

PARCO EOLICO "MONTE ARGENTU"

COMUNE DI NURRI

PROVINCIA DEL SUD SARDEGNA (SU)



STUDIO DI IMPATTO AMBIENTALE

Elaborato:

ELABORAZIONI SIA

Relazione Shadow-flickering

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Coordinamento: FAD SYSTEM SRL - Società di ingegneria

Dott. Ing. Ivano Distinto

Dott. Ing. Carlo Foddis

Elaborazione SIA:

Dott. Ing. Bruno Manca

Elaborato a cura di:

Dott. Giulio Casu

Dott.ssa Ing. Silvia Exana

Dott.ssa Ing. Ilaria Giovagnorio

Dott. Ing. Bruno Manca

Dott.ssa Ing. Alessandra Scalas

Dott. Ing. Luca Salvadori

Dott. Giovanni Lovigu

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Indice

1. Introduzione.....	2
2. Metodologia.....	4
2.1 Specifiche aerogeneratori.....	4
2.2 Modello digitale di elevazione (DEM)	4
2.3 Recettori.....	5
2.4 Eliofania e distribuzione dei venti	6
3. Risultati finali	9
3.1 Recettori.....	9
3.2 Strade	13
4. Conclusioni.....	14
5. Appendice.....	14

1. Introduzione

La presente relazione espone l'analisi dell'evoluzione dell'ombra giornaliera generata dalla presenza degli aerogeneratori del parco eolico proposto, denominato "Monte Argentu" (Comune di Nurri) in seconda presentazione, composto da 6 turbine eoliche, 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". La seconda presentazione prevede una diminuzione del numero totale di turbine del progetto che da 10 unità vengono ridotte a 6 unità (vengono eliminate le turbine N01, N02, N03, N04). Lo studio prende in considerazione la formazione di ghiaccio sulle strade e lo sfarfallio dell'ombra (shadow flicker) sugli edifici (di seguito recettori) 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 mostrato¹ che frequenze di sfarfallio inferiori a 3 Hz non pongono un rischio su soggetti fotosensitivi². 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.

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 all'impianto eolico, chiaramente lo sfarfallio delle ombre oltre certi limiti può costituire un problema per quei

lavoratori che si ritrovino con le loro postazioni proprio davanti alle pareti vetrate. Viceversa, lo sfarfallio diventa irrilevante per tutte i recettori 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.

2. Metodologia

Tramite una simulazione numerica con il software WindPro sono stati stimati il quantitativo di ombra annuale, il valore massimo di ombra giornaliera e i periodi di ombra (quali ore della giornata e quali periodi dell'anno) per ogni recettore. Queste grandezze dipendono dalla posizione dei recettori e dalla loro tipologia, dalla dimensione e posizione degli aerogeneratori, dall'eliofania, dall'orografia e dalla distribuzione dei venti.

2.1 Specifiche aerogeneratori

Il modello di aerogeneratori scelto è Vestas V162, con potenza installata di 6 MW, altezza al mozzo di 125 m (tranne la turbina N10 che ha altezza al mozzo 119 m) e altezza totale all'apice di 206 m (200 m per la turbina N10). Il raggio del cerchio spazzato dalla pala è lungo 81 m. Le pale possiedono larghezza massima di 4.3m. La velocità massima di rotazione del rotore è pari a 12.1 rpm.

2.2 Modello digitale di elevazione (DEM)

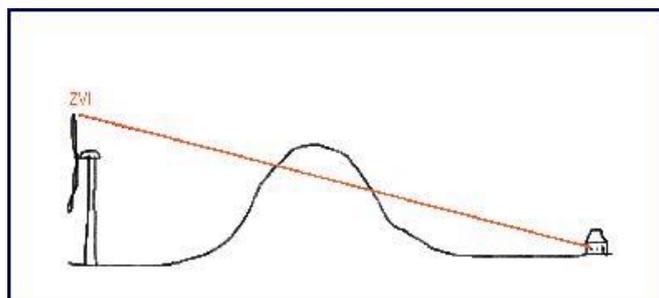


Figura 2 Occlusione visiva dell'aerogeneratore rispetto al recettore, a causa dell'andamento orografico.

Il modello digitale di elevazione (DEM) utilizzato per effettuare le simulazioni con il software WindPro è quello fornito dalla Regione Sardegna³, 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

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

degli aerogeneratori da parte dei recettori (Figura 2) ed in questi casi non viene considerato il possibile effetto di ombreggiamento.

2.3 Recettori

I recettori residenziali che si trovano in prossimità del parco, entro 1.5 km di distanza, sono riportati in

Tabella 1 con le relative informazioni catastali e la loro localizzazione rispetto al parco. Ai fini di questo elaborato i recettori sono suddivisi in due tipologie: residenziali e non residenziali, notiamo che nell'area considerata non sono presenti recettori di tipo residenziale. In via conservativa è stato considerato il caso peggiore, ovvero che tutti i recettori 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. 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) e l'eventuale allineamento di più turbine lungo la retta congiungente al sole.

Nome	Tipologia	E GB (m)	N GB (m)	Altitudine (m)	WTG più vicina	Distanza WTG più vicina (m)
A	Corpi aziendali ad utilizzazione agropastorale	1516714	4391194	456	N07	282
A1	Corpi aziendali ad utilizzazione agropastorale	1516678	4391999	427	N08	456
B	Corpi aziendali ad utilizzazione agropastorale	1516601	4391692	442	N07	249
B1	Corpi aziendali ad utilizzazione agropastorale	1515548	4390359	406	N06	942
C	Corpi aziendali ad utilizzazione agropastorale	1516923	4392174	429	N08	300
C1	Corpi aziendali ad utilizzazione agropastorale	1518127	4391911	480	N10	434
D	Casello ferroviario	1517159	4392757	435	N08	798
D1	Opificio - Cabina elettrica	1518163	4391987	480	N10	431
E	Corpi aziendali ad utilizzazione agropastorale	1516969	4392807	450	N08	864
E1	Corpi aziendali ad utilizzazione agropastorale	1515013	4390684	490	N06	1416
F	Corpi aziendali ad utilizzazione agropastorale	1515552	4392125	440	N07	1237
F1	Corpi aziendali ad utilizzazione agropastorale	1515901	4391695	418	N07	727
G	Corpi aziendali ad utilizzazione agropastorale	1515645	4391325	438	N07	945
H	Corpi aziendali ad utilizzazione agropastorale	1515480	4390782	440	N06	952
I	Corpi aziendali ad utilizzazione agropastorale	1515619	4390646	419	N06	811
J	Corpi aziendali ad utilizzazione agropastorale	1515653	4390147	390	N05	936
K	Corpi aziendali ad utilizzazione agropastorale	1515166	4389717	339	N05	1416
L	Corpi aziendali ad utilizzazione agropastorale	1516230	4389227	437	N05	786
M	Corpi aziendali ad utilizzazione agropastorale	1517197	4388932	373	N05	1188
N	Corpi aziendali ad utilizzazione agropastorale	1517399	4389950	367	N05	834

O	Corpi aziendali ad utilizzazione agropastorale	1516604	4390230	490	N05	296
P	Corpi aziendali ad utilizzazione agropastorale	1516237	4390471	479	N06	294
Q	Corpi aziendali ad utilizzazione agropastorale	1517391	4391882	470	N08	271
R	Corpi aziendali ad utilizzazione agropastorale	1518030	4391898	480	N09	374
S	Corpi aziendali ad utilizzazione agropastorale	1517973	4391660	480	N09	259
T	Corpi aziendali ad utilizzazione agropastorale	1518232	4391472	481	N10	430
U	Corpi aziendali ad utilizzazione agropastorale	1518631	4392069	480	N10	309
V	Corpi aziendali ad utilizzazione agropastorale	1519036	4392324	481	N10	742
W	Corpi aziendali ad utilizzazione agropastorale	1519536	4391842	409	N10	1000
X	Corpi aziendali ad utilizzazione agropastorale	1516088	4389241	430	N05	844
Y	Corpi aziendali ad utilizzazione agropastorale e Abitazione di tipo economico	1517122	4388679	337	N05	1377
Z	Corpi aziendali ad utilizzazione agropastorale	1517267	4389588	382	N05	785

Tabella 1: Recettori considerati.

2.4 Eliofoania e distribuzione dei venti

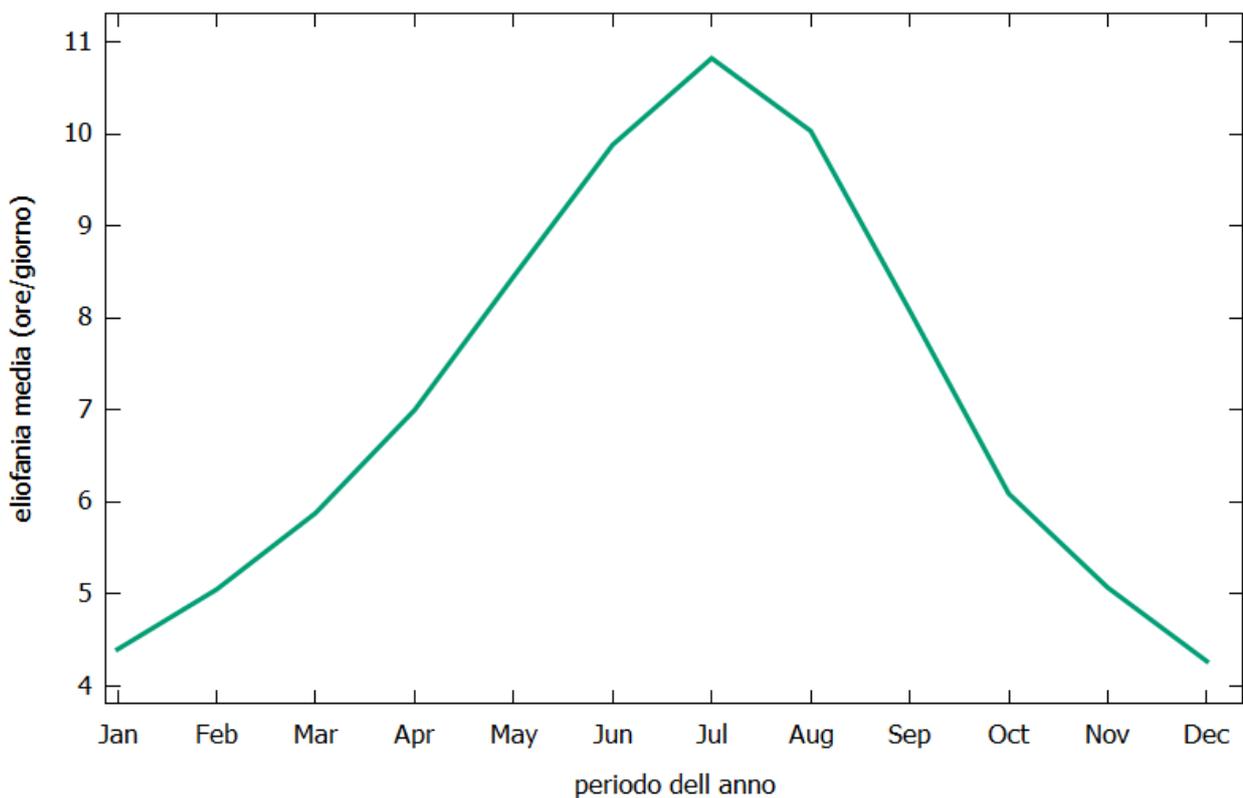


Figura 3 : Eliofoania media. Dati rilevati nella stazione di Elmas (aeronautica militare).

I problemi dovuti all'ombra degli aerogeneratori sono presenti solamente quando è presente illuminazione diretta del sole (eliofoania). 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 dell'aeronautica militare di Elmas.

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'orientazione del piano di rotazione è determinato dalla direzione del vento, quindi l'orientazione segue la distribuzione dei venti.

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW
324	376	415	484	626	572	481	398	478	800	2209	983

Tabella 2 Rosa dei venti. Valori scalati su un anno di attività, ovvero su un totale di 8147 ore, pari al 93% delle ore contenute in un anno (si veda la relazione "analisi anemologica e stima di produzione").

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 93% di un anno, che rappresenta il tempo medio di attività del parco (si veda la relazione "analisi anemologica e stima di produzione"). 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 in seguito 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).

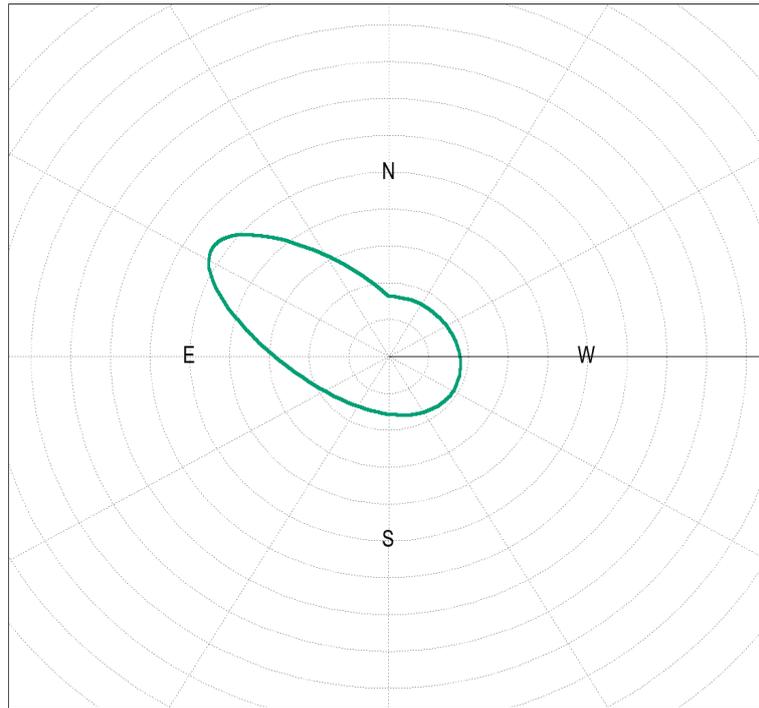


Figura 4 Rosa dei venti (distribuzione angolare della frequenza del vento) per la località del parco proposto in unità arbitrarie.

3. Risultati finali

3.1 Recettori

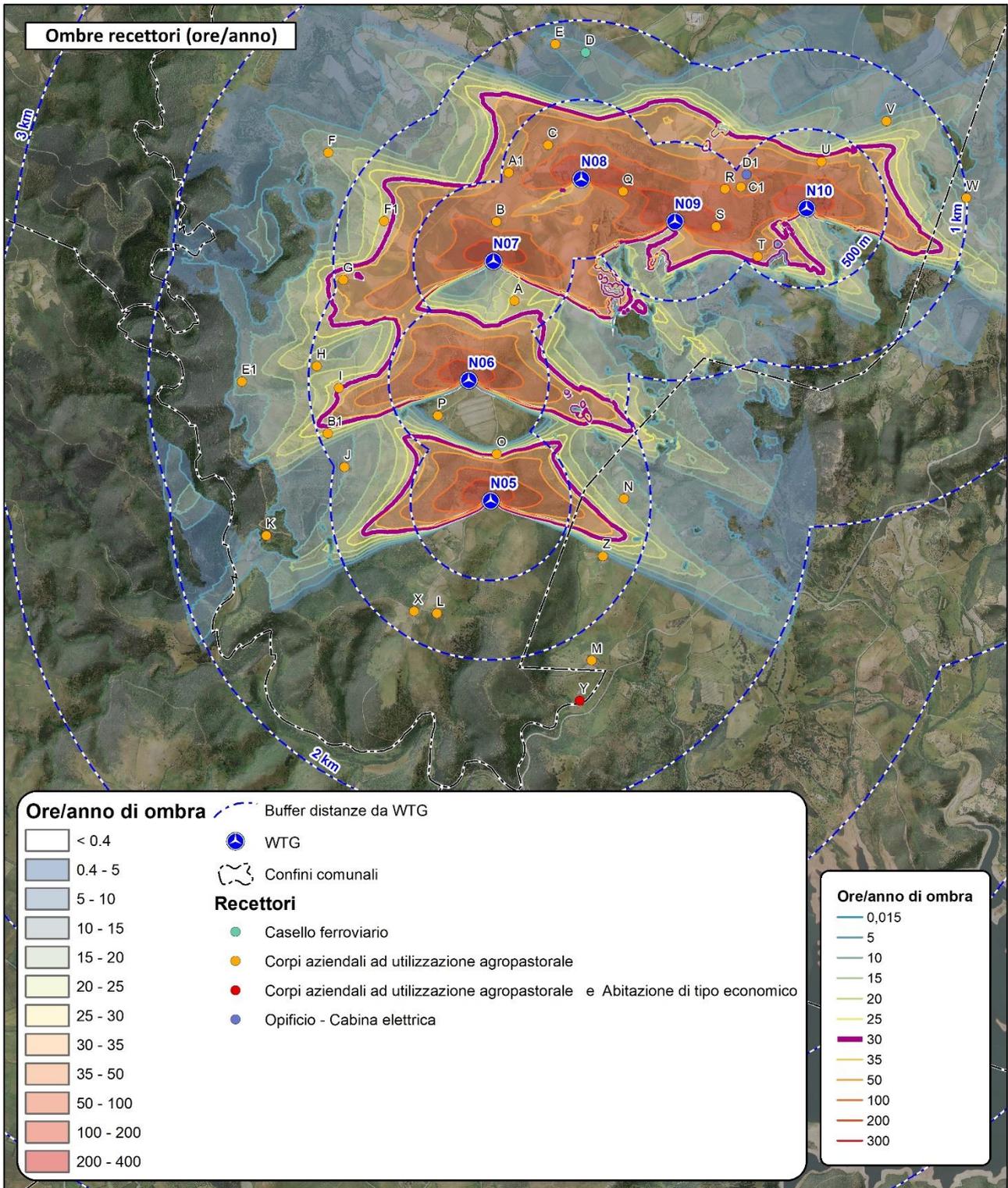


Figura 5: Ore di ombra totale all'anno su ortofoto. Sono presenti tutti i recettori. L'isolinea viola delimita al suo interno regioni con ombra > 30 ore/anno e al suo esterno regioni con ombra < 30 ore/anno.

Nome	ombra (ore/anno)	massimo ombra giornaliera (min/giorno)	Giornate di ombra all'anno
S	237	117	269
Q	179	65	288
R	107	51	248
D1	94	54	215
C1	92	58	207
B	75	34	209
C	66	37	153
A1	53	37	168
T	48	38	147
U	42	24	167
G	38	19	224

Tabella 3: Ombra proiettata sui recettori.

In Figura 5 sono riportati i risultati della simulazione di ore totali di ombra all'anno. I relativi valori sono tabulati in Tabella 3 solo per i recettori che subiscono un'ombra annuale > 30 ore/anno. Il recettore S subisce la maggiore ombreggiatura pari a 237 ore/anno da parte delle turbine N06,N07,N08,N09,N10. A seguire i recettori Q e R subiscono un ombreggiatura > 100 ore/anno. La Figura 6 riporta il massimo numero di minuti di ombra percepita dai recettori in un singolo giorno realisticamente. Per questa immagine valgono le stesse considerazioni fatte per la Figura 5 e la Tabella 3; il recettore S anche in questo caso è quello che subisce un'ombra massima giornaliera maggiore rispetto agli altri recettori, pari a 117 min/giorno.

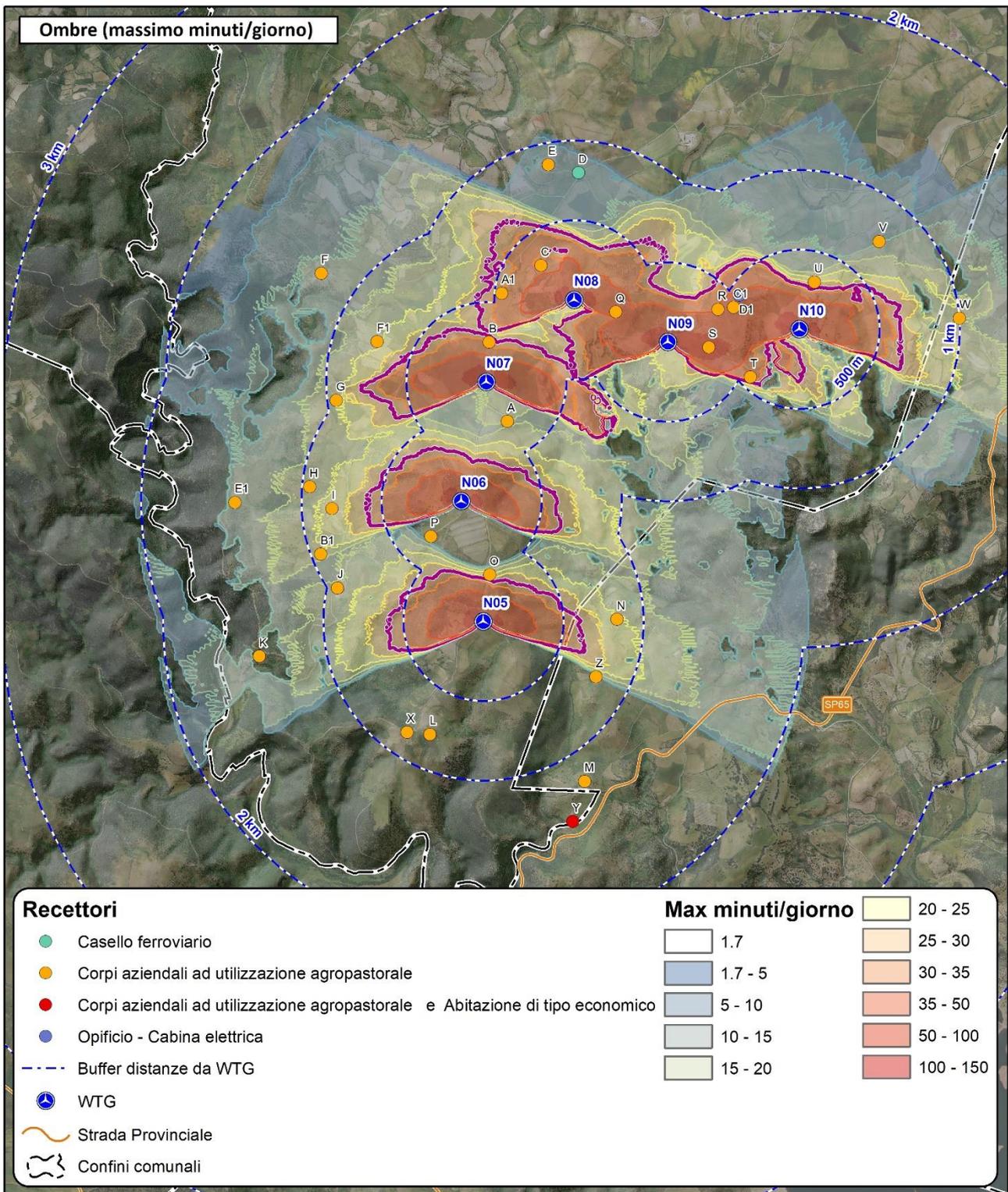


Figura 6. Numero massimo di minuti di ombra in un singolo giorno nel caso realistico. Sono riportate le principali strade provinciali comunali e statali, delle quali nessuna ricade nella zona ad alto impatto.

Il calendario grafico in Figura 7 mostra i periodi dell'anno e le ore alle quali i recettori sono interessati dall'ombra delle WTG nel caso peggiore, ovvero senza tenere conto dell'eliofania e della rosa dei venti. Di tutti i recettori solamente S, R e T (che in figura sono riportati come Y:S, Z:R e AC:T) che oltre

a subire un ombreggiatura maggiore di 30 ore/anno subiscono l'ombreggiatura contemporanea di più turbine; nello specifico S subisce contemporaneamente l'ombra delle WTG N08 e N09, R da N06 e N09, T da N08 e N09. Queste ombreggiature di 2 turbine contemporanee avvengono solamente negli orari compresi tra [19:23,19:46] per S, [16:11,16:39] per R, [19:48,20:27] per T.

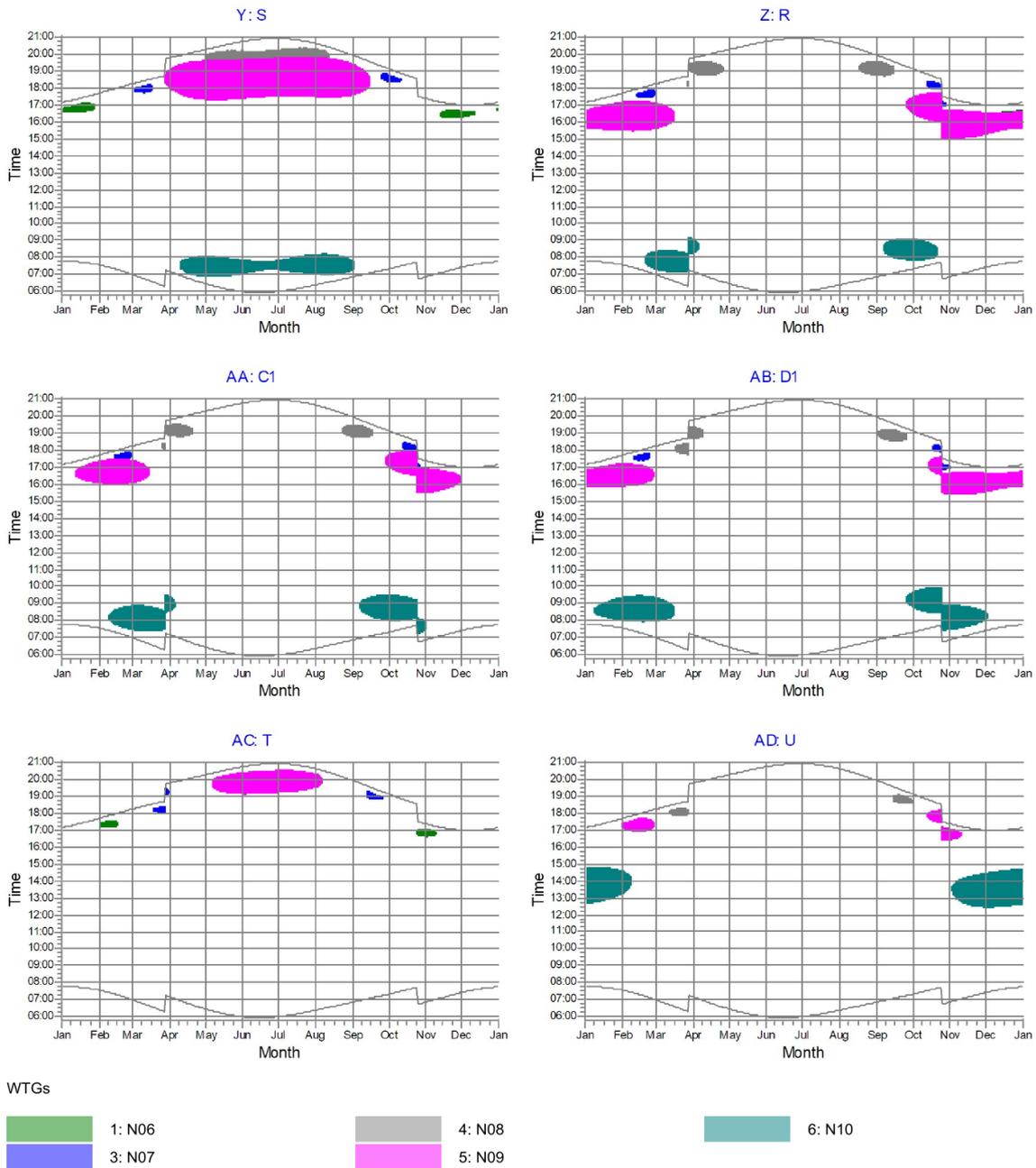


Figura 7 Calendario grafico ombre per ogni recettore al caso peggiore, senza tenere conto di eliofania e rosa dei venti. Le linee continue indicano l'ora di alba e tramonto. Le macchie colorate indicano il periodo dell'anno e le ore nelle quali i recettori sono interessati dall'ombra di una WTG. I recettori critici sono Y:S, Z:R, AC:T (che per brevità in tutto il documento chiamiamo S, R e T).

Nonostante sia presente questa sovrapposizione, ciò non pone un problema rilevante per i recettori S, R e T. Infatti la frequenza di rotazione di una singola turbina è 12 rpm = 0.2 Hz, ma siccome è una turbina tripala, essa taglia il sole con una frequenza di $0.2 \cdot 3 \text{ Hz} = 0.6 \text{ Hz}$. Di conseguenza due turbine

in fila hanno una frequenza media di $0.6 \cdot 2 \text{ Hz} = 1.2 \text{ Hz}$. Questo valore non è sufficiente per porre un problema ai fini della salute delle persone in quanto minore alla soglia dei 3 Hz (si veda il paragrafo 1). Inoltre nessuno di questi edificati è di tipo residenziale o lavorativo con postazioni statiche.

3.2 Strade

Le strade provinciali e statali sono riportate in Figura 6. La strada provinciale più vicina al parco è la SP 65, che non attraversano nessuna regione con ombra giornaliera $> 30 \text{ min/giorno}$ e quindi il parco proposto non contribuisce all'eventuale formazione di ghiaccio sulle strade circostanti.

4. Conclusioni

I recettori che subiscono un'ombreggiatura > 30 ore/anno sono 11 e sono riportati in Tabella 3. Di questi solamente I recettori R, S, T subiscono, in certi periodi dell'anno, l'ombra contemporanea di 2 turbine. Ciò non pone un problema per questi recettori in quanto la frequenza media di flickering (1.2 Hz) rimane sotto la soglia dei 3 Hz.

Inoltre nelle vicinanze del parco (1km) non sono presenti recettori di tipo residenziale né di tipo lavorativo-statico dove i lavoratori permangono continuamente in una determinata posizione rispetto alle WTG, di conseguenza i fenomeni di ombreggiatura e flickering non risultano critici e per tanto non si ritiene necessario proporre interventi di mitigazione.

Le strade provinciali e statali adiacenti al parco attraversano zone a basso impatto (ombra < 30 minuti/giorno) per cui il parco proposto non presenta criticità per la formazione di ghiaccio sulle strade.

5. Appendice

Si riportano 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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Ing. Bruno Manca

Via Vittorio Veneto 231

IT-09028 Sestu

+390702358125

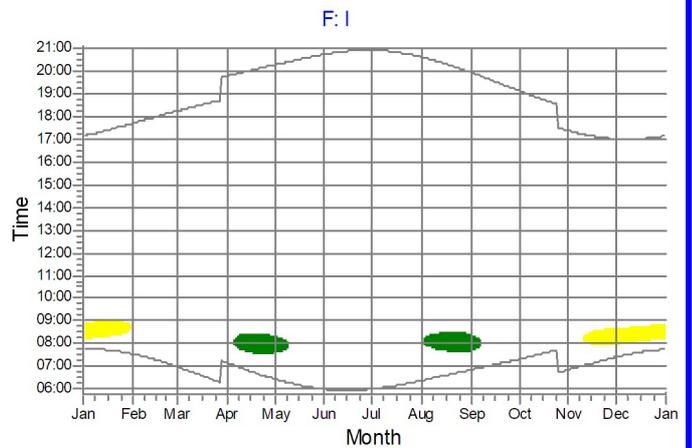
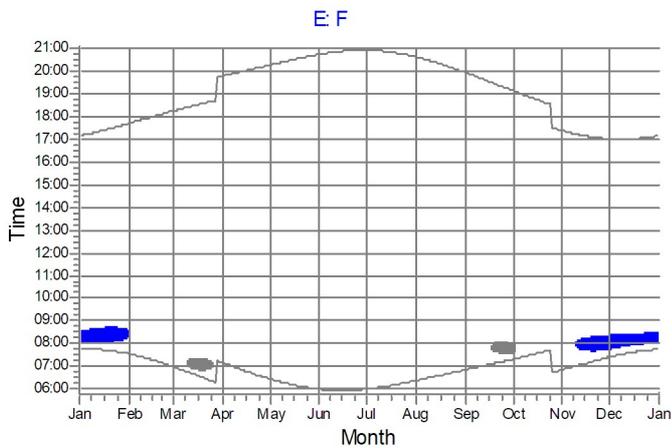
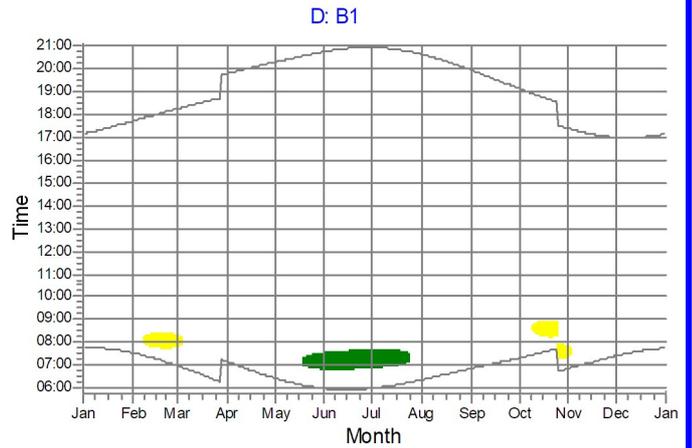
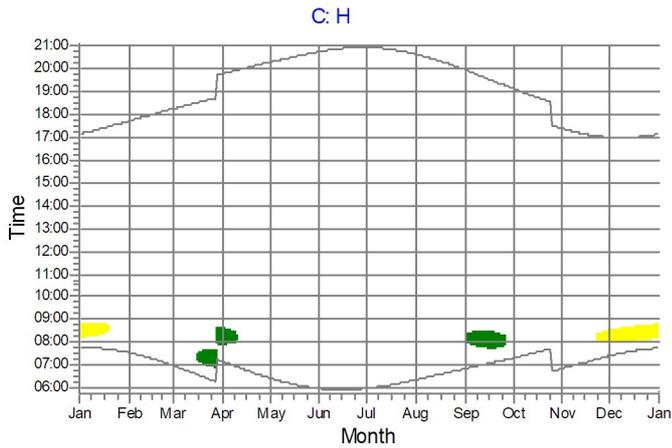
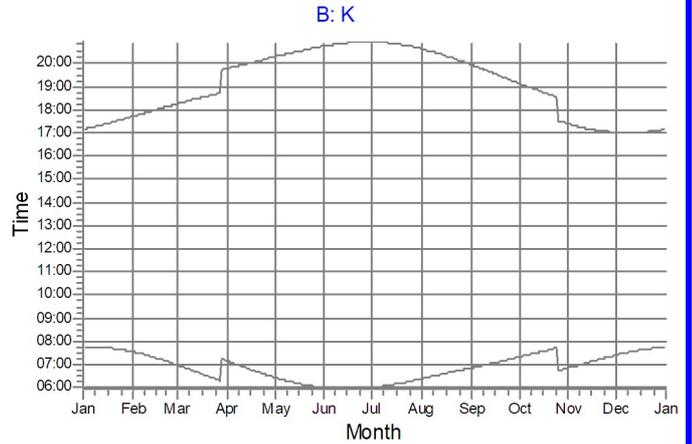
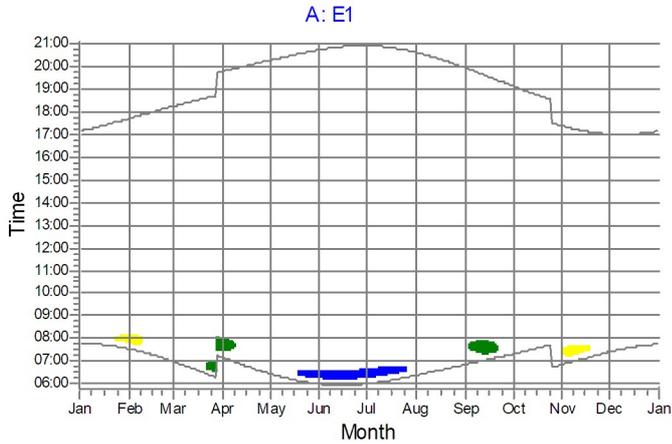
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WTGs

- | | |
|--|--|
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| 2: N05 | 4: N08 |

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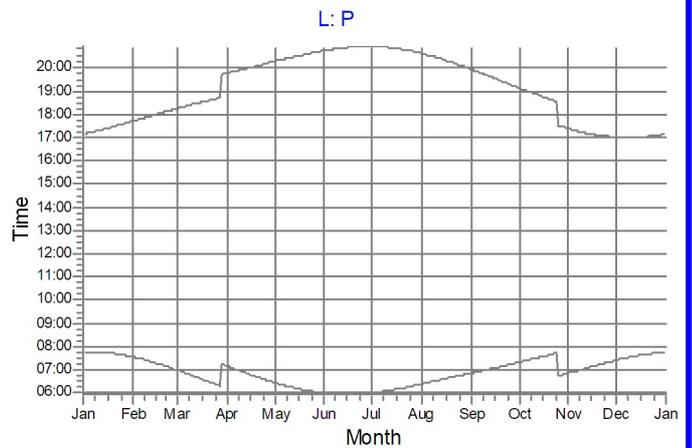
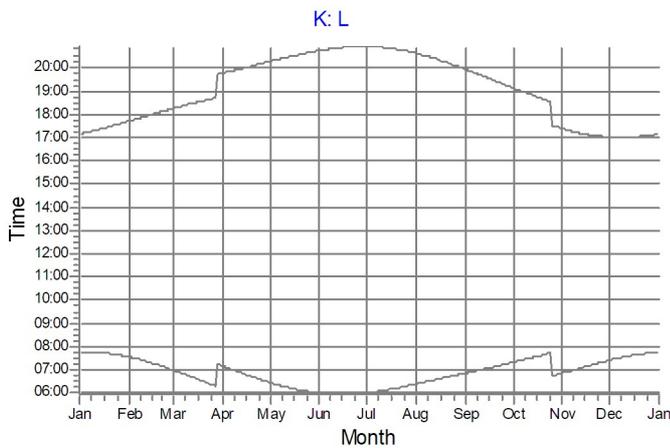
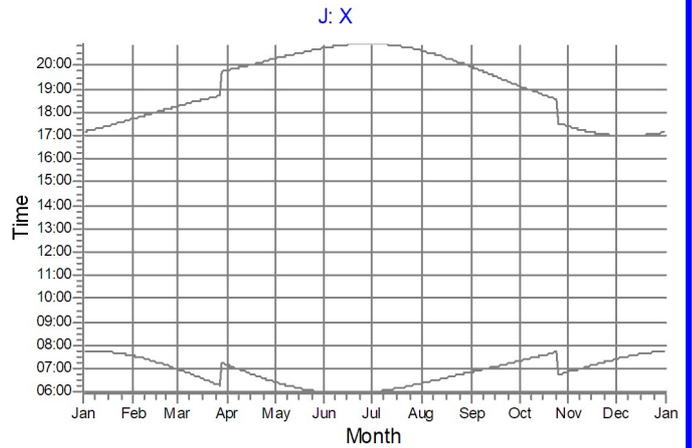
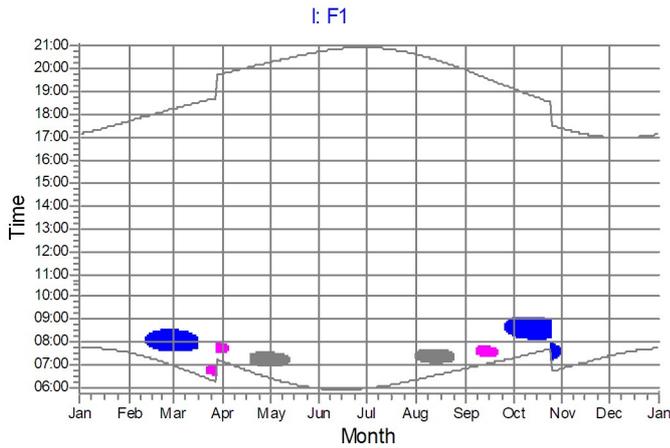
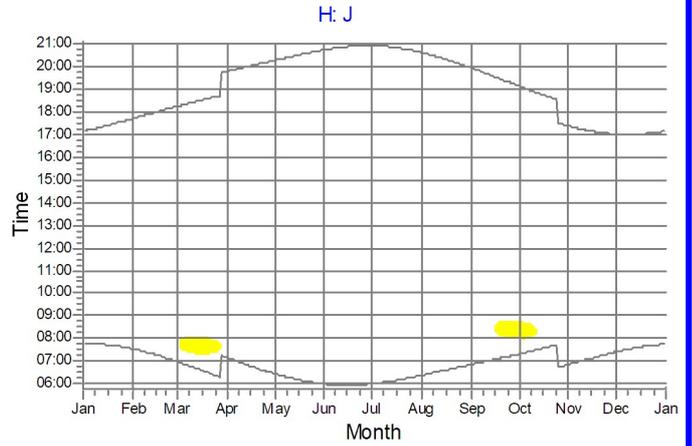
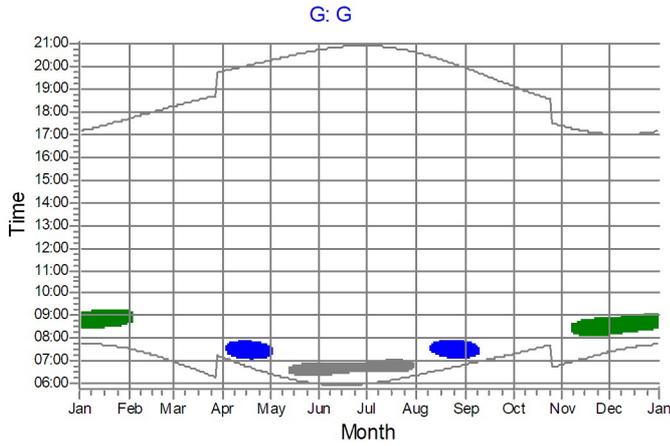
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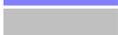
01/02/2023 11:35/2.8.579

SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs

- | | | | | | |
|---|--------|---|--------|---|--------|
|  | 1: N06 |  | 3: N07 |  | 5: N09 |
|  | 2: N05 |  | 4: N08 | | |

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Nurri_seconda presentazione

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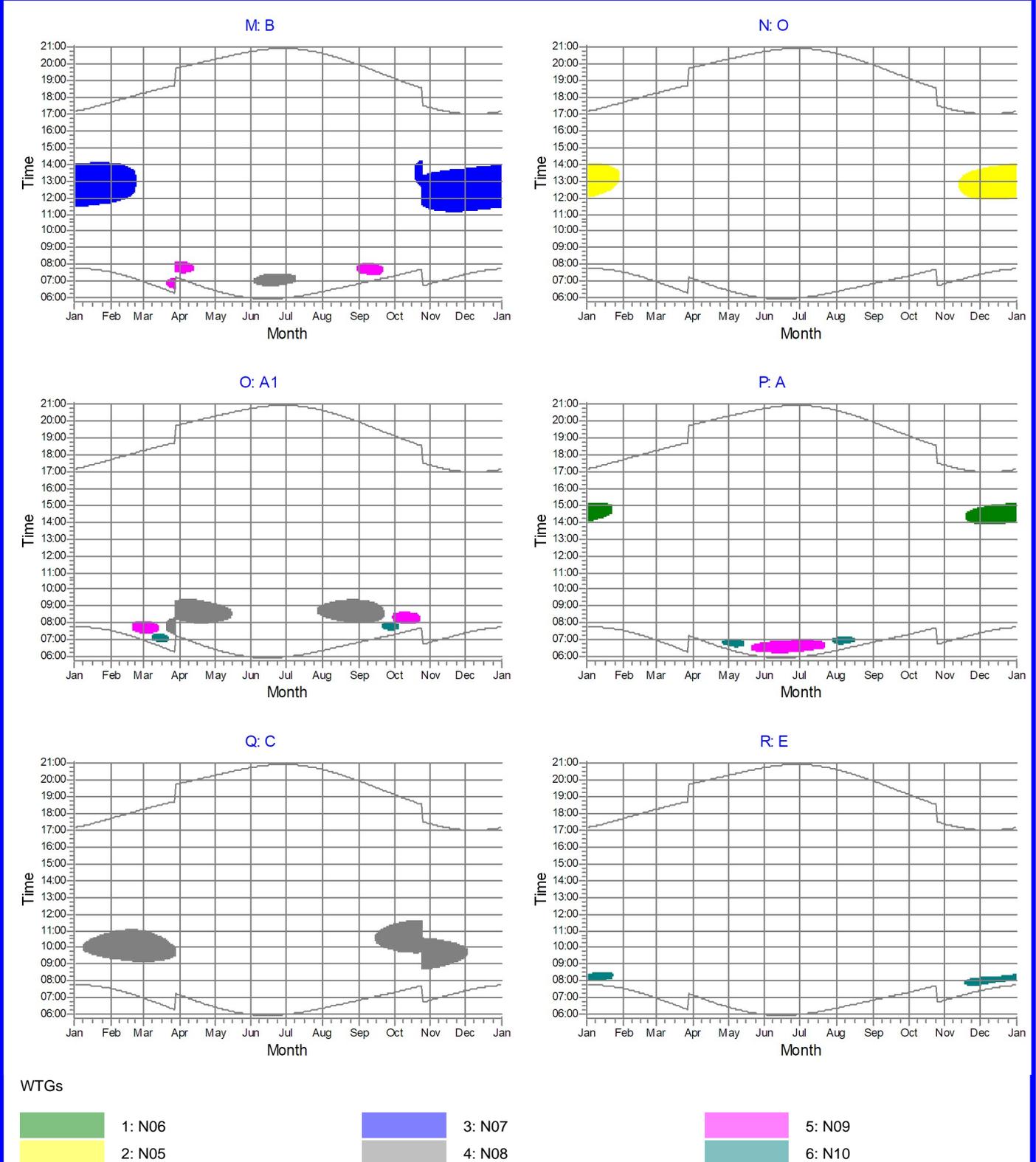
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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



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Nurri_seconda presentazione

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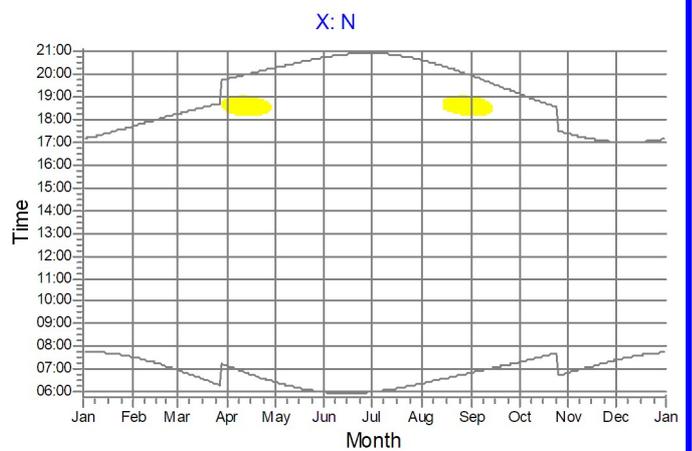
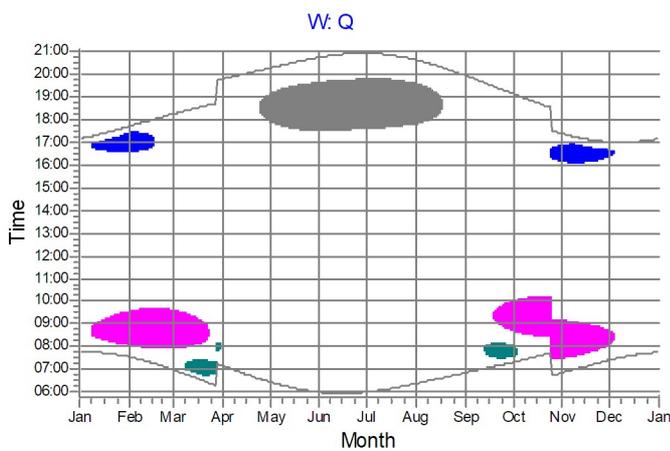
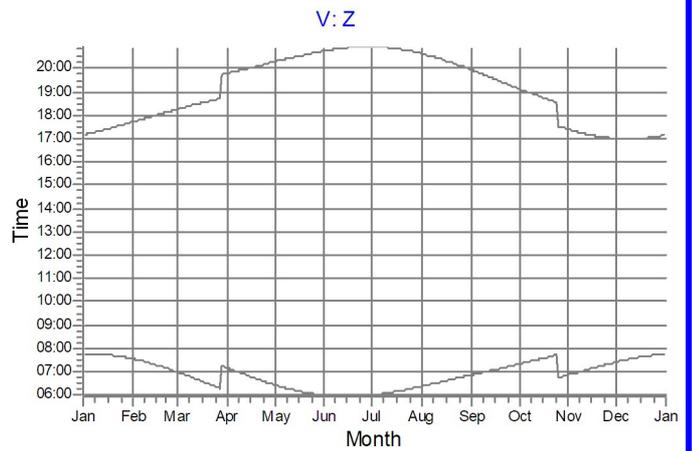
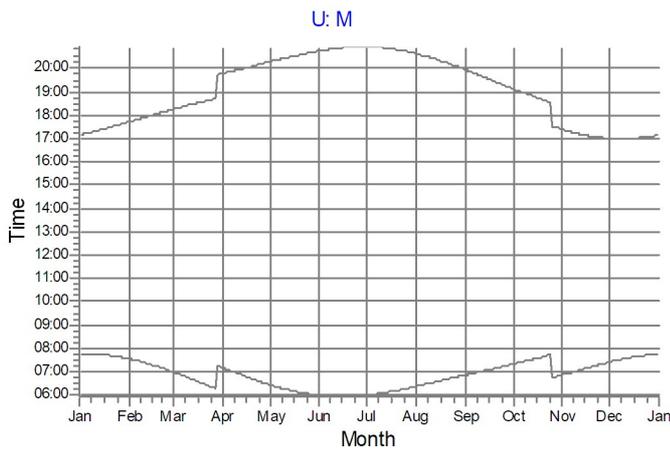
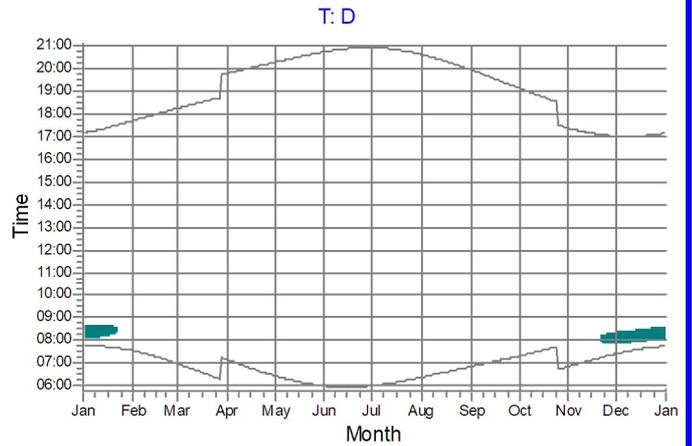
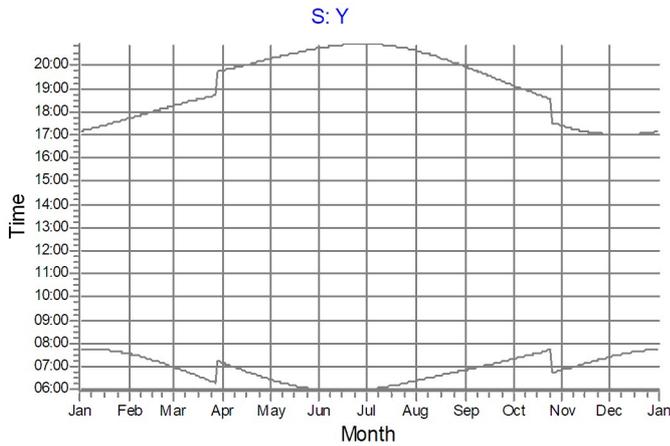
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Calculated:

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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs

2: N05
3: N07

4: N08
5: N09

6: N10

Project:

Nurri_seconda presentazione

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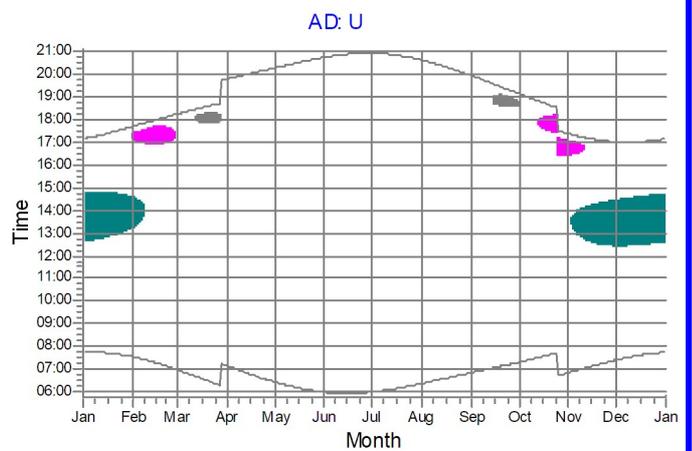
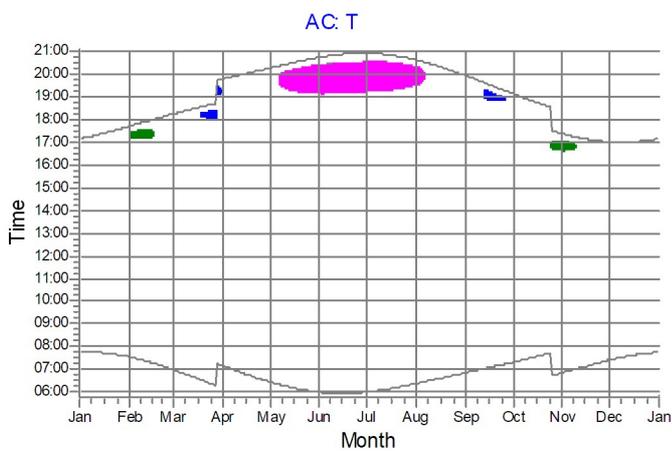
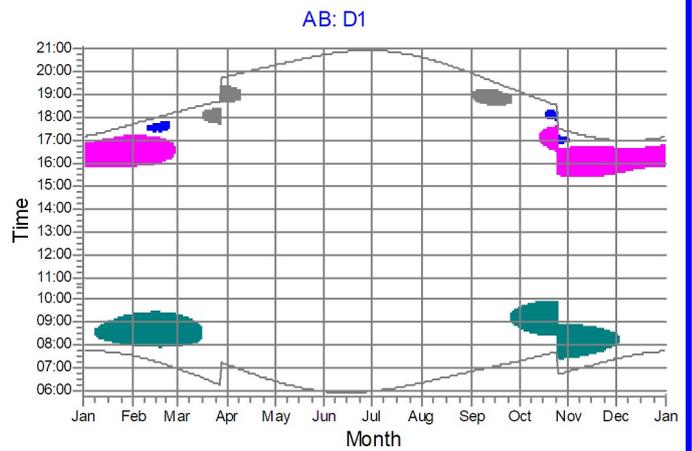
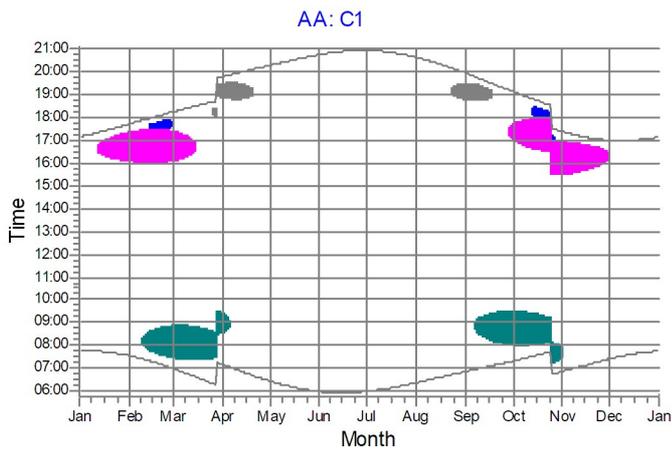
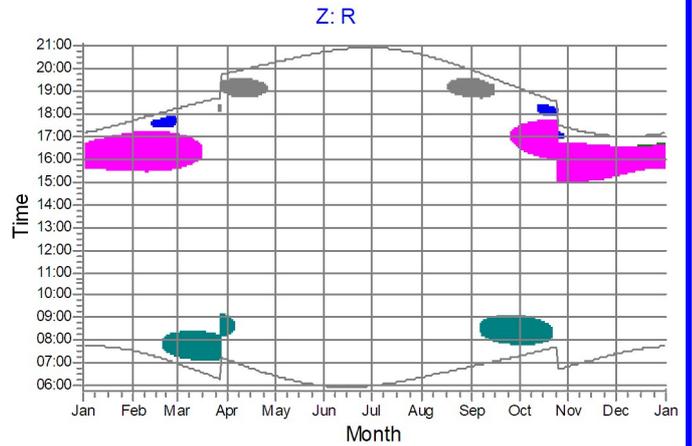
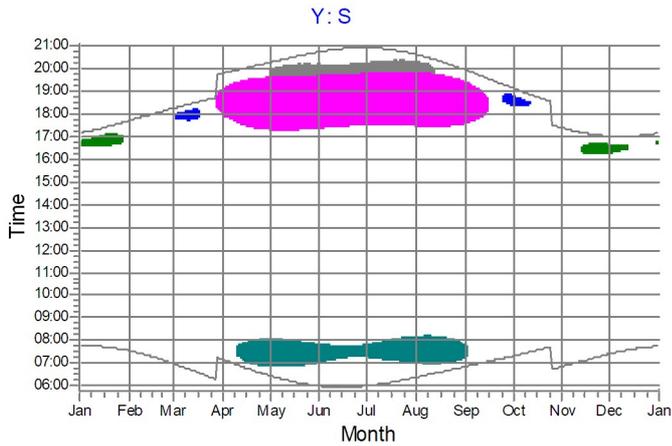
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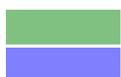
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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs



1: N06
3: N07



4: N08
5: N09



6: N10

Project:

Nurri_seconda presentazione

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Via Vittorio Veneto 231

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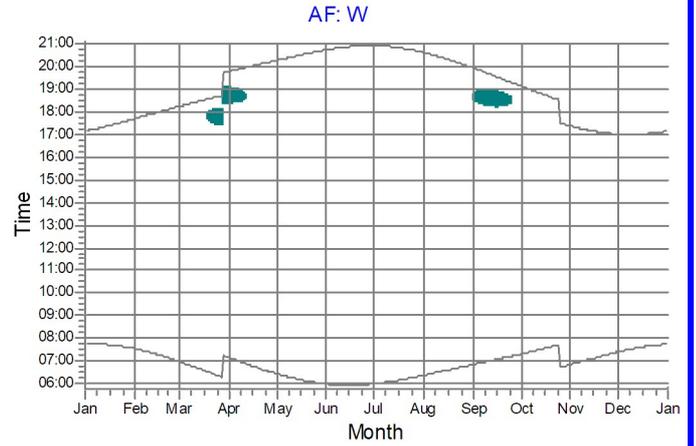
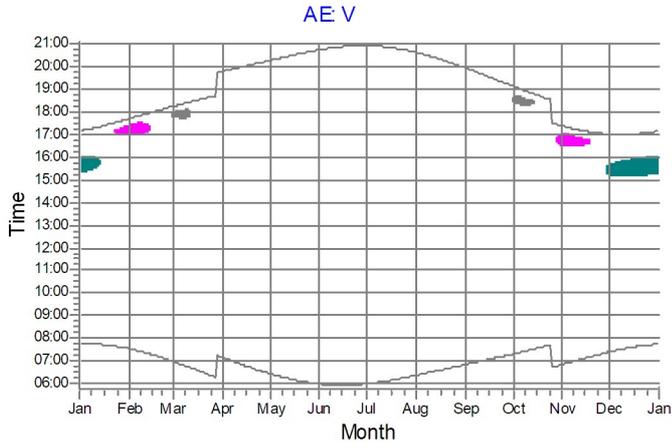
BrunoManca / ingbrunomanca@gmail.com

Calculated:

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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs

4: N08

5: N09

6: N10

Project:

Nurri_seconda presentazione

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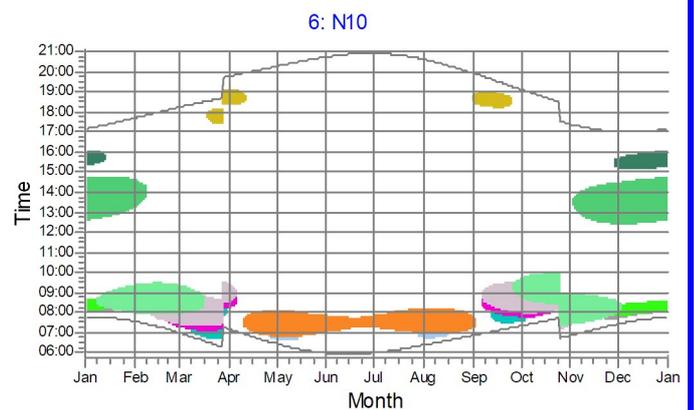
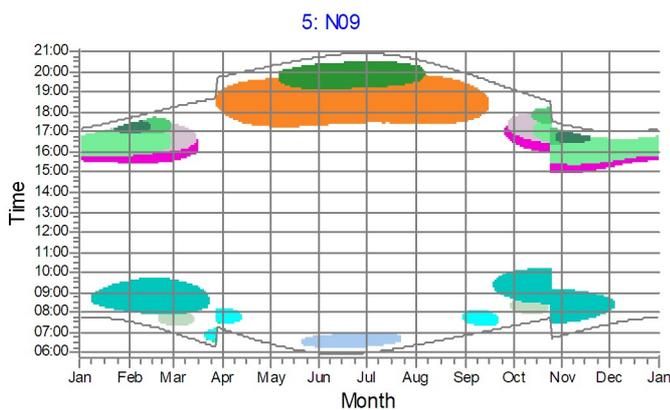
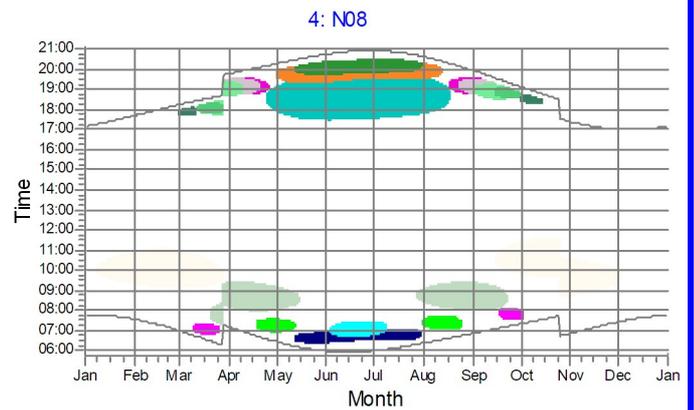
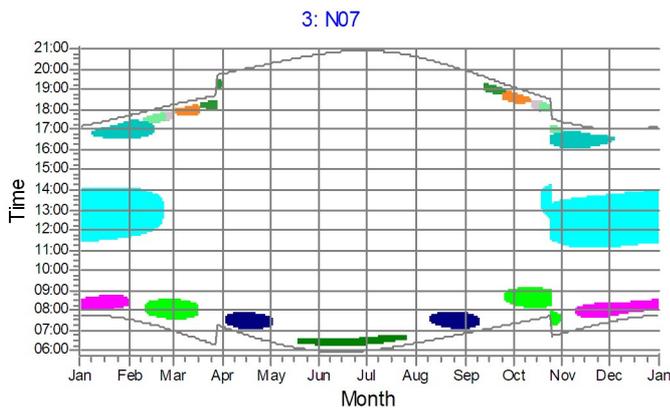
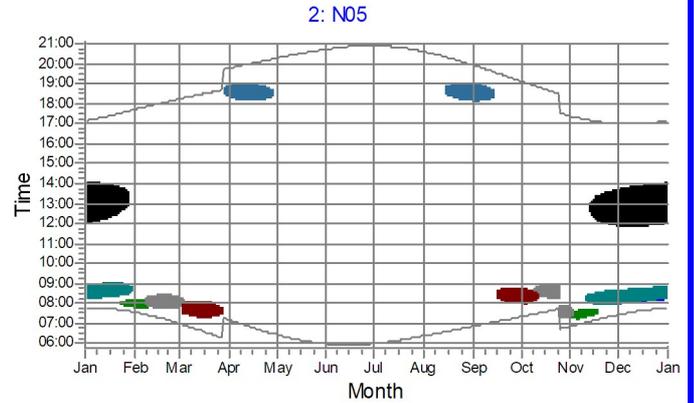
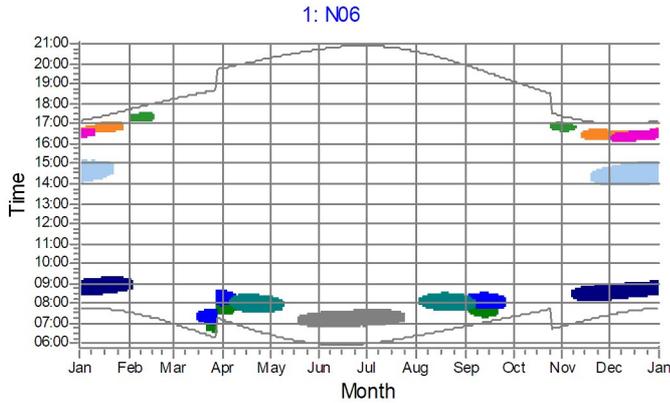
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Calculated:

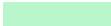
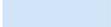
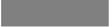
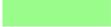
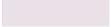
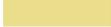
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SHADOW - Calendar per WTG, graphical

Calculation: Nurri seconda presentazione 6WTG



Shadow receptors

 A: E1	 G: G	 O: A1	 W: Q	 AB: D1
 C: H	 H: J	 P: A	 X: N	 AC: T
 D: B1	 I: F1	 Q: C	 Y: S	 AD: U
 E: F	 M: B	 R: E	 Z: R	 AE: V
 F: I	 N: O	 T: D	 AA: C1	 AF: W

Project:

Nurri_seconda presentazione

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Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
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SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: A - E1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June			
1	07:45	07:33	07:52 (2)	06:58	07:10	07:32 (1)	06:26	05:58	06:19 (3)
	17:10	17:43	08:06 (2)	18:15	19:47	07:57 (1)	20:17	20:45	12 06:31 (3)
2	07:45	07:32	07:51 (2)	06:57	07:08	07:31 (1)	06:25	05:58	06:19 (3)
	17:10	17:44	08:06 (2)	18:16	19:48	07:56 (1)	20:18	20:46	12 06:31 (3)
3	07:45	07:31	07:50 (2)	06:55	07:06	07:32 (1)	06:23	05:58	06:19 (3)
	17:11	17:45	08:06 (2)	18:17	19:49	07:56 (1)	20:19	20:46	13 06:32 (3)
4	07:45	07:30	07:49 (2)	06:54	07:05	07:32 (1)	06:22	05:57	06:18 (3)
	17:12	17:46	08:06 (2)	18:18	19:50	07:54 (1)	20:20	20:47	13 06:31 (3)
5	07:45	07:29	07:48 (2)	06:52	07:03	07:33 (1)	06:21	05:57	06:18 (3)
	17:13	17:47	08:05 (2)	18:19	19:51	07:52 (1)	20:21	20:48	13 06:31 (3)
6	07:45	07:28	07:47 (2)	06:51	07:02	07:34 (1)	06:20	05:57	06:18 (3)
	17:14	17:49	08:04 (2)	18:20	19:52	07:51 (1)	20:22	20:48	13 06:31 (3)
7	07:45	07:27	07:48 (2)	06:49	07:00	07:36 (1)	06:19	05:56	06:18 (3)
	17:15	17:50	08:03 (2)	18:21	19:53	07:48 (1)	20:23	20:49	13 06:31 (3)
8	07:45	07:26	07:50 (2)	06:48	06:59	07:41 (1)	06:17	05:56	06:17 (3)
	17:16	17:51	08:02 (2)	18:23	19:54	07:43 (1)	20:24	20:49	13 06:30 (3)
9	07:45	07:25	07:53 (2)	06:46	06:57		06:16	05:56	06:17 (3)
	17:17	17:52	07:59 (2)	18:24	19:55		20:25	20:50	14 06:31 (3)
10	07:45	07:23		06:45	06:56		06:15	05:56	06:17 (3)
	17:18	17:53		18:25	19:56		20:26	20:51	14 06:31 (3)
11	07:45	07:22		06:43	06:54		06:14	05:56	06:17 (3)
	17:19	17:55		18:26	19:57		20:27	20:51	14 06:31 (3)
12	07:44	07:21		06:42	06:52		06:13	05:56	06:17 (3)
	17:20	17:56		18:27	19:58		20:28	20:52	14 06:31 (3)
13	07:44	07:20		06:40	06:51		06:12	05:55	06:17 (3)
	17:21	17:57		18:28	19:59		20:29	20:52	14 06:31 (3)
14	07:44	07:19		06:38	06:49		06:11	05:55	06:17 (3)
	17:22	17:58		18:29	20:00		20:30	20:53	14 06:31 (3)
15	07:43	07:17		06:37	06:48		06:10	05:55	06:17 (3)
	17:23	17:59		18:30	20:01		20:31	20:53	14 06:31 (3)
16	07:43	07:16		06:35	06:46		06:09	05:55	06:17 (3)
	17:24	18:00		18:31	20:02		20:31	20:53	13 06:30 (3)
17	07:43	07:15		06:34	06:45		06:09	05:55	06:17 (3)
	17:25	18:02		18:32	20:03		20:32	20:54	13 06:30 (3)
18	07:42	07:14		06:32	06:43		06:08	05:56	06:17 (3)
	17:26	18:03		18:33	20:04		20:33	20:54	13 06:30 (3)
19	07:42	07:12		06:31	06:42		06:07	05:56	06:17 (3)
	17:27	18:04		18:34	20:05		20:34	2 06:29 (3) 20:54	13 06:30 (3)
20	07:41	07:11		06:29	06:41		06:06	06:26 (3) 05:56	06:18 (3)
	17:29	18:05		18:35	20:06		20:35	3 06:29 (3) 20:55	13 06:31 (3)
21	07:41	07:10		06:27	06:39		06:05	06:25 (3) 05:56	06:18 (3)
	17:30	18:06		18:36	20:07		20:36	4 06:29 (3) 20:55	13 06:31 (3)
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	17:31	18:07		18:37	20:08		20:37	5 06:30 (3) 20:55	13 06:31 (3)
23	07:39	07:07		06:24	06:36		06:04	06:24 (3) 05:56	06:18 (3)
	17:32	18:08		18:38	11 06:53 (1) 20:09		20:38	6 06:30 (3) 20:55	13 06:31 (3)
24	07:39	07:59 (2) 07:06		06:22	06:41 (1) 06:35		06:03	06:23 (3) 05:57	06:19 (3)
	17:33	2 08:01 (2) 18:09		18:39	15 06:56 (1) 20:10		20:39	7 06:30 (3) 20:55	13 06:32 (3)
25	07:38	07:58 (2) 07:04		06:21	06:39 (1) 06:34		06:02	06:23 (3) 05:57	06:19 (3)
	17:34	4 08:02 (2) 18:11		18:40	18 06:57 (1) 20:11		20:39	8 06:31 (3) 20:56	13 06:32 (3)
26	07:37	07:57 (2) 07:03		06:19	06:37 (1) 06:32		06:02	06:22 (3) 05:57	06:19 (3)
	17:36	6 08:03 (2) 18:12		18:41	20 06:57 (1) 20:12		20:40	9 06:31 (3) 20:56	13 06:32 (3)
27	07:37	07:57 (2) 07:01		06:18	06:36 (1) 06:31		06:01	06:22 (3) 05:58	06:20 (3)
	17:37	8 08:05 (2) 18:13		18:42	22 06:58 (1) 20:13		20:41	10 06:32 (3) 20:56	14 06:34 (3)
28	07:36	07:56 (2) 07:00		06:16	06:34 (1) 06:30		06:00	06:21 (3) 05:58	06:20 (3)
	17:38	9 08:05 (2) 18:14		18:43	24 06:58 (1) 20:14		20:42	10 06:31 (3) 20:56	14 06:34 (3)
29	07:35	07:55 (2) 07:00		06:14	07:33 (1) 06:28		06:00	06:21 (3) 05:58	06:20 (3)
	17:39	11 08:06 (2) 18:15		19:44	26 07:59 (1) 20:15		20:43	11 06:32 (3) 20:56	14 06:34 (3)
30	07:34	07:54 (2) 07:00		06:13	07:32 (1) 06:27		05:59	06:20 (3) 05:59	06:21 (3)
	17:40	12 08:06 (2) 18:16		19:45	26 07:58 (1) 20:16		20:43	11 06:31 (3) 20:56	14 06:35 (3)
31	07:33	07:53 (2) 07:00		06:11	07:31 (1) 06:22		05:59	06:20 (3) 05:59	06:21 (3)
	17:41	13 08:06 (2) 18:17		19:46	26 07:57 (1) 20:17		20:44	12 06:32 (3) 20:57	14 06:36 (3)
Potential sun hours	301	299	370	397	445	448			
Total, worst case	65	129	188	146	98	399			
Sun reduction	0,45	0,47	0,49	0,53	0,59	0,66			
Oper. time red.	0,93	0,93	0,93	0,93	0,93	0,93			
Wind dir. red.	0,76	0,76	0,75	0,75	0,67	0,67			
Total reduction	0,32	0,34	0,35	0,37	0,37	0,41			
Total, real	21	43	65	54	36	164			

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

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

Project:

Nurri_seconda presentazione

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Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: A - E1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	06:21 (3)	06:22	06:51	07:19	06:51
	20:56	14 06:35 (3)	20:38	19:56	19:08	17:23
2	06:00	06:22 (3)	06:23	06:52	07:20	06:52
	20:55	14 06:36 (3)	20:37	19:55	19:06	17:22
3	06:00	06:22 (3)	06:24	06:53	07:21	06:54
	20:55	14 06:36 (3)	20:36	19:53	19:05	17:21
4	06:01	06:23 (3)	06:25	06:54	07:38 (1)	07:22
	20:55	14 06:37 (3)	20:35	19:52	2 07:40 (1)	19:03
5	06:01	06:23 (3)	06:26	06:55	07:33 (1)	07:23
	20:55	13 06:36 (3)	20:33	19:50	12 07:45 (1)	19:01
6	06:02	06:24 (3)	06:27	06:56	07:31 (1)	07:24
	20:55	13 06:37 (3)	20:32	19:49	16 07:47 (1)	19:00
7	06:02	06:24 (3)	06:28	06:57	07:29 (1)	07:25
	20:54	13 06:37 (3)	20:31	19:47	19 07:48 (1)	18:58
8	06:03	06:25 (3)	06:28	06:57	07:26 (1)	07:26
	20:54	13 06:38 (3)	20:30	19:45	22 07:48 (1)	18:57
9	06:04	06:26 (3)	06:29	06:58	07:25 (1)	07:27
	20:54	13 06:39 (3)	20:29	19:44	24 07:49 (1)	18:55
10	06:04	06:26 (3)	06:30	06:59	07:24 (1)	07:28
	20:53	13 06:39 (3)	20:28	19:42	25 07:49 (1)	18:54
11	06:05	06:27 (3)	06:31	07:00	07:24 (1)	07:29
	20:53	12 06:39 (3)	20:26	19:41	25 07:49 (1)	18:52
12	06:06	06:28 (3)	06:32	07:01	07:23 (1)	07:30
	20:53	12 06:40 (3)	20:25	19:39	26 07:49 (1)	18:51
13	06:06	06:28 (3)	06:33	07:02	07:23 (1)	07:31
	20:52	11 06:39 (3)	20:24	19:37	26 07:49 (1)	18:49
14	06:07	06:29 (3)	06:34	07:03	07:23 (1)	07:32
	20:52	11 06:40 (3)	20:23	19:36	26 07:49 (1)	18:48
15	06:08	06:30 (3)	06:35	07:04	07:24 (1)	07:33
	20:51	10 06:40 (3)	20:21	19:34	24 07:48 (1)	18:46
16	06:09	06:30 (3)	06:36	07:05	07:25 (1)	07:34
	20:51	10 06:40 (3)	20:20	19:32	22 07:47 (1)	18:45
17	06:09	06:31 (3)	06:37	07:06	07:26 (1)	07:35
	20:50	9 06:40 (3)	20:19	19:31	20 07:46 (1)	18:43
18	06:10	06:32 (3)	06:38	07:07	07:26 (1)	07:36
	20:49	9 06:41 (3)	20:17	19:29	18 07:44 (1)	18:42
19	06:11	06:33 (3)	06:39	07:08	07:27 (1)	07:37
	20:49	8 06:41 (3)	20:16	19:27	15 07:42 (1)	18:40
20	06:12	06:33 (3)	06:40	07:09	07:28 (1)	07:38
	20:48	7 06:40 (3)	20:14	19:26	12 07:40 (1)	18:39
21	06:12	06:34 (3)	06:41	07:10	07:30 (1)	07:39
	20:47	6 06:40 (3)	20:13	19:24	6 07:36 (1)	18:37
22	06:13	06:35 (3)	06:42	07:10	07:40	07:15
	20:47	5 06:40 (3)	20:11	19:23	18:36	17:04
23	06:14	06:36 (3)	06:43	07:11	07:41	07:16
	20:46	4 06:40 (3)	20:10	19:21	18:35	17:04
24	06:15	06:37 (3)	06:43	07:12	07:42	07:17
	20:45	2 06:39 (3)	20:09	19:19	18:33	17:03
25	06:16	06:38 (3)	06:44	07:13	06:44	07:18
	20:44	2 06:39 (3)	20:07	19:18	17:32	17:03
26	06:17	06:45	07:14	06:45	07:19	07:43
	20:43	20:06	19:16	17:31	17:02	17:05
27	06:18	06:46	07:15	06:46	07:20	07:43
	20:43	20:04	19:14	17:29	17:02	17:06
28	06:18	06:47	07:16	06:47	07:21	07:44
	20:42	20:03	19:13	17:28	17:01	17:06
29	06:19	06:48	07:17	06:48	07:23	07:44
	20:41	20:01	19:11	17:27	17:01	17:07
30	06:20	06:49	07:18	06:49	07:24	07:44
	20:40	20:00	19:09	17:26	17:01	17:08
31	06:21	06:50	07:19	06:50	07:25	07:44
	20:39	19:58	19:08	17:24	17:00	17:09
Potential sun hours	455	425	374	347	301	292
Total, worst case	252		340		195	
Sun reduction	0,74		0,65		0,51	
Oper. time red.	0,93		0,93		0,93	
Wind dir. red.	0,67		0,75		0,76	
Total reduction	0,46		0,45		0,36	
Total, real	116		155		70	

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 3

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: B - K

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

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

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 4

Licensed user:

Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: C - H

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45	08:17 (2)	07:33	06:58	07:10	06:26
	17:10	08:45 (2)	17:43	18:15	19:47	08:35 (1)
2	07:45	08:17 (2)	07:32	06:57	07:08	07:58 (1)
	17:10	08:46 (2)	17:44	18:16	19:48	08:33 (1)
3	07:45	08:18 (2)	07:31	06:55	07:06	07:59 (1)
	17:11	08:46 (2)	17:45	18:17	19:49	08:33 (1)
4	07:45	08:18 (2)	07:30	06:54	07:05	07:59 (1)
	17:12	08:46 (2)	17:46	18:18	19:50	08:31 (1)
5	07:45	08:19 (2)	07:29	06:52	07:03	07:59 (1)
	17:13	08:47 (2)	17:47	18:19	19:51	08:29 (1)
6	07:45	08:19 (2)	07:28	06:51	07:02	08:01 (1)
	17:14	08:46 (2)	17:49	18:20	19:52	08:28 (1)
7	07:45	08:19 (2)	07:27	06:49	07:00	08:01 (1)
	17:15	08:46 (2)	17:50	18:21	19:53	08:26 (1)
8	07:45	08:20 (2)	07:26	06:48	06:59	08:03 (1)
	17:16	08:47 (2)	17:51	18:22	19:54	08:24 (1)
9	07:45	08:21 (2)	07:25	06:46	06:57	08:05 (1)
	17:17	08:47 (2)	17:52	18:24	19:55	08:21 (1)
10	07:45	08:22 (2)	07:23	06:45	06:55	08:10 (1)
	17:18	08:47 (2)	17:53	18:25	19:56	08:16 (1)
11	07:44	08:22 (2)	07:22	06:43	06:54	06:14
	17:19	08:46 (2)	17:54	18:26	19:57	20:27
12	07:44	08:23 (2)	07:21	06:42	06:52	06:13
	17:20	08:47 (2)	17:56	18:27	19:58	20:28
13	07:44	08:25 (2)	07:20	06:40	06:51	06:12
	17:21	08:47 (2)	17:57	18:28	19:59	20:29
14	07:44	08:25 (2)	07:19	06:38	06:49	06:11
	17:22	08:46 (2)	17:58	18:29	20:00	20:30
15	07:43	08:27 (2)	07:17	06:37	06:48	06:10
	17:23	08:46 (2)	17:59	18:30	20:01	20:31
16	07:43	08:29 (2)	07:16	06:35	06:46	06:09
	17:24	08:45 (2)	18:00	18:31	20:02	20:31
17	07:43	08:30 (2)	07:15	06:34	07:16 (1)	06:45
	17:25	08:44 (2)	18:01	18:32	07:27 (1)	20:03
18	07:42	08:32 (2)	07:14	06:32	07:11 (1)	06:43
	17:26	08:43 (2)	18:03	18:33	19:07 (1)	20:04
19	07:42	08:35 (2)	07:12	06:31	07:09 (1)	06:42
	17:27	08:39 (2)	18:04	18:34	24:07 (1)	20:05
20	07:41	07:11	06:29	07:07 (1)	06:41	06:06
	17:29	18:05	18:35	27:07 (1)	20:06	20:35
21	07:41	07:10	06:27	07:06 (1)	06:39	06:05
	17:30	18:06	18:36	29:07 (1)	20:07	20:36
22	07:40	07:08	06:26	07:04 (1)	06:38	06:04
	17:31	18:07	18:37	32:07 (1)	20:08	20:37
23	07:39	07:07	06:24	07:02 (1)	06:36	06:04
	17:32	18:08	18:38	34:07 (1)	20:09	20:38
24	07:39	07:06	06:22	07:02 (1)	06:35	06:03
	17:33	18:09	18:39	35:07 (1)	20:10	20:39
25	07:38	07:04	06:21	07:00 (1)	06:34	06:02
	17:34	18:11	18:40	37:07 (1)	20:11	20:39
26	07:37	07:03	06:19	06:59 (1)	06:32	06:02
	17:35	18:12	18:41	38:07 (1)	20:12	20:40
27	07:37	07:01	06:18	06:59 (1)	06:31	06:01
	17:37	18:13	18:42	38:07 (1)	20:13	20:41
28	07:36	07:00	06:16	06:58 (1)	06:30	06:00
	17:38	18:14	18:43	38:07 (1)	20:14	20:42
29	07:35		06:14	07:59 (1)	06:28	06:00
	17:39		19:44	38:08 (1)	20:15	20:43
30	07:34		07:13	07:58 (1)	06:27	05:59
	17:40		19:45	38:08 (1)	20:16	20:43
31	07:33		07:11	07:57 (1)		05:59
	17:41		19:46	38:08 (1)		20:44
Potential sun hours	301	299	370	397	445	448
Total, worst case	428		476	263		
Sun reduction	0,45		0,49	0,53		
Oper. time red.	0,93		0,93	0,93		
Wind dir. red.	0,73		0,76	0,76		
Total reduction	0,31		0,35	0,37		
Total, real	132		165	98		

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 5

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: C - H

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December	
1	05:59	06:22	06:51	07:19	06:51	07:25	08:05 (2)
	20:56	20:38	19:56	19:08	17:23	17:00	24 08:29 (2)
2	06:00	06:23	06:52	08:08 (1) 07:20	06:52	07:26	08:05 (2)
	20:55	20:37	19:55	6 08:14 (1) 19:06	17:22	17:00	25 08:30 (2)
3	06:00	06:24	06:53	08:03 (1) 07:21	06:53	07:27	08:05 (2)
	20:55	20:36	19:53	16 08:19 (1) 19:05	17:21	17:00	26 08:31 (2)
4	06:01	06:25	06:54	08:01 (1) 07:22	06:55	07:28	08:05 (2)
	20:55	20:35	19:52	20 08:21 (1) 19:03	17:20	17:00	27 08:32 (2)
5	06:01	06:26	06:55	07:58 (1) 07:23	06:56	07:28	08:04 (2)
	20:55	20:33	19:50	25 08:23 (1) 19:01	17:19	17:00	27 08:31 (2)
6	06:02	06:27	06:56	07:57 (1) 07:24	06:57	07:29	08:05 (2)
	20:55	20:32	19:49	27 08:24 (1) 19:00	17:18	16:59	27 08:32 (2)
7	06:02	06:28	06:57	07:55 (1) 07:25	06:58	07:30	08:05 (2)
	20:54	20:31	19:47	30 08:25 (1) 18:58	17:16	16:59	28 08:33 (2)
8	06:03	06:28	06:57	07:53 (1) 07:26	06:59	07:31	08:05 (2)
	20:54	20:30	19:45	32 08:25 (1) 18:57	17:15	16:59	28 08:33 (2)
9	06:04	06:29	06:58	07:52 (1) 07:27	07:00	07:32	08:06 (2)
	20:54	20:29	19:44	34 08:26 (1) 18:55	17:14	16:59	28 08:34 (2)
10	06:04	06:30	06:59	07:51 (1) 07:28	07:01	07:33	08:06 (2)
	20:53	20:28	19:42	35 08:26 (1) 18:54	17:13	16:59	29 08:35 (2)
11	06:05	06:31	07:00	07:50 (1) 07:29	07:03	07:34	08:07 (2)
	20:53	20:26	19:41	37 08:27 (1) 18:52	17:13	17:00	29 08:36 (2)
12	06:06	06:32	07:01	07:50 (1) 07:30	07:04	07:35	08:07 (2)
	20:53	20:25	19:39	37 08:27 (1) 18:51	17:12	17:00	29 08:36 (2)
13	06:06	06:33	07:02	07:49 (1) 07:31	07:05	07:35	08:07 (2)
	20:52	20:24	19:37	38 08:27 (1) 18:49	17:11	17:00	29 08:36 (2)
14	06:07	06:34	07:03	07:49 (1) 07:32	07:06	07:36	08:08 (2)
	20:52	20:22	19:36	38 08:27 (1) 18:48	17:10	17:00	29 08:37 (2)
15	06:08	06:35	07:04	07:49 (1) 07:33	07:07	07:37	08:08 (2)
	20:51	20:21	19:34	38 08:27 (1) 18:46	17:09	17:00	30 08:38 (2)
16	06:09	06:36	07:05	07:48 (1) 07:34	07:08	07:38	08:08 (2)
	20:51	20:20	19:32	38 08:26 (1) 18:45	17:08	17:00	29 08:37 (2)
17	06:09	06:37	07:06	07:48 (1) 07:35	07:09	07:38	08:09 (2)
	20:50	20:18	19:31	38 08:26 (1) 18:43	17:07	17:01	29 08:38 (2)
18	06:10	06:38	07:07	07:47 (1) 07:36	07:11	07:39	08:10 (2)
	20:49	20:17	19:29	37 08:24 (1) 18:42	17:07	17:01	29 08:39 (2)
19	06:11	06:39	07:08	07:48 (1) 07:37	07:12	07:39	08:10 (2)
	20:49	20:16	19:27	35 08:23 (1) 18:40	17:06	17:02	29 08:39 (2)
20	06:12	06:40	07:09	07:48 (1) 07:38	07:13	07:40	08:11 (2)
	20:48	20:14	19:26	35 08:23 (1) 18:39	17:05	17:02	29 08:40 (2)
21	06:12	06:41	07:09	07:49 (1) 07:39	07:14	07:41	08:10 (2)
	20:47	20:13	19:24	32 08:21 (1) 18:37	17:05	17:02	30 08:40 (2)
22	06:13	06:42	07:10	07:50 (1) 07:40	07:15	07:41	08:11 (2)
	20:47	20:11	19:23	30 08:20 (1) 18:36	17:04	17:03	30 08:41 (2)
23	06:14	06:43	07:11	07:51 (1) 07:41	07:16	08:13 (2) 07:42	08:11 (2)
	20:46	20:10	19:21	27 08:18 (1) 18:35	17:04	3 08:16 (2) 17:03	30 08:41 (2)
24	06:15	06:43	07:12	07:52 (1) 07:42	07:17	08:09 (2) 07:42	08:13 (2)
	20:45	20:09	19:19	25 08:17 (1) 18:33	17:03	11 08:20 (2) 17:04	29 08:42 (2)
25	06:16	06:44	07:13	07:54 (1) 06:44	07:18	08:08 (2) 07:43	08:13 (2)
	20:44	20:07	19:18	20 08:14 (1) 17:32	17:03	14 08:22 (2) 17:04	29 08:42 (2)
26	06:17	06:45	07:14	07:57 (1) 06:45	07:19	08:07 (2) 07:43	08:13 (2)
	20:43	20:06	19:16	14 08:11 (1) 17:31	17:02	16 08:23 (2) 17:05	29 08:42 (2)
27	06:18	06:46	07:15	06:46	07:20	08:06 (2) 07:43	08:14 (2)
	20:43	20:04	19:14	17:29	17:02	19 08:25 (2) 17:06	29 08:43 (2)
28	06:18	06:47	07:16	06:47	07:21	08:05 (2) 07:44	08:14 (2)
	20:42	20:03	19:13	17:28	17:01	21 08:26 (2) 17:06	29 08:43 (2)
29	06:19	06:48	07:17	06:48	07:23	08:05 (2) 07:44	08:15 (2)
	20:41	20:01	19:11	17:27	17:01	22 08:27 (2) 17:07	29 08:44 (2)
30	06:20	06:49	07:18	06:49	07:24	08:04 (2) 07:44	08:15 (2)
	20:40	20:00	19:09	17:26	17:01	24 08:28 (2) 17:08	29 08:44 (2)
31	06:21	06:50		06:50		07:44	08:15 (2)
	20:39	19:58		17:24		17:09	29 08:44 (2)
Potential sun hours	455	425	374	347	301	292	
Total, worst case			744		130		882
Sun reduction			0,65		0,51		0,45
Oper. time red.			0,93		0,93		0,93
Wind dir. red.			0,76		0,73		0,73
Total reduction			0,46		0,34		0,31
Total, real			339		45		272

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 6

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: D - B1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 17:10	07:33 17:43	06:58 18:15	07:53 (2) 08:14 (2)	07:10 19:47	06:26 20:17
2	07:45 17:10	07:32 17:44	06:57 18:16	07:54 (2) 08:12 (2)	07:08 19:48	06:25 20:18
3	07:45 17:11	07:31 17:45	06:55 18:17	07:58 (2) 08:09 (2)	07:06 19:49	06:23 20:19
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05 19:50	06:22 20:20	05:57 20:47
5	07:45 17:13	07:29 17:47	06:52 18:19	07:03 19:51	06:21 20:21	05:57 20:48
6	07:45 17:14	07:28 17:49	06:51 18:20	07:02 19:52	06:20 20:22	05:57 20:48
7	07:45 17:15	07:27 17:50	06:49 18:21	07:00 19:53	06:19 20:23	05:56 20:49
8	07:45 17:16	07:26 17:51	06:48 18:22	06:59 19:54	06:17 20:24	05:56 20:49
9	07:45 17:17	07:25 17:52	06:46 08:00 (2) 18:24	06:57 19:55	06:16 20:25	05:56 20:50
10	07:45 17:18	07:23 17:53	06:45 08:12 (2) 18:25	06:55 19:56	06:15 20:26	05:56 20:51
11	07:44 17:19	07:22 17:54	06:43 08:15 (2) 18:26	06:54 19:57	06:14 20:27	05:56 20:51
12	07:44 17:20	07:21 17:56	06:42 08:16 (2) 18:27	06:52 19:58	06:13 20:28	05:56 20:52
13	07:44 17:21	07:20 17:57	06:40 08:17 (2) 18:28	06:51 19:59	06:12 20:29	05:55 20:52
14	07:44 17:22	07:19 17:58	06:38 08:19 (2) 18:29	06:49 20:00	06:11 20:30	05:55 20:52
15	07:43 17:23	07:17 17:59	06:37 08:20 (2) 18:30	06:48 20:01	06:10 20:31	05:55 20:53
16	07:43 17:24	07:16 18:00	06:35 08:21 (2) 18:31	06:46 20:02	06:09 20:31	05:55 20:53
17	07:43 17:25	07:15 18:01	06:34 08:22 (2) 18:32	06:45 20:03	06:08 20:32	05:55 20:54
18	07:42 17:26	07:14 18:03	06:32 08:22 (2) 18:33	06:43 20:04	06:08 20:33	05:56 20:54
19	07:42 17:27	07:12 18:04	06:31 08:22 (2) 18:34	06:42 20:05	06:07 20:34	07:06 (1) 07:13 (1) 20:54
20	07:41 17:29	07:11 18:05	06:29 08:22 (2) 18:35	06:41 20:06	06:06 20:35	07:02 (1) 07:16 (1) 20:55
21	07:41 17:30	07:10 18:06	06:27 08:22 (2) 18:36	06:39 20:07	06:05 20:36	07:00 (1) 07:18 (1) 20:55
22	07:40 17:31	07:08 18:07	06:26 08:22 (2) 18:37	06:38 20:08	06:04 20:37	06:59 (1) 07:21 (1) 20:55
23	07:39 17:32	07:07 18:08	06:24 08:22 (2) 18:38	06:36 20:09	06:04 20:38	06:58 (1) 07:22 (1) 20:55
24	07:39 17:33	07:06 18:09	06:22 08:22 (2) 18:39	06:35 20:10	06:03 20:39	06:56 (1) 07:22 (1) 20:55
25	07:38 17:34	07:04 18:11	06:21 08:20 (2) 18:40	06:34 20:11	06:02 20:39	06:56 (1) 07:24 (1) 20:55
26	07:37 17:35	07:03 18:12	06:19 08:19 (2) 18:41	06:32 20:12	06:02 20:40	06:55 (1) 07:24 (1) 20:56
27	07:37 17:37	07:01 18:13	06:18 08:18 (2) 18:42	06:31 20:13	06:01 20:41	06:55 (1) 07:26 (1) 20:56
28	07:36 17:38	07:00 18:14	06:16 08:16 (2) 18:43	06:30 20:14	06:00 20:42	06:54 (1) 07:26 (1) 20:56
29	07:35 17:39		06:14 19:44	06:28 20:15	06:00 20:43	06:54 (1) 07:27 (1) 20:56
30	07:34 17:40		06:13 19:45	06:27 20:16	05:59 20:43	06:53 (1) 07:27 (1) 20:56
31	07:33 17:41		06:11 19:46		05:59 20:44	06:53 (1) 07:28 (1)
Potential sun hours	301	299	370	397	445	448
Total, worst case			574	50		333
Sun reduction			0,47	0,49		0,59
Oper. time red.			0,93	0,93		0,93
Wind dir. red.			0,76	0,76		0,68
Total reduction			0,34	0,35		0,38
Total, real			193	18		125

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 7

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: D - B1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	06:56 (1)	06:22	06:51	07:19	06:51
	20:56	07:36 (1)	20:38	19:56	19:08	17:23
2	06:00	06:57 (1)	06:23	06:52	07:20	06:52
	20:55	07:37 (1)	20:37	19:55	19:06	17:22
3	06:00	06:57 (1)	06:24	06:53	07:21	06:53
	20:55	07:36 (1)	20:36	19:53	19:05	17:21
4	06:01	06:58 (1)	06:25	06:54	07:22	06:55
	20:55	07:37 (1)	20:35	19:52	19:03	17:20
5	06:01	06:57 (1)	06:26	06:55	07:23	06:56
	20:55	07:36 (1)	20:33	19:50	19:01	17:19
6	06:02	06:58 (1)	06:27	06:56	07:24	06:57
	20:55	07:37 (1)	20:32	19:49	19:00	17:18
7	06:02	06:58 (1)	06:28	06:57	07:25	06:58
	20:54	07:36 (1)	20:31	19:47	18:58	17:16
8	06:03	06:59 (1)	06:28	06:57	07:26	06:59
	20:54	07:37 (1)	20:30	19:45	18:57	17:15
9	06:04	07:00 (1)	06:29	06:58	07:27	07:00
	20:54	07:37 (1)	20:29	19:44	18:55	17:14
10	06:04	06:59 (1)	06:30	06:59	07:28	08:37 (2)
	20:53	07:36 (1)	20:28	19:42	18:54	17:13
11	06:05	07:00 (1)	06:31	07:00	07:29	08:31 (2)
	20:53	07:36 (1)	20:26	19:41	18:52	17:13
12	06:06	07:01 (1)	06:32	07:01	07:30	08:28 (2)
	20:53	07:37 (1)	20:25	19:39	18:51	17:12
13	06:06	07:01 (1)	06:33	07:02	07:31	08:26 (2)
	20:52	07:36 (1)	20:24	19:37	18:49	17:11
14	06:07	07:02 (1)	06:34	07:03	07:32	08:24 (2)
	20:52	07:36 (1)	20:22	19:36	18:48	17:10
15	06:08	07:03 (1)	06:35	07:04	07:33	08:23 (2)
	20:51	07:36 (1)	20:21	19:34	18:46	17:09
16	06:09	07:03 (1)	06:36	07:05	07:34	08:22 (2)
	20:51	07:34 (1)	20:20	19:32	18:45	17:08
17	06:09	07:04 (1)	06:37	07:06	07:35	08:21 (2)
	20:50	07:34 (1)	20:18	19:31	18:43	17:07
18	06:10	07:05 (1)	06:38	07:07	07:36	08:20 (2)
	20:49	07:34 (1)	20:17	19:29	18:42	17:07
19	06:11	07:06 (1)	06:39	07:08	07:37	08:19 (2)
	20:49	07:33 (1)	20:16	19:27	18:40	17:06
20	06:12	07:06 (1)	06:40	07:09	07:38	08:19 (2)
	20:48	07:31 (1)	20:14	19:26	18:39	17:05
21	06:12	07:08 (1)	06:41	07:09	07:39	08:18 (2)
	20:47	07:31 (1)	20:13	19:24	18:37	17:05
22	06:13	07:09 (1)	06:42	07:10	07:40	08:19 (2)
	20:47	07:29 (1)	20:11	19:22	18:36	17:04
23	06:14	07:12 (1)	06:43	07:11	07:41	08:19 (2)
	20:46	07:28 (1)	20:10	19:21	18:35	17:04
24	06:15	07:14 (1)	06:43	07:12	07:42	08:19 (2)
	20:45	07:26 (1)	20:09	19:19	18:33	17:03
25	06:16		06:44	07:13	06:44	07:19 (2)
	20:44		20:07	19:18	17:32	17:03
26	06:17		06:45	07:14	06:45	07:19 (2)
	20:43		20:06	19:16	17:31	17:02
27	06:18		06:46	07:15	06:46	07:20 (2)
	20:43		20:04	19:14	17:29	17:02
28	06:18		06:47	07:16	06:47	07:20 (2)
	20:42		20:03	19:13	17:28	17:01
29	06:19		06:48	07:17	06:48	07:22 (2)
	20:41		20:01	19:11	17:27	17:01
30	06:20		06:49	07:18	06:49	07:23 (2)
	20:40		20:00	19:09	17:26	17:01
31	06:21		06:50		06:50	07:24 (2)
	20:39		19:58		17:24	17:01
Potential sun hours	455	425	374	347	301	292
Total, worst case	773			599		28
Sun reduction	0,74			0,54		0,51
Oper. time red.	0,93			0,93		0,93
Wind dir. red.	0,68			0,76		0,76
Total reduction	0,47			0,39		0,36
Total, real	364			232		10

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 8

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: E - F

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June		
1	07:45	08:07 (3)	07:33	06:58	07:10	06:26	05:58	
	17:10	23 08:30 (3)	17:43	18:15	19:47	20:17	20:45	
2	07:45	08:07 (3)	07:32	06:57	07:08	06:24	05:58	
	17:10	23 08:30 (3)	17:44	18:16	19:48	20:18	20:46	
3	07:45	08:07 (3)	07:31	06:55	07:06	06:23	05:58	
	17:11	24 08:31 (3)	17:45	18:17	19:49	20:19	20:46	
4	07:45	08:07 (3)	07:30	06:54	07:05	06:22	05:57	
	17:12	25 08:32 (3)	17:46	18:18	19:50	20:20	20:47	
5	07:45	08:07 (3)	07:29	06:52	07:03	06:21	05:57	
	17:13	25 08:32 (3)	17:47	18:19	19:51	20:21	20:48	
6	07:45	08:07 (3)	07:28	06:51	07:02	06:20	05:57	
	17:14	26 08:33 (3)	17:49	18:20	19:52	20:22	20:48	
7	07:45	08:06 (3)	07:27	06:49	07:00	06:19	05:56	
	17:15	27 08:33 (3)	17:50	18:21	19:53	20:23	20:49	
8	07:45	08:06 (3)	07:26	06:48	06:59	06:17	05:56	
	17:16	28 08:34 (3)	17:51	18:22	19:54	20:24	20:50	
9	07:45	08:06 (3)	07:25	06:46	06:57	06:16	05:56	
	17:17	29 08:35 (3)	17:52	18:24	19:55	20:25	20:50	
10	07:45	08:06 (3)	07:23	06:45	06:55	06:15	05:56	
	17:18	29 08:35 (3)	17:53	18:25	19:56	20:26	20:51	
11	07:45	08:06 (3)	07:22	06:43	07:04 (4)	06:54	06:14	05:56
	17:19	30 08:36 (3)	17:54	18:26	7 07:11 (4)	19:57	20:27	20:51
12	07:44	08:05 (3)	07:21	06:42	07:00 (4)	06:52	06:13	05:55
	17:20	31 08:36 (3)	17:56	18:27	14 07:14 (4)	19:58	20:28	20:52
13	07:44	08:05 (3)	07:20	06:40	06:58 (4)	06:51	06:12	05:55
	17:21	32 08:37 (3)	17:57	18:28	17 07:15 (4)	19:59	20:29	20:52
14	07:44	08:06 (3)	07:19	06:38	06:57 (4)	06:49	06:11	05:55
	17:22	32 08:38 (3)	17:58	18:29	19 07:16 (4)	20:00	20:30	20:53
15	07:43	08:06 (3)	07:17	06:37	06:55 (4)	06:48	06:10	05:55
	17:23	32 08:38 (3)	17:59	18:30	22 07:17 (4)	20:01	20:31	20:53
16	07:43	08:06 (3)	07:16	06:35	06:55 (4)	06:46	06:09	05:55
	17:24	32 08:38 (3)	18:00	18:31	22 07:17 (4)	20:02	20:31	20:53
17	07:43	08:06 (3)	07:15	06:34	06:54 (4)	06:45	06:08	05:55
	17:25	32 08:38 (3)	18:01	18:32	23 07:17 (4)	20:03	20:32	20:54
18	07:42	08:07 (3)	07:14	06:32	06:53 (4)	06:43	06:08	05:55
	17:26	32 08:39 (3)	18:03	18:33	24 07:17 (4)	20:04	20:33	20:54
19	07:42	08:07 (3)	07:12	06:31	06:54 (4)	06:42	06:07	05:56
	17:27	32 08:39 (3)	18:04	18:34	23 07:17 (4)	20:05	20:34	20:54
20	07:41	08:08 (3)	07:11	06:29	06:53 (4)	06:41	06:06	05:56
	17:29	32 08:40 (3)	18:05	18:35	23 07:16 (4)	20:06	20:35	20:55
21	07:41	08:08 (3)	07:10	06:27	06:54 (4)	06:39	06:05	05:56
	17:30	31 08:39 (3)	18:06	18:36	21 07:15 (4)	20:07	20:36	20:55
22	07:40	08:08 (3)	07:08	06:26	06:54 (4)	06:38	06:04	05:56
	17:31	31 08:39 (3)	18:07	18:37	20 07:14 (4)	20:08	20:37	20:55
23	07:39	08:10 (3)	07:07	06:24	06:55 (4)	06:36	06:04	05:56
	17:32	29 08:39 (3)	18:08	18:38	17 07:12 (4)	20:09	20:38	20:55
24	07:39	08:10 (3)	07:06	06:22	06:57 (4)	06:35	06:03	05:57
	17:33	29 08:39 (3)	18:09	18:39	14 07:11 (4)	20:10	20:39	20:55
25	07:38	08:11 (3)	07:04	06:21	06:59 (4)	06:34	06:02	05:57
	17:34	27 08:38 (3)	18:11	18:40	8 07:07 (4)	20:11	20:39	20:56
26	07:37	08:11 (3)	07:03	06:19	06:32	06:02	06:02	05:57
	17:35	27 08:38 (3)	18:12	18:41	20:12	20:40	20:56	
27	07:37	08:13 (3)	07:01	06:18	06:31	06:01	06:01	05:58
	17:37	25 08:38 (3)	18:13	18:42	20:13	20:41	20:56	
28	07:36	08:14 (3)	07:00	06:16	06:30	06:00	06:00	05:58
	17:38	23 08:37 (3)	18:14	18:43	20:14	20:42	20:56	
29	07:35	08:16 (3)		07:14	06:28	06:00	06:00	05:58
	17:39	20 08:36 (3)		19:44	20:15	20:43	20:56	
30	07:34	08:17 (3)		07:13	06:27	06:59	06:59	
	17:40	17 08:34 (3)		19:45	20:16	20:43	20:56	
31	07:33	08:20 (3)		07:11		06:59		
	17:41	12 08:32 (3)		19:46		20:44		
Potential sun hours	301	299	370	397	445	448		
Total, worst case	847		274					
Sun reduction	0,45		0,49					
Oper. time red.	0,93		0,93					
Wind dir. red.	0,75		0,76					
Total reduction	0,31		0,35					
Total, real	266		95					

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

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

Project:
Nurri_seconda presentazione

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Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: E - F

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:59 20:56	06:22 20:38	06:51 19:56	07:19 19:08	07:39 (4) 07:54 (4)	06:51 17:23
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	07:41 (4) 07:51 (4)	06:52 17:22
3	06:00 20:55	06:24 20:36	06:53 19:53	07:21 19:05	06:54 17:21	06:54 17:00
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	06:55 17:20	06:55 17:00
5	06:01 20:55	06:26 20:33	06:55 19:50	07:23 19:01	06:56 17:19	06:56 17:00
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	06:57 17:17	06:57 16:59
7	06:02 20:55	06:28 20:31	06:57 19:47	07:25 18:58	06:58 17:16	06:58 16:59
8	06:03 20:54	06:28 20:30	06:57 19:45	07:26 18:57	06:59 17:15	06:59 16:59
9	06:04 20:54	06:29 20:29	06:58 19:44	07:27 18:55	07:00 17:14	07:00 16:59
10	06:04 20:54	06:30 20:28	06:59 19:42	07:28 18:54	07:01 17:13	07:01 16:59
11	06:05 20:53	06:31 20:26	07:00 19:41	07:29 18:52	07:03 17:12	07:03 16:59
12	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:04 17:00
13	06:06 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:05 17:00
14	06:07 20:52	06:34 20:23	07:03 19:36	07:32 18:48	07:06 17:10	07:06 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:07 17:00
16	06:08 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:08	07:08 17:00
17	06:09 20:50	06:37 20:18	07:06 19:31	07:35 18:43	07:09 17:07	07:09 17:01
18	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:11 17:01
19	06:11 20:49	06:39 20:16	07:08 19:27	07:37 18:40	07:12 17:06	07:12 17:01
20	06:12 20:48	06:40 20:14	07:09 19:26	07:38 18:39	07:13 17:05	07:13 17:02
21	06:12 20:47	06:41 20:13	07:09 19:24	07:39 18:37	07:14 17:05	07:14 17:02
22	06:13 20:47	06:42 20:11	07:10 19:22	07:40 18:36	07:15 17:04	07:15 17:03
23	06:14 20:46	06:43 20:10	07:11 19:21	07:41 18:35	07:16 17:04	07:16 17:03
24	06:15 20:45	06:43 20:09	07:12 19:19	07:42 18:33	07:17 17:03	07:17 17:04
25	06:16 20:44	06:44 20:07	07:13 19:18	07:43 18:32	07:18 17:03	07:18 17:04
26	06:17 20:43	06:45 20:06	07:14 19:16	07:44 18:31	07:19 17:02	07:19 17:05
27	06:18 20:43	06:46 20:04	07:15 19:14	07:45 18:29	07:20 17:02	07:20 17:06
28	06:18 20:42	06:47 20:03	07:16 19:13	07:46 18:28	07:22 17:01	07:22 17:06
29	06:19 20:41	06:48 20:01	07:17 19:11	07:47 18:27	07:23 17:01	07:23 17:07
30	06:20 20:40	06:49 20:00	07:18 19:09	07:48 18:26	07:24 17:01	07:24 17:08
31	06:21 20:39	06:50 19:58	07:19 19:08	07:49 18:25	07:25 17:01	07:25 17:09
Potential sun hours	455	425	374	347	301	292
Total, worst case			249	25	564	697
Sun reduction			0,65	0,54	0,51	0,45
Oper. time red.			0,93	0,93	0,93	0,93
Wind dir. red.			0,76	0,76	0,75	0,75
Total reduction			0,46	0,38	0,35	0,31
Total, real			114	10	198	219

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

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

Project:

Nurri_seconda presentazione

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Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: F - I

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 17:10	08:18 (2) 17:43	07:33 18:15	06:58 18:15	07:10 19:47	06:26 20:17
2	07:45 17:10	08:18 (2) 17:44	07:32 18:16	06:57 19:48	07:08 19:48	06:24 20:18
3	07:45 17:11	08:18 (2) 17:45	07:31 18:17	06:55 19:49	07:06 19:49	06:23 20:19
4	07:45 17:12	08:19 (2) 17:46	07:30 18:18	06:54 19:50	07:05 19:50	06:22 20:20
5	07:45 17:13	08:19 (2) 17:47	07:29 18:19	06:52 19:51	07:03 19:51	06:21 20:21
6	07:45 17:14	08:18 (2) 17:48	07:28 18:20	06:51 19:52	07:02 19:52	06:20 20:22
7	07:45 17:15	08:19 (2) 17:50	07:27 18:21	06:49 19:53	07:00 19:53	06:19 20:23
8	07:45 17:16	08:19 (2) 17:51	07:26 18:22	06:48 19:54	06:59 19:54	06:17 20:24
9	07:45 17:17	08:20 (2) 17:52	07:25 18:24	06:46 19:55	06:57 19:55	06:16 20:25
10	07:45 17:18	08:20 (2) 17:53	07:23 18:25	06:45 19:56	06:55 20:00	06:15 20:26
11	07:44 17:19	08:20 (2) 17:54	07:22 18:26	06:43 19:57	06:54 20:01	06:14 20:27
12	07:44 17:20	08:21 (2) 17:56	07:21 18:27	06:42 19:58	06:52 20:02	06:13 20:28
13	07:44 17:21	08:21 (2) 17:57	07:20 18:28	06:40 19:59	06:51 20:03	06:12 20:29
14	07:44 17:22	08:21 (2) 17:58	07:19 18:29	06:38 20:00	06:49 20:04	06:11 20:30
15	07:43 17:23	08:22 (2) 17:59	07:17 18:30	06:37 20:01	06:48 20:05	06:10 20:31
16	07:43 17:24	08:23 (2) 18:00	07:16 18:31	06:35 20:02	06:46 20:06	06:09 20:31
17	07:43 17:25	08:23 (2) 18:01	07:15 18:32	06:34 20:03	06:45 20:07	06:08 20:32
18	07:42 17:26	08:24 (2) 18:03	07:14 18:33	06:32 20:04	06:43 20:08	06:08 20:33
19	07:42 17:27	08:24 (2) 18:04	07:12 18:34	06:30 20:05	06:42 20:09	06:07 20:34
20	07:41 17:29	08:24 (2) 18:05	07:11 18:35	06:29 20:06	06:41 20:10	06:06 20:35
21	07:41 17:30	08:25 (2) 18:06	07:10 18:36	06:27 20:07	06:39 20:11	06:05 20:36
22	07:40 17:31	08:26 (2) 18:07	07:08 18:37	06:26 20:08	06:38 20:12	06:04 20:37
23	07:39 17:32	08:27 (2) 18:08	07:07 18:38	06:24 20:09	06:36 20:13	06:04 20:38
24	07:39 17:33	08:28 (2) 18:09	07:06 18:39	06:22 20:10	06:35 20:14	06:03 20:39
25	07:38 17:34	08:29 (2) 18:11	07:04 18:40	06:21 20:11	06:34 20:15	06:02 20:39
26	07:37 17:35	08:30 (2) 18:12	07:03 18:41	06:19 20:12	06:32 20:16	06:02 20:40
27	07:37 17:37	08:32 (2) 18:13	07:01 18:42	06:18 20:13	06:31 20:17	06:01 20:41
28	07:36 17:38	08:34 (2) 18:14	07:00 18:43	06:16 20:14	06:30 20:18	06:00 20:42
29	07:35 17:39	08:36 (2) 18:15	06:59 18:44	06:15 20:15	06:29 20:19	06:00 20:43
30	07:34 17:40	08:39 (2) 18:16	06:58 19:45	06:14 20:16	06:28 20:20	06:00 20:43
31	07:33 17:41	08:46 (2)	06:57 19:46	06:13 20:17	06:27 20:21	06:00 20:44
Potential sun hours	301	299	370	397	445	448
Total, worst case	875			941		224
Sun reduction	0,45			0,53		0,59
Oper. time red.	0,93			0,93		0,93
Wind dir. red.	0,74			0,74		0,74
Total reduction	0,31			0,37		0,41
Total, real	272			344		91

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

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

Nurri_seconda presentazione

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Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: F - I

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 20:56	06:22 20:38	06:51 19:56	07:44 (1) 19:08	07:19 17:23	06:51 17:00
2	06:00 20:55	06:23 20:37	06:52 19:55	07:45 (1) 19:06	07:20 17:22	06:52 17:00
3	06:00 20:55	06:24 20:36	06:53 19:53	07:47 (1) 19:05	07:21 17:21	06:53 17:00
4	06:01 20:55	06:25 20:35	08:01 (1) 19:52	06:54 19:03	07:49 (1) 17:20	06:55 17:00
5	06:01 20:55	06:26 20:33	07:58 (1) 19:50	06:55 18:09 (1)	07:51 (1) 17:19	06:56 17:00
6	06:02 20:55	06:27 20:32	07:55 (1) 19:49	06:56 8:04 (1)	07:24 19:00	06:57 17:18
7	06:02 20:54	06:28 20:31	07:54 (1) 19:47	06:57 19:47	07:25 18:58	06:58 17:16
8	06:03 20:54	06:28 20:30	07:52 (1) 19:45	06:57 19:45	07:26 18:57	06:59 17:15
9	06:04 20:54	06:29 20:29	07:51 (1) 19:44	06:58 19:44	07:27 18:55	07:00 17:14
10	06:04 20:53	06:30 20:28	07:50 (1) 19:42	06:59 19:42	07:28 18:54	07:01 17:13
11	06:05 20:53	06:31 20:26	07:48 (1) 19:41	07:00 19:41	07:29 18:52	07:03 17:13
12	06:06 20:53	06:32 20:25	07:47 (1) 19:39	07:01 19:39	07:30 18:51	07:04 17:12
13	06:06 20:52	06:33 20:24	07:46 (1) 19:37	07:02 19:37	07:31 18:49	7 08:11 (2) 17:11
14	06:07 20:52	06:34 20:22	07:45 (1) 19:36	07:03 19:36	07:32 18:48	13 08:08 (2) 17:00
15	06:08 20:51	06:35 20:21	08:25 (1) 19:34	07:04 19:34	07:33 18:46	18 08:05 (2) 17:00
16	06:09 20:51	06:36 20:20	07:44 (1) 19:32	07:05 19:32	07:34 18:45	21 08:23 (2) 17:00
17	06:09 20:50	06:37 20:18	07:44 (1) 19:31	07:06 19:31	07:35 18:43	23 08:26 (2) 17:00
18	06:10 20:49	06:38 20:17	07:43 (1) 19:29	07:07 19:29	07:36 18:42	25 08:03 (2) 17:00
19	06:11 20:49	06:39 20:16	07:43 (1) 19:27	07:08 19:27	07:37 18:40	27 08:28 (2) 17:01
20	06:12 20:48	06:40 20:14	07:43 (1) 19:26	07:09 19:26	07:38 18:39	29 08:02 (2) 17:01
21	06:12 20:47	06:41 20:13	07:41 (1) 19:24	07:09 19:24	07:39 18:37	31 08:09 (2) 17:02
22	06:13 20:47	06:42 20:11	08:26 (1) 19:22	07:10 19:22	07:40 18:36	31 08:00 (2) 17:04
23	06:14 20:46	06:43 20:10	07:41 (1) 19:21	07:11 19:21	07:41 18:35	32 08:32 (2) 17:03
24	06:15 20:45	06:43 20:09	07:41 (1) 19:19	07:12 19:19	07:42 18:33	32 08:01 (2) 17:04
25	06:16 20:44	06:44 20:07	08:26 (1) 19:18	07:13 19:18	06:44 17:32	33 08:33 (2) 17:04
26	06:17 20:43	06:45 20:06	07:42 (1) 19:16	07:14 19:16	06:45 17:31	33 08:01 (2) 17:05
27	06:18 20:43	06:46 20:04	08:25 (1) 19:14	07:15 19:14	06:46 17:29	33 08:34 (2) 17:06
28	06:18 20:42	06:47 20:03	07:42 (1) 19:13	07:16 19:13	06:47 17:28	34 08:01 (2) 17:06
29	06:19 20:41	06:48 20:01	08:24 (1) 19:11	07:17 19:11	06:48 17:27	34 08:35 (2) 17:07
30	06:20 20:40	06:49 20:00	07:42 (1) 19:09	07:18 19:09	06:49 17:26	33 08:02 (2) 17:08
31	06:21 20:39	06:50 19:58	08:21 (1) 19:07	07:19 19:07	06:50 17:24	33 08:35 (2) 17:09
Potential sun hours	455	425	374	347	301	292
Total, worst case		1036	144		518	954
Sun reduction		0,73	0,65		0,51	0,45
Oper. time red.		0,93	0,93		0,93	0,93
Wind dir. red.		0,74	0,74		0,74	0,74
Total reduction		0,50	0,45		0,35	0,31
Total, real		523	64		179	296

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

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

Project:

Nurri_seconda presentazione

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Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: G - G

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January		February		March		April		May		June	
1	07:45	08:30 (1)	07:33	08:45 (1)	06:58	07:10			06:26	07:20 (3)	05:58	06:26 (4)
	17:10	09:04 (1)	17:43	09:07 (1)	18:15	19:47			19:47	20:17	20:45	06:50 (4)
2	07:45	08:30 (1)	07:32	08:47 (1)	06:57	07:08			06:24	07:33 (3)	05:58	06:26 (4)
	17:10	09:05 (1)	17:44	09:05 (1)	18:16	19:48			06:24	20:18	20:46	06:50 (4)
3	07:45	08:30 (1)	07:31	08:50 (1)	06:55	07:06			06:23		05:58	06:27 (4)
	17:11	09:06 (1)	17:45	09:03 (1)	18:17	19:49			20:19		20:46	06:50 (4)
4	07:45	08:31 (1)	07:30		06:54	07:05			07:29 (3)	06:22	05:57	06:27 (4)
	17:12	09:06 (1)	17:46		18:18	19:50	8	07:37 (3)	20:20		20:47	06:49 (4)
5	07:45	08:31 (1)	07:29		06:52	07:03			07:23 (3)	06:21	05:57	06:27 (4)
	17:13	09:07 (1)	17:47		18:19	19:51	18	07:41 (3)	20:21		20:48	06:50 (4)
6	07:45	08:30 (1)	07:28		06:51	07:02			07:21 (3)	06:20	05:57	06:28 (4)
	17:14	09:07 (1)	17:49		18:20	19:52	23	07:44 (3)	20:22		20:48	06:50 (4)
7	07:45	08:31 (1)	07:27		06:49	07:00			07:18 (3)	06:19	05:56	06:29 (4)
	17:15	09:07 (1)	17:50		18:21	19:53	27	07:45 (3)	20:23		20:49	06:50 (4)
8	07:45	08:31 (1)	07:26		06:48	06:59			07:17 (3)	06:17	05:56	06:28 (4)
	17:16	09:08 (1)	17:51		18:22	19:54	30	07:47 (3)	20:24		20:49	06:49 (4)
9	07:45	08:31 (1)	07:25		06:46	06:57			07:15 (3)	06:16	05:56	06:29 (4)
	17:17	09:09 (1)	17:52		18:24	19:55	32	07:47 (3)	20:25		20:50	06:49 (4)
10	07:45	08:32 (1)	07:23		06:45	06:55			07:14 (3)	06:15	05:56	06:30 (4)
	17:18	09:10 (1)	17:53		18:25	19:56	34	07:48 (3)	20:26		20:51	06:49 (4)
11	07:44	08:31 (1)	07:22		06:43	06:54			07:13 (3)	06:14	05:56	06:30 (4)
	17:19	09:10 (1)	17:54		18:26	19:57	35	07:48 (3)	20:27		20:51	06:49 (4)
12	07:44	08:32 (1)	07:21		06:42	06:52			07:12 (3)	06:13	05:55	06:31 (4)
	17:20	09:10 (1)	17:56		18:27	19:58	37	07:49 (3)	20:28		20:52	06:49 (4)
13	07:44	08:33 (1)	07:20		06:40	06:51			07:11 (3)	06:12	05:55	06:31 (4)
	17:21	09:11 (1)	17:57		18:28	19:59	38	07:49 (3)	20:29		20:52	06:49 (4)
14	07:44	08:32 (1)	07:19		06:38	06:49			07:11 (3)	06:11	05:55	06:31 (4)
	17:22	09:11 (1)	17:58		18:29	20:00	39	07:50 (3)	20:30	9	06:41 (4)	06:49 (4)
15	07:43	08:33 (1)	07:17		06:37	06:48			07:10 (3)	06:10	06:30 (4)	06:32 (4)
	17:23	09:12 (1)	17:59		18:30	20:01	39	07:49 (3)	20:31	13	06:43 (4)	06:49 (4)
16	07:43	08:34 (1)	07:16		06:35	06:46			07:10 (3)	06:09	06:29 (4)	06:32 (4)
	17:24	09:13 (1)	18:00		18:31	20:02	39	07:49 (3)	20:31	15	06:44 (4)	06:49 (4)
17	07:43	08:34 (1)	07:15		06:34	06:45			07:09 (3)	06:08	06:28 (4)	06:32 (4)
	17:25	09:12 (1)	18:01		18:32	20:03	40	07:49 (3)	20:32	17	06:45 (4)	06:49 (4)
18	07:42	08:34 (1)	07:14		06:32	06:43			07:09 (3)	06:08	06:28 (4)	06:33 (4)
	17:26	09:13 (1)	18:03		18:33	20:04	40	07:49 (3)	20:33	19	06:47 (4)	06:49 (4)
19	07:42	08:34 (1)	07:12		06:30	06:42			07:08 (3)	06:07	06:27 (4)	06:33 (4)
	17:27	09:13 (1)	18:04		18:34	20:05	40	07:48 (3)	20:34	20	06:47 (4)	06:49 (4)
20	07:41	08:35 (1)	07:11		06:29	06:41			07:09 (3)	06:06	06:26 (4)	06:34 (4)
	17:29	09:14 (1)	18:05		18:35	20:06	39	07:48 (3)	20:35	22	06:48 (4)	06:50 (4)
21	07:41	08:35 (1)	07:10		06:27	06:39			07:09 (3)	06:05	06:25 (4)	06:34 (4)
	17:30	09:13 (1)	18:06		18:36	20:07	38	07:47 (3)	20:36	23	06:48 (4)	06:50 (4)
22	07:40	08:36 (1)	07:08		06:26	06:38			07:09 (3)	06:04	06:26 (4)	06:34 (4)
	17:31	09:13 (1)	18:07		18:37	20:08	37	07:46 (3)	20:37	23	06:49 (4)	06:50 (4)
23	07:39	08:37 (1)	07:07		06:24	06:36			07:10 (3)	06:04	06:25 (4)	06:34 (4)
	17:32	09:14 (1)	18:08		18:38	20:09	36	07:46 (3)	20:38	24	06:49 (4)	06:50 (4)
24	07:39	08:37 (1)	07:06		06:22	06:35			07:10 (3)	06:03	06:25 (4)	06:34 (4)
	17:33	09:13 (1)	18:09		18:39	20:10	34	07:44 (3)	20:39	24	06:49 (4)	06:50 (4)
25	07:38	08:38 (1)	07:04		06:21	06:34			07:10 (3)	06:02	06:25 (4)	06:35 (4)
	17:34	09:13 (1)	18:11		18:40	20:11	33	07:43 (3)	20:39	25	06:50 (4)	06:51 (4)
26	07:37	08:38 (1)	07:03		06:19	06:32			07:12 (3)	06:02	06:25 (4)	06:34 (4)
	17:35	09:12 (1)	18:12		18:41	20:12	30	07:42 (3)	20:40	24	06:49 (4)	06:51 (4)
27	07:37	08:40 (1)	07:01		06:18	06:31			07:13 (3)	06:01	06:25 (4)	06:34 (4)
	17:37	09:12 (1)	18:13		18:42	20:13	28	07:41 (3)	20:41	25	06:50 (4)	06:51 (4)
28	07:36	08:40 (1)	07:00		06:16	06:30			07:13 (3)	06:00	06:25 (4)	06:35 (4)
	17:38	09:12 (1)	18:14		18:43	20:14	26	07:39 (3)	20:42	25	06:50 (4)	06:51 (4)
29	07:35	08:41 (1)			07:14	06:28			07:15 (3)	06:00	06:26 (4)	06:34 (4)
	17:39	09:11 (1)			19:44	20:15	23	07:38 (3)	20:43	24	06:50 (4)	06:52 (4)
30	07:34	08:42 (1)			07:13	06:27			07:17 (3)	05:59	06:25 (4)	06:35 (4)
	17:40	09:10 (1)			19:45	20:16	19	07:36 (3)	20:43	25	06:50 (4)	06:53 (4)
31	07:33	08:44 (1)			07:11				05:59		06:26 (4)	
	17:41	09:09 (1)			19:46				20:44	24	06:50 (4)	
Potential sun hours	301		299		370	397			445		448	
Total, worst case	1113		53			862			394		558	
Sun reduction	0,45		0,47			0,53			0,59		0,66	
Oper. time red.	0,93		0,93			0,93			0,93		0,93	
Wind dir. red.	0,73		0,73			0,73			0,68		0,68	
Total reduction	0,31		0,32			0,36			0,37		0,42	
Total, real	344		17			311			147		233	

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

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

Project:

Nurri_seconda presentazione

Printed/Page

01/02/2023 11:46 / 13

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: G - G

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July		August		September		October		November		December		
1	05:59	06:34 (4)	06:22		06:51	07:12 (3)	07:19	06:51		07:25	08:14 (1)		
	20:56	19 06:53 (4)	20:38		19:56	35 07:47 (3)	19:08	17:23		17:00	39 08:53 (1)		
2	06:00	06:35 (4)	06:23		06:52	07:12 (3)	07:20	06:52		07:26	08:15 (1)		
	20:55	19 06:54 (4)	20:37		19:55	34 07:46 (3)	19:06	17:22		17:00	38 08:53 (1)		
3	06:00	06:34 (4)	06:24		06:53	07:13 (3)	07:21	06:53		07:27	08:15 (1)		
	20:55	20 06:54 (4)	20:36		19:53	32 07:45 (3)	19:05	17:21		17:00	38 08:53 (1)		
4	06:01	06:35 (4)	06:25		06:54	07:14 (3)	07:22	06:55		07:28	08:16 (1)		
	20:55	20 06:55 (4)	20:35		19:52	30 07:44 (3)	19:03	17:20		17:00	37 08:53 (1)		
5	06:01	06:34 (4)	06:26		06:55	07:15 (3)	07:23	06:56		07:28	08:16 (1)		
	20:55	21 06:55 (4)	20:33		19:50	27 07:42 (3)	19:01	17:19		17:00	36 08:52 (1)		
6	06:02	06:34 (4)	06:27		06:56	07:17 (3)	07:24	06:57		07:29	08:16 (1)		
	20:55	22 06:56 (4)	20:32		19:49	23 07:40 (3)	19:00	17:17		16:59	37 08:53 (1)		
7	06:02	06:34 (4)	06:28		06:57	07:19 (3)	07:25	06:58		07:30	08:17 (1)		
	20:54	22 06:56 (4)	20:31		19:47	18 07:37 (3)	18:58	17:16		16:59	36 08:53 (1)		
8	06:03	06:34 (4)	06:28		06:57	07:22 (3)	07:26	06:59		07:31	08:18 (1)		
	20:54	23 06:57 (4)	20:30		19:45	10 07:32 (3)	18:57	17:15	13	08:34 (1)	16:59	35 08:53 (1)	
	06:04	06:34 (4)	06:29		06:58		07:27	07:00		08:18 (1)	07:32	08:19 (1)	
	20:54	23 06:57 (4)	20:29		19:44		18:55	17:14	18	08:36 (1)	16:59	35 08:54 (1)	
10	06:04	06:34 (4)	06:30		06:59		07:28	07:01		08:16 (1)	07:33	08:19 (1)	
	20:53	23 06:57 (4)	20:28		19:42		18:54	17:13	22	08:38 (1)	16:59	35 08:54 (1)	
11	06:05	06:34 (4)	06:31		07:31 (3)	07:00		07:29	07:03	08:15 (1)	07:34	08:20 (1)	
	20:53	24 06:58 (4)	20:26	6	07:37 (3)	19:41		18:52	17:13	25	08:40 (1)	16:59	34 08:54 (1)
12	06:06	06:34 (4)	06:32		07:27 (3)	07:01		07:30	07:04	08:14 (1)	07:35	08:21 (1)	
	20:53	24 06:58 (4)	20:25	14	07:41 (3)	19:39		18:51	17:12	28	08:42 (1)	17:00	34 08:55 (1)
13	06:06	06:34 (4)	06:33		07:24 (3)	07:02		07:31	07:05	08:13 (1)	07:35	08:21 (1)	
	20:52	24 06:58 (4)	20:24	20	07:44 (3)	19:37		18:49	17:11	30	08:43 (1)	17:00	33 08:54 (1)
14	06:07	06:34 (4)	06:34		07:22 (3)	07:03		07:32	07:06	08:12 (1)	07:36	08:22 (1)	
	20:52	25 06:59 (4)	20:22	24	07:46 (3)	19:36		18:48	17:10	32	08:44 (1)	17:00	33 08:55 (1)
15	06:08	06:34 (4)	06:35		07:21 (3)	07:04		07:33	07:07	08:12 (1)	07:37	08:23 (1)	
	20:51	25 06:59 (4)	20:21	26	07:47 (3)	19:34		18:46	17:09	32	08:44 (1)	17:00	33 08:56 (1)
16	06:08	06:34 (4)	06:36		07:19 (3)	07:05		07:34	07:08	08:11 (1)	07:38	08:23 (1)	
	20:51	24 06:58 (4)	20:20	29	07:48 (3)	19:32		18:45	17:08	34	08:45 (1)	17:00	32 08:55 (1)
17	06:09	06:34 (4)	06:37		07:18 (3)	07:06		07:35	07:09	08:12 (1)	07:38	08:23 (1)	
	20:50	25 06:59 (4)	20:18	31	07:49 (3)	19:31		18:43	17:07	35	08:47 (1)	17:01	33 08:56 (1)
18	06:10	06:35 (4)	06:38		07:17 (3)	07:07		07:36	07:11	08:11 (1)	07:39	08:24 (1)	
	20:49	24 06:59 (4)	20:17	33	07:50 (3)	19:29		18:42	17:07	36	08:47 (1)	17:01	33 08:57 (1)
19	06:11	06:35 (4)	06:39		07:16 (3)	07:08		07:37	07:12	08:11 (1)	07:39	08:24 (1)	
	20:49	24 06:59 (4)	20:16	35	07:51 (3)	19:27		18:40	17:06	37	08:48 (1)	17:01	32 08:56 (1)
20	06:12	06:34 (4)	06:40		07:15 (3)	07:09		07:38	07:13	08:11 (1)	07:40	08:25 (1)	
	20:48	24 06:58 (4)	20:14	36	07:51 (3)	19:26		18:39	17:05	37	08:48 (1)	17:02	32 08:57 (1)
21	06:12	06:35 (4)	06:41		07:14 (3)	07:09		07:39	07:14	08:10 (1)	07:41	08:25 (1)	
	20:47	24 06:59 (4)	20:13	37	07:51 (3)	19:24		18:37	17:05	38	08:48 (1)	17:02	32 08:57 (1)
22	06:13	06:35 (4)	06:42		07:13 (3)	07:10		07:40	07:15	08:11 (1)	07:41	08:26 (1)	
	20:47	24 06:59 (4)	20:11	38	07:51 (3)	19:22		18:36	17:04	39	08:50 (1)	17:03	32 08:58 (1)
23	06:14	06:36 (4)	06:43		07:13 (3)	07:11		07:41	07:16	08:11 (1)	07:42	08:26 (1)	
	20:46	22 06:58 (4)	20:10	38	07:51 (3)	19:21		18:35	17:04	39	08:50 (1)	17:03	32 08:58 (1)
24	06:15	06:37 (4)	06:43		07:12 (3)	07:12		07:42	07:17	08:11 (1)	07:42	08:27 (1)	
	20:45	21 06:58 (4)	20:09	40	07:52 (3)	19:19		18:33	17:03	39	08:50 (1)	17:04	32 08:59 (1)
25	06:16	06:38 (4)	06:44		07:12 (3)	07:13		06:44	07:18	08:12 (1)	07:43	08:27 (1)	
	20:44	20 06:58 (4)	20:07	40	07:52 (3)	19:18		17:32	17:03	38	08:50 (1)	17:04	33 09:00 (1)
26	06:17	06:38 (4)	06:45		07:12 (3)	07:14		06:45	07:19	08:12 (1)	07:43	08:27 (1)	
	20:43	18 06:56 (4)	20:06	39	07:51 (3)	19:16		17:31	17:02	39	08:51 (1)	17:05	33 09:00 (1)
27	06:18	06:39 (4)	06:46		07:12 (3)	07:15		06:46	07:20	08:12 (1)	07:43	08:28 (1)	
	20:43	17 06:56 (4)	20:04	39	07:51 (3)	19:14		17:29	17:02	39	08:51 (1)	17:06	33 09:01 (1)
28	06:18	06:40 (4)	06:47		07:12 (3)	07:16		06:47	07:21	08:12 (1)	07:44	08:29 (1)	
	20:42	15 06:55 (4)	20:03	39	07:51 (3)	19:13		17:28	17:01	39	08:51 (1)	17:06	32 09:01 (1)
29	06:19	06:41 (4)	06:48		07:12 (3)	07:17		06:48	07:23	08:13 (1)	07:44	08:29 (1)	
	20:41	12 06:53 (4)	20:01	38	07:50 (3)	19:11		17:27	17:01	38	08:51 (1)	17:07	33 09:02 (1)
30	06:20	06:44 (4)	06:49		07:11 (3)	07:18		06:49	07:24	08:13 (1)	07:44	08:29 (1)	
	20:40	7 06:51 (4)	20:00	38	07:49 (3)	19:09		17:26	17:01	38	08:51 (1)	17:08	33 09:02 (1)
31	06:21		06:50		07:11 (3)			06:50		07:44		08:29 (1)	
	20:39		19:58	37	07:48 (3)			17:24		17:09	34	09:03 (1)	
Potential sun hours	455		425		374			347		301		292	
Total, worst case		635		677		209			765		1054		
Sun reduction		0,74		0,73		0,65			0,51		0,45		
Oper. time red.		0,93		0,93		0,93			0,93		0,93		
Wind dir. red.		0,68		0,73		0,73			0,73		0,73		
Total reduction		0,46		0,50		0,44			0,34		0,31		
Total, real		295		338		92			264		326		

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 14

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: H - J

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:58 20:45	05:59 20:56	06:22 20:38	06:51 19:56	07:19 19:08	08:04 (2) 17:23	06:51 17:00
2	07:45 17:10	07:32 17:44	06:57 18:16	07:08 19:48	06:25 20:18	05:58 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	08:04 (2) 17:22	06:52 17:00
3	07:45 17:11	07:31 17:45	06:55 18:17	07:39 (2) 19:49	07:06 20:19	05:58 20:46	06:00 20:55	06:24 20:36	06:53 19:53	07:21 19:05	08:04 (2) 17:21	06:53 17:00
4	07:45 17:12	07:30 17:46	06:54 18:18	07:35 (2) 19:50	07:05 20:20	05:57 20:47	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	08:03 (2) 17:20	06:55 17:00
5	07:45 17:13	07:29 17:47	06:52 18:19	07:33 (2) 19:51	07:03 20:21	05:57 20:48	06:01 20:55	06:26 20:33	06:55 19:50	07:23 19:01	08:04 (2) 17:19	06:56 17:00
6	07:45 17:14	07:28 17:49	06:51 18:20	07:31 (2) 19:52	07:02 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	08:05 (2) 17:18	06:57 16:59
7	07:45 17:15	07:27 17:50	06:49 18:21	07:30 (2) 19:53	07:00 20:23	05:56 20:49	06:02 20:54	06:28 20:31	06:57 19:47	07:25 18:58	08:06 (2) 17:16	06:58 16:59
8	07:45 17:16	07:26 17:51	06:48 18:22	07:28 (2) 19:54	06:59 20:24	06:17 20:49	06:03 20:54	06:28 20:30	06:57 19:45	07:26 18:57	08:08 (2) 17:15	06:59 16:59
9	07:45 17:17	07:25 17:52	06:46 18:24	07:27 (2) 19:55	06:57 20:25	06:16 20:50	06:04 20:54	06:29 20:29	06:58 19:44	07:27 18:55	08:10 (2) 17:14	07:00 16:59
10	07:45 17:18	07:23 17:53	06:45 18:25	07:26 (2) 19:56	06:55 20:26	06:15 20:51	06:04 20:53	06:30 20:28	06:59 19:42	07:28 18:54	08:12 (2) 17:13	07:01 16:59
11	07:44 17:19	07:22 17:54	06:43 18:26	07:25 (2) 19:57	06:54 20:27	06:14 20:51	06:05 20:53	06:31 20:26	07:00 19:41	07:29 18:52	08:17 (2) 17:13	07:03 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	07:24 (2) 19:58	06:52 20:28	06:13 20:52	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	08:23 (2) 17:12	07:04 17:00
13	07:44 17:21	07:20 17:57	06:40 18:28	07:23 (2) 19:59	06:51 20:29	06:12 20:52	06:06 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 17:00
14	07:44 17:22	07:19 17:58	06:38 18:29	07:23 (2) 20:00	06:49 20:30	06:11 20:52	06:07 20:52	06:34 20:25	07:03 19:36	07:32 18:48	07:06 17:10	07:36 17:00
15	07:43 17:23	07:17 17:59	06:37 18:30	07:23 (2) 20:01	06:48 20:31	06:10 20:53	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 17:09	07:37 17:00
16	07:43 17:24	07:16 18:00	06:35 18:31	07:23 (2) 20:02	06:46 20:31	06:09 20:53	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:08	07:38 17:00
17	07:43 17:25	07:15 18:01	06:34 18:32	07:23 (2) 20:03	06:45 20:32	06:08 20:54	06:09 20:50	06:37 20:18	07:06 19:31	08:19 (2) 18:43	07:35 17:07	07:38 17:01
18	07:42 17:26	07:14 18:03	06:32 18:33	07:22 (2) 20:04	06:43 20:33	06:08 20:54	06:10 20:49	06:38 20:17	07:07 19:29	08:16 (2) 18:42	07:36 17:07	07:39 17:01
19	07:42 17:27	07:12 18:04	06:30 18:34	07:23 (2) 20:05	06:42 20:34	06:07 20:56	06:11 20:49	06:39 20:16	07:08 19:27	08:14 (2) 18:40	07:37 17:06	07:39 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	07:23 (2) 20:06	06:41 20:35	06:06 20:55	06:12 20:48	06:40 20:14	07:09 19:26	08:12 (2) 18:39	07:38 17:05	07:40 17:02
21	07:41 17:30	07:10 18:06	06:27 18:36	07:24 (2) 20:07	06:39 20:36	06:05 20:55	06:12 20:47	06:41 20:13	07:09 19:24	08:10 (2) 18:37	07:39 17:05	07:41 17:02
22	07:40 17:31	07:08 18:07	06:26 18:37	07:24 (2) 20:08	06:38 20:37	06:04 20:55	06:13 20:47	06:42 20:11	07:10 19:22	08:09 (2) 18:36	07:40 17:04	07:41 17:03
23	07:39 17:32	07:07 18:08	06:24 18:38	07:25 (2) 20:09	06:36 20:38	06:04 20:55	06:14 20:46	06:43 20:10	07:11 19:21	08:08 (2) 18:35	07:41 17:04	07:42 17:03
24	07:39 17:33	07:06 18:09	06:22 18:39	07:27 (2) 20:10	06:35 20:39	06:03 20:55	06:15 20:45	06:43 20:09	07:12 19:19	08:07 (2) 18:33	07:42 17:03	07:42 17:04
25	07:38 17:34	07:04 18:11	06:21 18:40	07:28 (2) 20:11	06:34 20:39	06:02 20:55	06:16 20:44	06:44 20:07	07:13 19:18	08:06 (2) 17:32	07:43 17:03	07:43 17:05
26	07:37 17:35	07:03 18:12	06:19 18:41	07:30 (2) 20:12	06:32 20:40	06:02 20:56	06:17 20:43	06:45 20:06	07:14 19:16	08:05 (2) 17:31	07:44 17:02	07:43 17:05
27	07:37 17:37	07:01 18:13	06:18 18:42	07:35 (2) 20:13	06:31 20:41	06:01 20:56	06:18 20:42	06:46 20:04	07:15 19:14	08:05 (2) 17:29	07:46 17:02	07:43 17:06
28	07:36 17:38	07:00 18:14	06:16 18:43	07:41 (2) 20:14	06:30 20:42	06:00 20:56	06:18 20:42	06:47 20:03	07:16 19:13	08:04 (2) 17:28	07:47 17:01	07:44 17:06
29	07:35 17:39	07:05 19:44	07:14 19:44	06:28 20:15	06:00 20:43	06:08 20:56	06:19 20:41	06:48 20:01	07:17 19:11	08:04 (2) 17:27	07:48 17:01	07:44 17:07
30	07:34 17:40	07:07 19:45	07:13 19:45	06:27 20:16	05:59 20:43	06:09 20:56	06:20 20:40	06:49 20:00	07:18 19:09	08:04 (2) 17:26	07:49 17:01	07:44 17:08
31	07:33 17:41	07:06 19:46	07:11 19:46	06:26 20:17	05:58 20:44	06:08 20:56	06:21 20:39	06:50 19:58	07:19 17:24	08:42 (2) 17:26	07:50 17:04	07:44 17:09
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Total, worst case			753						445	308		
Sun reduction			0,49						0,65	0,54		
Oper. time red.			0,93						0,93	0,93		
Wind dir. red.			0,76						0,76	0,76		
Total reduction			0,35						0,46	0,38		
Total, real			261						203	118		

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 15

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: I - F1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 17:10	07:33 17:43	06:58 18:15	07:39 (3) 07:10	07:35 (5) 06:26	07:00 (4) 05:58
2	07:45 17:10	07:32 17:44	06:57 18:16	07:39 (3) 07:08	07:36 (5) 06:24	07:00 (4) 05:58
3	07:45 17:11	07:31 17:45	06:55 18:17	07:39 (3) 07:06	07:38 (5) 06:23	07:00 (4) 05:58
4	07:45 17:12	07:30 17:46	06:54 18:18	07:39 (3) 07:05	07:40 (5) 06:22	07:01 (4) 05:57
5	07:45 17:13	07:29 17:47	06:52 18:19	07:39 (3) 07:03	07:46 (5) 06:21	07:01 (4) 05:57
6	07:45 17:14	07:28 17:49	06:51 18:20	07:39 (3) 07:02	07:46 (5) 06:21	07:01 (4) 05:57
7	07:45 17:15	07:27 17:50	06:49 18:21	07:40 (3) 07:00	07:46 (5) 06:21	07:02 (4) 05:57
8	07:45 17:16	07:26 17:51	06:48 18:22	07:40 (3) 06:59	07:46 (5) 06:21	07:02 (4) 05:57
9	07:45 17:17	07:25 17:52	06:46 18:24	07:41 (3) 06:57	07:46 (5) 06:21	07:02 (4) 05:57
10	07:45 17:18	07:23 17:53	06:45 18:25	07:41 (3) 06:55	07:46 (5) 06:21	07:02 (4) 05:57
11	07:44 17:19	07:22 17:54	06:43 18:26	07:43 (3) 06:54	07:46 (5) 06:21	07:02 (4) 05:57
12	07:44 17:20	07:21 17:56	07:59 (3) 08:12 (3)	06:42 18:27	07:43 (3) 06:52	06:13 07:13 (4)
13	07:44 17:21	07:20 17:57	07:56 (3) 08:16 (3)	06:40 18:28	07:44 (3) 06:51	07:16 (4) 05:55
14	07:44 17:22	07:19 17:58	07:53 (3) 08:19 (3)	06:38 18:29	07:47 (3) 06:49	06:11 05:55
15	07:43 17:23	07:17 17:59	07:50 (3) 08:21 (3)	06:37 18:30	07:48 (3) 06:48	06:10 05:55
16	07:43 17:24	07:16 18:00	07:49 (3) 08:23 (3)	06:35 18:31	07:52 (3) 06:46	06:09 05:55
17	07:43 17:25	07:15 18:01	07:48 (3) 08:24 (3)	06:34 18:32	08:08 (3) 20:02	20:31 20:53
18	07:42 17:26	07:14 18:03	07:47 (3) 08:26 (3)	06:32 18:33	06:45 06:32	06:08 05:55
19	07:42 17:27	07:12 18:04	07:45 (3) 08:26 (3)	06:30 18:34	06:42 20:05	07:11 (4) 06:07
20	07:41 17:29	07:11 18:05	07:44 (3) 08:27 (3)	06:29 18:35	06:41 20:06	07:23 (4) 20:34
21	07:41 17:30	07:10 18:06	07:43 (3) 08:28 (3)	06:27 18:36	06:41 20:06	07:08 (4) 06:06
22	07:40 17:31	07:08 18:07	07:42 (3) 08:29 (3)	06:26 18:37	06:39 20:07	07:26 (4) 20:35
23	07:39 17:32	07:07 18:08	07:42 (3) 08:29 (3)	06:24 18:38	06:38 20:08	07:07 (4) 06:05
24	07:39 17:33	07:06 18:09	07:41 (3) 08:29 (3)	06:22 18:39	06:36 20:09	07:28 (4) 20:36
25	07:38 17:34	07:04 18:11	07:41 (3) 08:30 (3)	06:21 18:40	06:35 20:10	07:29 (4) 20:37
26	07:37 17:35	07:03 18:12	07:40 (3) 08:29 (3)	06:19 18:41	06:34 20:11	07:02 (4) 06:02
27	07:37 17:37	07:01 18:13	07:40 (3) 08:30 (3)	06:18 18:42	06:33 20:12	07:01 (4) 06:01
28	07:36 17:38	07:00 18:14	07:39 (3) 08:29 (3)	06:16 18:43	06:32 20:13	07:01 (4) 06:01
29	07:35 17:39	07:00 18:14	07:39 (3) 19:44	06:16 19:45	06:31 20:14	07:00 (4) 06:00
30	07:34 17:40	07:00 18:14	07:39 (3) 19:45	06:16 19:46	06:30 20:15	07:00 (4) 06:00
31	07:33 17:41	07:00 18:14	07:39 (3) 19:46	06:16 19:47	06:29 20:16	07:00 (4) 06:00
Potential sun hours	301	299	370	397	445	448
Total, worst case			668	804	354	261
Sun reduction			0,47	0,49	0,53	0,59
Oper. time red.			0,93	0,93	0,93	0,93
Wind dir. red.			0,76	0,76	0,72	0,71
Total reduction			0,34	0,35	0,35	0,39
Total, real			224	280	125	102

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 16

Licensed user:

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

Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: I - F1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	06:22	07:20 (4)	06:51	07:19	08:24 (3)
	20:56	20:38	07:28 (4)	19:56	19:08	08:58 (3)
2	06:00	06:23	07:17 (4)	06:52	07:20	08:22 (3)
	20:55	20:37	07:30 (4)	19:55	19:06	08:59 (3)
3	06:00	06:24	07:15 (4)	06:53	07:21	08:20 (3)
	20:55	20:36	07:32 (4)	19:53	19:05	09:00 (3)
4	06:01	06:25	07:14 (4)	06:54	07:22	08:18 (3)
	20:55	20:35	07:34 (4)	19:52	19:03	09:00 (3)
5	06:01	06:26	07:13 (4)	06:55	07:23	08:17 (3)
	20:55	20:33	07:35 (4)	19:50	19:01	09:01 (3)
6	06:02	06:27	07:12 (4)	06:56	07:24	08:16 (3)
	20:55	20:32	07:36 (4)	19:49	19:00	09:01 (3)
7	06:02	06:27	07:11 (4)	06:56	07:25	08:15 (3)
	20:54	20:31	07:37 (4)	19:47	18:58	09:02 (3)
8	06:03	06:28	07:11 (4)	06:57	07:26	08:15 (3)
	20:54	20:30	07:37 (4)	19:45	6 07:40 (5)	18:57
9	06:04	06:29	07:10 (4)	06:58	07:27	08:14 (3)
	20:54	20:29	07:38 (4)	19:44	12 07:43 (5)	18:55
10	06:04	06:30	07:10 (4)	06:59	07:29	08:14 (3)
	20:53	20:28	07:38 (4)	19:42	15 07:44 (5)	18:54
11	06:05	06:31	07:08 (4)	07:00	07:27	08:13 (3)
	20:53	20:26	07:38 (4)	19:41	18 07:45 (5)	18:52
12	06:06	06:32	07:08 (4)	07:01	07:26	08:13 (3)
	20:53	20:25	07:38 (4)	19:39	19 07:45 (5)	18:51
13	06:06	06:33	07:08 (4)	07:02	07:26	08:13 (3)
	20:52	20:24	07:38 (4)	19:37	20 07:46 (5)	18:49
14	06:07	06:34	07:08 (4)	07:03	07:25	08:12 (3)
	20:52	20:22	07:38 (4)	19:36	21 07:46 (5)	18:47
15	06:08	06:35	07:08 (4)	07:04	07:25	08:12 (3)
	20:51	20:21	07:38 (4)	19:34	20 07:45 (5)	18:46
16	06:08	06:36	07:08 (4)	07:05	07:25	08:12 (3)
	20:51	20:20	07:38 (4)	19:32	20 07:45 (5)	18:45
17	06:09	06:37	07:08 (4)	07:06	07:25	08:12 (3)
	20:50	20:18	07:37 (4)	19:31	18 07:43 (5)	18:43
18	06:10	06:38	07:09 (4)	07:07	07:26	08:12 (3)
	20:49	20:17	07:37 (4)	19:29	16 07:42 (5)	18:42
19	06:11	06:39	07:09 (4)	07:08	07:27	08:13 (3)
	20:49	20:16	07:36 (4)	19:27	14 07:41 (5)	18:40
20	06:12	06:40	07:10 (4)	07:09	07:28	08:13 (3)
	20:48	20:14	07:35 (4)	19:26	10 07:38 (5)	18:39
21	06:12	06:41	07:10 (4)	07:09	07:31	08:13 (3)
	20:47	20:13	07:33 (4)	19:24	3 07:34 (5)	18:37
22	06:13	06:42	07:11 (4)	07:10	07:40	08:15 (3)
	20:47	20:11	07:31 (4)	19:22	18:36	08:58 (3)
23	06:14	06:42	07:12 (4)	07:11	07:41	08:16 (3)
	20:46	20:10	07:29 (4)	19:21	18:35	08:57 (3)
24	06:15	06:43	07:15 (4)	07:12	07:42	08:17 (3)
	20:45	20:09	07:27 (4)	19:19	18:33	08:55 (3)
25	06:16	06:44	07:13	07:13	06:44	07:18 (3)
	20:44	20:07	19:18	17:32	36 07:54 (3)	17:03
26	06:17	06:45	07:14	07:14	06:45	07:19 (3)
	20:43	20:06	19:16	17:31	33 07:52 (3)	17:02
27	06:17	06:46	07:15	07:15	08:35 (3)	06:46
	20:43	20:04	19:14	13 08:48 (3)	17:29	07:50 (3)
28	06:18	06:47	07:16	07:16	08:31 (3)	06:47
	20:42	20:03	19:13	21 08:52 (3)	17:28	07:47 (3)
29	06:19	06:48	07:17	07:17	08:28 (3)	06:48
	20:41	20:01	19:11	27 08:55 (3)	17:27	07:45 (3)
30	06:20	06:49	07:18	07:18	08:26 (3)	06:49
	20:40	20:00	19:09	30 08:56 (3)	17:26	07:41 (3)
31	06:21	06:50	07:19	07:19	06:50	07:44
	20:39	19:58	17:24	17:24	11 07:41 (3)	17:01
Potential sun hours	455	425	374	347	301	292
Total, worst case		573	303	1246		
Sun reduction		0,73	0,65	0,54		
Oper. time red.		0,93	0,93	0,93		
Wind dir. red.		0,71	0,75	0,76		
Total reduction		0,48	0,46	0,39		
Total, real		278	138	481		

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 17

Licensed user:

Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: J - X

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

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

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 18

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: K - L

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

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

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 19

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: L - P

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

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

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 20

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: M - B

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January		February		March		April		May		June		
1	07:45		11:30 (3)	07:33	11:45 (3)	06:58	07:10		07:34 (5)	06:26		05:58	
	17:10	145	13:55 (3)	17:43	14:00 (3)	18:15	19:47	33	08:07 (5)	20:17		20:45	
2	07:45		11:30 (3)	07:32	11:46 (3)	06:57	07:08		07:33 (5)	06:24		05:58	
	17:10	146	13:56 (3)	17:44	13:59 (3)	18:16	19:48	33	08:06 (5)	20:18		20:46	
3	07:45		11:30 (3)	07:31	11:47 (3)	06:55	07:06		07:34 (5)	06:23		05:58	
	17:11	146	13:56 (3)	17:45	13:59 (3)	18:17	19:49	32	08:06 (5)	20:19		20:46	
4	07:45		11:31 (3)	07:30	11:48 (3)	06:54	07:05		07:33 (5)	06:22		05:57	
	17:12	146	13:57 (3)	17:46	13:58 (3)	18:18	19:50	32	08:05 (5)	20:20	6	07:04 (4)	
5	07:45		11:31 (3)	07:29	11:49 (3)	06:52	07:03		07:33 (5)	06:21		05:57	
	17:13	146	13:57 (3)	17:47	13:58 (3)	18:19	19:51	31	08:04 (5)	20:21	13	07:08 (4)	
6	07:45		11:31 (3)	07:28	11:50 (3)	06:51	07:02		07:34 (5)	06:20		05:57	
	17:14	146	13:57 (3)	17:48	13:57 (3)	18:20	19:52	30	08:04 (5)	20:22	18	07:11 (4)	
7	07:45		11:31 (3)	07:27	11:51 (3)	06:49	07:00		07:34 (5)	06:19		05:56	
	17:15	146	13:57 (3)	17:50	13:57 (3)	18:21	19:53	28	08:02 (5)	20:23	21	07:12 (4)	
8	07:45		11:32 (3)	07:26	11:52 (3)	06:48	06:59		07:35 (5)	06:17		05:56	
	17:16	146	13:58 (3)	17:51	13:56 (3)	18:22	19:54	26	08:01 (5)	20:24	23	07:13 (4)	
9	07:45		11:33 (3)	07:24	11:54 (3)	06:46	06:57		07:35 (5)	06:16		05:56	
	17:17	145	13:58 (3)	17:52	13:55 (3)	18:23	19:55	24	07:59 (5)	20:25	26	07:15 (4)	
10	07:45		11:33 (3)	07:23	11:55 (3)	06:45	06:55		07:37 (5)	06:15		05:56	
	17:18	146	13:59 (3)	17:53	13:54 (3)	18:25	19:56	21	07:58 (5)	20:26	25	07:16 (4)	
11	07:44		11:33 (3)	07:22	11:56 (3)	06:43	06:54		07:39 (5)	06:14		05:56	
	17:19	145	13:58 (3)	17:54	13:52 (3)	18:26	19:57	16	07:55 (5)	20:27	29	07:17 (4)	
12	07:44		11:34 (3)	07:21	11:58 (3)	06:42	06:52		07:42 (5)	06:13		05:55	
	17:20	145	13:59 (3)	17:56	13:51 (3)	18:27	19:58	10	07:52 (5)	20:28	30	07:18 (4)	
13	07:44		11:35 (3)	07:20	12:00 (3)	06:40	06:51			06:12		05:55	
	17:21	145	14:00 (3)	17:57	11:55 (3)	18:28	19:59			20:29	31	07:19 (4)	
14	07:44		11:35 (3)	07:19	12:02 (3)	06:38	06:49			06:11		05:55	
	17:22	144	13:59 (3)	17:58	13:49 (3)	18:29	20:00			20:30	31	07:19 (4)	
15	07:43		11:35 (3)	07:17	12:04 (3)	06:37	06:48			06:10		05:55	
	17:23	145	14:00 (3)	17:59	13:46 (3)	18:30	20:01			20:31	33	07:20 (4)	
16	07:43		11:36 (3)	07:16	12:07 (3)	06:35	06:46			06:09		05:55	
	17:24	145	14:01 (3)	18:00	13:45 (3)	18:31	20:02			20:31	33	07:20 (4)	
17	07:43		11:36 (3)	07:15	12:10 (3)	06:34	06:45			06:08		05:55	
	17:25	144	14:00 (3)	18:01	13:42 (3)	18:32	20:03			20:32	34	07:21 (4)	
18	07:42		11:37 (3)	07:14	12:14 (3)	06:32	06:43			06:08		05:54	
	17:26	144	14:01 (3)	18:03	13:40 (3)	18:33	20:04			20:33	34	07:21 (4)	
19	07:42		11:37 (3)	07:12	12:18 (3)	06:30	06:42			06:07		05:56	
	17:27	144	14:01 (3)	18:04	13:36 (3)	18:34	20:05			20:34	34	07:21 (4)	
20	07:41		11:37 (3)	07:11	12:23 (3)	06:29	06:41			06:06		05:56	
	17:28	143	14:00 (3)	18:05	13:32 (3)	18:35	20:06			20:35	34	07:21 (4)	
21	07:41		11:39 (3)	07:10	12:30 (3)	06:27	06:39			06:05		05:56	
	17:30	142	14:01 (3)	18:06	13:26 (3)	18:36	20:07			20:36	34	07:22 (4)	
22	07:40		11:39 (3)	07:08	12:41 (3)	06:26	06:38			06:04		05:56	
	17:31	142	14:01 (3)	18:07	13:19 (3)	18:37	5	06:51 (5)	06:38	20:37	20:55	34	07:22 (4)
23	07:39		11:40 (3)	07:07		06:24	06:45 (5)	06:36		06:04		05:56	06:48 (4)
	17:32	142	14:02 (3)	18:08		18:38	15	07:00 (5)	20:09	20:38	20:55	34	07:22 (4)
24	07:39		11:40 (3)	07:06		06:22	06:43 (5)	06:35		06:03		05:57	06:48 (4)
	17:33	141	14:01 (3)	18:09		18:39	20	07:03 (5)	20:10	20:39	20:55	34	07:22 (4)
25	07:38		11:41 (3)	07:04		06:21	06:41 (5)	06:34		06:02		05:57	06:49 (4)
	17:34	140	14:01 (3)	18:10		18:40	23	07:04 (5)	20:11	20:39	20:55	34	07:23 (4)
26	07:37		11:41 (3)	07:03		06:19	06:39 (5)	06:32		06:02		05:57	06:49 (4)
	17:35	140	14:01 (3)	18:12		18:41	26	07:05 (5)	20:12	20:40	20:56	33	07:22 (4)
27	07:37		11:42 (3)	07:01		06:18	06:38 (5)	06:31		06:01		05:58	06:49 (4)
	17:37	139	14:01 (3)	18:13		18:42	28	07:06 (5)	20:13	20:41	20:56	33	07:22 (4)
28	07:36		11:43 (3)	07:00		06:16	06:36 (5)	06:30		06:00		05:58	06:50 (4)
	17:38	138	14:01 (3)	18:14		18:43	31	07:07 (5)	20:14	20:42	20:56	32	07:22 (4)
29	07:35		11:43 (3)			07:14	07:36 (5)	06:28		06:00		05:58	06:51 (4)
	17:39	138	14:01 (3)			19:44	31	08:07 (5)	20:15	20:43	20:56	31	07:22 (4)
30	07:34		11:44 (3)			07:13	07:35 (5)	06:27		05:59		05:59	06:52 (4)
	17:40	137	14:01 (3)			19:45	32	08:07 (5)	20:16	20:43	20:56	30	07:22 (4)
31	07:33		11:44 (3)			07:11	07:34 (5)			05:59			
	17:41	136	14:00 (3)			19:46	33	08:07 (5)		20:44			
Potential sun hours		301		299		370		397		445		448	
Total, worst case		4437		2341		244		316				786	
Sun reduction		0,45		0,47		0,49		0,53				0,66	
Oper. time red.		0,93		0,93		0,93		0,93				0,93	
Wind dir. red.		0,51		0,51		0,75		0,75				0,66	
Total reduction		0,21		0,22		0,34		0,37				0,40	
Total, real		946		521		83		116				317	

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 21

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: M - B

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	06:52 (4)	06:22	06:51	07:38 (5)	07:19
	20:56	29 07:21 (4)	20:38	19:56	16 07:54 (5)	19:08
2	06:00	06:54 (4)	06:23	06:52	07:35 (5)	07:20
	20:55	27 07:21 (4)	20:37	19:55	21 07:56 (5)	19:06
3	06:00	06:54 (4)	06:24	06:53	07:33 (5)	07:21
	20:55	26 07:20 (4)	20:36	19:53	24 07:57 (5)	19:05
4	06:01	06:56 (4)	06:25	06:54	07:32 (5)	07:22
	20:55	24 07:20 (4)	20:35	19:52	26 07:58 (5)	19:03
5	06:01	06:57 (4)	06:26	06:55	07:31 (5)	07:23
	20:55	21 07:18 (4)	20:33	19:50	28 07:59 (5)	19:01
6	06:02	06:59 (4)	06:27	06:56	07:30 (5)	07:24
	20:55	19 07:18 (4)	20:32	19:49	30 08:00 (5)	19:00
7	06:02	07:00 (4)	06:27	06:56	07:29 (5)	07:25
	20:54	15 07:15 (4)	20:31	19:47	31 08:00 (5)	18:58
8	06:03	07:03 (4)	06:28	06:57	07:27 (5)	07:26
	20:54	11 07:14 (4)	20:30	19:45	32 07:59 (5)	18:57
9	06:04		06:29	06:58	07:27 (5)	07:27
	20:54		20:29	19:44	33 08:00 (5)	18:55
10	06:04		06:30	06:59	07:26 (5)	07:28
	20:53		20:28	19:42	33 07:59 (5)	18:54
11	06:05		06:31	07:00	07:26 (5)	07:29
	20:53		20:26	19:40	33 07:59 (5)	18:52
12	06:06		06:32	07:01	07:26 (5)	07:30
	20:53		20:25	19:39	33 07:59 (5)	18:50
13	06:06		06:33	07:02	07:26 (5)	07:31
	20:52		20:24	19:37	32 07:58 (5)	18:49
14	06:07		06:34	07:03	07:26 (5)	07:32
	20:52		20:22	19:36	32 07:58 (5)	18:47
15	06:08		06:35	07:04	07:26 (5)	07:33
	20:51		20:21	19:34	31 07:57 (5)	18:46
16	06:08		06:36	07:05	07:27 (5)	07:34
	20:51		20:20	19:32	29 07:56 (5)	18:44
17	06:09		06:37	07:06	07:27 (5)	07:35
	20:50		20:18	19:31	27 07:54 (5)	18:43
18	06:10		06:38	07:07	07:28 (5)	07:36
	20:49		20:17	19:29	24 07:52 (5)	18:42
19	06:11		06:39	07:08	07:29 (5)	07:37
	20:49		20:16	19:27	21 07:50 (5)	18:40
20	06:12		06:40	07:09	07:31 (5)	07:38
	20:48		20:14	19:26	17 07:48 (5)	18:39
21	06:12		06:41	07:09	07:34 (5)	07:39
	20:47		20:13	19:24	10 07:44 (5)	18:37
22	06:13		06:42	07:10		07:40
	20:47		20:11	19:22		18:36
23	06:14		06:42	07:11		07:41
	20:46		20:10	19:21		18:35
24	06:15		06:43	07:12		07:42
	20:45		20:09	19:19		18:33
25	06:16		06:44	07:13		06:43
	20:44		20:07	19:18		17:32
26	06:17		06:45	07:14		06:45
	20:43		20:06	19:16		17:31
27	06:17		06:46	07:15		06:46
	20:42		20:04	19:14		17:29
28	06:18		06:47	07:16		06:47
	20:42		20:03	19:13		17:28
29	06:19		06:48	07:17		06:48
	20:41		20:01	19:11		17:27
30	06:20		06:49	07:18		06:49
	20:40		20:00	19:09		17:25
31	06:21		06:50			06:50
	20:39		19:58	10 07:41 (5)		17:24
Potential sun hours	455	425	374	347	301	292
Total, worst case	172	10	563	1103	4115	4518
Sun reduction	0,74	0,73	0,65	0,54	0,51	0,45
Oper. time red.	0,93	0,93	0,93	0,93	0,93	0,93
Wind dir. red.	0,66	0,75	0,75	0,51	0,51	0,51
Total reduction	0,45	0,51	0,45	0,26	0,24	0,21
Total, real	77	5	252	283	979	964

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 22

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: N - O

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	July	August	September	October	November	December						
1	07:45	12:05 (2)	07:33	06:58	07:10	06:26	05:58	05:59	06:22	06:51	07:19	06:51	07:25	11:57 (2)				
	17:10	112	13:57 (2)	17:43	18:15	19:47	20:17	20:45	20:55	20:38	19:56	19:08	17:23	17:00	101	13:38 (2)		
2	07:45	12:06 (2)	07:32	06:57	07:08	06:24	05:58	06:00	06:23	06:52	07:20	06:52	07:26	11:56 (2)				
	17:10	112	13:58 (2)	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:06	17:22	17:00	103	13:39 (2)		
3	07:45	12:07 (2)	07:31	06:55	07:06	06:23	05:58	06:00	06:24	06:53	07:21	06:53	07:26	11:56 (2)				
	17:11	111	13:58 (2)	17:45	18:17	19:49	20:19	20:46	20:55	20:36	19:53	19:05	17:21	17:00	104	13:40 (2)		
4	07:45	12:08 (2)	07:30	06:54	07:05	06:22	05:57	06:01	06:25	06:54	07:22	06:55	07:27	11:56 (2)				
	17:12	110	13:58 (2)	17:46	18:18	19:50	20:20	20:47	20:55	20:34	19:52	19:03	17:20	17:00	105	13:41 (2)		
5	07:45	12:08 (2)	07:29	06:52	07:03	06:21	05:57	06:01	06:26	06:55	07:23	06:56	07:28	11:55 (2)				
	17:13	109	13:57 (2)	17:47	18:19	19:51	20:21	20:48	20:55	20:33	19:50	19:01	17:19	17:00	107	13:42 (2)		
6	07:45	12:09 (2)	07:28	06:51	07:02	06:20	05:57	06:02	06:27	06:56	07:24	06:57	07:29	11:55 (2)				
	17:14	108	13:57 (2)	17:49	18:20	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:17	16:59	108	13:43 (2)		
7	07:45	12:10 (2)	07:27	06:49	07:00	06:19	05:56	06:02	06:27	06:56	07:25	06:58	07:30	11:55 (2)				
	17:15	107	13:57 (2)	17:50	18:21	19:53	20:23	20:49	20:54	20:31	19:47	18:58	17:16	16:59	109	13:44 (2)		
8	07:45	12:12 (2)	07:26	06:48	06:59	06:17	05:56	06:03	06:28	06:57	07:26	06:59	07:31	11:55 (2)				
	17:16	105	13:57 (2)	17:51	18:22	19:54	20:24	20:49	20:54	20:30	19:45	18:57	17:15	16:59	110	13:45 (2)		
9	07:45	12:13 (2)	07:24	06:46	06:57	06:16	05:56	06:04	06:29	06:58	07:27	07:00	07:32	11:55 (2)				
	17:17	104	13:57 (2)	17:52	18:23	19:55	20:25	20:50	20:54	20:29	19:44	18:55	17:14	16:59	111	13:46 (2)		
10	07:45	12:14 (2)	07:23	06:45	06:55	06:15	05:56	06:04	06:30	06:59	07:28	07:01	07:33	11:55 (2)				
	17:18	103	13:57 (2)	17:53	18:25	19:56	20:26	20:51	20:53	20:28	19:42	18:54	17:13	16:59	112	13:47 (2)		
11	07:44	12:15 (2)	07:22	06:43	06:54	06:14	05:56	06:05	06:31	07:00	07:29	07:03	07:34	11:56 (2)				
	17:19	101	13:56 (2)	17:54	18:26	19:57	20:27	20:51	20:53	20:26	19:40	18:52	17:12	16:59	112	13:48 (2)		
12	07:44	12:16 (2)	07:21	06:42	06:52	06:13	05:55	06:06	06:32	07:01	07:30	07:04	07:35	11:55 (2)				
	17:20	100	13:56 (2)	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:50	17:12	17:00	113	13:48 (2)		
13	07:44	12:18 (2)	07:20	06:40	06:51	06:12	05:55	06:06	06:33	07:02	07:31	07:05	07:35	11:55 (2)				
	17:21	98	13:56 (2)	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:37	18:49	17:11	17:00	114	13:49 (2)		
14	07:44	12:19 (2)	07:19	06:38	06:49	06:11	05:55	06:07	06:34	07:03	07:32	07:06	12:39 (2)	07:36	11:56 (2)			
	17:22	96	13:55 (2)	17:58	18:29	20:00	20:30	20:52	20:52	20:22	19:36	18:47	17:10	18	12:57 (2)	17:00	113	13:49 (2)
15	07:43	12:21 (2)	07:17	06:37	06:48	06:10	05:55	06:08	06:35	07:04	07:33	07:07	12:30 (2)	07:37	11:56 (2)			
	17:23	94	13:55 (2)	17:59	18:30	20:01	20:30	20:53	20:51	20:21	19:34	18:46	17:09	35	13:05 (2)	17:00	114	13:50 (2)
16	07:43	12:23 (2)	07:16	06:35	06:46	06:09	05:55	06:08	06:36	07:05	07:34	07:08	12:24 (2)	07:37	11:56 (2)			
	17:24	91	13:54 (2)	18:00	18:31	20:02	20:31	20:53	20:51	20:20	19:32	18:45	17:08	45	13:09 (2)	17:00	114	13:50 (2)
17	07:43	12:24 (2)	07:15	06:34	06:45	06:08	05:55	06:09	06:37	07:06	07:35	07:09	12:20 (2)	07:38	11:57 (2)			
	17:25	89	13:53 (2)	18:01	18:32	20:03	20:32	20:54	20:50	20:18	19:31	18:43	17:07	54	13:14 (2)	17:01	114	13:51 (2)
18	07:42	12:27 (2)	07:14	06:32	06:43	06:08	05:55	06:10	06:38	07:07	07:36	07:10	12:17 (2)	07:39	11:57 (2)			
	17:26	86	13:53 (2)	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	60	13:17 (2)	17:01	115	13:52 (2)
19	07:42	12:29 (2)	07:12	06:30	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	12:14 (2)	07:39	11:57 (2)			
	17:27	82	13:51 (2)	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:27	18:40	17:06	66	13:20 (2)	17:01	115	13:52 (2)
20	07:41	12:30 (2)	07:11	06:29	06:41	06:06	05:56	06:12	06:40	07:09	07:38	07:13	12:11 (2)	07:40	11:58 (2)			
	17:29	80	13:50 (2)	18:05	18:35	20:06	20:35	20:54	20:48	20:14	19:26	18:39	17:05	71	13:22 (2)	17:02	115	13:53 (2)
21	07:41	12:33 (2)	07:10	06:27	06:39	06:05	05:56	06:12	06:41	07:09	07:39	07:14	12:08 (2)	07:41	11:58 (2)			
	17:30	76	13:49 (2)	18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:37	17:05	76	13:24 (2)	17:02	115	13:53 (2)
22	07:40	12:36 (2)	07:08	06:26	06:38	06:04	05:56	06:13	06:42	07:10	07:40	07:15	12:06 (2)	07:41	11:59 (2)			
	17:31	71	13:47 (2)	18:07	18:37	20:08	20:37	20:55	20:47	20:11	19:22	18:36	17:04	80	13:26 (2)	17:03	115	13:54 (2)
23	07:39	12:39 (2)	07:07	06:24	06:36	06:04	05:56	06:14	06:42	07:11	07:41	07:16	12:06 (2)	07:42	11:59 (2)			
	17:32	66	13:45 (2)	18:08	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:04	82	13:28 (2)	17:03	115	13:54 (2)
24	07:39	12:43 (2)	07:05	06:22	06:35	06:03	05:57	06:15	06:43	07:12	07:42	07:17	12:04 (2)	07:42	12:00 (2)			
	17:33	60	13:43 (2)	18:09	18:39	20:10	20:39	20:55	20:45	20:09	19:19	18:33	17:03	86	13:30 (2)	17:04	115	13:55 (2)
25	07:38	12:46 (2)	07:04	06:21	06:34	06:02	05:57	06:16	06:44	07:13	07:43	07:18	12:03 (2)	07:42	12:00 (2)			
	17:34	54	13:40 (2)	18:10	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:03	88	13:31 (2)	17:04	115	13:55 (2)
26	07:37	12:51 (2)	07:03	06:19	06:32	06:02	05:57	06:17	06:45	07:14	07:45	07:19	12:01 (2)	07:43	12:00 (2)			
	17:35	45	13:36 (2)	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:02	91	13:32 (2)	17:05	115	13:55 (2)
27	07:37	12:57 (2)	07:01	06:18	06:31	06:01	05:58	06:17	06:46	07:15	07:46	07:20	12:00 (2)	07:43	12:02 (2)			
	17:37	35	13:32 (2)	18:13	18:42	20:13	20:41	20:56	20:42	20:04	19:14	17:29	17:02	94	13:34 (2)	17:06	114	13:56 (2)
28	07:36	13:08 (2)	07:00	06:16	06:30	06:00	05:58	06:18	06:47	07:16	07:47	07:21	11:59 (2)	07:44	12:02 (2)			
	17:38	16	13:24 (2)	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:28	17:01	96	13:35 (2)	17:06	114	13:56 (2)
29	07:35			07:14	06:28	06:00	05:58	06:19	06:48	07:17	07:48	07:22	11:58 (2)	07:44	12:03 (2)			
	17:39			19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	98	13:36 (2)	17:07	113	13:56 (2)	
30	07:34			07:13	06:27	05:59	05:59	06:20	06:49	07:18	07:49	07:23	11:58 (2)	07:44	12:03 (2)			
	17:40			19:45	20:16	20:43	20:56	20:40	20:00	19:09	17:25	17:01	99	13:37 (2)	17:08	113	13:56 (2)	
31	07:33			07:11		05:59		06:21	06:50		06:50		07:44		12:04 (2)			
	17:41			19:46		20:44		20:39	19:58		17:24		17:09		113	13:57 (2)		
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301		292					
Total, worst case	2421										1239			3466				
Sun reduction	0,45										0,51			0,45				
Oper. time red.	0,93										0,93			0,93				
Wind dir. red.	0,49	</																

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 23

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: O - A1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 17:10	07:33 17:43	06:58 18:15	07:27 (5) 07:10	08:14 (4) 06:26	08:07 (4) 05:58
2	07:45 17:10	07:32 17:44	06:57 18:16	07:27 (5) 07:08	08:13 (4) 06:24	08:07 (4) 05:58
3	07:45 17:11	07:31 17:45	06:55 18:17	07:27 (5) 07:06	08:12 (4) 06:23	08:08 (4) 05:58
4	07:45 17:12	07:30 17:46	06:54 18:18	07:26 (5) 07:05	08:11 (4) 06:22	08:09 (4) 05:57
5	07:45 17:13	07:29 17:47	06:52 18:19	07:27 (5) 07:03	08:09 (4) 06:21	08:10 (4) 05:57
6	07:45 17:14	07:28 17:48	06:51 18:20	07:27 (5) 07:02	08:09 (4) 06:20	08:11 (4) 05:57
7	07:45 17:15	07:27 17:50	06:49 18:21	07:28 (5) 07:00	08:08 (4) 06:19	08:12 (4) 05:56
8	07:45 17:16	07:26 17:51	06:48 18:22	07:28 (5) 06:59	08:07 (4) 06:17	08:13 (4) 05:56
9	07:45 17:17	07:24 17:52	06:46 18:23	07:27 (5) 06:57	08:06 (4) 06:16	08:15 (4) 05:56
10	07:45 17:18	07:23 17:53	06:45 18:25	07:03 (6) 06:55	08:06 (4) 06:15	08:16 (4) 05:56
11	07:44 17:19	07:22 17:54	06:43 18:26	07:02 (6) 06:54	08:05 (4) 06:14	08:18 (4) 05:56
12	07:44 17:20	07:21 17:56	06:42 18:27	07:00 (6) 06:52	08:05 (4) 06:13	08:20 (4) 05:55
13	07:44 17:21	07:20 17:57	06:40 18:28	07:00 (6) 06:51	08:04 (4) 06:12	08:22 (4) 05:55
14	07:44 17:22	07:19 17:58	06:38 18:29	07:46 (5) 19:59	08:04 (4) 06:11	08:25 (4) 05:55
15	07:43 17:23	07:17 17:59	06:37 18:30	07:17 (6) 20:00	08:03 (4) 06:10	08:30 (4) 05:55
16	07:43 17:24	07:16 18:00	06:35 18:31	07:16 (6) 20:01	08:04 (4) 06:09	08:36 (4) 05:55
17	07:43 17:25	07:15 18:01	06:34 18:32	07:16 (6) 20:02	08:03 (4) 06:08	05:55
18	07:42 17:26	07:14 18:03	06:32 18:33	07:15 (6) 20:03	08:03 (4) 06:08	05:55
19	07:42 17:27	07:12 18:04	06:30 18:34	07:14 (6) 20:04	08:03 (4) 06:07	05:56
20	07:41 17:28	07:11 18:05	06:29 18:35	07:13 (6) 20:05	08:03 (4) 06:06	05:56
21	07:41 17:30	07:10 18:06	06:27 18:36	07:11 (6) 20:06	08:03 (4) 06:05	05:55
22	07:40 17:31	07:08 18:07	06:26 18:37	07:00 (6) 06:39	08:03 (4) 06:05	05:55
23	07:39 17:32	07:07 18:08	06:24 18:38	07:55 (5) 18:36	08:03 (4) 06:04	05:56
24	07:39 17:33	07:06 18:09	06:22 18:39	07:55 (5) 18:37	08:03 (4) 06:04	05:56
25	07:38 17:34	07:04 18:10	06:21 18:40	07:38 (4) 06:38	08:02 (4) 20:08	05:55
26	07:37 17:35	07:03 18:12	06:19 18:41	07:37 (4) 06:38	08:03 (4) 06:04	05:55
27	07:37 17:37	07:01 18:13	06:18 18:42	07:24 (4) 06:32	08:03 (4) 06:04	05:56
28	07:36 17:38	07:00 18:14	06:16 18:43	08:05 (4) 06:06	08:04 (4) 06:02	05:57
29	07:35 17:39	06:59 18:15	06:14 18:44	07:27 (4) 06:34	08:05 (4) 06:00	05:58
30	07:34 17:40	06:58 18:16	06:13 18:45	08:11 (4) 20:11	08:06 (4) 05:59	05:59
31	07:33 17:41	06:57 18:17	06:12 18:46	08:11 (4) 20:11	08:06 (4) 05:59	05:59
Potential sun hours	301	299	370	397	445	448
Total, worst case		238	1035	2103	585	
Sun reduction		0,47	0,49	0,53	0,59	
Oper. time red.		0,93	0,93	0,93	0,93	
Wind dir. red.		0,76	0,76	0,76	0,76	
Total reduction		0,33	0,35	0,37	0,41	
Total, real		79	359	784	243	

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 24

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: O - A1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	06:22	08:29 (4) 06:51	08:04 (4) 07:19	07:39 (6) 06:51	07:25
	20:56	20:38	29 08:58 (4) 19:56	74 09:18 (4) 19:08	31 08:28 (5) 17:23	17:00
2	06:00	06:23	08:27 (4) 06:52	08:04 (4) 07:20	07:39 (6) 06:52	07:26
	20:55	20:37	33 09:00 (4) 19:55	74 09:18 (4) 19:06	34 08:30 (5) 17:22	17:00
3	06:00	06:24	08:25 (4) 06:53	08:04 (4) 07:21	07:40 (6) 06:53	07:27
	20:55	20:36	37 09:02 (4) 19:53	74 09:18 (4) 19:05	35 08:31 (5) 17:21	17:00
4	06:01	06:25	08:24 (4) 06:54	08:04 (4) 07:22	07:41 (6) 06:55	07:28
	20:55	20:35	40 09:04 (4) 19:52	73 09:17 (4) 19:03	35 08:33 (5) 17:20	17:00
5	06:01	06:26	08:23 (4) 06:55	08:05 (4) 07:23	08:05 (5) 06:56	07:28
	20:55	20:33	43 09:06 (4) 19:50	72 09:17 (4) 19:01	28 08:33 (5) 17:19	16:59
6	06:02	06:27	08:21 (4) 06:56	08:05 (4) 07:24	08:04 (5) 06:57	07:29
	20:55	20:32	46 09:07 (4) 19:49	71 09:16 (4) 19:00	30 08:34 (5) 17:17	16:59
7	06:02	06:27	08:20 (4) 06:56	08:05 (4) 07:25	08:03 (5) 06:58	07:30
	20:54	20:31	48 09:08 (4) 19:47	71 09:16 (4) 18:58	31 08:34 (5) 17:16	16:59
8	06:03	06:28	08:19 (4) 06:57	08:05 (4) 07:26	08:02 (5) 06:59	07:31
	20:54	20:30	51 09:10 (4) 19:45	69 09:14 (4) 18:57	33 08:35 (5) 17:15	16:59
9	06:04	06:29	08:18 (4) 06:58	08:05 (4) 07:27	08:01 (5) 07:00	07:32
	20:54	20:29	53 09:11 (4) 19:44	68 09:13 (4) 18:55	34 08:35 (5) 17:14	16:59
10	06:04	06:30	08:16 (4) 06:59	08:06 (4) 07:28	08:02 (5) 07:01	07:33
	20:53	20:28	55 09:11 (4) 19:42	66 09:12 (4) 18:54	34 08:36 (5) 17:13	16:59
11	06:05	06:31	08:15 (4) 07:00	08:06 (4) 07:29	08:01 (5) 07:03	07:34
	20:53	20:26	57 09:12 (4) 19:40	65 09:11 (4) 18:52	35 08:36 (5) 17:12	16:59
12	06:06	06:32	08:14 (4) 07:01	08:07 (4) 07:30	08:01 (5) 07:04	07:35
	20:53	20:25	59 09:13 (4) 19:39	63 09:10 (4) 18:50	34 08:35 (5) 17:12	17:00
13	06:06	06:33	08:14 (4) 07:02	08:08 (4) 07:31	08:01 (5) 07:05	07:35
	20:52	20:24	60 09:14 (4) 19:37	61 09:09 (4) 18:49	34 08:35 (5) 17:11	17:00
14	06:07	06:34	08:13 (4) 07:03	08:09 (4) 07:32	08:01 (5) 07:06	07:36
	20:52	20:22	62 09:15 (4) 19:36	58 09:07 (4) 18:47	33 08:34 (5) 17:10	17:00
15	06:08	06:35	08:12 (4) 07:04	08:10 (4) 07:33	08:01 (5) 07:07	07:37
	20:51	20:21	63 09:15 (4) 19:34	56 09:06 (4) 18:46	32 08:33 (5) 17:09	17:00
16	06:08	06:36	08:11 (4) 07:05	08:12 (4) 07:34	08:02 (5) 07:08	07:38
	20:51	20:20	65 09:16 (4) 19:32	52 09:04 (4) 18:44	31 08:33 (5) 17:08	17:00
17	06:09	06:37	08:11 (4) 07:06	08:12 (4) 07:35	08:02 (5) 07:09	07:38
	20:50	20:18	66 09:17 (4) 19:31	49 09:01 (4) 18:43	29 08:31 (5) 17:07	17:01
18	06:10	06:38	08:10 (4) 07:07	08:14 (4) 07:36	08:03 (5) 07:10	07:39
	20:49	20:17	67 09:17 (4) 19:29	44 08:58 (4) 18:42	27 08:30 (5) 17:07	17:01
19	06:11	06:39	08:10 (4) 07:08	08:16 (4) 07:37	08:04 (5) 07:12	07:39
	20:49	20:16	68 09:18 (4) 19:27	40 08:56 (4) 18:40	25 08:29 (5) 17:06	17:01
20	06:12	06:40	08:08 (4) 07:09	08:19 (4) 07:38	08:05 (5) 07:13	07:40
	20:48	20:14	70 09:18 (4) 19:26	34 08:53 (4) 18:39	22 08:27 (5) 17:05	17:02
21	06:12	06:41	08:08 (4) 07:09	08:22 (4) 07:39	08:07 (5) 07:14	07:41
	20:47	20:13	70 09:18 (4) 19:24	27 08:49 (4) 18:37	17 08:24 (5) 17:05	17:02
22	06:13	06:42	08:07 (4) 07:10	07:47 (6) 07:40	08:11 (5) 07:15	07:41
	20:47	20:11	71 09:18 (4) 19:22	21 08:43 (4) 18:36	11 08:22 (5) 17:04	17:03
23	06:14	06:42	08:07 (4) 07:11	07:43 (6) 07:41		07:42
	20:46	20:10	72 09:19 (4) 19:21	12 07:55 (6) 18:35		17:03
24	06:15	06:43	08:06 (4) 07:12	07:41 (6) 07:42		07:42
	20:45	20:09	73 09:19 (4) 19:19	15 07:56 (6) 18:33		17:03
25	06:16	06:44	08:06 (4) 07:13	07:40 (6) 06:43		07:43
	20:44	20:07	73 09:19 (4) 19:18	17 07:57 (6) 17:32		17:02
26	06:17	06:45	08:06 (4) 07:14	07:39 (6) 06:45		07:43
	20:43	20:06	74 09:20 (4) 19:16	19 07:58 (6) 17:31		17:02
27	06:17	06:46	08:06 (4) 07:15	07:38 (6) 06:46		07:43
	20:42	20:04	74 09:20 (4) 19:14	20 07:58 (6) 17:29		17:02
28	06:18	06:47	08:05 (4) 07:16	07:38 (6) 06:47		07:44
	20:42	20:03	75 09:20 (4) 19:13	20 07:58 (6) 17:28		17:01
29	06:19	08:38 (4) 06:48	08:05 (4) 07:17	07:38 (6) 06:48		07:44
	20:41	12 08:50 (4) 20:01	75 09:20 (4) 19:11	19 07:57 (6) 17:27		17:01
30	06:20	08:34 (4) 06:49	08:04 (4) 07:18	07:38 (6) 06:49		07:44
	20:40	20 08:54 (4) 20:00	75 09:19 (4) 19:09	22 08:23 (5) 17:25		17:01
31	06:21	08:32 (4) 06:50	08:04 (4)	06:50		07:44
	20:39	25 08:57 (4) 19:58	75 09:19 (4)	17:24		17:09
Potential sun hours	455	425	374	347	301	292
Total, worst case	57	1879	1426	655		
Sun reduction	0,74	0,73	0,65	0,54		
Oper. time red.	0,93	0,93	0,93	0,93		
Wind dir. red.	0,76	0,76	0,76	0,76		
Total reduction	0,52	0,52	0,46	0,38		
Total, real	30	968	651	251		

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 25

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: P - A

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45	14:06 (1)	07:33	06:58	07:10	06:26
	17:10	58 15:04 (1)	17:43	18:15	19:47	12 06:45 (6)
2	07:45	14:08 (1)	07:32	06:57	07:08	20:17 06:57 (6)
	17:10	57 15:05 (1)	17:44	18:16	19:48	12 06:46 (5)
3	07:45	14:09 (1)	07:31	06:55	07:06	06:24 06:43 (6)
	17:11	57 15:06 (1)	17:45	18:17	19:49	12 06:47 (5)
4	07:45	14:10 (1)	07:30	06:54	07:05	06:23 06:42 (6)
	17:12	56 15:06 (1)	17:46	18:18	19:50	12 06:48 (5)
5	07:45	14:10 (1)	07:29	06:52	07:03	20:19 06:57 (6)
	17:13	56 15:06 (1)	17:47	18:19	19:51	12 06:49 (5)
6	07:45	14:10 (1)	07:28	06:51	07:02	06:22 06:41 (6)
	17:14	55 15:05 (1)	17:48	18:20	19:52	12 06:50 (5)
7	07:45	14:11 (1)	07:27	06:49	07:00	20:20 06:57 (6)
	17:15	54 15:05 (1)	17:50	18:21	19:53	12 06:51 (5)
8	07:45	14:13 (1)	07:26	06:48	06:59	06:19 06:38 (6)
	17:16	52 15:05 (1)	17:51	18:22	19:54	12 06:52 (5)
9	07:45	14:14 (1)	07:24	06:46	06:57	06:17 06:38 (6)
	17:17	52 15:06 (1)	17:52	18:23	19:55	12 06:53 (5)
10	07:45	14:15 (1)	07:23	06:45	06:55	20:25 06:56 (6)
	17:18	51 15:06 (1)	17:53	18:25	19:56	12 06:54 (5)
11	07:44	14:16 (1)	07:22	06:43	06:54	06:15 06:39 (6)
	17:19	49 15:05 (1)	17:54	18:26	19:57	12 06:55 (5)
12	07:44	14:17 (1)	07:21	06:42	06:52	20:26 06:55 (6)
	17:20	48 15:05 (1)	17:56	18:27	19:58	12 06:56 (5)
13	07:44	14:19 (1)	07:20	06:40	06:51	06:13 06:41 (6)
	17:21	46 15:05 (1)	17:57	18:28	19:59	12 06:57 (5)
14	07:44	14:19 (1)	07:19	06:38	06:49	20:28 06:56 (6)
	17:22	45 15:04 (1)	17:58	18:29	20:00	12 06:58 (5)
15	07:43	14:21 (1)	07:17	06:37	06:48	06:11 06:40 (6)
	17:23	43 15:04 (1)	17:59	18:30	20:01	12 06:59 (5)
16	07:43	14:23 (1)	07:16	06:35	06:46	06:10 06:39 (6)
	17:24	40 15:03 (1)	18:00	18:31	20:02	12 07:00 (5)
17	07:43	14:25 (1)	07:15	06:34	06:45	20:30 06:58 (6)
	17:25	37 15:02 (1)	18:01	18:32	20:03	12 07:01 (5)
18	07:42	14:27 (1)	07:14	06:32	06:43	06:08 06:38 (6)
	17:26	35 15:02 (1)	18:03	18:33	20:04	12 07:02 (5)
19	07:42	14:29 (1)	07:12	06:30	06:42	20:33 06:57 (6)
	17:27	31 15:00 (1)	18:04	18:34	20:05	12 07:03 (5)
20	07:41	14:31 (1)	07:11	06:29	06:41	06:06 06:37 (6)
	17:28	27 14:58 (1)	18:05	18:35	20:06	12 07:04 (5)
21	07:41	14:35 (1)	07:10	06:27	06:39	06:05 06:36 (6)
	17:30	21 14:56 (1)	18:06	18:36	20:07	12 07:05 (5)
22	07:40	14:38 (1)	07:08	06:26	06:38	20:36 06:56 (6)
	17:31	15 14:53 (1)	18:07	18:37	20:08	12 07:06 (5)
23	07:39	07:07	06:24	06:36	06:04	7 06:27 (5)
	17:32	18:08	18:38	20:09	20:37 06:34 (5)	12 07:07 (5)
24	07:39	07:05	06:22	06:35	06:03	13 06:24 (5)
	17:33	18:09	18:39	20:10	20:38 06:37 (5)	12 07:08 (5)
25	07:38	07:04	06:21	06:34	06:02	16 06:23 (5)
	17:34	18:10	18:40	20:11	20:39 06:39 (5)	12 07:09 (5)
26	07:37	07:03	06:19	06:32	06:01	18 06:21 (5)
	17:35	18:12	18:41	20:12	20:40 06:41 (5)	12 07:10 (5)
27	07:37	07:01	06:18	06:31	06:00	19 06:22 (5)
	17:37	18:13	18:42	20:13	2 06:50 (6)	12 07:11 (5)
28	07:36	07:00	06:16	06:30	06:52 (6)	21 06:43 (5)
	17:38	18:14	18:43	20:14	5 06:48 (6)	12 07:12 (5)
29	07:35	06:14	06:28	06:47 (6)	06:00	22 06:21 (5)
	17:39	19:44	20:15	8 06:55 (6)	20:43 06:45 (5)	12 07:13 (5)
30	07:34	07:13	06:27	06:46 (6)	05:59	24 06:20 (5)
	17:40	19:45	20:16	10 06:56 (6)	20:43 06:45 (5)	12 07:14 (5)
31	07:33	07:11	06:25	06:39	05:59	25 06:20 (5)
	17:41	19:46	20:17	11 06:57 (6)	20:44 06:46 (5)	12 07:15 (5)
Potential sun hours	301	299	370	397	445	448
Total, worst case	985			25	387	994
Sun reduction	0,45			0,53	0,59	0,66
Oper. time red.	0,93			0,93	0,93	0,93
Wind dir. red.	0,52			0,69	0,68	0,66
Total reduction	0,21			0,33	0,36	0,40
Total, real	210			8	140	395

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 26

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: P - A

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	06:21 (5) 06:22	06:50 (6) 06:51	07:19	06:51	07:25
	20:56	33 06:54 (5) 20:38	13 07:03 (6) 19:56	19:08	17:23	17:00
2	06:00	06:22 (5) 06:23	06:49 (6) 06:52	07:20	06:52	07:26
	20:55	33 06:55 (5) 20:37	15 07:04 (6) 19:55	19:06	17:22	17:00
3	06:00	06:22 (5) 06:24	06:48 (6) 06:53	07:21	06:53	07:27
	20:55	33 06:55 (5) 20:36	17 07:05 (6) 19:53	19:05	17:21	17:00
4	06:01	06:23 (5) 06:25	06:48 (6) 06:54	07:22	06:55	07:27
	20:55	32 06:55 (5) 20:35	18 07:06 (6) 19:52	19:03	17:20	17:00
5	06:01	06:23 (5) 06:26	06:47 (6) 06:55	07:23	06:56	07:28
	20:55	32 06:55 (5) 20:33	19 07:06 (6) 19:50	19:01	17:19	16:59
6	06:02	06:24 (5) 06:27	06:48 (6) 06:56	07:24	06:57	07:29
	20:55	31 06:55 (5) 20:32	18 07:06 (6) 19:49	19:00	17:17	16:59
7	06:02	06:24 (5) 06:27	06:49 (6) 06:56	07:25	06:58	07:30
	20:54	30 06:54 (5) 20:31	18 07:07 (6) 19:47	18:58	17:16	16:59
8	06:03	06:25 (5) 06:28	06:50 (6) 06:57	07:26	06:59	07:31
	20:54	30 06:55 (5) 20:30	17 07:07 (6) 19:45	18:57	17:15	16:59
9	06:04	06:26 (5) 06:29	06:51 (6) 06:58	07:27	07:00	07:32
	20:54	29 06:55 (5) 20:29	16 07:07 (6) 19:44	18:55	17:14	16:59
10	06:04	06:26 (5) 06:30	06:51 (6) 06:59	07:28	07:01	07:33
	20:53	28 06:54 (5) 20:28	14 07:05 (6) 19:42	18:54	17:13	16:59
11	06:05	06:27 (5) 06:31	06:52 (6) 07:00	07:29	07:03	07:34
	20:53	27 06:54 (5) 20:26	13 07:05 (6) 19:40	18:52	17:12	16:59
12	06:06	06:27 (5) 06:32	06:53 (6) 07:01	07:30	07:04	07:35
	20:53	26 06:53 (5) 20:25	11 07:04 (6) 19:39	18:50	17:12	17:00
13	06:06	06:28 (5) 06:33	06:54 (6) 07:02	07:31	07:05	07:35
	20:52	25 06:53 (5) 20:24	10 07:04 (6) 19:37	18:49	17:11	17:00
14	06:07	06:29 (5) 06:34	06:55 (6) 07:03	07:32	07:06	07:36
	20:52	24 06:53 (5) 20:22	7 07:02 (6) 19:36	18:47	17:10	17:00
15	06:08	06:30 (5) 06:35	06:56 (6) 07:04	07:33	07:07	07:37
	20:51	23 06:53 (5) 20:21	5 07:01 (6) 19:34	18:46	17:09	17:00
16	06:08	06:30 (5) 06:36	07:05	07:34	07:08	07:38
	20:51	22 06:52 (5) 20:20	19:32	18:44	17:08	17:00
17	06:09	06:31 (5) 06:37	07:06	07:35	07:09	07:38
	20:50	20 06:51 (5) 20:18	19:31	18:43	17:07	17:01
18	06:10	06:32 (5) 06:38	07:07	07:36	07:10	07:39
	20:49	19 06:51 (5) 20:17	19:29	18:42	17:07	17:01
19	06:11	06:33 (5) 06:39	07:08	07:37	07:12	07:39
	20:49	17 06:50 (5) 20:16	19:27	18:40	17:06	17:01
20	06:12	06:33 (5) 06:40	07:09	07:38	07:13	07:40
	20:48	14 06:47 (5) 20:14	19:26	18:39	17:05	14:28 (1) 17:02
21	06:12	06:35 (5) 06:41	07:09	07:39	07:14	14:10 (1) 07:41
	20:47	11 06:46 (5) 20:13	19:24	18:37	17:05	21 14:31 (1) 17:02
22	06:13	06:42	07:10	07:40	07:15	14:08 (1) 07:41
	20:47	20:11	19:22	18:36	17:04	27 14:35 (1) 17:03
23	06:14	06:42	07:11	07:41	07:16	14:06 (1) 07:42
	20:46	20:10	19:21	18:35	17:04	31 14:37 (1) 17:03
24	06:15	06:43	07:12	07:42	07:17	14:04 (1) 07:42
	20:45	20:09	19:19	18:33	17:03	35 14:39 (1) 17:04
25	06:16	06:44	07:13	06:43	07:18	14:03 (1) 07:43
	20:44	20:07	19:18	17:32	17:02	37 14:40 (1) 17:04
26	06:17	06:45	07:14	06:45	07:19	14:02 (1) 07:43
	20:43	20:06	19:16	17:31	17:02	39 14:41 (1) 17:05
27	06:17	06:46	07:15	06:46	07:20	14:00 (1) 07:43
	20:42	20:04	19:14	17:29	17:02	43 14:43 (1) 17:06
28	06:18	06:47	07:16	06:47	07:21	14:00 (1) 07:44
	20:42	20:03	19:13	17:28	17:01	44 14:44 (1) 17:06
29	06:19	06:48	07:17	06:48	07:22	13:59 (1) 07:44
	20:41	20:01	19:11	17:27	17:01	46 14:45 (1) 17:07
30	06:20	06:55 (6) 06:49	07:18	06:49	07:24	13:58 (1) 07:44
	20:40	4 06:59 (6) 20:00	19:09	17:25	17:01	48 14:46 (1) 17:08
31	06:21	06:53 (6) 06:50	06:50	06:50	06:50	07:44
	20:39	9 07:02 (6) 19:58	17:24	17:24	17:09	58 15:04 (1)
Potential sun hours	455	425	374	347	301	292
Total, worst case	552	211			386	1785
Sun reduction	0,74	0,73			0,51	0,45
Oper. time red.	0,93	0,93			0,93	0,93
Wind dir. red.	0,66	0,69			0,52	0,52
Total reduction	0,44	0,46			0,24	0,21
Total, real	245	97			92	380

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 27

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: Q - C

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45	07:33	09:24 (4) 06:58	09:12 (4) 07:10	06:26	05:58
	17:10	17:43	10:50 (4) 18:15	10:56 (4) 19:47	20:17	20:45
2	07:45	07:32	09:23 (4) 06:57	09:12 (4) 07:08	06:24	05:58
	17:10	17:44	10:51 (4) 18:16	10:55 (4) 19:48	20:18	20:46
3	07:45	07:31	09:22 (4) 06:55	09:12 (4) 07:06	06:23	05:58
	17:11	17:45	10:52 (4) 18:17	10:54 (4) 19:49	20:19	20:46
4	07:45	07:30	09:22 (4) 06:54	09:12 (4) 07:05	06:22	05:57
	17:12	17:46	10:53 (4) 18:18	10:53 (4) 19:50	20:20	20:47
5	07:45	07:29	09:21 (4) 06:52	09:13 (4) 07:03	06:21	05:57
	17:13	17:47	10:54 (4) 18:19	10:52 (4) 19:51	20:21	20:48
6	07:45	07:28	09:20 (4) 06:51	09:12 (4) 07:02	06:20	05:57
	17:14	17:48	10:55 (4) 18:20	10:50 (4) 19:52	20:22	20:48
7	07:45	07:27	09:20 (4) 06:49	09:13 (4) 07:00	06:18	05:56
	17:15	17:50	10:56 (4) 18:21	10:50 (4) 19:53	20:23	20:49
8	07:45	07:26	09:19 (4) 06:48	09:13 (4) 06:59	06:17	05:56
	17:16	17:51	10:57 (4) 18:22	10:48 (4) 19:54	20:24	20:49
9	07:45	07:24	09:19 (4) 06:46	09:13 (4) 06:57	06:16	05:56
	17:17	17:52	10:58 (4) 18:23	10:47 (4) 19:55	20:25	20:50
10	07:45	09:53 (4) 07:23	09:19 (4) 06:45	09:13 (4) 06:55	06:15	05:56
	17:18	15 10:08 (4) 17:53	10:58 (4) 18:25	10:45 (4) 19:56	20:26	20:51
11	07:44	09:49 (4) 07:22	09:17 (4) 06:43	09:14 (4) 06:54	06:14	05:56
	17:19	23 10:12 (4) 17:54	10:58 (4) 18:26	10:43 (4) 19:57	20:27	20:51
12	07:44	09:47 (4) 07:21	09:17 (4) 06:42	09:14 (4) 06:52	06:13	05:55
	17:20	28 10:15 (4) 17:56	10:59 (4) 18:27	10:41 (4) 19:58	20:28	20:52
13	07:44	09:45 (4) 07:20	09:17 (4) 06:40	09:14 (4) 06:51	06:12	05:55
	17:21	33 10:18 (4) 17:57	10:59 (4) 18:28	10:39 (4) 19:59	20:29	20:52
14	07:44	09:43 (4) 07:19	09:17 (4) 06:38	09:15 (4) 06:49	06:11	05:55
	17:22	37 10:20 (4) 17:58	11:00 (4) 18:29	10:37 (4) 20:00	20:30	20:52
15	07:43	09:42 (4) 07:17	09:15 (4) 06:37	09:15 (4) 06:48	06:10	05:55
	17:23	41 10:23 (4) 17:59	11:00 (4) 18:30	10:35 (4) 20:01	20:31	20:53
16	07:43	09:41 (4) 07:16	09:15 (4) 06:35	09:17 (4) 06:46	06:09	05:55
	17:24	45 10:26 (4) 18:00	11:00 (4) 18:31	10:33 (4) 20:02	20:31	20:53
17	07:43	09:39 (4) 07:15	09:15 (4) 06:34	09:17 (4) 06:45	06:08	05:55
	17:25	48 10:27 (4) 18:01	11:01 (4) 18:32	10:30 (4) 20:03	20:32	20:54
18	07:42	09:38 (4) 07:14	09:15 (4) 06:32	09:17 (4) 06:43	06:08	05:55
	17:26	52 10:30 (4) 18:03	11:01 (4) 18:33	10:27 (4) 20:04	20:33	20:54
19	07:42	09:36 (4) 07:12	09:14 (4) 06:30	09:19 (4) 06:42	06:07	05:56
	17:27	55 10:31 (4) 18:04	11:00 (4) 18:34	10:25 (4) 20:05	20:34	20:54
20	07:41	09:35 (4) 07:11	09:14 (4) 06:29	09:19 (4) 06:40	06:06	05:56
	17:28	58 10:33 (4) 18:05	11:01 (4) 18:35	10:22 (4) 20:06	20:35	20:55
21	07:41	09:34 (4) 07:10	09:13 (4) 06:27	09:20 (4) 06:39	06:05	05:56
	17:30	61 10:35 (4) 18:06	11:00 (4) 18:36	10:18 (4) 20:07	20:36	20:55
22	07:40	09:33 (4) 07:08	09:13 (4) 06:26	09:22 (4) 06:38	06:04	05:56
	17:31	64 10:37 (4) 18:07	11:00 (4) 18:37	10:16 (4) 20:08	20:37	20:55
23	07:39	09:32 (4) 07:07	09:14 (4) 06:24	09:23 (4) 06:36	06:04	05:56
	17:32	67 10:39 (4) 18:08	11:00 (4) 18:38	10:12 (4) 20:09	20:38	20:55
24	07:39	09:31 (4) 07:05	09:13 (4) 06:22	09:26 (4) 06:35	06:03	05:57
	17:33	69 10:40 (4) 18:09	10:59 (4) 18:39	10:09 (4) 20:10	20:39	20:55
25	07:38	09:30 (4) 07:04	09:13 (4) 06:21	09:27 (4) 06:34	06:02	05:57
	17:34	71 10:41 (4) 18:10	10:59 (4) 18:40	10:05 (4) 20:11	20:39	20:55
26	07:37	09:29 (4) 07:03	09:12 (4) 06:19	09:30 (4) 06:32	06:02	05:57
	17:35	74 10:43 (4) 18:12	10:58 (4) 18:41	10:00 (4) 20:12	20:40	20:56
27	07:37	09:28 (4) 07:01	09:13 (4) 06:18	09:34 (4) 06:31	06:01	05:57
	17:37	77 10:45 (4) 18:13	10:58 (4) 18:42	09:55 (4) 20:13	20:41	20:56
28	07:36	09:27 (4) 07:00	09:12 (4) 06:16	06:30	06:00	05:58
	17:38	79 10:46 (4) 18:14	10:57 (4) 18:43	20:14	20:42	20:56
29	07:35	09:26 (4)	07:14	06:28	06:00	05:58
	17:39	81 10:47 (4)	19:44	20:15	20:43	20:56
30	07:34	09:26 (4)	07:13	06:27	05:59	05:59
	17:40	82 10:48 (4)	19:45	20:16	20:43	20:56
31	07:33	09:25 (4)	07:11	06:26	05:59	05:59
	17:41	84 10:49 (4)	19:46	20:17	20:44	05:59
Potential sun hours	301	299	370	397	445	448
Total, worst case	1244	2826	2049			
Sun reduction	0,45	0,47	0,49			
Oper. time red.	0,93	0,93	0,93			
Wind dir. red.	0,70	0,70	0,70			
Total reduction	0,30	0,31	0,32			
Total, real	368	873	660			

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

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

Project:

Nurri_seconda presentazione

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Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: Q - C

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 20:56	06:22 20:38	06:51 19:56	07:19 19:08	09:54 (4) 11:20 (4)	06:51 17:23
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	09:52 (4) 11:20 (4)	06:52 17:22
3	06:00 20:55	06:24 20:36	06:53 19:53	07:21 19:05	09:51 (4) 11:21 (4)	06:53 17:21
4	06:01 20:55	06:25 20:35	06:54 19:52	07:22 19:03	09:50 (4) 11:23 (4)	06:55 17:20
5	06:01 20:55	06:26 20:33	06:55 19:50	07:23 19:01	09:49 (4) 11:24 (4)	06:56 17:18
6	06:02 20:55	06:27 20:32	06:56 19:49	07:24 19:00	09:49 (4) 11:25 (4)	06:57 17:17
7	06:02 20:54	06:27 20:31	06:56 19:47	07:25 18:58	09:48 (4) 11:26 (4)	06:58 17:16
8	06:03 20:54	06:28 20:30	06:57 19:45	07:26 18:57	09:47 (4) 11:26 (4)	06:59 17:15
9	06:04 20:54	06:29 20:29	06:58 19:44	07:27 18:55	09:47 (4) 11:27 (4)	07:00 17:14
10	06:04 20:53	06:30 20:28	06:59 19:42	07:28 18:54	09:47 (4) 11:29 (4)	07:01 17:13
11	06:05 20:53	06:31 20:26	07:00 19:40	07:29 18:52	09:47 (4) 11:29 (4)	07:03 17:12
12	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:50	09:46 (4) 11:30 (4)	07:04 17:12
13	06:06 20:52	06:33 20:24	07:02 19:37	07:31 18:49	09:46 (4) 11:30 (4)	07:05 17:11
14	06:07 20:52	06:34 20:22	07:03 19:36	07:32 18:47	09:45 (4) 11:30 (4)	07:06 17:10
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	09:45 (4) 11:31 (4)	07:07 17:09
16	06:08 20:51	06:36 20:20	07:05 19:32	07:34 18:44	09:45 (4) 11:31 (4)	07:08 17:08
17	06:09 20:50	06:37 20:18	07:06 19:31	07:35 18:43	09:45 (4) 11:31 (4)	07:09 17:07
18	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	09:44 (4) 11:31 (4)	07:10 17:07
19	06:11 20:49	06:39 20:16	07:08 19:27	07:37 18:40	09:44 (4) 11:31 (4)	07:12 17:06
20	06:12 20:48	06:40 20:14	07:08 19:26	07:38 18:39	09:44 (4) 11:31 (4)	07:13 17:05
21	06:12 20:47	06:41 20:13	07:09 19:24	07:39 18:37	09:44 (4) 11:31 (4)	07:14 17:05
22	06:13 20:47	06:42 20:11	07:10 19:22	07:40 18:36	09:45 (4) 11:31 (4)	07:15 17:04
23	06:14 20:46	06:42 20:10	07:11 19:21	07:41 18:35	09:45 (4) 11:31 (4)	07:16 17:03
24	06:15 20:45	06:43 20:09	07:12 19:19	07:42 18:33	09:45 (4) 11:31 (4)	07:17 17:03
25	06:16 20:44	06:44 20:07	07:13 19:18	07:43 18:32	09:45 (4) 11:30 (4)	07:18 17:02
26	06:17 20:43	06:45 20:06	07:14 19:16	07:44 18:31	09:45 (4) 11:30 (4)	07:19 17:02
27	06:17 20:42	06:46 20:04	07:15 19:14	07:45 18:30	09:45 (4) 11:30 (4)	07:20 17:02
28	06:18 20:42	06:47 20:03	07:16 19:13	07:46 18:29	09:45 (4) 11:30 (4)	07:21 17:01
29	06:19 20:41	06:48 20:01	07:17 19:11	07:47 18:27	09:45 (4) 11:30 (4)	07:22 17:01
30	06:20 20:40	06:49 20:00	07:18 19:09	07:48 18:26	09:45 (4) 11:30 (4)	07:23 17:00
31	06:21 20:39	06:50 19:58		07:49 18:25	09:45 (4) 11:30 (4)	07:24 17:00
Potential sun hours	455	425	374	347	301	292
Total, worst case			868	3148	2143	39
Sun reduction			0,65	0,54	0,51	0,45
Oper. time red.			0,93	0,93	0,93	0,93
Wind dir. red.			0,70	0,70	0,70	0,70
Total reduction			0,42	0,36	0,33	0,30
Total, real			367	1121	708	12

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

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

Nurri_seconda presentazione

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Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: R - E

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	July	August	September	October	November	December						
1	07:45	08:07 (6)	07:33	06:58	07:10	06:26	05:58	05:59	06:22	06:51	07:19	06:51	07:25	07:47 (6)				
	17:10	14	08:21 (6)	17:42	18:15	19:47	20:17	20:45	20:56	20:38	19:56	19:08	17:23	17:00	20	08:07 (6)		
2	07:45	08:07 (6)	07:32	06:57	07:08	06:24	05:58	06:00	06:23	06:52	07:20	06:52	07:26	07:49 (6)				
	17:10	15	08:22 (6)	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:06	17:22	17:00	20	08:09 (6)		
3	07:45	08:07 (6)	07:31	06:55	07:06	06:23	05:57	06:00	06:24	06:53	07:21	06:53	07:27	07:50 (6)				
	17:11	15	08:22 (6)	17:45	18:17	19:49	20:19	20:46	20:55	20:36	19:53	19:05	17:21	17:00	19	08:09 (6)		
4	07:45	08:07 (6)	07:30	06:54	07:05	06:22	05:57	06:01	06:25	06:54	07:22	06:55	07:28	07:51 (6)				
	17:12	16	08:23 (6)	17:46	18:18	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00	18	08:09 (6)		
5	07:45	08:07 (6)	07:29	06:52	07:03	06:21	05:57	06:01	06:26	06:55	07:23	06:56	07:28	07:51 (6)				
	17:13	16	08:23 (6)	17:47	18:19	19:51	20:21	20:48	20:55	20:33	19:50	19:01	17:18	16:59	18	08:09 (6)		
6	07:45	08:06 (6)	07:28	06:51	07:02	06:20	05:57	06:02	06:26	06:56	07:24	06:57	07:29	07:52 (6)				
	17:14	17	08:23 (6)	17:48	18:20	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:17	16:59	17	08:09 (6)		
7	07:45	08:06 (6)	07:27	06:49	07:00	06:18	05:56	06:02	06:27	06:56	07:25	06:58	07:30	07:53 (6)				
	17:15	18	08:24 (6)	17:50	18:21	19:53	20:23	20:49	20:54	20:31	19:47	18:58	17:16	16:59	16	08:09 (6)		
8	07:45	08:06 (6)	07:26	06:48	06:59	06:17	05:56	06:03	06:28	06:57	07:26	06:59	07:31	07:54 (6)				
	17:16	18	08:24 (6)	17:51	18:22	19:54	20:24	20:49	20:54	20:30	19:45	18:57	17:15	16:59	16	08:10 (6)		
9	07:45	08:06 (6)	07:24	06:46	06:57	06:16	05:56	06:04	06:29	06:58	07:27	07:00	07:32	07:55 (6)				
	17:17	19	08:25 (6)	17:52	18:23	19:55	20:25	20:50	20:54	20:29	19:44	18:55	17:14	16:59	15	08:10 (6)		
10	07:45	08:06 (6)	07:23	06:45	06:55	06:15	05:56	06:04	06:30	06:59	07:28	07:01	07:33	07:56 (6)				
	17:18	20	08:26 (6)	17:53	18:25	19:56	20:26	20:51	20:53	20:28	19:42	18:54	17:13	16:59	15	08:11 (6)		
11	07:44	08:05 (6)	07:22	06:43	06:54	06:14	05:55	06:05	06:31	07:00	07:29	07:03	07:34	07:57 (6)				
	17:19	20	08:25 (6)	17:54	18:26	19:57	20:27	20:51	20:53	20:26	19:40	18:52	17:12	16:59	14	08:11 (6)		
12	07:44	08:05 (6)	07:21	06:42	06:52	06:13	05:55	06:05	06:32	07:01	07:30	07:04	07:35	07:58 (6)				
	17:20	21	08:26 (6)	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:50	17:12	17:00	14	08:12 (6)		
13	07:44	08:06 (6)	07:20	06:40	06:51	06:12	05:55	06:06	06:33	07:02	07:31	07:05	07:35	07:58 (6)				
	17:21	21	08:27 (6)	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:37	18:49	17:11	17:00	13	08:11 (6)		
14	07:44	08:05 (6)	07:19	06:38	06:49	06:11	05:55	06:07	06:34	07:03	07:32	07:06	07:36	07:59 (6)				
	17:22	21	08:26 (6)	17:58	18:29	20:00	20:30	20:52	20:52	20:22	19:36	18:47	17:10	17:00	13	08:12 (6)		
15	07:43	08:06 (6)	07:17	06:37	06:48	06:10	05:55	06:08	06:35	07:04	07:33	07:07	07:37	08:00 (6)				
	17:23	21	08:27 (6)	17:59	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:09	17:00	12	08:12 (6)		
16	07:43	08:08 (6)	07:16	06:35	06:46	06:09	05:55	06:08	06:36	07:05	07:34	07:08	07:38	08:00 (6)				
	17:24	19	08:27 (6)	18:00	18:31	20:02	20:31	20:53	20:51	20:20	19:32	18:44	17:08	17:00	12	08:12 (6)		
17	07:43	08:08 (6)	07:15	06:34	06:45	06:08	05:55	06:09	06:37	07:06	07:35	07:09	07:38	08:01 (6)				
	17:25	19	08:27 (6)	18:01	18:32	20:03	20:32	20:54	20:50	20:18	19:31	18:43	17:07	17:01	12	08:13 (6)		
18	07:42	08:09 (6)	07:14	06:32	06:43	06:07	05:55	06:10	06:38	07:07	07:36	07:10	07:39	08:02 (6)				
	17:26	18	08:27 (6)	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:01	11	08:13 (6)		
19	07:42	08:10 (6)	07:12	06:30	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:39	08:02 (6)				
	17:27	16	08:26 (6)	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:27	18:40	17:06	2	07:53 (6)	07:39	08:13 (6)	
20	07:41	08:10 (6)	07:11	06:29	06:40	06:06	05:56	06:12	06:40	07:08	07:38	07:13	07:49	07:40	08:03 (6)			
	17:28	15	08:25 (6)	18:05	18:35	20:06	20:35	20:55	20:48	20:14	19:26	18:39	17:05	9	07:58 (6)	17:02	11	08:14 (6)
21	07:41	08:13 (6)	07:10	06:27	06:39	06:05	05:56	06:12	06:41	07:09	07:39	07:14	07:48	07:41	08:03 (6)			
	17:30	12	08:25 (6)	18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:37	17:05	12	08:00 (6)	17:02	11	08:14 (6)
22	07:40	08:14 (6)	07:08	06:26	06:38	06:04	05:56	06:13	06:41	07:10	07:40	07:15	07:48	07:41	08:04 (6)			
	17:31	9	08:23 (6)	18:07	18:37	20:08	20:37	20:55	20:47	20:11	19:22	18:36	17:04	14	08:02 (6)	17:03	11	08:15 (6)
23	07:39	08:19 (6)	07:07	06:24	06:36	06:04	05:56	06:14	06:42	07:11	07:41	07:16	07:47	07:42	08:04 (6)			
	17:32	2	08:21 (6)	18:08	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:03	16	08:03 (6)	17:03	11	08:15 (6)
24	07:39	07:05	06:22	06:35	06:03	05:57	06:15	06:43	07:12	07:42	07:17	07:46	07:42	08:05 (6)				
	17:33	18:09	18:39	20:10	20:39	20:55	20:45	20:09	19:19	18:33	17:03	18	08:04 (6)	17:04	11	08:16 (6)		
25	07:38	07:04	06:21	06:33	06:02	05:57	06:16	06:44	07:13	06:43	07:18	07:46	07:43	08:05 (6)				
	17:34	18:10	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:02	19	08:05 (6)	17:04	11	08:16 (6)		
26	07:37	07:03	06:19	06:32	06:02	05:57	06:17	06:45	07:14	06:45	07:19	07:46	07:43	08:05 (6)				
	17:35	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:02	19	08:05 (6)	17:05	11	08:16 (6)		
27	07:37	07:01	06:18	06:31	06:01	05:57	06:17	06:46	07:15	06:46	07:20	07:46	07:43	08:06 (6)				
	17:37	18:13	18:42	20:13	20:41	20:56	20:42	20:04	19:14	17:29	17:02	20	08:06 (6)	17:06	12	08:18 (6)		
28	07:36	07:00	06:16	06:29	06:00	05:58	06:18	06:47	07:16	06:47	07:21	07:46	07:44	08:06 (6)				
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:28	17:01	20	08:06 (6)	17:06	12	08:18 (6)		
29	07:35	07:14	06:28	06:00	05:58	06:19	06:48	07:17	06:48	07:23	07:46	07:44	08:06 (6)					
	17:39	19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	21	08:07 (6)	17:07	12	08:18 (6)			
30	07:34	07:13	06:27	05:59	05:59	06:20	06:49	07:18	06:49	07:24	07:46	07:44	08:06 (6)					
	17:40	19:45	20:16	20:43	20:56	20:40	20:00	19:09	17:25	17:00	21	08:07 (6)	17:08	13	08:19 (6)			
31	07:33	07:11	06:28	05:59	05:59	06:21	06:50	07:19	06:50	07:25	07:48	07:44	08:06 (6)					
	17:41	19:46	20:17	20:44	20:56	20:39	19:58	17:24	17:24	17:00	21	08:07 (6)	17:08	13	08:19 (6)			
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292	292	292	425			
Total, worst case	382											191			425			
Sun reduction	0,45											0,51			0,45			
Oper. time red.	0,93											0,93			0,93			
Wind dir. red.	0,75											0,75			0,75			
Total reduction	0,31											0,35			0,32			
Total, real	120											67			134			

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 30

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: S - Y

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

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

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 31

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: T - D

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:45	08:09 (6)	07:33	06:58	07:10	06:26	05:58	05:59	06:22	06:51	07:19	06:51	07:25	07:55 (6)	
	17:10	24 08:33 (6)	17:42	18:15	19:47	20:17	20:45	20:56	20:38	19:56	19:08	17:23	17:00	23 08:18 (6)	
2	07:45	08:10 (6)	07:32	06:57	07:08	06:24	05:58	06:00	06:23	06:52	07:20	06:52	07:26	07:56 (6)	
	17:10	23 08:33 (6)	17:44	18:16	19:48	20:18	20:46	20:55	20:37	19:55	19:06	17:22	17:00	23 08:19 (6)	
3	07:45	08:10 (6)	07:31	06:55	07:06	06:23	05:57	06:00	06:24	06:53	07:21	06:53	07:27	07:56 (6)	
	17:11	24 08:34 (6)	17:45	18:17	19:49	20:19	20:46	20:55	20:36	19:53	19:05	17:21	17:00	24 08:20 (6)	
4	07:45	08:10 (6)	07:30	06:54	07:05	06:22	05:57	06:01	06:25	06:54	07:22	06:55	07:28	07:57 (6)	
	17:12	24 08:34 (6)	17:46	18:18	19:50	20:20	20:47	20:55	20:35	19:52	19:03	17:20	17:00	23 08:20 (6)	
5	07:45	08:11 (6)	07:29	06:52	07:03	06:21	05:57	06:01	06:26	06:55	07:23	06:56	07:28	07:56 (6)	
	17:13	24 08:35 (6)	17:47	18:19	19:51	20:21	20:48	20:55	20:33	19:50	19:01	17:18	16:59	24 08:20 (6)	
6	07:45	08:10 (6)	07:28	06:51	07:02	06:20	05:56	06:02	06:26	06:55	07:24	06:57	07:29	07:56 (6)	
	17:14	24 08:34 (6)	17:48	18:20	19:52	20:22	20:48	20:55	20:32	19:49	19:00	17:17	16:59	24 08:20 (6)	
7	07:45	08:11 (6)	07:27	06:49	07:00	06:18	05:56	06:02	06:27	06:56	07:25	06:58	07:30	07:57 (6)	
	17:15	24 08:35 (6)	17:50	18:21	19:53	20:23	20:49	20:54	20:31	19:47	18:58	17:16	16:59	24 08:21 (6)	
8	07:45	08:12 (6)	07:26	06:48	06:58	06:17	05:56	06:03	06:28	06:57	07:26	06:59	07:31	07:57 (6)	
	17:16	23 08:35 (6)	17:51	18:22	19:54	20:24	20:49	20:54	20:30	19:45	18:57	17:15	16:59	24 08:21 (6)	
9	07:45	08:12 (6)	07:24	06:46	06:57	06:16	05:56	06:04	06:29	06:58	07:27	07:00	07:32	07:58 (6)	
	17:17	24 08:36 (6)	17:52	18:23	19:55	20:25	20:50	20:54	20:29	19:44	18:55	17:14	16:59	24 08:22 (6)	
10	07:45	08:13 (6)	07:23	06:45	06:55	06:15	05:56	06:04	06:30	06:59	07:28	07:01	07:33	07:59 (6)	
	17:18	23 08:36 (6)	17:53	18:25	19:56	20:26	20:51	20:53	20:28	19:42	18:54	17:13	16:59	23 08:22 (6)	
11	07:44	08:13 (6)	07:22	06:43	06:54	06:14	05:55	06:05	06:31	07:00	07:29	07:03	07:34	07:59 (6)	
	17:19	22 08:35 (6)	17:54	18:26	19:57	20:27	20:51	20:53	20:26	19:40	18:52	17:12	16:59	24 08:23 (6)	
12	07:44	08:14 (6)	07:21	06:42	06:52	06:13	05:55	06:05	06:32	07:01	07:30	07:04	07:35	08:00 (6)	
	17:20	22 08:36 (6)	17:56	18:27	19:58	20:28	20:52	20:53	20:25	19:39	18:50	17:11	16:59	23 08:23 (6)	
13	07:44	08:15 (6)	07:20	06:40	06:51	06:12	05:55	06:06	06:33	07:02	07:31	07:05	07:35	08:00 (6)	
	17:21	21 08:36 (6)	17:57	18:28	19:59	20:29	20:52	20:52	20:24	19:37	18:49	17:11	17:00	23 08:23 (6)	
14	07:44	08:15 (6)	07:19	06:38	06:49	06:11	05:55	06:07	06:34	07:03	07:32	07:06	07:36	08:00 (6)	
	17:22	21 08:36 (6)	17:58	18:29	20:00	20:30	20:52	20:52	20:22	19:36	18:47	17:10	17:00	24 08:24 (6)	
15	07:43	08:16 (6)	07:17	06:37	06:48	06:10	05:55	06:08	06:35	07:04	07:33	07:07	07:37	08:01 (6)	
	17:23	20 08:36 (6)	17:59	18:30	20:01	20:31	20:53	20:51	20:21	19:34	18:46	17:09	17:00	23 08:24 (6)	
16	07:43	08:18 (6)	07:16	06:35	06:46	06:09	05:55	06:08	06:36	07:05	07:34	07:08	07:38	08:01 (6)	
	17:24	18 08:36 (6)	18:00	18:31	20:02	20:31	20:53	20:51	20:20	19:32	18:44	17:08	17:00	23 08:24 (6)	
17	07:43	08:18 (6)	07:15	06:34	06:45	06:08	05:55	06:09	06:37	07:06	07:35	07:09	07:38	08:02 (6)	
	17:25	17 08:35 (6)	18:01	18:32	20:03	20:32	20:54	20:50	20:18	19:31	18:43	17:07	17:01	23 08:25 (6)	
18	07:42	08:20 (6)	07:14	06:32	06:43	06:07	05:55	06:10	06:38	07:07	07:36	07:10	07:39	08:03 (6)	
	17:26	15 08:35 (6)	18:03	18:33	20:04	20:33	20:54	20:49	20:17	19:29	18:42	17:07	17:01	23 08:26 (6)	
19	07:42	08:21 (6)	07:12	06:30	06:42	06:07	05:56	06:11	06:39	07:08	07:37	07:12	07:39	08:03 (6)	
	17:27	13 08:34 (6)	18:04	18:34	20:05	20:34	20:54	20:49	20:16	19:27	18:40	17:06	17:01	23 08:26 (6)	
20	07:41	08:23 (6)	07:11	06:29	06:40	06:06	05:56	06:12	06:40	07:08	07:38	07:13	07:40	08:04 (6)	
	17:28	9 08:32 (6)	18:05	18:35	20:06	20:35	20:55	20:48	20:14	19:26	18:39	17:05	17:02	23 08:27 (6)	
21	07:41	08:28 (6)	07:10	06:27	06:39	06:05	05:56	06:12	06:41	07:09	07:39	07:14	07:41	08:04 (6)	
	17:30	2 08:29 (6)	18:06	18:36	20:07	20:36	20:55	20:47	20:13	19:24	18:37	17:05	17:02	22 08:26 (6)	
22	07:40	07:08	06:26	06:38	06:04	05:56	06:13	06:41	07:10	07:40	07:15		07:41	08:05 (6)	
	17:31	18:07	18:37	20:08	20:37	20:55	20:47	20:11	19:22	18:36	17:04	9 08:09 (6)	07:43	22 08:27 (6)	
23	07:39	07:07	06:24	06:36	06:04	05:56	06:14	06:42	07:11	07:41	07:16		07:58 (6)	07:42	08:05 (6)
	17:32	18:08	18:38	20:09	20:38	20:55	20:46	20:10	19:21	18:35	17:03	13 08:11 (6)	07:43	22 08:27 (6)	
24	07:39	07:05	06:22	06:35	06:03	05:57	06:15	06:43	07:12	07:42	07:17		07:57 (6)	07:42	08:06 (6)
	17:33	18:09	18:39	20:10	20:39	20:55	20:45	20:09	19:19	18:33	17:03	15 08:12 (6)	07:44	23 08:29 (6)	
25	07:38	07:04	06:21	06:33	06:02	05:57	06:16	06:44	07:13	06:43	07:18		07:56 (6)	07:43	08:06 (6)
	17:34	18:10	18:40	20:11	20:39	20:55	20:44	20:07	19:18	17:32	17:02	17 08:13 (6)	07:44	23 08:29 (6)	
26	07:37	07:03	06:19	06:32	06:02	05:57	06:17	06:45	07:14	06:45	07:19		07:56 (6)	07:43	08:06 (6)
	17:35	18:12	18:41	20:12	20:40	20:56	20:43	20:06	19:16	17:31	17:02	18 08:14 (6)	07:44	23 08:29 (6)	
27	07:37	07:01	06:18	06:31	06:01	05:57	06:17	06:46	07:15	06:46	07:20		07:55 (6)	07:43	08:07 (6)
	17:37	18:13	18:42	20:13	20:41	20:56	20:42	20:04	19:14	17:29	17:02	20 08:15 (6)	07:44	23 08:30 (6)	
28	07:36	07:00	06:16	06:29	06:00	05:58	06:18	06:47	07:16	06:47	07:21		07:55 (6)	07:44	08:07 (6)
	17:38	18:14	18:43	20:14	20:42	20:56	20:42	20:03	19:13	17:28	17:01	21 08:16 (6)	07:44	23 08:30 (6)	
29	07:35	07:14	06:28	06:00	05:58	06:19	06:48	07:17	06:48	07:22	07:22		07:55 (6)	07:44	08:07 (6)
	17:39	19:44	20:15	20:43	20:56	20:41	20:01	19:11	17:27	17:01	21 08:16 (6)	07:44	07:44	24 08:31 (6)	
30	07:34	07:13	06:27	05:59	05:59	06:20	06:49	07:18	06:49	07:24	07:24		07:55 (6)	07:44	08:08 (6)
	17:40	19:45	20:16	20:43	20:56	20:40	20:00	19:09	17:25	17:00	22 08:17 (6)	07:44	07:44	23 08:31 (6)	
31	07:33	07:11	06:59	06:29	05:59	06:21	06:50	07:19	06:50	07:25	07:25		07:44	08:08 (6)	
	17:41	19:46	20:44	20:44	20:56	20:39	19:58	17:24	17:24	17:24	17:24	17:08	23 08:31 (6)		
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301		292		
Total, worst case	417											156		719	
Sun reduction	0,45											0,51		0,45	
Oper. time red.	0,93											0,93		0,93	
Wind dir. red.	0,74											0,74		0,74	
Total reduction	0,31											0,35		0,31	
Total, real	130											54		225	

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 32

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: U - M

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

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

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

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

Project:
Nurri_seconda presentazione

Printed/Page
 01/02/2023 11:46 / 33

Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: V - Z

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELIMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

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

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

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

Project:

Nurri_seconda presentazione

Printed/Page

01/02/2023 11:46 / 34

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: W - Q

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June												
1	07:45	07:33	08:08 (5)	06:58	08:01 (5)	07:10	06:26	18:01 (4)	05:58	17:34 (4)								
	17:10	17:42	17:19 (3)	18:15	91	09:32 (5)	19:47	20:17	63	19:04 (4)	20:45	121	19:35 (4)					
2	07:45	07:32	08:07 (5)	06:57	08:01 (5)	07:08	06:24	17:57 (4)	05:58	17:34 (4)								
	17:10	17:44	17:20 (3)	18:16	89	09:30 (5)	19:48	20:18	69	19:06 (4)	20:46	122	19:36 (4)					
3	07:45	07:31	08:07 (5)	06:55	08:02 (5)	07:06	06:23	17:55 (4)	05:58	17:33 (4)								
	17:11	17:45	17:22 (3)	18:17	88	09:30 (5)	19:49	20:19	73	19:08 (4)	20:46	123	19:36 (4)					
4	07:45	07:30	08:06 (5)	06:54	08:01 (5)	07:05	06:22	17:53 (4)	05:57	17:34 (4)								
	17:12	17:46	17:22 (3)	18:18	87	09:28 (5)	19:50	20:20	77	19:10 (4)	20:47	122	19:36 (4)					
5	07:45	07:29	08:06 (5)	06:52	08:02 (5)	07:03	06:21	17:52 (4)	05:57	17:34 (4)								
	17:13	17:47	17:22 (3)	18:19	86	09:28 (5)	19:51	20:21	80	19:12 (4)	20:48	123	19:37 (4)					
6	07:45	07:28	08:05 (5)	06:51	08:02 (5)	07:02	06:20	17:50 (4)	05:57	17:34 (4)								
	17:14	17:48	17:22 (3)	18:20	84	09:26 (5)	19:52	20:22	84	19:14 (4)	20:48	124	19:38 (4)					
7	07:45	07:27	08:05 (5)	06:49	08:03 (5)	07:00	06:18	17:49 (4)	05:56	17:34 (4)								
	17:15	17:50	17:21 (3)	18:21	82	09:25 (5)	19:53	20:23	86	19:15 (4)	20:49	123	19:37 (4)					
8	07:45	07:26	08:04 (5)	06:48	08:03 (5)	06:58	06:17	17:47 (4)	05:56	17:34 (4)								
	17:16	17:51	17:21 (3)	18:22	81	09:24 (5)	19:54	20:24	90	19:17 (4)	20:49	124	19:38 (4)					
9	07:45	08:36 (5)	07:24	08:04 (5)	06:46	08:04 (5)	06:57	06:16	17:46 (4)	05:56	17:34 (4)							
	17:17	12	16:52 (3)	17:52	127	17:20 (3)	18:23	79	09:23 (5)	19:55	20:25	92	19:18 (4)	20:50	124	19:38 (4)		
10	07:45	08:33 (5)	07:23	08:03 (5)	06:45	07:03 (6)	06:55	06:15	17:45 (4)	05:56	17:34 (4)							
	17:18	22	16:53 (3)	17:53	126	17:19 (3)	18:25	84	09:21 (5)	19:56	20:26	94	19:19 (4)	20:51	125	19:39 (4)		
11	07:44	08:30 (5)	07:22	08:03 (5)	06:43	07:01 (6)	06:54	06:14	17:43 (4)	05:55	17:35 (4)							
	17:19	30	16:53 (3)	17:54	125	17:18 (3)	18:26	87	09:19 (5)	19:57	20:27	97	19:20 (4)	20:51	124	19:39 (4)		
12	07:44	08:28 (5)	07:21	08:03 (5)	06:42	07:00 (6)	06:52	06:13	17:42 (4)	05:55	17:35 (4)							
	17:20	38	16:55 (3)	17:56	123	17:17 (3)	18:27	89	09:18 (5)	19:58	20:28	99	19:21 (4)	20:52	125	19:40 (4)		
13	07:44	08:27 (5)	07:20	08:02 (5)	06:40	06:58 (6)	06:51	06:12	17:41 (4)	05:55	17:35 (4)							
	17:21	44	16:56 (3)	17:57	122	17:16 (3)	18:28	88	09:15 (5)	19:59	20:29	101	19:22 (4)	20:52	125	19:40 (4)		
14	07:44	08:24 (5)	07:19	08:02 (5)	06:38	06:57 (6)	06:49	06:11	17:40 (4)	05:55	17:35 (4)							
	17:22	50	16:57 (3)	17:58	119	17:15 (3)	18:29	87	09:14 (5)	20:00	20:30	103	19:23 (4)	20:52	125	19:40 (4)		
15	07:43	08:23 (5)	07:17	08:01 (5)	06:37	06:55 (6)	06:48	06:10	17:40 (4)	05:55	17:35 (4)							
	17:23	56	16:58 (3)	17:59	115	17:12 (3)	18:30	88	09:12 (5)	20:01	20:30	104	19:24 (4)	20:53	126	19:41 (4)		
16	07:43	08:23 (5)	07:16	08:01 (5)	06:35	06:54 (6)	06:46	06:09	17:39 (4)	05:55	17:35 (4)							
	17:24	60	17:00 (3)	18:00	109	17:09 (3)	18:31	86	09:10 (5)	20:02	20:31	106	19:25 (4)	20:53	126	19:41 (4)		
17	07:43	08:21 (5)	07:15	08:01 (5)	06:34	06:52 (6)	06:45	06:08	17:38 (4)	05:55	17:36 (4)							
	17:25	65	17:00 (3)	18:01	96	09:37 (5)	18:32	84	09:07 (5)	20:03	20:32	108	19:26 (4)	20:54	125	19:41 (4)		
18	07:42	08:20 (5)	07:14	08:01 (5)	06:32	06:50 (6)	06:43	06:07	17:37 (4)	05:55	17:36 (4)							
	17:26	70	17:02 (3)	18:03	95	09:36 (5)	18:33	81	09:04 (5)	20:04	20:33	109	19:26 (4)	20:54	125	19:41 (4)		
19	07:42	08:19 (5)	07:12	08:01 (5)	06:30	06:49 (6)	06:42	06:07	17:37 (4)	05:56	17:36 (4)							
	17:27	74	17:03 (3)	18:04	95	09:36 (5)	18:34	78	09:02 (5)	20:05	20:34	111	19:28 (4)	20:54	125	19:41 (4)		
20	07:41	08:17 (5)	07:11	08:01 (5)	06:29	06:48 (6)	06:40	06:06	17:37 (4)	05:56	17:36 (4)							
	17:28	80	17:04 (3)	18:05	95	09:36 (5)	18:35	72	08:58 (5)	20:06	20:35	111	19:28 (4)	20:55	125	19:41 (4)		
21	07:41	08:17 (5)	07:10	08:00 (5)	06:27	06:48 (6)	06:39	06:05	17:36 (4)	05:56	17:37 (4)							
	17:30	82	17:05 (3)	18:06	95	09:35 (5)	18:36	66	08:54 (5)	20:07	20:36	113	19:29 (4)	20:55	125	19:42 (4)		
22	07:40	08:16 (5)	07:08	08:01 (5)	06:26	06:48 (6)	06:38	06:04	17:35 (4)	05:56	17:37 (4)							
	17:31	86	17:06 (3)	18:07	95	09:36 (5)	18:37	58	08:50 (5)	20:08	20:37	114	19:29 (4)	20:55	125	19:42 (4)		
23	07:39	08:15 (5)	07:07	08:01 (5)	06:24	06:48 (6)	06:36	06:04	17:35 (4)	05:56	17:37 (4)							
	17:32	91	17:08 (3)	18:08	95	09:36 (5)	18:38	44	08:43 (5)	20:09	20:38	115	19:30 (4)	20:55	125	19:42 (4)		
24	07:39	08:14 (5)	07:05	08:00 (5)	06:22	06:49 (6)	06:35	06:03	17:35 (4)	05:57	17:37 (4)							
	17:33	94	17:09 (3)	18:09	95	09:35 (5)	18:39	29	07:18 (6)	20:10	20:39	116	19:31 (4)	20:55	125	19:42 (4)		
25	07:38	08:13 (5)	07:04	08:01 (5)	06:21	06:49 (6)	06:33	06:02	17:35 (4)	05:57	17:38 (4)							
	17:34	98	17:10 (3)	18:10	94	09:35 (5)	18:40	28	07:17 (6)	20:11	20:39	117	19:32 (4)	20:55	125	19:43 (4)		
26	07:37	08:12 (5)	07:03	08:00 (5)	06:19	06:49 (6)	06:32	06:02	18:22 (4)	06:02	06:02	117	19:32 (4)	20:56	126	19:43 (4)		
	17:35	102	17:11 (3)	18:12	93	09:33 (5)	18:41	26	07:15 (6)	20:12	22	18:44 (4)	20:40	117	19:32 (4)	20:56	126	19:43 (4)
27	07:37	08:11 (5)	07:01	08:01 (5)	06:18	06:51 (6)	06:31	06:01	18:14 (4)	06:01	06:01	118	19:32 (4)	20:56	126	19:43 (4)		
	17:37	105	17:12 (3)	18:13	92	09:33 (5)	18:42	23	07:14 (6)	20:13	36	18:50 (4)	20:41	118	19:32 (4)	20:56	126	19:43 (4)
28	07:36	08:11 (5)	07:00	08:00 (5)	06:16	06:52 (6)	06:29	06:00	18:10 (4)	06:00	06:00	119	19:33 (4)	20:56	125	19:43 (4)		
	17:38	108	17:14 (3)	18:14	92	09:32 (5)	18:43	19	07:11 (6)	20:14	45	18:55 (4)	20:42	119	19:33 (4)	20:56	125	19:43 (4)
29	07:35	08:10 (5)		07:14		07:53 (6)	06:28	06:00	18:06 (4)	06:00	06:00	120	19:34 (4)	20:56	125	19:43 (4)		
	17:39	112	17:15 (3)		19:44	15	08:08 (6)	20:15	52	18:58 (4)	20:43	119	19:33 (4)	20:56	125	19:43 (4)		
30	07:34	08:09 (5)		07:13		07:58 (6)	06:27	06:00	18:03 (4)	05:59	05:59	120	19:34 (4)	20:56	125	19:43 (4)		
	17:40	116	17:17 (3)		19:45	6	08:04 (6)	20:16	59	19:02 (4)	20:43	120	19:34 (4)	20:56	125	19:44 (4)		
31	07:33	08:09 (5)		07:11							05:59		17:34 (4)					
	17:41	118	17:18 (3)		19:46						20:44	121	19:35 (4)					
Potential sun hours	301	299	3103	370	2005	397	214	445	3146	448	3734							
Total, worst case	1713	3103	2005	214	445	3146	3734											
Sun reduction	0,45	0,47	0,49	0,53	0,59	0,66												
Oper. time red.	0,93	0,93	0,93	0,93	0,93	0,93												
Wind dir. red.	0,72	0,74	0,76	0,76	0,76	0,76												
Total reduction	0,30	0,32	0,35	0,37	0,41	0,46												
Total, real	521	1003	693	79	1301	1735												

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 35

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: W - Q

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December	
1	05:59	17:39 (4) 06:22	17:52 (4) 06:51	07:19	07:38 (6) 06:51	07:33 (5) 07:25	08:11 (5)
	20:55	124 19:43 (4) 20:38	99 19:31 (4) 19:56	19:08	89 09:56 (5) 17:23	127 16:49 (3) 17:00	32 16:35 (3)
2	06:00	17:39 (4) 06:23	17:54 (4) 06:52	07:20	07:39 (6) 06:52	07:33 (5) 07:26	08:15 (5)
	20:55	125 19:44 (4) 20:37	96 19:30 (4) 19:55	19:06	88 09:57 (5) 17:22	127 16:49 (3) 17:00	23 16:35 (3)
3	06:00	17:39 (4) 06:24	17:55 (4) 06:53	07:21	07:40 (6) 06:53	07:34 (5) 07:27	08:19 (5)
	20:55	125 19:44 (4) 20:36	93 19:28 (4) 19:53	19:05	85 09:58 (5) 17:21	128 16:51 (3) 17:00	13 16:35 (3)
4	06:01	17:40 (4) 06:25	17:56 (4) 06:54	07:22	08:42 (5) 06:55	07:35 (5) 07:27	
	20:55	124 19:44 (4) 20:34	91 19:27 (4) 19:52	19:03	77 09:59 (5) 17:20	127 16:51 (3) 17:00	
5	06:01	17:40 (4) 06:26	17:57 (4) 06:55	07:23	08:40 (5) 06:56	07:35 (5) 07:28	
	20:55	124 19:44 (4) 20:33	89 19:26 (4) 19:50	19:01	80 10:00 (5) 17:18	127 16:51 (3) 16:59	
6	06:02	17:40 (4) 06:26	17:59 (4) 06:55	07:24	08:39 (5) 06:57	07:36 (5) 07:29	
	20:55	124 19:44 (4) 20:32	85 19:24 (4) 19:49	19:00	82 10:01 (5) 17:17	127 16:52 (3) 16:59	
7	06:02	17:40 (4) 06:27	18:00 (4) 06:56	07:25	08:38 (5) 06:58	07:36 (5) 07:30	
	20:54	123 19:43 (4) 20:31	83 19:23 (4) 19:47	18:58	83 10:01 (5) 17:16	127 16:52 (3) 16:59	
8	06:03	17:41 (4) 06:28	18:02 (4) 06:57	07:26	08:37 (5) 06:59	07:38 (5) 07:31	
	20:54	123 19:44 (4) 20:30	79 19:21 (4) 19:45	18:57	85 10:02 (5) 17:15	124 16:52 (3) 16:59	
9	06:04	17:41 (4) 06:29	18:04 (4) 06:58	07:27	08:36 (5) 07:00	07:38 (5) 07:32	
	20:54	122 19:43 (4) 20:29	75 19:19 (4) 19:44	18:55	87 10:03 (5) 17:14	122 16:51 (3) 16:59	
10	06:04	17:41 (4) 06:30	18:05 (4) 06:59	07:28	08:36 (5) 07:01	07:39 (5) 07:33	
	20:53	122 19:43 (4) 20:27	71 19:16 (4) 19:42	18:54	87 10:03 (5) 17:13	120 16:50 (3) 16:59	
11	06:05	17:42 (4) 06:31	18:07 (4) 07:00	07:29	08:36 (5) 07:03	07:40 (5) 07:34	
	20:53	121 19:43 (4) 20:26	67 19:14 (4) 19:40	18:52	89 10:05 (5) 17:12	117 16:49 (3) 16:59	
12	06:06	17:41 (4) 06:32	18:09 (4) 07:01	07:30	08:35 (5) 07:04	07:41 (5) 07:35	
	20:53	121 19:42 (4) 20:25	62 19:11 (4) 19:39	18:50	90 10:05 (5) 17:12	115 16:49 (3) 17:00	
13	06:06	17:42 (4) 06:33	18:12 (4) 07:02	07:31	08:34 (5) 07:05	07:42 (5) 07:35	
	20:52	121 19:43 (4) 20:24	57 19:09 (4) 19:37	4 07:54 (6) 18:49	91 10:05 (5) 17:11	111 16:47 (3) 17:00	
14	06:07	17:43 (4) 06:34	18:15 (4) 07:03	07:32	08:34 (5) 07:06	07:43 (5) 07:36	
	20:52	120 19:43 (4) 20:22	50 19:05 (4) 19:36	14 07:59 (6) 18:47	92 10:06 (5) 17:10	109 16:46 (3) 17:00	
15	06:08	17:43 (4) 06:35	18:19 (4) 07:04	07:33	08:33 (5) 07:07	07:44 (5) 07:37	
	20:51	120 19:43 (4) 20:21	42 19:01 (4) 19:34	19 08:01 (6) 18:46	93 10:06 (5) 17:09	105 16:45 (3) 17:00	
16	06:08	17:43 (4) 06:36	18:23 (4) 07:05	07:34	08:33 (5) 07:08	07:45 (5) 07:37	
	20:51	119 19:42 (4) 20:20	33 18:56 (4) 19:32	23 08:03 (6) 18:44	93 10:06 (5) 17:08	102 16:44 (3) 17:00	
17	06:09	17:44 (4) 06:37	18:31 (4) 07:06	07:35	08:32 (5) 07:09	07:47 (5) 07:38	
	20:50	118 19:42 (4) 20:18	18 18:49 (4) 19:31	25 08:03 (6) 18:43	94 10:06 (5) 17:07	98 16:44 (3) 17:01	
18	06:10	17:44 (4) 06:38	07:07	07:36 (6) 07:36	08:32 (5) 07:10	07:48 (5) 07:39	
	20:49	117 19:41 (4) 20:17	19:29	28 08:04 (6) 18:42	94 10:06 (5) 17:07	94 16:43 (3) 17:01	
19	06:11	17:45 (4) 06:39	07:08	07:35 (6) 07:37	08:31 (5) 07:12	07:49 (5) 07:39	
	20:49	116 19:41 (4) 20:16	19:27	29 08:04 (6) 18:40	95 10:06 (5) 17:06	91 16:42 (3) 17:01	
20	06:12	17:45 (4) 06:40	07:08	07:34 (6) 07:38	08:31 (5) 07:13	07:51 (5) 07:40	
	20:48	115 19:40 (4) 20:14	19:26	40 09:27 (5) 18:39	95 10:06 (5) 17:05	86 16:41 (3) 17:02	
21	06:12	17:45 (4) 06:41	07:09	07:34 (6) 07:39	08:31 (5) 07:14	07:52 (5) 07:41	
	20:47	115 19:40 (4) 20:13	19:24	54 09:34 (5) 18:37	95 10:06 (5) 17:05	82 16:40 (3) 17:02	
22	06:13	17:46 (4) 06:41	07:10	07:33 (6) 07:40	08:31 (5) 07:15	07:53 (5) 07:41	
	20:47	113 19:39 (4) 20:11	19:22	65 09:39 (5) 18:36	95 10:06 (5) 17:04	80 16:40 (3) 17:03	
23	06:14	17:47 (4) 06:42	07:11	07:33 (6) 07:41	08:31 (5) 07:16	07:56 (5) 07:42	
	20:46	112 19:39 (4) 20:10	19:21	71 09:42 (5) 18:35	96 10:07 (5) 17:03	75 16:40 (3) 17:03	
24	06:15	17:47 (4) 06:43	07:12	07:32 (6) 07:42	08:31 (5) 07:17	07:57 (5) 07:42	
	20:45	111 19:38 (4) 20:08	19:19	76 09:44 (5) 18:33	96 10:07 (5) 17:03	70 16:39 (3) 17:04	
25	06:16	17:47 (4) 06:44	07:13	07:33 (6) 06:43	07:31 (5) 07:18	07:59 (5) 07:42	
	20:44	110 19:37 (4) 20:07	19:17	80 09:47 (5) 17:32	100 16:34 (3) 17:02	65 16:38 (3) 17:04	
26	06:17	17:48 (4) 06:45	07:14	07:34 (6) 06:45	07:31 (5) 07:19	08:00 (5) 07:43	
	20:43	108 19:36 (4) 20:06	19:16	83 09:49 (5) 17:31	110 16:39 (3) 17:02	62 16:38 (3) 17:05	
27	06:17	17:49 (4) 06:46	07:15	07:35 (6) 06:46	07:31 (5) 07:20	08:02 (5) 07:43	
	20:42	107 19:36 (4) 20:04	19:14	86 09:51 (5) 17:29	116 16:42 (3) 17:02	56 16:37 (3) 17:06	
28	06:18	17:50 (4) 06:47	07:16	07:36 (6) 06:47	07:31 (5) 07:21	08:04 (5) 07:44	
	20:42	105 19:35 (4) 20:03	19:13	87 09:52 (5) 17:28	120 16:44 (3) 17:01	51 16:37 (3) 17:06	
29	06:19	17:51 (4) 06:48	07:17	07:37 (6) 06:48	07:32 (5) 07:22	08:06 (5) 07:44	
	20:41	103 19:34 (4) 20:01	19:11	87 09:54 (5) 17:27	122 16:46 (3) 17:01	45 16:36 (3) 17:07	
30	06:20	17:51 (4) 06:49	07:18	07:38 (6) 06:49	07:32 (5) 07:23	08:09 (5) 07:44	
	20:40	103 19:34 (4) 19:59	19:09	88 09:55 (5) 17:25	124 16:47 (3) 17:00	38 16:36 (3) 17:08	
31	06:21	17:52 (4) 06:50		06:50	07:33 (5)	07:44	
	20:39	101 19:33 (4) 19:58		17:24	125 16:48 (3)	17:08	
Potential sun hours	455	425	374	347	301	292	
Total, worst case	3612	1190	959	2968	2908	68	
Sun reduction	0,74	0,73	0,65	0,54	0,51	0,45	
Oper. time red.	0,93	0,93	0,93	0,93	0,93	0,93	
Wind dir. red.	0,76	0,76	0,76	0,75	0,72	0,74	
Total reduction	0,52	0,51	0,45	0,38	0,34	0,31	
Total, real	1870	611	436	1124	986	21	

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 36

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: X - N

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:10	07:32 17:43	06:58 18:15	07:10 19:47	18:26 (2) 20:17	05:58 20:45	05:59 20:55	06:22 20:38	06:51 19:56	18:13 (2) 19:08	06:51 17:23	07:24 17:00
2	07:45 17:10	07:32 17:44	06:57 18:16	07:08 19:48	18:24 (2) 20:18	05:58 20:45	06:00 20:55	06:23 20:37	06:52 19:55	18:13 (2) 19:06	06:52 17:22	07:25 17:00
3	07:45 17:11	07:31 17:45	06:55 18:17	07:06 19:49	18:21 (2) 20:19	05:58 20:46	06:00 20:55	06:24 20:36	06:53 19:53	18:13 (2) 19:05	06:53 17:21	07:26 17:00
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05 19:50	18:20 (2) 20:20	05:57 20:47	06:01 20:55	06:25 20:34	06:54 19:52	18:13 (2) 19:03	06:55 17:20	07:27 17:00
5	07:45 17:13	07:29 17:47	06:52 18:19	07:03 19:51	18:19 (2) 20:21	05:57 20:48	06:01 20:55	06:26 20:33	06:55 19:50	18:14 (2) 19:01	06:56 17:19	07:28 16:59
6	07:45 17:14	07:28 17:48	06:51 18:20	07:02 19:52	18:18 (2) 20:22	05:57 20:48	06:02 20:55	06:27 20:32	06:56 19:48	18:14 (2) 19:00	06:57 17:17	07:29 16:59
7	07:45 17:15	07:27 17:50	06:49 18:21	07:00 19:53	18:17 (2) 20:23	05:56 20:49	06:02 20:54	06:27 20:31	06:56 19:47	18:14 (2) 18:58	06:58 17:16	07:30 16:59
8	07:45 17:16	07:26 17:51	06:48 18:22	06:59 19:54	18:16 (2) 20:24	05:56 20:49	06:03 20:54	06:28 20:30	06:57 19:45	18:14 (2) 18:57	06:59 17:15	07:31 16:59
9	07:45 17:17	07:24 17:52	06:46 18:23	06:57 19:55	18:15 (2) 20:25	05:56 20:50	06:04 20:54	06:29 20:29	06:58 19:44	18:15 (2) 18:27	07:00 17:14	07:32 16:59
10	07:45 17:18	07:23 17:53	06:45 18:25	06:55 19:56	18:15 (2) 20:26	05:56 20:50	06:04 20:53	06:30 20:27	06:59 19:42	18:17 (2) 18:54	07:01 17:13	07:33 16:59
11	07:44 17:19	07:22 17:54	06:43 18:26	06:54 19:57	18:14 (2) 20:27	05:56 20:51	06:05 20:53	06:31 20:26	07:00 19:40	18:18 (2) 18:52	07:29 17:12	07:34 16:59
12	07:44 17:20	07:21 17:56	06:42 18:27	06:52 19:58	18:15 (2) 20:28	05:55 20:51	06:06 20:53	06:32 20:25	07:01 19:39	18:20 (2) 18:50	07:30 17:12	07:34 17:00
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51 19:59	18:14 (2) 20:29	05:55 20:52	06:06 20:52	06:33 20:24	07:02 19:37	18:24 (2) 18:49	07:31 17:11	07:35 17:00
14	07:44 17:22	07:19 17:58	06:38 18:29	06:49 20:00	18:14 (2) 20:29	05:55 20:52	06:07 20:52	06:34 20:22	07:03 19:36	18:37 (2) 18:49	07:32 17:10	07:36 17:00
15	07:43 17:23	07:17 17:59	06:37 18:30	06:48 20:01	18:14 (2) 20:30	05:55 20:53	06:08 20:51	06:35 20:21	18:35 (2) 19:34	07:04 18:46 (2)	07:33 17:09	07:37 17:00
16	07:43 17:24	07:16 18:00	06:35 18:31	06:46 20:02	18:14 (2) 20:31	05:55 20:53	06:08 20:51	06:36 20:20	18:31 (2) 18:49 (2)	07:05 19:32	07:34 17:08	07:37 17:00
17	07:42 17:25	07:15 18:01	06:34 18:32	06:45 20:03	18:14 (2) 20:32	05:55 20:54	06:09 20:50	06:37 20:18	18:29 (2) 18:51 (2)	07:06 19:31	07:35 17:07	07:38 17:01
18	07:42 17:26	07:14 18:03	06:32 18:33	06:43 20:04	18:15 (2) 20:33	05:55 20:54	06:10 20:49	06:38 20:17	18:27 (2) 18:53 (2)	07:07 19:29	07:36 17:07	07:39 17:01
19	07:42 17:27	07:12 18:04	06:30 18:34	06:42 20:05	18:15 (2) 20:34	05:56 20:54	06:11 20:49	06:39 20:16	18:25 (2) 18:54 (2)	07:08 19:27	07:37 17:06	07:39 17:01
20	07:41 17:28	07:11 18:05	06:29 18:35	06:41 20:06	18:16 (2) 20:35	05:56 20:54	06:12 20:48	06:40 20:14	18:23 (2) 18:54 (2)	07:08 19:26	07:38 17:05	07:40 17:02
21	07:41 17:30	07:10 18:06	06:27 18:36	06:39 20:07	18:17 (2) 20:36	05:56 20:55	06:12 20:47	06:41 20:13	18:22 (2) 18:55 (2)	07:09 19:24	07:39 17:05	07:41 17:02
22	07:40 17:31	07:08 18:07	06:26 18:37	06:38 20:08	18:17 (2) 20:37	05:56 20:55	06:13 20:47	06:42 20:11	18:20 (2) 18:56 (2)	07:10 19:22	07:40 17:04	07:41 17:03
23	07:39 17:32	07:07 18:08	06:24 18:38	06:36 20:09	18:18 (2) 20:38	05:56 20:55	06:14 20:46	06:42 20:10	18:19 (2) 18:57 (2)	07:11 19:21	07:41 17:04	07:42 17:03
24	07:39 17:33	07:05 18:09	06:22 18:39	06:35 20:10	18:19 (2) 20:38	05:57 20:55	06:15 20:45	06:43 20:08	18:18 (2) 18:57 (2)	07:12 19:19	07:42 17:03	07:43 17:04
25	07:38 17:34	07:04 18:10	06:21 18:40	06:34 20:11	18:21 (2) 20:39	05:57 20:55	06:16 20:44	06:44 20:07	18:18 (2) 18:58 (2)	07:13 19:17	07:43 17:02	07:44 17:04
26	07:37 17:35	07:03 18:12	06:19 18:41	06:32 20:12	18:23 (2) 20:40	05:57 20:55	06:17 20:43	06:45 20:06	18:17 (2) 18:58 (2)	07:14 19:16	07:44 17:02	07:45 17:05
27	07:37 17:37	07:01 18:13	06:18 18:42	06:31 20:13	18:24 (2) 20:41	05:58 20:56	06:17 20:42	06:46 20:04	18:16 (2) 18:58 (2)	07:15 19:14	07:45 17:02	07:46 17:06
28	07:36 17:38	07:00 18:14	06:16 18:43	06:30 20:14	18:28 (2) 20:42	05:58 20:56	06:18 20:42	06:47 20:03	18:16 (2) 18:58 (2)	07:16 19:13	07:46 17:01	07:47 17:06
29	07:35 17:39	07:04 18:44	06:14 19:44	06:28 20:15	18:37 (2) 20:43	05:59 20:56	06:19 20:41	06:48 20:01	18:14 (2) 18:57 (2)	07:17 19:11	07:47 17:01	07:48 17:07
30	07:34 17:40	07:13 19:45	12 18:45 (2)	06:27 20:16	18:45 (2) 20:43	05:59 20:56	06:20 20:40	06:49 19:59	18:14 (2) 18:57 (2)	07:18 19:09	07:48 17:01	07:49 17:08
31	07:33 17:41	07:11 19:46	18:29 (2)	06:27 20:16	18:48 (2) 20:44	05:59 20:56	06:21 20:39	06:50 19:58	18:14 (2) 18:57 (2)	07:19 19:09	07:49 17:01	07:50 17:09
Potential sun hours	301	299	370	397	445	448	455	425	374	347	301	292
Total, worst case			31	973				577	441			
Sun reduction			0,49	0,53				0,73	0,65			
Oper. time red.			0,93	0,93				0,93	0,93			
Wind dir. red.			0,75	0,75				0,75	0,75			
Total reduction			0,34	0,37				0,51	0,45			
Total, real			11	359				294	199			

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 37

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: Y - S

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45	16:40 (1) 07:32	06:58	07:10	18:05 (5) 06:26	05:58
2	07:45	16:40 (1) 07:32	06:57	07:08	18:01 (5) 06:24	05:58
3	07:45	16:40 (1) 07:31	06:55	17:53 (3) 07:06	17:57 (5) 06:23	05:57
4	07:45	16:40 (1) 07:30	06:54	17:51 (3) 07:05	17:55 (5) 06:22	05:57
5	07:45	16:40 (1) 07:29	06:52	17:50 (3) 07:03	17:52 (5) 06:21	05:57
6	07:45	16:39 (1) 07:28	06:51	17:48 (3) 07:02	17:50 (5) 06:20	05:56
7	07:45	16:39 (1) 07:27	06:49	17:48 (3) 07:00	17:47 (5) 06:18	05:56
8	07:45	16:39 (1) 07:26	06:48	17:47 (3) 06:58	17:45 (5) 06:17	05:56
9	07:45	16:39 (1) 07:24	06:46	17:47 (3) 06:57	17:43 (5) 06:16	05:56
10	07:45	16:39 (1) 07:23	06:45	17:47 (3) 06:55	17:42 (5) 06:15	05:56
11	07:44	16:38 (1) 07:22	06:43	17:46 (3) 06:54	17:41 (5) 06:14	05:55
12	07:44	16:39 (1) 07:21	06:42	17:47 (3) 06:52	17:43 (5) 06:13	05:55
13	07:44	16:39 (1) 07:20	06:40	17:47 (3) 06:51	17:41 (5) 06:12	05:55
14	07:44	16:39 (1) 07:19	06:38	17:48 (3) 06:49	17:43 (5) 06:11	05:55
15	07:43	16:39 (1) 07:17	06:37	17:48 (3) 06:48	17:41 (5) 06:10	05:55
16	07:43	16:40 (1) 07:16	06:35	17:49 (3) 06:46	17:40 (5) 06:09	05:55
17	07:43	16:40 (1) 07:15	06:34	17:52 (3) 06:45	17:43 (5) 06:08	05:55
18	07:42	16:41 (1) 07:14	06:32	18:04 (3) 06:43	17:46 (5) 06:07	05:55
19	07:42	16:40 (1) 07:12	06:30	18:04 (3) 06:42	17:48 (5) 06:07	05:55
20	07:41	16:41 (1) 07:11	06:29	18:06 (3) 06:40	17:51 (5) 06:06	05:55
21	07:41	16:42 (1) 07:10	06:27	18:08 (3) 06:39	17:54 (5) 06:05	05:55
22	07:40	16:42 (1) 07:08	06:26	18:11 (3) 06:38	17:57 (5) 06:04	05:56
23	07:39	16:42 (1) 07:07	06:24	18:14 (3) 06:36	18:00 (5) 06:04	05:56
24	07:39	16:44 (1) 07:05	06:22	18:17 (3) 06:35	18:03 (5) 06:03	05:56
25	07:38	16:45 (1) 07:04	06:21	18:20 (3) 06:33	18:06 (5) 06:02	05:57
26	07:37	16:46 (1) 07:03	06:19	18:23 (3) 06:32	18:09 (5) 06:02	05:57
27	07:37	16:47 (1) 07:01	06:18	18:26 (3) 06:31	18:12 (5) 06:01	05:57
28	07:36	16:50 (1) 07:00	06:16	18:29 (3) 06:29	18:15 (5) 06:00	05:58
29	07:35	16:58 (1) 18:14	18:43	18:32 (5) 06:28	18:18 (5) 06:00	05:58
30	07:34	17:00 (1) 18:12	18:41	18:35 (5) 06:27	18:21 (5) 06:00	05:59
31	07:33	17:01 (1) 18:11	18:40	18:38 (5) 06:26	18:24 (5) 06:00	05:59
Potential sun hours	301	299	370	397	445	448
Total, worst case	405		329	4206	6789	5514
Sun reduction	0,45		0,49	0,53	0,59	0,66
Oper. time red.	0,93		0,93	0,93	0,93	0,93
Wind dir. red.	0,64		0,74	0,75	0,75	0,75
Total reduction	0,27		0,34	0,37	0,41	0,46
Total, real	108		111	1546	2775	2551

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 38

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: Y - S

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	07:19 (6) 06:22	07:04 (6) 06:51	07:22 (6) 07:19	18:26 (3) 06:51	07:24
	20:55	183 20:11 (4) 20:38	226 20:14 (4) 19:56	119 19:20 (5) 19:08	19 18:45 (3) 17:23	15 16:35 (1)
2	06:00	07:19 (6) 06:23	07:04 (6) 06:52	17:40 (5) 07:20	18:25 (3) 06:52	07:25
	20:55	186 20:12 (4) 20:37	225 20:13 (4) 19:55	98 19:18 (5) 19:06	19 18:44 (3) 17:22	14 16:35 (1)
3	06:00	07:18 (6) 06:24	07:04 (6) 06:53	17:41 (5) 07:21	18:24 (3) 06:53	07:26
	20:55	187 20:12 (4) 20:36	225 20:12 (4) 19:53	95 19:16 (5) 19:05	18 18:42 (3) 17:21	13 16:35 (1)
4	06:01	07:18 (6) 06:25	07:04 (6) 06:54	17:42 (5) 07:22	18:24 (3) 06:55	07:27
	20:55	189 20:13 (4) 20:34	224 20:11 (4) 19:52	92 19:14 (5) 19:03	16 18:40 (3) 17:20	12 16:35 (1)
5	06:01	07:17 (6) 06:26	07:04 (6) 06:55	17:44 (5) 07:23	18:24 (3) 06:56	07:28
	20:55	190 20:12 (4) 20:33	224 20:11 (4) 19:50	88 19:12 (5) 19:01	15 18:39 (3) 17:18	10 16:34 (1)
6	06:02	07:17 (6) 06:26	07:03 (6) 06:55	17:46 (5) 07:24	18:24 (3) 06:57	07:29
	20:55	192 20:13 (4) 20:32	224 20:10 (4) 19:48	84 19:10 (5) 19:00	13 18:37 (3) 17:17	9 16:34 (1)
7	06:02	07:16 (6) 06:27	07:03 (6) 06:56	17:47 (5) 07:25	18:24 (3) 06:58	07:30
	20:54	193 20:13 (4) 20:31	224 20:09 (4) 19:47	80 19:07 (5) 18:58	11 18:35 (3) 17:16	8 16:34 (1)
8	06:03	07:16 (6) 06:28	07:03 (6) 06:57	17:49 (5) 07:26	18:24 (3) 06:59	07:31
	20:54	196 20:14 (4) 20:30	223 20:08 (4) 19:45	75 19:04 (5) 18:57	10 18:34 (3) 17:15	7 16:34 (1)
9	06:03	07:15 (6) 06:29	07:03 (6) 06:58	17:51 (5) 07:27	18:25 (3) 07:00	07:32
	20:54	197 20:14 (4) 20:29	222 20:07 (4) 19:44	70 19:01 (5) 18:55	7 18:32 (3) 17:14	6 16:34 (1)
10	06:04	07:14 (6) 06:30	07:02 (6) 06:59	17:54 (5) 07:28	18:26 (3) 07:01	07:33
	20:53	199 20:14 (4) 20:27	219 20:04 (4) 19:42	64 18:58 (5) 18:53	5 18:31 (3) 17:13	5 16:35 (1)
11	06:05	07:14 (6) 06:31	07:02 (6) 07:00	17:57 (5) 07:29	18:28 (3) 07:02	07:34
	20:53	201 20:15 (4) 20:26	213 20:02 (4) 19:40	58 18:55 (5) 18:52	2 18:30 (3) 17:12	4 16:35 (1)
12	06:05	07:13 (6) 06:32	07:03 (6) 07:01	18:00 (5) 07:04	07:04	07:34
	20:53	204 20:15 (4) 20:25	200 19:56 (4) 19:39	51 18:51 (5) 18:50	17:11	2 16:34 (1)
13	06:06	07:13 (6) 06:33	07:03 (6) 07:02	18:05 (5) 07:31	07:05	07:35
	20:52	204 20:15 (4) 20:24	195 19:41 (5) 19:37	41 18:46 (5) 18:49	17:11	17:00
14	06:07	07:13 (6) 06:34	07:03 (6) 07:03	18:11 (5) 07:32	07:06	16:22 (1) 07:36
	20:52	206 20:16 (4) 20:22	195 19:41 (5) 19:36	28 18:39 (5) 18:47	8 16:30 (1) 17:00	17:10
15	06:08	07:12 (6) 06:35	07:03 (6) 07:04	07:33	07:07	16:20 (1) 07:37
	20:51	209 20:17 (4) 20:21	194 19:40 (5) 19:34	18:46	17:09	12 16:32 (1) 17:00
16	06:08	07:11 (6) 06:36	07:03 (6) 07:05	07:34	07:08	16:19 (1) 07:37
	20:51	210 20:16 (4) 20:20	191 19:39 (5) 19:32	18:44	17:08	14 16:33 (1) 17:00
17	06:09	07:11 (6) 06:37	07:04 (6) 07:06	07:35	07:09	16:19 (1) 07:38
	20:50	212 20:17 (4) 20:18	190 19:39 (5) 19:31	18:43	17:07	16 16:35 (1) 17:01
18	06:10	07:11 (6) 06:38	07:04 (6) 07:07	07:36	07:10	16:18 (1) 07:39
	20:49	212 20:17 (4) 20:17	188 19:38 (5) 19:29	18:42	17:07	18 16:36 (1) 17:01
19	06:11	07:10 (6) 06:39	07:05 (6) 07:08	07:37	07:12	16:17 (1) 07:39
	20:49	215 20:18 (4) 20:16	186 19:37 (5) 19:27	18:40	17:06	20 16:37 (1) 17:01
20	06:11	07:09 (6) 06:40	07:04 (6) 07:08	07:38	07:13	16:17 (1) 07:40
	20:48	216 20:17 (4) 20:14	183 19:35 (5) 19:26	18:39	17:05	20 16:37 (1) 17:02
21	06:12	07:09 (6) 06:41	07:05 (6) 07:09	07:39	07:14	16:17 (1) 07:41
	20:47	217 20:17 (4) 20:13	180 19:34 (5) 19:24	18:37	17:05	21 16:38 (1) 17:02
22	06:13	07:08 (6) 06:41	07:05 (6) 07:10	07:40	07:15	16:17 (1) 07:41
	20:47	220 20:18 (4) 20:11	178 19:34 (5) 19:22	18:36	17:04	21 16:38 (1) 17:03
23	06:14	07:08 (6) 06:42	07:06 (6) 07:11	07:41	07:16	16:18 (1) 07:42
	20:46	220 20:18 (4) 20:10	175 19:33 (5) 19:21	18:34	17:03	21 16:39 (1) 17:03
24	06:15	07:08 (6) 06:43	07:07 (6) 07:12	07:42	07:17	16:18 (1) 07:42
	20:45	221 20:18 (4) 20:08	170 19:31 (5) 19:19	18:33	17:03	21 16:39 (1) 17:04
25	06:16	07:07 (6) 06:44	07:08 (6) 07:13	06:43	07:18	16:18 (1) 07:42
	20:44	222 20:17 (4) 20:07	167 19:30 (5) 19:17	17:32	17:02	20 16:38 (1) 17:04
26	06:17	07:06 (6) 06:45	07:09 (6) 07:14	18:36 (3) 06:44	07:19	16:18 (1) 07:43
	20:43	224 20:17 (4) 20:06	162 19:29 (5) 19:16	9 18:45 (3) 17:30	17:02	20 16:38 (1) 17:05
27	06:17	07:06 (6) 06:46	07:10 (6) 07:15	18:33 (3) 06:46	07:20	16:18 (1) 07:43
	20:42	224 20:17 (4) 20:04	158 19:28 (5) 19:14	15 18:48 (3) 17:29	17:02	19 16:37 (1) 17:06
28	06:18	07:06 (6) 06:47	07:12 (6) 07:16	18:31 (3) 06:47	07:21	16:19 (1) 07:44
	20:42	225 20:17 (4) 20:03	153 19:27 (5) 19:13	18 18:49 (3) 17:28	17:01	18 16:37 (1) 17:06
29	06:19	07:06 (6) 06:48	07:13 (6) 07:17	18:29 (3) 06:48	07:22	16:19 (1) 07:44
	20:41	225 20:17 (4) 20:01	145 19:24 (5) 19:11	20 18:49 (3) 17:27	17:01	17 16:36 (1) 17:07
30	06:20	07:05 (6) 06:49	07:15 (6) 07:18	18:27 (3) 06:49	07:23	16:20 (1) 07:44
	20:40	227 20:17 (4) 19:59	139 19:23 (5) 19:09	20 18:47 (3) 17:25	17:00	16 16:36 (1) 17:08
31	06:21	07:05 (6) 06:50	07:18 (6)	06:50	07:18	07:44
	20:39	226 20:16 (4) 19:58	130 19:21 (5)	17:24	17:08	2 16:42 (1)
Potential sun hours	455	425	374	347	301	292
Total, worst case	6452	5928	1125	135	302	107
Sun reduction	0,74	0,73	0,65	0,54	0,51	0,45
Oper. time red.	0,93	0,93	0,93	0,93	0,93	0,93
Wind dir. red.	0,75	0,75	0,76	0,73	0,64	0,64
Total reduction	0,51	0,51	0,45	0,37	0,30	0,27
Total, real	3311	3001	511	50	90	29

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 39

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: Z - R

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June				
1	07:45 17:09	15:40 (5) 16:38 (1)	07:32 17:42	15:32 (5) 17:06 (5)	06:58 18:15	07:22 (6) 17:03 (5)	07:10 19:47	08:20 (6) 19:26 (4)	06:26 20:17	05:58 20:45
2	07:45 17:10	15:41 (5) 16:39 (1)	07:32 17:44	15:32 (5) 17:07 (5)	06:57 18:16	07:20 (6) 17:01 (5)	07:08 19:48	08:21 (6) 19:27 (4)	06:24 20:18	05:58 20:46
3	07:45 17:11	15:41 (5) 16:40 (1)	07:31 17:45	15:32 (5) 17:07 (5)	06:55 18:17	07:20 (6) 17:01 (5)	07:06 19:49	08:23 (6) 19:27 (4)	06:23 20:19	05:57 20:46
4	07:45 17:12	15:41 (5) 16:41 (5)	07:30 17:46	15:32 (5) 17:08 (5)	06:54 18:18	07:18 (6) 16:59 (5)	07:05 19:50	08:26 (6) 19:29 (4)	06:22 20:20	05:57 20:47
5	07:45 17:13	15:39 (5) 16:41 (5)	07:29 17:47	15:32 (5) 17:08 (5)	06:52 18:19	07:18 (6) 16:58 (5)	07:03 19:51	08:30 (6) 19:30 (4)	06:21 20:21	05:57 20:48
6	07:45 17:14	15:39 (5) 16:42 (5)	07:28 17:48	15:32 (5) 17:09 (5)	06:51 18:20	07:16 (6) 16:57 (5)	07:02 19:52	18:52 (4) 19:31 (4)	06:20 20:22	05:56 20:48
7	07:45 17:15	15:39 (5) 16:43 (5)	07:27 17:50	15:32 (5) 17:09 (5)	06:49 18:21	07:16 (6) 16:56 (5)	07:00 19:53	18:51 (4) 19:31 (4)	06:18 20:23	05:56 20:49
8	07:45 17:16	15:39 (5) 16:44 (5)	07:26 17:51	15:32 (5) 17:09 (5)	06:48 18:22	07:15 (6) 16:53 (5)	06:58 19:54	18:51 (4) 19:32 (4)	06:17 20:24	05:56 20:49
9	07:45 17:17	15:39 (5) 16:46 (5)	07:24 17:52	15:32 (5) 17:10 (5)	06:46 18:23	07:15 (6) 16:52 (5)	06:57 19:55	18:50 (4) 19:31 (4)	06:16 20:25	05:56 20:50
10	07:45 17:18	15:39 (5) 16:47 (5)	07:23 17:53	15:31 (5) 17:09 (5)	06:45 18:24	07:14 (6) 16:50 (5)	06:55 19:56	18:50 (4) 19:32 (4)	06:15 20:26	05:56 20:50
11	07:44 17:19	15:38 (5) 16:47 (5)	07:22 17:54	15:32 (5) 17:09 (5)	06:43 18:26	07:13 (6) 16:47 (5)	06:54 19:57	18:49 (4) 19:31 (4)	06:14 20:27	05:55 20:51
12	07:44 17:20	15:38 (5) 16:49 (5)	07:21 17:56	15:32 (5) 17:10 (5)	06:42 18:27	07:13 (6) 16:46 (5)	06:52 19:58	18:49 (4) 19:30 (4)	06:13 20:28	05:55 20:52
13	07:44 17:21	15:38 (5) 16:50 (5)	07:20 17:57	15:32 (5) 17:11 (5)	06:40 18:28	07:12 (6) 16:43 (5)	06:51 19:59	18:49 (4) 19:30 (4)	06:12 20:29	05:55 20:52
14	07:44 17:22	15:37 (5) 16:51 (5)	07:19 17:58	15:33 (5) 17:12 (5)	06:38 18:29	07:12 (6) 16:40 (5)	06:49 20:00	18:50 (4) 19:30 (4)	06:11 20:30	05:55 20:52
15	07:43 17:23	15:37 (5) 16:52 (5)	07:17 17:59	15:32 (5) 17:13 (3)	06:37 18:30	07:11 (6) 16:36 (5)	06:48 20:01	18:50 (4) 19:29 (4)	06:10 20:30	05:55 20:53
16	07:43 17:24	15:37 (5) 16:54 (5)	07:16 18:00	15:33 (5) 17:14 (3)	06:35 18:31	07:11 (6) 16:30 (5)	06:46 20:02	18:50 (4) 19:28 (4)	06:09 20:31	05:55 20:53
17	07:43 17:25	15:36 (5) 16:54 (5)	07:15 18:01	15:33 (5) 17:14 (3)	06:34 18:32	07:11 (6) 08:20 (6)	06:45 20:03	18:50 (4) 19:27 (4)	06:08 20:32	05:55 20:54
18	07:42 17:26	15:37 (5) 16:56 (5)	07:14 18:02	15:33 (5) 17:14 (3)	06:32 18:33	07:11 (6) 08:19 (6)	06:43 20:04	18:51 (4) 19:26 (4)	06:07 20:33	05:55 20:54
19	07:42 17:27	15:36 (5) 16:56 (5)	07:12 18:04	15:34 (5) 17:14 (3)	06:30 18:34	07:11 (6) 08:18 (6)	06:42 20:05	18:52 (4) 19:24 (4)	06:07 20:34	05:55 20:54
20	07:41 17:28	15:35 (5) 16:57 (5)	07:11 18:05	15:34 (5) 17:14 (3)	06:29 18:35	07:11 (6) 08:17 (6)	06:40 20:06	18:53 (4) 19:23 (4)	06:06 20:35	05:56 20:54
21	07:41 17:30	15:35 (5) 16:58 (5)	07:10 18:06	15:33 (5) 17:14 (3)	06:27 18:36	07:11 (6) 08:16 (6)	06:39 20:07	18:54 (4) 19:21 (4)	06:05 20:36	05:56 20:55
22	07:40 17:31	15:35 (5) 16:59 (5)	07:08 18:07	15:36 (6) 17:14 (3)	06:26 18:37	07:12 (6) 08:16 (6)	06:38 20:08	18:55 (4) 19:20 (4)	06:04 20:37	05:56 20:55
23	07:39 17:32	15:34 (5) 16:59 (5)	07:07 18:08	15:33 (6) 17:17 (3)	06:24 18:38	07:12 (6) 08:14 (6)	06:36 20:09	18:58 (4) 19:18 (4)	06:04 20:38	05:56 20:55
24	07:39 17:33	15:34 (5) 17:01 (5)	07:05 18:09	15:34 (5) 17:18 (3)	06:22 18:39	07:12 (6) 08:14 (6)	06:35 20:10	19:00 (4) 19:14 (4)	06:03 20:38	05:56 20:55
25	07:38 17:34	15:34 (5) 17:01 (5)	07:04 18:10	15:34 (5) 17:19 (3)	06:21 18:40	07:13 (6) 08:12 (6)	06:33 20:11	19:06 (4) 19:08 (4)	06:02 20:39	05:57 20:55
26	07:37 17:35	15:33 (5) 17:02 (5)	07:03 18:12	15:33 (5) 17:19 (3)	06:19 18:41	07:13 (6) 08:10 (6)	06:32 20:12	19:08 (4) 19:08 (4)	06:02 20:40	05:57 20:55
27	07:37 17:37	15:33 (5) 17:02 (5)	07:01 18:13	15:33 (5) 17:17 (3)	06:18 18:42	07:14 (6) 08:09 (6)	06:31 20:13	19:08 (4) 19:08 (4)	06:01 20:41	05:57 20:56
28	07:36 17:38	15:34 (5) 17:04 (5)	07:00 18:14	15:32 (6) 17:18 (3)	06:16 18:43	07:14 (6) 08:18 (4)	06:29 20:14	19:06 (4) 19:06 (4)	06:00 20:42	05:58 20:56
29	07:35 17:39	15:33 (5) 17:05 (5)	07:00 18:14	15:33 (5) 17:14 (3)	06:16 18:43	07:14 (6) 08:15 (6)	06:28 20:15	19:06 (4) 19:06 (4)	06:00 20:43	05:58 20:56
30	07:34 17:40	15:33 (5) 17:05 (5)	07:00 18:14	15:33 (5) 17:13 (3)	06:16 18:43	07:13 (6) 08:17 (6)	06:27 20:16	19:06 (4) 19:06 (4)	05:59 20:43	05:59 20:56
31	07:33 17:41	15:33 (5) 17:06 (5)	07:00 18:14	15:33 (5) 17:11 (3)	06:16 18:43	07:11 (6) 08:18 (6)	06:27 20:16	19:06 (4) 19:06 (4)	05:59 20:43	05:59 20:56
Potential sun hours	301	299	312	370	297	397	445	448		
Total, worst case	2352	3172	2947	979						
Sun reduction	0,45	0,47	0,49	0,53						
Oper. time red.	0,93	0,93	0,93	0,93						
Wind dir. red.	0,63	0,65	0,72	0,76						
Total reduction	0,26	0,28	0,33	0,37						
Total, real	620	897	961	362						

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 40

Licensed user:

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

Calculated:

01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: Z - R

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 20:55	06:22 20:38	06:51 19:56	18:48 (4) 07:19	07:51 (6) 06:51	15:01 (5) 07:24
2	06:00 20:55	06:23 20:37	06:52 19:55	18:48 (4) 07:20	07:51 (6) 06:52	15:01 (5) 07:25
3	06:00 20:55	06:24 20:36	06:53 19:53	18:48 (4) 07:21	07:51 (6) 06:53	15:02 (5) 07:26
4	06:01 20:55	06:25 20:34	06:54 19:52	18:48 (4) 07:22	07:51 (6) 06:55	15:02 (5) 07:27
5	06:01 20:55	06:26 20:33	06:55 19:50	18:48 (4) 07:23	07:51 (6) 06:56	15:02 (5) 07:28
6	06:02 20:55	06:26 20:32	06:55 19:48	18:48 (4) 07:24	07:51 (6) 06:57	15:02 (5) 07:29
7	06:02 20:54	06:27 20:31	06:56 19:47	08:25 (6) 07:25	07:52 (6) 06:58	15:02 (5) 07:30
8	06:03 20:54	06:28 20:30	06:57 19:45	08:20 (6) 07:26	07:52 (6) 06:59	15:03 (5) 07:31
9	06:03 20:54	06:29 20:29	06:58 19:44	08:17 (6) 07:27	07:52 (6) 07:00	15:03 (5) 07:32
10	06:04 20:53	06:30 20:27	06:59 19:42	08:14 (6) 07:28	07:53 (6) 07:01	15:03 (5) 07:33
11	06:05 20:53	06:31 20:26	07:00 19:40	08:12 (6) 07:29	07:54 (6) 07:02	15:03 (5) 07:34
12	06:05 20:53	06:32 20:25	07:01 19:39	08:10 (6) 07:30	07:55 (6) 07:04	15:04 (5) 07:34
13	06:06 20:52	06:33 20:24	07:02 19:37	08:08 (6) 07:31	07:56 (6) 07:05	15:05 (5) 07:35
14	06:07 20:52	06:34 20:22	07:03 19:36	08:06 (6) 07:32	07:57 (6) 07:06	15:06 (5) 07:36
15	06:08 20:51	06:35 20:21	07:04 19:34	08:05 (6) 07:33	07:58 (6) 07:07	15:06 (5) 07:37
16	06:08 20:51	06:36 20:20	07:05 19:32	08:02 (6) 07:34	07:59 (6) 07:08	15:06 (5) 07:37
17	06:09 20:50	06:37 20:18	07:06 19:31	08:01 (6) 07:35	08:01 (6) 07:09	15:08 (5) 07:38
18	06:10 20:49	06:38 20:17	19:10 (4) 07:07	08:00 (6) 07:36	08:03 (6) 07:10	15:08 (5) 07:39
19	06:11 20:49	06:39 20:16	19:17 (4) 07:08	08:59 (6) 07:37	18:19 (3) 07:07	16:35 (5) 07:01
20	06:11 20:48	06:40 20:14	19:06 (4) 07:08	09:00 (6) 07:38	18:16 (3) 07:05	16:34 (5) 07:02
21	06:12 20:47	06:41 20:13	19:22 (4) 07:09	09:01 (6) 07:39	18:14 (3) 07:04	16:33 (5) 07:01
22	06:13 20:47	06:41 20:11	19:00 (4) 07:09	09:01 (6) 07:39	18:14 (3) 07:05	16:33 (5) 07:02
23	06:14 20:46	06:42 20:10	18:58 (4) 07:10	09:01 (6) 07:40	16:04 (5) 07:15	15:11 (5) 07:41
24	06:15 20:45	06:43 20:08	19:26 (4) 07:11	09:01 (6) 07:41	18:13 (3) 07:04	16:33 (5) 07:03
25	06:16 20:44	06:44 20:07	19:02 (4) 07:11	09:01 (6) 07:41	18:12 (3) 07:03	16:33 (5) 07:03
26	06:17 20:43	06:45 20:06	18:55 (4) 07:12	09:01 (6) 07:42	16:03 (5) 07:17	15:14 (5) 07:42
27	06:17 20:42	06:46 20:04	19:28 (4) 07:13	09:02 (6) 07:43	18:11 (3) 07:03	16:33 (5) 07:04
28	06:18 20:42	06:47 20:03	18:54 (4) 07:13	09:02 (6) 07:43	15:03 (5) 07:18	15:14 (5) 07:42
29	06:19 20:41	06:48 20:01	19:29 (4) 07:14	09:02 (6) 07:44	17:09 (3) 07:02	16:32 (5) 07:04
30	06:20 20:40	06:49 19:59	18:53 (4) 07:14	09:02 (6) 07:44	15:02 (5) 07:19	15:15 (5) 07:43
31	06:21 20:39	06:50 19:58	19:30 (4) 07:16	09:02 (6) 07:46	17:08 (3) 07:02	16:32 (5) 07:05
Potential sun hours	455	425	374	347	301	292
Total, worst case		431	1911	3900	2619	1834
Sun reduction		0,73	0,65	0,54	0,51	0,45
Oper. time red.		0,93	0,93	0,93	0,93	0,93
Wind dir. red.		0,76	0,75	0,67	0,63	0,63
Total reduction		0,51	0,45	0,34	0,29	0,26
Total, real		220	856	1315	771	483

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

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

Project:
Nurri_seconda presentazione

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 01/02/2023 11:46 / 41

Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AA - C1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELIMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time
 N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:45 17:09	07:32 17:42	69 16:08 (5) 18:15	07:30 (6) 07:10 17:19 (5) 19:47	72 08:37 (6) 06:26 19:26 (4) 20:17	05:58 20:45
2	07:45 17:10	07:32 17:44	70 16:08 (5) 18:16	07:29 (6) 07:08 17:17 (5) 19:48	69 08:39 (6) 06:24 19:27 (4) 20:18	05:58 20:46
3	07:45 17:11	07:31 17:45	71 16:07 (5) 18:17	07:29 (6) 07:06 17:17 (5) 19:49	64 08:41 (6) 06:23 19:27 (4) 20:19	05:57 20:46
4	07:45 17:12	07:30 17:46	72 16:07 (5) 18:17	07:28 (6) 07:05 17:15 (5) 19:50	60 08:44 (6) 06:22 19:29 (4) 20:20	05:57 20:47
5	07:45 17:13	07:29 17:47	74 16:06 (5) 18:18	07:28 (6) 07:03 17:14 (5) 19:51	50 08:49 (6) 06:21 19:30 (4) 20:21	05:57 20:48
6	07:45 17:14	07:28 17:48	75 16:06 (5) 18:19	07:27 (6) 07:02 17:12 (5) 19:52	37 18:53 (4) 06:20 19:30 (4) 20:22	05:56 20:48
7	07:45 17:15	07:27 17:50	75 16:06 (5) 18:20	07:27 (6) 07:00 17:11 (5) 19:53	37 18:52 (4) 06:18 19:29 (4) 20:23	05:56 20:49
8	07:45 17:16	07:26 17:51	76 16:06 (5) 18:21	07:26 (6) 06:58 17:09 (5) 19:54	37 18:52 (4) 06:17 19:29 (4) 20:24	05:56 20:49
9	07:45 17:17	07:24 17:52	77 16:06 (5) 18:22	07:26 (6) 06:57 17:08 (5) 19:55	37 18:52 (4) 06:16 19:29 (4) 20:25	05:56 20:50
10	07:45 17:18	07:23 17:53	77 16:06 (5) 18:23	07:26 (6) 06:56 17:05 (5) 19:56	36 18:52 (4) 06:15 19:28 (4) 20:26	05:56 20:50
11	07:44 17:19	07:22 17:54	78 16:06 (5) 18:24	07:25 (6) 06:54 17:02 (5) 19:57	35 18:52 (4) 06:14 19:27 (4) 20:27	05:55 20:51
12	07:44 17:20	07:21 17:55	79 16:06 (5) 18:25	07:25 (6) 06:52 17:00 (5) 19:58	34 18:52 (4) 06:13 19:26 (4) 20:28	05:55 20:52
13	07:44 17:21	16:30 (5) 07:20 17:56	80 16:06 (5) 18:26	07:25 (6) 06:51 16:56 (5) 19:59	32 18:53 (4) 06:12 19:25 (4) 20:29	05:55 20:52
14	07:44 17:22	16:27 (5) 07:19 17:58	81 16:06 (5) 18:27	07:25 (6) 06:49 16:52 (5) 20:00	31 18:53 (4) 06:11 19:24 (4) 20:29	05:55 20:52
15	07:43 17:23	16:25 (5) 07:17 17:59	82 16:06 (5) 18:28	07:25 (6) 06:48 16:51 (5) 20:01	30 18:55 (4) 06:10 19:23 (4) 20:30	05:55 20:53
16	07:43 17:24	16:24 (5) 07:16 18:00	83 16:06 (5) 18:29	07:25 (6) 06:46 16:50 (5) 20:02	29 18:56 (4) 06:09 19:22 (4) 20:31	05:55 20:53
17	07:43 17:25	16:22 (5) 07:15 18:01	84 16:06 (5) 18:30	07:25 (6) 06:45 16:49 (5) 20:03	28 18:57 (4) 06:08 19:19 (4) 20:32	05:55 20:54
18	07:42 17:26	16:21 (5) 07:14 18:02	85 16:06 (5) 18:31	07:25 (6) 06:43 16:48 (5) 20:04	27 19:00 (4) 06:07 19:17 (4) 20:33	05:54 20:54
19	07:42 17:27	16:19 (5) 07:12 18:04	86 16:06 (5) 18:32	07:26 (6) 06:42 16:47 (5) 20:05	26 19:02 (4) 06:07 19:13 (4) 20:34	05:55 20:54
20	07:41 17:28	16:17 (5) 07:11 18:05	87 16:06 (5) 18:33	07:26 (6) 06:40 16:46 (5) 20:06	25 19:03 (4) 06:06 19:12 (4) 20:35	05:56 20:54
21	07:41 17:30	16:15 (5) 07:10 18:06	88 16:06 (5) 18:34	07:26 (6) 06:39 16:45 (5) 20:07	24 19:04 (4) 06:05 19:11 (4) 20:36	05:56 20:55
22	07:40 17:31	16:14 (5) 07:09 18:07	89 16:06 (5) 18:35	07:27 (6) 06:38 16:44 (5) 20:08	23 19:05 (4) 06:04 19:10 (4) 20:37	05:56 20:55
23	07:39 17:32	16:13 (5) 07:08 18:08	90 16:06 (5) 18:36	07:27 (6) 06:36 16:43 (5) 20:09	22 19:06 (4) 06:03 19:09 (4) 20:38	05:56 20:55
24	07:39 17:33	16:12 (5) 07:07 18:09	91 16:06 (5) 18:37	07:28 (6) 06:35 16:42 (5) 20:10	21 19:07 (4) 06:02 19:08 (4) 20:39	05:56 20:55
25	07:38 17:34	16:11 (5) 07:06 18:10	92 16:06 (5) 18:38	07:28 (6) 06:33 16:41 (5) 20:11	20 19:08 (4) 06:01 19:07 (4) 20:40	05:57 20:55
26	07:37 17:35	16:10 (5) 07:05 18:11	93 16:06 (5) 18:39	07:29 (6) 06:32 16:40 (5) 20:12	19 19:09 (4) 06:00 19:06 (4) 20:41	05:57 20:55
27	07:37 17:37	16:09 (5) 07:04 18:12	94 16:06 (5) 18:40	07:30 (6) 06:31 16:39 (5) 20:13	18 19:10 (4) 06:00 19:05 (4) 20:42	05:57 20:56
28	07:36 17:38	16:08 (5) 07:03 18:13	95 16:06 (5) 18:41	07:31 (6) 06:30 16:38 (5) 20:14	17 19:11 (4) 06:00 19:04 (4) 20:43	05:58 20:56
29	07:35 17:39	16:07 (5) 07:02 18:14	96 16:06 (5) 18:42	07:32 (6) 06:29 16:37 (5) 20:15	16 19:12 (4) 06:00 19:03 (4) 20:44	05:58 20:56
30	07:34 17:40	16:06 (5) 07:01 18:15	97 16:06 (5) 18:43	07:33 (6) 06:28 16:36 (5) 20:16	15 19:13 (4) 06:00 19:02 (4) 20:45	05:58 20:56
31	07:33 17:41	16:05 (5) 07:00 18:16	98 16:06 (5) 18:44	07:34 (6) 06:27 16:35 (5) 20:17	14 19:14 (4) 06:00 19:01 (4) 20:46	05:59 20:56
Potential sun hours	301	299	370	397	445	448
Total, worst case	882	3329	3106	735		
Sun reduction	0,45	0,47	0,49	0,53		
Oper. time red.	0,93	0,93	0,93	0,93		
Wind dir. red.	0,66	0,69	0,74	0,76		
Total reduction	0,28	0,30	0,34	0,37		
Total, real	243	1006	1043	272		

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

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

Project:
Nurri_seconda presentazione

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Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AA - C1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELIMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December			
1	05:59 20:55	06:22 20:38	06:51 19:56	18:51 (4) 19:26 (4)	07:19 19:08	08:04 (6) 17:37 (5)	06:51 17:23	15:34 (5) 16:52 (5)	07:24 17:00
2	06:00 20:55	06:23 20:37	06:52 19:55	18:50 (4) 19:26 (4)	07:20 19:06	08:04 (6) 17:40 (5)	06:52 17:22	15:34 (5) 16:51 (5)	07:25 17:00
3	06:00 20:55	06:24 20:36	06:53 19:53	18:50 (4) 19:27 (4)	07:21 19:04	08:03 (6) 17:42 (5)	06:53 17:21	15:36 (5) 16:52 (5)	07:26 17:00
4	06:01 20:55	06:25 20:34	06:54 19:52	18:49 (4) 19:27 (4)	07:22 19:03	08:03 (6) 17:44 (5)	06:55 17:20	15:36 (5) 16:51 (5)	07:27 17:00
5	06:01 20:55	06:26 20:33	06:55 19:50	18:49 (4) 19:26 (4)	07:23 19:01	08:03 (6) 17:45 (5)	06:56 17:18	15:36 (5) 16:50 (5)	07:28 16:59
6	06:02 20:55	06:26 20:32	06:55 19:48	18:49 (4) 19:26 (4)	07:24 19:00	08:03 (6) 17:46 (5)	06:57 17:17	15:36 (5) 16:50 (5)	07:29 16:59
7	06:02 20:54	06:27 20:31	06:56 19:47	08:45 (6) 19:25 (4)	07:25 18:58	08:02 (6) 17:47 (5)	06:58 17:16	15:37 (5) 16:49 (5)	07:30 16:59
8	06:03 20:54	06:28 20:30	06:57 19:45	08:39 (6) 19:23 (4)	07:26 18:57	08:02 (6) 17:48 (5)	06:59 17:15	15:38 (5) 16:49 (5)	07:31 16:59
9	06:03 20:54	06:29 20:29	06:58 19:44	08:35 (6) 19:22 (4)	07:27 18:55	08:02 (6) 17:49 (5)	07:00 17:14	15:39 (5) 16:49 (5)	07:32 16:59
10	06:04 20:53	06:30 20:27	06:59 19:42	08:32 (6) 19:20 (4)	07:28 18:53	08:02 (6) 17:50 (5)	07:01 17:13	15:39 (5) 16:48 (5)	07:33 16:59
11	06:05 20:53	06:31 20:26	07:00 19:40	08:29 (6) 19:19 (4)	07:29 18:52	08:04 (6) 17:51 (5)	07:02 17:12	15:40 (5) 16:47 (5)	07:34 16:59
12	06:05 20:53	06:32 20:25	07:01 19:39	08:27 (6) 19:17 (4)	07:30 18:50	08:04 (6) 17:52 (5)	07:04 17:11	15:41 (5) 16:46 (5)	07:34 16:59
13	06:06 20:52	06:33 20:24	07:02 19:37	08:25 (6) 19:16 (4)	07:31 18:49	08:04 (6) 17:52 (5)	07:05 17:11	15:42 (5) 16:46 (5)	07:35 17:00
14	06:07 20:52	06:34 20:22	07:03 19:36	08:23 (6) 19:14 (4)	07:32 18:47	08:04 (6) 18:21 (3)	07:06 17:10	15:43 (5) 16:45 (5)	07:36 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	08:21 (6) 19:13 (4)	07:33 18:46	08:05 (6) 18:23 (3)	07:07 17:09	15:44 (5) 16:44 (5)	07:37 17:00
16	06:08 20:51	06:36 20:20	07:05 19:32	08:19 (6) 19:10 (4)	07:34 18:44	08:05 (6) 18:22 (3)	07:08 17:08	15:45 (5) 16:43 (5)	07:37 17:00
17	06:09 20:50	06:37 20:18	07:06 19:31	08:17 (6) 19:08 (4)	07:35 18:43	08:06 (6) 18:20 (3)	07:09 17:07	15:47 (5) 16:43 (5)	07:38 17:01
18	06:10 20:49	06:38 20:17	07:07 19:29	08:16 (6) 09:21 (6)	07:36 18:42	08:06 (6) 18:19 (3)	07:10 17:07	15:48 (5) 16:42 (5)	07:39 17:01
19	06:11 20:49	06:39 20:16	07:08 19:27	08:15 (6) 09:21 (6)	07:37 18:40	08:07 (6) 18:17 (3)	07:12 17:06	15:49 (5) 16:41 (5)	07:39 17:01
20	06:11 20:48	06:40 20:14	07:08 19:26	08:13 (6) 09:22 (6)	07:38 18:39	08:08 (6) 18:16 (3)	07:13 17:05	15:51 (5) 16:40 (5)	07:40 17:02
21	06:12 20:47	06:41 20:13	07:09 19:24	08:12 (6) 09:23 (6)	07:39 18:37	08:09 (6) 18:14 (3)	07:14 17:05	15:52 (5) 16:39 (5)	07:41 17:02
22	06:13 20:47	06:41 20:11	07:10 19:22	08:11 (6) 09:24 (6)	07:40 18:36	08:10 (6) 18:13 (3)	07:15 17:04	15:53 (5) 16:37 (5)	07:41 17:03
23	06:14 20:46	06:42 20:10	07:11 19:21	08:10 (6) 09:24 (6)	07:41 18:34	08:12 (6) 18:12 (3)	07:16 17:03	15:56 (5) 16:37 (5)	07:42 17:03
24	06:15 20:45	06:43 20:08	19:05 (4) 19:17 (4)	07:12 19:19	08:09 (6) 18:33	08:13 (6) 18:11 (3)	07:17 17:03	15:58 (5) 16:36 (5)	07:42 17:04
25	06:16 20:44	06:44 20:07	19:02 (4) 19:20 (4)	07:13 19:17	08:09 (6) 18:32	07:14 (6) 17:09 (3)	07:18 17:02	16:00 (5) 16:34 (5)	07:42 17:04
26	06:17 20:43	06:45 20:06	19:00 (4) 19:22 (4)	07:14 19:16	08:08 (6) 18:30	07:16 (6) 17:08 (3)	07:19 17:02	16:02 (5) 16:32 (5)	07:43 17:05
27	06:17 20:42	06:46 20:04	18:58 (4) 19:24 (4)	07:15 19:14	08:07 (6) 18:29	07:17 (6) 17:06 (3)	07:20 17:02	16:04 (5) 16:31 (5)	07:43 17:06
28	06:18 20:42	06:47 20:02	18:56 (4) 19:25 (4)	07:16 19:13	08:07 (6) 18:28	07:20 (6) 16:53 (5)	07:21 17:01	16:07 (5) 16:28 (5)	07:44 17:06
29	06:19 20:41	06:48 20:01	18:54 (4) 19:25 (4)	07:17 19:11	08:06 (6) 18:27	07:23 (6) 16:53 (5)	07:22 17:01	16:10 (5) 16:25 (5)	07:44 17:07
30	06:20 20:40	06:49 19:59	18:53 (4) 19:25 (4)	07:18 19:09	08:04 (6) 17:30 (5)	07:26 (6) 17:25	07:23 17:00	16:16 (5) 16:20 (5)	07:44 17:08
31	06:21 20:39	06:50 19:58	18:52 (4) 19:26 (4)	07:19 17:24	06:50 17:24	07:30 (6) 16:52 (5)	07:44 17:08	16:20 (5) 17:08	17:08 17:08
Potential sun hours	455	425	374	347	301	292			
Total, worst case		204	1994	4339	1624				
Sun reduction		0,73	0,65	0,54	0,51				
Oper. time red.		0,93	0,93	0,93	0,93				
Wind dir. red.		0,76	0,76	0,71	0,66				
Total reduction		0,51	0,45	0,36	0,31				
Total, real		104	905	1548	499				

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 43

Licensed user:

Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AB - D1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

January		February		March		April		May		June				
1	07:45	15:56 (5)	07:32	08:04 (6)	06:58	08:01 (6)	07:09	18:46 (4)	06:26	05:58				
	17:09	48	16:44 (5)	17:42	144	17:07 (5)	18:15	76	09:17 (6)	19:47	34	19:20 (4)	20:17	20:45
2	07:45	15:56 (5)	07:32	08:03 (6)	06:57	08:01 (6)	07:08	18:46 (4)	06:24	05:58				
	17:10	49	16:45 (5)	17:44	146	17:07 (5)	18:16	74	09:15 (6)	19:48	33	19:19 (4)	20:18	20:46
3	07:45	15:57 (5)	07:31	08:03 (6)	06:55	08:02 (6)	07:06	18:46 (4)	06:23	05:57				
	17:11	49	16:46 (5)	17:45	148	17:08 (5)	18:17	72	09:14 (6)	19:49	31	19:17 (4)	20:19	20:46
4	07:45	15:57 (5)	07:30	08:02 (6)	06:54	08:02 (6)	07:05	18:47 (4)	06:22	05:57				
	17:12	50	16:47 (5)	17:46	149	17:08 (5)	18:18	71	09:13 (6)	19:50	30	19:17 (4)	20:20	20:47
5	07:45	15:56 (5)	07:29	08:02 (6)	06:52	08:04 (6)	07:03	18:47 (4)	06:21	05:57				
	17:13	51	16:47 (5)	17:47	149	17:08 (5)	18:19	68	09:12 (6)	19:51	28	19:15 (4)	20:21	20:48
6	07:45	15:56 (5)	07:28	08:02 (6)	06:51	08:04 (6)	07:02	18:49 (4)	06:20	05:56				
	17:14	52	16:48 (5)	17:48	150	17:08 (5)	18:20	66	09:10 (6)	19:52	25	19:14 (4)	20:22	20:48
7	07:45	15:56 (5)	07:27	08:01 (6)	06:49	08:05 (6)	07:00	18:50 (4)	06:18	05:56				
	17:15	53	16:49 (5)	17:50	151	17:08 (5)	18:21	64	09:09 (6)	19:53	21	19:11 (4)	20:23	20:49
8	07:45	15:56 (5)	07:26	08:01 (6)	06:48	08:06 (6)	06:58	18:52 (4)	06:17	05:56				
	17:16	54	16:50 (5)	17:51	151	17:08 (5)	18:22	60	09:06 (6)	19:54	17	19:09 (4)	20:24	20:49
9	07:45	15:57 (5)	07:24	08:01 (6)	06:46	08:08 (6)	06:57	18:55 (4)	06:16	05:56				
	17:17	55	16:52 (5)	17:52	151	17:08 (5)	18:23	57	09:05 (6)	19:55	10	19:05 (4)	20:25	20:50
10	07:45	08:29 (6)	07:23	08:00 (6)	06:45	08:08 (6)	06:55	06:15	05:56					
	17:18	67	16:53 (5)	17:53	149	17:06 (5)	18:24	55	09:03 (6)	19:56		20:26	20:50	
11	07:44	08:25 (6)	07:22	08:00 (6)	06:43	08:09 (6)	06:54	06:14	05:55					
	17:19	75	16:53 (5)	17:54	152	17:32 (3)	18:26	51	09:00 (6)	19:57		20:27	20:51	
12	07:44	08:23 (6)	07:21	08:00 (6)	06:42	08:12 (6)	06:52	06:13	05:55					
	17:20	83	16:55 (5)	17:56	154	17:33 (3)	18:27	46	08:58 (6)	19:58		20:28	20:52	
13	07:44	08:22 (6)	07:20	08:00 (6)	06:40	08:13 (6)	06:51	06:12	05:55					
	17:21	88	16:56 (5)	17:57	156	17:35 (3)	18:28	42	08:55 (6)	19:59		20:29	20:52	
14	07:44	08:19 (6)	07:19	08:00 (6)	06:38	08:16 (6)	06:49	06:11	05:55					
	17:22	93	16:57 (5)	17:58	156	17:36 (3)	18:29	36	08:52 (6)	20:00		20:29	20:52	
15	07:43	08:18 (6)	07:17	07:59 (6)	06:37	08:19 (6)	06:48	06:10	05:55					
	17:23	98	16:58 (5)	17:59	156	17:37 (3)	18:30	29	08:48 (6)	20:01		20:30	20:53	
16	07:43	08:18 (6)	07:16	07:59 (6)	06:35	08:22 (6)	06:46	06:09	05:55					
	17:24	101	16:59 (5)	18:00	155	17:38 (3)	18:31	21	08:43 (6)	20:02		20:31	20:53	
17	07:43	08:16 (6)	07:15	07:59 (6)	06:34	06:45	06:35	06:08	05:55					
	17:25	105	16:59 (5)	18:01	156	17:40 (3)	18:32		20:03			20:32	20:54	
18	07:42	08:15 (6)	07:14	07:58 (6)	06:32	18:00 (4)	06:43	06:07	05:55					
	17:26	110	17:01 (5)	18:02	154	17:40 (3)	18:33	12	18:12 (4)	20:04		20:33	20:54	
19	07:42	08:14 (6)	07:12	07:59 (6)	06:30	17:57 (4)	06:42	06:07	05:55					
	17:27	112	17:01 (5)	18:04	152	17:42 (3)	18:34	17	18:14 (4)	20:05		20:34	20:54	
20	07:41	08:12 (6)	07:11	07:59 (6)	06:29	17:55 (4)	06:40	06:06	05:56					
	17:28	117	17:01 (5)	18:05	149	17:43 (3)	18:35	19	18:14 (4)	20:06		20:35	20:54	
21	07:41	08:12 (6)	07:10	07:59 (6)	06:27	17:52 (4)	06:39	06:05	05:56					
	17:30	120	17:03 (5)	18:06	145	17:44 (3)	18:36	23	18:15 (4)	20:07		20:36	20:55	
22	07:40	08:11 (6)	07:08	07:59 (6)	06:26	17:51 (4)	06:38	06:04	05:56					
	17:31	123	17:03 (5)	18:07	142	17:45 (3)	18:37	25	18:16 (4)	20:08		20:37	20:55	
23	07:39	08:10 (6)	07:07	08:00 (6)	06:24	17:49 (4)	06:36	06:04	05:56					
	17:32	125	17:03 (5)	18:08	132	17:43 (3)	18:38	28	18:17 (4)	20:09		20:38	20:55	
24	07:39	08:10 (6)	07:05	07:59 (6)	06:22	17:49 (4)	06:35	06:03	05:56					
	17:33	127	17:04 (5)	18:09	117	16:51 (5)	18:39	30	18:19 (4)	20:10		20:38	20:55	
25	07:38	08:08 (6)	07:04	08:00 (6)	06:21	17:48 (4)	06:33	06:02	05:57					
	17:34	132	17:05 (5)	18:10	110	16:49 (5)	18:40	31	18:19 (4)	20:11		20:39	20:55	
26	07:37	08:08 (6)	07:03	08:00 (6)	06:19	17:47 (4)	06:32	06:01	05:57					
	17:35	133	17:05 (5)	18:12	102	16:45 (5)	18:41	33	18:20 (4)	20:12		20:40	20:55	
27	07:37	08:07 (6)	07:01	08:00 (6)	06:18	17:47 (4)	06:31	06:01	05:57					
	17:37	135	17:05 (5)	18:13	91	16:40 (5)	18:42	34	18:21 (4)	20:13		20:41	20:56	
28	07:36	08:07 (6)	07:00	08:00 (6)	06:16	17:46 (4)	06:29	06:00	05:58					
	17:38	138	17:07 (5)	18:14	77	09:17 (6)	18:43	36	18:22 (4)	20:14		20:42	20:56	
29	07:35	08:06 (6)				18:45 (4)	06:28	06:00	05:58					
	17:39	140	17:07 (5)			19:44	36	19:21 (4)	20:15			20:43	20:56	
30	07:34	08:05 (6)				18:45 (4)	06:27	05:59	05:59					
	17:40	142	17:07 (5)			19:45	36	19:21 (4)	20:16			20:43	20:56	
31	07:33	08:05 (6)				18:45 (4)		05:59						
	17:41	143	17:07 (5)			19:46	35	19:20 (4)	20:44			445	448	
Potential sun hours	301		299			370		397				445	448	
Total, worst case	2968		3944			1283		229						
Sun reduction	0,45		0,47			0,49		0,53						
Oper. time red.	0,93		0,93			0,93		0,93						
Wind dir. red.	0,67		0,70			0,75		0,75						
Total reduction	0,28		0,31			0,34		0,37						
Total, real	841		1217			442		84						

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 44

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AB - D1

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December				
1	05:59 20:55	06:22 20:38	06:51 19:56	07:19 19:08	08:51 (6) 09:36 (6)	06:51 17:23	07:30 (6) 16:36 (5)	07:24 17:00	08:07 (6) 16:35 (5)	
2	06:01 20:55	06:23 20:37	06:52 19:55	07:20 19:06	08:49 (6) 09:38 (6)	06:52 17:22	07:30 (6) 16:36 (5)	07:25 17:00	08:11 (6) 16:35 (5)	
3	06:00 20:55	06:24 20:36	06:53 19:53	18:53 (4) 19:03 (4)	07:21 19:04	08:47 (6) 09:39 (6)	06:53 17:21	07:31 (6) 16:38 (5)	07:26 17:00	15:40 (5) 16:35 (5)
4	06:01 20:55	06:25 20:34	06:54 19:52	18:49 (4) 19:06 (4)	07:22 19:03	08:45 (6) 09:41 (6)	06:55 17:20	07:31 (6) 16:38 (5)	07:27 17:00	15:40 (5) 16:35 (5)
5	06:01 20:55	06:26 20:33	06:55 19:50	18:47 (4) 19:08 (4)	07:23 19:01	08:43 (6) 09:42 (6)	06:56 17:18	07:32 (6) 16:38 (5)	07:28 16:59	15:41 (5) 16:34 (5)
6	06:02 20:55	06:26 20:32	06:55 19:48	18:45 (4) 19:10 (4)	07:24 19:00	08:42 (6) 09:44 (6)	06:57 17:17	07:32 (6) 16:38 (5)	07:29 16:59	15:42 (5) 16:34 (5)
7	06:02 20:54	06:27 20:31	06:56 19:47	18:42 (4) 19:10 (4)	07:25 18:58	08:40 (6) 09:45 (6)	06:58 17:16	07:32 (6) 16:38 (5)	07:30 16:59	15:43 (5) 16:34 (5)
8	06:03 20:54	06:28 20:30	06:57 19:45	18:41 (4) 19:11 (4)	07:26 18:57	08:39 (6) 09:46 (6)	06:59 17:15	07:34 (6) 16:38 (5)	07:31 16:59	15:44 (5) 16:34 (5)
9	06:03 20:54	06:29 20:29	06:58 19:44	18:40 (4) 19:11 (4)	07:27 18:55	08:37 (6) 09:47 (6)	07:00 17:14	07:34 (6) 16:38 (5)	07:32 16:59	15:45 (5) 16:34 (5)
10	06:04 20:53	06:30 20:27	06:59 19:42	18:39 (4) 19:12 (4)	07:28 18:53	08:36 (6) 09:47 (6)	07:01 17:13	07:35 (6) 16:38 (5)	07:33 16:59	15:46 (5) 16:35 (5)
11	06:05 20:53	06:31 20:26	07:00 19:40	18:38 (4) 19:12 (4)	07:29 18:52	08:35 (6) 09:48 (6)	07:02 17:12	07:35 (6) 16:38 (5)	07:34 16:59	15:47 (5) 16:35 (5)
12	06:05 20:53	06:32 20:25	07:01 19:39	18:37 (4) 19:12 (4)	07:30 18:50	08:35 (6) 09:50 (6)	07:04 17:11	07:36 (6) 16:38 (5)	07:34 16:59	15:47 (5) 16:34 (5)
13	06:06 20:52	06:33 20:24	07:02 19:37	18:37 (4) 19:12 (4)	07:31 18:49	08:34 (6) 09:50 (6)	07:05 17:11	07:38 (6) 16:39 (5)	07:35 17:00	15:48 (5) 16:34 (5)
14	06:07 20:52	06:34 20:22	07:03 19:36	18:36 (4) 19:12 (4)	07:32 18:47	08:33 (6) 09:51 (6)	07:06 17:10	07:39 (6) 16:38 (5)	07:36 17:00	15:49 (5) 16:35 (5)
15	06:08 20:51	06:35 20:21	07:04 19:34	18:36 (4) 19:12 (4)	07:33 18:46	08:33 (6) 17:15 (5)	07:07 17:09	07:40 (6) 16:38 (5)	07:37 17:00	15:50 (5) 16:35 (5)
16	06:08 20:51	06:36 20:20	07:05 19:32	18:35 (4) 19:10 (4)	07:34 18:44	08:32 (6) 17:19 (5)	07:08 17:08	07:41 (6) 16:38 (5)	07:37 17:00	15:50 (5) 16:35 (5)
17	06:09 20:50	06:37 20:18	07:06 19:31	18:35 (4) 19:08 (4)	07:35 18:43	08:31 (6) 17:22 (5)	07:09 17:07	07:42 (6) 16:39 (5)	07:38 17:01	15:51 (5) 16:36 (5)
18	06:10 20:49	06:38 20:17	07:07 19:29	18:35 (4) 19:07 (4)	07:36 18:42	08:31 (6) 18:11 (3)	07:10 17:07	07:44 (6) 16:38 (5)	07:39 17:01	15:52 (5) 16:36 (5)
19	06:11 20:49	06:39 20:16	07:08 19:27	18:35 (4) 19:05 (4)	07:37 18:40	08:30 (6) 18:15 (3)	07:12 17:06	07:45 (6) 16:38 (5)	07:39 17:01	15:52 (5) 16:36 (5)
20	06:11 20:48	06:40 20:14	07:08 19:26	18:36 (4) 19:04 (4)	07:38 18:39	08:30 (6) 18:16 (3)	07:13 17:05	07:46 (6) 16:38 (5)	07:40 17:02	15:53 (5) 16:37 (5)
21	06:12 20:47	06:41 20:13	07:09 19:24	18:36 (4) 19:02 (4)	07:39 18:37	08:29 (6) 18:14 (3)	07:14 17:05	07:47 (6) 16:38 (5)	07:41 17:02	15:53 (5) 16:37 (5)
22	06:13 20:47	06:41 20:11	07:10 19:22	18:37 (4) 19:01 (4)	07:40 18:36	08:29 (6) 18:13 (3)	07:15 17:04	07:48 (6) 16:37 (5)	07:41 17:03	15:54 (5) 16:38 (5)
23	06:14 20:46	06:42 20:10	07:11 19:21	18:38 (4) 18:59 (4)	07:41 18:34	08:29 (6) 18:12 (3)	07:16 17:03	07:51 (6) 16:38 (5)	07:42 17:03	15:54 (5) 16:38 (5)
24	06:15 20:45	06:43 20:08	07:12 19:19	18:40 (4) 18:57 (4)	07:42 18:33	08:29 (6) 18:11 (3)	07:17 17:03	07:52 (6) 16:38 (5)	07:42 17:04	15:55 (5) 16:39 (5)
25	06:16 20:44	06:44 20:07	07:13 19:17	18:42 (4) 18:56 (4)	06:43 17:32	07:29 (6) 17:09 (3)	07:18 17:02	07:54 (6) 16:38 (5)	07:42 17:04	15:55 (5) 16:39 (5)
26	06:17 20:43	06:45 20:06	07:14 19:16	18:48 (4) 18:51 (4)	06:44 17:30	07:29 (6) 17:08 (3)	07:19 17:02	07:55 (6) 16:37 (5)	07:43 17:05	15:55 (5) 16:39 (5)
27	06:17 20:42	06:46 20:04	07:15 19:14	09:07 (6) 09:23 (6)	06:46 17:29	07:28 (6) 17:06 (3)	07:20 17:02	07:57 (6) 16:37 (5)	07:43 17:06	15:55 (5) 16:40 (5)
28	06:18 20:42	06:47 20:02	07:16 19:13	09:01 (6) 09:28 (6)	06:47 17:28	07:28 (6) 17:05 (3)	07:21 17:01	07:59 (6) 16:37 (5)	07:44 17:06	15:56 (5) 16:41 (5)
29	06:19 20:41	06:48 20:01	07:17 19:11	08:58 (6) 09:31 (6)	06:48 17:27	07:29 (6) 17:04 (3)	07:22 17:01	08:02 (6) 16:36 (5)	07:44 17:07	15:56 (5) 16:42 (5)
30	06:20 20:40	06:49 19:59	07:18 19:09	08:54 (6) 09:33 (6)	06:49 17:25	07:29 (6) 17:03 (3)	07:23 17:00	08:04 (6) 16:36 (5)	07:44 17:08	15:56 (5) 16:42 (5)
31	06:21 20:39	06:50 19:58		06:50 17:24	06:50 17:24	07:29 (6) 17:01 (3)		07:44 17:08	07:44 16:43 (5)	15:56 (5) 16:43 (5)
Potential sun hours	455	425	374	347	301	292				
Total, worst case			749	3308	3853	1503				
Sun reduction			0,65	0,54	0,51	0,45				
Oper. time red.			0,93	0,93	0,93	0,93				
Wind dir. red.			0,75	0,72	0,69	0,63				
Total reduction			0,45	0,36	0,32	0,27				
Total, real			337	1203	1244	399				

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 45

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AC - T

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	
1	07:45	07:32	06:58	07:09	06:26	05:58	19:13 (5)
	17:09	17:42	18:15	19:47	20:17	20:45	67 20:20 (4)
2	07:45	07:32	17:17 (1) 06:57	07:08	06:24	05:58	19:13 (5)
	17:10	17:44	3 17:20 (1) 18:16	19:48	20:18	20:45	68 20:21 (4)
3	07:45	07:31	17:15 (1) 06:55	07:06	06:23	05:57	19:12 (5)
	17:11	17:45	7 17:22 (1) 18:17	19:49	20:19	20:46	69 20:21 (4)
4	07:45	07:30	17:14 (1) 06:54	07:05	06:22	05:57	19:13 (5)
	17:12	17:46	9 17:23 (1) 18:18	19:50	20:20	20:47	69 20:22 (4)
5	07:45	07:29	17:13 (1) 06:52	07:03	06:21	05:57	19:13 (5)
	17:13	17:47	11 17:24 (1) 18:19	19:51	20:21	20:48	69 20:22 (4)
6	07:45	07:28	17:13 (1) 06:51	07:02	06:20	05:56	19:13 (5)
	17:14	17:48	13 17:26 (1) 18:20	19:52	20:22	20:48	70 20:23 (4)
7	07:45	07:27	17:12 (1) 06:49	07:00	06:18	05:56	19:13 (5)
	17:15	17:50	15 17:27 (1) 18:21	19:53	20:23	13 19:52 (5) 20:49	69 20:22 (4)
8	07:45	07:26	17:12 (1) 06:48	06:58	06:17	19:35 (5) 05:56	19:13 (5)
	17:16	17:51	16 17:28 (1) 18:22	19:54	20:24	22 19:57 (5) 20:49	69 20:22 (4)
9	07:45	07:24	17:12 (1) 06:46	06:57	06:16	19:31 (5) 05:56	19:13 (5)
	17:17	17:52	18 17:30 (1) 18:23	19:55	20:25	29 20:00 (5) 20:50	70 20:23 (4)
10	07:45	07:23	17:12 (1) 06:45	06:55	06:15	19:29 (5) 05:56	19:13 (5)
	17:18	17:53	18 17:30 (1) 18:24	19:56	20:26	33 20:02 (5) 20:50	70 20:23 (4)
11	07:44	07:22	17:12 (1) 06:43	06:54	06:14	19:27 (5) 05:55	19:14 (5)
	17:19	17:54	19 17:31 (1) 18:26	19:57	20:27	37 20:04 (5) 20:51	69 20:23 (4)
12	07:44	07:21	17:13 (1) 06:41	06:52	06:13	19:25 (5) 05:55	19:14 (5)
	17:20	17:56	18 17:31 (1) 18:27	19:58	20:28	40 20:05 (5) 20:51	69 20:23 (4)
13	07:44	07:20	17:14 (1) 06:40	06:51	06:12	19:24 (5) 05:55	19:14 (5)
	17:21	17:57	16 17:30 (1) 18:28	19:59	20:29	42 20:06 (4) 20:52	70 20:24 (5)
14	07:44	07:19	17:15 (1) 06:38	06:49	06:11	19:22 (5) 05:55	19:14 (5)
	17:22	17:58	15 17:30 (1) 18:29	20:00	20:29	44 20:06 (4) 20:52	70 20:24 (5)
15	07:43	07:17	17:16 (1) 06:37	06:48	06:10	19:21 (5) 05:55	19:14 (5)
	17:23	17:59	11 17:27 (1) 18:30	20:01	20:30	46 20:07 (4) 20:53	70 20:24 (4)
16	07:43	07:16	17:19 (1) 06:35	06:46	06:09	19:20 (5) 05:55	19:14 (5)
	17:24	18:00	6 17:25 (1) 18:31	20:02	20:31	48 20:08 (4) 20:53	70 20:24 (4)
17	07:42	07:15	06:34	06:45	06:08	19:19 (5) 05:55	19:15 (5)
	17:25	18:01	18:32	20:03	20:32	50 20:09 (4) 20:54	70 20:25 (5)
18	07:42	07:14	06:32	06:43	06:07	19:18 (5) 05:55	19:15 (5)
	17:26	18:02	18:33	20:04	20:33	51 20:09 (4) 20:54	70 20:25 (5)
19	07:42	07:12	06:30	18:11 (3) 06:42	06:07	19:18 (5) 05:55	19:15 (5)
	17:27	18:04	18:34	3 18:14 (3) 20:05	20:34	53 20:11 (4) 20:54	70 20:25 (5)
20	07:41	07:11	06:29	18:09 (3) 06:40	06:06	19:17 (5) 05:56	19:15 (5)
	17:28	18:05	18:35	5 18:14 (3) 20:06	20:35	54 20:11 (4) 20:54	70 20:25 (5)
21	07:41	07:10	06:27	18:08 (3) 06:39	06:05	19:16 (5) 05:56	19:16 (5)
	17:30	18:06	18:36	7 18:15 (3) 20:07	20:36	56 20:12 (4) 20:55	70 20:26 (5)
22	07:40	07:08	06:26	18:08 (3) 06:38	06:04	19:15 (5) 05:56	19:16 (5)
	17:31	18:07	18:37	8 18:16 (3) 20:08	20:37	58 20:13 (4) 20:55	70 20:26 (5)
23	07:39	07:07	06:24	18:07 (3) 06:36	06:04	19:15 (5) 05:56	19:16 (5)
	17:32	18:08	18:38	10 18:17 (3) 20:09	20:38	59 20:14 (4) 20:55	70 20:26 (5)
24	07:39	07:05	06:22	18:07 (3) 06:35	06:03	19:14 (5) 05:56	19:16 (5)
	17:33	18:09	18:39	12 18:19 (3) 20:10	20:38	60 20:14 (4) 20:55	70 20:26 (5)
25	07:38	07:04	06:21	18:06 (3) 06:33	06:02	19:15 (5) 05:57	19:17 (5)
	17:34	18:10	18:40	13 18:19 (3) 20:11	20:39	61 20:16 (4) 20:55	70 20:27 (5)
26	07:37	07:03	06:19	18:06 (3) 06:32	06:02	19:14 (5) 05:57	19:16 (5)
	17:35	18:12	18:41	14 18:20 (3) 20:12	20:40	62 20:16 (4) 20:55	71 20:27 (5)
27	07:37	07:01	06:18	18:07 (3) 06:31	06:01	19:13 (5) 05:57	19:16 (5)
	17:37	18:13	18:42	14 18:21 (3) 20:13	20:41	63 20:16 (4) 20:56	70 20:26 (4)
28	07:36	07:00	06:16	18:07 (3) 06:29	06:00	19:14 (5) 05:58	19:17 (5)
	17:38	18:14	18:43	15 18:22 (3) 20:14	20:42	64 20:18 (4) 20:56	70 20:27 (4)
29	07:35		07:14	19:08 (3) 06:28	06:00	19:13 (5) 05:58	19:17 (5)
	17:39		19:44	15 19:23 (3) 20:15	20:43	65 20:18 (4) 20:56	70 20:27 (5)
30	07:34		07:13	19:10 (3) 06:27	05:59	19:13 (5) 05:59	19:18 (5)
	17:40		19:45	12 19:22 (3) 20:16	20:43	66 20:19 (4) 20:56	70 20:28 (5)
31	07:33		07:11	19:13 (3)	05:59	19:13 (5)	
	17:41		19:46	4 19:17 (3)	20:44	67 20:20 (4)	
Potential sun hours	301	299	370	397	445	448	
Total, worst case		195	132		1243		2089
Sun reduction		0,47	0,49		0,59		0,66
Oper. time red.		0,93	0,93		0,93		0,93
Wind dir. red.		0,67	0,75		0,76		0,76
Total reduction		0,30	0,34		0,42		0,47
Total, real		58	45		517		976

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

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

Nurri_seconda presentazione

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01/02/2023 11:46 / 46

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AC - T

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59	19:18 (5) 06:22	19:36 (5) 06:51	07:19	06:51	16:42 (1) 07:24
	20:55	69 20:27 (4) 20:38	38 20:14 (5) 19:56	19:08	17:23	18 17:00 (1) 17:00
2	06:00	19:18 (5) 06:23	19:37 (5) 06:52	07:20	06:52	16:41 (1) 07:25
	20:55	70 20:28 (4) 20:37	36 20:13 (5) 19:55	19:06	17:22	17 16:58 (1) 17:00
3	06:00	19:18 (5) 06:24	19:39 (5) 06:53	07:21	06:53	16:42 (1) 07:26
	20:55	70 20:28 (4) 20:36	32 20:11 (5) 19:53	19:04	17:21	16 16:58 (1) 17:00
4	06:01	19:19 (5) 06:25	19:42 (5) 06:54	07:22	06:55	16:42 (1) 07:27
	20:55	69 20:28 (4) 20:34	26 20:08 (5) 19:52	19:03	17:20	15 16:57 (1) 17:00
5	06:01	19:19 (5) 06:26	19:46 (5) 06:55	07:23	06:56	16:43 (1) 07:28
	20:55	69 20:28 (4) 20:33	19 20:05 (5) 19:50	19:01	17:18	12 16:55 (1) 16:59
6	06:02	19:19 (5) 06:26	19:52 (5) 06:55	07:24	06:57	16:43 (1) 07:29
	20:55	70 20:29 (4) 20:32	7 19:59 (5) 19:48	19:00	17:17	11 16:54 (1) 16:59
7	06:02	19:19 (5) 06:27	06:56	07:25	06:58	16:44 (1) 07:30
	20:54	69 20:28 (4) 20:31	19:47	18:58	17:16	9 16:53 (1) 16:59
8	06:03	19:20 (5) 06:28	06:57	07:26	06:59	16:46 (1) 07:31
	20:54	69 20:29 (4) 20:30	19:45	18:57	17:15	6 16:52 (1) 16:59
9	06:03	19:20 (5) 06:29	06:58	07:27	07:00	16:49 (1) 07:32
	20:54	69 20:29 (4) 20:29	19:44	18:55	17:14	2 16:51 (1) 16:59
10	06:04	19:20 (5) 06:30	06:59	07:28	07:01	07:33
	20:53	69 20:29 (4) 20:27	19:42	18:53	17:13	16:59
11	06:05	19:21 (5) 06:31	07:00	07:29	07:02	07:34
	20:53	68 20:29 (4) 20:26	19:40	18:52	17:12	16:59
12	06:05	19:21 (5) 06:32	07:01	07:30	07:04	07:34
	20:53	67 20:28 (4) 20:25	19:39	18:50	17:11	16:59
13	06:06	19:21 (5) 06:33	07:02	19:01 (3) 07:31	07:05	07:35
	20:52	67 20:28 (4) 20:24	19:37	12 19:13 (3) 18:49	17:11	17:00
14	06:07	19:22 (5) 06:34	07:03	18:59 (3) 07:32	07:06	07:36
	20:52	65 20:27 (4) 20:22	19:36	15 19:14 (3) 18:47	17:10	17:00
15	06:08	19:23 (5) 06:35	07:04	18:58 (3) 07:33	07:07	07:37
	20:51	64 20:27 (4) 20:21	19:34	15 19:13 (3) 18:46	17:09	17:00
16	06:08	19:22 (5) 06:36	07:05	18:55 (3) 07:34	07:08	07:37
	20:51	64 20:26 (4) 20:20	19:32	15 19:10 (3) 18:44	17:08	17:00
17	06:09	19:23 (5) 06:37	07:06	18:54 (3) 07:35	07:09	07:38
	20:50	63 20:26 (4) 20:18	19:31	14 19:08 (3) 18:43	17:07	17:01
18	06:10	19:24 (5) 06:38	07:07	18:54 (3) 07:36	07:10	07:39
	20:49	61 20:25 (4) 20:17	19:29	13 19:07 (3) 18:42	17:07	17:01
19	06:11	19:25 (5) 06:39	07:08	18:53 (3) 07:37	07:12	07:39
	20:49	60 20:25 (4) 20:16	19:27	12 19:05 (3) 18:40	17:06	17:01
20	06:11	19:24 (5) 06:40	07:08	18:53 (3) 07:38	07:13	07:40
	20:48	60 20:24 (4) 20:14	19:26	11 19:04 (3) 18:39	17:05	17:02
21	06:12	19:25 (5) 06:41	07:09	18:53 (3) 07:39	07:14	07:41
	20:47	58 20:23 (4) 20:13	19:24	9 19:02 (3) 18:37	17:05	17:02
22	06:13	19:26 (5) 06:41	07:10	18:53 (3) 07:40	07:15	07:41
	20:47	57 20:23 (4) 20:11	19:22	8 19:01 (3) 18:36	17:04	17:03
23	06:14	19:27 (5) 06:42	07:11	18:53 (3) 07:41	07:16	07:42
	20:46	55 20:22 (4) 20:10	19:21	6 18:59 (3) 18:34	17:03	17:03
24	06:15	19:28 (5) 06:43	07:12	18:54 (3) 07:42	07:17	07:42
	20:45	54 20:22 (4) 20:08	19:19	3 18:57 (3) 18:33	17:03	17:04
25	06:16	19:28 (5) 06:44	07:13	18:55 (3) 06:43	07:18	07:42
	20:44	52 20:20 (4) 20:07	19:17	2 18:56 (3) 17:32	17:02	17:04
26	06:17	19:29 (5) 06:45	07:14	06:44	16:48 (1) 07:19	07:43
	20:43	51 20:20 (4) 20:05	19:16	17:30	7 16:55 (1) 17:02	17:05
27	06:17	19:30 (5) 06:46	07:15	06:46	16:45 (1) 07:20	07:43
	20:42	49 20:19 (4) 20:04	19:14	17:29	12 16:57 (1) 17:02	17:06
28	06:18	19:31 (5) 06:47	07:16	06:47	16:44 (1) 07:21	07:44
	20:42	47 20:18 (4) 20:02	19:13	17:28	15 16:59 (1) 17:01	17:06
29	06:19	19:32 (5) 06:48	07:17	06:48	16:44 (1) 07:22	07:44
	20:41	45 20:17 (4) 20:01	19:11	17:27	16 17:00 (1) 17:01	17:07
30	06:20	19:33 (5) 06:49	07:18	06:49	16:43 (1) 07:23	07:44
	20:40	44 20:17 (4) 19:59	19:09	17:25	18 17:01 (1) 17:00	17:08
31	06:21	19:35 (5) 06:50	07:19	06:50	16:42 (1) 17:00	07:44
	20:39	41 20:16 (4) 19:58	19:07	17:24	19 17:01 (1) 17:00	17:08
Potential sun hours	455	425	374	347	301	292
Total, worst case	1885	158	135	87	106	
Sun reduction	0,74	0,73	0,65	0,54	0,51	
Oper. time red.	0,93	0,93	0,93	0,93	0,93	
Wind dir. red.	0,76	0,76	0,75	0,67	0,67	
Total reduction	0,52	0,52	0,45	0,34	0,32	
Total, real	982	82	61	30	34	

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

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

Project:

Nurri_seconda presentazione

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Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AD - U

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 17:09	12:41 (6) 14:39 (6)	07:32 17:42	13:20 (6) 17:19 (5)	06:58 18:15	07:09 19:47
2	07:45 17:10	12:41 (6) 14:40 (6)	07:32 17:44	13:23 (6) 17:20 (5)	06:57 18:16	07:08 19:48
3	07:45 17:11	12:43 (6) 14:41 (6)	07:31 17:45	13:27 (6) 17:22 (5)	06:55 18:17	07:06 19:49
4	07:45 17:12	12:42 (6) 14:40 (6)	07:30 17:46	13:30 (6) 17:23 (5)	06:54 18:18	07:05 19:50
5	07:45 17:13	12:43 (6) 14:41 (6)	07:29 17:47	13:35 (6) 17:24 (5)	06:52 18:19	07:03 19:51
6	07:45 17:14	12:44 (6) 14:41 (6)	07:28 17:48	13:40 (6) 17:26 (5)	06:51 18:20	07:02 19:52
7	07:45 17:15	12:45 (6) 14:41 (6)	07:27 17:50	13:46 (6) 17:27 (5)	06:49 18:21	07:00 19:53
8	07:45 17:16	12:46 (6) 14:41 (6)	07:25 17:51	17:03 (5) 17:28 (5)	06:48 18:22	06:58 19:54
9	07:45 17:17	12:47 (6) 14:42 (6)	07:24 17:52	17:02 (5) 17:30 (5)	06:46 18:23	06:57 19:55
10	07:45 17:18	12:48 (6) 14:42 (6)	07:23 17:53	17:01 (5) 17:30 (5)	06:45 18:24	06:55 19:56
11	07:44 17:19	12:48 (6) 14:42 (6)	07:22 17:54	17:01 (5) 17:32 (5)	06:43 18:25	06:54 19:57
12	07:44 17:20	12:49 (6) 14:42 (6)	07:21 17:55	17:01 (5) 17:33 (5)	06:41 18:27	06:52 19:58
13	07:44 17:21	12:50 (6) 14:42 (6)	07:20 17:57	17:01 (5) 17:35 (5)	06:40 18:28	18:03 (4) 19:59
14	07:44 17:22	12:51 (6) 14:42 (6)	07:19 17:58	17:01 (5) 17:36 (5)	06:38 18:29	18:00 (4) 19:59
15	07:43 17:23	12:52 (6) 14:42 (6)	07:17 17:59	17:00 (5) 17:37 (5)	06:37 18:30	17:58 (4) 19:59
16	07:43 17:24	12:54 (6) 14:42 (6)	07:16 18:00	17:00 (5) 17:38 (5)	06:35 18:31	18:09 (4) 20:00
17	07:42 17:25	12:54 (6) 14:42 (6)	07:15 18:01	17:01 (5) 17:39 (5)	06:34 18:32	18:10 (4) 20:01
18	07:42 17:26	12:56 (6) 14:42 (6)	07:14 18:02	17:00 (5) 17:38 (5)	06:32 18:33	17:54 (4) 20:02
19	07:42 17:27	12:57 (6) 14:41 (6)	07:12 18:04	17:01 (5) 17:38 (5)	06:30 18:34	17:54 (4) 20:03
20	07:41 17:28	12:57 (6) 14:41 (6)	07:11 18:05	17:02 (5) 17:37 (5)	06:29 18:35	17:54 (4) 20:04
21	07:41 17:30	12:59 (6) 14:41 (6)	07:10 18:06	17:02 (5) 17:36 (5)	06:27 18:36	17:53 (4) 20:05
22	07:40 17:31	13:00 (6) 14:40 (6)	07:08 18:07	17:03 (5) 17:35 (5)	06:26 18:37	17:54 (4) 20:06
23	07:39 17:32	13:01 (6) 14:39 (6)	07:07 18:08	17:05 (5) 17:35 (5)	06:24 18:38	18:16 (4) 20:07
24	07:39 17:33	13:04 (6) 14:40 (6)	07:05 18:09	17:05 (5) 17:33 (5)	06:22 18:39	18:17 (4) 20:08
25	07:38 17:34	13:05 (6) 14:39 (6)	07:04 18:10	17:07 (5) 17:31 (5)	06:21 18:40	17:55 (4) 20:09
26	07:37 17:35	13:07 (6) 14:38 (6)	07:03 18:11	17:09 (5) 17:29 (5)	06:19 18:41	17:56 (4) 20:10
27	07:37 17:36	13:08 (6) 14:37 (6)	07:01 18:13	17:12 (5) 17:26 (5)	06:17 18:42	18:12 (4) 20:11
28	07:36 17:38	13:11 (6) 14:37 (6)	07:00 18:14	06:16 18:43	06:16 18:43	18:03 (4) 20:12
29	07:35 17:39	13:13 (6) 14:35 (6)	07:00 18:15	07:14 19:44	06:15 19:44	18:04 (4) 20:13
30	07:34 17:40	13:15 (6) 14:34 (6)	07:00 18:16	07:13 19:45	06:14 19:45	20:14 20:14
31	07:33 17:41	13:18 (6) 14:33 (6)	07:00 18:17	07:11 19:46	06:13 19:46	20:15 20:15
Potential sun hours	301	299	370	397	445	448
Total, worst case	3250	1103	248			
Sun reduction	0,45	0,47	0,49			
Oper. time red.	0,93	0,93	0,93			
Wind dir. red.	0,46	0,61	0,74			
Total reduction	0,19	0,26	0,34			
Total, real	629	292	84			

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

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

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 01/02/2023 11:46 / 48

Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AD - U

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:59 20:55	06:22 20:38	06:51 19:56	07:19 19:08	06:51 17:23	07:24 17:00 (5)
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:25 16:58 (5)
3	06:00 20:55	06:24 20:36	06:53 19:53	07:21 19:04	06:53 17:21	07:26 16:58 (5)
4	06:01 20:55	06:25 20:34	06:54 19:52	07:22 19:03	06:54 17:20	07:27 16:57 (5)
5	06:01 20:55	06:26 20:33	06:55 19:50	07:23 19:01	06:56 17:18	07:28 16:55 (5)
6	06:02 20:55	06:26 20:32	06:55 19:48	07:24 19:00	06:57 17:17	07:29 16:54 (5)
7	06:02 20:54	06:27 20:31	06:56 19:47	07:25 18:58	06:58 17:16	07:30 16:53 (5)
8	06:03 20:54	06:28 20:30	06:57 19:45	07:26 18:57	06:59 17:15	07:31 16:52 (5)
9	06:03 20:54	06:29 20:29	06:58 19:44	07:27 18:55	07:00 17:14	07:32 16:51 (5)
10	06:04 20:53	06:30 20:27	06:59 19:42	07:28 18:53	07:01 17:13	07:33 16:50 (5)
11	06:05 20:53	06:31 20:26	07:00 19:40	07:29 18:52	07:02 17:12	07:34 16:49 (5)
12	06:05 20:53	06:32 20:25	07:01 19:39	07:30 18:50	07:04 17:11	07:34 16:48 (5)
13	06:06 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 16:47 (5)
14	06:07 20:52	06:34 20:22	07:03 19:35	07:32 18:47	07:06 17:10	07:36 16:46 (5)
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 18:00 (5)	07:37 16:45 (5)
16	06:08 20:51	06:36 20:20	07:05 19:32	07:34 18:44 (4)	07:08 18:02 (5)	07:37 16:44 (5)
17	06:09 20:50	06:37 20:18	07:06 19:31	07:35 18:43 (4)	07:09 18:01 (5)	07:38 16:43 (5)
18	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:41 (4)	07:10 18:00 (5)	07:39 16:42 (5)
19	06:11 20:49	06:39 20:16	07:07 19:27	07:37 18:40 (4)	07:12 18:00 (5)	07:39 16:41 (5)
20	06:11 20:48	06:40 20:14	07:08 19:26	07:38 18:40 (4)	07:13 18:00 (5)	07:40 16:41 (5)
21	06:12 20:47	06:40 20:13	07:09 19:24	07:39 18:39 (4)	07:14 18:00 (5)	07:41 16:40 (5)
22	06:13 20:47	06:41 20:11	07:10 19:22	07:40 18:38 (4)	07:15 18:00 (5)	07:41 16:40 (5)
23	06:14 20:46	06:42 20:10	07:11 19:21	07:41 18:38 (4)	07:16 18:00 (5)	07:42 16:40 (5)
24	06:15 20:45	06:43 20:08	07:12 19:19	07:42 18:38 (4)	07:17 18:00 (5)	07:42 16:40 (5)
25	06:16 20:44	06:44 20:07	07:13 19:17	07:43 18:37 (4)	07:18 18:00 (5)	07:42 16:40 (5)
26	06:16 20:43	06:45 20:05	07:14 19:16	07:44 18:36 (4)	07:19 18:00 (5)	07:43 16:40 (5)
27	06:17 20:42	06:46 20:04	07:15 19:14	07:45 18:35 (4)	07:20 18:00 (5)	07:43 16:40 (5)
28	06:18 20:41	06:47 20:02	07:16 19:13	07:46 18:34 (4)	07:21 18:00 (5)	07:44 16:40 (5)
29	06:19 20:41	06:48 20:01	07:17 19:11	07:47 18:33 (4)	07:22 18:00 (5)	07:44 16:40 (5)
30	06:20 20:40	06:49 19:59	07:18 19:09	07:48 18:32 (4)	07:23 18:00 (5)	07:44 16:40 (5)
31	06:21 20:39	06:50 19:58		07:49 18:31 (4)	07:24 18:00 (5)	07:44 16:40 (5)
Potential sun hours	455	425	374	347	301	292
Total, worst case			251	557	2547	3680
Sun reduction			0,65	0,54	0,51	0,45
Oper. time red.			0,93	0,93	0,93	0,93
Wind dir. red.			0,74	0,68	0,48	0,46
Total reduction			0,44	0,34	0,22	0,19
Total, real			111	190	569	713

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 49

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AE - V

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45	15:22 (6) 07:32	17:02 (5) 06:58	17:50 (4) 07:09	06:26	05:58
	17:09	36 15:58 (6) 17:42	17 17:19 (5) 18:15	4 17:54 (4) 19:47	20:17	20:45
2	07:45	15:23 (6) 07:32	17:02 (5) 06:57	17:48 (4) 07:08	06:24	05:58
	17:10	35 15:58 (6) 17:44	18 17:20 (5) 18:16	7 17:55 (4) 19:48	20:18	20:45
3	07:45	15:24 (6) 07:31	17:02 (5) 06:55	17:48 (4) 07:06	06:23	05:57
	17:11	34 15:58 (6) 17:45	20 17:22 (5) 18:17	8 17:56 (4) 19:49	20:19	20:46
4	07:45	15:25 (6) 07:30	17:03 (5) 06:54	17:47 (4) 07:05	06:22	05:57
	17:12	33 15:58 (6) 17:46	20 17:23 (5) 18:18	10 17:57 (4) 19:50	20:20	20:47
5	07:45	15:26 (6) 07:29	17:03 (5) 06:52	17:47 (4) 07:03	06:21	05:57
	17:13	32 15:58 (6) 17:47	21 17:24 (5) 18:19	11 17:58 (4) 19:51	20:21	20:48
6	07:45	15:27 (6) 07:28	17:03 (5) 06:51	17:46 (4) 07:02	06:20	05:56
	17:14	31 15:58 (6) 17:48	23 17:26 (5) 18:20	13 17:59 (4) 19:52	20:22	20:48
7	07:45	15:28 (6) 07:27	17:04 (5) 06:49	17:47 (4) 07:00	06:18	05:56
	17:15	29 15:57 (6) 17:50	23 17:27 (5) 18:21	14 18:01 (4) 19:53	20:23	20:49
8	07:45	15:30 (6) 07:25	17:05 (5) 06:48	17:46 (4) 06:58	06:17	05:56
	17:16	27 15:57 (6) 17:51	23 17:28 (5) 18:22	15 18:01 (4) 19:54	20:24	20:49
9	07:45	15:32 (6) 07:24	17:06 (5) 06:46	17:48 (4) 06:57	06:16	05:56
	17:17	25 15:57 (6) 17:52	22 17:28 (5) 18:23	15 18:03 (4) 19:55	20:25	20:50
10	07:45	15:34 (6) 07:23	17:06 (5) 06:45	17:48 (4) 06:55	06:15	05:56
	17:18	22 15:56 (6) 17:53	20 17:26 (5) 18:24	13 18:01 (4) 19:56	20:26	20:50
11	07:44	15:35 (6) 07:22	17:07 (5) 06:43	17:50 (4) 06:54	06:14	05:55
	17:19	19 15:54 (6) 17:54	18 17:25 (5) 18:25	9 17:59 (4) 19:57	20:27	20:51
12	07:44	15:38 (6) 07:21	17:09 (5) 06:41	06:52	06:13	05:55
	17:20	15 15:53 (6) 17:55	15 17:24 (5) 18:27	19:58	20:28	20:51
13	07:44	15:42 (6) 07:20	17:13 (5) 06:40	06:51	06:12	05:55
	17:21	8 15:50 (6) 17:57	8 17:21 (5) 18:28	19:59	20:29	20:52
14	07:44	07:19	06:38	06:49	06:11	05:55
	17:22	07:19	18:29	20:00	20:29	20:52
15	07:43	07:17	06:37	06:48	06:10	05:55
	17:23	07:19	18:30	20:01	20:30	20:53
16	07:43	07:16	06:35	06:46	06:09	05:55
	17:24	18:00	18:31	20:02	20:31	20:53
17	07:42	07:15	06:34	06:45	06:08	05:55
	17:25	18:01	18:32	20:03	20:32	20:54
18	07:42	07:14	06:32	06:43	06:07	05:55
	17:26	18:02	18:33	20:04	20:33	20:54
19	07:42	07:12	06:30	06:42	06:07	05:55
	17:27	18:04	18:34	20:05	20:34	20:54
20	07:41	07:11	06:29	06:40	06:06	05:56
	17:28	18:05	18:35	20:06	20:35	20:54
21	07:41	07:10	06:27	06:39	06:05	05:56
	17:29	18:06	18:36	20:07	20:36	20:55
22	07:40	07:08	06:26	06:38	06:04	05:56
	17:31	18:07	18:37	20:08	20:37	20:55
23	07:39	07:07	06:24	06:36	06:03	05:56
	17:32	18:08	18:38	20:09	20:38	20:55
24	07:39	17:08 (5) 07:05	06:22	06:35	06:03	05:56
	17:33	2 17:09 (5) 18:09	18:39	20:10	20:38	20:55
25	07:38	17:06 (5) 07:04	06:21	06:33	06:02	05:57
	17:34	4 17:10 (5) 18:10	18:40	20:11	20:39	20:55
26	07:37	17:05 (5) 07:03	06:19	06:32	06:01	05:57
	17:35	6 17:11 (5) 18:11	18:41	20:12	20:40	20:55
27	07:37	17:04 (5) 07:01	06:17	06:31	06:01	05:57
	17:36	8 17:12 (5) 18:13	18:42	20:13	20:41	20:56
28	07:36	17:04 (5) 07:00	06:16	06:29	06:00	05:58
	17:38	10 17:14 (5) 18:14	18:43	20:14	20:42	20:56
29	07:35	17:03 (5) 07:00	06:14	06:28	06:00	05:58
	17:39	12 17:15 (5) 18:15	19:44	20:15	20:43	20:56
30	07:34	17:03 (5) 07:00	06:13	06:27	05:59	05:59
	17:40	14 17:17 (5) 18:17	19:45	20:16	20:43	20:56
31	07:33	17:03 (5) 07:00	06:11	06:26	05:59	05:59
	17:41	15 17:18 (5) 18:18	19:46	20:17	20:44	20:56
Potential sun hours	301	299	370	397	445	448
Total, worst case	417	248	119			
Sun reduction	0,45	0,47	0,49			
Oper. time red.	0,93	0,93	0,93			
Wind dir. red.	0,57	0,67	0,72			
Total reduction	0,24	0,29	0,33			
Total, real	99	72	39			

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

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

Project:
Nurri_seconda presentazione

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 01/02/2023 11:46 / 50

Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AE - V

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELIMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:59	06:22	06:51	07:19	06:51	16:35 (5) 07:24 15:17 (6)
	20:55	20:38	19:56	19:08	17:23	16:56 (5) 17:00 15:36 (6)
2	05:59	06:23	06:52	07:20	18:30 (4) 06:52	16:34 (5) 07:25 15:16 (6)
	20:55	20:37	19:55	19:06	6 18:36 (4) 17:22	23 16:57 (5) 17:00 15:38 (6)
3	06:00	06:24	06:53	07:21	18:27 (4) 06:53	16:34 (5) 07:26 15:15 (6)
	20:55	20:36	19:53	19:04	11 18:38 (4) 17:21	24 16:58 (5) 17:00 15:40 (6)
4	06:00	06:25	06:54	07:22	18:25 (4) 06:54	16:34 (5) 07:27 15:14 (6)
	20:55	20:34	19:52	19:03	15 18:40 (4) 17:19	23 16:57 (5) 16:59 15:41 (6)
5	06:01	06:25	06:54	07:23	18:23 (4) 06:56	16:33 (5) 07:28 15:14 (6)
	20:55	20:33	19:50	19:01	16 18:39 (4) 17:18	22 16:55 (5) 16:59 15:42 (6)
6	06:02	06:26	06:55	07:24	18:22 (4) 06:57	16:33 (5) 07:29 15:13 (6)
	20:55	20:32	19:48	19:00	15 18:37 (4) 17:17	21 16:54 (5) 16:59 15:44 (6)
7	06:02	06:27	06:56	07:25	18:22 (4) 06:58	16:32 (5) 07:30 15:13 (6)
	20:54	20:31	19:47	18:58	13 18:35 (4) 17:16	21 16:53 (5) 16:59 15:45 (6)
8	06:03	06:28	06:57	07:26	18:21 (4) 06:59	16:33 (5) 07:31 15:13 (6)
	20:54	20:30	19:45	18:57	13 18:34 (4) 17:15	19 16:52 (5) 16:59 15:46 (6)
9	06:03	06:29	06:58	07:27	18:21 (4) 07:00	16:33 (5) 07:32 15:13 (6)
	20:54	20:29	19:44	18:55	11 18:32 (4) 17:14	18 16:51 (5) 16:59 15:47 (6)
10	06:04	06:30	06:59	07:28	18:21 (4) 07:01	16:33 (5) 07:33 15:13 (6)
	20:53	20:27	19:42	18:53	10 18:31 (4) 17:13	17 16:50 (5) 16:59 15:48 (6)
11	06:05	06:31	07:00	07:29	18:21 (4) 07:02	16:34 (5) 07:34 15:13 (6)
	20:53	20:26	19:40	18:52	8 18:29 (4) 17:12	15 16:49 (5) 16:59 15:49 (6)
12	06:05	06:32	07:01	07:30	18:23 (4) 07:04	16:34 (5) 07:34 15:12 (6)
	20:53	20:25	19:39	18:50	5 18:28 (4) 17:11	13 16:47 (5) 16:59 15:49 (6)
13	06:06	06:33	07:02	07:31	18:24 (4) 07:05	16:35 (5) 07:35 15:12 (6)
	20:52	20:24	19:37	18:49	3 18:27 (4) 17:11	12 16:47 (5) 17:00 15:50 (6)
14	06:07	06:34	07:03	07:32	07:06	16:36 (5) 07:36 15:13 (6)
	20:52	20:22	19:35	18:47	17:10	10 16:46 (5) 17:00 15:51 (6)
15	06:08	06:35	07:04	07:33	07:07	16:37 (5) 07:37 15:13 (6)
	20:51	20:21	19:34	18:46	17:09	8 16:45 (5) 17:00 15:52 (6)
16	06:08	06:36	07:05	07:34	07:08	16:38 (5) 07:37 15:13 (6)
	20:50	20:20	19:32	18:44	17:08	6 16:44 (5) 17:00 15:52 (6)
17	06:09	06:37	07:06	07:35	07:09	16:40 (5) 07:38 15:13 (6)
	20:50	20:18	19:31	18:43	17:07	4 16:44 (5) 17:01 15:53 (6)
18	06:10	06:38	07:07	07:36	07:10	16:42 (5) 07:39 15:14 (6)
	20:49	20:17	19:29	18:41	17:07	2 16:43 (5) 17:01 15:54 (6)
19	06:11	06:39	07:07	07:37	07:12	07:39 15:14 (6)
	20:49	20:16	19:27	18:40	17:06	17:01 40 15:54 (6)
20	06:11	06:40	07:08	07:38	07:13	07:40 40 15:15 (6)
	20:48	20:14	19:26	18:39	17:05	17:02 40 15:55 (6)
21	06:12	06:40	07:09	07:39	07:14	07:41 40 15:15 (6)
	20:47	20:13	19:24	18:37	17:05	17:02 40 15:55 (6)
22	06:13	06:41	07:10	07:40	07:15	07:41 40 15:16 (6)
	20:47	20:11	19:22	18:36	17:04	17:03 40 15:56 (6)
23	06:14	06:42	07:11	07:41	07:16	07:42 40 15:16 (6)
	20:46	20:10	19:21	18:34	17:03	17:03 40 15:56 (6)
24	06:15	06:43	07:12	07:42	07:17	07:42 40 15:16 (6)
	20:45	20:08	19:19	18:33	17:03	17:04 40 15:56 (6)
25	06:16	06:44	07:13	07:43	07:18	07:42 40 15:17 (6)
	20:44	20:07	19:17	17:32	17:02	17:04 40 15:57 (6)
26	06:16	06:45	07:14	07:44	07:19	07:43 40 15:17 (6)
	20:43	20:05	19:16	17:30	17:02	17:05 40 15:57 (6)
27	06:17	06:46	07:15	07:45	07:20	07:43 40 15:18 (6)
	20:42	20:04	19:14	17:29	17:01	17:06 39 15:57 (6)
28	06:18	06:47	07:16	07:46	07:21	07:44 40 15:19 (6)
	20:41	20:02	19:13	17:28	17:01	17:06 39 15:58 (6)
29	06:19	06:48	07:17	07:47	16:42 (5) 07:22	15:22 (6) 07:44 40 15:20 (6)
	20:41	20:01	19:11	17:27	9 16:51 (5) 17:01	8 15:30 (6) 17:07 38 15:58 (6)
30	06:20	06:49	07:18	07:49	16:39 (5) 07:23	15:19 (6) 07:44 40 15:20 (6)
	20:40	19:59	19:09	17:25	15 16:54 (5) 17:00	15 15:34 (6) 17:08 38 15:58 (6)
31	06:21	06:50	07:19	07:50	16:37 (5) 07:24	17:04 40 15:21 (6)
	20:39	19:58	19:08	17:24	18 16:55 (5) 17:01	17:08 37 15:58 (6)
Potential sun hours	455	425	374	347	301	292
Total, worst case				168	302	1104
Sun reduction				0,54	0,51	0,45
Oper. time red.				0,93	0,93	0,93
Wind dir. red.				0,70	0,66	0,55
Total reduction				0,35	0,31	0,23
Total, real				60	93	254

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

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

Project:
Nurri_seconda presentazione

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01/02/2023 11:46 / 51

Licensed user:
Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar

Calculation: Nurri seconda presentazione 6WTGShadow receptor: AF - W

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:45 17:09	07:32 17:42	06:58 18:15	07:09								
2	07:45 17:10	07:31 17:44	06:57 18:16	07:08	36	18:27 (6)	06:26	05:58	05:59	06:22	06:51	07:19
3	07:45 17:11	07:31 17:45	06:55 18:17	07:06	34	19:01 (6)	06:23	05:57	06:00	06:24	06:53	07:21
4	07:45 17:12	07:30 17:46	06:54 18:18	07:05	33	19:01 (6)	06:20	05:57	06:01	06:25	06:54	07:22
5	07:45 17:13	07:29 17:47	06:52 18:19	07:03	32	19:00 (6)	06:21	05:57	06:01	06:25	06:54	07:23
6	07:45 17:14	07:28 17:48	06:51 18:20	07:02	30	18:59 (6)	06:22	05:56	06:02	06:26	06:55	07:24
7	07:45 17:15	07:27 17:50	06:49 18:21	07:00	28	18:59 (6)	06:18	05:56	06:02	06:27	06:56	07:25
8	07:45 17:16	07:25 17:51	06:48 18:22	06:58	25	18:58 (6)	06:17	05:56	06:03	06:28	06:57	07:26
9	07:45 17:17	07:24 17:52	06:46 18:23	06:57	21	18:53 (6)	06:16	05:56	06:03	06:29	06:58	07:27
10	07:45 17:18	07:23 17:53	06:45 18:24	06:55	16	18:34 (6)	06:15	05:56	06:04	06:30	06:59	07:28
11	07:44 17:19	07:22 17:54	06:43 18:25	06:54	9	18:50 (6)	06:14	05:55	06:05	06:31	07:00	07:29
12	07:44 17:20	07:21 17:55	06:41 18:26	06:52		18:47 (6)	06:13	05:55	06:05	06:32	07:01	07:30
13	07:44 17:21	07:20 17:57	06:40 18:28	06:51			06:12	05:55	06:06	06:33	07:02	07:31
14	07:44 17:22	07:19 17:58	06:38 18:29	06:49			06:11	05:55	06:07	06:34	07:03	07:32
15	07:43 17:23	07:17 17:59	06:37 18:30	06:48			06:10	05:55	06:08	06:35	07:04	07:33
16	07:43 17:24	07:16 18:00	06:35 18:31	06:46			06:09	05:55	06:08	06:36	07:05	07:34
17	07:42 17:25	07:15 18:01	06:34 18:32	06:45			06:08	05:55	06:09	06:37	07:06	07:35
18	07:42 17:26	07:13 18:02	06:32 18:33	06:43			06:07	05:55	06:10	06:38	07:07	07:36
19	07:42 17:27	07:12 18:04	06:30 18:34	06:42	8	17:45 (6)	06:42	05:55	06:11	06:39	07:07	07:37
20	07:41 17:28	07:11 18:05	06:29 18:35	06:40	17	17:57 (6)	06:40	05:56	06:11	06:40	07:08	07:38
21	07:40 17:29	07:09 18:06	06:27 18:36	06:39	22	17:59 (6)	06:39	05:56	06:12	06:40	07:09	07:39
22	07:40 17:31	07:08 18:07	06:25 18:37	06:38	26	17:53 (6)	06:38	05:56	06:13	06:41	07:10	07:40
23	07:39 17:32	07:07 18:08	06:24 18:38	06:36	29	18:02 (6)	06:36	05:56	06:14	06:42	07:11	07:41
24	07:39 17:33	07:05 18:09	06:22 18:39	06:35	31	18:02 (6)	06:35	05:56	06:15	06:43	07:12	07:42
25	07:38 17:34	07:04 18:10	06:21 18:40	06:33	32	18:03 (6)	06:33	05:57	06:16	06:44	07:13	07:43
26	07:37 17:35	07:03 18:11	06:19 18:41	06:32	34	18:03 (6)	06:32	05:57	06:16	06:45	07:14	07:44
27	07:37 17:36	07:01 18:13	06:17 18:42	06:31	35	18:04 (6)	06:31	05:57	06:17	06:46	07:15	07:45
28	07:36 17:38	07:00 18:14	06:16 18:43	06:29	36	18:04 (6)	06:29	05:58	06:18	06:47	07:16	07:46
29	07:35 17:39	07:00 19:44	06:15 19:04	06:28	37	18:27 (6)	06:28	05:58	06:19	06:48	07:17	07:47
30	07:34 17:40	07:00 19:45	06:14 19:05	06:27	37	18:27 (6)	06:27	05:59	06:20	06:49	07:18	07:48
31	07:33 17:41	07:00 19:46	06:13 19:06	06:26			06:26	05:59	06:21	06:50	07:19	07:49
Potential sun hours	301	299	370	397			445	448	455	425	374	292
Total, worst case			380	299						690		
Sun reduction			0,49	0,53						0,65		
Oper. time red.			0,93	0,93						0,93		
Wind dir. red.			0,74	0,74						0,74		
Total reduction			0,34	0,36						0,45		
Total, real			129	109						308		

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

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

Project:

Nurri_seconda presentazione

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01/02/2023 11:48 / 1

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWTG: 1 - N06

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELIMA S]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:45 08:30-09:04/34 16:21-16:38/17 17:10 14:06-15:04/58 16:40-16:44/4	07:33 08:45-09:07/22 17:43 18:15	06:58 18:15	07:10 07:32-07:57/25 19:47 07:58-08:35/37	06:26 07:39-08:15/36 20:17 20:45	05:58 06:52-07:28/36 20:45
2	07:45 08:30-09:05/35 16:23-16:39/16 17:10 14:08-15:05/57 16:40-16:45/5	07:32 08:47-09:05/18 17:44 17:17-17:20/3	06:57 18:16	07:08 07:31-07:56/25 19:48 07:58-08:33/35	06:24 07:39-08:14/35 20:18 20:46	05:58 06:52-07:29/37 20:46
3	07:45 08:30-09:06/36 16:24-16:41/17 17:11 14:09-15:06/57 16:41-16:46/5	07:31 08:50-09:03/13 17:45 17:15-17:22/7	06:55 18:17	07:06 07:32-07:56/24 19:49 07:59-08:33/34	06:23 07:40-08:13/33 20:19 20:46	05:58 06:53-07:30/37 20:46
4	07:45 08:31-09:06/35 16:24-16:41/17 17:12 14:10-15:06/56 16:41-16:47/6	07:30 17:14-17:23/9 17:46 18:18	06:54 18:18	07:05 07:32-07:54/22 19:50 07:59-08:31/32	06:22 07:42-08:11/29 20:20 20:47	05:57 06:52-07:29/37 20:47
5	07:45 08:31-09:07/36 16:24-16:40/16 17:13 14:10-15:06/56 16:40-16:47/7	07:29 17:13-17:24/11 17:47 18:19	06:52 18:19	07:03 07:33-07:52/19 19:51 07:59-08:29/30	06:21 07:43-08:10/27 20:21 20:48	05:57 06:52-07:30/38 20:48
6	07:45 08:30-09:07/37 16:25-16:40/15 17:14 14:10-15:05/55 16:40-16:48/8	07:28 17:13-17:26/13 17:49 18:20	06:51 18:20	07:02 07:34-07:51/17 08:09-08:28/19 19:52 08:00-08:09/9	06:20 07:45-08:08/23 20:22 20:48	05:57 06:52-07:31/39 20:48
7	07:45 08:31-09:07/36 16:27-16:38/11 17:15 14:11-15:05/54 16:39-16:49/10	07:27 17:12-17:27/15 17:50 18:21	06:49 18:21	07:00 07:36-07:48/12 08:13-08:26/13 19:53 07:54-08:13/19	06:19 07:46-08:06/20 20:23 20:49	05:56 06:52-07:31/39 20:49
8	07:45 08:31-09:08/37 16:28-16:38/10 17:16 14:13-15:05/52 16:39-16:50/11	07:26 17:12-17:28/16 17:51 18:22	06:48 18:22	06:59 07:41-07:43/2 08:16-08:24/8 19:54 07:52-08:16/24	06:17 07:49-08:04/15 20:24 20:49	05:56 06:52-07:31/39 20:49
9	07:45 08:31-09:09/38 16:30-16:38/8 17:17 14:14-15:06/52 16:39-16:52/13	07:24 17:12-17:30/18 17:52 18:23	06:46 18:23	06:57 07:49-08:18/29 19:55 08:18-08:21/3	06:16 07:53-07:59/6 20:25 20:50	05:56 06:52-07:31/39 20:50
10	07:45 08:32-09:10/38 16:33-16:36/3 17:18 14:15-15:06/51 16:39-16:53/14	07:23 17:12-17:30/18 17:53 18:25	06:45 18:25	06:55 07:47-08:19/32 19:56 19:56	06:15 20:26 20:51	05:56 06:52-07:32/40 20:51
11	07:44 08:31-09:10/39 16:38-16:53/15 17:19 14:16-15:05/49	07:22 17:12-17:31/19 17:54 18:26	06:43 18:26	06:54 07:45-08:19/34 19:57 19:57	06:14 20:27 20:51	05:56 06:52-07:32/40 20:51
12	07:44 08:32-09:10/38 16:39-16:55/16 17:20 14:17-15:05/48	07:21 17:13-17:31/18 17:56 18:27	06:42 18:27	06:52 07:44-08:21/37 19:58 19:58	06:13 20:28 20:52	05:55 06:52-07:32/40 20:52
13	07:44 08:33-09:11/38 16:39-16:56/17 17:21 14:19-15:05/46	07:20 17:14-17:30/16 17:57 18:28	06:40 18:28	06:51 07:42-08:21/39 19:59 19:59	06:12 20:29 20:52	05:55 06:52-07:33/41 20:52
14	07:44 08:32-09:11/39 16:39-16:57/18 17:22 14:19-15:04/45	07:19 17:15-17:30/15 17:58 18:29	06:38 18:29	06:49 07:42-08:22/40 20:00 20:00	06:11 20:30 20:52	05:55 06:53-07:33/40 20:52
15	07:43 08:33-09:12/39 16:39-16:58/19 17:23 14:21-15:04/43	07:17 17:16-17:27/11 17:59 18:30	06:37 18:30	06:48 07:40-08:22/42 20:01 20:01	06:10 20:30 20:53	05:55 06:53-07:33/40 20:53
16	07:43 08:34-09:13/39 16:40-17:00/20 17:24 14:23-15:03/40	07:16 17:19-17:25/6 18:00 18:00	06:35 18:00	06:46 07:40-08:22/42 20:02 20:02	06:09 20:31 20:53	05:55 06:53-07:33/40 20:53
17	07:43 08:34-09:12/38 16:40-17:00/20 17:25 14:25-15:02/37	07:15 18:01 18:01 18:32	06:34 18:32	07:16-07:27/11 06:45 07:39-08:22/43 20:03 20:03	06:08 20:32 20:54	05:55 06:53-07:33/40 20:54
18	07:42 08:34-09:13/39 16:41-17:02/21 17:26 14:27-15:02/35	07:14 18:03 18:03 18:33	06:32 18:33	07:11-07:30/19 06:43 07:38-08:22/44 20:04 20:04	06:08 20:33 20:54	05:55 06:53-07:34/41 20:54
19	07:42 08:34-09:13/39 16:40-17:02/22 17:27 14:29-15:00/31	07:12 18:04 18:04 18:34	06:30 18:34	07:09-07:33/24 06:42 07:37-08:22/45 20:05 20:05	06:07 07:06-07:13/7 20:34 20:54	05:56 06:53-07:34/41 20:54
20	07:41 08:35-09:14/39 16:41-17:02/21 17:29 14:31-14:58/27	07:11 18:05 18:05 18:35	06:29 18:35	07:07-07:34/27 06:41 07:37-08:22/45 20:06 20:06	06:06 07:02-07:16/14 20:35 20:55	05:56 06:54-07:35/41 20:55
21	07:41 08:35-09:13/38 16:42-17:03/21 17:30 14:35-14:56/21	07:10 18:06 18:06 18:36	06:27 18:36	07:06-07:35/29 06:39 07:37-08:22/45 20:07 20:07	06:05 07:00-07:18/18 20:36 20:56	05:56 06:54-07:35/41 20:56
22	07:40 08:36-09:13/37 16:42-17:02/20 17:31 14:38-14:53/15	07:08 18:07 18:07 18:37	06:26 18:37	07:04-07:36/32 06:38 07:37-08:21/44 20:08 20:08	06:04 06:59-07:21/22 20:37 20:55	05:56 06:54-07:35/41 20:55
23	07:39 08:37-09:14/37 17:32 16:42-17:02/20	07:07 18:08 18:08 18:38	06:24 18:38	06:42-06:53/11 06:36 07:37-08:21/44 20:09 20:09	06:04 06:58-07:22/24 20:38 20:55	05:56 06:54-07:35/41 20:55
24	07:39 08:37-09:13/36 17:33 16:44-17:02/18	07:06 18:09 18:09 18:39	06:22 18:39	06:41-06:56/15 06:35 07:36-08:20/44 20:10 20:10	06:03 06:56-07:22/26 20:39 20:55	05:57 06:55-07:36/41 20:55
25	07:38 08:38-09:13/35 17:34 16:45-17:01/16	07:04 18:10 18:10 18:40	06:21 18:40	06:39-06:57/18 06:34 07:37-08:20/43 20:11 20:11	06:02 06:56-07:24/28 20:39 20:55	05:57 06:55-07:36/41 20:55
26	07:37 08:38-09:12/34 17:35 16:46-17:00/14	07:03 18:12 18:12 18:41	06:19 18:41	06:37-06:57/20 06:32 07:37-08:20/43 20:12 20:12	06:02 06:55-07:24/29 20:40 20:56	05:57 06:55-07:35/40 20:56
27	07:37 08:40-09:12/32 17:37 16:47-16:59/12	07:01 18:13 18:13 18:42	06:18 18:42	06:36-06:58/22 06:31 07:38-08:19/41 20:13 20:13	06:01 06:55-07:26/31 20:41 20:56	05:58 06:56-07:36/40 20:56
28	07:36 08:40-09:12/32 17:38 16:50-16:58/8	07:00 18:14 18:14 18:43	06:16 18:43	06:34-07:36/62 06:30 07:37-08:18/41 20:14 20:14	06:00 06:54-07:26/32 20:42 20:56	05:58 06:56-07:36/40 20:56
29	07:35 08:41-09:11/30 17:39 17:39	07:00 18:14 18:14 18:44	06:15 18:44	07:33-08:37/64 06:28 07:38-08:17/39 20:15 20:15	06:00 06:54-07:27/33 20:43 20:56	05:58 06:55-07:36/41 20:56
30	07:34 08:42-09:10/28 17:40 17:40	07:00 18:14 18:14 18:44	06:15 18:44	07:32-08:36/64 06:27 07:39-08:16/37 20:16 20:16	05:59 06:53-07:27/34 20:43 20:56	05:59 06:56-07:36/40 20:56
31	07:33 08:44-09:09/25 17:41 17:41	07:00 18:14 18:14 18:44	06:15 18:44	07:31-08:35/64 06:27 07:39-08:16/37 20:16 20:16	05:59 06:53-07:28/35 20:44 20:56	05:59 06:56-07:36/40 20:56
Potential sun hours	301	299	370	397	445	448
Sum of minutes with flicker	2629	248	664	1302	557	1191

Table 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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 2

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 1 - N06

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December	
1	05:59 06:56-07:36/40	06:22 20:38	06:51 07:44-08:18/34	07:19 19:08	06:51 16:42-17:00/18	07:25 08:14-08:53/39 16:20-16:35/15	
	20:56	20:38	19:56	19:08	17:23	17:00 13:58-14:47/49	
2	06:00 06:57-07:37/40	06:23 20:37	06:52 07:45-08:17/32	07:20 19:06	06:52 16:41-16:58/17	07:26 08:15-08:53/38 16:15-16:18/3	
	20:55	20:37	19:55	19:06	17:22	17:00 13:57-14:48/51 16:21-16:35/14	
3	06:00 06:57-07:36/39	06:24 20:36	06:53 07:47-08:16/29	07:21 19:05	06:53 16:42-16:58/16	07:27 08:15-08:53/38 16:13-16:20/7	
	20:55	20:36	19:53 08:16-08:19/3	19:05	17:21	17:00 13:57-14:49/52 16:22-16:35/13	
4	06:01 06:58-07:37/39	06:25 08:01-08:11/10	06:54 07:38-07:40/2 08:14-08:21/7	07:22 19:03	06:55 16:42-16:57/15	07:27 08:16-08:53/37 16:12-16:22/10	
	20:55	20:35	19:52 07:49-08:14/25	19:03	17:20	17:00 13:57-14:49/52 16:23-16:35/12	
5	06:01 06:57-07:36/39	06:26 07:58-08:14/16	06:55 07:33-07:45/12 08:10-08:23/13	07:23 19:01	06:56 16:43-16:55/12	07:28 08:16-08:52/36 16:12-16:23/11	
	20:55	20:33	19:50 07:51-08:10/19	19:01	17:19	16:59 13:57-14:50/53 16:24-16:34/10	
6	06:02 06:58-07:37/39	06:27 07:55-08:17/22	06:56 07:31-07:47/16 08:05-08:24/19	07:24 19:00	06:57 16:43-16:54/11	07:29 08:16-08:53/37 16:12-16:26/14	
	20:55	20:32	19:49 07:56-08:05/9	19:00	17:17	16:59 13:57-14:51/54 16:26-16:34/8	
7	06:02 06:58-07:36/38	06:27 07:54-08:19/25	06:56 07:29-07:48/19	07:25 19:02	06:58 16:44-16:53/9	07:30 08:17-08:53/36 16:11-16:27/16	
	20:54	20:31	19:47 07:55-08:25/30	19:02	17:16	16:59 13:57-14:52/55 16:27-16:34/7	
8	06:03 06:59-07:37/38	06:28 07:52-08:20/28	06:57 07:26-07:48/22	07:26 19:01	06:59 08:21-08:34/13	07:31 08:18-08:53/35 16:11-16:28/17	
	20:54	20:30	19:45 07:53-08:25/32	18:57	17:15	16:46 16:52/6	
9	06:04 07:00-07:37/37	06:29 07:51-08:21/30	06:58 07:25-07:49/24	07:27 19:00	07:00 08:18-08:36/18	07:32 08:19-08:54/35 16:12-16:29/17	
	20:54	20:29	19:44 07:52-08:26/34	18:55	17:14	16:49 16:51/2	
10	06:04 06:59-07:36/37	06:30 07:50-08:23/33	06:59 07:24-07:49/25	07:28 19:02	07:01 08:16-08:38/22	07:33 08:19-08:54/35 16:12-16:28/16	
	20:53	20:28	19:42 07:51-08:26/35	18:54	17:13	16:59 13:57-14:53/56 16:28-16:34/6	
11	06:05 07:00-07:36/36	06:31 07:48-08:23/35	07:00 07:24-07:49/25	07:29 19:03	07:03 08:15-08:40/25	07:34 08:20-08:54/34 16:12-16:29/17	
	20:53	20:26	19:40 07:50-08:27/37	18:52	17:12	16:59 13:57-14:55/58 16:31-16:35/4	
12	06:06 07:01-07:37/36	06:32 07:47-08:23/36	07:01 07:23-07:49/26	07:30 19:04	07:04 08:14-08:42/28	07:35 08:21-08:55/34 16:12-16:29/17	
	20:53	20:25	19:39 07:50-08:27/37	18:51	17:12	17:00 13:58-14:56/58 16:32-16:34/2	
13	06:06 07:01-07:36/35	06:33 07:46-08:24/38	07:02 07:23-08:27/64	07:31 19:03	07:05 08:13-08:43/30	07:35 08:21-08:54/33 16:12-16:30/18	
	20:52	20:24	19:37	18:49	17:11	17:00 13:57-14:56/59	
14	06:07 07:02-07:36/34	06:34 07:45-08:25/40	07:03 07:23-08:27/64	07:32 19:04	07:06 08:12-08:44/32	07:36 08:22-08:55/33 16:13-16:31/18	
	20:52	20:22	19:36	18:47	17:10	16:22-16:30/8	
15	06:08 07:03-07:36/33	06:35 07:45-08:25/40	07:04 07:24-07:48/24	07:33 19:05	07:07 08:12-08:44/32	07:37 08:23-08:56/33 16:13-16:32/19	
	20:51	20:21	19:34 07:49-08:27/38	18:46	17:09	16:20-16:32/12	
16	06:08 07:03-07:34/31	06:36 07:44-08:26/42	07:05 07:25-07:47/22	07:34 19:06	07:08 08:11-08:45/34	07:38 08:23-08:55/32 16:13-16:32/19	
	20:51	20:20	19:32 07:48-08:26/38	18:45	17:08	16:19-16:33/14	
17	06:09 07:04-07:34/30	06:37 07:44-08:26/42	07:06 07:26-07:46/20	07:35 19:07	07:09 08:12-08:47/35	07:38 08:23-08:56/33 16:14-16:33/19	
	20:50	20:18	19:31 07:48-08:26/38	18:43	17:07	16:19-16:35/16	
18	06:10 07:05-07:34/29	06:38 07:43-08:27/44	07:07 07:26-07:44/18	07:36 19:08	07:10 08:11-08:47/36	07:39 08:24-08:57/33 16:15-16:33/18	
	20:49	20:17	19:29 07:47-08:24/37	18:42	17:07	16:18-16:36/18	
19	06:11 07:06-07:33/27	06:39 07:43-08:27/44	07:08 07:27-07:42/15	07:37 19:09	07:12 08:11-08:48/37	07:39 08:24-08:56/32 16:14-16:33/19	
	20:49	20:16	19:27 07:48-08:23/35	18:40	17:06	16:17-16:37/20	
20	06:12 07:06-07:31/25	06:40 07:43-08:27/44	07:09 07:28-07:40/12	07:38 19:10	07:13 08:11-08:48/37 16:17-16:37/20	07:40 08:25-08:57/32 16:15-16:34/19	
	20:48	20:14	19:26 07:48-08:23/35	18:39	17:05	14:13-14:28/15	
21	06:12 07:08-07:31/23	06:41 07:41-08:26/45	07:09 07:30-07:36/6	07:39 19:11	07:14 08:10-08:48/38 16:17-16:38/21	07:41 08:25-08:57/32 16:15-16:34/19	
	20:47	20:13	19:24 07:49-08:21/32	18:37	17:05	14:10-14:31/21	
22	06:13 07:09-07:29/20	06:42 07:41-08:26/45	07:10 07:50-08:20/30	07:40 19:12	07:15 08:11-08:50/39 16:17-16:38/21	07:41 08:26-08:58/32 16:16-16:35/19	
	20:47	20:11	19:22	18:36	17:04	14:08-14:35/27	
23	06:14 07:12-07:28/16	06:42 07:41-08:26/45	07:11 07:51-08:18/27	07:41 19:13	07:16 08:11-08:50/39 16:18-16:39/21	07:42 08:26-08:58/32 16:16-16:35/19	
	20:46	20:10	19:21	18:35	17:04	14:06-14:37/31	
24	06:15 07:14-07:26/12	06:43 07:41-08:26/45	07:12 07:52-08:17/25	07:42 19:14	07:17 08:11-08:50/39 16:18-16:39/21	07:42 08:27-08:59/32 16:17-16:36/19	
	20:45	20:09	19:19	18:33	17:03	14:04-14:39/35	
25	06:16	06:44 07:41-08:25/44	07:13 07:54-08:14/20	07:43 19:15	07:18 08:12-08:50/38 16:18-16:38/20	07:43 08:27-09:00/33 16:18-16:36/18	
	20:44	20:07	19:18	18:32	17:03	14:03-14:40/37	
26	06:17	06:45 07:42-08:25/43	07:14 07:57-08:11/14	07:44 19:16	07:19 08:12-08:51/39 16:18-16:38/20	07:43 08:27-09:00/33 16:18-16:36/18	
	20:43	20:06	19:16	18:31	17:02	14:02-14:41/39	
27	06:17	06:46 07:42-08:24/42	07:15 19:14	07:45 16:45-16:57/12	07:20 08:12-08:51/39 16:18-16:37/19	07:43 08:28-09:01/33 16:19-16:38/19	
	20:42	20:04	19:14	17:29	17:02	14:00-14:43/43	
28	06:18	06:47 07:42-08:24/42	07:16 19:15	07:46 16:44-16:59/15	07:21 08:12-08:51/39 16:19-16:37/18	07:44 08:29-09:01/32 16:19-16:38/19	
	20:42	20:03	19:13	17:28	17:01	14:00-14:44/44	
29	06:19	06:48 07:43-08:23/40	07:17 19:16	07:48 16:44-17:00/16	07:22 08:13-08:51/38 16:19-16:36/17	07:44 08:29-09:02/33 16:20-16:38/18	
	20:41	20:01	19:11	17:27	17:01	13:59-14:45/46	
30	06:20	06:49 07:42-08:21/39	07:18 19:17	07:49 16:43-17:01/18	07:24 08:13-08:51/38 16:20-16:36/16	07:44 08:29-09:02/33 16:20-16:38/18	
	20:40	20:00	19:09	17:26	17:01	13:58-14:46/48	
31	06:21	06:50 07:43-08:20/37	07:19 19:18	07:50 16:42-17:01/19	07:25 08:13-08:51/38 16:20-16:36/16	07:44 08:29-09:03/34 16:21-16:38/17	
	20:39	19:58	19:09	17:24	17:02	14:06-15:04/58 16:42-16:43/1	
	Potential sun hours	455	425	374	347	301	292
	Sum of minutes with flicker	773	1036	1180	87	1559	3438

Table 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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 3

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 2 - N05

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 08:17-08:49/32 17:10 12:05-13:57/112	07:33 07:52-08:06/14 17:43	06:58 07:53-08:14/21 18:15	07:10 18:26-18:51/25 19:47	06:26 20:17	05:58 20:45
2	07:45 08:17-08:50/33 17:10 12:06-13:58/112	07:32 07:51-08:06/15 17:44	06:57 07:54-08:12/18 18:16	07:08 18:24-18:53/29 19:48	06:24 20:18	05:58 20:46
3	07:45 08:18-08:50/32 17:11 12:07-13:58/111	07:31 07:50-08:06/16 17:45	06:55 07:39-07:52/13 18:17	07:06 18:21-18:53/32 19:49	06:23 20:19	05:58 20:46
4	07:45 08:18-08:51/33 17:12 12:08-13:58/110	07:30 07:49-08:06/17 17:46	06:54 07:35-07:54/19 18:18	07:05 18:20-18:55/35 19:50	06:22 20:20	05:57 20:47
5	07:45 08:19-08:51/32 17:13 12:08-13:57/109	07:29 07:48-08:05/17 17:47	06:52 07:33-07:57/24 18:19	07:03 18:19-18:55/36 19:51	06:21 20:21	05:57 20:48
6	07:45 08:18-08:51/33 17:14 12:09-13:57/108	07:28 07:47-08:04/17 17:49	06:51 07:31-07:58/27 18:20	07:02 18:18-18:57/39 19:52	06:20 20:22	05:57 20:48
7	07:45 08:19-08:52/33 17:15 12:10-13:57/107	07:27 07:48-08:03/15 17:50	06:49 07:30-08:00/30 18:21	07:00 18:17-18:57/40 19:53	06:19 20:23	05:56 20:49
8	07:45 08:19-08:52/33 17:16 12:12-13:57/105	07:26 07:50-08:02/12 17:51	06:48 07:28-08:00/32 18:22	06:59 18:16-18:57/41 19:54	06:17 20:24	05:56 20:49
9	07:45 08:20-08:53/33 17:17 12:13-13:57/104	07:24 07:53-07:59/6 17:52	06:46 07:27-08:02/35 18:23	06:57 18:15-18:57/42 19:55	06:16 20:25	05:56 20:50
10	07:45 08:20-08:54/34 17:18 12:14-13:57/103	07:23 07:57-08:15/18 17:53	06:45 07:26-08:02/36 18:25	06:55 18:15-18:58/43 19:56	06:15 20:26	05:56 20:51
11	07:44 08:20-08:53/33 17:19 12:15-13:56/101	07:22 07:54-08:16/22 17:54	06:43 07:25-08:02/37 18:26	06:54 18:14-18:57/43 19:57	06:14 20:27	05:56 20:51
12	07:44 08:21-08:54/33 17:20 12:16-13:56/100	07:21 07:53-08:17/24 17:56	06:42 07:24-08:02/38 18:27	06:52 18:15-18:58/43 19:58	06:13 20:28	05:55 20:52
13	07:44 08:21-08:55/34 17:21 12:18-13:56/98	07:20 07:52-08:19/27 17:57	06:40 07:23-08:02/39 18:28	06:51 18:14-18:57/43 19:59	06:12 20:29	05:55 20:52
14	07:44 08:21-08:55/34 17:22 12:19-13:55/96	07:19 07:51-08:20/29 17:58	06:38 07:23-08:02/39 18:29	06:49 18:14-18:57/43 20:00	06:11 20:30	05:55 20:52
15	07:43 08:22-08:55/33 17:23 12:21-13:55/94	07:17 07:50-08:20/30 17:59	06:37 07:23-08:01/38 18:30	06:48 18:14-18:56/42 20:01	06:10 20:30	05:55 20:53
16	07:43 08:23-08:56/33 17:24 12:23-13:54/91	07:16 07:49-08:21/32 18:00	06:35 07:23-08:02/39 18:31	06:46 18:14-18:56/42 20:02	06:09 20:31	05:55 20:53
17	07:43 08:23-08:56/33 17:25 12:24-13:53/89	07:15 07:49-08:22/33 18:01	06:34 07:23-08:01/38 18:32	06:45 18:14-18:55/41 20:03	06:08 20:32	05:55 20:54
18	07:42 08:24-08:56/32 17:26 12:27-13:53/86	07:14 07:49-08:22/33 18:03	06:32 07:22-08:00/38 18:33	06:43 18:15-18:55/40 20:04	06:08 20:33	05:56 20:54
19	07:42 08:24-08:56/32 17:27 12:29-13:51/82	07:12 07:48-08:22/34 18:04	06:30 07:23-07:59/36 18:34	06:42 18:15-18:53/38 20:05	06:07 20:34	05:56 20:54
20	07:41 08:24-08:55/31 17:29 12:30-13:50/80	07:11 07:48-08:22/34 18:05	06:29 07:23-07:58/35 18:35	06:41 18:16-18:53/37 20:06	06:06 20:35	05:56 20:54
21	07:41 08:25-08:56/31 17:30 12:33-13:49/76	07:10 07:48-08:22/34 18:06	06:27 07:24-07:57/33 18:36	06:39 18:17-18:52/35 20:07	06:05 20:36	05:56 20:55
22	07:40 08:26-08:55/29 17:31 12:36-13:47/71	07:08 07:48-08:22/34 18:07	06:26 07:24-07:55/31 18:37	06:38 18:17-18:50/33 20:08	06:04 20:37	05:56 20:55
23	07:39 08:27-08:56/29 17:32 12:39-13:45/66	07:07 07:49-08:22/33 18:08	06:24 07:25-07:53/28 18:38	06:36 18:18-18:49/31 20:09	06:04 20:38	05:56 20:55
24	07:39 07:59-08:01/2 12:43-13:43/60 17:33 08:28-08:55/27	07:05 07:48-08:20/32 18:09	06:22 07:27-07:52/25 18:39	06:35 18:19-18:47/28 20:10	06:03 20:39	05:57 20:55
25	07:38 07:58-08:02/4 12:46-13:40/54 17:34 08:29-08:54/25	07:04 07:49-08:20/31 18:10	06:21 07:28-07:49/21 18:40	06:34 18:21-18:46/25 20:11	06:02 20:39	05:57 20:55
26	07:37 07:57-08:03/6 12:51-13:36/45 17:35 08:30-08:53/23	07:03 07:49-08:19/30 18:12	06:19 07:30-07:46/16 18:41	06:32 18:23-18:44/21 20:12	06:02 20:40	05:57 20:55
27	07:37 07:57-08:05/8 12:57-13:32/35 17:37 08:32-08:53/21	07:01 07:51-08:18/27 18:13	06:18 07:35-07:41/6 18:42	06:31 18:24-18:41/17 20:13	06:01 20:41	05:58 20:56
28	07:36 07:56-08:05/9 13:08-13:24/16 17:38 08:34-08:51/17	07:00 07:51-08:16/25 18:14	06:16 18:43	06:30 18:28-18:37/9 20:14	06:00 20:42	05:58 20:56
29	07:35 07:55-08:06/11 17:39 08:36-08:49/13		07:14 19:44	06:28 20:15	06:00 20:43	05:58 20:56
30	07:34 07:54-08:06/12 17:40 08:39-08:46/7		07:13 18:33-18:45/12 19:45	06:27 20:16	05:59 20:43	05:59 20:56
31	07:33 07:53-08:06/13 17:41		07:11 18:29-18:48/19 19:46		05:59 20:44	
	Potential sun hours 301	299	370	397	445	448
	Sum of minutes with flicker 3364	703	834	973	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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 4

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWTG: 2 - N05

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 20:55	06:22 20:38	06:51 18:13-18:56/43 19:56	07:19 08:04-08:42/38 19:08	06:51 07:26-07:43/17 17:23	07:25 08:02-08:36/34 17:00 11:57-13:38/101
2	06:00 20:55	06:23 20:37	06:52 18:13-18:56/43 19:55	07:20 08:04-08:41/37 19:06	06:52 07:21-07:40/19 17:22	07:26 08:03-08:37/34 17:00 11:56-13:39/103
3	06:00 20:55	06:24 20:36	06:53 18:13-18:55/42 19:53	07:21 08:04-08:40/36 19:05	06:53 07:19-07:32/13 17:21	07:26 08:04-08:37/33 17:00 11:56-13:40/104
4	06:01 20:55	06:25 20:34	06:54 18:13-18:54/41 19:52	07:22 08:03-08:38/35 19:03	06:55 07:18-07:33/15 17:20	07:27 08:04-08:37/33 17:00 11:56-13:41/105
5	06:01 20:55	06:26 20:33	06:55 18:14-18:54/40 19:50	07:23 08:04-08:37/33 19:01	06:56 07:17-07:34/17 17:19	07:28 08:04-08:37/33 17:00 11:55-13:42/107
6	06:02 20:55	06:27 20:32	06:56 18:14-18:53/39 19:49	07:24 08:05-08:36/31 19:00	06:57 07:18-07:35/17 17:17	07:29 08:05-08:37/32 16:59 11:55-13:43/108
7	06:02 20:54	06:27 20:31	06:56 18:14-18:50/36 19:47	07:25 08:06-08:35/29 18:58	06:58 07:20-07:36/16 17:16	07:30 08:05-08:37/32 16:59 11:55-13:44/109
8	06:03 20:54	06:28 20:30	06:57 18:14-18:49/35 19:45	07:26 08:08-08:34/26 18:57	06:59 07:21-07:37/16 17:15	07:31 08:05-08:38/33 16:59 11:55-13:45/110
9	06:04 20:54	06:29 20:29	06:58 18:15-18:48/33 19:44	07:27 08:10-08:31/21 18:55	07:00 07:22-07:37/15 17:14	07:32 08:06-08:38/32 16:59 11:55-13:46/111
10	06:04 20:53	06:30 20:27	06:59 18:17-18:46/29 19:42	07:28 08:12-08:28/16 18:54 08:37-08:39/2	07:01 07:23-07:37/14 17:13	07:33 08:06-08:39/33 16:59 11:55-13:47/112
11	06:05 20:53	06:31 20:26	07:00 18:18-18:44/26 19:40	07:29 08:17-08:23/6 18:52 08:31-08:45/14	07:03 07:24-07:37/13 17:12	07:34 08:07-08:39/32 16:59 11:56-13:48/112
12	06:06 20:53	06:32 20:25	07:01 18:20-18:41/21 19:39	07:30 08:28-08:47/19 18:51	07:04 07:26-07:38/12 17:12 08:11-08:18/7	07:35 08:07-08:40/33 17:00 11:55-13:48/113
13	06:06 20:52	06:33 20:24	07:02 18:24-18:37/13 19:37	07:31 08:26-08:49/23 18:49	07:05 07:27-07:37/10 17:11 08:08-08:21/13	07:35 08:07-08:39/32 17:00 11:55-13:49/114
14	06:07 20:52	06:34 20:22	07:03 19:36	07:32 08:24-08:50/26 18:47	07:06 07:28-07:37/9 12:39-12:57/18 17:10 08:05-08:23/18	07:36 08:08-08:40/32 17:00 11:56-13:49/113
15	06:08 20:51	06:35 18:35-18:46/11 20:21	07:04 19:34	07:33 08:23-08:51/28 18:46	07:07 07:29-07:37/8 12:30-13:05/35 17:09 08:04-08:25/21	07:37 08:08-08:40/32 17:00 11:56-13:50/114
16	06:08 20:51	06:36 18:31-18:49/18 20:20	07:05 19:32	07:34 08:22-08:51/29 18:45	07:08 07:30-07:36/6 12:24-13:09/45 17:08 08:03-08:26/23	07:37 08:08-08:40/32 17:00 11:56-13:50/114
17	06:09 20:50	06:37 18:29-18:51/22 20:18	07:06 08:19-08:33/14 19:31	07:35 08:21-08:52/31 18:43	07:09 07:32-07:36/4 12:20-13:14/54 17:07 08:03-08:28/25	07:38 08:09-08:41/32 17:01 11:57-13:51/114
18	06:10 20:49	06:38 18:27-18:53/26 20:17	07:07 08:16-08:36/20 19:29	07:36 08:20-08:52/32 18:42	07:10 07:33-07:35/2 12:17-13:17/60 17:07 08:02-08:29/27	07:39 08:10-08:42/32 17:01 11:57-13:52/115
19	06:11 20:49	06:39 18:25-18:54/29 20:16	07:08 08:14-08:38/24 19:27	07:37 08:19-08:52/33 18:40	07:12 08:01-08:30/29 17:06 12:14-13:20/66	07:39 08:10-08:41/31 17:01 11:57-13:52/115
20	06:12 20:48	06:40 18:23-18:54/31 20:14	07:09 08:12-08:39/27 19:26	07:38 08:19-08:52/33 18:39	07:13 08:01-08:30/29 17:05 12:11-13:22/71	07:40 08:11-08:42/31 17:02 11:58-13:53/115
21	06:12 20:47	06:41 18:22-18:55/33 20:13	07:09 08:10-08:40/30 19:24	07:39 08:18-08:52/34 18:37	07:14 08:00-08:31/31 17:05 12:08-13:24/76	07:41 08:10-08:42/32 17:02 11:58-13:53/115
22	06:13 20:47	06:42 18:20-18:56/36 20:11	07:10 08:09-08:41/32 19:22	07:40 08:19-08:53/34 18:36	07:15 08:01-08:32/31 17:04 12:06-13:26/80	07:41 08:11-08:43/32 17:03 11:59-13:54/115
23	06:14 20:46	06:42 18:19-18:57/38 20:10	07:11 08:08-08:42/34 19:21	07:41 08:19-08:53/34 18:35	07:16 08:01-08:33/32 17:04 12:06-13:28/82	07:42 08:11-08:43/32 17:03 11:59-13:54/115
24	06:15 20:45	06:43 18:18-18:57/39 20:09	07:12 08:07-08:42/35 19:19	07:42 08:19-08:52/33 18:33	07:17 08:01-08:33/32 17:03 12:04-13:30/86	07:42 08:13-08:44/31 17:04 12:00-13:55/115
25	06:16 20:44	06:44 18:18-18:58/40 20:07	07:13 08:06-08:43/37 19:18	06:43 07:19-07:51/32 17:32	07:18 08:01-08:34/33 17:03 12:03-13:31/88	07:42 08:13-08:44/31 17:04 12:00-13:55/115
26	06:17 20:43	06:45 18:17-18:58/41 20:06	07:14 08:05-08:43/38 19:16	06:45 07:19-07:51/32 17:31	07:19 08:01-08:34/33 17:02 12:01-13:32/91	07:43 08:13-08:45/32 17:05 12:00-13:55/115
27	06:18 20:42	06:46 18:16-18:58/42 20:04	07:15 08:05-08:43/38 19:14	06:46 07:20-07:50/30 17:29	07:20 08:01-08:34/33 17:02 12:00-13:34/94	07:43 08:14-08:46/32 17:06 12:02-13:56/114
28	06:18 20:42	06:47 18:16-18:58/42 20:03	07:16 08:04-08:43/39 19:13	06:47 07:20-07:49/29 17:28	07:21 08:01-08:35/34 17:01 11:59-13:35/96	07:44 08:14-08:46/32 17:06 12:02-13:56/114
29	06:19 20:41	06:48 18:14-18:57/43 20:01	07:17 08:04-08:43/39 19:11	06:48 07:22-07:48/26 17:27	07:22 08:01-08:35/34 17:01 11:58-13:36/98	07:44 08:15-08:47/32 17:07 12:03-13:56/113
30	06:20 20:40	06:49 18:14-18:57/43 19:59	07:18 08:04-08:42/38 19:09	06:49 07:23-07:47/24 17:26	07:23 08:02-08:35/33 17:01 11:58-13:37/99	07:44 08:15-08:47/32 17:08 12:03-13:56/113
31	06:21 20:39	06:50 18:14-18:57/43 19:58	06:50 07:24-07:45/21 17:24	06:50 07:24-07:45/21 17:24	07:24 08:02-08:35/33 17:01 11:58-13:37/99	07:44 08:15-08:47/32 17:09 12:04-13:57/113
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	0	577	886	907	1980	4464

Table 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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 5

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 3 - N07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:45 08:07-08:30/23 17:10 11:30-13:55/145	07:33 11:45-14:00/135 17:43 16:39-17:19/40	06:58 07:39-08:30/51 18:15	07:10 19:47	06:26 07:20-07:33/13	05:58 06:19-06:31/12 20:45
2	07:45 08:07-08:30/23 17:10 11:30-13:56/146	07:32 11:46-13:59/133 17:44 16:40-17:20/40	06:57 07:39-08:29/50 18:16	07:08 19:48	06:24 20:18	05:58 06:19-06:31/12 20:46
3	07:45 08:07-08:31/24 17:11 11:30-13:56/146	07:31 11:47-13:59/132 17:45 16:40-17:22/42	06:55 07:39-08:29/50 17:45 16:40-17:22/42	07:06 19:49	06:23 20:19	05:58 06:19-06:32/13 20:46
4	07:45 08:07-08:32/25 17:12 11:31-13:57/146	07:30 11:48-13:58/130 17:46 16:40-17:22/42	06:54 07:39-08:28/49 18:18 17:51-17:57/6	07:05 19:50	06:22 20:20	05:57 06:18-06:31/13 20:47
5	07:45 08:07-08:32/25 17:13 11:31-13:57/146	07:29 11:49-13:58/129 17:47 16:41-17:22/41	06:52 07:39-08:28/49 18:19 17:50-17:58/8	07:03 19:51	06:21 20:21	05:57 06:18-06:31/13 20:48
6	07:45 08:07-08:33/26 17:14 11:31-13:57/146	07:28 11:50-13:57/127 17:49 16:41-17:22/41	06:51 07:39-08:26/47 18:20 17:48-17:59/11	07:02 19:52	06:20 20:22	05:57 06:18-06:31/13 20:48
7	07:45 08:06-08:33/27 17:15 11:31-13:57/146	07:27 11:51-13:57/126 17:50 16:42-17:21/39	06:49 07:40-08:26/46 18:21 17:48-18:01/13	07:00 19:53	06:19 20:23	05:56 06:18-06:31/13 20:49
8	07:45 08:06-08:34/28 17:16 11:32-13:58/146	07:26 11:52-13:56/124 17:51 16:43-17:21/38	06:48 07:40-08:25/45 18:22 17:47-18:01/14	06:59 19:54	06:17 20:24	05:56 06:17-06:30/13 20:49
9	07:45 08:06-08:35/29 16:51-16:52/1 17:17 11:33-13:58/145	07:24 11:54-13:55/119 17:52 16:44-17:20/36	06:46 07:41-08:24/43 18:23 17:47-18:03/16	06:57 19:55	06:16 20:25	05:56 06:17-06:31/14 20:50
10	07:45 08:06-08:35/29 16:49-16:53/4 17:18 11:33-13:59/146	07:23 11:55-13:54/119 17:53 16:44-17:19/35	06:45 07:41-08:22/41 18:25 17:47-18:04/17	06:55 19:56	06:15 20:26	05:56 06:17-06:31/14 20:51
11	07:44 08:06-08:36/30 16:47-16:53/6 17:19 11:33-13:58/145	07:22 11:56-13:52/116 17:29-17:32/3 17:54 16:45-17:18/33	06:43 07:43-08:21/38 18:26 17:46-18:04/18	06:54 19:57	06:14 20:27	05:56 06:17-06:31/14 20:51
12	07:44 08:05-08:36/31 16:46-16:55/9 17:20 11:34-13:59/145	07:21 07:59-08:12/13 16:46-17:17/31 17:56 11:58-13:51/113 17:28-17:33/5	06:42 07:43-08:19/36 18:27 17:47-18:06/19	06:52 19:58	06:13 20:28	05:55 06:17-06:31/14 20:52
13	07:44 08:05-08:37/32 16:45-16:56/11 17:21 11:35-14:00/145	07:20 07:56-08:16/20 16:48-17:16/28 17:57 12:00-13:50/110 17:28-17:35/7	06:40 07:44-08:17/33 18:28 17:47-18:07/20	06:51 19:59	06:12 20:29	05:55 06:17-06:31/14 20:52
14	07:44 08:06-08:38/32 16:44-16:57/13 17:22 11:35-13:59/144	07:19 07:53-08:19/26 16:50-17:15/25 17:58 12:02-13:49/107 17:27-17:36/9	06:38 07:47-08:15/28 18:29 17:48-18:08/20	06:49 20:00	06:11 20:30	05:55 06:17-06:31/14 20:52
15	07:43 08:06-08:38/32 16:43-16:58/15 17:23 11:35-14:00/145	07:17 07:50-08:21/31 16:52-17:12/20 17:59 12:04-13:46/102 17:26-17:37/11	06:37 07:48-08:12/24 18:30 17:48-18:08/20	06:48 20:01	06:10 20:30	05:55 06:17-06:31/14 20:53
16	07:43 08:06-08:38/32 16:43-17:00/17 17:24 11:36-14:01/145	07:16 07:49-08:23/34 16:55-17:09/14 18:00 12:07-13:45/98 17:27-17:38/11	06:35 07:52-08:08/16 18:31 17:49-18:06/17	06:46 20:02	06:09 20:31	05:55 06:17-06:30/13 20:53
17	07:43 08:06-08:38/32 16:42-17:00/18 17:25 11:36-14:00/144	07:15 07:48-08:24/36 17:27-17:40/13 18:01 12:10-13:42/92	06:34 17:52-18:04/12 18:32	06:45 20:03	06:08 20:32	05:55 06:17-06:30/13 20:54
18	07:42 08:07-08:39/32 16:42-17:02/20 17:26 11:37-14:01/144	07:14 07:47-08:26/39 17:26-17:40/14 18:03 12:14-13:40/86	06:32 18:33	06:43 20:04	06:08 20:33	05:55 06:17-06:30/13 20:54
19	07:42 08:07-08:39/32 16:41-17:03/22 17:27 11:37-14:01/144	07:12 07:45-08:26/41 17:27-17:42/15 18:04 12:18-13:36/78	06:30 18:11-18:14/3 18:34	06:42 20:05	06:07 20:34	05:56 06:17-06:30/13 20:54
20	07:41 08:08-08:40/32 16:40-17:04/24 17:28 11:37-14:00/143	07:11 07:44-08:27/43 17:28-17:43/15 18:05 12:23-13:32/69	06:29 18:09-18:14/5 18:35	06:41 20:06	06:06 20:35	05:56 06:18-06:31/13 20:55
21	07:41 08:08-08:39/31 16:41-17:05/24 17:30 11:39-14:01/142	07:10 07:43-08:28/45 17:28-17:44/16 18:06 12:30-13:26/56	06:27 18:08-18:15/7 18:36	06:39 20:07	06:05 20:36	05:56 06:18-06:31/13 20:55
22	07:40 08:08-08:39/31 16:40-17:06/26 17:31 11:39-14:01/142	07:08 07:42-08:29/47 17:29-17:46/17 18:07 12:41-13:19/38	06:26 18:08-18:16/8 18:37	06:38 20:08	06:04 20:37	05:56 06:18-06:31/13 20:55
23	07:39 08:10-08:39/29 16:40-17:08/28 17:32 11:40-14:02/142	07:07 07:42-08:29/47 17:44-17:47/3 18:08 17:30-17:45/15	06:24 18:07-18:17/10 18:38	06:36 20:09	06:04 20:38	05:56 06:18-06:31/13 20:55
24	07:39 08:10-08:39/29 16:40-17:09/29 17:33 11:40-14:01/141	07:06 07:41-08:29/48 18:09 17:30-17:48/18	06:22 18:07-18:19/12 18:39	06:35 20:10	06:03 20:39	05:57 06:19-06:32/13 20:55
25	07:38 08:11-08:38/27 16:39-17:10/31 17:34 11:41-14:01/140	07:04 07:41-08:30/49 18:10 17:31-17:49/18	06:21 18:06-18:19/13 18:40	06:34 20:11	06:02 20:39	05:57 06:19-06:32/13 20:55
26	07:37 08:11-08:38/27 16:39-17:11/32 17:35 11:41-14:01/140	07:03 07:40-08:29/49 18:12 17:32-17:50/18	06:19 18:06-18:20/14 18:41	06:32 20:12	06:02 20:40	05:57 06:19-06:32/13 20:56
27	07:37 08:13-08:38/25 16:39-17:12/33 17:37 11:42-14:01/139	07:01 07:40-08:30/50 18:13 17:34-17:50/16	06:18 18:07-18:21/14 18:42	06:31 20:13	06:01 20:41	05:58 06:20-06:34/14 20:56
28	07:36 08:14-08:37/23 16:40-17:14/34 17:38 11:43-14:01/138	07:00 07:39-08:29/50 18:14 17:37-17:46/9	06:16 18:07-18:22/15 18:43	06:30 20:14	06:00 20:42	05:58 06:20-06:34/14 20:56
29	07:35 08:16-08:36/20 16:39-17:15/36 17:39 11:43-14:01/138	06:59 07:38-08:28/48 18:15 17:37-17:46/9	06:14 19:08-19:23/15 19:44	06:28 20:15	06:00 20:43	05:58 06:20-06:34/14 20:56
30	07:34 08:17-08:34/17 16:39-17:17/38 17:40 11:44-14:01/137	06:57 07:37-08:27/47 18:16 17:36-17:45/9	06:12 19:10-19:22/12 19:45	06:27 20:16	05:59 20:43	05:59 06:21-06:35/14 20:56
31	07:33 08:20-08:32/12 16:39-17:18/39 17:41 11:44-14:00/136	06:55 07:36-08:26/46 18:17 17:35-17:44/9	06:11 19:13-19:17/4 19:46	06:25 20:17	05:59 20:44	05:59 06:20-06:32/12 20:56
Potential sun hours	301	299	370	397	445	448
Sum of minutes with flicker	5794	3787	992	862	111	399

Table 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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 6

Licensed user:

Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWTTG: 3 - N07

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 06:21-06:35/14	06:22	06:51 07:12-07:47/35	07:19 08:24-08:58/34	06:51 11:24-13:23/119	07:25 07:48-08:18/30 16:28-16:35/7
	20:56	20:38	19:56	19:08 18:26-18:45/19	17:23 16:13-16:49/36	17:00 11:15-13:40/145
2	06:00 06:22-06:36/14	06:23	06:52 07:12-07:46/34	07:20 08:22-08:59/37	06:52 11:22-13:24/122	07:26 07:49-08:19/30 16:31-16:35/4
	20:55	20:37	19:55	19:06 18:25-18:44/19	17:22 16:12-16:49/37	17:00 11:16-13:42/146
3	06:00 06:22-06:36/14	06:24	06:53 07:13-07:45/32	07:21 08:20-09:00/40	06:53 11:22-13:26/124	07:27 07:50-08:19/29 16:34-16:35/1
	20:55	20:36	19:53	19:05 18:24-18:42/18	17:21 16:13-16:51/38	17:00 11:17-13:42/145
4	06:01 06:23-06:37/14	06:25	06:54 07:14-07:44/30	07:22 08:18-09:00/42	06:55 11:21-13:27/126	07:27 07:51-08:19/28
	20:55	20:35	19:52	19:03 18:24-18:40/16	17:20 16:12-16:51/39	17:00 11:16-13:42/146
5	06:01 06:23-06:36/13	06:26	06:55 07:15-07:42/27	07:23 08:17-09:01/44	06:56 11:19-13:27/128	07:28 07:52-08:19/27
	20:55	20:33	19:50	19:01 18:24-18:39/15	17:19 16:11-16:51/40	16:59 11:16-13:42/146
6	06:02 06:24-06:37/13	06:27	06:56 07:17-07:40/23	07:24 08:16-09:01/45	06:57 11:18-13:28/130	07:29 07:52-08:18/26
	20:55	20:32	19:49	19:00 18:24-18:37/13	17:17 16:11-16:52/41	16:59 11:17-13:43/146
7	06:02 06:24-06:37/13	06:27	06:56 07:19-07:37/18	07:25 08:15-09:02/47	06:58 11:17-13:28/131	07:30 07:53-08:19/26
	20:54	20:31	19:47	18:58 18:24-18:35/11	17:16 16:10-16:52/42	16:59 11:17-13:43/146
8	06:03 06:25-06:38/13	06:28	06:57 07:22-07:32/10	07:26 08:15-09:03/48	06:59 11:18-13:30/132	07:31 07:54-08:19/25
	20:54	20:30	19:45	18:57 18:24-18:34/10	17:15 16:11-16:52/41	16:59 11:18-13:44/146
9	06:04 06:26-06:39/13	06:29	06:58	07:27 08:14-09:03/49	07:00 11:17-13:30/133	07:32 07:55-08:19/24
	20:54	20:29	19:44	18:55 18:25-18:32/7	17:14 16:11-16:51/40	16:59 11:18-13:44/146
10	06:04 06:26-06:39/13	06:30	06:59	07:28 08:14-09:03/49	07:01 07:55-07:59/4 16:10-16:50/40	07:33 07:56-08:19/23
	20:53	20:28	19:42	18:54 18:26-18:31/5	17:13 11:16-13:31/135	16:59 11:19-13:45/146
11	06:05 06:27-06:39/12	06:31 07:31-07:37/6	07:00	07:29 08:13-09:03/50	07:03 07:50-08:03/13 16:10-16:49/39	07:34 07:57-08:20/23
	20:53	20:26	19:40	18:52 18:28-18:30/2	17:12 11:15-13:31/136	16:59 11:20-13:47/145
12	06:06 06:28-06:40/12	06:32 07:27-07:41/14	07:01	07:30 08:13-09:03/50	07:04 07:49-08:06/17 16:11-16:49/38	07:35 07:58-08:20/22
	20:53	20:25	19:39	18:50	17:12 11:16-13:32/136	17:00 11:20-13:46/146
13	06:06 06:28-06:39/11	06:33 07:24-07:44/20	07:02 19:01-19:13/12	07:31 08:13-09:03/50	07:05 07:48-08:08/20 16:11-16:47/36	07:35 07:58-08:20/22
	20:52	20:24	19:37	18:49	17:11 11:15-13:33/138	17:00 11:21-13:46/146
14	06:07 06:29-06:40/11	06:34 07:22-07:46/24	07:03 18:59-19:14/15	07:32 08:12-09:03/51	07:06 07:46-08:09/23 16:11-16:46/35	07:36 07:59-08:20/21
	20:52	20:22	19:36	18:47 18:09-18:21/12	17:10 11:15-13:33/138	17:00 11:21-13:46/145
15	06:08 06:30-06:40/10	06:35 07:21-07:47/26	07:04 18:58-19:13/15	07:33 08:12-09:02/50	07:07 07:45-08:10/25 16:12-16:45/33	07:37 08:00-08:21/21
	20:51	20:21	19:34	18:46 18:06-18:23/17	17:09 11:14-13:33/139	17:00 11:21-13:47/146
16	06:08 06:30-06:40/10	06:36 07:19-07:48/29	07:05 18:55-19:10/15	07:34 08:12-09:02/50	07:08 07:44-08:11/27 16:12-16:44/32	07:38 08:00-08:20/20
	20:51	20:20	19:32	18:44 18:04-18:20/18	17:08 11:14-13:34/140	17:00 11:21-13:47/146
17	06:09 06:31-06:40/9	06:37 07:18-07:49/31	07:06 18:54-19:08/14	07:35 08:12-09:01/49	07:09 07:45-08:12/27 16:13-16:44/31	07:38 08:01-08:21/20
	20:50	20:18	19:31	18:43 18:02-18:20/18	17:07 11:14-13:35/141	17:01 11:22-13:48/146
18	06:10 06:32-06:41/9	06:38 07:17-07:50/33	07:07 18:54-19:07/13	07:36 08:12-09:01/49 18:12-18:19/7	07:10 07:44-08:13/29 16:14-16:43/29	07:39 08:02-08:22/20
	20:49	20:17	19:29	18:42 18:01-18:13/12	17:07 11:14-13:35/141	17:01 11:23-13:49/146
19	06:11 06:33-06:41/8	06:39 07:16-07:51/35	07:08 18:53-19:05/12	07:37 08:13-09:00/47 18:00-18:17/17	07:12 07:44-08:13/29 16:14-16:42/28	07:39 08:02-08:22/20
	20:49	20:16	19:27	18:40 13:27-13:37/10 18:16-18:17/1	17:06 11:14-13:36/142	17:01 11:23-13:49/146
20	06:12 06:33-06:40/7	06:40 07:15-07:51/36	07:09 18:53-19:04/11	07:38 08:13-08:59/46 17:59-18:16/17	07:13 07:43-08:14/31 16:15-16:41/26	07:40 08:03-08:22/19
	20:48	20:14	19:26	18:39 13:07-13:52/45	17:05 11:14-13:36/142	17:02 11:24-13:49/145
21	06:12 06:34-06:40/6	06:41 07:14-07:51/37	07:09 18:53-19:02/9	07:39 08:13-08:58/45 17:59-18:14/15	07:14 07:43-08:14/31 16:16-16:40/24	07:41 08:03-08:22/19
	20:47	20:13	19:24	18:37 12:58-13:59/61	17:05 11:14-13:36/142	17:02 11:24-13:49/145
22	06:13 06:35-06:40/5	06:42 07:13-07:51/38	07:10 18:53-19:01/8	07:40 08:15-08:58/43 17:58-18:13/15	07:15 07:44-08:16/32 16:16-16:40/24	07:41 08:04-08:23/19
	20:47	20:11	19:22	18:36 12:52-14:04/72	17:04 11:14-13:38/144	17:03 11:25-13:50/145
23	06:14 06:36-06:40/4	06:42 07:13-07:51/38	07:11 18:53-18:59/6	07:41 08:16-08:57/41 17:58-18:12/14	07:16 07:44-08:16/32 16:18-16:40/22	07:42 08:04-08:23/19
	20:46	20:10	19:21	18:35 12:47-14:08/81	17:04 11:14-13:38/144	17:03 11:25-13:50/145
24	06:15 06:37-06:39/2	06:43 07:12-07:52/40	07:12 18:54-18:57/3	07:42 08:17-08:55/38 17:57-18:11/14	07:17 07:44-08:16/32 16:19-16:39/20	07:42 08:05-08:24/19
	20:45	20:09	19:19	18:33 12:42-14:10/88	17:03 11:14-13:38/144	17:04 11:26-13:52/146
25	06:16 06:38-06:39/1	06:44 07:12-07:52/40	07:13 18:55-18:56/1	06:43 07:18-07:54/36 16:29-16:34/5	07:18 07:44-08:16/32 16:20-16:38/18	07:43 08:05-08:25/20
	20:44	20:07	19:18	17:32 11:39-13:13/94 16:57-17:09/12	17:02 11:14-13:38/144	17:04 11:26-13:52/146
26	06:17	06:45 07:12-07:51/39	07:14 18:36-18:45/9	06:45 07:19-07:52/33 16:24-16:39/15	07:19 07:44-08:17/33 16:21-16:38/17	07:43 08:05-08:25/20
	20:43	20:06	19:16	17:31 11:36-13:15/99 16:56-17:08/12	17:02 11:14-13:39/145	17:05 11:26-13:52/146
27	06:17	06:46 07:12-07:51/39	07:15 08:35-08:48/13	06:46 07:21-07:50/29 16:21-16:42/21	07:20 07:45-08:17/32 16:22-16:37/15	07:43 08:06-08:26/20
	20:42	20:04	19:17	17:29 11:33-13:16/103 16:56-17:06/10	17:02 11:14-13:39/145	17:06 11:27-13:53/146
28	06:18	06:47 07:12-07:51/39	07:16 08:31-08:52/21	06:47 07:23-07:47/24 16:18-16:44/26	07:21 07:45-08:17/32 16:24-16:37/13	07:44 08:06-08:27/21
	20:42	20:03	19:13 18:31-18:49/18	17:28 11:30-13:18/108 16:56-17:05/9	17:01 11:15-13:39/144	17:06 11:27-13:53/146
29	06:19	06:48 07:12-07:50/38	07:17 08:28-08:55/27	06:48 07:26-07:45/19 16:18-16:46/28	07:22 07:45-08:17/32 16:25-16:36/11	07:44 08:06-08:27/21
	20:41	20:01	19:11 18:29-18:49/20	17:27 11:29-13:20/111 16:57-17:04/7	17:01 11:15-13:40/145	17:07 11:27-13:53/146
30	06:20	06:49 07:11-07:49/38	07:18 08:26-08:56/30	06:49 07:30-07:41/11 16:16-16:47/31	07:24 07:46-08:17/31 16:27-16:36/9	07:44 08:06-08:27/21
	20:40	20:00	19:09 18:27-18:47/20	17:25 11:27-13:21/114 16:58-17:03/5	17:01 11:15-13:40/145	17:08 11:28-13:54/146
31	06:21	06:50 07:11-07:48/37		06:50 11:25-13:22/117 16:59-17:01/2		07:44 08:06-08:28/22
	20:39	19:58		17:24 16:15-16:48/33		17:09 11:28-13:54/146
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	251	677	516	2875	5573	5227

Table 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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 7

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 4 - N08

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June	
1	07:45 17:10	07:33 09:24-10:50/86 17:43	06:58 09:12-10:56/104 18:15 17:50-17:54/4	07:10 08:14-09:19/65 19:21-19:26/5 19:47 18:46-19:22/36	06:26 07:00-07:30/30 18:01-19:04/63 20:17 08:07-09:05/58 19:41-19:50/9	05:58 06:26-06:50/24 20:45 17:34-20:21/166	
2	07:45 17:10	07:32 09:23-10:51/88 17:46	06:57 09:12-10:55/103 18:16 17:48-17:55/7	07:08 08:13-09:19/66 19:20-19:27/7 19:48 18:46-19:21/35	06:23 07:00-07:29/29 17:55-19:08/73 20:19 08:08-09:02/54 19:35-19:56/21	05:58 06:26-06:50/24 20:46 17:34-20:21/167	
3	07:45 17:11	07:31 09:22-10:52/90 17:45	06:55 09:12-10:54/102 18:17 17:47-17:56/8	07:06 08:12-09:20/68 19:18-19:27/9 19:49 18:46-19:21/33	06:23 07:00-07:29/29 17:55-19:08/73 20:19 08:08-09:02/54 19:35-19:56/21	05:58 06:27-06:50/23 20:46 17:33-20:21/168	
4	07:45 17:12	07:30 09:22-10:53/91 17:46	06:54 09:12-10:53/101 18:18 17:47-17:57/10	07:05 08:11-09:20/69 19:18-19:29/11 19:50 18:47-19:23/32	06:22 07:01-07:28/27 17:53-19:10/77 20:20 08:09-09:01/52 19:33-19:57/24	05:57 06:27-06:49/22 17:34-20:22/168 20:47 06:58-07:04/6	
5	07:45 17:13	07:29 09:21-10:54/93 17:47	06:52 09:13-10:52/99 18:19 17:47-17:58/11	07:03 08:09-09:20/71 19:16-19:30/14 19:51 18:47-19:23/30	06:21 07:01-07:28/27 17:52-19:12/80 20:21 08:10-09:00/50 19:31-19:58/27	05:57 06:27-06:50/23 17:34-20:22/168 20:48 06:55-07:08/13	
6	07:45 17:14	07:28 09:20-10:55/95 17:48	06:51 09:12-10:50/98 18:20 17:46-17:59/13	07:02 08:09-09:20/71 19:15-19:31/16 19:52 18:49-19:27/21	06:20 07:02-07:27/25 17:50-19:14/84 20:22 08:11-08:58/47 19:30-19:59/29	05:57 06:28-06:50/22 17:34-20:23/169 20:48 06:53-07:11/18	
7	07:45 17:15	07:27 09:20-10:56/96 17:50	06:49 09:13-10:50/97 18:21 17:47-18:01/14	07:00 08:08-09:20/72 19:12-19:31/19 19:53 18:50-19:23/23	06:18 07:03-07:26/23 17:49-19:15/86 20:23 08:12-08:57/45 19:29-20:00/31	05:56 06:29-06:50/21 17:34-20:22/168 20:49 06:51-07:12/21	
8	07:45 17:16	07:26 09:19-10:57/98 17:51	06:48 09:13-10:48/95 18:22 17:46-18:01/15	06:59 08:07-09:20/73 19:10-19:32/22 19:54 18:51-19:11/20	06:17 07:04-07:25/21 17:47-19:17/90 20:24 08:13-08:55/42 19:28-20:01/33	05:56 06:28-06:49/21 17:34-20:22/168 20:49 06:50-07:13/23	
9	07:45 17:17	07:24 09:19-10:58/99 17:52	06:46 09:13-10:47/94 18:23 17:48-18:03/15	06:57 08:06-09:20/74 19:06-19:31/25 19:55 18:50-19:07/17	06:16 07:05-07:24/19 17:46-19:18/92 20:25 08:15-08:54/39 19:27-20:02/35	05:56 06:29-07:15/46 20:50 17:34-20:23/169	
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11	07:44 17:19	07:22 09:17-10:58/101 17:54	06:43 07:04-07:11/7 17:50-17:59/9 18:26 09:14-10:43/89	06:54 08:05-09:19/74 19:28-19:31/3 19:57 18:49-19:28/39	06:14 07:08-07:20/12 17:43-19:20/97 20:27 08:18-08:50/32 19:26-20:04/38	05:56 06:30-07:17/47 20:51 17:35-20:23/168	
12	07:44 17:20	07:21 09:17-10:59/102 17:56	06:42 07:00-07:14/14 18:27 09:14-10:41/87	06:52 08:05-09:20/75 19:27-19:30/3 19:58 18:49-19:27/38	06:13 07:13-07:16/3 17:42-19:21/99 20:28 08:20-08:48/28 19:25-20:05/40	05:55 06:31-07:18/47 20:52 17:35-20:23/168	
13	07:44 17:21	07:20 09:17-10:59/102 17:57	06:40 06:58-07:15/17 18:03-18:07/4 18:28 09:14-10:39/85	06:51 08:04-09:19/75 19:26-19:30/4 19:59 18:49-19:26/37	06:12 08:22-08:45/23 19:25-20:06/41 20:29 17:41-19:22/101	05:55 06:31-07:19/48 20:52 17:35-20:23/168	
14	07:44 17:22	07:19 09:17-11:00/103 17:58	06:38 06:57-07:16/19 18:00-18:08/8 18:29 09:15-10:37/82	06:49 08:04-09:19/75 19:25-19:30/5 20:00 18:50-19:25/35	06:11 06:32-06:41/9 17:40-19:23/103 20:30 08:25-08:43/17 19:24-20:06/42	05:55 06:31-07:19/48 20:52 17:35-20:23/168	
15	07:43 17:23	07:17 09:15-11:00/105 17:59	06:37 06:55-07:17/23 17:58-18:09/11 18:30 09:15-10:35/80	06:48 08:03-09:18/75 19:24-19:29/5 20:01 18:50-19:24/34	06:10 06:30-06:43/13 17:40-20:07/147 20:30 08:30-08:36/6	05:55 06:32-07:20/48 20:53 17:35-20:24/169	
16	07:43 17:24	07:16 09:15-11:00/105 18:00	06:35 06:55-07:17/22 17:56-18:10/14 18:31 09:17-10:33/76	06:46 08:04-09:18/74 19:23-19:28/5 20:02 18:50-19:23/33	06:09 06:29-06:44/15 20:31 17:39-20:08/149	05:55 06:32-07:20/48 20:53 17:35-20:24/169	
17	07:43 17:25	07:15 09:15-11:01/106 18:01	06:34 06:54-07:17/23 17:56-18:11/15 18:32 09:17-10:30/73	06:45 08:03-09:17/74 19:20-19:27/7 20:03 18:50-19:20/30	06:08 06:28-06:45/17 20:32 17:38-20:09/151	05:55 06:32-07:21/49 20:54 17:36-20:24/168	
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19	07:42 17:27	07:12 09:14-11:00/106 18:04	06:30 06:54-07:17/23 17:54-18:14/20 18:34 09:19-10:25/66	06:42 07:11-07:23/12 18:52-19:14/22 20:05 08:03-09:15/72 19:14-19:24/10	06:07 06:27-06:47/20 20:34 17:37-20:11/154	05:56 06:34-07:21/48 20:54 17:36-20:24/168	
20	07:41 17:28	07:11 09:14-11:01/107 18:05	06:29 06:53-07:16/23 17:54-18:14/20 18:35 09:19-10:22/63	06:40 07:08-07:28/18 18:53-19:23/30 20:06 08:03-09:15/72	06:06 06:26-06:48/22 20:35 17:37-20:11/154	05:56 06:34-07:21/47 20:55 17:36-20:24/168	
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24	07:39 17:33	07:05 09:13-10:59/106 18:09	06:22 06:57-07:11/14 09:26-10:09/43 18:17-18:19/2 18:39 07:30-08:09/39 17:49-18:17/28	06:35 07:02-07:29/27 19:00-19:14/14 20:10 08:03-09:11/68	06:03 06:25-06:49/24 20:39 17:35-20:14/159	05:57 06:34-07:22/48 20:55 17:37-20:25/168	
25	07:38 17:34	07:04 09:13-10:59/106 18:10	06:21 06:59-07:07/8 09:27-10:05/38 18:15-18:19/4 18:40 07:27-08:11/44 17:48-18:15/27	06:33 07:02-07:30/28 19:06-19:08/2 20:11 08:04-09:11/67	06:02 06:25-06:50/25 20:39 17:35-20:16/161	05:57 06:35-07:23/48 20:55 17:38-20:26/168	
26	07:37 17:35	07:03 09:12-10:58/106 18:12	06:19 07:24-08:12/48 17:47-18:14/27 18:41 09:30-10:00/30 18:13-18:20/7	06:32 07:01-07:30/29 18:22-18:44/22 20:12 08:04-09:10/66	06:02 06:25-06:49/24 20:40 17:35-20:16/161	05:57 06:34-07:22/48 20:56 17:37-20:26/169	
27	07:37 17:37	07:01 09:13-10:58/105 18:13	06:18 07:23-08:14/51 17:47-18:12/25 18:42 09:34-09:55/21 18:11-18:21/10	06:31 07:01-07:31/30 18:14-18:50/36 20:13 08:05-09:09/64	06:01 06:25-06:50/25 20:41 17:34-20:16/162	05:57 06:34-07:22/48 20:56 17:37-20:26/169	
28	07:36 17:38	07:00 09:12-10:57/105 18:14	06:16 07:20-08:15/55 18:05-18:22/17 18:43 17:46-18:06/20	06:29 07:00-07:30/30 18:10-18:55/45 20:14 08:05-09:07/62	06:00 06:25-06:50/25 20:42 17:34-20:18/164	05:57 06:35-07:22/47 20:56 17:38-20:27/169	
29	07:35 17:39	07:00 09:12-10:57/105 18:14	06:15 07:20-08:15/55 18:05-18:22/17 18:43 17:46-18:06/20	06:28 07:00-07:30/30 18:06-18:58/52 20:15 08:05-09:07/62	06:00 06:25-06:50/24 20:43 17:34-20:18/164	05:58 06:34-07:22/48 20:56 17:38-20:26/168	
30	07:34 17:40	07:00 09:12-10:57/105 18:14	06:15 07:20-08:15/55 18:05-18:22/17 18:43 17:46-18:06/20	06:27 07:00-07:30/30 18:03-19:02/59 20:16 08:06-09:06/60	06:00 06:25-06:50/25 20:43 17:34-20:19/165	05:59 06:35-07:22/47 20:56 17:39-20:27/168	
31	07:33 17:41	07:00 09:12-10:57/105 18:14	06:15 07:20-08:15/55 18:05-18:22/17 18:43 17:46-18:06/20	06:27 07:00-07:30/30 18:03-19:02/59 20:16 08:06-09:06/60	06:00 06:25-06:50/25 20:44 17:34-20:20/166	05:59 06:35-07:22/47 20:56 17:39-20:27/168	
	Potential sun hours Sum of minutes with flicker	301 1244	299 2826	370 3393	397 3498	445 5541	448 6354

Table 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:

Nurri_seconda presentazione

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01/02/2023 11:48 / 8

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWTTG: 4 - N08

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 06:34-07:21/47	06:22 07:20-07:28/8 17:52-19:31/99	06:51 08:04-09:18/74 19:27-19:30/3	07:19 07:39-07:54/15	06:51 08:48-10:27/99	07:25 09:31-09:54/23
	20:56 17:39-20:27/168	20:38 08:29-08:58/29 19:35-20:14/39	19:56 18:48-19:27/39	19:08 09:54-11:20/86	17:23	17:00
2	06:00 06:35-07:21/46	06:23 07:17-07:30/13 17:54-19:30/96	06:52 08:04-09:18/74 19:27-19:30/3	07:20 07:41-07:51/10 18:30-18:36/6	06:52 08:48-10:26/98	07:26 09:36-09:52/16
	20:55 17:39-20:28/169	20:37 08:27-09:00/33 19:36-20:13/37	19:55 18:48-19:27/39	19:06 09:52-11:20/88	17:22	17:00
3	06:00 06:34-07:20/46	06:24 07:15-07:32/17 17:55-19:28/93	06:53 08:04-09:18/74 19:04-19:29/25	07:21 09:51-11:21/90	06:53 08:49-10:27/98	07:27
	20:55 17:39-20:28/169	20:36 08:25-09:02/37 19:36-20:12/36	19:53 18:48-19:05/17	19:05 18:27-18:38/11	17:21	17:00
4	06:01 06:35-06:55/20 17:40-20:28/168	06:25 07:14-07:34/20 17:56-19:27/91	06:54 08:04-09:17/73 19:07-19:29/22	07:22 09:50-11:23/93	06:55 08:50-10:26/96	07:27
	20:55 06:56-07:20/24	20:34 08:24-09:04/40 19:37-20:11/34	19:52 18:48-19:08/20	19:03 18:25-18:40/15	17:20	17:00
5	06:01 06:34-06:55/21 17:40-20:28/168	06:26 07:13-07:35/22 17:57-19:28/89	06:55 08:05-09:17/72 19:09-19:28/19	07:23 09:49-11:24/95	06:56 08:50-10:25/95	07:28
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7	06:02 06:34-06:56/22 17:40-20:28/168	06:27 07:11-07:37/26 18:00-19:23/83	06:56 08:05-09:17/71 19:11-19:25/14	07:25 09:48-11:26/98	06:58 08:52-10:23/91	07:30
	20:54 07:00-07:15/15	20:31 08:20-09:08/48 19:40-20:09/29	19:47 18:42-19:12/30	18:58 18:22-18:35/13	17:16	16:59
8	06:03 06:34-06:57/23 17:41-20:29/168	06:28 07:11-07:37/26 18:02-19:21/79	06:57 08:05-09:14/69 19:12-19:23/11	07:26 09:47-11:26/99	06:59 08:53-10:23/90	07:31
	20:54 07:03-07:14/11	20:30 08:19-09:10/51 19:41-20:08/27	19:45 18:41-19:13/32	18:57 18:21-18:34/13	17:15	16:59
9	06:04 06:34-06:57/23	06:29 07:10-07:38/28 18:04-19:19/75	06:58 08:05-09:13/68 19:12-19:22/10	07:27 09:47-11:27/100	07:30 08:54-10:28/98	07:32
	20:54 17:41-20:29/168	20:29 08:18-09:11/53 19:43-20:07/24	19:44 18:40-19:13/33	18:55 18:21-18:32/11	17:14	16:59
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	20:53 17:41-20:29/168	20:28 08:16-09:11/55 19:44-20:04/20	19:42 18:39-19:14/35	18:54 18:21-18:31/10	17:13	16:59
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	20:53 17:42-20:29/167	20:26 08:15-09:12/57 19:47-20:02/15	19:40 18:38-19:14/36	18:52 18:21-18:29/8	17:12	16:59
12	06:06 06:34-06:58/24	06:32 07:08-07:38/30 18:09-19:11/62	07:01 08:07-09:10/63 19:13-19:17/4	07:30 09:46-11:30/104	07:04 08:58-10:20/82	07:35
	20:53 17:41-20:28/167	20:25 08:14-09:13/59 19:52-19:56/4	19:39 18:37-19:14/37	18:50 18:23-18:28/5	17:12	17:00
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	20:52 17:43-20:27/164	20:22 08:13-09:15/62	19:36 18:36-19:14/38	18:47	17:10	17:00
15	06:08 06:34-06:59/25	06:35 07:08-07:38/30 18:19-19:01/42	07:04 08:10-09:06/56	07:33 09:45-11:31/106	07:07 09:00-10:17/77	07:37
	20:51 17:43-20:27/164	20:21 08:12-09:15/63	19:34 18:36-19:13/37	18:46	17:09	17:00
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	20:51 17:43-20:26/163	20:20 08:11-09:16/65	19:32 18:25-10:43/18 18:59-19:10/11	18:44	17:08	17:00
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	20:49 17:45-20:25/160	20:16 08:10-09:18/68	19:27 08:16-08:56/40 18:35-19:03/28	18:40	17:06	17:01
20	06:12 06:34-06:58/24	06:40 07:10-07:35/25 19:02-19:23/21	07:08 07:41-07:58/17 10:10-10:58/48	07:38 09:44-11:31/107	07:13 09:08-10:12/64	07:40
	20:48 17:45-20:24/159	20:14 08:08-09:18/70	19:26 08:19-08:53/34 18:36-19:04/28	18:39	17:05	17:02
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	20:47 17:45-20:23/158	20:13 08:08-09:18/70	19:24 08:22-08:49/27 18:36-19:02/26	18:37	17:05	17:02
22	06:13 06:35-06:59/24	06:41 07:11-07:31/20 18:58-19:26/28	07:10 07:39-08:00/21 10:06-11:03/57	07:40 09:45-11:31/106	07:15 09:12-10:10/58	07:41
	20:47 17:46-20:23/157	20:11 08:07-09:18/71	19:22 08:27-08:43/16 18:37-19:01/24	18:36	17:04	17:03
23	06:14 06:36-06:58/22	06:42 07:12-07:29/17 18:57-19:27/30	07:11 07:38-08:00/22 18:38-18:59/21	07:41 09:45-11:31/106	07:16 09:13-10:08/55	07:42
	20:46 17:47-20:22/155	20:10 08:07-09:19/72	19:21 10:04-11:05/61	18:35	17:03	17:03
24	06:15 06:37-06:58/21	06:43 07:15-07:27/12 18:55-19:18/23	07:12 07:37-08:00/23 18:38-18:57/19	07:42 09:45-11:31/106	07:17 09:15-10:07/52	07:42
	20:45 17:47-20:22/155	20:09 08:06-09:19/73 19:18-19:28/10	19:19 10:03-11:08/65	18:33	17:03	17:04
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	20:44 17:47-20:20/153	20:07 18:54-19:21/27	19:18 10:01-11:10/69	17:32	17:02	17:04
26	06:17 06:38-06:56/18	06:45 08:06-09:20/74 19:23-19:30/7	07:14 07:36-08:00/24 18:38-18:54/16	06:45 08:45-10:30/105	07:19 09:18-10:04/46	07:43
	20:43 17:48-20:20/152	20:06 18:53-19:23/30	19:16 10:00-11:12/72	17:31	17:02	17:05
27	06:17 06:39-06:56/17	06:46 08:06-09:20/74 19:25-19:30/5	07:15 07:36-07:59/23 18:38-18:53/15	06:46 08:45-10:29/104	07:20 09:20-10:02/42	07:43
	20:42 17:49-20:19/150	20:04 18:52-19:25/33	19:14 09:58-11:14/76	17:29	17:02	17:06
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	20:42 17:50-20:18/148	20:03 18:52-19:26/34	19:13 09:57-11:15/78	17:28	17:01	17:06
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31	06:21 08:32-08:57/25 19:36-20:16/40	06:50 08:04-09:19/75 19:27-19:30/3	06:50 08:04-09:19/75 19:27-19:30/3	06:50 08:47-10:28/101	17:24	17:08
	20:39 17:52-19:33/101	19:58 18:49-19:27/38	19:58 18:49-19:27/38	17:24	17:08	17:08
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	5838	4402	3330	3299	2143	39

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

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

Project:
Nurri_seconda presentazione

Printed/Page
 01/02/2023 11:48 / 9

Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWTTG: 5 - N09

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:45 15:40-16:44/64 17:10	07:32 08:08-09:28/80 17:42 15:32-17:19/107	06:58 07:27-09:32/125 18:15 15:40-17:19/99	07:10 07:34-08:07/33 19:47 18:05-19:02/57	06:26 17:21-19:33/132 20:17	05:58 06:19-06:46/27 20:45 17:26-20:20/174
2	07:45 15:41-16:45/64 17:10	07:32 08:07-09:29/82 17:44 15:32-17:20/108	06:57 07:27-09:30/123 18:16 15:41-17:17/96	07:08 07:33-08:06/33 19:48 18:01-19:05/64	06:24 17:21-19:34/133 20:18	05:58 06:19-06:47/28 20:46 17:27-20:20/173
3	07:45 15:41-16:46/65 17:11	07:31 08:07-09:30/83 17:45 15:32-17:22/110	06:55 07:27-08:01/34 15:42-17:17/95 18:17 08:02-09:30/88	07:06 07:34-08:06/32 19:49 17:57-19:07/70	06:23 17:21-19:34/133 20:19	05:57 06:19-06:48/29 20:46 17:26-20:20/174
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5	07:45 15:39-16:47/68 17:13	07:29 08:06-09:32/86 17:47 15:32-17:24/112	06:52 07:27-08:00/33 15:45-17:14/89 18:19 08:02-09:28/86	07:03 07:33-08:04/31 19:51 17:52-19:11/79	06:21 17:21-19:35/134 20:21	05:57 06:19-06:48/30 20:48 17:27-20:21/174
6	07:45 15:39-16:48/69 17:14	07:28 08:05-09:33/88 17:48 15:32-17:26/114	06:51 07:27-07:59/32 15:46-17:12/86 18:20 08:02-09:28/84	07:02 07:34-08:04/30 19:52 17:50-19:14/84	06:20 17:21-19:35/134 20:22	05:57 06:18-06:49/31 20:48 17:28-20:22/174
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8	07:45 15:39-16:50/71 17:16	07:26 08:04-09:34/90 17:51 15:32-17:28/116	06:48 07:28-07:57/29 15:49-17:09/80 18:22 08:03-09:24/81	06:58 07:35-08:01/26 19:54 17:45-19:17/92	06:17 17:21-19:37/156 20:24	05:56 06:17-06:49/32 20:49 17:28-20:22/174
9	07:45 08:36-08:46/10 17:17 15:39-16:52/73	07:24 08:04-09:35/91 17:29-17:30/1 17:52 15:32-17:29/117	06:46 07:29-07:56/27 15:51-17:08/77 18:23 08:04-09:23/79	06:57 07:35-07:59/24 19:55 17:43-19:18/95	06:16 17:21-20:00/159 20:25	05:56 06:17-06:49/32 20:50 17:29-20:22/173
10	07:45 08:33-08:51/18 17:18 15:39-16:53/74	07:23 08:03-09:34/91 17:27-17:30/3 17:53 15:31-17:27/116	06:45 07:30-07:54/24 15:52-17:05/73 18:24 08:05-09:21/76	06:55 07:37-07:58/21 19:56 17:42-19:20/98	06:15 17:21-20:02/161 20:26	05:56 06:17-06:50/33 20:51 17:29-20:23/174
11	07:44 08:30-08:54/24 17:19 15:38-16:53/75	07:22 08:03-09:35/92 17:26-17:32/6 17:54 15:32-17:26/114	06:43 07:32-07:53/21 15:54-17:02/68 18:26 08:05-09:19/74	06:54 07:39-07:55/16 19:57 17:39-19:21/102	06:14 17:21-20:04/163 20:27	05:55 06:17-06:50/33 20:51 17:29-20:23/174
12	07:44 08:27-09:00/33 17:20 15:38-16:55/77	07:21 08:03-09:35/92 17:25-17:33/8 17:56 15:32-17:25/113	06:42 07:33-07:50/17 15:57-17:00/63 18:27 08:06-09:18/72	06:52 07:42-07:52/10 19:58 17:38-19:22/104	06:13 17:21-20:05/164 20:28	05:55 06:17-06:51/34 20:52 17:30-20:23/173
13	07:44 08:27-09:00/33 17:21 15:38-16:56/78	07:20 08:02-09:36/94 17:22-17:35/13 17:57 15:32-17:23/111	06:40 07:36-07:46/10 15:59-16:56/57 18:28 07:09-09:15/68	06:51 17:36-19:23/107 19:59	06:12 17:21-20:06/165 20:29	05:55 06:17-06:51/34 20:52 17:30-20:24/174
14	07:44 08:24-09:01/37 17:22 15:37-16:57/80	07:19 08:02-09:36/94 17:58 15:33-17:36/123	06:38 08:09-09:14/65 18:29 16:02-16:52/50	06:49 17:35-19:24/109 20:00	06:11 17:21-20:06/165 20:30	05:55 06:17-06:51/34 20:52 17:31-20:24/173
15	07:43 08:23-09:04/41 17:23 15:37-16:58/81	07:17 08:01-09:36/95 17:59 15:32-17:37/125	06:37 18:09-09:12/63 18:30 16:06-16:36/30	06:48 17:33-19:25/112 20:01	06:10 17:21-20:07/166 20:30	05:55 06:17-06:52/35 20:53 17:31-20:24/173
16	07:43 08:23-09:06/43 17:24 15:37-16:59/82	07:16 08:01-09:36/95 18:00 15:33-17:38/125	06:35 18:11-09:10/59 18:31 16:10-16:30/20	06:46 17:33-19:26/113 20:02	06:09 17:21-20:08/167 20:31	05:55 06:17-06:52/35 20:53 17:31-20:24/173
17	07:43 08:21-09:08/47 17:25 15:36-16:59/83	07:15 08:01-09:37/96 18:01 15:33-17:39/126	06:34 18:12-09:07/55 18:32	06:45 17:31-19:26/115 20:03	06:08 17:21-20:09/168 20:32	05:55 06:17-06:52/35 20:54 17:31-20:25/174
18	07:42 08:20-09:10/50 17:26 15:37-17:01/84	07:14 08:01-09:36/95 18:03 15:33-17:38/125	06:32 08:13-09:04/51 18:33	06:43 17:30-19:28/118 20:04	06:07 17:21-20:09/168 20:33	05:55 06:17-06:52/35 20:54 17:31-20:25/174
19	07:42 08:19-09:11/52 17:27 15:36-17:01/85	07:12 08:01-09:36/95 16:07-17:00/53 18:04 15:34-17:38/124	06:30 08:16-09:02/46 18:34	06:42 17:29-19:28/119 20:05	06:07 17:22-20:11/169 20:34	05:56 06:17-06:52/35 20:54 17:31-20:25/174
20	07:41 08:17-09:13/56 17:28 15:35-17:01/86	07:11 07:39-07:53/14 15:34-17:37/123 18:05 08:01-09:36/95 16:09-16:59/50	06:29 08:18-08:58/40 18:35	06:40 17:28-19:29/121 20:06	06:06 17:22-20:11/169 20:35	05:56 06:17-06:52/35 20:54 17:32-20:25/173
21	07:41 08:17-09:15/58 17:30 15:35-17:04/89	07:10 07:36-07:55/19 15:34-17:36/122 18:06 08:00-09:35/95 16:10-16:57/47	06:27 08:20-08:54/34 18:36	06:39 17:27-19:29/122 20:07	06:05 17:22-20:12/170 20:36	05:56 06:18-06:53/35 20:55 17:33-20:26/173
22	07:40 08:16-09:16/60 17:04-17:05/1 17:31 15:35-17:04/89	07:08 07:34-07:57/23 15:35-17:35/120 18:07 08:01-09:36/95 16:12-16:56/44	06:26 06:51-06:56/5 18:37 08:24-08:50/26	06:38 17:26-19:30/124 20:08	06:04 06:27-06:34/7 20:37 17:22-20:13/171	05:56 06:18-06:53/35 20:55 17:33-20:26/173
23	07:39 08:15-09:18/63 17:04-17:06/2 17:32 15:34-17:04/90	07:07 07:33-07:59/26 15:36-17:35/119 18:08 08:01-09:36/95 16:14-16:54/40	06:24 06:42-07:00/18 18:38 08:29-08:43/14	06:36 17:26-19:31/125 20:09	06:04 06:24-06:37/13 20:38 17:23-20:14/171	05:56 06:18-06:53/35 20:55 17:32-20:26/174
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25	07:38 08:13-09:20/67 15:55-17:05/70 17:34 15:34-17:10/96	07:04 07:30-08:00/30 15:37-17:31/114 18:10 08:01-09:35/94 16:19-16:49/30	06:21 06:39-07:04/25 18:40	06:33 17:24-19:31/127 20:11	06:02 06:23-06:41/18 20:39 17:24-20:16/172	05:57 06:19-06:54/35 20:55 17:33-20:27/174
26	07:37 08:12-09:22/70 17:35 15:33-17:11/98	07:03 07:29-09:33/124 16:22-16:45/23 18:12 15:37-17:29/112	06:19 06:37-07:05/28 18:41	06:32 17:24-19:32/128 20:12	06:02 06:22-06:41/19 20:40 17:24-20:16/172	05:57 06:19-06:54/35 20:55 17:33-20:27/174
27	07:37 08:11-09:23/72 17:37 15:33-17:12/99	07:01 07:28-09:33/125 16:28-16:40/12 18:13 15:39-17:26/107	06:18 06:36-07:06/30 18:42	06:31 17:23-19:32/129 20:13	06:01 06:22-06:43/21 20:41 17:24-20:16/172	05:57 06:19-06:54/35 20:56 17:33-20:27/174
28	07:36 08:11-09:25/74 17:38 15:34-17:14/100	07:00 07:27-09:32/125 18:14 15:39-17:19/100	06:16 06:35-07:07/32 18:43	06:29 17:23-19:32/129 20:14	06:00 06:21-06:43/22 20:42 17:25-20:18/173	05:56 06:20-06:54/34 20:56 17:34-20:27/173
29	07:35 08:10-09:26/76 17:39 15:33-17:15/102		07:14 07:35-08:07/32 19:44 18:21-18:47/26	06:28 17:23-19:33/130 20:15	06:00 06:21-06:45/24 20:43 17:25-20:18/173	05:56 06:20-06:54/34 20:56 17:33-20:27/174
30	07:34 08:09-09:27/78 17:40 15:33-17:17/104		07:13 07:34-08:07/33 19:45 18:14-18:54/40	06:27 17:22-19:34/132 20:16	05:59 06:20-06:45/25 20:43 17:25-20:19/174	05:59 06:21-06:55/34 20:56 17:34-20:28/174
31	07:33 08:09-09:28/79 17:41 15:33-17:18/105		07:11 07:34-08:07/33 19:46 18:09-18:58/49		05:59 06:20-06:46/26 20:44 17:26-20:20/174	
Potential sun hours	301	299	370	397	445	448
Sum of minutes with flicker	3767	6072	3401	3509	5170	6202

Table 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:

Nurri_seconda presentazione

Printed/Page

01/02/2023 11:48 / 10

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 5 - N09

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	July	August	September	October	November	December
1	05:59 06:21-06:54/33	06:22 17:31-20:14/163	06:51 07:38-07:54/16	07:19 08:14-08:28/14 16:36-17:37/61	06:51 07:33-09:04/91 16:57-17:00/3	07:24 08:11-08:36/25
	20:55 17:34-20:27/173	20:38	19:56 17:38-19:20/102	19:08 08:45-09:56/71	17:23 15:01-16:57/116	17:00 15:20-16:35/75
2	06:00 06:22-06:55/33	06:23 17:31-20:13/162	06:52 07:35-07:56/21	07:20 08:10-08:30/20 16:34-17:40/66	06:52 07:33-09:03/90	07:25 08:15-08:34/19
	20:55 17:34-20:28/174	20:37	19:55 17:40-19:18/98	19:06 08:44-09:57/73	17:22 15:01-16:58/117	17:00 15:21-16:35/74
3	06:00 06:22-06:55/33	06:24 17:31-20:11/160	06:53 07:33-07:57/24	07:21 08:08-08:31/23 16:31-17:42/71	06:53 07:34-09:04/90	07:26 08:19-08:30/11
	20:55 17:34-20:28/174	20:36	19:53 17:41-19:16/95	19:05 08:43-09:58/75	17:21 15:02-16:58/116	17:00 15:22-16:35/73
4	06:01 06:23-06:55/32	06:25 17:31-20:08/157	06:54 07:32-07:58/26	07:22 08:06-08:33/27 16:29-17:44/75	06:55 07:35-09:03/88	07:27 15:23-16:35/72
	20:55 17:34-20:28/174	20:34	19:52 17:42-19:14/92	19:03 08:42-09:59/77	17:20 15:02-16:57/115	17:00
5	06:01 06:23-06:55/32	06:26 17:31-19:45/134	06:55 07:31-07:59/28	07:23 08:05-08:33/28 16:26-17:45/79	06:56 07:35-09:02/87	07:28 15:24-16:34/70
	20:55 17:34-20:28/174	20:33	19:50 17:44-19:12/88	19:01 08:40-10:00/80	17:18 15:02-16:55/113	16:59
6	06:02 06:24-06:55/31	06:26 17:31-19:45/134	06:55 07:30-08:00/30	07:24 08:04-08:34/30 16:24-17:46/82	06:57 07:36-09:02/86	07:29 15:25-16:34/69
	20:55 17:34-20:28/174	20:32	19:48 17:46-19:10/84	19:00 08:39-10:01/82	17:17 15:02-16:54/112	16:59
7	06:02 06:24-06:54/30	06:27 17:31-19:45/134	06:56 07:29-08:00/31	07:25 08:03-08:34/31 16:22-17:47/85	06:58 07:36-09:01/85	07:30 15:26-16:34/68
	20:54 17:34-20:28/174	20:31	19:47 17:47-19:07/80	18:58 08:38-10:01/83	17:16 15:02-16:53/111	16:59
8	06:03 06:25-06:55/30	06:28 17:31-19:44/133	06:57 07:27-07:59/32	07:26 08:02-08:35/33 16:20-17:48/88	06:59 07:38-09:01/83	07:31 15:27-16:34/67
	20:54 17:34-20:28/174	20:30	19:45 17:49-19:04/75	18:57 08:37-10:02/85	17:15 15:03-16:52/109	16:59
9	06:04 06:26-06:55/29	06:29 17:31-19:44/133	06:58 07:27-08:00/33	07:27 08:01-08:35/34 16:18-17:49/91	07:00 07:38-09:00/82	07:32 15:29-16:34/65
	20:54 17:34-20:27/173	20:29	19:44 17:51-19:01/70	18:55 08:36-10:03/87	17:14 15:03-16:51/108	16:59
10	06:04 06:26-06:54/28	06:30 17:30-19:43/133	06:59 07:26-07:59/33	07:28 08:02-10:03/121	07:01 07:39-08:59/80	07:33 15:30-16:35/65
	20:53 17:34-20:28/174	20:27	19:42 17:54-18:58/64	18:53 16:17-17:50/93	17:13 15:03-16:50/107	16:59
11	06:05 06:27-06:54/27	06:31 17:30-19:42/132	07:00 07:26-07:59/33	07:29 08:01-10:05/124	07:02 07:40-08:58/78	07:34 15:31-16:35/64
	20:53 17:34-20:28/174	20:26	19:40 17:57-18:55/58	18:52 16:16-17:51/95	17:12 15:03-16:49/106	16:59
12	06:05 06:27-06:53/26	06:32 17:30-19:42/132	07:01 07:26-07:59/33	07:30 08:01-10:05/124	07:04 07:41-08:58/77	07:35 15:31-16:34/63
	20:53 17:33-20:27/174	20:25	19:39 18:00-18:51/51	18:50 16:15-17:52/97	17:11 15:04-16:47/103	16:59
13	06:06 06:28-06:53/25	06:33 17:30-19:41/131	07:02 07:26-07:58/32	07:31 08:01-10:05/124	07:05 07:42-08:57/75	07:35 15:32-16:34/62
	20:52 17:34-20:27/173	20:24	19:37 18:05-18:46/41	18:49 16:13-17:52/99	17:11 15:05-16:47/102	17:00
14	06:07 06:29-06:53/24	06:34 17:30-19:41/131	07:03 07:25-07:58/33	07:32 08:01-10:06/125	07:06 07:43-08:57/74	07:36 15:33-16:35/62
	20:52 17:34-20:27/173	20:22	19:36 18:11-18:39/28	18:47 16:12-17:56/104	17:10 15:06-16:46/100	17:00
15	06:08 06:30-06:53/23	06:35 17:30-19:40/130	07:05 07:25-07:57/32	07:33 08:01-10:06/125 16:58-17:15/17	07:07 07:44-08:56/72	07:37 15:34-16:35/61
	20:51 17:34-20:27/173	20:21	19:34	18:46 16:11-18:00/109	17:09 15:06-16:45/99	17:00
16	06:08 06:30-06:52/22	06:36 17:31-19:39/128	07:05 07:25-07:56/31	07:34 08:02-10:06/124 16:53-17:19/26	07:08 07:45-08:55/70	07:37 15:35-16:35/60
	20:51 17:33-20:26/173	20:20	19:32	18:44 16:10-18:02/112	17:08 15:06-16:44/98	17:00
17	06:09 06:31-06:51/20	06:37 17:31-19:39/128	07:06 07:25-07:54/29	07:35 08:02-08:31/29 16:08-18:04/116	07:09 07:47-08:54/67 15:29-16:39/70	07:38 15:36-16:36/60
	20:50 17:33-20:26/173	20:18	19:31	18:43 08:32-10:06/94 16:49-17:22/33	17:07 15:08-16:44/96	17:01
18	06:10 06:32-06:51/19	06:38 17:31-19:38/127	07:07 07:26-07:52/26	07:36 08:03-08:30/27 16:07-18:05/118	07:10 07:48-08:53/65 15:30-16:38/68	07:39 15:37-16:36/59
	20:49 17:34-20:25/171	20:17	19:29	18:42 08:32-10:06/94 16:47-17:24/37	17:07 15:08-16:43/95	17:01
19	06:11 06:33-06:50/17	06:39 17:31-19:37/126	07:08 07:27-07:50/23	07:37 08:04-08:29/25 16:06-18:06/120	07:12 07:49-08:52/63 16:39-16:41/2	07:39 15:37-16:36/59
	20:49 17:34-20:25/171	20:16	19:27	18:40 08:31-10:06/95 16:44-17:25/41	17:06 15:09-16:39/90	17:01
20	06:12 06:33-06:47/14	06:40 17:31-19:35/124	07:08 07:28-07:48/20	07:38 08:05-08:27/22 16:05-18:06/121	07:13 07:51-08:51/60 16:39-16:40/1	07:40 15:38-16:37/59
	20:48 17:33-20:24/171	20:14	19:26 09:18-09:27/9	18:39 08:31-10:06/95 16:42-17:27/45	17:05 15:10-16:39/89	17:02
21	06:12 06:35-06:46/11	06:41 17:31-19:34/123	07:09 07:31-07:44/13	07:39 08:07-08:24/17 16:05-18:07/122	07:14 07:52-08:50/58	07:41 15:38-16:37/59
	20:47 17:33-20:23/170	20:13	19:24 09:11-09:34/23	18:37 08:31-10:06/95 16:40-17:28/48	17:05 15:10-16:39/89	17:02
22	06:13 17:33-20:23/170	06:41 17:32-19:34/122	07:10 09:06-09:39/33	07:40 08:11-08:22/11 16:04-18:07/123	07:15 07:53-08:49/56	07:41 15:39-16:38/59
	20:47	20:11	19:22	18:36 08:31-10:06/95 16:38-17:29/51	17:04 15:11-16:37/86	17:03
23	06:14 17:33-20:22/169	06:42 17:32-19:33/121	07:11 09:03-09:42/39	07:41 08:31-10:07/96 16:37-17:31/54	07:16 07:56-08:49/53	07:42 15:39-16:38/59
	20:46	20:10	19:21	18:35 16:04-18:08/124	17:03 15:13-16:38/85	17:03
24	06:15 17:33-20:22/169	06:43 17:33-19:31/118	07:12 09:00-09:44/44	07:42 08:31-10:07/96	07:17 07:57-08:47/50	07:42 15:40-16:39/59
	20:45	20:08	19:19	18:33 16:03-18:09/126	17:03 15:14-16:38/84	17:04
25	06:16 17:32-20:20/168	06:44 17:33-19:30/117	07:13 08:58-09:47/49	06:43 07:31-09:06/95	07:18 07:58-08:46/47	07:42 15:40-16:39/59
	20:44	20:07	19:17	17:32 15:03-17:09/126	17:02 15:14-16:38/84	17:04
26	06:17 17:32-20:20/168	06:45 17:34-19:29/115	07:14 08:55-09:49/54	06:45 07:31-09:06/95	07:19 08:00-08:45/45	07:43 15:40-16:39/59
	20:43	20:06	19:16	17:30 15:02-17:08/126	17:02 15:15-16:37/82	17:05
27	06:17 17:32-20:19/167	06:46 17:35-19:28/113	07:15 08:53-09:51/58	06:46 07:31-09:06/95	07:20 08:02-08:43/41	07:43 15:41-16:40/59
	20:42	20:04	19:14 16:55-17:10/15	17:29 15:02-17:06/124	17:02 15:16-16:37/81	17:06
28	06:18 17:32-20:18/166	06:47 17:35-19:27/112	07:16 08:51-09:52/61	06:47 07:31-09:05/94	07:21 08:04-08:42/38	07:44 15:40-16:41/61
	20:42	20:03	19:13 16:49-17:16/27	17:28 15:01-17:05/124	17:01 15:17-16:37/80	17:06
29	06:19 17:32-20:17/165	06:48 17:35-19:24/109	07:17 08:50-09:54/64	06:48 07:32-09:06/94 16:52-17:04/12	07:22 08:06-08:40/34	07:44 15:40-16:42/62
	20:41	20:01	19:11 16:44-17:30/46	17:27 15:02-16:53/111	17:01 15:18-16:36/78	17:07
30	06:20 17:32-20:17/165	06:49 17:36-19:23/107	07:18 08:20-08:23/3 16:40-17:34/54	06:49 07:32-09:05/93 16:55-17:03/8	07:23 08:09-08:38/29	07:44 15:40-16:42/62
	20:40	19:59	19:09 08:48-09:55/67	17:25 15:02-16:55/113	17:00 15:19-16:36/77	17:08
31	06:21 17:32-20:16/164	06:50 07:41-07:51/10		06:50 07:33-09:05/92 16:56-17:01/5	07:24 08:09-08:38/29	07:44 15:40-16:43/63
	20:39	19:58 17:37-19:21/104		17:24 15:01-16:56/115	17:00	17:08
Potential sun hours	1455	1425	1374	1347	1301	1292
Sum of minutes with flicker	5844	4029	2251	609	5016	2023

Table 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:

Nurri_seconda presentazione

Printed/Page

01/02/2023 11:48 / 11

Licensed user:

Ing. Bruno Manca
Via Vittorio Veneto 231
IT-09028 Sestu
+390702358125
BrunoManca / ingbrunomanca@gmail.com
Calculated:
01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 6 - N10

Assumptions for shadow calculations

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

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

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
324	376	415	483	626	572	481	398	478	800	2.208	983	8.144

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

	January	February	March	April	May	June
1	07:45 08:07-08:33/26 15:22-15:58/36	07:32 08:04-09:17/73	06:58 07:22-09:17/115	07:09 08:20-09:19/59	06:26 06:45-07:59/74	05:58 07:06-07:46/40
2	17:09 12:41-14:39/118	17:42 13:20-14:31/71	18:15	19:47 18:27-19:03/36	20:17	20:45
3	07:45 08:07-08:33/26 15:23-15:58/35	07:32 08:03-09:18/75	06:57 07:20-09:15/115	07:08 08:21-09:16/55	06:24 06:43-07:59/76	05:58 07:07-07:46/39
4	17:10 12:41-14:40/119	17:44 13:23-14:30/67	18:16	19:48 18:27-19:02/35	20:18	20:45
5	07:45 08:07-08:34/27 15:24-15:58/34	07:31 08:03-09:19/76	06:55 07:20-09:14/114	07:06 08:23-09:12/49	06:23 06:42-07:59/77	05:57 07:07-07:45/38
6	17:11 12:43-14:41/118	17:45 13:27-14:28/61	18:17	19:49 18:27-19:01/34	20:19	20:46
7	07:45 08:07-08:34/27 15:25-15:58/33	07:30 08:02-09:20/78	06:54 07:18-09:13/115	07:05 08:26-09:09/43	06:22 06:41-07:59/78	05:57 07:08-07:45/37
8	17:12 12:42-14:40/118	17:46 13:30-14:25/55	18:18	19:50 18:28-19:01/33	20:20	20:47
9	07:45 08:07-08:35/28 15:26-15:58/32	07:29 08:02-09:20/78	06:52 07:18-09:12/114	07:03 08:30-08:46/16	06:21 06:40-07:59/79	05:57 07:09-07:45/36
10	17:13 12:43-14:41/118	17:47 13:35-14:23/48	18:19	19:51 08:49-08:02/13	20:21	20:48
11	07:45 08:06-08:34/28 15:27-15:58/31	07:28 08:02-09:21/79	06:51 07:16-09:10/114	07:02 18:29-18:59/30	06:20 06:39-07:59/80	05:56 07:10-07:44/34
12	17:14 12:44-14:41/117	17:48 13:40-14:19/39	18:20	19:52	20:22	20:48
13	07:45 08:06-08:35/29 15:28-15:57/29	07:27 08:01-09:22/81	06:49 07:16-09:09/113	07:00 18:29-18:57/28	06:18 06:38-07:59/81	05:56 07:10-07:43/33
14	17:15 12:45-14:41/116	17:50 13:46-14:14/28	18:21	19:53	20:23	20:49
15	07:45 08:06-08:35/29 15:30-15:57/27	07:25 08:01-09:22/81	06:48 07:15-09:06/111	06:58 18:31-18:56/25	06:17 06:38-07:58/80	05:56 07:11-07:43/32
16	17:16 12:46-14:41/115	17:51	18:22	19:54	20:24	20:49
17	07:45 08:06-08:36/30 15:32-15:57/25	07:24 08:01-09:23/82	06:46 07:07-07:09/2	06:57 18:32-18:53/21	06:16 06:38-07:58/80	05:56 07:12-07:42/30
18	17:17 12:47-14:42/115	17:52	18:23 07:15-09:05/110	19:55	20:25	20:50
19	07:45 08:06-08:40/34 15:34-15:56/22	07:23 08:00-09:22/82	06:45 07:03-07:13/10	06:55 18:34-18:50/16	06:15 06:39-07:58/79	05:56 07:13-07:42/29
20	17:18 12:48-14:42/114	17:53	18:24 07:14-09:03/109	19:56	20:26	20:50
21	07:44 08:05-08:43/38 15:35-15:54/19	07:22 07:59-09:23/84	06:43 07:01-09:00/119	06:54 07:23-07:40/17	06:14 06:40-07:58/78	05:55 07:14-07:42/28
22	17:19 12:48-14:42/114	17:54	18:25	19:57 18:38-18:47/9	20:27	20:51
23	07:44 08:05-08:47/42 15:38-15:53/15	07:21 07:55-09:23/88	06:41 07:00-08:58/118	06:52 07:19-07:45/26	06:13 06:41-06:53/12	05:55 07:15-07:41/26
24	17:20 12:49-14:42/113	17:56	18:27	19:58	20:28	20:51
25	07:44 08:06-08:50/44 15:42-15:50/8	07:20 07:53-09:24/91	06:40 06:58-08:55/117	06:51 07:15-07:47/32	06:12 06:43-06:51/8	05:55 07:16-07:41/25
26	17:21 12:50-14:42/112	17:57	18:28	19:59	20:29	20:52
27	07:44 08:05-08:51/46	07:19 07:50-09:24/94	06:38 06:57-08:52/115	06:49 07:13-07:50/37	06:11 06:55-07:56/61	05:55 07:17-07:41/24
28	17:22 12:51-14:42/111	17:58	18:29	20:00	20:29	20:52
29	07:43 08:06-08:54/48	07:17 07:47-09:23/96	06:37 06:55-08:48/113	06:48 07:10-07:51/41	06:10 06:55-07:56/61	05:55 07:17-07:40/23
30	17:23 12:52-14:42/110	17:59	18:30	20:01	20:30	20:53
31	07:43 08:08-08:56/48	07:16 07:46-09:24/98	06:35 06:54-08:44/110	06:46 07:08-07:53/45	06:09 06:55-07:55/60	05:55 07:18-07:40/22
32	17:24 12:54-14:42/108	18:00	18:31	20:02	20:31	20:53
33	07:42 08:08-08:58/50	07:15 07:44-09:24/100	06:34 06:52-08:44/112	06:45 07:06-07:53/47	06:08 06:56-07:54/58	05:55 07:18-07:40/22
34	17:25 12:54-14:42/108	18:01	18:32	20:03	20:32	20:54
35	07:42 08:09-09:00/51	07:14 07:42-09:23/101	06:32 06:50-08:42/112	06:43 07:05-07:55/50	06:07 06:56-07:54/58	05:55 07:19-07:40/21
36	17:26 12:56-14:42/106	18:02	18:33	20:04	20:33	20:54
37	07:42 08:10-09:01/51	07:12 07:41-09:23/102	06:30 06:49-08:42/113	06:42 07:03-07:55/52	06:07 06:57-07:54/57	05:55 07:19-07:39/20
38	17:27 12:57-14:41/104	18:04	18:34 17:45-17:53/8	20:05	20:34	20:54
39	07:41 08:10-09:03/53	07:11 07:40-09:23/103	06:29 06:48-08:40/112	06:40 07:02-07:56/54	06:06 06:58-07:53/55	05:56 07:19-07:39/20
40	17:28 12:57-14:41/104	18:05	18:35 17:40-17:57/17	20:06	20:35	20:54
41	07:41 08:12-09:05/53	07:10 07:38-09:22/104	06:27 06:48-08:39/111	06:39 07:00-07:56/56	06:05 06:58-07:52/54	05:56 07:20-07:40/20
42	17:30 12:59-14:41/102	18:06	18:36 17:37-17:59/22	20:07	20:36	20:55
43	07:40 08:11-09:06/55	07:08 07:36-09:22/106	06:26 06:48-08:38/110	06:38 07:00-07:57/57	06:04 06:58-07:52/54	05:56 07:20-07:40/20
44	17:31 13:00-14:40/100	18:07	18:37 17:35-18:01/26	20:08	20:37	20:55
45	07:39 08:10-09:07/57	07:07 07:33-09:22/109	06:24 06:48-08:36/108	06:36 06:59-07:58/59	06:03 06:59-07:52/53	05:56 07:20-07:40/20
46	17:32 13:01-14:39/98	18:08	18:38 17:33-18:02/29	20:09	20:38	20:55
47	07:39 08:10-09:09/59	07:05 07:30-09:21/111	06:22 06:49-08:35/106	06:35 06:58-07:58/60	06:03 07:00-07:51/51	05:56 07:20-07:41/21
48	17:33 13:04-14:40/96	18:09	18:39 17:31-18:02/31	20:10	20:38	20:55
49	07:38 08:08-09:10/62	07:04 07:29-09:20/111	06:21 06:49-08:34/105	06:33 06:57-07:59/62	06:02 07:01-07:51/50	05:57 07:21-07:42/21
50	17:34 13:05-14:39/94	18:10	18:40 17:31-18:03/32	20:11	20:39	20:55
51	07:37 08:08-09:11/63	07:03 07:26-09:19/113	06:19 06:49-08:32/103	06:32 06:57-07:59/62	06:01 07:01-07:50/49	05:57 07:20-07:42/22
52	17:35 13:07-14:38/91	18:11	18:41 17:29-18:03/34	20:12	20:40	20:55
53	07:37 08:07-09:12/65	07:01 07:25-09:19/114	06:17 06:51-08:30/99	06:31 06:50-06:52/2	06:01 07:01-07:49/48	05:57 07:20-07:42/22
54	17:37 13:08-14:37/89	18:13	18:42 17:29-18:04/35	20:13 06:56-07:59/63	20:41	20:56
55	07:36 08:07-09:14/67	07:00 07:23-09:17/114	06:16 06:52-07:11/19 17:28-18:04/36	06:29 06:48-06:53/5	06:00 07:03-07:49/46	05:58 07:20-07:43/23
56	17:38 13:11-14:37/86	18:14	18:43 07:14-08:28/74	20:14 06:55-07:59/64	20:42	20:56
57	07:35 08:06-09:15/69		07:14 07:53-08:08/15 18:27-19:04/37	06:28 06:47-07:59/72	06:00 07:03-07:48/45	05:58 07:19-07:44/25
58	17:39 13:13-14:35/82		19:44 08:15-09:26/71	20:15	20:43	20:56
59	07:34 08:05-09:16/71		07:13 07:58-08:04/6 18:27-19:04/37	06:27 06:46-08:00/74	06:00 07:04-07:48/44	05:59 07:20-07:45/25
60	17:40 13:15-14:34/79		19:45 08:17-09:24/67	20:16	20:43	20:56
61	07:33 08:05-09:17/72		07:11 08:18-09:21/63		05:59 07:05-07:48/43	
62	17:41 13:18-14:33/75		19:46 18:27-19:03/36		20:44	
Potential sun hours	301	299	370	397	445	448
Sum of minutes with flicker	5044	2993	3720	1571	1953	798

Table 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:
Nurri_seconda presentazione

Printed/Page
 01/02/2023 11:48 / 12

Licensed user:
Ing. Bruno Manca
 Via Vittorio Veneto 231
 IT-09028 Sestu
 +390702358125
 BrunoManca / ingbrunomanca@gmail.com
 Calculated:
 01/02/2023 11:35/2.8.579

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWGTG: 6 - N10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [CAGLIARI / ELMA S]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:59 07:19-07:45/26	06:22 06:50-07:03/13	06:51 07:22-07:39/17	07:19 07:38-09:36/118	06:51 07:30-08:52/82	07:24 07:47-08:25/38 15:17-15:36/19
2	20:55 20:38 07:04-08:07/63	06:23 07:04-08:07/63	19:56 18:36-18:46/10	19:08	17:23	17:00 12:30-14:24/114
3	06:00 07:19-07:47/28	06:23 06:49-08:07/78	06:52 18:33-18:49/16	07:20 07:39-09:38/119	06:52 07:30-08:52/82	07:25 07:49-08:22/33 15:16-15:38/22
4	20:55 20:37	20:37	19:55	19:06	17:22	17:00 12:30-14:24/114
5	06:00 07:18-07:47/29	06:24 06:48-08:08/80	06:53 18:30-18:51/21	07:21 07:40-07:50/10	06:53 07:31-08:52/81	07:26 07:50-08:20/30 15:15-15:40/25
6	20:55 20:36	20:36	19:53	19:04 07:40-09:39/119	17:21 13:26-13:36/10	17:00 12:30-14:25/115
7	06:01 07:18-07:48/30	06:25 06:48-08:08/80	06:54 18:28-18:53/25	07:22 07:41-07:49/8	06:54 07:31-08:51/80	07:27 07:51-08:20/29 15:14-15:41/27
8	20:55 20:34	20:34	19:52	19:03 07:51-09:41/110	17:20 13:15-13:45/30	17:00 12:30-14:26/116
9	06:01 07:17-07:49/32	06:26 06:47-08:08/81	06:55 18:26-18:54/28	07:23 07:51-09:42/111	06:56 07:32-08:51/79	07:28 07:51-08:20/29 15:14-15:42/28
10	20:55 20:33	20:33	19:50	19:01	17:18 13:09-13:50/41	16:59 12:30-14:26/116
11	06:02 07:17-07:50/33	06:26 06:48-08:08/80	06:55 18:24-18:54/30	07:24 07:51-09:44/113	06:57 07:32-08:50/78	07:29 07:52-08:20/28 15:13-15:44/31
12	20:55 20:32	20:32	19:48	19:00	17:17 13:04-13:53/49	16:59 12:30-14:27/117
13	06:02 07:16-07:50/34	06:27 06:49-08:09/80	06:56 08:25-08:40/15 18:23-18:55/32	07:25 07:52-09:45/113	06:58 07:32-08:50/78	07:30 07:53-08:21/28 15:13-15:45/32
14	20:54 20:31	20:31	19:47 08:45-08:57/12	18:58	17:16 13:00-13:56/66	16:59 12:30-14:28/118
15	06:03 07:16-07:52/36	06:28 06:50-08:09/79	06:57 08:20-09:03/43	07:26 07:52-09:46/114	06:59 07:34-08:50/76	07:31 07:54-08:21/27 15:13-15:46/33
16	20:54 20:30	20:30	19:45 18:22-18:55/33	18:57	17:15 12:57-13:59/62	16:59 12:31-14:28/117
17	06:03 07:15-07:52/37	06:29 06:51-08:09/78	06:58 08:17-09:06/49	07:27 07:52-09:47/115	07:00 07:34-08:49/75	07:32 07:55-08:22/27 15:13-15:47/34
18	20:54 20:29	20:29	19:44 18:21-18:55/34	18:55	17:14 12:54-14:01/67	16:59 12:31-14:29/118
19	06:04 07:14-07:53/39	06:30 06:51-08:08/77	06:59 08:14-09:09/55	07:28 07:53-09:47/114	07:01 07:35-08:48/73	07:33 07:56-08:22/26 15:13-15:48/35
20	20:53 20:27	20:27	19:42 18:20-18:56/36	18:53	17:13 12:51-14:02/71	16:59 12:31-14:30/119
21	06:05 07:14-07:54/40	06:31 06:52-08:08/76	07:00 08:12-09:11/59	07:29 07:54-09:48/114	07:02 07:35-08:47/72	07:34 07:57-08:23/26 15:13-15:49/36
22	20:53 20:26	20:26	19:40 18:19-18:56/37	18:52	17:12 12:48-14:04/76	16:59 12:32-14:30/118
23	06:05 07:13-07:55/42	06:32 06:53-08:07/74	07:01 08:10-09:13/63	07:30 07:55-09:50/115	07:04 07:36-08:47/71	07:34 07:58-08:23/25 15:12-15:49/37
24	20:53 20:25	20:25	19:39 18:19-18:55/36	18:50	17:11 12:46-14:05/79	16:59 12:31-14:30/119
25	06:06 07:13-07:56/43	06:33 06:54-08:07/73	07:02 07:50-07:54/4 18:19-18:55/36	07:31 07:56-09:50/114	07:05 07:38-08:47/69	07:35 08:02-08:22/25 15:12-15:50/38
26	20:52 20:24	20:24	19:37 08:08-09:15/67	18:49	17:11 12:45-14:08/83	17:00 12:32-14:31/119
27	06:07 07:13-07:57/44	06:34 06:55-07:02/7	07:03 07:45-07:59/14 18:18-18:55/37	07:32 07:57-09:51/114	07:06 07:39-08:46/67	07:36 07:59-08:23/25 15:13-15:51/38
28	20:52 20:22	20:22 07:03-08:07/64	19:35 08:06-09:17/71	18:47	17:10 12:43-14:09/86	17:00 12:32-14:32/120
29	06:08 07:12-07:58/46	06:35 06:56-07:01/5	07:04 07:42-08:01/19 18:18-18:54/36	07:33 07:58-09:51/113	07:07 07:40-08:45/65	07:37 08:00-08:24/24 15:13-15:52/39
30	20:51 20:21	20:21 07:03-08:07/64	19:34 08:05-09:18/73	18:46	17:09 12:41-14:10/89	17:00 12:33-14:33/120
31	06:08 07:11-07:58/47	06:36 07:03-08:06/63	07:05 07:40-09:18/98	07:34 07:59-09:52/113	07:08 07:41-08:44/63	07:37 08:00-08:24/24 15:13-15:52/39
32	20:51 20:20	20:20	19:32 18:17-18:53/36	18:44	17:08 12:40-14:11/91	17:00 12:32-14:33/121
33	06:09 07:11-07:59/48	06:37 07:04-08:06/62	07:06 07:38-09:19/101	07:35 08:01-09:52/111	07:09 07:42-08:44/62	07:38 08:01-08:25/24 15:13-15:53/40
34	20:50 20:18	20:18	19:31 18:18-18:52/34	18:43	17:07 12:39-14:13/94	17:01 12:33-14:33/120
35	06:10 07:11-08:00/49	06:38 07:04-08:05/61	07:07 07:36-09:21/105	07:36 08:03-09:52/109	07:10 07:44-08:43/59	07:39 08:02-08:26/24 15:14-15:54/40
36	20:49 20:17	20:17	19:29 18:18-18:51/33	18:41	17:07 12:38-14:13/95	17:01 12:34-14:34/120
37	06:11 07:10-08:01/51	06:39 07:05-08:05/60	07:07 07:35-09:21/106	07:37 08:05-09:52/107	07:12 07:45-08:42/57	07:39 08:02-08:26/24 15:14-15:54/40
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39	06:11 07:09-08:01/52	06:40 07:04-08:03/59	07:08 07:34-09:22/108	07:38 08:08-09:53/105	07:13 07:46-08:41/55	07:40 08:03-08:27/24 15:15-15:55/40
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41	06:12 07:09-08:02/53	06:40 07:05-08:02/57	07:09 07:34-09:23/109	07:39 08:09-09:53/104	07:14 07:47-08:40/53	07:41 08:03-08:26/23 15:15-15:55/40
42	20:47 20:13	20:13	19:24 18:20-18:47/27	18:37	17:05 12:34-14:16/102	17:02 12:35-14:35/120
43	06:13 07:08-08:03/55	06:41 07:05-08:01/56	07:10 07:33-09:24/111	07:40 08:10-09:53/103	07:15 07:48-08:39/51	07:41 08:04-08:27/23 15:16-15:56/40
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47	06:15 07:08-08:04/56	06:43 07:07-07:59/52	07:12 07:32-09:25/113	07:42 08:13-09:54/101	07:17 07:46-08:37/51	07:42 08:05-08:29/24 15:16-15:56/40
48	20:45 20:08	20:08	19:19 18:27-18:38/11	18:33	17:03 12:33-14:19/106	17:04 12:36-14:36/120
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53	06:17 07:06-08:05/59	06:46 07:10-07:55/45	07:15 07:35-09:24/109	06:46 07:17-08:53/96	07:20 07:46-08:33/47	07:43 08:06-08:30/24 15:18-15:57/39
54	20:42 20:04	20:04	19:14 09:24-09:26/2	17:29	17:01 12:31-14:21/110	17:06 12:37-14:37/120
55	06:18 07:06-08:06/60	06:47 07:12-07:53/41	07:16 07:36-09:28/112	06:47 07:20-08:53/93	07:21 07:46-08:32/46	07:44 08:06-08:30/24 15:19-15:58/39
56	20:41 20:02	20:02	19:13	17:28	17:01 12:31-14:22/111	17:06 12:39-14:39/120
57	06:19 07:06-08:06/60	06:48 07:13-07:49/36	07:17 07:37-09:31/114	06:48 07:23-08:53/90	07:22 07:46-08:30/44 15:22-15:30/8	07:44 08:06-08:31/25 15:20-15:58/38
58	20:41 20:01	20:01	19:11	17:27	17:01 12:31-14:22/111	17:07 12:39-14:39/120
59	06:20 06:55-06:59/4	06:49 07:15-07:47/32	07:18 07:38-09:33/115	06:49 07:26-08:53/87	07:23 07:46-08:28/42 15:19-15:34/15	07:44 08:06-08:31/25 15:20-15:58/38
60	20:40 07:05-08:07/62	19:59	19:09	17:25	17:00 12:30-14:23/113	17:08 12:39-14:39/120
61	06:21 06:53-07:02/9	06:50 07:18-07:44/26		06:50 07:29-08:53/84		07:44 08:06-08:31/25 15:21-15:58/37
62	20:39 07:05-08:07/62	19:58		17:24		17:08 12:40-14:39/119
Potential sun hours	455	425	374	347	301	292
Sum of minutes with flicker	1437	1953	2889	3325	4285	5588

Table 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