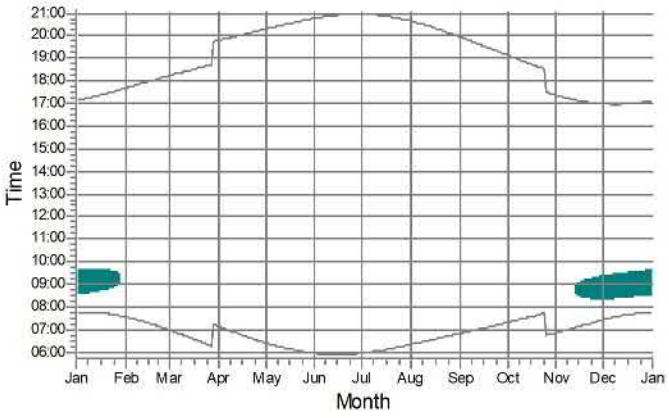
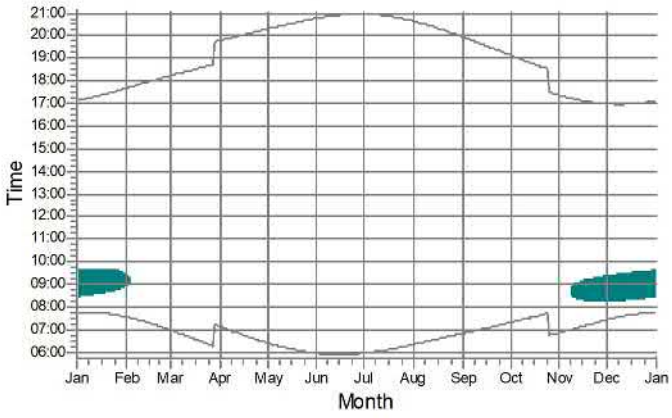
SHADOW - Calendar, graphical

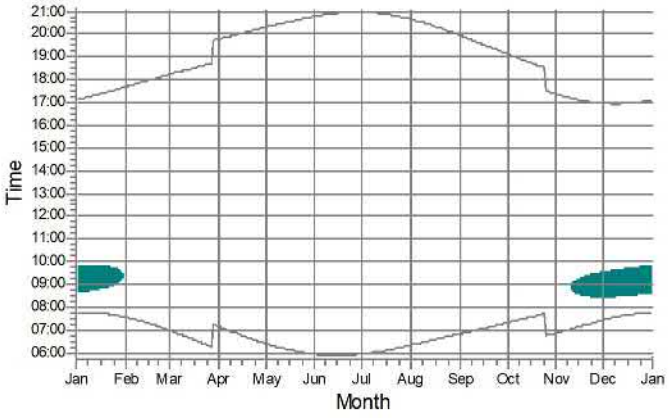
DE: R129



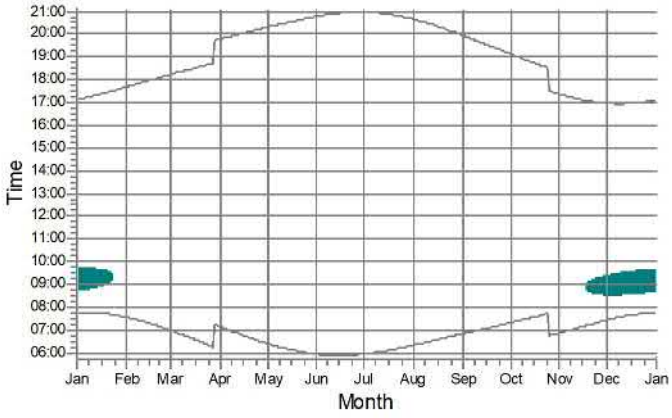
DF: R130



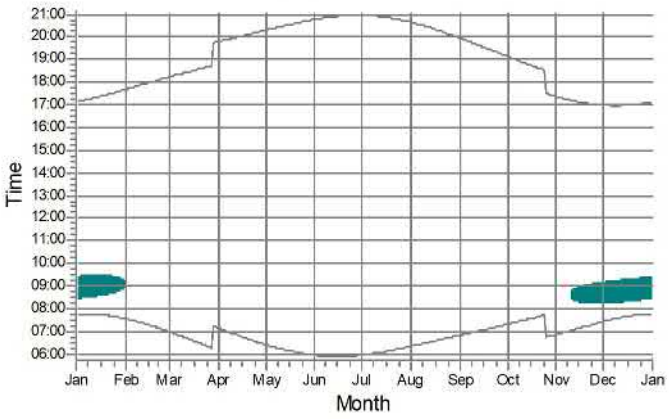
DG: R131



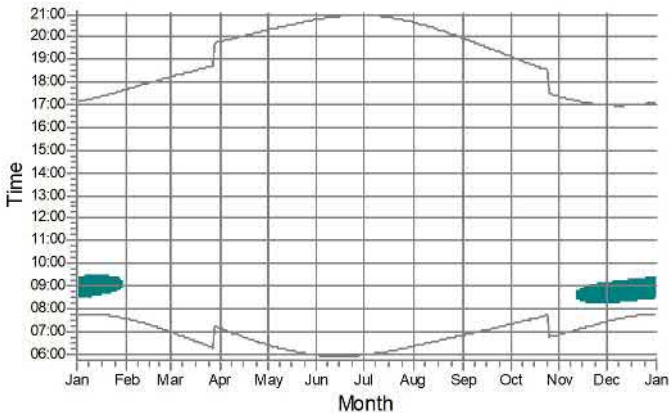
DH: R132



DI: R133



DJ: R134



WTGs

6: WT10

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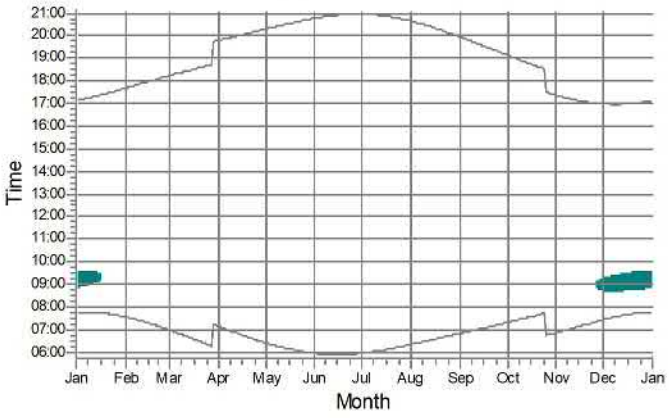
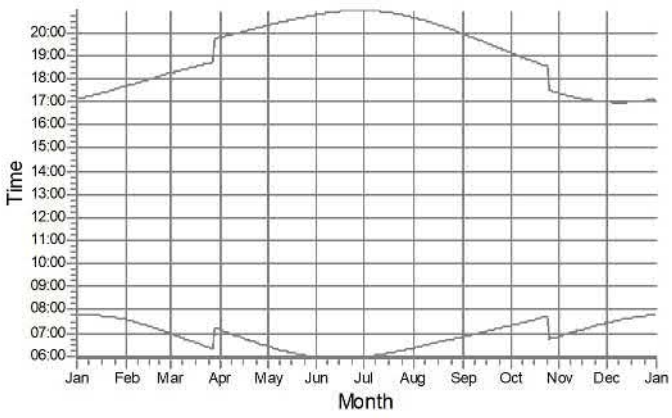
SHADOW - Calendar, graphical

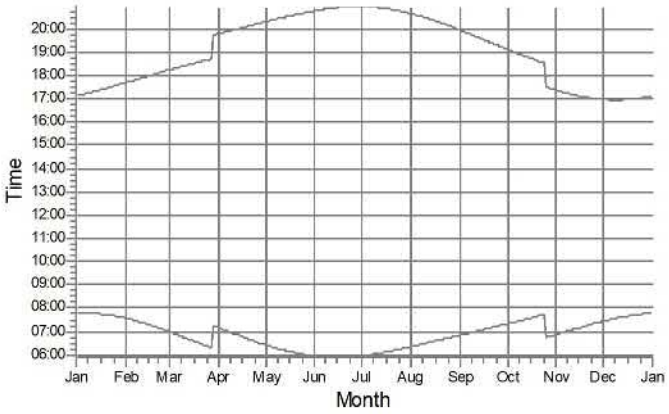
DK: R136



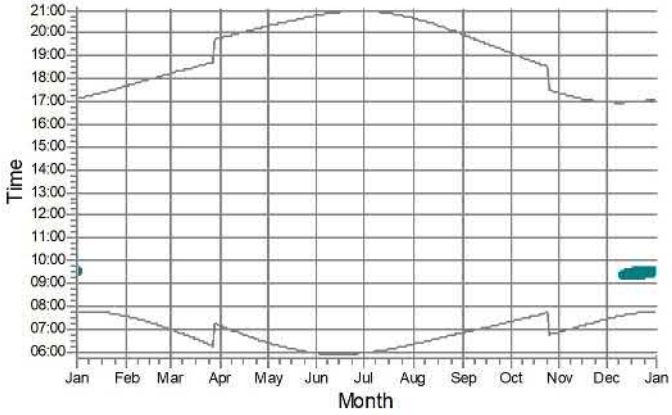
DL: R137



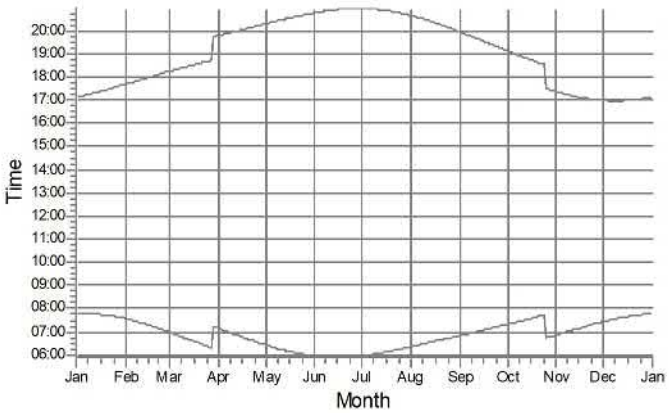
DM: R138



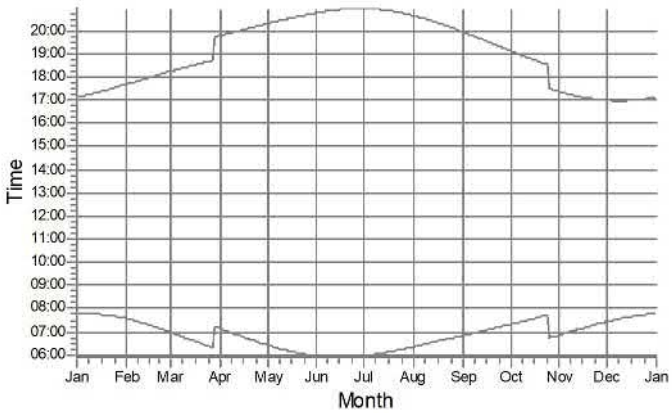
DN: R139



DO: R140



DP: R141



WTGs

6: WT10

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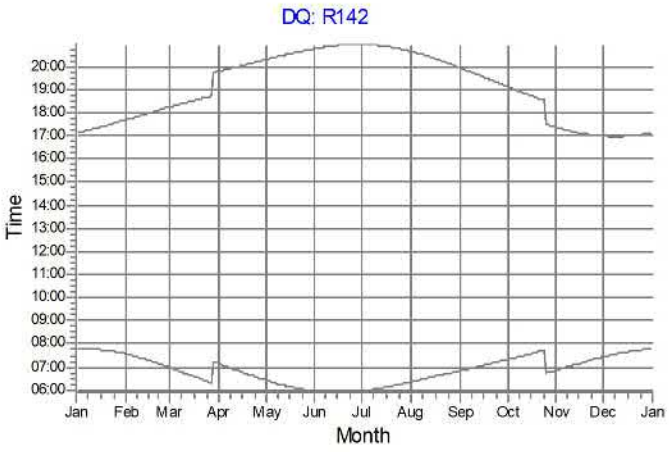
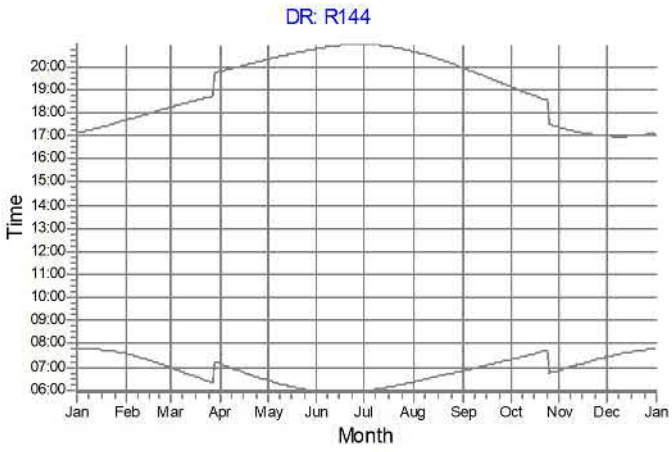
SHADOW - Calendar, graphical





WTGs

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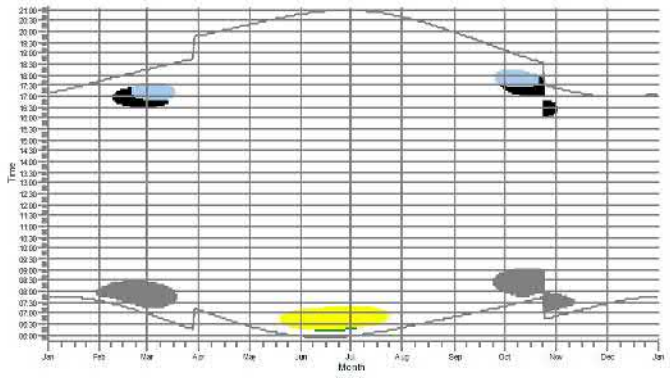
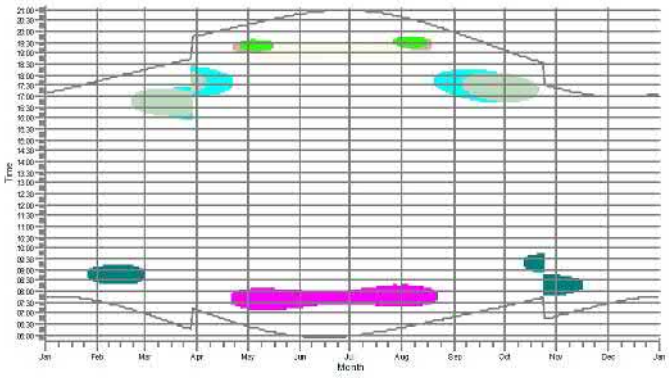
SHADOW - Calendar per WTG, graphical

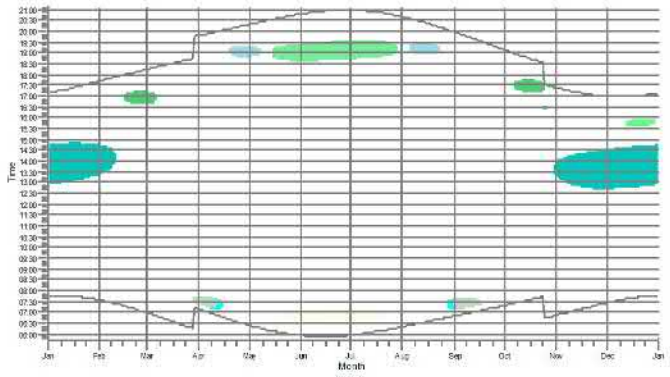
1: WT3



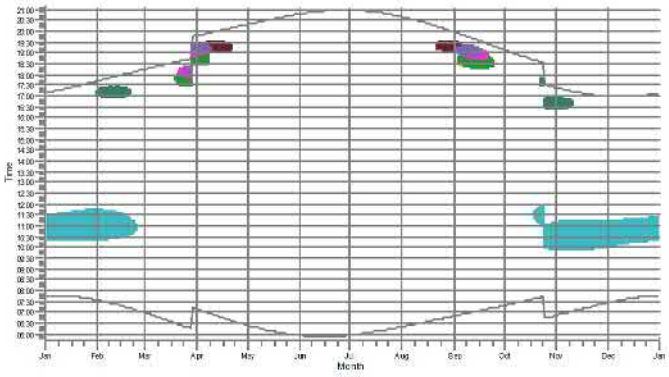
2: WT1



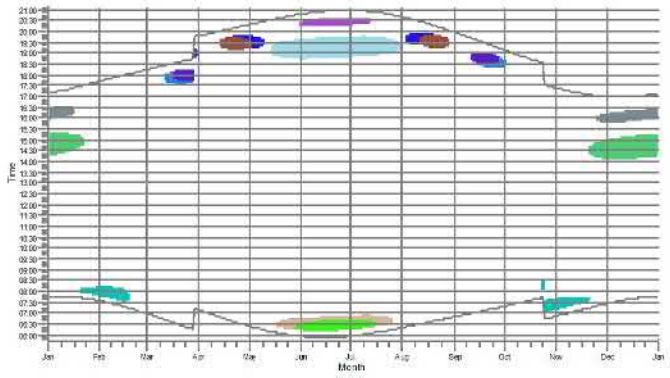
3: WT2



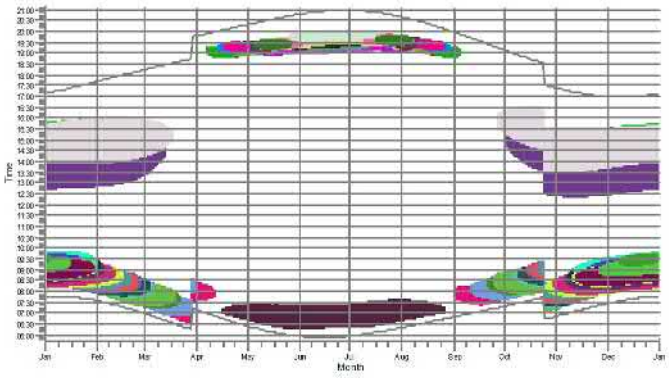
4: WT4



5: WT5



6: WT10



Shadow receptors

A: R025	P: R019	AD: R036	AO: R060	AZ: R068	BJ: R076	BS: R073	CR: R114	CZ: R124	DH: R132
B: R026	Q: R004	AE: R040	AP: R059	BA: R064	BK: R079	CI: R105	CS: R116	DA: R125	DI: R133
D: R027	S: R012	AG: R046	AQ: R057	BB: R077	BM: R080	CL: R108	CT: R117	DB: R126	DJ: R134
E: R006	T: R010	AH: R048	AR: R055	BC: R070	BN: R083	CM: R109	CU: R119	DC: R127	DK: R136
F: R007	U: R029	AI: R038	AS: R062	BD: R066	BO: R071	CN: R110	CV: R120	DD: R128	DN: R139
M: R003	W: R013	AJ: R047	AT: R056	BE: R065	BP: R074	CO: R111	CW: R121	DE: R129
N: R018	AB: R039	AM: R061	AU: R052	BG: R069	BQ: R081	CP: R112	CX: R122	DF: R130
O: R002	AC: R044	AN: R054	AX: R067	BI: R075	BR: R082	CQ: R113	CY: R123	DG: R131

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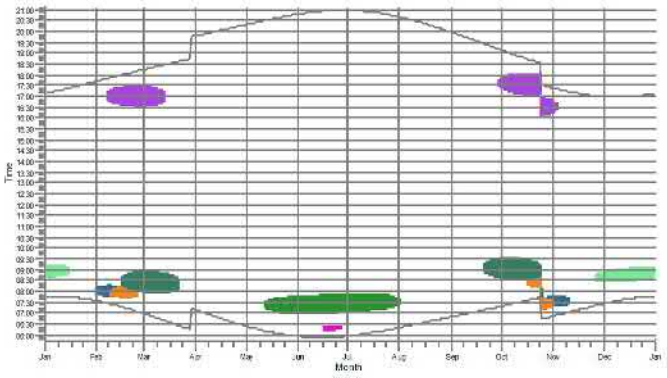
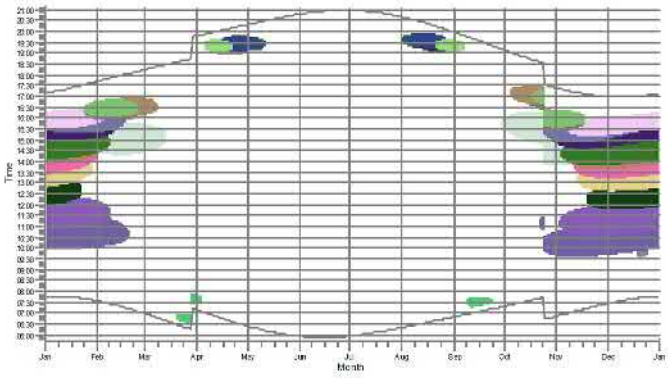
SHADOW - Calendar per WTG, graphical

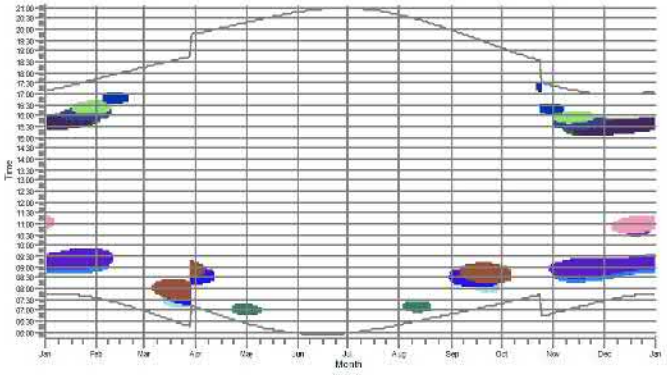
7: WT6



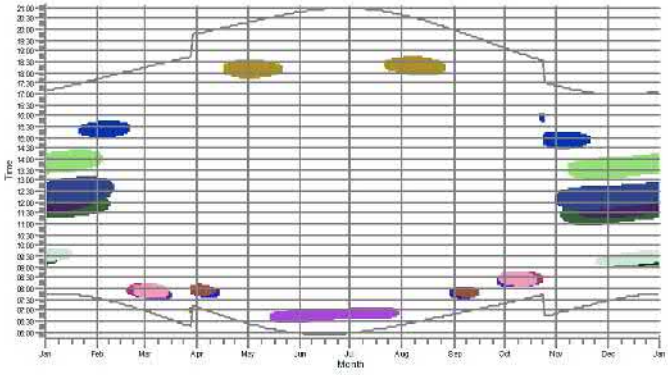
8: WT7



9: WT8



10: WT9



Shadow receptors

X: R014	AC: R044	AN: R054	AT: R056	BB: R077	BJ: R076	BN: R083	BU: R084	BY: R089	CC: R096
Y: R015	AD: R036	AP: R059	AU: R052	BF: R092	BK: R079	BP: R074	BV: R085	BZ: R087	CD: R097
Z: R031	AE: R040	AQ: R057	AV: R058	BH: R090	BL: R091	BQ: R081	BW: R086	CA: R095	CE: R099
AB: R039	AI: R038	AR: R055	AW: R078	BI: R075	BM: R080	BR: R082	BX: R088	CB: R094	CF: R100

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SHADOW - Calendar

Shadow receptor: A - R025

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June		July		August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:57		05:57	06:19 (1)	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46		20:57	15 06:34 (1)	20:39	19:57	19:07	17:22	16:59
2	07:46	07:33	06:57	07:08	06:23	05:56		05:58	06:20 (1)	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19	20:47		20:57	13 06:33 (1)	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56		05:58	06:21 (1)	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:17	19:49	20:20	20:48		20:57	11 06:32 (1)	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55		05:59	06:24 (1)	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49		20:57	7 06:31 (1)	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:20	05:55		05:59		06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49		20:57		20:35	19:51	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	05:55		06:00		06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50		20:56		20:33	19:49	18:59	17:16	16:58
7	07:47	07:28	06:50	07:00	06:17	05:54		06:00		06:26	06:56	07:25	06:59	07:32
	17:13	17:49	18:21	19:53	20:24	20:51		20:56		20:32	19:47	18:58	17:15	16:58
8	07:46	07:26	06:48	06:58	06:16	05:54		06:01		06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	4	06:24 (1)	20:56	20:31	19:46	18:56	17:14	16:58
9	07:46	07:25	06:46	06:56	06:15	05:54		06:18 (1)	06:02	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	9	06:27 (1)	20:55	20:30	19:44	18:55	17:13	16:58
10	07:46	07:24	06:45	06:55	06:14	05:54		06:16 (1)	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	12	06:28 (1)	20:55	20:29	19:42	18:53	17:12	16:58
11	07:46	07:23	06:43	06:53	06:13	05:54		06:15 (1)	06:03	06:30	07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	14	06:29 (1)	20:55	20:27	19:41	18:51	17:11	16:58
12	07:46	07:22	06:42	06:52	06:12	05:54		06:15 (1)	06:04	06:31	07:01	07:30	07:05	07:36
	17:18	17:55	18:26	19:58	20:29	20:53	15	06:30 (1)	20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	05:53		06:15 (1)	06:04	06:32	07:02	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	16	06:31 (1)	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:49	06:10	05:53		06:15 (1)	06:05	06:33	07:03	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	17	06:32 (1)	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53		06:15 (1)	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:30	20:01	20:32	20:55	18	06:33 (1)	20:53	20:22	19:34	18:45	17:08	16:58
16	07:44	07:17	06:35	06:46	06:08	05:53		06:15 (1)	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	18	06:33 (1)	20:52	20:21	19:32	18:44	17:07	16:59
17	07:44	07:16	06:34	06:44	06:07	05:53		06:15 (1)	06:07	06:36	07:05	07:35	07:11	07:40
	17:24	18:01	18:32	20:04	20:34	20:55	19	06:34 (1)	20:52	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:43	06:06	05:54		06:15 (1)	06:08	06:37	07:06	07:36	07:12	07:40
	17:25	18:02	18:33	20:05	20:35	20:56	19	06:34 (1)	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:54		06:16 (1)	06:09	06:38	07:07	07:38	07:13	07:41
	17:26	18:03	18:34	20:06	20:36	20:56	19	06:35 (1)	20:50	20:17	19:27	18:39	17:05	17:00
20	07:42	07:12	06:29	06:40	06:04	05:54		06:16 (1)	06:10	06:39	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:36	20:56	19	06:35 (1)	20:50	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54		06:16 (1)	06:11	06:40	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:57	19	06:35 (1)	20:49	20:14	19:24	18:37	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	05:54		06:16 (1)	06:12	06:41	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	19	06:35 (1)	20:48	20:12	19:22	18:35	17:03	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54		06:16 (1)	06:12	06:42	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	19	06:35 (1)	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:55		06:17 (1)	06:13	06:42	07:12	07:43	07:18	07:44
	17:32	18:09	18:39	20:11	20:40	20:57	19	06:36 (1)	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:05	06:21	06:32	06:01	05:55		06:17 (1)	06:14	06:43	07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	19	06:36 (1)	20:46	20:08	19:17	17:31	17:01	17:03
26	07:39	07:03	06:19	06:31	06:00	05:55		06:17 (1)	06:15	06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42	20:57	18	06:35 (1)	20:45	20:06	19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:56		06:18 (1)	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	18	06:36 (1)	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:59	05:56		06:18 (1)	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	17	06:35 (1)	20:43	20:03	19:12	17:27	17:00	17:05
29	07:36		07:14	06:27	05:58	05:56		06:19 (1)	06:18	06:47	07:17	06:49	07:24	07:46
	17:38		19:44	20:16	20:44	20:57	17	06:36 (1)	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:58	05:57		06:19 (1)	06:19	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	16	06:35 (1)	20:41	20:00	19:09	17:24	16:59	17:06
31	07:35		07:11		05:57				06:20	06:49		06:51		07:46
	17:40		19:46		20:46				20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450		457		426	375	346	300	290
Total, worst case						380			46					
Sun reduction						0.67			0.75					
Oper. time red.						0.37			0.37					
Wind dir. red.						0.73			0.73					
Total reduction						0.18			0.21					
Total, real						70			9					

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 2

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: B - R026

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May		June		July		August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24		05:57	06:22 (1)	05:57	06:24 (1)	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18		20:46 41	07:03 (1)	20:57 48	07:12 (1)	20:39	19:57	19:07	17:22	16:59
2	07:46	07:33	06:57	07:08	06:23		05:56	06:21 (1)	05:58	06:25 (1)	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19		20:47 42	07:03 (1)	20:57 47	07:12 (1)	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22		05:56	06:21 (1)	05:58	06:25 (1)	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:17	19:49	20:20		20:48 43	07:04 (1)	20:57 47	07:12 (1)	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21		05:55	06:21 (1)	05:59	06:26 (1)	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21		20:49 44	07:05 (1)	20:57 46	07:12 (1)	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:20		05:55	06:20 (1)	05:59	06:25 (1)	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22		20:49 45	07:05 (1)	20:57 47	07:12 (1)	20:35	19:51	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18		05:55	06:20 (1)	06:00	06:26 (1)	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23		20:50 46	07:06 (1)	20:56 46	07:12 (1)	20:33	19:49	18:59	17:16	16:58
7	07:47	07:28	06:50	06:59	06:17		05:54	06:20 (1)	06:00	06:27 (1)	06:26	06:56	07:25	06:59	07:32
	17:13	17:49	18:21	19:53	20:24		20:51 46	07:06 (1)	20:56 45	07:12 (1)	20:32	19:47	18:58	17:15	16:58
8	07:46	07:26	06:48	06:58	06:16		05:54	06:21 (1)	06:01	06:27 (1)	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25		20:51 46	07:07 (1)	20:56 44	07:11 (1)	20:31	19:46	18:56	17:14	16:58
9	07:46	07:25	06:46	06:56	06:15		05:54	06:21 (1)	06:02	06:28 (1)	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26		20:52 47	07:08 (1)	20:55 43	07:11 (1)	20:30	19:44	18:55	17:13	16:58
10	07:46	07:24	06:45	06:55	06:14		05:54	06:20 (1)	06:02	06:29 (1)	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27		20:52 47	07:07 (1)	20:55 42	07:11 (1)	20:29	19:42	18:53	17:12	16:58
11	07:46	07:23	06:43	06:53	06:13		05:54	06:20 (1)	06:03	06:29 (1)	06:30	07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28		20:53 48	07:08 (1)	20:55 41	07:10 (1)	20:27	19:41	18:51	17:11	16:58
12	07:46	07:22	06:42	06:52	06:12		05:54	06:20 (1)	06:04	06:30 (1)	06:31	07:01	07:30	07:05	07:36
	17:18	17:55	18:26	19:58	20:29		20:53 48	07:08 (1)	20:54 40	07:10 (1)	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11		05:53	06:20 (1)	06:04	06:32 (1)	06:32	07:02	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30		20:54 49	07:09 (1)	20:54 38	07:10 (1)	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:49	06:10		05:53	06:20 (1)	06:05	06:32 (1)	06:33	07:03	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31		20:54 49	07:09 (1)	20:53 37	07:09 (1)	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09		05:53	06:20 (1)	06:06	06:33 (1)	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:30	20:01	20:32		20:55 49	07:09 (1)	20:53 35	07:08 (1)	20:22	19:34	18:45	17:08	16:58
16	07:44	07:17	06:35	06:46	06:08		05:53	06:20 (1)	06:07	06:34 (1)	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33		20:55 50	07:10 (1)	20:52 34	07:08 (1)	20:21	19:32	18:44	17:07	16:59
17	07:44	07:16	06:34	06:44	06:07		05:53	06:20 (1)	06:07	06:36 (1)	06:36	07:05	07:35	07:11	07:40
	17:24	18:00	18:32	20:04	20:34		20:55 50	07:10 (1)	20:52 31	07:07 (1)	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:43	06:06		05:53	06:20 (1)	06:08	06:36 (1)	06:37	07:06	07:36	07:12	07:40
	17:25	18:02	18:33	20:05	20:35		20:56 50	07:10 (1)	20:51 29	07:05 (1)	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05		05:54	06:21 (1)	06:09	06:38 (1)	06:38	07:07	07:38	07:13	07:41
	17:26	18:03	18:34	20:06	20:36		20:56 50	07:11 (1)	20:50 26	07:04 (1)	20:17	19:27	18:39	17:04	17:00
20	07:42	07:12	06:29	06:40	06:04		05:54	06:21 (1)	06:10	06:40 (1)	06:39	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:36		20:56 50	07:11 (1)	20:50 23	07:03 (1)	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	06:38 (1)	05:54	06:21 (1)	06:11	06:42 (1)	06:40	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37 7	06:45 (1)	20:57 50	07:11 (1)	20:49 19	07:01 (1)	20:14	19:24	18:37	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	06:33 (1)	05:54	06:21 (1)	06:12	06:46 (1)	06:41	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38 16	06:49 (1)	20:57 50	07:11 (1)	20:48 12	06:58 (1)	20:12	19:22	18:35	17:03	17:01
23	07:41	07:07	06:24	06:35	06:02	06:31 (1)	05:54	06:21 (1)	06:12		06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39 20	06:51 (1)	20:57 50	07:11 (1)	20:47		20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	06:29 (1)	05:55	06:22 (1)	06:13		06:42	07:12	07:43	07:18	07:44
	17:32	18:09	18:39	20:11	20:40 25	06:54 (1)	20:57 50	07:12 (1)	20:46		20:09	19:19	18:32	17:01	17:02
25	07:39	07:05	06:21	06:32	06:01	06:27 (1)	05:55	06:22 (1)	06:14		06:43	07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12	20:41 28	06:55 (1)	20:57 50	07:12 (1)	20:46		20:08	19:17	17:31	17:01	17:03
26	07:39	07:03	06:19	06:31	06:00	06:27 (1)	05:55	06:22 (1)	06:15		06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42 30	06:57 (1)	20:57 50	07:12 (1)	20:45		20:06	19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	06:25 (1)	05:56	06:23 (1)	06:16		06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43 33	06:58 (1)	20:57 49	07:12 (1)	20:44		20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:59	06:24 (1)	05:56	06:23 (1)	06:17		06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43 35	06:59 (1)	20:57 49	07:12 (1)	20:43		20:03	19:12	17:27	17:00	17:05
29	07:36		07:14	06:27	05:58	06:24 (1)	05:56	06:24 (1)	06:18		06:47	07:17	06:49	07:24	07:46
	17:38		19:44	20:16	20:44 36	07:00 (1)	20:57 49	07:13 (1)	20:42		20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:58	06:23 (1)	05:57	06:24 (1)	06:19		06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45 37	07:00 (1)	20:57 48	07:12 (1)	20:41		20:00	19:09	17:24	16:59	17:06
31	07:35		07:11		05:57	06:22 (1)			06:20		06:49		06:51		07:46
	17:40		19:46		20:46 40	07:02 (1)			20:40		19:58		17:23		17:07
Potential sun hours	300	298	370	398	446		450		457		426	375	346	300	290
Total, worst case					307		1435		820						
Sun reduction					0.58		0.67		0.75						
Oper. time red.					0.37		0.37		0.37						
Wind dir. red.					0.74		0.74		0.74						
Total reduction					0.16		0.19		0.21						
Total, real					50		268		171						

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: C - R023

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:57	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:59
2	07:46	07:33	06:57	07:08	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:17	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:20	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:35	19:51	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:58
7	07:46	07:28	06:50	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:49	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:58
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16	07:44	07:17	06:35	06:46	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:59
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	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30	17:00	17:03
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	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	17:00	17:05
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:45
	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:58	05:57	06:19	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:35		07:11		05:57		06:20	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 4
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: D - R027

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	07:46			07:34		07:53 (1)	06:59		07:17 (1)	07:09	06:24	05:57
	17:08			17:41	11	08:04 (1)	18:14	66	08:23 (1)	19:47	20:18	20:46
2	07:46			07:33		07:52 (1)	06:57		07:17 (1)	07:08	06:23	05:56
	17:09			17:42	15	08:07 (1)	18:15	66	08:23 (1)	19:48	20:19	20:47
3	07:46			07:32		07:51 (1)	06:56		07:16 (1)	07:06	06:22	05:56
	17:09			17:44	18	08:09 (1)	18:16	66	08:22 (1)	19:49	20:20	20:48
4	07:47			07:31		07:50 (1)	06:54		07:17 (1)	07:04	06:21	05:55
	17:10			17:45	21	08:11 (1)	18:18	65	08:22 (1)	19:50	20:21	20:49
5	07:47			07:30		07:49 (1)	06:53		07:17 (1)	07:03	06:20	05:55
	17:11			17:46	24	08:13 (1)	18:19	63	08:20 (1)	19:51	20:22	20:49
6	07:47			07:29		07:48 (1)	06:51		07:18 (1)	07:01	06:18	05:55
	17:12			17:47	26	08:14 (1)	18:20	62	08:20 (1)	19:52	20:23	20:50
7	07:47			07:28		07:47 (1)	06:50		07:18 (1)	06:59	06:17	05:54
	17:13			17:49	29	08:16 (1)	18:21	60	08:18 (1)	19:53	20:24	20:51
8	07:46			07:26		07:46 (1)	06:48		07:20 (1)	06:58	06:16	05:54
	17:14			17:50	31	08:17 (1)	18:22	58	08:18 (1)	19:54	20:25	20:51
9	07:46			07:25		07:45 (1)	06:46		07:20 (1)	06:56	06:15	05:54
	17:15			17:51	34	08:19 (1)	18:23	56	08:16 (1)	19:55	20:26	20:52
10	07:46			07:24		07:44 (1)	06:45		07:20 (1)	06:55	06:14	05:54
	17:16			17:52	36	08:20 (1)	18:24	54	08:14 (1)	19:56	20:27	20:52
11	07:46			07:23		07:42 (1)	06:43		07:22 (1)	06:53	06:13	05:54
	17:17			17:53	38	08:20 (1)	18:25	51	08:13 (1)	19:57	20:28	20:53
12	07:46			07:22		07:41 (1)	06:42		07:23 (1)	06:52	06:12	05:53
	17:18			17:55	40	08:21 (1)	18:26	48	08:11 (1)	19:58	20:29	20:53
13	07:45			07:21		07:40 (1)	06:40		07:25 (1)	06:50	06:11	05:53
	17:19			17:56	42	08:22 (1)	18:27	44	08:09 (1)	19:59	20:30	20:54
14	07:45			07:19		07:39 (1)	06:38		07:26 (1)	06:49	06:10	05:53
	17:20			17:57	44	08:23 (1)	18:28	41	08:07 (1)	20:00	20:31	20:54
15	07:45			07:18		07:37 (1)	06:37		07:27 (1)	06:47	06:09	05:53
	17:21			17:58	46	08:23 (1)	18:30	37	08:04 (1)	20:01	20:32	20:55
16	07:44			07:17		07:36 (1)	06:35		07:30 (1)	06:46	06:08	05:53
	17:22			17:59	48	08:24 (1)	18:31	32	08:02 (1)	20:02	20:33	20:55
17	07:44			07:16		07:35 (1)	06:34		07:33 (1)	06:44	06:07	05:53
	17:24			18:00	50	08:25 (1)	18:32	25	07:58 (1)	20:04	20:34	20:55
18	07:44			07:14		07:33 (1)	06:32		07:37 (1)	06:43	06:06	05:53
	17:25			18:02	52	08:25 (1)	18:33	15	07:52 (1)	20:05	20:35	20:56
19	07:43			07:13		07:32 (1)	06:30			06:41	06:05	05:54
	17:26			18:03	53	08:25 (1)	18:34			20:06	20:36	20:56
20	07:42			07:12		07:31 (1)	06:29			06:40	06:04	05:54
	17:27			18:04	55	08:26 (1)	18:35			20:07	20:36	20:56
21	07:42			07:10		07:29 (1)	06:27			06:38	06:03	05:54
	17:28			18:05	56	08:25 (1)	18:36			20:08	20:37	20:57
22	07:41			07:09		07:28 (1)	06:25			06:37	06:03	05:54
	17:29			18:06	58	08:26 (1)	18:37			20:09	20:38	20:57
23	07:41			07:07		07:26 (1)	06:24			06:35	06:02	05:54
	17:30			18:07	59	08:25 (1)	18:38			20:10	20:39	20:57
24	07:40			07:06		07:25 (1)	06:22			06:34	06:01	05:55
	17:32			18:09	60	08:25 (1)	18:39			20:11	20:40	20:57
25	07:39			07:05		07:23 (1)	06:21			06:32	06:00	05:55
	17:33			18:10	62	08:25 (1)	18:40			20:12	20:41	20:57
26	07:39			07:03		07:22 (1)	06:19			06:31	06:00	05:55
	17:34			18:11	63	08:25 (1)	18:41			20:13	20:42	20:57
27	07:38			07:02		07:20 (1)	06:17			06:30	05:59	05:56
	17:35			18:12	64	08:24 (1)	18:42			20:14	20:43	20:57
28	07:37			07:00		07:19 (1)	06:16			06:28	05:59	05:56
	17:36			18:13	65	08:24 (1)	18:43			20:15	20:43	20:57
29	07:36						07:14			06:27	05:58	05:56
	17:38						19:44			20:16	20:44	20:57
30	07:35		07:55 (1)				07:12			06:26	05:58	05:57
	17:39	2	07:56 (1)				19:45			20:17	20:45	20:57
31	07:35		07:54 (1)				07:11				05:57	
	17:40	7	08:01 (1)				19:46				20:46	
Potential sun hours	300			298			370			398	446	450
Total, worst case		9			1200			909				
Sun reduction		0.40			0.43			0.47				
Oper. time red.		0.37			0.37			0.37				
Wind dir. red.		0.70			0.70			0.70				
Total reduction		0.11			0.11			0.12				
Total, real		1			137			113				

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

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

Project:
Flickering Nuoro Sud

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: D - R027

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October			November			December
1	05:57		06:20		06:50		07:19		08:03 (1)	06:52		07:13 (1)	07:26
	20:57		20:39		19:57		19:07	47	08:50 (1)	17:22	36	07:49 (1)	16:59
2	05:58		06:21		06:51		07:20		08:01 (1)	06:53		07:14 (1)	07:27
	20:57		20:38		19:55		19:06	50	08:51 (1)	17:21	33	07:47 (1)	16:58
3	05:58		06:22		06:52		07:21		08:00 (1)	06:54		07:16 (1)	07:28
	20:57		20:37		19:54		19:04	52	08:52 (1)	17:20	31	07:47 (1)	16:58
4	05:59		06:23		06:53		07:22		07:58 (1)	06:55		07:17 (1)	07:29
	20:57		20:36		19:52		19:03	55	08:53 (1)	17:18	29	07:46 (1)	16:58
5	05:59		06:24		06:54		07:23		07:57 (1)	06:57		07:18 (1)	07:30
	20:57		20:35		19:51		19:01	57	08:54 (1)	17:17	26	07:44 (1)	16:58
6	06:00		06:25		06:55		07:24		07:55 (1)	06:58		07:19 (1)	07:31
	20:56		20:33		19:49		18:59	59	08:54 (1)	17:16	23	07:42 (1)	16:58
7	06:00		06:26		06:56		07:25		07:54 (1)	06:59		07:21 (1)	07:32
	20:56		20:32		19:47		18:58	61	08:55 (1)	17:15	20	07:41 (1)	16:58
8	06:01		06:27		06:57		07:26		07:53 (1)	07:00		07:22 (1)	07:33
	20:56		20:31		19:46		18:56	63	08:56 (1)	17:14	17	07:39 (1)	16:57
9	06:02		06:28		06:58		07:27		07:52 (1)	07:01		07:23 (1)	07:34
	20:55		20:30		19:44		18:55	64	08:56 (1)	17:13	14	07:37 (1)	16:57
10	06:02		06:29		06:59		07:28		07:51 (1)	07:02		07:24 (1)	07:34
	20:55		20:29		19:42		18:53	65	08:56 (1)	17:12	11	07:35 (1)	16:58
11	06:03		06:30		07:00		07:29		07:51 (1)	07:04		07:26 (1)	07:35
	20:55		20:27		19:41		18:51	65	08:56 (1)	17:11	6	07:32 (1)	16:58
12	06:04		06:31		07:01		07:30		07:50 (1)	07:05			07:36
	20:54		20:26		19:39		18:50	67	08:57 (1)	17:10			16:58
13	06:04		06:32		07:02		07:31		07:51 (1)	07:06			07:37
	20:54		20:25		19:37		18:48	66	08:57 (1)	17:09			16:58
14	06:05		06:33		07:03		07:32		07:52 (1)	07:07			07:38
	20:53		20:23		19:36		18:47	65	08:57 (1)	17:08			16:58
15	06:06		06:34		07:03		07:33		07:53 (1)	07:08			07:38
	20:53		20:22		19:34		18:45	64	08:57 (1)	17:08			16:58
16	06:07		06:35		07:04		07:34		07:55 (1)	07:09			07:39
	20:52		20:21		19:32		18:44	62	08:57 (1)	17:07			16:59
17	06:07		06:36		07:05		07:35		07:56 (1)	07:11			07:40
	20:52		20:19		19:31		18:42	61	08:57 (1)	17:06			16:59
18	06:08		06:37		07:06		07:36		07:57 (1)	07:12			07:40
	20:51		20:18		19:29		18:41	60	08:57 (1)	17:05			16:59
19	06:09		06:38		07:07		07:38		07:58 (1)	07:13			07:41
	20:50		20:17		19:27		18:39	59	08:57 (1)	17:04			17:00
20	06:10		06:39		07:08		07:39		07:59 (1)	07:14			07:42
	20:50		20:15		19:26		18:38	57	08:56 (1)	17:04			17:00
21	06:11		06:40		07:09		07:40		08:00 (1)	07:15			07:42
	20:49		20:14		19:24		18:37	56	08:56 (1)	17:03			17:00
22	06:11		06:41		07:10		07:41		08:01 (1)	07:16			07:43
	20:48		20:12		19:22		18:35	54	08:55 (1)	17:03			17:01
23	06:12		06:41		07:11		07:42		08:02 (1)	07:17			07:43
	20:47		20:11		19:21		18:34	53	08:55 (1)	17:02			17:01
24	06:13		06:42		07:12		07:43		08:04 (1)	07:18			07:44
	20:46		20:09		19:19		18:32	51	08:55 (1)	17:01			17:02
25	06:14		06:43		07:13		08:23 (1)		06:44		07:05 (1)	07:20	07:44
	20:46		20:08		19:17	10	08:33 (1)		17:31	49	07:54 (1)	17:01	17:03
26	06:15		06:44		07:14		08:17 (1)		06:45		07:06 (1)	07:21	07:45
	20:45		20:06		19:16	22	08:39 (1)		17:30	48	07:54 (1)	17:00	17:03
27	06:16		06:45		07:15		08:13 (1)		06:46		07:07 (1)	07:22	07:45
	20:44		20:05		19:14	29	08:42 (1)		17:28	46	07:53 (1)	17:00	17:04
28	06:17		06:46		07:16		08:10 (1)		06:47		07:08 (1)	07:23	07:45
	20:43		20:03		19:12	35	08:45 (1)		17:27	44	07:52 (1)	17:00	17:04
29	06:18		06:47		07:17		08:07 (1)		06:49		07:10 (1)	07:24	07:46
	20:42		20:02		19:11	40	08:47 (1)		17:26	42	07:52 (1)	16:59	17:05
30	06:19		06:48		07:18		08:05 (1)		06:50		07:11 (1)	07:25	07:46
	20:41		20:00		19:09	43	08:48 (1)		17:24	40	07:51 (1)	16:59	17:06
31	06:20		06:49						06:51		07:12 (1)		07:46
	20:40		19:58						17:23	38	07:50 (1)		17:07
Potential sun hours	457		426		375				346			300	290
Total, worst case						179				1720		246	
Sun reduction						0.64				0.56		0.48	
Oper. time red.						0.37				0.37		0.37	
Wind dir. red.						0.70				0.70		0.70	
Total reduction						0.17				0.15		0.13	
Total, real						30				252		31	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 6

Licensed user:

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: E - R006

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	07:17 (2) 05:56	07:20 (2) 05:57	07:30 (2) 06:20	07:23 (2) 06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18 44	08:01 (2) 20:47 38	07:58 (2) 20:57 28	07:58 (2) 20:39 50	08:13 (2) 19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	07:16 (2) 05:56	07:20 (2) 05:58	07:31 (2) 06:21	07:23 (2) 06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 46	08:02 (2) 20:47 37	07:57 (2) 20:57 28	07:59 (2) 20:38 51	08:14 (2) 19:55	19:06	17:21	16:58
3	07:47	07:32	06:56	07:06	06:22	07:15 (2) 05:56	07:21 (2) 05:58	07:30 (2) 06:22	07:23 (2) 06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20 47	08:02 (2) 20:48 36	07:57 (2) 20:57 29	07:59 (2) 20:37 51	08:14 (2) 19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	07:15 (2) 05:55	07:22 (2) 05:59	07:30 (2) 06:23	07:23 (2) 06:53	07:22	06:56	07:29
	17:10	17:45	18:18	19:50	20:21 48	08:03 (2) 20:49 34	07:56 (2) 20:57 30	08:00 (2) 20:36 51	08:14 (2) 19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	07:15 (2) 05:55	07:22 (2) 05:59	07:29 (2) 06:24	07:23 (2) 06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22 48	08:03 (2) 20:49 33	07:55 (2) 20:57 31	08:00 (2) 20:35 50	08:13 (2) 19:51	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	07:14 (2) 05:55	07:23 (2) 06:00	07:29 (2) 06:25	07:24 (2) 06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 49	08:03 (2) 20:50 32	07:55 (2) 20:56 32	08:01 (2) 20:33 49	08:13 (2) 19:49	18:59	17:16	16:58
7	07:47	07:28	06:50	06:59	06:17	07:14 (2) 05:54	07:24 (2) 06:00	07:29 (2) 06:26	07:24 (2) 06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 50	08:04 (2) 20:51 31	07:55 (2) 20:56 33	08:02 (2) 20:32 49	08:13 (2) 19:47	18:58	17:15	16:57
8	07:46	07:27	06:48	06:58	06:16	07:13 (2) 05:54	07:25 (2) 06:01	07:28 (2) 06:27	07:24 (2) 06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25 50	08:03 (2) 20:51 30	07:55 (2) 20:56 34	08:02 (2) 20:31 49	08:13 (2) 19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	07:13 (2) 05:54	07:24 (2) 06:02	07:29 (2) 06:28	07:24 (2) 06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26 50	08:03 (2) 20:52 30	07:54 (2) 20:56 35	08:04 (2) 20:30 47	08:11 (2) 19:44	18:55	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	07:12 (2) 05:54	07:25 (2) 06:02	07:28 (2) 06:29	07:24 (2) 06:59	07:28	07:02	07:35
	17:16	17:52	18:24	19:56	20:27 51	08:03 (2) 20:52 29	07:54 (2) 20:55 36	08:04 (2) 20:29 47	08:11 (2) 19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	07:12 (2) 05:54	07:26 (2) 06:03	07:28 (2) 06:30	07:25 (2) 07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28 51	08:03 (2) 20:53 28	07:54 (2) 20:55 37	08:05 (2) 20:27 45	08:10 (2) 19:41	18:51	17:11	16:58
12	07:46	07:22	06:42	06:52	06:12	07:12 (2) 05:53	07:27 (2) 06:04	07:28 (2) 06:31	07:25 (2) 07:01	07:30	07:05	07:36
	17:18	17:55	18:26	19:58	20:29 51	08:03 (2) 20:53 26	07:53 (2) 20:54 38	08:06 (2) 20:26 44	08:09 (2) 19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	07:12 (2) 05:53	07:27 (2) 06:04	07:28 (2) 06:32	07:26 (2) 07:02	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30 51	08:03 (2) 20:54 26	07:53 (2) 20:54 39	08:07 (2) 20:25 43	08:09 (2) 19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:49	06:10	07:12 (2) 05:53	07:28 (2) 06:05	07:26 (2) 06:33	07:27 (2) 07:03	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 50	08:02 (2) 20:54 25	07:53 (2) 20:53 40	08:06 (2) 20:23 41	08:08 (2) 19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	07:13 (2) 05:53	07:28 (2) 06:06	07:26 (2) 06:34	07:28 (2) 07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 50	08:03 (2) 20:55 25	07:53 (2) 20:53 41	08:07 (2) 20:22 39	08:07 (2) 19:34	18:45	17:08	16:58
16	07:44	07:17	06:35	06:45	06:08	07:13 (2) 05:53	07:29 (2) 06:07	07:26 (2) 06:35	07:29 (2) 07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:03	20:33 50	08:03 (2) 20:55 24	07:53 (2) 20:52 42	08:08 (2) 20:21 36	08:05 (2) 19:32	18:44	17:07	16:58
17	07:44	07:16	06:34	06:44	06:07	07:13 (2) 05:53	07:29 (2) 06:07	07:25 (2) 06:36	07:30 (2) 07:05	07:35	07:11	07:40
	17:23	18:00	18:32	20:04	20:34 49	08:02 (2) 20:55 24	07:53 (2) 20:52 43	08:08 (2) 20:19 34	08:04 (2) 19:31	18:42	17:06	16:59
18	07:44	07:14	06:32	06:42	06:06	07:13 (2) 05:53	07:29 (2) 06:08	07:25 (2) 06:37	07:32 (2) 07:06	07:37	07:12	07:41
	17:25	18:02	18:33	20:05	20:35 49	08:02 (2) 20:56 24	07:53 (2) 20:51 44	08:09 (2) 20:18 30	08:02 (2) 19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	07:13 (2) 05:54	07:30 (2) 06:09	07:25 (2) 06:38	07:34 (2) 07:07	07:38	07:13	07:41
	17:26	18:03	18:34	20:06	20:36 49	08:02 (2) 20:56 23	07:53 (2) 20:50 45	08:10 (2) 20:17 26	08:00 (2) 19:27	18:39	17:04	16:59
20	07:43	07:12	06:29	06:40	06:04	07:13 (2) 05:54	07:31 (2) 06:10	07:25 (2) 06:39	07:36 (2) 07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:37 48	08:01 (2) 20:56 22	07:53 (2) 20:50 45	08:10 (2) 20:15 21	07:57 (2) 19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	07:14 (2) 05:54	07:31 (2) 06:11	07:25 (2) 06:40	07:40 (2) 07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37 47	08:01 (2) 20:57 22	07:53 (2) 20:49 46	08:11 (2) 20:14 13	07:53 (2) 19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37 07:34 (2)	06:03	07:14 (2) 05:54	07:31 (2) 06:11	07:24 (2) 06:40		07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09 14 07:48 (2)	20:38 47	08:01 (2) 20:57 22	07:53 (2) 20:48 47	08:11 (2) 20:12		19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35 07:30 (2)	06:02	07:14 (2) 05:54	07:31 (2) 06:12	07:24 (2) 06:41		07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10 22 07:52 (2)	20:39 46	08:00 (2) 20:57 23	07:54 (2) 20:47 47	08:11 (2) 20:11		19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34 07:28 (2)	06:01	07:16 (2) 05:54	07:32 (2) 06:13	07:24 (2) 06:42		07:12	07:43	07:19	07:44
	17:32	18:09	18:39	20:11 26 07:54 (2)	20:40 44	08:00 (2) 20:57 23	07:55 (2) 20:47 48	08:12 (2) 20:09		19:19	18:32	17:01	17:02
25	07:39	07:05	06:21	06:32 07:25 (2)	06:00	07:16 (2) 05:55	07:31 (2) 06:14	07:24 (2) 06:43		07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12 30 07:55 (2)	20:41 44	08:00 (2) 20:57 24	07:55 (2) 20:46 48	08:12 (2) 20:08		19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31 07:23 (2)	06:00	07:16 (2) 05:55	07:31 (2) 06:15	07:24 (2) 06:44		07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13 34 07:57 (2)	20:42 43	07:59 (2) 20:57 24	07:55 (2) 20:45 49	08:13 (2) 20:06		19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30 07:22 (2)	05:59	07:17 (2) 05:55	07:32 (2) 06:16	07:24 (2) 06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14 37 07:59 (2)	20:43 42	07:59 (2) 20:57 24	07:56 (2) 20:44 49	08:13 (2) 20:05		19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28 07:20 (2)	05:59	07:17 (2) 05:56	07:31 (2) 06:17	07:24 (2) 06:46		07:16	06:48	07:23	07:45
	17:36	18:13	18:43	20:15 39 07:59 (2)	20:43 41	07:58 (2) 20:57 25	07:56 (2) 20:43 50	08:14 (2) 20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27 07:19 (2)	05:58	07:18 (2) 05:56	07:31 (2) 06:18	07:23 (2) 06:47		07:17	06:49	07:24	07:46
	17:38		19:44	20:16 41 08:00 (2)	20:44 40	07:58 (2) 20:57 25	07:56 (2) 20:42 50	08:13 (2) 20:02		19:11	17:26	16:59	17:05
30	07:35		07:12	06:26 07:18 (2)	05:57	07:18 (2) 05:57	07:31 (2) 06:19	07:23 (2) 06:48		07:18	06:50	07:25	07:46
	17:39		19:45	20:17 43 08:01 (2)	20:45 39	07:57 (2) 20:57 26	07:57 (2) 20:41 50	08:13 (2) 20:00		19:09	17:24	16:59	17:06
31	07:35		07:11		05:57	07:19 (2)	06:19	07:23 (2) 06:49			06:51		07:46
	17:40		19:46		20:46 39	07:58 (2)	20:40 50	08:13 (2) 19:59			17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				286	1453	815	1264	866				
Sun reduction				0.51	0.58	0.67	0.75	0.72				
Oper. time red.				0.37	0.37	0.37	0.37	0.37				
Wind dir. red.				0.75	0.75	0.75	0.75	0.75				
Total reduction				0.14	0.16	0.19	0.21	0.20				
Total, real				41	238	154	268	176				

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 7

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: F - R007

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34 08:31 (2)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52 07:55 (2)	07:26
	17:08	17:41 32 09:03 (2)	18:14	19:47	20:18	20:47	20:57	20:39	19:57	19:07	17:22 45 08:40 (2)	16:58
2	07:46	07:33 08:30 (2)	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53 07:56 (2)	07:27
	17:08	17:42 34 09:04 (2)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21 44 08:40 (2)	16:58
3	07:47	07:32 08:29 (2)	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54 07:56 (2)	07:28
	17:09	17:44 36 09:05 (2)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20 43 08:39 (2)	16:58
4	07:47	07:31 08:28 (2)	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:56 07:57 (2)	07:29
	17:10	17:45 38 09:06 (2)	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18 42 08:39 (2)	16:58
5	07:47	07:30 08:28 (2)	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57 07:57 (2)	07:30
	17:11	17:46 39 09:07 (2)	18:19	19:51	20:22	20:49	20:57	20:35	19:51	19:01	17:17 41 08:38 (2)	16:58
6	07:47	07:29 08:27 (2)	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58 07:58 (2)	07:31
	17:12	17:47 41 09:08 (2)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16 39 08:37 (2)	16:58
7	07:47	07:28 08:27 (2)	06:50	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59 07:59 (2)	07:32
	17:13	17:48 42 09:09 (2)	18:21	19:53	20:24	20:51	20:56	20:32	19:47	18:58	17:15 38 08:37 (2)	16:57
8	07:46	07:27 08:27 (2)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00 08:00 (2)	07:33
	17:14	17:50 43 09:10 (2)	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14 36 08:36 (2)	16:57
9	07:46	07:25 08:26 (2)	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:27	07:01 08:01 (2)	07:34
	17:15	17:51 44 09:10 (2)	18:23	19:55	20:26	20:52	20:56	20:30	19:44	18:55	17:13 34 08:35 (2)	16:57
10	07:46	07:24 08:26 (2)	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02 08:02 (2)	07:35
	17:16	17:52 45 09:11 (2)	18:24	19:56	20:27	20:52	20:55	20:29	19:42	18:53	17:12 32 08:34 (2)	16:57
11	07:46	07:23 08:25 (2)	06:43	06:53	06:13	05:54	06:03	06:30	07:00	07:29	07:04 08:04 (2)	07:35
	17:17	17:53 45 09:10 (2)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11 29 08:33 (2)	16:58
12	07:46	07:22 08:25 (2)	06:42	06:52	06:12	05:53	06:04	06:31	07:01	07:30	07:05 08:06 (2)	07:36
	17:18	17:54 46 09:11 (2)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10 26 08:32 (2)	16:58
13	07:45	07:21 08:25 (2)	06:40	06:50	06:11	05:53	06:04	06:32	07:02	07:31 09:14 (2)	07:06 08:07 (2)	07:37
	17:19	17:56 46 09:11 (2)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48 9 09:23 (2)	17:09 23 08:30 (2)	16:58
14	07:45	07:19 08:26 (2)	06:38	06:49	06:10	05:53	06:05	06:33	07:03	07:32 09:09 (2)	07:07 08:09 (2)	07:38
	17:20	17:57 45 09:11 (2)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47 18 09:27 (2)	17:08 19 08:28 (2)	16:58
15	07:45	07:18 08:25 (2)	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33 09:06 (2)	07:08 08:13 (2)	07:39
	17:21	17:58 45 09:10 (2)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45 24 09:30 (2)	17:07 12 08:25 (2)	16:58
16	07:44	07:17 08:26 (2)	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34 09:05 (2)	07:09	07:39
	17:22	17:59 44 09:10 (2)	18:31	20:03	20:33	20:55	20:52	20:21	19:32	18:44 28 09:33 (2)	17:07	16:58
17	07:44	07:16 08:26 (2)	06:34	06:44	06:07	05:53	06:07	06:36	07:05	07:35 09:03 (2)	07:11	07:40
	17:23	18:00 44 09:10 (2)	18:32	20:04	20:34	20:55	20:52	20:19	19:31	18:42 31 09:34 (2)	17:06	16:59
18	07:44	07:14 08:26 (2)	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:37 09:01 (2)	07:12	07:41
	17:25	18:02 43 09:09 (2)	18:33	20:05	20:35	20:56	20:51	20:18	19:29	18:41 34 09:35 (2)	17:05	16:59
19	07:43	07:13 08:26 (2)	06:30	06:41	06:05	05:53	06:09	06:38	07:07	07:38 09:00 (2)	07:13	07:41
	17:26	18:03 43 09:09 (2)	18:34	20:06	20:36	20:56	20:50	20:17	19:27	18:39 36 09:36 (2)	17:04	16:59
20	07:43	07:12 08:27 (2)	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39 08:59 (2)	07:14	07:42
	17:27	18:04 41 09:08 (2)	18:35	20:07	20:37	20:56	20:50	20:15	19:26	18:38 38 09:37 (2)	17:04	17:00
21	07:42	07:10 08:27 (2)	06:27	06:38	06:03	05:54	06:11	06:40	07:09	07:40 08:58 (2)	07:15	07:42
	17:28	18:05 40 09:07 (2)	18:36	20:08	20:37	20:57	20:49	20:14	19:24	18:36 40 09:38 (2)	17:03	17:00
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	17:29	18:06 38 09:06 (2)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 41 09:38 (2)	17:02	17:01
23	07:41	07:07 08:29 (2)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42 08:57 (2)	07:17	07:43
	17:30	18:07 35 09:04 (2)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34 43 09:40 (2)	17:02	17:01
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	17:32	18:09 33 09:03 (2)	18:39	20:11	20:40	20:57	20:47	20:09	19:19	18:32 44 09:40 (2)	17:01	17:02
25	07:39	07:05 08:31 (2)	06:21	06:32	06:00	05:55	06:14	06:43	07:13	06:44 07:56 (2)	07:20	07:44
	17:33	18:10 30 09:01 (2)	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31 44 08:40 (2)	17:01	17:02
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	17:34	18:11 26 08:59 (2)	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30 45 08:40 (2)	17:00	17:03
27	07:38 08:40 (2)	07:02 08:36 (2)	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46 07:55 (2)	07:22	07:45
	17:35 13 08:53 (2)	18:12 21 08:57 (2)	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28 45 08:40 (2)	17:00	17:04
28	07:37 08:37 (2)	07:00 08:38 (2)	06:16	06:28	05:59	05:56	06:17	06:46	07:16	06:48 07:54 (2)	07:23	07:45
	17:36 19 08:56 (2)	18:13 15 08:53 (2)	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 46 08:40 (2)	16:59	17:04
29	07:36 08:35 (2)		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49 07:55 (2)	07:24	07:46
	17:38 23 08:58 (2)		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26 46 08:41 (2)	16:59	17:05
30	07:35 08:33 (2)		07:12	06:26	05:57	05:57	06:19	06:48	07:18	06:50 07:55 (2)	07:25	07:46
	17:39 27 09:00 (2)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 45 08:40 (2)	16:59	17:06
31	07:35 08:32 (2)		07:11		05:57		06:19	06:49		06:51 07:55 (2)		07:46
	17:40 30 09:02 (2)		19:46		20:46		20:40	19:59		17:23 45 08:40 (2)		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case	112	1074								702	503	
Sun reduction	0.40	0.43								0.56	0.48	
Oper. time red.	0.37	0.37								0.37	0.37	
Wind dir. red.	0.65	0.65								0.65	0.65	
Total reduction	0.10	0.10								0.13	0.12	
Total, real	11	112								95	58	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 8

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: G - R005

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:47	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:35	19:51	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:58
7	07:47	07:28	06:50	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:51	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:55	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:35
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:29	19:42	18:53	17:12	16:57
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13	07:45	07:21	06:40	06:50	06:11	05:53	06:04	06:32	07:02	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:49	06:10	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:58
17	07:44	07:16	06:34	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:11	07:40
	17:23	18:00	18:32	20:04	20:34	20:55	20:52	20:19	19:31	18:42	17:06	16:59
18	07:44	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	07:12	07:40
	17:25	18:02	18:33	20:05	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:38	07:13	07:41
	17:26	18:03	18:34	20:06	20:36	20:56	20:50	20:17	19:27	18:39	17:04	16:59
20	07:42	07:12	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:36	20:56	20:50	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:40	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:57	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:55	06:13	06:42	07:12	07:43	07:19	07:44
	17:32	18:09	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:05	06:21	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:59	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:46
	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:19	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:35		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 9

Licensed user:
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: H - R016

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:35	19:50	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:58
7	07:46	07:28	06:50	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:51	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:55	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:34
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14	07:45	07:19	06:38	06:49	06:10	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:08	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:59
17	07:44	07:16	06:34	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:11	07:40
	17:23	18:00	18:32	20:03	20:34	20:55	20:52	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	07:12	07:40
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19	07:43	07:13	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:38	07:13	07:41
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20	07:42	07:12	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39	07:14	07:42
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21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:40	07:09	07:40	07:15	07:42
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23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
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	17:33	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:03
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	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
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28	07:37	07:00	06:16	06:28	05:59	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:46
	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:19	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:35		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 10

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: I - R022

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:57	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:59
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
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	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:59
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19	07:43	07:13	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:38	07:13	07:41
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23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
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26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45
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27	07:38	07:02	06:17	06:30	05:59	05:56	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:04
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31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 11

Licensed user:
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Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: J - R001

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:47	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:47	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:56	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:35	19:51	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
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	17:13	17:48	18:21	19:53	20:24	20:51	20:56	20:32	19:47	18:58	17:15	16:57
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16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:58
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	17:23	18:00	18:32	20:04	20:34	20:55	20:52	20:19	19:31	18:42	17:06	16:59
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	17:26	18:03	18:34	20:06	20:36	20:56	20:50	20:17	19:27	18:39	17:04	16:59
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29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:46
	17:37		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:35		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 12

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: K - R021

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:57	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
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4	07:46	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
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	17:18	17:55	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	05:53	06:04	06:32	07:02	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:49	06:10	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:08	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:59
17	07:44	07:16	06:34	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:32	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	07:12	07:40
	17:25	18:02	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:38	07:13	07:41
	17:26	18:03	18:34	20:06	20:35	20:56	20:50	20:16	19:27	18:39	17:04	17:00
20	07:42	07:12	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:36	20:56	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:40	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:55	06:13	06:42	07:12	07:43	07:18	07:44
	17:32	18:09	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:05	06:21	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:03
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:56	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:59	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	17:00	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:45
	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:19	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 13

Licensed user:
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+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: L - R020

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:09	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:20	16:58
4	07:46	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21	20:49	20:57	20:36	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:58
7	07:46	07:28	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:55	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:29	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	05:54	06:03	06:30	07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:58
12	07:46	07:22	06:42	06:52	06:12	05:53	06:04	06:31	07:01	07:30	07:05	07:36
	17:18	17:55	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	05:53	06:04	06:32	07:02	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:49	06:10	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:08	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:31	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:59
17	07:44	07:16	06:34	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:32	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	07:12	07:40
	17:25	18:02	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:38	07:13	07:41
	17:26	18:03	18:34	20:06	20:35	20:56	20:50	20:16	19:27	18:39	17:04	17:00
20	07:42	07:12	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:36	20:56	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:40	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:55	06:13	06:42	07:12	07:43	07:18	07:44
	17:32	18:09	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:05	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:03
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:59	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:45
	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:19	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 14

Licensed user:
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Via Vittorio Veneto 231
IT-09028 Sestu
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: M - R003

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	07:27 (3)	06:24	05:56	05:57	06:20	06:50	07:11 (3)	07:19	16:53 (2)	06:52	07:26
	17:08	17:41	18:14	19:47	78 18:16 (2)	20:18	20:46	20:57	20:39	19:57	78 18:07 (2)	19:07	60 17:53 (2)	17:22	16:58
2	07:46	07:33	06:57	07:07	07:26 (3)	06:23	05:56	05:58	06:21	06:51	07:11 (3)	07:20	16:54 (2)	06:53	07:27
	17:08	17:42	18:15	19:48	80 18:16 (2)	20:19	20:47	20:57	20:38	19:55	79 18:07 (2)	19:06	58 17:52 (2)	17:21	16:58
3	07:47	07:32	06:56	07:06	07:24 (3)	06:22	05:56	05:58	06:22	06:52	07:12 (3)	07:21	16:55 (2)	06:54	07:28
	17:09	17:44	18:16	19:49	81 18:15 (2)	20:20	20:48	20:57	20:37	19:54	80 18:07 (2)	19:04	55 17:50 (2)	17:20	16:58
4	07:47	07:31	06:54	16:35 (2)	07:04	07:22 (3)	06:21	05:55	05:59	06:23	06:53	07:13 (3)	07:22	16:56 (2)	06:55	07:29
	17:10	17:45	18:18	21 16:56 (2)	19:50	82 18:14 (2)	20:21	20:49	20:57	20:36	19:52	82 18:08 (2)	19:03	52 17:48 (2)	17:18	16:58
5	07:47	07:30	06:53	16:30 (2)	07:03	07:21 (3)	06:19	05:55	05:59	06:24	06:54	07:14 (3)	07:23	16:57 (2)	06:57	07:30
	17:11	17:46	18:19	30 17:00 (2)	19:51	83 18:14 (2)	20:22	20:49	20:57	20:35	19:50	82 18:08 (2)	19:01	49 17:46 (2)	17:17	16:58
6	07:47	07:29	06:51	16:27 (2)	07:01	07:19 (3)	06:18	05:55	06:00	06:25	06:55	07:15 (3)	07:24	16:59 (2)	06:58	07:31
	17:12	17:47	18:20	37 17:04 (2)	19:52	82 18:12 (2)	20:23	20:50	20:56	20:33	19:49	82 18:08 (2)	18:59	44 17:43 (2)	17:16	16:57
7	07:47	07:28	06:50	16:23 (2)	06:59	07:18 (3)	06:17	05:54	06:00	06:26	06:56	07:16 (3)	07:25	17:01 (2)	06:59	07:32
	17:13	17:48	18:21	43 17:06 (2)	19:53	83 18:12 (2)	20:24	20:51	20:56	20:32	19:47	83 18:09 (2)	18:58	40 17:41 (2)	17:15	16:57
8	07:46	07:26	06:48	16:22 (2)	06:58	07:16 (3)	06:16	05:54	06:01	06:27	06:57	07:17 (3)	07:26	17:04 (2)	07:00	07:33
	17:14	17:50	18:22	46 17:08 (2)	19:54	82 18:11 (2)	20:25	20:51	20:56	20:31	19:46	82 18:09 (2)	18:56	33 17:37 (2)	17:14	16:57
9	07:46	07:25	06:46	16:19 (2)	06:56	07:15 (3)	06:15	05:54	06:02	06:28	06:58	07:18 (3)	07:27	17:07 (2)	07:01	07:34
	17:15	17:51	18:23	51 17:10 (2)	19:55	80 18:10 (2)	20:26	20:52	20:55	20:30	19:44	81 18:09 (2)	18:55	26 17:33 (2)	17:13	16:57
10	07:46	07:24	06:45	16:17 (2)	06:55	07:13 (3)	06:14	05:54	06:02	06:29	06:59	07:19 (3)	07:28	17:12 (2)	07:02	07:35
	17:16	17:52	18:24	54 17:11 (2)	19:56	79 18:09 (2)	20:27	20:52	20:55	20:29	19:42	80 18:09 (2)	18:53	15 17:27 (2)	17:12	16:57
11	07:46	07:23	06:43	16:16 (2)	06:53	07:11 (3)	06:13	05:53	06:03	06:30	07:00	07:20 (3)	07:29		07:04	07:35
	17:17	17:53	18:25	57 17:13 (2)	19:57	78 18:07 (2)	20:28	20:53	20:55	20:27	19:41	78 18:09 (2)	18:51		17:11	16:57
12	07:46	07:22	06:42	16:14 (2)	06:52	07:12 (3)	06:12	05:53	06:04	06:31	07:01	07:21 (3)	07:30		07:05	07:36
	17:18	17:54	18:26	59 17:13 (2)	19:58	73 18:06 (2)	20:29	20:53	20:54	20:26	19:39	76 18:09 (2)	18:50		17:10	16:58
13	07:45	07:21	06:40	16:13 (2)	06:50	07:13 (3)	06:11	05:53	06:04	06:32	07:01	16:55 (2)	07:31		07:06	07:37
	17:19	17:56	18:27	62 17:15 (2)	19:59	67 18:04 (2)	20:30	20:54	20:54	20:25	19:37	74 18:09 (2)	18:48		17:09	16:58
14	07:45	07:19	06:38	16:11 (2)	06:48	07:16 (3)	06:10	05:53	06:05	06:33	07:02	16:53 (2)	07:32		07:07	07:38
	17:20	17:57	18:28	64 17:15 (2)	20:00	59 18:03 (2)	20:31	20:54	20:53	20:23	19:36	74 18:07 (2)	18:47		17:08	16:58
15	07:45	07:18	06:37	16:10 (2)	06:47	17:14 (2)	06:09	05:53	06:06	06:34	07:03	16:52 (2)	07:33		07:08	07:38
	17:21	17:58	18:29	66 17:16 (2)	20:01	47 18:01 (2)	20:32	20:55	20:53	20:22	19:34	75 18:07 (2)	18:45		17:07	16:58
16	07:44	07:17	06:35	16:09 (2)	06:45	17:16 (2)	06:08	05:53	06:07	06:35	07:04	16:52 (2)	07:34		07:09	07:39
	17:22	17:59	18:30	68 17:17 (2)	20:02	44 18:00 (2)	20:33	20:55	20:52	20:21	19:32	75 18:07 (2)	18:44		17:07	16:58
17	07:44	07:16	06:34	16:08 (2)	06:44	17:17 (2)	06:07	05:53	06:07	06:36	07:05	16:51 (2)	07:35		07:11	07:40
	17:23	18:00	18:32	69 17:17 (2)	20:03	41 17:58 (2)	20:34	20:55	20:52	20:19	19:31	76 18:07 (2)	18:42		17:06	16:59
18	07:44	07:14	06:32	16:07 (2)	06:42	17:20 (2)	06:06	05:53	06:08	06:37	07:06	16:51 (2)	07:36		07:12	07:40
	17:25	18:02	18:33	70 17:17 (2)	20:05	36 17:56 (2)	20:35	20:56	20:51	20:18	19:29	75 18:06 (2)	18:41		17:05	16:59
19	07:43	07:13	06:30	16:06 (2)	06:41	17:22 (2)	06:05	05:53	06:09	06:38	07:07	16:50 (2)	07:38		07:13	07:41
	17:26	18:03	18:34	72 17:18 (2)	20:06	31 17:53 (2)	20:36	20:56	20:50	20:16	19:27	76 18:06 (2)	18:39		17:04	16:59
20	07:42	07:12	06:29	16:05 (2)	06:39	17:25 (2)	06:04	05:54	06:10	06:38	07:08	16:50 (2)	07:39		07:14	07:42
	17:27	18:04	18:35	73 17:18 (2)	20:07	25 17:50 (2)	20:36	20:56	20:50	20:15	19:26	75 18:05 (2)	18:38		17:04	17:00
21	07:42	07:10	06:27	16:05 (2)	06:38	17:29 (2)	06:03	05:54	06:11	06:39	17:39 (2)	07:09	16:50 (2)	07:40	07:15	07:42
	17:28	18:05	18:36	73 17:18 (2)	20:08	18 17:47 (2)	20:37	20:57	20:49	20:14	6 17:45 (2)	19:24	74 18:04 (2)	18:36	17:03	17:00
22	07:41	07:09	06:25	16:05 (2)	06:37		06:03	05:54	06:11	06:40	17:32 (2)	07:10	16:50 (2)	07:41	07:16	07:43
	17:29	18:06	18:37	74 17:19 (2)	20:09		20:38	20:57	20:48	20:12	19 17:51 (2)	19:22	74 18:04 (2)	18:35	17:02	17:01
23	07:41	07:07	06:24	16:04 (2)	06:35		06:02	05:54	06:12	06:41	17:28 (2)	07:11	16:50 (2)	07:42	07:17	07:43
	17:30	18:07	18:38	75 17:19 (2)	20:10		20:39	20:57	20:47	20:11	27 17:55 (2)	19:21	73 18:03 (2)	18:34	17:02	17:01
24	07:40	07:06	06:22	16:03 (2)	06:34		06:01	05:54	06:13	06:42	17:25 (2)	07:12	16:50 (2)	07:43	07:19	07:44
	17:31	18:09	18:39	75 17:18 (2)	20:11		20:40	20:57	20:46	20:09	32 17:57 (2)	19:19	72 18:02 (2)	18:32	17:01	17:02
25	07:39	07:05	06:20	16:04 (2)	06:32		06:00	05:55	06:14	06:43	17:22 (2)	07:13	16:50 (2)	06:44	07:20	07:44
	17:33	18:10	18:40	75 17:19 (2)	20:12		20:41	20:57	20:46	20:08	37 17:59 (2)	19:17	71 18:01 (2)	17:31	17:01	17:02
26	07:39	07:03	06:19	16:03 (2)	06:31		06:00	05:55	06:15	06:44	17:20 (2)	07:14	16:50 (2)	06:45	07:21	07:45
	17:34	18:11	18:41	75 17:18 (2)	20:13		20:42	20:57	20:45	20:06	41 18:01 (2)	19:16	70 18:00 (2)	17:30	17:00	17:03
27	07:38	07:02	06:17	16:03 (2)	06:30		05:59	05:55	06:16	06:45	17:18 (2)	07:15	16:50 (2)	06:46	07:22	07:45
	17:35	18:12	18:42	76 17:19 (2)	20:14		20:43	20:57	20:44	20:05	44 18:02 (2)	19:14	69 17:59 (2)	17:28	17:00	17:04
28	07:37	07:00	06:16	16:03 (2)	06:28		05:58	05:56	06:17	06:46	17:16 (2)	07:16	16:51 (2)	06:47	07:23	07:45
	17:36	18:13	18:43	75 17:18 (2)	20:15		20:43	20:57	20:43	20:03	47 18:03 (2)	19:12	67 17:58 (2)	17:27	16:59	17:04
29	07:36		07:14	17:03 (2)	06:27		05:58	05:56	06:18	06:47	07:17 (3)	07:17	16:51 (2)	06:49	07:24	07:46
	17:37		19:44	74 18:17 (2)	20:16		20:44	20:57	20:42	20:02	59 18:04 (2)	19:11	65 17:56 (2)	17:26	16:59	17:05
30	07:35		07:12	17:03 (2)	06:26		05:57	05:57	06:18	06:48	07:14 (3)	07:18	16:52 (2)	06:50	07:25	07:46
	17:39		19:45	75 18:18 (2)	20:17		20:45	20:57	20:41	20:00	67 18:05 (2)	19:09	63 17:55 (2)	17:24	16:59	17:06
31	07:35		07:11	07:29 (3)			05:57		06:19	06:49	07:12 (3)			06:51		07:46
	17:40		19:46	76 18:17 (2)			20:46		20:40	19:58	73 18:06 (2)			17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case			1765	1329				452	2261	432		
Sun reduction			0.47	0.51				0.72	0.64	0.56		
Oper. time red.			0.37	0.37				0.37	0.37	0.37		
Wind dir. red.			0.76	0.76				0.76	0.76	0.76		
Total reduction			0.13	0.14				0.20	0.18	0.16		
Total, real			235	191				92	412	68		

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 15

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: N - R018

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14 47 17:19 (1)	19:47	20:18	20:46	20:57	20:39	19:57	19:07 18 17:43 (1)	17:22 4 16:28 (1)	16:58
2	07:46	07:33	06:57	16:33 (1) 07:07	06:23	05:56	05:58	06:21	06:51	07:20	17:22 (1) 06:53	07:27
	17:08	17:42	18:15 46 17:19 (1)	19:48	20:19	20:47	20:57	20:38	19:55	19:06 23 17:45 (1)	17:21	16:58
3	07:46	07:32	06:56	16:33 (1) 07:06	06:22	05:56	05:58	06:22	06:52	07:21	17:19 (1) 06:54	07:28
	17:09	17:44	18:16 45 17:18 (1)	19:49	20:20	20:48	20:57	20:37	19:54	19:04 28 17:47 (1)	17:20	16:58
4	07:46	07:31	06:54	16:34 (1) 07:04	06:21	05:55	05:59	06:23	06:53	07:22	17:17 (1) 06:55	07:29
	17:10	17:45	18:18 44 17:18 (1)	19:50	20:21	20:49	20:57	20:36	19:52	19:03 32 17:49 (1)	17:18	16:58
5	07:47	07:30	06:53	16:34 (1) 07:03	06:19	05:55	05:59	06:24	06:54	07:23	17:15 (1) 06:57	07:30
	17:11	17:46	18:19 42 17:16 (1)	19:51	20:22	20:49	20:57	20:34	19:50	19:01 35 17:50 (1)	17:17	16:58
6	07:47	07:29	06:51	16:35 (1) 07:01	06:18	05:55	06:00	06:25	06:55	07:24	17:13 (1) 06:58	07:31
	17:12	17:47	18:20 41 17:16 (1)	19:52	20:23	20:50	20:56	20:33	19:49	18:59 38 17:51 (1)	17:16	16:58
7	07:46	07:28	06:49	16:36 (1) 06:59	06:17	05:54	06:00	06:26	06:56	07:25	17:12 (1) 06:59	07:32
	17:13	17:48	18:21 38 17:14 (1)	19:53	20:24	20:50	20:56	20:32	19:47	18:58 39 17:51 (1)	17:15	16:57
8	07:46	07:26	06:48	16:37 (1) 06:58	06:16	05:54	06:01	06:27	06:57	07:26	17:10 (1) 07:00	07:33
	17:14	17:50	18:22 37 17:14 (1)	19:54	20:25	20:51	20:56	20:31	19:46	18:56 42 17:52 (1)	17:14	16:57
9	07:46	07:25	06:46	16:38 (1) 06:56	06:15	05:54	06:02	06:28	06:58	07:27	17:09 (1) 07:01	07:34
	17:15	17:51	18:23 34 17:12 (1)	19:55	20:26	20:52	20:55	20:30	19:44	18:55 43 17:52 (1)	17:13	16:57
10	07:46	07:24 16:53 (1)	06:45	16:39 (1) 06:55	06:14	05:54	06:02	06:29	06:59	07:28	17:08 (1) 07:02	07:34
	17:16	17:52 8 17:01 (1)	18:24 30 17:09 (1)	19:56	20:27	20:52	20:55	20:29	19:42	18:53 44 17:52 (1)	17:12	16:57
11	07:46	07:23 16:48 (1)	06:43	16:42 (1) 06:53	06:13	05:54	06:03	06:30	07:00	07:29	17:07 (1) 07:04	07:35
	17:17	17:53 17 17:05 (1)	18:25 26 17:08 (1)	19:57	20:28	20:53	20:55	20:27	19:41	18:51 46 17:53 (1)	17:11	16:58
12	07:46	07:22 16:45 (1)	06:42	16:44 (1) 06:52	06:12	05:53	06:04	06:31	07:01	07:30	17:06 (1) 07:05	07:36
	17:18	17:54 24 17:09 (1)	18:26 21 17:05 (1)	19:58	20:29	20:53	20:54	20:26	19:39	18:50 47 17:53 (1)	17:10	16:58
13	07:45	07:21 16:43 (1)	06:40	16:47 (1) 06:50	06:11	05:53	06:04	06:32	07:02	07:31	17:06 (1) 07:06	07:37
	17:19	17:56 28 17:11 (1)	18:27 13 17:00 (1)	19:59	20:30	20:54	20:54	20:25	19:37	18:48 46 17:52 (1)	17:09	16:58
14	07:45	07:19 16:42 (1)	06:38	06:48	06:10	05:53	06:05	06:33	07:02	07:32	17:05 (1) 07:07	07:38
	17:20	17:57 31 17:13 (1)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47 47 17:52 (1)	17:08	16:58
15	07:45	07:18 16:40 (1)	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	17:05 (1) 07:08	07:38
	17:21	17:58 34 17:14 (1)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45 47 17:52 (1)	17:07	16:58
16	07:44	07:17 16:39 (1)	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	17:04 (1) 07:09	07:39
	17:22	17:59 36 17:15 (1)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44 48 17:52 (1)	17:07	16:58
17	07:44	07:16 16:38 (1)	06:34	06:44	06:07	05:53	06:07	06:36	07:05	07:35	17:05 (1) 07:10	07:40
	17:23	18:00 39 17:17 (1)	18:32	20:03	20:34	20:55	20:51	20:19	19:31	18:42 47 17:52 (1)	17:06	16:59
18	07:43	07:14 16:36 (1)	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	17:05 (1) 07:12	07:40
	17:25	18:02 41 17:17 (1)	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41 47 17:52 (1)	17:05	16:59
19	07:43	07:13 16:36 (1)	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:37	17:05 (1) 07:13	07:41
	17:26	18:03 42 17:18 (1)	18:34	20:06	20:36	20:56	20:50	20:16	19:27	18:39 46 17:51 (1)	17:04	17:00
20	07:42	07:12 16:35 (1)	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39	17:05 (1) 07:14	07:42
	17:27	18:04 44 17:19 (1)	18:35	20:07	20:36	20:56	20:49	20:15	19:26	18:38 45 17:50 (1)	17:04	17:00
21	07:42	07:10 16:34 (1)	06:27	06:38	06:03	05:54	06:11	06:39	07:09	07:40	17:05 (1) 07:15	07:42
	17:28	18:05 45 17:19 (1)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 45 17:50 (1)	17:03	17:00
22	07:41	07:09 16:34 (1)	06:25	06:37	06:03	05:54	06:11	06:40	07:10	07:41	17:05 (1) 07:16	07:43
	17:29	18:06 46 17:20 (1)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 44 17:49 (1)	17:02	17:01
23	07:41	07:07 16:33 (1)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	17:06 (1) 07:17	07:43
	17:30	18:07 47 17:20 (1)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34 42 17:48 (1)	17:02	17:01
24	07:40	07:06 16:33 (1)	06:22	06:34	06:01	05:55	06:13	06:42	07:12	07:43	17:07 (1) 07:18	07:44
	17:32	18:09 47 17:20 (1)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 40 17:47 (1)	17:01	17:02
25	07:39	07:05 16:32 (1)	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	16:08 (1) 07:20	07:44
	17:33	18:10 48 17:20 (1)	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31 38 16:46 (1)	17:01	17:02
26	07:39	07:03 16:33 (1)	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	16:09 (1) 07:21	07:44
	17:34	18:11 47 17:20 (1)	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:30 36 16:45 (1)	17:00	17:03
27	07:38	07:02 16:32 (1)	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	16:10 (1) 07:22	07:45
	17:35	18:12 48 17:20 (1)	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28 33 16:43 (1)	17:00	17:04
28	07:37	07:00 16:33 (1)	06:16	06:28	05:59	05:56	06:17	06:46	07:16	06:47	16:11 (1) 07:23	07:45
	17:36	18:13 47 17:20 (1)	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 30 16:41 (1)	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	16:13 (1) 07:24	07:45
	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26 27 16:40 (1)	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:19	06:48	07:18 17:31 (1)	06:50	16:15 (1) 07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09 7 17:38 (1)	17:24 23 16:38 (1)	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51	16:18 (1)	07:46
	17:40		19:46		20:46		20:40	19:58		17:23 17 16:35 (1)		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		719	464						7	1183	4	
Sun reduction		0.43	0.47						0.64	0.56	0.48	
Oper. time red.		0.37	0.37						0.37	0.37	0.37	
Wind dir. red.		0.75	0.75						0.75	0.75	0.75	
Total reduction		0.12	0.13						0.18	0.16	0.13	
Total, real		87	61						1	185	1	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 16

Licensed user:

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: O - R002

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14 50 17:10 (2)	19:47 53 18:00 (2)	20:18	20:46	20:57	20:39	19:57 7	07:29 (3) 19:07 66 17:56 (2)	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:17 (3) 07:20	06:53	07:27
	17:08	17:42	18:15 53 17:12 (2)	19:48 50 17:58 (2)	20:19	20:47	20:57	20:38	19:55 14	07:31 (3) 19:06 66 17:56 (2)	17:21	16:58
3	07:47	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:15 (3) 07:21	06:54	07:28
	17:09	17:44	18:16 56 17:13 (2)	19:49 47 17:55 (2)	20:20	20:48	20:57	20:37	19:54 18	07:33 (3) 19:04 65 17:55 (2)	17:19	16:58
4	07:47	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:14 (3) 07:22	06:55	07:29
	17:10	17:45	18:18 57 17:14 (2)	19:50 41 17:51 (2)	20:21	20:49	20:57	20:36	19:52 20	07:34 (3) 19:03 64 17:54 (2)	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:14 (3) 07:23	06:57	07:30
	17:11	17:46	18:19 59 17:14 (2)	19:51 35 17:48 (2)	20:22	20:49	20:57	20:35	19:50 20	07:34 (3) 19:01 64 17:54 (2)	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:15 (3) 07:24	06:58	07:31
	17:12	17:47	18:20 61 17:16 (2)	19:52 20 07:39 (3)	20:23	20:50	20:56	20:33	19:49 20	07:35 (3) 18:59 63 17:53 (2)	17:16	16:57
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	17:13	17:48	18:21 62 17:16 (2)	19:53 20 07:38 (3)	20:24	20:51	20:56	20:32	19:47 33	17:42 (2) 18:58 62 17:52 (2)	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:17 (3) 07:26	06:59	07:33
	17:14	17:50	18:22 64 17:17 (2)	19:54 20 07:37 (3)	20:25	20:51	20:56	20:31	19:46 41	17:46 (2) 18:56 59 17:50 (2)	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:18 (3) 07:27	07:01	07:34
	17:15	17:51	18:23 65 17:17 (2)	19:55 18 07:36 (3)	20:26	20:52	20:55	20:30	19:44 47	17:49 (2) 18:55 58 17:49 (2)	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:19 (3) 07:28	07:02	07:35
	17:16	17:52	18:24 65 17:16 (2)	19:56 13 07:33 (3)	20:27	20:52	20:55	20:29	19:42 49	17:51 (2) 18:53 56 17:48 (2)	17:12	16:57
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	17:17	17:53	18:25 65 17:17 (2)	19:57 7 07:29 (3)	20:28	20:53	20:55	20:27	19:41 53	17:53 (2) 18:51 55 17:47 (2)	17:11	16:57
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	17:18	17:54	18:26 66 17:17 (2)	19:58	20:29	20:53	20:54	20:26	19:39 54	17:54 (2) 18:50 52 17:45 (2)	17:10	16:58
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	17:19	17:56	18:27 66 17:17 (2)	19:59	20:30	20:54	20:54	20:25	19:37 55	17:55 (2) 18:48 49 17:43 (2)	17:09	16:58
14	07:45	07:19	06:38	06:48	06:10	05:53	06:05	06:33	07:02	07:22 (3) 07:32	07:07	07:38
	17:20	17:57	18:28 67 17:17 (2)	20:00	20:31	20:54	20:53	20:23	19:36 56	17:55 (2) 18:47 46 17:41 (2)	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:23 (3) 07:33	07:08	07:38
	17:21	17:58	18:29 66 17:16 (2)	20:01	20:32	20:55	20:53	20:22	19:34 56	17:56 (2) 18:45 42 17:39 (2)	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:24 (3) 07:34	07:09	07:39
	17:22	17:59	18:30 67 17:17 (2)	20:02	20:33	20:55	20:52	20:21	19:32 56	17:57 (2) 18:44 39 17:37 (2)	17:07	16:58
17	07:44	07:16	06:34	06:44	06:07	05:53	06:07	06:36	07:05	17:02 (2) 07:35	07:11	07:40
	17:23	18:00	18:32 66 17:16 (2)	20:03	20:34	20:55	20:52	20:19	19:31 55	17:57 (2) 18:42 34 17:35 (2)	17:06	16:59
18	07:44	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	17:01 (2) 07:36	07:12	07:40
	17:25	18:02	18:33 65 17:15 (2)	20:05	20:35	20:56	20:51	20:18	19:29 57	17:58 (2) 18:41 28 17:32 (2)	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:38	07:07	16:59 (2) 07:38	07:13	07:41
	17:26	18:03	18:34 64 17:15 (2)	20:06	20:36	20:56	20:50	20:16	19:27 59	17:58 (2) 18:39 21 17:28 (2)	17:04	16:59
20	07:42	07:12	06:29	06:39	06:04	05:54	06:10	06:38	07:08	16:58 (2) 07:39	07:14	07:42
	17:27	18:04	18:35 64 17:14 (2)	20:07	20:36	20:56	20:50	20:15	19:26 60	17:58 (2) 18:38 7 17:21 (2)	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:39	07:09	16:57 (2) 07:40	07:15	07:42
	17:28	18:05	18:36 63 17:13 (2)	20:08	20:37	20:57	20:49	20:14	19:24 62	17:59 (2) 18:36	17:03	17:00
22	07:41	07:09 16:40 (2)	06:25	06:37	06:03	05:54	06:11	06:40	07:10	16:56 (2) 07:41	07:16	07:43
	17:29	18:06 13 16:53 (2)	18:37 62 17:13 (2)	20:09	20:38	20:57	20:48	20:12	19:22 63	17:59 (2) 18:35	17:02	17:01
23	07:41	07:07 16:34 (2)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	16:55 (2) 07:42	07:17	07:43
	17:30	18:07 24 16:58 (2)	18:38 60 17:12 (2)	20:10	20:39	20:57	20:47	20:11	19:21 64	17:59 (2) 18:34	17:02	17:01
24	07:40	07:06 16:31 (2)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	16:54 (2) 07:43	07:18	07:44
	17:31	18:09 31 17:02 (2)	18:39 59 17:11 (2)	20:11	20:40	20:57	20:46	20:09	19:19 65	17:59 (2) 18:32	17:01	17:02
25	07:39	07:05 16:28 (2)	06:20	06:32	06:00	05:55	06:14	06:43	07:13	16:53 (2) 06:44	07:20	07:44
	17:33	18:10 36 17:04 (2)	18:40 58 17:11 (2)	20:12	20:41	20:57	20:46	20:08	19:17 66	17:59 (2) 17:31	17:01	17:02
26	07:39	07:03 16:26 (2)	06:19	06:31	06:00	05:55	06:15	06:44	07:14	16:53 (2) 06:45	07:21	07:45
	17:34	18:11 40 17:06 (2)	18:41 56 17:09 (2)	20:13	20:42	20:57	20:45	20:06	19:16 65	17:58 (2) 17:30	17:00	17:03
27	07:38	07:02 16:23 (2)	06:17	06:30	05:59	05:55	06:16	06:45	07:15	16:52 (2) 06:46	07:22	07:45
	17:35	18:12 45 17:08 (2)	18:42 54 17:09 (2)	20:14	20:43	20:57	20:44	20:05	19:14 66	17:58 (2) 17:28	17:00	17:04
28	07:37	07:00 16:22 (2)	06:16	06:34 (3) 06:28	05:58	05:56	06:17	06:46	07:16	16:51 (2) 06:47	07:23	07:45
	17:36	18:13 48 17:10 (2)	18:43 55 17:07 (2)	20:15	20:43	20:57	20:43	20:03	19:12 67	17:58 (2) 17:27	16:59	17:04
29	07:36		07:14	07:32 (3) 06:27	05:58	05:56	06:18	06:47	07:17	16:51 (2) 06:49	07:24	07:46
	17:37		19:44 56 18:05 (2)	20:16	20:44	20:57	20:42	20:02	19:11 66	17:57 (2) 17:26	16:59	17:05
30	07:35		07:12	07:31 (3) 06:26	05:57	05:57	06:18	06:48	07:18	16:51 (2) 06:50	07:25	07:46
	17:39		19:45 56 18:04 (2)	20:17	20:45	20:57	20:41	20:00	19:09 66	17:57 (2) 17:24	16:59	17:06
31	07:35		07:11	07:29 (3)	05:57		06:19	06:49		06:51		07:46
	17:40		19:46 55 18:02 (2)		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		237	1882	324					1480	996		
Sun reduction		0.43	0.47	0.51					0.64	0.56		
Oper. time red.		0.37	0.37	0.37					0.37	0.37		
Wind dir. red.		0.76	0.76	0.76					0.76	0.76		
Total reduction		0.12	0.13	0.14					0.18	0.16		
Total, real		29	250	46					269	156		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 17

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: P - R019

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59 16:55 (1)	07:09	06:24	05:56	05:57	06:20	06:50	07:19 17:35 (1)	06:52	07:26
	17:08	17:41	18:14 36 17:31 (1)	19:47	20:18	20:46	20:57	20:39	19:57	19:07 32 18:07 (1)	17:22	16:58
2	07:46	07:33	06:57 16:55 (1)	07:07	06:23	05:56	05:58	06:21	06:51	07:20 17:34 (1)	06:53	07:27
	17:08	17:42	18:15 37 17:32 (1)	19:48	20:19	20:47	20:57	20:38	19:55	19:06 33 18:07 (1)	17:21	16:58
3	07:46	07:32	06:56 16:54 (1)	07:06	06:22	05:56	05:58	06:22	06:52	07:21 17:33 (1)	06:54	07:28
	17:09	17:44	18:16 38 17:32 (1)	19:49	20:20	20:48	20:57	20:37	19:54	19:04 35 18:08 (1)	17:20	16:58
4	07:46	07:31	06:54 16:54 (1)	07:04	06:21	05:55	05:59	06:23	06:53	07:22 17:32 (1)	06:55	07:29
	17:10	17:45	18:18 38 17:32 (1)	19:50	20:21	20:49	20:57	20:36	19:52	19:03 36 18:08 (1)	17:18	16:58
5	07:47	07:30	06:53 16:53 (1)	07:03	06:19	05:55	05:59	06:24	06:54	07:23 17:31 (1)	06:57	07:30
	17:11	17:46	18:19 39 17:32 (1)	19:51	20:22	20:49	20:57	20:34	19:50	19:01 37 18:08 (1)	17:17	16:58
6	07:46	07:29	06:51 16:54 (1)	07:01	06:18	05:55	06:00	06:25	06:55	07:24 17:30 (1)	06:58	07:31
	17:12	17:47	18:20 38 17:32 (1)	19:52	20:23	20:50	20:56	20:33	19:49	18:59 38 18:08 (1)	17:16	16:58
7	07:46	07:28	06:49 16:53 (1)	06:59	06:17	05:54	06:00	06:26	06:56	07:25 17:30 (1)	06:59	07:32
	17:13	17:48	18:21 38 17:31 (1)	19:53	20:24	20:50	20:56	20:32	19:47	18:58 38 18:08 (1)	17:15	16:57
8	07:46	07:26	06:48 16:54 (1)	06:58	06:16	05:54	06:01	06:27	06:57	07:26 17:29 (1)	07:00	07:33
	17:14	17:50	18:22 37 17:31 (1)	19:54	20:25	20:51	20:56	20:31	19:46	18:56 38 18:07 (1)	17:14	16:57
9	07:46	07:25	06:46 16:54 (1)	06:56	06:15	05:54	06:02	06:28	06:58	07:27 17:29 (1)	07:01	07:34
	17:15	17:51	18:23 36 17:30 (1)	19:55	20:26	20:52	20:55	20:30	19:44	18:55 38 18:07 (1)	17:13	16:57
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	17:16	17:52	18:24 35 17:29 (1)	19:56	20:27	20:52	20:55	20:28	19:42	18:53 38 18:07 (1)	17:12	16:57
11	07:46	07:23	06:43 16:55 (1)	06:53	06:13	05:54	06:03	06:30	07:00	07:29 17:29 (1)	07:04	07:35
	17:17	17:53	18:25 34 17:29 (1)	19:57	20:28	20:53	20:55	20:27	19:41	18:51 37 18:06 (1)	17:11	16:58
12	07:46	07:22	06:42 16:55 (1)	06:52	06:12	05:53	06:04	06:31	07:01	07:30 17:29 (1)	07:05	07:36
	17:18	17:54	18:26 32 17:27 (1)	19:58	20:29	20:53	20:54	20:26	19:39	18:50 36 18:05 (1)	17:10	16:58
13	07:45	07:21	06:40 16:56 (1)	06:50	06:11	05:53	06:04	06:32	07:02	07:31 17:29 (1)	07:06	07:37
	17:19	17:56	18:27 30 17:26 (1)	19:59	20:30	20:54	20:54	20:25	19:37	18:48 35 18:04 (1)	17:09	16:58
14	07:45	07:19	06:38 16:58 (1)	06:48	06:10	05:53	06:05	06:33	07:02	07:32 17:29 (1)	07:07	07:38
	17:20	17:57	18:28 27 17:25 (1)	20:00	20:31	20:54	20:53	20:23	19:36	18:47 34 18:03 (1)	17:08	16:58
15	07:45	07:18	06:37 16:59 (1)	06:47	06:09	05:53	06:06	06:34	07:03	07:33 17:30 (1)	07:08	07:38
	17:21	17:58	18:29 23 17:22 (1)	20:01	20:32	20:55	20:53	20:22	19:34	18:45 32 18:02 (1)	17:07	16:58
16	07:44	07:17	06:35 17:02 (1)	06:45	06:08	05:53	06:07	06:35	07:04	07:34 17:30 (1)	07:09	07:39
	17:22	17:59	18:30 18 17:20 (1)	20:02	20:33	20:55	20:52	20:21	19:32	18:44 30 18:00 (1)	17:07	16:58
17	07:44	07:16	06:34 17:04 (1)	06:44	06:07	05:53	06:07	06:36	07:05	07:35 17:32 (1)	07:10	07:40
	17:23	18:00	18:32 12 17:16 (1)	20:03	20:34	20:55	20:51	20:19	19:31	18:42 28 18:00 (1)	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36 17:34 (1)	07:12	07:40
	17:25	18:02	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41 24 17:58 (1)	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:54	06:09	06:38	07:07	07:37 17:36 (1)	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39 19 17:55 (1)	17:04	16:59
20	07:42	07:12	06:29	06:40	06:04	05:54	06:10	06:39	07:08	07:39 17:38 (1)	07:14	07:42
	17:27	18:04	18:35	20:07	20:36	20:56	20:49	20:15	19:26	18:38 14 17:52 (1)	17:04	17:00
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	17:28	18:05 7 17:18 (1)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
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	17:29	18:06 16 17:23 (1)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
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	17:30	18:07 22 17:25 (1)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
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	17:32	18:09 25 17:27 (1)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
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	17:33	18:10 29 17:28 (1)	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
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	17:34	18:11 30 17:29 (1)	18:41	20:13	20:42	20:57	20:45	20:06	19:16 8 17:57 (1)	17:30	17:00	17:03
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	17:35	18:12 33 17:30 (1)	18:42	20:14	20:42	20:57	20:44	20:05	19:14 17 18:01 (1)	17:28	17:00	17:04
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	17:36	18:13 35 17:31 (1)	18:43	20:15	20:43	20:57	20:43	20:03	19:12 22 18:03 (1)	17:27	16:59	17:04
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	17:38		19:44	20:16	20:44	20:57	20:42	20:02	19:11 26 18:05 (1)	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:19	06:48	07:18 17:37 (1)	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09 29 18:06 (1)	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		197	548						102	652		
Sun reduction		0.43	0.47						0.64	0.56		
Oper. time red.		0.37	0.37						0.37	0.37		
Wind dir. red.		0.76	0.76						0.76	0.76		
Total reduction		0.12	0.13						0.18	0.16		
Total, real		24	73						19	103		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 18
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: Q - R004

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	06:31 (3)	05:57	06:35 (3)	06:20	18:53 (2)	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46 66	19:21 (2)	20:57 65	19:25 (2)	20:39 35	19:28 (2)	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	06:31 (3)	05:58	06:36 (3)	06:21	18:54 (2)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47 66	19:21 (2)	20:57 66	19:26 (2)	20:38 33	19:27 (2)	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	06:32 (3)	05:58	06:36 (3)	06:22	18:55 (2)	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48 66	19:21 (2)	20:57 66	19:26 (2)	20:37 32	19:27 (2)	19:54	19:04	17:19	16:58
4	07:47	07:31	06:54	07:04	06:21	18:54 (2) 05:55	06:31 (3)	05:59	06:37 (3)	06:23	18:56 (2)	06:53	07:22	06:55	07:29
	17:10	17:45	18:18	19:50	20:21 14	19:08 (2) 20:49 67	19:21 (2)	20:57 66	19:27 (2)	20:36 30	19:26 (2)	19:52	19:03	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	18:51 (2) 05:55	06:31 (3)	05:59	06:36 (3)	06:24	18:57 (2)	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22 19	19:10 (2) 20:49 66	19:21 (2)	20:57 67	19:26 (2)	20:35 27	19:24 (2)	19:50	19:01	17:17	16:58
6	07:47	07:29	06:51	07:01	06:18	18:49 (2) 05:55	06:31 (3)	06:00	06:37 (3)	06:25	18:58 (2)	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 23	19:12 (2) 20:50 67	19:21 (2)	20:56 66	19:27 (2)	20:33 25	19:23 (2)	19:49	18:59	17:16	16:57
7	07:46	07:28	06:49	06:59	06:17	18:47 (2) 05:54	06:31 (3)	06:00	06:37 (3)	06:26	19:00 (2)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 26	19:13 (2) 20:51 66	19:21 (2)	20:56 67	19:27 (2)	20:32 21	19:21 (2)	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	18:46 (2) 05:54	06:31 (3)	06:01	06:38 (3)	06:27	19:01 (2)	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25 28	19:14 (2) 20:51 66	19:21 (2)	20:56 67	19:28 (2)	20:31 17	19:18 (2)	19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	18:45 (2) 05:54	06:31 (3)	06:02	06:39 (3)	06:28	19:04 (2)	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26 30	19:15 (2) 20:52 66	19:21 (2)	20:55 66	19:29 (2)	20:30 11	19:15 (2)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	18:44 (2) 05:54	06:31 (3)	06:02	06:38 (3)	06:29		06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 32	19:16 (2) 20:52 66	19:21 (2)	20:55 66	19:28 (2)	20:29		19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	18:43 (2) 05:53	06:31 (3)	06:03	06:39 (3)	06:30		07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28 34	19:17 (2) 20:53 66	19:21 (2)	20:55 67	19:29 (2)	20:27		19:41	18:51	17:11	16:57
12	07:46	07:22	06:42	06:52	06:12	18:42 (2) 05:53	06:31 (3)	06:04	06:40 (3)	06:31		07:01	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 36	19:18 (2) 20:53 66	19:21 (2)	20:54 67	19:30 (2)	20:26		19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	18:42 (2) 05:53	06:32 (3)	06:04	06:40 (3)	06:32		07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30 36	19:18 (2) 20:54 65	19:21 (2)	20:54 65	19:29 (2)	20:25		19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:10	18:41 (2) 05:53	06:32 (3)	06:05	06:41 (3)	06:33		07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 38	19:19 (2) 20:54 64	19:21 (2)	20:53 65	19:30 (2)	20:23		19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	18:41 (2) 05:53	06:32 (3)	06:06	06:42 (3)	06:34		07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 38	19:19 (2) 20:55 64	19:21 (2)	20:53 63	19:30 (2)	20:22		19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	18:41 (2) 05:53	06:32 (3)	06:06	06:43 (3)	06:35		07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33 39	19:20 (2) 20:55 65	19:21 (2)	20:52 63	19:31 (2)	20:21		19:32	18:44	17:07	16:58
17	07:44	07:16	06:34	06:44	06:07	18:41 (2) 05:53	06:32 (3)	06:07	06:43 (3)	06:36		07:05	07:35	07:11	07:40
	17:23	18:00	18:32	20:03	20:34 39	19:20 (2) 20:55 64	19:21 (2)	20:52 62	19:30 (2)	20:19		19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	18:41 (2) 05:53	06:32 (3)	06:08	06:44 (3)	06:37		07:06	07:36	07:12	07:40
	17:24	18:02	18:33	20:04	20:35 39	19:20 (2) 20:56 64	19:21 (2)	20:51 60	19:31 (2)	20:18		19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	18:40 (2) 05:53	06:32 (3)	06:09	06:46 (3)	06:38		07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:06	20:36 40	19:20 (2) 20:56 64	19:21 (2)	20:50 57	19:31 (2)	20:16		19:27	18:39	17:04	16:59
20	07:42	07:12	06:29	06:39	06:04	18:40 (2) 05:54	06:33 (3)	06:10	06:48 (3)	06:38		07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:07	20:36 40	19:20 (2) 20:56 64	19:22 (2)	20:50 54	19:31 (2)	20:15		19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	18:41 (2) 05:54	06:33 (3)	06:11	06:50 (3)	06:39		07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37 40	19:21 (2) 20:57 64	19:22 (2)	20:49 50	19:31 (2)	20:14		19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	06:41 (3) 05:54	06:33 (3)	06:11	18:50 (2)	06:40		07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38 47	19:21 (2) 20:57 64	19:22 (2)	20:48 41	19:31 (2)	20:12		19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	06:38 (3) 05:54	06:33 (3)	06:12	18:51 (2)	06:41		07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39 53	19:21 (2) 20:57 64	19:22 (2)	20:47 40	19:31 (2)	20:11		19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	06:37 (3) 05:54	06:34 (3)	06:13	18:51 (2)	06:42		07:12	07:43	07:18	07:44
	17:31	18:09	18:39	20:11	20:40 57	19:22 (2) 20:57 64	19:23 (2)	20:46 40	19:31 (2)	20:09		19:19	18:32	17:01	17:02
25	07:39	07:05	06:20	06:32	06:00	06:36 (3) 05:55	06:34 (3)	06:14	18:51 (2)	06:43		07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12	20:41 58	19:21 (2) 20:57 64	19:23 (2)	20:46 40	19:31 (2)	20:08		19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	06:34 (3) 05:55	06:34 (3)	06:15	18:51 (2)	06:44		07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42 61	19:21 (2) 20:57 65	19:23 (2)	20:45 40	19:31 (2)	20:06		19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	06:34 (3) 05:55	06:35 (3)	06:16	18:52 (2)	06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43 61	19:21 (2) 20:57 65	19:24 (2)	20:44 39	19:31 (2)	20:05		19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:58	06:33 (3) 05:56	06:35 (3)	06:17	18:52 (2)	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43 63	19:21 (2) 20:57 64	19:24 (2)	20:43 39	19:31 (2)	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	06:33 (3) 05:56	06:35 (3)	06:18	18:52 (2)	06:47		07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44 64	19:21 (2) 20:57 65	19:24 (2)	20:42 37	19:29 (2)	20:02		19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	06:32 (3) 05:57	06:35 (3)	06:18	18:52 (2)	06:48		07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45 65	19:21 (2) 20:57 66	19:25 (2)	20:41 37	19:29 (2)	20:00		19:09	17:24	16:59	17:06
31	07:34		07:11		05:57	06:32 (3)		06:19	18:53 (2)	06:49			06:51		07:46
	17:40		19:46		20:46 65	19:21 (2)		20:40 36	19:29 (2)	19:58			17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case					1185	1953	1724	231				
Sun reduction					0.58	0.67	0.75	0.72				
Oper. time red.					0.37	0.37	0.37	0.37				
Wind dir. red.					0.72	0.73	0.73	0.72				
Total reduction					0.16	0.18	0.20	0.19				
Total, real					186	359	353	45				

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 19

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: R - R035

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02	17:18	16:58
5	07:46	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	05:53	06:03	06:30	07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:42	06:52	06:12	05:53	06:04	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:10	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	07:12	07:40
	17:24	18:02	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:38	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:54	06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 20

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: S - R012

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	19:04 (2) 05:56	06:17 (5) 05:57	06:19 (5) 06:20	19:22 (2) 06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	19:25 (2) 20:46	06:40 (5) 20:57	06:47 (5) 20:39	19:27 (2) 19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	19:04 (2) 05:56	06:17 (5) 05:57	06:20 (5) 06:21	19:19 (2) 06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	19:26 (2) 20:47	06:41 (5) 20:57	06:48 (5) 20:38	19:30 (2) 19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	19:04 (2) 05:55	06:17 (5) 05:58	06:20 (5) 06:22	19:18 (2) 06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	19:26 (2) 20:48	06:42 (5) 20:57	06:47 (5) 20:37	19:31 (2) 19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:21	19:04 (2) 05:55	06:16 (5) 05:59	06:21 (5) 06:23	19:17 (2) 06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	19:26 (2) 20:49	06:41 (5) 20:57	06:48 (5) 20:36	19:33 (2) 19:52	19:02	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	19:04 (2) 05:55	06:16 (5) 05:59	06:21 (5) 06:24	19:16 (2) 06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	19:25 (2) 20:49	06:42 (5) 20:57	06:48 (5) 20:34	19:34 (2) 19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	19:04 (2) 05:54	06:16 (5) 06:00	06:22 (5) 06:25	19:15 (2) 06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	19:24 (2) 20:50	06:42 (5) 20:56	06:48 (5) 20:33	19:34 (2) 19:49	18:59	17:16	16:57
7	07:46	07:28	06:49	06:59	06:17	19:04 (2) 05:54	06:16 (5) 06:00	06:22 (5) 06:26	19:13 (2) 06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	19:23 (2) 20:50	06:43 (5) 20:56	06:48 (5) 20:32	19:34 (2) 19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	19:05 (2) 05:54	06:15 (5) 06:01	06:23 (5) 06:27	19:13 (2) 06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	19:23 (2) 20:51	06:42 (5) 20:56	06:48 (5) 20:31	19:34 (2) 19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	19:06 (2) 05:54	06:15 (5) 06:01	06:24 (5) 06:28	19:13 (2) 06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	19:22 (2) 20:52	06:42 (5) 20:55	06:49 (5) 20:30	19:34 (2) 19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	19:08 (2) 05:54	06:15 (5) 06:02	06:24 (5) 06:29	19:12 (2) 06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	19:20 (2) 20:52	06:43 (5) 20:55	06:48 (5) 20:28	19:34 (2) 19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	19:09 (2) 05:53	06:15 (5) 06:03	06:25 (5) 06:30	19:12 (2) 07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28	19:19 (2) 20:53	06:43 (5) 20:55	06:49 (5) 20:27	19:34 (2) 19:41	18:51	17:11	16:57
12	07:46	07:22	06:42	06:51	06:12	05:53	06:15 (5) 06:04	06:26 (5) 06:31	19:12 (2) 07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	06:43 (5) 20:54	06:49 (5) 20:26	19:34 (2) 19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:10	05:53	06:15 (5) 06:04	06:26 (5) 06:32	19:12 (2) 07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	06:43 (5) 20:54	06:48 (5) 20:25	19:34 (2) 19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:15 (5) 06:05	06:27 (5) 06:33	19:13 (2) 07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	06:44 (5) 20:53	06:48 (5) 20:23	19:33 (2) 19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:15 (5) 06:06	06:28 (5) 06:34	19:13 (2) 07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	06:44 (5) 20:53	06:48 (5) 20:22	19:32 (2) 19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:15 (5) 06:06	06:29 (5) 06:35	19:14 (2) 07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	06:44 (5) 20:52	06:48 (5) 20:21	19:31 (2) 19:32	18:44	17:07	16:58
17	07:44	07:16	06:33	06:44	06:07	05:53	06:15 (5) 06:07	06:29 (5) 06:36	19:15 (2) 07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	06:44 (5) 20:51	06:47 (5) 20:19	19:30 (2) 19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:15 (5) 06:08	06:30 (5) 06:37	19:17 (2) 07:06	07:36	07:12	07:40
	17:24	18:02	18:33	20:04	20:35	20:56	06:44 (5) 20:51	06:47 (5) 20:18	19:28 (2) 19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	06:25 (5) 05:53	06:15 (5) 06:09	06:31 (5) 06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	5 06:30 (5) 20:56	29 06:44 (5) 20:50	16 06:47 (5) 20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	06:24 (5) 05:54	06:16 (5) 06:10	06:32 (5) 06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	8 06:32 (5) 20:56	29 06:45 (5) 20:49	15 06:47 (5) 20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	06:24 (5) 05:54	06:16 (5) 06:10	06:33 (5) 06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	10 06:34 (5) 20:56	29 06:45 (5) 20:49	13 06:46 (5) 20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:02	06:23 (5) 05:54	06:16 (5) 06:11	06:33 (5) 06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	12 06:35 (5) 20:57	29 06:45 (5) 20:48	11 06:44 (5) 20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	06:22 (5) 05:54	06:16 (5) 06:12	06:34 (5) 06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	14 06:36 (5) 20:57	29 06:45 (5) 20:47	9 06:43 (5) 20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34 19:13 (2)	06:01	06:22 (5) 05:54	06:17 (5) 06:13	06:35 (5) 06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11 5 19:18 (2)	20:40	15 06:37 (5) 20:57	29 06:46 (5) 20:46	7 06:42 (5) 20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32 19:10 (2)	06:00	06:21 (5) 05:55	06:17 (5) 06:14	06:36 (5) 06:43	07:13	06:44	07:20	07:44
	17:33	18:10	18:40	20:12 11 19:21 (2)	20:41	17 06:38 (5) 20:57	29 06:46 (5) 20:46	4 06:40 (5) 20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31 19:08 (2)	06:00	06:20 (5) 05:55	06:17 (5) 06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13 15 19:23 (2)	20:42	18 06:38 (5) 20:57	29 06:46 (5) 20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30 19:06 (2)	05:59	06:20 (5) 05:55	06:18 (5) 06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14 18 19:24 (2)	20:42	19 06:39 (5) 20:57	29 06:47 (5) 20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28 19:05 (2)	05:58	06:19 (5) 05:56	06:18 (5) 06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15 20 19:25 (2)	20:43	20 06:39 (5) 20:57	29 06:47 (5) 20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27 19:05 (2)	05:58	06:19 (5) 05:56	06:18 (5) 06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16 20 19:25 (2)	20:44	21 06:40 (5) 20:57	28 06:46 (5) 20:42	20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26 19:05 (2)	05:57	06:18 (5) 05:57	06:19 (5) 06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17 21 19:26 (2)	20:45	22 06:40 (5) 20:57	28 06:47 (5) 20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57	06:18 (5)	06:19	06:49		06:51		07:46
	17:40		19:46		20:46	23 06:41 (5)	20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				110	407	833	502	315				
Sun reduction				0.51	0.58	0.67	0.75	0.72				
Oper. time red.				0.37	0.37	0.37	0.37	0.37				
Wind dir. red.				0.72	0.73	0.75	0.75	0.72				
Total reduction				0.14	0.16	0.19	0.21	0.19				
Total, real				15	65	155	105	61				

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 21

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: T - R010

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	19:11 (2) 05:56	06:17 (5) 05:57	06:19 (5) 06:20	19:21 (2) 06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18 18	19:29 (2) 20:46 8	06:25 (5) 20:57 17	06:36 (5) 20:39 17	19:38 (2) 19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	19:10 (2) 05:56	06:17 (5) 05:57	06:20 (5) 06:21	19:21 (2) 06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 20	19:30 (2) 20:47 9	06:26 (5) 20:57 17	06:37 (5) 20:38 18	19:39 (2) 19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	19:10 (2) 05:55	06:17 (5) 05:58	06:20 (5) 06:22	19:20 (2) 06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20 20	19:30 (2) 20:48 11	06:28 (5) 20:57 16	06:36 (5) 20:37 20	19:40 (2) 19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:21	19:09 (2) 05:55	06:16 (5) 05:59	06:21 (5) 06:23	19:20 (2) 06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21 22	19:31 (2) 20:49 12	06:28 (5) 20:57 15	06:36 (5) 20:36 20	19:40 (2) 19:52	19:02	17:18	16:58
5	07:47	07:30	06:53	07:03	06:19	19:09 (2) 05:55	06:16 (5) 05:59	06:21 (5) 06:24	19:19 (2) 06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22 22	19:31 (2) 20:49 13	06:29 (5) 20:57 15	06:36 (5) 20:34 21	19:40 (2) 19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	19:08 (2) 05:54	06:16 (5) 06:00	06:22 (5) 06:25	19:19 (2) 06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 22	19:30 (2) 20:50 14	06:30 (5) 20:56 14	06:36 (5) 20:33 21	19:40 (2) 19:49	18:59	17:16	16:57
7	07:46	07:28	06:49	06:59	06:17	19:08 (2) 05:54	06:16 (5) 06:00	06:22 (5) 06:26	19:18 (2) 06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 22	19:30 (2) 20:50 14	06:30 (5) 20:56 13	06:35 (5) 20:32 21	19:39 (2) 19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	19:09 (2) 05:54	06:15 (5) 06:01	06:23 (5) 06:27	19:18 (2) 06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25 21	19:30 (2) 20:51 15	06:30 (5) 20:56 12	06:35 (5) 20:31 21	19:39 (2) 19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	19:09 (2) 05:54	06:15 (5) 06:01	06:24 (5) 06:28	19:18 (2) 06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26 20	19:29 (2) 20:52 16	06:31 (5) 20:55 11	06:35 (5) 20:30 21	19:39 (2) 19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	19:10 (2) 05:54	06:15 (5) 06:02	06:24 (5) 06:29	19:18 (2) 06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 19	19:29 (2) 20:52 16	06:31 (5) 20:55 10	06:34 (5) 20:28 21	19:39 (2) 19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	19:10 (2) 05:53	06:15 (5) 06:03	06:25 (5) 06:30	19:19 (2) 07:00	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28 18	19:28 (2) 20:53 17	06:32 (5) 20:55 8	06:33 (5) 20:27 19	19:38 (2) 19:41	18:51	17:11	16:57
12	07:46	07:22	06:42	06:51	06:12	19:11 (2) 05:53	06:15 (5) 06:04	06:26 (5) 06:31	19:20 (2) 07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 16	19:27 (2) 20:53 17	06:32 (5) 20:54 7	06:33 (5) 20:26 17	19:37 (2) 19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:10	19:12 (2) 05:53	06:15 (5) 06:04	06:26 (5) 06:32	19:20 (2) 07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30 14	19:26 (2) 20:54 18	06:33 (5) 20:54 5	06:31 (5) 20:25 16	19:36 (2) 19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	19:13 (2) 05:53	06:15 (5) 06:05	06:27 (5) 06:33	19:22 (2) 07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 12	19:25 (2) 20:54 18	06:33 (5) 20:53 2	06:29 (5) 20:23 13	19:35 (2) 19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	19:15 (2) 05:53	06:15 (5) 06:06	06:34	19:24 (2) 07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 8	19:23 (2) 20:55 18	06:33 (5) 20:53	20:22 8	19:32 (2) 19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:15 (5) 06:06	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55 19	06:34 (5) 20:52	20:21	19:32	18:44	17:07	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:15 (5) 06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55 19	06:34 (5) 20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:15 (5) 06:08	06:37	07:06	07:36	07:12	07:40
	17:24	18:02	18:33	20:04	20:35	20:56 19	06:34 (5) 20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:15 (5) 06:09	06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56 19	06:34 (5) 20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:54	06:16 (5) 06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56 19	06:35 (5) 20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:16 (5) 06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:56 19	06:35 (5) 20:49	20:14	19:24	18:36	17:03	17:00
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	17:29	18:06	18:37	20:09	20:38	20:57 19	06:35 (5) 20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:16 (5) 06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57 19	06:35 (5) 20:47	20:11	19:21	18:34	17:02	17:01
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	17:31	18:08	18:39	20:11	20:40	20:57 19	06:36 (5) 20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:17 (5) 06:14	06:43	07:13	06:44	07:20	07:44
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26	07:39	07:03	06:19	06:31	06:00	05:55	06:17 (5) 06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57 19	06:36 (5) 20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:18 (5) 06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57 19	06:37 (5) 20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28 19:16 (2)	05:58	05:56	06:18 (5) 06:17	19:27 (2) 06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15 9 19:25 (2)	20:43	20:57 18	06:36 (5) 20:43 5	19:32 (2) 20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27 19:14 (2)	05:58	05:56	06:18 (5) 06:17	19:25 (2) 06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16 13 19:27 (2)	20:44	20:57 18	06:36 (5) 20:42 9	19:34 (2) 20:02	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26 19:12 (2)	05:57 06:18 (5)	05:57	06:19 (5) 06:18	19:23 (2) 06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17 17 19:29 (2)	20:45 4 06:22 (5)	20:57 18	06:37 (5) 20:41 13	19:36 (2) 20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57 06:18 (5)		06:19	19:22 (2) 06:49		06:51		07:46
	17:40		19:46		20:46 6 06:24 (5)		20:40 15	19:37 (2) 19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				39	284	498	204	274				
Sun reduction				0.51	0.58	0.67	0.75	0.72				
Oper. time red.				0.37	0.37	0.37	0.37	0.37				
Wind dir. red.				0.72	0.72	0.74	0.73	0.72				
Total reduction				0.14	0.16	0.18	0.21	0.19				
Total, real				5	44	92	42	53				

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 22

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: U - R029

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:46	10:22 (4)	07:34	10:24 (4)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	09:57 (4)	07:26	10:05 (4)
	17:08 61	11:23 (4)	17:41 76	11:40 (4)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22 69	11:06 (4)	16:58 68	11:13 (4)
2	07:46	10:22 (4)	07:33	10:24 (4)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	09:56 (4)	07:27	10:06 (4)
	17:08 61	11:23 (4)	17:42 76	11:40 (4)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21 70	11:06 (4)	16:58 67	11:13 (4)
3	07:46	10:22 (4)	07:32	10:24 (4)	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21		06:54	09:56 (4)	07:28	10:07 (4)
	17:09 62	11:24 (4)	17:43 76	11:40 (4)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19 72	11:08 (4)	16:58 66	11:13 (4)
4	07:46	10:23 (4)	07:31	10:25 (4)	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22		06:55	09:56 (4)	07:29	10:07 (4)
	17:10 62	11:25 (4)	17:45 74	11:39 (4)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02		17:18 72	11:08 (4)	16:58 66	11:13 (4)
5	07:46	10:23 (4)	07:30	10:25 (4)	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23		06:57	09:55 (4)	07:30	10:08 (4)
	17:11 63	11:26 (4)	17:46 74	11:39 (4)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17 74	11:09 (4)	16:58 65	11:13 (4)
6	07:46	10:23 (4)	07:29	10:25 (4)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24		06:58	09:55 (4)	07:31	10:09 (4)
	17:12 64	11:27 (4)	17:47 74	11:39 (4)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16 74	11:09 (4)	16:57 64	11:13 (4)
7	07:46	10:23 (4)	07:27	10:26 (4)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	09:55 (4)	07:32	10:10 (4)
	17:13 65	11:28 (4)	17:48 72	11:38 (4)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15 75	11:10 (4)	16:57 63	11:13 (4)
8	07:46	10:23 (4)	07:26	10:27 (4)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	09:55 (4)	07:33	10:11 (4)
	17:14 65	11:28 (4)	17:50 71	11:38 (4)	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56		17:14 75	11:10 (4)	16:57 62	11:13 (4)
9	07:46	10:24 (4)	07:25	10:27 (4)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	09:55 (4)	07:34	10:11 (4)
	17:15 65	11:29 (4)	17:51 70	11:37 (4)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13 76	11:11 (4)	16:57 62	11:13 (4)
10	07:46	10:23 (4)	07:24	10:27 (4)	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28		07:02	09:55 (4)	07:34	10:12 (4)
	17:16 66	11:29 (4)	17:52 69	11:36 (4)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12 76	11:11 (4)	16:57 61	11:13 (4)
11	07:46	10:23 (4)	07:23	10:28 (4)	06:43	06:53	06:13	05:53	06:03	06:30	07:00	07:29		07:04	09:56 (4)	07:35	10:13 (4)
	17:17 68	11:31 (4)	17:53 67	11:35 (4)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11 76	11:12 (4)	16:57 61	11:14 (4)
12	07:46	10:23 (4)	07:22	10:29 (4)	06:42	06:51	06:12	05:53	06:04	06:31	07:00	07:30		07:05	09:56 (4)	07:36	10:13 (4)
	17:18 69	11:32 (4)	17:54 65	11:34 (4)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10 76	11:12 (4)	16:58 60	11:13 (4)
13	07:45	10:23 (4)	07:21	10:30 (4)	06:40	06:50	06:11	05:53	06:04	06:32	07:01	07:31		07:06	09:56 (4)	07:37	10:14 (4)
	17:19 69	11:32 (4)	17:56 63	11:33 (4)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09 76	11:12 (4)	16:58 60	11:14 (4)
14	07:45	10:23 (4)	07:19	10:31 (4)	06:38	06:48	06:10	05:53	06:05	06:33	07:02	07:32		07:07	09:56 (4)	07:38	10:15 (4)
	17:20 70	11:33 (4)	17:57 61	11:32 (4)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08 76	11:12 (4)	16:58 59	11:14 (4)
15	07:45	10:24 (4)	07:18	10:31 (4)	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33		07:08	09:57 (4)	07:38	10:16 (4)
	17:21 70	11:34 (4)	17:58 58	11:29 (4)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45		17:07 76	11:13 (4)	16:58 59	11:15 (4)
16	07:44	10:23 (4)	07:17	10:32 (4)	06:35	06:45	06:08	05:53	06:06	06:35	07:04	07:34		07:09	09:57 (4)	07:39	10:16 (4)
	17:22 71	11:34 (4)	17:59 56	11:28 (4)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44		17:07 76	11:13 (4)	16:58 58	11:14 (4)
17	07:44	10:24 (4)	07:15	10:34 (4)	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35		07:10	09:57 (4)	07:40	10:17 (4)
	17:23 71	11:35 (4)	18:00 52	11:26 (4)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42		17:06 75	11:12 (4)	16:59 58	11:15 (4)
18	07:43	10:23 (4)	07:14	10:34 (4)	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36		07:12	09:57 (4)	07:40	10:17 (4)
	17:24 72	11:35 (4)	18:02 49	11:23 (4)	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41		17:05 75	11:12 (4)	16:59 58	11:15 (4)
19	07:43	10:24 (4)	07:13	10:36 (4)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	11:19 (4)	07:13	09:57 (4)	07:41	10:18 (4)
	17:26 73	11:37 (4)	18:03 44	11:20 (4)	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39 16	11:35 (4)	17:04 75	11:12 (4)	16:59 57	11:15 (4)
20	07:42	10:23 (4)	07:11	10:38 (4)	06:29	06:39	06:04	05:54	06:10	06:38	07:08	07:39	11:14 (4)	07:14	09:59 (4)	07:42	10:19 (4)
	17:27 74	11:37 (4)	18:04 39	11:17 (4)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38 27	11:41 (4)	17:04 74	11:13 (4)	17:00 57	11:16 (4)
21	07:42	10:23 (4)	07:10	10:41 (4)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	11:10 (4)	07:15	09:59 (4)	07:42	10:19 (4)
	17:28 74	11:37 (4)	18:05 32	11:13 (4)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 35	11:45 (4)	17:03 74	11:13 (4)	17:00 57	11:16 (4)
22	07:41	10:24 (4)	07:09	10:45 (4)	06:25	06:37	06:02	05:54	06:11	06:40	07:10	07:41	11:08 (4)	07:16	09:59 (4)	07:43	10:20 (4)
	17:29 74	11:38 (4)	18:06 24	11:09 (4)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 40	11:48 (4)	17:02 74	11:13 (4)	17:01 57	11:17 (4)
23	07:41	10:23 (4)	07:07	10:51 (4)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	11:06 (4)	07:17	10:00 (4)	07:43	10:20 (4)
	17:30 75	11:38 (4)	18:07 9	11:00 (4)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34 45	11:51 (4)	17:02 73	11:13 (4)	17:01 57	11:17 (4)
24	07:40	10:23 (4)	07:06		06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	11:05 (4)	07:18	10:00 (4)	07:44	10:20 (4)
	17:31 75	11:38 (4)	18:08		18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 49	11:54 (4)	17:01 72	11:12 (4)	17:02 57	11:17 (4)
25	07:39	10:23 (4)	07:04		06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	10:03 (4)	07:20	10:02 (4)	07:44	10:21 (4)
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26	07:39	10:24 (4)	07:03		06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	10:02 (4)	07:21	10:02 (4)	07:44	10:21 (4)
	17:34 76	11:40 (4)	18:11		18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29 56	10:58 (4)	17:00 71	11:13 (4)	17:03 58	11:19 (4)
27	07:38	10:24 (4)	07:02		06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	10:00 (4)	07:22	10:03 (4)	07:45	10:21 (4)
	17:35 76	11:40 (4)	18:12		18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28 59	10:59 (4)	17:00 70	11:13 (4)	17:04 58	11:19 (4)
28	07:37	10:24 (4)	07:00		06:16	06:28	05:58	05:56	06:17	06:46	07:16	06:47	09:59 (4)	07:23	10:03 (4)	07:45	10:22 (4)
	17:36 76	11:40 (4)	18:13		18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 62	11:01 (4)	16:59 70	11:13 (4)	17:04 58	11:20 (4)
29	07:36	10:24 (4)			07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:49	09:59 (4)	07:24	10:04 (4)	07:45	10:22 (4)
	17:37 76	11:40 (4)			19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26 64	11:03 (4)	16:59 69	11:13 (4)	17:05 59	11:21 (4)
30	07:35	10:24 (4)			07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50	09:58 (4)	07:25	10:04 (4)	07:46	10:22 (4)
	17:39 76	11:40 (4)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 66	11:04 (4)	16:59 69	11:13 (4)	17:06 59	11:21 (4)
31	07:34	10:24 (4)			07:11		05:57		06:19	06:49		06:51	09:57 (4)			07:46	10:22 (4)
	17:40 76	11:40 (4)			19:46		20:46		20:40	19:58		17:23 68	11:05 (4)			17:07 60	11:22 (4)
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290	
Total, worst case		2171		1351									640		2201		1868
Sun reduction		0.40		0.43									0.56		0.48		0.41
Oper. time red.		0.37		0.37									0.37		0.37		0.37
Wind dir. red.		0.53		0.53									0.53		0.53		0.53
Total reduction		0.08		0.09									0.11		0.10		0.08
Total, real		172		116									71		209		153

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 23

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: V - R033

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:58	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:44	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02	17:18	16:58
5	07:46	07:30	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	05:55	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:02	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
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	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:42	06:51	06:12	05:53	06:04	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:11	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:10	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:07	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:37	07:06	07:36	07:12	07:40
	17:24	18:02	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:54	06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:11	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:03	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:16	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:18	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 24
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: W - R013

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June	July	August	September	October			November			December		
1	07:46		13:00 (3)	07:34		07:53 (5)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19			06:52		07:13 (5)	07:26		12:48 (3)
	17:07	100	14:40 (3)	17:41	84	14:38 (3)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07			17:22	39	13:46 (3)	16:58	97	14:25 (3)
2	07:46		13:00 (3)	07:33		07:52 (5)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20			06:53		07:14 (5)	07:27		12:48 (3)
	17:08	100	14:40 (3)	17:42	82	14:37 (3)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06			17:21	52	13:52 (3)	16:58	98	14:26 (3)
3	07:46		13:01 (3)	07:32		07:51 (5)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21			06:54		07:16 (5)	07:28		12:48 (3)
	17:09	100	14:41 (3)	17:43	80	14:36 (3)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04			17:19	61	13:57 (3)	16:58	98	14:26 (3)
4	07:46		13:01 (3)	07:31		07:50 (5)	06:54	07:04	06:21	05:55	05:58	06:23	06:53	07:22			06:55		07:17 (5)	07:29		12:48 (3)
	17:10	100	14:41 (3)	17:45	78	14:35 (3)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02			17:18	66	13:59 (3)	16:58	99	14:27 (3)
5	07:47		13:02 (3)	07:30		07:49 (5)	06:53	07:03	06:19	05:55	05:59	06:24	06:54	07:23			06:57		07:18 (5)	07:30		12:48 (3)
	17:11	99	14:41 (3)	17:46	74	14:33 (3)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01			17:17	70	14:01 (3)	16:57	99	14:27 (3)
6	07:47		13:02 (3)	07:29		07:48 (5)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24			06:58		07:19 (5)	07:31		12:49 (3)
	17:12	100	14:42 (3)	17:47	70	14:31 (3)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59			17:16	74	14:03 (3)	16:57	99	14:28 (3)
7	07:46		13:03 (3)	07:28		07:47 (5)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25			06:59		07:21 (5)	07:32		12:49 (3)
	17:13	99	14:42 (3)	17:48	65	14:29 (3)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58			17:15	78	14:06 (3)	16:57	100	14:29 (3)
8	07:46		13:04 (3)	07:26		07:46 (5)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26			07:00		07:22 (5)	07:33		12:49 (3)
	17:14	99	14:43 (3)	17:50	59	14:26 (3)	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56			17:14	81	14:07 (3)	16:57	100	14:29 (3)
9	07:46		13:05 (3)	07:25		07:45 (5)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27			07:01		07:23 (5)	07:34		12:50 (3)
	17:15	98	14:43 (3)	17:51	49	14:22 (3)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54			17:13	83	14:08 (3)	16:57	100	14:30 (3)
10	07:46		13:05 (3)	07:24		07:43 (5)	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28			07:02		07:24 (5)	07:34		12:50 (3)
	17:16	98	14:43 (3)	17:52	36	14:15 (3)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53			17:12	85	14:09 (3)	16:57	100	14:30 (3)
11	07:46		13:06 (3)	07:23		07:42 (5)	06:43	06:53	06:13	05:53	06:03	06:30	07:00	07:29			07:04		07:26 (5)	07:35		12:51 (3)
	17:17	97	14:43 (3)	17:53	23	08:05 (5)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51			17:11	87	14:11 (3)	16:57	100	14:31 (3)
12	07:46		13:07 (3)	07:22		07:41 (5)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30			07:05		07:27 (5)	07:36		12:50 (3)
	17:18	97	14:44 (3)	17:54	24	08:05 (5)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50			17:10	88	14:12 (3)	16:57	101	14:31 (3)
13	07:45		13:07 (3)	07:21		07:40 (5)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31			07:06		07:28 (5)	07:37		12:51 (3)
	17:19	96	14:43 (3)	17:56	24	08:04 (5)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48			17:09	89	14:13 (3)	16:58	100	14:31 (3)
14	07:45		13:08 (3)	07:19		07:39 (5)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32			07:07		07:29 (5)	07:38		12:51 (3)
	17:20	96	14:44 (3)	17:57	24	08:03 (5)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47			17:08	90	14:14 (3)	16:58	101	14:32 (3)
15	07:45		13:09 (3)	07:18		07:37 (5)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33			07:08		07:31 (5)	07:38		12:52 (3)
	17:21	96	14:45 (3)	17:58	24	08:01 (5)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45			17:07	90	14:15 (3)	16:58	101	14:33 (3)
16	07:44		13:09 (3)	07:17		07:36 (5)	06:35	06:45	06:08	05:53	06:06	06:35	07:04	07:34			07:09		07:32 (5)	07:39		12:52 (3)
	17:22	95	14:44 (3)	17:59	23	07:59 (5)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44			17:07	90	14:16 (3)	16:58	101	14:33 (3)
17	07:44		13:10 (3)	07:15		07:38 (5)	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35			07:10		07:33 (5)	07:40		12:53 (3)
	17:23	95	14:45 (3)	18:00	19	07:57 (5)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42			17:06	91	14:17 (3)	16:59	101	14:34 (3)
18	07:43		13:11 (3)	07:14		07:41 (5)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36			07:12		07:34 (5)	07:40		12:52 (3)
	17:24	93	14:44 (3)	18:01	11	07:52 (5)	18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41			17:05	90	14:17 (3)	16:59	101	14:33 (3)
19	07:43		13:12 (3)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37			07:13		07:35 (5)	07:41		12:53 (3)
	17:26	93	14:45 (3)	18:03			18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39			17:04	91	14:18 (3)	16:59	101	14:34 (3)
20	07:42		13:13 (3)	07:11			06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39			07:14		07:37 (5)	07:42		12:54 (3)
	17:27	91	14:44 (3)	18:04			18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38			17:04	91	14:19 (3)	17:00	101	14:35 (3)
21	07:42		13:13 (3)	07:10			06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40			07:15		12:49 (3)	07:42		12:54 (3)
	17:28	91	14:44 (3)	18:05			18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36			17:03	91	14:20 (3)	17:00	101	14:35 (3)
22	07:41		08:02 (5)	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41			07:16		12:49 (3)	07:43		12:55 (3)
	17:29	91	14:44 (3)	18:06			18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35			17:02	91	14:20 (3)	17:01	101	14:36 (3)
23	07:41		08:01 (5)	07:07			06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42			07:17		12:48 (3)	07:43		12:55 (3)
	17:30	91	14:44 (3)	18:07			18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34			17:02	93	14:21 (3)	17:01	101	14:36 (3)
24	07:40		08:00 (5)	07:06			06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43		08:10 (5)	07:18		12:48 (3)	07:44		12:55 (3)
	17:31	90	14:43 (3)	18:08			18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	14	08:24 (5)	17:01	93	14:21 (3)	17:02	101	14:36 (3)
25	07:39		07:59 (5)	07:04			06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44		07:07 (5)	07:20		12:49 (3)	07:44		12:56 (3)
	17:33	91	14:43 (3)	18:10			18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	20	07:27 (5)	17:01	94	14:23 (3)	17:02	101	14:37 (3)
26	07:39		07:59 (5)	07:03			06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45		07:06 (5)	07:21		12:48 (3)	07:44		12:57 (3)
	17:34	90	14:43 (3)	18:11			18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	23	07:29 (5)	17:00	95	14:23 (3)	17:03	101	14:38 (3)
27	07:38		07:58 (5)	07:02			06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46		07:07 (5)	07:22		12:48 (3)	07:45		12:57 (3)
	17:35	90	14:42 (3)	18:12			18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	24	07:31 (5)	17:00	96	14:24 (3)	17:04	101	14:38 (3)
28	07:37		07:57 (5)	07:00			06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47		07:08 (5)	07:23		12:48 (3)	07:45		12:58 (3)
	17:36	90	14:42 (3)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	24	07:32 (5)	16:59	96	14:24 (3)	17:04	101	14:39 (3)
29	07:36		07:56 (5)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49		07:10 (5)	07:24		12:48 (3)	07:45		12:58 (3)
	17:37	89	14:41 (3)				19:44	20:16	20:44	20:57	20:42	20:02	19:11	17:26	24	07:34 (5)	16:59	96	14:24 (3)	17:05	101	14:39 (3)
30	07:35		07:55 (5)				07:12	06:26	05:57	05:56	06:18	06:48	07:18	06:50		07:11 (5)	07:25		12:48 (3)	07:46		12:59 (3)
	17:39	88	14:40 (3)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	24	07:35 (5)	16:59	97	14:25 (3)	17:06	100	14:39 (3)
31	07:34		07:54 (5)				07:11		05:57		06:19	06:49		06:51		07:12 (5)				07:46		12:59 (3)
	17:40	86	14:39 (3)				19:46		20:46		20:40	19:58		17:23	23	07:35 (5)				17:06	101	14:40 (3)
Potential sun hours	300			298			370	398	446	450	457	426	375	346			300			290		
Total, worst case		2929			849										176			2528			3108	
Sun reduction		0.40			0.43										0.56			0.48			0.41	
Oper. time red.		0.37			0.37										0.37			0.37			0.37	
Wind dir. red.		0.59			0.63										0.69			0.60			0.59	
Total reduction		0.09			0.10										0.14			0.11			0.09	
Total, real		258			86										25			271			281	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 25

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: X - R014

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February		March	April	May	June	July	August	September	October		November		December
1	07:46	07:34		07:57 (7)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:21 (7)	07:26
	17:08	17:41	9	08:06 (7)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22	22 07:43 (7)	16:58
2	07:46	07:33		07:55 (7)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	07:21 (7)	07:27
	17:08	17:42	13	08:08 (7)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21	22 07:43 (7)	16:58
3	07:46	07:32		07:54 (7)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	07:22 (7)	07:28
	17:09	17:43	16	08:10 (7)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19	22 07:44 (7)	16:58
4	07:46	07:31		07:53 (7)	06:54	07:04	06:21	05:55	05:58	06:23	06:53	07:22		06:55	07:22 (7)	07:29
	17:10	17:45	18	08:11 (7)	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02		17:18	21 07:43 (7)	16:58
5	07:46	07:30		07:52 (7)	06:52	07:03	06:19	05:55	05:59	06:24	06:54	07:23		06:57	07:22 (7)	07:30
	17:11	17:46	20	08:12 (7)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17	21 07:43 (7)	16:57
6	07:46	07:29		07:52 (7)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24		06:58	07:22 (7)	07:31
	17:12	17:47	21	08:13 (7)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16	20 07:42 (7)	16:57
7	07:46	07:27		07:52 (7)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	07:24 (7)	07:32
	17:13	17:48	21	08:13 (7)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15	18 07:42 (7)	16:57
8	07:46	07:26		07:52 (7)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	07:25 (7)	07:33
	17:14	17:50	22	08:14 (7)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56		17:14	16 07:41 (7)	16:57
9	07:46	07:25		07:52 (7)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	07:26 (7)	07:34
	17:15	17:51	22	08:14 (7)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13	13 07:39 (7)	16:57
10	07:46	07:24		07:51 (7)	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28		07:02	07:28 (7)	07:34
	17:16	17:52	22	08:13 (7)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12	9 07:37 (7)	16:57
11	07:46	07:23		07:52 (7)	06:43	06:53	06:13	05:53	06:03	06:30	06:59	07:29		07:03		07:35
	07:17	17:53	21	08:13 (7)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11		16:57
12	07:46	07:22		07:53 (7)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05		07:36
	17:18	17:54	20	08:13 (7)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10		16:57
13	07:45	07:21		07:53 (7)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06		07:37
	17:19	17:56	20	08:13 (7)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09		16:58
14	07:45	07:19		07:55 (7)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32		07:07		07:38
	17:20	17:57	17	08:12 (7)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08		16:58
15	07:45	07:18		07:55 (7)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33		07:08		07:38
	17:21	17:58	15	08:10 (7)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45		17:07		16:58
16	07:44	07:17		07:57 (7)	06:35	06:45	06:08	05:53	06:06	06:35	07:04	07:34		07:09		07:39
	17:22	17:59	12	08:09 (7)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44		17:07		16:58
17	07:44	07:15		08:01 (7)	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35		07:10		07:40
	17:23	18:00	4	08:05 (7)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42		17:06		16:59
18	07:43	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36		07:12		07:40
	17:24	18:01			18:33	20:04	20:35	20:56	20:51	20:18	19:29	18:41		17:05		16:59
19	07:43	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37		07:13		07:41
	17:26	18:03			18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39		17:04		16:59
20	07:42	07:11			06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39		07:14		07:42
	17:27	18:04			18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38		17:04		17:00
21	07:42	07:10			06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40		07:15		07:42
	17:28	18:05			18:36	20:07	20:37	20:56	20:49	20:14	19:24	18:36		17:03		17:00
22	07:41	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41		07:16		07:43
	17:29	18:06			18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35		17:02		17:01
23	07:41	07:07			06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42		07:17		07:43
	17:30	18:07			18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34		17:02		17:01
24	07:40	07:06			06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43		07:18		07:44
	17:31	18:08			18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32		17:01		17:02
25	07:39	07:04			06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:30 (7)	07:20		07:44
	17:33	18:10			18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	6 07:36 (7)	17:01		17:02
26	07:39	07:03			06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:26 (7)	07:21		07:44
	17:34	18:11			18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	13 07:39 (7)	17:00		17:03
27	07:38	07:02			06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:24 (7)	07:22		07:45
	17:35	18:12			18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	16 07:40 (7)	17:00		17:04
28	07:37	07:00			06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23 (7)	07:23		07:45
	17:36	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	18 07:41 (7)	16:59		17:04
29	07:36				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:22 (7)	07:24		07:45
	17:37				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:26	20 07:42 (7)	16:59		17:05
30	07:35				07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50	07:22 (7)	07:25		07:46
	17:39				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	21 07:43 (7)	16:59		17:06
31	07:34				07:11		05:57		06:19	06:49		06:51	07:22 (7)			07:46
	17:40				19:46		20:46		20:40	19:58		17:23	21 07:43 (7)			17:06
Potential sun hours	300	298			370	398	446	450	457	426	375	346		300		290
Total, worst case			293									115		184		
Sun reduction			0.43									0.56		0.48		
Oper. time red.			0.37									0.37		0.37		
Wind dir. red.			0.68									0.68		0.68		
Total reduction			0.11									0.14		0.12		
Total, real			32									16		23		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 26

Licensed user:
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IT-09028 Sestu
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: Y - R015

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:22 (7)	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	8	07:30 (7)	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58
4	07:46	07:31	06:54	07:04	06:21	05:55	05:58	06:23	06:53	07:22	06:55			07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02	17:18			16:58
5	07:46	07:30	06:52	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57
6	07:46	07:29	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58			07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59			07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15			16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00			07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14			16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01			07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13			16:57
10	07:46	07:24 07:51 (7)	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02			07:34
	17:16	17:52 10 08:01 (7)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12			16:57
11	07:46	07:23 07:49 (7)	06:43	06:53	06:13	05:53	06:03	06:30	06:59	07:29	07:03			07:35
	17:17	17:53 15 08:04 (7)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11			16:57
12	07:46	07:22 07:48 (7)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05			07:36
	17:18	17:54 17 08:05 (7)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10			16:57
13	07:45	07:21 07:47 (7)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06			07:37
	17:19	17:56 20 08:07 (7)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09			16:58
14	07:45	07:19 07:47 (7)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07			07:38
	17:20	17:57 21 08:08 (7)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08			16:58
15	07:45	07:18 07:45 (7)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08			07:38
	17:21	17:58 23 08:08 (7)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07			16:58
16	07:44	07:17 07:45 (7)	06:35	06:45	06:08	05:53	06:06	06:35	07:04	07:34	07:09			07:39
	17:22	17:59 23 08:08 (7)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07			16:58
17	07:44	07:15 07:45 (7)	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35 08:22 (7)	07:10			07:40
	17:23	18:00 24 08:09 (7)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42 10 08:32 (7)	17:06			16:59
18	07:43	07:14 07:45 (7)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36 08:20 (7)	07:12			07:40
	17:24	18:01 23 08:08 (7)	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41 15 08:35 (7)	17:05			16:59
19	07:43	07:13 07:45 (7)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37 08:18 (7)	07:13			07:41
	17:26	18:03 23 08:08 (7)	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39 18 08:36 (7)	17:04			16:59
20	07:42	07:11 07:45 (7)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:38 08:17 (7)	07:14			07:42
	17:27	18:04 22 08:07 (7)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38 20 08:37 (7)	17:04			17:00
21	07:42	07:10 07:46 (7)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40 08:16 (7)	07:15			07:42
	17:28	18:05 21 08:07 (7)	18:36	20:07	20:37	20:56	20:49	20:14	19:24	18:36 22 08:38 (7)	17:03			17:00
22	07:41	07:09 07:47 (7)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41 08:15 (7)	07:16			07:43
	17:29	18:06 19 08:06 (7)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 23 08:38 (7)	17:02			17:01
23	07:41	07:07 07:47 (7)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42 08:15 (7)	07:17			07:43
	17:30	18:07 17 08:04 (7)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34 23 08:38 (7)	17:02			17:01
24	07:40	07:06 07:49 (7)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43 08:15 (7)	07:18			07:44
	17:31	18:08 14 08:03 (7)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 24 08:39 (7)	17:01			17:02
25	07:39	07:04 07:51 (7)	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44 07:15 (7)	07:19			07:44
	17:33	18:10 9 08:00 (7)	18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31 23 07:38 (7)	17:01			17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45 07:15 (7)	07:21			07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29 23 07:38 (7)	17:00			17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46 07:15 (7)	07:22			07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28 22 07:37 (7)	17:00			17:04
28	07:37	07:00	06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47 07:16 (7)	07:23			07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 20 07:36 (7)	16:59			17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48 07:16 (7)	07:24			07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:26 19 07:35 (7)	16:59			17:05
30	07:35		07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50 07:18 (7)	07:25			07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 17 07:35 (7)	16:59			17:06
31	07:34		07:11		05:57		06:19	06:49		06:51 07:19 (7)				07:46
	17:40		19:46		20:46		20:40	19:58		17:23 14 07:33 (7)				17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300			290
Total, worst case		301								293	8			
Sun reduction		0.43								0.56	0.48			
Oper. time red.		0.37								0.37	0.37			
Wind dir. red.		0.70								0.70	0.70			
Total reduction		0.11								0.14	0.12			
Total, real		34								42	1			

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 27

Licensed user:
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+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: Z - R031

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June		July	August	September	October	November	December
1	07:46	07:33	06:59	07:09	06:24	05:56		05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46		20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56		05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47		20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:56		05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48		20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:21	05:55		05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48		20:57	20:36	19:52	19:02	17:18	16:58
5	07:46	07:30	06:52	07:03	06:19	05:55		05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:19	19:51	20:22	20:49		20:56	20:34	19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	05:54		06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50		20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54		06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50		20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54		06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51		20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54		06:01	06:28	06:58	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:52		20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54		06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52		20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	05:53		06:03	06:30	07:00	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:53		20:55	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:12	05:53		06:04	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53		20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:10	05:53		06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54		20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53		06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54		20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53		06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54		20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53		06:06	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55		20:52	20:21	19:32	18:44	17:07	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53		06:15 (7)	06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	3	06:18 (7)	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53		06:15 (7)	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34	20:56	4	06:19 (7)	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53		06:15 (7)	06:09	06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56	5	06:20 (7)	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:54		06:16 (7)	06:10	06:38	07:08	07:38	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	5	06:21 (7)	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54		06:16 (7)	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	5	06:21 (7)	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:02	05:54		06:16 (7)	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	20:57	5	06:21 (7)	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54		06:16 (7)	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	5	06:21 (7)	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54		06:17 (7)	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	4	06:21 (7)	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55		06:17 (7)	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	4	06:21 (7)	20:45	20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	06:00	05:55		06:18 (7)	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	2	06:20 (7)	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55			06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57			20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:15	06:28	05:58	05:56			06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57			20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56			06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57			20:42	20:01	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57			06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57			20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57				06:19	06:49		06:51		07:46
	17:40		19:46		20:46				20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450		457	426	375	346	300	290
Total, worst case							42						
Sun reduction							0.67						
Oper. time red.							0.37						
Wind dir. red.							0.73						
Total reduction							0.18						
Total, real							8						

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 28

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AA - R030

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:21	05:55	05:59	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02	17:18	16:58
5	07:46	07:30	06:52	07:03	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:58
6	07:46	07:29	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:12	05:53	06:04	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:58
13	07:45	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:09	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:06	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:07	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:36	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:54	06:10	06:38	07:08	07:38	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:37	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:34	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	17:00	17:04
28	07:37	07:00	06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:26	16:59	17:05
30	07:35		07:12	06:26	05:57	05:57	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:07
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 29
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AB - R039

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May			June		
1	07:46		08:40 (7)	07:33	06:59	07:09	06:24			05:56		18:41 (3)
	17:07	27	09:07 (7)	17:41	18:14	19:47	20:18			20:46	38	19:19 (3)
2	07:46		08:41 (7)	07:33	06:57	07:07	06:23			05:56		18:42 (3)
	17:08	26	09:07 (7)	17:42	18:15	19:48	20:19			20:47	38	19:20 (3)
3	07:46		08:41 (7)	07:32	06:56	07:06	06:22			05:55		18:42 (3)
	17:09	26	09:07 (7)	17:43	18:16	19:49	20:20			20:48	38	19:20 (3)
4	07:46		08:42 (7)	07:31	06:54	07:04	06:20			05:55		18:41 (3)
	17:10	25	09:07 (7)	17:45	18:17	19:50	20:21			20:48	39	19:20 (3)
5	07:46		08:43 (7)	07:30	06:52	07:02	06:19			05:55		18:42 (3)
	17:11	24	09:07 (7)	17:46	18:19	19:51	20:22			20:49	38	19:20 (3)
6	07:46		08:44 (7)	07:29	06:51	07:01	06:18			05:54		18:42 (3)
	17:12	24	09:08 (7)	17:47	18:20	19:52	20:23			20:50	39	19:21 (3)
7	07:46		08:44 (7)	07:27	06:49	06:59	06:17			05:54		18:42 (3)
	17:13	24	09:08 (7)	17:48	18:21	19:53	20:24			20:50	39	19:21 (3)
8	07:46		08:45 (7)	07:26	06:48	06:58	06:16			05:54		18:42 (3)
	17:14	23	09:08 (7)	17:49	18:22	19:54	20:25			20:51	39	19:21 (3)
9	07:46		08:47 (7)	07:25	06:46	06:56	06:15			05:54		18:42 (3)
	17:15	21	09:08 (7)	17:51	18:23	19:55	20:26			20:52	39	19:21 (3)
10	07:46		08:47 (7)	07:24	06:45	06:55	06:14			05:53		18:42 (3)
	17:16	20	09:07 (7)	17:52	18:24	19:56	20:27			20:52	40	19:22 (3)
11	07:46		08:48 (7)	07:23	06:43	06:53	06:13			05:53		18:43 (3)
	17:17	19	09:07 (7)	17:53	18:25	19:57	20:28			20:53	39	19:22 (3)
12	07:46		08:50 (7)	07:22	06:41	06:51	06:11			05:53		18:43 (3)
	17:18	17	09:07 (7)	17:54	18:26	19:58	20:29			20:53	39	19:22 (3)
13	07:45		08:50 (7)	07:21	06:40	06:50	06:10			05:53		18:43 (3)
	17:19	16	09:06 (7)	17:56	18:27	19:59	20:30			20:54	40	19:23 (3)
14	07:45		08:52 (7)	07:19	06:38	06:48	06:09			05:53		18:43 (3)
	17:20	13	09:05 (7)	17:57	18:28	20:00	20:31			20:54	40	19:23 (3)
15	07:45		08:55 (7)	07:18	06:37	06:47	06:08			05:53		18:44 (3)
	17:21	9	09:04 (7)	17:58	18:29	20:01	20:32			20:55	39	19:23 (3)
16	07:44			07:17	06:35	06:45	06:08		18:53 (3)	05:53		18:44 (3)
	17:22			17:59	18:30	20:02	20:33	12	19:05 (3)	20:55	39	19:23 (3)
17	07:44			07:15	06:33	06:44	06:07		18:50 (3)	05:53		18:44 (3)
	17:23			18:00	18:31	20:03	20:34	17	19:07 (3)	20:55	39	19:23 (3)
18	07:43			07:14	06:32	06:42	06:06		18:49 (3)	05:53		18:44 (3)
	17:24			18:01	18:32	20:04	20:35	20	19:09 (3)	20:56	40	19:24 (3)
19	07:43			07:13	06:30	06:41	06:05		18:47 (3)	05:53		18:44 (3)
	17:26			18:03	18:34	20:05	20:35	23	19:10 (3)	20:56	40	19:24 (3)
20	07:42			07:11	06:29	06:39	06:04		18:46 (3)	05:53		18:44 (3)
	17:27			18:04	18:35	20:06	20:36	25	19:11 (3)	20:56	40	19:24 (3)
21	07:42			07:10	06:27	06:38	06:03		18:46 (3)	05:54		18:45 (3)
	17:28			18:05	18:36	20:07	20:37	27	19:13 (3)	20:56	40	19:25 (3)
22	07:41			07:09	06:25	06:36	06:02		18:45 (3)	05:54		18:45 (3)
	17:29			18:06	18:37	20:08	20:38	29	19:14 (3)	20:57	40	19:25 (3)
23	07:41			07:07	06:24	06:35	06:02		18:44 (3)	05:54		18:45 (3)
	17:30			18:07	18:38	20:10	20:39	30	19:14 (3)	20:57	40	19:25 (3)
24	07:40			07:06	06:22	06:34	06:01		18:44 (3)	05:54		18:45 (3)
	17:31			18:08	18:39	20:11	20:40	32	19:16 (3)	20:57	40	19:25 (3)
25	07:39			07:04	06:20	06:32	06:00		18:43 (3)	05:55		18:46 (3)
	17:33			18:10	18:40	20:12	20:41	33	19:16 (3)	20:57	39	19:25 (3)
26	07:38			07:03	06:19	06:31	06:00		18:42 (3)	05:55		18:46 (3)
	17:34			18:11	18:41	20:13	20:42	34	19:16 (3)	20:57	39	19:25 (3)
27	07:38			07:02	06:17	06:29	05:59		18:42 (3)	05:55		18:46 (3)
	17:35			18:12	18:42	20:14	20:42	35	19:17 (3)	20:57	39	19:25 (3)
28	07:37			07:00	06:15	06:28	05:58		18:42 (3)	05:56		18:47 (3)
	17:36			18:13	18:43	20:15	20:43	35	19:17 (3)	20:57	39	19:26 (3)
29	07:36				07:14	06:27	05:58		18:42 (3)	05:56		18:46 (3)
	17:37				19:44	20:16	20:44	36	19:18 (3)	20:57	40	19:26 (3)
30	07:35				07:12	06:26	05:57		18:41 (3)	05:56		18:47 (3)
	17:39				19:45	20:17	20:45	37	19:18 (3)	20:57	39	19:26 (3)
31	07:34				07:11		05:57		18:42 (3)			
	17:40				19:46		20:46	37	19:19 (3)			
Potential sun hours	300			298	370	398	446			450		
Total, worst case		314						462			1177	
Sun reduction		0.40						0.58			0.67	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.61						0.71			0.71	
Total reduction		0.09						0.15			0.18	
Total, real		28						71			207	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 30

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AB - R039

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August	September	October	November		December		
1	05:57		18:47 (3)	06:20	06:50	07:19	06:52		07:26		08:30 (7)
	20:57	39	19:26 (3)	20:39	19:57	19:07	17:22		16:58	19	08:49 (7)
2	05:57		18:48 (3)	06:21	06:51	07:20	06:53		07:27		08:30 (7)
	20:57	39	19:27 (3)	20:38	19:55	19:06	17:21		16:58	20	08:50 (7)
3	05:58		18:47 (3)	06:22	06:52	07:21	06:54		07:28		08:30 (7)
	20:57	40	19:27 (3)	20:37	19:54	19:04	17:19		16:58	21	08:51 (7)
4	05:58		18:48 (3)	06:23	06:53	07:22	06:55		07:29		08:30 (7)
	20:57	39	19:27 (3)	20:36	19:52	19:02	17:18		16:58	22	08:52 (7)
5	05:59		18:48 (3)	06:24	06:54	07:23	06:57		07:30		08:30 (7)
	20:57	39	19:27 (3)	20:34	19:50	19:01	17:17		16:57	23	08:53 (7)
6	06:00		18:48 (3)	06:25	06:55	07:24	06:58		07:31		08:30 (7)
	20:56	39	19:27 (3)	20:33	19:49	18:59	17:16		16:57	24	08:54 (7)
7	06:00		18:48 (3)	06:26	06:56	07:25	06:59		07:32		08:30 (7)
	20:56	39	19:27 (3)	20:32	19:47	18:58	17:15		16:57	25	08:55 (7)
8	06:01		18:49 (3)	06:27	06:57	07:26	07:00		07:33		08:30 (7)
	20:56	38	19:27 (3)	20:31	19:45	18:56	17:14		16:57	25	08:55 (7)
9	06:01		18:49 (3)	06:28	06:58	07:27	07:01		07:34		08:30 (7)
	20:55	39	19:28 (3)	20:30	19:44	18:54	17:13		16:57	26	08:56 (7)
10	06:02		18:49 (3)	06:29	06:59	07:28	07:02		07:34		08:31 (7)
	20:55	38	19:27 (3)	20:28	19:42	18:53	17:12		16:57	26	08:57 (7)
11	06:03		18:49 (3)	06:30	06:59	07:29	07:03		07:35		08:30 (7)
	20:55	38	19:27 (3)	20:27	19:41	18:51	17:11		16:57	27	08:57 (7)
12	06:03		18:50 (3)	06:31	07:00	07:30	07:05		07:36		08:31 (7)
	20:54	37	19:27 (3)	20:26	19:39	18:50	17:10		16:57	26	08:57 (7)
13	06:04		18:50 (3)	06:32	07:01	07:31	07:06		07:37		08:31 (7)
	20:54	37	19:27 (3)	20:25	19:37	18:48	17:09		16:58	27	08:58 (7)
14	06:05		18:50 (3)	06:33	07:02	07:32	07:07		07:38		08:32 (7)
	20:53	37	19:27 (3)	20:23	19:36	18:47	17:08		16:58	27	08:59 (7)
15	06:06		18:51 (3)	06:34	07:03	07:33	07:08		07:38		08:33 (7)
	20:53	36	19:27 (3)	20:22	19:34	18:45	17:07		16:58	27	09:00 (7)
16	06:06		18:52 (3)	06:35	07:04	07:34	07:09		07:39		08:32 (7)
	20:52	35	19:27 (3)	20:21	19:32	18:44	17:07		16:58	28	09:00 (7)
17	06:07		18:51 (3)	06:35	07:05	07:35	07:10		07:40		08:33 (7)
	20:51	35	19:26 (3)	20:19	19:31	18:42	17:06		16:59	28	09:01 (7)
18	06:08		18:52 (3)	06:36	07:06	07:36	07:12		07:40		08:33 (7)
	20:51	34	19:26 (3)	20:18	19:29	18:41	17:05		16:59	27	09:00 (7)
19	06:09		18:53 (3)	06:37	07:07	07:37	07:13		07:41		08:34 (7)
	20:50	32	19:25 (3)	20:16	19:27	18:39	17:04		16:59	27	09:01 (7)
20	06:10		18:54 (3)	06:38	07:08	07:38	07:14		07:42		08:35 (7)
	20:49	31	19:25 (3)	20:15	19:26	18:38	17:04		17:00	27	09:02 (7)
21	06:10		18:54 (3)	06:39	07:09	07:40	07:15		07:42		08:35 (7)
	20:49	30	19:24 (3)	20:13	19:24	18:36	17:03		17:00	27	09:02 (7)
22	06:11		18:55 (3)	06:40	07:10	07:41	07:16		07:43		08:36 (7)
	20:48	28	19:23 (3)	20:12	19:22	18:35	17:02		17:01	27	09:03 (7)
23	06:12		18:56 (3)	06:41	07:11	07:42	07:17		07:43		08:36 (7)
	20:47	26	19:22 (3)	20:11	19:21	18:33	17:02		17:01	27	09:03 (7)
24	06:13		18:57 (3)	06:42	07:12	07:43	07:18		07:44		08:36 (7)
	20:46	24	19:21 (3)	20:09	19:19	18:32	17:01		17:02	27	09:03 (7)
25	06:14		18:58 (3)	06:43	07:13	06:44	07:19		07:44		08:37 (7)
	20:45	22	19:20 (3)	20:08	19:17	17:31	17:01		17:02	27	09:04 (7)
26	06:15		19:00 (3)	06:44	07:14	06:45	07:21		07:44		08:37 (7)
	20:45	19	19:19 (3)	20:06	19:16	17:29	17:00		17:03	27	09:04 (7)
27	06:16		19:02 (3)	06:45	07:15	06:46	07:22		08:34 (7)		08:37 (7)
	20:44	15	19:17 (3)	20:05	19:14	17:28	17:00	9	08:43 (7)	28	09:05 (7)
28	06:17		19:04 (3)	06:46	07:16	06:47	07:23		08:32 (7)		08:38 (7)
	20:43	9	19:13 (3)	20:03	19:12	17:27	16:59	13	08:45 (7)	28	09:06 (7)
29	06:17			06:47	07:17	06:48	07:24		08:31 (7)		08:39 (7)
	20:42			20:01	19:11	17:25	16:59	16	08:47 (7)	27	09:06 (7)
30	06:18			06:48	07:18	06:50	07:25		08:31 (7)		08:39 (7)
	20:41			20:00	19:09	17:24	16:59	17	08:48 (7)	27	09:06 (7)
31	06:19			06:49		06:51				07:46		08:40 (7)
	20:40			19:58		17:23				17:06	26	09:06 (7)
Potential sun hours	457			426	375	346	300			290		
Total, worst case		914						55			800	
Sun reduction		0.75						0.48			0.41	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.71						0.61			0.61	
Total reduction		0.20						0.11			0.09	
Total, real		181						6			74	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 31

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AC - R044

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	07:46			07:33			06:59			07:09		18:28 (4)	06:24			05:56		07:01 (7)
	17:08			17:41			18:14			19:47	31	18:59 (4)	20:18			20:46	42	07:43 (7)
2	07:46			07:33			06:57			07:07		18:29 (4)	06:23			05:56		07:01 (7)
	17:08			17:42			18:15			19:48	30	18:59 (4)	20:19			20:47	43	07:44 (7)
3	07:46			07:32			06:56			07:06		18:29 (4)	06:22			05:55		07:01 (7)
	17:09			17:43			18:16			19:49	29	18:58 (4)	20:20			20:48	43	07:44 (7)
4	07:46			07:31			06:54			07:04		18:29 (4)	06:21			05:55		07:01 (7)
	17:10			17:45			18:17			19:50	27	18:56 (4)	20:21			20:48	43	07:44 (7)
5	07:46			07:30			06:52			07:02		18:30 (4)	06:19			05:55		07:01 (7)
	17:11			17:46			18:19			19:51	26	18:56 (4)	20:22			20:49	43	07:44 (7)
6	07:46			07:28			06:51			07:01		18:31 (4)	06:18			05:54		07:01 (7)
	17:12			17:47			18:20			19:52	22	18:53 (4)	20:23			20:50	44	07:45 (7)
7	07:46			07:27			06:49			06:59		18:33 (4)	06:17			05:54		07:02 (7)
	17:13			17:48			18:21			19:53	19	18:52 (4)	20:24			20:50	43	07:45 (7)
8	07:46			07:26			06:48			06:58		18:35 (4)	06:16			05:54		07:01 (7)
	17:14			17:50			18:22			19:54	14	18:49 (4)	20:25			20:51	44	07:45 (7)
9	07:46			07:25			06:46			06:56			06:15			05:54		07:01 (7)
	17:15			17:51			18:23			19:55			20:26			20:52	44	07:45 (7)
10	07:46			07:24			06:45			06:55			06:14			05:54		07:02 (7)
	17:16			17:52			18:24			19:56			20:27			20:52	43	07:45 (7)
11	07:46			07:23			06:43			06:53			06:13			05:53		07:02 (7)
	17:17			17:53			18:25			19:57			20:28			20:53	44	07:46 (7)
12	07:46			07:22			06:41			06:51			06:11			05:53		07:02 (7)
	17:18			17:54			18:26			19:58			20:29			20:53	44	07:46 (7)
13	07:45			07:20			06:40			06:50			06:10		07:16 (7)	05:53		07:02 (7)
	17:19			17:56			18:27			19:59			20:30	10	07:26 (7)	20:54	44	07:46 (7)
14	07:45			07:19			06:38			06:48			06:09		07:13 (7)	05:53		07:03 (7)
	17:20			17:57			18:28			20:00			20:31	17	07:30 (7)	20:54	43	07:46 (7)
15	07:45			07:18			06:37			06:47			06:08		07:10 (7)	05:53		07:03 (7)
	17:21			17:58			18:29			20:01			20:32	22	07:32 (7)	20:54	44	07:47 (7)
16	07:44			07:17			06:35			06:45			06:08		07:10 (7)	05:53		07:03 (7)
	17:22			17:59			18:30			20:02			20:33	24	07:34 (7)	20:55	44	07:47 (7)
17	07:44			07:15			06:33			06:44			06:07		07:08 (7)	05:53		07:03 (7)
	17:23			18:00			18:31			20:03			20:34	27	07:35 (7)	20:55	44	07:47 (7)
18	07:43			07:14			06:32			06:42			06:06		07:07 (7)	05:53		07:03 (7)
	17:24			18:01			18:32			20:04			20:34	29	07:36 (7)	20:56	44	07:47 (7)
19	07:43			07:13			06:30		17:45 (4)	06:41			06:05		07:06 (7)	05:53		07:03 (7)
	17:26			18:03			18:34	6	17:51 (4)	20:05			20:35	31	07:37 (7)	20:56	44	07:47 (7)
20	07:42			07:11			06:29		17:40 (4)	06:39			06:04		07:05 (7)	05:53		07:04 (7)
	17:27			18:04			18:35	15	17:55 (4)	20:06			20:36	33	07:38 (7)	20:56	44	07:48 (7)
21	07:42			07:10			06:27		17:37 (4)	06:38			06:03		07:05 (7)	05:54		07:04 (7)
	17:28			18:05			18:36	20	17:57 (4)	20:07			20:37	34	07:39 (7)	20:56	44	07:48 (7)
22	07:41			07:09			06:25		17:35 (4)	06:36			06:02		07:04 (7)	05:54		07:04 (7)
	17:29			18:06			18:37	24	17:59 (4)	20:08			20:38	35	07:39 (7)	20:57	44	07:48 (7)
23	07:41			07:07			06:24		17:33 (4)	06:35			06:02		07:03 (7)	05:54		07:04 (7)
	17:30			18:07			18:38	27	18:00 (4)	20:09			20:39	37	07:40 (7)	20:57	44	07:48 (7)
24	07:40			07:06			06:22		17:32 (4)	06:34			06:01		07:03 (7)	05:54		07:04 (7)
	17:31			18:08			18:39	28	18:00 (4)	20:11			20:40	38	07:41 (7)	20:57	44	07:48 (7)
25	07:39			07:04			06:20		17:31 (4)	06:32			06:00		07:02 (7)	05:55		07:05 (7)
	17:33			18:10			18:40	30	18:01 (4)	20:12			20:41	39	07:41 (7)	20:57	44	07:49 (7)
26	07:38			07:03			06:19		17:30 (4)	06:31			06:00		07:02 (7)	05:55		07:05 (7)
	17:34			18:11			18:41	31	18:01 (4)	20:13			20:42	39	07:41 (7)	20:57	44	07:49 (7)
27	07:38			07:01			06:17		17:29 (4)	06:30			05:59		07:02 (7)	05:55		07:05 (7)
	17:35			18:12			18:42	32	18:01 (4)	20:14			20:42	40	07:42 (7)	20:57	44	07:49 (7)
28	07:37			07:00			06:15		17:29 (4)	06:28			05:58		07:01 (7)	05:56		07:06 (7)
	17:36			18:13			18:43	32	18:01 (4)	20:15			20:43	41	07:42 (7)	20:57	44	07:50 (7)
29	07:36						07:14		18:28 (4)	06:27			05:58		07:02 (7)	05:56		07:05 (7)
	17:37						19:44	33	19:01 (4)	20:16			20:44	41	07:43 (7)	20:57	44	07:49 (7)
30	07:35						07:12		18:28 (4)	06:26			05:57		07:01 (7)	05:56		07:06 (7)
	17:39						19:45	32	19:00 (4)	20:17			20:45	42	07:43 (7)	20:57	44	07:50 (7)
31	07:34						07:11		18:28 (4)				05:57		07:01 (7)			
	17:40						19:46	32	19:00 (4)				20:46	42	07:43 (7)			
Potential sun hours	300			298			370			398			446			450		
Total, worst case								342			198			621			1311	
Sun reduction								0.47			0.51			0.58			0.67	
Oper. time red.								0.37			0.37			0.37			0.37	
Wind dir. red.								0.76			0.76			0.76			0.76	
Total reduction								0.13			0.14			0.16			0.19	
Total, real								46			28			102			248	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 32

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AC - R044

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August		September			October	November	December
1	05:57		07:06 (7)	06:20		06:50			07:19	06:52	07:26
	20:57	44	07:50 (7)	20:39		19:57			19:07	17:22	16:58
2	05:57		07:07 (7)	06:21		06:51			07:20	06:53	07:27
	20:57	44	07:51 (7)	20:38		19:55			19:06	17:21	16:58
3	05:58		07:06 (7)	06:22		06:52			07:21	06:54	07:28
	20:57	44	07:50 (7)	20:37		19:54			19:04	17:19	16:58
4	05:58		07:07 (7)	06:23		06:53		18:32 (4)	07:22	06:55	07:29
	20:57	44	07:51 (7)	20:36		19:52	14	18:46 (4)	19:02	17:18	16:58
5	05:59		07:07 (7)	06:24		06:54		18:29 (4)	07:23	06:56	07:30
	20:56	44	07:51 (7)	20:34		19:50	19	18:48 (4)	19:01	17:17	16:57
6	06:00		07:08 (7)	06:25		06:55		18:27 (4)	07:24	06:58	07:31
	20:56	43	07:51 (7)	20:33		19:49	22	18:49 (4)	18:59	17:16	16:57
7	06:00		07:07 (7)	06:26		06:56		18:26 (4)	07:25	06:59	07:32
	20:56	44	07:51 (7)	20:32		19:47	25	18:51 (4)	18:58	17:15	16:57
8	06:01		07:08 (7)	06:27		06:57		18:24 (4)	07:26	07:00	07:33
	20:56	43	07:51 (7)	20:31		19:45	27	18:51 (4)	18:56	17:14	16:57
9	06:01		07:09 (7)	06:28		06:58		18:23 (4)	07:27	07:01	07:33
	20:55	43	07:52 (7)	20:30		19:44	29	18:52 (4)	18:54	17:13	16:57
10	06:02		07:08 (7)	06:29		06:59		18:22 (4)	07:28	07:02	07:34
	20:55	43	07:51 (7)	20:28		19:42	30	18:52 (4)	18:53	17:12	16:57
11	06:03		07:09 (7)	06:30		06:59		18:21 (4)	07:29	07:03	07:35
	20:55	42	07:51 (7)	20:27		19:41	31	18:52 (4)	18:51	17:11	16:57
12	06:03		07:09 (7)	06:31		07:00		18:19 (4)	07:30	07:05	07:36
	20:54	43	07:52 (7)	20:26		19:39	33	18:52 (4)	18:50	17:10	16:57
13	06:04		07:09 (7)	06:32		07:01		18:19 (4)	07:31	07:06	07:37
	20:54	42	07:51 (7)	20:25		19:37	32	18:51 (4)	18:48	17:09	16:58
14	06:05		07:10 (7)	06:33		07:02		18:18 (4)	07:32	07:07	07:38
	20:53	41	07:51 (7)	20:23		19:36	33	18:51 (4)	18:47	17:08	16:58
15	06:06		07:10 (7)	06:34		07:03		18:18 (4)	07:33	07:08	07:38
	20:53	41	07:51 (7)	20:22		19:34	33	18:51 (4)	18:45	17:07	16:58
16	06:06		07:11 (7)	06:35		07:04		18:18 (4)	07:34	07:09	07:39
	20:52	41	07:52 (7)	20:21		19:32	32	18:50 (4)	18:44	17:07	16:58
17	06:07		07:11 (7)	06:35		07:05		18:18 (4)	07:35	07:10	07:40
	20:51	40	07:51 (7)	20:19		19:31	32	18:50 (4)	18:42	17:06	16:59
18	06:08		07:11 (7)	06:36		07:06		18:18 (4)	07:36	07:12	07:40
	20:51	40	07:51 (7)	20:18		19:29	31	18:49 (4)	18:41	17:05	16:59
19	06:09		07:12 (7)	06:37		07:07		18:19 (4)	07:37	07:13	07:41
	20:50	39	07:51 (7)	20:16		19:27	29	18:48 (4)	18:39	17:04	16:59
20	06:10		07:13 (7)	06:38		07:08		18:19 (4)	07:38	07:14	07:42
	20:49	37	07:50 (7)	20:15		19:26	27	18:46 (4)	18:38	17:04	17:00
21	06:10		07:13 (7)	06:39		07:09		18:20 (4)	07:40	07:15	07:42
	20:49	36	07:49 (7)	20:13		19:24	25	18:45 (4)	18:36	17:03	17:00
22	06:11		07:14 (7)	06:40		07:10		18:22 (4)	07:41	07:16	07:43
	20:48	35	07:49 (7)	20:12		19:22	21	18:43 (4)	18:35	17:02	17:01
23	06:12		07:15 (7)	06:41		07:11		18:23 (4)	07:42	07:17	07:43
	20:47	33	07:48 (7)	20:11		19:21	17	18:40 (4)	18:33	17:02	17:01
24	06:13		07:16 (7)	06:42		07:12		18:26 (4)	07:43	07:18	07:44
	20:46	32	07:48 (7)	20:09		19:19	10	18:36 (4)	18:32	17:01	17:02
25	06:14		07:17 (7)	06:43		07:13			06:44	07:19	07:44
	20:45	30	07:47 (7)	20:08		19:17			17:31	17:01	17:02
26	06:15		07:18 (7)	06:44		07:14			06:45	07:21	07:44
	20:45	28	07:46 (7)	20:06		19:16			17:29	17:00	17:03
27	06:16		07:19 (7)	06:45		07:15			06:46	07:22	07:45
	20:44	26	07:45 (7)	20:05		19:14			17:28	17:00	17:04
28	06:17		07:20 (7)	06:46		07:16			06:47	07:23	07:45
	20:43	23	07:43 (7)	20:03		19:12			17:27	16:59	17:04
29	06:17		07:22 (7)	06:47		07:17			06:48	07:24	07:45
	20:42	19	07:41 (7)	20:01		19:11			17:25	16:59	17:05
30	06:18		07:24 (7)	06:48		07:18			06:50	07:25	07:46
	20:41	15	07:39 (7)	20:00		19:09			17:24	16:59	17:06
31	06:19		07:28 (7)	06:49					06:51		07:46
	20:40	7	07:35 (7)	19:58					17:23		17:06
Potential sun hours	457			426		375			346	300	290
Total, worst case		1126					552				
Sun reduction		0.75					0.64				
Oper. time red.		0.37					0.37				
Wind dir. red.		0.76					0.76				
Total reduction		0.21					0.18				
Total, real		239					100				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 33

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AD - R036

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May	June
1	07:46		14:20 (5)	07:33			06:59		16:43 (3)	07:09		07:30 (8)	06:24	05:56
	17:07	51	15:11 (5)	17:41			18:14	24	17:07 (3)	19:47	17	07:47 (8)	20:18	20:46
2	07:46		14:20 (5)	07:33			06:57		16:44 (3)	07:07		07:32 (8)	06:23	05:56
	17:08	51	15:11 (5)	17:42			18:15	22	17:06 (3)	19:48	13	07:45 (8)	20:19	20:47
3	07:46		14:21 (5)	07:32			06:56		16:44 (3)	07:06		07:34 (8)	06:22	05:55
	17:09	50	15:11 (5)	17:43			18:16	20	17:04 (3)	19:49	8	07:42 (8)	20:20	20:48
4	07:46		14:22 (5)	07:31			06:54		16:46 (3)	07:04			06:20	05:55
	17:10	49	15:11 (5)	17:45			18:17	17	17:03 (3)	19:50			20:21	20:48
5	07:46		14:23 (5)	07:30			06:52		16:48 (3)	07:02			06:19	05:55
	17:11	48	15:11 (5)	17:46			18:18	13	17:01 (3)	19:51			20:22	20:49
6	07:46		14:24 (5)	07:29			06:51		16:53 (3)	07:01			06:18	05:54
	17:12	48	15:12 (5)	17:47			18:20	4	16:57 (3)	19:52			20:23	20:50
7	07:46		14:25 (5)	07:27			06:49			06:59			06:17	05:54
	17:13	47	15:12 (5)	17:48			18:21			19:53			20:24	20:50
8	07:46		14:26 (5)	07:26			06:48			06:58			06:16	05:54
	17:14	46	15:12 (5)	17:49			18:22			19:54			20:25	20:51
9	07:46		14:27 (5)	07:25			06:46			06:56			06:15	05:54
	17:15	45	15:12 (5)	17:51			18:23			19:55			20:26	20:52
10	07:46		14:27 (5)	07:24			06:45			06:55			06:14	05:53
	17:16	44	15:11 (5)	17:52			18:24			19:56			20:27	20:52
11	07:46		14:29 (5)	07:23			06:43			06:53			06:12	05:53
	17:17	42	15:11 (5)	17:53			18:25			19:57			20:28	20:53
12	07:46		14:30 (5)	07:22			06:41			06:51			06:11	05:53
	17:18	41	15:11 (5)	17:54			18:26			19:58			20:29	20:53
13	07:45		14:31 (5)	07:21			06:40			06:50			06:10	05:53
	17:19	39	15:10 (5)	17:55			18:27			19:59			20:30	20:54
14	07:45		14:33 (5)	07:19			06:38			06:48			06:09	05:53
	17:20	37	15:10 (5)	17:57			18:28			20:00			20:31	20:54
15	07:45		14:35 (5)	07:18			06:37			06:47			06:08	05:53
	17:21	35	15:10 (5)	17:58			18:29			20:01			20:32	20:55
16	07:44		14:36 (5)	07:17			06:35			06:45			06:07	05:53
	17:22	33	15:09 (5)	17:59			18:30			20:02			20:33	20:55
17	07:44		14:38 (5)	07:15		16:53 (3)	06:33			06:44			06:07	05:53
	17:23	30	15:08 (5)	18:00	7	17:00 (3)	18:31			20:03			20:34	20:55
18	07:43		14:40 (5)	07:14		16:49 (3)	06:32			06:42			06:06	05:53
	17:24	27	15:07 (5)	18:01	13	17:02 (3)	18:32			20:04			20:35	20:56
19	07:43		14:43 (5)	07:13		16:47 (3)	06:30			06:41			06:05	05:53
	17:25	23	15:06 (5)	18:03	18	17:05 (3)	18:34			20:05			20:35	20:56
20	07:42		14:45 (5)	07:11		16:45 (3)	06:29			06:39			06:04	05:53
	17:27	18	15:03 (5)	18:04	20	17:05 (3)	18:35			20:06			20:36	20:56
21	07:42		14:49 (5)	07:10		16:44 (3)	06:27		06:45 (8)	06:38			06:03	05:54
	17:28	10	14:59 (5)	18:05	23	17:07 (3)	18:36	4	06:49 (8)	20:07			20:37	20:56
22	07:41			07:09		16:44 (3)	06:25		06:44 (8)	06:36			06:02	05:54
	17:29			18:06	24	17:08 (3)	18:37	7	06:51 (8)	20:08			20:38	20:57
23	07:41			07:07		16:43 (3)	06:24		06:42 (8)	06:35			06:02	05:54
	17:30			18:07	25	17:08 (3)	18:38	9	06:51 (8)	20:10			20:39	20:57
24	07:40			07:06		16:43 (3)	06:22		06:40 (8)	06:34			06:01	05:54
	17:31			18:08	26	17:09 (3)	18:39	12	06:52 (8)	20:11			20:40	20:57
25	07:39			07:04		16:42 (3)	06:20		06:39 (8)	06:32			06:00	05:55
	17:32			18:10	26	17:08 (3)	18:40	13	06:52 (8)	20:12			20:41	20:57
26	07:38			07:03		16:42 (3)	06:19		06:37 (8)	06:31			06:00	05:55
	17:34			18:11	27	17:09 (3)	18:41	15	06:52 (8)	20:13			20:42	20:57
27	07:38			07:01		16:42 (3)	06:17		06:35 (8)	06:29			05:59	05:55
	17:35			18:12	26	17:08 (3)	18:42	16	06:51 (8)	20:14			20:42	20:57
28	07:37			07:00		16:43 (3)	06:15		06:34 (8)	06:28			05:58	05:56
	17:36			18:13	25	17:08 (3)	18:43	18	06:52 (8)	20:15			20:43	20:57
29	07:36						07:14		07:32 (8)	06:27			05:58	05:56
	17:37						19:44	19	07:51 (8)	20:16			20:44	20:57
30	07:35						07:12		07:30 (8)	06:25			05:57	05:56
	17:39						19:45	19	07:49 (8)	20:17			20:45	20:57
31	07:34						07:11		07:29 (8)				05:57	
	17:40						19:46	20	07:49 (8)				20:46	
Potential sun hours	300			298			370			398			446	450
Total, worst case		814			260			252			38			
Sun reduction		0.40			0.43			0.47			0.51			
Oper. time red.		0.37			0.37			0.37			0.37			
Wind dir. red.		0.63			0.75			0.75			0.75			
Total reduction		0.09			0.12			0.13			0.14			
Total, real		76			31			33			5			

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 34

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AD - R036

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September			October			November			December		
1	05:57		06:20		06:50			07:19			06:52			07:26		14:11 (5)
	20:57		20:39		19:57			19:07			17:22			16:58	42	14:53 (5)
2	05:57		06:21		06:51			07:20			06:53			07:27		14:11 (5)
	20:57		20:38		19:55			19:06			17:21			16:58	43	14:54 (5)
3	05:58		06:22		06:52			07:21			06:54			07:28		14:10 (5)
	20:57		20:37		19:54			19:04			17:19			16:58	45	14:55 (5)
4	05:58		06:23		06:53			07:22			06:55			07:29		14:10 (5)
	20:57		20:36		19:52			19:02			17:18			16:58	46	14:56 (5)
5	05:59		06:24		06:54			07:23			06:57			07:30		14:10 (5)
	20:57		20:34		19:50			19:01			17:17			16:57	47	14:57 (5)
6	06:00		06:25		06:55			07:24			06:58			07:31		14:10 (5)
	20:56		20:33		19:49			18:59			17:16			16:57	48	14:58 (5)
7	06:00		06:26		06:56			07:25			06:59			07:32		14:10 (5)
	20:56		20:32		19:47			18:58			17:15			16:57	48	14:58 (5)
8	06:01		06:27		06:57			07:26		17:25 (3)	07:00			07:33		14:10 (5)
	20:56		20:31		19:45			18:56	10	17:35 (3)	17:14			16:57	49	14:59 (5)
9	06:01		06:28		06:58		07:28 (8)	07:27		17:22 (3)	07:01			07:34		14:10 (5)
	20:55		20:30		19:44	7	07:35 (8)	18:54	15	17:37 (3)	17:13			16:57	50	15:00 (5)
10	06:02		06:29		06:58		07:25 (8)	07:28		17:20 (3)	07:02			07:34		14:11 (5)
	20:55		20:28		19:42	13	07:38 (8)	18:53	18	17:38 (3)	17:12			16:57	50	15:01 (5)
11	06:03		06:30		06:59		07:23 (8)	07:29		17:18 (3)	07:03			07:35		14:11 (5)
	20:55		20:27		19:41	17	07:40 (8)	18:51	21	17:39 (3)	17:11			16:57	51	15:02 (5)
12	06:03		06:31		07:00		07:20 (8)	07:30		17:17 (3)	07:05			07:36		14:10 (5)
	20:54		20:26		19:39	20	07:40 (8)	18:50	23	17:40 (3)	17:10			16:57	51	15:01 (5)
13	06:04		06:32		07:01		07:21 (8)	07:31		17:16 (3)	07:06			07:37		14:11 (5)
	20:54		20:25		19:37	19	07:40 (8)	18:48	24	17:40 (3)	17:09			16:58	51	15:02 (5)
14	06:05		06:33		07:02		07:22 (8)	07:32		17:15 (3)	07:07			07:38		14:11 (5)
	20:53		20:23		19:36	19	07:41 (8)	18:47	25	17:40 (3)	17:08			16:58	52	15:03 (5)
15	06:06		06:34		07:03		07:23 (8)	07:33		17:14 (3)	07:08			07:38		14:12 (5)
	20:53		20:22		19:34	18	07:41 (8)	18:45	26	17:40 (3)	17:07			16:58	52	15:04 (5)
16	06:06		06:34		07:04		07:24 (8)	07:34		17:14 (3)	07:09			07:39		14:11 (5)
	20:52		20:21		19:32	17	07:41 (8)	18:44	26	17:40 (3)	17:06			16:58	53	15:04 (5)
17	06:07		06:35		07:05		07:25 (8)	07:35		17:14 (3)	07:10			07:40		14:12 (5)
	20:51		20:19		19:31	15	07:40 (8)	18:42	26	17:40 (3)	17:06			16:59	53	15:05 (5)
18	06:08		06:36		07:06		07:26 (8)	07:36		17:14 (3)	07:12			07:40		14:12 (5)
	20:51		20:18		19:29	14	07:40 (8)	18:41	26	17:40 (3)	17:05			16:59	53	15:05 (5)
19	06:09		06:37		07:07		07:27 (8)	07:37		17:15 (3)	07:13			07:41		14:13 (5)
	20:50		20:16		19:27	12	07:39 (8)	18:39	24	17:39 (3)	17:04			16:59	53	15:06 (5)
20	06:10		06:38		07:08		07:28 (8)	07:38		17:15 (3)	07:14			07:42		14:14 (5)
	20:49		20:15		19:26	10	07:38 (8)	18:38	23	17:38 (3)	17:04			17:00	53	15:07 (5)
21	06:10		06:39		07:09		07:29 (8)	07:40		17:15 (3)	07:15		14:25 (5)	07:42		14:14 (5)
	20:49		20:13		19:24	8	07:37 (8)	18:36	22	17:37 (3)	17:03	10	14:35 (5)	17:00	53	15:07 (5)
22	06:11		06:40		07:10		07:30 (8)	07:41		17:16 (3)	07:16		14:21 (5)	07:43		14:14 (5)
	20:48		20:12		19:22	5	07:35 (8)	18:35	20	17:36 (3)	17:02	18	14:39 (5)	17:01	54	15:08 (5)
23	06:12		06:41		07:11		07:31 (8)	07:42		17:17 (3)	07:17		14:19 (5)	07:43		14:15 (5)
	20:47		20:11		19:21	2	07:32 (8)	18:33	17	17:34 (3)	17:02	23	14:42 (5)	17:01	53	15:08 (5)
24	06:13		06:42		07:12			07:43		17:20 (3)	07:18		14:17 (5)	07:44		14:15 (5)
	20:46		20:09		19:19			18:32	12	17:32 (3)	17:01	27	14:44 (5)	17:02	53	15:08 (5)
25	06:14		06:43		07:13			06:44		16:25 (3)	07:19		14:15 (5)	07:44		14:16 (5)
	20:45		20:08		19:17			17:31	2	16:27 (3)	17:01	30	14:45 (5)	17:02	53	15:09 (5)
26	06:15		06:44		07:14			06:45			07:21		14:15 (5)	07:44		14:16 (5)
	20:45		20:06		19:16			17:29			17:00	33	14:48 (5)	17:03	53	15:09 (5)
27	06:16		06:45		07:15			06:46			07:22		14:14 (5)	07:45		14:16 (5)
	20:44		20:05		19:14			17:28			17:00	35	14:49 (5)	17:04	53	15:09 (5)
28	06:16		06:46		07:16			06:47			07:23		14:13 (5)	07:45		14:18 (5)
	20:43		20:03		19:12			17:27			16:59	37	14:50 (5)	17:04	52	15:10 (5)
29	06:17		06:47		07:17			06:48			07:24		14:12 (5)	07:45		14:18 (5)
	20:42		20:01		19:11			17:25			16:59	39	14:51 (5)	17:05	52	15:10 (5)
30	06:18		06:48		07:18			06:50			07:25		14:12 (5)	07:46		14:18 (5)
	20:41		20:00		19:09			17:24			16:59	40	14:52 (5)	17:06	52	15:10 (5)
31	06:19		06:49					06:51						07:46		14:19 (5)
	20:40		19:58					17:23						17:06	51	15:10 (5)
Potential sun hours	457		426		375			346			300			290		
Total, worst case						196			360			292			1569	
Sun reduction						0.64			0.56			0.48			0.41	
Oper. time red.						0.37			0.37			0.37			0.37	
Wind dir. red.						0.75			0.75			0.63			0.63	
Total reduction						0.18			0.15			0.11			0.10	
Total, real						35			56			33			151	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 35

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AE - R040

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	07:46		17:07 (4)	07:33		17:07 (4)	06:59		08:01 (7)	07:09			06:24		06:50 (9)	05:56		
	17:07			17:41	5	17:12 (4)	18:14	52	08:53 (7)	19:47			20:18	20	07:10 (9)	20:46		
2	07:46		17:04 (4)	07:33		17:04 (4)	06:57		08:01 (7)	07:07			06:23		06:51 (9)	05:56		
	17:08			17:42	11	17:15 (4)	18:15	52	08:53 (7)	19:48			20:19	19	07:10 (9)	20:47		
3	07:46		17:02 (4)	07:32		17:02 (4)	06:56		08:00 (7)	07:06			06:22		06:51 (9)	05:55		
	17:09			17:43	16	17:18 (4)	18:16	53	08:53 (7)	19:49			20:20	19	07:10 (9)	20:48		
4	07:46		17:01 (4)	07:31		17:01 (4)	06:54		08:00 (7)	07:04			06:20		06:51 (9)	05:55		
	17:10			17:45	18	17:19 (4)	18:17	54	08:54 (7)	19:50			20:21	19	07:10 (9)	20:48		
5	07:46		17:00 (4)	07:30		17:00 (4)	06:52		08:00 (7)	07:02			06:19		06:52 (9)	05:55		
	17:11			17:46	20	17:20 (4)	18:18	53	08:53 (7)	19:51			20:22	17	07:09 (9)	20:49		
6	07:46		16:59 (4)	07:28		16:59 (4)	06:51		08:00 (7)	07:01			06:18		06:52 (9)	05:54		
	17:12			17:47	22	17:21 (4)	18:20	53	08:53 (7)	19:52			20:23	15	07:07 (9)	20:50		
7	07:46		16:59 (4)	07:27		16:59 (4)	06:49		07:59 (7)	06:59			06:17		06:53 (9)	05:54		
	17:13			17:48	23	17:22 (4)	18:21	53	08:52 (7)	19:53			20:24	13	07:06 (9)	20:50		
8	07:46		16:58 (4)	07:26		16:58 (4)	06:48		07:59 (7)	06:58			06:16		06:55 (9)	05:54		
	17:14			17:49	25	17:23 (4)	18:22	52	08:51 (7)	19:54			20:25	9	07:04 (9)	20:51		
9	07:46		16:58 (4)	07:25		16:58 (4)	06:46		07:59 (7)	06:56			06:15		06:58 (9)	05:54		
	17:15			17:51	26	17:24 (4)	18:23	52	08:51 (7)	19:55			20:26	3	07:01 (9)	20:52		
10	07:46		16:57 (4)	07:24		16:57 (4)	06:45		07:59 (7)	06:55			06:14			05:53		
	17:16			17:52	26	17:23 (4)	18:24	51	08:50 (7)	19:56			20:27			20:52		
11	07:46		16:58 (4)	07:23		16:58 (4)	06:43		08:00 (7)	06:53			06:12			05:53		
	17:17			17:53	25	17:23 (4)	18:25	50	08:50 (7)	19:57			20:28			20:53		
12	07:46		16:58 (4)	07:22		16:58 (4)	06:41		08:00 (7)	06:51			06:11			05:53		
	17:18			17:54	26	17:24 (4)	18:26	49	08:49 (7)	19:58			20:29			20:53		
13	07:45		16:58 (4)	07:20		16:58 (4)	06:40		07:59 (7)	06:50			06:10			05:53		
	17:19			17:56	26	17:24 (4)	18:27	48	08:47 (7)	19:59			20:30			20:54		
14	07:45		16:58 (4)	07:19		16:58 (4)	06:38		08:01 (7)	06:48			06:09			05:53		
	17:20			17:57	25	17:23 (4)	18:28	46	08:47 (7)	20:00			20:31			20:54		
15	07:45		16:59 (4)	07:18		16:59 (4)	06:37		08:01 (7)	06:47			06:08			05:53		
	17:21			17:58	23	17:22 (4)	18:29	44	08:45 (7)	20:01			20:32			20:54		
16	07:44		17:00 (4)	07:17		17:00 (4)	06:35		08:01 (7)	06:45			06:08			05:53		
	17:22			17:59	22	17:22 (4)	18:30	42	08:43 (7)	20:02			20:33			20:55		
17	07:44		17:01 (4)	07:15		08:21 (7)	06:33		08:03 (7)	06:44			06:07			05:53		
	17:23			18:00	37	17:21 (4)	18:31	39	08:42 (7)	20:03			20:34			20:55		
18	07:43		17:01 (4)	07:14		08:17 (7)	06:32		08:03 (7)	06:42			06:06			05:53		
	17:24			18:01	41	17:19 (4)	18:32	37	08:40 (7)	20:04			20:34			20:56		
19	07:43		17:02 (4)	07:13		08:15 (7)	06:30		08:05 (7)	06:41			06:05			05:53		
	17:26			18:03	41	17:17 (4)	18:34	33	08:38 (7)	20:05			20:35			20:56		
20	07:42		17:02 (4)	07:11		08:12 (7)	06:29		08:07 (7)	06:39			06:04			05:53		
	17:27			18:04	38	17:13 (4)	18:35	28	08:35 (7)	20:06			20:36			20:56		
21	07:42		17:03 (4)	07:10		08:11 (7)	06:27		08:08 (7)	06:38			06:03			05:54		
	17:28			18:05	36	08:47 (7)	18:36	24	08:32 (7)	20:07			20:37			20:56		
22	07:41		17:03 (4)	07:09		08:09 (7)	06:25		08:12 (7)	06:36			06:02			05:54		
	17:29			18:06	40	08:49 (7)	18:37	16	08:28 (7)	20:08			20:38			20:57		
23	07:41		17:04 (4)	07:07		08:07 (7)	06:24			06:35			06:02			05:54		
	17:30			18:07	42	08:49 (7)	18:38			20:09			20:39			20:57		
24	07:40		17:04 (4)	07:06		08:07 (7)	06:22			06:34		06:57 (9)	06:01			05:54		
	17:31			18:08	44	08:51 (7)	18:39			20:11	9	07:06 (9)	20:40			20:57		
25	07:39		17:05 (4)	07:04		08:05 (7)	06:20			06:32		06:55 (9)	06:00			05:55		
	17:33			18:10	46	08:51 (7)	18:40			20:12	13	07:08 (9)	20:41			20:57		
26	07:38		17:06 (4)	07:03		08:04 (7)	06:19			06:31		06:54 (9)	06:00			05:55		
	17:34			18:11	48	08:52 (7)	18:41			20:13	16	07:10 (9)	20:42			20:57		
27	07:38		17:07 (4)	07:01		08:03 (7)	06:17			06:29		06:52 (9)	05:59			05:55		
	17:35			18:12	49	08:52 (7)	18:42			20:14	18	07:10 (9)	20:42			20:57		
28	07:37		17:08 (4)	07:00		08:03 (7)	06:15			06:28		06:52 (9)	05:58			05:56		
	17:36			18:13	50	08:53 (7)	18:43			20:15	18	07:10 (9)	20:43			20:57		
29	07:36						07:14			06:27		06:51 (9)	05:58			05:56		
	17:37						19:44			20:16	20	07:11 (9)	20:44			20:57		
30	07:35						07:12			06:26		06:51 (9)	05:57			05:56		
	17:39						19:45			20:17	20	07:11 (9)	20:45			20:57		
31	07:34						07:11						05:57					
	17:40						19:46						20:46					
Potential sun hours	300			298			370			398			446			450		
Total, worst case				851			981			114			134					
Sun reduction				0.43			0.47			0.51			0.58					
Oper. time red.				0.37			0.37			0.37			0.37					
Wind dir. red.				0.72			0.69			0.76			0.76					
Total reduction				0.12			0.12			0.14			0.16					
Total, real				99			119			16			22					

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 36

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AE - R040

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August			September			October			November			December
1	05:57		06:20			06:50			07:19		08:39 (7)	06:52		16:27 (4)	07:26
	20:57		20:39			19:57			19:07	49	09:28 (7)	17:22	26	16:53 (4)	16:58
2	05:57		06:21			06:51			07:20		08:38 (7)	06:53		16:27 (4)	07:27
	20:57		20:38			19:55			19:06	50	09:28 (7)	17:21	25	16:52 (4)	16:58
3	05:58		06:22			06:52			07:21		08:38 (7)	06:54		16:28 (4)	07:28
	20:57		20:37			19:54			19:04	51	09:29 (7)	17:19	25	16:53 (4)	16:58
4	05:58		06:23		07:07 (9)	06:53			07:22		08:37 (7)	06:55		16:29 (4)	07:29
	20:57		20:36	7	07:14 (9)	19:52			19:02	52	09:29 (7)	17:18	23	16:52 (4)	16:58
5	05:59		06:24		07:05 (9)	06:54			07:23		08:36 (7)	06:56		16:29 (4)	07:30
	20:56		20:34	11	07:16 (9)	19:50			19:01	53	09:29 (7)	17:17	22	16:51 (4)	16:57
6	06:00		06:25		07:02 (9)	06:55			07:24		08:36 (7)	06:58		16:30 (4)	07:31
	20:56		20:33	14	07:16 (9)	19:49			18:59	53	09:29 (7)	17:16	20	16:50 (4)	16:57
7	06:00		06:26		07:01 (9)	06:56			07:25		08:36 (7)	06:59		16:32 (4)	07:32
	20:56		20:32	16	07:17 (9)	19:47			18:58	53	09:29 (7)	17:15	18	16:50 (4)	16:57
8	06:01		06:27		07:00 (9)	06:57			07:26		08:35 (7)	07:00		16:33 (4)	07:33
	20:56		20:31	18	07:18 (9)	19:45			18:56	54	09:29 (7)	17:14	15	16:48 (4)	16:57
9	06:01		06:28		07:00 (9)	06:58			07:27		08:35 (7)	07:01		16:35 (4)	07:33
	20:55		20:30	18	07:18 (9)	19:44			18:54	53	09:28 (7)	17:13	11	16:46 (4)	16:57
10	06:02		06:29		06:59 (9)	06:59			07:28		08:35 (7)	07:02		16:39 (4)	07:34
	20:55		20:28	20	07:19 (9)	19:42			18:53	53	09:28 (7)	17:12	3	16:42 (4)	16:57
11	06:03		06:30		06:59 (9)	06:59			07:29		08:35 (7)	07:03			07:35
	20:55		20:27	20	07:19 (9)	19:41			18:51	52	09:27 (7)	17:11			16:57
12	06:03		06:31		06:59 (9)	07:00			07:30		08:35 (7)	07:05			07:36
	20:54		20:26	20	07:19 (9)	19:39			18:50	52	09:27 (7)	17:10			16:57
13	06:04		06:32		06:59 (9)	07:01			07:31		08:35 (7)	07:06			07:37
	20:54		20:25	20	07:19 (9)	19:37			18:48	51	09:26 (7)	17:09			16:58
14	06:05		06:33		06:59 (9)	07:02			07:32		08:35 (7)	07:07			07:38
	20:53		20:23	20	07:19 (9)	19:36			18:47	50	09:25 (7)	17:08			16:58
15	06:06		06:34		07:00 (9)	07:03			07:33		08:36 (7)	07:08			07:38
	20:53		20:22	18	07:18 (9)	19:34			18:45	48	09:24 (7)	17:07			16:58
16	06:06		06:35		07:00 (9)	07:04			07:34		08:36 (7)	07:09			07:39
	20:52		20:21	17	07:17 (9)	19:32			18:44	47	09:23 (7)	17:06			16:58
17	06:07		06:35		07:01 (9)	07:05			07:35		08:37 (7)	07:10			07:40
	20:51		20:19	15	07:16 (9)	19:31			18:42	45	09:22 (7)	17:06			16:59
18	06:08		06:36		07:02 (9)	07:06			07:36		08:38 (7)	07:12			07:40
	20:51		20:18	13	07:15 (9)	19:29			18:41	44	09:22 (7)	17:05			16:59
19	06:09		06:37		07:03 (9)	07:07			07:37		08:39 (7)	07:13			07:41
	20:50		20:16	8	07:11 (9)	19:27			18:39	41	09:20 (7)	17:04			16:59
20	06:10		06:38			07:08			07:38		08:40 (7)	07:14			07:42
	20:49		20:15			19:26			18:38	39	09:19 (7)	17:04			17:00
21	06:10		06:39			07:09		08:59 (7)	07:40		08:42 (7)	07:15			07:42
	20:49		20:13			19:24	13	09:12 (7)	18:36	35	09:17 (7)	17:03			17:00
22	06:11		06:40			07:10		08:55 (7)	07:41		08:43 (7)	07:16			07:43
	20:48		20:12			19:22	21	09:16 (7)	18:35	40	17:45 (4)	17:02			17:01
23	06:12		06:41			07:11		08:52 (7)	07:42		08:45 (7)	07:17			07:43
	20:47		20:11			19:21	27	09:19 (7)	18:33	42	17:48 (4)	17:02			17:01
24	06:13		06:42			07:12		08:49 (7)	07:43		08:48 (7)	07:18			07:44
	20:46		20:09			19:19	32	09:21 (7)	18:32	39	17:49 (4)	17:01			17:02
25	06:14		06:43			07:13		08:47 (7)	06:44		07:52 (7)	07:19			07:44
	20:45		20:08			19:17	36	09:23 (7)	17:31	34	16:51 (4)	17:01			17:02
26	06:15		06:44			07:14		08:46 (7)	06:45		16:29 (4)	07:21			07:44
	20:45		20:06			19:16	38	09:24 (7)	17:29	23	16:52 (4)	17:00			17:03
27	06:16		06:45			07:15		08:44 (7)	06:46		16:28 (4)	07:22			07:45
	20:44		20:05			19:14	41	09:25 (7)	17:28	24	16:52 (4)	17:00			17:04
28	06:17		06:46			07:16		08:43 (7)	06:47		16:28 (4)	07:23			07:45
	20:43		20:03			19:12	43	09:26 (7)	17:27	24	16:52 (4)	16:59			17:04
29	06:17		06:47			07:17		08:41 (7)	06:48		16:27 (4)	07:24			07:45
	20:42		20:01			19:11	46	09:27 (7)	17:25	26	16:53 (4)	16:59			17:05
30	06:18		06:48			07:18		08:40 (7)	06:50		16:28 (4)	07:25			07:46
	20:41		20:00			19:09	47	09:27 (7)	17:24	25	16:53 (4)	16:59			17:06
31	06:19		06:49						06:51		16:27 (4)				07:46
	20:40		19:58						17:23	26	16:53 (4)				17:06
Potential sun hours	457		426			375			346			300			290
Total, worst case				255			344			1328			188		
Sun reduction				0.72			0.64			0.56			0.48		
Oper. time red.				0.37			0.37			0.37			0.37		
Wind dir. red.				0.76			0.69			0.70			0.75		
Total reduction				0.20			0.17			0.15			0.13		
Total, real				52			57			193			25		

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AF - R049

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:08	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02	17:18	16:58
5	07:46	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:50	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:54	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:13	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:54	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:56	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:08	05:53	06:06	06:35	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:44	17:07	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:38	07:14	07:41
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:01	06:17	06:30	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:04
28	07:37	07:00	06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:26	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AG - R046

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March			April			May	June	July	August	September			October	November	December
1	07:46	07:33	06:59			07:09		18:53 (4)	06:24	05:56	05:57	06:20	06:50			07:19	06:52	07:26
	17:07	17:41	18:14			19:47	21	19:14 (4)	20:18	20:46	20:57	20:39	19:57			19:07	17:22	16:58
2	07:46	07:32	06:57			07:07		18:54 (4)	06:23	05:56	05:57	06:21	06:51			07:20	06:53	07:27
	17:08	17:42	18:15			19:48	20	19:14 (4)	20:19	20:47	20:57	20:38	19:55			19:06	17:21	16:58
3	07:46	07:32	06:55			07:06		18:54 (4)	06:22	05:55	05:58	06:22	06:52			07:21	06:54	07:28
	17:09	17:43	18:16			19:49	18	19:12 (4)	20:20	20:48	20:57	20:37	19:54			19:04	17:19	16:58
4	07:46	07:31	06:54			07:04		18:55 (4)	06:20	05:55	05:58	06:23	06:53			07:22	06:55	07:29
	17:10	17:45	18:17			19:50	15	19:10 (4)	20:21	20:48	20:57	20:35	19:52			19:02	17:18	16:58
5	07:46	07:30	06:52			07:02		18:58 (4)	06:19	05:55	05:59	06:24	06:54			07:23	06:56	07:30
	17:11	17:46	18:18			19:51	10	19:08 (4)	20:22	20:49	20:56	20:34	19:50			19:01	17:17	16:57
6	07:46	07:28	06:51			07:01			06:18	05:54	06:00	06:25	06:55			07:24	06:58	07:31
	17:12	17:47	18:20			19:52			20:23	20:50	20:56	20:33	19:49			18:59	17:16	16:57
7	07:46	07:27	06:49			06:59			06:17	05:54	06:00	06:26	06:56		18:53 (4)	07:25	06:59	07:32
	17:13	17:48	18:21			19:53			20:24	20:50	20:56	20:32	19:47	10	19:03 (4)	18:58	17:15	16:57
8	07:46	07:26	06:48			06:58			06:16	05:54	06:01	06:27	06:57		18:50 (4)	07:26	07:00	07:33
	17:14	17:49	18:22			19:54			20:25	20:51	20:56	20:31	19:45	15	19:05 (4)	18:56	17:14	16:57
9	07:46	07:25	06:46			06:56			06:15	05:54	06:01	06:28	06:58		18:49 (4)	07:27	07:01	07:33
	17:15	17:51	18:23			19:55			20:26	20:52	20:55	20:30	19:44	17	19:06 (4)	18:54	17:13	16:57
10	07:46	07:24	06:45			06:55			06:14	05:53	06:02	06:29	06:58		18:47 (4)	07:28	07:02	07:34
	17:16	17:52	18:24			19:56			20:27	20:52	20:55	20:28	19:42	20	19:07 (4)	18:53	17:12	16:57
11	07:46	07:23	06:43			06:53			06:12	05:53	06:03	06:30	06:59		18:46 (4)	07:29	07:03	07:35
	07:17	17:53	18:25			19:57			20:28	20:53	20:54	20:27	19:40	21	19:07 (4)	18:51	17:11	16:57
12	07:46	07:22	06:41			06:51			06:11	05:53	06:03	06:31	07:00		18:44 (4)	07:30	07:05	07:36
	17:18	17:54	18:26			19:58			20:29	20:53	20:54	20:26	19:39	23	19:07 (4)	18:50	17:10	16:57
13	07:45	07:20	06:40			06:50			06:10	05:53	06:04	06:32	07:01		18:44 (4)	07:31	07:06	07:37
	17:19	17:56	18:27			19:59			20:30	20:54	20:54	20:25	19:37	23	19:07 (4)	18:48	17:09	16:58
14	07:45	07:19	06:38			06:48			06:09	05:53	06:05	06:33	07:02		18:43 (4)	07:32	07:07	07:38
	17:20	17:57	18:28			20:00			20:31	20:54	20:53	20:23	19:36	24	19:07 (4)	18:47	17:08	16:58
15	07:45	07:18	06:37			06:47			06:08	05:53	06:06	06:34	07:03		18:43 (4)	07:33	07:08	07:38
	17:21	17:58	18:29			20:01			20:32	20:54	20:53	20:22	19:34	23	19:06 (4)	18:45	17:07	16:58
16	07:44	07:17	06:35			06:45			06:08	05:53	06:06	06:35	07:04		18:43 (4)	07:34	07:09	07:39
	17:22	17:59	18:30			20:02			20:33	20:55	20:52	20:20	19:32	22	19:05 (4)	18:44	17:06	16:58
17	07:44	07:15	06:33			06:44			06:07	05:53	06:07	06:35	07:05		18:43 (4)	07:35	07:10	07:40
	17:23	18:00	18:31			20:03			20:34	20:55	20:51	20:19	19:31	22	19:05 (4)	18:42	17:06	16:59
18	07:43	07:14	06:32			06:42			06:06	05:53	06:08	06:36	07:06		18:44 (4)	07:36	07:12	07:40
	17:24	18:01	18:32			20:04			20:34	20:56	20:51	20:18	19:29	19	19:03 (4)	18:41	17:05	16:59
19	07:43	07:13	06:30			06:41			06:05	05:53	06:09	06:37	07:07		18:45 (4)	07:37	07:13	07:41
	17:26	18:03	18:33			20:05			20:35	20:56	20:50	20:16	19:27	17	19:02 (4)	18:39	17:04	16:59
20	07:42	07:11	06:29			06:39			06:04	05:53	06:10	06:38	07:08		18:46 (4)	07:38	07:14	07:41
	17:27	18:04	18:35			20:06			20:36	20:56	20:49	20:15	19:26	14	19:00 (4)	18:38	17:04	17:00
21	07:42	07:10	06:27			06:38			06:03	05:54	06:10	06:39	07:09		18:48 (4)	07:40	07:15	07:42
	17:28	18:05	18:36			20:07			20:37	20:56	20:49	20:13	19:24	9	18:57 (4)	18:36	17:03	17:00
22	07:41	07:09	06:25		18:04 (4)	06:36			06:02	05:54	06:11	06:40	07:10			07:41	07:16	07:43
	17:29	18:06	18:37	6	18:10 (4)	20:08			20:38	20:57	20:48	20:12	19:22			18:35	17:02	17:01
23	07:41	07:07	06:24		18:00 (4)	06:35			06:02	05:54	06:12	06:41	07:11			07:42	07:17	07:43
	17:30	18:07	18:38	13	18:13 (4)	20:09			20:39	20:57	20:47	20:11	19:21			18:33	17:02	17:01
24	07:40	07:06	06:22		17:58 (4)	06:34			06:01	05:54	06:13	06:42	07:12			07:43	07:18	07:44
	17:31	18:08	18:39	16	18:14 (4)	20:10			20:40	20:57	20:46	20:09	19:19			18:32	17:01	17:02
25	07:39	07:04	06:20		17:57 (4)	06:32			06:00	05:55	06:14	06:43	07:13			06:44	07:19	07:44
	17:33	18:10	18:40	19	18:16 (4)	20:12			20:41	20:57	20:45	20:08	19:17			17:31	17:01	17:02
26	07:38	07:03	06:19		17:55 (4)	06:31			06:00	05:55	06:15	06:44	07:14			06:45	07:21	07:44
	17:34	18:11	18:41	21	18:16 (4)	20:13			20:42	20:57	20:45	20:06	19:16			17:29	17:00	17:03
27	07:38	07:01	06:17		17:54 (4)	06:29			05:59	05:55	06:16	06:45	07:15			06:46	07:22	07:45
	17:35	18:12	18:42	22	18:16 (4)	20:14			20:42	20:57	20:44	20:04	19:14			17:28	17:00	17:04
28	07:37	07:00	06:15		17:54 (4)	06:28			05:58	05:56	06:17	06:46	07:16			06:47	07:23	07:45
	17:36	18:13	18:43	23	18:17 (4)	20:15			20:43	20:57	20:43	20:03	19:12			17:27	16:59	17:04
29	07:36		07:14		18:53 (4)	06:27			05:58	05:56	06:17	06:47	07:17			06:48	07:24	07:45
	17:37		19:44	23	19:16 (4)	20:16			20:44	20:57	20:42	20:01	19:11			17:25	16:59	17:05
30	07:35		07:12		18:52 (4)	06:26			05:57	05:56	06:18	06:48	07:18			06:50	07:25	07:46
	17:39		19:45	24	19:16 (4)	20:17			20:45	20:57	20:41	20:00	19:09			17:24	16:59	17:06
31	07:34		07:11		18:53 (4)				05:57		06:19	06:49				06:51		07:46
	17:40		19:46	23	19:16 (4)				20:46		20:40	19:58				17:23		17:06
Potential sun hours	300	298	370			398			446	450	457	426	375			346	300	290
Total, worst case				190			84							279				
Sun reduction				0.47			0.51							0.64				
Oper. time red.				0.37			0.37							0.37				
Wind dir. red.				0.75			0.75							0.75				
Total reduction				0.13			0.14							0.18				
Total, real				25			12							51				

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AH - R048

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May	June	July	August		September		October	November	December
1	07:46	07:33	06:58	07:09		06:24	05:56	05:57	06:20		06:50	19:04 (4)	07:19	06:52	07:26
	17:07	17:41	18:14	19:47		20:18	20:46	20:57	20:39		19:57	22 19:26 (4)	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07		06:23	05:56	05:57	06:21		06:51	19:04 (4)	07:20	06:53	07:27
	17:08	17:42	18:15	19:48		20:19	20:47	20:57	20:38		19:55	21 19:25 (4)	19:06	17:21	16:58
3	07:46	07:32	06:55	07:06		06:22	05:55	05:58	06:22		06:52	19:05 (4)	07:21	06:54	07:28
	17:09	17:43	18:16	19:49		20:20	20:48	20:57	20:37		19:54	19 19:24 (4)	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04		06:20	05:55	05:58	06:23		06:53	19:06 (4)	07:22	06:55	07:29
	17:10	17:45	18:17	19:50		20:21	20:48	20:57	20:35		19:52	16 19:22 (4)	19:02	17:18	16:58
5	07:46	07:30	06:52	07:02		06:19	05:55	05:59	06:24		06:54	19:08 (4)	07:23	06:56	07:30
	17:11	17:46	18:18	19:51		20:22	20:49	20:56	20:34		19:50	12 19:20 (4)	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	19:15 (4)	06:18	05:54	06:00	06:25		06:55	19:11 (4)	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	5 19:20 (4)	20:23	20:50	20:56	20:33		19:49	5 19:16 (4)	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	19:12 (4)	06:17	05:54	06:00	06:26		06:56		07:25	06:59	07:32
	17:13	17:48	18:21	19:53	12 19:24 (4)	20:24	20:50	20:56	20:32		19:47		18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	19:09 (4)	06:16	05:54	06:01	06:27		06:57		07:26	07:00	07:33
	17:14	17:49	18:22	19:54	16 19:25 (4)	20:25	20:51	20:56	20:31		19:45		18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	19:07 (4)	06:15	05:54	06:01	06:28		06:58		07:27	07:01	07:33
	17:15	17:51	18:23	19:55	19 19:26 (4)	20:26	20:52	20:55	20:30		19:44		18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	19:06 (4)	06:14	05:53	06:02	06:29		06:58		07:28	07:02	07:34
	17:16	17:52	18:24	19:56	21 19:27 (4)	20:27	20:52	20:55	20:28		19:42		18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	19:05 (4)	06:12	05:53	06:03	06:30		06:59		07:29	07:03	07:35
	17:17	17:53	18:25	19:57	22 19:27 (4)	20:28	20:53	20:54	20:27		19:40		18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	19:05 (4)	06:11	05:53	06:03	06:31		07:00		07:30	07:05	07:36
	17:18	17:54	18:26	19:58	22 19:27 (4)	20:29	20:53	20:54	20:26		19:39		18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	19:04 (4)	06:10	05:53	06:04	06:32		07:01		07:31	07:06	07:37
	17:19	17:56	18:27	19:59	23 19:27 (4)	20:30	20:54	20:54	20:25		19:37		18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	19:04 (4)	06:09	05:53	06:05	06:33		07:02		07:32	07:07	07:37
	17:20	17:57	18:28	20:00	23 19:27 (4)	20:31	20:54	20:53	20:23		19:36		18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	19:04 (4)	06:08	05:53	06:06	06:34		07:03		07:33	07:08	07:38
	17:21	17:58	18:29	20:01	22 19:26 (4)	20:32	20:54	20:53	20:22		19:34		18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	19:04 (4)	06:08	05:53	06:06	06:35		07:04		07:34	07:09	07:39
	17:22	17:59	18:30	20:02	22 19:26 (4)	20:33	20:55	20:52	20:20		19:32		18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	19:04 (4)	06:07	05:53	06:07	06:35		07:05		07:35	07:10	07:40
	17:23	18:00	18:31	20:03	21 19:25 (4)	20:34	20:55	20:51	20:19		19:31		18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	19:05 (4)	06:06	05:53	06:08	06:36		07:06		07:36	07:12	07:40
	17:24	18:01	18:32	20:04	19 19:24 (4)	20:34	20:56	20:51	20:18		19:29		18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	19:05 (4)	06:05	05:53	06:09	06:37		07:07		07:37	07:13	07:41
	17:26	18:03	18:33	20:05	17 19:22 (4)	20:35	20:56	20:50	20:16		19:27		18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	19:07 (4)	06:04	05:53	06:10	06:38		07:08		07:38	07:14	07:41
	17:27	18:04	18:35	20:06	14 19:21 (4)	20:36	20:56	20:49	20:15		19:26		18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	19:09 (4)	06:03	05:54	06:10	06:39		07:09		07:40	07:15	07:42
	17:28	18:05	18:36	20:07	9 19:18 (4)	20:37	20:56	20:49	20:13		19:24		18:36	17:03	17:00
22	07:41	07:09	06:25	06:36		06:02	05:54	06:11	06:40	19:13 (4)	07:10		07:41	07:16	07:43
	17:29	18:06	18:37	20:08		20:38	20:57	20:48	20:12	10 19:23 (4)	19:22		18:35	17:02	17:01
23	07:41	07:07	06:24	06:35		06:02	05:54	06:12	06:41	19:11 (4)	07:11		07:42	07:17	07:43
	17:30	18:07	18:38	20:09		20:39	20:57	20:47	20:11	14 19:25 (4)	19:21		18:33	17:02	17:01
24	07:40	07:06	06:22	06:34		06:01	05:54	06:13	06:42	19:09 (4)	07:12		07:43	07:18	07:44
	17:31	18:08	18:39	20:10		20:40	20:57	20:46	20:09	17 19:26 (4)	19:19		18:32	17:01	17:02
25	07:39	07:04	06:20	06:32		06:00	05:55	06:14	06:43	19:08 (4)	07:13		06:44	07:19	07:44
	17:33	18:10	18:40	20:12		20:41	20:57	20:45	20:08	19 19:27 (4)	19:17		17:31	17:01	17:02
26	07:38	07:03	06:19	06:31		06:00	05:55	06:15	06:44	19:07 (4)	07:14		06:45	07:21	07:44
	17:34	18:11	18:41	20:13		20:42	20:57	20:45	20:06	21 19:28 (4)	19:16		17:29	17:00	17:03
27	07:38	07:01	06:17	06:29		05:59	05:55	06:16	06:45	19:06 (4)	07:15		06:46	07:22	07:45
	17:35	18:12	18:42	20:14		20:42	20:57	20:44	20:04	22 19:28 (4)	19:14		17:28	17:00	17:04
28	07:37	07:00	06:15	06:28		05:58	05:56	06:17	06:46	19:05 (4)	07:16		06:47	07:23	07:45
	17:36	18:13	18:43	20:15		20:43	20:57	20:43	20:03	23 19:28 (4)	19:12		17:27	16:59	17:04
29	07:36		07:14	06:27		05:58	05:56	06:17	06:47	19:05 (4)	07:17		06:48	07:24	07:45
	17:37		19:44	20:16		20:44	20:57	20:42	20:01	23 19:28 (4)	19:11		17:25	16:59	17:05
30	07:35		07:12	06:26		05:57	05:56	06:18	06:48	19:05 (4)	07:18		06:50	07:25	07:46
	17:39		19:45	20:17		20:45	20:57	20:41	20:00	23 19:28 (4)	19:09		17:24	16:59	17:06
31	07:34		07:11			05:57		06:19	06:49	19:04 (4)			06:51		07:46
	17:40		19:46			20:46		20:40	19:58	22 19:26 (4)			17:23		17:06
Potential sun hours	300	298	370	398		446	450	457	426		375		346	300	290
Total, worst case					287					194		95			
Sun reduction					0.51					0.72		0.64			
Oper. time red.					0.37					0.37		0.37			
Wind dir. red.					0.74					0.74		0.74			
Total reduction					0.14					0.20		0.18			
Total, real					40					39		17			

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 40

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AI - R038

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April		May		June	
1	07:46	07:33	06:59		07:09		06:24	18:52 (3)	05:56	18:47 (5)
	17:07	17:41	18:14		19:47		20:18	21 19:13 (3)	20:46	45 19:32 (5)
2	07:46	07:33	06:57		07:07		06:23	18:53 (3)	05:56	18:48 (5)
	17:08	17:42	18:15		19:48		20:19	19 19:12 (3)	20:47	45 19:33 (5)
3	07:46	07:32	06:55		07:06		06:22	18:54 (3)	05:55	18:48 (5)
	17:09	17:43	18:16		19:49		20:20	18 19:12 (3)	20:48	45 19:33 (5)
4	07:46	07:31	06:54		07:04		06:20	18:55 (3)	05:55	18:47 (5)
	17:10	17:45	18:17		19:50		20:21	16 19:11 (3)	20:48	46 19:33 (5)
5	07:46	07:30	06:52		07:02		06:19	18:56 (3)	05:55	18:48 (5)
	17:11	17:46	18:18		19:51		20:22	14 19:10 (3)	20:49	46 19:34 (5)
6	07:46	07:28	06:51		07:01		06:18	18:57 (3)	05:54	18:48 (5)
	17:12	17:47	18:20		19:52		20:23	10 19:07 (3)	20:50	46 19:34 (5)
7	07:46	07:27	06:49		06:59		06:17	19:00 (3)	05:54	18:48 (5)
	17:13	17:48	18:21		19:53		20:24	4 19:04 (3)	20:50	47 19:35 (5)
8	07:46	07:26	06:48		06:58		06:16		05:54	18:48 (5)
	17:14	17:49	18:22		19:54		20:25		20:51	46 19:34 (5)
9	07:46	07:25	06:46		06:56		06:15		05:54	18:48 (5)
	17:15	17:51	18:23		19:55		20:26		20:52	47 19:35 (5)
10	07:46	07:24	06:45		06:55		06:14		05:53	18:48 (5)
	17:16	17:52	18:24		19:56		20:27		20:52	47 19:35 (5)
11	07:46	07:23	06:43		06:53		06:12		05:53	18:48 (5)
	17:17	17:53	18:25		19:57		20:28		20:53	47 19:35 (5)
12	07:46	07:22	06:41		06:51		06:11		05:53	18:49 (5)
	17:18	17:54	18:26		19:58		20:29		20:53	47 19:36 (5)
13	07:45	07:20	06:40		06:50		06:10		05:53	18:49 (5)
	17:19	17:55	18:27		19:59		20:30		20:54	47 19:36 (5)
14	07:45	07:19	06:38		07:22 (9)		06:48		06:09	05:53	18:49 (5)
	17:20	17:57	18:28	6	07:28 (9)		20:00		20:31	20:54	47 19:36 (5)
15	07:45	07:18	06:37		07:18 (9)		06:47		06:08	19:01 (5)	05:53	18:49 (5)
	17:21	17:58	18:29	13	07:31 (9)		20:01		20:32	13 19:14 (5)	20:54	48 19:37 (5)
16	07:44	07:17	06:35		07:16 (9)		06:45		06:07	18:58 (5)	05:53	18:49 (5)
	17:22	17:59	18:30	16	07:32 (9)		20:02		20:33	19 19:17 (5)	20:55	48 19:37 (5)
17	07:44	07:15	06:33		07:15 (9)		06:44		06:07	18:57 (5)	05:53	18:49 (5)
	17:23	18:00	18:31	19	07:34 (9)		20:03		20:34	23 19:20 (5)	20:55	48 19:37 (5)
18	07:43	07:14	06:32		07:13 (9)		06:42		06:06	18:55 (5)	05:53	18:50 (5)
	17:24	18:01	18:32	21	07:34 (9)		20:04		20:34	27 19:22 (5)	20:56	47 19:37 (5)
19	07:43	07:13	06:30		07:13 (9)		06:41		06:05	18:54 (5)	05:53	18:50 (5)
	17:25	18:03	18:33	22	07:35 (9)		20:05		20:35	29 19:23 (5)	20:56	47 19:37 (5)
20	07:42	07:11	06:29		07:12 (9)		06:39	19:04 (3)	06:04	18:53 (5)	05:53	18:50 (5)
	17:27	18:04	18:35	23	07:35 (9)		20:06	2 19:05 (3)	20:36	31 19:24 (5)	20:56	47 19:37 (5)
21	07:42	07:10	06:27		07:11 (9)		06:38	18:58 (3)	06:03	18:52 (5)	05:54	18:51 (5)
	17:28	18:05	18:36	23	07:34 (9)		20:07	11 19:09 (3)	20:37	34 19:26 (5)	20:56	47 19:38 (5)
22	07:41	07:09	06:25		07:11 (9)		06:36	18:57 (3)	06:02	18:51 (5)	05:54	18:51 (5)
	17:29	18:06	18:37	24	07:35 (9)		20:08	14 19:11 (3)	20:38	35 19:26 (5)	20:57	47 19:38 (5)
23	07:41	07:07	06:24		07:11 (9)		06:35	18:56 (3)	06:02	18:50 (5)	05:54	18:51 (5)
	17:30	18:07	18:38	23	07:34 (9)		20:09	17 19:13 (3)	20:39	37 19:27 (5)	20:57	47 19:38 (5)
24	07:40	07:06	06:22		07:11 (9)		06:34	18:54 (3)	06:01	18:49 (5)	05:54	18:51 (5)
	17:31	18:08	18:39	22	07:33 (9)		20:11	19 19:13 (3)	20:40	38 19:27 (5)	20:57	47 19:38 (5)
25	07:39	07:04	06:20		07:12 (9)		06:32	18:53 (3)	06:00	18:50 (5)	05:55	18:51 (5)
	17:32	18:10	18:40	20	07:32 (9)		20:12	21 19:14 (3)	20:41	38 19:28 (5)	20:57	48 19:39 (5)
26	07:38	07:03	06:19		07:12 (9)		06:31	18:53 (3)	06:00	18:49 (5)	05:55	18:51 (5)
	17:34	18:11	18:41	18	07:30 (9)		20:13	21 19:14 (3)	20:42	40 19:29 (5)	20:57	48 19:39 (5)
27	07:38	07:01	06:17		07:13 (9)		06:29	18:52 (3)	05:59	18:49 (5)	05:55	18:51 (5)
	17:35	18:12	18:42	15	07:28 (9)		20:14	22 19:14 (3)	20:42	41 19:30 (5)	20:57	48 19:39 (5)
28	07:37	07:00	06:15		07:15 (9)		06:28	18:52 (3)	05:58	18:48 (5)	05:56	18:52 (5)
	17:36	18:13	18:43	11	07:26 (9)		20:15	22 19:14 (3)	20:43	42 19:30 (5)	20:57	47 19:39 (5)
29	07:36		07:14		06:27		18:52 (3)		05:58	18:49 (5)	05:56	18:52 (5)
	17:37		19:44		20:16	22	19:14 (3)		20:44	42 19:31 (5)	20:57	47 19:39 (5)
30	07:35		07:12		06:25		18:52 (3)		05:57	18:48 (5)	05:56	18:53 (5)
	17:39		19:45		20:17	21	19:13 (3)		20:45	43 19:31 (5)	20:57	47 19:40 (5)
31	07:34		07:11						05:57	18:48 (5)		
	17:40		19:46						20:46	44 19:32 (5)		
Potential sun hours	300	298	370		398		446		450	
Total, worst case				276		192		678		1406
Sun reduction				0.47		0.51		0.58		0.67
Oper. time red.				0.37		0.37		0.37		0.37
Wind dir. red.				0.73		0.73		0.71		0.71
Total reduction				0.13		0.14		0.15		0.18
Total, real				36		27		105		250

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

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

Project:

Flickering Nuoro Sud

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2024-01-12 10:10 / 41

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AI - R038

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August			September			October		November	December
1	05:57		18:52 (5)	06:20			06:50			07:19		06:52	07:26
	20:57	48	19:40 (5)	20:39			19:57			19:07		17:22	16:58
2	05:57		18:53 (5)	06:21			06:51			07:20		06:53	07:27
	20:57	47	19:40 (5)	20:38			19:55			19:06		17:21	16:58
3	05:58		18:53 (5)	06:22			06:52			07:21		06:54	07:28
	20:57	47	19:40 (5)	20:37			19:54			19:04		17:19	16:58
4	05:58		18:54 (5)	06:23			06:53			07:22		06:55	07:29
	20:57	46	19:40 (5)	20:36			19:52			19:02		17:18	16:58
5	05:59		18:53 (5)	06:24			06:54			07:23		06:56	07:30
	20:56	47	19:40 (5)	20:34			19:50			19:01		17:17	16:57
6	06:00		18:54 (5)	06:25		19:08 (3)	06:55			07:24		06:58	07:31
	20:56	46	19:40 (5)	20:33	7	19:15 (3)	19:49			18:59		17:16	16:57
7	06:00		18:54 (5)	06:26		19:06 (3)	06:56			07:25		06:59	07:32
	20:56	46	19:40 (5)	20:32	11	19:17 (3)	19:47			18:58		17:15	16:57
8	06:01		18:55 (5)	06:27		19:04 (3)	06:57			07:26		07:00	07:33
	20:56	45	19:40 (5)	20:31	15	19:19 (3)	19:45			18:56		17:14	16:57
9	06:01		18:55 (5)	06:28		19:03 (3)	06:58			07:27		07:01	07:33
	20:55	46	19:41 (5)	20:30	17	19:20 (3)	19:44			18:54		17:13	16:57
10	06:02		18:55 (5)	06:29		19:02 (3)	06:58			07:28		07:02	07:34
	20:55	45	19:40 (5)	20:28	19	19:21 (3)	19:42			18:53		17:12	16:57
11	06:03		18:56 (5)	06:30		19:01 (3)	06:59			07:29		07:03	07:35
	20:55	44	19:40 (5)	20:27	20	19:21 (3)	19:41			18:51		17:11	16:57
12	06:03		18:56 (5)	06:31		19:01 (3)	07:00			07:30		07:05	07:36
	20:54	44	19:40 (5)	20:26	21	19:22 (3)	19:39			18:50		17:10	16:57
13	06:04		18:56 (5)	06:32		19:00 (3)	07:01			07:31		07:06	07:37
	20:54	43	19:39 (5)	20:25	22	19:22 (3)	19:37			18:48		17:09	16:58
14	06:05		18:57 (5)	06:33		19:00 (3)	07:02			07:32		07:07	07:38
	20:53	43	19:40 (5)	20:23	22	19:22 (3)	19:36			18:47		17:08	16:58
15	06:06		18:57 (5)	06:34		19:00 (3)	07:03		08:05 (9)	07:33		07:08	07:38
	20:53	43	19:40 (5)	20:22	22	19:22 (3)	19:34	10	08:15 (9)	18:45		17:07	16:58
16	06:06		18:58 (5)	06:34		19:00 (3)	07:04		08:02 (9)	07:34		07:09	07:39
	20:52	41	19:39 (5)	20:21	21	19:21 (3)	19:32	15	08:17 (9)	18:44		17:06	16:58
17	06:07		18:58 (5)	06:35		19:00 (3)	07:05		08:01 (9)	07:35		07:10	07:40
	20:51	40	19:38 (5)	20:19	21	19:21 (3)	19:31	17	08:18 (9)	18:42		17:06	16:59
18	06:08		18:59 (5)	06:36		19:00 (3)	07:06		07:59 (9)	07:36		07:12	07:40
	20:51	39	19:38 (5)	20:18	20	19:20 (3)	19:29	20	08:19 (9)	18:41		17:05	16:59
19	06:09		19:00 (5)	06:37		19:00 (3)	07:07		07:58 (9)	07:37		07:13	07:41
	20:50	38	19:38 (5)	20:16	18	19:18 (3)	19:27	22	08:20 (9)	18:39		17:04	16:59
20	06:10		19:00 (5)	06:38		19:01 (3)	07:08		07:57 (9)	07:38		07:14	07:42
	20:49	37	19:37 (5)	20:15	16	19:17 (3)	19:26	23	08:20 (9)	18:38		17:04	17:00
21	06:10		19:00 (5)	06:39		19:02 (3)	07:09		07:57 (9)	07:40		07:15	07:42
	20:49	36	19:36 (5)	20:13	14	19:16 (3)	19:24	23	08:20 (9)	18:36		17:03	17:00
22	06:11		19:01 (5)	06:40		19:04 (3)	07:10		07:56 (9)	07:41		07:16	07:43
	20:48	34	19:35 (5)	20:12	10	19:14 (3)	19:22	24	08:20 (9)	18:35		17:02	17:01
23	06:12		19:03 (5)	06:41			07:11		07:56 (9)	07:42		07:17	07:43
	20:47	32	19:35 (5)	20:11			19:21	23	08:19 (9)	18:33		17:02	17:01
24	06:13		19:04 (5)	06:42			07:12		07:56 (9)	07:43		07:18	07:44
	20:46	30	19:34 (5)	20:09			19:19	23	08:19 (9)	18:32		17:01	17:02
25	06:14		19:05 (5)	06:43			07:13		07:56 (9)	06:44		07:19	07:44
	20:45	28	19:33 (5)	20:08			19:17	22	08:18 (9)	17:31		17:01	17:02
26	06:15		19:07 (5)	06:44			07:14		07:57 (9)	06:45		07:21	07:44
	20:45	24	19:31 (5)	20:06			19:16	20	08:17 (9)	17:29		17:00	17:03
27	06:16		19:08 (5)	06:45			07:15		07:57 (9)	06:46		07:22	07:45
	20:44	21	19:29 (5)	20:05			19:14	18	08:15 (9)	17:28		17:00	17:04
28	06:16		19:10 (5)	06:46			07:16		07:59 (9)	06:47		07:23	07:45
	20:43	17	19:27 (5)	20:03			19:12	14	08:13 (9)	17:27		16:59	17:04
29	06:17		19:14 (5)	06:47			07:17		08:01 (9)	06:48		07:24	07:45
	20:42	9	19:23 (5)	20:01			19:11	10	08:11 (9)	17:25		16:59	17:05
30	06:18			06:48			07:18			06:50		07:25	07:46
	20:41			20:00			19:09			17:24		16:59	17:06
31	06:19			06:49						06:51			07:46
	20:40			19:58						17:23			17:06
Potential sun hours	457			426			375			346		300	290
Total, worst case		1106			296			284					
Sun reduction		0.75			0.72			0.64					
Oper. time red.		0.37			0.37			0.37					
Wind dir. red.		0.71			0.73			0.73					
Total reduction		0.20			0.20			0.18					
Total, real		220			58			50					

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 42

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AJ - R047

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March			April			May		June		July		August		September			October		November		December	
1	07:46	17:07	07:33	17:41	06:58	18:14		07:09	19:47	22	19:00 (4) 19:22 (4)	06:24	20:18	05:56	20:46	05:57	20:57	06:20	20:39	06:50	19:57			07:19	19:07	06:52	17:22	07:26	16:58
2	07:46	17:08	07:32	17:42	06:57	18:15		07:07	19:48	22	19:01 (4) 19:23 (4)	06:23	20:19	05:56	20:47	05:57	20:57	06:21	20:38	06:51	19:55			07:20	19:06	06:53	17:21	07:27	16:58
3	07:46	17:09	07:32	17:43	06:55	18:16		07:06	19:49	22	19:00 (4) 19:22 (4)	06:22	20:20	05:55	20:48	05:58	20:57	06:22	20:37	06:52	19:54	7	19:03 (4) 19:10 (4)	07:21	19:04	06:54	17:19	07:28	16:58
4	07:46	17:10	07:31	17:45	06:54	18:17		07:04	19:50	21	19:00 (4) 19:21 (4)	06:20	20:21	05:55	20:48	05:58	20:57	06:23	20:35	06:53	19:52	13	19:00 (4) 19:13 (4)	07:22	19:02	06:55	17:18	07:29	16:58
5	07:46	17:11	07:30	17:46	06:52	18:18		07:02	19:51	20	19:01 (4) 19:21 (4)	06:19	20:22	05:55	20:49	05:59	20:56	06:24	20:34	06:54	19:50	16	18:58 (4) 19:14 (4)	07:23	19:01	06:56	17:17	07:30	16:57
6	07:46	17:12	07:28	17:47	06:51	18:20		07:01	19:52	18	19:01 (4) 19:19 (4)	06:18	20:23	05:54	20:50	06:00	20:56	06:25	20:33	06:55	19:49	18	18:57 (4) 19:15 (4)	07:24	18:59	06:58	17:16	07:31	16:57
7	07:46	17:13	07:27	17:48	06:49	18:21		06:59	19:53	16	19:02 (4) 19:18 (4)	06:17	20:24	05:54	20:50	06:00	20:56	06:26	20:32	06:56	19:47	20	18:56 (4) 19:16 (4)	07:25	18:58	06:59	17:15	07:32	16:57
8	07:46	17:14	07:26	17:49	06:48	18:22		06:58	19:54	13	19:03 (4) 19:16 (4)	06:16	20:25	05:54	20:51	06:01	20:56	06:27	20:31	06:57	19:45	21	18:55 (4) 19:16 (4)	07:26	18:56	07:00	17:14	07:33	16:57
9	07:46	17:15	07:25	17:51	06:46	18:23		06:56	19:55	7	19:05 (4) 19:12 (4)	06:15	20:26	05:54	20:52	06:01	20:55	06:28	20:30	06:58	19:44	22	18:54 (4) 19:16 (4)	07:27	18:54	07:01	17:13	07:33	16:57
10	07:46	17:16	07:24	17:52	06:45	18:24		06:55	19:56			06:14	20:27	05:53	20:52	06:02	20:55	06:29	20:28	06:58	19:42	22	18:54 (4) 19:16 (4)	07:28	18:53	07:02	17:12	07:34	16:57
11	07:46	17:17	07:23	17:53	06:43	18:25		06:53	19:57			06:12	20:28	05:53	20:53	06:03	20:54	06:30	20:27	06:59	19:40	21	18:54 (4) 19:15 (4)	07:29	18:51	07:03	17:11	07:35	16:57
12	07:46	17:18	07:22	17:54	06:41	18:26		06:51	19:58			06:11	20:29	05:53	20:53	06:03	20:54	06:31	20:26	07:00	19:39	21	18:53 (4) 19:14 (4)	07:30	18:50	07:05	17:10	07:36	16:57
13	07:45	17:19	07:20	17:56	06:40	18:27		06:50	19:59			06:10	20:30	05:53	20:54	06:04	20:54	06:32	20:25	07:01	19:37	20	18:53 (4) 19:13 (4)	07:31	18:48	07:06	17:09	07:37	16:58
14	07:45	17:20	07:19	17:57	06:38	18:28		06:48	20:00			06:09	20:31	05:53	20:54	06:05	20:53	06:33	20:23	07:02	19:36	19	18:53 (4) 19:12 (4)	07:32	18:47	07:07	17:08	07:37	16:58
15	07:45	17:21	07:18	17:58	06:37	18:29		06:47	20:01			06:08	20:32	05:53	20:54	06:06	20:53	06:34	20:22	07:03	19:34	16	18:54 (4) 19:10 (4)	07:33	18:45	07:08	17:07	07:38	16:58
16	07:44	17:22	07:17	17:59	06:35	18:30		06:45	20:02			06:08	20:33	05:53	20:55	06:06	20:52	06:34	20:20	07:04	19:32	12	18:56 (4) 19:08 (4)	07:34	18:44	07:09	17:06	07:39	16:58
17	07:44	17:23	07:15	18:00	06:33	18:31		06:44	20:03			06:07	20:34	05:53	20:55	06:07	20:51	06:35	20:19	07:05	19:31	4	19:00 (4) 19:04 (4)	07:35	18:42	07:10	17:06	07:40	16:59
18	07:43	17:24	07:14	18:01	06:32	18:32		06:42	20:04			06:06	20:34	05:53	20:56	06:08	20:51	06:36	20:18	07:06	19:29			07:36	18:41	07:12	17:05	07:40	16:59
19	07:43	17:26	07:13	18:03	06:30	18:33		06:41	20:05			06:05	20:35	05:53	20:56	06:09	20:50	06:37	20:16	07:07	19:27			07:37	18:39	07:13	17:04	07:41	16:59
20	07:42	17:27	07:11	18:04	06:29	18:35		06:39	20:06			06:04	20:36	05:53	20:56	06:10	20:49	06:38	20:15	07:08	19:26			07:38	18:38	07:14	17:04	07:41	17:00
21	07:42	17:28	07:10	18:05	06:27	18:36		06:38	20:07			06:03	20:37	05:54	20:56	06:10	20:49	06:39	20:13	07:09	19:24			07:40	18:36	07:15	17:03	07:42	17:00
22	07:41	17:29	07:09	18:06	06:25	18:37		06:36	20:08			06:02	20:38	05:54	20:57	06:11	20:48	06:40	20:12	07:10	19:22			07:41	18:35	07:16	17:02	07:43	17:01
23	07:41	17:30	07:07	18:07	06:24	18:38		06:35	20:09			06:02	20:39	05:54	20:57	06:12	20:47	06:41	20:11	07:11	19:21			07:42	18:33	07:17	17:02	07:43	17:01
24	07:40	17:31	07:06	18:08	06:22	18:39		06:34	20:10			06:01	20:40	05:54	20:57	06:13	20:46	06:42	20:09	07:12	19:19			07:43	18:32	07:18	17:01	07:44	17:02
25	07:39	17:33	07:04	18:10	06:20	18:40		06:32	20:12			06:00	20:41	05:55	20:57	06:14	20:45	06:43	20:08	07:13	19:17			07:44	17:31	07:19	17:01	07:44	17:02
26	07:38	17:34	07:03	18:11	06:19	18:41		06:31	20:13			06:00	20:42	05:55	20:57	06:15	20:45	06:44	20:06	07:14	19:16			07:45	17:29	07:21	17:00	07:44	17:03
27	07:38	17:35	07:01	18:12	06:17	18:42	11	18:07 (4) 18:18 (4)	06:29	20:14		05:59	20:42	05:55	20:57	06:16	20:44	06:45	20:04	07:15	19:14			07:46	17:28	07:22	17:00	07:45	17:04
28	07:37	17:36	07:00	18:13	06:15	18:43	16	18:05 (4) 18:21 (4)	06:28	20:15		05:58	20:43	05:56	20:57	06:17	20:43	06:46	20:03	07:16	19:12			07:47	17:27	07:23	16:59	07:45	17:04
29	07:36	17:37			07:14	19:44	18	19:03 (4) 19:21 (4)	06:27	20:16		05:58	20:44	05:56	20:57	06:17	20:42	06:47	20:01	07:17	19:11			07:48	17:25	07:24	16:59	07:45	17:05
30	07:35	17:39			07:12	19:45	20	19:02 (4) 19:22 (4)	06:26	20:17		05:57	20:45	05:56	20:57	06:18	20:41	06:48	20:00	07:18	19:09			07:50	17:24	07:25	16:59	07:46	17:06
31	07:34	17:40			07:11	19:46	20	19:02 (4) 19:22 (4)				05:57	20:46			06:19	20:40	06:49	19:58					06:51	17:23			07:46	17:06
Potential sun hours	300		298		370			398				446		450		457		426		375				346		300		290	
Total, worst case							85			161											252							
Sun reduction							0.47			0.51											0.64							
Oper. time red.							0.37			0.37											0.37							
Wind dir. red.							0.75			0.75											0.75							
Total reduction							0.13			0.14											0.18							
Total, real							11			23											45							

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 43

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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AK - R050

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:31	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	16:58
5	07:46	07:29	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:51	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11	16:57
12	07:45	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:37
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:33	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:11	07:40
	17:24	18:01	18:32	20:04	20:34	20:55	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:26	18:03	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	05:53	06:10	06:38	07:08	07:38	07:14	07:41
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:04	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:40	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:11	20:41	20:57	20:45	20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:20	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:04
28	07:37	07:00	06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 44

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AL - R051

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:31	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19	16:58
4	07:46	07:30	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	16:58
5	07:46	07:29	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
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	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
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	17:15	17:51	18:23	19:55	20:26	20:51	20:55	20:30	19:44	18:54	17:13	16:57
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	17:21	17:58	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45	17:07	16:58
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	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:33	20:55	20:51	20:19	19:31	18:42	17:06	16:59
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	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:04	17:00
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22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
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23	07:40	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:43
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:19	07:44
	17:33	18:10	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:20	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:04
28	07:37	07:00	06:15	06:28	05:58	05:56	06:17	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:45		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 45
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AM - R061

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May		June		July		August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24		05:56	19:00 (6)	05:57	19:06 (6)	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18		20:46 36	19:36 (6)	20:57 37	19:43 (6)	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23		05:56	19:00 (6)	05:57	19:07 (6)	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19		20:47 37	19:37 (6)	20:57 36	19:43 (6)	20:38	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22		05:55	19:01 (6)	05:58	19:06 (6)	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20		20:48 36	19:37 (6)	20:57 37	19:43 (6)	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20		05:55	19:00 (6)	05:58	19:07 (6)	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21		20:48 37	19:37 (6)	20:57 37	19:44 (6)	20:36	19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02	06:19		05:55	19:01 (6)	05:59	19:07 (6)	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22		20:49 36	19:37 (6)	20:56 36	19:43 (6)	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18		05:54	19:01 (6)	05:59	19:07 (6)	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23		20:50 37	19:38 (6)	20:56 37	19:44 (6)	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17		05:54	19:01 (6)	06:00	19:07 (6)	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24		20:50 36	19:37 (6)	20:56 37	19:44 (6)	20:32	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16		05:54	19:01 (6)	06:01	19:07 (6)	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25		20:51 37	19:38 (6)	20:56 37	19:44 (6)	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15		05:54	19:01 (6)	06:01	19:08 (6)	06:28	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26		20:52 37	19:38 (6)	20:55 37	19:45 (6)	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13		05:53	19:02 (6)	06:02	19:08 (6)	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27		20:52 36	19:38 (6)	20:55 36	19:44 (6)	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12		05:53	19:02 (6)	06:03	19:08 (6)	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28		20:53 37	19:39 (6)	20:55 36	19:44 (6)	20:27	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11		05:53	19:02 (6)	06:03	19:09 (6)	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29		20:53 37	19:39 (6)	20:54 36	19:45 (6)	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10		05:53	19:03 (6)	06:04	19:08 (6)	06:32	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30		20:54 36	19:39 (6)	20:54 36	19:44 (6)	20:25	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	19:11 (6)	05:53	19:03 (6)	06:05	19:09 (6)	06:32	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 11	19:22 (6)	20:54 36	19:39 (6)	20:53 35	19:44 (6)	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	19:08 (6)	05:53	19:03 (6)	06:06	19:09 (6)	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 16	19:24 (6)	20:54 36	19:39 (6)	20:53 36	19:45 (6)	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	19:07 (6)	05:53	19:03 (6)	06:06	19:09 (6)	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33 19	19:26 (6)	20:55 37	19:40 (6)	20:52 35	19:44 (6)	20:20	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	19:06 (6)	05:53	19:03 (6)	06:07	19:09 (6)	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34 22	19:28 (6)	20:55 37	19:40 (6)	20:51 35	19:44 (6)	20:19	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	19:05 (6)	05:53	19:04 (6)	06:08	19:10 (6)	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34 24	19:29 (6)	20:56 36	19:40 (6)	20:51 34	19:44 (6)	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	19:04 (6)	05:53	19:04 (6)	06:09	19:11 (6)	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35 26	19:30 (6)	20:56 36	19:40 (6)	20:50 33	19:44 (6)	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	19:03 (6)	05:53	19:04 (6)	06:09	19:11 (6)	06:38	07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36 28	19:31 (6)	20:56 36	19:40 (6)	20:49 33	19:44 (6)	20:15	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	19:02 (6)	05:54	19:05 (6)	06:10	19:11 (6)	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37 29	19:31 (6)	20:56 36	19:41 (6)	20:49 31	19:42 (6)	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	19:02 (6)	05:54	19:05 (6)	06:11	19:12 (6)	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38 31	19:33 (6)	20:57 36	19:41 (6)	20:48 30	19:42 (6)	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	19:01 (6)	05:54	19:05 (6)	06:12	19:13 (6)	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39 32	19:33 (6)	20:57 36	19:41 (6)	20:47 29	19:42 (6)	20:11	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	19:00 (6)	05:54	19:05 (6)	06:13	19:14 (6)	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40 33	19:33 (6)	20:57 36	19:41 (6)	20:46 27	19:41 (6)	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	19:01 (6)	05:54	19:05 (6)	06:14	19:15 (6)	06:43	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	20:41 33	19:34 (6)	20:57 37	19:42 (6)	20:45 25	19:40 (6)	20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	05:59	19:00 (6)	05:55	19:05 (6)	06:15	19:16 (6)	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42 34	19:34 (6)	20:57 37	19:42 (6)	20:45 23	19:39 (6)	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	19:01 (6)	05:55	19:05 (6)	06:16	19:16 (6)	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42 34	19:35 (6)	20:57 37	19:42 (6)	20:44 21	19:37 (6)	20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	19:00 (6)	05:56	19:06 (6)	06:16	19:18 (6)	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43 35	19:35 (6)	20:57 36	19:42 (6)	20:43 18	19:36 (6)	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	19:00 (6)	05:56	19:06 (6)	06:17	19:20 (6)	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44 36	19:36 (6)	20:57 36	19:42 (6)	20:42 14	19:34 (6)	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	19:00 (6)	05:56	19:06 (6)	06:18	19:24 (6)	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45 36	19:36 (6)	20:57 37	19:43 (6)	20:41 6	19:30 (6)	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57	19:00 (6)			06:19		06:49		06:51		07:46
	17:40		19:46		20:46 37	19:37 (6)			20:40		19:58		17:23		17:06
Potential sun hours	300	298	370	398	446		450		457		426	375	346	300	290
Total, worst case					516		1093		940						
Sun reduction					0.58		0.67		0.75						
Oper. time red.					0.37		0.37		0.37						
Wind dir. red.					0.71		0.71		0.71						
Total reduction					0.15		0.18		0.20						
Total, real					79		194		187						

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 46

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AN - R054

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09 07:46 (10)	06:24 19:17 (5)	05:56	05:57	06:20	06:50 07:39 (10)	07:19	06:52	07:26
	17:07	17:41	18:14	19:47 53 08:59 (9)	20:18 24 19:41 (5)	20:46	20:57	20:39	19:57 32 08:41 (9)	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07 07:44 (10)	06:23 19:17 (5)	05:56	05:57	06:21	06:51 07:38 (10)	07:20	06:53	07:27
	17:08	17:42	18:15	19:48 57 08:59 (9)	20:19 24 19:41 (5)	20:47	20:57	20:38	19:55 39 08:44 (9)	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06 07:42 (10)	06:22 19:18 (5)	05:55	05:58	06:22	06:52 07:37 (10)	07:21	06:54	07:28
	17:09	17:43	18:16	19:49 58 08:58 (9)	20:20 23 19:41 (5)	20:48	20:57	20:37	19:53 46 08:46 (9)	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04 07:41 (10)	06:20 19:18 (5)	05:55	05:58	06:23 19:35 (5)	06:53 07:36 (10)	07:22	06:55	07:29
	17:10	17:45	18:17	19:50 57 08:56 (9)	20:21 22 19:40 (5)	20:48	20:57	20:35 8 19:43 (5)	19:52 50 08:47 (9)	19:02	17:18	16:58
5	07:46	07:29	06:52	07:02 07:41 (10)	06:19 19:18 (5)	05:55	05:59	06:24 19:33 (5)	06:54 07:36 (10)	07:23	06:56	07:30
	17:11	17:46	18:18	19:51 56 08:55 (9)	20:22 20 19:38 (5)	20:49	20:56	20:34 12 19:45 (5)	19:50 53 08:49 (9)	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01 07:40 (10)	06:18 19:19 (5)	05:54	05:59	06:25 19:30 (5)	06:55 07:36 (10)	07:24	06:58	07:31
	17:12	17:47	18:20	19:52 56 08:54 (9)	20:23 18 19:37 (5)	20:50	20:56	20:33 16 19:46 (5)	19:49 56 08:50 (9)	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59 07:40 (10)	06:17 19:21 (5)	05:54	06:00	06:26 19:29 (5)	06:56 07:36 (10)	07:25	06:59	07:32
	17:13	17:48	18:21	19:53 53 08:53 (9)	20:24 15 19:36 (5)	20:50	20:56	20:32 18 19:47 (5)	19:47 56 08:50 (9)	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58 07:39 (10)	06:16 19:23 (5)	05:54	06:01	06:27 19:28 (5)	06:57 07:36 (10)	07:26	07:00	07:33
	17:14	17:49	18:22	19:54 50 08:50 (9)	20:25 11 19:34 (5)	20:51	20:56	20:31 20 19:48 (5)	19:45 57 08:51 (9)	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56 07:39 (10)	06:15 19:26 (5)	05:54	06:01	06:28 19:27 (5)	06:57 07:36 (10)	07:27	07:01	07:33
	17:15	17:51	18:23	19:55 46 08:48 (9)	20:26 5 19:31 (5)	20:52	20:55	20:30 22 19:49 (5)	19:44 58 08:52 (9)	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54 07:40 (10)	06:14	05:53	06:02	06:29 19:26 (5)	06:58 07:37 (10)	07:28	07:02	07:34
	17:16	17:52	18:24	19:56 39 08:46 (9)	20:27	20:52	20:55	20:28 23 19:49 (5)	19:42 57 08:52 (9)	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53 07:40 (10)	06:12	05:53	06:03	06:30 19:26 (5)	06:59 07:39 (10)	07:29	07:03	07:35
	17:17	17:53	18:25	19:57 32 08:42 (9)	20:28	20:53	20:54	20:27 24 19:50 (5)	19:40 53 08:52 (9)	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51 07:41 (10)	06:11	05:53	06:03	06:31 19:25 (5)	07:00 07:41 (10)	07:30	07:05	07:36
	17:18	17:54	18:26	19:58 15 07:56 (10)	20:29	20:53	20:54	20:26 25 19:50 (5)	19:39 48 08:52 (9)	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50 07:43 (10)	06:10	05:53	06:04	06:32 19:25 (5)	07:01 08:09 (9)	07:31	07:06	07:37
	17:19	17:55	18:27	19:59 10 07:53 (10)	20:30	20:54	20:54	20:24 25 19:50 (5)	19:37 43 08:52 (9)	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33 19:25 (5)	07:02 08:08 (9)	07:32	07:07	07:37
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23 25 19:50 (5)	19:35 44 08:52 (9)	18:47	17:08	16:58
15	07:45	07:18	06:37 07:40 (9)	06:47	06:08	05:53	06:06	06:33 19:25 (5)	07:03 08:08 (9)	07:33	07:08	07:38
	17:21	17:58	18:29 9 07:49 (9)	20:01	20:32	20:54	20:53	20:22 25 19:50 (5)	19:34 43 08:51 (9)	18:45	17:07	16:58
16	07:44	07:17	06:35 07:35 (9)	06:45	06:07	05:53	06:06	06:34 19:25 (5)	07:04 08:08 (9)	07:34	07:09	07:39
	17:22	17:59	18:30 18 07:53 (9)	20:02	20:33	20:55	20:52	20:20 25 19:50 (5)	19:32 43 08:51 (9)	18:44	17:06	16:58
17	07:44	07:15	06:33 07:32 (9)	06:44	06:07	05:53	06:07	06:35 19:25 (5)	07:05 08:08 (9)	07:35	07:10	07:40
	17:23	18:00	18:31 24 07:56 (9)	20:03	20:34	20:55	20:51	20:19 24 19:49 (5)	19:30 43 08:51 (9)	18:42	17:06	16:59
18	07:43	07:14	06:32 07:29 (9)	06:42	06:06	05:53	06:08	06:36 19:24 (5)	07:06 08:08 (9)	07:36	07:12	07:40
	17:24	18:01	18:32 29 07:58 (9)	20:04	20:34	20:56	20:51	20:18 23 19:47 (5)	19:29 42 08:50 (9)	18:41	17:05	16:59
19	07:43	07:13	06:30 07:27 (9)	06:41	06:05	05:53	06:09	06:37 19:25 (5)	07:07 08:08 (9)	07:37	07:13	07:41
	17:25	18:03	18:33 32 07:59 (9)	20:05	20:35	20:56	20:50	20:16 21 19:46 (5)	19:27 41 08:49 (9)	18:39	17:04	16:59
20	07:42	07:11	06:28 07:26 (9)	06:39 19:27 (5)	06:04	05:53	06:10	06:38 19:26 (5)	07:08 08:08 (9)	07:38	07:14	07:41
	17:27	18:04	18:34 34 08:00 (9)	20:06 9 19:36 (5)	20:36	20:56	20:49	20:15 19 19:45 (5)	19:25 41 08:49 (9)	18:38	17:03	17:00
21	07:42	07:10	06:27 07:24 (9)	06:38 19:23 (5)	06:03	05:54	06:10	06:39 19:27 (5)	07:09 08:09 (9)	07:39	07:15	07:42
	17:28	18:05	18:36 37 08:01 (9)	20:07 14 19:37 (5)	20:37	20:56	20:49	20:13 17 19:44 (5)	19:24 39 08:48 (9)	18:36	17:03	17:00
22	07:41	07:09	06:25 07:23 (9)	06:36 19:22 (5)	06:02	05:54	06:11	06:40 19:29 (5)	07:10 08:09 (9)	07:41	07:16	07:43
	17:29	18:06	18:37 39 08:02 (9)	20:08 17 19:39 (5)	20:38	20:57	20:48	20:12 13 19:42 (5)	19:22 37 08:46 (9)	18:35	17:02	17:01
23	07:40	07:07	06:24 07:22 (9)	06:35 19:21 (5)	06:02	05:54	06:12	06:41 19:31 (5)	07:11 08:10 (9)	07:42	07:17	07:43
	17:30	18:07	18:38 40 08:02 (9)	20:09 20 19:41 (5)	20:39	20:57	20:47	20:10 8 19:39 (5)	19:20 35 08:45 (9)	18:33	17:02	17:01
24	07:40	07:06	06:22 07:21 (9)	06:34 19:19 (5)	06:01	05:54	06:13	06:42 07:12	08:11 (9)	07:43	07:18	07:44
	17:31	18:08	18:39 41 08:02 (9)	20:10 22 19:41 (5)	20:40	20:57	20:46	20:09 19:19	33 08:44 (9)	18:32	17:01	17:02
25	07:39	07:04	06:20 07:20 (9)	06:32 19:19 (5)	06:00	05:55	06:14	06:43 07:13	08:12 (9)	06:44	07:19	07:44
	17:32	18:09	18:40 43 08:03 (9)	20:11 23 19:42 (5)	20:41	20:57	20:45	20:08 19:17	30 08:42 (9)	17:31	17:01	17:02
26	07:38	07:03	06:19 07:19 (9)	06:31 19:18 (5)	06:00	05:55	06:15	06:44 07:14	08:14 (9)	06:45	07:21	07:44
	17:34	18:11	18:41 43 08:02 (9)	20:13 24 19:42 (5)	20:42	20:57	20:45	20:06 19:15	25 08:39 (9)	17:29	17:00	17:03
27	07:38	07:01	06:17 07:18 (9)	06:29 19:17 (5)	05:59	05:55	06:16	06:45 07:15	08:16 (9)	06:46	07:22	07:45
	17:35	18:12	18:42 44 08:02 (9)	20:14 25 19:42 (5)	20:42	20:57	20:44	20:04 19:14	21 08:37 (9)	17:28	17:00	17:03
28	07:37	07:00	06:15 07:19 (9)	06:28 19:17 (5)	05:58	05:56	06:16	06:46 07:16	08:19 (9)	06:47	07:23	07:45
	17:36	18:13	18:43 43 08:02 (9)	20:15 25 19:42 (5)	20:43	20:57	20:43	20:03 19:12	14 08:33 (9)	17:27	16:59	17:04
29	07:36		07:14 08:18 (9)	06:27 19:17 (5)	05:58	05:56	06:17	06:47 07:17	06:48	07:24	07:45
	17:37		19:44 43 09:01 (9)	20:16 25 19:42 (5)	20:44	20:57	20:42	20:01 19:11	17:25	16:59	17:05
30	07:35		07:12 08:17 (9)	06:25 19:16 (5)	05:57	05:56	06:18	06:48 07:43 (10)	07:18	06:50	07:25	07:46
	17:38		19:45 43 09:00 (9)	20:17 25 19:41 (5)	20:45	20:57	20:41	20:00 11 07:54 (10)	19:09	17:24	16:59	17:06
31	07:34		07:10 07:51 (10)		05:57		06:19	06:49 07:40 (10)		06:51		07:46
	17:40		19:46 45 09:00 (9)		20:46		20:40	19:58 17 08:34 (9)		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case			607	811	162			421	1179			
Sun reduction			0.47	0.51	0.58			0.72	0.64			
Oper. time red.			0.37	0.37	0.37			0.37	0.37			
Wind dir. red.			0.73	0.73	0.72			0.72	0.73			
Total reduction			0.13	0.14	0.16			0.19	0.18			
Total, real			78	113	25			82	208			

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 47

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AO - R060

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May		June		July		August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24		05:56	19:05 (6)	05:57	19:10 (6)	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18		20:46	31 19:36 (6)	20:57	34 19:44 (6)	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23		05:56	19:05 (6)	05:57	19:10 (6)	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19		20:47	32 19:37 (6)	20:57	35 19:45 (6)	20:38	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22		05:55	19:05 (6)	05:58	19:10 (6)	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20		20:48	33 19:38 (6)	20:57	35 19:45 (6)	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20		05:55	19:05 (6)	05:58	19:11 (6)	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21		20:48	33 19:38 (6)	20:57	34 19:45 (6)	20:36	19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02	06:19		05:55	19:05 (6)	05:59	19:11 (6)	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22		20:49	33 19:38 (6)	20:56	34 19:45 (6)	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18		05:54	19:05 (6)	05:59	19:11 (6)	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23		20:50	34 19:39 (6)	20:56	34 19:45 (6)	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17		05:54	19:04 (6)	06:00	19:11 (6)	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24		20:50	34 19:38 (6)	20:56	34 19:45 (6)	20:32	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16		05:54	19:05 (6)	06:01	19:12 (6)	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25		20:51	34 19:39 (6)	20:56	33 19:45 (6)	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15		05:54	19:05 (6)	06:01	19:13 (6)	06:28	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26		20:52	34 19:39 (6)	20:55	32 19:45 (6)	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13		05:53	19:05 (6)	06:02	19:12 (6)	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27		20:52	35 19:40 (6)	20:55	33 19:45 (6)	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12		05:53	19:05 (6)	06:03	19:13 (6)	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28		20:53	35 19:40 (6)	20:55	32 19:45 (6)	20:27	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11		05:53	19:06 (6)	06:03	19:14 (6)	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29		20:53	35 19:41 (6)	20:54	31 19:45 (6)	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10		05:53	19:06 (6)	06:04	19:14 (6)	06:32	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30		20:54	35 19:41 (6)	20:54	30 19:44 (6)	20:25	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09		05:53	19:06 (6)	06:05	19:14 (6)	06:32	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31		20:54	35 19:41 (6)	20:53	30 19:44 (6)	20:23	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08		05:53	19:06 (6)	06:06	19:15 (6)	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32		20:54	35 19:41 (6)	20:53	29 19:44 (6)	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07		05:53	19:06 (6)	06:06	19:15 (6)	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33		20:55	36 19:42 (6)	20:52	28 19:43 (6)	20:20	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06		05:53	19:07 (6)	06:07	19:16 (6)	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34		20:55	35 19:42 (6)	20:51	26 19:42 (6)	20:19	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06		05:53	19:07 (6)	06:08	19:17 (6)	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34		20:56	35 19:42 (6)	20:51	25 19:42 (6)	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05		05:53	19:07 (6)	06:09	19:18 (6)	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35		20:56	35 19:42 (6)	20:50	23 19:41 (6)	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	19:15 (6)	05:53	19:07 (6)	06:09	19:20 (6)	06:38	07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36	8 19:23 (6)	20:56	35 19:42 (6)	20:49	21 19:41 (6)	20:15	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	19:12 (6)	05:54	19:08 (6)	06:10	19:20 (6)	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	14 19:26 (6)	20:56	35 19:43 (6)	20:49	19 19:39 (6)	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	19:11 (6)	05:54	19:08 (6)	06:11	19:22 (6)	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	17 19:28 (6)	20:57	35 19:43 (6)	20:48	15 19:37 (6)	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	19:10 (6)	05:54	19:08 (6)	06:12	19:24 (6)	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20 19:30 (6)	20:57	35 19:43 (6)	20:47	11 19:35 (6)	20:11	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	19:08 (6)	05:54	19:08 (6)	06:13	19:29 (6)	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40	22 19:30 (6)	20:57	35 19:43 (6)	20:46	2 19:31 (6)	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	19:08 (6)	05:54	19:09 (6)	06:14		06:43	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	20:41	24 19:32 (6)	20:57	35 19:44 (6)	20:45		20:08	19:17	17:31	17:01	17:02
26	07:38	07:03	06:19	06:31	05:59	19:07 (6)	05:55	19:08 (6)	06:15		06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	26 19:33 (6)	20:57	36 19:44 (6)	20:45		20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	19:07 (6)	05:55	19:08 (6)	06:16		06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	27 19:34 (6)	20:57	35 19:43 (6)	20:44		20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	19:06 (6)	05:56	19:09 (6)	06:16		06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	28 19:34 (6)	20:57	35 19:44 (6)	20:43		20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	19:06 (6)	05:56	19:09 (6)	06:17		06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	29 19:35 (6)	20:57	35 19:44 (6)	20:42		20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	19:05 (6)	05:56	19:10 (6)	06:18		06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	30 19:35 (6)	20:57	35 19:45 (6)	20:41		20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57	19:06 (6)			06:19		06:49		06:51		07:46
	17:40		19:46		20:46	30 19:36 (6)			20:40		19:58		17:23		17:06
Potential sun hours	300	298	370	398	446		450		457		426	375	346	300	290
Total, worst case					275		1035		660						
Sun reduction					0.58		0.67		0.75						
Oper. time red.					0.37		0.37		0.37						
Wind dir. red.					0.71		0.71		0.71						
Total reduction					0.15		0.18		0.20						
Total, real					42		183		131						

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 48

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AP - R059

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May		June		
1	07:46		16:03 (5)	07:33	06:58	07:09	06:24		05:56		19:09 (6)
	17:07	20	16:23 (5)	17:41	18:14	19:47	20:18		20:46	26	19:35 (6)
2	07:46		16:03 (5)	07:32	06:57	07:07	06:23		05:56		19:09 (6)
	17:08	21	16:24 (5)	17:42	18:15	19:48	20:19		20:47	27	19:36 (6)
3	07:46		16:04 (5)	07:32	06:55	07:06	06:22		05:55		19:09 (6)
	17:09	20	16:24 (5)	17:43	18:16	19:49	20:20		20:48	28	19:37 (6)
4	07:46		16:04 (5)	07:31	06:54	07:04	06:20		05:55		19:08 (6)
	17:10	20	16:24 (5)	17:45	18:17	19:50	20:21		20:48	29	19:37 (6)
5	07:46		16:05 (5)	07:30	06:52	07:02	06:19		05:55		19:08 (6)
	17:11	20	16:25 (5)	17:46	18:18	19:51	20:22		20:49	30	19:38 (6)
6	07:46		16:05 (5)	07:28	06:51	07:01	06:18		05:54		19:08 (6)
	17:12	20	16:25 (5)	17:47	18:20	19:52	20:23		20:50	31	19:39 (6)
7	07:46		16:06 (5)	07:27	06:49	06:59	06:17		05:54		19:08 (6)
	17:13	20	16:26 (5)	17:48	18:21	19:53	20:24		20:50	30	19:38 (6)
8	07:46		16:07 (5)	07:26	06:48	06:58	06:16		05:54		19:08 (6)
	17:14	19	16:26 (5)	17:49	18:22	19:54	20:25		20:51	31	19:39 (6)
9	07:46		16:08 (5)	07:25	06:46	06:56	06:15		05:54		19:08 (6)
	17:15	18	16:26 (5)	17:51	18:23	19:55	20:26		20:52	32	19:40 (6)
10	07:46		16:08 (5)	07:24	06:45	06:54	06:13		05:53		19:08 (6)
	17:16	18	16:26 (5)	17:52	18:24	19:56	20:27		20:52	32	19:40 (6)
11	07:46		16:09 (5)	07:23	06:43	06:53	06:12		05:53		19:08 (6)
	17:17	17	16:26 (5)	17:53	18:25	19:57	20:28		20:53	33	19:41 (6)
12	07:46		16:10 (5)	07:22	06:41	06:51	06:11		05:53		19:08 (6)
	17:18	16	16:26 (5)	17:54	18:26	19:58	20:29		20:53	33	19:41 (6)
13	07:45		16:11 (5)	07:20	06:40	06:50	06:10		05:53		19:08 (6)
	17:19	14	16:25 (5)	17:55	18:27	19:59	20:30		20:54	33	19:41 (6)
14	07:45		16:12 (5)	07:19	06:38	06:48	06:09		05:53		19:09 (6)
	17:20	13	16:25 (5)	17:57	18:28	20:00	20:31		20:54	33	19:42 (6)
15	07:45		16:14 (5)	07:18	06:37	06:47	06:08		05:53		19:09 (6)
	17:21	11	16:25 (5)	17:58	18:29	20:01	20:32		20:54	33	19:42 (6)
16	07:44		16:16 (5)	07:17	06:35	06:45	06:07		05:53		19:09 (6)
	17:22	7	16:23 (5)	17:59	18:30	20:02	20:33		20:55	33	19:42 (6)
17	07:44			07:15	06:33	06:44	06:06		05:53		19:09 (6)
	17:23			18:00	18:31	20:03	20:34		20:55	33	19:42 (6)
18	07:43			07:14	06:32	06:42	06:06		05:53		19:09 (6)
	17:24			18:01	18:32	20:04	20:34		20:56	34	19:43 (6)
19	07:43			07:13	06:30	06:41	06:05		05:53		19:09 (6)
	17:25			18:03	18:33	20:05	20:35		20:56	34	19:43 (6)
20	07:42			07:11	06:28	06:39	06:04		05:53		19:09 (6)
	17:27			18:04	18:34	20:06	20:36		20:56	34	19:43 (6)
21	07:42			07:10	06:27	06:38	06:03		05:54		19:10 (6)
	17:28			18:05	18:36	20:07	20:37		20:56	34	19:44 (6)
22	07:41			07:09	06:25	06:36	06:02		05:54		19:10 (6)
	17:29			18:06	18:37	20:08	20:38		20:57	34	19:44 (6)
23	07:41			07:07	06:24	06:35	06:02		05:54		19:10 (6)
	17:30			18:07	18:38	20:09	20:39		20:57	34	19:44 (6)
24	07:40			07:06	06:22	06:34	06:01		19:17 (6)	05:54		19:10 (6)
	17:31			18:08	18:39	20:10	20:40	8	19:25 (6)	20:57	34	19:44 (6)
25	07:39			07:04	06:20	06:32	06:00		19:15 (6)	05:54		19:11 (6)
	17:32			18:09	18:40	20:12	20:41	13	19:28 (6)	20:57	33	19:44 (6)
26	07:38			07:03	06:19	06:31	05:59		19:13 (6)	05:55		19:11 (6)
	17:34			18:11	18:41	20:13	20:42	16	19:29 (6)	20:57	33	19:44 (6)
27	07:38			07:01	06:17	06:29	05:59		19:13 (6)	05:55		19:11 (6)
	17:35			18:12	18:42	20:14	20:42	18	19:31 (6)	20:57	33	19:44 (6)
28	07:37			07:00	06:15	06:28	05:58		19:11 (6)	05:56		19:12 (6)
	17:36			18:13	18:43	20:15	20:43	21	19:32 (6)	20:57	33	19:45 (6)
29	07:36				07:14	06:27	05:58		19:11 (6)	05:56		19:12 (6)
	17:37				19:44	20:16	20:44	23	19:34 (6)	20:57	33	19:45 (6)
30	07:35				07:12	06:25	05:57		19:10 (6)	05:56		19:12 (6)
	17:38				19:45	20:17	20:45	24	19:34 (6)	20:57	33	19:45 (6)
31	07:34				07:10		05:57		19:10 (6)			
	17:40				19:46		20:46	25	19:35 (6)			
Potential sun hours	300			298	370	398	446			450		
Total, worst case		274						148			963	
Sun reduction		0.40						0.58			0.67	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.71						0.70			0.70	
Total reduction		0.11						0.15			0.18	
Total, real		29						23			170	

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

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

Project:
Flickering Nuoro Sud

Licensed user:
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IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AP - R059

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August	September	October	November			December		
1	05:57		19:12 (6)	06:20	06:50	07:19	06:52			07:26		15:51 (5)
	20:57	33	19:45 (6)	20:39	19:57	19:07	17:22			16:58	17	16:08 (5)
2	05:57		19:13 (6)	06:21	06:51	07:20	06:53			07:27		15:51 (5)
	20:57	32	19:45 (6)	20:38	19:55	19:06	17:20			16:58	18	16:09 (5)
3	05:58		19:13 (6)	06:22	06:52	07:21	06:54			07:28		15:51 (5)
	20:57	32	19:45 (6)	20:37	19:54	19:04	17:19			16:58	18	16:09 (5)
4	05:58		19:14 (6)	06:23	06:53	07:22	06:55			07:29		15:51 (5)
	20:57	31	19:45 (6)	20:36	19:52	19:02	17:18			16:57	19	16:10 (5)
5	05:59		19:14 (6)	06:24	06:54	07:23	06:56			07:30		15:51 (5)
	20:56	31	19:45 (6)	20:34	19:50	19:01	17:17			16:57	20	16:11 (5)
6	05:59		19:14 (6)	06:25	06:55	07:24	06:58			07:31		15:51 (5)
	20:56	31	19:45 (6)	20:33	19:49	18:59	17:16			16:57	20	16:11 (5)
7	06:00		19:14 (6)	06:26	06:56	07:25	06:59			07:32		15:52 (5)
	20:56	30	19:44 (6)	20:32	19:47	18:57	17:15			16:57	20	16:12 (5)
8	06:01		19:15 (6)	06:27	06:57	07:26	07:00			07:33		15:52 (5)
	20:56	30	19:45 (6)	20:31	19:45	18:56	17:14			16:57	20	16:12 (5)
9	06:01		19:16 (6)	06:28	06:57	07:27	07:01			07:33		15:53 (5)
	20:55	29	19:45 (6)	20:30	19:44	18:54	17:13			16:57	20	16:13 (5)
10	06:02		19:16 (6)	06:29	06:58	07:28	07:02			07:34		15:53 (5)
	20:55	28	19:44 (6)	20:28	19:42	18:53	17:12			16:57	21	16:14 (5)
11	06:03		19:17 (6)	06:30	06:59	07:29	07:03			07:35		15:53 (5)
	20:55	27	19:44 (6)	20:27	19:40	18:51	17:11			16:57	20	16:13 (5)
12	06:03		19:18 (6)	06:31	07:00	07:30	07:05			07:36		15:53 (5)
	20:54	26	19:44 (6)	20:26	19:39	18:50	17:10			16:57	21	16:14 (5)
13	06:04		19:18 (6)	06:32	07:01	07:31	07:06			07:37		15:54 (5)
	20:54	25	19:43 (6)	20:25	19:37	18:48	17:09			16:57	21	16:15 (5)
14	06:05		19:19 (6)	06:32	07:02	07:32	07:07			07:38		15:55 (5)
	20:53	23	19:42 (6)	20:23	19:35	18:47	17:08			16:58	20	16:15 (5)
15	06:06		19:20 (6)	06:33	07:03	07:33	07:08			07:38		15:54 (5)
	20:53	22	19:42 (6)	20:22	19:34	18:45	17:07			16:58	21	16:15 (5)
16	06:06		19:21 (6)	06:34	07:04	07:34	07:09			07:39		15:55 (5)
	20:52	19	19:40 (6)	20:20	19:32	18:44	17:06			16:58	21	16:16 (5)
17	06:07		19:22 (6)	06:35	07:05	07:35	07:10			07:40		15:56 (5)
	20:51	17	19:39 (6)	20:19	19:30	18:42	17:06			16:58	21	16:17 (5)
18	06:08		19:24 (6)	06:36	07:06	07:36	07:12			07:40		15:56 (5)
	20:51	14	19:38 (6)	20:18	19:29	18:41	17:05			16:59	21	16:17 (5)
19	06:09		19:26 (6)	06:37	07:07	07:37	07:13			07:41		15:57 (5)
	20:50	11	19:37 (6)	20:16	19:27	18:39	17:04			16:59	20	16:17 (5)
20	06:09			06:38	07:08	07:38	07:14			07:42		09:41 (8)
	20:49			20:15	19:25	18:38	17:03			17:00	23	16:18 (5)
21	06:10			06:39	07:09	07:40	07:15			07:42		09:40 (8)
	20:49			20:13	19:24	18:36	17:03			17:00	24	16:18 (5)
22	06:11			06:40	07:10	07:41	07:16			07:43		09:41 (8)
	20:48			20:12	19:22	18:35	17:02			17:01	24	16:19 (5)
23	06:12			06:41	07:11	07:42	07:17			07:43		09:41 (8)
	20:47			20:11	19:20	18:33	17:02			17:01	24	16:19 (5)
24	06:13			06:42	07:12	07:43	07:18			07:44		09:43 (8)
	20:46			20:09	19:19	18:32	17:01			17:02	22	16:19 (5)
25	06:14			06:43	07:13	06:44	07:19			07:44		16:00 (5)
	20:45			20:08	19:17	17:31	17:01			17:02	21	16:21 (5)
26	06:15			06:44	07:14	06:45	07:21		15:55 (5)	07:44		16:00 (5)
	20:45			20:06	19:15	17:29	17:00	6	16:01 (5)	17:03	21	16:21 (5)
27	06:16			06:45	07:15	06:46	07:22		15:54 (5)	07:45		16:00 (5)
	20:44			20:04	19:14	17:28	17:00	9	16:03 (5)	17:03	21	16:21 (5)
28	06:16			06:46	07:16	06:47	07:23		15:53 (5)	07:45		16:01 (5)
	20:43			20:03	19:12	17:27	16:59	12	16:05 (5)	17:04	21	16:22 (5)
29	06:17			06:47	07:17	06:48	07:24		15:52 (5)	07:45		16:01 (5)
	20:42			20:01	19:11	17:25	16:59	14	16:06 (5)	17:05	21	16:22 (5)
30	06:18			06:48	07:18	06:50	07:25		15:51 (5)	07:46		16:02 (5)
	20:41			20:00	19:09	17:24	16:58	16	16:07 (5)	17:06	21	16:23 (5)
31	06:19			06:49		06:51				07:46		16:02 (5)
	20:40			19:58		17:23				17:06	21	16:23 (5)
Potential sun hours	457			426	375	346	300			290		
Total, worst case		491						57			643	
Sun reduction		0.75						0.48			0.41	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.70						0.71			0.71	
Total reduction		0.20						0.13			0.11	
Total, real		97						7			70	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 50
Licensed user:
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+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AQ - R057

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April	May	June
1	07:46	08:48 (9)	07:33		08:53 (9)	06:58	07:37 (10)	07:09	06:24	05:56
	17:07	23 09:11 (9)	17:41	33	09:26 (9)	18:14	14 07:51 (10)	19:47	20:18	20:46
2	07:46	08:48 (9)	07:32		08:53 (9)	06:57	07:36 (10)	07:07	06:23	05:56
	17:08	24 09:12 (9)	17:42	32	09:25 (9)	18:15	17 07:53 (10)	19:48	20:19	20:47
3	07:46	08:48 (9)	07:32		08:54 (9)	06:55	07:35 (10)	07:06	06:22	05:55
	17:09	25 09:13 (9)	17:43	30	09:24 (9)	18:16	18 07:53 (10)	19:49	20:20	20:48
4	07:46	08:48 (9)	07:31		08:56 (9)	06:54	07:34 (10)	07:04	06:20	05:55
	17:10	26 09:14 (9)	17:45	27	09:23 (9)	18:17	20 07:54 (10)	19:50	20:21	20:48
5	07:46	08:48 (9)	07:30		08:57 (9)	06:52	07:33 (10)	07:02	06:19	05:55
	17:11	27 09:15 (9)	17:46	25	09:22 (9)	18:18	21 07:54 (10)	19:51	20:22	20:49
6	07:46	08:48 (9)	07:28		08:59 (9)	06:51	07:33 (10)	07:01	06:18	05:54
	17:12	28 09:16 (9)	17:47	21	09:20 (9)	18:20	21 07:54 (10)	19:52	20:23	20:50
7	07:46	08:48 (9)	07:27		09:01 (9)	06:49	07:33 (10)	06:59	06:17	05:54
	17:13	29 09:17 (9)	17:48	17	09:18 (9)	18:21	21 07:54 (10)	19:53	20:24	20:50
8	07:46	08:48 (9)	07:26		09:05 (9)	06:48	07:33 (10)	06:58	06:16	05:54
	17:14	30 09:18 (9)	17:49	10	09:15 (9)	18:22	20 07:53 (10)	19:54	20:25	20:51
9	07:46	08:48 (9)	07:25			06:46	07:34 (10)	06:56	06:15	05:54
	17:15	31 09:19 (9)	17:51			18:23	18 07:52 (10)	19:55	20:26	20:52
10	07:46	08:47 (9)	07:24			06:45	07:34 (10)	06:54	06:13	05:53
	17:16	32 09:19 (9)	17:52			18:24	17 07:51 (10)	19:56	20:27	20:52
11	07:46	08:47 (9)	07:23			06:43	07:36 (10)	06:53	06:12	05:53
	17:17	33 09:20 (9)	17:53			18:25	14 07:50 (10)	19:57	20:28	20:53
12	07:46	08:48 (9)	07:22			06:41	07:37 (10)	06:51	06:11	05:53
	17:18	33 09:21 (9)	17:54			18:26	10 07:47 (10)	19:58	20:29	20:53
13	07:45	08:47 (9)	07:20			06:40	17:47 (5)	06:50	06:10	05:53
	17:19	34 09:21 (9)	17:55			18:27	9 17:56 (5)	19:59	20:30	20:54
14	07:45	08:47 (9)	07:19			06:38	17:44 (5)	06:48	06:09	05:53
	17:20	35 09:22 (9)	17:57			18:28	15 17:59 (5)	20:00	20:31	20:54
15	07:45	08:48 (9)	07:18			06:37	17:42 (5)	06:47	06:08	05:53
	17:21	36 09:24 (9)	17:58			18:29	18 18:00 (5)	20:01	20:32	20:54
16	07:44	08:47 (9)	07:17			06:35	17:40 (5)	06:45	06:07	05:53
	17:22	37 09:24 (9)	17:59			18:30	21 18:01 (5)	20:02	20:33	20:55
17	07:44	08:48 (9)	07:15			06:33	17:40 (5)	06:44	06:07	05:53
	17:23	37 09:25 (9)	18:00			18:31	22 18:02 (5)	20:03	20:34	20:55
18	07:43	08:48 (9)	07:14			06:32	17:39 (5)	06:42	06:06	05:53
	17:24	37 09:25 (9)	18:01			18:32	23 18:02 (5)	20:04	20:34	20:56
19	07:43	08:47 (9)	07:13			06:30	17:38 (5)	06:41	06:05	05:53
	17:25	38 09:25 (9)	18:03			18:33	23 18:01 (5)	20:05	20:35	20:56
20	07:42	08:48 (9)	07:11			06:28	17:38 (5)	06:39	06:04	05:53
	17:27	38 09:26 (9)	18:04			18:34	24 18:02 (5)	20:06	20:36	20:56
21	07:42	08:48 (9)	07:10			06:27	17:37 (5)	06:38	06:03	05:54
	17:28	38 09:26 (9)	18:05			18:36	24 18:01 (5)	20:07	20:37	20:56
22	07:41	08:49 (9)	07:09			06:25	17:38 (5)	06:36	06:02	05:54
	17:29	38 09:27 (9)	18:06			18:37	23 18:01 (5)	20:08	20:38	20:57
23	07:41	08:49 (9)	07:07			06:24	17:38 (5)	06:35	06:02	05:54
	17:30	38 09:27 (9)	18:07			18:38	22 18:00 (5)	20:09	20:39	20:57
24	07:40	08:48 (9)	07:06			06:22	17:38 (5)	06:34	06:01	05:54
	17:31	39 09:27 (9)	18:08			18:39	20 17:58 (5)	20:10	20:40	20:57
25	07:39	08:49 (9)	07:04			06:20	17:40 (5)	06:32	06:00	05:55
	17:32	38 09:27 (9)	18:09			18:40	18 17:58 (5)	20:12	20:41	20:57
26	07:38	08:50 (9)	07:03			06:19	17:41 (5)	06:31	05:59	05:55
	17:34	38 09:28 (9)	18:11			18:41	14 17:55 (5)	20:13	20:42	20:57
27	07:38	08:50 (9)	07:01			06:17	17:43 (5)	06:29	05:59	05:55
	17:35	38 09:28 (9)	18:12			18:42	9 17:52 (5)	20:14	20:42	20:57
28	07:37	08:50 (9)	07:00		07:40 (10)	06:15		06:28	05:58	05:56
	17:36	37 09:27 (9)	18:13	10	07:50 (10)	18:43		20:15	20:43	20:57
29	07:36	08:51 (9)				07:14		06:27	05:58	05:56
	17:37	36 09:27 (9)				19:44		20:16	20:44	20:57
30	07:35	08:51 (9)				07:12		06:25	05:57	05:56
	17:38	36 09:27 (9)				19:45		20:17	20:45	20:57
31	07:34	08:52 (9)				07:10			05:57	
	17:40	34 09:26 (9)				19:46			20:46	
Potential sun hours	300		298			370		398	446	450
Total, worst case		1043		205		496				
Sun reduction		0.40		0.43		0.47				
Oper. time red.		0.37		0.37		0.37				
Wind dir. red.		0.62		0.62		0.74				
Total reduction		0.09		0.10		0.13				
Total, real		96		20		64				

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 51

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AQ - R057

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September			October			November			December		
1	05:57		06:20		06:50			07:19		08:17 (10)	06:52			07:26		08:30 (9)
	20:57		20:39		19:57			19:07	10	18:32 (5)	17:22			16:58	32	09:02 (9)
2	05:57		06:21		06:51			07:20		08:14 (10)	06:53			07:27		08:30 (9)
	20:57		20:38		19:55			19:06	12	08:26 (10)	17:20			16:58	32	09:02 (9)
3	05:58		06:22		06:52			07:21		08:13 (10)	06:54		08:34 (9)	07:28		08:31 (9)
	20:57		20:37		19:54			19:04	16	08:29 (10)	17:19	12	08:46 (9)	16:58	31	09:02 (9)
4	05:58		06:23		06:53			07:22		08:12 (10)	06:55		08:31 (9)	07:29		08:32 (9)
	20:57		20:35		19:52			19:02	17	08:29 (10)	17:18	18	08:49 (9)	16:58	30	09:02 (9)
5	05:59		06:24		06:54			07:23		08:11 (10)	06:56		08:28 (9)	07:30		08:33 (9)
	20:56		20:34		19:50			19:01	19	08:30 (10)	17:17	22	08:50 (9)	16:57	29	09:02 (9)
6	05:59		06:25		06:55			07:24		08:10 (10)	06:58		08:27 (9)	07:31		08:34 (9)
	20:56		20:33		19:49			18:59	20	08:30 (10)	17:16	25	08:52 (9)	16:57	28	09:02 (9)
7	06:00		06:26		06:56			07:25		08:09 (10)	06:59		08:25 (9)	07:32		08:35 (9)
	20:56		20:32		19:47			18:57	21	08:30 (10)	17:15	28	08:53 (9)	16:57	27	09:02 (9)
8	06:01		06:27		06:57			07:26		08:09 (10)	07:00		08:25 (9)	07:33		08:36 (9)
	20:56		20:31		19:45			18:56	21	08:30 (10)	17:14	30	08:55 (9)	16:57	26	09:02 (9)
9	06:01		06:28		06:57			07:27		08:09 (10)	07:01		08:24 (9)	07:33		08:37 (9)
	20:55		20:30		19:44			18:54	20	08:29 (10)	17:13	32	08:56 (9)	16:57	25	09:02 (9)
10	06:02		06:29		06:58			07:28		08:09 (10)	07:02		08:23 (9)	07:34		08:38 (9)
	20:55		20:28		19:42			18:53	19	08:28 (10)	17:12	34	08:57 (9)	16:57	24	09:02 (9)
11	06:03		06:30		06:59			07:29		08:09 (10)	07:03		08:23 (9)	07:35		08:38 (9)
	20:54		20:27		19:40			18:51	18	08:27 (10)	17:11	34	08:57 (9)	16:57	23	09:01 (9)
12	06:03		06:31		07:00			07:30		08:10 (10)	07:05		08:23 (9)	07:36		08:39 (9)
	20:54		20:26		19:39			18:50	16	08:26 (10)	17:10	36	08:59 (9)	16:57	22	09:01 (9)
13	06:04		06:32		07:01			07:31		08:12 (10)	07:06		08:23 (9)	07:37		08:40 (9)
	20:54		20:25		19:37			18:48	12	08:24 (10)	17:09	36	08:59 (9)	16:58	21	09:01 (9)
14	06:05		06:32		07:02			07:32		08:14 (10)	07:07		08:22 (9)	07:38		08:42 (9)
	20:53		20:23		19:35			18:47	7	08:21 (10)	17:08	37	08:59 (9)	16:58	19	09:01 (9)
15	06:06		06:33		07:03			07:33			07:08		08:22 (9)	07:38		08:42 (9)
	20:53		20:22		19:34			18:45			17:07	38	09:00 (9)	16:58	19	09:01 (9)
16	06:06		06:34		07:04		18:33 (5)	07:34			07:09		08:23 (9)	07:39		08:43 (9)
	20:52		20:20		19:32	7	18:40 (5)	18:44			17:06	38	09:01 (9)	16:58	18	09:01 (9)
17	06:07		06:35		07:05		18:29 (5)	07:35			07:10		08:23 (9)	07:40		08:44 (9)
	20:51		20:19		19:30	14	18:43 (5)	18:42			17:06	38	09:01 (9)	16:59	18	09:02 (9)
18	06:08		06:36		07:06		18:27 (5)	07:36			07:12		08:22 (9)	07:40		08:44 (9)
	20:51		20:18		19:29	18	18:45 (5)	18:41			17:05	39	09:01 (9)	16:59	17	09:01 (9)
19	06:09		06:37		07:07		18:26 (5)	07:37			07:13		08:23 (9)	07:41		08:45 (9)
	20:50		20:16		19:27	20	18:46 (5)	18:39			17:04	38	09:01 (9)	16:59	17	09:02 (9)
20	06:09		06:38		07:08		18:25 (5)	07:38			07:14		08:24 (9)	07:41		08:45 (9)
	20:49		20:15		19:25	21	18:46 (5)	18:38			17:03	38	09:02 (9)	17:00	17	09:02 (9)
21	06:10		06:39		07:09		18:24 (5)	07:39			07:15		08:24 (9)	07:42		08:46 (9)
	20:49		20:13		19:24	22	18:46 (5)	18:36			17:03	38	09:02 (9)	17:00	17	09:03 (9)
22	06:11		06:40		07:10		18:23 (5)	07:41			07:16		08:24 (9)	07:43		08:46 (9)
	20:48		20:12		19:22	23	18:46 (5)	18:35			17:02	38	09:02 (9)	17:01	17	09:03 (9)
23	06:12		06:41		07:11		18:22 (5)	07:42			07:17		08:24 (9)	07:43		08:47 (9)
	20:47		20:10		19:20	24	18:46 (5)	18:33			17:02	38	09:02 (9)	17:01	17	09:04 (9)
24	06:13		06:42		07:12		18:22 (5)	07:43			07:18		08:25 (9)	07:44		08:47 (9)
	20:46		20:09		19:19	24	18:46 (5)	18:32			17:01	37	09:02 (9)	17:02	17	09:04 (9)
25	06:14		06:43		07:13		18:22 (5)	06:44			07:19		08:25 (9)	07:44		08:48 (9)
	20:45		20:08		19:17	23	18:45 (5)	17:31			17:01	37	09:02 (9)	17:02	17	09:05 (9)
26	06:15		06:44		07:14		18:22 (5)	06:45			07:21		08:26 (9)	07:44		08:48 (9)
	20:45		20:06		19:15	23	18:45 (5)	17:29			17:00	37	09:03 (9)	17:03	18	09:06 (9)
27	06:16		06:45		07:15		18:22 (5)	06:46			07:22		08:27 (9)	07:45		08:48 (9)
	20:44		20:04		19:14	22	18:44 (5)	17:28			17:00	36	09:03 (9)	17:03	18	09:06 (9)
28	06:16		06:46		07:16		18:23 (5)	06:47			07:23		08:28 (9)	07:45		08:49 (9)
	20:43		20:03		19:12	19	18:42 (5)	17:27			16:59	34	09:02 (9)	17:04	19	09:08 (9)
29	06:17		06:47		07:17		18:24 (5)	06:48			07:24		08:28 (9)	07:45		08:49 (9)
	20:42		20:01		19:11	16	18:40 (5)	17:25			16:59	34	09:02 (9)	17:05	19	09:08 (9)
30	06:18		06:48		07:18		18:25 (5)	06:50			07:25		08:29 (9)	07:46		08:48 (9)
	20:41		20:00		19:09	12	18:37 (5)	17:24			16:58	33	09:02 (9)	17:06	21	09:09 (9)
31	06:19		06:49					06:51						07:46		08:48 (9)
	20:40		19:58					17:23						17:06	22	09:10 (9)
Potential sun hours	457		426		375			346			300			290		
Total, worst case						288			228			935			677	
Sun reduction						0.64			0.56			0.48			0.41	
Oper. time red.						0.37			0.37			0.37			0.37	
Wind dir. red.						0.76			0.71			0.62			0.62	
Total reduction						0.18			0.15			0.11			0.09	
Total, real						52			34			103			64	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 52

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AR - R055

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April			May			June
1	07:46	07:33	06:58		07:09		07:47 (10)	06:24		19:19 (5)	05:56
	17:07	17:41	18:14		19:47	52	09:09 (9)	20:18	9	19:28 (5)	20:46
2	07:46	07:32	06:57		07:07		07:47 (10)	06:23			05:56
	17:08	17:42	18:15		19:48	50	09:08 (9)	20:19			20:47
3	07:46	07:32	06:55		07:06		07:46 (10)	06:22			05:55
	17:09	17:43	18:16		19:49	46	09:05 (9)	20:20			20:48
4	07:46	07:31	06:54		07:04		07:45 (10)	06:20			05:55
	17:10	17:45	18:17		19:50	41	09:01 (9)	20:21			20:48
5	07:46	07:29	06:52		07:02		07:46 (10)	06:19			05:55
	17:11	17:46	18:18		19:51	31	08:57 (9)	20:22			20:49
6	07:46	07:28	06:51		07:01		07:45 (10)	06:18			05:54
	17:12	17:47	18:20		19:52	21	08:06 (10)	20:23			20:50
7	07:46	07:27	06:49		07:58 (9)		07:46 (10)	06:17			05:54
	17:13	17:48	18:21	9	08:07 (9)		08:06 (10)	20:24			20:50
8	07:46	07:26	06:48		07:52 (9)		07:46 (10)	06:16			05:54
	17:14	17:49	18:22	19	08:11 (9)		08:04 (10)	20:25			20:51
9	07:46	07:25	06:46		07:50 (9)		07:47 (10)	06:15			05:54
	17:15	17:51	18:23	25	08:15 (9)		08:02 (10)	20:26			20:52
10	07:46	07:24	06:45		07:47 (9)		07:49 (10)	06:13			05:53
	17:16	17:52	18:24	29	08:16 (9)		08:00 (10)	20:27			20:52
11	07:46	07:23	06:43		07:45 (9)		07:52 (10)	06:12			05:53
	17:17	17:53	18:25	33	08:18 (9)		07:56 (10)	20:28			20:53
12	07:46	07:22	06:41		07:43 (9)			06:11			05:53
	17:18	17:54	18:26	36	08:19 (9)			20:29			20:53
13	07:45	07:20	06:40		07:41 (9)			06:10			05:53
	17:19	17:55	18:27	39	08:20 (9)			20:30			20:54
14	07:45	07:19	06:38		07:41 (9)		19:26 (5)	06:09			05:53
	17:20	17:57	18:28	40	08:21 (9)		19:29 (5)	20:31			20:54
15	07:45	07:18	06:37		07:39 (9)		19:21 (5)	06:08			05:53
	17:21	17:58	18:29	42	08:21 (9)		19:32 (5)	20:32			20:54
16	07:44	07:17	06:35		07:38 (9)		19:19 (5)	06:07			05:53
	17:22	17:59	18:30	43	08:21 (9)		19:35 (5)	20:33			20:55
17	07:44	07:15	06:33		07:37 (9)		19:17 (5)	06:07			05:53
	17:23	18:00	18:31	45	08:22 (9)		19:35 (5)	20:34			20:55
18	07:43	07:14	06:32		07:36 (9)		19:16 (5)	06:06			05:53
	17:24	18:01	18:32	46	08:22 (9)		19:37 (5)	20:34			20:56
19	07:43	07:13	06:30		07:35 (9)		19:14 (5)	06:05			05:53
	17:25	18:03	18:33	46	08:21 (9)		19:37 (5)	20:35			20:56
20	07:42	07:11	06:28		07:35 (9)		19:14 (5)	06:04			05:53
	17:27	18:04	18:34	47	08:22 (9)		19:37 (5)	20:36			20:56
21	07:42	07:10	06:27		07:35 (9)		19:13 (5)	06:03			05:54
	17:28	18:05	18:36	46	08:21 (9)		19:37 (5)	20:37			20:56
22	07:41	07:09	06:25		07:35 (9)		19:13 (5)	06:02			05:54
	17:29	18:06	18:37	46	08:21 (9)		19:37 (5)	20:38			20:57
23	07:40	07:07	06:24		07:34 (9)		19:13 (5)	06:02			05:54
	17:30	18:07	18:38	46	08:20 (9)		19:37 (5)	20:39			20:57
24	07:40	07:06	06:22		07:34 (9)		19:13 (5)	06:01			05:54
	17:31	18:08	18:39	45	08:19 (9)		19:36 (5)	20:40			20:57
25	07:39	07:04	06:20		07:34 (9)		19:13 (5)	06:00			05:55
	17:32	18:09	18:40	45	08:19 (9)		19:36 (5)	20:41			20:57
26	07:38	07:03	06:19		07:34 (9)		19:14 (5)	06:00			05:55
	17:34	18:11	18:41	44	08:18 (9)		19:36 (5)	20:42			20:57
27	07:38	07:01	06:17		07:34 (9)		19:14 (5)	05:59			05:55
	17:35	18:12	18:42	42	08:16 (9)		19:34 (5)	20:42			20:57
28	07:37	07:00	06:15		06:56 (10)		19:15 (5)	05:58			05:56
	17:36	18:13	18:43	47	08:16 (9)		19:34 (5)	20:43			20:57
29	07:36		07:14		07:52 (10)		19:16 (5)	05:58			05:56
	17:37		19:44	52	09:14 (9)		19:32 (5)	20:44			20:57
30	07:35		07:12		07:50 (10)		19:17 (5)	05:57			05:56
	17:38		19:45	53	09:12 (9)		19:30 (5)	20:45			20:57
31	07:34		07:10		07:49 (10)			05:57			
	17:40		19:46	52	09:11 (9)			20:46			
Potential sun hours	300	298	370		398			446			450
Total, worst case				1017		632			9		
Sun reduction				0.47		0.51			0.58		
Oper. time red.				0.37		0.37			0.37		
Wind dir. red.				0.72		0.73			0.73		
Total reduction				0.13		0.14			0.16		
Total, real				129		88			1		

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AR - R055

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November	December
1	05:57		06:20		06:50		07:51 (10)	07:19	08:21 (9)	06:52	07:26
	20:57		20:39		19:57	4	07:55 (10)	19:07	37	08:58 (9)	17:22	16:58
2	05:57		06:21		06:51		07:47 (10)	07:20	08:22 (9)	06:53	07:27
	20:57		20:38		19:55	11	07:58 (10)	19:06	34	08:56 (9)	17:20	16:58
3	05:58		06:22		06:52		07:45 (10)	07:21	08:25 (9)	06:54	07:28
	20:57		20:37		19:53	15	08:00 (10)	19:04	31	08:56 (9)	17:19	16:58
4	05:58		06:23		06:53		07:43 (10)	07:22	08:26 (9)	06:55	07:29
	20:57		20:35		19:52	18	08:01 (10)	19:02	27	08:53 (9)	17:18	16:58
5	05:59		06:24		06:54		07:42 (10)	07:23	08:28 (9)	06:56	07:30
	20:56		20:34		19:50	20	08:02 (10)	19:01	22	08:50 (9)	17:17	16:57
6	05:59		06:25		06:55		07:41 (10)	07:24	08:32 (9)	06:58	07:31
	20:56		20:33		19:49	21	08:02 (10)	18:59	15	08:47 (9)	17:16	16:57
7	06:00		06:26		06:56		07:41 (10)	07:25			06:59	07:32
	20:56		20:32		19:47	31	08:52 (9)	18:57			17:15	16:57
8	06:01		06:27		06:57		07:40 (10)	07:26			07:00	07:33
	20:56		20:31		19:45	40	08:56 (9)	18:56			17:14	16:57
9	06:01		06:28		06:57		07:40 (10)	07:27			07:01	07:33
	20:55		20:30		19:44	46	08:59 (9)	18:54			17:13	16:57
10	06:02		06:29		06:58		07:40 (10)	07:28			07:02	07:34
	20:55		20:28		19:42	49	09:01 (9)	18:53			17:12	16:57
11	06:03		06:30		06:59		07:39 (10)	07:29			07:03	07:35
	20:54		20:27		19:40	52	09:01 (9)	18:51			17:11	16:57
12	06:03		06:31	19:27 (5)	07:00		07:40 (10)	07:30			07:05	07:36
	20:54		20:26	10 19:37 (5)	19:39	53	09:02 (9)	18:50			17:10	16:57
13	06:04		06:32	19:25 (5)	07:01		07:41 (10)	07:31			07:06	07:37
	20:54		20:24	14 19:39 (5)	19:37	52	09:03 (9)	18:48			17:09	16:58
14	06:05		06:33	19:23 (5)	07:02		07:42 (10)	07:32			07:07	07:37
	20:53		20:23	18 19:41 (5)	19:35	52	09:04 (9)	18:47			17:08	16:58
15	06:06		06:33	19:22 (5)	07:03		07:45 (10)	07:33			07:08	07:38
	20:53		20:22	19 19:41 (5)	19:34	48	09:05 (9)	18:45			17:07	16:58
16	06:06		06:34	19:21 (5)	07:04		08:23 (9)	07:34			07:09	07:39
	20:52		20:20	21 19:42 (5)	19:32	43	09:06 (9)	18:44			17:06	16:58
17	06:07		06:35	19:20 (5)	07:05		08:23 (9)	07:35			07:10	07:40
	20:51		20:19	23 19:43 (5)	19:30	43	09:06 (9)	18:42			17:06	16:59
18	06:08		06:36	19:19 (5)	07:06		08:22 (9)	07:36			07:12	07:40
	20:51		20:18	23 19:42 (5)	19:29	44	09:06 (9)	18:41			17:05	16:59
19	06:09		06:37	19:18 (5)	07:07		08:21 (9)	07:37			07:13	07:41
	20:50		20:16	24 19:42 (5)	19:27	45	09:06 (9)	18:39			17:04	16:59
20	06:09		06:38	19:18 (5)	07:08		08:21 (9)	07:38			07:14	07:41
	20:49		20:15	24 19:42 (5)	19:25	45	09:06 (9)	18:38			17:03	17:00
21	06:10		06:39	19:18 (5)	07:09		08:20 (9)	07:39			07:15	07:42
	20:49		20:13	24 19:42 (5)	19:24	46	09:06 (9)	18:36			17:03	17:00
22	06:11		06:40	19:18 (5)	07:10		08:20 (9)	07:41			07:16	07:43
	20:48		20:12	24 19:42 (5)	19:22	46	09:06 (9)	18:35			17:02	17:01
23	06:12		06:41	19:18 (5)	07:11		08:20 (9)	07:42			07:17	07:43
	20:47		20:10	23 19:41 (5)	19:20	46	09:06 (9)	18:33			17:02	17:01
24	06:13		06:42	19:18 (5)	07:12		08:20 (9)	07:43			07:18	07:44
	20:46		20:09	22 19:40 (5)	19:19	46	09:06 (9)	18:32			17:01	17:02
25	06:14		06:43	19:19 (5)	07:13		08:20 (9)	06:44			07:19	07:44
	20:45		20:07	20 19:39 (5)	19:17	45	09:05 (9)	17:31			17:01	17:02
26	06:15		06:44	19:20 (5)	07:14		08:20 (9)	06:45			07:21	07:44
	20:45		20:06	18 19:38 (5)	19:15	44	09:04 (9)	17:29			17:00	17:03
27	06:16		06:45	19:21 (5)	07:15		08:20 (9)	06:46			07:22	07:45
	20:44		20:04	15 19:36 (5)	19:14	44	09:04 (9)	17:28			17:00	17:03
28	06:16		06:46	19:23 (5)	07:16		08:20 (9)	06:47			07:23	07:45
	20:43		20:03	11 19:34 (5)	19:12	43	09:03 (9)	17:27			16:59	17:04
29	06:17		06:47		07:17		08:21 (9)	06:48			07:24	07:45
	20:42		20:01		19:11	41	09:02 (9)	17:25			16:59	17:05
30	06:18		06:48		07:18		08:20 (9)	06:50			07:25	07:46
	20:41		20:00		19:09	39	08:59 (9)	17:24			16:58	17:06
31	06:19		06:49					06:51				07:46
	20:40		19:58					17:23				17:06
Potential sun hours	457		426		375			346		300		290
Total, worst case				333		1172			166			
Sun reduction				0.72		0.64			0.56			
Oper. time red.				0.37		0.37			0.37			
Wind dir. red.				0.73		0.72			0.72			
Total reduction				0.20		0.17			0.15			
Total, real				65		204			25			

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AS - R062

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	19:02 (6)	05:56	05:57	06:20	19:05 (6)	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18 17	19:19 (6)	20:46	20:57	20:39 31	19:36 (6)	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	19:01 (6)	05:56	05:57	06:21	19:05 (6)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 20	19:21 (6)	20:47	20:57	20:38 31	19:36 (6)	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22	18:59 (6)	05:55	05:58	06:22	19:05 (6)	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20 23	19:22 (6)	20:48	20:57	20:37 31	19:36 (6)	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	18:58 (6)	05:55	05:58	06:23	19:06 (6)	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21 25	19:23 (6)	20:48	20:57	20:36 30	19:36 (6)	19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02	06:19	18:57 (6)	05:55	05:59	06:24	19:05 (6)	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22 26	19:23 (6)	20:49	20:56	20:34 29	19:34 (6)	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	18:56 (6)	05:54	05:59	06:25	19:05 (6)	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 28	19:24 (6)	20:50	20:56	20:33 29	19:34 (6)	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	18:56 (6)	05:54	06:00	06:26	19:06 (6)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 28	19:24 (6)	20:50	20:56	20:32 27	19:33 (6)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	18:55 (6)	05:54	06:01	06:27	19:07 (6)	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25 30	19:25 (6)	20:51	20:56	20:31 25	19:32 (6)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	18:55 (6)	05:54	06:01	06:28	19:07 (6)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26 30	19:25 (6)	20:52	20:55	20:30 25	19:32 (6)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13	18:55 (6)	05:53	06:02	06:29	19:08 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 30	19:25 (6)	20:52	20:55	20:28 22	19:30 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	18:55 (6)	05:53	06:03	06:30	19:10 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28 30	19:25 (6)	20:53	20:55	20:27 19	19:29 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	18:55 (6)	05:53	06:03	06:31	19:11 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 30	19:25 (6)	20:53	20:54	20:26 16	19:27 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	18:55 (6)	05:53	06:04 19:18 (6)	06:32	19:14 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30 30	19:25 (6)	20:54	20:54 3 19:21 (6)	20:25 10	19:24 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	18:55 (6)	05:53	06:05 19:16 (6)	06:32		07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 30	19:25 (6)	20:54	20:53 9 19:25 (6)	20:23		19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	18:55 (6)	05:53	06:06 19:14 (6)	06:33		07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 30	19:25 (6)	20:54	20:53 13 19:27 (6)	20:22		19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	18:55 (6)	05:53	06:06 19:12 (6)	06:34		07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33 30	19:25 (6)	20:55	20:52 15 19:27 (6)	20:20		19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	18:56 (6)	05:53	06:07 19:12 (6)	06:35		07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34 29	19:25 (6)	20:55	20:51 17 19:29 (6)	20:19		19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	18:56 (6)	05:53	06:08 19:11 (6)	06:36		07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34 29	19:25 (6)	20:56	20:51 19 19:30 (6)	20:18		19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	18:57 (6)	05:53	06:09 19:10 (6)	06:37		07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35 27	19:24 (6)	20:56	20:50 21 19:31 (6)	20:16		19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	18:57 (6)	05:53	06:09 19:10 (6)	06:38		07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36 27	19:24 (6)	20:56	20:49 22 19:32 (6)	20:15		19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	18:57 (6)	05:53	06:10 19:08 (6)	06:39		07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37 26	19:23 (6)	20:56	20:49 24 19:32 (6)	20:13		19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	18:59 (6)	05:54	06:11 19:08 (6)	06:40		07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38 24	19:23 (6)	20:57	20:48 25 19:33 (6)	20:12		19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	18:59 (6)	05:54	06:12 19:08 (6)	06:41		07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39 23	19:22 (6)	20:57	20:47 26 19:34 (6)	20:11		19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	19:00 (6)	05:54	06:13 19:07 (6)	06:42		07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40 21	19:21 (6)	20:57	20:46 27 19:34 (6)	20:09		19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	19:01 (6)	05:54	06:14 19:07 (6)	06:43		07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	20:41 20	19:21 (6)	20:57	20:45 28 19:35 (6)	20:08		19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	05:59	19:02 (6)	05:55	06:15 19:07 (6)	06:44		07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42 18	19:20 (6)	20:57	20:45 29 19:36 (6)	20:06		19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	19:03 (6)	05:55	06:15 19:06 (6)	06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42 17	19:20 (6)	20:57	20:44 29 19:35 (6)	20:04		19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	19:04 (6)	05:56	06:16 19:05 (6)	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43 14	19:18 (6)	20:57	20:43 30 19:35 (6)	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	19:06 (6)	05:56	06:17 19:05 (6)	06:47		07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44 11	19:17 (6)	20:57	20:42 31 19:36 (6)	20:01		19:10	17:25	16:59	17:05
30	07:35		07:12	06:25 19:04 (6)	05:57	19:08 (6)	05:56	06:18 19:05 (6)	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17 12 19:16 (6)	20:45 7	19:15 (6)	20:57	20:41 31 19:36 (6)	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10		05:57			06:19 19:05 (6)	06:49			06:51		07:46
	17:40		19:46		20:46			20:40 31 19:36 (6)	19:58			17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				12	730		430	325				
Sun reduction				0.51	0.58		0.75	0.72				
Oper. time red.				0.37	0.37		0.37	0.37				
Wind dir. red.				0.72	0.72		0.72	0.72				
Total reduction				0.14	0.16		0.20	0.19				
Total, real				2	114		87	63				

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 55

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AT - R056

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April		May	June
1	07:46		08:59 (9)	07:33		09:04 (9)	06:58			07:09		06:24	05:56
	17:07	31	09:30 (9)	17:41	40	09:44 (9)	18:14			19:47		20:18	20:46
2	07:46		08:59 (9)	07:32		09:04 (9)	06:57		07:42 (10)	07:07		06:23	05:56
	17:08	32	09:31 (9)	17:42	39	09:43 (9)	18:15	5	07:47 (10)	19:48		20:19	20:47
3	07:46		08:59 (9)	07:32		09:05 (9)	06:55		07:38 (10)	07:06		06:22	05:55
	17:09	33	09:32 (9)	17:43	38	09:43 (9)	18:16	12	07:50 (10)	19:49		20:20	20:48
4	07:46		08:59 (9)	07:31		09:06 (9)	06:54		07:36 (10)	07:04		06:20	05:55
	17:10	34	09:33 (9)	17:45	36	09:42 (9)	18:17	16	07:52 (10)	19:50		20:21	20:48
5	07:46		08:59 (9)	07:29		09:07 (9)	06:52		07:34 (10)	07:02		06:19	05:55
	17:11	35	09:34 (9)	17:46	34	09:41 (9)	18:18	19	07:53 (10)	19:51		20:22	20:49
6	07:46		08:59 (9)	07:28		09:09 (9)	06:51		07:34 (10)	07:01		06:18	05:54
	17:12	36	09:35 (9)	17:47	31	09:40 (9)	18:20	20	07:54 (10)	19:52		20:23	20:50
7	07:46		08:59 (9)	07:27		09:10 (9)	06:49		07:32 (10)	06:59		06:17	05:54
	17:13	36	09:35 (9)	17:48	29	09:39 (9)	18:21	22	07:54 (10)	19:53		20:24	20:50
8	07:46		08:59 (9)	07:26		09:12 (9)	06:48		07:31 (10)	06:58		06:16	05:54
	17:14	37	09:36 (9)	17:49	25	09:37 (9)	18:22	23	07:54 (10)	19:54		20:25	20:51
9	07:46		08:59 (9)	07:25		09:14 (9)	06:46		07:32 (10)	06:56		06:15	05:54
	17:15	38	09:37 (9)	17:51	21	09:35 (9)	18:23	22	07:54 (10)	19:55		20:26	20:52
10	07:46		08:59 (9)	07:24		09:17 (9)	06:45		07:31 (10)	06:54		06:13	05:53
	17:16	38	09:37 (9)	17:52	14	09:31 (9)	18:24	23	07:54 (10)	19:56		20:27	20:52
11	07:46		08:59 (9)	07:23			06:43		07:32 (10)	06:53		06:12	05:53
	17:17	40	09:39 (9)	17:53			18:25	22	07:54 (10)	19:57		20:28	20:53
12	07:46		08:59 (9)	07:22			06:41		07:32 (10)	06:51		06:11	05:53
	17:18	41	09:40 (9)	17:54			18:26	20	07:52 (10)	19:58		20:29	20:53
13	07:45		08:59 (9)	07:20			06:40		07:32 (10)	06:50		06:10	05:53
	17:19	41	09:40 (9)	17:55			18:27	19	07:51 (10)	19:59		20:30	20:54
14	07:45		08:59 (9)	07:19			06:38		07:33 (10)	06:48		06:09	05:53
	17:20	42	09:41 (9)	17:57			18:28	17	07:50 (10)	20:00		20:31	20:54
15	07:45		09:00 (9)	07:18			06:37		07:34 (10)	06:47		06:08	05:53
	17:21	42	09:42 (9)	17:58			18:29	13	07:47 (10)	20:01		20:32	20:54
16	07:44		08:59 (9)	07:17			06:35		07:37 (10)	06:45		06:07	05:53
	17:22	43	09:42 (9)	17:59			18:30	7	07:44 (10)	20:02		20:33	20:55
17	07:44		09:00 (9)	07:15			06:33			06:44		06:06	05:53
	17:23	43	09:43 (9)	18:00			18:31			20:03		20:34	20:55
18	07:43		08:59 (9)	07:14			06:32		17:54 (5)	06:42		06:06	05:53
	17:24	44	09:43 (9)	18:01			18:32	11	18:05 (5)	20:04		20:34	20:56
19	07:43		08:59 (9)	07:13			06:30		17:51 (5)	06:41		06:05	05:53
	17:25	44	09:43 (9)	18:03			18:33	15	18:06 (5)	20:05		20:35	20:56
20	07:42		09:00 (9)	07:11			06:28		17:50 (5)	06:39		06:04	05:53
	17:27	44	09:44 (9)	18:04			18:34	18	18:08 (5)	20:06		20:36	20:56
21	07:42		09:00 (9)	07:10			06:27		17:49 (5)	06:38		06:03	05:54
	17:28	44	09:44 (9)	18:05			18:36	19	18:08 (5)	20:07		20:37	20:56
22	07:41		09:00 (9)	07:09			06:25		17:48 (5)	06:36		06:02	05:54
	17:29	45	09:45 (9)	18:06			18:37	21	18:09 (5)	20:08		20:38	20:57
23	07:41		09:00 (9)	07:07			06:24		17:47 (5)	06:35		06:02	05:54
	17:30	45	09:45 (9)	18:07			18:38	22	18:09 (5)	20:09		20:39	20:57
24	07:40		09:00 (9)	07:06			06:22		17:46 (5)	06:34		06:01	05:54
	17:31	45	09:45 (9)	18:08			18:39	23	18:09 (5)	20:10		20:40	20:57
25	07:39		09:00 (9)	07:04			06:20		17:47 (5)	06:32		06:00	05:55
	17:32	45	09:45 (9)	18:09			18:40	22	18:09 (5)	20:11		20:41	20:57
26	07:38		09:01 (9)	07:03			06:19		17:46 (5)	06:31		05:59	05:55
	17:34	45	09:46 (9)	18:11			18:41	22	18:08 (5)	20:13		20:42	20:57
27	07:38		09:02 (9)	07:01			06:17		17:46 (5)	06:29		05:59	05:55
	17:35	44	09:46 (9)	18:12			18:42	21	18:07 (5)	20:14		20:42	20:57
28	07:37		09:02 (9)	07:00			06:15		17:48 (5)	06:28		05:58	05:56
	17:36	43	09:45 (9)	18:13			18:43	18	18:06 (5)	20:15		20:43	20:57
29	07:36		09:02 (9)				07:14		18:48 (5)	06:27		05:58	05:56
	17:37	43	09:45 (9)				19:44	16	19:04 (5)	20:16		20:44	20:57
30	07:35		09:03 (9)				07:12		18:49 (5)	06:25		05:57	05:56
	17:38	42	09:45 (9)				19:45	13	19:02 (5)	20:17		20:45	20:57
31	07:34		09:03 (9)				07:10		18:53 (5)			05:57	
	17:40	41	09:44 (9)				19:46	6	18:59 (5)			20:46	
Potential sun hours	300			298			370			398		446	450
Total, worst case		1256			307			507					
Sun reduction		0.40			0.43			0.47					
Oper. time red.		0.37			0.37			0.37					
Wind dir. red.		0.61			0.61			0.74					
Total reduction		0.09			0.10			0.13					
Total, real		113			30			65					

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 56

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AT - R056

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October			November			December		
1	05:57		06:20		06:50		07:19		08:10 (10)	06:52		08:46 (9)	07:26		08:41 (9)
	20:57		20:39		19:57		19:07	21	08:31 (10)	17:22	15	09:01 (9)	16:58	40	09:21 (9)
2	05:57		06:21		06:51		07:20		08:10 (10)	06:53		08:43 (9)	07:27		08:42 (9)
	20:57		20:38		19:55		19:06	21	08:31 (10)	17:20	21	09:04 (9)	16:58	39	09:21 (9)
3	05:58		06:22		06:52		07:21		08:09 (10)	06:54		08:42 (9)	07:28		08:42 (9)
	20:57		20:37		19:53		19:04	22	08:31 (10)	17:19	25	09:07 (9)	16:58	39	09:21 (9)
4	05:58		06:23		06:53		07:22		08:09 (10)	06:55		08:40 (9)	07:29		08:43 (9)
	20:57		20:35		19:52		19:02	23	08:32 (10)	17:18	29	09:09 (9)	16:58	38	09:21 (9)
5	05:59		06:24		06:54		07:23		08:09 (10)	06:56		08:38 (9)	07:30		08:44 (9)
	20:56		20:34		19:50		19:01	23	08:32 (10)	17:17	32	09:10 (9)	16:57	37	09:21 (9)
6	05:59		06:25		06:55		07:24		08:09 (10)	06:58		08:37 (9)	07:31		08:45 (9)
	20:56		20:33		19:49		18:59	22	08:31 (10)	17:16	34	09:11 (9)	16:57	36	09:21 (9)
7	06:00		06:26		06:56		07:25		08:09 (10)	06:59		08:36 (9)	07:32		08:46 (9)
	20:56		20:32		19:47		18:57	21	08:30 (10)	17:15	36	09:12 (9)	16:57	35	09:21 (9)
8	06:01		06:27		06:57		07:26		08:09 (10)	07:00		08:36 (9)	07:33		08:47 (9)
	20:56		20:31		19:45		18:56	20	08:29 (10)	17:14	38	09:14 (9)	16:57	34	09:21 (9)
9	06:01		06:28		06:57		07:27		08:10 (10)	07:01		08:35 (9)	07:33		08:48 (9)
	20:55		20:30		19:44		18:54	18	08:28 (10)	17:13	39	09:14 (9)	16:57	33	09:21 (9)
10	06:02		06:29		06:58		07:28		08:11 (10)	07:02		08:35 (9)	07:34		08:49 (9)
	20:55		20:28		19:42		18:53	15	08:26 (10)	17:12	40	09:15 (9)	16:57	32	09:21 (9)
11	06:03		06:30		06:59		07:29		08:13 (10)	07:03		08:34 (9)	07:35		08:49 (9)
	20:54		20:27		19:40		18:51	10	08:23 (10)	17:11	41	09:15 (9)	16:57	31	09:20 (9)
12	06:03		06:31		07:00	18:45 (5)	07:30			07:05		08:35 (9)	07:36		08:50 (9)
	20:54		20:26		19:39	4 18:49 (5)	18:50			17:10	42	09:17 (9)	16:57	31	09:21 (9)
13	06:04		06:32		07:01	18:41 (5)	07:31			07:06		08:34 (9)	07:37		08:51 (9)
	20:54		20:24		19:37	12 18:53 (5)	18:48			17:09	43	09:17 (9)	16:58	30	09:21 (9)
14	06:05		06:32		07:02	18:39 (5)	07:32			07:07		08:34 (9)	07:38		08:52 (9)
	20:53		20:23		19:35	15 18:54 (5)	18:47			17:08	43	09:17 (9)	16:58	29	09:21 (9)
15	06:06		06:33		07:03	18:37 (5)	07:33			07:08		08:34 (9)	07:38		08:52 (9)
	20:53		20:22		19:34	18 18:55 (5)	18:45			17:07	44	09:18 (9)	16:58	29	09:21 (9)
16	06:06		06:34		07:04	18:36 (5)	07:34			07:09		08:34 (9)	07:39		08:53 (9)
	20:52		20:20		19:32	20 18:56 (5)	18:44			17:06	45	09:19 (9)	16:58	28	09:21 (9)
17	06:07		06:35		07:05	18:35 (5)	07:35			07:10		08:34 (9)	07:40		08:54 (9)
	20:51		20:19		19:30	21 18:56 (5)	18:42			17:06	45	09:19 (9)	16:59	28	09:22 (9)
18	06:08		06:36		07:06	18:34 (5)	07:36			07:12		08:34 (9)	07:40		08:54 (9)
	20:51		20:18		19:29	22 18:56 (5)	18:41			17:05	45	09:19 (9)	16:59	28	09:22 (9)
19	06:09		06:37		07:07	18:34 (5)	07:37			07:13		08:34 (9)	07:41		08:55 (9)
	20:50		20:16		19:27	22 18:56 (5)	18:39			17:04	45	09:19 (9)	16:59	27	09:22 (9)
20	06:09		06:38		07:08	18:33 (5)	07:38			07:14		08:35 (9)	07:41		08:55 (9)
	20:49		20:15		19:25	22 18:55 (5)	18:38			17:03	45	09:20 (9)	17:00	27	09:22 (9)
21	06:10		06:39		07:09	18:33 (5)	07:39			07:15		08:36 (9)	07:42		08:56 (9)
	20:49		20:13		19:24	22 18:55 (5)	18:36			17:03	44	09:20 (9)	17:00	27	09:23 (9)
22	06:11		06:40		07:10	18:34 (5)	07:41			07:16		08:36 (9)	07:43		08:56 (9)
	20:48		20:12		19:22	20 18:54 (5)	18:35			17:02	44	09:20 (9)	17:01	27	09:23 (9)
23	06:12		06:41		07:11	18:34 (5)	07:42			07:17		08:36 (9)	07:43		08:57 (9)
	20:47		20:10		19:20	19 18:53 (5)	18:33			17:02	44	09:20 (9)	17:01	27	09:24 (9)
24	06:13		06:42		07:12	18:35 (5)	07:43			07:18		08:36 (9)	07:44		08:57 (9)
	20:46		20:09		19:19	16 18:51 (5)	18:32			17:01	44	09:20 (9)	17:02	27	09:24 (9)
25	06:14		06:43		07:13	18:37 (5)	06:44			07:19		08:37 (9)	07:44		08:58 (9)
	20:45		20:07		19:17	12 18:49 (5)	17:31			17:01	43	09:20 (9)	17:02	28	09:26 (9)
26	06:15		06:44		07:14	18:40 (5)	06:45			07:21		08:38 (9)	07:44		08:58 (9)
	20:45		20:06		19:15	5 18:45 (5)	17:29			17:00	43	09:21 (9)	17:03	28	09:26 (9)
27	06:16		06:45		07:15		06:46			07:22		08:39 (9)	07:45		08:58 (9)
	20:44		20:04		19:14		17:28			17:00	42	09:21 (9)	17:03	28	09:26 (9)
28	06:16		06:46		07:16	08:17 (10)	06:47			07:23		08:39 (9)	07:45		08:59 (9)
	20:43		20:03		19:12	11 08:28 (10)	17:27			16:59	42	09:21 (9)	17:04	29	09:28 (9)
29	06:17		06:47		07:17	08:14 (10)	06:48			07:24		08:40 (9)	07:45		08:59 (9)
	20:42		20:01		19:11	16 08:30 (10)	17:25			16:59	41	09:21 (9)	17:05	29	09:28 (9)
30	06:18		06:48		07:18	08:12 (10)	06:50			07:25		08:40 (9)	07:46		08:59 (9)
	20:41		20:00		19:09	18 08:30 (10)	17:24			16:58	41	09:21 (9)	17:06	30	09:29 (9)
31	06:19		06:49				06:51		08:51 (9)				07:46		08:59 (9)
	20:40		19:58				17:23	5	08:56 (9)				17:06	30	09:29 (9)
Potential sun hours	457		426		375		346			300			290		
Total, worst case						295		221			1175			961	
Sun reduction						0.64		0.56			0.48			0.41	
Oper. time red.						0.37		0.37			0.37			0.37	
Wind dir. red.						0.75		0.71			0.61			0.61	
Total reduction						0.18		0.15			0.11			0.09	
Total, real						53		33			127			90	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 57

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AU - R052

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February			March			April		May			June		
1	07:46		07:33			06:58		16:35 (7)	07:09		06:24			05:56		06:30 (10)
	17:07		17:41			18:14	50	17:25 (7)	19:47		20:18			20:46	26	20:21 (5)
2	07:46		07:32			06:57		16:36 (7)	07:07		06:23			05:56		06:31 (10)
	17:08		17:42			18:15	49	17:25 (7)	19:48		20:19			20:47	26	20:22 (5)
3	07:46		07:31			06:55		16:36 (7)	07:06		06:22			05:55		06:32 (10)
	17:09		17:43			18:16	48	17:24 (7)	19:49		20:20			20:48	27	20:23 (5)
4	07:46		07:30			06:54		16:37 (7)	07:04		06:20			05:55		06:31 (10)
	17:10		17:45			18:17	47	17:24 (7)	19:50		20:21			20:48	28	20:23 (5)
5	07:46		07:29			06:52		16:37 (7)	07:02		06:19			05:55		06:32 (10)
	17:11		17:46			18:18	45	17:22 (7)	19:51		20:22			20:49	28	20:24 (5)
6	07:46		07:28			06:51		16:38 (7)	07:01		06:18			05:54		06:32 (10)
	17:12		17:47			18:20	43	17:21 (7)	19:52		20:23			20:50	28	20:25 (5)
7	07:46		07:27			06:49		16:39 (7)	06:59		06:17			05:54		06:33 (10)
	17:13		17:48			18:21	41	17:20 (7)	19:53		20:24			20:50	29	20:26 (5)
8	07:46		07:26		16:55 (7)	06:48		16:40 (7)	06:58		06:16			05:54		06:33 (10)
	17:14		17:49	13	17:08 (7)	18:22	38	17:18 (7)	19:54		20:25			20:51	29	20:26 (5)
9	07:46		07:25		16:51 (7)	06:46		16:42 (7)	06:56		06:15			05:54		06:33 (10)
	17:15		17:51	21	17:12 (7)	18:23	35	17:17 (7)	19:55		20:26			20:51	29	20:26 (5)
10	07:46		07:24		16:48 (7)	06:45		16:43 (7)	06:54		06:14			05:53		06:34 (10)
	17:16		17:52	26	17:14 (7)	18:24	32	17:15 (7)	19:56		20:27			20:52	29	20:27 (5)
11	07:46		07:23		16:46 (7)	06:43		16:45 (7)	06:53		06:12			05:53		06:34 (10)
	17:17		17:53	30	17:16 (7)	18:25	28	17:13 (7)	19:57		20:28			20:53	30	20:28 (5)
12	07:45		07:22		16:45 (7)	06:41		16:47 (7)	06:51		06:11			05:53		06:35 (10)
	17:18		17:54	33	17:18 (7)	18:26	23	17:10 (7)	19:58		20:29			20:53	28	20:28 (5)
13	07:45		07:20		16:43 (7)	06:40		16:50 (7)	06:50		06:10			05:53		06:35 (10)
	17:19		17:55	37	17:20 (7)	18:27	16	17:06 (7)	19:59		20:30			20:54	29	20:29 (5)
14	07:45		07:19		16:41 (7)	06:38			06:48		06:09			05:53		06:36 (10)
	17:20		17:57	39	17:20 (7)	18:28			20:00		20:31			20:54	28	20:29 (5)
15	07:45		07:18		16:41 (7)	06:37			06:47		06:08		06:37 (10)	05:53		06:36 (10)
	17:21		17:58	41	17:22 (7)	18:29			20:01		20:32	7	06:44 (10)	20:54	28	20:29 (5)
16	07:44		07:17		16:40 (7)	06:35			06:45		06:07		06:35 (10)	05:53		06:36 (10)
	17:22		17:59	43	17:23 (7)	18:30			20:02		20:33	12	06:47 (10)	20:55	29	20:30 (5)
17	07:44		07:15		16:38 (7)	06:33			06:44		06:07		06:34 (10)	05:53		06:36 (10)
	17:23		18:00	45	17:23 (7)	18:31			20:03		20:33	15	06:49 (10)	20:55	29	20:30 (5)
18	07:43		07:14		16:38 (7)	06:32			06:42		06:06		06:33 (10)	05:53		06:37 (10)
	17:24		18:01	46	17:24 (7)	18:32			20:04		20:34	17	06:50 (10)	20:55	28	20:30 (5)
19	07:43		07:13		16:38 (7)	06:30			06:41		06:05		06:32 (10)	05:53		06:37 (10)
	17:25		18:03	47	17:25 (7)	18:33			20:05		20:35	18	06:50 (10)	20:56	28	20:30 (5)
20	07:42		07:11		16:37 (7)	06:28			06:39		06:04		06:31 (10)	05:53		06:37 (10)
	17:27		18:04	48	17:25 (7)	18:34			20:06		20:36	20	06:51 (10)	20:56	29	20:31 (5)
21	07:42		07:10		16:36 (7)	06:27			06:38		06:03		06:30 (10)	05:54		06:38 (10)
	17:28		18:05	50	17:26 (7)	18:36			20:07		20:37	21	06:51 (10)	20:56	29	20:32 (5)
22	07:41		07:09		16:36 (7)	06:25			06:36		06:02		06:31 (10)	05:54		06:38 (10)
	17:29		18:06	51	17:27 (7)	18:37			20:08		20:38	22	06:53 (10)	20:57	29	20:32 (5)
23	07:40		07:07		16:36 (7)	06:24			06:35		06:02		06:30 (10)	05:54		06:38 (10)
	17:30		18:07	50	17:26 (7)	18:38			20:09		20:39	23	06:53 (10)	20:57	28	20:31 (5)
24	07:40		07:06		16:36 (7)	06:22			06:34		06:01		06:30 (10)	05:54		06:38 (10)
	17:31		18:08	51	17:27 (7)	18:39			20:10		20:40	23	06:53 (10)	20:57	28	20:31 (5)
25	07:39		07:04		16:35 (7)	06:20			06:32		06:00		06:30 (10)	05:55		06:39 (10)
	17:32		18:09	51	17:26 (7)	18:40			20:11		20:41	23	06:53 (10)	20:57	28	20:32 (5)
26	07:38		07:03		16:36 (7)	06:19			06:31		06:00		06:30 (10)	05:55		06:38 (10)
	17:34		18:11	50	17:26 (7)	18:41			20:13		20:42	23	06:53 (10)	20:57	29	20:32 (5)
27	07:38		07:01		16:35 (7)	06:17			06:29		05:59		06:30 (10)	05:55		06:38 (10)
	17:35		18:12	51	17:26 (7)	18:42			20:14		20:42	24	06:54 (10)	20:57	29	20:32 (5)
28	07:37		07:00		16:36 (7)	06:15			06:28		05:58		06:30 (10)	05:56		06:39 (10)
	17:36		18:13	50	17:26 (7)	18:43			20:15		20:43	24	06:54 (10)	20:57	28	20:32 (5)
29	07:36					07:14			06:27		05:58		06:30 (10)	05:56		06:38 (10)
	17:37					19:44			20:16		20:44	24	06:54 (10)	20:57	29	20:32 (5)
30	07:35					07:12			06:25		05:57		06:30 (10)	05:56		06:39 (10)
	17:38					19:45			20:17		20:45	24	06:54 (10)	20:57	28	20:32 (5)
31	07:34					07:10					05:57		06:31 (10)			
	17:40					19:46					20:45	23	06:54 (10)			
Potential sun hours	300		298			370			398		446			450		
Total, worst case				873			495					343			850	
Sun reduction				0.43			0.47					0.58			0.67	
Oper. time red.				0.37			0.37					0.37			0.37	
Wind dir. red.				0.75			0.75					0.75			0.72	
Total reduction				0.12			0.13					0.16			0.18	
Total, real				106			66					56			155	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 58

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AU - R052

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August	September			October			November			December
1	05:57		06:38 (10)	06:20	06:50			07:19		17:27 (7)	06:52		16:18 (7)	07:26
	20:57	30	20:32 (5)	20:39	19:57			19:07	20	17:47 (7)	17:22	25	16:43 (7)	16:58
2	05:57		06:39 (10)	06:21	06:51			07:20		17:24 (7)	06:53		16:21 (7)	07:27
	20:57	29	20:32 (5)	20:38	19:55			19:06	26	17:50 (7)	17:20	19	16:40 (7)	16:58
3	05:58		06:38 (10)	06:22	06:52			07:21		17:21 (7)	06:54		16:25 (7)	07:28
	20:57	30	20:32 (5)	20:37	19:53			19:04	31	17:52 (7)	17:19	11	16:36 (7)	16:58
4	05:58		06:39 (10)	06:23	06:53			07:22		17:20 (7)	06:55			07:29
	20:57	29	20:32 (5)	20:35	19:52			19:02	34	17:54 (7)	17:18			16:58
5	05:59		06:38 (10)	06:24	06:54			07:23		17:18 (7)	06:56			07:30
	20:56	29	20:31 (5)	20:34	19:50			19:01	37	17:55 (7)	17:17			16:57
6	05:59		06:39 (10)	06:25	06:55			07:24		17:16 (7)	06:58			07:31
	20:56	28	20:31 (5)	20:33	19:49			18:59	40	17:56 (7)	17:16			16:57
7	06:00		06:38 (10)	06:26	06:56			07:25		17:15 (7)	06:59			07:32
	20:56	28	20:31 (5)	20:32	19:47			18:57	42	17:57 (7)	17:15			16:57
8	06:01		06:39 (10)	06:27	06:57			07:26		17:14 (7)	07:00			07:33
	20:56	28	20:31 (5)	20:31	19:45			18:56	43	17:57 (7)	17:14			16:57
9	06:01		06:39 (10)	06:28	06:57			07:27		17:12 (7)	07:01			07:33
	20:55	28	20:31 (5)	20:30	19:44			18:54	46	17:58 (7)	17:13			16:57
10	06:02		06:38 (10)	06:29	06:58			07:28		17:11 (7)	07:02			07:34
	20:55	27	20:30 (5)	20:28	19:42			18:53	47	17:58 (7)	17:12			16:57
11	06:03		06:39 (10)	06:30	06:59			07:29		17:10 (7)	07:03			07:35
	20:54	25	20:30 (5)	20:27	19:40			18:51	48	17:58 (7)	17:11			16:57
12	06:03		06:39 (10)	06:31	07:00			07:30		17:09 (7)	07:05			07:36
	20:54	26	20:30 (5)	20:26	19:39			18:50	49	17:58 (7)	17:10			16:57
13	06:04		06:38 (10)	06:32	07:01			07:31		17:09 (7)	07:06			07:37
	20:54	24	07:02 (10)	20:24	19:37			18:48	49	17:58 (7)	17:09			16:58
14	06:05		06:39 (10)	06:33	07:02			07:32		17:08 (7)	07:07			07:37
	20:53	24	07:03 (10)	20:23	19:35			18:47	50	17:58 (7)	17:08			16:58
15	06:06		06:39 (10)	06:33	07:03			07:33		17:07 (7)	07:08			07:38
	20:52	24	07:03 (10)	20:22	19:34			18:45	51	17:58 (7)	17:07			16:58
16	06:06		06:39 (10)	06:34	07:04			07:34		17:07 (7)	07:09			07:39
	20:52	23	07:02 (10)	20:20	19:32			18:44	51	17:58 (7)	17:06			16:58
17	06:07		06:39 (10)	06:35	07:05			07:35		17:07 (7)	07:10			07:40
	20:51	24	07:03 (10)	20:19	19:30			18:42	51	17:58 (7)	17:06			16:59
18	06:08		06:39 (10)	06:36	07:06			07:36		17:07 (7)	07:11			07:40
	20:51	24	07:03 (10)	20:18	19:29			18:41	51	17:58 (7)	17:05			16:59
19	06:09		06:40 (10)	06:37	07:07			07:37		17:07 (7)	07:13			07:41
	20:50	23	07:03 (10)	20:16	19:27			18:39	51	17:58 (7)	17:04			16:59
20	06:10		06:40 (10)	06:38	07:08			07:38		17:07 (7)	07:14			07:41
	20:49	23	07:03 (10)	20:15	19:25			18:38	50	17:57 (7)	17:03			17:00
21	06:10		06:40 (10)	06:39	07:09			07:39		17:07 (7)	07:15			07:42
	20:49	22	07:02 (10)	20:13	19:24			18:36	49	17:56 (7)	17:03			17:00
22	06:11		06:41 (10)	06:40	07:10			07:41		17:07 (7)	07:16			07:43
	20:48	21	07:02 (10)	20:12	19:22			18:35	49	17:56 (7)	17:02			17:01
23	06:12		06:41 (10)	06:41	07:11			07:42		17:07 (7)	07:17			07:43
	20:47	21	07:02 (10)	20:10	19:20			18:33	48	17:55 (7)	17:02			17:01
24	06:13		06:42 (10)	06:42	07:12			07:43		17:08 (7)	07:18			07:44
	20:46	19	07:01 (10)	20:09	19:19			18:32	46	17:54 (7)	17:01			17:02
25	06:14		06:43 (10)	06:43	07:13			06:44		16:09 (7)	07:19			07:44
	20:45	18	07:01 (10)	20:07	19:17			17:31	45	16:54 (7)	17:01			17:02
26	06:15		06:44 (10)	06:44	07:14			06:45		16:10 (7)	07:20			07:44
	20:45	16	07:00 (10)	20:06	19:15			17:29	43	16:53 (7)	17:00			17:03
27	06:16		06:45 (10)	06:45	07:15			06:46		16:11 (7)	07:22			07:45
	20:44	13	06:58 (10)	20:04	19:14			17:28	40	16:51 (7)	17:00			17:03
28	06:16		06:46 (10)	06:46	07:16			06:47		16:11 (7)	07:23			07:45
	20:43	10	06:56 (10)	20:03	19:12			17:27	39	16:50 (7)	16:59			17:04
29	06:17		06:50 (10)	06:47	07:17			06:48		16:12 (7)	07:24			07:45
	20:42	3	06:53 (10)	20:01	19:11			17:25	36	16:48 (7)	16:59			17:05
30	06:18			06:48	07:18		17:32 (7)	06:50		16:15 (7)	07:25			07:46
	20:41			20:00	19:09	11	17:43 (7)	17:24	32	16:47 (7)	16:59			17:06
31	06:19			06:49				06:51		16:16 (7)				07:46
	20:40			19:58				17:23	29	16:45 (7)				17:06
Potential sun hours	457			426	375			346			300			290
Total, worst case		669				11			1323			55		
Sun reduction		0.75				0.64			0.56			0.48		
Oper. time red.		0.37				0.37			0.37			0.37		
Wind dir. red.		0.74				0.75			0.75			0.75		
Total reduction		0.21				0.18			0.16			0.14		
Total, real		140				2			207			7		

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 59

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AV - R058

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:46	10:01 (8)	07:33	10:07 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	09:43 (8)	07:26	09:45 (8)
	17:07	66 11:07 (8)	17:41	72 11:19 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22	58 10:41 (8)	16:58	71 10:56 (8)
2	07:46	10:01 (8)	07:32	10:08 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	09:42 (8)	07:27	09:46 (8)
	17:08	67 11:08 (8)	17:42	70 11:18 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:20	60 10:42 (8)	16:58	70 10:56 (8)
3	07:46	10:01 (8)	07:32	10:08 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	09:42 (8)	07:28	09:46 (8)
	17:09	68 11:09 (8)	17:43	70 11:18 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19	62 10:44 (8)	16:58	70 10:56 (8)
4	07:46	10:02 (8)	07:31	10:09 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	09:41 (8)	07:29	09:47 (8)
	17:10	67 11:09 (8)	17:45	68 11:17 (8)	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02		17:18	64 10:45 (8)	16:57	69 10:56 (8)
5	07:46	10:02 (8)	07:30	10:10 (8)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23		06:56	09:40 (8)	07:30	09:47 (8)
	17:11	68 11:10 (8)	17:46	67 11:17 (8)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01		17:17	66 10:46 (8)	16:57	70 10:57 (8)
6	07:46	10:02 (8)	07:28	10:10 (8)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24		06:58	09:39 (8)	07:31	09:48 (8)
	17:12	69 11:11 (8)	17:47	66 11:16 (8)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16	68 10:47 (8)	16:57	69 10:57 (8)
7	07:46	10:02 (8)	07:27	10:11 (8)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	09:39 (8)	07:32	09:49 (8)
	17:13	70 11:12 (8)	17:48	64 11:15 (8)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57		17:15	68 10:47 (8)	16:57	68 10:57 (8)
8	07:46	10:03 (8)	07:26	10:12 (8)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	09:39 (8)	07:33	09:50 (8)
	17:14	69 11:12 (8)	17:49	62 11:14 (8)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56		17:14	70 10:49 (8)	16:57	67 10:57 (8)
9	07:46	10:03 (8)	07:25	10:13 (8)	06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27		07:01	09:39 (8)	07:33	09:50 (8)
	17:15	70 11:13 (8)	17:51	60 11:13 (8)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13	70 10:49 (8)	16:57	68 10:58 (8)
10	07:46	10:03 (8)	07:24	10:13 (8)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28		07:02	09:38 (8)	07:34	09:51 (8)
	17:16	70 11:13 (8)	17:52	58 11:11 (8)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12	72 10:50 (8)	16:57	67 10:58 (8)
11	07:46	10:03 (8)	07:23	10:14 (8)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29		07:03	09:38 (8)	07:35	09:51 (8)
	17:17	71 11:14 (8)	17:53	56 11:10 (8)	18:25	19:57	20:28	20:53	20:55	20:27	19:40	18:51		17:11	72 10:50 (8)	16:57	66 10:57 (8)
12	07:46	10:04 (8)	07:22	10:16 (8)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05	09:39 (8)	07:36	09:52 (8)
	17:18	71 11:15 (8)	17:54	52 11:08 (8)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10	72 10:51 (8)	16:57	66 10:58 (8)
13	07:45	10:03 (8)	07:20	10:17 (8)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06	09:39 (8)	07:37	09:53 (8)
	17:19	72 11:15 (8)	17:55	50 11:07 (8)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09	73 10:52 (8)	16:57	65 10:58 (8)
14	07:45	10:04 (8)	07:19	10:18 (8)	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32		07:07	09:38 (8)	07:38	09:53 (8)
	17:20	72 11:16 (8)	17:57	46 11:04 (8)	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:47		17:08	74 10:52 (8)	16:58	66 10:59 (8)
15	07:45	10:04 (8)	07:18	10:20 (8)	06:37	06:47	06:08	05:53	06:06	06:33	07:03	07:33		07:08	09:38 (8)	07:38	09:53 (8)
	17:21	73 11:17 (8)	17:58	42 11:02 (8)	18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45		17:07	74 10:52 (8)	16:58	66 10:59 (8)
16	07:44	10:04 (8)	07:17	10:22 (8)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34		07:09	09:39 (8)	07:39	09:54 (8)
	17:22	73 11:17 (8)	17:59	37 10:59 (8)	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:44		17:06	74 10:53 (8)	16:58	65 10:59 (8)
17	07:44	10:04 (8)	07:15	10:24 (8)	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35		07:10	09:39 (8)	07:40	09:55 (8)
	17:23	74 11:18 (8)	18:00	31 10:55 (8)	18:31	20:03	20:34	20:55	20:51	20:19	19:30	18:42		17:06	74 10:53 (8)	16:58	65 11:00 (8)
18	07:43	10:04 (8)	07:14	10:27 (8)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36		07:12	09:39 (8)	07:40	09:55 (8)
	17:24	74 11:18 (8)	18:01	24 10:51 (8)	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:41		17:05	74 10:53 (8)	16:59	65 11:00 (8)
19	07:43	10:04 (8)	07:13	10:34 (8)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37		07:13	09:39 (8)	07:41	09:56 (8)
	17:25	74 11:18 (8)	18:03	10 10:44 (8)	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39		17:04	74 10:53 (8)	16:59	65 11:01 (8)
20	07:42	10:05 (8)	07:11		06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38		07:14	09:40 (8)	07:42	09:57 (8)
	17:27	74 11:19 (8)	18:04		18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38		17:03	74 10:54 (8)	17:00	64 11:01 (8)
21	07:42	10:04 (8)	07:10		06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:39		07:15	09:40 (8)	07:42	09:57 (8)
	17:28	74 11:18 (8)	18:05		18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36		17:03	74 10:54 (8)	17:00	64 11:01 (8)
22	07:41	10:05 (8)	07:09		06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41		07:16	09:41 (8)	07:43	09:57 (8)
	17:29	74 11:19 (8)	18:06		18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35		17:02	74 10:55 (8)	17:01	64 11:01 (8)
23	07:41	10:05 (8)	07:07		06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	11:01 (8)	07:17	09:41 (8)	07:43	09:58 (8)
	17:30	74 11:19 (8)	18:07		18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	16 11:17 (8)	17:02	74 10:55 (8)	17:01	64 11:02 (8)
24	07:40	10:05 (8)	07:06		06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	10:56 (8)	07:18	09:41 (8)	07:44	09:58 (8)
	17:31	74 11:19 (8)	18:08		18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	26 11:22 (8)	17:01	74 10:55 (8)	17:02	65 11:03 (8)
25	07:39	10:05 (8)	07:04		06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	09:54 (8)	07:19	09:41 (8)	07:44	09:59 (8)
	17:32	74 11:19 (8)	18:09		18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	33 10:27 (8)	17:01	74 10:55 (8)	17:02	65 11:04 (8)
26	07:38	10:06 (8)	07:03		06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	09:51 (8)	07:21	09:43 (8)	07:44	09:59 (8)
	17:34	74 11:20 (8)	18:11		18:41	20:13	20:42	20:57	20:45	20:06	19:15	17:29	39 10:30 (8)	17:00	73 10:56 (8)	17:03	65 11:04 (8)
27	07:38	10:06 (8)	07:01		06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	09:49 (8)	07:22	09:43 (8)	07:45	09:59 (8)
	17:35	74 11:20 (8)	18:12		18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	43 10:32 (8)	17:00	73 10:56 (8)	17:03	65 11:04 (8)
28	07:37	10:06 (8)	07:00		06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	09:47 (8)	07:23	09:44 (8)	07:45	10:00 (8)
	17:36	74 11:20 (8)	18:13		18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	47 10:34 (8)	16:59	72 10:56 (8)	17:04	66 11:06 (8)
29	07:36	10:07 (8)			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	09:46 (8)	07:24	09:44 (8)	07:45	10:00 (8)
	17:37	73 11:20 (8)			19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	50 10:36 (8)	16:59	72 10:56 (8)	17:05	66 11:06 (8)
30	07:35	10:07 (8)			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	09:45 (8)	07:25	09:45 (8)	07:46	10:01 (8)
	17:38	72 11:19 (8)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	54 10:39 (8)	16:58	71 10:56 (8)	17:06	65 11:06 (8)
31	07:34	10:07 (8)			07:10		05:57		06:19	06:49		06:51	09:44 (8)			07:46	10:01 (8)
	17:40	72 11:19 (8)			19:46		20:46		20:40	19:58		17:23	56 10:40 (8)			17:06	66 11:07 (8)
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290	
Total, worst case		2221		1005									364		2124		2057
Sun reduction		0.40		0.43									0.56		0.48		0.41
Oper. time red.		0.37		0.37									0.37		0.37		0.37
Wind dir. red.		0.54		0.54									0.54		0.54		0.54
Total reduction		0.08		0.09									0.11		0.10		0.08
Total, real		178		87									41		205		171

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 60

Licensed user:
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AW - R078

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:46		10:53 (8)	07:33		11:12 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		10:39 (8)
	17:07	77	12:10 (8)	17:41	54	12:06 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	77	11:56 (8)
2	07:46		10:53 (8)	07:32		11:14 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		10:40 (8)
	17:08	77	12:10 (8)	17:42	51	12:05 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20			16:58	76	11:56 (8)
3	07:46		10:53 (8)	07:32		11:16 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54		11:06 (8)	07:28		10:40 (8)
	17:09	78	12:11 (8)	17:43	47	12:03 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19	4	11:10 (8)	16:58	77	11:57 (8)
4	07:46		10:54 (8)	07:31		11:18 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55		10:57 (8)	07:29		10:40 (8)
	17:10	77	12:11 (8)	17:45	42	12:00 (8)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	23	11:20 (8)	16:57	77	11:57 (8)
5	07:46		10:54 (8)	07:30		11:20 (8)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56		10:53 (8)	07:30		10:41 (8)
	17:11	77	12:11 (8)	17:46	37	11:57 (8)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	31	11:24 (8)	16:57	77	11:58 (8)
6	07:46		10:55 (8)	07:28		11:23 (8)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58		10:50 (8)	07:31		10:41 (8)
	17:12	77	12:12 (8)	17:47	31	11:54 (8)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	38	11:28 (8)	16:57	77	11:58 (8)
7	07:46		10:56 (8)	07:27		11:28 (8)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59		10:47 (8)	07:32		10:41 (8)
	17:13	76	12:12 (8)	17:48	21	11:49 (8)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15	43	11:30 (8)	16:57	77	11:58 (8)
8	07:46		10:56 (8)	07:26			06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00		10:46 (8)	07:33		10:42 (8)
	17:14	77	12:13 (8)	17:49			18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	48	11:34 (8)	16:57	77	11:59 (8)
9	07:46		10:57 (8)	07:25			06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27	07:01		10:45 (8)	07:33		10:43 (8)
	17:15	77	12:14 (8)	17:51			18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	51	11:36 (8)	16:57	77	12:00 (8)
10	07:46		10:56 (8)	07:24			06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02		10:43 (8)	07:34		10:43 (8)
	17:16	77	12:13 (8)	17:52			18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	54	11:37 (8)	16:57	77	12:00 (8)
11	07:46		10:57 (8)	07:23			06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03		10:42 (8)	07:35		10:43 (8)
	17:17	77	12:14 (8)	17:53			18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11	57	11:39 (8)	16:57	77	12:00 (8)
12	07:46		10:58 (8)	07:22			06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		10:42 (8)	07:36		10:43 (8)
	17:18	76	12:14 (8)	17:54			18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	59	11:41 (8)	16:57	77	12:00 (8)
13	07:45		10:58 (8)	07:20			06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		10:41 (8)	07:37		10:44 (8)
	17:19	76	12:14 (8)	17:55			18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	61	11:42 (8)	16:57	77	12:01 (8)
14	07:45		10:59 (8)	07:19			06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07		10:40 (8)	07:38		10:45 (8)
	17:20	75	12:14 (8)	17:57			18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:47	17:08	63	11:43 (8)	16:58	77	12:02 (8)
15	07:45		11:00 (8)	07:18			06:37	06:47	06:08	05:53	06:06	06:33	07:03	07:33	07:08		10:39 (8)	07:38		10:45 (8)
	17:21	75	12:15 (8)	17:58			18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07	65	11:44 (8)	16:58	76	12:01 (8)
16	07:44		11:00 (8)	07:17			06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		10:39 (8)	07:39		10:45 (8)
	17:22	75	12:15 (8)	17:59			18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:44	17:06	67	11:46 (8)	16:58	77	12:02 (8)
17	07:44		11:01 (8)	07:15			06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10		10:39 (8)	07:40		10:46 (8)
	17:23	74	12:15 (8)	18:00			18:31	20:03	20:34	20:55	20:51	20:19	19:30	18:42	17:06	68	11:47 (8)	16:58	77	12:03 (8)
18	07:43		11:01 (8)	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		10:38 (8)	07:40		10:46 (8)
	17:24	74	12:15 (8)	18:01			18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:41	17:05	69	11:47 (8)	16:59	77	12:03 (8)
19	07:43		11:01 (8)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		10:38 (8)	07:41		10:47 (8)
	17:25	73	12:14 (8)	18:03			18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	70	11:48 (8)	16:59	77	12:04 (8)
20	07:42		11:02 (8)	07:11			06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14		10:39 (8)	07:42		10:48 (8)
	17:27	73	12:15 (8)	18:04			18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	71	11:50 (8)	17:00	77	12:05 (8)
21	07:42		11:02 (8)	07:10			06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15		10:38 (8)	07:42		10:48 (8)
	17:28	72	12:14 (8)	18:05			18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	72	11:50 (8)	17:00	77	12:05 (8)
22	07:41		11:04 (8)	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		10:38 (8)	07:43		10:48 (8)
	17:29	71	12:15 (8)	18:06			18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	73	11:51 (8)	17:01	77	12:05 (8)
23	07:41		11:04 (8)	07:07			06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		10:38 (8)	07:43		10:49 (8)
	17:30	70	12:14 (8)	18:07			18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	73	11:51 (8)	17:01	77	12:06 (8)
24	07:40		11:04 (8)	07:06			06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		10:38 (8)	07:44		10:49 (8)
	17:31	69	12:13 (8)	18:08			18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	74	11:52 (8)	17:02	77	12:06 (8)
25	07:39		11:05 (8)	07:04			06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19		10:38 (8)	07:44		10:50 (8)
	17:32	68	12:13 (8)	18:09			18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	17:00	74	11:52 (8)	17:02	77	12:07 (8)
26	07:38		11:06 (8)	07:03			06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:21		10:39 (8)	07:44		10:50 (8)
	17:34	67	12:13 (8)	18:11			18:41	20:13	20:42	20:57	20:45	20:06	19:15	17:29	17:00	75	11:54 (8)	17:03	77	12:07 (8)
27	07:38		11:07 (8)	07:01			06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:22		10:39 (8)	07:45		10:50 (8)
	17:35	65	12:12 (8)	18:12			18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	75	11:54 (8)	17:03	77	12:07 (8)
28	07:37		11:08 (8)	07:00			06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		10:39 (8)	07:45		10:52 (8)
	17:36	63	12:11 (8)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	75	11:54 (8)	17:04	76	12:08 (8)
29	07:36		11:09 (8)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24		10:39 (8)	07:45		10:52 (8)
	17:37	61	12:10 (8)				19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	16:59	76	11:55 (8)	17:05	77	12:09 (8)
30	07:35		11:10 (8)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		10:39 (8)	07:46		10:52 (8)
	17:38	59	12:09 (8)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	76	11:55 (8)	17:06	77	12:09 (8)
31	07:34		11:11 (8)				07:10		05:57		06:19	06:49		06:51				07:46		10:52 (8)
	17:40	57	12:08 (8)				19:46		20:46		20:40	19:58		17:23				17:06	77	12:09 (8)
Potential sun hours	300			298			370	398	446	450	457	426	375	346	300			290		
Total, worst case		2240			283											1685			2384	
Sun reduction		0.40			0.43											0.48			0.41	
Oper. time red.		0.37			0.37											0.37			0.37	
Wind dir. red.		0.50			0.50											0.50			0.50	
Total reduction		0.07			0.08											0.09			0.08	
Total, real		166			23											150			183	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 61

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2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AX - R067

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	19:01 (6)	05:56	05:57	06:20	19:10 (6)	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18 22	19:23 (6)	20:46	20:57	20:39 24	19:34 (6)	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	19:00 (6)	05:56	05:57	06:21	19:09 (6)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 24	19:24 (6)	20:47	20:57	20:38 25	19:34 (6)	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22	19:00 (6)	05:55	05:58	06:22	19:09 (6)	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20 24	19:24 (6)	20:48	20:57	20:37 26	19:35 (6)	19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	18:59 (6)	05:55	05:58	06:23	19:09 (6)	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21 26	19:25 (6)	20:48	20:57	20:36 26	19:35 (6)	19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02	06:19	18:58 (6)	05:55	05:59	06:24	19:08 (6)	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22 26	19:24 (6)	20:49	20:56	20:34 26	19:34 (6)	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	18:58 (6)	05:54	05:59	06:25	19:08 (6)	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 26	19:24 (6)	20:50	20:56	20:33 26	19:34 (6)	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	18:58 (6)	05:54	06:00	06:26	19:08 (6)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 26	19:24 (6)	20:50	20:56	20:32 26	19:34 (6)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	18:58 (6)	05:54	06:01	06:27	19:08 (6)	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25 26	19:24 (6)	20:51	20:56	20:31 26	19:34 (6)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	18:58 (6)	05:54	06:01	06:28	19:08 (6)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26 26	19:24 (6)	20:52	20:55	20:30 25	19:33 (6)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13	18:58 (6)	05:53	06:02	06:29	19:08 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 26	19:24 (6)	20:52	20:55	20:28 25	19:33 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	18:59 (6)	05:53	06:03	06:30	19:09 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28 25	19:24 (6)	20:53	20:55	20:27 23	19:32 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	18:59 (6)	05:53	06:03	06:31	19:10 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 24	19:23 (6)	20:53	20:54	20:26 21	19:31 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	19:00 (6)	05:53	06:04	06:31	19:10 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30 23	19:23 (6)	20:54	20:54	20:25 20	19:30 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	19:00 (6)	05:53	06:05	06:32	19:12 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 22	19:22 (6)	20:54	20:53	20:23 17	19:29 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	19:01 (6)	05:53	06:05	06:33	19:13 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 20	19:21 (6)	20:54	20:53	20:22 14	19:27 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	19:02 (6)	05:53	06:06	06:34	19:16 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33 18	19:20 (6)	20:55	20:52	20:20 8	19:24 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	19:04 (6)	05:53	06:07	06:35		07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34 16	19:20 (6)	20:55	20:51	20:19		19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	19:05 (6)	05:53	06:08	06:36		07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34 14	19:19 (6)	20:56	20:51	20:18		19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	19:07 (6)	05:53	06:09	06:37		07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35 10	19:17 (6)	20:56	20:50	20:16		19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	19:10 (6)	05:53	06:09	06:38		07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36 3	19:13 (6)	20:56	20:49	20:15		19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03		05:53	06:10	06:39		07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	20:37		20:56	20:49	20:13		19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02		05:54	06:11	06:40		07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38		20:57	20:48	20:12		19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02		05:54	06:12	06:41		07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39		20:57	20:47	20:10		19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01		05:54	06:13 19:18 (6)	06:42		07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40		20:57	20:46 8 19:26 (6)	20:09		19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00		05:54	06:14 19:16 (6)	06:43		07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	20:41		20:57	20:45 12 19:28 (6)	20:08		19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	05:59		05:55	06:15 19:15 (6)	06:44		07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42		20:57	20:45 15 19:30 (6)	20:06		19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29 19:07 (6)	05:59		05:55	06:15 19:13 (6)	06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14 10 19:17 (6)	20:42		20:57	20:44 17 19:30 (6)	20:04		19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28 19:05 (6)	05:58		05:56	06:16 19:12 (6)	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15 15 19:20 (6)	20:43		20:57	20:43 19 19:31 (6)	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27 19:04 (6)	05:58		05:56	06:17 19:11 (6)	06:47		07:17	06:48	07:24	07:45
	17:37		19:44	20:16 17 19:21 (6)	20:44		20:57	20:42 21 19:32 (6)	20:01		19:10	17:25	16:59	17:05
30	07:35		07:12	06:25 19:01 (6)	05:57		05:56	06:18 19:11 (6)	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17 21 19:22 (6)	20:45		20:57	20:41 22 19:33 (6)	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10		05:57			06:19 19:10 (6)	06:49			06:51		07:46
	17:40		19:46		20:46			20:40 24 19:34 (6)	19:58			17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				63	427		138	358				
Sun reduction				0.51	0.58		0.75	0.72				
Oper. time red.				0.37	0.37		0.37	0.37				
Wind dir. red.				0.72	0.72		0.72	0.72				
Total reduction				0.14	0.16		0.20	0.19				
Total, real				9	67		28	70				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 62

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AY - R063

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:48	20:57	20:36	19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
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	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
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	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	20:41	20:57	20:45	20:08	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 63

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: AZ - R068

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	18:59 (6)	05:56	05:57	06:20	19:10 (6)	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	24 19:23 (6)	20:46	20:57	20:39	22 19:32 (6)	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	18:59 (6)	05:56	05:57	06:21	19:10 (6)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	25 19:24 (6)	20:47	20:57	20:38	23 19:33 (6)	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22	18:58 (6)	05:55	05:58	06:22	19:09 (6)	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	26 19:24 (6)	20:48	20:57	20:37	24 19:33 (6)	19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	18:58 (6)	05:55	05:58	06:23	19:09 (6)	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	26 19:24 (6)	20:48	20:57	20:36	25 19:34 (6)	19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02	06:19	18:57 (6)	05:55	05:59	06:24	19:07 (6)	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	26 19:23 (6)	20:49	20:56	20:34	26 19:33 (6)	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	18:57 (6)	05:54	05:59	06:25	19:07 (6)	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	26 19:23 (6)	20:50	20:56	20:33	26 19:33 (6)	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	18:58 (6)	05:54	06:00	06:26	19:07 (6)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	25 19:23 (6)	20:50	20:56	20:32	26 19:33 (6)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	18:58 (6)	05:54	06:01	06:27	19:07 (6)	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25	25 19:23 (6)	20:51	20:56	20:31	26 19:33 (6)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	18:58 (6)	05:54	06:01	06:28	19:07 (6)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	25 19:23 (6)	20:52	20:55	20:30	26 19:33 (6)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13	18:59 (6)	05:53	06:02	06:29	19:07 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	23 19:22 (6)	20:52	20:55	20:28	26 19:33 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	18:59 (6)	05:53	06:03	06:30	19:07 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	23 19:22 (6)	20:53	20:55	20:27	25 19:32 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	19:00 (6)	05:53	06:03	06:31	19:08 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	21 19:21 (6)	20:53	20:54	20:26	23 19:31 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	19:01 (6)	05:53	06:04	06:31	19:08 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	19 19:20 (6)	20:54	20:54	20:25	23 19:31 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	19:02 (6)	05:53	06:05	06:32	19:09 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	17 19:19 (6)	20:54	20:53	20:23	21 19:30 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	19:03 (6)	05:53	06:05	06:33	19:10 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	15 19:18 (6)	20:54	20:53	20:22	18 19:28 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	19:04 (6)	05:53	06:06	06:34	19:12 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	12 19:16 (6)	20:55	20:52	20:20	15 19:27 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	19:07 (6)	05:53	06:07	06:35	19:14 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	8 19:15 (6)	20:55	20:51	20:19	10 19:24 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06		05:53	06:08	06:36		07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34		20:56	20:51	20:18		19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05		05:53	06:09	06:37		07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35		20:56	20:50	20:16		19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04		05:53	06:09	06:38		07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36		20:56	20:49	20:15		19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03		05:53	06:10	06:39		07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	20:37		20:56	20:49	20:13		19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02		05:54	06:11	06:40		07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38		20:57	20:48	20:12		19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02		05:54	06:12	06:41		07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39		20:57	20:47	20:10		19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01		05:54	06:13	06:42		07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40		20:57	20:46	20:09		19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	19:11 (6)	06:00	05:54	06:14	06:43		07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	2 19:13 (6)	20:41	20:57	20:45	20:08		19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	19:06 (6)	05:59	05:55	06:15	19:21 (6)	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	12 19:18 (6)	20:42	20:57	20:45	2 19:22 (6)	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	19:04 (6)	05:59	05:55	06:15	19:16 (6)	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	15 19:19 (6)	20:42	20:57	20:44	10 19:26 (6)	20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	19:02 (6)	05:58	05:55	06:16	19:14 (6)	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	19 19:21 (6)	20:43	20:57	20:43	14 19:28 (6)	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	19:01 (6)	05:58	05:56	06:17	19:13 (6)	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	21 19:22 (6)	20:44	20:57	20:42	16 19:29 (6)	20:01	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	19:00 (6)	05:57	05:56	06:18	19:12 (6)	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	22 19:22 (6)	20:45	20:57	20:41	18 19:30 (6)	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10			05:57		06:19	19:11 (6)	06:49		06:51		07:46
	17:40		19:46			20:46		20:40	20 19:31 (6)	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				91	366		80	385				
Sun reduction				0.51	0.58		0.75	0.72				
Oper. time red.				0.37	0.37		0.37	0.37				
Wind dir. red.				0.72	0.72		0.72	0.72				
Total reduction				0.14	0.16		0.20	0.19				
Total, real				12	57		16	75				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 64

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BA - R064

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June	July	August		September	October	November	December
1	07:46	07:33	06:58	07:09		06:24	18:55 (6)	05:56	05:57	06:20		06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47		20:18	17 19:12 (6)	20:46	20:57	20:39		19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07		06:23	18:57 (6)	05:56	05:57	06:21		06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48		20:19	13 19:10 (6)	20:47	20:57	20:38		19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06		06:22	19:00 (6)	05:55	05:58	06:22		06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49		20:20	8 19:08 (6)	20:48	20:57	20:37		19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04		06:20		05:55	05:58	06:23		06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50		20:21		20:48	20:57	20:35		19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02		06:19		05:55	05:59	06:24		06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51		20:22		20:49	20:56	20:34		19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01		06:18		05:54	05:59	06:25		06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52		20:23		20:50	20:56	20:33		19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59		06:17		05:54	06:00	06:26		06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53		20:24		20:50	20:56	20:32		19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58		06:16		05:54	06:01	06:27		06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54		20:25		20:51	20:56	20:31		19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56		06:15		05:54	06:01	06:28		06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55		20:26		20:52	20:55	20:30		19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54		06:13		05:53	06:02	06:29	19:08 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56		20:27		20:52	20:55	20:28	10 19:18 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53		06:12		05:53	06:03	06:30	19:05 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57		20:28		20:53	20:55	20:27	15 19:20 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51		06:11		05:53	06:03	06:31	19:04 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58		20:29		20:53	20:54	20:26	17 19:21 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50		06:10		05:53	06:04	06:31	19:03 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59		20:30		20:54	20:54	20:25	19 19:22 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48		06:09		05:53	06:05	06:32	19:02 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00		20:31		20:54	20:53	20:23	21 19:23 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	19:06 (6)	06:08		05:53	06:05	06:33	19:01 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	2 19:07 (6)	20:32		20:54	20:53	20:22	22 19:23 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	19:01 (6)	06:07		05:53	06:06	06:34	19:00 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	12 19:13 (6)	20:33		20:55	20:52	20:20	24 19:24 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	18:58 (6)	06:06		05:53	06:07	06:35	19:00 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	16 19:14 (6)	20:34		20:55	20:51	20:19	24 19:24 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	18:57 (6)	06:06		05:53	06:08	06:36	18:58 (6)	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	19 19:16 (6)	20:34		20:56	20:51	20:18	25 19:23 (6)	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	18:55 (6)	06:05		05:53	06:09	06:37	18:58 (6)	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	21 19:16 (6)	20:35		20:56	20:50	20:16	25 19:23 (6)	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	18:55 (6)	06:04		05:53	06:09	06:38	18:58 (6)	07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	22 19:17 (6)	20:36		20:56	20:49	20:15	25 19:23 (6)	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	18:53 (6)	06:03		05:53	06:10	06:39	18:58 (6)	07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	24 19:17 (6)	20:37		20:56	20:49	20:13	24 19:22 (6)	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	18:53 (6)	06:02		05:54	06:11	06:40	18:58 (6)	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	24 19:17 (6)	20:38		20:57	20:48	20:12	24 19:22 (6)	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	18:53 (6)	06:02		05:54	06:12	06:41	18:58 (6)	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	25 19:18 (6)	20:39		20:57	20:47	20:10	23 19:21 (6)	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	18:52 (6)	06:01		05:54	06:13	06:42	18:59 (6)	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	25 19:17 (6)	20:40		20:57	20:46	20:09	21 19:20 (6)	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	18:52 (6)	06:00		05:54	06:14	06:43	19:00 (6)	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	25 19:17 (6)	20:41		20:57	20:45	20:08	18 19:18 (6)	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	18:53 (6)	05:59		05:55	06:15	06:44	19:01 (6)	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	24 19:17 (6)	20:42		20:57	20:45	20:06	16 19:17 (6)	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	18:52 (6)	05:59		05:55	06:15	06:45	19:03 (6)	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	24 19:16 (6)	20:42		20:57	20:44	20:04	11 19:14 (6)	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	18:53 (6)	05:58		05:55	06:16	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	22 19:15 (6)	20:43		20:57	20:43	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	18:54 (6)	05:58		05:56	06:17	06:47		07:17	06:48	07:24	07:45
	17:37		19:44	20:16	21 19:15 (6)	20:44		20:57	20:42	20:01		19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	18:54 (6)	05:57		05:56	06:18	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17	19 19:13 (6)	20:45		20:57	20:41	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10			05:57			06:19	06:49			06:51		07:46
	17:40		19:46			20:46			20:40	19:58			17:23		17:06
Potential sun hours	300	298	370	398		446		450	457	426		375	346	300	290
Total, worst case					325		38				364				
Sun reduction					0.51		0.58				0.72				
Oper. time red.					0.37		0.37				0.37				
Wind dir. red.					0.74		0.74				0.74				
Total reduction					0.14		0.16				0.20				
Total, real					45		6				72				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 65

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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BB - R077

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February		March		April		May			June		
1	07:46		09:11 (10)	07:33		06:58		07:09		06:24			05:56		19:13 (6)
	17:07	78	13:04 (8)	17:41		18:14		19:47		20:18			20:46	25	19:38 (6)
2	07:46		09:12 (10)	07:32		06:57		07:07		06:23			05:56		19:14 (6)
	17:08	75	13:04 (8)	17:42		18:15		19:48		20:19			20:47	25	19:39 (6)
3	07:46		09:13 (10)	07:32		06:55		07:06		06:22			05:55		19:14 (6)
	17:09	74	13:04 (8)	17:43		18:16		19:49		20:20			20:48	25	19:39 (6)
4	07:46		09:14 (10)	07:31		06:54		07:04		06:20			05:55		19:14 (6)
	17:10	72	13:04 (8)	17:45		18:17		19:50		20:21			20:48	25	19:39 (6)
5	07:46		09:15 (10)	07:29		06:52		07:02		06:19			05:55		19:14 (6)
	17:11	70	13:04 (8)	17:46		18:18		19:51		20:22			20:49	25	19:39 (6)
6	07:46		09:17 (10)	07:28		06:51		07:01		06:18			05:54		19:15 (6)
	17:12	67	13:05 (8)	17:47		18:20		19:52		20:23			20:50	24	19:39 (6)
7	07:46		09:20 (10)	07:27		06:49		06:59		06:17			05:54		19:15 (6)
	17:13	61	13:05 (8)	17:48		18:21		19:53		20:24			20:50	24	19:39 (6)
8	07:46		12:07 (8)	07:26		06:48		06:58		06:16			05:54		19:15 (6)
	17:14	58	13:05 (8)	17:49		18:22		19:54		20:25			20:51	24	19:39 (6)
9	07:46		12:08 (8)	07:25		06:46		06:56		06:15			05:54		19:15 (6)
	17:15	57	13:05 (8)	17:51		18:23		19:55		20:26			20:52	24	19:39 (6)
10	07:46		12:09 (8)	07:24		06:45		06:54		06:13			05:53		19:16 (6)
	17:16	55	13:04 (8)	17:52		18:24		19:56		20:27			20:52	23	19:39 (6)
11	07:46		12:10 (8)	07:23		06:43		06:53		06:12			05:53		19:16 (6)
	17:17	54	13:04 (8)	17:53		18:25		19:57		20:28			20:53	24	19:40 (6)
12	07:46		12:11 (8)	07:22		06:41		06:51		06:11			05:53		19:17 (6)
	17:18	53	13:04 (8)	17:54		18:26		19:58		20:29			20:53	23	19:40 (6)
13	07:45		12:12 (8)	07:20		06:40		06:50		06:10			05:53		19:17 (6)
	17:19	51	13:03 (8)	17:55		18:27		19:59		20:30			20:54	23	19:40 (6)
14	07:45		12:14 (8)	07:19		06:38		06:48		06:09			05:53		19:17 (6)
	17:20	49	13:03 (8)	17:57		18:28		20:00		20:31			20:54	23	19:40 (6)
15	07:45		12:16 (8)	07:18		06:37		06:47		06:08			05:53		19:18 (6)
	17:21	46	13:02 (8)	17:58		18:29		20:01		20:32			20:54	22	19:40 (6)
16	07:44		12:17 (8)	07:17		06:35		06:45		06:07			05:53		19:18 (6)
	17:22	44	13:01 (8)	17:59		18:30		20:02		20:33			20:55	22	19:40 (6)
17	07:44		12:19 (8)	07:15		06:33		06:44		06:06			19:22 (6)	05:53	19:18 (6)
	17:23	41	13:00 (8)	18:00		18:31		20:03		20:34	5		19:27 (6)	20:55	22	19:40 (6)
18	07:43		12:21 (8)	07:14		06:32		06:42		06:06			19:19 (6)	05:53	19:18 (6)
	17:24	38	12:59 (8)	18:01		18:32		20:04		20:34	11		19:30 (6)	20:56	22	19:40 (6)
19	07:43		12:23 (8)	07:13		06:30		06:41		06:05			19:18 (6)	05:53	19:18 (6)
	17:25	34	12:57 (8)	18:03		18:33		20:05		20:35	14		19:32 (6)	20:56	22	19:40 (6)
20	07:42		12:26 (8)	07:11		06:28		06:39		06:04			19:16 (6)	05:53	19:18 (6)
	17:27	29	12:55 (8)	18:04		18:34		20:06		20:36	17		19:33 (6)	20:56	22	19:40 (6)
21	07:42		12:29 (8)	07:10		06:27		06:38		06:03			19:15 (6)	05:53	19:19 (6)
	17:28	23	12:52 (8)	18:05		18:36		20:07		20:37	18		19:33 (6)	20:56	22	19:41 (6)
22	07:41		12:35 (8)	07:09		06:25		06:36		06:02			19:15 (6)	05:54	19:19 (6)
	17:29	13	12:48 (8)	18:06		18:37		20:08		20:38	20		19:35 (6)	20:57	22	19:41 (6)
23	07:41			07:07		06:24		06:35		06:02			19:14 (6)	05:54	19:19 (6)
	17:30			18:07		18:38		20:09		20:39	21		19:35 (6)	20:57	22	19:41 (6)
24	07:40			07:06		06:22		06:34		06:01			19:14 (6)	05:54	19:19 (6)
	17:31			18:08		18:39		20:10		20:40	21		19:35 (6)	20:57	22	19:41 (6)
25	07:39			07:04		06:20		06:32		06:00			19:14 (6)	05:54	19:20 (6)
	17:32			18:09		18:40		20:11		20:41	22		19:36 (6)	20:57	22	19:42 (6)
26	07:38			07:03		06:19		06:31		05:59			19:13 (6)	05:55	19:20 (6)
	17:34			18:11		18:41		20:13		20:42	23		19:36 (6)	20:57	22	19:42 (6)
27	07:38			07:01		06:17		06:29		05:59			19:14 (6)	05:55	19:20 (6)
	17:35			18:12		18:42		20:14		20:42	23		19:37 (6)	20:57	22	19:42 (6)
28	07:37			07:00		06:15		06:28		05:58			19:13 (6)	05:56	19:20 (6)
	17:36			18:13		18:43		20:15		20:43	24		19:37 (6)	20:57	23	19:43 (6)
29	07:36					07:14		06:27		05:58			19:14 (6)	05:56	19:20 (6)
	17:37					19:44		20:16		20:44	24		19:38 (6)	20:57	23	19:43 (6)
30	07:35					07:12		06:25		05:57			19:13 (6)	05:56	19:21 (6)
	17:38					19:45		20:17		20:45	25		19:38 (6)	20:57	23	19:44 (6)
31	07:34					07:10				05:57			19:14 (6)		
	17:40					19:46				20:46	24		19:38 (6)		
Potential sun hours	300			298		370		398		446				450	
Total, worst case		1142									292				692
Sun reduction		0.40									0.58				0.67
Oper. time red.		0.37									0.37				0.37
Wind dir. red.		0.53									0.71				0.71
Total reduction		0.08									0.15				0.17
Total, real		87									43				119

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 66

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BB - R077

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August	September	October	November		December		
1	05:57		19:20 (6)	06:20	06:50	07:19	06:52		07:26		11:52 (8)
	20:57	24	19:44 (6)	20:39	19:57	19:07	17:22		16:58	54	12:46 (8)
2	05:57		19:21 (6)	06:21	06:51	07:20	06:53		07:27		11:52 (8)
	20:57	24	19:45 (6)	20:38	19:55	19:06	17:20		16:58	55	12:47 (8)
3	05:58		19:21 (6)	06:22	06:52	07:21	06:54		07:28		11:51 (8)
	20:57	23	19:44 (6)	20:37	19:53	19:04	17:19		16:58	57	12:48 (8)
4	05:58		19:21 (6)	06:23	06:53	07:22	06:55		07:29		11:51 (8)
	20:57	24	19:45 (6)	20:35	19:52	19:02	17:18		16:57	58	12:49 (8)
5	05:59		19:21 (6)	06:24	06:54	07:23	06:56		07:30		09:06 (10)
	20:56	24	19:45 (6)	20:34	19:50	19:01	17:17		16:57	61	12:50 (8)
6	05:59		19:21 (6)	06:25	06:55	07:24	06:58		07:31		09:03 (10)
	20:56	24	19:45 (6)	20:33	19:49	18:59	17:16		16:57	67	12:51 (8)
7	06:00		19:21 (6)	06:26	06:56	07:25	06:59		07:32		09:03 (10)
	20:56	24	19:45 (6)	20:32	19:47	18:57	17:15		16:57	69	12:51 (8)
8	06:01		19:21 (6)	06:27	06:57	07:26	07:00		07:33		09:02 (10)
	20:56	25	19:46 (6)	20:31	19:45	18:56	17:14		16:57	72	12:52 (8)
9	06:01		19:22 (6)	06:28	06:57	07:27	07:01		07:33		09:02 (10)
	20:55	24	19:46 (6)	20:30	19:44	18:54	17:13		16:57	73	12:53 (8)
10	06:02		19:21 (6)	06:29	06:58	07:28	07:02		07:34		09:02 (10)
	20:55	25	19:46 (6)	20:28	19:42	18:53	17:12		16:57	75	12:54 (8)
11	06:03		19:22 (6)	06:30	06:59	07:29	07:03		07:35		09:01 (10)
	20:54	24	19:46 (6)	20:27	19:40	18:51	17:11		16:57	78	12:54 (8)
12	06:03		19:22 (6)	06:31	07:00	07:30	07:05		07:36		09:02 (10)
	20:54	25	19:47 (6)	20:26	19:39	18:50	17:10		16:57	78	12:55 (8)
13	06:04		19:22 (6)	06:31	07:01	07:31	07:06		07:37		09:02 (10)
	20:54	24	19:46 (6)	20:25	19:37	18:48	17:09		16:57	80	12:56 (8)
14	06:05		19:22 (6)	06:32	07:02	07:32	07:07		07:38		09:02 (10)
	20:53	24	19:46 (6)	20:23	19:35	18:47	17:08		16:58	79	12:56 (8)
15	06:05		19:23 (6)	06:33	07:03	07:33	07:08		07:38		09:02 (10)
	20:53	24	19:47 (6)	20:22	19:34	18:45	17:07		16:58	80	12:56 (8)
16	06:06		19:22 (6)	06:34	07:04	07:34	07:09		07:39		09:03 (10)
	20:52	24	19:46 (6)	20:20	19:32	18:43	17:06		16:58	80	12:57 (8)
17	06:07		19:23 (6)	06:35	07:05	07:35	07:10		07:40		09:03 (10)
	20:51	23	19:46 (6)	20:19	19:30	18:42	17:06		16:58	81	12:58 (8)
18	06:08		19:23 (6)	06:36	07:06	07:36	07:12		07:40		09:03 (10)
	20:51	23	19:46 (6)	20:18	19:29	18:41	17:05		16:59	82	12:58 (8)
19	06:09		19:24 (6)	06:37	07:07	07:37	07:13		07:41		09:04 (10)
	20:50	22	19:46 (6)	20:16	19:27	18:39	17:04		16:59	82	12:59 (8)
20	06:09		19:25 (6)	06:38	07:08	07:38	07:14		12:10 (8)	07:42	09:05 (10)
	20:49	21	19:46 (6)	20:15	19:25	18:38	17:03	13	12:23 (8)	17:00	82 13:00 (8)
21	06:10		19:24 (6)	06:39	07:09	07:39	07:15		12:05 (8)	07:42	09:05 (10)
	20:49	20	19:44 (6)	20:13	19:24	18:36	17:03	23	12:28 (8)	17:00	82 13:00 (8)
22	06:11		19:25 (6)	06:40	07:10	07:41	07:16		12:02 (8)	07:43	09:05 (10)
	20:48	19	19:44 (6)	20:12	19:22	18:35	17:02	29	12:31 (8)	17:01	82 13:00 (8)
23	06:12		19:26 (6)	06:41	07:11	07:42	07:17		12:00 (8)	07:43	09:06 (10)
	20:47	17	19:43 (6)	20:10	19:20	18:33	17:02	34	12:34 (8)	17:01	82 13:01 (8)
24	06:13		19:27 (6)	06:42	07:12	07:43	07:18		11:58 (8)	07:44	09:06 (10)
	20:46	16	19:43 (6)	20:09	19:19	18:32	17:01	38	12:36 (8)	17:02	82 13:01 (8)
25	06:14		19:29 (6)	06:43	07:13	06:44	07:19		11:56 (8)	07:44	09:07 (10)
	20:45	13	19:42 (6)	20:07	19:17	17:31	17:00	41	12:37 (8)	17:02	82 13:02 (8)
26	06:15		19:31 (6)	06:44	07:14	06:45	07:21		11:56 (8)	07:44	09:07 (10)
	20:45	9	19:40 (6)	20:06	19:15	17:29	17:00	44	12:40 (8)	17:03	82 13:02 (8)
27	06:15			06:45	07:15	06:46	07:22		11:55 (8)	07:45	09:07 (10)
	20:44			20:04	19:14	17:28	17:00	46	12:41 (8)	17:03	81 13:02 (8)
28	06:16			06:46	07:16	06:47	07:23		11:54 (8)	07:45	09:09 (10)
	20:43			20:03	19:12	17:27	16:59	49	12:43 (8)	17:04	80 13:03 (8)
29	06:17			06:47	07:17	06:48	07:24		11:53 (8)	07:45	09:09 (10)
	20:42			20:01	19:10	17:25	16:59	51	12:44 (8)	17:05	80 13:03 (8)
30	06:18			06:48	07:18	06:50	07:25		11:53 (8)	07:46	09:10 (10)
	20:41			20:00	19:09	17:24	16:58	52	12:45 (8)	17:06	80 13:04 (8)
31	06:19			06:49		06:51				07:46	09:10 (10)
	20:40			19:58		17:23				17:06	80 13:04 (8)
Potential sun hours	457			426	375	346	300			290	
Total, worst case		569						420			2336
Sun reduction		0.75						0.48			0.41
Oper. time red.		0.37						0.37			0.37
Wind dir. red.		0.71						0.52			0.53
Total reduction		0.19						0.09			0.08
Total, real		109						38			186

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 67

Licensed user:
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IT-09028 Sestu
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BC - R070

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May	June	July	August		September	October	November	December
1	07:46	07:33	06:58	07:09		06:24	05:56	05:57	06:20		06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47		20:18	20:46	20:57	20:39		19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07		06:23	05:56	05:57	06:21		06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48		20:19	20:47	20:57	20:38		19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06		06:22	05:55	05:58	06:22		06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49		20:20	20:48	20:57	20:37		19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04		06:20	05:55	05:58	06:23		06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50		20:21	20:48	20:57	20:35		19:52	19:02	17:18	16:57
5	07:46	07:30	06:52	07:02		06:19	05:55	05:59	06:24		06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51		20:22	20:49	20:56	20:34		19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01		06:18	05:54	05:59	06:25		06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52		20:23	20:50	20:56	20:33		19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59		06:17	05:54	06:00	06:26		06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53		20:24	20:50	20:56	20:32		19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58		06:16	05:54	06:01	06:27		06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54		20:25	20:51	20:56	20:31		19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56		06:15	05:54	06:01	06:28		06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55		20:26	20:52	20:55	20:30		19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54		06:13	05:53	06:02	06:29		06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56		20:27	20:52	20:55	20:28		19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53		06:12	05:53	06:03	06:30		06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57		20:28	20:53	20:54	20:27		19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51		19:03 (6)	06:11	05:53	06:03	06:31		07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	6	19:09 (6)	20:29	20:53	20:54	20:26		19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50		18:59 (6)	06:10	05:53	06:04	06:31		07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	13	19:12 (6)	20:30	20:54	20:54	20:25		19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48		18:57 (6)	06:09	05:53	06:05	06:32	19:06 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	17	19:14 (6)	20:31	20:54	20:53	20:23	9	19:15 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47		18:55 (6)	06:08	05:53	06:05	06:33		19:04 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20	19:15 (6)	20:32	20:54	20:53	20:22	13	19:17 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45		18:55 (6)	06:07	05:53	06:06	06:34		19:02 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	21	19:16 (6)	20:33	20:55	20:52	20:20	17	19:19 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44		18:53 (6)	06:06	05:53	06:07	06:35		19:01 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	23	19:16 (6)	20:34	20:55	20:51	20:19	19	19:20 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42		18:53 (6)	06:06	05:53	06:08	06:36		18:59 (6)	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	24	19:17 (6)	20:34	20:56	20:51	20:18	20	19:19 (6)	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41		18:52 (6)	06:05	05:53	06:09	06:37		18:58 (6)	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	24	19:16 (6)	20:35	20:56	20:50	20:16	22	19:20 (6)	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39		18:52 (6)	06:04	05:53	06:09	06:38		18:57 (6)	07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	24	19:16 (6)	20:36	20:56	20:49	20:15	23	19:20 (6)	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38		18:51 (6)	06:03	05:53	06:10	06:39		18:57 (6)	07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	25	19:16 (6)	20:37	20:56	20:49	20:13	23	19:20 (6)	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36		18:52 (6)	06:02	05:54	06:11	06:40		18:56 (6)	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	24	19:16 (6)	20:38	20:57	20:48	20:12	24	19:20 (6)	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35		18:52 (6)	06:02	05:54	06:12	06:41		18:56 (6)	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	23	19:15 (6)	20:39	20:57	20:47	20:10	24	19:20 (6)	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34		18:52 (6)	06:01	05:54	06:13	06:42		18:56 (6)	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	22	19:14 (6)	20:40	20:57	20:46	20:09	24	19:20 (6)	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32		18:53 (6)	06:00	05:54	06:14	06:43		18:56 (6)	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:12	21	19:14 (6)	20:41	20:57	20:45	20:07	23	19:19 (6)	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31		18:54 (6)	05:59	05:55	06:15	06:44		18:56 (6)	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	19	19:13 (6)	20:42	20:57	20:45	20:06	23	19:19 (6)	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29		18:55 (6)	05:59	05:55	06:15	06:45		18:57 (6)	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	16	19:11 (6)	20:42	20:57	20:44	20:04	21	19:18 (6)	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28		18:57 (6)	05:58	05:55	06:16	06:46		18:57 (6)	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	12	19:09 (6)	20:43	20:57	20:43	20:03	20	19:17 (6)	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27		19:00 (6)	05:58	05:56	06:17	06:47		18:59 (6)	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	6	19:06 (6)	20:44	20:57	20:42	20:01	16	19:15 (6)	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25			05:57	05:56	06:18	06:48		18:59 (6)	07:18	06:50	07:25	07:46
	17:38		19:45	20:17			20:45	20:57	20:41	20:00	13	19:12 (6)	19:09	17:24	16:58	17:06
31	07:34		07:10				05:57		06:19	06:49		19:03 (6)		06:51		07:46
	17:40		19:46				20:46		20:40	19:58	5	19:08 (6)		17:23		17:06
Potential sun hours	300	298	370	398		446	450	457	426		375	346	300	290
Total, worst case					340					339				
Sun reduction					0.51					0.72				
Oper. time red.					0.37					0.37				
Wind dir. red.					0.74					0.74				
Total reduction					0.14					0.20				
Total, real					48					68				

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 68
Licensed user:
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Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BD - R066

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	19:02 (6)	05:56	05:57	06:20	19:14 (6)	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18 23	19:25 (6)	20:46	20:57	20:39 18	19:32 (6)	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	19:01 (6)	05:56	05:57	06:21	19:13 (6)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 24	19:25 (6)	20:47	20:57	20:38 20	19:33 (6)	19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06	06:22	19:01 (6)	05:55	05:58	06:22	19:13 (6)	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20 24	19:25 (6)	20:48	20:57	20:37 21	19:34 (6)	19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	19:01 (6)	05:55	05:58	06:23	19:12 (6)	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21 25	19:26 (6)	20:48	20:57	20:35 22	19:34 (6)	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02	06:19	19:00 (6)	05:55	05:59	06:24	19:11 (6)	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22 25	19:25 (6)	20:49	20:56	20:34 23	19:34 (6)	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	19:01 (6)	05:54	05:59	06:25	19:10 (6)	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 24	19:25 (6)	20:50	20:56	20:33 24	19:34 (6)	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	19:01 (6)	05:54	06:00	06:26	19:10 (6)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 23	19:24 (6)	20:50	20:56	20:32 24	19:34 (6)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	19:01 (6)	05:54	06:01	06:27	19:10 (6)	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25 23	19:24 (6)	20:51	20:56	20:31 24	19:34 (6)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	19:02 (6)	05:54	06:01	06:28	19:10 (6)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26 21	19:23 (6)	20:52	20:55	20:30 24	19:34 (6)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13	19:02 (6)	05:53	06:02	06:29	19:10 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 21	19:23 (6)	20:52	20:55	20:28 24	19:34 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	19:03 (6)	05:53	06:03	06:30	19:10 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28 19	19:22 (6)	20:53	20:54	20:27 24	19:34 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	19:04 (6)	05:53	06:03	06:31	19:10 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 17	19:21 (6)	20:53	20:54	20:26 23	19:33 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	19:05 (6)	05:53	06:04	06:31	19:11 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30 15	19:20 (6)	20:54	20:54	20:25 21	19:32 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	19:07 (6)	05:53	06:05	06:32	19:12 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 11	19:18 (6)	20:54	20:53	20:23 20	19:32 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	19:09 (6)	05:53	06:05	06:33	19:12 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 7	19:16 (6)	20:54	20:53	20:22 18	19:30 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07		05:53	06:06	06:34	19:14 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33		20:55	20:52	20:20 15	19:29 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06		05:53	06:07	06:35	19:16 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34		20:55	20:51	20:19 11	19:27 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06		05:53	06:08	06:36	19:19 (6)	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:34		20:56	20:51	20:18 2	19:21 (6)	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05		05:53	06:09	06:37		07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	20:35		20:56	20:50	20:16		19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04		05:53	06:09	06:38		07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	20:36		20:56	20:49	20:15		19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03		05:53	06:10	06:39		07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	20:37		20:56	20:49	20:13		19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02		05:54	06:11	06:40		07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38		20:57	20:48	20:12		19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02		05:54	06:12	06:41		07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39		20:57	20:47	20:10		19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01		05:54	06:13	06:42		07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40		20:57	20:46	20:09		19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32 19:11 (6)	06:00		05:54	06:14	06:43		07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11 6 19:17 (6)	20:41		20:57	20:45	20:07		19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31 19:08 (6)	05:59		05:55	06:15	06:44		07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13 13 19:21 (6)	20:42		20:57	20:45	20:06		19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29 19:06 (6)	05:59		05:55	06:15	06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14 16 19:22 (6)	20:42		20:57	20:44	20:04		19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28 19:04 (6)	05:58		05:55	06:16	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15 19 19:23 (6)	20:43		20:57	20:43	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27 19:04 (6)	05:58		05:56	06:17 19:18 (6)	06:47		07:17	06:48	07:24	07:45
	17:37		19:44	20:16 20 19:24 (6)	20:44		20:57	20:42 10 19:28 (6)	20:01		19:10	17:25	16:59	17:05
30	07:35		07:12	06:25 19:02 (6)	05:57		05:56	06:18 19:17 (6)	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17 22 19:24 (6)	20:45		20:57	20:41 13 19:30 (6)	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10		05:57			06:19 19:15 (6)	06:49			06:51		07:46
	17:40		19:46		20:46			20:40 16 19:31 (6)	19:58			17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				96	302		39	358				
Sun reduction				0.51	0.58		0.75	0.72				
Oper. time red.				0.37	0.37		0.37	0.37				
Wind dir. red.				0.72	0.72		0.72	0.72				
Total reduction				0.14	0.16		0.20	0.19				
Total, real				13	47		8	70				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 69

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BE - R065

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June	July	August		September	October	November	December
1	07:46	07:33	06:58	07:09		06:24	18:57 (6)	05:56	05:57	06:20		06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47		20:18	20 19:17 (6)	20:46	20:57	20:39		19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07		06:23	18:58 (6)	05:56	05:57	06:21		06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48		20:19	18 19:16 (6)	20:47	20:57	20:38		19:55	19:06	17:20	16:58
3	07:46	07:32	06:55	07:06		06:22	18:59 (6)	05:55	05:58	06:22		06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49		20:20	16 19:15 (6)	20:48	20:57	20:37		19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04		06:20	19:01 (6)	05:55	05:58	06:23		06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50		20:21	13 19:14 (6)	20:48	20:57	20:35		19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02		06:19	19:02 (6)	05:55	05:59	06:24		06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51		20:22	9 19:11 (6)	20:49	20:56	20:34		19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01		06:18		05:54	05:59	06:25		06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52		20:23		20:50	20:56	20:33		19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59		06:17		05:54	06:00	06:26	19:15 (6)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53		20:24		20:50	20:56	20:32	2 19:17 (6)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58		06:16		05:54	06:01	06:27	19:11 (6)	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54		20:25		20:51	20:56	20:31	10 19:21 (6)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56		06:15		05:54	06:01	06:28	19:09 (6)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55		20:26		20:52	20:55	20:30	14 19:23 (6)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54		06:13		05:53	06:02	06:29	19:07 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56		20:27		20:52	20:55	20:28	17 19:24 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53		06:12		05:53	06:03	06:30	19:06 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57		20:28		20:53	20:54	20:27	19 19:25 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51		06:11		05:53	06:03	06:31	19:05 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58		20:29		20:53	20:54	20:26	21 19:26 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50		06:10		05:53	06:04	06:31	19:05 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59		20:30		20:54	20:54	20:25	22 19:27 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48		06:09		05:53	06:05	06:32	19:04 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00		20:31		20:54	20:53	20:23	23 19:27 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47		06:08		05:53	06:05	06:33	19:03 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01		20:32		20:54	20:53	20:22	24 19:27 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45		06:07		05:53	06:06	06:34	19:03 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02		20:33		20:55	20:52	20:20	24 19:27 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44		06:06		05:53	06:07	06:35	19:03 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03		20:34		20:55	20:51	20:19	24 19:27 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	19:05 (6)	06:06		05:53	06:08	06:36	19:02 (6)	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	10 19:15 (6)	20:34		20:56	20:51	20:18	24 19:26 (6)	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	19:01 (6)	06:05		05:53	06:09	06:37	19:02 (6)	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	15 19:16 (6)	20:35		20:56	20:50	20:16	23 19:25 (6)	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	19:00 (6)	06:04		05:53	06:09	06:38	19:02 (6)	07:08	07:38	07:14	07:42
	17:27	18:04	18:34	20:06	18 19:18 (6)	20:36		20:56	20:49	20:15	23 19:25 (6)	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	18:58 (6)	06:03		05:53	06:10	06:39	19:03 (6)	07:09	07:39	07:15	07:42
	17:28	18:05	18:36	20:07	20 19:18 (6)	20:37		20:56	20:49	20:13	21 19:24 (6)	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	18:58 (6)	06:02		05:54	06:11	06:40	19:03 (6)	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	21 19:19 (6)	20:38		20:57	20:48	20:12	20 19:23 (6)	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	18:57 (6)	06:02		05:54	06:12	06:41	19:04 (6)	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	23 19:20 (6)	20:39		20:57	20:47	20:10	18 19:22 (6)	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	18:56 (6)	06:01		05:54	06:13	06:42	19:06 (6)	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	24 19:20 (6)	20:40		20:57	20:46	20:09	14 19:20 (6)	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	18:56 (6)	06:00		05:54	06:14	06:43	19:08 (6)	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	24 19:20 (6)	20:41		20:57	20:45	20:07	9 19:17 (6)	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	18:56 (6)	05:59		05:55	06:15	06:44		07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	24 19:20 (6)	20:42		20:57	20:45	20:06		19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	18:55 (6)	05:59		05:55	06:15	06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	24 19:19 (6)	20:42		20:57	20:44	20:04		19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	18:56 (6)	05:58		05:55	06:16	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	23 19:19 (6)	20:43		20:57	20:43	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	18:56 (6)	05:58		05:56	06:17	06:47		07:17	06:48	07:24	07:45
	17:37		19:44	20:16	23 19:19 (6)	20:44		20:57	20:42	20:01		19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	18:56 (6)	05:57		05:56	06:18	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17	22 19:18 (6)	20:45		20:57	20:41	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10			05:57			06:19	06:49			06:51		07:46
	17:40		19:46			20:46			20:40	19:58			17:23		17:06
Potential sun hours	300	298	370	398		446		450	457	426		375	346	300	290
Total, worst case					271		76				352				
Sun reduction					0.51		0.58				0.72				
Oper. time red.					0.37		0.37				0.37				
Wind dir. red.					0.73		0.73				0.73				
Total reduction					0.14		0.16				0.20				
Total, real					38		12				69				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 70

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BF - R092

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April	May	June	July	August	September	October		November	December
1	07:46	07:33		06:58	07:41 (10)	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:26
	17:07	17:41		18:14	28 08:09 (10)	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22	16:58
2	07:46	07:32		06:57	07:41 (10)	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	07:27
	17:08	17:42		18:15	28 08:09 (10)	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:20	16:58
3	07:46	07:31		06:55	07:41 (10)	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	07:28
	17:09	17:43		18:16	27 08:08 (10)	19:49	20:20	20:48	20:57	20:37	19:53	19:04		17:19	16:58
4	07:46	07:30		06:54	07:42 (10)	07:04	06:20	05:55	05:58	06:23	06:53	07:22	08:27 (10)	06:55	07:29
	17:10	17:45		18:17	26 08:08 (10)	19:50	20:21	20:48	20:57	20:35	19:52	19:02	7 08:34 (10)	17:18	16:57
5	07:46	07:29		06:52	07:42 (10)	07:02	06:19	05:55	05:59	06:24	06:54	07:23	08:24 (10)	06:56	07:30
	17:11	17:46		18:18	25 08:07 (10)	19:51	20:22	20:49	20:56	20:34	19:50	19:01	14 08:38 (10)	17:17	16:57
6	07:46	07:28		06:51	07:42 (10)	07:01	06:18	05:54	05:59	06:25	06:55	07:24	08:21 (10)	06:58	07:31
	17:12	17:47		18:20	23 08:05 (10)	19:52	20:23	20:50	20:56	20:33	19:49	18:59	19 08:40 (10)	17:16	16:57
7	07:46	07:27		06:49	07:44 (10)	06:59	06:17	05:54	06:00	06:26	06:56	07:25	08:19 (10)	06:59	07:32
	17:13	17:48		18:21	20 08:04 (10)	19:53	20:24	20:50	20:56	20:32	19:47	18:57	22 08:41 (10)	17:15	16:57
8	07:46	07:26		06:48	07:45 (10)	06:58	06:16	05:54	06:01	06:27	06:57	07:26	08:18 (10)	07:00	07:33
	17:14	17:49		18:22	16 08:01 (10)	19:54	20:25	20:51	20:56	20:31	19:45	18:56	24 08:42 (10)	17:14	16:57
9	07:46	07:25		06:46	07:48 (10)	06:56	06:15	05:54	06:01	06:28	06:57	07:27	08:17 (10)	07:01	07:33
	17:15	17:51		18:23	11 07:59 (10)	19:55	20:26	20:52	20:55	20:30	19:44	18:54	25 08:42 (10)	17:13	16:57
10	07:46	07:24		06:45		06:54	06:13	05:53	06:02	06:29	06:58	07:28	08:16 (10)	07:02	07:34
	17:16	17:52		18:24		19:56	20:27	20:52	20:55	20:28	19:42	18:53	27 08:43 (10)	17:12	16:57
11	07:46	07:23		06:43		06:53	06:12	05:53	06:03	06:30	06:59	07:29	08:15 (10)	07:03	07:35
	17:17	17:53		18:25		19:57	20:28	20:53	20:54	20:27	19:40	18:51	28 08:43 (10)	17:11	16:57
12	07:45	07:22		06:41		06:51	06:11	05:53	06:03	06:31	07:00	07:30	08:15 (10)	07:05	07:36
	17:18	17:54		18:26		19:58	20:29	20:53	20:54	20:26	19:39	18:50	28 08:43 (10)	17:10	16:57
13	07:45	07:20		06:40		06:50	06:10	05:53	06:04	06:32	07:01	07:31	08:14 (10)	07:06	07:37
	17:19	17:55		18:27		19:59	20:30	20:54	20:54	20:24	19:37	18:48	29 08:43 (10)	17:09	16:58
14	07:45	07:19		06:38		06:48	06:09	05:53	06:05	06:32	07:02	07:32	08:14 (10)	07:07	07:37
	17:20	17:57		18:28		20:00	20:31	20:54	20:53	20:23	19:35	18:47	28 08:42 (10)	17:08	16:58
15	07:45	07:18		06:37		06:47	06:08	05:53	06:06	06:33	07:03	07:33	08:14 (10)	07:08	07:38
	17:21	17:58		18:29		20:01	20:32	20:54	20:52	20:22	19:34	18:45	28 08:42 (10)	17:07	16:58
16	07:44	07:17		06:35		06:45	06:07	05:53	06:06	06:34	07:04	07:34	08:14 (10)	07:09	07:39
	17:22	17:59		18:30		20:02	20:33	20:55	20:52	20:20	19:32	18:44	27 08:41 (10)	17:06	16:58
17	07:44	07:15		06:33		06:44	06:06	05:53	06:07	06:35	07:05	07:35	08:14 (10)	07:10	07:40
	17:23	18:00		18:31		20:03	20:33	20:55	20:51	20:19	19:30	18:42	26 08:40 (10)	17:06	16:58
18	07:43	07:14		06:32		06:42	06:06	05:53	06:08	06:36	07:06	07:36	08:16 (10)	07:11	07:40
	17:24	18:01		18:32		20:04	20:34	20:56	20:51	20:18	19:29	18:41	24 08:40 (10)	17:05	16:59
19	07:43	07:13	07:56 (10)	06:30		06:41	06:05	05:53	06:09	06:37	07:07	07:37	08:16 (10)	07:13	07:41
	17:25	18:03	2 07:57 (10)	18:33		20:05	20:35	20:56	20:50	20:16	19:27	18:39	23 08:39 (10)	17:04	16:59
20	07:42	07:11	07:50 (10)	06:28		06:39	06:04	05:53	06:09	06:38	07:08	07:38	08:18 (10)	07:14	07:41
	17:27	18:04	12 08:02 (10)	18:34		20:06	20:36	20:56	20:49	20:15	19:25	18:38	19 08:37 (10)	17:03	17:00
21	07:42	07:10	07:48 (10)	06:27		06:38	06:03	05:54	06:10	06:39	07:09	07:39	08:19 (10)	07:15	07:42
	17:28	18:05	17 08:05 (10)	18:36		20:07	20:37	20:56	20:49	20:13	19:24	18:36	16 08:35 (10)	17:03	17:00
22	07:41	07:09	07:46 (10)	06:25		06:36	06:02	05:54	06:11	06:40	07:10	07:41	08:21 (10)	07:16	07:43
	17:29	18:06	21 08:07 (10)	18:37		20:08	20:38	20:57	20:48	20:12	19:22	18:35	11 08:32 (10)	17:02	17:01
23	07:40	07:07	07:45 (10)	06:24		06:35	06:02	05:54	06:12	06:41	07:11	07:42		07:17	07:43
	17:30	18:07	23 08:08 (10)	18:38		20:09	20:39	20:57	20:47	20:10	19:20	18:33		17:02	17:01
24	07:40	07:06	07:44 (10)	06:22		06:34	06:01	05:54	06:13	06:42	07:12	07:43		07:18	07:44
	17:31	18:08	25 08:09 (10)	18:39		20:10	20:40	20:57	20:46	20:09	19:19	18:32		17:01	17:02
25	07:39	07:04	07:42 (10)	06:20		06:32	06:00	05:54	06:14	06:43	07:13	06:44		07:19	07:44
	17:32	18:09	27 08:09 (10)	18:40		20:11	20:41	20:57	20:45	20:07	19:17	17:31		17:01	17:02
26	07:38	07:03	07:42 (10)	06:19		06:31	05:59	05:55	06:15	06:44	07:14	06:45		07:20	07:44
	17:34	18:11	28 08:10 (10)	18:41		20:13	20:42	20:57	20:45	20:06	19:15	17:29		17:00	17:03
27	07:38	07:01	07:41 (10)	06:17		06:29	05:59	05:55	06:16	06:45	07:15	06:46		07:22	07:45
	17:35	18:12	28 08:09 (10)	18:42		20:14	20:42	20:57	20:44	20:04	19:14	17:28		17:00	17:03
28	07:37	07:00	07:41 (10)	06:15		06:28	05:58	05:56	06:16	06:46	07:16	06:47		07:23	07:45
	17:36	18:13	29 08:10 (10)	18:43		20:15	20:43	20:57	20:43	20:03	19:12	17:27		16:59	17:04
29	07:36			07:14		06:27	05:58	05:56	06:17	06:47	07:17	06:48		07:24	07:45
	17:37			19:44		20:16	20:44	20:57	20:42	20:01	19:10	17:25		16:59	17:05
30	07:35			07:12		06:25	05:57	05:56	06:18	06:48	07:18	06:50		07:25	07:46
	17:38			19:45		20:17	20:45	20:57	20:41	20:00	19:09	17:24		16:58	17:06
31	07:34			07:10			05:57		06:19	06:49		06:51			07:46
	17:40			19:46			20:46		20:40	19:58		17:23			17:06
Potential sun hours	300	298		370		398	446	450	457	426	375	346		300	290
Total, worst case			212		204								425		
Sun reduction			0.43		0.47								0.56		
Oper. time red.			0.37		0.37								0.37		
Wind dir. red.			0.70		0.70								0.70		
Total reduction			0.11		0.12								0.15		
Total, real			24		25								62		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 71

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BG - R069

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April			May		June		July		August			September			October		November	December
1	07:46	17:07	07:33	17:41	06:58	18:14	07:09	19:47		06:24	20:18	05:56	20:46	05:57	20:57	06:20	20:39		06:50	19:57	20	18:52 (6) 19:12 (6)	07:19	19:07	06:52	17:22	07:26	16:58
2	07:46	17:08	07:32	17:42	06:57	18:15	07:07	19:48		06:23	20:19	05:56	20:47	05:57	20:57	06:21	20:38		06:51	19:55	19	18:52 (6) 19:11 (6)	07:20	19:06	06:53	17:20	07:27	16:58
3	07:46	17:09	07:32	17:43	06:55	18:16	07:06	19:49		06:22	20:20	05:55	20:48	05:58	20:57	06:22	20:37		06:52	19:53	15	18:54 (6) 19:09 (6)	07:21	19:04	06:54	17:19	07:28	16:58
4	07:46	17:10	07:31	17:44	06:54	18:17	07:04	19:50		06:20	20:21	05:55	20:48	05:58	20:57	06:23	20:35		06:53	19:52	10	18:56 (6) 19:06 (6)	07:22	19:02	06:55	17:18	07:29	16:57
5	07:46	17:11	07:30	17:46	06:52	18:18	07:02	19:51		06:19	20:22	05:55	20:49	05:59	20:56	06:24	20:34		06:54	19:50			07:23	19:01	06:56	17:17	07:30	16:57
6	07:46	17:12	07:28	17:47	06:51	18:20	07:01	19:52		06:18	20:23	05:54	20:50	05:59	20:56	06:25	20:33		06:55	19:49			07:24	18:59	06:58	17:16	07:31	16:57
7	07:46	17:13	07:27	17:48	06:49	18:21	06:59	19:53		06:17	20:24	05:54	20:50	06:00	20:56	06:26	20:32		06:56	19:47			07:25	18:57	06:59	17:15	07:32	16:57
8	07:46	17:14	07:26	17:49	06:48	18:22	06:58	19:54	10	18:59 (6) 19:09 (6)	06:16	05:54	20:25	06:01	20:51	06:27	20:31		06:57	19:45			07:26	18:56	07:00	17:14	07:33	16:57
9	07:46	17:15	07:25	17:51	06:46	18:23	06:56	19:55	15	18:56 (6) 19:11 (6)	06:15	05:54	20:26	06:01	20:52	06:28	20:30		06:57	19:44			07:27	18:54	07:01	17:13	07:33	16:57
10	07:46	17:16	07:24	17:52	06:45	18:24	06:54	19:56	19	18:54 (6) 19:13 (6)	06:13	05:53	20:27	06:02	20:52	06:29	20:28		06:58	19:42			07:28	18:53	07:02	17:12	07:34	16:57
11	07:46	17:17	07:23	17:53	06:43	18:25	06:53	19:57	20	18:53 (6) 19:13 (6)	06:12	05:53	20:28	06:03	20:53	06:30	20:27		06:59	19:40			07:29	18:51	07:03	17:11	07:35	16:57
12	07:46	17:18	07:22	17:54	06:41	18:26	06:51	19:58	22	18:52 (6) 19:14 (6)	06:11	05:53	20:29	06:03	20:54	06:31	20:26		07:00	19:39			07:30	18:50	07:05	17:10	07:36	16:57
13	07:45	17:19	07:20	17:55	06:40	18:27	06:50	19:59	23	18:51 (6) 19:14 (6)	06:10	05:53	20:30	06:04	20:54	06:31	20:25		07:01	19:37			07:31	18:48	07:06	17:09	07:37	16:57
14	07:45	17:20	07:19	17:57	06:38	18:28	06:48	20:00	24	18:51 (6) 19:15 (6)	06:09	05:53	20:31	06:05	20:54	06:32	20:23		07:02	19:35			07:32	18:47	07:07	17:08	07:38	16:58
15	07:45	17:21	07:18	17:58	06:37	18:29	06:47	20:01	24	18:50 (6) 19:14 (6)	06:08	05:53	20:32	06:05	20:54	06:33	20:22		07:03	19:34			07:33	18:45	07:08	17:07	07:38	16:58
16	07:44	17:22	07:17	17:59	06:35	18:30	06:45	20:02	24	18:50 (6) 19:14 (6)	06:07	05:53	20:33	06:06	20:55	06:34	20:20		07:04	19:32			07:34	18:43	07:09	17:06	07:39	16:58
17	07:44	17:23	07:15	18:00	06:33	18:31	06:44	20:03	23	18:50 (6) 19:13 (6)	06:06	05:53	20:34	06:07	20:55	06:35	20:19		07:05	19:30			07:35	18:42	07:10	17:06	07:40	16:58
18	07:43	17:24	07:14	18:01	06:32	18:32	06:42	20:04	23	18:50 (6) 19:13 (6)	06:06	05:53	20:34	06:08	20:56	06:36	20:18		07:06	19:29			07:36	18:41	07:12	17:05	07:40	16:59
19	07:43	17:25	07:13	18:02	06:30	18:33	06:41	20:05	22	18:50 (6) 19:12 (6)	06:05	05:53	20:35	06:09	20:56	06:37	20:16	2	19:05 (6) 19:07 (6)	07:07	19:27		07:37	18:39	07:13	17:04	07:41	16:59
20	07:42	17:27	07:11	18:04	06:28	18:34	06:39	20:06	20	18:51 (6) 19:11 (6)	06:04	05:53	20:36	06:09	20:56	06:38	20:15	11	19:00 (6) 19:11 (6)	07:08	19:25		07:38	18:38	07:14	17:03	07:42	17:00
21	07:42	17:28	07:10	18:05	06:27	18:36	06:38	20:07	17	18:52 (6) 19:09 (6)	06:03	05:53	20:37	06:10	20:56	06:39	20:13	15	18:58 (6) 19:13 (6)	07:09	19:24		07:39	18:36	07:15	17:03	07:42	17:00
22	07:41	17:29	07:09	18:06	06:25	18:37	06:36	20:08	15	18:53 (6) 19:08 (6)	06:02	05:54	20:38	06:11	20:57	06:40	20:12	18	18:56 (6) 19:14 (6)	07:10	19:22		07:41	18:35	07:16	17:02	07:43	17:00
23	07:41	17:30	07:07	18:07	06:24	18:38	06:35	20:09	10	18:56 (6) 19:06 (6)	06:02	05:54	20:39	06:12	20:57	06:41	20:10	20	18:55 (6) 19:15 (6)	07:11	19:20		07:42	18:33	07:17	17:02	07:43	17:01
24	07:40	17:31	07:06	18:08	06:22	18:39	06:34	20:10		06:01	20:40	05:54	20:57	06:13	20:46	06:42	20:09	22	18:54 (6) 19:16 (6)	07:12	19:19		07:43	18:32	07:18	17:01	07:44	17:02
25	07:39	17:32	07:04	18:09	06:20	18:40	06:32	20:11		06:00	20:41	05:54	20:57	06:14	20:45	06:43	20:07	23	18:53 (6) 19:16 (6)	07:13	19:17		07:44	18:31	07:19	17:00	07:44	17:02
26	07:38	17:34	07:03	18:11	06:19	18:41	06:31	20:13		05:59	20:42	05:55	20:57	06:15	20:45	06:44	20:06	23	18:53 (6) 19:16 (6)	07:14	19:15		07:45	17:29	07:21	17:00	07:44	17:03
27	07:38	17:35	07:01	18:12	06:17	18:42	06:29	20:14		05:59	20:42	05:55	20:57	06:15	20:44	06:45	20:04	24	18:52 (6) 19:16 (6)	07:15	19:14		07:46	17:28	07:22	17:00	07:45	17:03
28	07:37	17:36	07:00	18:13	06:15	18:43	06:28	20:15		05:58	20:43	05:55	20:57	06:16	20:43	06:46	20:03	24	18:52 (6) 19:16 (6)	07:16	19:12		07:47	17:27	07:23	16:59	07:45	17:04
29	07:36	17:37			07:14	19:44	06:27	20:16		05:58	20:44	05:56	20:57	06:17	20:42	06:47	20:01	23	18:52 (6) 19:15 (6)	07:17	19:10		07:48	17:25	07:24	16:59	07:45	17:05
30	07:35	17:38			07:12	19:45	06:25	20:17		05:57	20:45	05:56	20:57	06:18	20:41	06:48	20:00	23	18:51 (6) 19:14 (6)	07:18	19:09		07:50	17:24	07:25	16:58	07:46	17:06
31	07:34	17:40			07:10	19:46				05:57	20:46			06:19	20:40	06:49	19:58	22	18:51 (6) 19:13 (6)				06:51	17:23			07:46	17:06
Potential sun hours	300		298		370		398			446		450		457		426			375				346		300		290	
Total, worst case								311									250				64							
Sun reduction								0.51									0.72				0.64							
Oper. time red.								0.37									0.37				0.37							
Wind dir. red.								0.74									0.74				0.74							
Total reduction								0.14									0.20				0.18							
Total, real								44									50				11							

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 72
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BH - R090

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April	May	June	July	August	September	October		November	December	
1	07:46	07:33		06:58	07:38 (10)	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:26	
	17:07	17:41		18:14	29 08:07 (10)	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22	16:58	
2	07:46	07:32		06:57	07:38 (10)	07:07	06:23	05:56	05:57	06:21	06:51	07:20	08:22 (10)	06:53	07:27	
	17:08	17:42		18:15	30 08:08 (10)	19:48	20:19	20:47	20:57	20:38	19:55	19:06	12 08:34 (10)	17:20	16:58	
3	07:46	07:31		06:55	07:37 (10)	07:06	06:22	05:55	05:58	06:22	06:52	07:21	08:19 (10)	06:54	07:28	
	17:09	17:43		18:16	30 08:07 (10)	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17 08:36 (10)	17:19	16:58	
4	07:46	07:30		06:54	07:38 (10)	07:04	06:20	05:55	05:58	06:23	06:53	07:22	08:17 (10)	06:55	07:29	
	17:10	17:45		18:17	29 08:07 (10)	19:50	20:21	20:48	20:57	20:35	19:52	19:02	21 08:38 (10)	17:18	16:57	
5	07:46	07:29		06:52	07:37 (10)	07:02	06:19	05:55	05:59	06:24	06:54	07:23	08:17 (10)	06:56	07:30	
	17:11	17:46		18:18	29 08:06 (10)	19:51	20:22	20:49	20:56	20:34	19:50	19:01	23 08:40 (10)	17:17	16:57	
6	07:46	07:28		06:51	07:37 (10)	07:01	06:18	05:54	05:59	06:25	06:55	07:24	08:15 (10)	06:58	07:31	
	17:12	17:47		18:20	28 08:05 (10)	19:52	20:23	20:50	20:56	20:33	19:49	18:59	26 08:41 (10)	17:16	16:57	
7	07:46	07:27		06:49	07:38 (10)	06:59	06:17	05:54	06:00	06:26	06:56	07:25	08:14 (10)	06:59	07:32	
	17:13	17:48		18:21	27 08:05 (10)	19:53	20:24	20:50	20:56	20:32	19:47	18:57	27 08:41 (10)	17:15	16:57	
8	07:46	07:26		06:48	07:38 (10)	06:58	06:16	05:54	06:01	06:27	06:57	07:26	08:13 (10)	07:00	07:33	
	17:14	17:49		18:22	25 08:03 (10)	19:54	20:25	20:51	20:56	20:31	19:45	18:56	29 08:42 (10)	17:14	16:57	
9	07:46	07:25		06:46	07:40 (10)	06:56	06:15	05:54	06:01	06:28	06:57	07:27	08:13 (10)	07:01	07:33	
	17:15	17:51		18:23	22 08:02 (10)	19:55	20:26	20:51	20:55	20:30	19:44	18:54	29 08:42 (10)	17:13	16:57	
10	07:46	07:24		06:45	07:41 (10)	06:54	06:13	05:53	06:02	06:29	06:58	07:28	08:12 (10)	07:02	07:34	
	17:16	17:52		18:24	19 08:00 (10)	19:56	20:27	20:52	20:55	20:28	19:42	18:53	30 08:42 (10)	17:12	16:57	
11	07:46	07:23		06:43	07:44 (10)	06:53	06:12	05:53	06:03	06:30	06:59	07:29	08:12 (10)	07:03	07:35	
	17:17	17:53		18:25	14 07:58 (10)	19:57	20:28	20:53	20:54	20:27	19:40	18:51	29 08:41 (10)	17:11	16:57	
12	07:45	07:22		06:41	07:47 (10)	06:51	06:11	05:53	06:03	06:31	07:00	07:30	08:11 (10)	07:05	07:36	
	17:18	17:54		18:26	6 07:53 (10)	19:58	20:29	20:53	20:54	20:26	19:39	18:50	30 08:41 (10)	17:10	16:57	
13	07:45	07:20		06:40		06:50	06:10	05:53	06:04	06:32	07:01	07:31	08:11 (10)	07:06	07:37	
	17:19	17:55		18:27		19:59	20:30	20:54	20:54	20:24	19:37	18:48	30 08:41 (10)	17:09	16:58	
14	07:45	07:19		06:38		06:48	06:09	05:53	06:05	06:32	07:02	07:32	08:11 (10)	07:07	07:37	
	17:20	17:57		18:28		20:00	20:31	20:54	20:53	20:23	19:35	18:47	29 08:40 (10)	17:08	16:58	
15	07:45	07:18		06:37		06:47	06:08	05:53	06:06	06:33	07:03	07:33	08:12 (10)	07:08	07:38	
	17:21	17:58		18:29		20:01	20:32	20:54	20:52	20:22	19:34	18:45	27 08:39 (10)	17:07	16:58	
16	07:44	07:17		06:35		06:45	06:07	05:53	06:06	06:34	07:04	07:34	08:12 (10)	07:09	07:39	10:32 (9)
	17:22	17:59		18:30		20:02	20:33	20:55	20:52	20:20	19:32	18:43	26 08:38 (10)	17:06	16:58	6 10:38 (9)
17	07:44	07:15		06:33		06:44	06:06	05:53	06:07	06:35	07:05	07:35	08:13 (10)	07:10	07:40	10:31 (9)
	17:23	18:00		18:31		20:03	20:33	20:55	20:51	20:19	19:30	18:42	24 08:37 (10)	17:06	16:58	10 10:41 (9)
18	07:43	07:14		06:32		06:42	06:06	05:53	06:08	06:36	07:06	07:36	08:15 (10)	07:11	07:40	10:30 (9)
	17:24	18:01		18:32		20:04	20:34	20:56	20:51	20:18	19:29	18:41	21 08:36 (10)	17:05	16:59	11 10:41 (9)
19	07:43	07:13		06:30		06:41	06:05	05:53	06:09	06:37	07:07	07:37	08:16 (10)	07:13	07:41	10:30 (9)
	17:25	18:03		18:33		20:05	20:35	20:56	20:50	20:16	19:27	18:39	18 08:34 (10)	17:04	16:59	13 10:43 (9)
20	07:42	07:11		06:28		06:39	06:04	05:53	06:09	06:38	07:08	07:38	08:18 (10)	07:14	07:41	10:30 (9)
	17:27	18:04		18:34		20:06	20:36	20:56	20:49	20:15	19:25	18:38	13 08:31 (10)	17:03	17:00	13 10:43 (9)
21	07:42	07:10	07:50 (10)	06:27		06:38	06:03	05:54	06:10	06:39	07:09	07:39		07:15	07:42	10:30 (9)
	17:28	18:05	7 07:57 (10)	18:36		20:07	20:37	20:56	20:49	20:13	19:24	18:36		17:03	17:00	15 10:45 (9)
22	07:41	07:09	07:47 (10)	06:25		06:36	06:02	05:54	06:11	06:40	07:10	07:41		07:16	07:43	10:30 (9)
	17:29	18:06	15 08:02 (10)	18:37		20:08	20:38	20:57	20:48	20:12	19:22	18:35		17:02	17:01	15 10:45 (9)
23	07:40	07:07	07:44 (10)	06:24		06:35	06:02	05:54	06:12	06:41	07:11	07:42		07:17	07:43	10:32 (9)
	17:30	18:07	19 08:03 (10)	18:38		20:09	20:39	20:57	20:47	20:10	19:20	18:33		17:02	17:01	13 10:45 (9)
24	07:40	07:06	07:43 (10)	06:22		06:34	06:01	05:54	06:13	06:42	07:12	07:43		07:18	07:44	10:32 (9)
	17:31	18:08	22 08:05 (10)	18:39		20:10	20:40	20:57	20:46	20:09	19:19	18:32		17:01	17:02	13 10:45 (9)
25	07:39	07:04	07:41 (10)	06:20		06:32	06:00	05:54	06:14	06:43	07:13	06:44		07:19	07:44	10:34 (9)
	17:32	18:09	24 08:05 (10)	18:40		20:11	20:41	20:57	20:45	20:07	19:17	17:31		17:01	17:02	12 10:46 (9)
26	07:38	07:03	07:40 (10)	06:19		06:31	05:59	05:55	06:15	06:44	07:14	06:45		07:20	07:44	10:35 (9)
	17:34	18:11	27 08:07 (10)	18:41		20:13	20:42	20:57	20:45	20:06	19:15	17:29		17:00	17:03	10 10:45 (9)
27	07:38	07:01	07:39 (10)	06:17		06:29	05:59	05:55	06:16	06:45	07:15	06:46		07:22	07:45	10:36 (9)
	17:35	18:12	28 08:07 (10)	18:42		20:14	20:42	20:57	20:44	20:04	19:14	17:28		17:00	17:03	8 10:44 (9)
28	07:37	07:00	07:39 (10)	06:15		06:28	05:58	05:56	06:16	06:46	07:16	06:47		07:23	07:45	
	17:36	18:13	29 08:08 (10)	18:43		20:15	20:43	20:57	20:43	20:03	19:12	17:27		16:59	17:04	
29	07:36			07:14		06:27	05:58	05:56	06:17	06:47	07:17	06:48		07:24	07:45	
	17:37			19:44		20:16	20:44	20:57	20:42	20:01	19:10	17:25		16:59	17:05	
30	07:35			07:12		06:25	05:57	05:56	06:18	06:48	07:18	06:50		07:25	07:46	
	17:38			19:45		20:17	20:45	20:57	20:41	20:00	19:09	17:24		16:58	17:06	
31	07:34			07:10			05:57		06:19	06:49		06:51			07:46	
	17:40			19:46			20:46		20:40	19:58		17:23			17:06	
Potential sun hours	300	298		370		398	446	450	457	426	375	346		300	290	
Total, worst case			171		288								461			139
Sun reduction			0.43		0.47								0.56			0.41
Oper. time red.			0.37		0.37								0.37			0.37
Wind dir. red.			0.71		0.71								0.71			0.52
Total reduction			0.11		0.12								0.15			0.08
Total, real			19		36								67			11

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 73
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BI - R075

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May			June		
1	07:46		13:03 (8)	07:33	06:58	07:09	06:24			05:56		19:21 (6)
	17:07	27	13:30 (8)	17:41	18:14	19:47	20:18			20:46	3	19:24 (6)
2	07:46		13:04 (8)	07:32	06:57	07:07	06:23			05:56		
	17:08	25	13:29 (8)	17:42	18:15	19:48	20:19			20:47		
3	07:46		13:06 (8)	07:32	06:55	07:06	06:22			05:55		
	17:09	23	13:29 (8)	17:43	18:16	19:49	20:20			20:48		
4	07:46		13:08 (8)	07:31	06:54	07:04	06:20			05:55		
	17:10	20	13:28 (8)	17:45	18:17	19:50	20:21			20:48		
5	07:46		13:11 (8)	07:29	06:52	07:02	06:19			05:55		
	17:11	15	13:26 (8)	17:46	18:18	19:51	20:22			20:49		
6	07:46		13:15 (8)	07:28	06:51	07:01	06:18			05:54		
	17:12	8	13:23 (8)	17:47	18:20	19:52	20:23			20:50		
7	07:46			07:27	06:49	06:59	06:17		19:16 (6)	05:54		
	17:13			17:48	18:21	19:53	20:24	10	19:26 (6)	20:50		
8	07:46			07:26	06:48	06:58	06:16		19:14 (6)	05:54		
	17:14			17:49	18:22	19:54	20:25	14	19:28 (6)	20:51		
9	07:46			07:25	06:46	06:56	06:15		19:13 (6)	05:54		
	17:15			17:51	18:23	19:55	20:26	16	19:29 (6)	20:52		
10	07:46			07:24	06:45	06:54	06:13		19:12 (6)	05:53		
	17:16			17:52	18:24	19:56	20:27	18	19:30 (6)	20:52		
11	07:46			07:23	06:43	06:53	06:12		19:11 (6)	05:53		
	17:17			17:53	18:25	19:57	20:28	20	19:31 (6)	20:53		
12	07:46			07:22	06:41	06:51	06:11		19:10 (6)	05:53		
	17:18			17:54	18:26	19:58	20:29	21	19:31 (6)	20:53		
13	07:45			07:20	06:40	06:50	06:10		19:10 (6)	05:53		
	17:19			17:55	18:27	19:59	20:30	22	19:32 (6)	20:54		
14	07:45			07:19	06:38	06:48	06:09		19:10 (6)	05:53		
	17:20			17:57	18:28	20:00	20:31	22	19:32 (6)	20:54		
15	07:45			07:18	06:37	06:47	06:08		19:09 (6)	05:53		
	17:21			17:58	18:29	20:01	20:32	23	19:32 (6)	20:54		
16	07:44			07:17	06:35	06:45	06:07		19:09 (6)	05:53		
	17:22			17:59	18:30	20:02	20:33	23	19:32 (6)	20:55		
17	07:44			07:15	06:33	06:44	06:06		19:10 (6)	05:53		
	17:23			18:00	18:31	20:03	20:34	23	19:33 (6)	20:55		
18	07:43			07:14	06:32	06:42	06:06		19:10 (6)	05:53		
	17:24			18:01	18:32	20:04	20:34	23	19:33 (6)	20:56		
19	07:43			07:13	06:30	06:41	06:05		19:10 (6)	05:53		
	17:25			18:02	18:33	20:05	20:35	23	19:33 (6)	20:56		
20	07:42			07:11	06:28	06:39	06:04		19:10 (6)	05:53		
	17:27			18:04	18:34	20:06	20:36	22	19:32 (6)	20:56		
21	07:42			07:10	06:27	06:38	06:03		19:10 (6)	05:53		
	17:28			18:05	18:36	20:07	20:37	22	19:32 (6)	20:56		
22	07:41			07:09	06:25	06:36	06:02		19:11 (6)	05:54		
	17:29			18:06	18:37	20:08	20:38	21	19:32 (6)	20:57		
23	07:41			07:07	06:24	06:35	06:02		19:11 (6)	05:54		
	17:30			18:07	18:38	20:09	20:39	21	19:32 (6)	20:57		
24	07:40			07:06	06:22	06:34	06:01		19:11 (6)	05:54		
	17:31			18:08	18:39	20:10	20:40	20	19:31 (6)	20:57		
25	07:39			07:04	06:20	06:32	06:00		19:13 (6)	05:54		
	17:32			18:09	18:40	20:11	20:41	18	19:31 (6)	20:57		
26	07:38			07:03	06:19	06:31	05:59		19:13 (6)	05:55		
	17:34			18:11	18:41	20:13	20:42	17	19:30 (6)	20:57		
27	07:38			07:01	06:17	06:29	05:59		19:14 (6)	05:55		
	17:35			18:12	18:42	20:14	20:42	16	19:30 (6)	20:57		
28	07:37			07:00	06:15	06:28	05:58		19:15 (6)	05:55		
	17:36			18:13	18:43	20:15	20:43	14	19:29 (6)	20:57		
29	07:36				07:14	06:27	05:58		19:16 (6)	05:56		
	17:37				19:44	20:16	20:44	13	19:29 (6)	20:57		
30	07:35				07:12	06:25	05:57		19:17 (6)	05:56		
	17:38				19:45	20:17	20:45	11	19:28 (6)	20:57		
31	07:34				07:10		05:57		19:19 (6)			
	17:40				19:46		20:46	8	19:27 (6)			
Potential sun hours	300			298	370	398	446			450		
Total, worst case		118						461			3	
Sun reduction		0.40						0.58			0.67	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.53						0.71			0.71	
Total reduction		0.08						0.15			0.17	
Total, real		9						69			1	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 74

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BI - R075

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September	October	November	December	
1	05:57		06:20	19:21 (6)	06:50	07:19	06:52	07:26	
	20:57		20:39	21 19:42 (6)	19:57	19:07	17:22	16:58	
2	05:57		06:21	19:22 (6)	06:51	07:20	06:53	07:27	
	20:57		20:38	19 19:41 (6)	19:55	19:06	17:20	16:58	
3	05:58		06:22	19:23 (6)	06:52	07:21	06:54	07:28	
	20:57		20:37	17 19:40 (6)	19:53	19:04	17:19	16:58	
4	05:58		06:23	19:24 (6)	06:53	07:22	06:55	07:29	
	20:57		20:35	15 19:39 (6)	19:52	19:02	17:18	16:57	
5	05:59		06:24	19:24 (6)	06:54	07:23	06:56	07:30	
	20:56		20:34	13 19:37 (6)	19:50	19:01	17:17	16:57	
6	05:59		06:25	19:27 (6)	06:55	07:24	06:58	07:31	13:01 (8)
	20:56		20:33	7 19:34 (6)	19:49	18:59	17:16	16:57	8 13:09 (8)
7	06:00		06:26		06:56	07:25	06:59	07:32	12:58 (8)
	20:56		20:32		19:47	18:57	17:15	16:57	15 13:13 (8)
8	06:01		06:27		06:57	07:26	07:00	07:33	12:56 (8)
	20:56		20:31		19:45	18:56	17:14	16:57	19 13:15 (8)
9	06:01		06:28		06:57	07:27	07:01	07:33	12:55 (8)
	20:55		20:30		19:44	18:54	17:13	16:57	23 13:18 (8)
10	06:02		06:29		06:58	07:28	07:02	07:34	12:54 (8)
	20:55		20:28		19:42	18:53	17:12	16:57	25 13:19 (8)
11	06:03		06:30		06:59	07:29	07:03	07:35	12:53 (8)
	20:54		20:27		19:40	18:51	17:11	16:57	27 13:20 (8)
12	06:03	19:28 (6)	06:31		07:00	07:30	07:05	07:36	12:52 (8)
	20:54	6 19:34 (6)	20:26		19:39	18:50	17:10	16:57	29 13:21 (8)
13	06:04	19:26 (6)	06:31		07:01	07:31	07:06	07:37	12:52 (8)
	20:54	9 19:35 (6)	20:24		19:37	18:48	17:09	16:57	31 13:23 (8)
14	06:05	19:25 (6)	06:32		07:02	07:32	07:07	07:38	12:52 (8)
	20:53	12 19:37 (6)	20:23		19:35	18:47	17:08	16:58	32 13:24 (8)
15	06:05	19:25 (6)	06:33		07:03	07:33	07:08	07:38	12:52 (8)
	20:53	13 19:38 (6)	20:22		19:34	18:45	17:07	16:58	32 13:24 (8)
16	06:06	19:23 (6)	06:34		07:04	07:34	07:09	07:39	12:52 (8)
	20:52	15 19:38 (6)	20:20		19:32	18:43	17:06	16:58	34 13:26 (8)
17	06:07	19:23 (6)	06:35		07:05	07:35	07:10	07:40	12:52 (8)
	20:51	16 19:39 (6)	20:19		19:30	18:42	17:06	16:58	35 13:27 (8)
18	06:08	19:22 (6)	06:36		07:06	07:36	07:12	07:40	12:52 (8)
	20:51	18 19:40 (6)	20:18		19:29	18:41	17:05	16:59	35 13:27 (8)
19	06:09	19:22 (6)	06:37		07:07	07:37	07:13	07:41	12:52 (8)
	20:50	19 19:41 (6)	20:16		19:27	18:39	17:04	16:59	36 13:28 (8)
20	06:09	19:22 (6)	06:38		07:08	07:38	07:14	07:41	12:53 (8)
	20:49	20 19:42 (6)	20:15		19:25	18:38	17:03	17:00	36 13:29 (8)
21	06:10	19:21 (6)	06:39		07:09	07:39	07:15	07:42	12:53 (8)
	20:49	21 19:42 (6)	20:13		19:24	18:36	17:03	17:00	36 13:29 (8)
22	06:11	19:21 (6)	06:40		07:10	07:41	07:16	07:43	12:53 (8)
	20:48	21 19:42 (6)	20:12		19:22	18:35	17:02	17:01	36 13:29 (8)
23	06:12	19:20 (6)	06:41		07:11	07:42	07:17	07:43	12:54 (8)
	20:47	23 19:43 (6)	20:10		19:20	18:33	17:02	17:01	36 13:30 (8)
24	06:13	19:20 (6)	06:42		07:12	07:43	07:18	07:44	12:54 (8)
	20:46	23 19:43 (6)	20:09		19:19	18:32	17:01	17:02	36 13:30 (8)
25	06:14	19:20 (6)	06:43		07:13	06:44	07:19	07:44	12:56 (8)
	20:45	23 19:43 (6)	20:07		19:17	17:31	17:00	17:02	35 13:31 (8)
26	06:15	19:20 (6)	06:44		07:14	06:45	07:21	07:44	12:56 (8)
	20:45	24 19:44 (6)	20:06		19:15	17:29	17:00	17:03	35 13:31 (8)
27	06:15	19:20 (6)	06:45		07:15	06:46	07:22	07:45	12:57 (8)
	20:44	23 19:43 (6)	20:04		19:14	17:28	17:00	17:03	34 13:31 (8)
28	06:16	19:20 (6)	06:46		07:16	06:47	07:23	07:45	12:58 (8)
	20:43	23 19:43 (6)	20:03		19:12	17:27	16:59	17:04	33 13:31 (8)
29	06:17	19:20 (6)	06:47		07:17	06:48	07:24	07:45	12:59 (8)
	20:42	23 19:43 (6)	20:01		19:10	17:25	16:59	17:05	32 13:31 (8)
30	06:18	19:20 (6)	06:48		07:18	06:50	07:25	07:46	13:00 (8)
	20:41	23 19:43 (6)	20:00		19:09	17:24	16:58	17:06	31 13:31 (8)
31	06:19	19:21 (6)	06:49			06:51		07:46	13:01 (8)
	20:40	21 19:42 (6)	19:58			17:23		17:06	30 13:31 (8)
Potential sun hours	457		426		375	346	300	290	
Total, worst case		376		92				791	
Sun reduction		0.75		0.72				0.41	
Oper. time red.		0.37		0.37				0.37	
Wind dir. red.		0.71		0.71				0.53	
Total reduction		0.19		0.19				0.08	
Total, real		73		17				63	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 75
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BJ - R076

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May			June		
1	07:46		12:54 (8)	07:33	06:58	07:09	06:24			05:56		19:16 (6)
	17:07	49	13:43 (8)	17:41	18:14	19:47	20:18			20:46	15	19:31 (6)
2	07:46		12:54 (8)	07:32	06:57	07:07	06:23			05:56		19:18 (6)
	17:08	49	13:43 (8)	17:42	18:15	19:48	20:19			20:47	13	19:31 (6)
3	07:46		12:55 (8)	07:32	06:55	07:06	06:22			05:55		19:19 (6)
	17:09	48	13:43 (8)	17:43	18:16	19:49	20:20			20:48	11	19:30 (6)
4	07:46		12:56 (8)	07:31	06:54	07:04	06:20			05:55		19:19 (6)
	17:10	47	13:43 (8)	17:45	18:17	19:50	20:21			20:48	10	19:29 (6)
5	07:46		12:58 (8)	07:29	06:52	07:02	06:19			05:55		19:21 (6)
	17:11	44	13:42 (8)	17:46	18:18	19:51	20:22			20:49	7	19:28 (6)
6	07:46		12:59 (8)	07:28	06:51	07:01	06:18			05:54		19:24 (6)
	17:12	43	13:42 (8)	17:47	18:20	19:52	20:23			20:50	2	19:26 (6)
7	07:46		13:00 (8)	07:27	06:49	06:59	06:17			05:54		
	17:13	42	13:42 (8)	17:48	18:21	19:53	20:24			20:50		
8	07:46		13:02 (8)	07:26	06:48	06:58	06:16			05:54		
	17:14	40	13:42 (8)	17:49	18:22	19:54	20:25			20:51		
9	07:46		13:04 (8)	07:25	06:46	06:56	06:15		19:18 (6)	05:54		
	17:15	38	13:42 (8)	17:51	18:23	19:55	20:26	8	19:26 (6)	20:52		
10	07:46		13:04 (8)	07:24	06:45	06:54	06:13		19:16 (6)	05:53		
	17:16	36	13:40 (8)	17:52	18:24	19:56	20:27	12	19:28 (6)	20:52		
11	07:46		13:07 (8)	07:23	06:43	06:53	06:12		19:14 (6)	05:53		
	17:17	33	13:40 (8)	17:53	18:25	19:57	20:28	16	19:30 (6)	20:53		
12	07:46		13:09 (8)	07:22	06:41	06:51	06:11		19:13 (6)	05:53		
	17:18	30	13:39 (8)	17:54	18:26	19:58	20:29	18	19:31 (6)	20:53		
13	07:45		13:11 (8)	07:20	06:40	06:50	06:10		19:12 (6)	05:53		
	17:19	26	13:37 (8)	17:55	18:27	19:59	20:30	20	19:32 (6)	20:54		
14	07:45		13:14 (8)	07:19	06:38	06:48	06:09		19:12 (6)	05:53		
	17:20	21	13:35 (8)	17:57	18:28	20:00	20:31	20	19:32 (6)	20:54		
15	07:45		13:19 (8)	07:18	06:37	06:47	06:08		19:11 (6)	05:53		
	17:21	14	13:33 (8)	17:58	18:29	20:01	20:32	22	19:33 (6)	20:54		
16	07:44			07:17	06:35	06:45	06:07		19:11 (6)	05:53		
	17:22			17:59	18:30	20:02	20:33	22	19:33 (6)	20:55		
17	07:44			07:15	06:33	06:44	06:06		19:11 (6)	05:53		
	17:23			18:00	18:31	20:03	20:34	23	19:34 (6)	20:55		
18	07:43			07:14	06:32	06:42	06:06		19:11 (6)	05:53		
	17:24			18:01	18:32	20:04	20:34	23	19:34 (6)	20:56		
19	07:43			07:13	06:30	06:41	06:05		19:11 (6)	05:53		
	17:25			18:02	18:33	20:05	20:35	23	19:34 (6)	20:56		
20	07:42			07:11	06:28	06:39	06:04		19:11 (6)	05:53		
	17:27			18:04	18:34	20:06	20:36	23	19:34 (6)	20:56		
21	07:42			07:10	06:27	06:38	06:03		19:11 (6)	05:53		
	17:28			18:05	18:36	20:07	20:37	23	19:34 (6)	20:56		
22	07:41			07:09	06:25	06:36	06:02		19:11 (6)	05:54		
	17:29			18:06	18:37	20:08	20:38	23	19:34 (6)	20:57		
23	07:41			07:07	06:24	06:35	06:02		19:11 (6)	05:54		
	17:30			18:07	18:38	20:09	20:39	23	19:34 (6)	20:57		
24	07:40			07:06	06:22	06:34	06:01		19:11 (6)	05:54		
	17:31			18:08	18:39	20:10	20:40	22	19:33 (6)	20:57		
25	07:39			07:04	06:20	06:32	06:00		19:12 (6)	05:54		
	17:32			18:09	18:40	20:11	20:41	22	19:34 (6)	20:57		
26	07:38			07:03	06:19	06:31	05:59		19:12 (6)	05:55		
	17:34			18:11	18:41	20:13	20:42	21	19:33 (6)	20:57		
27	07:38			07:01	06:17	06:29	05:59		19:13 (6)	05:55		
	17:35			18:12	18:42	20:14	20:42	20	19:33 (6)	20:57		
28	07:37			07:00	06:15	06:28	05:58		19:14 (6)	05:55		
	17:36			18:13	18:43	20:15	20:43	19	19:33 (6)	20:57		
29	07:36				07:14	06:27	05:58		19:15 (6)	05:56		
	17:37				19:44	20:16	20:44	18	19:33 (6)	20:57		
30	07:35				07:12	06:25	05:57		19:15 (6)	05:56		
	17:38				19:45	20:17	20:45	17	19:32 (6)	20:57		
31	07:34				07:10		05:57		19:16 (6)			
	17:40				19:46		20:46	16	19:32 (6)			
Potential sun hours	300			298	370	398	446			450		
Total, worst case		560						454			58	
Sun reduction		0.40						0.58			0.67	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.54						0.71			0.71	
Total reduction		0.08						0.15			0.17	
Total, real		44						68			10	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 76

Licensed user:
Ing. Bruno Manca
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IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BJ - R076

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August			September	October	November			December		
1	05:57			06:20		19:24 (6)	06:50	07:19	06:52			07:26		12:49 (8)
	20:57			20:39	17	19:41 (6)	19:57	19:07	17:22			16:58	33	13:22 (8)
2	05:57			06:21		19:26 (6)	06:51	07:20	06:53			07:27		12:48 (8)
	20:57			20:38	14	19:40 (6)	19:55	19:06	17:20			16:58	35	13:23 (8)
3	05:58			06:22		19:27 (6)	06:52	07:21	06:54			07:28		12:47 (8)
	20:57			20:37	11	19:38 (6)	19:53	19:04	17:19			16:58	38	13:25 (8)
4	05:58			06:23		19:30 (6)	06:53	07:22	06:55			07:29		12:46 (8)
	20:57			20:35	5	19:35 (6)	19:52	19:02	17:18			16:57	40	13:26 (8)
5	05:59			06:24			06:54	07:23	06:56			07:30		12:45 (8)
	20:56			20:34			19:50	19:01	17:17			16:57	42	13:27 (8)
6	05:59			06:25			06:55	07:24	06:58			07:31		12:45 (8)
	20:56			20:33			19:49	18:59	17:16			16:57	43	13:28 (8)
7	06:00		19:28 (6)	06:26			06:56	07:25	06:59			07:32		12:45 (8)
	20:56	5	19:33 (6)	20:32			19:47	18:57	17:15			16:57	44	13:29 (8)
8	06:01		19:27 (6)	06:27			06:57	07:26	07:00			07:33		12:45 (8)
	20:56	8	19:35 (6)	20:31			19:45	18:56	17:14			16:57	46	13:31 (8)
9	06:01		19:26 (6)	06:28			06:57	07:27	07:01			07:33		12:44 (8)
	20:55	10	19:36 (6)	20:30			19:44	18:54	17:13			16:57	48	13:32 (8)
10	06:02		19:25 (6)	06:29			06:58	07:28	07:02			07:34		12:44 (8)
	20:55	12	19:37 (6)	20:28			19:42	18:53	17:12			16:57	49	13:33 (8)
11	06:03		19:25 (6)	06:30			06:59	07:29	07:03			07:35		12:44 (8)
	20:54	14	19:39 (6)	20:27			19:40	18:51	17:11			16:57	49	13:33 (8)
12	06:03		19:25 (6)	06:31			07:00	07:30	07:05			07:36		12:44 (8)
	20:54	15	19:40 (6)	20:26			19:39	18:50	17:10			16:57	50	13:34 (8)
13	06:04		19:23 (6)	06:31			07:01	07:31	07:06			07:37		12:44 (8)
	20:54	17	19:40 (6)	20:24			19:37	18:48	17:09			16:57	51	13:35 (8)
14	06:05		19:23 (6)	06:32			07:02	07:32	07:07			07:38		12:45 (8)
	20:53	18	19:41 (6)	20:23			19:35	18:47	17:08			16:58	50	13:35 (8)
15	06:05		19:23 (6)	06:33			07:03	07:33	07:08			07:38		12:44 (8)
	20:53	19	19:42 (6)	20:22			19:34	18:45	17:07			16:58	51	13:35 (8)
16	06:06		19:22 (6)	06:34			07:04	07:34	07:09			07:39		12:45 (8)
	20:52	20	19:42 (6)	20:20			19:32	18:43	17:06			16:58	51	13:36 (8)
17	06:07		19:22 (6)	06:35			07:05	07:35	07:10			07:40		12:45 (8)
	20:51	20	19:42 (6)	20:19			19:30	18:42	17:06			16:58	52	13:37 (8)
18	06:08		19:22 (6)	06:36			07:06	07:36	07:12			07:40		12:45 (8)
	20:51	21	19:43 (6)	20:18			19:29	18:41	17:05			16:59	52	13:37 (8)
19	06:09		19:22 (6)	06:37			07:07	07:37	07:13			07:41		12:46 (8)
	20:50	22	19:44 (6)	20:16			19:27	18:39	17:04			16:59	52	13:38 (8)
20	06:09		19:22 (6)	06:38			07:08	07:38	07:14			07:41		12:46 (8)
	20:49	22	19:44 (6)	20:15			19:25	18:38	17:03			17:00	53	13:39 (8)
21	06:10		19:21 (6)	06:39			07:09	07:39	07:15			07:42		12:46 (8)
	20:49	23	19:44 (6)	20:13			19:24	18:36	17:03			17:00	53	13:39 (8)
22	06:11		19:21 (6)	06:40			07:10	07:41	07:16			07:43		12:46 (8)
	20:48	23	19:44 (6)	20:12			19:22	18:35	17:02			17:01	53	13:39 (8)
23	06:12		19:21 (6)	06:41			07:11	07:42	07:17			07:43		12:47 (8)
	20:47	23	19:44 (6)	20:10			19:20	18:33	17:02			17:01	53	13:40 (8)
24	06:13		19:21 (6)	06:42			07:12	07:43	07:18			07:44		12:48 (8)
	20:46	23	19:44 (6)	20:09			19:19	18:32	17:01			17:02	52	13:40 (8)
25	06:14		19:21 (6)	06:43			07:13	06:44	07:19			07:44		12:49 (8)
	20:45	24	19:45 (6)	20:07			19:17	17:31	17:00			17:02	52	13:41 (8)
26	06:15		19:22 (6)	06:44			07:14	06:45	07:21			07:44		12:49 (8)
	20:45	23	19:45 (6)	20:06			19:15	17:29	17:00			17:03	52	13:41 (8)
27	06:15		19:21 (6)	06:45			07:15	06:46	07:22		12:58 (8)	07:45		12:49 (8)
	20:44	22	19:43 (6)	20:04			19:14	17:28	17:00	13	13:11 (8)	17:03	52	13:41 (8)
28	06:16		19:22 (6)	06:46			07:16	06:47	07:23		12:54 (8)	07:45		12:51 (8)
	20:43	21	19:43 (6)	20:03			19:12	17:27	16:59	21	13:15 (8)	17:04	51	13:42 (8)
29	06:17		19:22 (6)	06:47			07:17	06:48	07:24		12:52 (8)	07:45		12:51 (8)
	20:42	21	19:43 (6)	20:01			19:10	17:25	16:59	26	13:18 (8)	17:05	51	13:42 (8)
30	06:18		19:23 (6)	06:48			07:18	06:50	07:25		12:50 (8)	07:46		12:52 (8)
	20:41	20	19:43 (6)	20:00			19:09	17:24	16:58	30	13:20 (8)	17:06	51	13:43 (8)
31	06:19		19:23 (6)	06:49				06:51				07:46		12:53 (8)
	20:40	19	19:42 (6)	19:58				17:23				17:06	50	13:43 (8)
Potential sun hours	457			426			375	346	300			290		
Total, worst case		465			47					90			1499	
Sun reduction		0.75			0.72					0.48			0.41	
Oper. time red.		0.37			0.37					0.37			0.37	
Wind dir. red.		0.71			0.71					0.54			0.54	
Total reduction		0.19			0.19					0.09			0.08	
Total, real		90			9					8			120	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 77

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BK - R079

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February		March		April		May			June		
1	07:46		12:53 (8)	07:33		06:58		07:09		06:24			05:56		19:16 (6)
	17:07	67	14:00 (8)	17:41		18:14		19:47		20:18			20:46	21	19:37 (6)
2	07:46		12:54 (8)	07:32		06:57		07:07		06:23			05:56		19:17 (6)
	17:08	66	14:00 (8)	17:42		18:15		19:48		20:19			20:47	20	19:37 (6)
3	07:46		12:54 (8)	07:32		06:55		07:06		06:22			05:55		19:18 (6)
	17:09	67	14:01 (8)	17:43		18:16		19:49		20:20			20:48	19	19:37 (6)
4	07:46		12:55 (8)	07:31		06:54		07:04		06:20			05:55		19:18 (6)
	17:10	66	14:01 (8)	17:45		18:17		19:50		20:21			20:48	18	19:36 (6)
5	07:46		12:56 (8)	07:29		06:52		07:02		06:19			05:55		19:18 (6)
	17:11	65	14:01 (8)	17:46		18:18		19:51		20:22			20:49	19	19:37 (6)
6	07:46		12:56 (8)	07:28		06:51		07:01		06:18			05:54		19:19 (6)
	17:12	66	14:02 (8)	17:47		18:20		19:52		20:23			20:50	18	19:37 (6)
7	07:46		12:57 (8)	07:27		06:49		06:59		06:17			05:54		19:19 (6)
	17:13	65	14:02 (8)	17:48		18:21		19:53		20:24			20:50	17	19:36 (6)
8	07:46		12:58 (8)	07:26		06:48		06:58		06:16			05:54		19:20 (6)
	17:14	64	14:02 (8)	17:49		18:22		19:54		20:25			20:51	16	19:36 (6)
9	07:46		12:59 (8)	07:25		06:46		06:56		06:15			05:54		19:20 (6)
	17:15	64	14:03 (8)	17:51		18:23		19:55		20:26			20:52	16	19:36 (6)
10	07:46		12:59 (8)	07:24		06:45		06:54		06:13			05:53		19:21 (6)
	17:16	63	14:02 (8)	17:52		18:24		19:56		20:27			20:52	15	19:36 (6)
11	07:46		13:00 (8)	07:23		06:43		06:53		06:12			05:53		19:22 (6)
	17:17	62	14:02 (8)	17:53		18:25		19:57		20:28			20:53	13	19:35 (6)
12	07:46		13:02 (8)	07:22		06:41		06:51		06:11			05:53		19:23 (6)
	17:18	61	14:03 (8)	17:54		18:26		19:58		20:29			20:53	12	19:35 (6)
13	07:45		13:02 (8)	07:20		06:40		06:50		06:10		19:21 (6)	05:53		19:23 (6)
	17:19	60	14:02 (8)	17:55		18:27		19:59		20:30	8	19:29 (6)	20:54	12	19:35 (6)
14	07:45		13:03 (8)	07:19		06:38		06:48		06:09		19:19 (6)	05:53		19:24 (6)
	17:20	59	14:02 (8)	17:57		18:28		20:00		20:31	12	19:31 (6)	20:54	11	19:35 (6)
15	07:45		13:05 (8)	07:18		06:37		06:47		06:08		19:17 (6)	05:53		19:24 (6)
	17:21	58	14:03 (8)	17:58		18:29		20:01		20:32	15	19:32 (6)	20:54	11	19:35 (6)
16	07:44		13:05 (8)	07:17		06:35		06:45		06:07		19:16 (6)	05:53		19:25 (6)
	17:22	57	14:02 (8)	17:59		18:30		20:02		20:33	17	19:33 (6)	20:55	10	19:35 (6)
17	07:44		13:07 (8)	07:15		06:33		06:44		06:06		19:16 (6)	05:53		19:25 (6)
	17:23	55	14:02 (8)	18:00		18:31		20:03		20:34	19	19:35 (6)	20:55	10	19:35 (6)
18	07:43		13:08 (8)	07:14		06:32		06:42		06:06		19:16 (6)	05:53		19:26 (6)
	17:24	53	14:01 (8)	18:01		18:32		20:04		20:34	19	19:35 (6)	20:56	8	19:34 (6)
19	07:43		13:09 (8)	07:13		06:30		06:41		06:05		19:15 (6)	05:53		19:26 (6)
	17:25	51	14:00 (8)	18:02		18:33		20:05		20:35	21	19:36 (6)	20:56	8	19:34 (6)
20	07:42		13:11 (8)	07:11		06:28		06:39		06:04		19:14 (6)	05:53		19:26 (6)
	17:27	49	14:00 (8)	18:04		18:34		20:06		20:36	22	19:36 (6)	20:56	8	19:34 (6)
21	07:42		13:12 (8)	07:10		06:27		06:38		06:03		19:14 (6)	05:53		19:27 (6)
	17:28	47	13:59 (8)	18:05		18:36		20:07		20:37	22	19:36 (6)	20:56	8	19:35 (6)
22	07:41		13:15 (8)	07:09		06:25		06:36		06:02		19:14 (6)	05:54		19:27 (6)
	17:29	44	13:59 (8)	18:06		18:37		20:08		20:38	23	19:37 (6)	20:57	8	19:35 (6)
23	07:41		13:16 (8)	07:07		06:24		06:35		06:02		19:14 (6)	05:54		19:27 (6)
	17:30	42	13:58 (8)	18:07		18:38		20:09		20:39	23	19:37 (6)	20:57	8	19:35 (6)
24	07:40		13:18 (8)	07:06		06:22		06:34		06:01		19:14 (6)	05:54		19:27 (6)
	17:31	38	13:56 (8)	18:08		18:39		20:10		20:40	23	19:37 (6)	20:57	8	19:35 (6)
25	07:39		13:21 (8)	07:04		06:20		06:32		06:00		19:14 (6)	05:54		19:27 (6)
	17:32	33	13:54 (8)	18:09		18:40		20:11		20:41	23	19:37 (6)	20:57	9	19:36 (6)
26	07:38		13:25 (8)	07:03		06:19		06:31		05:59		19:14 (6)	05:55		19:27 (6)
	17:34	28	13:53 (8)	18:11		18:41		20:13		20:42	23	19:37 (6)	20:57	10	19:37 (6)
27	07:38		13:29 (8)	07:01		06:17		06:29		05:59		19:15 (6)	05:55		19:27 (6)
	17:35	20	13:49 (8)	18:12		18:42		20:14		20:42	23	19:38 (6)	20:57	10	19:37 (6)
28	07:37		13:35 (8)	07:00		06:15		06:28		05:58		19:15 (6)	05:55		19:27 (6)
	17:36	8	13:43 (8)	18:13		18:43		20:15		20:43	22	19:37 (6)	20:57	11	19:38 (6)
29	07:36					07:14		06:27		05:58		19:16 (6)	05:56		19:26 (6)
	17:37					19:44		20:16		20:44	22	19:38 (6)	20:57	12	19:38 (6)
30	07:35					07:12		06:25		05:57		19:15 (6)	05:56		19:27 (6)
	17:38					19:45		20:17		20:45	22	19:37 (6)	20:57	12	19:39 (6)
31	07:34					07:10				05:57		19:16 (6)			
	17:40					19:46				20:46	21	19:37 (6)			
Potential sun hours	300			298		370		398		446			450		
Total, worst case		1478									380			378	
Sun reduction		0.40									0.58			0.67	
Oper. time red.		0.37									0.37			0.37	
Wind dir. red.		0.55									0.71			0.71	
Total reduction		0.08									0.15			0.17	
Total, real		120									57			66	

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

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

Project:

Flickering Nuoro Sud

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2024-01-12 10:10 / 78
Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BK - R079

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August	September	October	November			December		
1	05:57		19:26 (6)	06:20	06:50	07:19	06:52			07:26		12:43 (8)
	20:57	13	19:39 (6)	20:39	19:57	19:07	17:22			16:58	61	13:44 (8)
2	05:57		19:26 (6)	06:21	06:51	07:20	06:53			07:27		12:42 (8)
	20:57	15	19:41 (6)	20:38	19:55	19:06	17:20			16:58	63	13:45 (8)
3	05:58		19:26 (6)	06:22	06:52	07:21	06:54			07:28		12:42 (8)
	20:57	15	19:41 (6)	20:37	19:53	19:04	17:19			16:58	64	13:46 (8)
4	05:58		19:26 (6)	06:23	06:53	07:22	06:55			07:29		12:42 (8)
	20:57	16	19:42 (6)	20:35	19:52	19:02	17:18			16:57	64	13:46 (8)
5	05:59		19:25 (6)	06:24	06:54	07:23	06:56			07:30		12:42 (8)
	20:56	17	19:42 (6)	20:34	19:50	19:01	17:17			16:57	65	13:47 (8)
6	05:59		19:25 (6)	06:25	06:55	07:24	06:58			07:31		12:43 (8)
	20:56	18	19:43 (6)	20:33	19:49	18:59	17:16			16:57	65	13:48 (8)
7	06:00		19:25 (6)	06:26	06:56	07:25	06:59			07:32		12:43 (8)
	20:56	18	19:43 (6)	20:32	19:47	18:57	17:15			16:57	65	13:48 (8)
8	06:01		19:25 (6)	06:27	06:57	07:26	07:00			07:33		12:43 (8)
	20:56	18	19:43 (6)	20:31	19:45	18:56	17:14			16:57	66	13:49 (8)
9	06:01		19:24 (6)	06:28	06:57	07:27	07:01			07:33		12:43 (8)
	20:55	19	19:43 (6)	20:30	19:44	18:54	17:13			16:57	67	13:50 (8)
10	06:02		19:24 (6)	06:29	06:58	07:28	07:02			07:34		12:44 (8)
	20:55	20	19:44 (6)	20:28	19:42	18:53	17:12			16:57	66	13:50 (8)
11	06:03		19:24 (6)	06:30	06:59	07:29	07:03			07:35		12:43 (8)
	20:54	21	19:45 (6)	20:27	19:40	18:51	17:11			16:57	67	13:50 (8)
12	06:03		19:25 (6)	06:31	07:00	07:30	07:05			07:36		12:44 (8)
	20:54	21	19:46 (6)	20:26	19:39	18:50	17:10			16:57	67	13:51 (8)
13	06:04		19:24 (6)	06:31	07:01	07:31	07:06			07:37		12:44 (8)
	20:54	21	19:45 (6)	20:24	19:37	18:48	17:09			16:57	68	13:52 (8)
14	06:05		19:24 (6)	06:32	07:02	07:32	07:07		13:07 (8)	07:38		09:19 (10)
	20:53	22	19:46 (6)	20:23	19:35	18:47	17:08	9	13:16 (8)	16:58	71	13:52 (8)
15	06:05		19:24 (6)	06:33	07:03	07:33	07:08		13:00 (8)	07:38		09:18 (10)
	20:53	22	19:46 (6)	20:22	19:34	18:45	17:07	22	13:22 (8)	16:58	74	13:52 (8)
16	06:06		19:23 (6)	06:34	07:04	07:34	07:09		12:57 (8)	07:39		09:18 (10)
	20:52	23	19:46 (6)	20:20	19:32	18:43	17:06	29	13:26 (8)	16:58	75	13:53 (8)
17	06:07		19:24 (6)	06:35	07:05	07:35	07:10		12:55 (8)	07:40		09:18 (10)
	20:51	22	19:46 (6)	20:19	19:30	18:42	17:06	33	13:28 (8)	16:58	77	13:54 (8)
18	06:08		19:24 (6)	06:36	07:06	07:36	07:12		12:52 (8)	07:40		09:18 (10)
	20:51	23	19:47 (6)	20:18	19:29	18:41	17:05	38	13:30 (8)	16:59	77	13:54 (8)
19	06:09		19:24 (6)	06:37	07:07	07:37	07:13		12:50 (8)	07:41		09:19 (10)
	20:50	23	19:47 (6)	20:16	19:27	18:39	17:04	42	13:32 (8)	16:59	77	13:55 (8)
20	06:09		19:24 (6)	06:38	07:08	07:38	07:14		12:50 (8)	07:41		09:18 (10)
	20:49	23	19:47 (6)	20:15	19:25	18:38	17:03	44	13:34 (8)	17:00	79	13:55 (8)
21	06:10		19:24 (6)	06:39	07:09	07:39	07:15		12:48 (8)	07:42		09:19 (10)
	20:49	22	19:46 (6)	20:13	19:24	18:36	17:03	47	13:35 (8)	17:00	79	13:56 (8)
22	06:11		19:24 (6)	06:40	07:10	07:41	07:16		12:47 (8)	07:43		09:19 (10)
	20:48	22	19:46 (6)	20:12	19:22	18:35	17:02	49	13:36 (8)	17:01	79	13:56 (8)
23	06:12		19:25 (6)	06:41	07:11	07:42	07:17		12:46 (8)	07:43		09:20 (10)
	20:47	21	19:46 (6)	20:10	19:20	18:33	17:02	51	13:37 (8)	17:01	79	13:57 (8)
24	06:13		19:25 (6)	06:42	07:12	07:43	07:18		12:45 (8)	07:44		09:20 (10)
	20:46	21	19:46 (6)	20:09	19:19	18:32	17:01	53	13:38 (8)	17:02	79	13:57 (8)
25	06:14		19:26 (6)	06:43	07:13	06:44	07:19		12:44 (8)	07:44		09:22 (10)
	20:45	20	19:46 (6)	20:07	19:17	17:31	17:00	55	13:39 (8)	17:02	77	13:58 (8)
26	06:15		19:26 (6)	06:44	07:14	06:45	07:21		12:44 (8)	07:44		09:22 (10)
	20:45	20	19:46 (6)	20:06	19:15	17:29	17:00	57	13:41 (8)	17:03	77	13:58 (8)
27	06:15		19:26 (6)	06:45	07:15	06:46	07:22		12:44 (8)	07:45		09:23 (10)
	20:44	18	19:44 (6)	20:04	19:14	17:28	17:00	58	13:42 (8)	17:03	76	13:58 (8)
28	06:16		19:27 (6)	06:46	07:16	06:47	07:23		12:43 (8)	07:45		09:24 (10)
	20:43	16	19:43 (6)	20:03	19:12	17:27	16:59	59	13:42 (8)	17:04	75	13:59 (8)
29	06:17		19:29 (6)	06:47	07:17	06:48	07:24		12:43 (8)	07:45		09:26 (10)
	20:42	13	19:42 (6)	20:01	19:10	17:25	16:59	60	13:43 (8)	17:05	72	13:59 (8)
30	06:18		19:30 (6)	06:48	07:18	06:50	07:25		12:43 (8)	07:46		09:28 (10)
	20:41	11	19:41 (6)	20:00	19:09	17:24	16:58	61	13:44 (8)	17:06	70	14:00 (8)
31	06:19		19:34 (6)	06:49		06:51				07:46		12:52 (8)
	20:40	4	19:38 (6)	19:58		17:23				17:06	68	14:00 (8)
Potential sun hours	457			426	375	346	300			290		
Total, worst case		578						767			2209	
Sun reduction		0.75						0.48			0.41	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.71						0.55			0.56	
Total reduction		0.19						0.10			0.08	
Total, real		112						75			185	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 79

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BL - R091

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	07:46		10:50 (9)	07:33			06:58		07:39 (10)	07:09	06:24	05:56
	17:07	25	11:15 (9)	17:41			18:14	29	08:08 (10)	19:47	20:18	20:46
2	07:46		10:51 (9)	07:32			06:57		07:39 (10)	07:07	06:23	05:56
	17:08	23	11:14 (9)	17:42			18:15	30	08:09 (10)	19:48	20:19	20:47
3	07:46		10:53 (9)	07:31			06:55		07:38 (10)	07:06	06:22	05:55
	17:09	20	11:13 (9)	17:43			18:16	31	08:09 (10)	19:49	20:20	20:48
4	07:46		10:55 (9)	07:30			06:54		07:38 (10)	07:04	06:20	05:55
	17:10	17	11:12 (9)	17:45			18:17	31	08:09 (10)	19:50	20:21	20:48
5	07:46		10:59 (9)	07:29			06:52		07:38 (10)	07:02	06:19	05:55
	17:11	10	11:09 (9)	17:46			18:18	31	08:09 (10)	19:51	20:22	20:49
6	07:46			07:28			06:51		07:37 (10)	07:01	06:18	05:54
	17:12			17:47			18:20	31	08:08 (10)	19:52	20:23	20:50
7	07:46			07:27			06:49		07:38 (10)	06:59	06:17	05:54
	17:13			17:48			18:21	30	08:08 (10)	19:53	20:24	20:50
8	07:46			07:26			06:48		07:37 (10)	06:58	06:16	05:54
	17:14			17:49			18:22	30	08:07 (10)	19:54	20:25	20:51
9	07:46			07:25			06:46		07:38 (10)	06:56	06:15	05:54
	17:15			17:51			18:23	28	08:06 (10)	19:55	20:26	20:51
10	07:46			07:24			06:45		07:39 (10)	06:54	06:13	05:53
	17:16			17:52			18:24	26	08:05 (10)	19:56	20:27	20:52
11	07:46			07:23			06:43		07:40 (10)	06:53	06:12	05:53
	17:17			17:53			18:25	24	08:04 (10)	19:57	20:28	20:53
12	07:45			07:22			06:41		07:41 (10)	06:51	06:11	05:53
	17:18			17:54			18:26	21	08:02 (10)	19:58	20:29	20:53
13	07:45			07:20			06:40		07:42 (10)	06:50	06:10	05:53
	17:19			17:55			18:27	17	07:59 (10)	19:59	20:30	20:54
14	07:45			07:19			06:38		07:46 (10)	06:48	06:09	05:53
	17:20			17:57			18:28	10	07:56 (10)	20:00	20:31	20:54
15	07:45			07:18			06:37			06:47	06:08	05:53
	17:21			17:58			18:29			20:01	20:32	20:54
16	07:44			07:17			06:35			06:45	06:07	05:53
	17:22			17:59			18:30			20:02	20:33	20:55
17	07:44			07:15			06:33			06:44	06:06	05:53
	17:23			18:00			18:31			20:03	20:33	20:55
18	07:43			07:14			06:32			06:42	06:06	05:53
	17:24			18:01			18:32			20:04	20:34	20:55
19	07:43			07:13			06:30			06:41	06:05	05:53
	17:25			18:03			18:33			20:05	20:35	20:56
20	07:42			07:11			06:28			06:39	06:04	05:53
	17:27			18:04			18:34			20:06	20:36	20:56
21	07:42			07:10			06:27			06:38	06:03	05:54
	17:28			18:05			18:36			20:07	20:37	20:56
22	07:41			07:09			06:25			06:36	06:02	05:54
	17:29			18:06			18:37			20:08	20:38	20:57
23	07:40			07:07		07:50 (10)	06:24			06:35	06:02	05:54
	17:30			18:07	10	08:00 (10)	18:38			20:09	20:39	20:57
24	07:40			07:06		07:47 (10)	06:22			06:34	06:01	05:54
	17:31			18:08	17	08:04 (10)	18:39			20:10	20:40	20:57
25	07:39			07:04		07:44 (10)	06:20			06:32	06:00	05:54
	17:32			18:09	21	08:05 (10)	18:40			20:11	20:41	20:57
26	07:38			07:03		07:43 (10)	06:19			06:31	05:59	05:55
	17:34			18:11	24	08:07 (10)	18:41			20:12	20:42	20:57
27	07:38			07:01		07:41 (10)	06:17			06:29	05:59	05:55
	17:35			18:12	26	08:07 (10)	18:42			20:14	20:42	20:57
28	07:37			07:00		07:41 (10)	06:15			06:28	05:58	05:56
	17:36			18:13	27	08:08 (10)	18:43			20:15	20:43	20:57
29	07:36						07:14			06:27	05:58	05:56
	17:37						19:44			20:16	20:44	20:57
30	07:35						07:12			06:25	05:57	05:56
	17:38						19:45			20:17	20:45	20:57
31	07:34						07:10				05:57	
	17:40						19:46				20:46	
Potential sun hours	300			298			370			398	446	450
Total, worst case		95			125			369				
Sun reduction		0.40			0.43			0.47				
Oper. time red.		0.37			0.37			0.37				
Wind dir. red.		0.51			0.71			0.71				
Total reduction		0.08			0.11			0.12				
Total, real		7			14			45				

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 80

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BL - R091

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October			November		December		
1	05:57		06:20		06:50		07:19		08:20 (10)	06:52		07:26		
	20:57		20:39		19:57		19:07	20	08:40 (10)	17:22		16:58		
2	05:57		06:21		06:51		07:20		08:18 (10)	06:53		07:27		
	20:57		20:38		19:55		19:06	23	08:41 (10)	17:20		16:58		
3	05:58		06:22		06:52		07:21		08:17 (10)	06:54		07:28		
	20:57		20:37		19:53		19:04	25	08:42 (10)	17:19		16:58		
4	05:58		06:23		06:53		07:22		08:15 (10)	06:55		07:29		
	20:57		20:35		19:52		19:02	28	08:43 (10)	17:18		16:57		
5	05:59		06:24		06:54		07:23		08:15 (10)	06:56		07:30		
	20:56		20:34		19:50		19:01	29	08:44 (10)	17:17		16:57		
6	05:59		06:25		06:55		07:24		08:15 (10)	06:58		07:31		
	20:56		20:33		19:49		18:59	29	08:44 (10)	17:16		16:57		
7	06:00		06:26		06:56		07:25		08:14 (10)	06:59		07:32		10:46 (9)
	20:56		20:32		19:47		18:57	30	08:44 (10)	17:15		16:57	10	10:56 (9)
8	06:01		06:27		06:57		07:26		08:13 (10)	07:00		07:33		10:44 (9)
	20:56		20:31		19:45		18:56	31	08:44 (10)	17:14		16:57	15	10:59 (9)
9	06:01		06:28		06:57		07:27		08:13 (10)	07:01		07:33		10:42 (9)
	20:55		20:30		19:44		18:54	31	08:44 (10)	17:13		16:57	20	11:02 (9)
10	06:02		06:29		06:58		07:28		08:13 (10)	07:02		07:34		10:41 (9)
	20:55		20:28		19:42		18:53	31	08:44 (10)	17:12		16:57	23	11:04 (9)
11	06:03		06:30		06:59		07:29		08:13 (10)	07:03		07:35		10:40 (9)
	20:54		20:27		19:40		18:51	30	08:43 (10)	17:11		16:57	25	11:05 (9)
12	06:03		06:31		07:00		07:30		08:13 (10)	07:05		07:36		10:39 (9)
	20:54		20:26		19:39		18:50	29	08:42 (10)	17:10		16:57	28	11:07 (9)
13	06:04		06:32		07:01		07:31		08:13 (10)	07:06		07:37		10:39 (9)
	20:54		20:24		19:37		18:48	29	08:42 (10)	17:09		16:58	29	11:08 (9)
14	06:05		06:32		07:02		07:32		08:13 (10)	07:07		07:37		10:39 (9)
	20:53		20:23		19:35		18:47	28	08:41 (10)	17:08		16:58	31	11:10 (9)
15	06:06		06:33		07:03		07:33		08:14 (10)	07:08		07:38		10:39 (9)
	20:52		20:22		19:34		18:45	25	08:39 (10)	17:07		16:58	31	11:10 (9)
16	06:06		06:34		07:04		07:34		08:15 (10)	07:09		07:39		10:39 (9)
	20:52		20:20		19:32		18:43	23	08:38 (10)	17:06		16:58	33	11:12 (9)
17	06:07		06:35		07:05		07:35		08:16 (10)	07:10		07:40		10:39 (9)
	20:51		20:19		19:30		18:42	20	08:36 (10)	17:06		16:58	34	11:13 (9)
18	06:08		06:36		07:06		07:36		08:18 (10)	07:11		07:40		10:39 (9)
	20:51		20:18		19:29		18:41	15	08:33 (10)	17:05		16:59	34	11:13 (9)
19	06:09		06:37		07:07		07:37		08:23 (10)	07:13		07:41		10:39 (9)
	20:50		20:16		19:27		18:39	7	08:30 (10)	17:04		16:59	35	11:14 (9)
20	06:09		06:38		07:08		07:38			07:14		07:41		10:39 (9)
	20:49		20:15		19:25		18:38			17:03		17:00	35	11:14 (9)
21	06:10		06:39		07:09		07:39			07:15		07:42		10:40 (9)
	20:49		20:13		19:24		18:36			17:03		17:00	35	11:15 (9)
22	06:11		06:40		07:10		07:41			07:16		07:43		10:40 (9)
	20:48		20:12		19:22		18:35			17:02		17:01	35	11:15 (9)
23	06:12		06:41		07:11		07:42			07:17		07:43		10:41 (9)
	20:47		20:10		19:20		18:33			17:02		17:01	35	11:16 (9)
24	06:13		06:42		07:12		07:43			07:18		07:44		10:41 (9)
	20:46		20:09		19:19		18:32			17:01		17:02	35	11:16 (9)
25	06:14		06:43		07:13		06:44			07:19		07:44		10:43 (9)
	20:45		20:07		19:17		17:31			17:01		17:02	34	11:17 (9)
26	06:15		06:44		07:14		06:45			07:20		07:44		10:43 (9)
	20:45		20:06		19:15		17:29			17:00		17:03	34	11:17 (9)
27	06:16		06:45		07:15		06:46			07:22		07:45		10:44 (9)
	20:44		20:04		19:14		17:28			17:00		17:03	33	11:17 (9)
28	06:16		06:46		07:16		06:47			07:23		07:45		10:45 (9)
	20:43		20:03		19:12		17:27			16:59		17:04	32	11:17 (9)
29	06:17		06:47		07:17		08:27 (10)		06:48	07:24		07:45		10:46 (9)
	20:42		20:01		19:10	7	08:34 (10)		17:25	16:59		17:05	31	11:17 (9)
30	06:18		06:48		07:18		08:23 (10)		06:50	07:25		07:46		10:47 (9)
	20:41		20:00		19:09	15	08:38 (10)		17:24	16:58		17:06	30	11:17 (9)
31	06:19		06:49						06:51			07:46		10:48 (9)
	20:40		19:58						17:23			17:06	28	11:16 (9)
Potential sun hours	457		426		375				346			290		
Total, worst case						22			483				745	
Sun reduction						0.64			0.56				0.41	
Oper. time red.						0.37			0.37				0.37	
Wind dir. red.						0.71			0.71				0.51	
Total reduction						0.17			0.14				0.08	
Total, real						4			70				58	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 81

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BM - R080

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May			June		
1	07:46		13:29 (8)	07:33	06:58	07:09	06:24			05:56		19:21 (6)
	17:07	65	14:34 (8)	17:41	18:14	19:47	20:18			20:46	9	19:30 (6)
2	07:46		13:30 (8)	07:32	06:57	07:07	06:23			05:56		19:23 (6)
	17:08	64	14:34 (8)	17:42	18:15	19:48	20:19			20:47	6	19:29 (6)
3	07:46		13:30 (8)	07:31	06:55	07:06	06:22			05:55		
	17:09	64	14:34 (8)	17:43	18:16	19:49	20:20			20:48		
4	07:46		13:31 (8)	07:31	06:54	07:04	06:20			05:55		
	17:10	64	14:35 (8)	17:44	18:17	19:50	20:21			20:48		
5	07:46		13:32 (8)	07:29	06:52	07:02	06:19			05:55		
	17:11	63	14:35 (8)	17:46	18:18	19:51	20:22			20:49		
6	07:46		13:32 (8)	07:28	06:51	07:01	06:18			05:54		
	17:12	63	14:35 (8)	17:47	18:19	19:52	20:23			20:50		
7	07:46		13:33 (8)	07:27	06:49	06:59	06:17			05:54		
	17:13	63	14:36 (8)	17:48	18:21	19:53	20:24			20:50		
8	07:46		13:34 (8)	07:26	06:48	06:58	06:16			05:54		
	17:14	62	14:36 (8)	17:49	18:22	19:54	20:25			20:51		
9	07:46		13:35 (8)	07:25	06:46	06:56	06:15		19:20 (6)	05:54		
	17:15	62	14:37 (8)	17:51	18:23	19:55	20:26	8	19:28 (6)	20:52		
10	07:46		13:35 (8)	07:24	06:45	06:54	06:13		19:18 (6)	05:53		
	17:16	61	14:36 (8)	17:52	18:24	19:56	20:27	12	19:30 (6)	20:52		
11	07:46		13:36 (8)	07:23	06:43	06:53	06:12		19:17 (6)	05:53		
	17:17	60	14:36 (8)	17:53	18:25	19:57	20:28	15	19:32 (6)	20:53		
12	07:46		13:37 (8)	07:22	06:41	06:51	06:11		19:16 (6)	05:53		
	17:18	60	14:37 (8)	17:54	18:26	19:58	20:29	17	19:33 (6)	20:53		
13	07:45		13:37 (8)	07:20	06:40	06:50	06:10		19:15 (6)	05:53		
	17:19	59	14:36 (8)	17:55	18:27	19:59	20:30	18	19:33 (6)	20:54		
14	07:45		13:38 (8)	07:19	06:38	06:48	06:09		19:14 (6)	05:53		
	17:20	59	14:37 (8)	17:57	18:28	20:00	20:31	20	19:34 (6)	20:54		
15	07:45		13:40 (8)	07:18	06:37	06:47	06:08		19:14 (6)	05:53		
	17:21	57	14:37 (8)	17:58	18:29	20:01	20:32	20	19:34 (6)	20:54		
16	07:44		13:40 (8)	07:17	06:35	06:45	06:07		19:13 (6)	05:53		
	17:22	56	14:36 (8)	17:59	18:30	20:02	20:33	21	19:34 (6)	20:55		
17	07:44		13:42 (8)	07:15	06:33	06:44	06:06		19:14 (6)	05:53		
	17:23	55	14:37 (8)	18:00	18:31	20:03	20:34	21	19:35 (6)	20:55		
18	07:43		13:42 (8)	07:14	06:32	06:42	06:06		19:14 (6)	05:53		
	17:24	54	14:36 (8)	18:01	18:32	20:04	20:34	21	19:35 (6)	20:56		
19	07:43		13:43 (8)	07:13	06:30	06:41	06:05		19:14 (6)	05:53		
	17:25	52	14:35 (8)	18:02	18:33	20:05	20:35	21	19:35 (6)	20:56		
20	07:42		13:45 (8)	07:11	06:28	06:39	06:04		19:13 (6)	05:53		
	17:27	51	14:36 (8)	18:04	18:34	20:06	20:36	22	19:35 (6)	20:56		
21	07:42		13:46 (8)	07:10	06:27	06:38	06:03		19:13 (6)	05:53		
	17:28	49	14:35 (8)	18:05	18:36	20:07	20:37	22	19:35 (6)	20:56		
22	07:41		13:48 (8)	07:09	06:25	06:36	06:02		19:14 (6)	05:54		
	17:29	47	14:35 (8)	18:06	18:37	20:08	20:38	21	19:35 (6)	20:57		
23	07:40		13:49 (8)	07:07	06:24	06:35	06:02		19:14 (6)	05:54		
	17:30	45	14:34 (8)	18:07	18:38	20:09	20:39	21	19:35 (6)	20:57		
24	07:40		13:51 (8)	07:06	06:22	06:34	06:01		19:14 (6)	05:54		
	17:31	42	14:33 (8)	18:08	18:39	20:10	20:40	20	19:34 (6)	20:57		
25	07:39		13:52 (8)	07:04	06:20	06:32	06:00		19:16 (6)	05:54		
	17:32	40	14:32 (8)	18:09	18:40	20:11	20:41	19	19:35 (6)	20:57		
26	07:38		13:55 (8)	07:03	06:19	06:31	05:59		19:16 (6)	05:55		
	17:34	36	14:31 (8)	18:11	18:41	20:13	20:42	18	19:34 (6)	20:57		
27	07:38		13:58 (8)	07:01	06:17	06:29	05:59		19:17 (6)	05:55		
	17:35	32	14:30 (8)	18:12	18:42	20:14	20:42	17	19:34 (6)	20:57		
28	07:37		14:00 (8)	07:00	06:15	06:28	05:58		19:17 (6)	05:55		
	17:36	27	14:27 (8)	18:13	18:43	20:15	20:43	16	19:33 (6)	20:57		
29	07:36		14:04 (8)		07:14	06:27	05:58		19:19 (6)	05:56		
	17:37	21	14:25 (8)		19:44	20:16	20:44	14	19:33 (6)	20:57		
30	07:35		14:10 (8)		07:12	06:25	05:57		19:19 (6)	05:56		
	17:38	10	14:20 (8)		19:45	20:17	20:45	13	19:32 (6)	20:57		
31	07:34				07:10		05:57		19:20 (6)			
	17:40				19:46		20:46	12	19:32 (6)			
Potential sun hours	300			298	370	398	446			450		
Total, worst case		1543						409			15	
Sun reduction		0.40						0.58			0.67	
Oper. time red.		0.37						0.37			0.37	
Wind dir. red.		0.60						0.71			0.71	
Total reduction		0.09						0.15			0.18	
Total, real		136						62			3	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 82

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BM - R080

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August			September	October	November			December		
1	05:57			06:20		19:27 (6)	06:50	07:19	06:52			07:26		13:18 (8)
	20:57			20:39	16	19:43 (6)	19:57	19:07	17:22			16:58	60	14:18 (8)
2	05:57			06:21		19:28 (6)	06:51	07:20	06:53			07:27		13:18 (8)
	20:57			20:38	14	19:42 (6)	19:55	19:06	17:20			16:58	61	14:19 (8)
3	05:58			06:22		19:29 (6)	06:52	07:21	06:54			07:28		13:18 (8)
	20:57			20:37	11	19:40 (6)	19:53	19:04	17:19			16:58	62	14:20 (8)
4	05:58			06:23		19:32 (6)	06:53	07:22	06:55			07:29		13:18 (8)
	20:57			20:35	6	19:38 (6)	19:52	19:02	17:18			16:57	62	14:20 (8)
5	05:59			06:24			06:54	07:23	06:56			07:30		13:18 (8)
	20:56			20:34			19:50	19:01	17:17			16:57	63	14:21 (8)
6	05:59			06:25			06:55	07:24	06:58			07:31		13:18 (8)
	20:56			20:33			19:49	18:59	17:16			16:57	63	14:21 (8)
7	06:00			06:26			06:56	07:25	06:59			07:32		13:19 (8)
	20:56			20:32			19:47	18:57	17:15			16:57	63	14:22 (8)
8	06:01			06:27			06:56	07:26	07:00			07:33		13:19 (8)
	20:56			20:31			19:45	18:56	17:14			16:57	64	14:23 (8)
9	06:01			06:28			06:57	07:27	07:01			07:33		13:19 (8)
	20:55			20:30			19:44	18:54	17:13			16:57	64	14:23 (8)
10	06:02		19:32 (6)	06:29			06:58	07:28	07:02			07:34		13:20 (8)
	20:55	3	19:35 (6)	20:28			19:42	18:53	17:12			16:57	64	14:24 (8)
11	06:03		19:30 (6)	06:30			06:59	07:29	07:03			07:35		13:19 (8)
	20:54	8	19:38 (6)	20:27			19:40	18:51	17:11			16:57	65	14:24 (8)
12	06:03		19:28 (6)	06:31			07:00	07:30	07:05		13:41 (8)	07:36		13:20 (8)
	20:54	10	19:38 (6)	20:26			19:39	18:50	17:10	11	13:52 (8)	16:57	64	14:24 (8)
13	06:04		19:28 (6)	06:31			07:01	07:31	07:06		13:36 (8)	07:37		13:20 (8)
	20:54	12	19:40 (6)	20:24			19:37	18:48	17:09	21	13:57 (8)	16:57	65	14:25 (8)
14	06:05		19:27 (6)	06:32			07:02	07:32	07:07		13:32 (8)	07:38		13:21 (8)
	20:53	14	19:41 (6)	20:23			19:35	18:47	17:08	27	13:59 (8)	16:58	65	14:26 (8)
15	06:05		19:27 (6)	06:33			07:03	07:33	07:08		13:30 (8)	07:38		13:21 (8)
	20:53	15	19:42 (6)	20:22			19:34	18:45	17:07	32	14:02 (8)	16:58	65	14:26 (8)
16	06:06		19:26 (6)	06:34			07:04	07:34	07:09		13:28 (8)	07:39		13:21 (8)
	20:52	16	19:42 (6)	20:20			19:32	18:43	17:06	36	14:04 (8)	16:58	65	14:26 (8)
17	06:07		19:25 (6)	06:35			07:05	07:35	07:10		13:26 (8)	07:40		13:22 (8)
	20:51	18	19:43 (6)	20:19			19:30	18:42	17:06	40	14:06 (8)	16:58	65	14:27 (8)
18	06:08		19:25 (6)	06:36			07:06	07:36	07:12		13:25 (8)	07:40		13:22 (8)
	20:51	19	19:44 (6)	20:18			19:29	18:41	17:05	42	14:07 (8)	16:59	65	14:27 (8)
19	06:09		19:25 (6)	06:37			07:07	07:37	07:13		13:23 (8)	07:41		13:23 (8)
	20:50	19	19:44 (6)	20:16			19:27	18:39	17:04	45	14:08 (8)	16:59	65	14:28 (8)
20	06:09		19:25 (6)	06:38			07:08	07:38	07:14		13:23 (8)	07:41		13:23 (8)
	20:49	20	19:45 (6)	20:15			19:25	18:38	17:03	47	14:10 (8)	17:00	65	14:28 (8)
21	06:10		19:24 (6)	06:39			07:09	07:39	07:15		13:22 (8)	07:42		13:24 (8)
	20:49	21	19:45 (6)	20:13			19:24	18:36	17:03	49	14:11 (8)	17:00	65	14:29 (8)
22	06:11		19:24 (6)	06:40			07:10	07:41	07:16		13:21 (8)	07:43		13:24 (8)
	20:48	21	19:45 (6)	20:12			19:22	18:35	17:02	51	14:12 (8)	17:01	65	14:29 (8)
23	06:12		19:24 (6)	06:41			07:11	07:42	07:17		13:20 (8)	07:43		13:25 (8)
	20:47	21	19:45 (6)	20:10			19:20	18:33	17:02	52	14:12 (8)	17:01	65	14:30 (8)
24	06:13		19:24 (6)	06:42			07:12	07:43	07:18		13:19 (8)	07:44		13:25 (8)
	20:46	22	19:46 (6)	20:09			19:19	18:32	17:01	54	14:13 (8)	17:02	65	14:30 (8)
25	06:14		19:24 (6)	06:43			07:13	06:44	07:19		13:19 (8)	07:44		13:26 (8)
	20:45	22	19:46 (6)	20:07			19:17	17:31	17:00	55	14:14 (8)	17:02	65	14:31 (8)
26	06:15		19:24 (6)	06:44			07:14	06:45	07:21		13:19 (8)	07:44		13:26 (8)
	20:45	22	19:46 (6)	20:06			19:15	17:29	17:00	57	14:16 (8)	17:03	65	14:31 (8)
27	06:15		19:24 (6)	06:45			07:15	06:46	07:22		13:19 (8)	07:45		13:26 (8)
	20:44	21	19:45 (6)	20:04			19:14	17:28	17:00	57	14:16 (8)	17:03	65	14:31 (8)
28	06:16		19:24 (6)	06:46			07:16	06:47	07:23		13:19 (8)	07:45		13:28 (8)
	20:43	21	19:45 (6)	20:03			19:12	17:27	16:59	58	14:17 (8)	17:04	64	14:32 (8)
29	06:17		19:24 (6)	06:47			07:17	06:48	07:24		13:18 (8)	07:45		13:28 (8)
	20:42	21	19:45 (6)	20:01			19:10	17:25	16:59	59	14:17 (8)	17:05	65	14:33 (8)
30	06:18		19:25 (6)	06:48			07:18	06:50	07:25		13:18 (8)	07:46		13:28 (8)
	20:41	19	19:44 (6)	20:00			19:09	17:24	16:58	60	14:18 (8)	17:06	65	14:33 (8)
31	06:19		19:26 (6)	06:49				06:51				07:46		13:29 (8)
	20:40	18	19:44 (6)	19:58				17:23				17:06	64	14:33 (8)
Potential sun hours	457			426			375	346	300			290		
Total, worst case		383			47					853			1988	
Sun reduction		0.75			0.72					0.48			0.41	
Oper. time red.		0.37			0.37					0.37			0.37	
Wind dir. red.		0.71			0.71					0.60			0.60	
Total reduction		0.20			0.19					0.11			0.09	
Total, real		76			9					90			181	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 83

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BN - R083

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May			June		
1	07:46		09:18 (10)	07:33		14:28 (8)	06:58		14:30 (8)	07:09	06:24			05:56		19:35 (6)
	17:07	25	09:43 (10)	17:41	64	15:32 (8)	18:14	67	15:37 (8)	19:47	20:18			20:46	16	19:51 (6)
2	07:46		09:19 (10)	07:32		14:27 (8)	06:57		14:31 (8)	07:07	06:23			05:56		19:35 (6)
	17:08	24	09:43 (10)	17:42	66	15:33 (8)	18:15	66	15:37 (8)	19:48	20:19			20:47	17	19:52 (6)
3	07:46		09:19 (10)	07:31		14:26 (8)	06:55		14:32 (8)	07:06	06:22			05:55		19:35 (6)
	17:09	24	09:43 (10)	17:43	68	15:34 (8)	18:16	63	15:35 (8)	19:49	20:20			20:48	18	19:53 (6)
4	07:46		09:20 (10)	07:30		14:26 (8)	06:54		14:34 (8)	07:04	06:20			05:55		19:34 (6)
	17:10	24	09:44 (10)	17:44	68	15:34 (8)	18:17	61	15:35 (8)	19:50	20:21			20:48	19	19:53 (6)
5	07:46		09:21 (10)	07:29		14:25 (8)	06:52		14:35 (8)	07:02	06:19			05:55		19:35 (6)
	17:11	23	09:44 (10)	17:46	70	15:35 (8)	18:18	58	15:33 (8)	19:51	20:22			20:49	18	19:53 (6)
6	07:46		09:21 (10)	07:28		14:25 (8)	06:51		14:37 (8)	07:01	06:18			05:54		19:35 (6)
	17:12	23	09:44 (10)	17:47	71	15:36 (8)	18:19	54	15:31 (8)	19:52	20:23			20:50	19	19:54 (6)
7	07:46		09:22 (10)	07:27		14:25 (8)	06:49		14:39 (8)	06:59	06:17			05:54		19:34 (6)
	17:13	22	09:44 (10)	17:48	72	15:37 (8)	18:21	51	15:30 (8)	19:53	20:24			20:50	20	19:54 (6)
8	07:46		09:23 (10)	07:26		14:24 (8)	06:48		14:41 (8)	06:58	06:16			05:54		19:34 (6)
	17:14	22	09:45 (10)	17:49	74	15:38 (8)	18:22	47	15:28 (8)	19:54	20:25			20:51	20	19:54 (6)
9	07:46		09:24 (10)	07:25		14:24 (8)	06:46		14:44 (8)	06:56	06:15			05:54		19:35 (6)
	17:15	21	09:45 (10)	17:51	75	15:39 (8)	18:23	43	15:27 (8)	19:55	20:26			20:52	20	19:55 (6)
10	07:46		09:24 (10)	07:24		14:23 (8)	06:45		14:46 (8)	06:54	06:13			05:53		19:35 (6)
	17:16	20	09:44 (10)	17:52	75	15:38 (8)	18:24	39	15:25 (8)	19:56	20:27			20:52	20	19:55 (6)
11	07:46		09:25 (10)	07:23		14:23 (8)	06:43		14:50 (8)	06:53	06:12			05:53		19:35 (6)
	17:17	19	09:44 (10)	17:53	76	15:39 (8)	18:25	33	15:23 (8)	19:57	20:28			20:53	20	19:55 (6)
12	07:46		09:27 (10)	07:22		14:23 (8)	06:41		14:54 (8)	06:51	06:11			05:53		19:35 (6)
	17:18	17	09:44 (10)	17:54	77	15:40 (8)	18:26	25	15:19 (8)	19:58	20:29			20:53	21	19:56 (6)
13	07:45		09:27 (10)	07:20		14:23 (8)	06:40		14:59 (8)	06:50	06:10			05:53		19:35 (6)
	17:19	16	09:43 (10)	17:55	77	15:40 (8)	18:27	14	15:13 (8)	19:59	20:30			20:54	21	19:56 (6)
14	07:45		09:29 (10)	07:19		14:22 (8)	06:38			06:48	06:09			05:53		19:36 (6)
	17:20	14	09:43 (10)	17:57	78	15:40 (8)	18:28			20:00	20:31			20:54	20	19:56 (6)
15	07:45		09:31 (10)	07:18		14:23 (8)	06:37			06:47	06:08			05:53		19:36 (6)
	17:21	11	09:42 (10)	17:58	77	15:40 (8)	18:29			20:01	20:32			20:54	21	19:57 (6)
16	07:44		09:33 (10)	07:17		14:23 (8)	06:35			06:45	06:07			05:53		19:36 (6)
	17:22	7	09:40 (10)	17:59	78	15:41 (8)	18:30			20:02	20:33			20:55	21	19:57 (6)
17	07:44		14:50 (8)	07:15		14:22 (8)	06:33			06:44	06:06			05:53		19:36 (6)
	17:23	13	15:03 (8)	18:00	78	15:40 (8)	18:31			20:03	20:33			20:55	21	19:57 (6)
18	07:43		14:46 (8)	07:14		14:23 (8)	06:32			06:42	06:06			05:53		19:36 (6)
	17:24	21	15:07 (8)	18:01	78	15:41 (8)	18:32			20:04	20:34			20:56	21	19:57 (6)
19	07:43		14:43 (8)	07:13		14:23 (8)	06:30			06:41	06:05			05:53		19:36 (6)
	17:25	26	15:09 (8)	18:02	78	15:41 (8)	18:33			20:05	20:35			20:56	21	19:57 (6)
20	07:42		14:41 (8)	07:11		14:23 (8)	06:28			06:39	06:04			05:53		19:36 (6)
	17:27	32	15:13 (8)	18:04	77	15:40 (8)	18:34			20:06	20:36			20:56	21	19:57 (6)
21	07:42		14:39 (8)	07:10		14:24 (8)	06:27			06:38	06:03			05:53		19:37 (6)
	17:28	36	15:15 (8)	18:05	77	15:41 (8)	18:35			20:07	20:37			20:56	21	19:58 (6)
22	07:41		14:38 (8)	07:09		14:25 (8)	06:25			06:36	06:02			05:54		19:37 (6)
	17:29	39	15:17 (8)	18:06	76	15:41 (8)	18:37			20:08	20:38			20:57	21	19:58 (6)
23	07:40		14:37 (8)	07:07		14:25 (8)	06:24			06:35	06:02			05:54		19:37 (6)
	17:30	42	15:19 (8)	18:07	75	15:40 (8)	18:38			20:09	20:39			20:57	21	19:58 (6)
24	07:40		14:35 (8)	07:06		14:26 (8)	06:22			06:34	06:01			05:54		19:37 (6)
	17:31	46	15:21 (8)	18:08	74	15:40 (8)	18:39			20:10	20:40			20:57	21	19:58 (6)
25	07:39		14:34 (8)	07:04		14:26 (8)	06:20			06:32	06:00			05:54		19:38 (6)
	17:32	48	15:22 (8)	18:09	73	15:39 (8)	18:40			20:11	20:41			20:57	21	19:59 (6)
26	07:38		14:33 (8)	07:03		14:27 (8)	06:19			06:31	05:59			05:55		19:38 (6)
	17:34	51	15:24 (8)	18:11	72	15:39 (8)	18:41			20:13	20:42			20:57	21	19:59 (6)
27	07:38		14:32 (8)	07:01		14:28 (8)	06:17			06:29	05:59		19:41 (6)	05:55		19:38 (6)
	17:35	54	15:26 (8)	18:12	70	15:38 (8)	18:42			20:14	20:42	4	19:45 (6)	20:57	21	19:59 (6)
28	07:37		14:31 (8)	07:00		14:29 (8)	06:15			06:28	05:58		19:38 (6)	05:55		19:39 (6)
	17:36	56	15:27 (8)	18:13	69	15:38 (8)	18:43			20:15	20:43	9	19:47 (6)	20:57	20	19:59 (6)
29	07:36		14:30 (8)				07:14			06:27	05:58		19:38 (6)	05:56		19:38 (6)
	17:37	58	15:28 (8)				19:44			20:16	20:44	11	19:49 (6)	20:57	21	19:59 (6)
30	07:35		14:29 (8)				07:12			06:25	05:57		19:36 (6)	05:56		19:39 (6)
	17:38	60	15:29 (8)				19:45			20:17	20:45	13	19:49 (6)	20:57	21	20:00 (6)
31	07:34		14:28 (8)				07:10				05:57		19:36 (6)			
	17:40	62	15:30 (8)				19:46				20:46	15	19:51 (6)			
Potential sun hours	300			298			370			398	446			450		
Total, worst case		956			2063			621				52			604	
Sun reduction		0.40			0.43			0.47				0.58			0.67	
Oper. time red.		0.37			0.37			0.37				0.37			0.37	
Wind dir. red.		0.64			0.67			0.67				0.70			0.70	
Total reduction		0.10			0.11			0.12				0.15			0.17	
Total, real		92			224			74				8			105	

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

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

Project:
Flickering Nuoro Sud

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BN - R083

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August		September			October			November			December		
1	05:57		19:39 (6)	06:20		06:50			07:19		15:34 (8)	06:52		13:53 (8)	07:26		09:07 (10)
	20:57	21	20:00 (6)	20:39		19:57			19:07	22	15:56 (8)	17:22	75	15:08 (8)	16:58	19	09:26 (10)
2	05:57		19:39 (6)	06:21		06:51			07:20		15:29 (8)	06:53		13:53 (8)	07:27		09:07 (10)
	20:57	20	19:59 (6)	20:38		19:55			19:06	30	15:59 (8)	17:20	74	15:07 (8)	16:58	20	09:27 (10)
3	05:58		19:40 (6)	06:22		06:52			07:21		15:25 (8)	06:54		13:53 (8)	07:28		09:07 (10)
	20:57	20	20:00 (6)	20:37		19:53			19:04	36	16:01 (8)	17:19	74	15:07 (8)	16:58	21	09:28 (10)
4	05:58		19:40 (6)	06:23		06:53			07:22		15:22 (8)	06:55		13:54 (8)	07:29		09:07 (10)
	20:57	20	20:00 (6)	20:35		19:52			19:02	41	16:03 (8)	17:18	73	15:07 (8)	16:57	22	09:29 (10)
5	05:59		19:40 (6)	06:24		06:54			07:23		15:20 (8)	06:56		13:55 (8)	07:30		09:07 (10)
	20:56	20	20:00 (6)	20:34		19:50			19:01	45	16:05 (8)	17:17	71	15:06 (8)	16:57	22	09:29 (10)
6	05:59		19:41 (6)	06:25		06:55			07:24		15:17 (8)	06:58		13:55 (8)	07:31		09:07 (10)
	20:56	19	20:00 (6)	20:33		19:49			18:59	49	16:06 (8)	17:16	70	15:05 (8)	16:57	23	09:30 (10)
7	06:00		19:41 (6)	06:26		06:56			07:25		15:14 (8)	06:59		13:56 (8)	07:32		09:08 (10)
	20:56	19	20:00 (6)	20:32		19:47			18:57	53	16:07 (8)	17:15	68	15:04 (8)	16:57	23	09:31 (10)
8	06:01		19:42 (6)	06:27		06:56			07:26		15:12 (8)	07:00		13:57 (8)	07:33		09:08 (10)
	20:56	18	20:00 (6)	20:31		19:45			18:56	56	16:08 (8)	17:14	67	15:04 (8)	16:57	24	09:32 (10)
9	06:01		19:41 (6)	06:28		06:57			07:27		15:10 (8)	07:01		13:58 (8)	07:33		09:08 (10)
	20:55	18	19:59 (6)	20:30		19:44			18:54	59	16:09 (8)	17:13	65	15:03 (8)	16:57	24	09:32 (10)
10	06:02		19:42 (6)	06:29		06:58			07:28		15:08 (8)	07:02		13:59 (8)	07:34		09:09 (10)
	20:55	17	19:59 (6)	20:28		19:42			18:53	61	16:09 (8)	17:12	63	15:02 (8)	16:57	24	09:33 (10)
11	06:03		19:43 (6)	06:30		06:59			07:29		15:06 (8)	07:03		13:59 (8)	07:35		09:08 (10)
	20:54	16	19:59 (6)	20:27		19:40			18:51	64	16:10 (8)	17:11	62	15:01 (8)	16:57	25	09:33 (10)
12	06:03		19:44 (6)	06:31		07:00			07:30		15:04 (8)	07:05		14:01 (8)	07:36		09:09 (10)
	20:54	15	19:59 (6)	20:26		19:39			18:50	66	16:10 (8)	17:10	60	15:01 (8)	16:57	25	09:34 (10)
13	06:04		19:44 (6)	06:31		07:01			07:31		15:02 (8)	07:06		14:02 (8)	07:37		09:09 (10)
	20:54	14	19:58 (6)	20:24		19:37			18:48	69	16:11 (8)	17:09	58	15:00 (8)	16:57	25	09:34 (10)
14	06:05		19:45 (6)	06:32		07:02			07:32		15:01 (8)	07:07		14:03 (8)	07:37		09:10 (10)
	20:53	13	19:58 (6)	20:23		19:35			18:47	70	16:11 (8)	17:08	56	14:59 (8)	16:58	25	09:35 (10)
15	06:05		19:47 (6)	06:33		07:03			07:33		15:00 (8)	07:08		14:04 (8)	07:38		09:10 (10)
	20:53	10	19:57 (6)	20:22		19:34			18:45	71	16:11 (8)	17:07	54	14:58 (8)	16:58	25	09:35 (10)
16	06:06		19:48 (6)	06:34		07:04			07:34		14:58 (8)	07:09		14:06 (8)	07:39		09:11 (10)
	20:52	7	19:55 (6)	20:20		19:32			18:43	73	16:11 (8)	17:06	51	14:57 (8)	16:58	25	09:36 (10)
17	06:07			06:35		07:05			07:35		14:57 (8)	07:10		14:08 (8)	07:40		09:11 (10)
	20:51			20:19		19:30			18:42	74	16:11 (8)	17:06	48	14:56 (8)	16:58	25	09:36 (10)
18	06:08			06:36		07:06			07:36		14:57 (8)	07:11		14:09 (8)	07:40		09:11 (10)
	20:51			20:18		19:29			18:41	75	16:12 (8)	17:05	45	14:54 (8)	16:59	25	09:36 (10)
19	06:09			06:37		07:07			07:37		14:56 (8)	07:13		14:11 (8)	07:41		09:12 (10)
	20:50			20:16		19:27			18:39	76	16:12 (8)	17:04	42	14:53 (8)	16:59	25	09:37 (10)
20	06:09			06:38		07:08			07:38		14:55 (8)	07:14		14:13 (8)	07:41		09:12 (10)
	20:49			20:15		19:25			18:38	77	16:12 (8)	17:03	39	14:52 (8)	17:00	25	09:37 (10)
21	06:10			06:39		07:09			07:39		14:54 (8)	07:15		14:15 (8)	07:42		09:13 (10)
	20:49			20:13		19:24			18:36	77	16:11 (8)	17:03	36	14:51 (8)	17:00	25	09:38 (10)
22	06:11			06:40		07:10			07:41		14:54 (8)	07:16		14:17 (8)	07:43		09:13 (10)
	20:48			20:12		19:22			18:35	77	16:11 (8)	17:02	32	14:49 (8)	17:01	25	09:38 (10)
23	06:12			06:41		07:11			07:42		14:53 (8)	07:17		14:20 (8)	07:43		09:14 (10)
	20:47			20:10		19:20			18:33	78	16:11 (8)	17:02	26	14:46 (8)	17:01	25	09:39 (10)
24	06:13			06:42		07:12			07:43		14:52 (8)	07:18		14:23 (8)	07:44		09:14 (10)
	20:46			20:09		19:19			18:32	78	16:10 (8)	17:01	21	14:44 (8)	17:02	25	09:39 (10)
25	06:14			06:43		07:13			06:44		13:53 (8)	07:19		14:27 (8)	07:44		09:15 (10)
	20:45			20:07		19:17			17:31	78	15:11 (8)	17:00	13	14:40 (8)	17:02	25	09:40 (10)
26	06:15			06:44		07:14			06:45		13:53 (8)	07:20		09:12 (10)	07:44		09:15 (10)
	20:45			20:06		19:15			17:29	78	15:11 (8)	17:00	7	09:19 (10)	17:03	25	09:40 (10)
27	06:15			06:45		07:15			06:46		13:52 (8)	07:22		09:10 (10)	07:45		09:15 (10)
	20:44			20:04		19:14			17:28	78	15:10 (8)	17:00	11	09:21 (10)	17:03	26	09:41 (10)
28	06:16			06:46		07:16			06:47		13:52 (8)	07:23		09:09 (10)	07:45		09:17 (10)
	20:43			20:03		19:12			17:27	78	15:10 (8)	16:59	14	09:23 (10)	17:04	25	09:42 (10)
29	06:17			06:47		07:17			06:48		13:52 (8)	07:24		09:08 (10)	07:45		09:17 (10)
	20:42			20:01		19:10			17:25	77	15:09 (8)	16:59	16	09:24 (10)	17:05	25	09:42 (10)
30	06:18			06:48		07:18		15:43 (8)	06:50		13:53 (8)	07:25		09:08 (10)	07:46		09:17 (10)
	20:41			20:00		19:09	5	15:48 (8)	17:24	76	15:09 (8)	16:58	17	09:25 (10)	17:06	25	09:42 (10)
31	06:19			06:49					06:51		13:53 (8)				07:46		09:18 (10)
	20:40			19:58					17:23	76	15:09 (8)				17:06	24	09:42 (10)
Potential sun hours	457			426		375			346			300			290		
Total, worst case		267					5			2018			1408			747	
Sun reduction		0.75					0.64			0.56			0.48			0.41	
Oper. time red.		0.37					0.37			0.37			0.37			0.37	
Wind dir. red.		0.70					0.67			0.67			0.67			0.58	
Total reduction		0.19					0.16			0.14			0.12			0.09	
Total, real		52					1			282			169			67	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 85

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BO - R071

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May	June	July	August		September	October	November	December
1	07:46	07:33	06:58	07:09		06:24	05:56	05:57	06:20		06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47		20:18	20:46	20:57	20:39		19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07		06:23	05:56	05:57	06:21		06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48		20:19	20:47	20:57	20:38		19:55	19:06	17:20	16:58
3	07:46	07:31	06:55	07:06		06:22	05:55	05:58	06:22		06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49		20:20	20:48	20:57	20:37		19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04		06:20	05:55	05:58	06:23		06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50		20:21	20:48	20:57	20:35		19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02		06:19	05:55	05:59	06:24		06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51		20:22	20:49	20:56	20:34		19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01		06:18	05:54	05:59	06:25		06:55	07:24	06:58	07:31
	17:12	17:47	18:19	19:52		20:23	20:50	20:56	20:33		19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59		06:17	05:54	06:00	06:26		06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53		20:24	20:50	20:56	20:32		19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58		06:16	05:54	06:01	06:27		06:56	07:26	07:00	07:33
	17:14	17:49	18:22	19:54		20:25	20:51	20:56	20:31		19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56		06:15	05:54	06:01	06:28		06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55		20:26	20:52	20:55	20:30		19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54		06:13	05:53	06:02	06:29		06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56		20:27	20:52	20:55	20:28		19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53		06:12	05:53	06:03	06:30		06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57		20:28	20:53	20:54	20:27		19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51		06:11	05:53	06:03	06:31		07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58		20:29	20:53	20:54	20:26		19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50		06:10	05:53	06:04	06:31		07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59		20:30	20:54	20:54	20:24		19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	19:10 (6)	06:09	05:53	06:05	06:32	19:14 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	5 19:15 (6)	20:31	20:54	20:53	20:23	7 19:21 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	19:06 (6)	06:08	05:53	06:05	06:33	19:11 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	12 19:18 (6)	20:32	20:54	20:53	20:22	12 19:23 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	19:05 (6)	06:07	05:53	06:06	06:34	19:10 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	15 19:20 (6)	20:33	20:55	20:52	20:20	15 19:25 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	19:03 (6)	06:06	05:53	06:07	06:35	19:09 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	17 19:20 (6)	20:34	20:55	20:51	20:19	17 19:26 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	19:02 (6)	06:06	05:53	06:08	06:36	19:07 (6)	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	19 19:21 (6)	20:34	20:56	20:51	20:18	18 19:25 (6)	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	19:01 (6)	06:05	05:53	06:09	06:37	19:06 (6)	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	20 19:21 (6)	20:35	20:56	20:50	20:16	20 19:26 (6)	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	19:01 (6)	06:04	05:53	06:09	06:38	19:05 (6)	07:08	07:38	07:14	07:41
	17:27	18:04	18:34	20:06	21 19:22 (6)	20:36	20:56	20:49	20:15	21 19:26 (6)	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	19:00 (6)	06:03	05:53	06:10	06:39	19:05 (6)	07:09	07:39	07:15	07:42
	17:28	18:05	18:35	20:07	21 19:21 (6)	20:37	20:56	20:49	20:13	21 19:26 (6)	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	19:00 (6)	06:02	05:54	06:11	06:40	19:05 (6)	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	21 19:21 (6)	20:38	20:57	20:48	20:12	21 19:26 (6)	19:22	18:35	17:02	17:00
23	07:41	07:07	06:24	06:35	19:01 (6)	06:01	05:54	06:12	06:41	19:05 (6)	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20 19:21 (6)	20:39	20:57	20:47	20:10	20 19:25 (6)	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:33	19:00 (6)	06:01	05:54	06:13	06:42	19:05 (6)	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20 19:20 (6)	20:40	20:57	20:46	20:09	20 19:25 (6)	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	19:01 (6)	06:00	05:54	06:14	06:43	19:05 (6)	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	18 19:19 (6)	20:41	20:57	20:45	20:07	19 19:24 (6)	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	19:02 (6)	05:59	05:55	06:15	06:44	19:06 (6)	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	17 19:19 (6)	20:42	20:57	20:45	20:06	17 19:23 (6)	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	19:02 (6)	05:59	05:55	06:15	06:45	19:07 (6)	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	15 19:17 (6)	20:42	20:57	20:44	20:04	14 19:21 (6)	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	19:04 (6)	05:58	05:55	06:16	06:46	19:08 (6)	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	11 19:15 (6)	20:43	20:57	20:43	20:03	11 19:19 (6)	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	19:08 (6)	05:58	05:56	06:17	06:47	19:12 (6)	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	4 19:12 (6)	20:44	20:57	20:42	20:01	3 19:15 (6)	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25		05:57	05:56	06:18	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17		20:45	20:57	20:41	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10			05:57		06:19	06:49			06:51		07:46
	17:40		19:46			20:46		20:40	19:58			17:23		17:06
Potential sun hours	300	298	370	398		446	450	457	426		375	346	300	290
Total, worst case					256					256				
Sun reduction					0.51					0.72				
Oper. time red.					0.37					0.37				
Wind dir. red.					0.74					0.74				
Total reduction					0.14					0.20				
Total, real					36					51				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 86

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2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BP - R074

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24 19:07 (6)	05:56	05:57	06:20 19:20 (6)	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18 20 19:27 (6)	20:46	20:57	20:39 13 19:33 (6)	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23 19:07 (6)	05:56	05:57	06:21 19:19 (6)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 20 19:27 (6)	20:47	20:57	20:38 15 19:34 (6)	19:55	19:06	17:20	16:58
3	07:46	07:31	06:55	07:06	06:22 19:07 (6)	05:55	05:58	06:22 19:18 (6)	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20 20 19:27 (6)	20:48	20:57	20:37 17 19:35 (6)	19:53	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20 19:07 (6)	05:55	05:58	06:23 19:18 (6)	06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50	20:21 21 19:28 (6)	20:48	20:57	20:35 18 19:36 (6)	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02	06:19 19:06 (6)	05:55	05:59	06:24 19:16 (6)	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22 21 19:27 (6)	20:49	20:56	20:34 20 19:36 (6)	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18 19:06 (6)	05:54	05:59	06:25 19:16 (6)	06:55	07:24	06:58	07:31
	17:12	17:47	18:19	19:52	20:23 21 19:27 (6)	20:50	20:56	20:33 20 19:36 (6)	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17 19:06 (6)	05:54	06:00	06:26 19:15 (6)	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 20 19:26 (6)	20:50	20:56	20:32 21 19:36 (6)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16 19:07 (6)	05:54	06:01	06:27 19:15 (6)	06:56	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25 19 19:26 (6)	20:51	20:56	20:31 21 19:36 (6)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15 19:07 (6)	05:54	06:01	06:28 19:15 (6)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26 18 19:25 (6)	20:52	20:55	20:30 21 19:36 (6)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13 19:08 (6)	05:53	06:02	06:29 19:15 (6)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 16 19:24 (6)	20:52	20:55	20:28 21 19:36 (6)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12 19:09 (6)	05:53	06:03	06:30 19:16 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28 14 19:23 (6)	20:53	20:54	20:27 20 19:36 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11 19:10 (6)	05:53	06:03	06:31 19:16 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 12 19:22 (6)	20:53	20:54	20:26 19 19:35 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10 19:12 (6)	05:53	06:04	06:31 19:16 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30 8 19:20 (6)	20:54	20:54	20:24 18 19:34 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:32 19:17 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23 16 19:33 (6)	19:35	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:05	06:33 19:18 (6)	07:03	07:33	07:08	07:38 14:03 (8)
	17:21	17:58	18:29	20:01	20:32	20:54	20:53	20:22 14 19:32 (6)	19:34	18:45	17:07	16:58 5 14:08 (8)
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34 19:20 (6)	07:04	07:34	07:09	07:39 14:01 (8)
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:20 10 19:30 (6)	19:32	18:43	17:06	16:58 9 14:10 (8)
17	07:44	07:15	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	07:40 14:01 (8)
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:30	18:42	17:06	16:58 11 14:12 (8)
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40 14:00 (8)
	17:24	18:01	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:41	17:05	16:59 13 14:13 (8)
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41 14:01 (8)
	17:25	18:02	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59 13 14:14 (8)
20	07:42	07:11	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	07:41 14:00 (8)
	17:27	18:04	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	17:00 14 14:14 (8)
21	07:42	07:10	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15	07:42 14:01 (8)
	17:28	18:05	18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00 14 14:15 (8)
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43 14:01 (8)
	17:29	18:06	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:00 14 14:15 (8)
23	07:40	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43 14:02 (8)
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01 14 14:16 (8)
24	07:40	07:06	06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44 14:02 (8)
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02 14 14:16 (8)
25	07:39	07:04	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19	07:44 14:04 (8)
	17:32	18:09	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:00	17:02 13 14:17 (8)
26	07:38	07:03	06:19	06:31 19:17 (6)	05:59	05:55	06:15	06:44	07:14	06:45	07:21	07:44 14:05 (8)
	17:34	18:11	18:41	20:13 2 19:19 (6)	20:42	20:57	20:45	20:06	19:15	17:29	17:00	17:03 11 14:16 (8)
27	07:38	07:01	06:17	06:29 19:12 (6)	05:59	05:55	06:15	06:45	07:15	06:46	07:22	07:45 14:06 (8)
	17:35	18:12	18:42	20:14 11 19:23 (6)	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:03 10 14:16 (8)
28	07:37	07:00	06:15	06:28 19:10 (6)	05:58	05:55	06:16	06:46	07:16	06:47	07:23	07:45 14:09 (8)
	17:36	18:13	18:43	20:15 14 19:24 (6)	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04 6 14:15 (8)
29	07:36		07:14	06:27 19:09 (6)	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16 17 19:26 (6)	20:44	20:57	20:42	20:01	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25 19:08 (6)	05:57	05:56	06:18 19:25 (6)	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17 18 19:26 (6)	20:45	20:57	20:41 4 19:29 (6)	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57		06:19 19:22 (6)	06:49		06:51		07:46
	17:40		19:46		20:46		20:40 10 19:32 (6)	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				62	230		14	284				161
Sun reduction				0.51	0.58		0.75	0.72				0.41
Oper. time red.				0.37	0.37		0.37	0.37				0.37
Wind dir. red.				0.72	0.72		0.72	0.72				0.60
Total reduction				0.14	0.15		0.20	0.19				0.09
Total, real				8	36		3	55				15

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 87

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BQ - R081

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May			June
1	07:46		13:55 (8)	07:33		14:26 (8)	06:58	07:09	06:24			05:56
	17:07	62	14:57 (8)	17:41	26	14:52 (8)	18:14	19:47	20:18			20:46
2	07:46		13:56 (8)	07:32		14:30 (8)	06:57	07:07	06:23			05:56
	17:08	61	14:57 (8)	17:42	19	14:49 (8)	18:15	19:48	20:19			20:47
3	07:46		13:56 (8)	07:31		14:35 (8)	06:55	07:06	06:22			05:55
	17:09	61	14:57 (8)	17:43	10	14:45 (8)	18:16	19:49	20:20			20:48
4	07:46		13:57 (8)	07:31			06:54	07:04	06:20			05:55
	17:10	61	14:58 (8)	17:44			18:17	19:50	20:21			20:48
5	07:46		13:57 (8)	07:29			06:52	07:02	06:19			05:55
	17:11	61	14:58 (8)	17:46			18:18	19:51	20:22			20:49
6	07:46		13:58 (8)	07:28			06:51	07:01	06:18		19:20 (6)	05:54
	17:12	61	14:59 (8)	17:47			18:19	19:52	20:23	6	19:26 (6)	20:50
7	07:46		13:59 (8)	07:27			06:49	06:59	06:17		19:17 (6)	05:54
	17:13	60	14:59 (8)	17:48			18:21	19:53	20:24	11	19:28 (6)	20:50
8	07:46		13:59 (8)	07:26			06:48	06:58	06:16		19:16 (6)	05:54
	17:14	61	15:00 (8)	17:49			18:22	19:54	20:25	14	19:30 (6)	20:51
9	07:46		14:00 (8)	07:25			06:46	06:56	06:15		19:15 (6)	05:54
	17:15	60	15:00 (8)	17:51			18:23	19:55	20:26	16	19:31 (6)	20:52
10	07:46		14:00 (8)	07:24			06:45	06:54	06:13		19:14 (6)	05:53
	17:16	60	15:00 (8)	17:52			18:24	19:56	20:27	18	19:32 (6)	20:52
11	07:46		14:01 (8)	07:23			06:43	06:53	06:12		19:13 (6)	05:53
	17:17	60	15:01 (8)	17:53			18:25	19:57	20:28	19	19:32 (6)	20:53
12	07:46		14:02 (8)	07:22			06:41	06:51	06:11		19:13 (6)	05:53
	17:18	59	15:01 (8)	17:54			18:26	19:58	20:29	20	19:33 (6)	20:53
13	07:45		14:02 (8)	07:20			06:40	06:50	06:10		19:12 (6)	05:53
	17:19	59	15:01 (8)	17:55			18:27	19:59	20:30	21	19:33 (6)	20:54
14	07:45		14:03 (8)	07:19			06:38	06:48	06:09		19:12 (6)	05:53
	17:20	58	15:01 (8)	17:57			18:28	20:00	20:31	21	19:33 (6)	20:54
15	07:45		14:04 (8)	07:18			06:37	06:47	06:08		19:12 (6)	05:53
	17:21	58	15:02 (8)	17:58			18:29	20:01	20:32	21	19:33 (6)	20:54
16	07:44		14:04 (8)	07:17			06:35	06:45	06:07		19:12 (6)	05:53
	17:22	58	15:02 (8)	17:59			18:30	20:02	20:33	21	19:33 (6)	20:55
17	07:44		14:05 (8)	07:15			06:33	06:44	06:06		19:13 (6)	05:53
	17:23	57	15:02 (8)	18:00			18:31	20:03	20:34	20	19:33 (6)	20:55
18	07:43		14:06 (8)	07:14			06:32	06:42	06:06		19:13 (6)	05:53
	17:24	56	15:02 (8)	18:01			18:32	20:04	20:34	20	19:33 (6)	20:56
19	07:43		14:06 (8)	07:13			06:30	06:41	06:05		19:13 (6)	05:53
	17:25	55	15:01 (8)	18:02			18:33	20:05	20:35	20	19:33 (6)	20:56
20	07:42		14:07 (8)	07:11			06:28	06:39	06:04		19:13 (6)	05:53
	17:27	55	15:02 (8)	18:04			18:34	20:06	20:36	19	19:32 (6)	20:56
21	07:42		14:08 (8)	07:10			06:27	06:38	06:03		19:14 (6)	05:53
	17:28	53	15:01 (8)	18:05			18:35	20:07	20:37	17	19:31 (6)	20:56
22	07:41		14:10 (8)	07:09			06:25	06:36	06:02		19:15 (6)	05:54
	17:29	52	15:02 (8)	18:06			18:37	20:08	20:38	17	19:32 (6)	20:57
23	07:40		14:11 (8)	07:07			06:24	06:35	06:02		19:16 (6)	05:54
	17:30	50	15:01 (8)	18:07			18:38	20:09	20:39	15	19:31 (6)	20:57
24	07:40		14:11 (8)	07:06			06:22	06:33	06:01		19:16 (6)	05:54
	17:31	49	15:00 (8)	18:08			18:39	20:10	20:40	14	19:30 (6)	20:57
25	07:39		14:12 (8)	07:04			06:20	06:32	06:00		19:18 (6)	05:54
	17:32	48	15:00 (8)	18:09			18:40	20:11	20:41	11	19:29 (6)	20:57
26	07:38		14:15 (8)	07:03			06:19	06:31	05:59		19:19 (6)	05:55
	17:34	45	15:00 (8)	18:11			18:41	20:13	20:42	9	19:28 (6)	20:57
27	07:38		14:16 (8)	07:01			06:17	06:29	05:59		19:22 (6)	05:55
	17:35	43	14:59 (8)	18:12			18:42	20:14	20:42	4	19:26 (6)	20:57
28	07:37		14:17 (8)	07:00			06:15	06:28	05:58			05:55
	17:36	41	14:58 (8)	18:13			18:43	20:15	20:43			20:57
29	07:36		14:19 (8)				07:14	06:27	05:58			05:56
	17:37	38	14:57 (8)				19:44	20:16	20:44			20:57
30	07:35		14:21 (8)				07:12	06:25	05:57			05:56
	17:38	35	14:56 (8)				19:45	20:17	20:45			20:57
31	07:34		14:23 (8)				07:10		05:57			
	17:40	31	14:54 (8)				19:46		20:46			
Potential sun hours	300			298			370	398	446			450
Total, worst case		1668			55					354		
Sun reduction		0.40			0.43					0.58		
Oper. time red.		0.37			0.37					0.37		
Wind dir. red.		0.62			0.62					0.71		
Total reduction		0.09			0.10					0.15		
Total, real		154			5					54		

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BQ - R081

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August			September	October	November			December		
1	05:57			06:20		19:24 (6)	06:50	07:19	06:52			07:26		13:43 (8)
	20:57			20:39	19	19:43 (6)	19:57	19:07	17:22			16:58	60	14:43 (8)
2	05:57			06:21		19:24 (6)	06:51	07:20	06:53			07:27		13:43 (8)
	20:57			20:38	19	19:43 (6)	19:55	19:06	17:20			16:58	60	14:43 (8)
3	05:58			06:22		19:25 (6)	06:52	07:21	06:54			07:28		13:43 (8)
	20:57			20:37	17	19:42 (6)	19:53	19:04	17:19			16:58	60	14:43 (8)
4	05:58			06:23		19:26 (6)	06:53	07:22	06:55			07:29		13:43 (8)
	20:57			20:35	15	19:41 (6)	19:52	19:02	17:18			16:57	61	14:44 (8)
5	05:59			06:24		19:26 (6)	06:54	07:23	06:56			07:30		13:44 (8)
	20:56			20:34	13	19:39 (6)	19:50	19:01	17:17			16:57	60	14:44 (8)
6	05:59			06:25		19:27 (6)	06:55	07:24	06:58			07:31		13:44 (8)
	20:56			20:33	10	19:37 (6)	19:49	18:59	17:16			16:57	61	14:45 (8)
7	06:00			06:26		19:31 (6)	06:56	07:25	06:59			07:32		13:44 (8)
	20:56			20:32	3	19:34 (6)	19:47	18:57	17:15			16:57	61	14:45 (8)
8	06:01			06:27			06:56	07:26	07:00		14:05 (8)	07:33		13:45 (8)
	20:56			20:31			19:45	18:56	17:14	11	14:16 (8)	16:57	61	14:46 (8)
9	06:01			06:28			06:57	07:27	07:01		14:00 (8)	07:33		13:45 (8)
	20:55			20:30			19:44	18:54	17:13	21	14:21 (8)	16:57	61	14:46 (8)
10	06:02			06:29			06:58	07:28	07:02		13:57 (8)	07:34		13:46 (8)
	20:55			20:28			19:42	18:53	17:12	26	14:23 (8)	16:57	61	14:47 (8)
11	06:03			06:30			06:59	07:29	07:03		13:54 (8)	07:35		13:45 (8)
	20:54			20:27			19:40	18:51	17:11	31	14:25 (8)	16:57	62	14:47 (8)
12	06:03			06:31			07:00	07:30	07:05		13:53 (8)	07:36		13:46 (8)
	20:54			20:26			19:39	18:50	17:10	35	14:28 (8)	16:57	61	14:47 (8)
13	06:04			06:31			07:01	07:31	07:06		13:51 (8)	07:37		13:47 (8)
	20:54			20:24			19:37	18:48	17:09	38	14:29 (8)	16:57	61	14:48 (8)
14	06:05			06:32			07:02	07:32	07:07		13:49 (8)	07:38		13:47 (8)
	20:53			20:23			19:35	18:47	17:08	41	14:30 (8)	16:58	62	14:49 (8)
15	06:05			06:33			07:03	07:33	07:08		13:48 (8)	07:38		13:47 (8)
	20:53			20:22			19:34	18:45	17:07	43	14:31 (8)	16:58	61	14:48 (8)
16	06:06			06:34			07:04	07:34	07:09		13:48 (8)	07:39		13:48 (8)
	20:52			20:20			19:32	18:43	17:06	45	14:33 (8)	16:58	61	14:49 (8)
17	06:07		19:29 (6)	06:35			07:05	07:35	07:10		13:46 (8)	07:40		13:49 (8)
	20:51	7	19:36 (6)	20:19			19:30	18:42	17:06	48	14:34 (8)	16:58	61	14:50 (8)
18	06:08		19:28 (6)	06:36			07:06	07:36	07:12		13:45 (8)	07:40		13:49 (8)
	20:51	10	19:38 (6)	20:18			19:29	18:41	17:05	49	14:34 (8)	16:59	61	14:50 (8)
19	06:09		19:27 (6)	06:37			07:07	07:37	07:13		13:45 (8)	07:41		13:49 (8)
	20:50	13	19:40 (6)	20:16			19:27	18:39	17:04	50	14:35 (8)	16:59	62	14:51 (8)
20	06:09		19:26 (6)	06:38			07:08	07:38	07:14		13:45 (8)	07:41		13:49 (8)
	20:49	15	19:41 (6)	20:15			19:25	18:38	17:03	52	14:37 (8)	17:00	62	14:51 (8)
21	06:10		19:25 (6)	06:39			07:09	07:39	07:15		13:44 (8)	07:42		13:50 (8)
	20:49	16	19:41 (6)	20:13			19:24	18:36	17:03	53	14:37 (8)	17:00	62	14:52 (8)
22	06:11		19:25 (6)	06:40			07:10	07:41	07:16		13:44 (8)	07:43		13:50 (8)
	20:48	17	19:42 (6)	20:12			19:22	18:35	17:02	54	14:38 (8)	17:00	61	14:51 (8)
23	06:12		19:24 (6)	06:41			07:11	07:42	07:17		13:43 (8)	07:43		13:51 (8)
	20:47	18	19:42 (6)	20:10			19:20	18:33	17:02	55	14:38 (8)	17:01	62	14:53 (8)
24	06:13		19:24 (6)	06:42			07:12	07:43	07:18		13:43 (8)	07:44		13:51 (8)
	20:46	19	19:43 (6)	20:09			19:19	18:32	17:01	56	14:39 (8)	17:02	62	14:53 (8)
25	06:14		19:24 (6)	06:43			07:13	06:44	07:19		13:42 (8)	07:44		13:52 (8)
	20:45	19	19:43 (6)	20:07			19:17	17:31	17:00	57	14:39 (8)	17:02	62	14:54 (8)
26	06:15		19:24 (6)	06:44			07:14	06:45	07:21		13:43 (8)	07:44		13:53 (8)
	20:45	20	19:44 (6)	20:06			19:15	17:29	17:00	58	14:41 (8)	17:03	61	14:54 (8)
27	06:15		19:23 (6)	06:45			07:15	06:46	07:22		13:43 (8)	07:45		13:53 (8)
	20:44	20	19:43 (6)	20:04			19:14	17:28	17:00	58	14:41 (8)	17:03	61	14:54 (8)
28	06:16		19:23 (6)	06:46			07:16	06:47	07:23		13:43 (8)	07:45		13:54 (8)
	20:43	20	19:43 (6)	20:03			19:12	17:27	16:59	58	14:41 (8)	17:04	61	14:55 (8)
29	06:17		19:23 (6)	06:47			07:17	06:48	07:24		13:43 (8)	07:45		13:54 (8)
	20:42	20	19:43 (6)	20:01			19:10	17:25	16:59	59	14:42 (8)	17:05	62	14:56 (8)
30	06:18		19:23 (6)	06:48			07:18	06:50	07:25		13:43 (8)	07:46		13:55 (8)
	20:41	20	19:43 (6)	20:00			19:09	17:24	16:58	59	14:42 (8)	17:06	61	14:56 (8)
31	06:19		19:23 (6)	06:49				06:51				07:46		13:55 (8)
	20:40	20	19:43 (6)	19:58				17:23				17:06	61	14:56 (8)
Potential sun hours	457			426			375	346	300			290		
Total, worst case		254			96					1057			1896	
Sun reduction		0.75			0.72					0.48			0.41	
Oper. time red.		0.37			0.37					0.37			0.37	
Wind dir. red.		0.71			0.71					0.62			0.62	
Total reduction		0.20			0.19					0.11			0.10	
Total, real		51			18					117			181	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 89
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BR - R082

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May			June
1	07:46		14:07 (8)	07:33		14:29 (8)	06:58	07:09	06:24			05:56
	17:07	60	15:07 (8)	17:41	41	15:10 (8)	18:14	19:47	20:18			20:46
2	07:46		14:08 (8)	07:32		14:31 (8)	06:57	07:07	06:23			05:56
	17:08	59	15:07 (8)	17:42	38	15:09 (8)	18:15	19:48	20:19			20:47
3	07:46		14:08 (8)	07:31		14:33 (8)	06:55	07:06	06:22			05:55
	17:09	60	15:08 (8)	17:43	34	15:07 (8)	18:16	19:49	20:20			20:48
4	07:46		14:08 (8)	07:30		14:35 (8)	06:54	07:04	06:20			05:55
	17:10	60	15:08 (8)	17:44	31	15:06 (8)	18:17	19:50	20:21			20:48
5	07:46		14:09 (8)	07:29		14:38 (8)	06:52	07:02	06:19			05:55
	17:11	60	15:09 (8)	17:46	26	15:04 (8)	18:18	19:51	20:22			20:49
6	07:46		14:09 (8)	07:28		14:42 (8)	06:51	07:01	06:18		19:21 (6)	05:54
	17:12	60	15:09 (8)	17:47	19	15:01 (8)	18:19	19:52	20:23	5	19:26 (6)	20:50
7	07:46		14:10 (8)	07:27		14:49 (8)	06:49	06:59	06:17		19:18 (6)	05:54
	17:13	60	15:10 (8)	17:48	6	14:55 (8)	18:21	19:53	20:24	11	19:29 (6)	20:50
8	07:46		14:11 (8)	07:26			06:48	06:58	06:16		19:16 (6)	05:54
	17:14	59	15:10 (8)	17:49			18:22	19:54	20:25	14	19:30 (6)	20:51
9	07:46		14:11 (8)	07:25			06:46	06:56	06:15		19:15 (6)	05:54
	17:15	60	15:11 (8)	17:51			18:23	19:55	20:26	16	19:31 (6)	20:52
10	07:46		14:11 (8)	07:24			06:45	06:54	06:13		19:15 (6)	05:53
	17:16	60	15:11 (8)	17:52			18:24	19:56	20:27	17	19:32 (6)	20:52
11	07:46		14:12 (8)	07:23			06:43	06:53	06:12		19:14 (6)	05:53
	17:17	60	15:12 (8)	17:53			18:25	19:57	20:28	19	19:33 (6)	20:53
12	07:46		14:12 (8)	07:22			06:41	06:51	06:11		19:14 (6)	05:53
	17:18	60	15:12 (8)	17:54			18:26	19:58	20:29	19	19:33 (6)	20:53
13	07:45		14:12 (8)	07:20			06:40	06:50	06:10		19:13 (6)	05:53
	17:19	60	15:12 (8)	17:55			18:27	19:59	20:30	20	19:33 (6)	20:54
14	07:45		14:13 (8)	07:19			06:38	06:48	06:09		19:13 (6)	05:53
	17:20	60	15:13 (8)	17:57			18:28	20:00	20:31	20	19:33 (6)	20:54
15	07:45		14:14 (8)	07:18			06:37	06:47	06:08		19:13 (6)	05:53
	17:21	59	15:13 (8)	17:58			18:29	20:01	20:32	20	19:33 (6)	20:54
16	07:44		14:14 (8)	07:17			06:35	06:45	06:07		19:13 (6)	05:53
	17:22	59	15:13 (8)	17:59			18:30	20:02	20:33	20	19:33 (6)	20:55
17	07:44		14:15 (8)	07:15			06:33	06:44	06:06		19:14 (6)	05:53
	17:23	59	15:14 (8)	18:00			18:31	20:03	20:34	20	19:34 (6)	20:55
18	07:43		14:15 (8)	07:14			06:32	06:42	06:06		19:14 (6)	05:53
	17:24	59	15:14 (8)	18:01			18:32	20:04	20:34	20	19:34 (6)	20:56
19	07:43		14:15 (8)	07:13			06:30	06:41	06:05		19:14 (6)	05:53
	17:25	58	15:13 (8)	18:02			18:33	20:05	20:35	19	19:33 (6)	20:56
20	07:42		14:17 (8)	07:11			06:28	06:39	06:04		19:14 (6)	05:53
	17:27	57	15:14 (8)	18:04			18:34	20:06	20:36	19	19:33 (6)	20:56
21	07:42		14:17 (8)	07:10			06:27	06:38	06:03		19:15 (6)	05:53
	17:28	57	15:14 (8)	18:05			18:35	20:07	20:37	17	19:32 (6)	20:56
22	07:41		14:18 (8)	07:09			06:25	06:36	06:02		19:16 (6)	05:54
	17:29	56	15:14 (8)	18:06			18:37	20:08	20:38	16	19:32 (6)	20:57
23	07:40		14:19 (8)	07:07			06:24	06:35	06:02		19:17 (6)	05:54
	17:30	55	15:14 (8)	18:07			18:38	20:09	20:39	14	19:31 (6)	20:57
24	07:40		14:19 (8)	07:06			06:22	06:33	06:01		19:17 (6)	05:54
	17:31	55	15:14 (8)	18:08			18:39	20:10	20:40	13	19:30 (6)	20:57
25	07:39		14:20 (8)	07:04			06:20	06:32	06:00		19:19 (6)	05:54
	17:32	53	15:13 (8)	18:09			18:40	20:11	20:41	11	19:30 (6)	20:57
26	07:38		14:22 (8)	07:03			06:19	06:31	05:59		19:20 (6)	05:55
	17:34	52	15:14 (8)	18:11			18:41	20:13	20:42	8	19:28 (6)	20:57
27	07:38		14:23 (8)	07:01			06:17	06:29	05:59		19:24 (6)	05:55
	17:35	50	15:13 (8)	18:12			18:42	20:14	20:42	2	19:25 (6)	20:57
28	07:37		14:24 (8)	07:00			06:15	06:28	05:58			05:55
	17:36	49	15:13 (8)	18:13			18:43	20:15	20:43			20:57
29	07:36		14:25 (8)				07:14	06:27	05:58			05:56
	17:37	47	15:12 (8)				19:44	20:16	20:44			20:57
30	07:35		14:26 (8)				07:12	06:25	05:57			05:56
	17:38	45	15:11 (8)				19:45	20:17	20:45			20:57
31	07:34		14:28 (8)				07:10		05:57			
	17:40	43	15:11 (8)				19:46		20:46			
Potential sun hours	300			298			370	398	446			450
Total, worst case		1751			195					340		
Sun reduction		0.40			0.43					0.58		
Oper. time red.		0.37			0.37					0.37		
Wind dir. red.		0.63			0.63					0.71		
Total reduction		0.09			0.10					0.15		
Total, real		165			20					52		

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 90

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BR - R082

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July			August			September	October	November			December		
1	05:57			06:20		19:24 (6)	06:50	07:19	06:52			07:26		13:54 (8)
	20:57			20:39	20	19:44 (6)	19:57	19:07	17:22			16:58	60	14:54 (8)
2	05:57			06:21		19:25 (6)	06:51	07:20	06:53			07:27		13:54 (8)
	20:57			20:38	18	19:43 (6)	19:55	19:06	17:20			16:58	60	14:54 (8)
3	05:58			06:22		19:26 (6)	06:52	07:21	06:54			07:28		13:54 (8)
	20:57			20:37	16	19:42 (6)	19:53	19:04	17:19			16:58	60	14:54 (8)
4	05:58			06:23		19:26 (6)	06:53	07:22	06:55		14:17 (8)	07:29		13:55 (8)
	20:57			20:35	16	19:42 (6)	19:52	19:02	17:18	9	14:26 (8)	16:57	60	14:55 (8)
5	05:59			06:24		19:27 (6)	06:54	07:23	06:56		14:11 (8)	07:30		13:55 (8)
	20:56			20:34	12	19:39 (6)	19:50	19:01	17:17	20	14:31 (8)	16:57	60	14:55 (8)
6	05:59			06:25		19:28 (6)	06:55	07:24	06:58		14:08 (8)	07:31		13:55 (8)
	20:56			20:33	10	19:38 (6)	19:49	18:59	17:16	26	14:34 (8)	16:57	60	14:55 (8)
7	06:00			06:26			06:56	07:25	06:59		14:05 (8)	07:32		13:56 (8)
	20:56			20:32			19:47	18:57	17:15	31	14:36 (8)	16:57	60	14:56 (8)
8	06:01			06:27			06:56	07:26	07:00		14:04 (8)	07:33		13:56 (8)
	20:56			20:31			19:45	18:56	17:14	34	14:38 (8)	16:57	60	14:56 (8)
9	06:01			06:28			06:57	07:27	07:01		14:02 (8)	07:33		13:57 (8)
	20:55			20:30			19:44	18:54	17:13	38	14:40 (8)	16:57	60	14:57 (8)
10	06:02			06:29			06:58	07:28	07:02		14:00 (8)	07:34		13:58 (8)
	20:55			20:28			19:42	18:53	17:12	41	14:41 (8)	16:57	59	14:57 (8)
11	06:03			06:30			06:59	07:29	07:03		13:58 (8)	07:35		13:57 (8)
	20:54			20:27			19:40	18:51	17:11	44	14:42 (8)	16:57	60	14:57 (8)
12	06:03			06:31			07:00	07:30	07:05		13:58 (8)	07:36		13:58 (8)
	20:54			20:26			19:39	18:50	17:10	45	14:43 (8)	16:57	59	14:57 (8)
13	06:04			06:31			07:01	07:31	07:06		13:57 (8)	07:37		13:59 (8)
	20:54			20:24			19:37	18:48	17:09	47	14:44 (8)	16:57	59	14:58 (8)
14	06:05			06:32			07:02	07:32	07:07		13:56 (8)	07:38		13:59 (8)
	20:53			20:23			19:35	18:47	17:08	49	14:45 (8)	16:58	59	14:58 (8)
15	06:05			06:33			07:03	07:33	07:08		13:55 (8)	07:38		13:59 (8)
	20:53			20:22			19:34	18:45	17:07	50	14:45 (8)	16:58	59	14:58 (8)
16	06:06			06:34			07:04	07:34	07:09		13:55 (8)	07:39		14:00 (8)
	20:52			20:20			19:32	18:43	17:06	52	14:47 (8)	16:58	59	14:59 (8)
17	06:07		19:31 (6)	06:35			07:05	07:35	07:10		13:54 (8)	07:40		14:01 (8)
	20:51	5	19:36 (6)	20:19			19:30	18:42	17:06	53	14:47 (8)	16:58	59	15:00 (8)
18	06:08		19:29 (6)	06:36			07:06	07:36	07:11		13:53 (8)	07:40		14:01 (8)
	20:51	9	19:38 (6)	20:18			19:29	18:41	17:05	55	14:48 (8)	16:59	59	15:00 (8)
19	06:09		19:28 (6)	06:37			07:07	07:37	07:13		13:53 (8)	07:41		14:02 (8)
	20:50	12	19:40 (6)	20:16			19:27	18:39	17:04	55	14:48 (8)	16:59	58	15:00 (8)
20	06:09		19:27 (6)	06:38			07:08	07:38	07:14		13:53 (8)	07:41		14:02 (8)
	20:49	14	19:41 (6)	20:15			19:25	18:38	17:03	56	14:49 (8)	17:00	58	15:00 (8)
21	06:10		19:26 (6)	06:39			07:09	07:39	07:15		13:53 (8)	07:42		14:03 (8)
	20:49	15	19:41 (6)	20:13			19:24	18:36	17:03	57	14:50 (8)	17:00	58	15:01 (8)
22	06:11		19:25 (6)	06:40			07:10	07:41	07:16		13:53 (8)	07:43		14:03 (8)
	20:48	17	19:42 (6)	20:12			19:22	18:35	17:02	57	14:50 (8)	17:00	58	15:01 (8)
23	06:12		19:25 (6)	06:41			07:11	07:42	07:17		13:52 (8)	07:43		14:04 (8)
	20:47	18	19:43 (6)	20:10			19:20	18:33	17:02	58	14:50 (8)	17:01	58	15:02 (8)
24	06:13		19:25 (6)	06:42			07:12	07:43	07:18		13:52 (8)	07:44		14:04 (8)
	20:46	18	19:43 (6)	20:09			19:19	18:32	17:01	59	14:51 (8)	17:02	58	15:02 (8)
25	06:14		19:25 (6)	06:43			07:13	06:44	07:19		13:52 (8)	07:44		14:05 (8)
	20:45	19	19:44 (6)	20:07			19:17	17:31	17:00	59	14:51 (8)	17:02	58	15:03 (8)
26	06:15		19:24 (6)	06:44			07:14	06:45	07:20		13:53 (8)	07:44		14:05 (8)
	20:45	20	19:44 (6)	20:06			19:15	17:29	17:00	59	14:52 (8)	17:03	59	15:04 (8)
27	06:15		19:23 (6)	06:45			07:15	06:46	07:22		13:53 (8)	07:45		14:05 (8)
	20:44	21	19:44 (6)	20:04			19:14	17:28	17:00	59	14:52 (8)	17:03	59	15:04 (8)
28	06:16		19:23 (6)	06:46			07:16	06:47	07:23		13:53 (8)	07:45		14:06 (8)
	20:43	21	19:44 (6)	20:03			19:12	17:27	16:59	60	14:53 (8)	17:04	59	15:05 (8)
29	06:17		19:24 (6)	06:47			07:17	06:48	07:24		13:53 (8)	07:45		14:06 (8)
	20:42	20	19:44 (6)	20:01			19:10	17:25	16:59	60	14:53 (8)	17:05	59	15:05 (8)
30	06:18		19:24 (6)	06:48			07:18	06:50	07:25		13:53 (8)	07:46		14:07 (8)
	20:41	20	19:44 (6)	20:00			19:09	17:24	16:58	60	14:53 (8)	17:06	59	15:06 (8)
31	06:19		19:24 (6)	06:49				06:51				07:46		14:07 (8)
	20:40	20	19:44 (6)	19:58				17:23				17:06	59	15:06 (8)
Potential sun hours	457			426			375	346	300			290		
Total, worst case		249			92					1293			1832	
Sun reduction		0.75			0.72					0.48			0.41	
Oper. time red.		0.37			0.37					0.37			0.37	
Wind dir. red.		0.71			0.71					0.63			0.63	
Total reduction		0.20			0.19					0.11			0.10	
Total, real		50			18					146			178	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 91

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BS - R073

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June	July	August		September	October	November	December
1	07:46	07:33	06:58	07:09		06:24	19:08 (6)	05:56	05:57	06:20		06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47		20:18	11 19:19 (6)	20:46	20:57	20:39		19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07		06:23	19:11 (6)	05:56	05:57	06:21		06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48		20:19	6 19:17 (6)	20:47	20:57	20:38		19:55	19:06	17:20	16:58
3	07:46	07:31	06:55	07:06		06:22		05:55	05:58	06:22		06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49		20:20		20:48	20:57	20:37		19:53	19:04	17:19	16:58
4	07:46	07:30	06:54	07:04		06:20		05:55	05:58	06:23		06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50		20:21		20:48	20:57	20:35		19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02		06:19		05:55	05:59	06:24		06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51		20:22		20:49	20:56	20:34		19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01		06:18		05:54	05:59	06:25		06:55	07:24	06:58	07:31
	17:12	17:47	18:19	19:52		20:23		20:50	20:56	20:33		19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59		06:17		05:54	06:00	06:26		06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53		20:24		20:50	20:56	20:32		19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58		06:16		05:54	06:01	06:27		06:56	07:26	07:00	07:33
	17:14	17:49	18:22	19:54		20:25		20:51	20:56	20:31		19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56		06:15		05:54	06:01	06:28		06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55		20:26		20:52	20:55	20:30		19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54		06:13		05:53	06:02	06:29		06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56		20:27		20:52	20:55	20:28		19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53		06:12		05:53	06:03	06:30	19:19 (6)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57		20:28		20:53	20:54	20:27	7 19:26 (6)	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51		06:11		05:53	06:03	06:31	19:17 (6)	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58		20:29		20:53	20:54	20:26	11 19:28 (6)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50		06:10		05:53	06:04	06:31	19:15 (6)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59		20:30		20:54	20:54	20:24	15 19:30 (6)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48		06:09		05:53	06:05	06:32	19:14 (6)	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00		20:31		20:54	20:53	20:23	16 19:30 (6)	19:35	18:46	17:08	16:58
15	07:45	07:18	06:37	06:47		06:08		05:53	06:05	06:33	19:13 (6)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01		20:32		20:54	20:53	20:22	18 19:31 (6)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45		06:07		05:53	06:06	06:34	19:13 (6)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02		20:33		20:55	20:52	20:20	18 19:31 (6)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44		06:06		05:53	06:07	06:35	19:11 (6)	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03		20:34		20:55	20:51	20:19	20 19:31 (6)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	19:13 (6)	06:06		05:53	06:08	06:36	19:11 (6)	07:06	07:36	07:11	07:40
	17:24	18:01	18:32	20:04	7 19:20 (6)	20:34		20:56	20:51	20:18	19 19:30 (6)	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	19:10 (6)	06:05		05:53	06:09	06:37	19:11 (6)	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	12 19:22 (6)	20:35		20:56	20:50	20:16	19 19:30 (6)	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	19:09 (6)	06:04		05:53	06:09	06:38	19:11 (6)	07:08	07:38	07:14	07:41
	17:27	18:04	18:34	20:06	14 19:23 (6)	20:36		20:56	20:49	20:15	19 19:30 (6)	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	19:07 (6)	06:03		05:53	06:10	06:39	19:11 (6)	07:09	07:39	07:15	07:42
	17:28	18:05	18:35	20:07	17 19:24 (6)	20:37		20:56	20:49	20:13	18 19:29 (6)	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	19:06 (6)	06:02		05:54	06:11	06:40	19:12 (6)	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	18 19:24 (6)	20:38		20:57	20:48	20:12	16 19:28 (6)	19:22	18:35	17:02	17:00
23	07:40	07:07	06:24	06:35	19:06 (6)	06:01		05:54	06:12	06:41	19:13 (6)	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	19 19:25 (6)	20:39		20:57	20:47	20:10	14 19:27 (6)	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:33	19:05 (6)	06:01		05:54	06:13	06:42	19:14 (6)	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	19 19:24 (6)	20:40		20:57	20:46	20:09	11 19:25 (6)	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	19:05 (6)	06:00		05:54	06:14	06:43	19:17 (6)	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	20 19:25 (6)	20:41		20:57	20:45	20:07	5 19:22 (6)	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	19:05 (6)	05:59		05:55	06:15	06:44		07:14	06:45	07:20	07:44
	17:34	18:11	18:41	20:13	20 19:25 (6)	20:42		20:57	20:45	20:06		19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	19:05 (6)	05:59		05:55	06:15	06:45		07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	19 19:24 (6)	20:42		20:57	20:44	20:04		19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	19:06 (6)	05:58		05:55	06:16	06:46		07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	17 19:23 (6)	20:43		20:57	20:43	20:03		19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	19:07 (6)	05:58		05:56	06:17	06:47		07:17	06:48	07:24	07:45
	17:37		19:44	20:16	16 19:23 (6)	20:44		20:57	20:42	20:01		19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	19:07 (6)	05:57		05:56	06:18	06:48		07:18	06:50	07:25	07:46
	17:38		19:45	20:17	14 19:21 (6)	20:45		20:57	20:41	20:00		19:09	17:24	16:58	17:06
31	07:34		07:10			05:57			06:19	06:49			06:51		07:46
	17:40		19:46			20:46			20:40	19:58			17:23		17:06
Potential sun hours	300	298	370	398		446		450	457	426		375	346	300	290
Total, worst case				212		17				226					
Sun reduction				0.51		0.58				0.72					
Oper. time red.				0.37		0.37				0.37					
Wind dir. red.				0.73		0.73				0.73					
Total reduction				0.14		0.16				0.20					
Total, real				29		3				44					

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 92

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BT - R072

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20	16:58
3	07:46	07:31	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19	16:58
4	07:46	07:30	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:11	07:40
	17:24	18:01	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:40	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	07:41
	17:27	18:04	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15	07:42
	17:28	18:05	18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:00
23	07:40	07:07	06:24	06:35	06:01	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:20	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Flickering Nuoro Sud

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2024-01-12 10:10 / 93

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BU - R084

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October	November	December
1	07:46	15:00 (8)	07:33	15:10 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07 42	15:42 (8)	17:41 45	15:55 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22 24	15:16 (8) 16:58 48	14:44 (8) 15:32 (8)
2	07:46	15:00 (8)	07:32	15:10 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	14:50 (8) 07:27	14:44 (8)
	17:08 43	15:43 (8)	17:42 45	15:55 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20 28	15:18 (8) 16:58 48	15:32 (8)
3	07:46	15:00 (8)	07:31	15:12 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	14:48 (8) 07:28	14:45 (8)
	17:09 44	15:44 (8)	17:43 42	15:54 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19 31	15:19 (8) 16:58 47	15:32 (8)
4	07:46	15:01 (8)	07:30	15:13 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	14:47 (8) 07:29	14:46 (8)
	17:10 44	15:45 (8)	17:44 41	15:54 (8)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18 34	15:21 (8) 16:57 46	15:32 (8)
5	07:46	15:01 (8)	07:29	15:14 (8)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	14:45 (8) 07:30	14:46 (8)
	17:11 44	15:45 (8)	17:46 39	15:53 (8)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17 37	15:22 (8) 16:57 46	15:32 (8)
6	07:46	15:01 (8)	07:28	15:15 (8)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	14:44 (8) 07:31	14:47 (8)
	17:12 45	15:46 (8)	17:47 37	15:52 (8)	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16 39	15:23 (8) 16:57 45	15:32 (8)
7	07:46	15:01 (8)	07:27	15:17 (8)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	14:42 (8) 07:32	14:48 (8)
	17:13 46	15:47 (8)	17:48 34	15:51 (8)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15 42	15:24 (8) 16:57 44	15:32 (8)
8	07:46	15:02 (8)	07:26	15:19 (8)	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00	14:42 (8) 07:33	14:49 (8)
	17:14 46	15:48 (8)	17:49 31	15:50 (8)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14 43	15:25 (8) 16:57 44	15:33 (8)
9	07:46	15:02 (8)	07:25	15:21 (8)	06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27	07:01	14:41 (8) 07:33	14:49 (8)
	17:15 47	15:49 (8)	17:51 28	15:49 (8)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13 45	15:26 (8) 16:57 44	15:33 (8)
10	07:46	15:01 (8)	07:24	15:23 (8)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02	14:40 (8) 07:34	14:50 (8)
	17:16 48	15:49 (8)	17:52 23	15:46 (8)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12 46	15:26 (8) 16:57 43	15:33 (8)
11	07:46	15:02 (8)	07:23	15:27 (8)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	14:40 (8) 07:35	14:50 (8)
	17:17 48	15:50 (8)	17:53 16	15:43 (8)	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11 47	15:27 (8) 16:57 43	15:33 (8)
12	07:45	15:02 (8)	07:22	15:34 (8)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	14:40 (8) 07:36	14:51 (8)
	17:18 49	15:51 (8)	17:54 3	15:37 (8)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10 48	15:28 (8) 16:57 42	15:33 (8)
13	07:45	15:02 (8)	07:20		06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06	14:39 (8) 07:37	14:52 (8)
	17:19 49	15:51 (8)	17:55		18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48	17:09 49	15:28 (8) 16:57 41	15:33 (8)
14	07:45	15:02 (8)	07:19		06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07	14:39 (8) 07:37	14:53 (8)
	17:20 50	15:52 (8)	17:57		18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08 49	15:28 (8) 16:58 41	15:34 (8)
15	07:45	15:02 (8)	07:18		06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08	14:39 (8) 07:38	14:53 (8)
	17:21 50	15:52 (8)	17:58		18:29	20:01	20:32	20:54	20:53	20:22	19:34	18:45	17:07 50	15:29 (8) 16:58 40	15:33 (8)
16	07:44	15:03 (8)	07:17		06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	14:39 (8) 07:39	14:54 (8)
	17:22 50	15:53 (8)	17:59		18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43	17:06 51	15:30 (8) 16:58 40	15:34 (8)
17	07:44	15:03 (8)	07:15		06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	14:39 (8) 07:40	14:54 (8)
	17:23 51	15:54 (8)	18:00		18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42	17:06 51	15:30 (8) 16:58 41	15:35 (8)
18	07:43	15:03 (8)	07:14		06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:11	14:39 (8) 07:40	14:54 (8)
	17:24 51	15:54 (8)	18:01		18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:40	17:05 51	15:30 (8) 16:59 40	15:34 (8)
19	07:43	15:03 (8)	07:13		06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	14:39 (8) 07:41	14:55 (8)
	17:25 51	15:54 (8)	18:02		18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04 51	15:30 (8) 16:59 40	15:35 (8)
20	07:42	15:04 (8)	07:11		06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	14:39 (8) 07:41	14:55 (8)
	17:27 51	15:55 (8)	18:04		18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03 51	15:30 (8) 17:00 40	15:35 (8)
21	07:42	15:04 (8)	07:10		06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15	14:40 (8) 07:42	14:56 (8)
	17:28 51	15:55 (8)	18:05		18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03 51	15:31 (8) 17:00 40	15:36 (8)
22	07:41	15:05 (8)	07:09		06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	14:40 (8) 07:43	14:56 (8)
	17:29 51	15:56 (8)	18:06		18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02 51	15:31 (8) 17:00 40	15:36 (8)
23	07:40	15:05 (8)	07:07		06:24	06:35	06:01	05:54	06:12	06:41	07:11	07:42	07:17	14:40 (8) 07:43	14:57 (8)
	17:30 51	15:56 (8)	18:07		18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02 51	15:31 (8) 17:01 40	15:37 (8)
24	07:40	15:05 (8)	07:06		06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	07:18	14:40 (8) 07:44	14:57 (8)
	17:31 51	15:56 (8)	18:08		18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01 51	15:31 (8) 17:02 40	15:37 (8)
25	07:39	15:05 (8)	07:04		06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19	14:40 (8) 07:44	14:58 (8)
	17:32 51	15:56 (8)	18:09		18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:00 51	15:31 (8) 17:02 40	15:38 (8)
26	07:38	15:06 (8)	07:03		06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:20	14:42 (8) 07:44	14:58 (8)
	17:34 51	15:57 (8)	18:11		18:41	20:12	20:42	20:57	20:45	20:06	19:15	17:29	17:00 50	15:32 (8) 17:03 41	15:39 (8)
27	07:38	15:07 (8)	07:01		06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:22	14:42 (8) 07:45	14:59 (8)
	17:35 50	15:57 (8)	18:12		18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00 50	15:32 (8) 17:03 40	15:39 (8)
28	07:37	15:07 (8)	07:00		06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47	07:23	14:42 (8) 07:45	15:00 (8)
	17:36 49	15:56 (8)	18:13		18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59 50	15:32 (8) 17:04 40	15:40 (8)
29	07:36	15:08 (8)			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	14:43 (8) 07:45	15:00 (8)
	17:37 48	15:56 (8)			19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	16:59 49	15:32 (8) 17:05 41	15:41 (8)
30	07:35	15:08 (8)			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	14:43 (8) 07:46	15:00 (8)
	17:38 48	15:56 (8)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 8	15:09 (8) 16:58 49	15:32 (8) 17:06 41	15:41 (8)
31	07:34	15:09 (8)			07:10		05:57		06:19	06:49		06:51	14:56 (8)	07:46	15:00 (8)
	17:40 47	15:56 (8)			19:46		20:46		20:40	19:58		17:23 18	15:14 (8)	17:06 42	15:42 (8)
Potential sun hours	300		298		370	398	446	450	457	426	375	346	300	290	
Total, worst case		1497		384								26		1370	1308
Sun reduction		0.40		0.43								0.56		0.48	0.41
Oper. time red.		0.37		0.37								0.37		0.37	0.37
Wind dir. red.		0.68		0.68								0.68		0.68	0.68
Total reduction		0.10		0.11								0.14		0.12	0.11
Total, real		153		43								4		168	138

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

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

Project:

Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BV - R085

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June	July	August	September	October			November			December		
1	07:46		15:28 (8)	07:33		15:25 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19			06:52		15:01 (8)	07:26		15:07 (8)
	17:07	21	15:49 (8)	17:41	49	16:14 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07			17:22	39	15:40 (8)	16:58	36	15:43 (8)
2	07:46		15:28 (8)	07:32		15:25 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20			06:53		15:00 (8)	07:27		15:08 (8)
	17:08	22	15:50 (8)	17:42	49	16:14 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06			17:20	41	15:41 (8)	16:58	34	15:42 (8)
3	07:46		15:27 (8)	07:31		15:26 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21			06:54		14:58 (8)	07:28		15:09 (8)
	17:09	24	15:51 (8)	17:43	48	16:14 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04			17:19	43	15:41 (8)	16:58	33	15:42 (8)
4	07:46		15:27 (8)	07:30		15:26 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22			06:55		14:58 (8)	07:29		15:10 (8)
	17:10	25	15:52 (8)	17:44	47	16:13 (8)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02			17:18	45	15:43 (8)	16:57	32	15:42 (8)
5	07:46		15:27 (8)	07:29		15:27 (8)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23			06:56		14:58 (8)	07:30		15:11 (8)
	17:11	27	15:54 (8)	17:46	46	16:13 (8)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01			17:17	45	15:43 (8)	16:57	30	15:41 (8)
6	07:46		15:27 (8)	07:28		15:28 (8)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24			06:58		14:57 (8)	07:31		15:13 (8)
	17:12	28	15:55 (8)	17:47	45	16:13 (8)	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59			17:16	46	15:43 (8)	16:57	28	15:41 (8)
7	07:46		15:26 (8)	07:27		15:29 (8)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25			06:59		14:56 (8)	07:32		15:14 (8)
	17:13	30	15:56 (8)	17:48	44	16:13 (8)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57			17:15	47	15:43 (8)	16:57	27	15:41 (8)
8	07:46		15:26 (8)	07:26		15:30 (8)	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26			07:00		14:57 (8)	07:33		15:15 (8)
	17:14	31	15:57 (8)	17:49	42	16:12 (8)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56			17:14	47	15:44 (8)	16:57	25	15:40 (8)
9	07:46		15:26 (8)	07:25		15:31 (8)	06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27			07:01		14:56 (8)	07:33		15:16 (8)
	17:15	33	15:59 (8)	17:51	41	16:12 (8)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54			17:13	49	15:45 (8)	16:57	24	15:40 (8)
10	07:46		15:25 (8)	07:24		15:31 (8)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28			07:02		14:56 (8)	07:34		15:18 (8)
	17:16	34	15:59 (8)	17:52	39	16:10 (8)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53			17:12	49	15:45 (8)	16:57	22	15:40 (8)
11	07:46		15:25 (8)	07:23		15:33 (8)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29			07:03		14:55 (8)	07:35		15:18 (8)
	17:17	36	16:01 (8)	17:53	37	16:10 (8)	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51			17:11	49	15:44 (8)	16:57	21	15:39 (8)
12	07:45		15:25 (8)	07:22		15:34 (8)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30			07:05		14:56 (8)	07:36		15:19 (8)
	17:18	37	16:02 (8)	17:54	35	16:09 (8)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50			17:10	49	15:45 (8)	16:57	20	15:39 (8)
13	07:45		15:24 (8)	07:20		15:36 (8)	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31			07:06		14:56 (8)	07:37		15:21 (8)
	17:19	38	16:02 (8)	17:55	32	16:08 (8)	18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48			17:09	49	15:45 (8)	16:57	18	15:39 (8)
14	07:45		15:24 (8)	07:19		15:38 (8)	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32			07:07		14:56 (8)	07:37		15:22 (8)
	17:20	40	16:04 (8)	17:57	27	16:05 (8)	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46			17:08	49	15:45 (8)	16:58	17	15:39 (8)
15	07:45		15:24 (8)	07:18		15:40 (8)	06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33			07:08		14:56 (8)	07:38		15:23 (8)
	17:21	40	16:04 (8)	17:58	23	16:03 (8)	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45			17:07	49	15:45 (8)	16:58	14	15:37 (8)
16	07:44		15:24 (8)	07:17		15:44 (8)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34			07:09		14:57 (8)	07:39		15:24 (8)
	17:22	41	16:05 (8)	17:59	17	16:01 (8)	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43			17:06	49	15:46 (8)	16:58	14	15:38 (8)
17	07:44		15:24 (8)	07:15		15:49 (8)	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35			07:10		14:57 (8)	07:40		15:26 (8)
	17:23	43	16:07 (8)	18:00	6	15:55 (8)	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42			17:06	48	15:45 (8)	16:58	12	15:38 (8)
18	07:43		15:24 (8)	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36			07:11		14:57 (8)	07:40		15:26 (8)
	17:24	43	16:07 (8)	18:01			18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:40			17:05	48	15:45 (8)	16:59	11	15:37 (8)
19	07:43		15:23 (8)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37			07:13		14:58 (8)	07:41		15:28 (8)
	17:25	45	16:08 (8)	18:02			18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39			17:04	47	15:45 (8)	16:59	9	15:37 (8)
20	07:42		15:24 (8)	07:11			06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38			07:14		14:58 (8)	07:41		15:28 (8)
	17:27	45	16:09 (8)	18:04			18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38			17:03	47	15:45 (8)	17:00	9	15:37 (8)
21	07:42		15:23 (8)	07:10			06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39			07:15		14:59 (8)	07:42		15:29 (8)
	17:28	46	16:09 (8)	18:05			18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36			17:03	46	15:45 (8)	17:00	8	15:37 (8)
22	07:41		15:24 (8)	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41			07:16		15:00 (8)	07:43		15:29 (8)
	17:29	47	16:11 (8)	18:06			18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35			17:02	45	15:45 (8)	17:00	8	15:37 (8)
23	07:40		15:24 (8)	07:07			06:24	06:35	06:01	05:54	06:12	06:41	07:11	07:42			07:17		15:00 (8)	07:43		15:30 (8)
	17:30	47	16:11 (8)	18:07			18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33			17:02	45	15:45 (8)	17:01	9	15:39 (8)
24	07:40		15:23 (8)	07:06			06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43			07:18		15:01 (8)	07:44		15:30 (8)
	17:31	48	16:11 (8)	18:08			18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32			17:01	43	15:44 (8)	17:02	9	15:39 (8)
25	07:39		15:23 (8)	07:04			06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44		15:17 (8)	07:19		15:01 (8)	07:44		15:31 (8)
	17:32	48	16:11 (8)	18:09			18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	10	15:27 (8)	17:00	43	15:44 (8)	17:02	10	15:41 (8)
26	07:38		15:24 (8)	07:03			06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45		15:12 (8)	07:20		15:03 (8)	07:44		15:30 (8)
	17:34	49	16:13 (8)	18:11			18:41	20:12	20:42	20:57	20:45	20:06	19:15	17:29	19	15:31 (8)	17:00	41	15:44 (8)	17:03	11	15:41 (8)
27	07:38		15:24 (8)	07:01			06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46		15:09 (8)	07:22		15:04 (8)	07:45		15:30 (8)
	17:35	49	16:13 (8)	18:12			18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	25	15:34 (8)	17:00	40	15:44 (8)	17:03	12	15:42 (8)
28	07:37		15:24 (8)	07:00			06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47		15:07 (8)	07:23		15:04 (8)	07:45		15:30 (8)
	17:36	49	16:13 (8)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	28	15:35 (8)	16:59	40	15:44 (8)	17:04	14	15:44 (8)
29	07:36		15:24 (8)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48		15:05 (8)	07:24		15:05 (8)	07:45		15:30 (8)
	17:37	49	16:13 (8)				19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	32	15:37 (8)	16:59	38	15:43 (8)	17:05	15	15:45 (8)
30	07:35		15:24 (8)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50		15:04 (8)	07:25		15:06 (8)	07:46		15:29 (8)
	17:38	49	16:13 (8)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	35	15:39 (8)	16:58	37	15:43 (8)	17:06	17	15:46 (8)
31	07:34		15:25 (8)				07:10		05:57		06:19	06:49		06:51		15:02 (8)				07:46		15:29 (8)
	17:40	49	16:14 (8)				19:46		20:46		20:40	19:58		17:23	38	15:40 (8)				17:06	18	15:47 (8)
Potential sun hours	300			298			370	398	446	450	457	426	375	346			300			290		
Total, worst case		1213			627										187			1353			567	
Sun reduction		0.40			0.43										0.56			0.48			0.41	
Oper. time red.		0.37			0.37										0.37			0.37			0.37	
Wind dir. red.		0.70			0.70										0.70			0.70			0.70	
Total reduction		0.11			0.11										0.15			0.13			0.11	
Total, real		127			71										27			170			61	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 95
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BW - R086

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:46		15:32 (8)	07:33		15:50 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		15:17 (8)
	17:07	40	16:12 (8)	17:41	26	16:16 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	43	16:00 (8)
2	07:46		15:32 (8)	07:32		15:51 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		15:17 (8)
	17:08	40	16:12 (8)	17:42	23	16:14 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20			16:58	43	16:00 (8)
3	07:46		15:32 (8)	07:31		15:54 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		15:18 (8)
	17:09	41	16:13 (8)	17:43	19	16:13 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19			16:58	42	16:00 (8)
4	07:46		15:33 (8)	07:30		15:57 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		15:18 (8)
	17:10	40	16:13 (8)	17:44	13	16:10 (8)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18			16:57	42	16:00 (8)
5	07:46		15:33 (8)	07:29			06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56			07:30		15:19 (8)
	17:11	41	16:14 (8)	17:46			18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17			16:57	41	16:00 (8)
6	07:46		15:33 (8)	07:28			06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58			07:31		15:19 (8)
	17:12	42	16:15 (8)	17:47			18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57	42	16:01 (8)
7	07:46		15:34 (8)	07:27			06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59		15:27 (8)	07:32		15:20 (8)
	17:13	41	16:15 (8)	17:48			18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15	13	15:40 (8)	16:57	41	16:01 (8)
8	07:46		15:34 (8)	07:26			06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00		15:24 (8)	07:33		15:21 (8)
	17:14	42	16:16 (8)	17:49			18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	20	15:44 (8)	16:57	40	16:01 (8)
9	07:46		15:35 (8)	07:25			06:46	06:56	06:15	05:53	06:01	06:28	06:57	07:27	07:01		15:22 (8)	07:33		15:21 (8)
	17:15	42	16:17 (8)	17:51			18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	23	15:45 (8)	16:57	41	16:02 (8)
10	07:46		15:34 (8)	07:24			06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02		15:20 (8)	07:34		15:22 (8)
	17:16	43	16:17 (8)	17:52			18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	27	15:47 (8)	16:57	40	16:02 (8)
11	07:46		15:35 (8)	07:23			06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03		15:19 (8)	07:35		15:22 (8)
	17:17	42	16:17 (8)	17:53			18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11	29	15:48 (8)	16:57	40	16:02 (8)
12	07:45		15:35 (8)	07:22			06:41	06:51	06:11	05:53	06:03	06:30	07:00	07:30	07:05		15:18 (8)	07:36		15:23 (8)
	17:18	43	16:18 (8)	17:54			18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	32	15:50 (8)	16:57	39	16:02 (8)
13	07:45		15:35 (8)	07:20			06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06		15:17 (8)	07:37		15:23 (8)
	17:19	43	16:18 (8)	17:55			18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48	17:09	34	15:51 (8)	16:57	40	16:03 (8)
14	07:45		15:36 (8)	07:19			06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07		15:16 (8)	07:37		15:24 (8)
	17:20	43	16:19 (8)	17:57			18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08	36	15:52 (8)	16:58	39	16:03 (8)
15	07:45		15:36 (8)	07:18			06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08		15:16 (8)	07:38		15:24 (8)
	17:21	43	16:19 (8)	17:58			18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45	17:07	36	15:52 (8)	16:58	39	16:03 (8)
16	07:44		15:37 (8)	07:17			06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		15:16 (8)	07:39		15:25 (8)
	17:22	43	16:20 (8)	17:59			18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43	17:06	38	15:54 (8)	16:58	38	16:03 (8)
17	07:44		15:37 (8)	07:15			06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10		15:15 (8)	07:40		15:26 (8)
	17:23	43	16:20 (8)	18:00			18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42	17:06	39	15:54 (8)	16:58	38	16:04 (8)
18	07:43		15:37 (8)	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:11		15:15 (8)	07:40		15:26 (8)
	17:24	43	16:20 (8)	18:01			18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:40	17:05	40	15:55 (8)	16:59	38	16:04 (8)
19	07:43		15:37 (8)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		15:14 (8)	07:41		15:27 (8)
	17:25	43	16:20 (8)	18:02			18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	41	15:55 (8)	16:59	38	16:05 (8)
20	07:42		15:39 (8)	07:11			06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14		15:14 (8)	07:41		15:27 (8)
	17:27	42	16:21 (8)	18:04			18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	41	15:55 (8)	17:00	38	16:05 (8)
21	07:42		15:39 (8)	07:10			06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15		15:15 (8)	07:42		15:28 (8)
	17:28	41	16:20 (8)	18:05			18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	41	15:56 (8)	17:00	38	16:06 (8)
22	07:41		15:40 (8)	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		15:15 (8)	07:43		15:28 (8)
	17:29	41	16:21 (8)	18:06			18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35	17:02	42	15:57 (8)	17:00	38	16:06 (8)
23	07:40		15:40 (8)	07:07			06:24	06:35	06:01	05:54	06:12	06:41	07:11	07:42	07:17		15:14 (8)	07:43		15:29 (8)
	17:30	41	16:21 (8)	18:07			18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	43	15:57 (8)	17:01	38	16:07 (8)
24	07:40		15:41 (8)	07:06			06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	07:18		15:14 (8)	07:44		15:29 (8)
	17:31	40	16:21 (8)	18:08			18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	43	15:57 (8)	17:02	38	16:07 (8)
25	07:39		15:41 (8)	07:04			06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19		15:14 (8)	07:44		15:30 (8)
	17:32	39	16:20 (8)	18:09			18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:00	43	15:57 (8)	17:02	38	16:08 (8)
26	07:38		15:43 (8)	07:03			06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:20		15:16 (8)	07:44		15:30 (8)
	17:34	38	16:21 (8)	18:11			18:41	20:12	20:42	20:57	20:45	20:06	19:15	17:29	17:00	43	15:59 (8)	17:03	38	16:08 (8)
27	07:38		15:44 (8)	07:01			06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:22		15:16 (8)	07:45		15:30 (8)
	17:35	36	16:20 (8)	18:12			18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28	17:00	43	15:59 (8)	17:03	38	16:08 (8)
28	07:37		15:44 (8)	07:00			06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47	07:23		15:16 (8)	07:45		15:31 (8)
	17:36	36	16:20 (8)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	43	15:59 (8)	17:04	39	16:10 (8)
29	07:36		15:45 (8)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24		15:16 (8)	07:45		15:31 (8)
	17:37	34	16:19 (8)				19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25	16:59	43	15:59 (8)	17:05	39	16:10 (8)
30	07:35		15:47 (8)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		15:16 (8)	07:46		15:31 (8)
	17:38	31	16:18 (8)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	43	15:59 (8)	17:05	39	16:10 (8)
31	07:34		15:48 (8)				07:10		05:57		06:19	06:49		06:51				07:46		15:32 (8)
	17:40	29	16:17 (8)				19:46		20:46		20:40	19:58		17:23				17:06	39	16:11 (8)
Potential sun hours	300			298			370	398	446	450	457	426	375	346	300			290		
Total, worst case		1246			81											876			1224	
Sun reduction		0.40			0.43											0.48			0.41	
Oper. time red.		0.37			0.37											0.37			0.37	
Wind dir. red.		0.70			0.70											0.70			0.70	
Total reduction		0.11			0.11											0.13			0.11	
Total, real		131			9											111			133	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 96

Licensed user:
Ing. Bruno Manca
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IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BX - R088

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33 16:02 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52 15:27 (8)	07:26
	17:07	17:41 33 16:35 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22 44 16:11 (8)	16:58
2	07:46	07:32 16:01 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53 15:27 (8)	07:27
	17:08	17:42 35 16:36 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20 43 16:10 (8)	16:58
3	07:46	07:31 16:00 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54 15:27 (8)	07:28
	17:09	17:43 37 16:37 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19 43 16:10 (8)	16:58
4	07:46	07:30 16:00 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55 15:28 (8)	07:29
	17:10	17:44 38 16:38 (8)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18 42 16:10 (8)	16:57
5	07:46	07:29 15:59 (8)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56 15:29 (8)	07:30
	17:11	17:46 40 16:39 (8)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17 40 16:09 (8)	16:57
6	07:46	07:28 15:59 (8)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58 15:29 (8)	07:31
	17:12	17:47 41 16:40 (8)	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16 40 16:09 (8)	16:57
7	07:46	07:27 15:59 (8)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59 15:30 (8)	07:32
	17:13	17:48 41 16:40 (8)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15 38 16:08 (8)	16:57
8	07:46	07:26 15:58 (8)	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00 15:31 (8)	07:33
	17:14	17:49 43 16:41 (8)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14 37 16:08 (8)	16:57
9	07:46	07:25 15:58 (8)	06:46	06:56	06:15	05:53	06:01	06:28	06:57	07:27	07:01 15:32 (8)	07:33
	17:15	17:51 44 16:42 (8)	18:23	19:55	20:26	20:51	20:55	20:30	19:44	18:54	17:13 35 16:07 (8)	16:57
10	07:46	07:24 15:58 (8)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02 15:33 (8)	07:34
	17:16	17:52 43 16:41 (8)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12 33 16:06 (8)	16:57
11	07:46	07:23 15:58 (8)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03 15:34 (8)	07:35
	17:17	17:53 43 16:41 (8)	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11 30 16:04 (8)	16:57
12	07:45	07:22 15:58 (8)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05 15:36 (8)	07:36
	17:18	17:54 44 16:42 (8)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10 28 16:04 (8)	16:57
13	07:45	07:20 15:58 (8)	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06 15:37 (8)	07:37
	17:19	17:55 44 16:42 (8)	18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48	17:09 25 16:02 (8)	16:57
14	07:45	07:19 15:58 (8)	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07 15:39 (8)	07:37
	17:20	17:57 43 16:41 (8)	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08 21 16:00 (8)	16:58
15	07:45	07:18 15:58 (8)	06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33 16:46 (8)	07:08 15:41 (8)	07:38
	17:21	17:58 43 16:41 (8)	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45 12 16:58 (8)	17:07 17 15:58 (8)	16:58
16	07:44	07:17 15:59 (8)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34 16:42 (8)	07:09 15:45 (8)	07:39
	17:22	17:59 42 16:41 (8)	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43 20 17:02 (8)	17:06 11 15:56 (8)	16:58
17	07:44	07:15 15:59 (8)	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35 16:39 (8)	07:10	07:40
	17:23	18:00 41 16:40 (8)	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42 25 17:04 (8)	17:06	16:58
18	07:43	07:14 16:00 (8)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36 16:37 (8)	07:11	07:40
	17:24	18:01 40 16:40 (8)	18:32	20:04	20:34	20:56	20:51	20:18	19:29	18:40 28 17:05 (8)	17:05	16:59
19	07:43	07:13 16:01 (8)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37 16:36 (8)	07:13	07:41
	17:25	18:02 39 16:40 (8)	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39 31 17:07 (8)	17:04	16:59
20	07:42	07:11 16:01 (8)	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38 16:34 (8)	07:14	07:41
	17:27	18:04 37 16:38 (8)	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38 34 17:08 (8)	17:03	17:00
21	07:42	07:10 16:03 (8)	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39 16:33 (8)	07:15	07:42
	17:28	18:05 35 16:38 (8)	18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36 36 17:09 (8)	17:03	17:00
22	07:41	07:09 16:04 (8)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41 16:31 (8)	07:16	07:43
	17:29	18:06 33 16:37 (8)	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35 38 17:09 (8)	17:02	17:00
23	07:40	07:07 16:05 (8)	06:23	06:35	06:01	05:54	06:12	06:41	07:11	07:42 16:30 (8)	07:17	07:43
	17:30	18:07 30 16:35 (8)	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33 40 17:10 (8)	17:02	17:01
24	07:40	07:06 16:07 (8)	06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43 16:29 (8)	07:18	07:44
	17:31	18:08 27 16:34 (8)	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32 41 17:10 (8)	17:01	17:02
25	07:39	07:04 16:09 (8)	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44 15:29 (8)	07:19	07:44
	17:32	18:09 22 16:31 (8)	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31 42 16:11 (8)	17:00	17:02
26	07:38 16:12 (8)	07:03 16:12 (8)	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45 15:29 (8)	07:20	07:44
	17:34 11 16:23 (8)	18:11 17 16:29 (8)	18:41	20:12	20:42	20:57	20:45	20:06	19:15	17:29 42 16:11 (8)	17:00	17:03
27	07:38 16:09 (8)	07:01 16:17 (8)	06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46 15:28 (8)	07:22	07:45
	17:35 17 16:26 (8)	18:12 6 16:23 (8)	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28 43 16:11 (8)	17:00	17:03
28	07:37 16:07 (8)	07:00	06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47 15:27 (8)	07:23	07:45
	17:36 22 16:29 (8)	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 44 16:11 (8)	16:59	17:04
29	07:36 16:05 (8)		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48 15:27 (8)	07:24	07:45
	17:37 25 16:30 (8)		19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25 44 16:11 (8)	16:59	17:05
30	07:35 16:04 (8)		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50 15:28 (8)	07:25	07:46
	17:38 28 16:32 (8)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 44 16:12 (8)	16:58	17:06
31	07:34 16:03 (8)		07:10		05:57		06:19	06:49		06:51 15:27 (8)		07:46
	17:40 30 16:33 (8)		19:46		20:46		20:40	19:58		17:23 44 16:11 (8)		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case	133	981								608	527	
Sun reduction	0.40	0.43								0.56	0.48	
Oper. time red.	0.37	0.37								0.37	0.37	
Wind dir. red.	0.72	0.72								0.72	0.72	
Total reduction	0.11	0.12								0.15	0.13	
Total, real	14	114								91	68	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 97
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BY - R089

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58 16:14 (8)	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52 15:51 (8)	07:26
	17:07	17:41	18:14 36 16:50 (8)	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22 22 16:13 (8)	16:58
2	07:46	07:32	06:57 16:15 (8)	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53 15:54 (8)	07:27
	17:08	17:42	18:15 35 16:50 (8)	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20 16 16:10 (8)	16:58
3	07:46	07:31	06:55 16:16 (8)	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54 15:58 (8)	07:28
	17:09	17:43	18:16 32 16:48 (8)	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19 7 16:05 (8)	16:58
4	07:46	07:30	06:54 16:18 (8)	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:44	18:17 29 16:47 (8)	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52 16:19 (8)	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18 26 16:45 (8)	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51 16:20 (8)	07:01	06:18	05:54	05:59	06:25	06:55	07:24 17:02 (8)	06:58	07:31
	17:12	17:47	18:19 23 16:43 (8)	19:52	20:23	20:50	20:56	20:33	19:49	18:59 13 17:15 (8)	17:16	16:57
7	07:46	07:27	06:49 16:23 (8)	06:59	06:17	05:54	06:00	06:26	06:56	07:25 16:58 (8)	06:59	07:32
	17:13	17:48	18:21 17 16:40 (8)	19:53	20:24	20:50	20:56	20:32	19:47	18:57 20 17:18 (8)	17:15	16:57
8	07:46	07:26 16:28 (8)	06:48 16:28 (8)	06:58	06:16	05:54	06:01	06:27	06:56	07:26 16:55 (8)	07:00	07:33
	17:14	17:49 10 16:38 (8)	18:22 7 16:35 (8)	19:54	20:25	20:51	20:56	20:31	19:45	18:56 25 17:20 (8)	17:14	16:57
9	07:46	07:25 16:24 (8)	06:46	06:56	06:15	05:53	06:01	06:28	06:57	07:27 16:53 (8)	07:01	07:33
	17:15	17:51 18 16:42 (8)	18:23	19:55	20:26	20:51	20:55	20:30	19:44	18:54 28 17:21 (8)	17:13	16:57
10	07:46	07:24 16:21 (8)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28 16:51 (8)	07:02	07:34
	17:16	17:52 22 16:43 (8)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53 31 17:22 (8)	17:12	16:57
11	07:46	07:23 16:19 (8)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29 16:50 (8)	07:03	07:35
	17:17	17:53 27 16:46 (8)	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51 33 17:23 (8)	17:11	16:57
12	07:45	07:22 16:18 (8)	06:41	06:51	06:11	05:53	06:03	06:30	07:00	07:30 16:48 (8)	07:05	07:36
	17:18	17:54 29 16:47 (8)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50 36 17:24 (8)	17:10	16:57
13	07:45	07:20 16:17 (8)	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31 16:47 (8)	07:06	07:37
	17:19	17:55 32 16:49 (8)	18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48 37 17:24 (8)	17:09	16:57
14	07:45	07:19 16:15 (8)	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32 16:46 (8)	07:07	07:37
	17:20	17:57 35 16:50 (8)	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46 38 17:24 (8)	17:08	16:58
15	07:45	07:18 16:15 (8)	06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33 16:45 (8)	07:08	07:38
	17:21	17:58 36 16:51 (8)	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45 40 17:25 (8)	17:07	16:58
16	07:44	07:17 16:14 (8)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34 16:44 (8)	07:09	07:39
	17:22	17:59 38 16:52 (8)	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43 41 17:25 (8)	17:06	16:58
17	07:44	07:15 16:13 (8)	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35 16:43 (8)	07:10	07:40
	17:23	18:00 39 16:52 (8)	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42 42 17:25 (8)	17:06	16:58
18	07:43	07:14 16:13 (8)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36 16:43 (8)	07:11	07:40
	17:24	18:01 40 16:53 (8)	18:32	20:04	20:34	20:55	20:51	20:18	19:29	18:40 41 17:24 (8)	17:05	16:59
19	07:43	07:13 16:13 (8)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37 16:43 (8)	07:13	07:41
	17:25	18:02 40 16:53 (8)	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39 42 17:25 (8)	17:04	16:59
20	07:42	07:11 16:12 (8)	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38 16:43 (8)	07:14	07:41
	17:27	18:04 41 16:53 (8)	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38 42 17:25 (8)	17:03	17:00
21	07:42	07:10 16:12 (8)	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39 16:43 (8)	07:15	07:42
	17:28	18:05 42 16:54 (8)	18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36 41 17:24 (8)	17:03	17:00
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	17:29	18:06 42 16:54 (8)	18:37	20:08	20:38	20:57	20:48	20:12	19:22	18:35 42 17:24 (8)	17:02	17:00
23	07:40	07:07 16:12 (8)	06:23	06:35	06:01	05:54	06:12	06:41	07:11	07:42 16:42 (8)	07:17	07:43
	17:30	18:07 42 16:54 (8)	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33 41 17:23 (8)	17:02	17:01
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	17:31	18:08 42 16:54 (8)	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32 40 17:22 (8)	17:01	17:02
25	07:39	07:04 16:12 (8)	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44 15:44 (8)	07:19	07:44
	17:32	18:09 41 16:53 (8)	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31 38 16:22 (8)	17:00	17:02
26	07:38	07:03 16:13 (8)	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45 15:44 (8)	07:20	07:44
	17:34	18:11 40 16:53 (8)	18:41	20:12	20:42	20:57	20:45	20:06	19:15	17:29 37 16:21 (8)	17:00	17:03
27	07:38	07:01 16:13 (8)	06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46 15:45 (8)	07:22	07:45
	17:35	18:12 39 16:52 (8)	18:42	20:14	20:42	20:57	20:44	20:04	19:14	17:28 35 16:20 (8)	17:00	17:03
28	07:37	07:00 16:14 (8)	06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47 15:45 (8)	07:23	07:45
	17:36	18:13 38 16:52 (8)	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 34 16:19 (8)	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48 15:46 (8)	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:10	17:25 32 16:18 (8)	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:49 15:48 (8)	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 29 16:17 (8)	16:58	17:05
31	07:34		07:10		05:57		06:19	06:49		06:51 15:49 (8)		07:46
	17:40		19:46		20:46		20:40	19:58		17:23 26 16:15 (8)		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		733	205							904	45	
Sun reduction		0.43	0.47							0.56	0.48	
Oper. time red.		0.37	0.37							0.37	0.37	
Wind dir. red.		0.74	0.74							0.74	0.74	
Total reduction		0.12	0.13							0.15	0.13	
Total, real		88	27							139	6	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 98

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: BZ - R087

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33 16:10 (8)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52 15:37 (8)	07:26
	17:07	17:41 32 16:42 (8)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22 39 16:16 (8)	16:58
2	07:46	07:32 16:09 (8)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53 15:37 (8)	07:27
	17:08	17:42 34 16:43 (8)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20 39 16:16 (8)	16:58
3	07:46	07:31 16:08 (8)	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54 15:37 (8)	07:28
	17:09	17:43 36 16:44 (8)	18:16	19:49	20:20	20:48	20:57	20:37	19:53	19:04	17:19 39 16:16 (8)	16:58
4	07:46	07:30 16:08 (8)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55 15:37 (8)	07:29
	17:10	17:44 37 16:45 (8)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18 39 16:16 (8)	16:57
5	07:46	07:29 16:08 (8)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56 15:38 (8)	07:30
	17:11	17:46 37 16:45 (8)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17 38 16:16 (8)	16:57
6	07:46	07:28 16:08 (8)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58 15:38 (8)	07:31
	17:12	17:47 38 16:46 (8)	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16 37 16:15 (8)	16:57
7	07:46	07:27 16:08 (8)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59 15:38 (8)	07:32
	17:13	17:48 39 16:47 (8)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15 37 16:15 (8)	16:57
8	07:46	07:26 16:08 (8)	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00 15:39 (8)	07:33
	17:14	17:49 39 16:47 (8)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14 36 16:15 (8)	16:57
9	07:46	07:25 16:08 (8)	06:46	06:56	06:15	05:53	06:01	06:28	06:57	07:27	07:01 15:40 (8)	07:33
	17:15	17:51 39 16:47 (8)	18:23	19:55	20:26	20:51	20:55	20:30	19:44	18:54	17:13 34 16:14 (8)	16:57
10	07:46	07:24 16:07 (8)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02 15:41 (8)	07:34
	17:16	17:52 40 16:47 (8)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12 32 16:13 (8)	16:57
11	07:46	07:23 16:08 (8)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03 15:41 (8)	07:35
	17:17	17:53 39 16:47 (8)	18:25	19:57	20:28	20:53	20:54	20:27	19:40	18:51	17:11 31 16:12 (8)	16:57
12	07:45	07:22 16:08 (8)	06:41	06:51	06:11	05:53	06:03	06:30	07:00	07:30	07:05 15:43 (8)	07:36
	17:18	17:54 39 16:47 (8)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10 29 16:12 (8)	16:57
13	07:45	07:20 16:09 (8)	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06 15:44 (8)	07:37
	17:19	17:55 38 16:47 (8)	18:27	19:59	20:30	20:54	20:54	20:24	19:37	18:48	17:09 27 16:11 (8)	16:57
14	07:45	07:19 16:08 (8)	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07 15:45 (8)	07:37
	17:20	17:57 38 16:46 (8)	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08 24 16:09 (8)	16:58
15	07:45	07:18 16:09 (8)	06:37	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08 15:47 (8)	07:38
	17:21	17:58 37 16:46 (8)	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45	17:07 20 16:07 (8)	16:58
16	07:44	07:17 16:10 (8)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09 15:50 (8)	07:39
	17:22	17:59 36 16:46 (8)	18:30	20:02	20:33	20:55	20:52	20:20	19:32	18:43	17:06 16 16:06 (8)	16:58
17	07:44	07:15 16:10 (8)	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10 15:53 (8)	07:40
	17:23	18:00 34 16:44 (8)	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42	17:06 10 16:03 (8)	16:58
18	07:43	07:14 16:12 (8)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36 16:57 (8)	07:11	07:40
	17:24	18:01 32 16:44 (8)	18:32	20:04	20:34	20:55	20:51	20:18	19:29	18:40 3 17:00 (8)	17:05	16:59
19	07:43	07:13 16:13 (8)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37 16:52 (8)	07:13	07:41
	17:25	18:02 30 16:43 (8)	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39 15 17:07 (8)	17:04	16:59
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	17:27	18:04 27 16:41 (8)	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38 21 17:09 (8)	17:03	17:00
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	17:28	18:05 24 16:40 (8)	18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36 25 17:11 (8)	17:03	17:00
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	17:38 29 16:40 (8)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 39 16:17 (8)	16:58	17:05
31	07:34 16:10 (8)		07:10		05:57		06:19	06:49		06:51 15:37 (8)		07:46
	17:40 31 16:41 (8)		19:46		20:46		20:40	19:58		17:23 40 16:17 (8)		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case	157	777								418	527	
Sun reduction	0.40	0.43								0.56	0.48	
Oper. time red.	0.37	0.37								0.37	0.37	
Wind dir. red.	0.72	0.72								0.72	0.72	
Total reduction	0.11	0.12								0.15	0.13	
Total, real	17	91								63	69	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 99
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CA - R095

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April			May			June
1	07:46		11:19 (10)	07:33		11:33 (10)	06:58	07:09			06:24		19:09 (8)	05:56
	17:07	78	15:53 (9)	17:41	57	15:59 (9)	18:14	19:47			20:18	31	19:40 (8)	20:46
2	07:46		11:19 (10)	07:32		11:34 (10)	06:57	07:07			06:23		19:09 (8)	05:56
	17:08	80	15:54 (9)	17:42	49	15:56 (9)	18:15	19:48			20:19	30	19:39 (8)	20:47
3	07:46		11:20 (10)	07:31		11:36 (10)	06:55	07:06			06:22		19:10 (8)	05:55
	17:09	80	15:55 (9)	17:43	36	12:12 (10)	18:16	19:49			20:20	29	19:39 (8)	20:48
4	07:46		11:20 (10)	07:30		11:38 (10)	06:54	07:04			06:20		19:11 (8)	05:55
	17:10	82	15:56 (9)	17:44	32	12:10 (10)	18:17	19:50			20:21	27	19:38 (8)	20:48
5	07:46		11:20 (10)	07:29		11:40 (10)	06:52	07:02			06:19		19:11 (8)	05:55
	17:11	81	15:56 (9)	17:46	28	12:08 (10)	18:18	19:51			20:22	26	19:37 (8)	20:49
6	07:46		11:21 (10)	07:28		11:44 (10)	06:51	07:01			06:18		19:11 (8)	05:54
	17:12	82	15:57 (9)	17:47	20	12:04 (10)	18:19	19:52			20:23	25	19:36 (8)	20:50
7	07:46		11:21 (10)	07:27		11:51 (10)	06:49	06:59			06:17		19:13 (8)	05:54
	17:13	84	15:58 (9)	17:48	5	11:56 (10)	18:21	19:53			20:24	22	19:35 (8)	20:50
8	07:46		11:21 (10)	07:26			06:48	06:58			06:16		19:14 (8)	05:54
	17:14	86	15:59 (9)	17:49			18:22	19:54			20:25	20	19:34 (8)	20:51
9	07:46		11:21 (10)	07:25			06:46	06:56			06:15		19:15 (8)	05:53
	17:15	85	15:59 (9)	17:51			18:23	19:55			20:26	17	19:32 (8)	20:51
10	07:46		11:21 (10)	07:24			06:45	06:54			06:13		19:17 (8)	05:53
	17:16	87	16:00 (9)	17:52			18:24	19:56			20:27	13	19:30 (8)	20:52
11	07:46		11:22 (10)	07:23			06:43	06:53			06:12		19:21 (8)	05:53
	17:17	87	16:01 (9)	17:53			18:25	19:57			20:28	5	19:26 (8)	20:53
12	07:45		11:22 (10)	07:22			06:41	06:51			06:11			05:53
	17:18	89	16:02 (9)	17:54			18:26	19:58			20:29			20:53
13	07:45		11:22 (10)	07:20			06:40	06:50			06:10			05:53
	17:19	88	16:01 (9)	17:55			18:27	19:59			20:30			20:54
14	07:45		11:23 (10)	07:19			06:38	06:48			06:09			05:53
	17:20	88	16:02 (9)	17:57			18:28	20:00			20:31			20:54
15	07:45		11:22 (10)	07:18			06:37	06:47			06:08			05:53
	17:21	89	16:02 (9)	17:58			18:29	20:01			20:32			20:54
16	07:44		11:23 (10)	07:17			06:35	06:45			06:07			05:53
	17:22	89	16:03 (9)	17:59			18:30	20:02			20:32			20:55
17	07:44		11:23 (10)	07:15			06:33	06:44		19:21 (8)	06:06			05:53
	17:23	89	16:03 (9)	18:00			18:31	20:03	12	19:33 (8)	20:33			20:55
18	07:43		11:24 (10)	07:14			06:32	06:42		19:18 (8)	06:06			05:53
	17:24	90	16:04 (9)	18:01			18:32	20:04	18	19:36 (8)	20:34			20:55
19	07:43		11:24 (10)	07:13			06:30	06:41		19:16 (8)	06:05			05:53
	17:25	89	16:04 (9)	18:02			18:33	20:05	21	19:37 (8)	20:35			20:56
20	07:42		11:25 (10)	07:11			06:28	06:39		19:15 (8)	06:04			05:53
	17:27	89	16:05 (9)	18:04			18:34	20:06	23	19:38 (8)	20:36			20:56
21	07:42		11:25 (10)	07:10			06:27	06:38		19:13 (8)	06:03			05:53
	17:28	88	16:05 (9)	18:05			18:35	20:07	26	19:39 (8)	20:37			20:56
22	07:41		11:25 (10)	07:09			06:25	06:36		19:12 (8)	06:02			05:54
	17:29	87	16:04 (9)	18:06			18:36	20:08	28	19:40 (8)	20:38			20:56
23	07:40		11:26 (10)	07:07			06:23	06:35		19:11 (8)	06:01			05:54
	17:30	86	16:05 (9)	18:07			18:38	20:09	30	19:41 (8)	20:39			20:57
24	07:40		11:26 (10)	07:06			06:22	06:33		19:10 (8)	06:01			05:54
	17:31	85	16:05 (9)	18:08			18:39	20:10	30	19:40 (8)	20:40			20:57
25	07:39		11:27 (10)	07:04			06:20	06:32		19:10 (8)	06:00			05:54
	17:32	83	16:04 (9)	18:09			18:40	20:11	31	19:41 (8)	20:41			20:57
26	07:38		11:27 (10)	07:03			06:19	06:31		19:09 (8)	05:59			05:55
	17:34	81	16:04 (9)	18:11			18:41	20:12	31	19:40 (8)	20:41			20:57
27	07:38		11:29 (10)	07:01			06:17	06:29		19:09 (8)	05:59			05:55
	17:35	79	16:04 (9)	18:12			18:42	20:13	32	19:41 (8)	20:42			20:57
28	07:37		11:29 (10)	07:00			06:15	06:28		19:09 (8)	05:58			05:55
	17:36	77	16:04 (9)	18:13			18:43	20:15	32	19:41 (8)	20:43			20:57
29	07:36		11:30 (10)				07:14	06:27		19:09 (8)	05:58			05:56
	17:37	72	16:03 (9)				19:44	20:16	32	19:41 (8)	20:44			20:57
30	07:35		11:31 (10)				07:12	06:25		19:08 (8)	05:57			05:56
	17:38	68	16:02 (9)				19:45	20:17	32	19:40 (8)	20:45			20:57
31	07:34		11:32 (10)				07:10				05:57			
	17:40	62	16:00 (9)				19:46				20:45			
Potential sun hours	300			298			370	398			446			450
Total, worst case		2580			227				378			245		
Sun reduction		0.40			0.43				0.51			0.58		
Oper. time red.		0.37			0.37				0.37			0.37		
Wind dir. red.		0.56			0.51				0.72			0.72		
Total reduction		0.08			0.08				0.13			0.15		
Total, real		214			18				51			38		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 100

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CA - R095

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August			September	October	November			December		
1	05:57		06:20			06:50	07:19	06:52			07:26		11:04 (10)
	20:57		20:39			19:57	19:07	17:22			16:58	87	15:43 (9)
2	05:57		06:21		19:30 (8)	06:51	07:20	06:53			07:27		11:04 (10)
	20:57		20:38	9	19:39 (8)	19:55	19:06	17:20			16:58	87	15:43 (9)
3	05:58		06:22		19:27 (8)	06:52	07:21	06:54			07:28		11:05 (10)
	20:57		20:37	14	19:41 (8)	19:53	19:04	17:19			16:58	85	15:43 (9)
4	05:58		06:23		19:25 (8)	06:53	07:22	06:55		11:19 (10)	07:29		11:05 (10)
	20:57		20:35	18	19:43 (8)	19:52	19:02	17:18	9	11:28 (10)	16:57	86	15:43 (9)
5	05:59		06:24		19:23 (8)	06:54	07:23	06:56		11:13 (10)	07:30		11:06 (10)
	20:56		20:34	21	19:44 (8)	19:50	19:01	17:17	21	11:34 (10)	16:57	84	15:43 (9)
6	05:59		06:25		19:22 (8)	06:55	07:24	06:58		11:10 (10)	07:31		11:07 (10)
	20:56		20:33	23	19:45 (8)	19:49	18:59	17:16	28	11:38 (10)	16:57	82	15:43 (9)
7	06:00		06:26		19:21 (8)	06:56	07:25	06:59		11:08 (10)	07:32		11:07 (10)
	20:56		20:32	25	19:46 (8)	19:47	18:57	17:15	32	11:40 (10)	16:57	82	15:43 (9)
8	06:01		06:27		19:20 (8)	06:56	07:26	07:00		11:07 (10)	07:32		11:08 (10)
	20:56		20:31	27	19:47 (8)	19:45	18:56	17:14	36	11:43 (10)	16:57	82	15:44 (9)
9	06:01		06:28		19:19 (8)	06:57	07:27	07:01		11:05 (10)	07:33		11:09 (10)
	20:55		20:30	28	19:47 (8)	19:44	18:54	17:13	49	15:27 (9)	16:57	80	15:44 (9)
10	06:02		06:29		19:19 (8)	06:58	07:28	07:02		11:04 (10)	07:34		11:09 (10)
	20:55		20:28	29	19:48 (8)	19:42	18:53	17:12	57	15:30 (9)	16:57	80	15:44 (9)
11	06:03		06:30		19:18 (8)	06:59	07:29	07:03		11:03 (10)	07:35		11:09 (10)
	20:54		20:27	30	19:48 (8)	19:40	18:51	17:11	64	15:32 (9)	16:57	78	15:43 (9)
12	06:03		06:30		19:17 (8)	07:00	07:30	07:04		11:03 (10)	07:36		11:10 (10)
	20:54		20:26	31	19:48 (8)	19:39	18:50	17:10	68	15:34 (9)	16:57	78	15:44 (9)
13	06:04		06:31		19:17 (8)	07:01	07:31	07:06		11:02 (10)	07:37		11:11 (10)
	20:53		20:24	32	19:49 (8)	19:37	18:48	17:09	73	15:35 (9)	16:57	76	15:44 (9)
14	06:05		06:32		19:17 (8)	07:02	07:32	07:07		11:01 (10)	07:37		11:12 (10)
	20:53		20:23	32	19:49 (8)	19:35	18:46	17:08	77	15:36 (9)	16:58	76	15:45 (9)
15	06:05		06:33		19:17 (8)	07:03	07:33	07:08		11:01 (10)	07:38		11:11 (10)
	20:52		20:22	31	19:48 (8)	19:34	18:45	17:07	79	15:36 (9)	16:58	75	15:44 (9)
16	06:06		06:34		19:17 (8)	07:04	07:34	07:09		11:01 (10)	07:39		11:12 (10)
	20:52		20:20	31	19:48 (8)	19:32	18:43	17:06	81	15:38 (9)	16:58	75	15:45 (9)
17	06:07		06:35		19:16 (8)	07:05	07:35	07:10		11:01 (10)	07:40		11:13 (10)
	20:51		20:19	31	19:47 (8)	19:30	18:42	17:06	83	15:38 (9)	16:58	74	15:45 (9)
18	06:08		06:36		19:16 (8)	07:06	07:36	07:11		11:00 (10)	07:40		11:13 (10)
	20:51		20:18	31	19:47 (8)	19:29	18:40	17:05	85	15:39 (9)	16:59	74	15:45 (9)
19	06:09		06:37		19:16 (8)	07:07	07:37	07:13		11:00 (10)	07:41		11:14 (10)
	20:50		20:16	30	19:46 (8)	19:27	18:39	17:04	86	15:39 (9)	16:59	73	15:46 (9)
20	06:09		06:38		19:16 (8)	07:08	07:38	07:14		11:00 (10)	07:41		11:14 (10)
	20:49		20:15	29	19:45 (8)	19:25	18:38	17:03	87	15:39 (9)	17:00	73	15:46 (9)
21	06:10		06:39		19:17 (8)	07:09	07:39	07:15		11:01 (10)	07:42		11:15 (10)
	20:49		20:13	27	19:44 (8)	19:24	18:36	17:03	88	15:41 (9)	17:00	73	15:47 (9)
22	06:11		06:40		19:18 (8)	07:10	07:41	07:16		11:01 (10)	07:43		11:15 (10)
	20:48		20:12	25	19:43 (8)	19:22	18:35	17:02	88	15:41 (9)	17:00	73	15:47 (9)
23	06:12		06:41		19:19 (8)	07:11	07:42	07:17		11:01 (10)	07:43		11:16 (10)
	20:47		20:10	23	19:42 (8)	19:20	18:33	17:02	89	15:41 (9)	17:01	73	15:48 (9)
24	06:13		06:42		19:20 (8)	07:12	07:43	07:18		11:01 (10)	07:43		11:16 (10)
	20:46		20:09	20	19:40 (8)	19:19	18:32	17:01	89	15:41 (9)	17:02	73	15:48 (9)
25	06:14		06:43		19:22 (8)	07:13	06:44	07:19		11:01 (10)	07:44		11:17 (10)
	20:45		20:07	16	19:38 (8)	19:17	17:31	17:00	89	15:41 (9)	17:02	73	15:49 (9)
26	06:15		06:44		19:24 (8)	07:14	06:45	07:20		11:01 (10)	07:44		11:17 (10)
	20:44		20:06	11	19:35 (8)	19:15	17:29	17:00	89	15:41 (9)	17:03	74	15:49 (9)
27	06:15		06:45			07:15	06:46	07:22		11:02 (10)	07:45		11:17 (10)
	20:44		20:04			19:14	17:28	17:00	89	15:42 (9)	17:03	75	15:50 (9)
28	06:16		06:46			07:16	06:47	07:23		11:03 (10)	07:45		11:17 (10)
	20:43		20:03			19:12	17:27	16:59	88	15:42 (9)	17:04	75	15:50 (9)
29	06:17		06:47			07:17	06:48	07:24		11:03 (10)	07:45		11:19 (10)
	20:42		20:01			19:10	17:25	16:59	89	15:43 (9)	17:05	75	15:51 (9)
30	06:18		06:48			07:18	06:49	07:25		11:03 (10)	07:46		11:19 (10)
	20:41		20:00			19:09	17:24	16:58	89	15:43 (9)	17:05	76	15:52 (9)
31	06:19		06:49				06:51				07:46		11:19 (10)
	20:40		19:58				17:23				17:06	77	15:53 (9)
Potential sun hours	457		426			375	346	300			290		
Total, worst case				624					1902			2404	
Sun reduction				0.72					0.48			0.41	
Oper. time red.				0.37					0.37			0.37	
Wind dir. red.				0.72					0.56			0.56	
Total reduction				0.19					0.10			0.08	
Total, real				119					187			204	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 101

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CB - R094

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April			May			June
1	07:46		11:33 (10)	07:33	06:58	07:09			06:24		19:12 (8)	05:56
	17:07	82	15:52 (9)	17:41	18:14	19:47			20:18	5	19:17 (8)	20:46
2	07:46		11:33 (10)	07:32	06:57	07:07			06:23			05:56
	17:08	83	15:53 (9)	17:42	18:15	19:48			20:19			20:47
3	07:46		11:34 (10)	07:31	06:55	07:06			06:22			05:55
	17:09	82	15:53 (9)	17:43	18:16	19:49			20:20			20:48
4	07:46		11:34 (10)	07:30	06:54	07:04			06:20			05:55
	17:10	84	15:54 (9)	17:44	18:17	19:50			20:21			20:48
5	07:46		11:35 (10)	07:29	06:52	07:02			06:19			05:55
	17:11	83	15:55 (9)	17:46	18:18	19:51			20:22			20:49
6	07:46		11:36 (10)	07:28	06:51	07:01			06:18			05:54
	17:12	82	15:55 (9)	17:47	18:19	19:52			20:23			20:50
7	07:46		11:36 (10)	07:27	06:49	06:59			06:17			05:54
	17:13	83	15:56 (9)	17:48	18:21	19:53			20:24			20:50
8	07:46		11:37 (10)	07:26	06:48	06:58			06:16			05:54
	17:14	83	15:57 (9)	17:49	18:22	19:54			20:25			20:51
9	07:46		11:37 (10)	07:25	06:46	06:56		19:17 (8)	06:14			05:53
	17:15	82	15:56 (9)	17:51	18:23	19:55	4	19:21 (8)	20:26			20:51
10	07:46		11:37 (10)	07:24	06:45	06:54		19:12 (8)	06:13			05:53
	17:16	83	15:57 (9)	17:52	18:24	19:56	14	19:26 (8)	20:27			20:52
11	07:46		11:38 (10)	07:23	06:43	06:53		19:09 (8)	06:12			05:53
	17:17	83	15:58 (9)	17:53	18:25	19:57	19	19:28 (8)	20:28			20:53
12	07:45		11:39 (10)	07:22	06:41	06:51		19:08 (8)	06:11			05:53
	17:18	81	15:58 (9)	17:54	18:26	19:58	22	19:30 (8)	20:29			20:53
13	07:45		11:39 (10)	07:20	06:40	06:50		19:06 (8)	06:10			05:53
	17:19	82	15:58 (9)	17:55	18:27	19:59	24	19:30 (8)	20:30			20:54
14	07:45		11:40 (10)	07:19	06:38	06:48		19:05 (8)	06:09			05:53
	17:20	81	15:59 (9)	17:57	18:28	20:00	27	19:32 (8)	20:31			20:54
15	07:45		11:40 (10)	07:18	06:37	06:47		19:03 (8)	06:08			05:53
	17:21	81	15:59 (9)	17:58	18:29	20:01	29	19:32 (8)	20:32			20:54
16	07:44		11:41 (10)	07:17	06:35	06:45		19:03 (8)	06:07			05:53
	17:22	79	15:59 (9)	17:59	18:30	20:02	29	19:32 (8)	20:32			20:55
17	07:44		11:42 (10)	07:15	06:33	06:44		19:02 (8)	06:06			05:53
	17:23	77	15:59 (9)	18:00	18:31	20:03	30	19:32 (8)	20:33			20:55
18	07:43		11:43 (10)	07:14	06:32	06:42		19:02 (8)	06:06			05:53
	17:24	75	15:59 (9)	18:01	18:32	20:04	30	19:32 (8)	20:34			20:55
19	07:43		11:43 (10)	07:13	06:30	06:41		19:01 (8)	06:05			05:53
	17:25	74	15:59 (9)	18:02	18:33	20:05	31	19:32 (8)	20:35			20:56
20	07:42		11:45 (10)	07:11	06:28	06:39		19:01 (8)	06:04			05:53
	17:26	71	15:59 (9)	18:04	18:34	20:06	31	19:32 (8)	20:36			20:56
21	07:42		11:46 (10)	07:10	06:27	06:38		19:01 (8)	06:03			05:53
	17:28	68	15:59 (9)	18:05	18:35	20:07	30	19:31 (8)	20:37			20:56
22	07:41		11:46 (10)	07:09	06:25	06:36		19:01 (8)	06:02			05:54
	17:29	65	15:58 (9)	18:06	18:36	20:08	30	19:31 (8)	20:38			20:56
23	07:40		11:48 (10)	07:07	06:23	06:35		19:02 (8)	06:01			05:54
	17:30	62	15:58 (9)	18:07	18:38	20:09	29	19:31 (8)	20:39			20:57
24	07:40		11:50 (10)	07:06	06:22	06:33		19:01 (8)	06:01			05:54
	17:31	58	15:58 (9)	18:08	18:39	20:10	29	19:30 (8)	20:40			20:57
25	07:39		11:51 (10)	07:04	06:20	06:32		19:02 (8)	06:00			05:54
	17:32	52	15:57 (9)	18:09	18:40	20:11	27	19:29 (8)	20:41			20:57
26	07:38		11:53 (10)	07:03	06:19	06:31		19:02 (8)	05:59			05:55
	17:34	45	15:55 (9)	18:11	18:41	20:12	25	19:27 (8)	20:41			20:57
27	07:38		11:56 (10)	07:01	06:17	06:29		19:03 (8)	05:59			05:55
	17:35	37	15:54 (9)	18:12	18:42	20:13	24	19:27 (8)	20:42			20:57
28	07:37		12:00 (10)	07:00	06:15	06:28		19:05 (8)	05:58			05:55
	17:36	22	15:51 (9)	18:13	18:43	20:15	20	19:25 (8)	20:43			20:57
29	07:36				07:14	06:27		19:07 (8)	05:58			05:56
	17:37				19:44	20:16	17	19:24 (8)	20:44			20:57
30	07:35				07:12	06:25		19:08 (8)	05:57			05:56
	17:38				19:45	20:17	13	19:21 (8)	20:45			20:57
31	07:34				07:10				05:57			
	17:40				19:46				20:45			
Potential sun hours	300			298	370	398			446			450
Total, worst case		2020					534			5		
Sun reduction		0.40					0.51			0.58		
Oper. time red.		0.37					0.37			0.37		
Wind dir. red.		0.57					0.73			0.73		
Total reduction		0.08					0.14			0.16		
Total, real		171					73			1		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 102

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CB - R094

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:57		06:20		06:50	19:08 (8)	07:19		06:52		07:26	11:20 (10)
	20:57		20:39		19:57	19 19:27 (8)	19:07		17:22		16:58	83 15:40 (9)
2	05:57		06:21		06:51	19:10 (8)	07:20		06:53		07:27	11:20 (10)
	20:57		20:38		19:55	14 19:24 (8)	19:06		17:20		16:58	83 15:40 (9)
3	05:58		06:22		06:52	19:15 (8)	07:21		06:54		07:28	11:21 (10)
	20:57		20:37		19:53	4 19:19 (8)	19:04		17:19		16:58	82 15:40 (9)
4	05:58		06:23		06:53		07:22		06:55		07:29	11:21 (10)
	20:57		20:35		19:52		19:02		17:18		16:57	83 15:41 (9)
5	05:59		06:24		06:54		07:23		06:56		07:30	11:21 (10)
	20:56		20:34		19:50		19:01		17:17		16:57	83 15:41 (9)
6	05:59		06:25		06:55		07:24		06:58		07:31	11:22 (10)
	20:56		20:33		19:49		18:59		17:16		16:57	82 15:41 (9)
7	06:00		06:26		06:55		07:25		06:59		07:32	11:22 (10)
	20:56		20:32		19:47		18:57		17:15		16:57	83 15:42 (9)
8	06:01		06:27		06:56		07:26		07:00		07:32	11:22 (10)
	20:56		20:31		19:45		18:56		17:14		16:57	84 15:42 (9)
9	06:01		06:28		06:57		07:27		07:01		07:33	11:23 (10)
	20:55		20:30		19:44		18:54		17:13		16:57	83 15:43 (9)
10	06:02		06:29		06:58		07:28		07:02		07:34	11:24 (10)
	20:55		20:28		19:42		18:53		17:12		16:57	82 15:43 (9)
11	06:03		06:30		06:59		07:29		07:03		07:35	11:23 (10)
	20:54		20:27		19:40		18:51		17:11		16:57	82 15:42 (9)
12	06:03		06:30	19:19 (8)	07:00		07:30		07:04		07:36	11:24 (10)
	20:54		20:26	8 19:27 (8)	19:39		18:50		17:10		16:57	82 15:43 (9)
13	06:04		06:31	19:16 (8)	07:01		07:31		07:06		07:37	11:24 (10)
	20:53		20:24	14 19:30 (8)	19:37		18:48		17:09		16:57	83 15:44 (9)
14	06:05		06:32	19:14 (8)	07:02		07:32		07:07	11:32 (10)	07:37	11:25 (10)
	20:53		20:23	18 19:32 (8)	19:35		18:46		17:08	23 15:23 (9)	16:58	81 15:44 (9)
15	06:05		06:33	19:12 (8)	07:03		07:33		07:08	11:28 (10)	07:38	11:25 (10)
	20:52		20:22	21 19:33 (8)	19:34		18:45		17:07	37 15:26 (9)	16:58	82 15:44 (9)
16	06:06		06:34	19:11 (8)	07:04		07:34		07:09	11:27 (10)	07:39	11:26 (10)
	20:52		20:20	24 19:35 (8)	19:32		18:43		17:06	45 15:29 (9)	16:58	81 15:44 (9)
17	06:07		06:35	19:09 (8)	07:05		07:35		07:10	11:25 (10)	07:40	11:26 (10)
	20:51		20:19	25 19:34 (8)	19:30		18:42		17:06	52 15:31 (9)	16:58	82 15:45 (9)
18	06:08		06:36	19:08 (8)	07:06		07:36		07:11	11:24 (10)	07:40	11:26 (10)
	20:51		20:18	27 19:35 (8)	19:29		18:40		17:05	58 15:32 (9)	16:59	82 15:45 (9)
19	06:09		06:37	19:07 (8)	07:07		07:37		07:13	11:22 (10)	07:41	11:27 (10)
	20:50		20:16	28 19:35 (8)	19:27		18:39		17:04	62 15:32 (9)	16:59	82 15:46 (9)
20	06:09		06:38	19:06 (8)	07:08		07:38		07:14	11:21 (10)	07:41	11:27 (10)
	20:49		20:15	30 19:36 (8)	19:25		18:38		17:03	65 15:33 (9)	17:00	81 15:46 (9)
21	06:10		06:39	19:06 (8)	07:09		07:39		07:15	11:22 (10)	07:42	11:28 (10)
	20:49		20:13	30 19:36 (8)	19:24		18:36		17:03	68 15:35 (9)	17:00	81 15:47 (9)
22	06:11		06:40	19:05 (8)	07:10		07:41		07:16	11:21 (10)	07:43	11:28 (10)
	20:48		20:12	31 19:36 (8)	19:22		18:35		17:02	71 15:35 (9)	17:00	81 15:47 (9)
23	06:12		06:41	19:05 (8)	07:11		07:42		07:17	11:20 (10)	07:43	11:29 (10)
	20:47		20:10	31 19:36 (8)	19:20		18:33		17:02	74 15:36 (9)	17:01	81 15:48 (9)
24	06:13		06:42	19:05 (8)	07:12		07:43		07:18	11:20 (10)	07:43	11:29 (10)
	20:46		20:09	31 19:36 (8)	19:19		18:32		17:01	75 15:36 (9)	17:02	81 15:48 (9)
25	06:14		06:43	19:05 (8)	07:13		06:44		07:19	11:20 (10)	07:44	11:30 (10)
	20:45		20:07	30 19:35 (8)	19:17		17:31		17:00	76 15:37 (9)	17:02	82 15:49 (9)
26	06:15		06:44	19:05 (8)	07:14		06:45		07:20	11:19 (10)	07:44	11:30 (10)
	20:44		20:06	30 19:35 (8)	19:15		17:29		17:00	79 15:37 (9)	17:03	82 15:49 (9)
27	06:15		06:45	19:05 (8)	07:15		06:46		07:22	11:20 (10)	07:45	11:31 (10)
	20:44		20:04	29 19:34 (8)	19:14		17:28		17:00	81 15:39 (9)	17:03	81 15:49 (9)
28	06:16		06:46	19:05 (8)	07:16		06:47		07:23	11:20 (10)	07:45	11:31 (10)
	20:43		20:03	28 19:33 (8)	19:12		17:27		16:59	81 15:39 (9)	17:04	82 15:50 (9)
29	06:17		06:47	19:06 (8)	07:17		06:48		07:24	11:20 (10)	07:45	11:32 (10)
	20:42		20:01	26 19:32 (8)	19:10		17:25		16:59	81 15:39 (9)	17:05	81 15:51 (9)
30	06:18		06:48	19:06 (8)	07:18		06:49		07:25	11:20 (10)	07:46	11:32 (10)
	20:41		20:00	24 19:30 (8)	19:09		17:24		16:58	81 15:39 (9)	17:05	82 15:51 (9)
31	06:19		06:49	19:07 (8)			06:51				07:46	11:33 (10)
	20:40		19:58	22 19:29 (8)			17:23				17:06	82 15:52 (9)
Potential sun hours	457		426		375		346		300		290	
Total, worst case				507		37				1109		2542
Sun reduction				0.72		0.64				0.48		0.41
Oper. time red.				0.37		0.37				0.37		0.37
Wind dir. red.				0.73		0.73				0.57		0.57
Total reduction				0.19		0.17				0.10		0.09
Total, real				99		6				113		221

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 103

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CC - R096

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April			May			June
1	07:46		12:03 (10)	07:33		12:12 (10)	06:58	07:09			06:24		19:12 (8)	05:56
	17:07	49	12:52 (10)	17:41	80	16:22 (9)	18:14	19:47			20:18	26	19:38 (8)	20:46
2	07:46		12:03 (10)	07:32		12:13 (10)	06:57	07:07			06:23		19:13 (8)	05:56
	17:08	50	12:53 (10)	17:42	78	16:22 (9)	18:15	19:48			20:19	25	19:38 (8)	20:47
3	07:46		12:03 (10)	07:31		12:14 (10)	06:55	07:06			06:22		19:14 (8)	05:55
	17:09	50	12:53 (10)	17:43	74	16:21 (9)	18:16	19:49			20:20	23	19:37 (8)	20:48
4	07:46		12:03 (10)	07:30		12:16 (10)	06:54	07:04			06:20		19:15 (8)	05:55
	17:10	51	12:54 (10)	17:44	70	16:21 (9)	18:17	19:50			20:21	21	19:36 (8)	20:48
5	07:46		12:04 (10)	07:29		12:17 (10)	06:52	07:02			06:19		19:15 (8)	05:55
	17:11	51	12:55 (10)	17:46	66	16:20 (9)	18:18	19:51			20:22	19	19:34 (8)	20:49
6	07:46		12:04 (10)	07:28		12:19 (10)	06:51	07:01			06:18		19:17 (8)	05:54
	17:12	52	12:56 (10)	17:47	60	16:19 (9)	18:19	19:52			20:23	15	19:32 (8)	20:50
7	07:46		12:04 (10)	07:27		12:21 (10)	06:49	06:59			06:17		19:19 (8)	05:54
	17:13	52	12:56 (10)	17:48	53	16:18 (9)	18:21	19:53			20:24	11	19:30 (8)	20:50
8	07:46		12:05 (10)	07:26		12:24 (10)	06:48	06:58			06:16		19:24 (8)	05:54
	17:14	52	12:57 (10)	17:49	43	16:16 (9)	18:22	19:54			20:25	2	19:25 (8)	20:51
9	07:46		12:04 (10)	07:25		12:27 (10)	06:46	06:56			06:14			05:53
	17:15	53	12:57 (10)	17:51	28	16:11 (9)	18:23	19:55			20:26			20:51
10	07:46		12:04 (10)	07:24		12:34 (10)	06:45	06:54			06:13			05:53
	17:16	54	12:58 (10)	17:52	9	12:43 (10)	18:24	19:56			20:27			20:52
11	07:46		12:05 (10)	07:23			06:43	06:53			06:12			05:53
	17:17	63	16:06 (9)	17:53			18:25	19:57			20:28			20:53
12	07:45		12:05 (10)	07:22			06:41	06:51			06:11			05:53
	17:18	67	16:08 (9)	17:54			18:26	19:58			20:29			20:53
13	07:45		12:05 (10)	07:20			06:40	06:50			06:10			05:53
	17:19	70	16:09 (9)	17:55			18:27	19:59			20:30			20:53
14	07:45		12:05 (10)	07:19			06:38	06:48			06:09			05:53
	17:20	73	16:11 (9)	17:57			18:28	20:00			20:31			20:54
15	07:45		12:05 (10)	07:18			06:37	06:47			06:08			05:53
	17:21	75	16:12 (9)	17:58			18:29	20:01			20:32			20:54
16	07:44		12:05 (10)	07:17			06:35	06:45		19:27 (8)	06:07			05:53
	17:22	79	16:14 (9)	17:59			18:30	20:02	4	19:31 (8)	20:32			20:55
17	07:44		12:05 (10)	07:15			06:33	06:44		19:21 (8)	06:06			05:53
	17:23	80	16:15 (9)	18:00			18:31	20:03	13	19:34 (8)	20:33			20:55
18	07:43		12:06 (10)	07:14			06:32	06:42		19:19 (8)	06:06			05:53
	17:24	81	16:16 (9)	18:01			18:32	20:04	18	19:37 (8)	20:34			20:55
19	07:43		12:06 (10)	07:13			06:30	06:41		19:17 (8)	06:05			05:53
	17:25	83	16:17 (9)	18:02			18:33	20:05	21	19:38 (8)	20:35			20:56
20	07:42		12:06 (10)	07:11			06:28	06:39		19:16 (8)	06:04			05:53
	17:26	85	16:18 (9)	18:04			18:34	20:06	23	19:39 (8)	20:36			20:56
21	07:42		12:06 (10)	07:10			06:27	06:38		19:14 (8)	06:03			05:53
	17:28	86	16:19 (9)	18:05			18:35	20:07	25	19:39 (8)	20:37			20:56
22	07:41		12:06 (10)	07:09			06:25	06:36		19:14 (8)	06:02			05:54
	17:29	87	16:19 (9)	18:06			18:36	20:08	26	19:40 (8)	20:38			20:56
23	07:40		12:07 (10)	07:07			06:23	06:35		19:13 (8)	06:01			05:54
	17:30	87	16:20 (9)	18:07			18:38	20:09	28	19:41 (8)	20:39			20:57
24	07:40		12:07 (10)	07:06			06:22	06:33		19:12 (8)	06:01			05:54
	17:31	88	16:21 (9)	18:08			18:39	20:10	28	19:40 (8)	20:40			20:57
25	07:39		12:08 (10)	07:04			06:20	06:32		19:12 (8)	06:00			05:54
	17:32	87	16:21 (9)	18:09			18:40	20:11	29	19:41 (8)	20:41			20:57
26	07:38		12:08 (10)	07:03			06:19	06:31		19:11 (8)	05:59			05:55
	17:34	87	16:21 (9)	18:11			18:41	20:12	29	19:40 (8)	20:41			20:57
27	07:38		12:09 (10)	07:01			06:17	06:29		19:11 (8)	05:59			05:55
	17:35	87	16:22 (9)	18:12			18:42	20:13	29	19:40 (8)	20:42			20:57
28	07:37		12:10 (10)	07:00			06:15	06:28		19:12 (8)	05:58			05:55
	17:36	86	16:23 (9)	18:13			18:43	20:14	28	19:40 (8)	20:43			20:57
29	07:36		12:10 (10)				07:14	06:27		19:12 (8)	05:58			05:56
	17:37	86	16:23 (9)				19:44	20:16	28	19:40 (8)	20:44			20:57
30	07:35		12:11 (10)				07:12	06:25		19:12 (8)	05:57			05:56
	17:38	84	16:23 (9)				19:45	20:17	27	19:39 (8)	20:45			20:57
31	07:34		12:11 (10)				07:10				05:57			
	17:40	82	16:22 (9)				19:46				20:45			
Potential sun hours	300			298			370	398			446			450
Total, worst case		2217			561				356			142		
Sun reduction		0.40			0.43				0.51			0.58		
Oper. time red.		0.37			0.37				0.37			0.37		
Wind dir. red.		0.56			0.58				0.72			0.72		
Total reduction		0.08			0.09				0.14			0.15		
Total, real		185			52				48			22		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 104
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CC - R096

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August			September		October		November			December		
1	05:57		06:20			06:50		07:19		06:52		12:02 (10)	07:26		11:47 (10)
	20:57		20:39			19:57		19:07		17:22	13	12:15 (10)	16:58	63	15:48 (9)
2	05:57		06:21			06:51		07:20		06:53		11:56 (10)	07:27		11:47 (10)
	20:57		20:38			19:55		19:05		17:20	31	15:42 (9)	16:58	54	12:41 (10)
3	05:58		06:22			06:52		07:21		06:54		11:53 (10)	07:28		11:48 (10)
	20:57		20:37			19:53		19:04		17:19	44	15:45 (9)	16:58	53	12:41 (10)
4	05:58		06:23			06:53		07:22		06:55		11:51 (10)	07:29		11:49 (10)
	20:57		20:35			19:52		19:02		17:18	54	15:48 (9)	16:57	52	12:41 (10)
5	05:59		06:24		19:31 (8)	06:54		07:23		06:56		11:49 (10)	07:30		11:49 (10)
	20:56		20:34	7	19:38 (8)	19:50		19:01		17:17	60	15:49 (9)	16:57	53	12:42 (10)
6	05:59		06:25		19:28 (8)	06:55		07:24		06:58		11:47 (10)	07:31		11:50 (10)
	20:56		20:33	13	19:41 (8)	19:49		18:59		17:16	66	15:50 (9)	16:57	52	12:42 (10)
7	06:00		06:26		19:26 (8)	06:55		07:25		06:59		11:45 (10)	07:32		11:51 (10)
	20:56		20:32	17	19:43 (8)	19:47		18:57		17:15	72	15:51 (9)	16:57	51	12:42 (10)
8	06:01		06:27		19:25 (8)	06:56		07:26		07:00		11:45 (10)	07:32		11:51 (10)
	20:56		20:31	19	19:44 (8)	19:45		18:56		17:14	75	15:52 (9)	16:57	51	12:42 (10)
9	06:01		06:28		19:23 (8)	06:57		07:27		07:01		11:44 (10)	07:33		11:52 (10)
	20:55		20:30	22	19:45 (8)	19:44		18:54		17:13	78	15:53 (9)	16:57	50	12:42 (10)
10	06:02		06:29		19:22 (8)	06:58		07:28		07:02		11:43 (10)	07:34		11:53 (10)
	20:55		20:28	24	19:46 (8)	19:42		18:53		17:12	80	15:53 (9)	16:57	50	12:43 (10)
11	06:03		06:30		19:22 (8)	06:59		07:29		07:03		11:42 (10)	07:35		11:53 (10)
	20:54		20:27	25	19:47 (8)	19:40		18:51		17:11	83	15:53 (9)	16:57	49	12:42 (10)
12	06:03		06:30		19:21 (8)	07:00		07:30		07:04		11:43 (10)	07:36		11:54 (10)
	20:54		20:26	26	19:47 (8)	19:39		18:50		17:10	83	15:54 (9)	16:57	49	12:43 (10)
13	06:04		06:31		19:20 (8)	07:01		07:31		07:06		11:42 (10)	07:37		11:55 (10)
	20:53		20:24	28	19:48 (8)	19:37		18:48		17:09	85	15:54 (9)	16:57	48	12:43 (10)
14	06:05		06:32		19:20 (8)	07:02		07:32		07:07		11:42 (10)	07:37		11:56 (10)
	20:53		20:23	28	19:48 (8)	19:35		18:46		17:08	86	15:54 (9)	16:58	48	12:44 (10)
15	06:05		06:33		19:19 (8)	07:03		07:33		07:08		11:41 (10)	07:38		11:55 (10)
	20:52		20:22	29	19:48 (8)	19:34		18:45		17:07	87	15:54 (9)	16:58	48	12:43 (10)
16	06:06		06:34		19:19 (8)	07:04		07:34		07:09		11:42 (10)	07:39		11:56 (10)
	20:52		20:20	29	19:48 (8)	19:32		18:43		17:06	87	15:55 (9)	16:58	48	12:44 (10)
17	06:07		06:35		19:18 (8)	07:05		07:35		07:10		11:42 (10)	07:40		11:57 (10)
	20:51		20:19	29	19:47 (8)	19:30		18:42		17:06	88	15:55 (9)	16:58	47	12:44 (10)
18	06:08		06:36		19:18 (8)	07:06		07:36		07:11		11:41 (10)	07:40		11:57 (10)
	20:51		20:18	28	19:46 (8)	19:29		18:40		17:05	88	15:55 (9)	16:59	47	12:44 (10)
19	06:09		06:37		19:18 (8)	07:07		07:37		07:13		11:41 (10)	07:41		11:58 (10)
	20:50		20:16	28	19:46 (8)	19:27		18:39		17:04	87	15:54 (9)	16:59	47	12:45 (10)
20	06:09		06:38		19:18 (8)	07:08		07:38		07:14		11:41 (10)	07:41		11:58 (10)
	20:49		20:15	28	19:46 (8)	19:25		18:38		17:03	87	15:54 (9)	17:00	47	12:45 (10)
21	06:10		06:39		19:19 (8)	07:09		07:39		07:15		11:42 (10)	07:42		11:59 (10)
	20:49		20:13	26	19:45 (8)	19:24		18:36		17:03	86	15:55 (9)	17:00	47	12:46 (10)
22	06:11		06:40		19:19 (8)	07:10		07:41		07:16		11:42 (10)	07:43		11:59 (10)
	20:48		20:12	25	19:44 (8)	19:22		18:35		17:02	85	15:54 (9)	17:00	47	12:46 (10)
23	06:12		06:41		19:20 (8)	07:11		07:42		07:17		11:43 (10)	07:43		12:00 (10)
	20:47		20:10	23	19:43 (8)	19:20		18:33		17:02	83	15:54 (9)	17:01	47	12:47 (10)
24	06:13		06:42		19:21 (8)	07:12		07:43		07:18		11:43 (10)	07:43		12:00 (10)
	20:46		20:09	20	19:41 (8)	19:19		18:32		17:01	81	15:53 (9)	17:02	47	12:47 (10)
25	06:14		06:43		19:22 (8)	07:13		06:44		07:19		11:43 (10)	07:44		12:01 (10)
	20:45		20:07	18	19:40 (8)	19:17		17:31		17:00	80	15:53 (9)	17:02	47	12:48 (10)
26	06:15		06:44		19:24 (8)	07:14		06:45		07:20		11:43 (10)	07:44		12:01 (10)
	20:44		20:06	13	19:37 (8)	19:15		17:29		17:00	79	15:52 (9)	17:03	47	12:48 (10)
27	06:15		06:45		19:30 (8)	07:15		06:46		07:22		11:45 (10)	07:45		12:01 (10)
	20:44		20:04	2	19:31 (8)	19:14		17:28		17:00	75	15:52 (9)	17:03	48	12:49 (10)
28	06:16		06:46			07:16		06:47		07:23		11:45 (10)	07:45		12:01 (10)
	20:43		20:03			19:12		17:27		16:59	74	15:52 (9)	17:04	48	12:49 (10)
29	06:17		06:47			07:17		06:48		07:24		11:46 (10)	07:45		12:02 (10)
	20:42		20:01			19:10		17:25		16:59	71	15:51 (9)	17:05	48	12:50 (10)
30	06:18		06:48			07:18		06:49		07:25		11:46 (10)	07:46		12:03 (10)
	20:41		20:00			19:09		17:24		16:58	67	15:49 (9)	17:05	48	12:51 (10)
31	06:19		06:49					06:51					07:46		12:03 (10)
	20:40		19:58					17:23					17:06	48	12:51 (10)
Potential sun hours	457		426			375		346		300			290		
Total, worst case				507							2215			1529	
Sun reduction				0.72							0.48			0.41	
Oper. time red.				0.37							0.37			0.37	
Wind dir. red.				0.72							0.58			0.52	
Total reduction				0.19							0.10			0.08	
Total, real				97							228			121	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 105

Licensed user:
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IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CD - R097

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April			May	June
1	07:46		13:24 (10)	07:33		13:47 (10)	06:58	07:09			06:24	05:56
	17:07	46	14:10 (10)	17:41	52	16:37 (9)	18:14	19:47			20:18	20:46
2	07:46		13:24 (10)	07:32		13:50 (10)	06:57	07:07			06:23	05:56
	17:08	47	14:11 (10)	17:42	46	16:37 (9)	18:15	19:48			20:19	20:47
3	07:46		13:25 (10)	07:31		13:54 (10)	06:55	07:06			06:22	05:55
	17:09	46	14:11 (10)	17:43	36	16:36 (9)	18:16	19:49			20:20	20:48
4	07:46		13:25 (10)	07:30		16:13 (9)	06:54	07:04			06:20	05:55
	17:10	47	14:12 (10)	17:44	23	16:36 (9)	18:17	19:50			20:21	20:48
5	07:46		13:25 (10)	07:29		16:14 (9)	06:52	07:02			06:19	05:55
	17:11	48	14:13 (10)	17:46	21	16:35 (9)	18:18	19:51			20:22	20:49
6	07:46		13:26 (10)	07:28		16:16 (9)	06:51	07:01		19:15 (8)	06:18	05:54
	17:12	47	14:13 (10)	17:47	19	16:35 (9)	18:19	19:52	11	19:26 (8)	20:23	20:50
7	07:46		13:26 (10)	07:27		16:17 (9)	06:49	06:59		19:12 (8)	06:17	05:54
	17:13	48	14:14 (10)	17:48	17	16:34 (9)	18:21	19:53	15	19:27 (8)	20:24	20:50
8	07:46		13:27 (10)	07:26		16:19 (9)	06:48	06:58		19:11 (8)	06:16	05:54
	17:14	48	14:15 (10)	17:49	13	16:32 (9)	18:22	19:54	18	19:29 (8)	20:25	20:51
9	07:46		13:26 (10)	07:25		16:21 (9)	06:46	06:56		19:09 (8)	06:14	05:53
	17:15	48	14:14 (10)	17:51	8	16:29 (9)	18:23	19:55	20	19:29 (8)	20:26	20:51
10	07:46		13:27 (10)	07:24			06:44	06:54		19:08 (8)	06:13	05:53
	17:16	48	14:15 (10)	17:52			18:24	19:56	22	19:30 (8)	20:27	20:52
11	07:46		13:28 (10)	07:23			06:43	06:53		19:07 (8)	06:12	05:53
	17:17	48	14:16 (10)	17:53			18:25	19:57	23	19:30 (8)	20:28	20:53
12	07:45		13:28 (10)	07:22			06:41	06:51		19:07 (8)	06:11	05:53
	17:18	49	14:17 (10)	17:54			18:26	19:58	24	19:31 (8)	20:29	20:53
13	07:45		13:28 (10)	07:20			06:40	06:50		19:06 (8)	06:10	05:53
	17:19	48	14:16 (10)	17:55			18:27	19:59	24	19:30 (8)	20:30	20:53
14	07:45		13:29 (10)	07:19			06:38	06:48		19:07 (8)	06:09	05:53
	17:20	48	14:17 (10)	17:57			18:28	20:00	23	19:30 (8)	20:31	20:54
15	07:44		13:29 (10)	07:18			06:36	06:47		19:06 (8)	06:08	05:53
	17:21	48	14:17 (10)	17:58			18:29	20:01	23	19:29 (8)	20:32	20:54
16	07:44		13:30 (10)	07:17			06:35	06:45		19:07 (8)	06:07	05:53
	17:22	48	14:18 (10)	17:59			18:30	20:02	22	19:29 (8)	20:32	20:55
17	07:44		13:30 (10)	07:15			06:33	06:44		19:07 (8)	06:06	05:53
	17:23	48	14:18 (10)	18:00			18:31	20:03	21	19:28 (8)	20:33	20:55
18	07:43		13:31 (10)	07:14			06:32	06:42		19:08 (8)	06:06	05:53
	17:24	54	16:24 (9)	18:01			18:32	20:04	19	19:27 (8)	20:34	20:55
19	07:43		13:31 (10)	07:13			06:30	06:41		19:08 (8)	06:05	05:53
	17:25	58	16:26 (9)	18:02			18:33	20:05	17	19:25 (8)	20:35	20:56
20	07:42		13:32 (10)	07:11			06:28	06:39		19:10 (8)	06:04	05:53
	17:26	62	16:29 (9)	18:04			18:34	20:06	13	19:23 (8)	20:36	20:56
21	07:42		13:32 (10)	07:10			06:27	06:38		19:12 (8)	06:03	05:53
	17:28	64	16:30 (9)	18:05			18:35	20:07	8	19:20 (8)	20:37	20:56
22	07:41		13:33 (10)	07:09			06:25	06:36			06:02	05:54
	17:29	64	16:31 (9)	18:06			18:36	20:08			20:38	20:56
23	07:40		13:34 (10)	07:07			06:23	06:35			06:01	05:54
	17:30	65	16:32 (9)	18:07			18:38	20:09			20:39	20:57
24	07:40		13:35 (10)	07:06			06:22	06:33			06:01	05:54
	17:31	66	16:33 (9)	18:08			18:39	20:10			20:40	20:57
25	07:39		13:36 (10)	07:04			06:20	06:32			06:00	05:54
	17:32	65	16:34 (9)	18:09			18:40	20:11			20:41	20:57
26	07:38		13:36 (10)	07:03			06:19	06:31			05:59	05:55
	17:34	66	16:34 (9)	18:11			18:41	20:12			20:41	20:57
27	07:38		13:38 (10)	07:01			06:17	06:29			05:59	05:55
	17:35	65	16:36 (9)	18:12			18:42	20:13			20:42	20:57
28	07:37		13:40 (10)	07:00			06:15	06:28			05:58	05:55
	17:36	62	16:36 (9)	18:13			18:43	20:14			20:43	20:57
29	07:36		13:41 (10)				07:14	06:27			05:58	05:56
	17:37	60	16:36 (9)				19:44	20:16			20:44	20:57
30	07:35		13:43 (10)				07:12	06:25			05:57	05:56
	17:38	58	16:37 (9)				19:45	20:17			20:45	20:57
31	07:34		13:44 (10)				07:10				05:57	
	17:40	56	16:37 (9)				19:46				20:45	
Potential sun hours	300			298			370	398			446	450
Total, worst case		1675			235				303			
Sun reduction		0.40			0.43				0.51			
Oper. time red.		0.37			0.37				0.37			
Wind dir. red.		0.61			0.69				0.74			
Total reduction		0.09			0.11				0.14			
Total, real		152			26				42			

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 106

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CD - R097

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August			September			October		November			December		
1	05:57		06:20			06:50		19:06 (8)	07:19		06:52			07:26		13:10 (10)
	20:57		20:39			19:57	23	19:29 (8)	19:07		17:22			16:58	48	13:58 (10)
2	05:57		06:21			06:51		19:06 (8)	07:20		06:53		15:51 (9)	07:27		13:10 (10)
	20:57		20:38			19:55	22	19:28 (8)	19:05		17:20	8	15:59 (9)	16:58	48	13:58 (10)
3	05:58		06:22			06:52		19:07 (8)	07:21		06:54		15:48 (9)	07:28		13:10 (10)
	20:57		20:37			19:53	20	19:27 (8)	19:04		17:19	13	16:01 (9)	16:58	48	13:58 (10)
4	05:58		06:23			06:53		19:08 (8)	07:22		06:55		15:47 (9)	07:29		13:11 (10)
	20:57		20:35			19:52	18	19:26 (8)	19:02		17:18	17	16:04 (9)	16:57	48	13:59 (10)
5	05:59		06:24			06:54		19:09 (8)	07:23		06:56		15:45 (9)	07:30		13:11 (10)
	20:56		20:34			19:50	16	19:25 (8)	19:01		17:17	20	16:05 (9)	16:57	48	13:59 (10)
6	05:59		06:25			06:55		19:11 (8)	07:24		06:58		15:44 (9)	07:31		13:12 (10)
	20:56		20:33			19:49	11	19:22 (8)	18:59		17:16	21	16:05 (9)	16:57	47	13:59 (10)
7	06:00		06:26			06:55			07:25		06:59		15:43 (9)	07:32		13:12 (10)
	20:56		20:32			19:47			18:57		17:15	23	16:06 (9)	16:57	48	14:00 (10)
8	06:01		06:27			06:56			07:26		07:00		13:24 (10)	07:32		13:13 (10)
	20:56		20:31			19:45			18:56		17:14	39	16:07 (9)	16:57	47	14:00 (10)
9	06:01		06:28			06:57			07:27		07:01		13:20 (10)	07:33		13:14 (10)
	20:55		20:30			19:44			18:54		17:13	46	16:07 (9)	16:57	46	14:00 (10)
10	06:02		06:29			06:58			07:28		07:02		13:17 (10)	07:34		13:14 (10)
	20:55		20:28			19:42			18:53		17:12	53	16:08 (9)	16:57	47	14:01 (10)
11	06:03		06:30			06:59			07:29		07:03		13:15 (10)	07:35		13:14 (10)
	20:54		20:27			19:40			18:51		17:11	56	16:08 (9)	16:57	46	14:00 (10)
12	06:03		06:30			07:00			07:30		07:04		13:14 (10)	07:36		13:15 (10)
	20:54		20:26			19:39			18:50		17:10	58	16:08 (9)	16:57	46	14:01 (10)
13	06:04		06:31			07:01			07:31		07:06		13:13 (10)	07:37		13:16 (10)
	20:53		20:24			19:37			18:48		17:09	60	16:08 (9)	16:57	45	14:01 (10)
14	06:05		06:32			07:02			07:32		07:07		13:12 (10)	07:37		13:16 (10)
	20:53		20:23			19:35			18:46		17:08	62	16:08 (9)	16:58	46	14:02 (10)
15	06:05		06:33			07:03			07:33		07:08		13:10 (10)	07:38		13:16 (10)
	20:52		20:22			19:34			18:45		17:07	65	16:08 (9)	16:58	46	14:02 (10)
16	06:06		06:34			07:04			07:34		07:09		13:10 (10)	07:39		13:17 (10)
	20:52		20:20			19:32			18:43		17:06	66	16:08 (9)	16:58	45	14:02 (10)
17	06:07		06:35			07:05			07:35		07:10		13:10 (10)	07:40		13:18 (10)
	20:51		20:19			19:30			18:42		17:06	65	16:08 (9)	16:58	45	14:03 (10)
18	06:08		06:36			07:06			07:36		07:11		13:09 (10)	07:40		13:18 (10)
	20:51		20:18			19:29			18:40		17:05	66	16:07 (9)	16:59	45	14:03 (10)
19	06:09		06:37			07:07			07:37		07:13		13:08 (10)	07:41		13:19 (10)
	20:50		20:16			19:27			18:39		17:04	65	16:06 (9)	16:59	45	14:04 (10)
20	06:09		06:38			07:08			07:38		07:14		13:08 (10)	07:41		13:19 (10)
	20:49		20:15			19:25			18:38		17:03	64	16:06 (9)	17:00	45	14:04 (10)
21	06:10		06:39			07:09			07:39		07:15		13:08 (10)	07:42		13:20 (10)
	20:49		20:13			19:24			18:36		17:03	64	16:06 (9)	17:00	44	14:04 (10)
22	06:11		06:40		19:16 (8)	07:10			07:40		07:16		13:08 (10)	07:42		13:20 (10)
	20:48		20:12	9	19:25 (8)	19:22			18:35		17:02	62	16:05 (9)	17:00	44	14:04 (10)
23	06:12		06:41		19:14 (8)	07:11			07:42		07:17		13:08 (10)	07:43		13:21 (10)
	20:47		20:10	14	19:28 (8)	19:20			18:33		17:01	58	16:03 (9)	17:01	45	14:06 (10)
24	06:13		06:42		19:12 (8)	07:12			07:43		07:18		13:08 (10)	07:43		13:21 (10)
	20:46		20:09	17	19:29 (8)	19:19			18:32		17:01	54	16:01 (9)	17:02	45	14:06 (10)
25	06:14		06:43		19:11 (8)	07:13			06:44		07:19		13:08 (10)	07:44		13:22 (10)
	20:45		20:07	19	19:30 (8)	19:17			17:31		17:00	48	13:56 (10)	17:02	45	14:07 (10)
26	06:15		06:44		19:09 (8)	07:14			06:45		07:20		13:08 (10)	07:44		13:22 (10)
	20:44		20:06	22	19:31 (8)	19:15			17:29		17:00	48	13:56 (10)	17:03	45	14:07 (10)
27	06:15		06:45		19:09 (8)	07:15			06:46		07:22		13:09 (10)	07:45		13:22 (10)
	20:44		20:04	22	19:31 (8)	19:14			17:28		17:00	48	13:57 (10)	17:03	45	14:07 (10)
28	06:16		06:46		19:08 (8)	07:16			06:47		07:23		13:09 (10)	07:45		13:22 (10)
	20:43		20:03	23	19:31 (8)	19:12			17:27		16:59	48	13:57 (10)	17:04	46	14:08 (10)
29	06:17		06:47		19:07 (8)	07:17			06:48		07:24		13:09 (10)	07:45		13:23 (10)
	20:42		20:01	24	19:31 (8)	19:10			17:25		16:59	49	13:58 (10)	17:05	46	14:09 (10)
30	06:18		06:48		19:06 (8)	07:18			06:49		07:25		13:09 (10)	07:46		13:23 (10)
	20:41		20:00	24	19:30 (8)	19:09			17:24		16:58	49	13:58 (10)	17:05	46	14:09 (10)
31	06:19		06:49		19:06 (8)				06:51					07:46		13:24 (10)
	20:40		19:58	24	19:30 (8)				17:23					17:06	46	14:10 (10)
Potential sun hours	457		426			375			346		300			290		
Total, worst case				198			110					1395			1426	
Sun reduction				0.72			0.64					0.48			0.41	
Oper. time red.				0.37			0.37					0.37			0.37	
Wind dir. red.				0.74			0.74					0.63			0.59	
Total reduction				0.20			0.18					0.11			0.09	
Total, real				39			19					157			128	

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CE - R099

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:46		07:33	15:03 (10)	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	14:34 (10)	07:26
	17:07		17:41 34	15:37 (10)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22 55	16:28 (9)	16:58
2	07:46		07:32	15:03 (10)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	14:33 (10)	07:27
	17:08		17:42 35	15:38 (10)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:05		17:20 54	16:27 (9)	16:58
3	07:46		07:31	15:03 (10)	06:55	07:05	06:22	05:55	05:58	06:22	06:52	07:21		06:54	14:33 (10)	07:28
	17:09		17:43 36	15:39 (10)	18:16	19:49	20:20	20:48	20:57	20:36	19:53	19:04		17:19 53	16:26 (9)	16:58
4	07:46		07:30	15:03 (10)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	14:33 (10)	07:29
	17:10		17:44 36	15:39 (10)	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02		17:18 52	16:26 (9)	16:57
5	07:46		07:29	15:03 (10)	06:52	07:02	06:19	05:54	05:59	06:24	06:54	07:23		06:56	14:33 (10)	07:30
	17:11		17:46 44	16:52 (9)	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01		17:17 48	16:24 (9)	16:57
6	07:46		07:28	15:03 (10)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24		06:57	14:33 (10)	07:31
	17:12		17:47 49	16:54 (9)	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16 42	16:21 (9)	16:57
7	07:46		07:27	15:03 (10)	06:49	06:59	06:17	05:54	06:00	06:26	06:55	07:25		06:59	14:33 (10)	07:32
	17:13		17:48 52	16:56 (9)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57		17:15 36	15:09 (10)	16:57
8	07:46		07:26	15:04 (10)	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26		07:00	14:34 (10)	07:32
	17:14		17:49 53	16:57 (9)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56		17:14 35	15:09 (10)	16:57
9	07:46		07:25	15:03 (10)	06:46	06:56	06:14	05:53	06:01	06:28	06:57	07:27		07:01	14:34 (10)	07:33
	17:15		17:51 54	16:57 (9)	18:23	19:55	20:26	20:51	20:55	20:29	19:44	18:54		17:13 35	15:09 (10)	16:57
10	07:46		07:24	15:04 (10)	06:44	06:54	06:13	05:53	06:02	06:29	06:58	07:28		07:02	14:34 (10)	07:34
	17:16		17:52 54	16:58 (9)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12 34	15:08 (10)	16:57
11	07:46		07:23	15:05 (10)	06:43	06:53	06:12	05:53	06:03	06:29	06:59	07:29		07:03	14:34 (10)	07:35
	17:17		17:53 55	16:59 (9)	18:25	19:57	20:28	20:52	20:54	20:27	19:40	18:51		17:11 33	15:07 (10)	16:57
12	07:45		07:22	15:06 (10)	06:41	06:51	06:11	05:53	06:03	06:30	07:00	07:30		07:04	14:36 (10)	07:36
	17:18		17:54 53	16:59 (9)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10 32	15:08 (10)	16:57
13	07:45		07:20	15:07 (10)	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31		07:06	14:36 (10)	07:37
	17:19		17:55 52	16:59 (9)	18:27	19:59	20:30	20:53	20:53	20:24	19:37	18:48		17:09 31	15:07 (10)	16:57
14	07:45		07:19	15:07 (10)	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32		07:07	14:37 (10)	07:37
	17:20		17:57 51	16:59 (9)	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46		17:08 29	15:06 (10)	16:58
15	07:44		07:18	15:09 (10)	06:36	06:47	06:08	05:53	06:05	06:33	07:03	07:33		07:08	14:38 (10)	07:38
	17:21		17:58 47	16:58 (9)	18:29	20:01	20:32	20:54	20:52	20:22	19:34	18:45		17:07 27	15:05 (10)	16:58
16	07:44		07:17	15:11 (10)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34		07:09	14:40 (10)	07:39
	17:22		17:59 43	16:58 (9)	18:30	20:02	20:32	20:55	20:52	20:20	19:32	18:43		17:06 25	15:05 (10)	16:58
17	07:44		07:15	15:12 (10)	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35		07:10	14:41 (10)	07:40
	17:23		18:00 37	16:56 (9)	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42		17:06 22	15:03 (10)	16:58
18	07:43		07:14	15:15 (10)	06:32	06:42	06:05	05:53	06:08	06:36	07:06	07:36		07:11	14:43 (10)	07:40
	17:24		18:01 30	16:55 (9)	18:32	20:04	20:34	20:55	20:51	20:18	19:29	18:40		17:05 18	15:01 (10)	16:59
19	07:43		07:13	15:20 (10)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37		07:13	14:45 (10)	07:41
	17:25		18:02 16	16:53 (9)	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39		17:04 14	14:59 (10)	16:59
20	07:42		07:11		06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38		07:14	14:48 (10)	07:41
	17:26		18:04		18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38		17:03 8	14:56 (10)	17:00
21	07:42		07:10		06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39		07:15		07:42
	17:28		18:05		18:35	20:07	20:37	20:56	20:49	20:13	19:24	18:36		17:03		17:00
22	07:41	15:13 (10)	07:08		06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:40		07:16		07:42
	17:29 8	15:21 (10)	18:06		18:36	20:08	20:38	20:56	20:48	20:12	19:22	18:35		17:02		17:00
23	07:40	15:11 (10)	07:07		06:23	06:35	06:01	05:54	06:12	06:41	07:11	07:42	15:48 (10)	07:17		07:43
	17:30 14	15:25 (10)	18:07		18:37	20:09	20:39	20:57	20:47	20:10	19:20	18:33 21	17:24 (9)	17:01		17:01
24	07:40	15:09 (10)	07:06		06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	15:44 (10)	07:18		07:43
	17:31 18	15:27 (10)	18:08		18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32 31	17:25 (9)	17:01		17:02
25	07:39	15:07 (10)	07:04		06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	14:42 (10)	07:19		07:44
	17:32 22	15:29 (10)	18:09		18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31 39	16:27 (9)	17:00		17:02
26	07:38	15:06 (10)	07:03		06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	14:40 (10)	07:20		07:44
	17:34 25	15:31 (10)	18:10		18:41	20:12	20:41	20:57	20:44	20:06	19:15	17:29 44	16:28 (9)	17:00		17:03
27	07:38	15:06 (10)	07:01		06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	14:38 (10)	07:21		07:45
	17:35 27	15:33 (10)	18:12		18:42	20:13	20:42	20:57	20:44	20:04	19:14	17:28 48	16:28 (9)	16:59		17:03
28	07:37	15:05 (10)	07:00		06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47	14:37 (10)	07:23		07:45
	17:36 29	15:34 (10)	18:13		18:43	20:14	20:43	20:57	20:43	20:03	19:12	17:27 50	16:28 (9)	16:59		17:04
29	07:36	15:04 (10)			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	14:36 (10)	07:24		07:45
	17:37 31	15:35 (10)			19:44	20:15	20:44	20:57	20:42	20:01	19:10	17:25 52	16:28 (9)	16:59		17:05
30	07:35	15:04 (10)			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:49	14:36 (10)	07:25		07:45
	17:38 32	15:36 (10)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 54	16:29 (9)	16:58		17:05
31	07:34	15:03 (10)			07:10		05:57		06:19	06:49		06:51	14:35 (10)			07:46
	17:40 34	15:37 (10)			19:46		20:45		20:40	19:58		17:23 54	16:28 (9)			17:06
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290
Total, worst case	240		831									393		683		
Sun reduction	0.40		0.43									0.56		0.48		
Oper. time red.	0.37		0.37									0.37		0.37		
Wind dir. red.	0.68		0.70									0.71		0.69		
Total reduction	0.10		0.11									0.15		0.12		
Total, real	25		94									58		85		

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 108

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CF - R100

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April			May			June	July			August			September	October	November	December
1	07:46	07:33	06:58	07:09			06:24		17:48 (10)	05:56	05:57			06:20		18:03 (10)	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47			20:18	40	18:28 (10)	20:46	20:57			20:39	33	18:36 (10)	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07			06:23		17:49 (10)	05:56	05:57			06:21		18:02 (10)	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48			20:19	39	18:28 (10)	20:47	20:57			20:38	34	18:36 (10)	19:55	19:05	17:20	16:58
3	07:46	07:31	06:55	07:05			06:22		17:49 (10)	05:55	05:58			06:22		18:01 (10)	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49			20:20	39	18:28 (10)	20:48	20:57			20:36	36	18:37 (10)	19:53	19:04	17:19	16:58
4	07:46	07:30	06:54	07:04			06:20		17:49 (10)	05:55	05:58			06:23		18:00 (10)	06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50			20:21	40	18:29 (10)	20:48	20:57			20:35	36	18:36 (10)	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02			06:19		17:48 (10)	05:55	05:59			06:24		17:59 (10)	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51			20:22	40	18:28 (10)	20:49	20:56			20:34	38	18:37 (10)	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01			06:18		17:49 (10)	05:54	05:59			06:25		17:59 (10)	06:55	07:24	06:57	07:31
	17:12	17:47	18:19	19:52			20:23	38	18:27 (10)	20:50	20:56			20:33	38	18:37 (10)	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59			06:17		17:49 (10)	05:54	06:00			06:26		17:58 (10)	06:55	07:25	06:59	07:32
	17:13	17:48	18:21	19:53			20:24	38	18:27 (10)	20:50	20:56			20:32	39	18:37 (10)	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:57			06:16		17:50 (10)	05:54	06:01			06:27		17:58 (10)	06:56	07:26	07:00	07:32
	17:14	17:49	18:22	19:54			20:25	37	18:27 (10)	20:51	20:55			20:31	39	18:37 (10)	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56			06:14		17:50 (10)	05:53	06:01			06:28		17:58 (10)	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55			20:26	37	18:27 (10)	20:51	20:55			20:29	39	18:37 (10)	19:44	18:54	17:13	16:57
10	07:46	07:24	06:44	06:54			06:13		17:51 (10)	05:53	06:02			06:29		17:57 (10)	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56			20:27	35	18:26 (10)	20:52	20:55			20:28	40	18:37 (10)	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53			06:12		17:52 (10)	05:53	06:03			06:29		17:57 (10)	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57			20:28	34	18:26 (10)	20:52	20:54			20:27	40	18:37 (10)	19:40	18:51	17:11	16:57
12	07:45	07:22	06:41	06:51			06:11		17:52 (10)	05:53	06:03			06:30		17:57 (10)	07:00	07:30	07:04	07:36
	17:18	17:54	18:26	19:58			20:29	33	18:25 (10)	20:53	20:54			20:26	40	18:37 (10)	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50			06:10		17:53 (10)	05:53	06:04			06:31		17:57 (10)	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59			20:30	31	18:24 (10)	20:53	20:53			20:24	39	18:36 (10)	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48			06:09		17:54 (10)	05:53	06:05			06:32		17:57 (10)	07:02	07:32	07:07	07:37
	17:20	17:57	18:28	20:00			20:31	30	18:24 (10)	20:54	20:53			20:23	39	18:36 (10)	19:35	18:46	17:08	16:58
15	07:44	07:18	06:36	06:47			06:08		17:55 (10)	05:53	06:05			06:33		17:57 (10)	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01			20:31	28	18:23 (10)	20:54	20:52			20:22	39	18:36 (10)	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45			06:07		17:56 (10)	05:53	06:06			06:34		17:57 (10)	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02			20:32	26	18:22 (10)	20:55	20:52			20:20	38	18:35 (10)	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44			06:06		17:57 (10)	05:53	06:07			06:35		17:57 (10)	07:05	07:35	07:10	07:39
	17:23	18:00	18:31	20:03			20:33	24	18:21 (10)	20:55	20:51			20:19	36	18:33 (10)	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42		18:03 (10)	06:05		17:59 (10)	05:53	06:08			06:36		17:57 (10)	07:06	07:36	07:11	07:40
	17:24	18:01	18:32	20:04	14	18:17 (10)	20:34	21	18:20 (10)	20:55	20:51			20:18	35	18:32 (10)	19:29	18:40	17:05	16:59
19	07:43	07:13	06:30	06:41		17:59 (10)	06:05		18:00 (10)	05:53	06:09			06:37		17:57 (10)	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	20	18:19 (10)	20:35	19	18:19 (10)	20:56	20:50			20:16	34	18:31 (10)	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39		17:57 (10)	06:04		18:02 (10)	05:53	06:09			06:38		17:58 (10)	07:08	07:38	07:14	07:41
	17:26	18:04	18:34	20:06	25	18:22 (10)	20:36	15	18:17 (10)	20:56	20:49			20:15	32	18:30 (10)	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38		17:55 (10)	06:03		18:04 (10)	05:53	06:10			06:39		17:59 (10)	07:09	07:39	07:15	07:42
	17:28	18:05	18:35	20:07	28	18:23 (10)	20:37	10	18:14 (10)	20:56	20:48			20:13	30	18:29 (10)	19:24	18:36	17:03	17:00
22	07:41	07:08	06:25	06:36		17:54 (10)	06:02			05:54	06:11		18:16 (10)	06:40		18:00 (10)	07:10	07:40	07:16	07:42
	17:29	18:06	18:36	20:08	30	18:24 (10)	20:38			20:56	20:48	7	18:23 (10)	20:12	27	18:27 (10)	19:22	18:35	17:02	17:00
23	07:40	07:07	06:23	06:35		17:53 (10)	06:01			05:54	06:12		18:13 (10)	06:41		18:02 (10)	07:11	07:42	07:17	07:43
	17:30	18:07	18:37	20:09	33	18:26 (10)	20:39			20:57	20:47	13	18:26 (10)	20:10	23	18:25 (10)	19:20	18:33	17:01	17:01
24	07:40	07:06	06:22	06:33		17:52 (10)	06:01			05:54	06:13		18:11 (10)	06:42		18:03 (10)	07:12	07:43	07:18	07:43
	17:31	18:08	18:39	20:10	34	18:26 (10)	20:40			20:57	20:46	17	18:28 (10)	20:09	20	18:23 (10)	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32		17:51 (10)	06:00			05:54	06:14		18:10 (10)	06:43		18:06 (10)	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	36	18:27 (10)	20:41			20:57	20:45	20	18:30 (10)	20:07	13	18:19 (10)	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31		17:50 (10)	05:59			05:55	06:15		18:08 (10)	06:44			07:14	06:45	07:20	07:44
	17:34	18:10	18:41	20:12	37	18:27 (10)	20:41			20:57	20:44	22	18:30 (10)	20:06			19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29		17:49 (10)	05:59			05:55	06:15		18:07 (10)	06:45			07:15	06:46	07:21	07:45
	17:35	18:12	18:42	20:13	38	18:27 (10)	20:42			20:57	20:44	25	18:32 (10)	20:04			19:14	17:28	16:59	17:03
28	07:37	07:00	06:15	06:28		17:49 (10)	05:58			05:55	06:16		18:06 (10)	06:46			07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:14	39	18:28 (10)	20:43			20:57	20:43	27	18:33 (10)	20:03			19:12	17:27	16:59	17:04
29	07:36		07:14	06:27		17:49 (10)	05:58			05:56	06:17		18:05 (10)	06:47			07:17	06:48	07:24	07:45
	17:37		19:44	20:15	39	18:28 (10)	20:44			20:57	20:42	29	18:34 (10)	20:01			19:10	17:25	16:59	17:05
30	07:35		07:12	06:25		17:48 (10)	05:57			05:56	06:18		18:04 (10)	06:48			07:18	06:49	07:25	07:45
	17:38		19:45	20:16	40	18:28 (10)	20:45			20:57	20:41	30	18:34 (10)	20:00			19:09	17:24	16:58	17:05
31	07:34		07:10				05:57				06:19		18:03 (10)	06:49				06:51		07:46
	17:40		19:46				20:45				20:40	32	18:35 (10)	19:58				17:23		17:06
Potential sun hours	300	298	370	398			446			450	457			426			375	346	300	290
Total, worst case					413			654				222			857					
Sun reduction					0.51			0.58				0.75			0.72					
Oper. time red.					0.37			0.37				0.37			0.37					
Wind dir. red.					0.75			0.75				0.75			0.75					
Total reduction					0.14			0.16				0.21			0.20					
Total, real					59			107				47			173					

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 109

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CG - R103

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:05	17:20	16:58
3	07:46	07:31	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:36	19:53	19:04	17:19	16:58
4	07:46	07:30	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:57	07:31
	17:12	17:47	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:55	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00	07:32
	17:14	17:49	18:22	19:54	20:25	20:51	20:55	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:51	20:55	20:29	19:44	18:54	17:13	16:57
10	07:46	07:24	06:44	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:52	20:54	20:27	19:40	18:51	17:11	16:57
12	07:45	07:22	06:41	06:51	06:11	05:53	06:03	06:30	07:00	07:30	07:04	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:53	20:53	20:24	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07	07:37
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08	16:58
15	07:44	07:18	06:36	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:31	20:54	20:52	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:32	20:55	20:52	20:20	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:11	07:40
	17:24	18:01	18:32	20:04	20:34	20:55	20:51	20:18	19:29	18:40	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	07:41
	17:27	18:04	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15	07:42
	17:28	18:05	18:35	20:07	20:37	20:56	20:48	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:40	07:16	07:42
	17:29	18:06	18:36	20:08	20:38	20:56	20:48	20:12	19:22	18:35	17:02	17:00
23	07:40	07:07	06:23	06:35	06:01	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:43
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:20	07:44
	17:34	18:11	18:41	20:12	20:41	20:57	20:44	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:21	07:45
	17:35	18:12	18:42	20:13	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:55	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:14	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:15	20:44	20:57	20:42	20:01	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:49	07:25	07:45
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:45		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 110

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CH - R104

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:58	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:32	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:05	17:20	16:58
3	07:46	07:31	06:55	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:36	19:53	19:04	17:19	16:58
4	07:46	07:30	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:44	18:17	19:50	20:21	20:48	20:57	20:35	19:52	19:02	17:18	16:57
5	07:46	07:29	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:56	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:56	20:34	19:50	19:01	17:17	16:57
6	07:46	07:28	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:57	07:31
	17:12	17:47	18:19	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:55	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:57	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:56	07:26	07:00	07:32
	17:14	17:49	18:22	19:54	20:25	20:51	20:55	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:57	07:27	07:01	07:33
	17:15	17:51	18:23	19:55	20:26	20:51	20:55	20:29	19:44	18:54	17:13	16:57
10	07:46	07:24	06:44	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:52	20:54	20:27	19:40	18:51	17:11	16:57
12	07:45	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:04	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:20	06:40	06:50	06:10	05:53	06:04	06:31	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:53	20:53	20:24	19:37	18:48	17:09	16:57
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:32	07:02	07:32	07:07	07:37
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:35	18:46	17:08	16:58
15	07:44	07:18	06:36	06:47	06:08	05:53	06:05	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:31	20:54	20:52	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:32	20:55	20:52	20:20	19:32	18:43	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:33	20:55	20:51	20:19	19:30	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:11	07:40
	17:24	18:01	18:32	20:04	20:34	20:55	20:51	20:18	19:29	18:40	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:02	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:28	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	07:41
	17:27	18:04	18:34	20:06	20:36	20:56	20:49	20:15	19:25	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:53	06:10	06:39	07:09	07:39	07:15	07:42
	17:28	18:05	18:35	20:07	20:37	20:56	20:48	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:40	07:16	07:42
	17:29	18:06	18:36	20:08	20:38	20:56	20:48	20:12	19:22	18:35	17:02	17:01
23	07:40	07:07	06:23	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:09	20:39	20:57	20:47	20:10	19:20	18:33	17:02	17:01
24	07:40	07:06	06:22	06:33	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:43
	17:31	18:08	18:39	20:10	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:19	07:44
	17:32	18:09	18:40	20:11	20:41	20:57	20:45	20:07	19:17	17:31	17:00	17:02
26	07:38	07:03	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:20	07:44
	17:34	18:11	18:41	20:12	20:41	20:57	20:44	20:06	19:15	17:29	17:00	17:03
27	07:38	07:01	06:17	06:29	05:59	05:55	06:15	06:45	07:15	06:46	07:21	07:45
	17:35	18:12	18:42	20:13	20:42	20:57	20:44	20:04	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:14	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:15	20:44	20:57	20:42	20:01	19:10	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:49	07:25	07:45
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:10		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:45		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CI - R105

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	07:46		12:46 (6)	07:33		12:54 (6)	06:59		13:26 (6)	07:09	06:24	05:56
	17:07	140	15:06 (6)	17:41	145	15:19 (6)	18:14	100	15:06 (6)	19:47	20:18	20:46
2	07:46		12:47 (6)	07:33		12:54 (6)	06:57		13:30 (6)	07:07	06:23	05:56
	17:08	139	15:06 (6)	17:42	145	15:19 (6)	18:15	95	15:05 (6)	19:48	20:19	20:47
3	07:46		12:47 (6)	07:32		12:55 (6)	06:56		13:32 (6)	07:06	06:22	05:55
	17:09	140	15:07 (6)	17:43	144	15:19 (6)	18:16	91	15:03 (6)	19:49	20:20	20:48
4	07:46		12:47 (6)	07:31		12:55 (6)	06:54		13:36 (6)	07:04	06:20	05:55
	17:10	140	15:07 (6)	17:45	144	15:19 (6)	18:17	86	15:02 (6)	19:50	20:21	20:49
5	07:46		12:48 (6)	07:30		12:56 (6)	06:52		13:39 (6)	07:02	06:19	05:55
	17:11	140	15:08 (6)	17:46	143	15:19 (6)	18:18	81	15:00 (6)	19:51	20:22	20:49
6	07:46		12:48 (6)	07:29		12:56 (6)	06:51		13:44 (6)	07:01	06:18	05:54
	17:12	141	15:09 (6)	17:47	143	15:19 (6)	18:20	74	14:58 (6)	19:52	20:23	20:50
7	07:46		12:48 (6)	07:27		12:57 (6)	06:49		13:48 (6)	06:59	06:17	05:54
	17:13	141	15:09 (6)	17:48	143	15:20 (6)	18:21	68	14:56 (6)	19:53	20:24	20:50
8	07:46		12:49 (6)	07:26		12:58 (6)	06:48		13:52 (6)	06:58	06:16	05:54
	17:14	141	15:10 (6)	17:49	142	15:20 (6)	18:22	61	14:53 (6)	19:54	20:25	20:51
9	07:46		12:49 (6)	07:25		12:58 (6)	06:46		13:57 (6)	06:56	06:15	05:54
	17:15	142	15:11 (6)	17:51	142	15:20 (6)	18:23	53	14:50 (6)	19:55	20:26	20:52
10	07:46		12:49 (6)	07:24		12:58 (6)	06:45		14:02 (6)	06:54	06:13	05:53
	17:16	142	15:11 (6)	17:52	141	15:19 (6)	18:24	45	14:47 (6)	19:56	20:27	20:52
11	07:46		12:49 (6)	07:23		12:59 (6)	06:43		14:09 (6)	06:53	06:12	05:53
	17:17	143	15:12 (6)	17:53	140	15:19 (6)	18:25	34	14:43 (6)	19:57	20:28	20:53
12	07:46		12:50 (6)	07:22		13:00 (6)	06:41		14:18 (6)	06:51	06:11	05:53
	17:18	142	15:12 (6)	17:54	139	15:19 (6)	18:26	17	14:35 (6)	19:58	20:29	20:53
13	07:45		12:49 (6)	07:21		13:01 (6)	06:40			06:50	06:10	05:53
	17:19	143	15:12 (6)	17:55	137	15:18 (6)	18:27			19:59	20:30	20:54
14	07:45		12:50 (6)	07:19		13:01 (6)	06:38			06:48	06:09	05:53
	17:20	143	15:13 (6)	17:57	136	15:17 (6)	18:28			20:00	20:31	20:54
15	07:45		12:51 (6)	07:18		13:02 (6)	06:37			06:47	06:08	05:53
	17:21	143	15:14 (6)	17:58	135	15:17 (6)	18:29			20:01	20:32	20:55
16	07:44		12:50 (6)	07:17		13:03 (6)	06:35			06:45	06:07	05:53
	17:22	144	15:14 (6)	17:59	134	15:17 (6)	18:30			20:02	20:33	20:55
17	07:44		12:51 (6)	07:15		13:05 (6)	06:33			06:44	06:07	05:53
	17:23	144	15:15 (6)	18:00	132	15:17 (6)	18:31			20:03	20:34	20:55
18	07:43		12:51 (6)	07:14		13:05 (6)	06:32			06:42	06:06	05:53
	17:24	144	15:15 (6)	18:01	131	15:16 (6)	18:32			20:04	20:35	20:56
19	07:43		12:52 (6)	07:13		13:07 (6)	06:30			06:41	06:05	05:53
	17:25	144	15:16 (6)	18:03	129	15:16 (6)	18:33			20:05	20:35	20:56
20	07:42		12:52 (6)	07:11		13:08 (6)	06:29			06:39	06:04	05:53
	17:27	144	15:16 (6)	18:04	126	15:14 (6)	18:35			20:06	20:36	20:56
21	07:42		12:51 (6)	07:10		13:09 (6)	06:27			06:38	06:03	05:54
	17:28	145	15:16 (6)	18:05	125	15:14 (6)	18:36			20:07	20:37	20:56
22	07:41		12:52 (6)	07:09		13:11 (6)	06:25			06:36	06:02	05:54
	17:29	145	15:17 (6)	18:06	123	15:14 (6)	18:37			20:08	20:38	20:57
23	07:41		12:52 (6)	07:07		13:13 (6)	06:24			06:35	06:02	05:54
	17:30	145	15:17 (6)	18:07	119	15:12 (6)	18:38			20:10	20:39	20:57
24	07:40		12:52 (6)	07:06		13:15 (6)	06:22			06:34	06:01	05:54
	17:31	145	15:17 (6)	18:08	117	15:12 (6)	18:39			20:11	20:40	20:57
25	07:39		12:52 (6)	07:04		13:16 (6)	06:20			06:32	06:00	05:55
	17:32	145	15:17 (6)	18:09	114	15:10 (6)	18:40			20:12	20:41	20:57
26	07:39		12:53 (6)	07:03		13:19 (6)	06:19			06:31	05:59	05:55
	17:34	145	15:18 (6)	18:11	111	15:10 (6)	18:41			20:13	20:42	20:57
27	07:38		12:53 (6)	07:02		13:21 (6)	06:17			06:29	05:59	05:55
	17:35	146	15:19 (6)	18:12	107	15:08 (6)	18:42			20:14	20:42	20:57
28	07:37		12:53 (6)	07:00		13:24 (6)	06:15			06:28	05:58	05:56
	17:36	146	15:19 (6)	18:13	103	15:07 (6)	18:43			20:15	20:43	20:57
29	07:36		12:53 (6)				07:14			06:27	05:58	05:56
	17:37	146	15:19 (6)				19:44			20:16	20:44	20:57
30	07:35		12:54 (6)				07:12			06:25	05:57	05:56
	17:38	145	15:19 (6)				19:45			20:17	20:45	20:57
31	07:34		12:54 (6)				07:11				05:57	
	17:40	145	15:19 (6)				19:46				20:46	
Potential sun hours	300			298			370			398	446	450
Total, worst case		4438			3690			805				
Sun reduction		0.40			0.43			0.47				
Oper. time red.		0.37			0.37			0.37				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.09			0.10			0.11				
Total, real		402			361			86				

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CI - R105

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October			November			December		
1	05:57		06:20		06:50		07:19			06:52		12:28 (6)	07:26		12:31 (6)
	20:57		20:39		19:57		19:07			17:22	140	14:48 (6)	16:58	143	14:54 (6)
2	05:57		06:21		06:51		07:20		14:51 (6)	06:53		12:27 (6)	07:27		12:32 (6)
	20:57		20:38		19:55		19:06	28	15:19 (6)	17:20	141	14:48 (6)	16:58	142	14:54 (6)
3	05:58		06:22		06:52		07:21		14:43 (6)	06:54		12:27 (6)	07:28		12:32 (6)
	20:57		20:37		19:54		19:04	40	15:23 (6)	17:19	142	14:49 (6)	16:58	142	14:54 (6)
4	05:58		06:23		06:53		07:22		14:37 (6)	06:55		12:27 (6)	07:29		12:33 (6)
	20:57		20:36		19:52		19:02	50	15:27 (6)	17:18	142	14:49 (6)	16:58	141	14:54 (6)
5	05:59		06:24		06:54		07:23		14:32 (6)	06:57		12:26 (6)	07:30		12:33 (6)
	20:57		20:34		19:50		19:01	57	15:29 (6)	17:17	143	14:49 (6)	16:57	141	14:54 (6)
6	05:59		06:25		06:55		07:24		14:26 (6)	06:58		12:26 (6)	07:31		12:34 (6)
	20:56		20:33		19:49		18:59	65	15:31 (6)	17:16	143	14:49 (6)	16:57	141	14:55 (6)
7	06:00		06:26		06:56		07:25		14:22 (6)	06:59		12:26 (6)	07:32		12:35 (6)
	20:56		20:32		19:47		18:58	71	15:33 (6)	17:15	144	14:50 (6)	16:57	140	14:55 (6)
8	06:01		06:27		06:57		07:26		14:17 (6)	07:00		12:26 (6)	07:33		12:35 (6)
	20:56		20:31		19:45		18:56	77	15:34 (6)	17:14	144	14:50 (6)	16:57	141	14:56 (6)
9	06:01		06:28		06:58		07:27		14:13 (6)	07:01		12:25 (6)	07:34		12:36 (6)
	20:55		20:30		19:44		18:54	83	15:36 (6)	17:13	145	14:50 (6)	16:57	140	14:56 (6)
10	06:02		06:29		06:58		07:28		14:09 (6)	07:02		12:25 (6)	07:34		12:37 (6)
	20:55		20:28		19:42		18:53	88	15:37 (6)	17:12	145	14:50 (6)	16:57	139	14:56 (6)
11	06:03		06:30		06:59		07:29		14:05 (6)	07:03		12:26 (6)	07:35		12:37 (6)
	20:55		20:27		19:41		18:51	93	15:38 (6)	17:11	145	14:51 (6)	16:57	140	14:57 (6)
12	06:03		06:31		07:00		07:30		14:02 (6)	07:05		12:26 (6)	07:36		12:37 (6)
	20:54		20:26		19:39		18:50	97	15:39 (6)	17:10	145	14:51 (6)	16:57	139	14:56 (6)
13	06:04		06:32		07:01		07:31		13:58 (6)	07:06		12:25 (6)	07:37		12:38 (6)
	20:54		20:25		19:37		18:48	102	15:40 (6)	17:09	146	14:51 (6)	16:58	139	14:57 (6)
14	06:05		06:33		07:02		07:32		13:55 (6)	07:07		12:25 (6)	07:38		12:39 (6)
	20:53		20:23		19:36		18:47	105	15:40 (6)	17:08	146	14:51 (6)	16:58	139	14:58 (6)
15	06:06		06:33		07:03		07:33		13:52 (6)	07:08		12:26 (6)	07:38		12:39 (6)
	20:53		20:22		19:34		18:45	109	15:41 (6)	17:07	146	14:52 (6)	16:58	139	14:58 (6)
16	06:06		06:34		07:04		07:34		13:50 (6)	07:09		12:26 (6)	07:39		12:39 (6)
	20:52		20:21		19:32		18:44	112	15:42 (6)	17:06	145	14:51 (6)	16:58	139	14:58 (6)
17	06:07		06:35		07:05		07:35		13:47 (6)	07:10		12:26 (6)	07:40		12:40 (6)
	20:51		20:19		19:31		18:42	115	15:42 (6)	17:06	145	14:51 (6)	16:59	139	14:59 (6)
18	06:08		06:36		07:06		07:36		13:46 (6)	07:12		12:26 (6)	07:40		12:40 (6)
	20:51		20:18		19:29		18:41	118	15:44 (6)	17:05	145	14:51 (6)	16:59	139	14:59 (6)
19	06:09		06:37		07:07		07:37		13:43 (6)	07:13		12:26 (6)	07:41		12:41 (6)
	20:50		20:16		19:27		18:39	121	15:44 (6)	17:04	145	14:51 (6)	16:59	138	14:59 (6)
20	06:09		06:38		07:08		07:38		13:41 (6)	07:14		12:27 (6)	07:42		12:42 (6)
	20:49		20:15		19:26		18:38	123	15:44 (6)	17:03	145	14:52 (6)	17:00	138	15:00 (6)
21	06:10		06:39		07:09		07:40		13:40 (6)	07:15		12:27 (6)	07:42		12:42 (6)
	20:49		20:13		19:24		18:36	125	15:45 (6)	17:03	145	14:52 (6)	17:00	138	15:00 (6)
22	06:11		06:40		07:10		07:41		13:38 (6)	07:16		12:28 (6)	07:43		12:43 (6)
	20:48		20:12		19:22		18:35	127	15:45 (6)	17:02	144	14:52 (6)	17:01	138	15:01 (6)
23	06:12		06:41		07:11		07:42		13:36 (6)	07:17		12:28 (6)	07:43		12:43 (6)
	20:47		20:11		19:21		18:33	129	15:45 (6)	17:02	144	14:52 (6)	17:01	138	15:01 (6)
24	06:13		06:42		07:12		07:43		13:36 (6)	07:18		12:28 (6)	07:44		12:43 (6)
	20:46		20:09		19:19		18:32	131	15:47 (6)	17:01	144	14:52 (6)	17:02	138	15:01 (6)
25	06:14		06:43		07:13		06:44		12:34 (6)	07:20		12:29 (6)	07:44		12:44 (6)
	20:46		20:08		19:17		17:31	133	14:47 (6)	17:01	144	14:53 (6)	17:02	139	15:03 (6)
26	06:15		06:44		07:14		06:45		12:33 (6)	07:21		12:29 (6)	07:44		12:44 (6)
	20:45		20:06		19:16		17:29	134	14:47 (6)	17:00	144	14:53 (6)	17:03	139	15:03 (6)
27	06:16		06:45		07:15		06:46		12:32 (6)	07:22		12:30 (6)	07:45		12:44 (6)
	20:44		20:05		19:14		17:28	135	14:47 (6)	17:00	143	14:53 (6)	17:03	139	15:03 (6)
28	06:16		06:46		07:16		06:47		12:30 (6)	07:23		12:30 (6)	07:45		12:45 (6)
	20:43		20:03		19:12		17:27	137	14:47 (6)	16:59	143	14:53 (6)	17:04	139	15:04 (6)
29	06:17		06:47		07:17		06:48		12:29 (6)	07:24		12:31 (6)	07:45		12:46 (6)
	20:42		20:01		19:11		17:25	138	14:47 (6)	16:59	142	14:53 (6)	17:05	138	15:04 (6)
30	06:18		06:48		07:18		06:50		12:29 (6)	07:25		12:31 (6)	07:46		12:46 (6)
	20:41		20:00		19:09		17:24	139	14:48 (6)	16:58	142	14:53 (6)	17:06	139	15:05 (6)
31	06:19		06:49				06:51		12:29 (6)				07:46		12:46 (6)
	20:40		19:58				17:23	139	14:48 (6)				17:06	139	15:05 (6)
Potential sun hours	457		426		375		346			300			290		
Total, worst case								3121			4317			4323	
Sun reduction								0.56			0.48			0.41	
Oper. time red.								0.37			0.37			0.37	
Wind dir. red.								0.60			0.60			0.60	
Total reduction								0.13			0.11			0.09	
Total, real								393			469			404	

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CJ - R106

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:57
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57
6	07:46	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:58
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:53	06:09	06:38	07:08	07:38	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:13	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:54	06:14	06:43	07:13	06:44	07:20	07:44
	17:32	18:09	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:42	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 114

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CK - R107

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:33	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
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	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 115
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CL - R108

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:46	14:14 (6)	07:33		14:31 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	14:14 (6)	07:26	14:00 (6)
	17:07	80 15:34 (6)	17:41	70	15:41 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	50 15:04 (6)	16:58	81 15:21 (6)
2	07:46	14:14 (6)	07:33		14:32 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	14:11 (6)	07:27	14:01 (6)
	17:08	81 15:35 (6)	17:42	69	15:41 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:20	54 15:05 (6)	16:58	81 15:22 (6)
3	07:46	14:15 (6)	07:32		14:33 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	14:10 (6)	07:28	14:01 (6)
	17:09	80 15:35 (6)	17:43	67	15:40 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	57 15:07 (6)	16:58	81 15:22 (6)
4	07:46	14:15 (6)	07:31		14:35 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	14:09 (6)	07:29	14:01 (6)
	17:10	81 15:36 (6)	17:45	65	15:40 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	59 15:08 (6)	16:58	81 15:22 (6)
5	07:46	14:16 (6)	07:30		14:36 (6)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	14:07 (6)	07:30	14:02 (6)
	17:11	80 15:36 (6)	17:46	63	15:39 (6)	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	61 15:08 (6)	16:57	81 15:23 (6)
6	07:46	14:16 (6)	07:29		14:37 (6)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	14:06 (6)	07:31	14:02 (6)
	17:12	81 15:37 (6)	17:47	61	15:38 (6)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	63 15:09 (6)	16:57	81 15:23 (6)
7	07:46	14:17 (6)	07:27		14:39 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	14:05 (6)	07:32	14:03 (6)
	17:13	81 15:38 (6)	17:48	59	15:38 (6)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	66 15:11 (6)	16:57	80 15:23 (6)
8	07:46	14:17 (6)	07:26		14:41 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	14:04 (6)	07:33	14:03 (6)
	17:14	81 15:38 (6)	17:49	56	15:37 (6)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	67 15:11 (6)	16:57	81 15:24 (6)
9	07:46	14:18 (6)	07:25		14:43 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	14:03 (6)	07:34	14:04 (6)
	17:15	81 15:39 (6)	17:51	53	15:36 (6)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	69 15:12 (6)	16:57	80 15:24 (6)
10	07:46	14:17 (6)	07:24		14:44 (6)	06:45	06:54	06:13	05:53	06:02	06:29	06:58	07:28	07:02	14:02 (6)	07:34	14:04 (6)
	17:16	82 15:39 (6)	17:52	50	15:34 (6)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	70 15:12 (6)	16:57	81 15:25 (6)
11	07:46	14:18 (6)	07:23		14:47 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:03	14:02 (6)	07:35	14:05 (6)
	17:17	81 15:39 (6)	17:53	45	15:32 (6)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	72 15:14 (6)	16:57	80 15:25 (6)
12	07:46	14:19 (6)	07:22		14:49 (6)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	14:01 (6)	07:36	14:05 (6)
	17:18	81 15:40 (6)	17:54	42	15:31 (6)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	73 15:14 (6)	16:57	80 15:25 (6)
13	07:45	14:19 (6)	07:21		14:52 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	14:00 (6)	07:37	14:05 (6)
	17:19	81 15:40 (6)	17:55	37	15:29 (6)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	74 15:14 (6)	16:58	81 15:26 (6)
14	07:45	14:19 (6)	07:19		14:55 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	14:00 (6)	07:38	14:06 (6)
	17:20	82 15:41 (6)	17:57	30	15:25 (6)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	75 15:15 (6)	16:58	80 15:26 (6)
15	07:45	14:20 (6)	07:18		14:59 (6)	06:37	06:47	06:08	05:53	06:06	06:33	07:03	07:33	07:08	13:59 (6)	07:38	14:07 (6)
	17:21	81 15:41 (6)	17:58	23	15:22 (6)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	76 15:15 (6)	16:58	80 15:27 (6)
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	17:22	81 15:41 (6)	17:59	9	15:16 (6)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	77 15:16 (6)	16:58	80 15:27 (6)
17	07:44	14:21 (6)	07:15			06:33	06:44	06:06	05:53	06:07	06:35	07:05	07:35	07:10	13:59 (6)	07:40	14:08 (6)
	17:23	81 15:42 (6)	18:00			18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	77 15:16 (6)	16:58	79 15:27 (6)
18	07:43	14:21 (6)	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	13:59 (6)	07:40	14:08 (6)
	17:24	81 15:42 (6)	18:01			18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	78 15:17 (6)	16:59	79 15:27 (6)
19	07:43	14:22 (6)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	13:58 (6)	07:41	14:08 (6)
	17:25	81 15:43 (6)	18:03			18:33	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	79 15:17 (6)	16:59	80 15:28 (6)
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29	07:36	14:28 (6)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:48	14:20 (6)	07:24	14:00 (6)	07:45	14:13 (6)
	17:37	74 15:42 (6)				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	38 14:58 (6)	16:59	81 15:21 (6)	17:05	80 15:33 (6)
30	07:35	14:29 (6)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	14:18 (6)	07:25	14:00 (6)	07:46	14:13 (6)
	17:38	73 15:42 (6)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	43 15:01 (6)	16:58	81 15:21 (6)	17:06	80 15:33 (6)
31	07:34	14:30 (6)				07:11		05:57		06:19	06:49		06:51	14:16 (6)			07:46	14:14 (6)
	17:40	72 15:42 (6)				19:46		20:46		20:40	19:58		17:23	46 15:02 (6)			17:06	80 15:34 (6)
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290	
Total, worst case		2457		799									198		2183		2486
Sun reduction		0.40		0.43									0.56		0.48		0.41
Oper. time red.		0.37		0.37									0.37		0.37		0.37
Wind dir. red.		0.65		0.65									0.65		0.65		0.65
Total reduction		0.10		0.11									0.14		0.12		0.10
Total, real		240		84									27		256		250

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 116

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CM - R109

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	07:46		14:09 (6)	07:33		14:17 (6)	06:59		15:05 (6)	07:09	06:24	05:56
	17:07	93	15:42 (6)	17:41	99	15:56 (6)	18:14	18	15:23 (6)	19:47	20:18	20:46
2	07:46		14:09 (6)	07:33		14:18 (6)	06:57			07:07	06:23	05:56
	17:08	94	15:43 (6)	17:42	98	15:56 (6)	18:15			19:48	20:19	20:47
3	07:46		14:09 (6)	07:32		14:19 (6)	06:56			07:06	06:22	05:55
	17:09	94	15:43 (6)	17:43	97	15:56 (6)	18:16			19:49	20:20	20:48
4	07:46		14:09 (6)	07:31		14:19 (6)	06:54			07:04	06:20	05:55
	17:10	95	15:44 (6)	17:45	97	15:56 (6)	18:17			19:50	20:21	20:49
5	07:46		14:10 (6)	07:30		14:20 (6)	06:52			07:02	06:19	05:55
	17:11	94	15:44 (6)	17:46	96	15:56 (6)	18:18			19:51	20:22	20:49
6	07:46		14:10 (6)	07:29		14:21 (6)	06:51			07:01	06:18	05:54
	17:12	95	15:45 (6)	17:47	94	15:55 (6)	18:20			19:52	20:23	20:50
7	07:46		14:11 (6)	07:27		14:22 (6)	06:49			06:59	06:17	05:54
	17:13	95	15:46 (6)	17:48	93	15:55 (6)	18:21			19:53	20:24	20:50
8	07:46		14:11 (6)	07:26		14:22 (6)	06:48			06:58	06:16	05:54
	17:14	96	15:47 (6)	17:49	93	15:55 (6)	18:22			19:54	20:25	20:51
9	07:46		14:11 (6)	07:25		14:23 (6)	06:46			06:56	06:15	05:54
	17:15	96	15:47 (6)	17:51	92	15:55 (6)	18:23			19:55	20:26	20:52
10	07:46		14:11 (6)	07:24		14:24 (6)	06:45			06:54	06:13	05:53
	17:16	96	15:47 (6)	17:52	90	15:54 (6)	18:24			19:56	20:27	20:52
11	07:46		14:11 (6)	07:23		14:25 (6)	06:43			06:53	06:12	05:53
	17:17	97	15:48 (6)	17:53	89	15:54 (6)	18:25			19:57	20:28	20:53
12	07:46		14:12 (6)	07:22		14:26 (6)	06:41			06:51	06:11	05:53
	17:18	97	15:49 (6)	17:54	87	15:53 (6)	18:26			19:58	20:29	20:53
13	07:45		14:12 (6)	07:21		14:27 (6)	06:40			06:50	06:10	05:53
	17:19	97	15:49 (6)	17:55	86	15:53 (6)	18:27			19:59	20:30	20:54
14	07:45		14:12 (6)	07:19		14:28 (6)	06:38			06:48	06:09	05:53
	17:20	98	15:50 (6)	17:57	84	15:52 (6)	18:28			20:00	20:31	20:54
15	07:45		14:13 (6)	07:18		14:29 (6)	06:37			06:47	06:08	05:53
	17:21	98	15:51 (6)	17:58	82	15:51 (6)	18:29			20:01	20:32	20:55
16	07:44		14:12 (6)	07:17		14:31 (6)	06:35			06:45	06:07	05:53
	17:22	99	15:51 (6)	17:59	80	15:51 (6)	18:30			20:02	20:33	20:55
17	07:44		14:13 (6)	07:15		14:33 (6)	06:33			06:44	06:07	05:53
	17:23	99	15:52 (6)	18:00	77	15:50 (6)	18:31			20:03	20:34	20:55
18	07:43		14:13 (6)	07:14		14:34 (6)	06:32			06:42	06:06	05:53
	17:24	99	15:52 (6)	18:01	74	15:48 (6)	18:32			20:04	20:35	20:56
19	07:43		14:14 (6)	07:13		14:36 (6)	06:30			06:41	06:05	05:53
	17:25	99	15:53 (6)	18:03	72	15:48 (6)	18:33			20:05	20:35	20:56
20	07:42		14:14 (6)	07:11		14:37 (6)	06:29			06:39	06:04	05:53
	17:27	99	15:53 (6)	18:04	69	15:46 (6)	18:35			20:06	20:36	20:56
21	07:42		14:13 (6)	07:10		14:39 (6)	06:27			06:38	06:03	05:54
	17:28	100	15:53 (6)	18:05	66	15:45 (6)	18:36			20:07	20:37	20:56
22	07:41		14:14 (6)	07:09		14:42 (6)	06:25			06:36	06:02	05:54
	17:29	100	15:54 (6)	18:06	62	15:44 (6)	18:37			20:08	20:38	20:57
23	07:41		14:14 (6)	07:07		14:43 (6)	06:24			06:35	06:02	05:54
	17:30	100	15:54 (6)	18:07	59	15:42 (6)	18:38			20:10	20:39	20:57
24	07:40		14:14 (6)	07:06		14:46 (6)	06:22			06:34	06:01	05:54
	17:31	100	15:54 (6)	18:08	54	15:40 (6)	18:39			20:11	20:40	20:57
25	07:39		14:15 (6)	07:04		14:48 (6)	06:20			06:32	06:00	05:55
	17:32	99	15:54 (6)	18:09	50	15:38 (6)	18:40			20:12	20:41	20:57
26	07:39		14:16 (6)	07:03		14:52 (6)	06:19			06:31	05:59	05:55
	17:34	99	15:55 (6)	18:11	44	15:36 (6)	18:41			20:13	20:42	20:57
27	07:38		14:16 (6)	07:01		14:55 (6)	06:17			06:29	05:59	05:55
	17:35	99	15:55 (6)	18:12	37	15:32 (6)	18:42			20:14	20:42	20:57
28	07:37		14:16 (6)	07:00		15:00 (6)	06:15			06:28	05:58	05:56
	17:36	99	15:55 (6)	18:13	29	15:29 (6)	18:43			20:15	20:43	20:57
29	07:36		14:16 (6)				07:14			06:27	05:58	05:56
	17:37	100	15:56 (6)				19:44			20:16	20:44	20:57
30	07:35		14:17 (6)				07:12			06:25	05:57	05:56
	17:38	99	15:56 (6)				19:45			20:17	20:45	20:57
31	07:34		14:17 (6)				07:11				05:57	
	17:40	99	15:56 (6)				19:46				20:46	
Potential sun hours	300			298			370			398	446	450
Total, worst case		3024			2150			18				
Sun reduction		0.40			0.43			0.47				
Oper. time red.		0.37			0.37			0.37				
Wind dir. red.		0.66			0.66			0.66				
Total reduction		0.10			0.11			0.12				
Total, real		300			230			2				

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 117

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CM - R109

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October			November			December		
1	05:57		06:20		06:50		07:19			06:52		13:53 (6)	07:26		13:53 (6)
	20:57		20:39		19:57		19:07			17:22	91	15:24 (6)	16:58	97	15:30 (6)
2	05:57		06:21		06:51		07:20			06:53		13:52 (6)	07:27		13:54 (6)
	20:57		20:38		19:55		19:06			17:20	92	15:24 (6)	16:58	96	15:30 (6)
3	05:58		06:22		06:52		07:21			06:54		13:52 (6)	07:28		13:54 (6)
	20:57		20:37		19:54		19:04			17:19	93	15:25 (6)	16:58	97	15:31 (6)
4	05:58		06:23		06:53		07:22			06:55		13:51 (6)	07:29		13:55 (6)
	20:57		20:36		19:52		19:02			17:18	94	15:25 (6)	16:58	96	15:31 (6)
5	05:59		06:24		06:54		07:23			06:57		13:50 (6)	07:30		13:56 (6)
	20:57		20:34		19:50		19:01			17:17	95	15:25 (6)	16:57	95	15:31 (6)
6	05:59		06:25		06:55		07:24			06:58		13:50 (6)	07:31		13:56 (6)
	20:56		20:33		19:49		18:59			17:16	95	15:25 (6)	16:57	95	15:31 (6)
7	06:00		06:26		06:56		07:25			06:59		13:50 (6)	07:32		13:57 (6)
	20:56		20:32		19:47		18:58			17:15	96	15:26 (6)	16:57	95	15:32 (6)
8	06:01		06:27		06:57		07:26			07:00		13:49 (6)	07:33		13:57 (6)
	20:56		20:31		19:45		18:56			17:14	97	15:26 (6)	16:57	95	15:32 (6)
9	06:01		06:28		06:58		07:27			07:01		13:49 (6)	07:34		13:58 (6)
	20:55		20:30		19:44		18:54			17:13	98	15:27 (6)	16:57	94	15:32 (6)
10	06:02		06:29		06:58		07:28			07:02		13:48 (6)	07:34		13:59 (6)
	20:55		20:28		19:42		18:53			17:12	99	15:27 (6)	16:57	94	15:33 (6)
11	06:03		06:30		06:59		07:29			07:03		13:49 (6)	07:35		14:00 (6)
	20:55		20:27		19:41		18:51			17:11	99	15:28 (6)	16:57	93	15:33 (6)
12	06:03		06:31		07:00		07:30		15:47 (6)	07:05		13:49 (6)	07:36		13:59 (6)
	20:54		20:26		19:39		18:50	3	15:50 (6)	17:10	98	15:27 (6)	16:57	94	15:33 (6)
13	06:04		06:32		07:01		07:31		15:36 (6)	07:06		13:48 (6)	07:37		14:00 (6)
	20:54		20:25		19:37		18:48	23	15:59 (6)	17:09	99	15:27 (6)	16:58	93	15:33 (6)
14	06:05		06:33		07:02		07:32		15:30 (6)	07:07		13:48 (6)	07:38		14:01 (6)
	20:53		20:23		19:36		18:47	33	16:03 (6)	17:08	99	15:27 (6)	16:58	93	15:34 (6)
15	06:06		06:33		07:03		07:33		15:26 (6)	07:08		13:48 (6)	07:38		14:02 (6)
	20:53		20:22		19:34		18:45	40	16:06 (6)	17:07	99	15:27 (6)	16:58	92	15:34 (6)
16	06:06		06:34		07:04		07:34		15:22 (6)	07:09		13:49 (6)	07:39		14:02 (6)
	20:52		20:21		19:32		18:44	46	16:08 (6)	17:06	99	15:28 (6)	16:58	92	15:34 (6)
17	06:07		06:35		07:05		07:35		15:19 (6)	07:10		13:48 (6)	07:40		14:03 (6)
	20:51		20:19		19:31		18:42	51	16:10 (6)	17:06	100	15:28 (6)	16:59	92	15:35 (6)
18	06:08		06:36		07:06		07:36		15:17 (6)	07:12		13:48 (6)	07:40		14:03 (6)
	20:51		20:18		19:29		18:41	55	16:12 (6)	17:05	100	15:28 (6)	16:59	92	15:35 (6)
19	06:09		06:37		07:07		07:37		15:14 (6)	07:13		13:48 (6)	07:41		14:03 (6)
	20:50		20:16		19:27		18:39	60	16:14 (6)	17:04	100	15:28 (6)	16:59	92	15:35 (6)
20	06:09		06:38		07:08		07:38		15:11 (6)	07:14		13:49 (6)	07:42		14:04 (6)
	20:49		20:15		19:26		18:38	64	16:15 (6)	17:03	100	15:29 (6)	17:00	92	15:36 (6)
21	06:10		06:39		07:09		07:40		15:09 (6)	07:15		13:49 (6)	07:42		14:04 (6)
	20:49		20:13		19:24		18:36	67	16:16 (6)	17:03	100	15:29 (6)	17:00	92	15:36 (6)
22	06:11		06:40		07:10		07:41		15:07 (6)	07:16		13:50 (6)	07:43		14:05 (6)
	20:48		20:12		19:22		18:35	70	16:17 (6)	17:02	99	15:29 (6)	17:01	92	15:37 (6)
23	06:12		06:41		07:11		07:42		15:05 (6)	07:17		13:50 (6)	07:43		14:05 (6)
	20:47		20:11		19:21		18:33	73	16:18 (6)	17:02	99	15:29 (6)	17:01	92	15:37 (6)
24	06:13		06:42		07:12		07:43		15:04 (6)	07:18		13:50 (6)	07:44		14:05 (6)
	20:46		20:09		19:19		18:32	75	16:19 (6)	17:01	99	15:29 (6)	17:02	92	15:37 (6)
25	06:14		06:43		07:13		06:44		14:02 (6)	07:19		13:51 (6)	07:44		14:07 (6)
	20:46		20:08		19:17		17:31	78	15:20 (6)	17:01	99	15:30 (6)	17:02	91	15:38 (6)
26	06:15		06:44		07:14		06:45		14:00 (6)	07:21		13:51 (6)	07:44		14:07 (6)
	20:45		20:06		19:16		17:29	80	15:20 (6)	17:00	99	15:30 (6)	17:03	92	15:39 (6)
27	06:16		06:45		07:15		06:46		13:59 (6)	07:22		13:52 (6)	07:45		14:07 (6)
	20:44		20:05		19:14		17:28	82	15:21 (6)	17:00	98	15:30 (6)	17:03	92	15:39 (6)
28	06:16		06:46		07:16		06:47		13:57 (6)	07:23		13:52 (6)	07:45		14:08 (6)
	20:43		20:03		19:12		17:27	84	15:21 (6)	16:59	98	15:30 (6)	17:04	92	15:40 (6)
29	06:17		06:47		07:17		06:48		13:56 (6)	07:24		13:53 (6)	07:45		14:08 (6)
	20:42		20:01		19:11		17:25	86	15:22 (6)	16:59	97	15:30 (6)	17:05	93	15:41 (6)
30	06:18		06:48		07:18		06:50		13:56 (6)	07:25		13:53 (6)	07:46		14:08 (6)
	20:41		20:00		19:09		17:24	87	15:23 (6)	16:58	97	15:30 (6)	17:06	93	15:41 (6)
31	06:19		06:49				06:51		13:54 (6)				07:46		14:08 (6)
	20:40		19:58				17:23	89	15:23 (6)				17:06	93	15:41 (6)
Potential sun hours	457		426		375		346			300			290		
Total, worst case								1246			2928			2893	
Sun reduction								0.56			0.48			0.41	
Oper. time red.								0.37			0.37			0.37	
Wind dir. red.								0.66			0.66			0.66	
Total reduction								0.14			0.12			0.10	
Total, real								172			348			296	

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

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

Project:

Flickering Nuoro Sud

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2024-01-12 10:10 / 118

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CN - R110

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May		June
1	07:46		14:01 (6)	07:33		14:01 (6)	06:59		14:17 (6)	07:09			06:24		05:56
	17:07	96	15:37 (6)	17:41	117	15:58 (6)	18:14	95	15:52 (6)	19:47			20:18		20:46
2	07:46		14:01 (6)	07:33		14:01 (6)	06:57		14:19 (6)	07:07			06:23		05:56
	17:08	96	15:37 (6)	17:42	117	15:58 (6)	18:15	93	15:52 (6)	19:48			20:19		20:47
3	07:46		14:02 (6)	07:32		14:01 (6)	06:56		14:20 (6)	07:06			06:22		05:55
	17:09	96	15:38 (6)	17:43	118	15:59 (6)	18:16	90	15:50 (6)	19:49			20:20		20:48
4	07:46		14:02 (6)	07:31		14:01 (6)	06:54		14:23 (6)	07:04			06:20		05:55
	17:10	97	15:39 (6)	17:45	118	15:59 (6)	18:17	87	15:50 (6)	19:50			20:21		20:49
5	07:46		14:02 (6)	07:30		14:01 (6)	06:52		14:24 (6)	07:02			06:19		05:55
	17:11	98	15:40 (6)	17:46	118	15:59 (6)	18:18	84	15:48 (6)	19:51			20:22		20:49
6	07:46		14:02 (6)	07:29		14:02 (6)	06:51		14:27 (6)	07:01			06:18		05:54
	17:12	98	15:40 (6)	17:47	118	16:00 (6)	18:20	80	15:47 (6)	19:52			20:23		20:50
7	07:46		14:02 (6)	07:27		14:02 (6)	06:49		14:28 (6)	06:59			06:17		05:54
	17:13	99	15:41 (6)	17:48	118	16:00 (6)	18:21	78	15:46 (6)	19:53			20:24		20:50
8	07:46		14:02 (6)	07:26		14:02 (6)	06:48		14:30 (6)	06:58			06:16		05:54
	17:14	100	15:42 (6)	17:49	118	16:00 (6)	18:22	74	15:44 (6)	19:54			20:25		20:51
9	07:46		14:03 (6)	07:25		14:03 (6)	06:46		14:33 (6)	06:56			06:15		05:54
	17:15	100	15:43 (6)	17:51	117	16:00 (6)	18:23	70	15:43 (6)	19:55			20:26		20:52
10	07:46		14:02 (6)	07:24		14:02 (6)	06:45		14:35 (6)	06:54			06:13		05:53
	17:16	101	15:43 (6)	17:52	118	16:00 (6)	18:24	65	15:40 (6)	19:56			20:27		20:52
11	07:46		14:02 (6)	07:23		14:03 (6)	06:43		14:38 (6)	06:53			06:12		05:53
	17:17	102	15:44 (6)	17:53	117	16:00 (6)	18:25	61	15:39 (6)	19:57			20:28		20:53
12	07:46		14:03 (6)	07:22		14:03 (6)	06:41		14:41 (6)	06:51			06:11		05:53
	17:18	103	15:46 (6)	17:54	117	16:00 (6)	18:26	56	15:37 (6)	19:58			20:29		20:53
13	07:45		14:02 (6)	07:21		14:04 (6)	06:40		14:44 (6)	06:50			06:10		05:53
	17:19	104	15:46 (6)	17:55	116	16:00 (6)	18:27	50	15:34 (6)	19:59			20:30		20:54
14	07:45		14:02 (6)	07:19		14:03 (6)	06:38		14:48 (6)	06:48			06:09		05:53
	17:20	105	15:47 (6)	17:57	117	16:00 (6)	18:28	44	15:32 (6)	20:00			20:31		20:54
15	07:45		14:03 (6)	07:18		14:04 (6)	06:37		14:51 (6)	06:47			06:08		05:53
	17:21	105	15:48 (6)	17:58	116	16:00 (6)	18:29	37	15:28 (6)	20:01			20:32		20:55
16	07:44		14:02 (6)	07:17		14:05 (6)	06:35		14:56 (6)	06:45			06:07		05:53
	17:22	106	15:48 (6)	17:59	115	16:00 (6)	18:30	27	15:23 (6)	20:02			20:33		20:55
17	07:44		14:02 (6)	07:15		14:06 (6)	06:33		15:05 (6)	06:44			06:07		05:53
	17:23	108	15:50 (6)	18:00	114	16:00 (6)	18:31	11	15:16 (6)	20:03			20:34		20:55
18	07:43		14:02 (6)	07:14		14:06 (6)	06:32			06:42			06:06		05:53
	17:24	108	15:50 (6)	18:01	113	15:59 (6)	18:32			20:04			20:35		20:56
19	07:43		14:02 (6)	07:13		14:07 (6)	06:30			06:41			06:05		05:53
	17:25	109	15:51 (6)	18:03	112	15:59 (6)	18:33			20:05			20:35		20:56
20	07:42		14:02 (6)	07:11		14:07 (6)	06:29			06:39			06:04		05:53
	17:27	109	15:51 (6)	18:04	111	15:58 (6)	18:35			20:06			20:36		20:56
21	07:42		14:01 (6)	07:10		14:08 (6)	06:27			06:38			06:03		05:54
	17:28	111	15:52 (6)	18:05	110	15:58 (6)	18:36			20:07			20:37		20:56
22	07:41		14:02 (6)	07:09		14:10 (6)	06:25			06:36			06:02		05:54
	17:29	111	15:53 (6)	18:06	108	15:58 (6)	18:37			20:08			20:38		20:57
23	07:41		14:02 (6)	07:07		14:10 (6)	06:24			06:35			06:02		05:54
	17:30	111	15:53 (6)	18:07	107	15:57 (6)	18:38			20:10			20:39		20:57
24	07:40		14:01 (6)	07:06		14:11 (6)	06:22			06:34			06:01		05:54
	17:31	113	15:54 (6)	18:08	106	15:57 (6)	18:39			20:11			20:40		20:57
25	07:39		14:01 (6)	07:04		14:12 (6)	06:20			06:32			06:00		05:55
	17:32	113	15:54 (6)	18:09	104	15:56 (6)	18:40			20:12			20:41		20:57
26	07:39		14:02 (6)	07:03		14:14 (6)	06:19			06:31			05:59		05:55
	17:34	114	15:56 (6)	18:11	101	15:55 (6)	18:41			20:13			20:42		20:57
27	07:38		14:02 (6)	07:01		14:14 (6)	06:17			06:29			05:59		05:55
	17:35	114	15:56 (6)	18:12	100	15:54 (6)	18:42			20:14			20:42		20:57
28	07:37		14:01 (6)	07:00		14:16 (6)	06:15			06:28			05:58		05:56
	17:36	115	15:56 (6)	18:13	98	15:54 (6)	18:43			20:15			20:43		20:57
29	07:36		14:01 (6)				07:14			06:27			05:58		05:56
	17:37	116	15:57 (6)				19:44			20:16			20:44		20:57
30	07:35		14:01 (6)				07:12			06:25			05:57		05:56
	17:38	116	15:57 (6)				19:45			20:17			20:45		20:57
31	07:34		14:01 (6)				07:11						05:57		
	17:40	116	15:57 (6)				19:46						20:46		
Potential sun hours	300			298			370			398			446		450
Total, worst case		3290			3159			1102							
Sun reduction		0.40			0.43			0.47							
Oper. time red.		0.37			0.37			0.37							
Wind dir. red.		0.67			0.67			0.67							
Total reduction		0.10			0.11			0.12							
Total, real		328			341			129							

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 119

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CN - R110

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September			October			November			December		
1	05:57		06:20		06:50			07:19		15:22 (6)	06:52		13:32 (6)	07:26		13:44 (6)
	20:57		20:39		19:57			19:07	53	16:15 (6)	17:22	117	15:29 (6)	16:58	103	15:27 (6)
2	05:57		06:21		06:51			07:20		15:18 (6)	06:53		13:31 (6)	07:27		13:45 (6)
	20:57		20:38		19:55			19:06	59	16:17 (6)	17:20	118	15:29 (6)	16:58	101	15:26 (6)
3	05:58		06:22		06:52			07:21		15:15 (6)	06:54		13:32 (6)	07:28		13:46 (6)
	20:57		20:37		19:54			19:04	63	16:18 (6)	17:19	118	15:30 (6)	16:58	100	15:26 (6)
4	05:58		06:23		06:53			07:22		15:12 (6)	06:55		13:32 (6)	07:29		13:47 (6)
	20:57		20:36		19:52			19:02	68	16:20 (6)	17:18	118	15:30 (6)	16:58	99	15:26 (6)
5	05:59		06:24		06:54			07:23		15:09 (6)	06:57		13:31 (6)	07:30		13:47 (6)
	20:57		20:34		19:50			19:01	72	16:21 (6)	17:17	118	15:29 (6)	16:57	99	15:26 (6)
6	05:59		06:25		06:55			07:24		15:06 (6)	06:58		13:31 (6)	07:31		13:48 (6)
	20:56		20:33		19:49			18:59	76	16:22 (6)	17:16	118	15:29 (6)	16:57	99	15:27 (6)
7	06:00		06:26		06:56			07:25		15:03 (6)	06:59		13:32 (6)	07:32		13:49 (6)
	20:56		20:32		19:47			18:58	79	16:22 (6)	17:15	118	15:30 (6)	16:57	98	15:27 (6)
8	06:01		06:27		06:57			07:26		15:01 (6)	07:00		13:32 (6)	07:33		13:50 (6)
	20:56		20:31		19:45			18:56	82	16:23 (6)	17:14	117	15:29 (6)	16:57	97	15:27 (6)
9	06:01		06:28		06:58			07:27		14:58 (6)	07:01		13:32 (6)	07:34		13:51 (6)
	20:55		20:30		19:44			18:54	86	16:24 (6)	17:13	117	15:29 (6)	16:57	96	15:27 (6)
10	06:02		06:29		06:58			07:28		14:56 (6)	07:02		13:32 (6)	07:34		13:52 (6)
	20:55		20:28		19:42			18:53	89	16:25 (6)	17:12	117	15:29 (6)	16:57	95	15:27 (6)
11	06:03		06:30		06:59			07:29		14:54 (6)	07:03		13:33 (6)	07:35		13:52 (6)
	20:55		20:27		19:41			18:51	91	16:25 (6)	17:11	116	15:29 (6)	16:57	96	15:28 (6)
12	06:03		06:31		07:00			07:30		14:52 (6)	07:05		13:33 (6)	07:36		13:52 (6)
	20:54		20:26		19:39			18:50	94	16:26 (6)	17:10	116	15:29 (6)	16:57	95	15:27 (6)
13	06:04		06:32		07:01			07:31		14:50 (6)	07:06		13:33 (6)	07:37		13:53 (6)
	20:54		20:25		19:37			18:48	96	16:26 (6)	17:09	116	15:29 (6)	16:58	95	15:28 (6)
14	06:05		06:33		07:02			07:32		14:48 (6)	07:07		13:33 (6)	07:38		13:54 (6)
	20:53		20:23		19:36			18:47	98	16:26 (6)	17:08	115	15:28 (6)	16:58	94	15:28 (6)
15	06:06		06:33		07:03			07:33		14:46 (6)	07:08		13:34 (6)	07:38		13:55 (6)
	20:53		20:22		19:34			18:45	101	16:27 (6)	17:07	114	15:28 (6)	16:58	94	15:29 (6)
16	06:06		06:34		07:04			07:34		14:45 (6)	07:09		13:35 (6)	07:39		13:55 (6)
	20:52		20:21		19:32			18:44	102	16:27 (6)	17:06	114	15:29 (6)	16:58	93	15:28 (6)
17	06:07		06:35		07:05			07:35		14:43 (6)	07:10		13:35 (6)	07:40		13:56 (6)
	20:51		20:19		19:31			18:42	104	16:27 (6)	17:06	113	15:28 (6)	16:59	93	15:29 (6)
18	06:08		06:36		07:06			07:36		14:42 (6)	07:12		13:35 (6)	07:40		13:56 (6)
	20:51		20:18		19:29			18:41	106	16:28 (6)	17:05	113	15:28 (6)	16:59	93	15:29 (6)
19	06:09		06:37		07:07			07:37		14:41 (6)	07:13		13:36 (6)	07:41		13:57 (6)
	20:50		20:16		19:27			18:39	108	16:29 (6)	17:04	111	15:27 (6)	16:59	92	15:29 (6)
20	06:09		06:38		07:08			07:38		14:40 (6)	07:14		13:37 (6)	07:42		13:58 (6)
	20:49		20:15		19:26			18:38	109	16:29 (6)	17:03	111	15:28 (6)	17:00	92	15:30 (6)
21	06:10		06:39		07:09			07:40		14:39 (6)	07:15		13:37 (6)	07:42		13:58 (6)
	20:49		20:13		19:24			18:36	110	16:29 (6)	17:03	111	15:28 (6)	17:00	92	15:30 (6)
22	06:11		06:40		07:10			07:41		14:37 (6)	07:16		13:38 (6)	07:43		13:59 (6)
	20:48		20:12		19:22			18:35	112	16:29 (6)	17:02	109	15:27 (6)	17:01	92	15:31 (6)
23	06:12		06:41		07:11			07:42		14:36 (6)	07:17		13:38 (6)	07:43		13:59 (6)
	20:47		20:11		19:21			18:33	113	16:29 (6)	17:02	109	15:27 (6)	17:01	92	15:31 (6)
24	06:13		06:42		07:12			07:43		14:36 (6)	07:18		13:39 (6)	07:44		13:59 (6)
	20:46		20:09		19:19			18:32	114	16:30 (6)	17:01	108	15:27 (6)	17:02	92	15:31 (6)
25	06:14		06:43		07:13			06:44		13:35 (6)	07:19		13:40 (6)	07:44		14:00 (6)
	20:46		20:08		19:17			17:31	115	15:30 (6)	17:01	108	15:28 (6)	17:02	93	15:33 (6)
26	06:15		06:44		07:14			06:45		13:34 (6)	07:21		13:41 (6)	07:44		14:00 (6)
	20:45		20:06		19:16			17:29	116	15:30 (6)	17:00	106	15:27 (6)	17:03	93	15:33 (6)
27	06:16		06:45		07:15		15:41 (6)	06:46		13:34 (6)	07:22		13:42 (6)	07:45		14:00 (6)
	20:44		20:05		19:14	23	16:04 (6)	17:28	115	15:29 (6)	17:00	105	15:27 (6)	17:03	93	15:33 (6)
28	06:16		06:46		07:16		15:35 (6)	06:47		13:33 (6)	07:23		13:42 (6)	07:45		14:01 (6)
	20:43		20:03		19:12	33	16:08 (6)	17:27	116	15:29 (6)	16:59	105	15:27 (6)	17:04	93	15:34 (6)
29	06:17		06:47		07:17		15:30 (6)	06:48		13:32 (6)	07:24		13:43 (6)	07:45		14:01 (6)
	20:42		20:01		19:11	41	16:11 (6)	17:25	117	15:29 (6)	16:59	104	15:27 (6)	17:05	94	15:35 (6)
30	06:18		06:48		07:18		15:26 (6)	06:50		13:33 (6)	07:25		13:44 (6)	07:46		14:01 (6)
	20:41		20:00		19:09	47	16:13 (6)	17:24	117	15:30 (6)	16:58	103	15:27 (6)	17:06	94	15:35 (6)
31	06:19		06:49					06:51		13:32 (6)				07:46		14:01 (6)
	20:40		19:58					17:23	118	15:30 (6)				17:06	95	15:36 (6)
Potential sun hours	457		426		375			346			300			290		
Total, worst case						144			2999			3383			2947	
Sun reduction						0.64			0.56			0.48			0.41	
Oper. time red.						0.37			0.37			0.37			0.37	
Wind dir. red.						0.67			0.67			0.67			0.67	
Total reduction						0.16			0.14			0.12			0.10	
Total, real						23			416			405			303	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 120

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CO - R111

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26		
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58		
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27		
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58		
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28		
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58		
4	07:46	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29		
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58		
5	07:46	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30		
	17:11	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57		
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	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57		
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	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57		
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	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58	5	15:45 (3)
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38		15:40 (3)
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17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40		15:39 (3)
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28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45		15:45 (3)
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	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05	5	15:52 (3)
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46		
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06		
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46		
	17:40		19:46		20:46		20:40	19:58		17:23		17:06		
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290		
Total, worst case													144	
Sun reduction													0.41	
Oper. time red.													0.37	
Wind dir. red.													0.69	
Total reduction													0.11	
Total, real													15	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 121

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CP - R112

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	06:43 (6) 05:56	06:17 (6) 05:57	06:25 (6) 06:20	06:42 (6) 06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18 37	07:20 (6) 20:46 60	07:17 (6) 20:57 55	07:20 (6) 20:39 49	07:31 (6) 19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	06:42 (6) 05:56	06:17 (6) 05:57	06:25 (6) 06:21	06:43 (6) 06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19 38	07:20 (6) 20:47 60	07:17 (6) 20:57 56	07:21 (6) 20:38 49	07:32 (6) 19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	06:41 (6) 05:55	06:17 (6) 05:58	06:25 (6) 06:22	06:44 (6) 06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20 40	07:21 (6) 20:48 60	07:17 (6) 20:57 56	07:21 (6) 20:37 48	07:32 (6) 19:54	19:04	17:19	16:58
4	07:46	07:31	06:54	07:04	06:20	06:40 (6) 05:55	06:17 (6) 05:58	06:25 (6) 06:23	06:45 (6) 06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21 41	07:21 (6) 20:49 60	07:17 (6) 20:57 57	07:22 (6) 20:36 46	07:31 (6) 19:52	19:02	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	06:39 (6) 05:55	06:18 (6) 05:59	06:24 (6) 06:24	06:46 (6) 06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22 42	07:21 (6) 20:49 59	07:17 (6) 20:57 58	07:22 (6) 20:34 45	07:31 (6) 19:50	19:01	17:17	16:57
6	07:46	07:29	06:51	07:01	06:18	06:37 (6) 05:54	06:18 (6) 06:00	06:25 (6) 06:25	06:46 (6) 06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23 43	07:20 (6) 20:50 59	07:17 (6) 20:56 58	07:23 (6) 20:33 44	07:30 (6) 19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	06:36 (6) 05:54	06:19 (6) 06:00	06:24 (6) 06:26	06:47 (6) 06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24 45	07:21 (6) 20:50 58	07:17 (6) 20:56 59	07:23 (6) 20:32 43	07:30 (6) 19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	06:35 (6) 05:54	06:19 (6) 06:01	06:24 (6) 06:27	06:48 (6) 06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25 46	07:21 (6) 20:51 57	07:16 (6) 20:56 60	07:24 (6) 20:31 42	07:30 (6) 19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	06:34 (6) 05:54	06:19 (6) 06:01	06:25 (6) 06:28	06:49 (6) 06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26 47	07:21 (6) 20:52 57	07:16 (6) 20:55 59	07:24 (6) 20:30 40	07:29 (6) 19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	06:33 (6) 05:53	06:20 (6) 06:02	06:24 (6) 06:29	06:50 (6) 06:59	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27 48	07:21 (6) 20:52 56	07:16 (6) 20:55 60	07:24 (6) 20:28 39	07:29 (6) 19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	06:32 (6) 05:53	06:21 (6) 06:03	06:25 (6) 06:30	06:51 (6) 06:59	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28 49	07:21 (6) 20:53 55	07:16 (6) 20:55 60	07:25 (6) 20:27 38	07:29 (6) 19:41	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	06:31 (6) 05:53	06:21 (6) 06:03	06:26 (6) 06:31	06:52 (6) 07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29 50	07:21 (6) 20:53 55	07:16 (6) 20:54 60	07:26 (6) 20:26 36	07:28 (6) 19:39	18:50	17:10	16:57
13	07:45	07:21	06:40	06:50	06:10	06:30 (6) 05:53	06:21 (6) 06:04	06:26 (6) 06:32	06:53 (6) 07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30 51	07:21 (6) 20:54 55	07:16 (6) 20:54 60	07:26 (6) 20:25 35	07:28 (6) 19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	06:29 (6) 05:53	06:22 (6) 06:05	06:27 (6) 06:33	06:54 (6) 07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31 52	07:21 (6) 20:54 54	07:16 (6) 20:53 59	07:26 (6) 20:23 33	07:27 (6) 19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	06:28 (6) 05:53	06:22 (6) 06:06	06:28 (6) 06:34	06:55 (6) 07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32 52	07:20 (6) 20:55 54	07:16 (6) 20:53 59	07:27 (6) 20:22 31	07:26 (6) 19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	06:27 (6) 05:53	06:23 (6) 06:06	06:29 (6) 06:34	06:56 (6) 07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33 53	07:20 (6) 20:55 53	07:16 (6) 20:52 59	07:28 (6) 20:21 29	07:25 (6) 19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44 07:02 (6)	06:07	06:27 (6) 05:53	06:23 (6) 06:07	06:29 (6) 06:35	06:57 (6) 07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03 4	07:06 (6) 20:34 54	07:21 (6) 20:55 53	07:16 (6) 20:51 59	07:28 (6) 20:19 27	07:24 (6) 19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42 07:01 (6)	06:06	06:26 (6) 05:53	06:23 (6) 06:08	06:30 (6) 06:36	06:58 (6) 07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04 7	07:08 (6) 20:35 54	07:20 (6) 20:56 53	07:16 (6) 20:51 58	07:28 (6) 20:18 25	07:23 (6) 19:29	18:41	17:05	16:59
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	17:25	18:03	18:34	20:05 11	07:10 (6) 20:35 55	07:20 (6) 20:56 53	07:16 (6) 20:50 58	07:29 (6) 20:16 23	07:21 (6) 19:27	18:39	17:04	16:59
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	17:27	18:04	18:35	20:06 14	07:12 (6) 20:36 56	07:20 (6) 20:56 53	07:16 (6) 20:49 57	07:29 (6) 20:15 21	07:20 (6) 19:26	18:38	17:04	17:00
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	17:28	18:05	18:36	20:07 16	07:12 (6) 20:37 56	07:20 (6) 20:56 53	07:17 (6) 20:49 57	07:29 (6) 20:14 19	07:19 (6) 19:24	18:36	17:03	17:00
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	17:30	18:07	18:38	20:10 21	07:15 (6) 20:39 57	07:19 (6) 20:57 53	07:17 (6) 20:47 56	07:30 (6) 20:11 13	07:15 (6) 19:21	18:33	17:02	17:01
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	17:33	18:10	18:40	20:12 26	07:17 (6) 20:41 58	07:19 (6) 20:57 53	07:18 (6) 20:46 55	07:31 (6) 20:08 7	07:11 (6) 19:17	17:31	17:01	17:02
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29	07:36		07:14	06:27 06:46 (6)	05:58	06:19 (6) 05:56	06:25 (6) 06:17	06:39 (6) 06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16 33	07:19 (6) 20:44 59	07:18 (6) 20:57 54	07:19 (6) 20:42 52	07:31 (6) 20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25 06:44 (6)	05:57	06:18 (6) 05:56	06:25 (6) 06:18	06:40 (6) 06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17 35	07:19 (6) 20:45 60	07:18 (6) 20:57 55	07:20 (6) 20:41 51	07:31 (6) 20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57	06:18 (6)	06:19	06:41 (6) 06:49		06:51		07:46
	17:40		19:46		20:46 60	07:18 (6)	20:40 50	07:31 (6) 19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case				300	1594	1659	1759	811				
Sun reduction				0.51	0.58	0.67	0.75	0.72				
Oper. time red.				0.37	0.37	0.37	0.37	0.37				
Wind dir. red.				0.76	0.76	0.76	0.76	0.76				
Total reduction				0.14	0.16	0.19	0.21	0.20				
Total, real				43	262	314	373	165				

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 122

Licensed user:
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Via Vittorio Veneto 231
IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CQ - R113

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	07:36 (6)	06:24	05:56	05:57	06:20	06:50	07:48 (6)	07:19	07:39 (6)	06:52	07:26
	17:07	17:41	18:14	19:47	45 08:21 (6)	20:18	20:46	20:57	20:39	19:57	12 08:00 (6)	19:07	11 07:50 (6)	17:22	16:58
2	07:46	07:33	06:57	07:07	07:37 (6)	06:23	05:56	05:57	06:21	06:51	07:44 (6)	07:20		06:53	07:27
	17:08	17:42	18:15	19:48	43 08:20 (6)	20:19	20:47	20:57	20:38	19:55	20 08:04 (6)	19:06		17:21	16:58
3	07:46	07:32	06:56	07:06	07:37 (6)	06:22	05:55	05:58	06:22	06:52	07:41 (6)	07:21		06:54	07:28
	17:09	17:43	18:16	19:49	42 08:19 (6)	20:20	20:48	20:57	20:37	19:54	25 08:06 (6)	19:04		17:19	16:58
4	07:47	07:31	06:54	07:04	07:37 (6)	06:20	05:55	05:58	06:23	06:53	07:39 (6)	07:22		06:55	07:29
	17:10	17:45	18:17	19:50	40 08:17 (6)	20:21	20:49	20:57	20:36	19:52	29 08:08 (6)	19:02		17:18	16:58
5	07:47	07:30	06:53	07:02	07:39 (6)	06:19	05:55	05:59	06:24	06:54	07:37 (6)	07:23		06:57	07:30
	17:11	17:46	18:19	19:51	37 08:16 (6)	20:22	20:49	20:57	20:34	19:50	32 08:09 (6)	19:01		17:17	16:57
6	07:47	07:29	06:51	07:01	07:39 (6)	06:18	05:54	06:00	06:25	06:55	07:35 (6)	07:24		06:58	07:31
	17:12	17:47	18:20	19:52	35 08:14 (6)	20:23	20:50	20:56	20:33	19:49	35 08:10 (6)	18:59		17:16	16:57
7	07:46	07:28	06:49	06:59	07:41 (6)	06:17	05:54	06:00	06:26	06:56	07:34 (6)	07:25		06:59	07:32
	17:13	17:48	18:21	19:53	32 08:13 (6)	20:24	20:50	20:56	20:32	19:47	37 08:11 (6)	18:58		17:15	16:57
8	07:46	07:26	06:48	06:58	07:42 (6)	06:16	05:54	06:01	06:27	06:57	07:32 (6)	07:26		07:00	07:33
	17:14	17:49	18:22	19:54	29 08:11 (6)	20:25	20:51	20:56	20:31	19:46	40 08:12 (6)	18:56		17:14	16:57
9	07:46	07:25	06:46	06:56	07:43 (6)	06:15	05:54	06:01	06:28	06:58	07:31 (6)	07:27		07:01	07:34
	17:15	17:51	18:23	19:55	25 08:08 (6)	20:26	20:52	20:55	20:30	19:44	42 08:13 (6)	18:54		17:13	16:57
10	07:46	07:24	06:45	06:55	07:46 (6)	06:14	05:53	06:02	06:29	06:59	07:30 (6)	07:28		07:02	07:34
	17:16	17:52	18:24	19:56	20 08:06 (6)	20:27	20:52	20:55	20:28	19:42	43 08:13 (6)	18:53		17:12	16:57
11	07:46	07:23	06:43	06:53	07:49 (6)	06:12	05:53	06:03	06:30	06:59	07:29 (6)	07:29		07:04	07:35
	17:17	17:53	18:25	19:57	12 08:01 (6)	20:28	20:53	20:55	20:27	19:41	45 08:14 (6)	18:51		17:11	16:57
12	07:46	07:22	06:42	06:51		06:11	05:53	06:03	06:31	07:00	07:29 (6)	07:30		07:05	07:36
	17:18	17:54	18:26	19:58		20:29	20:53	20:54	20:26	19:39	45 08:14 (6)	18:50		17:10	16:57
13	07:45	07:21	06:40	06:58 (6)	06:50	06:10	05:53	06:04	06:32	07:01	07:27 (6)	07:31		07:06	07:37
	17:19	17:56	18:27	15 07:13 (6)	19:59	20:30	20:54	20:54	20:25	19:37	46 08:13 (6)	18:48		17:09	16:58
14	07:45	07:19	06:38	06:57 (6)	06:48	06:09	05:53	06:05	06:33	07:02	07:26 (6)	07:32		07:07	07:38
	17:20	17:57	18:28	19 07:16 (6)	20:00	20:31	20:54	20:53	20:23	19:36	47 08:13 (6)	18:47		17:08	16:58
15	07:45	07:18	06:37	06:55 (6)	06:47	06:08	05:53	06:06	06:34	07:03	07:26 (6)	07:33		07:08	07:38
	17:21	17:58	18:29	23 07:18 (6)	20:01	20:32	20:55	20:53	20:22	19:34	47 08:13 (6)	18:45		17:07	16:58
16	07:44	07:17	06:35	06:54 (6)	06:45	06:07	05:53	06:06	06:34	07:04	07:26 (6)	07:34		07:09	07:39
	17:22	17:59	18:30	26 07:20 (6)	20:02	20:33	20:55	20:52	20:21	19:32	47 08:13 (6)	18:44		17:06	16:58
17	07:44	07:15	06:33	06:52 (6)	06:44	06:07	05:53	06:07	06:35	07:05	07:25 (6)	07:35		07:10	07:40
	17:23	18:00	18:31	29 07:21 (6)	20:03	20:34	20:55	20:51	20:19	19:31	48 08:13 (6)	18:42		17:06	16:59
18	07:43	07:14	06:32	06:50 (6)	06:42	06:06	05:53	06:08	06:36	07:06	07:26 (6)	07:36		07:12	07:40
	17:24	18:01	18:32	32 07:22 (6)	20:04	20:35	20:56	20:51	20:18	19:29	46 08:12 (6)	18:41		17:05	16:59
19	07:43	07:13	06:30	06:49 (6)	06:41	06:05	05:53	06:09	06:37	07:07	07:27 (6)	07:37		07:13	07:41
	17:25	18:03	18:34	34 07:23 (6)	20:05	20:36	20:56	20:50	20:16	19:27	45 08:12 (6)	18:39		17:04	16:59
20	07:42	07:11	06:29	06:47 (6)	06:39	06:04	05:53	06:10	06:38	07:08	07:28 (6)	07:39		07:14	07:42
	17:27	18:04	18:35	37 07:24 (6)	20:06	20:36	20:56	20:49	20:15	19:26	43 08:11 (6)	18:38		17:04	17:00
21	07:42	07:10	06:27	06:45 (6)	06:38	06:03	05:54	06:10	06:39	07:09	07:29 (6)	07:40		07:15	07:42
	17:28	18:05	18:36	39 07:24 (6)	20:08	20:37	20:56	20:49	20:14	19:24	41 08:10 (6)	18:36		17:03	17:00
22	07:41	07:09	06:25	06:44 (6)	06:36	06:02	05:54	06:11	06:40	07:10	07:30 (6)	07:41		07:16	07:43
	17:29	18:06	18:37	41 07:25 (6)	20:09	20:38	20:57	20:48	20:12	19:22	39 08:09 (6)	18:35		17:02	17:01
23	07:41	07:07	06:24	06:42 (6)	06:35	06:02	05:54	06:12	06:41	07:11	07:31 (6)	07:42		07:17	07:43
	17:30	18:07	18:38	43 07:25 (6)	20:10	20:39	20:57	20:47	20:11	19:21	37 08:08 (6)	18:33		17:02	17:01
24	07:40	07:06	06:22	06:40 (6)	06:34	06:01	05:54	06:13	06:42	07:12	07:32 (6)	07:43		07:18	07:44
	17:31	18:08	18:39	44 07:24 (6)	20:11	20:40	20:57	20:46	20:09	19:19	35 08:07 (6)	18:32		17:01	17:02
25	07:39	07:04	06:20	06:39 (6)	06:32	06:00	05:55	06:14	06:43	07:13	07:33 (6)	06:44		07:20	07:44
	17:33	18:10	18:40	46 07:25 (6)	20:12	20:41	20:57	20:46	20:08	19:17	33 08:06 (6)	17:31		17:01	17:02
26	07:39	07:03	06:19	06:37 (6)	06:31	06:00	05:55	06:15	06:44	07:14	07:34 (6)	06:45		07:21	07:45
	17:34	18:11	18:41	47 07:24 (6)	20:13	20:42	20:57	20:45	20:06	19:16	30 08:04 (6)	17:29		17:00	17:03
27	07:38	07:02	06:17	06:36 (6)	06:29	05:59	05:55	06:16	06:45	07:15	07:35 (6)	06:46		07:22	07:45
	17:35	18:12	18:42	48 07:24 (6)	20:14	20:43	20:57	20:44	20:05	19:14	27 08:02 (6)	17:28		17:00	17:04
28	07:37	07:00	06:15	06:37 (6)	06:28	05:58	05:56	06:16	06:46	07:16	07:36 (6)	06:47		07:23	07:45
	17:36	18:13	18:43	47 07:24 (6)	20:15	20:43	20:57	20:43	20:03	19:12	24 08:00 (6)	17:27		16:59	17:04
29	07:36		07:14	07:36 (6)	06:27	05:58	05:56	06:17	06:47	07:17	07:37 (6)	06:49		07:24	07:45
	17:37		19:44	47 08:23 (6)	20:16	20:44	20:57	20:42	20:01	19:11	21 07:58 (6)	17:25		16:59	17:05
30	07:35		07:12	07:36 (6)	06:26	05:57	05:56	06:18	06:48	07:18	07:38 (6)	06:50		07:25	07:46
	17:39		19:45	46 08:22 (6)	20:17	20:45	20:57	20:41	20:00	19:09	17 07:55 (6)	17:24		16:59	17:06
31	07:34		07:11	07:36 (6)		05:57		06:19	06:49			06:51			07:46
	17:40		19:46	46 08:22 (6)		20:46		20:40	19:58			17:23			17:06
Potential sun hours	300	298	370	398		446	450	457	426	375		346		300	290
Total, worst case			709	360						1078		11			
Sun reduction			0.47	0.51						0.64		0.56			
Oper. time red.			0.37	0.37						0.37		0.37			
Wind dir. red.			0.75	0.75						0.75		0.75			
Total reduction			0.13	0.14						0.18		0.16			
Total, real			93	51						194		2			

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 123
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CR - R114

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April		May	June	July	August	September		October		November	December
1	07:46	07:34	06:59		07:09	08:13 (6)	06:24	05:56	05:57	06:20	06:50		07:19	07:39 (6)	06:52	07:26
	17:07	17:41	18:14		19:47	5 08:18 (6)	20:18	20:46	20:57	20:39	19:57		19:07	45 08:24 (6)	17:22	16:58
2	07:46	07:33	06:57		07:07		06:23	05:56	05:57	06:21	06:51		07:20	07:40 (6)	06:53	07:27
	17:08	17:42	18:15		19:48		20:19	20:47	20:57	20:38	19:55		19:06	43 08:23 (6)	17:21	16:58
3	07:46	07:32	06:56	07:16 (6)	07:06		06:22	05:55	05:58	06:22	06:52		07:21	07:41 (6)	06:54	07:28
	17:09	17:43	18:16	16 07:32 (6)	19:49		20:20	20:48	20:57	20:37	19:54		19:04	41 08:22 (6)	17:19	16:58
4	07:47	07:31	06:54	07:13 (6)	07:04		06:20	05:55	05:58	06:23	06:53		07:22	07:42 (6)	06:55	07:29
	17:10	17:45	18:17	22 07:35 (6)	19:50		20:21	20:49	20:57	20:36	19:52		19:02	39 08:21 (6)	17:18	16:58
5	07:47	07:30	06:53	07:11 (6)	07:02		06:19	05:55	05:59	06:24	06:54		07:23	07:43 (6)	06:57	07:30
	17:11	17:46	18:19	26 07:37 (6)	19:51		20:22	20:49	20:57	20:34	19:50		19:01	36 08:19 (6)	17:17	16:57
6	07:47	07:29	06:51	07:10 (6)	07:01		06:18	05:54	06:00	06:25	06:55		07:24	07:44 (6)	06:58	07:31
	17:12	17:47	18:20	30 07:40 (6)	19:52		20:23	20:50	20:56	20:33	19:49		18:59	34 08:18 (6)	17:16	16:57
7	07:46	07:28	06:49	07:08 (6)	06:59		06:17	05:54	06:00	06:26	06:56		07:25	07:45 (6)	06:59	07:32
	17:13	17:48	18:21	32 07:40 (6)	19:53		20:24	20:50	20:56	20:32	19:47		18:58	31 08:16 (6)	17:15	16:57
8	07:46	07:26	06:48	07:06 (6)	06:58		06:16	05:54	06:01	06:27	06:57		07:26	07:46 (6)	07:00	07:33
	17:14	17:49	18:22	35 07:41 (6)	19:54		20:25	20:51	20:56	20:31	19:46		18:56	28 08:14 (6)	17:14	16:57
9	07:46	07:25	06:46	07:05 (6)	06:56		06:15	05:54	06:01	06:28	06:58		07:27	07:47 (6)	07:01	07:34
	17:15	17:51	18:23	38 07:43 (6)	19:55		20:26	20:52	20:55	20:30	19:44		18:54	25 08:12 (6)	17:13	16:57
10	07:46	07:24	06:45	07:03 (6)	06:55		06:14	05:53	06:02	06:29	06:59		07:28	07:49 (6)	07:02	07:34
	17:16	17:52	18:24	40 07:43 (6)	19:56		20:27	20:52	20:55	20:28	19:42		18:53	19 08:08 (6)	17:12	16:57
11	07:46	07:23	06:43	07:02 (6)	06:53		06:12	05:53	06:03	06:30	06:59		07:29	07:53 (6)	07:04	07:35
	17:17	17:53	18:25	42 07:44 (6)	19:57		20:28	20:53	20:55	20:27	19:41		18:51	11 08:04 (6)	17:11	16:57
12	07:46	07:22	06:42	07:00 (6)	06:51		06:11	05:53	06:03	06:31	07:00	08:00 (6)	07:30		07:05	07:36
	17:18	17:54	18:26	44 07:44 (6)	19:58		20:29	20:53	20:54	20:26	19:39	16 08:16 (6)	18:50		17:10	16:57
13	07:45	07:21	06:40	06:59 (6)	06:50		06:10	05:53	06:04	06:32	07:01	07:56 (6)	07:31		07:06	07:37
	17:19	17:56	18:27	45 07:44 (6)	19:59		20:30	20:54	20:54	20:25	19:37	22 08:18 (6)	18:48		17:09	16:58
14	07:45	07:19	06:38	06:59 (6)	06:48		06:09	05:53	06:05	06:33	07:02	07:53 (6)	07:32		07:07	07:38
	17:20	17:57	18:28	46 07:45 (6)	20:00		20:31	20:54	20:53	20:23	19:36	27 08:20 (6)	18:47		17:08	16:58
15	07:45	07:18	06:37	06:58 (6)	06:47		06:08	05:53	06:06	06:34	07:03	07:51 (6)	07:33		07:08	07:38
	17:21	17:58	18:29	46 07:44 (6)	20:01		20:32	20:55	20:53	20:22	19:34	31 08:22 (6)	18:45		17:07	16:58
16	07:44	07:17	06:35	06:58 (6)	06:45		06:07	05:53	06:06	06:34	07:04	07:49 (6)	07:34		07:09	07:39
	17:22	17:59	18:30	47 07:45 (6)	20:02		20:33	20:55	20:52	20:21	19:32	34 08:23 (6)	18:44		17:06	16:58
17	07:44	07:15	06:33	06:57 (6)	06:44		06:07	05:53	06:07	06:35	07:05	07:47 (6)	07:35		07:10	07:40
	17:23	18:00	18:31	47 07:44 (6)	20:03		20:34	20:55	20:51	20:19	19:31	37 08:24 (6)	18:42		17:06	16:59
18	07:43	07:14	06:32	06:57 (6)	06:42		06:06	05:53	06:08	06:36	07:06	07:46 (6)	07:36		07:12	07:40
	17:24	18:01	18:32	46 07:43 (6)	20:04		20:35	20:56	20:51	20:18	19:29	39 08:25 (6)	18:41		17:05	16:59
19	07:43	07:13	06:30	06:57 (6)	06:41		06:05	05:53	06:09	06:37	07:07	07:45 (6)	07:37		07:13	07:41
	17:25	18:03	18:34	46 07:43 (6)	20:05		20:36	20:56	20:50	20:16	19:27	41 08:26 (6)	18:39		17:04	16:59
20	07:42	07:11	06:29	06:57 (6)	06:39		06:04	05:53	06:10	06:38	07:08	07:44 (6)	07:39		07:14	07:42
	17:27	18:04	18:35	46 07:43 (6)	20:06		20:36	20:56	20:49	20:15	19:26	42 08:26 (6)	18:38		17:04	17:00
21	07:42	07:10	06:27	06:56 (6)	06:38		06:03	05:54	06:10	06:39	07:09	07:43 (6)	07:40		07:15	07:42
	17:28	18:05	18:36	45 07:41 (6)	20:08		20:37	20:56	20:49	20:14	19:24	43 08:26 (6)	18:36		17:03	17:00
22	07:41	07:09	06:25	06:57 (6)	06:36		06:02	05:54	06:11	06:40	07:10	07:42 (6)	07:41		07:16	07:43
	17:29	18:06	18:37	44 07:41 (6)	20:09		20:38	20:57	20:48	20:12	19:22	45 08:27 (6)	18:35		17:02	17:01
23	07:41	07:07	06:24	06:57 (6)	06:35		06:02	05:54	06:12	06:41	07:11	07:41 (6)	07:42		07:17	07:43
	17:30	18:07	18:38	43 07:40 (6)	20:10		20:39	20:57	20:47	20:11	19:21	46 08:27 (6)	18:33		17:02	17:01
24	07:40	07:06	06:22	06:57 (6)	06:34		06:01	05:54	06:13	06:42	07:12	07:41 (6)	07:43		07:18	07:44
	17:31	18:08	18:39	41 07:38 (6)	20:11		20:40	20:57	20:46	20:09	19:19	46 08:27 (6)	18:32		17:01	17:02
25	07:39	07:04	06:20	06:58 (6)	06:32		06:00	05:55	06:14	06:43	07:13	07:40 (6)	06:44		07:20	07:44
	17:33	18:10	18:40	40 07:38 (6)	20:12		20:41	20:57	20:46	20:08	19:17	47 08:27 (6)	17:31		17:01	17:02
26	07:39	07:03	06:19	06:59 (6)	06:31		06:00	05:55	06:15	06:44	07:14	07:40 (6)	06:45		07:21	07:45
	17:34	18:11	18:41	37 07:36 (6)	20:13		20:42	20:57	20:45	20:06	19:16	47 08:27 (6)	17:29		17:00	17:03
27	07:38	07:02	06:17	06:59 (6)	06:29		05:59	05:55	06:16	06:45	07:15	07:39 (6)	06:46		07:22	07:45
	17:35	18:12	18:42	35 07:34 (6)	20:14		20:43	20:57	20:44	20:05	19:14	47 08:26 (6)	17:28		17:00	17:04
28	07:37	07:00	06:15	07:01 (6)	06:28		05:58	05:56	06:16	06:46	07:16	07:39 (6)	06:47		07:23	07:45
	17:36	18:13	18:43	32 07:33 (6)	20:15		20:43	20:57	20:43	20:03	19:12	47 08:26 (6)	17:27		16:59	17:04
29	07:36		07:14	08:02 (6)	06:27		05:58	05:56	06:17	06:47	07:17	07:39 (6)	06:49		07:24	07:45
	17:37		19:44	28 08:30 (6)	20:16		20:44	20:57	20:42	20:01	19:11	46 08:25 (6)	17:25		16:59	17:05
30	07:35		07:12	08:04 (6)	06:26		05:57	05:56	06:18	06:48	07:18	07:39 (6)	06:50		07:25	07:46
	17:39		19:45	23 08:27 (6)	20:17		20:45	20:57	20:41	20:00	19:09	46 08:25 (6)	17:24		16:59	17:06
31	07:34		07:11	08:07 (6)			05:57		06:19	06:49			06:51			07:46
	17:40		19:46	17 08:24 (6)			20:46		20:40	19:58			17:23			17:06
Potential sun hours	300	298	370		398		446	450	457	426	375		346		300	290
Total, worst case				1079		5						749		352		
Sun reduction				0.47		0.51						0.64		0.56		
Oper. time red.				0.37		0.37						0.37		0.37		
Wind dir. red.				0.73		0.73						0.73		0.73		
Total reduction				0.13		0.14						0.18		0.15		
Total, real				139		1						132		53		

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 124

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CS - R116

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14 48 07:19 (6)	19:47	20:18	20:46	20:57	20:39	19:57	19:07 46 07:57 (6)	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15 49 07:19 (6)	19:48	20:19	20:47	20:57	20:38	19:55	19:06 48 07:56 (6)	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16 50 07:18 (6)	19:49	20:20	20:48	20:57	20:37	19:54	19:04 48 07:56 (6)	17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17 50 07:18 (6)	19:50	20:21	20:49	20:57	20:36	19:52	19:02 49 07:55 (6)	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19 51 07:17 (6)	19:51	20:22	20:49	20:57	20:34	19:50	19:01 50 07:54 (6)	17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20 50 07:18 (6)	19:52	20:23	20:50	20:56	20:33	19:49	18:59 50 07:54 (6)	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21 50 07:17 (6)	19:53	20:24	20:50	20:56	20:32	19:47	18:58 51 07:53 (6)	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22 50 07:17 (6)	19:54	20:25	20:51	20:56	20:31	19:46	18:56 50 07:53 (6)	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23 50 07:17 (6)	19:55	20:26	20:52	20:55	20:30	19:44	18:54 50 07:53 (6)	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02	07:34
	17:16	17:52	18:24 49 07:17 (6)	19:56	20:27	20:52	20:55	20:28	19:42	18:53 50 07:53 (6)	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04	07:35
	17:17	17:53	18:25 47 08:05 (6)	19:57	20:28	20:53	20:55	20:27	19:41	18:51 49 08:42 (6)	17:11	16:57
12	07:46	07:22	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26 46 08:04 (6)	19:58	20:29	20:53	20:54	20:26	19:39	18:50 48 08:41 (6)	17:10	16:57
13	07:45	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:56	18:27 45 08:03 (6)	19:59	20:30	20:54	20:54	20:25	19:37	18:48 47 08:40 (6)	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28 43 08:02 (6)	20:00	20:31	20:54	20:53	20:23	19:36	18:47 47 08:40 (6)	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29 42 08:01 (6)	20:01	20:32	20:55	20:53	20:22	19:34	18:45 45 08:39 (6)	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30 40 08:00 (6)	20:02	20:33	20:55	20:52	20:21	19:32	18:44 43 08:37 (6)	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31 37 07:58 (6)	20:03	20:34	20:55	20:51	20:19	19:31	18:42 41 08:37 (6)	17:06	16:59
18	07:43	07:14 07:38 (6)	06:32	07:22 (6)	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01 13 07:51 (6)	18:32 33 07:55 (6)	20:04	20:35	20:56	20:51	20:18	19:29	18:41 39 08:36 (6)	17:05	16:59
19	07:43	07:13 07:34 (6)	06:30	07:24 (6)	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:58 (6)	07:13	07:41
	17:25	18:03 22 07:56 (6)	18:34 30 07:54 (6)	20:05	20:36	20:56	20:50	20:16	19:27	18:39 36 08:34 (6)	17:04	16:59
20	07:42	07:11 07:31 (6)	06:29	07:26 (6)	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:59 (6)	07:14	07:42
	17:27	18:04 27 07:58 (6)	18:35 25 07:51 (6)	20:06	20:36	20:56	20:49	20:15	19:26	18:38 33 08:32 (6)	17:04	17:00
21	07:42	07:10 07:29 (6)	06:27	07:28 (6)	06:38	06:03	05:54	06:10	06:39	07:09	07:40	08:00 (6)	07:15	07:42
	17:28	18:05 31 08:00 (6)	18:36 19 07:47 (6)	20:08	20:37	20:56	20:49	20:14	19:24	18:36 30 08:30 (6)	17:03	17:00
22	07:41	07:09 07:28 (6)	06:25	07:34 (6)	06:36	06:02	05:54	06:11	06:40	07:10 08:15 (6)	07:41	08:02 (6)	07:16	07:43
	17:29	18:06 34 08:02 (6)	18:37 8 07:42 (6)	20:09	20:38	20:57	20:48	20:12	19:22 16 08:31 (6)	18:35 26 08:28 (6)	17:02	17:01
23	07:41	07:07 07:26 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11 08:11 (6)	07:42	08:05 (6)	07:17	07:43
	17:30	18:07 37 08:03 (6)	18:38	20:10	20:39	20:57	20:47	20:11	19:21 23 08:34 (6)	18:33 19 08:24 (6)	17:02	17:01
24	07:40	07:06 07:25 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12 08:08 (6)	07:43	08:10 (6)	07:18	07:44
	17:31	18:08 40 08:05 (6)	18:39	20:11	20:40	20:57	20:46	20:09	19:19 28 08:36 (6)	18:32 10 08:20 (6)	17:01	17:02
25	07:39	07:04 07:23 (6)	06:20	06:32	06:00	05:55	06:14	06:43	07:13 08:06 (6)	06:44	07:20	07:44
	17:33	18:10 42 08:05 (6)	18:40	20:12	20:41	20:57	20:46	20:08	19:17 32 08:38 (6)	17:31	17:01	17:02
26	07:39	07:03 07:22 (6)	06:19	06:31	06:00	05:55	06:15	06:44	07:14 08:04 (6)	06:45	07:21	07:45
	17:34	18:11 44 08:06 (6)	18:41	20:13	20:42	20:57	20:45	20:06	19:16 36 08:40 (6)	17:29	17:00	17:03
27	07:38	07:02 07:21 (6)	06:17	06:29	05:59	05:55	06:16	06:45	07:15 08:02 (6)	06:46	07:22	07:45
	17:35	18:12 45 08:06 (6)	18:42	20:14	20:43	20:57	20:44	20:05	19:14 39 08:41 (6)	17:28	17:00	17:04
28	07:37	07:00 07:21 (6)	06:15	06:28	05:58	05:56	06:16	06:46	07:16 08:01 (6)	06:47	07:23	07:45
	17:36	18:13 46 08:07 (6)	18:43	20:15	20:43	20:57	20:43	20:03	19:12 41 08:42 (6)	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17 08:00 (6)	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11 42 08:42 (6)	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18 07:58 (6)	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09 45 08:43 (6)	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		381	912						302	1005		
Sun reduction		0.43	0.47						0.64	0.56		
Oper. time red.		0.37	0.37						0.37	0.37		
Wind dir. red.		0.71	0.71						0.71	0.71		
Total reduction		0.12	0.13						0.17	0.15		
Total, real		44	115						52	149		

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 125

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CT - R117

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59 07:24 (6)	07:09	06:24	05:56	05:57	06:20	06:50	07:19 08:06 (6)	06:52	07:26
	17:07	17:41	18:14 49 08:13 (6)	19:47	20:18	20:46	20:57	20:39	19:57	19:07 39 08:45 (6)	17:22	16:58
2	07:46	07:33	06:57 07:24 (6)	07:07	06:23	05:56	05:57	06:21	06:51	07:20 08:05 (6)	06:53	07:27
	17:08	17:42	18:15 49 08:13 (6)	19:48	20:19	20:47	20:57	20:38	19:55	19:06 41 08:46 (6)	17:21	16:58
3	07:46	07:32	06:56 07:24 (6)	07:06	06:22	05:55	05:58	06:22	06:52	07:21 08:03 (6)	06:54	07:28
	17:09	17:43	18:16 49 08:13 (6)	19:49	20:20	20:48	20:57	20:37	19:54	19:04 44 08:47 (6)	17:19	16:58
4	07:47	07:31	06:54 07:24 (6)	07:04	06:20	05:55	05:58	06:23	06:53	07:22 08:02 (6)	06:55	07:29
	17:10	17:45	18:17 49 08:13 (6)	19:50	20:21	20:49	20:57	20:36	19:52	19:02 45 08:47 (6)	17:18	16:58
5	07:47	07:30	06:53 07:24 (6)	07:02	06:19	05:55	05:59	06:24	06:54	07:23 08:01 (6)	06:57	07:30
	17:11	17:46	18:19 48 08:12 (6)	19:51	20:22	20:49	20:57	20:34	19:50	19:01 46 08:47 (6)	17:17	16:57
6	07:47	07:29	06:51 07:24 (6)	07:01	06:18	05:54	06:00	06:25	06:55	07:24 08:01 (6)	06:58	07:31
	17:12	17:47	18:20 48 08:12 (6)	19:52	20:23	20:50	20:56	20:33	19:49	18:59 47 08:48 (6)	17:16	16:57
7	07:46	07:28	06:49 07:24 (6)	06:59	06:17	05:54	06:00	06:26	06:56	07:25 08:00 (6)	06:59	07:32
	17:13	17:48	18:21 47 08:11 (6)	19:53	20:24	20:50	20:56	20:32	19:47	18:58 48 08:48 (6)	17:15	16:57
8	07:46	07:26	06:48 07:24 (6)	06:58	06:16	05:54	06:01	06:27	06:57	07:26 07:59 (6)	07:00	07:33
	17:14	17:49	18:22 46 08:10 (6)	19:54	20:25	20:51	20:56	20:31	19:46	18:56 49 08:48 (6)	17:14	16:57
9	07:46	07:25	06:46 07:24 (6)	06:56	06:15	05:54	06:01	06:28	06:58	07:27 07:59 (6)	07:01	07:34
	17:15	17:51	18:23 46 08:10 (6)	19:55	20:26	20:52	20:55	20:30	19:44	18:54 49 08:48 (6)	17:13	16:57
10	07:46	07:24	06:45 07:25 (6)	06:55	06:14	05:53	06:02	06:29	06:59	07:28 07:58 (6)	07:02	07:34
	17:16	17:52	18:24 43 08:08 (6)	19:56	20:27	20:52	20:55	20:28	19:42	18:53 49 08:47 (6)	17:12	16:57
11	07:46	07:23	06:43 07:26 (6)	06:53	06:12	05:53	06:03	06:30	06:59	07:29 07:58 (6)	07:04	07:35
	17:17	17:53	18:25 42 08:08 (6)	19:57	20:28	20:53	20:55	20:27	19:41	18:51 49 08:47 (6)	17:11	16:57
12	07:46	07:22	06:42 07:26 (6)	06:51	06:11	05:53	06:03	06:31	07:00	07:30 07:58 (6)	07:05	07:36
	17:18	17:54	18:26 40 08:06 (6)	19:58	20:29	20:53	20:54	20:26	19:39	18:50 49 08:47 (6)	17:10	16:57
13	07:45	07:21	06:40 07:26 (6)	06:50	06:10	05:53	06:04	06:32	07:01	07:31 07:58 (6)	07:06	07:37
	17:19	17:56	18:27 38 08:04 (6)	19:59	20:30	20:54	20:54	20:25	19:37	18:48 48 08:46 (6)	17:09	16:58
14	07:45	07:19	06:38 07:28 (6)	06:48	06:09	05:53	06:05	06:33	07:02	07:32 07:58 (6)	07:07	07:38
	17:20	17:57	18:28 35 08:03 (6)	20:00	20:31	20:54	20:53	20:23	19:36	18:47 48 08:46 (6)	17:08	16:58
15	07:45	07:18 07:45 (6)	06:37 07:29 (6)	06:47	06:08	05:53	06:06	06:34	07:03	07:33 07:58 (6)	07:08	07:38
	17:21	17:58 10 07:55 (6)	18:29 32 08:01 (6)	20:01	20:32	20:55	20:53	20:22	19:34	18:45 47 08:45 (6)	17:07	16:58
16	07:44	07:17 07:41 (6)	06:35 07:31 (6)	06:45	06:07	05:53	06:06	06:34	07:04	07:34 07:58 (6)	07:09	07:39
	17:22	17:59 19 08:00 (6)	18:30 28 07:59 (6)	20:02	20:33	20:55	20:52	20:21	19:32	18:44 46 08:44 (6)	17:06	16:58
17	07:44	07:15 07:38 (6)	06:33 07:33 (6)	06:44	06:07	05:53	06:07	06:35	07:05	07:35 07:59 (6)	07:10	07:40
	17:23	18:00 25 08:03 (6)	18:31 23 07:56 (6)	20:03	20:34	20:55	20:51	20:19	19:31	18:42 45 08:44 (6)	17:06	16:59
18	07:43	07:14 07:35 (6)	06:32 07:36 (6)	06:42	06:06	05:53	06:08	06:36	07:06	07:36 08:00 (6)	07:12	07:40
	17:24	18:01 30 08:05 (6)	18:32 16 07:52 (6)	20:04	20:35	20:56	20:51	20:18	19:29	18:41 43 08:43 (6)	17:05	16:59
19	07:43	07:13 07:34 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37 08:00 (6)	07:13	07:41
	17:25	18:03 33 08:07 (6)	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39 42 08:42 (6)	17:04	16:59
20	07:42	07:11 07:33 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39 08:01 (6)	07:14	07:42
	17:27	18:04 36 08:09 (6)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38 40 08:41 (6)	17:04	17:00
21	07:42	07:10 07:31 (6)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40 08:02 (6)	07:15	07:42
	17:28	18:05 38 08:09 (6)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 37 08:39 (6)	17:03	17:00
22	07:41	07:09 07:30 (6)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41 08:03 (6)	07:16	07:43
	17:29	18:06 41 08:11 (6)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 35 08:38 (6)	17:02	17:01
23	07:41	07:07 07:28 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42 08:04 (6)	07:17	07:43
	17:30	18:07 43 08:11 (6)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33 32 08:36 (6)	17:02	17:01
24	07:40	07:06 07:28 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43 08:07 (6)	07:18	07:44
	17:31	18:08 44 08:12 (6)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 28 08:35 (6)	17:01	17:02
25	07:39	07:04 07:27 (6)	06:20	06:32	06:00	05:55	06:14	06:43	07:13 08:21 (6)	06:44	07:20	07:44
	17:33	18:10 45 08:12 (6)	18:40	20:12	20:41	20:57	20:46	20:08	19:17 12 08:33 (6)	17:31 23	07:32 (6)	17:01	17:02
26	07:39	07:03 07:26 (6)	06:19	06:31	06:00	05:55	06:15	06:44	07:14 08:17 (6)	06:45	07:11 (6)	07:21	07:45
	17:34	18:11 47 08:13 (6)	18:41	20:13	20:42	20:57	20:45	20:06	19:16 20 08:37 (6)	17:29 18	07:29 (6)	17:00	17:03
27	07:38	07:02 07:25 (6)	06:17	06:29	05:59	05:55	06:16	06:45	07:15 08:14 (6)	06:46	07:17 (6)	07:22	07:45
	17:35	18:12 48 08:13 (6)	18:42	20:14	20:43	20:57	20:44	20:05	19:14 26 08:40 (6)	17:28 6	07:23 (6)	17:00	17:04
28	07:37	07:00 07:25 (6)	06:15	06:28	05:58	05:56	06:16	06:46	07:16 08:11 (6)	06:47	07:23	07:45
	17:36	18:13 48 08:13 (6)	18:43	20:15	20:43	20:57	20:43	20:03	19:12 31 08:42 (6)	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17 08:09 (6)	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11 34 08:43 (6)	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18 08:08 (6)	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09 36 08:44 (6)	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		507	728						159	1093		
Sun reduction		0.43	0.47						0.64	0.56		
Oper. time red.		0.37	0.37						0.37	0.37		
Wind dir. red.		0.71	0.71						0.71	0.71		
Total reduction		0.11	0.13						0.17	0.15		
Total, real		58	91						27	161		

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 126

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CU - R119

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:37 (6)	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:16 (6)	07:26
	17:07	17:41	18:14	47 08:24 (6)	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	32 07:48 (6)	16:58
2	07:46	07:33	06:57	07:38 (6)	07:07	06:23	05:56	05:57	06:21	06:51	07:20	08:31 (6)	06:53	07:17 (6)	07:27
	17:08	17:42	18:15	46 08:24 (6)	19:48	20:19	20:47	20:57	20:38	19:55	19:06	12 08:43 (6)	17:21	29 07:46 (6)	16:58
3	07:46	07:32	06:56	07:38 (6)	07:06	06:22	05:55	05:58	06:22	06:52	07:21	08:27 (6)	06:54	07:20 (6)	07:28
	17:09	17:43	18:16	45 08:23 (6)	19:49	20:20	20:48	20:57	20:37	19:54	19:04	20 08:47 (6)	17:19	25 07:45 (6)	16:58
4	07:47	07:31	06:54	07:39 (6)	07:04	06:20	05:55	05:58	06:23	06:53	07:22	08:24 (6)	06:55	07:23 (6)	07:29
	17:10	17:45	18:17	43 08:22 (6)	19:50	20:21	20:49	20:57	20:36	19:52	19:02	26 08:50 (6)	17:18	19 07:42 (6)	16:58
5	07:47	07:30	06:52	07:40 (6)	07:02	06:19	05:55	05:59	06:24	06:54	07:23	08:21 (6)	06:57	07:26 (6)	07:30
	17:11	17:46	18:19	40 08:20 (6)	19:51	20:22	20:49	20:57	20:34	19:50	19:01	31 08:52 (6)	17:17	12 07:38 (6)	16:57
6	07:47	07:29	07:56 (6)	06:51	07:41 (6)	07:01	06:18	05:54	06:00	06:25	06:55	07:24	08:19 (6)	06:58		07:31
	17:12	17:47	13 08:09 (6)	18:20	38 08:19 (6)	19:52	20:23	20:50	20:56	20:33	19:49	18:59	34 08:53 (6)	17:16		16:57
7	07:46	07:27	07:52 (6)	06:49	07:42 (6)	06:59	06:17	05:54	06:00	06:26	06:56	07:25	08:17 (6)	06:59		07:32
	17:13	17:48	21 08:13 (6)	18:21	35 08:17 (6)	19:53	20:24	20:50	20:56	20:32	19:47	18:58	37 08:54 (6)	17:15		16:57
8	07:46	07:26	07:50 (6)	06:48	07:43 (6)	06:58	06:16	05:54	06:01	06:27	06:57	07:26	08:16 (6)	07:00		07:33
	17:14	17:49	26 08:16 (6)	18:22	32 08:15 (6)	19:54	20:25	20:51	20:56	20:31	19:46	18:56	39 08:55 (6)	17:14		16:57
9	07:46	07:25	07:48 (6)	06:46	07:45 (6)	06:56	06:15	05:54	06:01	06:28	06:58	07:27	08:14 (6)	07:01		07:34
	17:15	17:51	30 08:18 (6)	18:23	28 08:13 (6)	19:55	20:26	20:52	20:55	20:30	19:44	18:54	42 08:56 (6)	17:13		16:57
10	07:46	07:24	07:46 (6)	06:45	07:47 (6)	06:55	06:14	05:53	06:02	06:29	06:59	07:28	08:13 (6)	07:02		07:34
	17:16	17:52	33 08:19 (6)	18:24	23 08:10 (6)	19:56	20:27	20:52	20:55	20:28	19:42	18:53	44 08:57 (6)	17:12		16:57
11	07:46	07:23	07:45 (6)	06:43	07:51 (6)	06:53	06:12	05:53	06:03	06:30	06:59	07:29	08:12 (6)	07:04		07:35
	17:17	17:53	35 08:20 (6)	18:25	16 08:07 (6)	19:57	20:28	20:53	20:55	20:27	19:41	18:51	45 08:57 (6)	17:11		16:57
12	07:46	07:22	07:44 (6)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30	08:11 (6)	07:05			07:36
	17:18	17:54	38 08:22 (6)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	47 08:58 (6)	17:10			16:57
13	07:45	07:21	07:43 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	08:10 (6)	07:06			07:37
	17:19	17:55	40 08:23 (6)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	48 08:58 (6)	17:09			16:58
14	07:45	07:19	07:42 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	08:10 (6)	07:07			07:38
	17:20	17:57	43 08:25 (6)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	48 08:58 (6)	17:08			16:58
15	07:45	07:18	07:40 (6)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	08:09 (6)	07:08			07:38
	17:21	17:58	45 08:25 (6)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	49 08:58 (6)	17:07			16:58
16	07:44	07:17	07:40 (6)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	08:08 (6)	07:09			07:39
	17:22	17:59	46 08:26 (6)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	50 08:58 (6)	17:06			16:58
17	07:44	07:15	07:40 (6)	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	08:09 (6)	07:10			07:40
	17:23	18:00	47 08:27 (6)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	50 08:59 (6)	17:06			16:59
18	07:43	07:14	07:38 (6)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	08:09 (6)	07:12			07:40
	17:24	18:01	48 08:26 (6)	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	50 08:59 (6)	17:05			16:59
19	07:43	07:13	07:38 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	08:08 (6)	07:13			07:41
	17:25	18:03	49 08:27 (6)	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	51 08:59 (6)	17:04			16:59
20	07:42	07:11	07:37 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	08:08 (6)	07:14			07:42
	17:27	18:04	50 08:27 (6)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	50 08:58 (6)	17:04			17:00
21	07:42	07:10	07:37 (6)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	08:08 (6)	07:15			07:42
	17:28	18:05	50 08:27 (6)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	50 08:58 (6)	17:03			17:00
22	07:41	07:09	07:37 (6)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	08:08 (6)	07:16			07:43
	17:29	18:06	51 08:28 (6)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	49 08:57 (6)	17:02			17:01
23	07:41	07:07	07:37 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	08:08 (6)	07:17			07:43
	17:30	18:07	50 08:27 (6)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	49 08:57 (6)	17:02			17:01
24	07:40	07:06	07:37 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	08:09 (6)	07:18			07:44
	17:31	18:08	50 08:27 (6)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	48 08:57 (6)	17:01			17:02
25	07:39	07:04	07:36 (6)	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:09 (6)	07:20			07:44
	17:32	18:10	51 08:27 (6)	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	47 07:56 (6)	17:01			17:02
26	07:39	07:03	07:37 (6)	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:10 (6)	07:21			07:45
	17:34	18:11	50 08:27 (6)	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	45 07:55 (6)	17:00			17:03
27	07:38	07:02	07:37 (6)	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:10 (6)	07:22			07:45
	17:35	18:12	49 08:26 (6)	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	44 07:54 (6)	17:00			17:04
28	07:37	07:00	07:37 (6)	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:11 (6)	07:23			07:45
	17:36	18:13	49 08:26 (6)	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	42 07:53 (6)	16:59			17:04
29	07:36		07:14		06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:13 (6)	07:24			07:45
	17:37		19:44		20:16	20:44	20:57	20:42	20:01	19:11	17:25	40 07:53 (6)	16:59			17:05
30	07:35		07:12		06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:14 (6)	07:25			07:46
	17:39		19:45		20:17	20:45	20:57	20:41	20:00	19:09	17:24	37 07:51 (6)	16:59			17:06
31	07:34		07:11			05:57		06:19	06:49		06:51	07:15 (6)				07:46
	17:40		19:46			20:46		20:40	19:58		17:23	35 07:50 (6)				17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		964	393							1259	117	
Sun reduction		0.43	0.47							0.56	0.48	
Oper. time red.		0.37	0.37							0.37	0.37	
Wind dir. red.		0.70	0.70							0.70	0.70	
Total reduction		0.11	0.12							0.14	0.13	
Total, real		109	48							183	15	

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

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

Project:

Flickering Nuoro Sud

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Calculated:

2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CV - R120

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14 58	08:20 (6) 19:47	20:18	20:46	20:57	20:39	19:57	19:07 43	08:06 (6) 07:13 (6) 08:49 (6) 17:22 21	07:34 (6) 16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	08:04 (6) 06:53	07:27
	17:08	17:42	18:15 58	08:20 (6) 19:48	20:19	20:47	20:57	20:38	19:55	19:06 46	08:50 (6) 07:14 (6) 17:21 16	07:30 (6) 16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	08:03 (6) 06:54	07:28
	17:09	17:43	18:16 57	08:19 (6) 19:49	20:20	20:48	20:57	20:37	19:54	19:04 48	08:51 (6) 17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	08:02 (6) 06:55	07:29
	17:10	17:45	18:17 57	08:19 (6) 19:50	20:21	20:49	20:57	20:36	19:52	19:02 50	08:52 (6) 17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	08:01 (6) 06:57	07:30
	17:11	17:46	18:19 56	08:18 (6) 19:51	20:22	20:49	20:57	20:34	19:50	19:01 52	08:53 (6) 17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	08:00 (6) 06:58	07:31
	17:12	17:47	18:20 55	08:18 (6) 19:52	20:23	20:50	20:56	20:33	19:49	18:59 53	08:53 (6) 17:16	16:57
7	07:46	07:27	06:49	07:04	06:17	05:54	06:00	06:26	06:56	07:25	07:59 (6) 06:59	07:32
	17:13	17:48	18:21 54	08:17 (6) 19:53	20:24	20:50	20:56	20:32	19:47	18:58 54	08:53 (6) 17:15	16:57
8	07:46	07:26 07:50 (6)	06:48	07:23 (6) 06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:58 (6) 07:00	07:33
	17:14	17:49 5 07:55 (6)	18:22 52	08:15 (6) 19:54	20:25	20:51	20:56	20:31	19:45	18:56 56	08:54 (6) 17:14	16:57
9	07:46	07:25 07:45 (6)	06:46	07:24 (6) 06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:57 (6) 07:01	07:34
	17:15	17:51 17 08:02 (6)	18:23 51	08:15 (6) 19:55	20:26	20:52	20:55	20:30	19:44	18:54 57	08:54 (6) 17:13	16:57
10	07:46	07:24 07:43 (6)	06:45	07:24 (6) 06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:57 (6) 07:02	07:34
	17:16	17:52 22 08:05 (6)	18:24 49	08:13 (6) 19:56	20:27	20:52	20:55	20:28	19:42	18:53 57	08:54 (6) 17:12	16:57
11	07:46	07:23 07:42 (6)	06:43	07:25 (6) 06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:56 (6) 07:04	07:35
	17:17	17:53 25 08:07 (6)	18:25 47	08:12 (6) 19:57	20:28	20:53	20:55	20:27	19:41	18:51 58	08:54 (6) 17:11	16:57
12	07:46	07:22 07:41 (6)	06:41	07:26 (6) 06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:56 (6) 07:05	07:36
	17:18	17:54 29 08:10 (6)	18:26 45	08:11 (6) 19:58	20:29	20:53	20:54	20:26	19:39	18:50 58	08:54 (6) 17:10	16:57
13	07:45	07:21 07:40 (6)	06:40	07:27 (6) 06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:55 (6) 07:06	07:37
	17:19	17:55 32 08:12 (6)	18:27 41	08:08 (6) 19:59	20:30	20:54	20:54	20:25	19:37	18:48 58	08:53 (6) 17:09	16:58
14	07:45	07:19 07:39 (6)	06:38	07:29 (6) 06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:55 (6) 07:07	07:38
	17:20	17:57 35 08:14 (6)	18:28 38	08:07 (6) 20:00	20:31	20:54	20:53	20:23	19:36	18:47 58	08:53 (6) 17:08	16:58
15	07:45	07:18 07:37 (6)	06:37	07:30 (6) 06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:55 (6) 07:08	07:38
	17:21	17:58 37 08:14 (6)	18:29 35	08:05 (6) 20:01	20:32	20:55	20:53	20:22	19:34	18:45 58	08:53 (6) 17:07	16:58
16	07:44	07:17 07:36 (6)	06:35	07:32 (6) 06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:55 (6) 07:09	07:39
	17:22	17:59 40 08:16 (6)	18:30 31	08:03 (6) 20:02	20:33	20:55	20:52	20:21	19:32	18:44 57	08:52 (6) 17:06	16:58
17	07:44	07:15 07:35 (6)	06:33	07:34 (6) 06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:56 (6) 07:10	07:40
	17:23	18:00 42 08:17 (6)	18:31 25	07:59 (6) 20:03	20:34	20:55	20:51	20:19	19:31	18:42 57	08:53 (6) 17:06	16:59
18	07:43	07:14 07:33 (6)	06:32	07:37 (6) 06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:57 (6) 07:12	07:40
	17:24	18:01 44 08:17 (6)	18:32 18	07:55 (6) 20:04	20:35	20:56	20:51	20:18	19:29	18:41 55	08:52 (6) 17:05	16:59
19	07:43	07:13 07:32 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:58 (6) 07:13	07:41
	17:25	18:03 46 08:18 (6)	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39 53	08:51 (6) 17:04	16:59
20	07:42	07:11 07:30 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:59 (6) 07:14	07:42
	17:27	18:04 48 08:18 (6)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38 52	08:51 (6) 17:04	17:00
21	07:42	07:10 07:29 (6)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	08:00 (6) 07:15	07:42
	17:28	18:05 50 08:19 (6)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 50	08:50 (6) 17:03	17:00
22	07:41	07:09 07:28 (6)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	08:01 (6) 07:16	07:43
	17:29	18:06 52 08:20 (6)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 48	08:49 (6) 17:02	17:01
23	07:41	07:07 07:26 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	08:02 (6) 07:17	07:43
	17:30	18:07 54 08:20 (6)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33 46	08:48 (6) 17:02	17:01
24	07:40	07:06 07:25 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	08:04 (6) 07:18	07:44
	17:31	18:08 56 08:21 (6)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 44	08:48 (6) 17:01	17:02
25	07:39	07:04 07:23 (6)	06:20	06:32	06:00	05:55	06:14	06:43	07:13 08:22 (6)	06:44	07:05 (6) 07:20	07:44
	17:32	18:10 57 08:20 (6)	18:40	20:12	20:41	20:57	20:46	20:08	19:17 14 08:36 (6)	17:31 41	07:46 (6) 17:01	17:02
26	07:39	07:03 07:23 (6)	06:19	06:31	06:00	05:55	06:15	06:44	07:14 08:18 (6)	06:45	07:06 (6) 07:21	07:44
	17:34	18:11 58 08:21 (6)	18:41	20:13	20:42	20:57	20:45	20:06	19:16 23 08:41 (6)	17:29 39	07:45 (6) 17:00	17:03
27	07:38	07:02 07:22 (6)	06:17	06:29	05:59	05:55	06:16	06:45	07:15 08:15 (6)	06:46	07:07 (6) 07:22	07:45
	17:35	18:12 58 08:20 (6)	18:42	20:14	20:43	20:57	20:44	20:05	19:14 28 08:43 (6)	17:28 37	07:44 (6) 17:00	17:03
28	07:37	07:00 07:22 (6)	06:15	06:28	05:58	05:56	06:16	06:46	07:16 08:12 (6)	06:47	07:08 (6) 07:23	07:45
	17:36	18:13 59 08:21 (6)	18:43	20:15	20:43	20:57	20:43	20:03	19:12 33 08:45 (6)	17:27 34	07:42 (6) 16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17 08:10 (6)	06:49	07:10 (6) 07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11 37 08:47 (6)	17:25 31	07:41 (6) 16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18 08:08 (6)	06:50	07:11 (6) 07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09 40 08:48 (6)	17:24 28	07:39 (6) 16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51	07:12 (6)	07:46
	17:40		19:46		20:46		20:40	19:58		17:23 25	07:37 (6)	17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case		866	827						175	1503	37	
Sun reduction		0.43	0.47						0.64	0.56	0.48	
Oper. time red.		0.37	0.37						0.37	0.37	0.37	
Wind dir. red.		0.71	0.71						0.71	0.71	0.71	
Total reduction		0.11	0.12						0.17	0.15	0.13	
Total, real		99	103						30	221	5	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 128
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CW - R121

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	07:59 (6) / 06:59	07:51 (6) / 07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:18 (6) / 07:26
	17:07	17:41 24	08:23 (6) / 18:14 38	08:29 (6) / 19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22 46	08:04 (6) / 16:58
2	07:46	07:33	07:57 (6) / 06:57	07:52 (6) / 07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:19 (6) / 07:27
	17:08	17:42 28	08:25 (6) / 18:15 36	08:28 (6) / 19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21 44	08:03 (6) / 16:58
3	07:46	07:32	07:55 (6) / 06:56	07:53 (6) / 07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:20 (6) / 07:28
	17:09	17:43 32	08:27 (6) / 18:16 32	08:25 (6) / 19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19 43	08:03 (6) / 16:58
4	07:47	07:31	07:54 (6) / 06:54	07:56 (6) / 07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:21 (6) / 07:29
	17:10	17:45 34	08:28 (6) / 18:17 27	08:23 (6) / 19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18 41	08:02 (6) / 16:58
5	07:47	07:30	07:53 (6) / 06:52	07:58 (6) / 07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:22 (6) / 07:30
	17:11	17:46 37	08:30 (6) / 18:19 22	08:20 (6) / 19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17 39	08:01 (6) / 16:57
6	07:47	07:29	07:52 (6) / 06:51	08:02 (6) / 07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58	07:23 (6) / 07:31
	17:12	17:47 39	08:31 (6) / 18:20 15	08:17 (6) / 19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16 36	07:59 (6) / 16:57
7	07:46	07:27	07:51 (6) / 06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	08:40 (6) / 06:59	07:25 (6) / 07:32
	17:13	17:48 41	08:32 (6) / 18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58 9	08:49 (6) / 17:15 34	07:59 (6) / 16:57
8	07:46	07:26	07:50 (6) / 06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	08:35 (6) / 07:00	07:26 (6) / 07:33
	17:14	17:49 43	08:33 (6) / 18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56 19	08:54 (6) / 17:14 31	07:57 (6) / 16:57
9	07:46	07:25	07:50 (6) / 06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	08:32 (6) / 07:01	07:28 (6) / 07:34
	17:15	17:51 44	08:34 (6) / 18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54 25	08:57 (6) / 17:13 28	07:56 (6) / 16:57
10	07:46	07:24	07:48 (6) / 06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	08:29 (6) / 07:02	07:30 (6) / 07:34
	17:16	17:52 46	08:34 (6) / 18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53 30	08:59 (6) / 17:12 23	07:53 (6) / 16:57
11	07:46	07:23	07:48 (6) / 06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	08:27 (6) / 07:04	07:33 (6) / 07:35
	17:17	17:53 47	08:35 (6) / 18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51 33	09:00 (6) / 17:11 19	07:52 (6) / 16:57
12	07:46	07:22	07:48 (6) / 06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30	08:25 (6) / 07:05	07:37 (6) / 07:36
	17:18	17:54 48	08:36 (6) / 18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50 37	09:02 (6) / 17:10 11	07:48 (6) / 16:57
13	07:45	07:21	07:48 (6) / 06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	08:24 (6) / 07:06	07:37
	17:19	17:55 49	08:37 (6) / 18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48 39	09:03 (6) / 17:09	16:58
14	07:45	07:19	07:48 (6) / 06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	08:22 (6) / 07:07	07:38
	17:20	17:57 49	08:37 (6) / 18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47 42	09:04 (6) / 17:08	16:58
15	07:45	07:18	07:47 (6) / 06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	08:21 (6) / 07:08	07:38
	17:21	17:58 50	08:37 (6) / 18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45 43	09:04 (6) / 17:07	16:58
16	07:44	07:17	07:47 (6) / 06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	08:20 (6) / 07:09	07:39
	17:22	17:59 50	08:37 (6) / 18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44 45	09:05 (6) / 17:06	16:58
17	07:44	07:15	07:47 (6) / 06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	08:20 (6) / 07:10	07:40
	17:23	18:00 51	08:38 (6) / 18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42 46	09:06 (6) / 17:06	16:59
18	07:43	07:14	07:46 (6) / 06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	08:19 (6) / 07:12	07:40
	17:24	18:01 51	08:37 (6) / 18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41 48	09:07 (6) / 17:05	16:59
19	07:43	07:13	07:46 (6) / 06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	08:18 (6) / 07:13	07:41
	17:25	18:03 51	08:37 (6) / 18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39 49	09:07 (6) / 17:04	16:59
20	07:42	07:11	07:46 (6) / 06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	08:18 (6) / 07:14	07:42
	17:27	18:04 50	08:36 (6) / 18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38 49	09:07 (6) / 17:04	17:00
21	07:42	07:10	07:46 (6) / 06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	08:17 (6) / 07:15	07:42
	17:28	18:05 50	08:36 (6) / 18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 50	09:07 (6) / 17:03	17:00
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	17:29	18:06 49	08:36 (6) / 18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 51	09:07 (6) / 17:02	17:01
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	17:30	18:07 48	08:35 (6) / 18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33 51	09:07 (6) / 17:02	17:01
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	17:31	18:08 47	08:35 (6) / 18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 51	09:08 (6) / 17:01	17:02
25	07:39	07:04	07:48 (6) / 06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:17 (6) / 07:20	07:44
	17:32	18:10 45	08:33 (6) / 18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31 50	08:07 (6) / 17:01	17:02
26	07:39	07:03	07:49 (6) / 06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:16 (6) / 07:21	07:45
	17:34	18:11 44	08:33 (6) / 18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29 51	08:07 (6) / 17:00	17:03
27	07:38	07:02	07:49 (6) / 06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:16 (6) / 07:22	07:45
	17:35	18:12 42	08:31 (6) / 18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28 50	08:06 (6) / 17:00	17:03
28	07:37	07:00	07:50 (6) / 06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:16 (6) / 07:23	07:45
	17:36	18:13 41	08:31 (6) / 18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 50	08:06 (6) / 16:59	17:04
29	07:36			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:17 (6) / 07:24	07:45
	17:37			19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25 49	08:06 (6) / 16:59	17:05
30	07:35	08:05 (6)		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:18 (6) / 07:25	07:46
	17:39 11	08:16 (6)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 48	08:06 (6) / 16:59	17:06
31	07:34	08:01 (6)		07:11		05:57		06:19	06:49		06:51	07:18 (6)	07:46
	17:40 19	08:20 (6)		19:46		20:46		20:40	19:58		17:23 47	08:05 (6)	17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case	30	1230	170							1062	395	
Sun reduction	0.40	0.43	0.47							0.56	0.48	
Oper. time red.	0.37	0.37	0.37							0.37	0.37	
Wind dir. red.	0.69	0.69	0.69							0.69	0.69	
Total reduction	0.10	0.11	0.12							0.14	0.12	
Total, real	3	136	21							151	49	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 129

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CX - R122

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34 07:58 (6)	06:59 08:00 (6)	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52 07:21 (6)	07:26
	17:07	17:41 36	08:34 (6) 18:14 29	08:29 (6) 19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22 50	08:11 (6) 16:58
2	07:46	07:33 07:57 (6)	06:57 08:03 (6)	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53 07:22 (6)	07:27
	17:08	17:42 38	08:35 (6) 18:15 24	08:27 (6) 19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21 48	08:10 (6) 16:58
3	07:46	07:32 07:56 (6)	06:56 08:05 (6)	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54 07:23 (6)	07:28
	17:09	17:43 40	08:36 (6) 18:16 18	08:23 (6) 19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19 47	08:10 (6) 16:58
4	07:47	07:31 07:55 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55 07:23 (6)	07:29
	17:10	17:45 42	08:37 (6) 18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18 47	08:10 (6) 16:58
5	07:47	07:30 07:54 (6)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57 07:24 (6)	07:30
	17:11	17:46 44	08:38 (6) 18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17 45	08:09 (6) 16:57
6	07:47	07:29 07:54 (6)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24	06:58 07:24 (6)	07:31
	17:12	17:47 45	08:39 (6) 18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16 44	08:08 (6) 16:57
7	07:46	07:27 07:53 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59 07:26 (6)	07:32
	17:13	17:48 47	08:40 (6) 18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15 42	08:08 (6) 16:57
8	07:46	07:26 07:53 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00 07:27 (6)	07:33
	17:14	17:49 48	08:41 (6) 18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14 40	08:07 (6) 16:57
9	07:46	07:25 07:53 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01 07:28 (6)	07:34
	17:15	17:51 48	08:41 (6) 18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13 38	08:06 (6) 16:57
10	07:46	07:24 07:52 (6)	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28 08:43 (6)	07:02 07:29 (6)	07:34
	17:16	17:52 49	08:41 (6) 18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53 12	08:55 (6) 17:12 35	08:04 (6) 16:57
11	07:46	07:23 07:52 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29 08:38 (6)	07:04 07:31 (6)	07:35
	17:17	17:53 50	08:42 (6) 18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51 21	08:59 (6) 17:11 33	08:04 (6) 16:57
12	07:46	07:22 07:52 (6)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30 08:35 (6)	07:05 07:32 (6)	07:36
	17:18	17:54 50	08:42 (6) 18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50 26	09:01 (6) 17:10 30	08:02 (6) 16:57
13	07:45	07:21 07:52 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31 08:33 (6)	07:06 07:34 (6)	07:37
	17:19	17:55 50	08:42 (6) 18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48 30	09:03 (6) 17:09 27	08:01 (6) 16:58
14	07:45	07:19 07:52 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32 08:31 (6)	07:07 07:35 (6)	07:38
	17:20	17:57 51	08:43 (6) 18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47 34	09:05 (6) 17:08 24	07:59 (6) 16:58
15	07:45	07:18 07:51 (6)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33 08:29 (6)	07:08 07:39 (6)	07:38
	17:21	17:58 51	08:42 (6) 18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45 37	09:06 (6) 17:07 18	07:57 (6) 16:58
16	07:44	07:17 07:51 (6)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34 08:27 (6)	07:09 07:42 (6)	07:39
	17:22	17:59 51	08:42 (6) 18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44 40	09:07 (6) 17:06 12	07:54 (6) 16:58
17	07:44	07:15 07:52 (6)	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35 08:27 (6)	07:10	07:40
	17:23	18:00 50	08:42 (6) 18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42 42	09:09 (6) 17:06	16:59
18	07:43	07:14 07:51 (6)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36 08:26 (6)	07:12	07:40
	17:24	18:01 50	08:41 (6) 18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41 43	09:09 (6) 17:05	16:59
19	07:43	07:13 07:52 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37 08:25 (6)	07:13	07:41
	17:25	18:03 49	08:41 (6) 18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39 45	09:10 (6) 17:04	16:59
20	07:42	07:11 07:52 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39 08:24 (6)	07:14	07:42
	17:27	18:04 48	08:40 (6) 18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38 46	09:10 (6) 17:04	17:00
21	07:42	07:10 07:52 (6)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40 08:23 (6)	07:15	07:42
	17:28	18:05 48	08:40 (6) 18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 48	09:11 (6) 17:03	17:00
22	07:41	07:09 07:53 (6)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41 08:22 (6)	07:16	07:43
	17:29	18:06 47	08:40 (6) 18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 49	09:11 (6) 17:02	17:01
23	07:41	07:07 07:53 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42 08:21 (6)	07:17	07:43
	17:30	18:07 45	08:38 (6) 18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33 50	09:11 (6) 17:02	17:01
24	07:40	07:06 07:55 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43 08:22 (6)	07:18	07:44
	17:31	18:08 43	08:38 (6) 18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 50	09:12 (6) 17:01	17:02
25	07:39	07:04 07:55 (6)	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44 07:21 (6)	07:20	07:44
	17:32	18:10 41	08:36 (6) 18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31 51	08:12 (6) 17:01	17:02
26	07:39 08:09 (6)	07:03 07:56 (6)	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45 07:21 (6)	07:21	07:45
	17:34 12 08:21 (6)	18:11 39	08:35 (6) 18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29 51	08:12 (6) 17:00	17:03
27	07:38 08:06 (6)	07:02 07:57 (6)	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46 07:21 (6)	07:22	07:45
	17:35 18 08:24 (6)	18:12 36	08:33 (6) 18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28 51	08:12 (6) 17:00	17:03
28	07:37 08:03 (6)	07:00 07:59 (6)	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47 07:21 (6)	07:23	07:45
	17:36 24 08:27 (6)	18:13 32	08:31 (6) 18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 50	08:11 (6) 16:59	17:04
29	07:36 08:02 (6)		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49 07:21 (6)	07:24	07:45
	17:37 27 08:29 (6)		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25 51	08:12 (6) 16:59	17:05
30	07:35 08:00 (6)		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50 07:21 (6)	07:25	07:46
	17:39 31 08:31 (6)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 51	08:12 (6) 16:59	17:06
31	07:34 07:59 (6)		07:11		05:57		06:19	06:49		06:51 07:21 (6)		07:46
	17:40 33 08:32 (6)		19:46		20:46		20:40	19:58		17:23 50	08:11 (6)	17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
Total, worst case	145	1268	71							928	580	
Sun reduction	0.40	0.43	0.47							0.56	0.48	
Oper. time red.	0.37	0.37	0.37							0.37	0.37	
Wind dir. red.	0.68	0.68	0.68							0.68	0.68	
Total reduction	0.10	0.11	0.12							0.14	0.12	
Total, real	15	139	8							131	71	

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

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

Project:

Flickering Nuoro Sud

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2024-01-12 10:10 / 130

Licensed user:

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CY - R123

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:46		07:34		08:02 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:31 (6)	07:26
	17:07		17:41	49	08:51 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22	52 08:23 (6)	16:58
2	07:46		07:33		08:02 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	07:30 (6)	07:27
	17:08		17:42	49	08:51 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21	53 08:23 (6)	16:58
3	07:46		07:32		08:01 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	07:31 (6)	07:28
	17:09		17:43	51	08:52 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19	52 08:23 (6)	16:58
4	07:47		07:31		08:01 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	07:31 (6)	07:29
	17:10		17:45	51	08:52 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02		17:18	52 08:23 (6)	16:58
5	07:47		07:30		08:01 (6)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23		06:57	07:31 (6)	07:30
	17:11		17:46	52	08:53 (6)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17	52 08:23 (6)	16:57
6	07:47		07:29		08:01 (6)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24		06:58	07:31 (6)	07:31
	17:12		17:47	52	08:53 (6)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16	51 08:22 (6)	16:57
7	07:46		07:27		08:01 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	07:32 (6)	07:32
	17:13		17:48	52	08:53 (6)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15	51 08:23 (6)	16:57
8	07:46		07:26		08:01 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	07:32 (6)	07:33
	17:14		17:49	53	08:54 (6)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56		17:14	51 08:23 (6)	16:57
9	07:46		07:25		08:02 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	07:33 (6)	07:34
	17:15		17:51	52	08:54 (6)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13	49 08:22 (6)	16:57
10	07:46		07:24		08:01 (6)	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28		07:02	07:33 (6)	07:34
	17:16		17:52	52	08:53 (6)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12	49 08:22 (6)	16:57
11	07:46		07:23		08:01 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29		07:04	07:34 (6)	07:35
	17:17		17:53	52	08:53 (6)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11	48 08:22 (6)	16:57
12	07:46		07:22		08:02 (6)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05	07:35 (6)	07:36
	17:18		17:54	51	08:53 (6)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10	46 08:21 (6)	16:57
13	07:45		07:21		08:02 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06	07:35 (6)	07:37
	17:19		17:55	51	08:53 (6)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09	46 08:21 (6)	16:58
14	07:45		07:19		08:03 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32		07:07	07:36 (6)	07:38
	17:20		17:57	50	08:53 (6)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08	44 08:20 (6)	16:58
15	07:45		07:18		08:03 (6)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	08:53 (6)	07:08	07:38 (6)	07:38
	17:21		17:58	49	08:52 (6)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	10 09:03 (6)	17:07	42 08:20 (6)	16:58
16	07:44	08:19 (6)	07:17		08:03 (6)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	08:48 (6)	07:09	07:38 (6)	07:39
	17:22	7 08:26 (6)	17:59	48	08:51 (6)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	19 09:07 (6)	17:06	41 08:19 (6)	16:58
17	07:44	08:16 (6)	07:15		08:04 (6)	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	08:45 (6)	07:10	07:39 (6)	07:40
	17:23	15 08:31 (6)	18:00	47	08:51 (6)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	26 09:11 (6)	17:06	39 08:18 (6)	16:59
18	07:43	08:13 (6)	07:14		08:04 (6)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	08:43 (6)	07:12	07:40 (6)	07:40
	17:24	20 08:33 (6)	18:01	45	08:49 (6)	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	30 09:13 (6)	17:05	37 08:17 (6)	16:59
19	07:43	08:12 (6)	07:13		08:05 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	08:41 (6)	07:13	07:41 (6)	07:41
	17:25	24 08:36 (6)	18:03	44	08:49 (6)	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	34 09:15 (6)	17:04	35 08:16 (6)	16:59
20	07:42	08:10 (6)	07:11		08:06 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	08:39 (6)	07:14	07:43 (6)	07:42
	17:27	27 08:37 (6)	18:04	41	08:47 (6)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	37 09:16 (6)	17:04	33 08:16 (6)	17:00
21	07:42	08:09 (6)	07:10		08:07 (6)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	08:37 (6)	07:15	07:45 (6)	07:42
	17:28	30 08:39 (6)	18:05	39	08:46 (6)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	40 09:17 (6)	17:03	30 08:15 (6)	17:00
22	07:41	08:08 (6)	07:09		08:09 (6)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	08:36 (6)	07:16	07:46 (6)	07:43
	17:29	33 08:41 (6)	18:06	36	08:45 (6)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	42 09:18 (6)	17:02	27 08:13 (6)	17:01
23	07:41	08:07 (6)	07:07		08:10 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	08:35 (6)	07:17	07:48 (6)	07:43
	17:30	35 08:42 (6)	18:07	32	08:42 (6)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	44 09:19 (6)	17:02	24 08:12 (6)	17:01
24	07:40	08:06 (6)	07:06		08:12 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	08:35 (6)	07:18	07:50 (6)	07:44
	17:31	37 08:43 (6)	18:08	29	08:41 (6)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	45 09:20 (6)	17:01	20 08:10 (6)	17:02
25	07:39	08:05 (6)	07:04		08:14 (6)	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:34 (6)	07:20	07:54 (6)	07:44
	17:32	39 08:44 (6)	18:10	23	08:37 (6)	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	47 08:21 (6)	17:01	15 08:09 (6)	17:02
26	07:39	08:05 (6)	07:03		08:18 (6)	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:33 (6)	07:21	07:57 (6)	07:45
	17:34	41 08:46 (6)	18:11	16	08:34 (6)	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	48 08:21 (6)	17:00	8 08:05 (6)	17:03
27	07:38	08:05 (6)	07:02			06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:32 (6)	07:22		07:45
	17:35	42 08:47 (6)	18:12			18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	49 08:21 (6)	17:00		17:03
28	07:37	08:04 (6)	07:00			06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:31 (6)	07:23		07:45
	17:36	44 08:48 (6)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	51 08:22 (6)	16:59		17:04
29	07:36	08:03 (6)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:32 (6)	07:24		07:45
	17:37	46 08:49 (6)				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	51 08:23 (6)	16:59		17:05
30	07:35	08:03 (6)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:31 (6)	07:25		07:46
	17:39	46 08:49 (6)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	52 08:23 (6)	16:59		17:06
31	07:34	08:02 (6)				07:11		05:57		06:19	06:49		06:51	07:31 (6)			07:46
	17:40	48 08:50 (6)				19:46		20:46		20:40	19:58		17:23	52 08:23 (6)			17:06
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290	
Total, worst case		534		1166									677		1047		
Sun reduction		0.40		0.43									0.56		0.48		
Oper. time red.		0.37		0.37									0.37		0.37		
Wind dir. red.		0.66		0.66									0.66		0.66		
Total reduction		0.10		0.11									0.14		0.12		
Total, real		53		125									93		125		

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 131

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: CZ - R124

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February			March	April	May	June	July	August	September	October		November		December
1	07:46		07:34		08:04 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:33 (6)	07:26
	17:07		17:41	45	08:49 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22	47 08:20 (6)	16:58
2	07:46		07:33		08:04 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	07:32 (6)	07:27
	17:08		17:42	45	08:49 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21	48 08:20 (6)	16:58
3	07:46		07:32		08:03 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	07:33 (6)	07:28
	17:09		17:43	47	08:50 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19	48 08:21 (6)	16:58
4	07:47		07:31		08:03 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	07:33 (6)	07:29
	17:10		17:45	47	08:50 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02		17:18	48 08:21 (6)	16:58
5	07:47		07:30		08:03 (6)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23		06:57	07:33 (6)	07:30
	17:11		17:46	48	08:51 (6)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17	48 08:21 (6)	16:57
6	07:47		07:29		08:03 (6)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24		06:58	07:33 (6)	07:31
	17:12		17:47	48	08:51 (6)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16	47 08:20 (6)	16:57
7	07:46		07:28		08:03 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	07:34 (6)	07:32
	17:13		17:48	48	08:51 (6)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15	47 08:21 (6)	16:57
8	07:46		07:26		08:03 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	07:34 (6)	07:33
	17:14		17:49	48	08:51 (6)	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56		17:14	46 08:20 (6)	16:57
9	07:46		07:25		08:04 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	07:34 (6)	07:34
	17:15		17:51	48	08:52 (6)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13	46 08:20 (6)	16:57
10	07:46		07:24		08:03 (6)	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28		07:02	07:35 (6)	07:34
	17:16		17:52	48	08:51 (6)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12	44 08:19 (6)	16:57
11	07:46		07:23		08:03 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29		07:04	07:36 (6)	07:35
	17:17		17:53	48	08:51 (6)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11	44 08:20 (6)	16:57
12	07:46		07:22		08:04 (6)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05	07:37 (6)	07:36
	17:18		17:54	47	08:51 (6)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10	42 08:19 (6)	16:57
13	07:45		07:21		08:05 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06	07:37 (6)	07:37
	17:19		17:55	45	08:50 (6)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09	41 08:18 (6)	16:58
14	07:45		07:19		08:05 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32		07:07	07:38 (6)	07:38
	17:20		17:57	45	08:50 (6)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08	40 08:18 (6)	16:58
15	07:45		07:18		08:05 (6)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33		07:08	07:40 (6)	07:38
	17:21		17:58	44	08:49 (6)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45		17:07	38 08:18 (6)	16:58
16	07:44		07:17		08:06 (6)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34		07:09	07:40 (6)	07:39
	17:22		17:59	42	08:48 (6)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44		17:06	37 08:17 (6)	16:58
17	07:44		07:15		08:07 (6)	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	08:53 (6)	07:10	07:41 (6)	07:40
	17:23		18:00	41	08:48 (6)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	10 09:03 (6)	17:06	35 08:16 (6)	16:59
18	07:43	08:18 (6)	07:14		08:07 (6)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	08:49 (6)	07:12	07:42 (6)	07:40
	17:24	10 08:28 (6)	18:01	39	08:46 (6)	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	18 09:07 (6)	17:05	33 08:15 (6)	16:59
19	07:43	08:15 (6)	07:13		08:09 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	08:46 (6)	07:13	07:44 (6)	07:41
	17:25	17 08:32 (6)	18:03	36	08:45 (6)	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	24 09:10 (6)	17:04	30 08:14 (6)	16:59
20	07:42	08:13 (6)	07:11		08:10 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	08:43 (6)	07:14	07:46 (6)	07:42
	17:27	21 08:34 (6)	18:04	34	08:44 (6)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	29 09:12 (6)	17:04	27 08:13 (6)	17:00
21	07:42	08:11 (6)	07:10		08:11 (6)	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	08:41 (6)	07:15	07:47 (6)	07:42
	17:28	25 08:36 (6)	18:05	31	08:42 (6)	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	32 09:13 (6)	17:03	25 08:12 (6)	17:00
22	07:41	08:11 (6)	07:09		08:13 (6)	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	08:39 (6)	07:16	07:49 (6)	07:43
	17:29	27 08:38 (6)	18:06	27	08:40 (6)	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	35 09:14 (6)	17:02	21 08:10 (6)	17:01
23	07:41	08:10 (6)	07:07		08:15 (6)	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	08:38 (6)	07:17	07:51 (6)	07:43
	17:30	30 08:40 (6)	18:07	22	08:37 (6)	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	37 09:15 (6)	17:02	17 08:08 (6)	17:01
24	07:40	08:08 (6)	07:06		08:18 (6)	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	08:38 (6)	07:18	07:54 (6)	07:44
	17:31	33 08:41 (6)	18:08	16	08:34 (6)	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	39 09:17 (6)	17:01	11 08:05 (6)	17:02
25	07:39	08:07 (6)	07:04			06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:37 (6)	07:20		07:44
	17:32	35 08:42 (6)	18:10			18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	41 08:18 (6)	17:01		17:02
26	07:39	08:07 (6)	07:03			06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:36 (6)	07:21		07:45
	17:34	37 08:44 (6)	18:11			18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	42 08:18 (6)	17:00		17:03
27	07:38	08:07 (6)	07:02			06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:35 (6)	07:22		07:45
	17:35	38 08:45 (6)	18:12			18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	44 08:19 (6)	17:00		17:03
28	07:37	08:06 (6)	07:00			06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:34 (6)	07:23		07:45
	17:36	40 08:46 (6)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	45 08:19 (6)	16:59		17:04
29	07:36	08:05 (6)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:34 (6)	07:24		07:45
	17:37	41 08:46 (6)				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	46 08:20 (6)	16:59		17:05
30	07:35	08:05 (6)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:34 (6)	07:25		07:46
	17:39	42 08:47 (6)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	46 08:20 (6)	16:59		17:06
31	07:34	08:04 (6)				07:11		05:57		06:19	06:49		06:51	07:33 (6)			07:46
	17:40	44 08:48 (6)				19:46		20:46		20:40	19:58		17:23	47 08:20 (6)			17:06
Potential sun hours	300		298			370	398	446	450	457	426	375	346		300		290
Total, worst case		440		989										535		910	
Sun reduction		0.40		0.43										0.56		0.48	
Oper. time red.		0.37		0.37										0.37		0.37	
Wind dir. red.		0.66		0.66										0.66		0.66	
Total reduction		0.10		0.11										0.14		0.12	
Total, real		44		106										74		108	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 132

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DA - R125

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:46		07:34	08:10 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:41 (6)	07:26
	17:07		17:41 45	08:55 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22 43	08:24 (6)	16:58
2	07:46		07:33	08:10 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	07:40 (6)	07:27
	17:08		17:42 45	08:55 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21 45	08:25 (6)	16:58
3	07:46		07:32	08:10 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	07:41 (6)	07:28
	17:09		17:43 46	08:56 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19 45	08:26 (6)	16:58
4	07:47		07:31	08:10 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	07:40 (6)	07:29
	17:10		17:45 46	08:56 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02		17:18 46	08:26 (6)	16:58
5	07:47		07:30	08:10 (6)	06:53	07:02	06:19	05:55	05:59	06:24	06:54	07:23		06:57	07:40 (6)	07:30
	17:11		17:46 46	08:56 (6)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17 46	08:26 (6)	16:57
6	07:47		07:29	08:10 (6)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24		06:58	07:40 (6)	07:31
	17:12		17:47 46	08:56 (6)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16 46	08:26 (6)	16:57
7	07:46		07:28	08:11 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	07:41 (6)	07:32
	17:13		17:48 45	08:56 (6)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15 46	08:27 (6)	16:57
8	07:46		07:26	08:11 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	07:41 (6)	07:33
	17:14		17:49 45	08:56 (6)	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56		17:14 46	08:27 (6)	16:57
9	07:46		07:25	08:12 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	07:40 (6)	07:34
	17:15		17:51 44	08:56 (6)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13 46	08:26 (6)	16:57
10	07:46		07:24	08:12 (6)	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28		07:02	07:41 (6)	07:34
	17:16		17:52 44	08:56 (6)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12 45	08:26 (6)	16:57
11	07:46		07:23	08:12 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29		07:04	07:42 (6)	07:35
	17:17		17:53 42	08:54 (6)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11 45	08:27 (6)	16:57
12	07:46	08:26 (6)	07:22	08:13 (6)	06:42	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05	07:42 (6)	07:36
	17:18 3	08:29 (6)	17:54 41	08:54 (6)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10 44	08:26 (6)	16:57
13	07:45	08:21 (6)	07:21	08:14 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06	07:42 (6)	07:37
	17:19 12	08:33 (6)	17:55 39	08:53 (6)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09 44	08:26 (6)	16:58
14	07:45	08:20 (6)	07:19	08:15 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32		07:07	07:42 (6)	07:38
	17:20 16	08:36 (6)	17:57 38	08:53 (6)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08 43	08:25 (6)	16:58
15	07:45	08:19 (6)	07:18	08:15 (6)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33		07:08	07:44 (6)	07:38
	17:21 20	08:39 (6)	17:58 36	08:51 (6)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45		17:07 42	08:26 (6)	16:58
16	07:44	08:17 (6)	07:17	08:17 (6)	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34		07:09	07:44 (6)	07:39
	17:22 23	08:40 (6)	17:59 33	08:50 (6)	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44		17:06 41	08:25 (6)	16:58
17	07:44	08:16 (6)	07:15	08:19 (6)	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35		07:10	07:45 (6)	07:40
	17:23 26	08:42 (6)	18:00 29	08:48 (6)	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42		17:06 40	08:25 (6)	16:59
18	07:43	08:15 (6)	07:14	08:20 (6)	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36		07:12	07:45 (6)	07:40
	17:24 28	08:43 (6)	18:01 26	08:46 (6)	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41		17:05 39	08:24 (6)	16:59
19	07:43	08:15 (6)	07:13	08:22 (6)	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37		07:13	07:46 (6)	07:41
	17:25 30	08:45 (6)	18:03 22	08:44 (6)	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39		17:04 37	08:23 (6)	16:59
20	07:42	08:14 (6)	07:11	08:26 (6)	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39		07:14	07:48 (6)	07:42
	17:27 32	08:46 (6)	18:04 15	08:41 (6)	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38		17:04 36	08:24 (6)	17:00
21	07:42	08:13 (6)	07:10		06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	09:00 (6)	07:15	07:49 (6)	07:42
	17:28 34	08:47 (6)	18:05		18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36 6	09:06 (6)	17:03 34	08:23 (6)	17:00
22	07:41	08:13 (6)	07:09		06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	08:54 (6)	07:16	07:50 (6)	07:43
	17:29 36	08:49 (6)	18:06		18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35 17	09:11 (6)	17:02 32	08:22 (6)	17:01
23	07:41	08:12 (6)	07:07		06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	08:51 (6)	07:17	07:51 (6)	07:43
	17:30 37	08:49 (6)	18:07		18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33 23	09:14 (6)	17:02 30	08:21 (6)	17:01
24	07:40	08:11 (6)	07:06		06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	08:50 (6)	07:18	07:52 (6)	07:44
	17:31 39	08:50 (6)	18:08		18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32 27	09:17 (6)	17:01 28	08:20 (6)	17:02
25	07:39	08:11 (6)	07:04		06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:48 (6)	07:20	07:54 (6)	07:44
	17:32 40	08:51 (6)	18:10		18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31 30	08:18 (6)	17:01 26	08:20 (6)	17:02
26	07:39	08:11 (6)	07:03		06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:46 (6)	07:21	07:56 (6)	07:45
	17:34 41	08:52 (6)	18:11		18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29 34	08:20 (6)	17:00 23	08:19 (6)	17:03
27	07:38	08:11 (6)	07:02		06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:45 (6)	07:22	07:58 (6)	07:45
	17:35 42	08:53 (6)	18:12		18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28 36	08:21 (6)	17:00 20	08:18 (6)	17:03
28	07:37	08:10 (6)	07:00		06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:44 (6)	07:23	08:00 (6)	07:45
	17:36 43	08:53 (6)	18:13		18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 37	08:21 (6)	16:59 16	08:16 (6)	17:04
29	07:36	08:10 (6)			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:44 (6)	07:24	08:02 (6)	07:45
	17:37 44	08:54 (6)			19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25 39	08:23 (6)	16:59 12	08:14 (6)	17:05
30	07:35	08:10 (6)			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:43 (6)	07:25	08:06 (6)	07:46
	17:39 44	08:54 (6)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 41	08:24 (6)	16:59 4	08:10 (6)	17:06
31	07:34	08:10 (6)			07:11		05:57		06:19	06:49		06:51	07:42 (6)			07:46
	17:40 45	08:55 (6)			19:46		20:46		20:40	19:58		17:23 42	08:24 (6)			17:06
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290
Total, worst case		635		773									332		1090	
Sun reduction		0.40		0.43									0.56		0.48	
Oper. time red.		0.37		0.37									0.37		0.37	
Wind dir. red.		0.65		0.65									0.65		0.65	
Total reduction		0.10		0.11									0.14		0.12	
Total, real		62		81									45		127	

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

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

Project:

Flickering Nuoro Sud

Printed/Page

2024-01-12 10:10 / 133

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:

2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DB - R126

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:46	08:13 (6)	07:34	08:17 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	07:54 (6)	07:26	07:56 (6)
	17:07 40	08:53 (6)	17:41 52	09:09 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22 38	08:32 (6)	16:58 47	08:43 (6)
2	07:46	08:13 (6)	07:33	08:18 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	07:53 (6)	07:27	07:57 (6)
	17:08 41	08:54 (6)	17:42 50	09:08 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21 40	08:33 (6)	16:58 46	08:43 (6)
3	07:46	08:14 (6)	07:32	08:19 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	07:53 (6)	07:28	07:58 (6)
	17:09 40	08:54 (6)	17:43 49	09:08 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19 42	08:35 (6)	16:58 45	08:43 (6)
4	07:47	08:14 (6)	07:31	08:19 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	07:52 (6)	07:29	07:58 (6)
	17:10 41	08:55 (6)	17:45 49	09:08 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02		17:18 44	08:36 (6)	16:58 45	08:43 (6)
5	07:47	08:14 (6)	07:30	08:20 (6)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23		06:57	07:51 (6)	07:30	07:59 (6)
	17:11 42	08:56 (6)	17:46 47	09:07 (6)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17 46	08:37 (6)	16:57 44	08:43 (6)
6	07:47	08:14 (6)	07:29	08:21 (6)	06:51	07:01	06:18	05:54	06:00	06:25	06:55	07:24		06:58	07:50 (6)	07:31	08:00 (6)
	17:12 43	08:57 (6)	17:47 46	09:07 (6)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16 47	08:37 (6)	16:57 43	08:43 (6)
7	07:46	08:14 (6)	07:27	08:22 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	07:50 (6)	07:32	08:01 (6)
	17:13 44	08:58 (6)	17:48 44	09:06 (6)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15 49	08:39 (6)	16:57 42	08:43 (6)
8	07:46	08:14 (6)	07:26	08:23 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	07:49 (6)	07:33	08:02 (6)
	17:14 45	08:59 (6)	17:49 42	09:05 (6)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56		17:14 50	08:39 (6)	16:57 41	08:43 (6)
9	07:46	08:15 (6)	07:25	08:24 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	07:49 (6)	07:34	08:03 (6)
	17:15 45	09:00 (6)	17:51 40	09:04 (6)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13 50	08:39 (6)	16:57 41	08:44 (6)
10	07:46	08:14 (6)	07:24	08:25 (6)	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28		07:02	07:48 (6)	07:34	08:03 (6)
	17:16 46	09:00 (6)	17:52 37	09:02 (6)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12 52	08:40 (6)	16:57 41	08:44 (6)
11	07:46	08:14 (6)	07:23	08:26 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29		07:04	07:49 (6)	07:35	08:04 (6)
	17:17 47	09:01 (6)	17:53 35	09:01 (6)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11 52	08:41 (6)	16:57 40	08:44 (6)
12	07:46	08:14 (6)	07:22	08:28 (6)	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05	07:49 (6)	07:36	08:04 (6)
	17:18 48	09:02 (6)	17:54 32	09:00 (6)	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10 52	08:41 (6)	16:57 39	08:43 (6)
13	07:45	08:14 (6)	07:21	08:30 (6)	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06	07:48 (6)	07:37	08:05 (6)
	17:19 48	09:02 (6)	17:55 28	08:58 (6)	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09 53	08:41 (6)	16:58 39	08:44 (6)
14	07:45	08:14 (6)	07:19	08:33 (6)	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32		07:07	07:48 (6)	07:38	08:06 (6)
	17:20 49	09:03 (6)	17:57 23	08:56 (6)	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08 53	08:41 (6)	16:58 38	08:44 (6)
15	07:45	08:15 (6)	07:18	08:36 (6)	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33		07:08	07:49 (6)	07:38	08:07 (6)
	17:21 49	09:04 (6)	17:58 15	08:51 (6)	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45		17:07 53	08:42 (6)	16:58 38	08:45 (6)
16	07:44	08:14 (6)	07:17		06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34		07:09	07:49 (6)	07:39	08:07 (6)
	17:22 51	09:05 (6)	17:59		18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44		17:06 53	08:42 (6)	16:58 37	08:44 (6)
17	07:44	08:15 (6)	07:15		06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35		07:10	07:49 (6)	07:40	08:08 (6)
	17:23 51	09:06 (6)	18:00		18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42		17:06 53	08:42 (6)	16:59 37	08:45 (6)
18	07:43	08:14 (6)	07:14		06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36		07:12	07:49 (6)	07:40	08:09 (6)
	17:24 52	09:06 (6)	18:01		18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41		17:05 53	08:42 (6)	16:59 37	08:46 (6)
19	07:43	08:15 (6)	07:13		06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37		07:13	07:49 (6)	07:41	08:09 (6)
	17:25 52	09:07 (6)	18:03		18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39		17:04 53	08:42 (6)	16:59 36	08:45 (6)
20	07:42	08:15 (6)	07:11		06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39		07:14	07:50 (6)	07:42	08:10 (6)
	17:27 52	09:07 (6)	18:04		18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38		17:04 53	08:43 (6)	17:00 36	08:46 (6)
21	07:42	08:14 (6)	07:10		06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40		07:15	07:50 (6)	07:42	08:10 (6)
	17:28 53	09:07 (6)	18:05		18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36		17:03 53	08:43 (6)	17:00 36	08:46 (6)
22	07:41	08:15 (6)	07:09		06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41		07:16	07:51 (6)	07:43	08:11 (6)
	17:29 53	09:08 (6)	18:06		18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35		17:02 52	08:43 (6)	17:01 36	08:47 (6)
23	07:41	08:15 (6)	07:07		06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42		07:17	07:51 (6)	07:43	08:11 (6)
	17:30 53	09:08 (6)	18:07		18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33		17:02 52	08:43 (6)	17:01 36	08:47 (6)
24	07:40	08:15 (6)	07:06		06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43		07:18	07:51 (6)	07:44	08:11 (6)
	17:31 53	09:08 (6)	18:08		18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32		17:01 52	08:43 (6)	17:02 36	08:47 (6)
25	07:39	08:15 (6)	07:04		06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44		07:20	07:53 (6)	07:44	08:12 (6)
	17:32 53	09:08 (6)	18:10		18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31		17:01 51	08:44 (6)	17:02 36	08:48 (6)
26	07:39	08:16 (6)	07:03		06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	08:11 (6)	07:21	07:53 (6)	07:45	08:12 (6)
	17:34 53	09:09 (6)	18:11		18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29 5	08:16 (6)	17:00 51	08:44 (6)	17:03 37	08:49 (6)
27	07:38	08:16 (6)	07:02		06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	08:04 (6)	07:22	07:54 (6)	07:45	08:12 (6)
	17:35 53	09:09 (6)	18:12		18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28 18	08:22 (6)	17:00 49	08:43 (6)	17:03 37	08:49 (6)
28	07:37	08:16 (6)	07:00		06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	08:01 (6)	07:23	07:54 (6)	07:45	08:13 (6)
	17:36 53	09:09 (6)	18:13		18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27 24	08:25 (6)	16:59 49	08:43 (6)	17:04 37	08:50 (6)
29	07:36	08:16 (6)			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	08:00 (6)	07:24	07:55 (6)	07:45	08:13 (6)
	17:37 53	09:09 (6)			19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25 28	08:28 (6)	16:59 48	08:43 (6)	17:05 38	08:51 (6)
30	07:35	08:17 (6)			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:58 (6)	07:25	07:55 (6)	07:46	08:13 (6)
	17:39 52	09:09 (6)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24 32	08:30 (6)	16:59 48	08:43 (6)	17:06 39	08:52 (6)
31	07:34	08:17 (6)			07:11		05:57		06:19	06:49		06:51	07:56 (6)			07:46	08:13 (6)
	17:40 52	09:09 (6)			19:46		20:46		20:40	19:58		17:23 35	08:31 (6)			17:06 39	08:52 (6)
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290	
Total, worst case		1507		589									142		1491		1219
Sun reduction		0.40		0.43									0.56		0.48		0.41
Oper. time red.		0.37		0.37									0.37		0.37		0.37
Wind dir. red.		0.63		0.63									0.63		0.63		0.63
Total reduction		0.09		0.10									0.13		0.11		0.10
Total, real		143		60									19		170		119

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

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

Project:

Flickering Nuoro Sud

Printed/Page

2024-01-12 10:10 / 134

Licensed user:

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Calculated:

2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DC - R127

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:46	08:15 (6)	07:34	08:27 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19		06:52	08:11 (6)	07:26	08:00 (6)
	17:07 51	09:06 (6)	17:41 46	09:13 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07		17:22 19	08:30 (6)	16:58 54	08:54 (6)
2	07:46	08:16 (6)	07:33	08:28 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20		06:53	08:08 (6)	07:27	08:01 (6)
	17:08 50	09:06 (6)	17:42 45	09:13 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06		17:21 25	08:33 (6)	16:58 53	08:54 (6)
3	07:46	08:16 (6)	07:32	08:29 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21		06:54	08:06 (6)	07:28	08:01 (6)
	17:09 51	09:07 (6)	17:43 43	09:12 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04		17:19 30	08:36 (6)	16:58 53	08:54 (6)
4	07:47	08:16 (6)	07:31	08:30 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22		06:55	08:04 (6)	07:29	08:02 (6)
	17:10 51	09:07 (6)	17:45 41	09:11 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02		17:18 33	08:37 (6)	16:58 52	08:54 (6)
5	07:47	08:16 (6)	07:30	08:32 (6)	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23		06:57	08:03 (6)	07:30	08:02 (6)
	17:11 52	09:08 (6)	17:46 38	09:10 (6)	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01		17:17 36	08:39 (6)	16:57 53	08:55 (6)
6	07:47	08:17 (6)	07:29	08:33 (6)	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24		06:58	08:01 (6)	07:31	08:03 (6)
	17:12 52	09:09 (6)	17:47 36	09:09 (6)	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59		17:16 39	08:40 (6)	16:57 52	08:55 (6)
7	07:46	08:17 (6)	07:27	08:35 (6)	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25		06:59	08:01 (6)	07:32	08:03 (6)
	17:13 53	09:10 (6)	17:48 32	09:07 (6)	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58		17:15 41	08:42 (6)	16:57 52	08:55 (6)
8	07:46	08:18 (6)	07:26	08:37 (6)	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26		07:00	08:00 (6)	07:33	08:04 (6)
	17:14 52	09:10 (6)	17:49 29	09:06 (6)	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56		17:14 43	08:43 (6)	16:57 52	08:56 (6)
9	07:46	08:18 (6)	07:25	08:39 (6)	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27		07:01	07:59 (6)	07:34	08:05 (6)
	17:15 53	09:11 (6)	17:51 24	09:03 (6)	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54		17:13 45	08:44 (6)	16:57 51	08:56 (6)
10	07:46	08:18 (6)	07:24	08:41 (6)	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28		07:02	07:58 (6)	07:34	08:06 (6)
	17:16 53	09:11 (6)	17:52 19	09:00 (6)	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53		17:12 46	08:44 (6)	16:57 50	08:56 (6)
11	07:46	08:18 (6)	07:23	08:47 (6)	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29		07:04	07:58 (6)	07:35	08:06 (6)
	17:17 54	09:12 (6)	17:53 7	08:54 (6)	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51		17:11 48	08:46 (6)	16:57 51	08:57 (6)
12	07:46	08:19 (6)	07:22		06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30		07:05	07:58 (6)	07:36	08:06 (6)
	17:18 54	09:13 (6)	17:54		18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50		17:10 48	08:46 (6)	16:57 50	08:56 (6)
13	07:45	08:18 (6)	07:21		06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31		07:06	07:57 (6)	07:37	08:07 (6)
	17:19 54	09:12 (6)	17:55		18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48		17:09 50	08:47 (6)	16:58 50	08:57 (6)
14	07:45	08:19 (6)	07:19		06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32		07:07	07:56 (6)	07:38	08:08 (6)
	17:20 54	09:13 (6)	17:57		18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47		17:08 51	08:47 (6)	16:58 49	08:57 (6)
15	07:45	08:20 (6)	07:18		06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33		07:08	07:57 (6)	07:38	08:09 (6)
	17:21 54	09:14 (6)	17:58		18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45		17:07 52	08:49 (6)	16:58 49	08:58 (6)
16	07:44	08:19 (6)	07:17		06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34		07:09	07:57 (6)	07:39	08:09 (6)
	17:22 55	09:14 (6)	17:59		18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44		17:06 52	08:49 (6)	16:58 49	08:58 (6)
17	07:44	08:20 (6)	07:15		06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35		07:10	07:56 (6)	07:40	08:09 (6)
	17:23 55	09:15 (6)	18:00		18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42		17:06 53	08:49 (6)	16:59 49	08:58 (6)
18	07:43	08:20 (6)	07:14		06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36		07:12	07:56 (6)	07:40	08:10 (6)
	17:24 55	09:15 (6)	18:01		18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41		17:05 54	08:50 (6)	16:59 49	08:59 (6)
19	07:43	08:21 (6)	07:13		06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37		07:13	07:56 (6)	07:41	08:10 (6)
	17:25 55	09:16 (6)	18:03		18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39		17:04 54	08:50 (6)	16:59 49	08:59 (6)
20	07:42	08:21 (6)	07:11		06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39		07:14	07:57 (6)	07:42	08:11 (6)
	17:27 54	09:15 (6)	18:04		18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38		17:03 54	08:51 (6)	17:00 49	09:00 (6)
21	07:42	08:21 (6)	07:10		06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40		07:15	07:57 (6)	07:42	08:11 (6)
	17:28 54	09:15 (6)	18:05		18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36		17:03 54	08:51 (6)	17:00 49	09:00 (6)
22	07:41	08:22 (6)	07:09		06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41		07:16	07:57 (6)	07:43	08:12 (6)
	17:29 54	09:16 (6)	18:06		18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35		17:02 54	08:51 (6)	17:01 49	09:01 (6)
23	07:41	08:22 (6)	07:07		06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42		07:17	07:57 (6)	07:43	08:12 (6)
	17:30 54	09:16 (6)	18:07		18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33		17:02 55	08:52 (6)	17:01 49	09:01 (6)
24	07:40	08:22 (6)	07:06		06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43		07:18	07:57 (6)	07:44	08:12 (6)
	17:31 54	09:16 (6)	18:08		18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32		17:01 55	08:52 (6)	17:02 49	09:01 (6)
25	07:39	08:22 (6)	07:04		06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44		07:20	07:58 (6)	07:44	08:13 (6)
	17:32 53	09:15 (6)	18:10		18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31		17:01 55	08:53 (6)	17:02 49	09:02 (6)
26	07:39	08:24 (6)	07:03		06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45		07:21	07:58 (6)	07:45	08:13 (6)
	17:34 52	09:16 (6)	18:11		18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29		17:00 55	08:53 (6)	17:03 49	09:02 (6)
27	07:38	08:24 (6)	07:02		06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46		07:22	07:59 (6)	07:45	08:14 (6)
	17:35 52	09:16 (6)	18:12		18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28		17:00 54	08:53 (6)	17:03 49	09:03 (6)
28	07:37	08:25 (6)	07:00		06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47		07:23	07:59 (6)	07:45	08:15 (6)
	17:36 50	09:15 (6)	18:13		18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27		16:59 54	08:53 (6)	17:04 49	09:04 (6)
29	07:36	08:25 (6)			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49		07:24	07:59 (6)	07:45	08:15 (6)
	17:37 50	09:15 (6)			19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25		16:59 54	08:53 (6)	17:05 49	09:04 (6)
30	07:35	08:26 (6)			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50		07:25	08:00 (6)	07:46	08:15 (6)
	17:39 49	09:15 (6)			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24		16:59 54	08:54 (6)	17:06 50	09:05 (6)
31	07:34	08:26 (6)			07:11		05:57		06:19	06:49		06:51	08:15 (6)			07:46	08:15 (6)
	17:40 48	09:14 (6)			19:46		20:46		20:40	19:58		17:23 11	08:26 (6)			17:06 50	09:05 (6)
Potential sun hours	300		298		370	398	446	450	457	426	375	346		300		290	
Total, worst case		1632		360									11		1417		1557
Sun reduction		0.40		0.43									0.56		0.48		0.41
Oper. time red.		0.37		0.37									0.37		0.37		0.37
Wind dir. red.		0.63		0.63									0.63		0.63		0.63
Total reduction		0.09		0.10									0.13		0.11		0.10
Total, real		153		37									1		160		151

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

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

Project:

Flickering Nuoro Sud

Printed/Page

2024-01-12 10:10 / 135

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Calculated:

2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DD - R128

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:46		08:24 (6)	07:34		08:46 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		08:11 (6)
	17:07	57	09:21 (6)	17:41	31	09:17 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	56	09:07 (6)
2	07:46		08:24 (6)	07:33		08:48 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		08:11 (6)
	17:08	57	09:21 (6)	17:42	28	09:16 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58	56	09:07 (6)
3	07:46		08:25 (6)	07:32		08:51 (6)	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		08:11 (6)
	17:09	57	09:22 (6)	17:43	22	09:13 (6)	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58	57	09:08 (6)
4	07:47		08:25 (6)	07:31		08:54 (6)	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		08:12 (6)
	17:10	57	09:22 (6)	17:45	16	09:10 (6)	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18			16:58	56	09:08 (6)
5	07:47		08:26 (6)	07:30			06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30		08:12 (6)
	17:11	57	09:23 (6)	17:46			18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57	57	09:09 (6)
6	07:47		08:26 (6)	07:29			06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58		08:29 (6)	07:31		08:12 (6)
	17:12	57	09:23 (6)	17:47			18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	6	08:35 (6)	16:57	57	09:09 (6)
7	07:46		08:27 (6)	07:27			06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59		08:24 (6)	07:32		08:13 (6)
	17:13	57	09:24 (6)	17:48			18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	18	08:42 (6)	16:57	57	09:10 (6)
8	07:46		08:28 (6)	07:26			06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00		08:21 (6)	07:33		08:13 (6)
	17:14	56	09:24 (6)	17:49			18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	24	08:45 (6)	16:57	57	09:10 (6)
9	07:46		08:28 (6)	07:25			06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01		08:19 (6)	07:34		08:14 (6)
	17:15	57	09:25 (6)	17:51			18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	28	08:47 (6)	16:57	57	09:11 (6)
10	07:46		08:28 (6)	07:24			06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02		08:17 (6)	07:34		08:15 (6)
	17:16	56	09:24 (6)	17:52			18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	32	08:49 (6)	16:57	56	09:11 (6)
11	07:46		08:29 (6)	07:23			06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04		08:16 (6)	07:35		08:15 (6)
	17:17	56	09:25 (6)	17:53			18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	35	08:51 (6)	16:57	57	09:12 (6)
12	07:46		08:29 (6)	07:22			06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		08:15 (6)	07:36		08:15 (6)
	17:18	57	09:26 (6)	17:54			18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	37	08:52 (6)	16:57	56	09:11 (6)
13	07:45		08:29 (6)	07:21			06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		08:14 (6)	07:37		08:16 (6)
	17:19	56	09:25 (6)	17:55			18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	40	08:54 (6)	16:58	56	09:12 (6)
14	07:45		08:30 (6)	07:19			06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		08:13 (6)	07:38		08:16 (6)
	17:20	56	09:26 (6)	17:57			18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	42	08:55 (6)	16:58	57	09:13 (6)
15	07:45		08:31 (6)	07:18			06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		08:13 (6)	07:38		08:17 (6)
	17:21	55	09:26 (6)	17:58			18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	44	08:57 (6)	16:58	57	09:14 (6)
16	07:44		08:31 (6)	07:17			06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		08:12 (6)	07:39		08:17 (6)
	17:22	55	09:26 (6)	17:59			18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	45	08:57 (6)	16:58	56	09:13 (6)
17	07:44		08:32 (6)	07:15			06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		08:11 (6)	07:40		08:18 (6)
	17:23	54	09:26 (6)	18:00			18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	47	08:58 (6)	16:59	56	09:14 (6)
18	07:43		08:32 (6)	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		08:10 (6)	07:40		08:19 (6)
	17:24	54	09:26 (6)	18:01			18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	49	08:59 (6)	16:59	56	09:15 (6)
19	07:43		08:33 (6)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		08:10 (6)	07:41		08:18 (6)
	17:25	54	09:27 (6)	18:03			18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	49	08:59 (6)	16:59	57	09:15 (6)
20	07:42		08:34 (6)	07:11			06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		08:10 (6)	07:42		08:19 (6)
	17:27	52	09:26 (6)	18:04			18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	51	09:01 (6)	17:00	57	09:16 (6)
21	07:42		08:34 (6)	07:10			06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		08:10 (6)	07:42		08:19 (6)
	17:28	52	09:26 (6)	18:05			18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	52	09:02 (6)	17:00	57	09:16 (6)
22	07:41		08:35 (6)	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		08:10 (6)	07:43		08:20 (6)
	17:29	51	09:26 (6)	18:06			18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	52	09:02 (6)	17:01	57	09:17 (6)
23	07:41		08:36 (6)	07:07			06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		08:10 (6)	07:43		08:20 (6)
	17:30	49	09:25 (6)	18:07			18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	53	09:03 (6)	17:01	57	09:17 (6)
24	07:40		08:36 (6)	07:06			06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		08:09 (6)	07:44		08:20 (6)
	17:31	49	09:25 (6)	18:08			18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	54	09:03 (6)	17:02	57	09:17 (6)
25	07:39		08:37 (6)	07:04			06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		08:10 (6)	07:44		08:21 (6)
	17:32	47	09:24 (6)	18:10			18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	54	09:04 (6)	17:02	57	09:18 (6)
26	07:39		08:39 (6)	07:03			06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		08:10 (6)	07:45		08:22 (6)
	17:34	45	09:24 (6)	18:11			18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	55	09:05 (6)	17:03	56	09:18 (6)
27	07:38		08:40 (6)	07:02			06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22		08:10 (6)	07:45		08:22 (6)
	17:35	44	09:24 (6)	18:12			18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	55	09:05 (6)	17:03	56	09:18 (6)
28	07:37		08:41 (6)	07:00			06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		08:10 (6)	07:45		08:23 (6)
	17:36	42	09:23 (6)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	56	09:06 (6)	17:04	56	09:19 (6)
29	07:36		08:42 (6)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24		08:10 (6)	07:45		08:23 (6)
	17:37	40	09:22 (6)				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	56	09:06 (6)	17:05	57	09:20 (6)
30	07:35		08:43 (6)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		08:10 (6)	07:46		08:23 (6)
	17:39	37	09:20 (6)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	57	09:07 (6)	17:06	57	09:20 (6)
31	07:34		08:44 (6)				07:11		05:57		06:19	06:49		06:51				07:46		08:24 (6)
	17:40	35	09:19 (6)				19:46		20:46		20:40	19:58		17:23				17:06	56	09:20 (6)
Potential sun hours	300			298			370	398	446	450	457	426	375	346	300			290		
Total, worst case		1608			97											1091			1754	
Sun reduction		0.40			0.43											0.48			0.41	
Oper. time red.		0.37			0.37											0.37			0.37	
Wind dir. red.		0.62			0.62											0.62			0.62	
Total reduction		0.09			0.10											0.11			0.10	
Total, real		148			10											121			167	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 136

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DE - R129

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:46		08:38 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		08:26 (6)
	17:07	56	09:34 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	52	09:18 (6)
2	07:46		08:38 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		08:26 (6)
	17:08	56	09:34 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58	53	09:19 (6)
3	07:46		08:39 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		08:26 (6)
	17:09	56	09:35 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58	54	09:20 (6)
4	07:47		08:40 (6)	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		08:27 (6)
	17:10	55	09:35 (6)	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18			16:58	53	09:20 (6)
5	07:47		08:40 (6)	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30		08:27 (6)
	17:11	55	09:35 (6)	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57	54	09:21 (6)
6	07:47		08:41 (6)	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58			07:31		08:27 (6)
	17:12	54	09:35 (6)	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57	55	09:22 (6)
7	07:46		08:42 (6)	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59			07:32		08:27 (6)
	17:13	54	09:36 (6)	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15			16:57	55	09:22 (6)
8	07:46		08:42 (6)	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00			07:33		08:28 (6)
	17:14	54	09:36 (6)	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14			16:57	55	09:23 (6)
9	07:46		08:43 (6)	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01			07:34		08:28 (6)
	17:15	54	09:37 (6)	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13			16:57	56	09:24 (6)
10	07:46		08:43 (6)	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02			07:34		08:29 (6)
	17:16	53	09:36 (6)	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12			16:57	55	09:24 (6)
11	07:46		08:44 (6)	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04			07:35		08:29 (6)
	17:17	52	09:36 (6)	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11			16:57	56	09:25 (6)
12	07:46		08:45 (6)	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05			07:36		08:29 (6)
	17:18	52	09:37 (6)	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10			16:57	56	09:25 (6)
13	07:45		08:45 (6)	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06			07:37		08:29 (6)
	17:19	51	09:36 (6)	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09			16:58	56	09:25 (6)
14	07:45		08:47 (6)	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		08:39 (6)	07:38		08:30 (6)
	17:20	49	09:36 (6)	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	15	08:54 (6)	16:58	56	09:26 (6)
15	07:45		08:48 (6)	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		08:37 (6)	07:38		08:31 (6)
	17:21	48	09:36 (6)	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	21	08:58 (6)	16:58	56	09:27 (6)
16	07:44		08:48 (6)	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		08:35 (6)	07:39		08:30 (6)
	17:22	48	09:36 (6)	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	26	09:01 (6)	16:58	57	09:27 (6)
17	07:44		08:50 (6)	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		08:33 (6)	07:40		08:31 (6)
	17:23	46	09:36 (6)	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	30	09:03 (6)	16:59	57	09:28 (6)
18	07:43		08:50 (6)	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		08:31 (6)	07:40		08:32 (6)
	17:24	45	09:35 (6)	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	33	09:04 (6)	16:59	57	09:29 (6)
19	07:43		08:52 (6)	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		08:30 (6)	07:41		08:32 (6)
	17:25	43	09:35 (6)	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	36	09:06 (6)	16:59	57	09:29 (6)
20	07:42		08:52 (6)	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		08:30 (6)	07:42		08:33 (6)
	17:27	42	09:34 (6)	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	38	09:08 (6)	17:00	56	09:29 (6)
21	07:42		08:53 (6)	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		08:29 (6)	07:42		08:33 (6)
	17:28	40	09:33 (6)	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	40	09:09 (6)	17:00	56	09:29 (6)
22	07:41		08:55 (6)	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		08:28 (6)	07:43		08:34 (6)
	17:29	38	09:33 (6)	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	42	09:10 (6)	17:01	56	09:30 (6)
23	07:41		08:56 (6)	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		08:28 (6)	07:43		08:34 (6)
	17:30	36	09:32 (6)	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	43	09:11 (6)	17:01	56	09:30 (6)
24	07:40		08:57 (6)	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		08:27 (6)	07:44		08:34 (6)
	17:31	33	09:30 (6)	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	45	09:12 (6)	17:02	57	09:31 (6)
25	07:39		08:59 (6)	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		08:28 (6)	07:44		08:35 (6)
	17:32	30	09:29 (6)	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	46	09:14 (6)	17:02	57	09:32 (6)
26	07:39		09:02 (6)	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		08:27 (6)	07:44		08:35 (6)
	17:34	26	09:28 (6)	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	48	09:15 (6)	17:03	57	09:32 (6)
27	07:38		09:04 (6)	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22		08:27 (6)	07:45		08:35 (6)
	17:35	21	09:25 (6)	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	48	09:15 (6)	17:03	57	09:32 (6)
28	07:37		09:08 (6)	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		08:27 (6)	07:45		08:36 (6)
	17:36	14	09:22 (6)	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	49	09:16 (6)	17:04	57	09:33 (6)
29	07:36				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24		08:26 (6)	07:45		08:37 (6)
	17:37				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	51	09:17 (6)	17:05	56	09:33 (6)
30	07:35				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		08:26 (6)	07:46		08:37 (6)
	17:39				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	52	09:18 (6)	17:06	56	09:33 (6)
31	07:34				07:11		05:57		06:19	06:49		06:51				07:46		08:37 (6)
	17:40				19:46		20:46		20:40	19:58		17:23				17:06	57	09:34 (6)
Potential sun hours	300			298	370	398	446	450	457	426	375	346	300			290		
Total, worst case		1261												663			1728	
Sun reduction		0.40												0.48			0.41	
Oper. time red.		0.37												0.37			0.37	
Wind dir. red.		0.60												0.60			0.60	
Total reduction		0.09												0.11			0.09	
Total, real		113												72			160	

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 137
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DF - R130

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February			March	April	May	June	July	August	September	October	November			December		
1	07:46		08:32 (6)	07:34		09:02 (6)	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		08:19 (6)
	17:07	62	09:34 (6)	17:41	20	09:22 (6)	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	60	09:19 (6)
2	07:46		08:32 (6)	07:33		09:06 (6)	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		08:19 (6)
	17:08	62	09:34 (6)	17:42	11	09:17 (6)	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58	60	09:19 (6)
3	07:46		08:33 (6)	07:32			06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		08:20 (6)
	17:09	61	09:34 (6)	17:43			18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58	60	09:20 (6)
4	07:47		08:33 (6)	07:31			06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		08:20 (6)
	17:10	62	09:35 (6)	17:45			18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18			16:58	60	09:20 (6)
5	07:47		08:34 (6)	07:30			06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30		08:20 (6)
	17:11	61	09:35 (6)	17:46			18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57	61	09:21 (6)
6	07:47		08:34 (6)	07:29			06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58			07:31		08:20 (6)
	17:12	61	09:35 (6)	17:47			18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57	61	09:21 (6)
7	07:46		08:35 (6)	07:27			06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59			07:32		08:21 (6)
	17:13	61	09:36 (6)	17:48			18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15			16:57	61	09:22 (6)
8	07:46		08:36 (6)	07:26			06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00			07:33		08:21 (6)
	17:14	60	09:36 (6)	17:49			18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14			16:57	62	09:23 (6)
9	07:46		08:36 (6)	07:25			06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01		08:36 (6)	07:34		08:22 (6)
	17:15	61	09:37 (6)	17:51			18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	13	08:49 (6)	16:57	61	09:23 (6)
10	07:46		08:36 (6)	07:24			06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02		08:32 (6)	07:34		08:22 (6)
	17:16	60	09:36 (6)	17:52			18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	21	08:53 (6)	16:57	62	09:24 (6)
11	07:46		08:37 (6)	07:23			06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04		08:30 (6)	07:35		08:23 (6)
	17:17	60	09:37 (6)	17:53			18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	27	08:57 (6)	16:57	62	09:25 (6)
12	07:46		08:38 (6)	07:22			06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		08:28 (6)	07:36		08:22 (6)
	17:18	59	09:37 (6)	17:54			18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	31	08:59 (6)	16:57	62	09:24 (6)
13	07:45		08:38 (6)	07:21			06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		08:26 (6)	07:37		08:23 (6)
	17:19	58	09:36 (6)	17:55			18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	35	09:01 (6)	16:58	62	09:25 (6)
14	07:45		08:39 (6)	07:19			06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		08:25 (6)	07:38		08:24 (6)
	17:20	58	09:37 (6)	17:57			18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	37	09:02 (6)	16:58	62	09:26 (6)
15	07:45		08:40 (6)	07:18			06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		08:24 (6)	07:38		08:24 (6)
	17:21	57	09:37 (6)	17:58			18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	40	09:04 (6)	16:58	63	09:27 (6)
16	07:44		08:40 (6)	07:17			06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		08:23 (6)	07:39		08:24 (6)
	17:22	57	09:37 (6)	17:59			18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	43	09:06 (6)	16:58	62	09:26 (6)
17	07:44		08:42 (6)	07:15			06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		08:22 (6)	07:40		08:25 (6)
	17:23	55	09:37 (6)	18:00			18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	45	09:07 (6)	16:59	62	09:27 (6)
18	07:43		08:42 (6)	07:14			06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		08:21 (6)	07:40		08:26 (6)
	17:24	54	09:36 (6)	18:01			18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	47	09:08 (6)	16:59	62	09:28 (6)
19	07:43		08:43 (6)	07:13			06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		08:21 (6)	07:41		08:26 (6)
	17:25	54	09:37 (6)	18:03			18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	48	09:09 (6)	16:59	62	09:28 (6)
20	07:42		08:44 (6)	07:11			06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		08:21 (6)	07:42		08:27 (6)
	17:27	52	09:36 (6)	18:04			18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	50	09:11 (6)	17:00	62	09:29 (6)
21	07:42		08:44 (6)	07:10			06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		08:20 (6)	07:42		08:26 (6)
	17:28	51	09:35 (6)	18:05			18:36	20:07	20:37	20:56	20:49	20:14	19:24	18:36	17:03	51	09:11 (6)	17:00	63	09:29 (6)
22	07:41		08:46 (6)	07:09			06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		08:20 (6)	07:43		08:27 (6)
	17:29	50	09:36 (6)	18:06			18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	52	09:12 (6)	17:01	63	09:30 (6)
23	07:41		08:47 (6)	07:07			06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		08:19 (6)	07:43		08:27 (6)
	17:30	48	09:35 (6)	18:07			18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	54	09:13 (6)	17:01	63	09:30 (6)
24	07:40		08:47 (6)	07:06			06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		08:19 (6)	07:44		08:28 (6)
	17:31	47	09:34 (6)	18:08			18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	54	09:13 (6)	17:02	62	09:30 (6)
25	07:39		08:48 (6)	07:04			06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		08:20 (6)	07:44		08:29 (6)
	17:32	45	09:33 (6)	18:10			18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	55	09:15 (6)	17:02	62	09:31 (6)
26	07:39		08:50 (6)	07:03			06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		08:19 (6)	07:44		08:29 (6)
	17:34	43	09:33 (6)	18:11			18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	57	09:16 (6)	17:03	62	09:31 (6)
27	07:38		08:52 (6)	07:02			06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22		08:19 (6)	07:45		08:29 (6)
	17:35	39	09:31 (6)	18:12			18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	57	09:16 (6)	17:03	62	09:31 (6)
28	07:37		08:53 (6)	07:00			06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		08:19 (6)	07:45		08:30 (6)
	17:36	37	09:30 (6)	18:13			18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	58	09:17 (6)	17:04	62	09:32 (6)
29	07:36		08:54 (6)				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24		08:19 (6)	07:45		08:31 (6)
	17:37	34	09:28 (6)				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	58	09:17 (6)	17:05	62	09:33 (6)
30	07:35		08:56 (6)				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		08:19 (6)	07:46		08:31 (6)
	17:39	31	09:27 (6)				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	59	09:18 (6)	17:06	62	09:33 (6)
31	07:34		08:59 (6)				07:11		05:57		06:19	06:49		06:51				07:46		08:31 (6)
	17:40	25	09:24 (6)				19:46		20:46		20:40	19:58		17:23				17:06	62	09:33 (6)
Potential sun hours	300			298			370	398	446	450	457	426	375	346	300			290		
Total, worst case		1625			31											992			1914	
Sun reduction		0.40			0.43											0.48			0.41	
Oper. time red.		0.37			0.37											0.37			0.37	
Wind dir. red.		0.61			0.61											0.61			0.61	
Total reduction		0.09			0.10											0.11			0.09	
Total, real		147			3											108			179	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 138

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DG - R131

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:46		08:43 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		08:31 (6)
	17:07	62	09:45 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	58	09:29 (6)
2	07:46		08:43 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		08:31 (6)
	17:08	62	09:45 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58	59	09:30 (6)
3	07:46		08:44 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		08:31 (6)
	17:09	61	09:45 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58	59	09:30 (6)
4	07:47		08:44 (6)	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		08:31 (6)
	17:10	62	09:46 (6)	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18			16:58	60	09:31 (6)
5	07:47		08:45 (6)	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30		08:32 (6)
	17:11	61	09:46 (6)	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57	60	09:32 (6)
6	07:47		08:46 (6)	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58			07:31		08:32 (6)
	17:12	60	09:46 (6)	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57	60	09:32 (6)
7	07:46		08:46 (6)	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59			07:32		08:32 (6)
	17:13	61	09:47 (6)	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15			16:57	61	09:33 (6)
8	07:46		08:47 (6)	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00			07:33		08:32 (6)
	17:14	60	09:47 (6)	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14			16:57	62	09:34 (6)
9	07:46		08:48 (6)	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01			07:34		08:33 (6)
	17:15	59	09:47 (6)	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13			16:57	61	09:34 (6)
10	07:46		08:48 (6)	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02			07:34		08:33 (6)
	17:16	59	09:47 (6)	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12			16:57	62	09:35 (6)
11	07:46		08:49 (6)	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04			07:35		08:34 (6)
	17:17	58	09:47 (6)	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11			16:57	62	09:36 (6)
12	07:46		08:50 (6)	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		08:49 (6)	07:36		08:33 (6)
	17:18	57	09:47 (6)	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	10	08:59 (6)	16:57	63	09:36 (6)
13	07:45		08:50 (6)	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		08:45 (6)	07:37		08:34 (6)
	17:19	56	09:46 (6)	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	19	09:04 (6)	16:58	62	09:36 (6)
14	07:45		08:51 (6)	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		08:42 (6)	07:38		08:35 (6)
	17:20	56	09:47 (6)	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	25	09:07 (6)	16:58	62	09:37 (6)
15	07:45		08:53 (6)	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		08:40 (6)	07:38		08:35 (6)
	17:21	54	09:47 (6)	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	30	09:10 (6)	16:58	63	09:38 (6)
16	07:44		08:53 (6)	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		08:39 (6)	07:39		08:35 (6)
	17:22	53	09:46 (6)	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	33	09:12 (6)	16:58	63	09:38 (6)
17	07:44		08:54 (6)	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		08:37 (6)	07:40		08:36 (6)
	17:23	52	09:46 (6)	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	37	09:14 (6)	16:59	63	09:39 (6)
18	07:43		08:55 (6)	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		08:36 (6)	07:40		08:37 (6)
	17:24	51	09:46 (6)	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	39	09:15 (6)	16:59	63	09:40 (6)
19	07:43		08:56 (6)	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		08:35 (6)	07:41		08:36 (6)
	17:25	50	09:46 (6)	18:03	18:34	20:05	20:35	20:56	20:50	20:16	19:27	18:39	17:04	41	09:16 (6)	16:59	63	09:39 (6)
20	07:42		08:57 (6)	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		08:35 (6)	07:42		08:37 (6)
	17:27	48	09:45 (6)	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	44	09:19 (6)	17:00	63	09:40 (6)
21	07:42		08:58 (6)	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		08:34 (6)	07:42		08:37 (6)
	17:28	46	09:44 (6)	18:05	18:36	20:07	20:37	20:56	20:49	20:14	19:24	18:36	17:03	46	09:20 (6)	17:00	63	09:40 (6)
22	07:41		09:00 (6)	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		08:33 (6)	07:43		08:38 (6)
	17:29	44	09:44 (6)	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	48	09:21 (6)	17:01	63	09:41 (6)
23	07:41		09:01 (6)	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		08:32 (6)	07:43		08:38 (6)
	17:30	41	09:42 (6)	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	50	09:22 (6)	17:01	63	09:41 (6)
24	07:40		09:02 (6)	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		08:32 (6)	07:44		08:38 (6)
	17:31	39	09:41 (6)	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	51	09:23 (6)	17:02	63	09:41 (6)
25	07:39		09:03 (6)	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		08:32 (6)	07:44		08:39 (6)
	17:32	37	09:40 (6)	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	52	09:24 (6)	17:02	64	09:43 (6)
26	07:39		09:06 (6)	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		08:32 (6)	07:44		08:40 (6)
	17:34	33	09:39 (6)	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	53	09:25 (6)	17:03	63	09:43 (6)
27	07:38		09:08 (6)	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22		08:32 (6)	07:45		08:40 (6)
	17:35	29	09:37 (6)	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	54	09:26 (6)	17:03	63	09:43 (6)
28	07:37		09:10 (6)	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		08:31 (6)	07:45		08:41 (6)
	17:36	25	09:35 (6)	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	56	09:27 (6)	17:04	63	09:44 (6)
29	07:36		09:13 (6)		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24		08:31 (6)	07:45		08:41 (6)
	17:37	19	09:32 (6)		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	57	09:28 (6)	17:05	63	09:44 (6)
30	07:35		09:18 (6)		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		08:31 (6)	07:46		08:42 (6)
	17:38	9	09:27 (6)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	57	09:28 (6)	17:06	62	09:44 (6)
31	07:34				07:11		05:57		06:19	06:49		06:51				07:46		08:42 (6)
	17:40				19:46		20:46		20:40	19:58		17:23				17:06	62	09:44 (6)
Potential sun hours	300			298	370	398	446	450	457	426	375	346	300			290		
Total, worst case		1464												802			1921	
Sun reduction		0.40												0.48			0.41	
Oper. time red.		0.37												0.37			0.37	
Wind dir. red.		0.59												0.59			0.59	
Total reduction		0.09												0.11			0.09	
Total, real		130												85			176	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 139
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DH - R132

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:46	08:47 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52		07:26	08:37 (6)
	17:07	50 09:37 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22		16:58	43 09:20 (6)
2	07:46	08:48 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53		07:27	08:37 (6)
	17:08	50 09:38 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21		16:58	44 09:21 (6)
3	07:46	08:48 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54		07:28	08:36 (6)
	17:09	50 09:38 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19		16:58	46 09:22 (6)
4	07:47	08:49 (6)	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55		07:29	08:36 (6)
	17:10	49 09:38 (6)	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18		16:58	47 09:23 (6)
5	07:47	08:50 (6)	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57		07:30	08:37 (6)
	17:11	48 09:38 (6)	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17		16:57	47 09:24 (6)
6	07:47	08:51 (6)	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58		07:31	08:37 (6)
	17:12	47 09:38 (6)	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16		16:57	47 09:24 (6)
7	07:46	08:51 (6)	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59		07:32	08:37 (6)
	17:13	47 09:38 (6)	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15		16:57	48 09:25 (6)
8	07:46	08:52 (6)	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00		07:33	08:37 (6)
	17:14	47 09:39 (6)	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14		16:57	49 09:26 (6)
9	07:46	08:53 (6)	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01		07:34	08:37 (6)
	17:15	46 09:39 (6)	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13		16:57	50 09:27 (6)
10	07:46	08:54 (6)	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02		07:34	08:38 (6)
	17:16	44 09:38 (6)	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12		16:57	50 09:28 (6)
11	07:46	08:55 (6)	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04		07:35	08:38 (6)
	17:17	43 09:38 (6)	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11		16:57	50 09:28 (6)
12	07:46	08:56 (6)	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		07:36	08:38 (6)
	17:18	42 09:38 (6)	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10		16:57	50 09:28 (6)
13	07:45	08:56 (6)	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		07:37	08:38 (6)
	17:19	41 09:37 (6)	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09		16:58	51 09:29 (6)
14	07:45	08:58 (6)	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		07:38	08:39 (6)
	17:20	39 09:37 (6)	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08		16:58	51 09:30 (6)
15	07:45	08:59 (6)	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		07:38	08:39 (6)
	17:21	38 09:37 (6)	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07		16:58	52 09:31 (6)
16	07:44	09:00 (6)	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		07:39	08:39 (6)
	17:22	36 09:36 (6)	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06		16:58	52 09:31 (6)
17	07:44	09:02 (6)	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		07:40	08:40 (6)
	17:23	34 09:36 (6)	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06		16:59	52 09:32 (6)
18	07:43	09:03 (6)	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		07:40	08:41 (6)
	17:24	31 09:34 (6)	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05		16:59	51 09:32 (6)
19	07:43	09:05 (6)	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	08:50 (6)	07:41	08:40 (6)
	17:25	29 09:34 (6)	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	8 08:58 (6)	16:59	52 09:32 (6)
20	07:42	09:06 (6)	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14	08:47 (6)	07:42	08:41 (6)
	17:27	26 09:32 (6)	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	16 09:03 (6)	17:00	52 09:33 (6)
21	07:42	09:08 (6)	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	08:44 (6)	07:42	08:41 (6)
	17:28	22 09:30 (6)	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	22 09:06 (6)	17:00	52 09:33 (6)
22	07:41	09:12 (6)	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	08:42 (6)	07:43	08:42 (6)
	17:29	16 09:28 (6)	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	26 09:08 (6)	17:01	52 09:34 (6)
23	07:41	09:16 (6)	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	08:41 (6)	07:43	08:42 (6)
	17:30	8 09:24 (6)	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	29 09:10 (6)	17:01	52 09:34 (6)
24	07:40		07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	08:40 (6)	07:44	08:42 (6)
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25	07:39		07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	08:40 (6)	07:44	08:44 (6)
	17:32		18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	34 09:14 (6)	17:02	51 09:35 (6)
26	07:39		07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	08:39 (6)	07:45	08:44 (6)
	17:34		18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	36 09:15 (6)	17:03	51 09:35 (6)
27	07:38		07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	08:38 (6)	07:45	08:44 (6)
	17:35		18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	38 09:16 (6)	17:03	52 09:36 (6)
28	07:37		07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	08:38 (6)	07:45	08:45 (6)
	17:36		18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	39 09:17 (6)	17:04	52 09:37 (6)
29	07:36			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	08:37 (6)	07:45	08:46 (6)
	17:37			19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	41 09:18 (6)	17:05	51 09:37 (6)
30	07:35			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	08:37 (6)	07:46	08:46 (6)
	17:39			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	42 09:19 (6)	17:06	51 09:37 (6)
31	07:34			07:11		05:57		06:19	06:49		06:51			07:46	08:46 (6)
	17:40			19:46		20:46		20:40	19:58		17:23			17:06	51 09:37 (6)
Potential sun hours	300		298	370	398	446	450	457	426	375	346	300		290	
Total, worst case		883											362		1551
Sun reduction		0.40											0.48		0.41
Oper. time red.		0.37											0.37		0.37
Wind dir. red.		0.59											0.59		0.59
Total reduction		0.09											0.11		0.09
Total, real		78											39		142

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 140

Licensed user:
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IT-09028 Sestu
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DI - R133

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:46		08:31 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		08:18 (6)
	17:07	50	09:21 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	49	09:07 (6)
2	07:46		08:32 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		08:18 (6)
	17:08	50	09:22 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58	49	09:07 (6)
3	07:46		08:32 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		08:19 (6)
	17:09	50	09:22 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58	49	09:08 (6)
4	07:47		08:32 (6)	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		08:19 (6)
	17:10	50	09:22 (6)	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18			16:58	49	09:08 (6)
5	07:47		08:33 (6)	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30		08:19 (6)
	17:11	50	09:23 (6)	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57	50	09:09 (6)
6	07:47		08:34 (6)	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58			07:31		08:20 (6)
	17:12	49	09:23 (6)	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57	49	09:09 (6)
7	07:46		08:34 (6)	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59			07:32		08:20 (6)
	17:13	50	09:24 (6)	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15			16:57	50	09:10 (6)
8	07:46		08:35 (6)	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00			07:33		08:21 (6)
	17:14	49	09:24 (6)	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14			16:57	49	09:10 (6)
9	07:46		08:36 (6)	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01			07:34		08:21 (6)
	17:15	49	09:25 (6)	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13			16:57	50	09:11 (6)
10	07:46		08:35 (6)	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02			07:34		08:22 (6)
	17:16	49	09:24 (6)	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12			16:57	50	09:12 (6)
11	07:46		08:36 (6)	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04		08:33 (6)	07:35		08:22 (6)
	17:17	49	09:25 (6)	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	9	08:42 (6)	16:57	50	09:12 (6)
12	07:46		08:37 (6)	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		08:29 (6)	07:36		08:22 (6)
	17:18	48	09:25 (6)	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	17	08:46 (6)	16:57	50	09:12 (6)
13	07:45		08:37 (6)	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		08:26 (6)	07:37		08:22 (6)
	17:19	48	09:25 (6)	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	22	08:48 (6)	16:58	51	09:13 (6)
14	07:45		08:38 (6)	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		08:24 (6)	07:38		08:23 (6)
	17:20	47	09:25 (6)	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	26	08:50 (6)	16:58	50	09:13 (6)
15	07:45		08:39 (6)	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		08:23 (6)	07:38		08:24 (6)
	17:21	47	09:26 (6)	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	30	08:53 (6)	16:58	50	09:14 (6)
16	07:44		08:39 (6)	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		08:22 (6)	07:39		08:24 (6)
	17:22	46	09:25 (6)	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	32	08:54 (6)	16:58	50	09:14 (6)
17	07:44		08:40 (6)	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		08:21 (6)	07:40		08:25 (6)
	17:23	46	09:26 (6)	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	34	08:55 (6)	16:59	50	09:15 (6)
18	07:43		08:41 (6)	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		08:20 (6)	07:40		08:25 (6)
	17:24	44	09:25 (6)	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	36	08:56 (6)	16:59	50	09:15 (6)
19	07:43		08:42 (6)	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		08:19 (6)	07:41		08:25 (6)
	17:25	43	09:25 (6)	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	38	08:57 (6)	16:59	50	09:15 (6)
20	07:42		08:42 (6)	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		08:20 (6)	07:42		08:26 (6)
	17:27	43	09:25 (6)	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	39	08:59 (6)	17:00	50	09:16 (6)
21	07:42		08:43 (6)	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		08:19 (6)	07:42		08:26 (6)
	17:28	41	09:24 (6)	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	41	09:00 (6)	17:00	50	09:16 (6)
22	07:41		08:44 (6)	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		08:18 (6)	07:43		08:27 (6)
	17:29	40	09:24 (6)	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	43	09:01 (6)	17:01	50	09:17 (6)
23	07:41		08:45 (6)	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		08:18 (6)	07:43		08:27 (6)
	17:30	38	09:23 (6)	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	43	09:01 (6)	17:01	50	09:17 (6)
24	07:40		08:46 (6)	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		08:18 (6)	07:44		08:27 (6)
	17:31	36	09:22 (6)	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	44	09:02 (6)	17:02	50	09:17 (6)
25	07:39		08:47 (6)	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		08:18 (6)	07:44		08:28 (6)
	17:32	34	09:21 (6)	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	46	09:04 (6)	17:02	50	09:18 (6)
26	07:39		08:49 (6)	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		08:18 (6)	07:45		08:28 (6)
	17:34	32	09:21 (6)	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	46	09:04 (6)	17:03	51	09:19 (6)
27	07:38		08:51 (6)	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22		08:18 (6)	07:45		08:29 (6)
	17:35	29	09:20 (6)	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	47	09:05 (6)	17:03	50	09:19 (6)
28	07:37		08:52 (6)	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		08:18 (6)	07:45		08:30 (6)
	17:36	26	09:18 (6)	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	47	09:05 (6)	17:04	50	09:20 (6)
29	07:36		08:54 (6)		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24		08:18 (6)	07:45		08:30 (6)
	17:37	22	09:16 (6)		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	48	09:06 (6)	17:05	50	09:20 (6)
30	07:35		08:57 (6)		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		08:18 (6)	07:46		08:30 (6)
	17:39	17	09:14 (6)		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	48	09:06 (6)	17:06	50	09:20 (6)
31	07:34		09:01 (6)		07:11		05:57		06:19	06:49		06:51				07:46		08:31 (6)
	17:40	8	09:09 (6)		19:46		20:46		20:40	19:58		17:23				17:06	50	09:21 (6)
Potential sun hours	300			298	370	398	446	450	457	426	375	346	300			290		
Total, worst case		1280												736			1546	
Sun reduction		0.40												0.48			0.41	
Oper. time red.		0.37												0.37			0.37	
Wind dir. red.		0.61												0.61			0.61	
Total reduction		0.09												0.11			0.09	
Total, real		117												81			146	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:10 / 141
Licensed user:
Ing. Bruno Manca
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+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DJ - R134

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:46		08:33 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52			07:26		08:20 (6)
	17:07	47	09:20 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22			16:58	46	09:06 (6)
2	07:46		08:33 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53			07:27		08:20 (6)
	17:08	47	09:20 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21			16:58	46	09:06 (6)
3	07:46		08:34 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54			07:28		08:21 (6)
	17:09	47	09:21 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19			16:58	46	09:07 (6)
4	07:47		08:34 (6)	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55			07:29		08:21 (6)
	17:10	47	09:21 (6)	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18			16:58	46	09:07 (6)
5	07:47		08:35 (6)	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57			07:30		08:21 (6)
	17:11	47	09:22 (6)	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17			16:57	47	09:08 (6)
6	07:47		08:36 (6)	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58			07:31		08:22 (6)
	17:12	46	09:22 (6)	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16			16:57	46	09:08 (6)
7	07:46		08:36 (6)	07:28	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59			07:32		08:22 (6)
	17:13	47	09:23 (6)	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15			16:57	47	09:09 (6)
8	07:46		08:37 (6)	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00			07:33		08:22 (6)
	17:14	46	09:23 (6)	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14			16:57	47	09:09 (6)
9	07:46		08:38 (6)	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01			07:34		08:23 (6)
	17:15	46	09:24 (6)	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13			16:57	47	09:10 (6)
10	07:46		08:37 (6)	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02			07:34		08:23 (6)
	17:16	46	09:23 (6)	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12			16:57	48	09:11 (6)
11	07:46		08:38 (6)	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04			07:35		08:24 (6)
	17:17	46	09:24 (6)	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11			16:57	47	09:11 (6)
12	07:46		08:39 (6)	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05			07:36		08:24 (6)
	17:18	45	09:24 (6)	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10			16:57	47	09:11 (6)
13	07:45		08:39 (6)	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		08:32 (6)	07:37		08:24 (6)
	17:19	44	09:23 (6)	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	11	08:43 (6)	16:58	48	09:12 (6)
14	07:45		08:40 (6)	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		08:29 (6)	07:38		08:25 (6)
	17:20	44	09:24 (6)	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	18	08:47 (6)	16:58	47	09:12 (6)
15	07:45		08:41 (6)	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		08:27 (6)	07:38		08:26 (6)
	17:21	43	09:24 (6)	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	23	08:50 (6)	16:58	47	09:13 (6)
16	07:44		08:41 (6)	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		08:26 (6)	07:39		08:26 (6)
	17:22	43	09:24 (6)	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	26	08:52 (6)	16:58	47	09:13 (6)
17	07:44		08:43 (6)	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		08:24 (6)	07:40		08:26 (6)
	17:23	41	09:24 (6)	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	29	08:53 (6)	16:59	48	09:14 (6)
18	07:43		08:43 (6)	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		08:23 (6)	07:40		08:27 (6)
	17:24	41	09:24 (6)	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	31	08:54 (6)	16:59	47	09:14 (6)
19	07:43		08:44 (6)	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		08:22 (6)	07:41		08:27 (6)
	17:25	40	09:24 (6)	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	33	08:55 (6)	16:59	47	09:14 (6)
20	07:42		08:45 (6)	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		08:22 (6)	07:42		08:28 (6)
	17:27	38	09:23 (6)	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	35	08:57 (6)	17:00	47	09:15 (6)
21	07:42		08:45 (6)	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		08:22 (6)	07:42		08:28 (6)
	17:28	37	09:22 (6)	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	36	08:58 (6)	17:00	47	09:15 (6)
22	07:41		08:47 (6)	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		08:21 (6)	07:43		08:29 (6)
	17:29	35	09:22 (6)	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	38	08:59 (6)	17:01	47	09:16 (6)
23	07:41		08:48 (6)	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		08:20 (6)	07:43		08:29 (6)
	17:30	33	09:21 (6)	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	40	09:00 (6)	17:01	47	09:16 (6)
24	07:40		08:49 (6)	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		08:20 (6)	07:44		08:29 (6)
	17:31	31	09:20 (6)	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	41	09:01 (6)	17:02	47	09:16 (6)
25	07:39		08:50 (6)	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		08:21 (6)	07:44		08:30 (6)
	17:32	29	09:19 (6)	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	41	09:02 (6)	17:02	47	09:17 (6)
26	07:39		08:53 (6)	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		08:20 (6)	07:45		08:30 (6)
	17:34	25	09:18 (6)	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	43	09:03 (6)	17:03	48	09:18 (6)
27	07:38		08:54 (6)	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22		08:20 (6)	07:45		08:30 (6)
	17:35	23	09:17 (6)	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	43	09:03 (6)	17:03	48	09:18 (6)
28	07:37		08:57 (6)	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23		08:20 (6)	07:45		08:32 (6)
	17:36	17	09:14 (6)	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	44	09:04 (6)	17:04	47	09:19 (6)
29	07:36		09:00 (6)		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24		08:20 (6)	07:45		08:32 (6)
	17:37	11	09:11 (6)		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	44	09:04 (6)	17:05	47	09:19 (6)
30	07:35				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25		08:20 (6)	07:46		08:32 (6)
	17:39				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	45	09:05 (6)	17:06	47	09:19 (6)
31	07:34				07:11		05:57		06:19	06:49		06:51				07:46		08:33 (6)
	17:40				19:46		20:46		20:40	19:58		17:23				17:06	47	09:20 (6)
Potential sun hours	300			298	370	398	446	450	457	426	375	346	300			290		
Total, worst case		1132												621			1457	
Sun reduction		0.40												0.48			0.41	
Oper. time red.		0.37												0.37			0.37	
Wind dir. red.		0.61												0.61			0.61	
Total reduction		0.09												0.11			0.09	
Total, real		104												68			138	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 142

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DK - R136

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:46	08:56 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52		07:26	08:48 (6)
	17:07	35 09:31 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22		16:58	24 09:12 (6)
2	07:46	08:57 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53		07:27	08:47 (6)
	17:08	34 09:31 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21		16:58	26 09:13 (6)
3	07:46	08:58 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54		07:28	08:47 (6)
	17:09	33 09:31 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19		16:58	27 09:14 (6)
4	07:47	08:58 (6)	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55		07:29	08:47 (6)
	17:10	33 09:31 (6)	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18		16:58	28 09:15 (6)
5	07:47	08:59 (6)	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57		07:30	08:47 (6)
	17:11	32 09:31 (6)	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17		16:57	29 09:16 (6)
6	07:47	09:00 (6)	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58		07:31	08:46 (6)
	17:12	31 09:31 (6)	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16		16:57	31 09:17 (6)
7	07:46	09:01 (6)	07:28	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59		07:32	08:46 (6)
	17:13	30 09:31 (6)	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15		16:57	32 09:18 (6)
8	07:46	09:03 (6)	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00		07:33	08:47 (6)
	17:14	28 09:31 (6)	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:46	18:56	17:14		16:57	32 09:19 (6)
9	07:46	09:04 (6)	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01		07:34	08:47 (6)
	17:15	27 09:31 (6)	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13		16:57	33 09:20 (6)
10	07:46	09:04 (6)	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02		07:34	08:47 (6)
	17:16	26 09:30 (6)	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12		16:57	34 09:21 (6)
11	07:46	09:06 (6)	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04		07:35	08:47 (6)
	17:17	24 09:30 (6)	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11		16:57	35 09:22 (6)
12	07:46	09:08 (6)	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05		07:36	08:47 (6)
	17:18	21 09:29 (6)	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10		16:57	35 09:22 (6)
13	07:45	09:09 (6)	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06		07:37	08:47 (6)
	17:19	19 09:28 (6)	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09		16:58	36 09:23 (6)
14	07:45	09:11 (6)	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07		07:38	08:48 (6)
	17:20	15 09:26 (6)	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08		16:58	36 09:24 (6)
15	07:45	09:15 (6)	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08		07:38	08:48 (6)
	17:21	10 09:25 (6)	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07		16:58	37 09:25 (6)
16	07:44		07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09		07:39	08:48 (6)
	17:22		17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06		16:58	37 09:25 (6)
17	07:44		07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10		07:40	08:49 (6)
	17:23		18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06		16:59	37 09:26 (6)
18	07:43		07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12		07:40	08:49 (6)
	17:24		18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05		16:59	38 09:27 (6)
19	07:43		07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13		07:41	08:49 (6)
	17:25		18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04		16:59	38 09:27 (6)
20	07:42		07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14		07:42	08:50 (6)
	17:27		18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03		17:00	38 09:28 (6)
21	07:42		07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15		07:42	08:50 (6)
	17:28		18:05	18:36	20:08	20:37	20:57	20:49	20:14	19:24	18:36	17:03		17:00	38 09:28 (6)
22	07:41		07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16		07:43	08:51 (6)
	17:29		18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02		17:01	38 09:29 (6)
23	07:41		07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17		07:43	08:51 (6)
	17:30		18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02		17:01	38 09:29 (6)
24	07:40		07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18		07:44	08:51 (6)
	17:31		18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01		17:02	38 09:29 (6)
25	07:39		07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20		07:44	08:52 (6)
	17:32		18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01		17:02	38 09:30 (6)
26	07:39		07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21		07:45	08:52 (6)
	17:34		18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00		17:03	38 09:30 (6)
27	07:38		07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	08:54 (6)	07:45	08:53 (6)
	17:35		18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	9 09:03 (6)	17:03	37 09:30 (6)
28	07:37		07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	08:52 (6)	07:45	08:54 (6)
	17:36		18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	14 09:06 (6)	17:04	37 09:31 (6)
29	07:36			07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	08:50 (6)	07:45	08:54 (6)
	17:37			19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	18 09:08 (6)	17:05	37 09:31 (6)
30	07:35			07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	08:49 (6)	07:46	08:55 (6)
	17:39			19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	21 09:10 (6)	17:06	36 09:31 (6)
31	07:34			07:11		05:57		06:19	06:49		06:51			07:46	08:55 (6)
	17:40			19:46		20:46		20:40	19:58		17:23			17:06	36 09:31 (6)
Potential sun hours	300		298	370	398	446	450	457	426	375	346	300		290	
Total, worst case		398											62		1074
Sun reduction		0.40											0.48		0.41
Oper. time red.		0.37											0.37		0.37
Wind dir. red.		0.59											0.59		0.59
Total reduction		0.09											0.11		0.09
Total, real		35											7		98

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 143

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DL - R137

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
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	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
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	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
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	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
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	17:19	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
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	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:32	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 144

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+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DM - R138

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:19	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:28	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
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	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
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12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
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13	07:45	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
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	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00
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	17:28	18:05	18:36	20:08	20:37	20:57	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
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	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
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	17:32	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:39		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 145

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DN - R139

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January			February	March	April	May	June	July	August	September	October	November	December		
1	07:46		09:25 (6)	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26		
	17:07	15	09:40 (6)	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58		
2	07:46		09:27 (6)	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27		
	17:08	12	09:39 (6)	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58		
3	07:46		09:30 (6)	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28		
	17:09	7	09:37 (6)	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58		
4	07:47			07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29		
	17:10			17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58		
5	07:47			07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30		
	17:11			17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57		
6	07:47			07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31		
	17:12			17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57		
7	07:46			07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32		
	17:13			17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57		
8	07:46			07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33		
	17:14			17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57		
9	07:46			07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:34		09:19 (6)
	17:15			17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57	6	09:25 (6)
10	07:46			07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:59	07:28	07:02	07:34		09:17 (6)
	17:16			17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57	11	09:28 (6)
11	07:46			07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04	07:35		09:17 (6)
	17:17			17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57	14	09:31 (6)
12	07:46			07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36		09:15 (6)
	17:18			17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57	16	09:31 (6)
13	07:45			07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37		09:15 (6)
	17:19			17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58	18	09:33 (6)
14	07:45			07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38		09:15 (6)
	17:20			17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58	19	09:34 (6)
15	07:45			07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38		09:15 (6)
	17:21			17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58	21	09:36 (6)
16	07:44			07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39		09:14 (6)
	17:22			17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58	22	09:36 (6)
17	07:44			07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40		09:15 (6)
	17:23			18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59	22	09:37 (6)
18	07:43			07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40		09:15 (6)
	17:24			18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59	23	09:38 (6)
19	07:43			07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41		09:15 (6)
	17:25			18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	16:59	23	09:38 (6)
20	07:42			07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14	07:42		09:16 (6)
	17:27			18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00	23	09:39 (6)
21	07:42			07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42		09:16 (6)
	17:28			18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00	24	09:40 (6)
22	07:41			07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43		09:17 (6)
	17:29			18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01	24	09:41 (6)
23	07:41			07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43		09:17 (6)
	17:30			18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01	23	09:40 (6)
24	07:40			07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44		09:17 (6)
	17:31			18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02	23	09:40 (6)
25	07:39			07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44		09:18 (6)
	17:32			18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02	23	09:41 (6)
26	07:39			07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45		09:19 (6)
	17:34			18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03	22	09:41 (6)
27	07:38			07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45		09:19 (6)
	17:35			18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03	22	09:41 (6)
28	07:37			07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45		09:21 (6)
	17:36			18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04	21	09:42 (6)
29	07:36				07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45		09:22 (6)
	17:37				19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05	19	09:41 (6)
30	07:35				07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46		09:23 (6)
	17:38				19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06	18	09:41 (6)
31	07:34				07:11		05:57		06:19	06:49		06:51		07:46		09:24 (6)
	17:40				19:46		20:46		20:40	19:58		17:23		17:06	17	09:41 (6)
Potential sun hours	300			298	370	398	446	450	457	426	375	346	300	290		
Total, worst case		34													454	
Sun reduction		0.40													0.41	
Oper. time red.		0.37													0.37	
Wind dir. red.		0.56													0.56	
Total reduction		0.08													0.09	
Total, real		3													40	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 146

Licensed user:
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IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DO - R140

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
8	07:46	07:26	06:48	06:58	06:16	05:54	06:01	06:27	06:57	07:26	07:00	07:33
	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
9	07:46	07:25	06:46	06:56	06:15	05:54	06:01	06:28	06:58	07:27	07:01	07:34
	17:15	17:51	18:23	19:55	20:26	20:52	20:55	20:30	19:44	18:54	17:13	16:57
10	07:46	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
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12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
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14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:07	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:32	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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2024-01-12 10:10 / 147

Licensed user:
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Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DP - R141

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
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	17:14	17:49	18:22	19:54	20:25	20:51	20:56	20:31	19:45	18:56	17:14	16:57
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10	07:46	07:24	06:45	06:55	06:14	05:53	06:02	06:29	06:58	07:28	07:02	07:34
	17:16	17:52	18:24	19:56	20:27	20:52	20:55	20:28	19:42	18:53	17:12	16:57
11	07:46	07:23	06:43	06:53	06:12	05:53	06:03	06:30	06:59	07:29	07:04	07:35
	17:17	17:53	18:25	19:57	20:28	20:53	20:55	20:27	19:41	18:51	17:11	16:57
12	07:46	07:22	06:41	06:51	06:11	05:53	06:03	06:31	07:00	07:30	07:05	07:36
	17:18	17:54	18:26	19:58	20:29	20:53	20:54	20:26	19:39	18:50	17:10	16:57
13	07:45	07:21	06:40	06:50	06:10	05:53	06:04	06:32	07:01	07:31	07:06	07:37
	17:19	17:55	18:27	19:59	20:30	20:54	20:54	20:25	19:37	18:48	17:09	16:58
14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
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16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
	17:24	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	16:59
20	07:42	07:11	06:29	06:39	06:04	05:53	06:10	06:38	07:08	07:39	07:14	07:42
	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00
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23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:32	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DQ - R142

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
	17:12	17:47	18:20	19:52	20:23	20:50	20:56	20:33	19:49	18:59	17:16	16:57
7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
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15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:34	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
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	17:24	18:01	18:32	20:04	20:35	20:56	20:51	20:18	19:29	18:41	17:05	16:59
19	07:43	07:13	06:30	06:41	06:05	05:53	06:09	06:37	07:07	07:37	07:13	07:41
	17:25	18:03	18:34	20:05	20:36	20:56	20:50	20:16	19:27	18:39	17:04	16:59
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	17:27	18:04	18:35	20:06	20:36	20:56	20:49	20:15	19:26	18:38	17:03	17:00
21	07:42	07:10	06:27	06:38	06:03	05:54	06:10	06:39	07:09	07:40	07:15	07:42
	17:28	18:05	18:36	20:08	20:37	20:56	20:49	20:14	19:24	18:36	17:03	17:00
22	07:41	07:09	06:25	06:36	06:02	05:54	06:11	06:40	07:10	07:41	07:16	07:43
	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
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26	07:39	07:03	06:19	06:31	06:00	05:55	06:15	06:44	07:14	06:45	07:21	07:45
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:59	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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Licensed user:
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IT-09028 Sestu
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar

Shadow receptor: DR - R144

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:46	07:34	06:59	07:09	06:24	05:56	05:57	06:20	06:50	07:19	06:52	07:26
	17:07	17:41	18:14	19:47	20:18	20:46	20:57	20:39	19:57	19:07	17:22	16:58
2	07:46	07:33	06:57	07:07	06:23	05:56	05:57	06:21	06:51	07:20	06:53	07:27
	17:08	17:42	18:15	19:48	20:19	20:47	20:57	20:38	19:55	19:06	17:21	16:58
3	07:46	07:32	06:56	07:06	06:22	05:55	05:58	06:22	06:52	07:21	06:54	07:28
	17:09	17:43	18:16	19:49	20:20	20:48	20:57	20:37	19:54	19:04	17:19	16:58
4	07:47	07:31	06:54	07:04	06:20	05:55	05:58	06:23	06:53	07:22	06:55	07:29
	17:10	17:45	18:17	19:50	20:21	20:49	20:57	20:36	19:52	19:02	17:18	16:58
5	07:47	07:30	06:52	07:02	06:19	05:55	05:59	06:24	06:54	07:23	06:57	07:30
	17:11	17:46	18:18	19:51	20:22	20:49	20:57	20:34	19:50	19:01	17:17	16:57
6	07:47	07:29	06:51	07:01	06:18	05:54	05:59	06:25	06:55	07:24	06:58	07:31
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7	07:46	07:27	06:49	06:59	06:17	05:54	06:00	06:26	06:56	07:25	06:59	07:32
	17:13	17:48	18:21	19:53	20:24	20:50	20:56	20:32	19:47	18:58	17:15	16:57
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14	07:45	07:19	06:38	06:48	06:09	05:53	06:05	06:33	07:02	07:32	07:07	07:38
	17:20	17:57	18:28	20:00	20:31	20:54	20:53	20:23	19:36	18:47	17:08	16:58
15	07:45	07:18	06:37	06:47	06:08	05:53	06:06	06:33	07:03	07:33	07:08	07:38
	17:21	17:58	18:29	20:01	20:32	20:55	20:53	20:22	19:34	18:45	17:07	16:58
16	07:44	07:17	06:35	06:45	06:07	05:53	06:06	06:34	07:04	07:34	07:09	07:39
	17:22	17:59	18:30	20:02	20:33	20:55	20:52	20:21	19:32	18:44	17:06	16:58
17	07:44	07:15	06:33	06:44	06:07	05:53	06:07	06:35	07:05	07:35	07:10	07:40
	17:23	18:00	18:31	20:03	20:34	20:55	20:51	20:19	19:31	18:42	17:06	16:59
18	07:43	07:14	06:32	06:42	06:06	05:53	06:08	06:36	07:06	07:36	07:12	07:40
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	17:29	18:06	18:37	20:09	20:38	20:57	20:48	20:12	19:22	18:35	17:02	17:01
23	07:41	07:07	06:24	06:35	06:02	05:54	06:12	06:41	07:11	07:42	07:17	07:43
	17:30	18:07	18:38	20:10	20:39	20:57	20:47	20:11	19:21	18:33	17:02	17:01
24	07:40	07:06	06:22	06:34	06:01	05:54	06:13	06:42	07:12	07:43	07:18	07:44
	17:31	18:08	18:39	20:11	20:40	20:57	20:46	20:09	19:19	18:32	17:01	17:02
25	07:39	07:04	06:20	06:32	06:00	05:55	06:14	06:43	07:13	06:44	07:20	07:44
	17:32	18:10	18:40	20:12	20:41	20:57	20:46	20:08	19:17	17:31	17:01	17:02
26	07:39	07:03	06:19	06:31	05:59	05:55	06:15	06:44	07:14	06:45	07:21	07:44
	17:34	18:11	18:41	20:13	20:42	20:57	20:45	20:06	19:16	17:29	17:00	17:03
27	07:38	07:02	06:17	06:29	05:59	05:55	06:16	06:45	07:15	06:46	07:22	07:45
	17:35	18:12	18:42	20:14	20:43	20:57	20:44	20:05	19:14	17:28	17:00	17:03
28	07:37	07:00	06:15	06:28	05:58	05:56	06:16	06:46	07:16	06:47	07:23	07:45
	17:36	18:13	18:43	20:15	20:43	20:57	20:43	20:03	19:12	17:27	16:59	17:04
29	07:36		07:14	06:27	05:58	05:56	06:17	06:47	07:17	06:49	07:24	07:45
	17:37		19:44	20:16	20:44	20:57	20:42	20:01	19:11	17:25	16:59	17:05
30	07:35		07:12	06:25	05:57	05:56	06:18	06:48	07:18	06:50	07:25	07:46
	17:38		19:45	20:17	20:45	20:57	20:41	20:00	19:09	17:24	16:58	17:06
31	07:34		07:11		05:57		06:19	06:49		06:51		07:46
	17:40		19:46		20:46		20:40	19:58		17:23		17:06
Potential sun hours	300	298	370	398	446	450	457	426	375	346	300	290
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 1 - WT3

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April	May		June	
1	07:46		07:34	07:53-08:04/11	06:59	07:17-08:23/66	07:09	06:24		05:57	06:22-07:03/41
	17:08		17:41		18:14	16:32-17:31/59	19:47	20:18		20:46	
2	07:46		07:33	07:52-08:07/15	06:57	07:17-08:23/66	07:07	06:23		05:56	06:21-07:03/42
	17:09		17:42		18:15	16:33-17:32/59	19:48	20:19		20:47	
3	07:46		07:32	07:51-08:09/18	06:56	07:16-08:22/66	07:06	06:22		05:56	06:21-07:04/43
	17:09		17:44		18:16	16:33-17:32/59	19:49	20:20		20:48	
4	07:47		07:31	07:50-08:11/21	06:54	07:17-08:22/65	07:04	06:21		05:55	06:21-07:05/44
	17:10		17:45		18:18	16:34-17:32/58	19:50	20:21		20:49	
5	07:47		07:30	07:49-08:13/24	06:53	07:17-08:20/63	07:03	06:19		05:55	06:20-07:05/45
	17:11		17:46		18:19	16:34-17:32/58	19:51	20:22		20:49	
6	07:47		07:29	07:48-08:14/26	06:51	07:18-08:20/62	07:01	06:18		05:55	06:20-07:06/46
	17:12		17:47		18:20	16:35-17:32/57	19:52	20:23		20:50	
7	07:46		07:28	07:47-08:16/29	06:50	07:18-08:18/60	06:59	06:17		05:54	06:20-07:06/46
	17:13		17:48		18:21	16:36-17:31/55	19:53	20:24		20:50	
8	07:46		07:26	07:46-08:17/31	06:48	07:20-08:18/58	06:58	06:16		05:54	06:20-07:07/47
	17:14		17:50		18:22	16:37-17:31/54	19:54	20:25		20:51	
9	07:46		07:25	07:45-08:19/34	06:46	07:20-08:16/56	06:56	06:15		05:54	06:18-07:08/50
	17:15		17:51		18:23	16:38-17:30/52	19:55	20:26		20:52	
10	07:46		07:24	07:44-08:20/36	06:45	07:20-08:14/54	06:55	06:14		05:54	06:16-07:07/51
	17:16		17:52	16:53-17:01/8	18:24	16:39-17:29/50	19:56	20:27		20:52	
11	07:46		07:23	07:42-08:20/38	06:43	07:22-08:13/51	06:53	06:13		05:54	06:15-07:08/53
	17:17		17:53	16:48-17:05/17	18:25	16:42-17:29/47	19:57	20:28		20:53	
12	07:46		07:22	07:41-08:21/40	06:42	07:23-08:11/48	06:52	06:12		05:53	06:15-07:08/53
	17:18		17:55	16:45-17:09/24	18:26	16:44-17:27/43	19:58	20:29		20:53	
13	07:45		07:21	07:40-08:22/42	06:40	07:25-08:09/44	06:50	06:11		05:53	06:15-07:09/54
	17:19		17:56	16:43-17:11/28	18:27	16:47-17:26/39	19:59	20:30		20:54	
14	07:45		07:19	07:39-08:23/44	06:38	07:26-08:07/41	06:49	06:10		05:53	06:15-07:09/54
	17:20		17:57	16:42-17:13/31	18:28	16:58-17:25/27	20:00	20:31		20:54	
15	07:45		07:18	07:37-08:23/46	06:37	07:27-08:04/37	06:47	06:09		05:53	06:15-07:09/54
	17:21		17:58	16:40-17:14/34	18:29	16:59-17:22/23	20:01	20:32		20:55	
16	07:44		07:17	07:36-08:24/48	06:35	07:30-08:02/32	06:45	06:08		05:53	06:15-07:10/55
	17:22		17:59	16:39-17:15/36	18:31	17:02-17:20/18	20:02	20:33		20:55	
17	07:44		07:16	07:35-08:25/50	06:34	07:33-07:58/25	06:44	06:07		05:53	06:15-07:10/55
	17:23		18:00	16:38-17:17/39	18:32	17:04-17:16/12	20:03	20:34		20:55	
18	07:43		07:14	07:33-08:25/52	06:32	07:37-07:52/15	06:42	06:06		05:53	06:15-07:10/55
	17:25		18:02	16:36-17:17/41	18:33		20:05	20:35		20:56	
19	07:43		07:13	07:32-08:25/53	06:30		06:41	06:05		05:54	06:16-07:11/55
	17:26		18:03	16:36-17:18/42	18:34		20:06	20:36		20:56	
20	07:42		07:12	07:31-08:26/55	06:29		06:40	06:04		05:54	06:16-07:11/55
	17:27		18:04	16:35-17:19/44	18:35		20:07	20:36		20:56	
21	07:42		07:10	07:29-08:25/56	06:27		06:38	06:03	06:38-06:45/7	05:54	06:16-07:11/55
	17:28		18:05	16:34-17:19/45	18:36		20:08	20:37		20:56	
22	07:41		07:09	07:28-08:26/58	06:25		06:37	06:03	06:33-06:49/16	05:54	06:16-07:11/55
	17:29		18:06	16:34-17:23/49	18:37		20:09	20:38		20:57	
23	07:41		07:07	07:26-08:25/59	06:24		06:35	06:02	06:31-06:51/20	05:54	06:16-07:11/55
	17:30		18:07	16:33-17:25/52	18:38		20:10	20:39		20:57	
24	07:40		07:06	07:25-08:25/60	06:22		06:34	06:01	06:29-06:54/25	05:55	06:17-07:12/55
	17:32		18:09	16:33-17:27/54	18:39		20:11	20:40		20:57	
25	07:39		07:05	07:23-08:25/62	06:21		06:32	06:00	06:27-06:55/28	05:55	06:17-07:12/55
	17:33		18:10	16:32-17:28/56	18:40		20:12	20:41		20:57	
26	07:39		07:03	07:22-08:25/63	06:19		06:31	06:00	06:27-06:57/30	05:55	06:17-07:12/55
	17:34		18:11	16:33-17:29/56	18:41		20:13	20:42		20:57	
27	07:38		07:02	07:20-08:24/64	06:17		06:30	05:59	06:25-06:58/33	05:56	06:18-07:12/54
	17:35		18:12	16:32-17:30/58	18:42		20:14	20:43		20:57	
28	07:37		07:00	07:19-08:24/65	06:16		06:28	05:59	06:24-06:59/35	05:56	06:18-07:12/54
	17:36		18:13	16:33-17:31/58	18:43		20:15	20:43		20:57	
29	07:36				07:14		06:27	05:58	06:24-07:00/36	05:56	06:19-07:13/54
	17:38				19:44		20:16	20:44		20:57	
30	07:35	07:55-07:56/1			07:12		06:26	05:57	06:23-07:00/37	05:57	06:19-07:12/53
	17:39				19:45		20:17	20:45		20:57	
31	07:34	07:54-08:01/7			07:11			05:57	06:22-07:02/40		
	17:40				19:46			20:46			
Potential sun hours	300		298		370		398	446		450	
Sum of minutes with flicker	8		1972		1679		0	307		1543	

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 1 - WT3

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August	September		October		November		December
1	05:57	06:19-07:12/53	06:20	06:50		07:19	08:03-08:50/47	06:52	07:13-07:49/36	07:26
	20:57		20:39	19:57		19:07	17:25-18:07/42	17:22	16:24-16:28/4	16:59
2	05:58	06:20-07:12/52	06:21	06:51		07:20	08:01-08:51/50	06:53	07:14-07:47/33	07:27
	20:57		20:38	19:55		19:06	17:22-18:07/45	17:21		16:58
3	05:58	06:21-07:12/51	06:22	06:52		07:21	08:00-08:52/52	06:54	07:16-07:47/31	07:28
	20:57		20:37	19:54		19:04	17:19-18:08/49	17:20		16:58
4	05:59	06:24-07:12/48	06:23	06:53		07:22	07:58-08:53/55	06:55	07:17-07:46/29	07:29
	20:57		20:36	19:52		19:03	17:17-18:08/51	17:18		16:58
5	05:59	06:25-07:12/47	06:24	06:54		07:23	07:57-08:54/57	06:57	07:18-07:44/26	07:30
	20:57		20:35	19:50		19:01	17:15-18:08/53	17:17		16:58
6	06:00	06:26-07:12/46	06:25	06:55		07:24	07:55-08:54/59	06:58	07:19-07:42/23	07:31
	20:56		20:33	19:49		18:59	17:13-18:08/55	17:16		16:58
7	06:00	06:27-07:12/45	06:26	06:56		07:25	07:54-08:55/61	06:59	07:21-07:41/20	07:32
	20:56		20:32	19:47		18:58	17:12-18:08/56	17:15		16:57
8	06:01	06:27-07:11/44	06:27	06:57		07:26	07:53-08:56/63	07:00	07:22-07:39/17	07:33
	20:56		20:31	19:46		18:56	17:10-18:07/57	17:14		16:57
9	06:02	06:28-07:11/43	06:28	06:58		07:27	07:52-08:56/64	07:01	07:23-07:37/14	07:34
	20:55		20:30	19:44		18:55	17:09-18:07/58	17:13		16:57
10	06:02	06:29-07:11/42	06:29	06:59		07:28	07:51-08:56/65	07:02	07:24-07:35/11	07:34
	20:55		20:29	19:42		18:53	17:08-18:07/59	17:12		16:58
11	06:03	06:29-07:10/41	06:30	07:00		07:29	07:51-08:56/65	07:04	07:26-07:32/6	07:35
	20:55		20:27	19:41		18:51	17:07-18:06/59	17:11		16:58
12	06:04	06:30-07:10/40	06:31	07:01		07:30	07:50-08:57/67	07:05		07:36
	20:54		20:26	19:39		18:50	17:06-18:05/59	17:10		16:58
13	06:04	06:32-07:10/38	06:32	07:02		07:31	07:51-08:57/66	07:06		07:37
	20:54		20:25	19:37		18:48	17:06-18:04/58	17:09		16:58
14	06:05	06:32-07:09/37	06:33	07:02		07:32	07:52-08:57/65	07:07		07:38
	20:53		20:23	19:36		18:47	17:05-18:03/58	17:08		16:58
15	06:06	06:33-07:08/35	06:34	07:03		07:33	07:53-08:57/64	07:08		07:38
	20:53		20:22	19:34		18:45	17:05-18:02/57	17:08		16:58
16	06:07	06:34-07:08/34	06:35	07:04		07:34	07:55-08:57/62	07:09		07:39
	20:52		20:21	19:32		18:44	17:04-18:00/56	17:07		16:59
17	06:07	06:36-07:07/31	06:36	07:05		07:35	07:56-08:57/61	07:11		07:40
	20:51		20:19	19:31		18:42	17:05-18:00/55	17:06		16:59
18	06:08	06:36-07:05/29	06:37	07:06		07:36	07:57-08:57/60	07:12		07:40
	20:51		20:18	19:29		18:41	17:05-17:58/53	17:05		16:59
19	06:09	06:38-07:04/26	06:38	07:07		07:38	07:58-08:57/59	07:13		07:41
	20:50		20:16	19:27		18:39	17:05-17:55/50	17:04		17:00
20	06:10	06:40-07:03/23	06:39	07:08		07:39	07:59-08:56/57	07:14		07:42
	20:49		20:15	19:26		18:38	17:05-17:52/47	17:04		17:00
21	06:11	06:42-07:01/19	06:40	07:09		07:40	08:00-08:56/56	07:15		07:42
	20:49		20:14	19:24		18:36	17:05-17:50/45	17:03		17:00
22	06:11	06:46-06:58/12	06:40	07:10		07:41	08:01-08:55/54	07:16		07:43
	20:48		20:12	19:22		18:35	17:05-17:49/44	17:02		17:01
23	06:12		06:41	07:11		07:42	08:02-08:55/53	07:17		07:43
	20:47		20:11	19:21		18:34	17:06-17:48/42	17:02		17:01
24	06:13		06:42	07:12		07:43	08:04-08:55/51	07:18		07:44
	20:46		20:09	19:19		18:32	17:07-17:47/40	17:01		17:02
25	06:14		06:43	07:13	08:23-08:33/10	06:44	07:05-07:54/49	07:20		07:44
	20:46		20:08	19:17		17:31	16:08-16:46/38	17:01		17:03
26	06:15		06:44	07:14	08:17-08:39/22	06:45	07:06-07:54/48	07:21		07:45
	20:45		20:06	19:16	17:49-17:57/8	17:30	16:09-16:45/36	17:00		17:03
27	06:16		06:45	07:15	08:13-08:42/29	06:46	07:07-07:53/46	07:22		07:45
	20:44		20:05	19:14	17:44-18:01/17	17:28	16:10-16:43/33	17:00		17:04
28	06:17		06:46	07:16	08:10-08:45/35	06:47	07:08-07:52/44	07:23		07:45
	20:43		20:03	19:12	17:41-18:03/22	17:27	16:11-16:41/30	17:00		17:04
29	06:18		06:47	07:17	08:07-08:47/40	06:49	07:10-07:52/42	07:24		07:45
	20:42		20:02	19:11	17:39-18:05/26	17:26	16:13-16:40/27	16:59		17:05
30	06:19		06:48	07:18	08:05-08:48/43	06:50	07:11-07:51/40	07:25		07:46
	20:41		20:00	19:09	17:31-18:06/35	17:24	16:15-16:38/23	16:59		17:06
31	06:19		06:49			06:51	07:12-07:50/38			07:46
	20:40		19:58			17:23	16:18-16:35/17			17:07
Potential sun hours	457		426	375		346		300		290
Sum of minutes with flicker		836		0	287		3172		250	0

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 2 - WT1

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:46		07:34	08:31-09:03/32	06:59	16:20-17:10/50	07:09	17:03-18:01/58	06:24	07:17-08:01/44	05:56	07:20-07:58/38
	17:08		17:41		18:14		19:47	18:01-18:16/15	20:18	19:04-19:29/25	20:46	18:43-19:21/38
2	07:46		07:33	08:30-09:04/34	06:57	16:19-17:12/53	07:07	17:04-17:59/55	06:23	07:16-08:02/46	05:56	07:20-07:57/37
	17:08		17:42		18:15		19:48	17:59-18:16/17	20:19	19:04-19:30/26	20:47	18:44-19:21/37
3	07:47		07:32	08:29-09:05/36	06:56	16:17-17:13/56	07:06	17:04-17:56/52	06:22	07:15-08:02/47	05:56	07:21-07:57/36
	17:09		17:44		18:16		19:49	17:56-18:15/19	20:20	19:04-19:30/26	20:48	18:44-19:21/37
4	07:47		07:31	08:28-09:06/38	06:54	16:17-17:14/57	07:04	17:04-17:52/48	06:21	07:15-08:03/48	05:55	07:22-07:56/34
	17:10		17:45		18:18		19:50	17:52-18:14/22	20:21	18:54-19:31/37	20:49	18:44-19:21/37
5	07:47		07:30	08:28-09:07/39	06:53	16:15-17:14/59	07:03	17:05-17:49/44	06:19	07:15-08:03/48	05:55	07:22-07:55/33
	17:11		17:46		18:19		19:51	17:49-18:14/25	20:22	18:51-19:31/40	20:49	18:45-19:21/36
6	07:47		07:29	08:27-09:08/41	06:51	16:15-17:16/61	07:01	17:05-18:12/67	06:18	07:14-08:03/49	05:55	07:23-07:55/32
	17:12		17:47		18:20		19:52		20:23	18:49-19:30/41	20:50	18:45-19:21/36
7	07:47		07:28	08:27-09:09/42	06:50	16:14-17:16/62	06:59	17:06-18:12/66	06:17	07:14-08:04/50	05:54	07:24-07:55/31
	17:13		17:48		18:21		19:53		20:24	18:47-19:30/43	20:51	18:46-19:21/35
8	07:46		07:26	08:27-09:10/43	06:48	16:13-17:17/64	06:58	17:07-18:11/64	06:16	07:13-08:03/50	05:54	07:25-07:55/30
	17:14		17:50		18:22		19:54		20:25	18:46-19:30/44	20:51	18:46-19:21/35
9	07:46		07:25	08:26-09:10/44	06:46	16:12-17:17/65	06:56	17:08-18:10/62	06:15	07:13-08:03/50	05:54	07:24-07:54/30
	17:15		17:51		18:23		19:55		20:26	18:45-19:29/44	20:52	18:46-19:21/35
10	07:46		07:24	08:26-09:11/45	06:45	16:11-17:16/65	06:55	17:09-18:09/60	06:14	07:12-08:03/51	05:54	07:25-07:54/29
	17:16		17:52		18:24		19:56		20:27	18:44-19:29/45	20:52	18:47-19:21/34
11	07:46		07:23	08:25-09:10/45	06:43	16:12-17:17/65	06:53	17:09-18:07/58	06:13	07:12-08:03/51	05:53	07:26-07:54/28
	17:17		17:53		18:25		19:57		20:28	18:43-19:28/45	20:53	18:47-19:21/34
12	07:46		07:22	08:25-09:11/46	06:42	16:11-17:17/66	06:52	17:11-18:06/55	06:12	07:12-08:03/51	05:53	07:27-07:53/26
	17:18		17:54		18:26		19:58		20:29	18:42-19:27/45	20:53	18:48-19:21/33
13	07:45		07:21	08:25-09:11/46	06:40	16:11-17:17/66	06:50	17:11-18:04/53	06:11	07:12-08:03/51	05:53	07:27-07:53/26
	17:19		17:56		18:27		19:59		20:30	18:42-19:26/44	20:54	18:48-19:21/33
14	07:45		07:19	08:26-09:11/45	06:38	16:10-17:17/67	06:48	17:13-18:03/50	06:10	07:12-08:02/50	05:53	07:28-07:53/25
	17:20		17:57		18:28		20:00		20:31	18:41-19:25/44	20:54	18:49-19:21/32
15	07:45		07:18	08:25-09:10/45	06:37	16:10-17:16/66	06:47	17:14-18:01/47	06:09	07:13-08:03/50	05:53	07:28-07:53/25
	17:21		17:58		18:29		20:01		20:32	18:41-19:23/42	20:55	18:49-19:21/32
16	07:44		07:17	08:26-09:10/44	06:35	16:09-17:17/68	06:45	17:16-18:00/44	06:08	07:13-08:03/50	05:53	07:29-07:53/24
	17:22		17:59		18:31		20:02		20:33	18:41-19:20/39	20:55	18:49-19:21/32
17	07:44		07:16	08:26-09:10/44	06:34	16:08-17:17/69	06:44	17:17-17:58/41	06:07	07:13-08:02/49	05:53	07:29-07:53/24
	17:23		18:00		18:32		20:04		20:34	18:41-19:20/39	20:55	18:50-19:21/31
18	07:44		07:14	08:26-09:09/43	06:32	16:07-17:16/69	06:42	17:20-17:56/36	06:06	07:13-08:02/49	05:53	07:29-07:53/24
	17:25		18:02		18:33	17:16-17:17/1	20:05		20:35	18:41-19:20/39	20:56	18:50-19:21/31
19	07:43		07:13	08:26-09:09/43	06:30	16:06-17:16/70	06:41	17:22-17:53/31	06:05	07:13-08:02/49	05:53	07:30-07:53/23
	17:26		18:03		18:34	17:16-17:18/2	20:06		20:36	18:40-19:20/40	20:56	18:50-19:21/31
20	07:43		07:12	08:27-09:08/41	06:29	16:05-17:15/70	06:40	17:25-17:50/25	06:04	07:13-08:01/48	05:54	07:31-07:53/22
	17:27		18:04		18:35	17:15-17:18/3	20:07		20:37	18:40-19:20/40	20:56	18:51-19:22/31
21	07:42		07:10	08:27-09:07/40	06:27	16:05-17:14/69	06:38	17:29-17:47/18	06:03	07:14-08:01/47	05:54	07:31-07:53/22
	17:28		18:05		18:36	17:14-17:18/4	20:08		20:37	18:41-19:21/40	20:57	18:51-19:22/31
22	07:41		07:09	08:28-09:06/38	06:25	16:05-17:14/69	06:37	07:34-07:48/14	06:03	07:14-08:01/47	05:54	07:31-07:53/22
	17:29		18:06	16:40-16:53/13	18:37	17:14-17:19/5	20:09		20:38	18:41-19:21/40	20:57	18:51-19:22/31
23	07:41		07:07	08:29-09:04/35	06:24	16:04-17:13/69	06:35	07:30-07:52/22	06:02	07:14-08:00/46	05:54	07:31-07:54/23
	17:30		18:07	16:34-16:58/24	18:38	17:13-17:19/6	20:10		20:39	18:41-19:21/40	20:57	18:51-19:22/31
24	07:40		07:06	08:30-09:03/33	06:22	16:03-17:12/69	06:34	07:28-07:54/26	06:01	07:16-08:00/44	05:54	07:32-07:55/23
	17:31		18:09	16:31-17:02/31	18:39	17:12-17:18/6	20:11	19:13-19:18/5	20:40	18:41-19:22/41	20:57	18:52-19:23/31
25	07:39		07:05	08:31-09:01/30	06:21	16:04-17:12/68	06:32	07:25-07:55/30	06:00	07:16-08:00/44	05:55	07:31-07:55/24
	17:33		18:10	16:28-17:04/36	18:40	17:12-17:19/7	20:12	19:10-19:21/11	20:41	18:41-19:21/40	20:57	18:52-19:23/31
26	07:39		07:03	08:33-08:59/26	06:19	16:03-17:10/67	06:31	07:23-07:57/34	06:00	07:16-07:59/43	05:55	07:31-07:55/24
	17:34		18:11	16:26-17:06/40	18:41	17:10-17:18/8	20:13	19:08-19:23/15	20:42	18:41-19:21/40	20:57	18:51-19:23/32
27	07:38	08:40-08:53/13	07:02	08:36-08:57/21	06:17	16:03-17:10/67	06:30	07:22-07:59/37	05:59	07:17-07:59/42	05:55	07:32-07:56/24
	17:35		18:12	16:23-17:08/45	18:42	17:10-17:19/9	20:14	19:06-19:24/18	20:43	18:42-19:21/39	20:57	18:52-19:24/32
28	07:37	08:37-08:56/19	07:00	08:38-08:53/15	06:16	16:03-17:08/65	06:28	07:20-07:59/39	05:58	07:17-07:58/41	05:56	07:31-07:56/25
	17:36		18:13	16:22-17:10/48	18:43	17:08-17:18/10	20:15	19:05-19:25/20	20:43	18:42-19:21/39	20:57	18:52-19:24/32
29	07:36	08:35-08:58/23			07:14	17:03-18:06/63	06:27	07:19-08:00/41	05:58	07:18-07:58/40	05:56	07:31-07:56/25
	17:37				19:44	18:06-18:17/11	20:16	19:05-19:27/22	20:44	18:42-19:21/39	20:57	18:51-19:24/33
30	07:35	08:33-09:00/27			07:12	17:03-18:05/62	06:26	07:18-08:01/43	05:57	07:18-07:57/39	05:57	07:31-07:57/26
	17:39				19:45	18:05-18:18/13	20:17	19:05-19:29/24	20:45	18:42-19:21/39	20:57	18:52-19:25/33
31	07:35	08:32-09:02/30			07:11	17:03-18:03/60			05:57	07:19-07:58/39		
	17:40				19:46	18:03-18:17/14			20:46	18:43-19:21/38		
Potential sun hours	300		298		370		398		446		450	
Sum of minutes with flicker		112		1311		2095		1533		2676		1812

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 4

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 2 - WT1

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December
1	05:57	07:30-07:58/28	06:20	07:23-08:13/50	06:50	17:09-18:07/58	07:19	16:50-17:56/66	06:52	07:55-08:40/45	07:26
	20:57	18:52-19:25/33	20:39	18:53-19:38/45	19:57		19:07		17:22		16:58
2	05:58	07:31-07:59/28	06:21	07:23-08:14/51	06:51	17:07-18:07/60	07:20	16:50-17:56/66	06:53	07:56-08:40/44	07:27
	20:57	18:52-19:26/34	20:38	18:54-19:39/45	19:55		19:06		17:21		16:58
3	05:58	07:30-07:59/29	06:22	07:23-08:14/51	06:52	17:05-18:07/62	07:21	16:50-17:55/65	06:54	07:56-08:39/43	07:28
	20:57	18:52-19:26/34	20:37	18:55-19:40/45	19:54		19:04		17:20		16:58
4	05:59	07:30-08:00/30	06:23	07:23-08:14/51	06:53	17:04-18:08/64	07:22	16:50-17:54/64	06:55	07:57-08:39/42	07:29
	20:57	18:52-19:27/35	20:36	18:56-19:40/44	19:52		19:03		17:18		16:58
5	05:59	07:29-08:00/31	06:24	07:23-08:13/50	06:54	17:03-18:08/65	07:23	16:50-17:54/64	06:57	07:57-08:38/41	07:30
	20:57	18:51-19:26/35	20:35	18:57-19:40/43	19:51		19:01		17:17		16:58
6	06:00	07:29-08:01/32	06:25	07:24-08:13/49	06:55	17:01-18:08/67	07:24	16:50-17:53/63	06:58	07:58-08:37/39	07:31
	20:56	18:52-19:27/35	20:33	18:58-19:40/42	19:49		18:59		17:16		16:57
7	06:00	07:29-08:02/33	06:26	07:24-08:13/49	06:56	17:00-17:43/43	07:25	16:50-17:52/62	06:59	07:59-08:37/38	07:32
	20:56	18:51-19:27/36	20:32	19:00-19:39/39	19:47	17:43-18:09/26	18:58		17:15		16:57
8	06:01	07:28-08:02/34	06:27	07:24-08:13/49	06:57	16:59-17:47/48	07:26	16:51-17:50/59	07:00	08:00-08:36/36	07:33
	20:56	18:51-19:28/37	20:31	19:01-19:39/38	19:46	17:47-18:09/22	18:56		17:14		16:57
9	06:02	07:29-08:04/35	06:28	07:24-08:11/47	06:58	16:58-17:50/52	07:27	16:51-17:49/58	07:01	08:01-08:35/34	07:34
	20:55	18:52-19:29/37	20:30	19:04-19:39/35	19:44	17:50-18:09/19	18:55		17:13		16:57
10	06:02	07:28-08:04/36	06:29	07:24-08:11/47	06:59	16:57-17:52/55	07:28	16:52-17:48/56	07:02	08:02-08:34/32	07:35
	20:55	18:51-19:28/37	20:29	19:12-19:39/27	19:42	17:52-18:09/17	18:53		17:12		16:57
11	06:03	07:28-08:05/37	06:30	07:25-08:10/45	07:00	16:56-17:54/58	07:29	16:52-17:47/55	07:04	08:04-08:33/29	07:35
	20:55	18:51-19:29/38	20:27	19:12-19:38/26	19:41	17:54-18:09/15	18:51		17:11		16:57
12	06:04	07:28-08:06/38	06:31	07:25-08:09/44	07:01	16:55-17:55/60	07:30	16:53-17:45/52	07:05	08:06-08:32/26	07:36
	20:54	18:51-19:30/39	20:26	19:12-19:37/25	19:39	17:55-18:09/14	18:50		17:10		16:58
13	06:04	07:28-08:07/39	06:32	07:26-08:09/43	07:02	16:55-17:56/61	07:31	09:14-09:23/9	07:06	08:07-08:30/23	07:37
	20:54	18:51-19:29/38	20:25	19:12-19:36/24	19:37	17:56-18:09/13	18:48	16:54-17:43/49	17:09		16:58
14	06:05	07:26-08:06/40	06:33	07:27-08:08/41	07:02	16:53-17:56/63	07:32	09:09-09:27/18	07:07	08:09-08:28/19	07:38
	20:53	18:51-19:30/39	20:23	19:13-19:35/22	19:36	17:56-18:07/11	18:47	16:55-17:41/46	17:08		16:58
15	06:06	07:26-08:07/41	06:34	07:28-08:07/39	07:03	16:52-17:57/65	07:33	09:06-09:30/24	07:08	08:13-08:25/12	07:38
	20:53	18:51-19:30/39	20:22	19:13-19:32/19	19:34	17:57-18:07/10	18:45	16:57-17:39/42	17:07		16:58
16	06:07	07:26-08:08/42	06:35	07:29-08:05/36	07:04	16:52-17:58/66	07:34	09:05-09:33/28	07:09		07:39
	20:52	18:51-19:31/40	20:21	19:14-19:31/17	19:32	17:58-18:07/9	18:44	16:58-17:37/39	17:07		16:58
17	06:07	07:25-08:08/43	06:36	07:30-08:04/34	07:05	16:51-17:58/67	07:35	09:03-09:34/31	07:11		07:40
	20:52	18:50-19:30/40	20:19	19:15-19:30/15	19:31	17:58-18:07/9	18:42	17:01-17:35/34	17:06		16:59
18	06:08	07:25-08:09/44	06:37	07:32-08:02/30	07:06	16:51-17:59/68	07:36	09:01-09:35/34	07:12		07:40
	20:51	18:51-19:31/40	20:18	19:17-19:28/11	19:29	17:59-18:06/7	18:41	17:04-17:32/28	17:05		16:59
19	06:09	07:25-08:10/45	06:38	07:34-08:00/26	07:07	16:50-17:59/69	07:38	09:00-09:36/36	07:13		07:41
	20:50	18:51-19:31/40	20:17		19:27	17:59-18:06/7	18:39	17:07-17:28/21	17:04		16:59
20	06:10	07:25-08:10/45	06:39	07:36-07:57/21	07:08	16:50-17:59/69	07:39	08:59-09:37/38	07:14		07:42
	20:50	18:51-19:31/40	20:15		19:26	17:59-18:05/6	18:38	17:14-17:21/7	17:04		17:00
21	06:11	07:25-08:11/46	06:39	07:40-07:53/13	07:09	16:50-18:00/70	07:40	08:58-09:38/40	07:15		07:42
	20:49	18:51-19:31/40	20:14	17:39-17:45/6	19:24	18:00-18:04/4	18:36		17:03		17:00
22	06:11	07:24-08:11/47	06:40	17:32-17:51/19	07:10	16:50-18:00/70	07:41	08:57-09:38/41	07:16		07:43
	20:48	18:50-19:31/41	20:12		19:22	18:00-18:04/4	18:35		17:02		17:01
23	06:12	07:24-08:11/47	06:41	17:28-17:55/27	07:11	16:50-18:00/70	07:42	08:57-09:40/43	07:17		07:43
	20:47	18:51-19:31/40	20:11		19:21	18:00-18:03/3	18:34		17:02		17:01
24	06:13	07:24-08:12/48	06:42	17:25-17:57/32	07:12	16:50-18:00/70	07:43	08:56-09:40/44	07:19		07:44
	20:46	18:51-19:31/40	20:09		19:19	18:00-18:02/2	18:32		17:01		17:02
25	06:14	07:24-08:12/48	06:43	17:22-17:59/37	07:13	16:50-18:00/70	06:44	07:56-08:40/44	07:20		07:44
	20:46	18:51-19:31/40	20:08		19:17	18:00-18:01/1	17:31		17:01		17:02
26	06:15	07:24-08:13/49	06:44	17:20-18:01/41	07:14	16:50-17:59/69	06:45	07:55-08:40/45	07:21		07:45
	20:45	18:51-19:31/40	20:06		19:16	17:59-18:00/1	17:30		17:00		17:03
27	06:16	07:24-08:13/49	06:45	17:18-18:02/44	07:15	16:50-17:59/69	06:46	07:55-08:40/45	07:22		07:45
	20:44	18:52-19:31/39	20:05		19:14		17:28		17:00		17:04
28	06:17	07:24-08:14/50	06:46	17:16-18:03/47	07:16	16:51-17:58/67	06:47	07:54-08:40/46	07:23		07:45
	20:43	18:52-19:32/40	20:03		19:12		17:27		16:59		17:04
29	06:18	07:23-08:13/50	06:47	17:14-18:04/50	07:17	16:51-17:57/66	06:49	07:55-08:41/46	07:24		07:46
	20:42	18:52-19:34/42	20:02		19:11		17:26		16:59		17:05
30	06:18	07:23-08:13/50	06:48	17:12-18:05/53	07:18	16:51-17:57/66	06:50	07:55-08:40/45	07:25		07:46
	20:41	18:52-19:36/44	20:00		19:09		17:24		16:59		17:06
31	06:19	07:23-08:13/50	06:49	17:11-18:06/55			06:51	07:55-08:40/45			07:46
	20:40	18:53-19:37/44	19:58				17:23				17:07
Potential sun hours	457		426		375		346		300		290
Sum of minutes with flicker		2460		1839		2107		1698		503	0

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:15 / 5

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 3 - WT2

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:46	13:00-14:40/100	07:34	13:29-14:38/69	06:59	16:43-17:07/24	07:09	07:27-07:41/14	06:24	18:52-19:13/21	05:56	06:31-06:59/28
	17:08		17:41		18:14		19:47		20:18		20:46	18:41-19:19/38
2	07:46	13:00-14:40/100	07:33	13:31-14:37/66	06:57	16:44-17:06/22	07:07	07:26-07:41/15	06:23	18:53-19:12/19	05:56	06:31-07:00/29
	17:08		17:42		18:15		19:48		20:19		20:47	18:42-19:20/38
3	07:46	13:01-14:41/100	07:32	13:33-14:36/63	06:56	16:44-17:04/20	07:06	07:24-07:41/17	06:22	18:54-19:12/18	05:55	06:32-07:01/29
	17:09		17:43		18:16		19:49		20:20		20:48	18:42-19:20/38
4	07:46	13:01-14:41/100	07:31	13:35-14:35/60	06:54	16:46-17:03/17	07:04	07:22-07:40/18	06:21	18:55-19:11/16	05:55	06:31-07:01/30
	17:10		17:45		18:17		19:50		20:21		20:49	18:41-19:20/39
5	07:47	13:02-14:41/99	07:30	13:38-14:33/55	06:53	16:48-17:01/13	07:03	07:21-07:40/19	06:19	18:56-19:10/14	05:55	06:31-07:01/30
	17:11		17:46		18:19		19:51		20:22		20:49	18:42-19:20/38
6	07:47	13:02-14:42/100	07:29	13:41-14:31/50	06:51	16:53-16:57/4	07:01	07:19-07:39/20	06:18	18:57-19:07/10	05:54	06:31-07:02/31
	17:12		17:47		18:20		19:52		20:23		20:50	18:42-19:21/39
7	07:46	13:03-14:42/99	07:28	13:45-14:29/44	06:49		06:59	07:18-07:38/20	06:17	19:00-19:04/4	05:54	06:31-07:02/31
	17:13		17:48		18:21		19:53		20:24		20:50	18:42-19:21/39
8	07:46	13:04-14:43/99	07:26	13:49-14:26/37	06:48		06:58	07:16-07:37/21	06:16		05:54	06:31-07:02/31
	17:14		17:50		18:22		19:54		20:25		20:51	18:42-19:21/39
9	07:46	13:05-14:43/98	07:25	13:55-14:22/27	06:46		06:56	07:15-07:36/21	06:15		05:54	06:31-07:02/31
	17:15		17:51		18:23		19:55		20:26		20:52	18:42-19:21/39
10	07:46	13:05-14:43/98	07:24	14:02-14:15/13	06:45		06:55	07:13-07:33/20	06:14		05:54	06:31-07:03/32
	17:16		17:52		18:24		19:56		20:27		20:52	18:42-19:22/40
11	07:46	13:06-14:43/97	07:23		06:43		06:53	07:11-07:30/19	06:13		05:53	06:31-07:03/32
	17:17		17:53		18:25		19:57	07:30-07:31/1	20:28		20:53	18:43-19:22/39
12	07:46	13:07-14:44/97	07:22		06:42		06:51	07:12-07:30/18	06:11		05:53	06:31-07:04/33
	17:18		17:54		18:26		19:58		20:29		20:53	18:43-19:22/39
13	07:45	13:07-14:43/96	07:21		06:40		06:50	07:13-07:27/14	06:10		05:53	06:32-07:04/32
	17:19		17:56		18:27		19:59		20:30		20:54	18:43-19:23/40
14	07:45	13:08-14:44/96	07:19		06:38		06:48	07:16-07:25/9	06:09		05:53	06:32-07:04/32
	17:20		17:57		18:28		20:00		20:31		20:54	18:43-19:23/40
15	07:45	13:09-14:45/96	07:18		06:37		06:47		06:08		05:53	06:32-07:04/32
	17:21		17:58		18:29		20:01		20:32		20:55	18:44-19:23/39
16	07:44	13:09-14:44/95	07:17		06:35		06:45		06:08	18:53-19:05/12	05:53	06:32-07:05/33
	17:22		17:59		18:30		20:02		20:33		20:55	18:44-19:23/39
17	07:44	13:10-14:45/95	07:15	16:53-17:00/7	06:33		06:44		06:07	18:50-19:07/17	05:53	06:32-07:05/33
	17:23		18:00		18:31		20:03		20:34		20:55	18:44-19:23/39
18	07:43	13:11-14:44/93	07:14	16:49-17:02/13	06:32		06:42		06:06	18:49-19:09/20	05:53	06:32-07:05/33
	17:24		18:01		18:33		20:04		20:35		20:56	18:44-19:24/40
19	07:43	13:12-14:45/93	07:13	16:47-17:05/18	06:30		06:41		06:05	18:47-19:10/23	05:53	06:32-07:05/33
	17:26		18:03		18:34		20:05		20:35		20:56	18:44-19:24/40
20	07:42	13:13-14:44/91	07:11	16:45-17:05/20	06:29		06:39	19:04-19:05/1	06:04	18:46-19:11/25	05:53	06:33-07:06/33
	17:27		18:04		18:35		20:06		20:36		20:56	18:44-19:24/40
21	07:42	13:13-14:44/91	07:10	16:44-17:07/23	06:27		06:38	18:58-19:09/11	06:03	18:46-19:13/27	05:54	06:33-07:06/33
	17:28		18:05		18:36		20:08		20:37		20:56	18:45-19:25/40
22	07:41	13:15-14:44/89	07:09	16:44-17:08/24	06:25		06:37	18:57-19:11/14	06:02	06:41-06:48/7	05:54	06:33-07:06/33
	17:29		18:06		18:37		20:09		20:38	18:45-19:14/29	20:57	18:45-19:25/40
23	07:41	13:16-14:44/88	07:07	16:43-17:08/25	06:24		06:35	18:56-19:13/17	06:02	06:38-06:51/13	05:54	06:33-07:06/33
	17:30		18:07		18:38		20:10		20:39	18:44-19:14/30	20:57	18:45-19:25/40
24	07:40	13:17-14:43/86	07:06	16:43-17:09/26	06:22		06:34	18:54-19:13/19	06:01	06:37-06:53/16	05:54	06:34-07:07/33
	17:31		18:08		18:39		20:11		20:40	18:44-19:16/32	20:57	18:45-19:25/40
25	07:39	13:18-14:43/85	07:04	16:42-17:08/26	06:20		06:32	18:53-19:14/21	06:00	06:36-06:54/18	05:55	06:34-07:07/33
	17:33		18:10		18:40		20:12		20:41	18:43-19:16/33	20:57	18:46-19:25/39
26	07:39	13:20-14:43/83	07:03	16:42-17:09/27	06:19		06:31	18:53-19:14/21	06:00	06:34-06:55/21	05:55	06:34-07:07/33
	17:34		18:11		18:41		20:13		20:42	18:42-19:16/34	20:57	18:46-19:25/39
27	07:38	13:21-14:42/81	07:02	16:42-17:08/26	06:17		06:30	18:52-19:14/22	05:59	06:34-06:56/22	05:55	06:35-07:08/33
	17:35		18:12		18:42		20:14		20:42	18:42-19:17/35	20:57	18:46-19:25/39
28	07:37	13:22-14:42/80	07:00	16:43-17:08/25	06:15	06:34-06:38/4	06:28	18:52-19:14/22	05:58	06:33-06:57/24	05:56	06:35-07:07/32
	17:36		18:13		18:43		20:15		20:43	18:42-19:17/35	20:57	18:47-19:26/39
29	07:36	13:23-14:41/78			07:14	07:32-07:39/7	06:27	18:52-19:14/22	05:58	06:33-06:58/25	05:56	06:35-07:07/32
	17:37				19:44		20:16		20:44	18:42-19:18/36	20:57	18:46-19:26/40
30	07:35	13:25-14:40/75			07:12	07:31-07:41/10	06:26	18:52-19:13/21	05:57	06:32-06:58/26	05:57	06:35-07:08/33
	17:39				19:45		20:17		20:45	18:41-19:18/37	20:57	18:47-19:26/39
31	07:34	13:27-14:39/72			07:11	07:29-07:41/12			05:57	06:32-06:59/27		
	17:40				19:46				20:46	18:42-19:19/37		
Potential sun hours	300		298		370		398		446		450	
Sum of minutes with flicker	2850		744		133		437		763		2133	

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

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

Project:
Flickering Nuoro Sud

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2024-01-12 10:15 / 6

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 3 - WT2

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:57	06:35-07:07/32	06:20		06:50	07:11-07:30/19	07:19		06:52	13:30-13:46/16	07:26	12:48-14:25/97
	20:57	18:47-19:26/39	20:39		19:57	07:30-07:31/1	19:07		17:22		16:58	
2	05:57	06:36-07:08/32	06:21		06:51	07:11-07:31/20	07:20		06:53	13:22-13:52/30	07:27	12:48-14:26/98
	20:57	18:48-19:27/39	20:38		19:55		19:06		17:21		16:58	
3	05:58	06:36-07:08/32	06:22		06:52	07:12-07:33/21	07:21		06:54	13:18-13:57/39	07:28	12:48-14:26/98
	20:57	18:47-19:27/40	20:37		19:54		19:04		17:19		16:58	
4	05:58	06:37-07:08/31	06:23		06:53	07:13-07:34/21	07:22		06:55	13:14-13:59/45	07:29	12:48-14:27/99
	20:57	18:48-19:27/39	20:36		19:52		19:02		17:18		16:58	
5	05:59	06:36-07:08/32	06:24		06:54	07:14-07:34/20	07:23		06:57	13:11-14:01/50	07:30	12:48-14:27/99
	20:57	18:48-19:27/39	20:34		19:50		19:01		17:17		16:57	
6	06:00	06:37-07:08/31	06:25	19:08-19:15/7	06:55	07:15-07:35/20	07:24		06:58	13:08-14:03/55	07:31	12:49-14:28/99
	20:56	18:48-19:27/39	20:33		19:49		18:59		17:16		16:57	
7	06:00	06:37-07:08/31	06:26	19:06-19:17/11	06:56	07:16-07:35/19	07:25		06:59	13:06-14:06/60	07:32	12:49-14:29/100
	20:56	18:48-19:27/39	20:32		19:47		18:58		17:15		16:57	
8	06:01	06:38-07:08/30	06:27	19:04-19:19/15	06:57	07:17-07:35/18	07:26	17:25-17:35/10	07:00	13:03-14:07/64	07:33	12:49-14:29/100
	20:56	18:49-19:27/38	20:31		19:46		18:56		17:14		16:57	
9	06:01	06:39-07:08/29	06:28	19:03-19:20/17	06:58	07:18-07:35/17	07:27	17:22-17:37/15	07:01	13:01-14:08/67	07:34	12:50-14:30/100
	20:55	18:49-19:28/39	20:30		19:44		18:54		17:13		16:57	
10	06:02	06:38-07:07/29	06:29	19:02-19:21/19	06:59	07:19-07:34/15	07:28	17:20-17:38/18	07:02	12:59-14:09/70	07:34	12:50-14:30/100
	20:55	18:49-19:27/38	20:28		19:42		18:53		17:12		16:57	
11	06:03	06:39-07:08/29	06:30	19:01-19:21/20	07:00	07:20-07:34/14	07:29	17:18-17:39/21	07:04	12:58-14:11/73	07:35	12:51-14:31/100
	20:55	18:49-19:27/38	20:27		19:41		18:51		17:11		16:57	
12	06:03	06:40-07:08/28	06:31	19:01-19:22/21	07:00	07:21-07:33/12	07:30	17:17-17:40/23	07:05	12:57-14:12/75	07:36	12:50-14:31/101
	20:54	18:50-19:27/37	20:26		19:39		18:50		17:10		16:58	
13	06:04	06:40-07:07/27	06:32	19:00-19:22/22	07:01	07:22-07:32/10	07:31	17:16-17:40/24	07:06	12:55-14:13/78	07:37	12:51-14:31/100
	20:54	18:50-19:27/37	20:25		19:37		18:48		17:09		16:58	
14	06:05	06:41-07:07/26	06:33	19:00-19:22/22	07:02	07:22-07:30/8	07:32	17:15-17:40/25	07:07	12:54-14:14/80	07:38	12:51-14:32/101
	20:53	18:50-19:27/37	20:23		19:36		18:47		17:08		16:58	15:40-15:45/5
15	06:06	06:42-07:06/24	06:34	19:00-19:22/22	07:03	07:23-07:28/5	07:33	17:14-17:40/26	07:08	12:54-14:15/81	07:38	12:52-14:33/101
	20:53	18:51-19:27/36	20:22		19:34		18:45		17:07		16:58	15:40-15:46/6
16	06:06	06:43-07:06/23	06:35	19:00-19:21/21	07:04	07:24-07:25/1	07:34	17:14-17:40/26	07:09	12:53-14:16/83	07:39	12:52-14:33/101
	20:52	18:52-19:27/35	20:21		19:32		18:44		17:07		16:58	15:39-15:47/8
17	06:07	06:43-07:05/22	06:36	19:00-19:21/21	07:05		07:35	17:14-17:40/26	07:10	12:52-14:17/85	07:40	12:53-14:34/101
	20:51	18:51-19:26/35	20:19		19:31		18:42		17:06		16:59	15:39-15:48/9
18	06:08	06:44-07:04/20	06:36	19:00-19:20/20	07:06		07:36	17:14-17:40/26	07:12	12:51-14:17/86	07:40	12:52-14:33/101
	20:51	18:52-19:26/34	20:18		19:29		18:41		17:05		16:59	15:39-15:48/9
19	06:09	06:46-07:03/17	06:37	19:00-19:18/18	07:07		07:37	17:15-17:39/24	07:13	12:50-14:18/88	07:41	12:53-14:34/101
	20:50	18:53-19:25/32	20:16		19:27		18:39		17:04		16:59	15:39-15:50/11
20	06:10	06:48-07:02/14	06:38	19:01-19:17/16	07:08		07:39	17:15-17:38/23	07:14	12:50-14:19/89	07:42	12:54-14:35/101
	20:49	18:54-19:25/31	20:15		19:26		18:38		17:04		17:00	15:40-15:51/11
21	06:10	06:50-07:00/10	06:39	19:02-19:16/14	07:09		07:40	17:15-17:37/22	07:15	12:49-14:20/91	07:42	12:54-14:35/101
	20:49	18:54-19:24/30	20:14		19:24		18:36		17:03		17:00	15:40-15:51/11
22	06:11	18:55-19:23/28	06:40	19:04-19:14/10	07:10		07:41	17:16-17:36/20	07:16	12:49-14:20/91	07:43	12:55-14:36/101
	20:48		20:12		19:22		18:35		17:02		17:01	15:41-15:52/11
23	06:12	18:56-19:22/26	06:41		07:11		07:42	17:17-17:34/17	07:17	12:48-14:21/93	07:43	12:55-14:36/101
	20:47		20:11		19:21		18:34		17:02		17:01	15:41-15:52/11
24	06:13	18:57-19:21/24	06:42		07:12		07:43	17:20-17:32/12	07:18	12:48-14:21/93	07:44	12:55-14:36/101
	20:46		20:09		19:19		18:32		17:01		17:02	15:41-15:52/11
25	06:14	18:58-19:20/22	06:43		07:13		06:44	16:25-16:27/2	07:20	12:49-14:23/94	07:44	12:56-14:37/101
	20:46		20:08		19:17		17:31		17:01		17:02	15:42-15:53/11
26	06:15	19:00-19:19/19	06:44		07:14		06:45		07:21	12:48-14:23/95	07:44	12:57-14:38/101
	20:45		20:06		19:16		17:29		17:00		17:03	15:43-15:52/9
27	06:16	19:02-19:17/15	06:45		07:15		06:46		07:22	12:48-14:24/96	07:45	12:57-14:38/101
	20:44		20:05		19:14		17:28		17:00		17:04	15:44-15:52/8
28	06:17	19:04-19:13/9	06:46		07:16		06:47		07:23	12:48-14:24/96	07:45	12:58-14:39/101
	20:43		20:03		19:12		17:27		16:59		17:04	15:45-15:53/8
29	06:17		06:47	07:17-07:26/9	07:17		06:49		07:24	12:48-14:24/96	07:45	12:58-14:39/101
	20:42		20:02		19:11		17:26		16:59		17:05	15:47-15:52/5
30	06:18		06:48	07:14-07:28/14	07:18		06:50		07:25	12:48-14:25/97	07:46	12:59-14:39/100
	20:41		20:00		19:09		17:24		16:59		17:06	
31	06:19		06:49	07:12-07:30/18			06:51				07:46	12:59-14:40/101
	20:40		19:58				17:23				17:06	
Potential sun hours	457		426		375		346		300		290	
Sum of minutes with flicker		1463		337		241		360		2256		3252

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 4 - WT4

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:46 10:22-11:23/61 17:08	07:33 10:24-11:40/76 17:41 17:07-17:12/5	06:59 18:14	07:09 18:28-19:22/54 19:47	06:24 20:18	05:56 20:46
2	07:46 10:22-11:23/61 17:08	07:33 10:24-11:40/76 17:42 17:04-17:15/11	06:57 18:15	07:07 18:29-19:23/54 19:48	06:23 20:19	05:56 20:47
3	07:46 10:22-11:24/62 17:09	07:32 10:24-11:40/76 17:43 17:02-17:18/16	06:56 18:16	07:06 18:29-19:22/53 19:49	06:22 20:20	05:56 20:48
4	07:46 10:23-11:25/62 17:10	07:31 10:25-11:39/74 17:45 17:01-17:19/18	06:54 18:17	07:04 18:29-19:21/52 19:50	06:21 20:21	05:55 20:48
5	07:46 10:23-11:26/63 17:11	07:30 10:25-11:39/74 17:46 17:00-17:20/20	06:53 18:19	07:03 18:30-18:56/26 19:51 18:58-19:21/23	06:19 20:22	05:55 20:49
6	07:46 10:23-11:27/64 17:12	07:29 10:25-11:39/74 17:47 16:59-17:21/22	06:51 18:20	07:01 18:31-18:53/22 19:52 19:01-19:20/19	06:18 20:23	05:54 20:50
7	07:46 10:23-11:28/65 17:13	07:27 10:26-11:38/72 17:48 16:59-17:22/23	06:49 18:21	06:59 18:33-18:52/19 19:19-19:24/5 19:53 19:02-19:19/17	06:17 20:24	05:54 20:50
8	07:46 10:23-11:28/65 17:14	07:26 10:27-11:38/71 17:50 16:58-17:23/25	06:48 18:22	06:58 18:35-18:49/14 19:17-19:25/8 19:54 19:03-19:17/14	06:16 20:25	05:54 20:51
9	07:46 10:24-11:29/65 17:15	07:25 10:27-11:37/70 17:51 16:58-17:24/26	06:46 18:23	06:56 19:05-19:13/8 19:55 19:13-19:26/13	06:15 20:26	05:54 20:52
10	07:46 10:23-11:29/66 17:16	07:24 10:27-11:36/69 17:52 16:57-17:23/26	06:45 18:24	06:55 19:06-19:27/21 19:56	06:14 20:27	05:54 20:52
11	07:46 10:23-11:31/68 17:17	07:23 10:28-11:35/67 17:53 16:58-17:23/25	06:43 18:25	06:53 19:05-19:27/22 19:57	06:13 20:28	05:53 20:53
12	07:46 10:23-11:32/69 17:18	07:22 10:29-11:34/65 17:54 16:58-17:24/26	06:42 18:26	06:51 19:05-19:27/22 19:58	06:12 20:29	05:53 20:53
13	07:45 10:23-11:32/69 17:19	07:21 10:30-11:33/63 17:56 16:58-17:24/26	06:40 18:27	06:50 19:04-19:27/23 19:59	06:11 20:30	05:53 20:54
14	07:45 10:23-11:33/70 17:20	07:19 10:31-11:32/61 17:57 16:58-17:23/25	06:38 18:28	06:48 19:04-19:27/23 20:00	06:10 20:31	05:53 20:54
15	07:45 10:24-11:34/70 17:21	07:18 10:31-11:29/58 17:58 16:59-17:22/23	06:37 18:29	06:47 19:04-19:26/22 20:01	06:09 20:32	05:53 20:55
16	07:44 10:23-11:34/71 17:22	07:17 10:32-11:28/56 17:59 17:00-17:22/22	06:35 18:30	06:45 19:04-19:26/22 20:02	06:08 20:33	05:53 20:55
17	07:44 10:24-11:35/71 17:23	07:15 10:34-11:26/52 18:00 17:01-17:21/20	06:33 18:31	06:44 19:04-19:25/21 20:03	06:07 20:34	05:53 20:55
18	07:43 10:23-11:35/72 17:24	07:14 10:34-11:23/49 18:02 17:02-17:19/17	06:32 18:33	06:42 19:05-19:24/19 20:04	06:06 20:35	05:53 20:56
19	07:43 10:24-11:37/73 17:26	07:13 10:36-11:20/44 18:03 17:04-17:17/13	06:30 17:45-17:51/6 18:34	06:41 19:05-19:22/17 20:05	06:05 20:35	05:53 20:56
20	07:42 10:23-11:37/74 17:27	07:11 10:38-11:17/39 18:04 17:08-17:13/5	06:29 17:40-17:55/15 18:35	06:39 19:07-19:21/14 20:06	06:04 20:36	05:54 20:56
21	07:42 10:23-11:37/74 17:28	07:10 10:41-11:13/32 18:05	06:27 17:37-17:57/20 18:36	06:38 19:09-19:18/9 20:07	06:03 20:37	05:54 20:56
22	07:41 10:24-11:38/74 17:29	07:09 10:45-11:09/24 18:06	06:25 17:35-17:59/24 18:37 18:04-18:10/6	06:37 20:09	06:02 20:38	05:54 20:57
23	07:41 10:23-11:38/75 17:30	07:07 10:51-11:00/9 18:07	06:24 17:33-18:13/40 18:38	06:35 20:10	06:02 20:39	05:54 20:57
24	07:40 10:23-11:38/75 17:31	07:06 18:08	06:22 17:32-18:14/42 18:39	06:34 20:11	06:01 20:40	05:54 20:57
25	07:39 10:23-11:39/76 17:33	07:04 18:10	06:20 17:31-18:16/45 18:40	06:32 20:12	06:00 20:41	05:55 20:57
26	07:39 10:24-11:40/76 17:34	07:03 18:11	06:19 17:30-18:16/46 18:41	06:31 20:13	06:00 20:42	05:55 20:57
27	07:38 10:24-11:40/76 17:35	07:02 18:12	06:17 17:29-18:18/49 18:42	06:30 20:14	05:59 20:42	05:55 20:57
28	07:37 10:24-11:40/76 17:36	07:00 18:13	06:15 17:29-18:21/52 18:43	06:28 20:15	05:58 20:43	05:56 20:57
29	07:36 10:24-11:40/76 17:37		07:14 18:28-19:21/53 19:44	06:27 20:16	05:58 20:44	05:56 20:57
30	07:35 10:24-11:40/76 17:39		07:12 18:28-19:22/54 19:45	06:26 20:17	05:57 20:45	05:57 20:57
31	07:34 10:24-11:40/76 17:40		07:11 18:28-19:22/54 19:46		05:57 20:46	
Potential sun hours	300	298	370	398	446	450
Sum of minutes with flicker	2171	1745	506	636	0	0

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 4 - WT4

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July	August		September		October		November		December	
1	05:57	06:20		06:50	19:04-19:26/22	07:19		06:52	09:57-11:06/69	07:26	10:05-11:13/68
	20:57	20:39		19:57		19:07		17:22	16:27-16:53/26	16:58	
2	05:57	06:21		06:51	19:04-19:25/21	07:20		06:53	09:56-11:06/70	07:27	10:06-11:13/67
	20:57	20:38		19:55		19:06		17:21	16:27-16:52/25	16:58	
3	05:58	06:22		06:52	19:03-19:11/8	07:21		06:54	09:56-11:08/72	07:28	10:07-11:13/66
	20:57	20:37		19:54	19:11-19:24/13	19:04		17:19	16:28-16:53/25	16:58	
4	05:59	06:23		06:53	18:32-18:46/14 19:14-19:22/8	07:22		06:55	09:56-11:08/72	07:29	10:07-11:13/66
	20:57	20:36		19:52	19:00-19:14/14	19:02		17:18	16:29-16:52/23	16:58	
5	05:59	06:24		06:54	18:29-18:48/19 19:15-19:20/5	07:23		06:57	09:55-11:09/74	07:30	10:08-11:13/65
	20:57	20:34		19:50	18:58-19:15/17	19:01		17:17	16:29-16:51/22	16:58	
6	06:00	06:25		06:55	18:27-18:49/22	07:24		06:58	09:55-11:09/74	07:31	10:09-11:13/64
	20:56	20:33		19:49	18:57-19:16/19	18:59		17:16	16:30-16:50/20	16:57	
7	06:00	06:26		06:56	18:26-18:51/25	07:25		06:59	09:55-11:10/75	07:32	10:10-11:13/63
	20:56	20:32		19:47	18:53-19:16/23	18:58		17:15	16:32-16:50/18	16:57	
8	06:01	06:27		06:57	18:24-19:16/52	07:26		07:00	09:55-11:10/75	07:33	10:11-11:13/62
	20:56	20:31		19:46		18:56		17:14	16:33-16:48/15	16:57	
9	06:01	06:28		06:58	18:23-19:16/53	07:27		07:01	09:55-11:11/76	07:34	10:11-11:13/62
	20:55	20:30		19:44		18:54		17:13	16:35-16:46/11	16:57	
10	06:02	06:29		06:59	18:22-19:16/54	07:28		07:02	09:55-11:11/76	07:34	10:12-11:13/61
	20:55	20:28		19:42		18:53		17:12	16:39-16:42/3	16:57	
11	06:03	06:30		07:00	18:21-19:15/54	07:29		07:03	09:56-11:12/76	07:35	10:13-11:14/61
	20:55	20:27		19:41		18:51		17:11		16:57	
12	06:04	06:31		07:00	18:19-19:14/55	07:30		07:05	09:56-11:12/76	07:36	10:13-11:13/60
	20:54	20:26		19:39		18:50		17:10		16:58	
13	06:04	06:32		07:01	18:19-19:13/54	07:31		07:06	09:56-11:12/76	07:37	10:14-11:14/60
	20:54	20:25		19:37		18:48		17:09		16:58	
14	06:05	06:33		07:02	18:18-19:12/54	07:32		07:07	09:56-11:12/76	07:38	10:15-11:14/59
	20:53	20:23		19:36		18:47		17:08		16:58	
15	06:06	06:34		07:03	18:18-19:10/52	07:33		07:08	09:57-11:13/76	07:38	10:16-11:15/59
	20:53	20:22		19:34		18:45		17:07		16:58	
16	06:06	06:35		07:04	18:18-19:08/50	07:34		07:09	09:57-11:13/76	07:39	10:16-11:14/58
	20:52	20:21		19:32		18:44		17:07		16:58	
17	06:07	06:36		07:05	18:18-19:05/47	07:35		07:10	09:57-11:12/75	07:40	10:17-11:15/58
	20:51	20:19		19:31		18:42		17:06		16:59	
18	06:08	06:37		07:06	18:18-19:03/45	07:36		07:12	09:57-11:12/75	07:40	10:17-11:15/58
	20:51	20:18		19:29		18:41		17:05		16:59	
19	06:09	06:37		07:07	18:19-19:02/43	07:37	11:19-11:35/16	07:13	09:57-11:12/75	07:41	10:18-11:15/57
	20:50	20:16		19:27		18:39		17:04		16:59	
20	06:10	06:38		07:08	18:19-19:00/41	07:39	11:14-11:41/27	07:14	09:59-11:13/74	07:42	10:19-11:16/57
	20:49	20:15		19:26		18:38		17:04		17:00	
21	06:10	06:39		07:09	18:20-18:45/25	07:40	11:10-11:45/35	07:15	09:59-11:13/74	07:42	10:19-11:16/57
	20:49	20:14		19:24	18:48-18:57/9	18:36		17:03		17:00	
22	06:11	06:40	19:13-19:23/10	07:10	18:22-18:43/21	07:41	11:08-11:48/40	07:16	09:59-11:13/74	07:43	10:20-11:17/57
	20:48	20:12		19:22		18:35	17:37-17:45/8	17:02		17:01	
23	06:12	06:41	19:11-19:25/14	07:11	18:23-18:40/17	07:42	11:06-11:51/45	07:17	10:00-11:13/73	07:43	10:20-11:17/57
	20:47	20:11		19:21		18:34	17:33-17:48/15	17:02		17:01	
24	06:13	06:42	19:09-19:26/17	07:12	18:26-18:36/10	07:43	11:05-11:54/49	07:18	10:00-11:12/72	07:44	10:20-11:17/57
	20:46	20:09		19:19		18:32	17:31-17:49/18	17:01		17:02	
25	06:14	06:43	19:08-19:27/19	07:13		06:44	10:03-10:56/53	07:19	10:02-11:13/71	07:44	10:21-11:18/57
	20:45	20:08		19:17		17:31	16:31-16:51/20	17:01		17:02	
26	06:15	06:44	19:07-19:28/21	07:14		06:45	10:02-10:58/56	07:21	10:02-11:13/71	07:44	10:21-11:19/58
	20:45	20:06		19:16		17:29	16:29-16:52/23	17:00		17:03	
27	06:16	06:45	19:06-19:28/22	07:15		06:46	10:00-10:59/59	07:22	10:03-11:13/70	07:45	10:21-11:19/58
	20:44	20:05		19:14		17:28	16:28-16:52/24	17:00		17:04	
28	06:17	06:46	19:05-19:28/23	07:16		06:47	09:59-11:01/62	07:23	10:03-11:13/70	07:45	10:22-11:20/58
	20:43	20:03		19:12		17:27	16:28-16:52/24	16:59		17:04	
29	06:18	06:47	19:05-19:28/23	07:17		06:49	09:59-11:03/64	07:24	10:04-11:13/69	07:45	10:22-11:21/59
	20:42	20:01		19:11		17:26	16:27-16:53/26	16:59		17:05	
30	06:18	06:48	19:05-19:28/23	07:18		06:50	09:58-11:04/66	07:25	10:04-11:13/69	07:46	10:22-11:21/59
	20:41	20:00		19:09		17:24	16:28-16:53/25	16:59		17:06	
31	06:19	06:49	19:04-19:26/22			06:51	09:57-11:05/68			07:46	10:22-11:22/60
	20:40	19:58				17:23	16:27-16:53/26			17:07	
Potential sun hours	457	426		375		346		300		290	
Sum of minutes with flicker	0	194		966		849		2389		1868	

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

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

Project:
Flickering Nuoro Sud

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 5 - WT5

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:46	14:20-15:11/51	07:33	07:53-08:08/15	06:59		07:09		06:24	19:17-19:29/12	05:56	06:17-06:40/23 20:20-20:21/1
	17:07	16:03-16:23/20	17:41		18:14		19:47		20:18	19:29-19:41/12	20:46	18:47-19:32/45
2	07:46	14:20-15:11/51	07:33	07:52-08:08/16	06:57		07:07		06:23	19:17-19:41/24	05:56	06:17-06:41/24 20:19-20:22/3
	17:08	16:03-16:24/21	17:42		18:15		19:48		20:19		20:47	18:48-19:33/45
3	07:46	14:21-15:11/50	07:32	07:51-08:08/17	06:56		07:06		06:22	19:18-19:41/23	05:55	06:17-06:42/25 20:19-20:23/4
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	17:10	16:04-16:24/20	17:45		18:17		19:50		20:21		20:48	18:47-19:33/46
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	17:11	16:05-16:25/20	17:46		18:19		19:51		20:22		20:49	18:48-19:34/46
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	17:12	16:05-16:25/20	17:47		18:20		19:52		20:23		20:50	18:48-19:34/46
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	17:14	16:07-16:26/19	17:49		18:22		19:54		20:25		20:51	18:48-19:34/46
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	17:15	16:08-16:26/18	17:51		18:23		19:55		20:26		20:52	18:48-19:35/47
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	17:16	16:08-16:26/18	17:52		18:24		19:56		20:27		20:52	18:48-19:35/47
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	17:17	16:09-16:26/17	17:53		18:25		19:57		20:28		20:53	18:48-19:35/47
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	17:18	16:10-16:26/16	17:54		18:26		19:58		20:29		20:53	18:49-19:36/47
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	17:21	16:14-16:25/11	17:58		18:29		20:01		20:32		20:55	18:49-19:37/48
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	17:22	16:16-16:23/7	17:59		18:30		20:02		20:33		20:55	18:49-19:37/48
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	17:23		18:00		18:31		20:03		20:34		20:55	18:49-19:37/48
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	17:37				19:44		20:16	19:33-19:42/9	20:44	18:49-19:31/42	20:57	18:52-19:39/47
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	17:39				19:45		20:17	19:31-19:41/10	20:45	18:48-19:31/43	20:57	18:53-19:40/47
31	07:34	07:54-08:08/14			07:11	18:53-18:59/6			05:57	06:18-06:41/23		
	17:40				19:46				20:46	18:48-19:32/44		
Potential sun hours	300		298		370		398		446		450	
Sum of minutes with flicker	1166		365		426		384		942		2509	

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 10

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 5 - WT5

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:57 06:19-06:47/28 20:22-20:32/10	06:20	06:50	07:19 18:29-18:32/3	06:52 07:13-07:36/23	07:26 14:11-14:53/42
	20:57 18:52-19:40/48	20:39	19:57	19:07	17:22	16:58 15:51-16:08/17
2	05:57 06:20-06:48/28 20:23-20:32/9	06:21	06:51	07:20	06:53 07:14-07:36/22	07:27 14:11-14:54/43
	20:57 18:53-19:40/47	20:38	19:55	19:06	17:21	16:58 15:51-16:09/18
3	05:58 06:20-06:47/27 20:23-20:32/9	06:22	06:52	07:21	06:54 07:16-07:38/22	07:28 14:10-14:55/45
	20:57 18:53-19:40/47	20:37	19:54	19:04	17:19	16:58 15:51-16:09/18
4	05:58 06:21-06:48/27 20:24-20:32/8	06:23 19:35-19:43/8	06:53	07:22	06:55 07:17-07:38/21	07:29 14:10-14:56/46
	20:57 18:54-19:40/46	20:36	19:52	19:02	17:18	16:58 15:51-16:10/19
5	05:59 06:21-06:48/27 20:24-20:31/7	06:24 19:33-19:45/12	06:54	07:23	06:57 07:18-07:38/20	07:30 14:10-14:57/47
	20:57 18:53-19:40/47	20:34	19:50	19:01	17:17	16:57 15:51-16:11/20
6	06:00 06:22-06:48/26 20:25-20:31/6	06:25 19:30-19:46/16	06:55	07:24	06:58 07:19-07:38/19	07:31 14:10-14:58/48
	20:56 18:54-19:40/46	20:33	19:49	18:59	17:16	16:57 15:51-16:11/20
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	20:55 18:55-19:41/46	20:30	19:44	18:54	17:13	16:57 15:53-16:13/20
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	20:55 18:56-19:40/44	20:27	19:41	18:51	17:11	16:57 15:53-16:13/20
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	20:41	20:00	19:09	17:24	16:59 15:51-16:07/16	17:06 16:02-16:23/21
31	06:19	06:49		06:51 07:12-07:35/23		07:46 14:19-15:10/51
	20:40	19:58		17:23		17:06 16:02-16:23/21
Potential sun hours	457	426	375	346	300	290
Sum of minutes with flicker	1681	548	429	179	620	2195

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 11

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 6 - WT10

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:46 08:13-09:41/88 12:46-15:42/176	07:33 07:58-09:22/84	06:59 07:19-08:29/70	07:09 07:36-08:19/43	06:24 06:43-07:20/37	05:56 06:17-07:17/60
	17:07 09:41-09:45/4	17:41 12:54-15:58/184	18:14 13:26-15:52/146	19:47 08:19-08:21/2	20:18 18:55-19:27/32	20:46 19:00-19:51/51
2	07:46 08:13-09:40/87 12:47-15:43/176	07:33 07:57-09:17/80	06:57 07:19-08:28/69	07:07 07:37-08:20/43	06:23 06:42-07:20/38	05:56 06:17-07:17/60
	17:08 09:40-09:45/5	17:42 12:54-15:58/184	18:15 13:30-15:52/142	19:48	20:19 18:57-19:27/30	20:47 19:00-19:52/52
3	07:46 08:14-09:39/85 12:47-15:43/176	07:32 07:55-09:13/78	06:56 07:16-08:24/68 13:32-15:50/138	07:06 07:37-08:19/42	06:22 06:41-07:21/40	05:55 06:17-07:17/60
	17:09 09:39-09:45/6	17:43 12:55-15:59/184	18:16 08:24-08:25/1	19:49	20:20 18:58-19:27/29	20:48 19:01-19:53/52
4	07:46 08:14-09:35/81 12:47-15:44/177	07:31 07:54-09:11/77	06:54 07:13-08:23/70	07:04 07:37-08:17/40	06:20 06:40-07:21/41	05:55 06:17-07:17/60
	17:10 09:32-09:46/14	17:45 12:55-15:59/184	18:17 13:36-15:50/134	19:50	20:21 18:58-19:28/30	20:49 19:00-19:53/53
5	07:46 08:14-09:35/81 12:48-15:44/176	07:30 07:53-09:10/77	06:52 07:11-08:20/69	07:02 07:39-08:16/37	06:19 06:39-07:21/42	05:55 06:18-07:17/59
	17:11 09:32-09:46/14	17:46 12:56-15:59/183	18:18 13:39-15:48/129	19:51	20:22 18:57-19:27/30	20:49 19:01-19:53/52
6	07:46 08:14-09:35/81 12:48-15:45/177	07:29 07:52-09:09/77	06:51 07:10-08:19/69	07:01 07:39-08:14/35	06:18 06:37-07:20/43	05:54 06:18-07:17/59
	17:12 09:32-09:46/14	17:47 12:56-16:00/184	18:20 13:44-15:47/123	19:52	20:23 18:56-19:27/31	20:50 19:01-19:54/53
7	07:46 08:14-09:35/81 12:48-15:46/178	07:27 07:51-09:07/76	06:49 07:08-08:17/69	06:59 07:41-08:13/32	06:17 06:36-07:21/45	05:54 06:19-07:17/58
	17:13 09:32-09:47/15	17:48 12:57-16:00/183	18:21 13:48-15:46/118	19:53	20:24 18:56-19:29/33	20:50 19:01-19:54/53
8	07:46 08:14-09:35/81 12:49-15:47/178	07:26 07:50-09:06/76	06:48 07:06-08:15/69	06:58 07:42-08:11/29	06:16 06:35-07:21/46	05:54 06:19-07:16/57
	17:14 09:32-09:47/15	17:49 12:58-16:00/182	18:22 13:52-15:44/112	19:54 18:59-19:09/10	20:25 18:55-19:30/35	20:51 19:01-19:54/53
9	07:46 08:15-09:35/80 12:49-15:47/178	07:25 07:45-09:04/79	06:46 07:05-08:15/70	06:56 07:43-08:08/25	06:15 06:34-07:21/47	05:54 06:19-07:16/57
	17:15 09:32-09:47/15	17:51 12:58-16:00/182	18:23 13:57-15:43/106	19:55 18:56-19:11/15	20:26 18:55-19:31/36	20:52 19:01-19:55/54
10	07:46 08:14-09:34/80 12:49-15:47/178	07:24 07:43-09:01/78 12:58-16:00/182	06:45 07:03-08:13/70	06:55 07:46-08:06/20	06:14 06:33-07:21/48	05:53 06:20-07:16/56
	17:16 09:31-09:47/16	17:52 09:01-09:02/1	18:24 14:02-15:40/98	19:56 18:54-19:13/19	20:27 18:55-19:32/37	20:52 19:02-19:55/53
11	07:46 08:14-09:34/80 12:49-15:48/179	07:23 07:42-08:55/73 12:59-16:00/181	06:43 07:02-08:12/70	06:53 07:49-08:01/12	06:12 06:32-07:21/49	05:53 06:21-07:16/55
	17:17 09:31-09:47/16	17:53 08:55-09:01/6	18:25 14:09-15:39/90	19:57 18:53-19:13/20	20:28 18:55-19:33/38	20:53 19:02-19:55/53
12	07:46 08:14-09:33/79 12:50-15:49/179	07:22 07:41-09:00/79	06:41 07:00-08:11/71 14:41-15:37/56	06:51 18:52-19:14/22	06:11 06:31-07:21/50	05:53 06:21-07:16/55
	17:18 09:30-09:47/17	17:54 13:00-16:00/180	18:26 14:18-14:35/17	19:58	20:29 18:55-19:33/38	20:53 19:02-19:56/54
13	07:45 08:14-09:32/78 12:49-15:49/180	07:21 07:40-08:58/78	06:40 06:58-08:08/70	06:50 18:51-19:14/23	06:10 06:30-07:21/51	05:53 06:21-07:16/55
	17:19 09:29-09:46/17	17:55 13:01-16:00/179	18:27 14:44-15:34/50	19:59	20:30 18:55-19:33/38	20:54 19:03-19:56/53
14	07:45 08:14-09:30/76 12:50-15:50/180	07:19 07:39-08:56/77	06:38 06:57-08:07/70	06:48 18:51-19:15/24	06:09 06:29-07:21/52	05:53 06:22-07:16/54
	17:20 09:27-09:47/20	17:57 13:01-16:00/179	18:28 14:48-15:32/44	20:00	20:31 18:55-19:34/39	20:54 19:03-19:56/53
15	07:45 08:15-09:30/75 12:51-15:51/180	07:18 07:37-08:52/75	06:37 06:55-08:05/70	06:47 18:50-19:18/28	06:08 06:28-07:20/52	05:53 06:22-07:16/54
	17:21 09:27-09:47/20	17:58 13:02-16:00/178	18:29 14:51-15:28/37	20:01	20:32 18:55-19:34/39	20:55 19:03-19:57/54
16	07:44 08:14-09:29/75 12:50-15:51/181	07:17 07:36-08:51/75	06:35 06:54-08:03/69	06:45 18:50-19:20/30	06:07 06:27-07:20/53	05:53 06:23-07:16/53
	17:22 09:26-09:46/20	17:59 13:03-16:00/177	18:30 14:56-15:23/27	20:02	20:33 18:55-19:34/39	20:55 19:03-19:57/54
17	07:44 08:15-09:29/74 12:51-15:52/181	07:15 07:35-08:49/74 13:05-16:00/175	06:33 06:52-07:59/67	06:44 07:02-07:06/4	06:07 06:27-07:21/54	05:53 06:23-07:16/53
	17:23 09:25-09:46/21	18:00 08:49-08:51/2	18:31 15:05-15:16/11	20:03 18:50-19:20/30	20:34 18:56-19:35/39	20:55 19:03-19:57/54
18	07:43 08:13-09:29/76 12:51-15:52/181	07:14 07:33-08:47/74 13:05-15:59/174	06:32 06:50-07:55/65	06:42 07:01-07:08/7	06:06 06:26-07:20/54	05:53 06:23-07:16/53
	17:24 09:26-09:46/20	18:01 08:47-08:49/2	18:32	20:04 18:50-19:21/31	20:35 18:56-19:35/39	20:56 19:04-19:57/53
19	07:43 08:12-09:29/77 12:52-15:53/181	07:13 07:32-08:46/74 13:07-15:59/172	06:30 06:49-07:54/65	06:41 06:59-07:10/11	06:05 06:25-07:20/55	05:53 06:23-07:16/53
	17:25 09:26-09:46/20	18:03 08:46-08:49/3	18:33	20:05 18:50-19:22/32	20:35 18:57-19:36/39	20:56 19:04-19:57/53
20	07:42 08:10-09:28/78 12:52-15:53/181	07:11 07:30-08:43/73 13:08-15:58/170	06:29 06:47-07:51/64	06:39 06:58-07:12/14	06:04 06:24-07:20/56	05:53 06:23-07:16/53
	17:27 09:24-09:45/21	18:04 08:42-08:47/5	18:35	20:06 18:51-19:23/32	20:36 18:57-19:36/39	20:56 19:04-19:57/53
21	07:42 08:09-09:27/78 12:51-15:53/182	07:10 07:29-08:43/74 13:09-15:58/169	06:27 06:45-07:47/62	06:38 06:56-07:12/16	06:03 06:24-07:20/56	05:54 06:24-07:17/53
	17:28 09:23-09:44/21	18:05 08:43-08:46/3	18:36	20:07 18:51-19:24/33	20:37 18:57-19:36/39	20:56 19:05-19:58/53
22	07:41 08:08-09:27/79 12:52-15:54/182	07:09 07:28-08:41/73 13:11-15:58/167	06:25 06:44-07:42/58	06:36 06:55-07:14/19	06:02 06:23-07:20/57	05:54 06:24-07:17/53
	17:29 09:23-09:44/21	18:06 08:41-08:45/4	18:37	20:08 18:52-19:24/32	20:38 18:59-19:37/38	20:57 19:05-19:58/53
23	07:41 08:07-09:26/79 12:52-15:54/182	07:07 07:26-08:38/72 13:13-15:57/164	06:24 06:42-07:40/58	06:35 06:54-07:15/21	06:02 06:22-07:19/57	05:54 06:24-07:17/53
	17:30 09:22-09:42/20	18:07 08:38-08:42/4	18:38	20:10 18:52-19:25/33	20:39 18:59-19:37/38	20:57 19:05-19:58/53
24	07:40 08:06-09:25/79 12:52-15:54/182	07:06 07:25-08:36/71 13:15-15:57/162	06:22 06:40-07:38/58	06:34 06:52-07:16/24	06:01 06:21-07:19/58	05:54 06:24-07:17/53
	17:31 09:21-09:41/20	18:08 08:35-08:41/6	18:39	20:11 18:52-19:24/32	20:40 19:00-19:37/37	20:57 19:05-19:58/53
25	07:39 08:05-09:24/79 12:52-15:54/182	07:04 07:23-08:37/74	06:20 06:39-07:38/59	06:32 06:51-07:17/26	06:00 06:21-07:19/58	05:55 06:25-07:18/53
	17:32 09:20-09:40/20	18:10 13:16-15:56/160	18:40	20:12 18:52-19:25/33	20:41 19:01-19:37/36	20:57 19:05-19:59/54
26	07:39 08:05-09:23/78 12:53-15:56/183	07:03 07:22-08:35/73	06:19 06:37-07:36/59	06:31 06:50-07:18/28	06:00 06:20-07:18/58	05:55 06:25-07:18/53
	17:34 09:19-09:39/20	18:11 13:19-15:55/156	18:41	20:13 18:53-19:25/32	20:42 19:00-19:37/37	20:57 19:05-19:59/54
27	07:38 08:05-09:22/77 12:53-15:56/183	07:02 07:21-08:33/72	06:17 06:36-07:34/58	06:29 06:48-07:18/30	05:59 06:20-07:19/59 19:41-19:45/4	05:55 06:24-07:18/54
	17:35 09:18-09:37/19	18:12 13:21-15:54/153	18:42	20:14 18:52-19:24/32	20:42 19:01-19:38/37	20:57 19:05-19:59/54
28	07:37 08:03-09:19/76 12:53-15:56/183	07:00 07:21-08:31/70	06:15 06:37-07:33/56	06:28 06:47-07:19/32	05:58 06:19-07:18/59 19:38-19:47/9	05:56 06:25-07:19/54
	17:36 09:15-09:35/20	18:13 13:24-15:54/150	18:43	20:15 18:53-19:24/31	20:43 19:00-19:37/37	20:57 19:06-19:59/53
29	07:36 08:02-09:15/73 12:53-15:57/184		07:14 07:36-08:30/54	06:27 06:46-07:19/33	05:58 06:19-07:18/59	05:56 06:25-07:19/54
	17:37 09:12-09:32/20		19:44	20:16 18:54-19:26/32	20:44 19:00-19:49/49	20:57 19:06-19:59/53
30	07:35 08:00-09:16/76 12:54-15:57/183		07:12 07:36-08:27/51	06:25 06:44-07:19/35	05:57 06:18-07:18/60	05:56 06:25-07:20/55
	17:38 09:15-09:27/12		19:45	20:17 18:54-19:26/32	20:45 19:00-19:49/49	20:57 19:06-20:00/54
31	07:34 07:59-09:12/73 12:54-15:57/183		07:11 07:36-08:24/48		05:57 06:18-07:18/60	
	17:40 09:10-09:24/14		19:46		20:46 19:00-19:51/51	
Potential sun hours	300	298	370	398	446	450
Sum of minutes with flicker	8448	7025	3574	1298	2765	3253

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

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

Project:

Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 12
Licensed user:
Ing. Bruno Manca
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+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 6 - WT10

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:57 06:25-07:20/55	06:20 06:42-07:31/49	06:50 07:48-08:00/12	07:19 07:39-08:49/70	06:52 07:13-08:31/78 12:28-15:29/181	07:26 07:56-09:16/80 12:31-15:30/179
	20:57 19:06-20:00/54	20:39 19:05-19:44/39	19:57 18:52-19:12/20	19:07 15:22-16:15/53	17:22 08:31-08:32/1	16:58 09:13-09:29/16
2	05:57 06:25-07:21/56	06:21 06:43-07:32/49	06:51 07:44-08:04/20	07:20 07:40-08:50/70	06:53 07:14-08:33/79	07:27 07:57-09:17/80 12:32-15:30/178
	20:57 19:07-19:59/52	20:38 19:05-19:43/38	19:55 18:52-19:11/19	19:06 14:51-16:17/86	17:21 12:27-15:29/182	16:58 09:14-09:30/16
3	05:58 06:25-07:21/56	06:22 06:44-07:32/48	06:52 07:41-08:06/25	07:21 07:41-08:51/70	06:54 07:20-08:36/76	07:28 07:58-09:18/80 12:32-15:31/179
	20:57 19:06-20:00/54	20:37 19:05-19:42/37	19:54 18:54-19:09/15	19:04 14:43-16:18/95	17:19 12:27-15:30/183	16:58 09:15-09:30/15
4	05:58 06:25-07:22/57	06:23 06:45-07:31/46	06:53 07:39-08:08/29	07:22 07:42-08:52/70	06:55 07:21-08:37/76	07:29 07:58-09:19/81 12:33-15:31/178
	20:57 19:07-20:00/53	20:36 19:06-19:42/36	19:52 18:56-19:06/10	19:02 14:37-16:20/103	17:18 12:27-15:30/183	16:58 09:16-09:31/15
5	05:59 06:24-07:22/58	06:24 06:46-07:31/45	06:54 07:37-08:09/32	07:23 07:43-08:53/70	06:57 07:22-08:39/77	07:30 07:59-09:20/81 12:33-15:31/178
	20:57 19:07-20:00/53	20:34 19:05-19:39/34	19:50	19:01 14:32-16:21/109	17:17 12:26-15:29/183	16:57 09:17-09:32/15
6	05:59 06:25-07:23/58	06:25 06:46-07:30/44	06:55 07:35-08:10/35	07:24 07:44-08:53/69	06:58 07:23-08:37/74 12:26-15:29/183	07:31 08:00-09:21/81 12:34-15:31/177
	20:56 19:07-20:00/53	20:33 19:05-19:38/33	19:49	18:59 14:26-16:22/116	17:16 08:36-08:40/4	16:57 09:18-09:32/14
7	06:00 06:24-07:23/59	06:26 06:47-07:30/43	06:56 07:34-08:11/37	07:25 07:45-08:51/66 14:22-16:22/120	06:59 07:25-08:42/77	07:32 08:01-09:22/81 12:35-15:32/177
	20:56 19:07-20:00/53	20:32 19:06-19:36/30	19:47	18:58 08:50-08:54/4	17:15 12:26-15:30/184	16:57 09:19-09:33/14
8	06:01 06:24-07:24/60	06:27 06:48-07:30/42	06:57 07:32-08:12/40	07:26 07:46-08:55/69	07:00 07:26-08:45/79	07:33 08:02-09:23/81 12:35-15:32/177
	20:56 19:07-20:00/53	20:31 19:07-19:36/29	19:45	18:56 14:17-16:23/126	17:14 12:26-15:29/183	16:57 09:20-09:34/14
9	06:01 06:25-07:24/59	06:28 06:49-07:29/40	06:58 07:31-08:13/42	07:27 07:47-08:57/70	07:01 07:28-08:49/81	07:34 08:03-09:27/84 12:36-15:32/176
	20:55 19:08-19:59/51	20:30 19:07-19:36/29	19:44	18:54 14:13-16:24/131	17:13 12:25-15:29/184	16:57 09:26-09:34/8
10	06:02 06:24-07:24/60	06:29 06:50-07:29/39	06:58 07:30-08:13/43	07:28 07:49-08:57/68 14:09-16:25/136	07:02 07:29-08:53/84	07:34 08:03-09:29/86 12:37-15:33/176
	20:55 19:08-19:59/51	20:28 19:07-19:36/29	19:42	18:53 08:56-08:59/3	17:12 12:25-15:29/184	16:57 09:29-09:35/6
11	06:03 06:25-07:25/60	06:30 06:51-07:29/38	06:59 07:29-08:14/45	07:29 07:53-09:00/67	07:03 07:31-08:45/74 12:26-15:29/183	07:35 08:04-09:32/88 12:37-15:33/176
	20:55 19:08-19:59/51	20:27 19:05-19:36/31	19:41	18:51 14:05-16:25/140	17:11 08:43-08:57/14	16:57 09:32-09:36/4
12	06:03 06:26-07:26/60	06:31 06:52-07:28/36	07:00 07:29-08:16/47	07:30 07:53-09:02/69	07:05 07:32-08:48/76 12:26-15:29/183	07:36 08:04-09:32/88 12:37-15:33/176
	20:54 19:09-19:59/50	20:26 19:04-19:35/31	19:39	18:50 14:02-16:26/144	17:10 08:47-08:59/12	16:57 09:32-09:36/4
13	06:04 06:26-07:26/60	06:32 06:53-07:28/35	07:01 07:27-08:18/51	07:31 07:53-09:03/70	07:06 07:34-08:47/73 12:25-15:29/184	07:37 08:05-09:34/89 12:38-15:33/175
	20:54 19:08-19:58/50	20:25 19:03-19:34/31	19:37	18:48 13:58-16:26/148	17:09 08:44-09:04/20	16:58 09:34-09:36/2
14	06:05 06:27-07:26/59	06:33 06:54-07:27/33	07:02 07:26-08:20/54	07:32 07:53-09:05/72	07:07 07:35-08:52/77 12:25-15:28/183	07:38 08:06-09:35/89 12:39-15:34/175
	20:53 19:09-19:58/49	20:23 19:02-19:33/31	19:36	18:47 13:55-16:26/151	17:08 08:48-09:07/19	16:58 09:35-09:37/2
15	06:06 06:28-07:27/59	06:33 06:55-07:26/31	07:03 07:26-08:22/56	07:33 07:54-09:04/70 13:52-16:27/155	07:08 07:38-08:55/77 12:26-15:28/182	07:38 08:07-09:37/90 12:39-15:34/175
	20:53 19:09-19:57/48	20:22 19:01-19:32/31	19:34	18:45 09:04-09:06/2	17:07 08:51-09:10/19	16:58 09:37-09:38/1
16	06:06 06:29-07:28/59 19:48-19:55/7	06:34 06:56-07:25/29	07:04 07:26-08:23/57	07:34 07:54-09:07/73	07:09 07:38-08:57/79 12:26-15:29/183	07:39 08:07-09:37/90 12:39-15:34/175
	20:52 19:09-19:46/37	20:21 19:00-19:31/31	19:32	18:44 13:50-16:27/157	17:06 08:53-09:12/19	16:58 09:37-09:38/1
17	06:07 06:29-07:28/59	06:35 06:57-07:24/27	07:05 07:25-08:24/59	07:35 07:56-09:06/70 13:47-16:27/160	07:10 07:39-08:58/79 12:26-15:28/182	07:40 08:08-09:38/90 12:40-15:35/175
	20:51 19:09-19:46/37	20:19 19:00-19:31/31	19:31	18:42 09:04-09:11/7	17:06 08:54-09:14/20	16:59 09:38-09:39/1
18	06:08 06:30-07:28/58	06:36 06:58-07:23/25	07:06 07:26-08:25/59	07:36 07:57-09:09/72 13:46-16:28/162	07:12 07:40-08:59/79 12:26-15:28/182	07:40 08:09-09:39/90 12:40-15:35/175
	20:51 19:10-19:47/37	20:18 18:58-19:30/32	19:29	18:41 09:08-09:13/5	17:05 08:55-09:15/20	16:59 09:39-09:40/1
19	06:09 06:31-07:29/58	06:37 06:58-07:21/23	07:07 07:27-08:26/59	07:37 07:58-09:11/73 13:43-16:29/166	07:13 07:41-09:00/79 12:26-15:28/182	07:41 08:09-09:39/90
	20:50 19:10-19:47/37	20:16 18:58-19:30/32	19:27	18:39 09:11-09:15/4	17:04 08:56-09:16/20	16:59 12:41-15:35/174
20	06:10 06:32-07:29/57	06:38 06:59-07:20/21	07:08 07:28-08:26/58	07:38 07:59-09:13/74 13:41-16:29/168	07:14 07:43-09:02/79 12:27-15:29/182	07:42 08:10-09:40/90
	20:49 19:10-19:47/37	20:15 18:57-19:30/33	19:26	18:38 09:13-09:16/3	17:03 08:58-09:19/21	17:00 12:42-15:36/174
21	06:10 06:32-07:29/57	06:39 07:00-07:19/19	07:09 07:29-08:26/57	07:40 08:00-09:09/69 13:40-16:29/169	07:15 07:45-09:03/78 12:27-15:29/182	07:42 08:10-09:40/90
	20:49 19:08-19:46/38	20:13 18:57-19:29/32	19:24	18:36 09:07-09:17/10	17:03 08:59-09:20/21	17:00 12:42-15:36/174
22	06:11 06:33-07:29/56	06:40 07:01-07:17/16	07:10 07:30-08:31/61	07:41 08:01-09:13/72 13:38-16:29/171	07:16 07:46-09:04/78 12:28-15:29/181	07:43 08:11-09:41/90
	20:48 19:08-19:46/38	20:12 18:56-19:28/32	19:22	18:35 09:12-09:18/6	17:02 09:00-09:21/21	17:01 12:43-15:37/174
23	06:12 06:34-07:30/56	06:41 07:02-07:15/13	07:11 07:31-08:34/63	07:42 08:02-09:16/74 13:36-16:29/173	07:17 07:48-09:05/77 12:28-15:29/181	07:43 08:11-09:41/90
	20:47 19:08-19:46/38	20:11 18:55-19:27/32	19:21	18:33 09:16-09:19/3	17:02 09:02-09:22/20	17:01 12:43-15:37/174
24	06:13 06:35-07:30/55	06:42 07:03-07:13/10	07:12 07:32-08:36/64	07:43 08:04-09:18/74 13:36-16:30/174	07:18 07:50-09:06/76 12:28-15:29/181	07:44 08:11-09:41/90
	20:46 19:07-19:46/39	20:09 18:54-19:25/31	19:19	18:32 09:18-09:20/2	17:01 09:03-09:23/20	17:02 12:43-15:37/174
25	06:14 06:36-07:31/55	06:43 07:04-07:11/7	07:13 07:33-08:37/64	06:44 07:05-08:19/74 12:34-15:30/176	07:20 07:53-09:07/74 12:29-15:30/181	07:44 08:12-09:42/90 12:44-15:38/174
	20:46 19:07-19:46/39	20:08 18:53-19:24/31	19:17 08:37-08:38/1	17:31 08:19-08:21/2	17:01 09:03-09:24/21	17:02 09:42-09:43/1
26	06:15 06:37-07:31/54	06:44 07:05-07:08/3	07:14 07:34-08:41/67	06:45 07:06-08:19/73 12:33-15:30/177	07:21 07:53-09:08/75 12:29-15:30/181	07:44 08:12-09:42/90 12:44-15:39/175
	20:45 19:07-19:46/39	20:06 18:53-19:23/30	19:16	17:29 08:17-08:21/4	17:00 09:05-09:25/20	17:03 09:42-09:43/1
27	06:16 06:37-07:30/53	06:45 18:52-19:21/29	07:15 07:35-08:43/68	06:46 07:07-08:22/75	07:22 07:54-09:08/74 12:30-15:30/180	07:45 08:12-09:42/90 12:44-15:39/175
	20:44 19:06-19:45/39	20:05	19:14 15:41-16:04/23	17:28 12:32-15:29/177	17:00 09:04-09:26/22	17:03 09:42-09:43/1
28	06:16 06:38-07:31/53	06:46 18:52-19:19/27	07:16 07:36-08:45/69	06:47 07:08-08:25/77	07:23 07:54-09:10/76 12:30-15:30/180	07:45 08:13-09:43/90 12:45-15:40/175
	20:43 19:05-19:45/40	20:03	19:12 15:35-16:08/33	17:27 12:30-15:29/179	16:59 09:07-09:27/20	17:04 09:43-09:44/1
29	06:17 06:39-07:31/52	06:47 18:52-19:15/23	07:17 07:37-08:47/70	06:48 07:10-08:28/78	07:24 07:55-09:12/77 12:31-15:30/179	07:45 08:13-09:42/89 12:46-15:41/175
	20:42 19:05-19:45/40	20:01	19:11 15:30-16:11/41	17:25 12:29-15:29/180	16:59 09:09-09:28/19	17:05 09:42-09:44/2
30	06:18 06:40-07:31/51	06:48 18:51-19:14/23	07:18 07:38-08:48/70	06:50 07:11-08:30/79	07:25 07:55-09:14/79 12:31-15:30/179	07:46 08:13-09:42/89 12:46-15:41/175
	20:41 19:05-19:44/39	20:00	19:09 15:26-16:13/47	17:24 12:29-15:30/181	16:59 09:11-09:28/17	17:06 09:42-09:44/2
31	06:19 06:41-07:31/50	06:49 18:51-19:13/22		06:51 07:12-08:27/75 12:29-15:30/181		07:46 08:13-09:42/89 12:46-15:41/175
	20:40 19:05-19:44/39	19:58		17:23 08:27-08:31/4		17:06 09:42-09:44/2
Potential sun hours	457	426	375	346	300	290
Sum of minutes with flicker	3154	1771	1722	6835	8102	8275

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 13

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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 7 - WT6

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:46	08:40-09:07/27	07:33	07:57-08:06/9	06:58	08:01-08:53/52	07:09		06:24		05:56	07:01-07:43/42
	17:07		17:41		18:14	16:35-17:25/50	19:47		20:18		20:46	
2	07:46	08:41-09:07/26	07:32	07:55-08:08/13	06:57	08:01-08:53/52	07:07		06:23		05:56	07:01-07:44/43
	17:08		17:42		18:15	16:36-17:25/49	19:48		20:19		20:47	
3	07:46	08:41-09:07/26	07:32	07:54-08:10/16	06:55	08:00-08:53/53	07:06		06:22		05:55	07:01-07:44/43
	17:09		17:43		18:16	16:36-17:24/48	19:49		20:20		20:48	
4	07:46	08:42-09:07/25	07:31	07:53-08:11/18	06:54	08:00-08:54/54	07:04		06:20		05:55	07:01-07:44/43
	17:10		17:45		18:17	16:37-17:24/47	19:50		20:21		20:48	
5	07:46	08:43-09:07/24	07:29	07:52-08:12/20	06:52	08:00-08:53/53	07:02		06:19		05:55	07:01-07:44/43
	17:11		17:46		18:18	16:37-17:22/45	19:51		20:22		20:49	
6	07:46	08:44-09:08/24	07:28	07:52-08:13/21	06:51	08:00-08:53/53	07:01		06:18		05:54	07:01-07:45/44
	17:12		17:47		18:20	16:38-17:21/43	19:52		20:23		20:50	
7	07:46	08:44-09:08/24	07:27	07:52-08:13/21	06:49	07:59-08:52/53	06:59		06:17		05:54	07:02-07:45/43
	17:13		17:48		18:21	16:39-17:20/41	19:53		20:24		20:50	
8	07:46	08:45-09:08/23	07:26	07:52-08:14/22	06:48	07:59-08:51/52	06:58		06:16		05:54	07:01-07:45/44
	17:14		17:49	16:55-17:08/13	18:22	16:40-17:18/38	19:54		20:25		20:51	
9	07:46	08:47-09:08/21	07:25	07:52-08:14/22	06:46	07:59-08:51/52	06:56		06:15		05:54	07:01-07:45/44
	17:15		17:51	16:51-17:12/21	18:23	16:42-17:17/35	19:55		20:26		20:52	
10	07:46	08:47-09:07/20	07:24	07:51-08:13/22	06:45	07:59-08:50/51	06:55		06:14		05:53	07:02-07:45/43
	17:16		17:52	16:48-17:14/26	18:24	16:43-17:15/32	19:56		20:27		20:52	
11	07:46	08:48-09:07/19	07:23	07:49-08:13/24	06:43	08:00-08:50/50	06:53		06:12		05:53	07:02-07:46/44
	17:17		17:53	16:46-17:16/30	18:25	16:45-17:13/28	19:57		20:28		20:53	
12	07:46	08:50-09:07/17	07:22	07:48-08:13/25	06:41	08:00-08:49/49	06:51		06:11		05:53	07:02-07:46/44
	17:18		17:54	16:45-17:18/33	18:26	16:47-17:10/23	19:58		20:29		20:53	
13	07:45	08:50-09:06/16	07:20	07:47-08:13/26	06:40	07:59-08:47/48	06:50		06:10	07:16-07:26/10	05:53	07:02-07:46/44
	17:19		17:55	16:43-17:20/37	18:27	16:50-17:06/16	19:59		20:30		20:54	
14	07:45	08:52-09:05/13	07:19	07:47-08:12/25	06:38	08:01-08:47/46	06:48		06:09	07:13-07:30/17	05:53	07:03-07:46/43
	17:20		17:57	16:41-17:20/39	18:28		20:00		20:31		20:54	
15	07:45	08:55-09:04/9	07:18	07:45-08:10/25	06:37	08:01-08:45/44	06:47		06:08	07:10-07:32/22	05:53	07:03-07:47/44
	17:21		17:58	16:41-17:22/41	18:29		20:01		20:32		20:54	
16	07:44		07:17	07:45-08:09/24	06:35	08:01-08:43/42	06:45		06:07	07:10-07:34/24	05:53	07:03-07:47/44
	17:22		17:59	16:40-17:23/43	18:30		20:02		20:33		20:55	
17	07:44		07:15	07:45-08:09/24 16:38-17:23/45	06:33	08:03-08:42/39	06:44		06:07	07:08-07:35/27	05:53	06:15-06:18/3
	17:23		18:00	08:21-08:38/17	18:31		20:03		20:34		20:55	07:03-07:47/44
18	07:43		07:14	07:45-08:08/23 16:38-17:24/46	06:32	08:03-08:40/37	06:42		06:06	07:07-07:36/29	05:53	06:15-06:19/4
	17:24		18:01	08:17-08:41/24	18:32		20:04		20:34		20:56	07:03-07:47/44
19	07:43		07:13	07:45-08:08/23 16:38-17:25/47	06:30	08:05-08:38/33	06:41		06:05	07:06-07:37/31	05:53	06:15-06:20/5
	17:25		18:03	08:15-08:43/28	18:33		20:05		20:35		20:56	07:03-07:47/44
20	07:42		07:11	07:45-08:07/22 16:37-17:25/48	06:28	08:07-08:35/28	06:39		06:04	07:05-07:38/33	05:53	06:16-06:21/5
	17:27		18:04	08:12-08:45/33	18:35		20:06		20:36		20:56	07:04-07:48/44
21	07:42		07:10	07:46-08:07/21 16:36-17:26/50	06:27	08:08-08:32/24	06:38		06:03	07:05-07:39/34	05:54	06:16-06:21/5
	17:28		18:05	08:11-08:47/36	18:36		20:07		20:37		20:56	07:04-07:48/44
22	07:41		07:09	07:47-08:06/19 16:36-17:27/51	06:25	08:12-08:28/16	06:36		06:02	07:04-07:39/35	05:54	06:16-06:21/5
	17:29		18:06	08:09-08:49/40	18:37		20:08		20:38		20:57	07:04-07:48/44
23	07:41		07:07	07:47-08:04/17 16:36-17:26/50	06:24		06:35		06:02	07:03-07:40/37	05:54	06:16-06:21/5
	17:30		18:07	08:07-08:49/42	18:38		20:09		20:39		20:57	07:04-07:48/44
24	07:40		07:06	07:49-08:03/14 16:36-17:27/51	06:22		06:34		06:01	07:03-07:41/38	05:54	06:17-06:21/4
	17:31		18:08	08:07-08:51/44	18:39		20:10		20:40		20:57	07:04-07:48/44
25	07:39		07:04	07:51-08:00/9 16:35-17:26/51	06:20		06:32		06:00	07:02-07:41/39	05:55	06:17-06:21/4
	17:33		18:10	08:05-08:51/46	18:40		20:12		20:41		20:57	07:05-07:49/44
26	07:38		07:03	08:04-08:52/48	06:19		06:31		06:00	07:02-07:41/39	05:55	06:18-06:20/2
	17:34		18:11	16:36-17:26/50	18:41		20:13		20:42		20:57	07:05-07:49/44
27	07:38		07:01	08:03-08:52/49	06:17		06:29		05:59	07:02-07:42/40	05:55	07:05-07:49/44
	17:35		18:12	16:35-17:26/51	18:42		20:14		20:42		20:57	
28	07:37		07:00	08:03-08:53/50	06:15		06:28		05:58	07:01-07:42/41	05:56	07:06-07:50/44
	17:36		18:13	16:36-17:26/50	18:43		20:15		20:43		20:57	
29	07:36				07:14		06:27		05:58	07:02-07:43/41	05:56	07:05-07:49/44
	17:37				19:44		20:16		20:44		20:57	
30	07:35				07:12		06:25		05:57	07:01-07:43/42	05:56	07:06-07:50/44
	17:39				19:45		20:17		20:45		20:57	
31	07:34				07:11				05:57	07:01-07:43/42		
	17:40				19:46				20:46			
Potential sun hours	300		298		370		398		446		450	
Sum of minutes with flicker		314		1835		1476		0		621		1353

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 14

Licensed user:
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Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 7 - WT6

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:57 07:06-07:50/44 20:57	06:20 20:39	06:50 19:57	07:19 08:39-09:28/49 19:07 17:27-17:47/20	06:52 07:21-07:43/22 17:22 16:18-16:43/25	07:26 08:30-08:49/19 16:58
2	05:57 07:07-07:51/44 20:57	06:21 20:38	06:51 19:55	07:20 08:38-09:28/50 19:06 17:24-17:50/26	06:53 07:21-07:43/22 17:21 16:21-16:40/19	07:27 08:30-08:50/20 16:58
3	05:58 07:06-07:50/44 20:57	06:22 20:37	06:52 19:54	07:21 08:38-09:29/51 19:04 17:21-17:52/31	06:54 07:22-07:44/22 17:19 16:25-16:36/11	07:28 08:30-08:51/21 16:58
4	05:58 07:07-07:51/44 20:57	06:23 20:35	06:53 19:52	07:22 08:37-09:29/52 19:02 17:20-17:54/34	06:55 07:22-07:43/21 17:18	07:29 08:30-08:52/22 16:58
5	05:59 07:07-07:51/44 20:56	06:24 20:34	06:54 19:50	07:23 08:36-09:29/53 19:01 17:18-17:55/37	06:56 07:22-07:43/21 17:17	07:30 08:30-08:53/23 16:57
6	06:00 07:08-07:51/43 20:56	06:25 20:33	06:55 19:49	07:24 08:36-09:29/53 18:59 17:16-17:56/40	06:58 07:22-07:42/20 17:16	07:31 08:30-08:54/24 16:57
7	06:00 07:07-07:51/44 20:56	06:26 20:32	06:56 19:47	07:25 08:36-09:29/53 18:58 17:15-17:57/42	06:59 07:24-07:42/18 17:15	07:32 08:30-08:55/25 16:57
8	06:01 07:08-07:51/43 20:56	06:27 20:31	06:57 19:45	07:26 08:35-09:29/54 18:56 17:14-17:57/43	07:00 07:25-07:41/16 17:14	07:33 08:30-08:55/25 16:57
9	06:01 07:09-07:52/43 20:55	06:28 20:30	06:58 19:44	07:27 08:35-09:28/53 18:54 17:12-17:58/46	07:01 07:26-07:39/13 17:13	07:33 08:30-08:56/26 16:57
10	06:02 07:08-07:51/43 20:55	06:29 20:28	06:58 19:42	07:28 08:35-09:28/53 18:53 17:11-17:58/47	07:02 07:28-07:37/9 17:12	07:34 08:31-08:57/26 16:57
11	06:03 07:09-07:51/42 20:54	06:30 20:27	06:59 19:40	07:29 08:35-09:27/52 18:51 17:10-17:58/48	07:03 17:11	07:35 08:30-08:57/27 16:57
12	06:03 07:09-07:52/43 20:54	06:31 20:26	07:00 19:39	07:30 08:35-09:27/52 18:50 17:09-17:58/49	07:05 17:10	07:36 08:31-08:57/26 16:57
13	06:04 07:09-07:51/42 20:54	06:32 20:25	07:01 19:37	07:31 08:35-09:26/51 18:48 17:09-17:58/49	07:06 17:09	07:37 08:31-08:58/27 16:58
14	06:05 07:10-07:51/41 20:53	06:33 20:23	07:02 19:36	07:32 08:35-09:25/50 18:47 17:08-17:58/50	07:07 17:08	07:37 08:32-08:59/27 16:58
15	06:06 07:10-07:51/41 20:53	06:34 20:22	07:03 19:34	07:33 08:36-09:24/48 18:45 17:07-17:58/51	07:08 17:07	07:38 08:33-09:00/27 16:58
16	06:06 07:11-07:52/41 20:52	06:34 20:20	07:04 19:32	07:34 08:36-09:23/47 18:44 17:07-17:58/51	07:09 17:06	07:39 08:32-09:00/28 16:58
17	06:07 07:11-07:51/40 20:51	06:35 20:19	07:05 19:31	07:35 08:22-08:32/10 17:07-17:58/51 18:42 08:37-09:22/45	07:10 17:06	07:40 08:33-09:01/28 16:59
18	06:08 07:11-07:51/40 20:51	06:36 20:18	07:06 19:29	07:36 08:20-08:35/15 17:07-17:58/51 18:41 08:38-09:22/44	07:12 17:05	07:40 08:33-09:00/27 16:59
19	06:09 07:12-07:51/39 20:50	06:37 20:16	07:07 19:27	07:37 08:18-08:36/18 17:07-17:58/51 18:39 08:39-09:20/41	07:13 17:04	07:41 08:34-09:01/27 16:59
20	06:10 07:13-07:50/37 20:49	06:38 20:15	07:08 19:26	07:38 08:17-08:37/20 17:07-17:57/50 18:38 08:40-09:19/39	07:14 17:04	07:41 08:35-09:02/27 17:00
21	06:10 07:13-07:49/36 20:49	06:39 20:13	07:09 08:59-09:12/13 19:24	07:40 08:16-08:38/22 17:07-17:56/49 18:36 08:42-09:17/35	07:15 17:03	07:42 08:35-09:02/27 17:00
22	06:11 07:14-07:49/35 20:48	06:40 20:12	07:10 08:55-09:16/21 19:22	07:41 08:15-08:38/23 17:07-17:56/49 18:35 08:43-09:15/32	07:16 17:02	07:43 08:36-09:03/27 17:01
23	06:12 07:15-07:48/33 20:47	06:41 20:10	07:11 08:52-09:19/27 19:20	07:42 08:15-08:38/23 17:07-17:55/48 18:33 08:45-09:12/27	07:17 17:02	07:43 08:36-09:03/27 17:01
24	06:13 07:16-07:48/32 20:46	06:42 20:09	07:12 08:49-09:21/32 19:19	07:43 08:15-08:39/24 17:08-17:54/46 18:32 08:48-09:09/21	07:18 17:01	07:44 08:36-09:03/27 17:02
25	06:14 07:17-07:47/30 20:45	06:43 20:08	07:13 08:47-09:23/36 19:17	06:44 07:15-07:38/23 16:09-16:54/45 17:31 07:52-08:06/14	07:19 17:01	07:44 08:37-09:04/27 17:02
26	06:15 07:18-07:46/28 20:45	06:44 20:06	07:14 08:46-09:24/38 19:15	06:45 07:15-07:39/24 17:29 16:10-16:53/43	07:21 17:00	07:44 08:37-09:04/27 17:03
27	06:16 07:19-07:45/26 20:44	06:45 20:04	07:15 08:44-09:25/41 19:14	06:46 07:15-07:40/25 17:28 16:11-16:51/40	07:22 08:34-08:43/9 17:00	07:45 08:37-09:05/28 17:04
28	06:16 07:20-07:43/23 20:43	06:46 20:03	07:16 08:43-09:26/43 19:12	06:47 07:16-07:41/25 17:27 16:11-16:50/39	07:23 08:32-08:45/13 16:59	07:45 08:38-09:06/28 17:04
29	06:17 07:22-07:41/19 20:42	06:47 20:01	07:17 08:41-09:27/46 19:11	06:48 07:16-07:42/26 17:25 16:12-16:48/36	07:24 08:31-08:47/16 16:59	07:45 08:39-09:06/27 17:05
30	06:18 07:24-07:39/15 20:41	06:48 20:00	07:18 08:40-09:27/47 19:09 17:32-17:43/11	06:50 07:18-07:43/25 17:24 16:15-16:47/32	07:25 08:31-08:48/17 16:59	07:46 08:39-09:06/27 17:06
31	06:19 07:28-07:35/7 20:40	06:49 19:58		06:51 07:19-07:43/24 17:23 16:16-16:45/29		07:46 08:40-09:06/26 17:06
Potential sun hours	457	426	375	346	300	290
Sum of minutes with flicker	1126	0	355	2769	294	800

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 15

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 8 - WT7

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:46 10:01-16:12/371 17:07	07:33 10:07-12:06/119 17:41 14:26-16:42/136	06:58 14:30-15:37/67 18:14 16:14-16:50/36	07:09 07:30-07:47/17 19:47	06:24 19:09-19:39/30 20:18 19:39-19:40/1	05:56 20:46
2	07:46 10:01-16:12/371 17:08	07:32 10:08-12:05/117 14:30-15:09/39 17:42 14:27-16:43/136	06:57 14:31-15:37/66 18:15 16:15-16:50/35	07:07 07:32-07:45/13 19:48	06:23 19:09-19:39/30 20:19	05:56 20:47
3	07:46 10:01-16:13/372 17:09	07:31 10:08-12:03/115 14:33-15:07/34 17:43 14:26-16:44/138	06:55 14:32-15:35/63 18:16 16:16-16:48/32	07:06 07:34-07:42/8 19:49	06:22 19:10-19:38/28 20:20 19:38-19:39/1	05:55 20:48
4	07:46 10:02-16:13/371 17:10	07:31 10:09-11:17/68 14:26-16:45/139 17:45 11:18-12:00/42 14:35-15:06/31	06:54 14:34-15:35/61 18:17 16:18-16:47/29	07:04 19:50	06:20 19:11-19:37/26 20:21 19:37-19:38/1	05:55 20:48
5	07:46 10:02-16:14/372 17:11	07:29 10:10-11:17/67 14:25-16:45/140 17:46 11:20-11:57/37 14:38-15:04/26	06:52 14:35-15:33/58 18:18 16:19-16:45/26	07:02 19:51	06:19 19:11-19:35/24 20:22 19:35-19:37/2	05:55 20:49
6	07:46 10:02-16:15/373 17:12	07:28 10:10-11:16/66 14:25-16:46/141 17:47 11:23-11:54/31 14:42-15:01/19	06:51 14:37-15:31/54 18:20 16:20-16:43/23	07:01 19:15-19:26/11 19:52	06:18 19:11-19:33/22 20:23 19:33-19:36/3	05:54 20:50
7	07:46 10:02-16:15/373 17:13	07:27 10:11-11:15/64 14:25-16:47/142 17:48 11:28-11:49/21 14:49-14:55/6	06:49 14:39-15:30/51 18:21 16:23-16:40/17	06:59 19:12-19:27/15 19:53	06:17 19:13-19:31/18 20:24 19:31-19:35/4	05:54 20:50
8	07:46 10:03-16:16/373 17:14	07:26 10:12-11:14/62 17:49 14:24-16:47/143	06:48 14:41-15:28/47 18:22 16:28-16:35/7	06:58 19:11-19:29/18 19:54	06:16 19:14-19:26/12 20:25 19:26-19:34/8	05:54 20:51
9	07:46 10:03-16:17/374 17:15	07:25 10:13-11:13/60 17:51 14:24-16:47/143	06:46 14:44-15:27/43 18:23	06:56 19:09-19:29/20 19:55	06:15 19:15-19:32/17 20:26	05:54 20:52
10	07:46 10:03-16:17/374 17:16	07:24 10:13-11:11/58 17:52 14:23-16:47/144	06:45 14:46-15:25/39 18:24	06:54 19:08-19:30/22 19:56	06:13 19:17-19:30/13 20:27	05:53 20:52
11	07:46 10:03-16:17/374 17:17	07:23 10:14-11:10/56 17:53 14:23-16:47/144	06:43 14:50-15:23/33 18:25	06:53 19:07-19:30/23 19:57	06:12 19:21-19:26/5 20:28	05:53 20:53
12	07:46 10:04-16:18/374 17:18	07:22 10:16-11:08/52 17:54 14:23-16:47/144	06:41 14:54-15:19/25 18:26	06:51 19:07-19:31/24 19:58	06:11 20:29	05:53 20:53
13	07:45 10:03-16:18/375 17:19	07:20 10:17-11:07/50 16:48-16:49/1 17:55 14:23-16:48/145	06:40 14:59-15:13/14 18:27	06:50 19:06-19:30/24 19:59	06:10 20:30	05:53 20:54
14	07:45 10:04-16:19/375 17:20	07:19 10:18-11:04/46 16:47-16:50/3 17:57 14:22-16:47/145	06:38 18:28	06:48 19:05-19:31/26 20:00 19:31-19:32/1	06:09 20:31	05:53 20:54
15	07:45 10:04-12:15/131 13:05-16:19/194 17:21 12:16-13:02/46	07:18 10:20-11:02/42 16:47-16:51/4 17:58 14:23-16:47/144	06:37 18:29	06:47 19:03-19:30/27 20:01 19:30-19:32/2	06:08 20:32	05:53 20:54
16	07:44 10:04-12:15/131 13:05-16:20/195 17:22 12:17-13:01/44	07:17 10:22-10:59/37 15:44-16:47/63 17:59 14:23-15:41/78 16:47-16:52/5	06:35 18:30	06:45 19:03-19:31/28 20:02 19:30-19:32/2	06:07 20:33	05:53 20:55
17	07:44 10:04-12:15/131 13:07-16:20/193 17:23 12:19-13:00/41	07:15 10:24-10:55/31 15:49-15:55/6 16:45-16:52/7 18:00 14:22-15:40/78 15:59-16:45/46	06:33 18:31	06:44 19:02-19:31/29 20:03 19:29-19:34/5	06:06 20:34	05:53 20:55
18	07:43 10:04-12:15/131 13:08-16:20/192 17:24 12:21-12:59/38	07:14 10:27-10:51/24 16:00-16:45/45 18:01 14:23-15:41/78 16:45-16:53/8	06:32 18:32	06:42 19:02-19:30/28 20:04 19:28-19:37/9	06:06 20:34	05:53 20:56
19	07:43 10:04-12:14/130 13:09-16:20/191 17:25 12:23-12:57/34	07:13 10:34-10:44/10 16:01-16:44/43 18:03 14:23-15:41/78 16:44-16:53/9	06:30 18:33	06:41 19:01-19:28/27 20:05 19:26-19:38/12	06:05 20:35	05:53 20:56
20	07:42 10:05-12:15/130 13:11-16:21/190 17:27 12:26-12:55/29	07:11 14:23-15:40/77 16:42-16:53/11 18:04 16:01-16:42/41	06:28 18:34	06:39 19:01-19:26/25 20:06 19:24-19:39/15	06:04 20:36	05:53 20:56
21	07:42 10:04-12:14/130 13:12-16:20/188 17:28 12:29-12:52/23	07:10 14:24-15:41/77 16:41-16:54/13 18:05 16:03-16:41/38	06:27 06:45-06:49/4 18:36	06:38 19:01-19:23/22 20:07 19:21-19:39/18	06:03 20:37	05:54 20:56
22	07:41 10:05-12:15/130 13:15-16:21/186 17:29 12:35-12:48/13	07:09 14:25-15:41/76 16:39-16:54/15 18:06 16:04-16:39/35	06:25 06:44-06:51/7 18:37	06:36 19:01-19:40/39 20:08	06:02 20:38	05:54 20:57
23	07:40 10:05-12:14/129 17:30 13:16-16:21/185	07:07 14:25-15:40/75 16:35-16:54/19 18:07 16:05-16:35/30	06:24 06:42-06:51/9 18:38	06:35 19:02-19:41/39 20:09	06:02 20:39	05:54 20:57
24	07:40 10:05-12:13/128 17:31 13:18-16:21/183	07:06 14:26-15:40/74 18:08 16:07-16:54/47	06:22 06:40-06:52/12 18:39	06:34 19:01-19:40/39 20:10	06:01 20:40	05:54 20:57
25	07:39 10:05-12:13/128 17:32 13:21-16:29/188	07:04 14:26-15:39/73 18:09 16:09-16:53/44	06:20 06:39-06:52/13 18:40	06:32 19:02-19:41/39 20:11	06:00 20:41	05:54 20:57
26	07:38 10:06-12:13/127 13:55-16:33/158 17:34 13:25-13:53/28	07:03 14:27-15:39/72 18:11 16:12-16:53/41	06:19 06:37-06:52/15 18:41	06:31 19:02-19:40/38 20:13	05:59 20:42	05:55 20:57
27	07:38 10:06-12:12/126 13:58-16:35/157 17:35 13:29-13:49/20	07:01 14:28-15:38/70 18:12 16:13-16:52/39	06:17 06:35-06:51/16 18:42	06:29 19:03-19:41/38 20:14	05:59 20:42	05:55 20:57
28	07:37 10:06-12:11/125 14:00-16:37/157 17:36 13:35-13:43/8	07:00 14:29-15:38/69 18:13 16:14-16:52/38	06:15 06:34-06:52/18 18:43	06:28 19:05-19:41/36 20:15	05:58 20:43	05:56 20:57
29	07:36 10:07-12:10/123 17:37 14:04-16:39/155		07:14 07:32-07:51/19 19:44	06:27 19:07-19:41/34 20:16	05:58 20:44	05:56 20:57
30	07:35 10:07-12:09/122 14:21-16:40/139 17:38 14:10-14:20/10		07:12 07:30-07:49/19 19:45	06:25 19:08-19:40/32 20:17	05:57 20:45	05:56 20:57
31	07:34 10:07-12:08/121 17:40 14:23-16:41/138		07:10 07:29-07:49/20 19:46		05:57 20:46	
Potential sun hours	300	298	370	398	446	450
Sum of minutes with flicker	10718	5025	978	796	245	0

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 16

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 8 - WT7

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:57 20:57	06:20 20:39	06:50 19:06-19:29/23 19:57	07:19 15:34-15:56/22 19:07	06:52 09:43-10:41/58 17:22 13:53-16:16/143	07:26 09:45-16:00/375 16:58
2	05:57 20:57	06:21 19:30-19:39/9 20:38	06:51 19:06-19:28/22 19:55	07:20 15:29-15:59/30 19:06	06:53 09:42-10:42/60 17:20 13:53-16:16/143	07:27 09:46-16:00/374 16:58
3	05:58 20:57	06:22 19:27-19:41/14 20:37	06:52 19:07-19:27/20 19:53	07:21 15:25-16:01/36 19:04	06:54 09:42-10:44/62 13:53-16:16/143 17:19 11:06-11:10/4	07:28 09:46-16:00/374 16:58
4	05:58 20:57	06:23 19:25-19:43/18 20:35	06:53 19:08-19:26/18 19:52	07:22 15:22-16:03/41 19:02	06:55 09:41-10:45/64 13:54-16:16/142 17:18 10:57-11:20/23 14:17-14:26/9	07:29 09:47-16:00/373 16:57
5	05:59 20:56	06:24 19:23-19:39/16 20:34 19:39-19:44/5	06:54 19:09-19:25/16 19:50	07:23 15:20-16:05/45 19:01	06:56 09:40-10:46/66 13:55-16:16/141 17:17 10:53-11:24/31 14:11-14:31/20	07:30 09:47-16:00/373 16:57
6	05:59 20:56	06:25 19:22-19:42/20 20:33 19:42-19:45/3	06:55 19:11-19:22/11 19:49	07:24 15:17-16:06/49 18:59 17:02-17:15/13	06:58 09:39-10:47/68 13:55-16:15/140 17:16 10:50-11:28/38 14:08-14:34/26	07:31 09:48-16:01/373 16:57
7	06:00 20:56	06:26 19:21-19:44/23 20:32 19:44-19:46/2	06:56 19:47	07:25 15:14-16:07/53 18:57 16:58-17:18/20	06:59 09:39-11:30/111 14:05-14:36/31 17:15 13:56-16:15/139	07:32 09:49-16:01/372 16:57
8	06:01 20:56	06:27 19:20-19:45/25 20:31 19:45-19:47/2	06:57 19:45	07:26 15:12-16:08/56 18:56 16:55-17:20/25	07:00 09:39-11:34/115 14:04-14:38/34 17:14 13:57-16:15/138	07:33 09:50-16:01/371 16:57
9	06:01 20:55	06:28 19:19-19:46/27 20:30 19:46-19:47/1	06:57 07:28-07:35/7 19:44	07:27 15:10-16:09/59 18:54 16:53-17:21/28	07:01 09:39-11:36/117 14:00-14:40/40 17:13 13:58-16:14/136	07:33 09:50-16:02/372 16:57
10	06:02 20:55	06:29 19:19-19:47/28 20:28 19:47-19:48/1	06:58 07:25-07:38/13 19:42	07:28 15:08-16:09/61 18:53 16:51-17:22/31	07:02 09:38-11:37/119 17:12 13:57-16:13/136	07:34 09:51-16:02/371 16:57
11	06:03 20:54	06:30 19:18-19:48/30 20:27	06:59 07:23-07:40/17 19:40	07:29 15:06-16:10/64 18:51 16:50-17:23/33	07:03 09:38-11:39/121 17:11 13:54-16:12/138	07:35 09:51-16:02/371 16:57
12	06:03 20:54	06:31 19:17-19:48/31 20:26	07:00 07:20-07:40/20 19:39	07:30 15:04-16:10/66 18:50 16:48-17:24/36	07:05 09:39-11:41/122 13:53-16:12/139 17:10 13:41-13:52/11	07:36 09:52-16:02/370 16:57
13	06:04 20:54	06:32 19:16-19:49/33 20:24	07:01 07:21-07:40/19 19:37	07:31 15:02-16:11/69 18:48 16:47-17:24/37	07:06 09:39-11:42/123 17:09 13:36-16:11/155	07:37 09:53-16:03/370 16:57
14	06:05 20:53	06:32 19:14-19:49/35 20:23	07:02 07:22-07:41/19 19:35	07:32 15:01-16:11/70 18:47 16:46-17:24/38	07:07 09:38-11:43/125 13:32-16:09/157 17:08 13:07-13:16/9	07:38 09:53-16:03/370 16:58
15	06:06 20:53	06:33 19:12-19:48/36 20:22	07:03 07:23-07:41/18 19:34	07:33 15:00-16:11/71 18:45 16:45-17:25/40	07:08 09:38-11:44/126 13:30-16:07/157 17:07 13:00-13:22/22	07:38 09:53-16:03/370 16:58
16	06:06 20:52	06:34 19:11-19:48/37 20:20	07:04 07:24-07:41/17 19:32	07:34 14:58-16:11/73 18:43 16:42-17:25/43	07:09 09:39-11:46/127 13:28-16:06/158 17:06 12:57-13:26/29	07:39 09:54-16:03/369 16:58
17	06:07 20:51	06:35 19:09-19:47/38 20:19	07:05 07:25-07:40/15 19:30	07:35 14:57-16:11/74 18:42 16:39-17:25/46	07:10 09:39-11:47/128 17:06 12:55-16:03/188	07:40 09:55-16:04/369 16:58
18	06:08 20:51	06:36 19:08-19:47/39 20:18	07:06 07:26-07:40/14 19:29	07:36 14:57-16:12/75 17:01-17:24/23 18:41 16:37-17:02/25	07:12 09:39-11:47/128 17:05 12:52-15:55/183	07:40 09:55-16:04/369 16:59
19	06:09 20:50	06:37 19:07-19:46/39 20:16	07:07 07:27-07:39/12 19:27	07:37 14:56-16:12/76 17:08-17:25/17 18:39 16:36-17:08/32	07:13 09:39-11:48/129 17:04 12:50-15:55/185	07:41 09:56-16:05/369 16:59
20	06:09 20:49	06:38 19:06-19:46/40 20:15	07:08 07:28-07:38/10 19:25	07:38 14:55-16:12/77 17:10-17:25/15 18:38 16:34-17:10/36	07:14 09:40-11:50/130 12:50-15:55/185 17:03 12:10-12:23/13	07:41 09:41-09:44/3 17:00 09:57-16:05/368
21	06:10 20:49	06:39 19:06-19:45/39 20:13	07:09 07:29-07:37/8 19:24	07:39 14:54-16:11/77 17:12-17:24/12 18:36 16:33-17:12/39	07:15 09:40-11:50/130 12:48-15:56/188 17:03 12:05-12:28/23	07:42 09:40-09:44/4 17:00 09:57-16:06/369
22	06:11 20:48	06:40 19:05-19:28/23 20:12 19:26-19:44/18	07:10 07:30-07:35/5 19:22	07:41 14:54-16:11/77 17:13-17:24/11 18:35 16:31-17:13/42	07:16 09:41-11:51/130 12:47-15:57/190 17:02 12:02-12:31/29	07:43 09:41-09:45/4 17:01 09:57-16:06/369
23	06:12 20:47	06:41 19:05-19:31/26 20:10 19:29-19:43/14	07:11 07:31-07:32/1 19:20	07:42 11:01-11:17/16 16:30-17:14/44 18:33 14:53-16:11/78 17:14-17:23/9	07:17 09:41-11:51/130 12:46-15:57/191 17:02 12:00-12:34/34	07:43 09:41-09:45/4 17:01 09:58-16:07/369
24	06:13 20:46	06:42 19:05-19:32/27 20:09 19:30-19:41/11	07:12 19:19	07:43 10:56-11:22/26 16:29-17:15/46 18:32 14:52-16:10/78 17:15-17:22/7	07:18 09:41-11:52/131 12:45-15:57/192 17:01 11:58-12:36/38	07:44 09:43-09:44/1 17:02 09:58-16:07/369
25	06:14 20:45	06:43 19:05-19:33/28 20:07 19:31-19:40/9	07:13 19:17	06:44 09:54-10:27/33 15:17-15:27/10 16:16-16:22/6 17:31 13:53-15:11/78 15:29-16:16/47	07:19 09:41-11:52/131 12:44-15:57/193 17:01 11:56-12:37/41	07:44 09:59-16:08/369 17:02
26	06:15 20:45	06:44 19:05-19:34/29 20:06 19:32-19:37/5	07:14 19:15	06:45 09:51-10:30/39 15:12-16:16/64 17:29 13:53-15:11/78 16:16-16:21/5	07:21 09:43-11:54/131 12:44-15:59/195 17:00 11:56-12:40/44	07:44 09:59-16:08/369 17:03
27	06:15 20:44	06:45 19:05-19:32/27 20:04 19:32-19:34/2	07:15 19:14	06:46 09:49-10:32/43 16:17-16:20/3 17:28 13:52-16:17/145	07:22 09:43-11:54/131 12:44-15:59/195 17:00 11:55-12:41/46	07:45 09:59-16:08/369 17:03
28	06:16 20:43	06:46 19:05-19:32/27 20:03 19:32-19:33/1	07:16 19:12	06:47 09:47-10:34/47 16:17-16:19/2 17:27 13:52-16:17/145	07:23 09:44-15:59/375 16:59	07:45 10:00-16:10/370 17:04
29	06:17 20:42	06:47 19:06-19:32/26 20:01	07:17 19:10	06:48 09:46-10:36/50 16:17-16:18/1 17:25 13:52-16:17/145	07:24 09:44-15:59/375 16:59	07:45 10:00-16:10/370 17:05
30	06:18 20:41	06:48 19:06-19:30/24 20:00	07:18 15:43-15:48/5 19:09	06:50 09:45-10:39/54 17:24 13:53-16:17/144	07:25 09:45-15:59/374 16:58	07:46 10:01-16:10/369 17:06
31	06:19 20:40	06:49 19:06-19:30/24 19:58		06:51 09:44-10:40/56 17:23 13:53-16:17/144		07:46 10:01-16:11/370 17:06
Potential sun hours	457	426	375	346	300	290
Sum of minutes with flicker	0	902	310	3605	8962	11501

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 17
Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com
Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 9 - WT8

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:46 08:48-09:30/42 15:22-15:53/31	07:33 08:53-09:44/51	06:58	07:09 08:17-09:09/52	06:24 06:50-07:10/20	05:56
	17:07 10:50-11:15/25	17:41 15:44-16:37/53	18:14	19:47	20:18	20:46
2	07:46 08:48-09:31/43 15:23-15:54/31	07:32 08:53-09:43/50	06:57	07:07 08:18-09:08/50	06:23 06:51-07:10/19	05:56
	17:08 10:51-11:14/23	17:42 15:47-16:37/50	18:15	19:48	20:19	20:47
3	07:46 08:48-09:32/44 15:23-15:54/31	07:31 08:54-09:43/49	06:55	07:06 08:18-09:05/47	06:22 06:51-07:10/19	05:55
	17:09 10:53-11:13/20 15:54-15:55/1	17:43 15:55-16:36/41	18:16	19:49	20:20	20:48
4	07:46 08:48-09:33/45 15:23-15:55/32	07:30 08:56-09:42/46	06:54	07:04 08:18-09:01/43	06:20 06:51-07:10/19	05:55
	17:10 10:55-11:12/17 15:55-15:56/1	17:45 15:56-16:36/40	18:17	19:50	20:21	20:48
5	07:46 08:48-09:34/46 15:24-15:56/32	07:29 08:57-09:41/44 16:45-16:52/7	06:52	07:02 08:19-08:57/38	06:19 06:52-07:09/17	05:55
	17:11 10:59-11:09/10	17:46 15:57-16:35/38	18:18	19:51	20:22	20:49
6	07:46 08:48-09:35/47 15:56-15:57/1	07:28 08:59-09:40/41 16:42-16:54/12	06:51	07:01 08:19-08:54/35	06:18 06:52-07:07/15	05:54
	17:12 15:24-15:56/32	17:47 15:58-16:35/37	18:20	19:52	20:23	20:50
7	07:46 08:48-09:35/47 15:57-15:58/1	07:27 09:01-09:39/38 16:41-16:56/15	06:49 07:58-08:07/9	06:59 08:21-08:53/32	06:17 06:53-07:06/13	05:54
	17:13 15:25-15:57/32	17:48 16:00-16:34/34	18:21	19:53	20:24	20:50
8	07:46 08:48-09:36/48 15:58-15:59/1	07:26 09:05-09:37/32 16:19-16:32/13	06:48 07:52-08:11/19	06:58 08:21-08:50/29	06:16 06:55-07:04/9	05:54
	17:14 15:25-15:58/33	17:49 16:03-16:16/13 16:40-16:57/17	18:22	19:54	20:25	20:51
9	07:46 08:48-09:37/49 15:57-15:59/2	07:25 09:14-09:35/21 16:21-16:29/8	06:46 07:50-08:15/25	06:56 08:22-08:48/26	06:15 06:58-07:01/3	05:54
	17:15 15:25-15:57/32	17:51 16:06-16:11/5 16:39-16:57/18	18:23	19:55	20:26	20:51
10	07:46 08:47-09:37/50 15:58-16:00/2	07:24 09:17-09:31/14	06:45 07:47-08:16/29	06:54 08:25-08:46/21	06:13	05:53
	17:16 15:25-15:58/33	17:52 16:39-16:58/19	18:24	19:56	20:27	20:52
11	07:46 08:47-09:39/52	07:23 16:38-16:59/21	06:43 07:45-08:18/33	06:53 08:27-08:42/15	06:12	05:53
	17:17 15:26-16:06/40	17:53	18:25	19:57	20:28	20:53
12	07:45 08:48-09:40/52	07:22 16:39-16:59/20	06:41 07:43-08:19/36	06:51	06:11	05:53
	17:18 15:27-16:08/41	17:54	18:26	19:58	20:29	20:53
13	07:45 08:47-09:40/53	07:20 16:39-16:59/20	06:40 07:41-08:20/39	06:50	06:10	05:53
	17:19 15:26-16:09/43	17:55	18:27	19:59	20:30	20:54
14	07:45 08:47-09:41/54	07:19 16:38-16:59/21	06:38 07:22-07:28/6	06:48	06:09	05:53
	17:20 15:27-16:11/44	17:57	18:28 07:41-08:21/40	20:00	20:31	20:54
15	07:45 08:48-09:42/54	07:18 16:39-16:58/19	06:37 07:18-07:31/13	06:47	06:08	05:53
	17:21 15:27-16:12/45	17:58	18:29 07:39-08:21/42	20:01	20:32	20:54
16	07:44 08:47-09:42/55	07:17 16:40-16:58/18	06:35 07:16-07:32/16	06:45	06:07	05:53
	17:22 15:28-16:14/46	17:59	18:30 07:35-08:21/46	20:02	20:33	20:55
17	07:44 08:48-09:43/55	07:15 16:41-16:56/15	06:33 07:15-08:22/67	06:44	06:06	05:53
	17:23 15:28-16:15/47	18:00	18:31	20:03	20:33	20:55
18	07:43 08:48-09:43/55 16:17-16:24/7	07:14 16:42-16:55/13	06:32 07:13-08:22/69	06:42	06:06	05:53
	17:24 15:30-16:16/46	18:01	18:32	20:04	20:34	20:55
19	07:43 08:47-09:43/56	07:13 16:45-16:53/8	06:30 07:13-08:21/68	06:41	06:05	05:53
	17:25 15:30-16:26/56	18:03	18:33	20:05	20:35	20:56
20	07:42 08:48-09:44/56	07:11	06:28 07:12-08:22/70	06:39	06:04	05:53
	17:27 15:31-16:29/58	18:04	18:34	20:06	20:36	20:56
21	07:42 08:48-09:44/56	07:10	06:27 07:11-08:21/70	06:38	06:03	05:54
	17:28 15:32-16:30/58	18:05	18:35	20:07	20:37	20:56
22	07:41 08:49-09:45/56	07:09	06:25 07:11-08:21/70	06:36	06:02	05:54
	17:29 15:32-16:31/59	18:06	18:37	20:08	20:38	20:57
23	07:40 08:49-09:45/56	07:07	06:24 07:11-08:20/69	06:35	06:02	05:54
	17:30 15:33-16:32/59	18:07	18:38	20:09	20:39	20:57
24	07:40 08:48-09:45/57	07:06	06:22 07:11-08:19/68	06:34 06:57-07:06/9	06:01	05:54
	17:31 15:34-16:33/59	18:08	18:39	20:10	20:40	20:57
25	07:39 08:49-09:45/56	07:04	06:20 07:12-08:19/67	06:32 06:55-07:08/13	06:00	05:54
	17:32 15:34-16:34/60	18:09	18:40	20:11	20:41	20:57
26	07:38 08:50-09:46/56	07:03	06:19 07:12-08:18/66	06:31 06:54-07:10/16	05:59	05:55
	17:34 15:35-16:34/59	18:11	18:41	20:12	20:41	20:57
27	07:38 08:50-09:46/56	07:01	06:17 07:13-08:16/63	06:29 06:52-07:10/18	05:59	05:55
	17:35 15:36-16:36/60	18:12	18:42	20:14	20:42	20:57
28	07:37 08:50-09:45/55 15:45-15:51/6	07:00	06:15 07:15-08:16/61	06:28 06:52-07:10/18	05:58	05:56
	17:36 15:37-16:36/59	18:13	18:43	20:15	20:43	20:57
29	07:36 08:51-09:45/54		07:14 08:18-09:14/56	06:27 06:51-07:11/20	05:58	05:56
	17:37 15:39-16:36/57		19:44	20:16	20:44	20:57
30	07:35 08:51-09:45/54		07:12 08:17-09:12/55	06:25 06:51-07:11/20	05:57	05:56
	17:38 15:40-16:37/57		19:45	20:17	20:45	20:57
31	07:34 08:52-09:44/52		07:10 08:18-09:11/53		05:57	
	17:40 15:42-16:37/55		19:46		20:45	
Potential sun hours	300	298	370	398	446	450
Sum of minutes with flicker	3149	961	1325	502	134	0

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 18

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 9 - WT8

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:57 20:57	06:20 20:39	06:50 08:26-08:41/15 19:57	07:19 08:21-08:58/37 19:07	06:52 08:46-09:01/15 17:22 16:08-16:28/20	07:26 08:30-09:21/51 16:58 15:08-15:48/40
2	05:57 20:57	06:21 20:38	06:51 08:23-08:44/21 19:55	07:20 08:22-08:56/34 19:06	06:53 08:43-09:04/21 15:51-15:59/8 17:20 15:35-15:42/7 16:09-16:27/18	07:27 08:30-09:21/51 15:41-15:43/2 16:58 15:08-15:41/33
3	05:58 20:57	06:22 20:37	06:52 08:20-08:46/26 19:53	07:21 08:25-08:56/31 19:04	06:54 08:34-09:07/33 15:48-16:01/13 17:19 15:31-15:45/14 16:09-16:26/17	07:28 08:31-09:21/50 15:41-15:43/2 16:58 15:09-15:41/32
4	05:58 20:57	06:23 07:07-07:14/7 20:35	06:53 08:18-08:47/29 19:52	07:22 08:26-08:53/27 19:02	06:55 08:31-09:09/38 16:11-16:26/15 17:18 15:30-16:04/34	07:29 08:32-09:21/49 15:42-15:43/1 16:57 15:09-15:42/33
5	05:59 20:56	06:24 07:05-07:16/11 20:34	06:54 08:17-08:49/32 19:50	07:23 08:28-08:50/22 19:01	06:56 08:28-09:10/42 16:13-16:24/11 17:17 15:28-16:05/37	07:30 08:33-09:21/48 15:42-15:43/1 16:57 15:10-15:42/32
6	05:59 20:56	06:25 07:02-07:16/14 20:33	06:55 08:15-08:50/35 19:49	07:24 08:32-08:47/15 18:59	06:58 08:27-09:11/44 16:15-16:21/6 17:16 15:27-16:05/38	07:31 08:34-09:21/47 15:42-15:43/1 16:57 15:10-15:42/32
7	06:00 20:56	06:26 07:01-07:17/16 20:32	06:56 08:14-08:52/38 19:47	07:25 18:57	06:59 08:25-09:12/47 17:15 15:25-16:06/41	07:32 08:35-09:21/46 15:11-15:43/32 16:57 10:46-10:56/10
8	06:01 20:56	06:27 07:00-07:18/18 20:31	06:57 08:13-08:56/43 19:45	07:26 18:56	07:00 08:25-09:14/49 17:14 15:25-16:07/42	07:33 08:36-09:21/45 15:11-15:43/32 16:57 10:44-10:59/15 15:43-15:44/1
9	06:01 20:55	06:28 07:00-07:18/18 20:30	06:57 08:12-08:59/47 19:44	07:27 18:54	07:01 08:24-09:14/50 17:13 15:18-16:07/49	07:33 08:37-09:21/44 15:12-15:44/32 16:57 10:42-11:02/20
10	06:02 20:55	06:29 06:59-07:19/20 20:28	06:58 08:11-09:01/50 19:42	07:28 18:53	07:02 08:23-09:15/52 17:12 15:15-16:08/53	07:34 08:38-09:21/43 15:13-15:44/31 16:57 10:41-11:04/23
11	06:03 20:54	06:30 06:59-07:19/20 20:27	06:59 08:11-09:01/50 19:40	07:29 18:51	07:03 08:23-09:15/52 17:11 15:12-16:08/56	07:35 08:38-09:20/42 15:12-15:43/31 16:57 10:40-11:05/25
12	06:03 20:54	06:31 06:59-07:19/20 20:26	07:00 08:09-09:02/53 19:39	07:30 18:50	07:05 08:23-09:17/54 17:10 15:12-16:08/56	07:36 08:39-09:21/42 15:13-15:44/31 16:57 10:39-11:07/28
13	06:04 20:54	06:32 06:59-07:19/20 20:24	07:01 08:09-09:03/54 19:37	07:31 18:48	07:06 08:23-09:17/54 17:09 15:10-16:08/58	07:37 08:40-09:21/41 15:14-15:44/30 16:58 10:39-11:08/29
14	06:05 20:53	06:32 06:59-07:19/20 20:23	07:02 08:08-09:04/56 19:35	07:32 18:47	07:07 08:22-09:17/55 17:08 15:09-16:08/59	07:37 08:42-09:21/39 15:15-15:45/30 16:58 10:39-11:10/31
15	06:06 20:52	06:33 07:00-07:18/18 20:22	07:03 08:05-09:05/60 19:34	07:33 18:45	07:08 08:22-09:18/56 17:07 15:08-16:08/60	07:38 08:42-09:21/39 15:14-15:44/30 16:58 10:39-11:10/31
16	06:06 20:52	06:34 07:00-07:17/17 20:20	07:04 08:02-09:06/64 19:32	07:34 18:43	07:09 08:23-09:19/56 17:06 15:09-16:08/59	07:39 08:43-09:21/38 10:39-11:12/33 16:58 10:32-10:38/6 15:15-15:45/30
17	06:07 20:51	06:35 07:01-07:16/15 20:19	07:05 08:01-09:06/65 19:30	07:35 18:42	07:10 08:23-09:19/56 17:06 15:08-16:08/60	07:40 08:44-09:22/38 15:16-15:45/29 16:58 10:31-11:13/42
18	06:08 20:51	06:36 07:02-07:15/13 20:18	07:06 07:59-09:06/67 19:29	07:36 18:41	07:11 08:22-09:19/57 17:05 15:08-16:07/59	07:40 08:44-09:22/38 15:16-15:45/29 16:59 10:30-11:13/43
19	06:09 20:50	06:37 07:03-07:11/8 20:16	07:07 07:58-09:06/68 19:27	07:37 18:39	07:13 08:23-09:19/56 17:04 15:07-16:06/59	07:41 08:45-09:22/37 15:17-15:46/29 16:59 10:30-11:14/44
20	06:09 20:49	06:38 20:15	07:08 07:57-09:06/69 19:25	07:38 18:38	07:14 08:24-09:20/56 17:03 15:07-16:06/59	07:41 08:45-09:22/37 15:17-15:46/29 17:00 10:30-11:14/44
21	06:10 20:49	06:39 20:13	07:09 07:57-09:06/69 19:24	07:39 18:36	07:15 08:24-09:20/56 17:03 15:08-16:06/58	07:42 08:46-09:23/37 15:18-15:47/29 17:00 10:30-11:15/45
22	06:11 20:48	06:40 20:12	07:10 07:56-09:06/70 19:22	07:41 18:35	07:16 08:24-09:20/56 17:02 15:07-16:05/58	07:43 08:46-09:23/37 15:18-15:47/29 17:01 10:30-11:15/45
23	06:12 20:47	06:41 20:10	07:11 07:56-09:06/70 19:20	07:42 17:14-17:24/10 18:33	07:17 08:24-09:20/56 17:02 15:07-16:03/56	07:43 08:47-09:24/37 15:19-15:48/29 17:01 10:32-11:16/44
24	06:13 20:46	06:42 20:09	07:12 07:56-09:06/70 19:19	07:43 17:12-17:25/13 18:32	07:18 08:25-09:20/55 15:54-16:01/7 17:01 15:07-15:53/46	07:43 08:47-09:24/37 15:19-15:48/29 17:02 10:32-11:16/44
25	06:14 20:45	06:43 20:07	07:13 07:56-09:05/69 19:17	06:44 16:11-16:27/16 17:31	07:19 08:25-09:20/55 17:01 15:07-15:53/46	07:44 08:48-09:26/38 15:20-15:49/29 17:02 10:34-11:17/43
26	06:15 20:44	06:44 20:06	07:14 07:57-09:04/67 19:15	06:45 16:10-16:28/18 17:29	07:20 08:26-09:21/55 17:00 15:06-15:52/46	07:44 08:48-09:26/38 15:20-15:49/29 17:03 10:35-11:17/42
27	06:16 20:44	06:45 20:04	07:15 07:57-08:15/18 19:14 08:16-09:04/48	06:46 16:09-16:28/19 17:28	07:22 08:27-09:21/54 17:00 15:07-15:52/45	07:45 08:48-09:26/38 15:20-15:50/30 17:03 10:36-11:17/41
28	06:16 20:43	06:46 20:03	07:16 07:59-08:13/14 19:12 08:19-09:03/44	06:47 16:08-16:28/20 17:27	07:23 08:28-09:21/53 16:59 15:07-15:52/45	07:45 08:49-09:28/39 15:20-15:50/30 17:04 10:45-11:17/32
29	06:17 20:42	06:47 20:01	07:17 08:01-08:11/10 19:10 08:21-09:02/41	06:48 16:08-16:28/20 17:25	07:24 08:28-09:21/53 16:59 15:08-15:51/43	07:45 08:49-09:28/39 15:22-15:51/29 17:05 10:46-11:17/31
30	06:18 20:41	06:48 20:00	07:18 08:20-08:59/39 19:09	06:49 16:08-16:29/21 17:24	07:25 08:29-09:21/52 16:58 15:08-15:49/41	07:46 08:48-09:29/41 15:22-15:52/30 17:06 10:47-11:17/30
31	06:19 20:40	06:49 08:33-08:34/1 19:58		06:51 08:51-08:56/5 17:23 16:08-16:28/20		07:46 08:48-09:29/41 15:22-15:53/31 17:06 10:48-11:16/28
Potential sun hours	457	426	375	346	300	290
Sum of minutes with flicker	0	256	1571	328	2987	3095

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 19

Licensed user:
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IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 10 - WT9

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:46 09:11-09:43/32 13:24-14:10/46 17:07 11:19-12:52/93	07:33 11:33-13:03/90 15:03-15:37/34 17:41 13:47-14:13/26	06:58 07:37-08:09/32 18:14	07:09 07:46-08:07/21 19:47	06:24 17:48-18:28/40 20:18	05:56 06:30-06:54/24 20:46
2	07:46 09:12-09:43/31 13:24-14:11/47 17:08 11:19-12:53/94	07:32 11:34-13:03/89 15:03-15:38/35 17:42 13:50-14:11/21	06:57 07:36-08:09/33 18:15	07:07 07:44-08:08/24 19:48	06:23 17:49-18:28/39 20:19	05:56 06:31-06:54/23 20:47
3	07:46 09:13-09:43/30 13:25-14:11/46 17:09 11:20-12:53/93	07:31 11:36-12:12/36 13:54-14:07/13 17:43 12:14-13:02/48 15:03-15:39/36	06:55 07:35-08:09/34 18:16	07:06 07:42-08:08/26 19:49	06:22 17:49-18:28/39 20:20	05:55 06:32-06:55/23 20:48
4	07:46 09:14-09:44/30 13:25-14:12/47 17:10 11:20-12:54/94	07:30 11:38-12:10/32 15:03-15:39/36 17:44 12:16-13:01/45	06:54 07:34-08:09/35 18:17	07:04 07:41-08:07/26 19:50	06:20 17:49-18:29/40 20:21	05:55 06:31-06:54/23 20:48
5	07:46 09:15-09:44/29 13:25-14:13/48 17:11 11:20-12:55/95	07:29 11:40-12:08/28 15:03-15:40/37 17:46 12:17-13:00/43	06:52 07:33-08:09/36 18:18	07:02 07:41-08:07/26 19:51	06:19 17:48-18:28/40 20:22	05:55 06:32-06:54/22 20:49
6	07:46 09:17-09:44/27 13:26-14:13/47 17:12 11:21-12:56/95	07:28 11:44-12:04/20 15:03-15:40/37 17:47 12:19-12:58/39	06:51 07:33-08:08/35 18:19	07:01 07:40-08:06/26 19:52	06:18 17:49-18:27/38 20:23	05:54 06:32-06:54/22 20:50
7	07:46 09:20-09:44/24 13:26-14:14/48 17:13 11:21-12:56/95	07:27 11:51-11:56/5 15:03-15:40/37 17:48 12:21-12:56/35	06:49 07:32-08:08/36 18:21	06:59 07:40-08:06/26 19:53	06:17 17:49-18:27/38 20:24	05:54 06:33-06:55/22 20:50
8	07:46 09:23-09:45/22 13:27-14:15/48 17:14 11:21-12:57/96	07:26 12:24-12:54/30 17:49 15:04-15:40/36	06:48 07:31-08:07/36 18:22	06:58 07:39-08:04/25 19:54	06:16 17:50-18:27/37 20:25	05:54 06:33-06:54/21 20:51
9	07:46 09:24-09:45/21 13:26-14:14/48 17:15 11:21-12:57/96	07:25 12:27-12:50/23 17:51 15:03-15:39/36	06:46 07:32-08:06/34 18:23	06:56 07:39-08:02/23 19:55	06:15 17:50-18:27/37 20:26	05:54 06:33-06:54/21 20:51
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11	07:46 09:25-09:44/19 13:28-14:16/48 17:17 11:22-12:59/97	07:23 15:05-15:39/34 17:53	06:43 07:32-08:04/32 18:25	06:53 07:40-07:57/17 19:57	06:12 17:52-18:26/34 20:28	05:53 06:34-06:54/20 20:53
12	07:45 09:27-09:44/17 13:28-14:17/49 17:18 11:22-13:00/98	07:22 15:06-15:39/33 17:54	06:41 07:32-08:02/30 18:26	06:51 07:41-07:56/15 19:58	06:11 17:52-18:25/33 20:29	05:53 06:35-06:54/19 20:53
13	07:45 09:27-09:43/16 13:28-14:16/48 17:19 11:22-13:00/98	07:20 15:07-15:39/32 17:55	06:40 07:32-07:59/27 18:27	06:50 07:43-07:53/10 19:59	06:10 17:53-18:24/31 20:30	05:53 06:35-06:54/19 20:53
14	07:45 09:29-09:43/14 13:29-14:17/48 17:20 11:23-13:01/98	07:19 15:07-15:37/30 17:57	06:38 07:33-07:56/23 18:28	06:48 20:00	06:09 17:54-18:24/30 20:31	05:53 06:36-06:54/18 20:54
15	07:44 09:31-09:42/11 13:29-14:17/48 17:21 11:22-13:01/99	07:18 15:09-15:37/28 17:58	06:37 07:34-07:47/13 18:29	06:47 20:01	06:08 06:37-06:44/7 20:32 17:55-18:23/28	05:53 06:36-06:54/18 20:54
16	07:44 09:33-09:40/7 13:30-14:18/48 17:22 11:23-13:02/99	07:17 15:11-15:36/25 17:59	06:35 07:37-07:44/7 18:30	06:45 20:02	06:07 06:35-06:47/12 20:32 17:56-18:22/26	05:53 06:36-06:54/18 20:55
17	07:44 11:23-13:02/99 17:23 13:30-14:18/48	07:15 15:12-15:34/22 18:00	06:33 18:31	06:44 20:03	06:06 06:34-06:49/15 20:33 17:57-18:21/24	05:53 06:36-06:54/18 20:55
18	07:43 11:24-13:03/99 17:24 13:31-14:18/47	07:14 15:15-15:32/17 18:01	06:32 18:32	06:42 18:03-18:17/14 20:04	06:06 06:33-06:50/17 20:34 17:59-18:20/21	05:53 06:37-06:54/17 20:55
19	07:43 11:24-13:03/99 17:25 13:31-14:18/47	07:13 07:56-07:57/1 18:02 15:20-15:28/8	06:30 18:33	06:41 17:59-18:19/20 20:05	06:05 06:32-06:50/18 20:35 18:00-18:19/19	05:53 06:37-06:54/17 20:56
20	07:42 11:25-13:04/99 17:27 13:32-14:19/47	07:11 07:50-08:02/12 18:04	06:28 18:34	06:39 17:57-18:22/25 20:06	06:04 06:31-06:51/20 20:36 18:02-18:17/15	05:53 06:37-06:54/17 20:56
21	07:42 11:25-13:04/99 17:28 13:32-14:19/47	07:10 07:48-07:58/10 18:05 07:58-08:05/7	06:27 18:35	06:38 17:55-18:23/28 20:07	06:03 06:30-06:51/21 20:37 18:04-18:14/10	05:53 06:38-06:55/17 20:56
22	07:41 11:25-13:04/99 15:13-15:21/8 17:29 13:33-14:18/45	07:09 07:46-08:03/17 18:06 08:03-08:07/4	06:25 18:36	06:36 17:54-18:24/30 20:08	06:02 06:31-06:53/22 20:38	05:54 06:38-06:55/17 20:56
23	07:40 11:26-13:05/99 15:11-15:25/14 17:30 13:34-14:19/45	07:07 07:44-08:02/18 18:07 08:01-08:08/7	06:23 18:38	06:35 17:53-18:26/33 20:09	06:01 06:30-06:53/23 20:39	05:54 06:38-06:55/17 20:57
24	07:40 11:26-13:05/99 15:09-15:27/18 17:31 13:35-14:19/44	07:06 07:43-08:06/23 18:08 08:06-08:09/3	06:22 18:39	06:33 17:52-18:26/34 20:10	06:01 06:30-06:53/23 20:40	05:54 06:38-06:55/17 20:57
25	07:39 11:27-13:05/98 15:07-15:29/22 17:32 13:36-14:18/42	07:04 07:41-08:06/25 18:09 08:06-08:09/3	06:20 18:40	06:32 17:51-18:27/36 20:11	06:00 06:30-06:53/23 20:41	05:54 06:39-06:56/17 20:57
26	07:38 11:27-13:04/97 15:06-15:31/25 17:34 13:36-14:18/42	07:03 07:40-08:08/28 18:11 08:08-08:10/2	06:19 18:41	06:31 17:50-18:27/37 20:12	05:59 06:30-06:53/23 20:41	05:55 06:38-06:56/18 20:57
27	07:38 11:29-13:05/96 15:06-15:33/27 17:35 13:38-14:18/40	07:01 07:39-08:08/29 18:12 08:08-08:09/1	06:17 18:42	06:29 17:49-18:27/38 20:13	05:59 06:30-06:54/24 20:42	05:55 06:38-06:56/18 20:57
28	07:37 11:29-13:05/96 15:05-15:34/29 17:36 13:40-14:17/37	07:00 07:39-08:09/30 18:13 08:09-08:10/1	06:15 06:56-07:02/6 18:43	06:28 17:49-18:28/39 20:14	05:58 06:30-06:54/24 20:43	05:55 06:39-06:57/18 20:57
29	07:36 11:30-13:05/95 15:04-15:35/31 17:37 13:41-14:16/35		07:14 07:52-08:05/13 19:44	06:27 17:49-18:28/39 20:16	05:58 06:30-06:54/24 20:44	05:56 06:38-06:57/19 20:57
30	07:35 11:31-13:04/93 15:04-15:36/32 17:38 13:43-14:15/32		07:12 07:50-08:06/16 19:45	06:25 17:48-18:28/40 20:17	05:57 06:30-06:54/24 20:45	05:56 06:39-06:58/19 20:57
31	07:34 11:32-13:04/92 15:03-15:37/34 17:40 13:44-14:14/30		07:10 07:49-08:07/18 19:46		05:57 06:31-06:54/23 20:45	
Potential sun hours	300	298	370	398	446	450
Sum of minutes with flicker	4976	1440	530	698	997	579

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

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

Project:
Flickering Nuoro Sud

Printed/Page
2024-01-12 10:15 / 20

Licensed user:
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Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
Bruno Manca / ingbrunomanca@gmail.com

Calculated:
2024-01-11 20:06/2.8.579

SHADOW - Calendar per WTG

WTG: 10 - WT9

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.87	4.61	5.62	6.73	8.36	10.04	11.06	9.91	8.03	6.21	4.80	3.87

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
94	141	161	179	189	174	179	139	114	109	203	347	566	412	164	104	3,275

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:57	06:38-06:58/20	06:20	18:03-18:36/33	06:50	07:39-07:56/17	07:19	08:10-08:40/30	06:52	12:02-12:15/13	07:26	09:07-09:26/19 13:10-13:58/48
	20:57		20:39		19:57		19:07		17:22	14:34-15:09/35	16:58	11:04-12:41/97
2	05:57	06:39-06:59/20	06:21	18:02-18:36/34	06:51	07:38-07:58/20	07:20	08:10-08:41/31	06:53	11:56-12:20/24	07:27	09:07-09:27/20 13:10-13:58/48
	20:57		20:38		19:55		19:05		17:20	14:33-15:09/36	16:58	11:04-12:41/97
3	05:58	06:38-06:59/21	06:22	18:01-18:37/36	06:52	07:37-08:00/23	07:21	08:09-08:42/33	06:54	11:53-12:23/30	07:28	09:07-09:28/21 13:10-13:58/48
	20:57		20:37		19:53		19:04		17:19	14:33-15:09/36	16:58	11:05-12:41/96
4	05:58	06:39-07:00/21	06:23	18:00-18:36/36	06:53	07:36-08:01/25	07:22	08:09-08:43/34	06:55	11:19-11:28/9 14:33-15:10/37	07:29	09:07-09:29/22 13:11-13:59/48
	20:57		20:35		19:52		19:02		17:18	11:51-12:27/36	16:57	11:05-12:41/96
5	05:59	06:38-07:00/22	06:24	17:59-18:37/38	06:54	07:36-08:02/26	07:23	08:09-08:44/35	06:56	11:13-11:34/21 14:33-15:10/37	07:30	09:06-09:29/23 13:11-13:59/48
	20:56		20:34		19:50		19:01		17:17	11:49-12:28/39	16:57	11:06-12:42/96
6	05:59	06:39-07:01/22	06:25	17:59-18:37/38	06:55	07:36-08:02/26	07:24	08:09-08:44/35	06:58	11:10-11:38/28 14:33-15:09/36	07:31	09:03-09:30/27 13:12-13:59/47
	20:56		20:33		19:49		18:59		17:16	11:47-12:30/43	16:57	11:07-12:42/95
7	06:00	06:38-07:00/22	06:26	17:58-18:37/39	06:56	07:36-08:02/26	07:25	08:09-08:44/35	06:59	11:08-11:40/32 14:33-15:09/36	07:32	09:03-09:31/28 13:12-14:00/48
	20:56		20:32		19:47		18:57		17:15	11:45-12:31/46	16:57	11:07-12:42/95
8	06:01	06:39-07:01/22	06:27	17:58-18:37/39	06:56	07:36-08:02/26	07:26	08:09-08:44/35	07:00	11:07-11:43/36 13:24-13:39/15	07:32	09:02-09:32/30 13:13-14:00/47
	20:56		20:31		19:45		18:56		17:14	11:45-12:33/48 14:34-15:09/35	16:57	11:08-12:42/94
9	06:01	06:39-07:02/23	06:28	17:58-18:37/39	06:57	07:36-08:02/26	07:27	08:09-08:44/35	07:01	11:05-12:34/89 14:34-15:09/35	07:33	09:02-09:32/30 13:14-14:00/46
	20:55		20:30		19:44		18:54		17:13	13:20-13:42/22	16:57	11:09-12:42/93
10	06:02	06:38-07:01/23	06:29	17:57-18:37/40	06:58	07:37-08:01/24	07:28	08:09-08:44/35	07:02	11:04-12:34/90 14:34-15:08/34	07:34	09:02-09:33/31 13:14-14:01/47
	20:55		20:28		19:42		18:53		17:12	13:17-13:44/27	16:57	11:09-12:43/94
11	06:03	06:39-07:02/23	06:30	17:57-18:37/40	06:59	07:39-08:00/21	07:29	08:09-08:43/34	07:03	11:03-12:35/92 14:34-15:07/33	07:35	09:01-09:33/32 13:14-14:00/46
	20:54		20:27		19:40		18:51		17:11	13:15-13:45/30	16:57	11:09-12:42/93
12	06:03	06:39-07:03/24	06:30	17:57-18:37/40	07:00	07:40-07:59/19	07:30	08:10-08:43/33	07:04	11:03-12:36/93 14:36-15:08/32	07:36	09:02-09:34/32 13:15-14:01/46
	20:54		20:26		19:39		18:50		17:10	13:14-13:47/33	16:57	11:10-12:43/93
13	06:04	06:38-07:02/24	06:31	17:57-18:36/39	07:01	07:41-07:57/16	07:31	08:11-08:43/32	07:06	11:02-12:37/95 14:36-15:07/31	07:37	09:02-09:34/32 13:16-14:01/45
	20:53		20:24		19:37		18:48		17:09	13:13-13:48/35	16:57	11:11-12:43/92
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	20:52		20:22		19:34		18:45	08:40-08:42/2	17:07	13:10-13:50/40	16:58	11:11-12:43/92
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	20:52		20:20		19:32		18:43	08:39-08:41/2	17:06	13:10-13:52/42	16:58	11:12-12:44/92
17	06:07	06:39-07:03/24	06:35	17:57-18:33/36	07:05		07:35	08:13-08:38/25	07:10	11:01-12:39/98 14:41-15:03/22	07:40	09:03-09:36/33 13:18-14:03/45
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18	06:08	06:39-07:03/24	06:36	17:57-18:32/35	07:06		07:36	08:15-08:35/20	07:11	11:00-12:39/99 14:43-15:01/18	07:40	09:03-09:36/33 13:18-14:03/45
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	20:48	18:16-18:23/7	20:12		19:22		18:35		17:02	13:08-13:55/47	17:00	11:15-12:46/91
23	06:12	06:41-07:02/21	06:41	18:02-18:25/23	07:11		07:42	15:48-15:59/11	07:17	11:01-12:40/99	07:43	09:06-09:39/33 13:21-14:06/45
	20:47	18:13-18:26/13	20:10		19:20		18:33		17:02	13:08-13:55/47	17:01	11:16-12:47/91
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	20:46	18:11-18:28/17	20:09		19:19		18:32		17:01	13:08-13:55/47	17:02	11:16-12:47/91
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	20:45	18:10-18:30/20	20:07		19:17		17:31		17:00	13:08-13:56/48	17:02	11:17-12:48/91
26	06:15	06:44-07:00/16	06:44		07:14		06:45	14:40-15:06/26	07:20	09:12-09:19/7 13:08-13:56/48	07:44	09:07-09:40/33 13:22-14:07/45
	20:44	18:08-18:30/22	20:06		19:15		17:29		17:00	11:01-12:40/99	17:03	11:17-12:48/91
27	06:15	06:45-06:58/13	06:45		07:15		06:46	14:38-15:07/29	07:22	09:10-09:21/11 13:09-13:57/48	07:45	09:07-09:41/34 13:22-14:07/45
	20:44	18:07-18:32/25	20:04		19:14		17:28		17:00	11:02-12:41/99	17:03	11:17-12:49/92
28	06:16	06:46-06:56/10	06:46		07:16	08:17-08:28/11	06:47	14:37-15:07/30	07:23	09:09-09:23/14 13:09-13:57/48	07:45	09:09-09:42/33 13:22-14:08/46
	20:43	18:06-18:33/27	20:03		19:12		17:27		16:59	11:03-12:41/98	17:04	11:17-12:49/92
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	20:42	18:05-18:34/29	20:01		19:10		17:25		16:59	11:03-12:41/98	17:05	11:19-12:50/91
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	20:41		20:00		19:09		17:24		16:58	11:03-12:41/98	17:06	11:19-12:51/92
31	06:19	18:03-18:35/32	06:49	07:40-07:55/15			06:51	14:35-15:09/34			07:46	09:10-09:42/32 13:24-14:10/46
	20:40		19:58				17:23				17:06	11:19-12:51/92
Potential sun hours	457		426		375		346		300		290	
Sum of minutes with flicker	817		883		372		884		4131		5241	

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