

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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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)

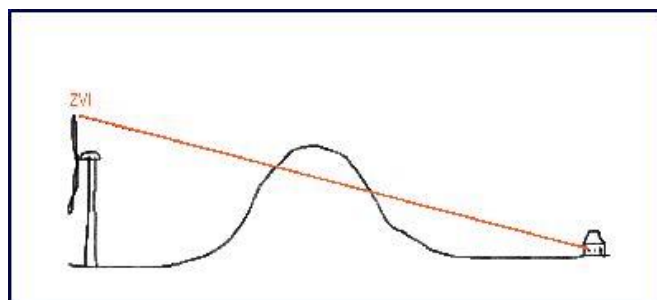


Figura 2 Occlusione visiva dell'aerogeneratore rispetto al recettore, a causa dell'andamento orografico.

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.sardegnaegeoportale.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

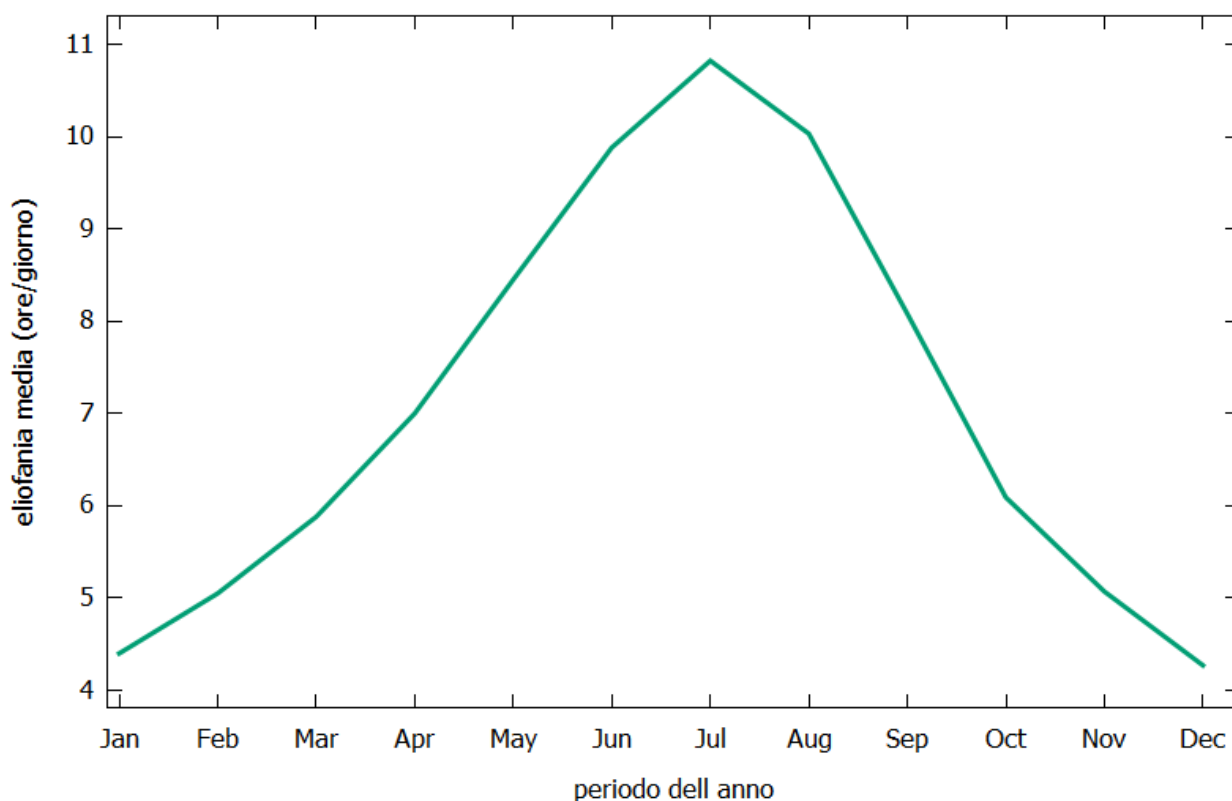


Figura 3 : Eliofoania media. Dati rilevati nella stazione di Elmas (aeronautica militare).

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).

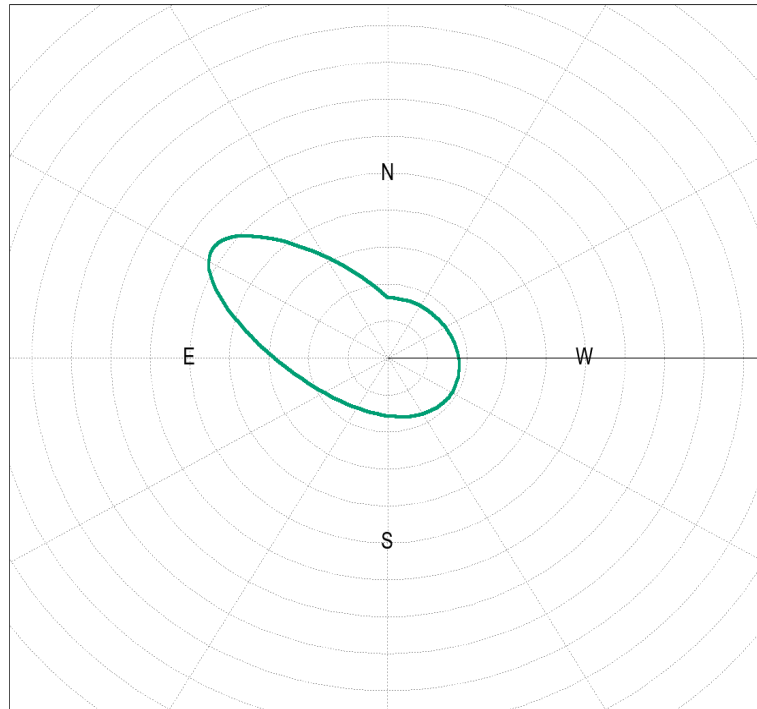


Figura 4 Rosa dei venti (distribuzione angolare della frequenza del vento) per la località del parco proposto in unità arbitrarie.

3. Risultati finali

3.1 Recettori

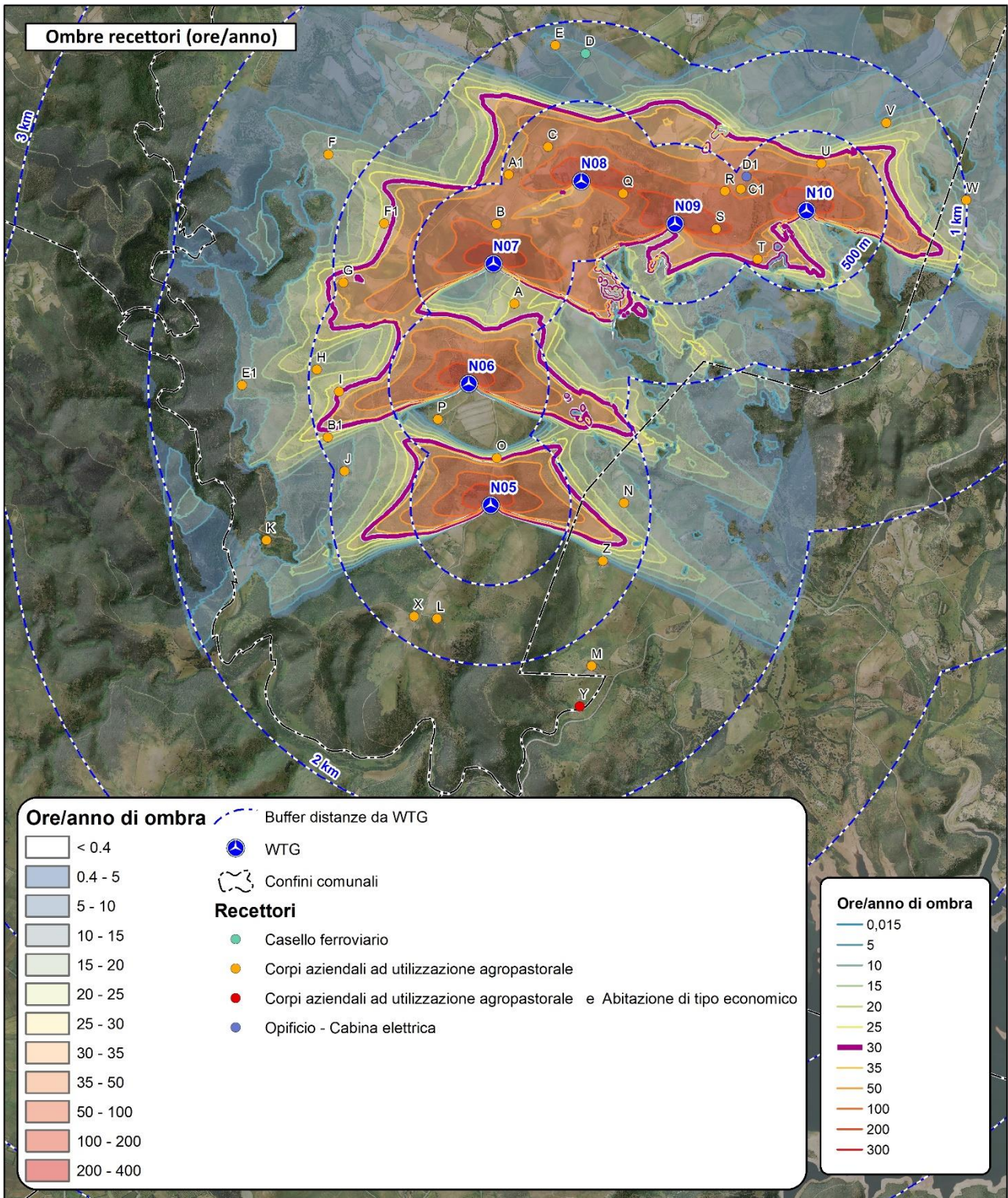


Figura 5: Ore di ombra totale all'anno su ortofoto. Sono presenti tutti i recettori. L'isolinea viola delimita al suo interno regioni con ombra > 30 ore/anno e al suo esterno regioni con ombra < 30 ore/anno.

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.

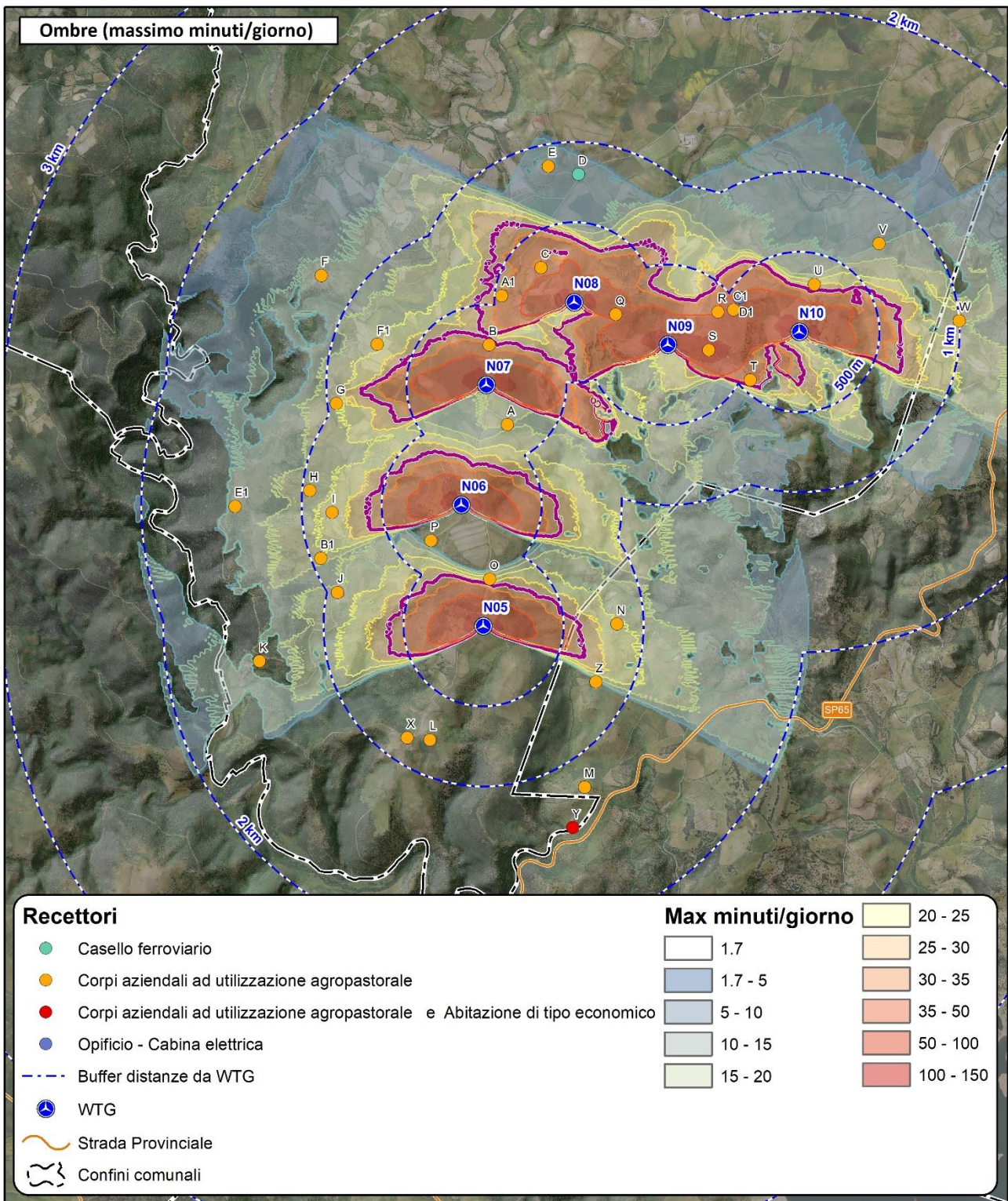


Figura 6. Numero massimo di minuti di ombra in un singolo giorno nel caso realistico. Sono riportate le principali strade provinciali comunali e statali, delle quali nessuna ricade nella zona ad alto impatto.

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.

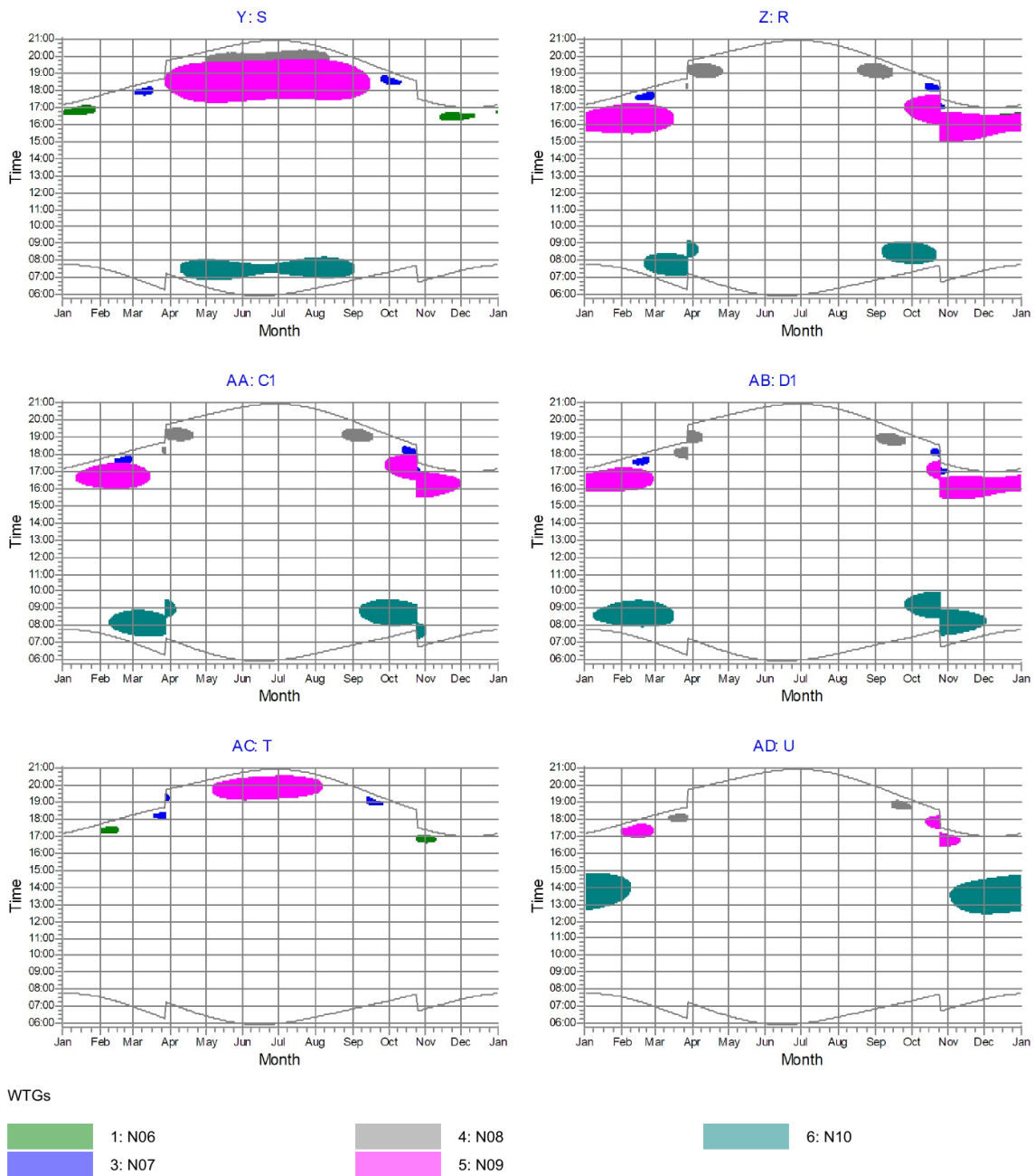


Figura 7 Calendario grafico ombre per ogni recettore al caso peggiore, senza tenere conto di eliofania e rosa dei venti. Le linee continue indicano l'ora di alba e tramonto. Le macchie colorate indicano il periodo dell'anno e le ore nelle quali i recettori sono interessati dall'ombra di una WTG. I recettori 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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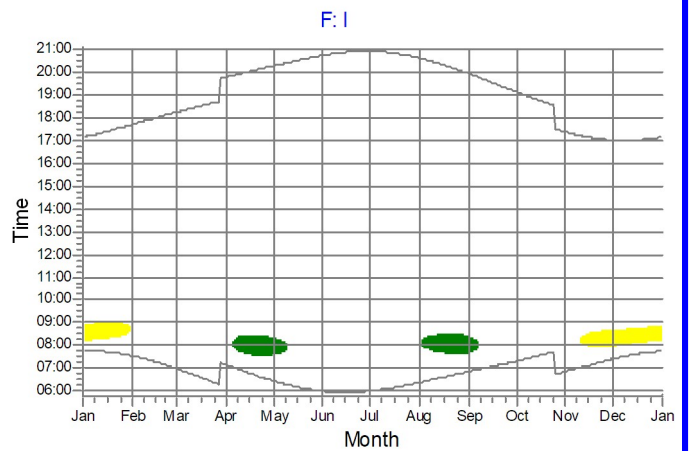
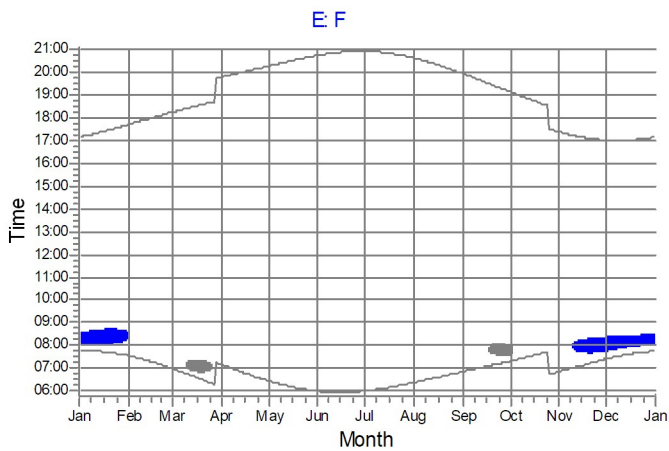
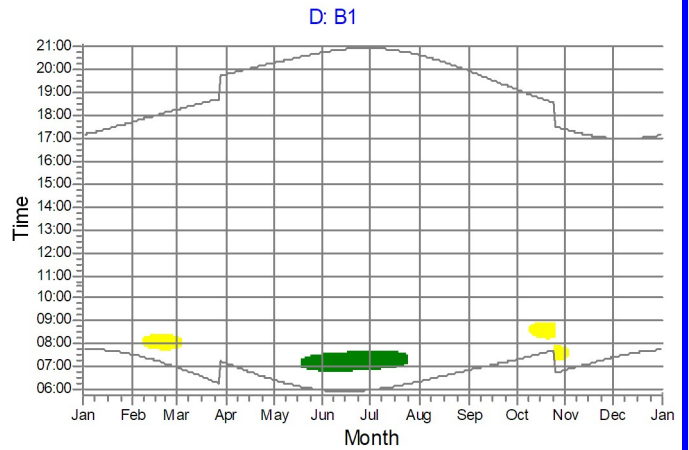
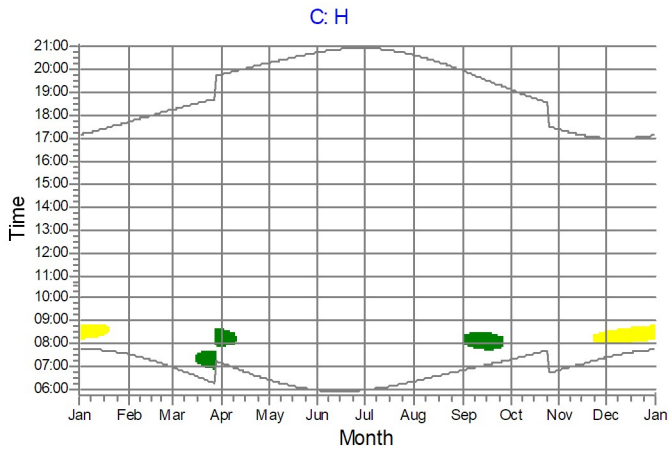
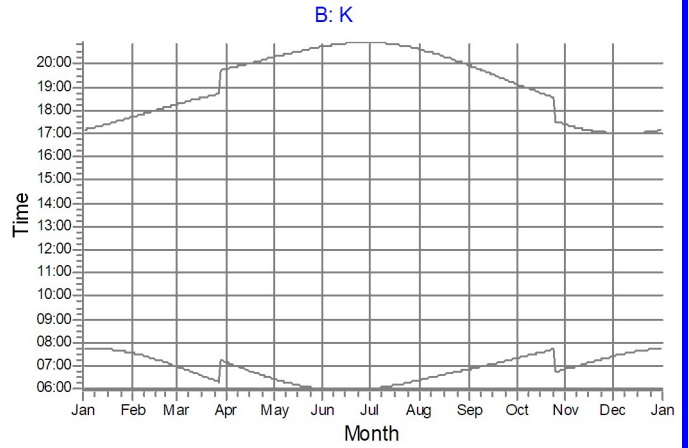
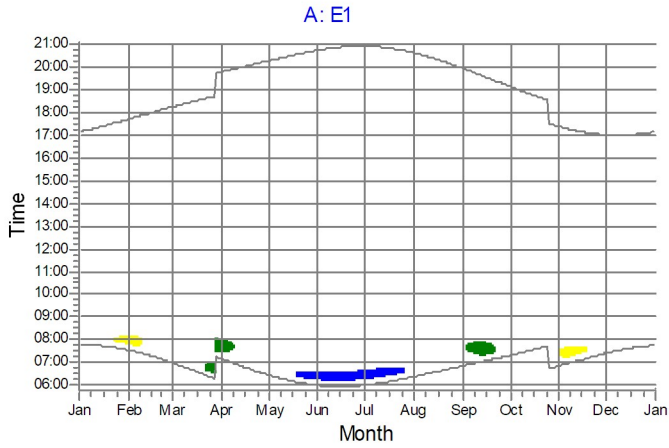
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WTGs

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| | 2: N05 | | 4: N08 |

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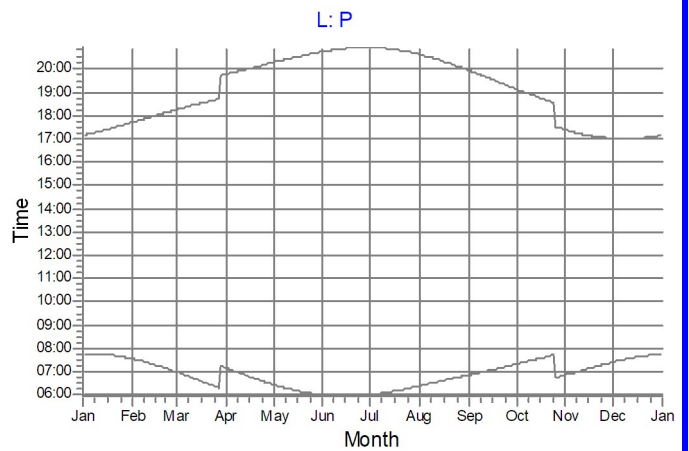
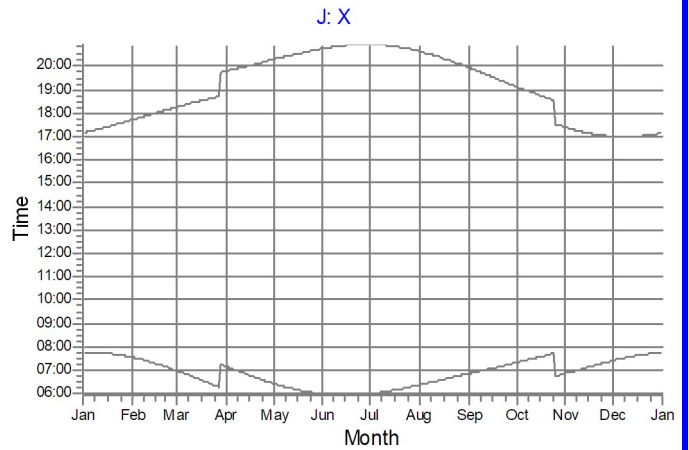
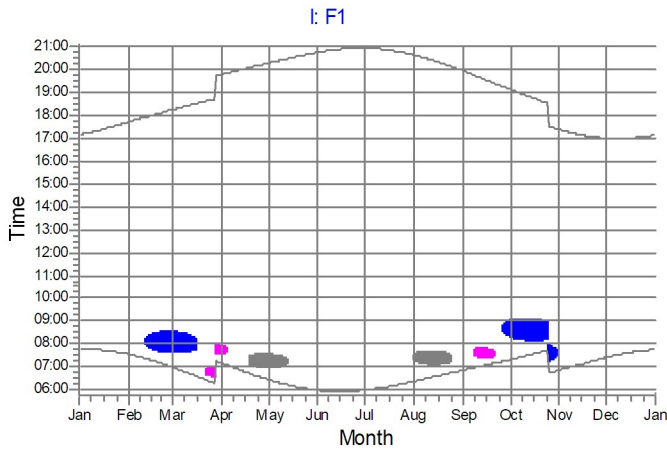
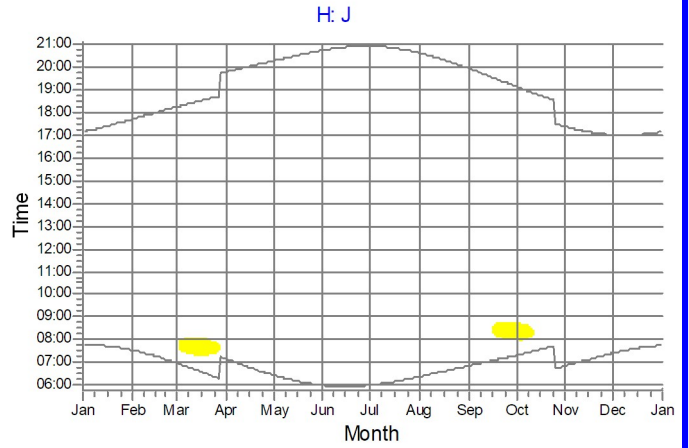
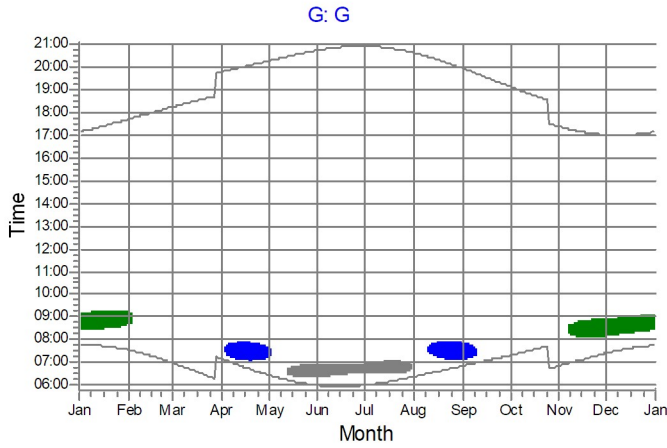
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WTGs



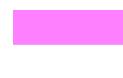
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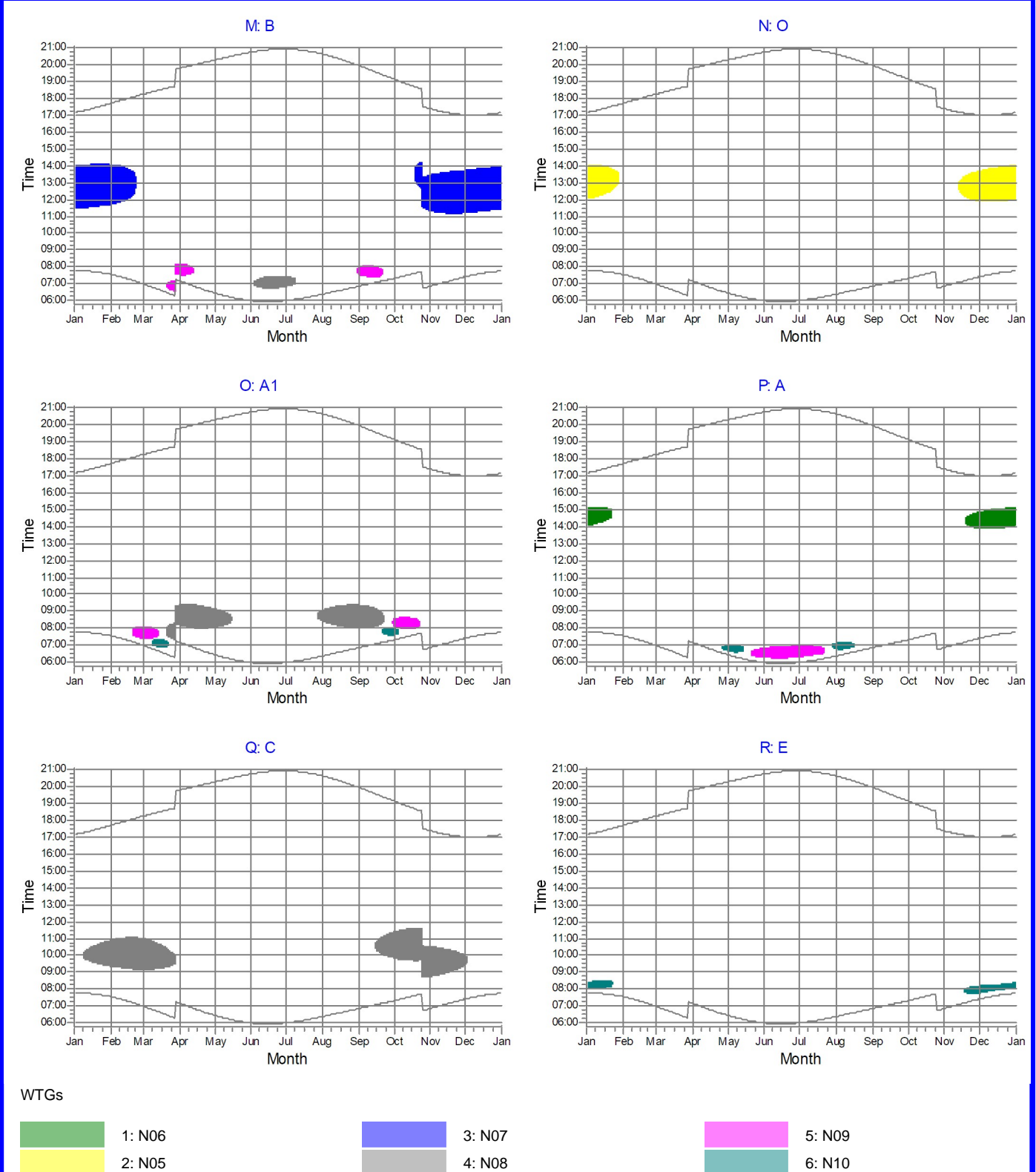
BrunoManca / ingbrunomanca@gmail.com

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01/02/2023 11:35/2.8.579

SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



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Nurri_seconda presentazione

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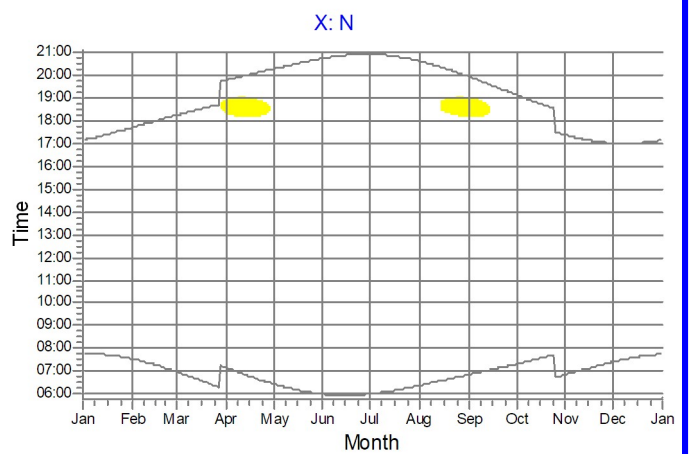
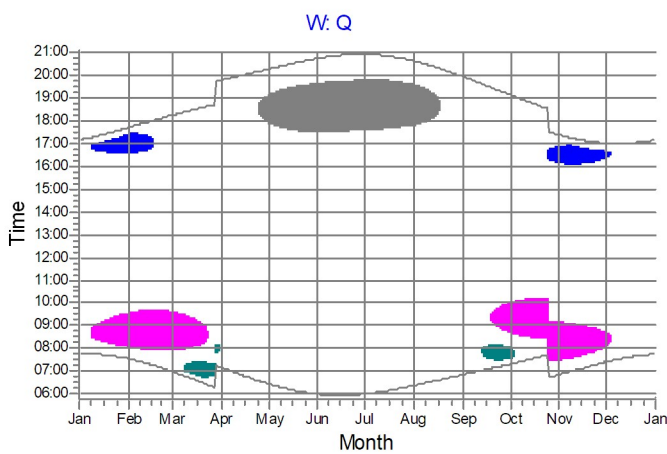
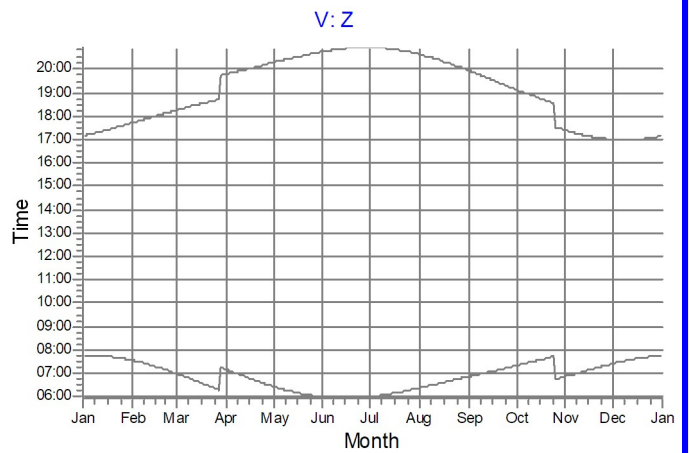
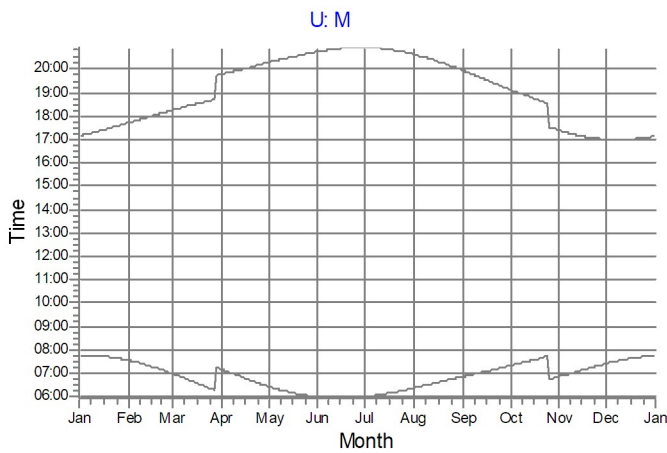
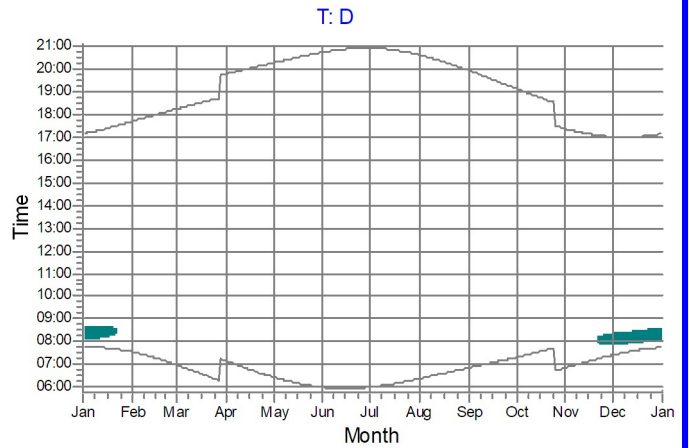
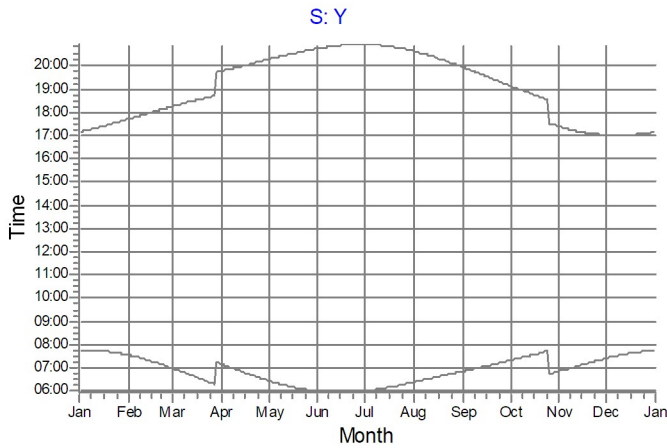
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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs



2: N05
3: N07



4: N08
5: N09



6: N10

Project:

Nurri_seconda presentazione

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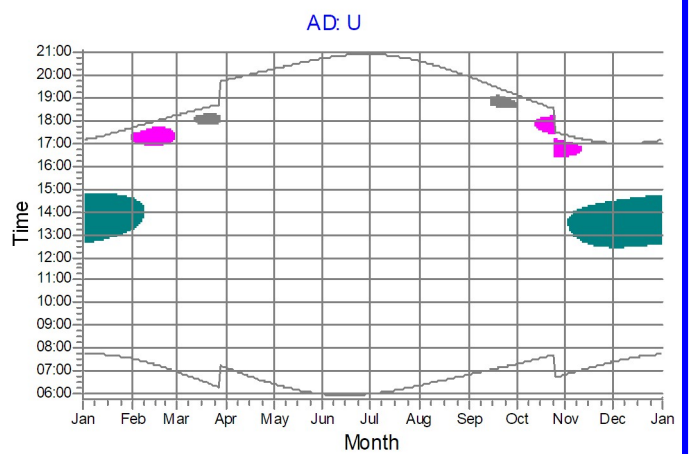
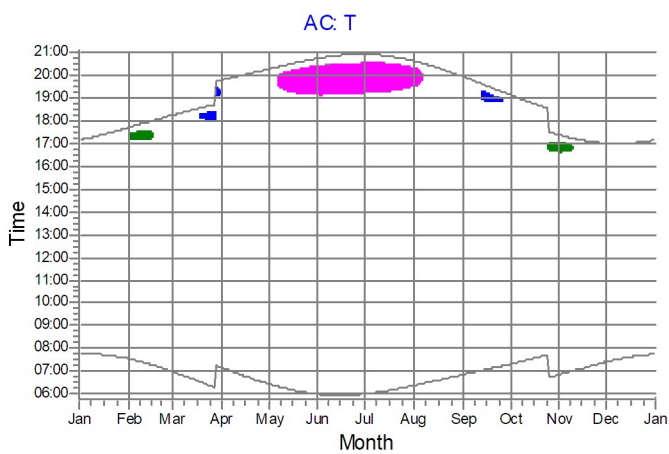
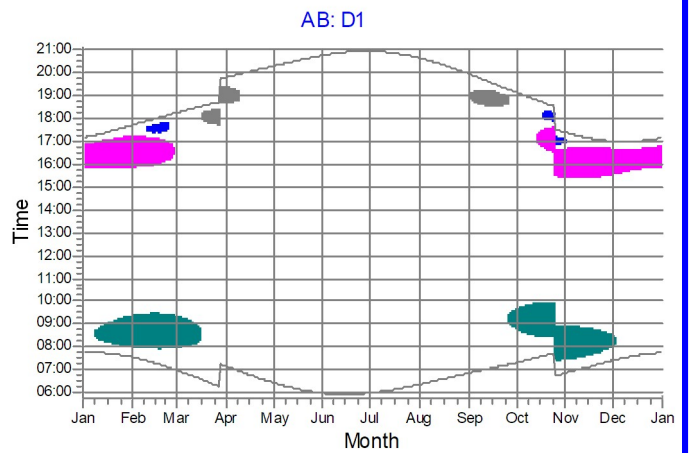
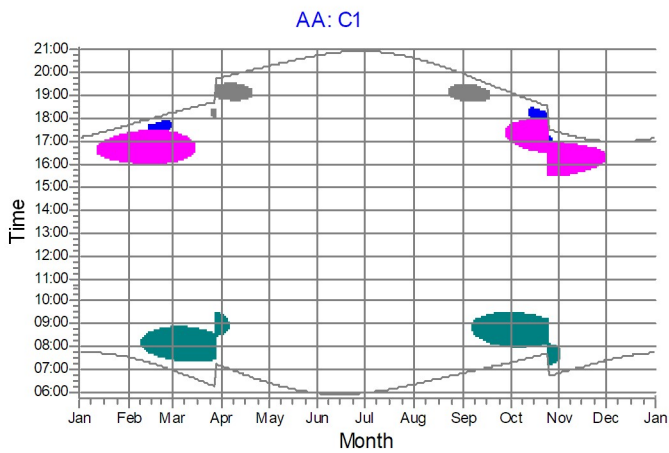
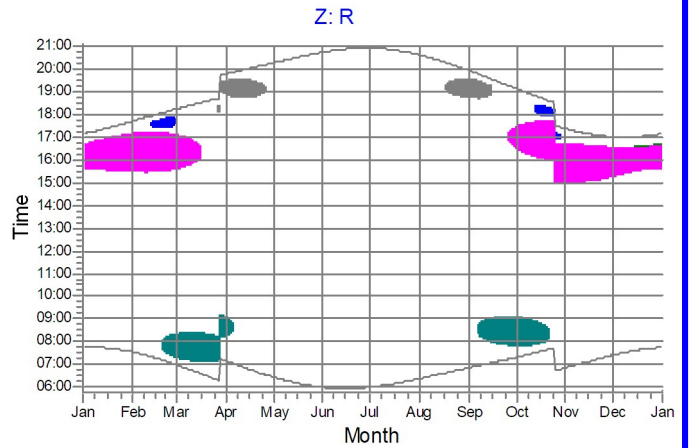
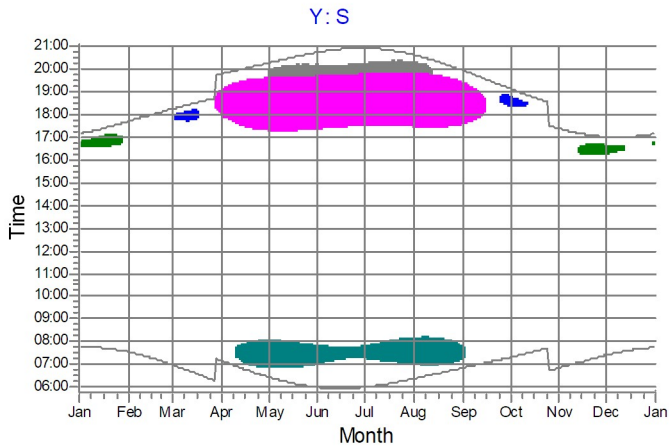
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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs



1: N06
3: N07



4: N08
5: N09



6: N10

Project:

Nurri_seconda presentazione

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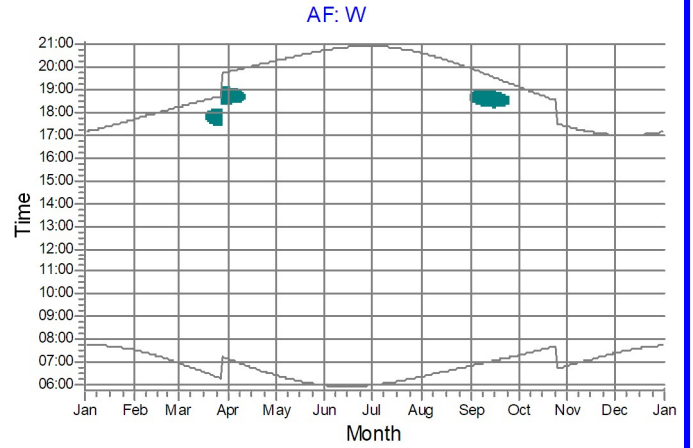
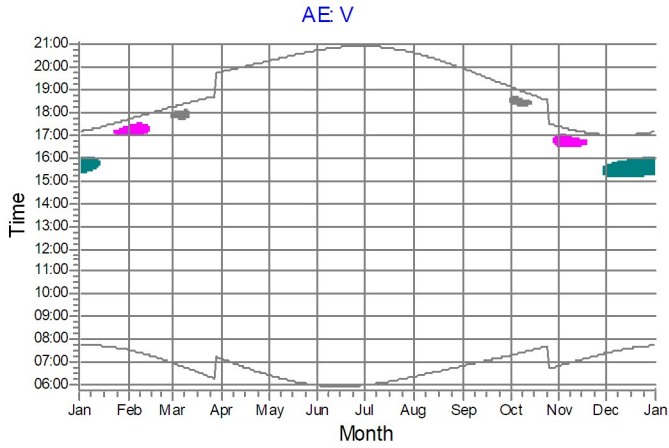
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SHADOW - Calendar, graphical

Calculation: Nurri seconda presentazione 6WTG



WTGs

4: N08

5: N09

6: N10

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Nurri_seconda presentazione

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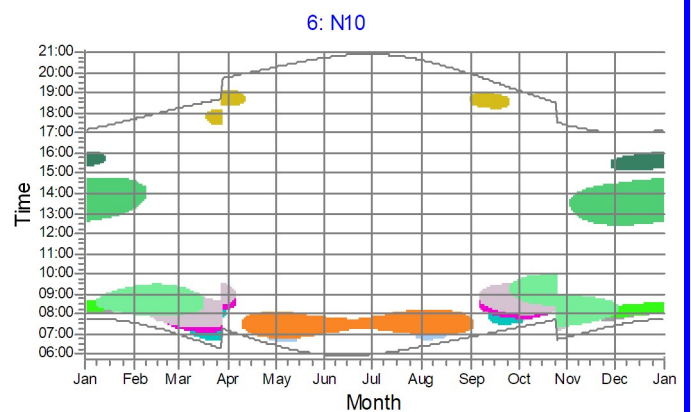
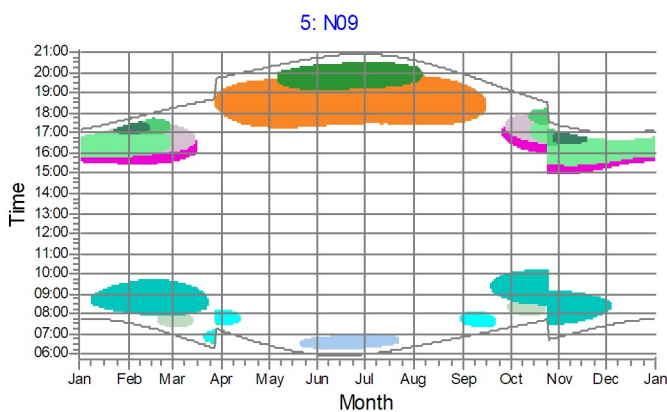
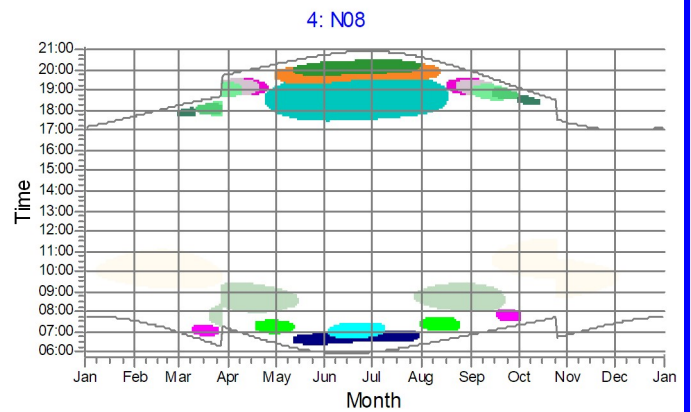
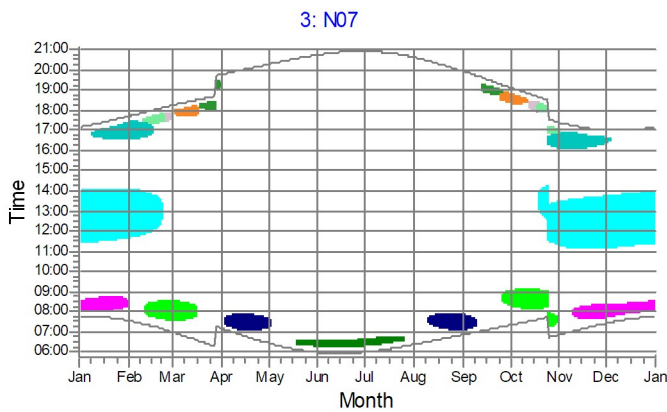
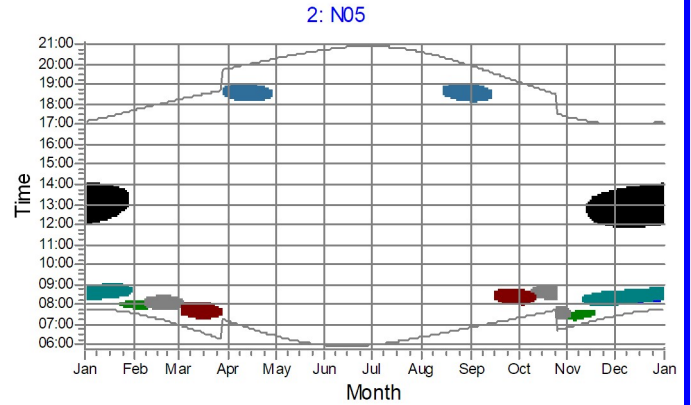
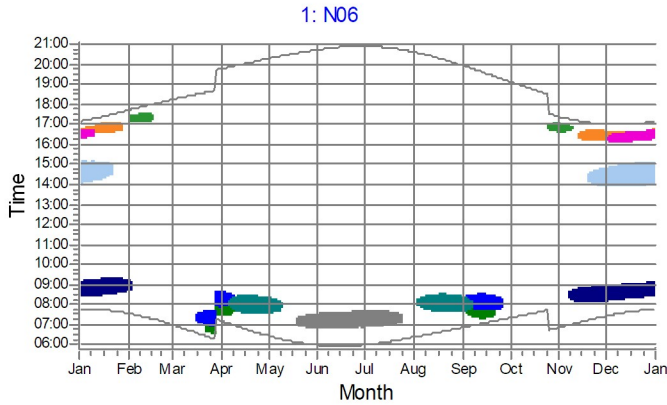
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Calculated:





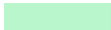












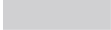





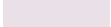

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SHADOW - Calendar per WTG, graphical

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

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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)
22	07:40	07:08		06:26	06:38		06:04	06:25 (3) 05:56	06:18 (3)
	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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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	07:25		
	20:56	14 06:35 (3)	20:38	19:56	19:08	17:23	17:00		
2	06:00	06:22 (3)	06:23	06:52	07:20	06:52	07:26		
	20:55	14 06:36 (3)	20:37	19:55	19:06	17:22	17:00		
3	06:00	06:22 (3)	06:24	06:53	07:21	06:54	07:27		
	20:55	14 06:36 (3)	20:36	19:53	19:05	17:21	17:00		
4	06:01	06:23 (3)	06:25	06:54	07:38 (1)	07:22	06:55	07:18 (2)	07:28
	20:55	14 06:37 (3)	20:35	19:52	2 07:40 (1)	19:03	17:20	15 07:33 (2)	17:00
5	06:01	06:23 (3)	06:26	06:55	07:33 (1)	07:23	06:56	07:17 (2)	07:29
	20:55	13 06:36 (3)	20:33	19:50	12 07:45 (1)	19:01	17:19	17 07:34 (2)	17:00
6	06:02	06:24 (3)	06:27	06:56	07:31 (1)	07:24	06:57	07:18 (2)	07:29
	20:55	13 06:37 (3)	20:32	19:49	16 07:47 (1)	19:00	17:18	17 07:35 (2)	16:59
7	06:02	06:24 (3)	06:28	06:57	07:29 (1)	07:25	06:58	07:20 (2)	07:30
	20:54	13 06:37 (3)	20:31	19:47	19 07:48 (1)	18:58	17:16	16 07:36 (2)	16:59
8	06:03	06:25 (3)	06:28	06:57	07:26 (1)	07:26	06:59	07:21 (2)	07:31
	20:54	13 06:38 (3)	20:30	19:45	22 07:48 (1)	18:57	17:15	16 07:37 (2)	16:59
9	06:04	06:26 (3)	06:29	06:58	07:25 (1)	07:27	07:00	07:22 (2)	07:32
	20:54	13 06:39 (3)	20:29	19:44	24 07:49 (1)	18:55	17:14	15 07:37 (2)	16:59
10	06:04	06:26 (3)	06:30	06:59	07:24 (1)	07:28	07:01	07:23 (2)	07:33
	20:53	13 06:39 (3)	20:28	19:42	25 07:49 (1)	18:54	17:13	14 07:37 (2)	16:59
11	06:05	06:27 (3)	06:31	07:00	07:24 (1)	07:29	07:03	07:24 (2)	07:34
	20:53	12 06:39 (3)	20:26	19:41	25 07:49 (1)	18:52	17:13	13 07:37 (2)	17:00
12	06:06	06:28 (3)	06:32	07:01	07:23 (1)	07:30	07:04	07:26 (2)	07:35
	20:53	12 06:40 (3)	20:25	19:39	26 07:49 (1)	18:51	17:12	12 07:38 (2)	17:00
13	06:06	06:28 (3)	06:33	07:02	07:23 (1)	07:31	07:05	07:27 (2)	07:35
	20:52	11 06:39 (3)	20:24	19:37	26 07:49 (1)	18:49	17:11	10 07:37 (2)	17:00
14	06:07	06:29 (3)	06:34	07:03	07:23 (1)	07:32	07:06	07:28 (2)	07:36
	20:52	11 06:40 (3)	20:23	19:36	26 07:49 (1)	18:48	17:10	9 07:37 (2)	17:00
15	06:08	06:30 (3)	06:35	07:04	07:24 (1)	07:33	07:07	07:29 (2)	07:37
	20:51	10 06:40 (3)	20:21	19:34	24 07:48 (1)	18:46	17:09	8 07:37 (2)	17:00
16	06:09	06:30 (3)	06:36	07:05	07:25 (1)	07:34	07:08	07:30 (2)	07:38
	20:51	10 06:40 (3)	20:20	19:32	22 07:47 (1)	18:45	17:08	6 07:36 (2)	17:01
17	06:09	06:31 (3)	06:37	07:06	07:26 (1)	07:35	07:09	07:32 (2)	07:38
	20:50	9 06:40 (3)	20:19	19:31	20 07:46 (1)	18:43	17:08	4 07:36 (2)	17:01
18	06:10	06:32 (3)	06:38	07:07	07:26 (1)	07:36	07:11	07:33 (2)	07:39
	20:49	9 06:41 (3)	20:17	19:29	18 07:44 (1)	18:42	17:07	2 07:35 (2)	17:01
19	06:11	06:33 (3)	06:39	07:08	07:27 (1)	07:37	07:12		07:40
	20:49	8 06:41 (3)	20:16	19:27	15 07:42 (1)	18:40	17:06		17:02
20	06:12	06:33 (3)	06:40	07:09	07:28 (1)	07:38	07:13		07:40
	20:48	7 06:40 (3)	20:14	19:26	12 07:40 (1)	18:39	17:05		17:02
21	06:12	06:34 (3)	06:41	07:10	07:30 (1)	07:39	07:14		07:41
	20:47	6 06:40 (3)	20:13	19:24	6 07:36 (1)	18:37	17:05		17:02
22	06:13	06:35 (3)	06:42	07:10		07:40	07:15		07:41
	20:47	5 06:40 (3)	20:11	19:23		18:36	17:04		17:03
23	06:14	06:36 (3)	06:43	07:11	07:41	07:16	07:16		07:42
	20:46	4 06:40 (3)	20:10	19:21	18:35	17:04	17:03		17:03
24	06:15	06:37 (3)	06:43	07:12	07:42	07:17	07:17		07:42
	20:45	2 06:39 (3)	20:09	19:19	18:33	17:03	17:04		17:04
25	06:16	06:38 (3)	06:44	07:13	06:44	07:18	07:18		07:43
	20:44	2 06:39 (3)	20:07	19:18	17:32	17:03	17:05		17:05
26	06:17	06:45	07:14	06:45	06:45	07:19	07:43		07:43
	20:43	20:06	19:16	17:31	17:02	17:02	17:05		17:05
27	06:18	06:46	07:15	06:46	06:46	07:20	07:43		07:43
	20:43	20:04	19:14	17:29	17:02	17:02	17:06		17:06
28	06:18	06:47	07:16	06:47	06:47	07:21	07:44		07:44
	20:42	20:03	19:13	17:28	17:01	17:01	17:06		17:06
29	06:19	06:48	07:17	06:48	06:48	07:23	07:44		07:44
	20:41	20:01	19:11	17:27	17:01	17:01	17:07		17:07
30	06:20	06:49	07:18	06:49	06:49	07:24	07:44		07:44
	20:40	20:00	19:09	17:26	17:01	17:01	17:08		17:08
31	06:21	06:50		06:50			07:44		07:44
	20:39	19:58		17:24			17:09		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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Licensed user:

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 +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 / 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	07:33 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	06:51 17:23	07:25 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	06:52 17:22	07:26 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	07:27 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 20:35	06:54 19:52	07:22 19:03	06:55 17:20	07:28 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 17:00
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 19:49	07:24 19:00	06:57 17:18	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	06:28 20:31	06:57 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 18:23	06:59 19:54	06:18 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	07:25 17:52	06:46 18:24	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	06:56 19:56	06:15 20:26	05:56 20:51	06:04 20:53	06:30 20:28	06:59 19:42	07:28 18:54	07:01 17:14	07:33 16:59
11	07:44 17:19	07:22 17:55	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 19:41	07:29 18:52	07:03 17:13	07:34 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	06:52 19:58	06:13 20:28	05:56 20:52	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:35 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 20:30	05:55 20:52	06:07 20:52	06:34 20:22	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	06:48 20:01	06:10 20:31	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	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:08	07:38 17:01
17	07:43 17:25	07:15 18:02	06:34 18:32	06:45 20:03	06:09 20:32	05:55 20:54	06:09 20:50	06:37 20:18	07:06 19:31	07:35 18:43	07:09 17:08	07:38 17:01
18	07:42 17:26	07:14 18:03	06:32 18:33	06:44 20:04	06:08 20:33	05:56 20:54	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:42	07:11 17:07	07:39 17:01
19	07:42 17:27	07:12 18:04	06:31 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 17:02
20	07:41 17:29	07:11 18:05	06:29 18:35	06:41 20:06	06:06 20:35	05:56 20:55	06:12 20:48	06:40 20:14	07:09 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	07:10 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 19:23	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	06:43 20:10	07:11 19:21	07:41 18:35	07:16 17:04	07:42 17:03
24	07:39 17:33	07:06 18:09	06:22 18:39	06:35 20:10	06:03 20:39	05:57 20:55	06:15 20:45	06:43 20:09	07:12 19:19	07:42 18:33	07:17 17:03	07:42 17:04
25	07:38 17:34	07:04 18:11	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	06:44 17:32	07:18 17:03	07:43 17:05
26	07:37 17:36	07:03 18:12	06:19 18:41	06:32 20:12	06:02 20:40	05:57 20:56	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	06:18 20:43	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 17:40	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	07:33 17:41	07:03 18:11	06:19 18:40	06:32 20:11	06:02 20:39	05:57 20:55	06:17 20:44	06:45 20:07	07:14 19:18	06:45 17:32	07:19 17:03	07:43 17:05
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)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 4

Licensed user:

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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	07:58 (1)	06:26	05:58
	17:10	28 08:45 (2)	17:43	18:15	19:47	37 08:35 (1)	20:17	20:45
2	07:45	08:17 (2)	07:32	06:57	07:08	07:58 (1)	06:25	05:58
	17:10	29 08:46 (2)	17:44	18:16	19:48	35 08:33 (1)	20:18	20:46
3	07:45	08:18 (2)	07:31	06:55	07:06	07:59 (1)	06:23	05:58
	17:11	28 08:46 (2)	17:45	18:17	19:49	34 08:33 (1)	20:19	20:46
4	07:45	08:18 (2)	07:30	06:54	07:05	07:59 (1)	06:22	05:57
	17:12	28 08:46 (2)	17:46	18:18	19:50	32 08:31 (1)	20:20	20:47
5	07:45	08:19 (2)	07:29	06:52	07:03	07:59 (1)	06:21	05:57
	17:13	28 08:47 (2)	17:47	18:19	19:51	30 08:29 (1)	20:21	20:48
6	07:45	08:19 (2)	07:28	06:51	07:02	08:01 (1)	06:20	05:57
	17:14	27 08:46 (2)	17:49	18:20	19:52	27 08:28 (1)	20:22	20:48
7	07:45	08:19 (2)	07:27	06:49	07:00	08:01 (1)	06:19	05:56
	17:15	27 08:46 (2)	17:50	18:21	19:53	25 08:26 (1)	20:23	20:49
8	07:45	08:20 (2)	07:26	06:48	06:59	08:03 (1)	06:17	05:56
	17:16	27 08:47 (2)	17:51	18:22	19:54	21 08:24 (1)	20:24	20:49
9	07:45	08:21 (2)	07:25	06:46	06:57	08:05 (1)	06:16	05:56
	17:17	26 08:47 (2)	17:52	18:24	19:55	16 08:21 (1)	20:25	20:50
10	07:45	08:22 (2)	07:23	06:45	06:55	08:10 (1)	06:15	05:56
	17:18	25 08:47 (2)	17:53	18:25	19:56	6 08:16 (1)	20:26	20:51
11	07:44	08:22 (2)	07:22	06:43	06:54		06:14	05:56
	17:19	24 08:46 (2)	17:54	18:26	19:57		20:27	20:51
12	07:44	08:23 (2)	07:21	06:42	06:52		06:13	05:56
	17:20	24 08:47 (2)	17:56	18:27	19:58		20:28	20:52
13	07:44	08:25 (2)	07:20	06:40	06:51		06:12	05:55
	17:21	22 08:47 (2)	17:57	18:28	19:59		20:29	20:52
14	07:44	08:25 (2)	07:19	06:38	06:49		06:11	05:55
	17:22	21 08:46 (2)	17:58	18:29	20:00		20:30	20:53
15	07:43	08:27 (2)	07:17	06:37	06:48		06:10	05:55
	17:23	19 08:46 (2)	17:59	18:30	20:01		20:31	20:53
16	07:43	08:29 (2)	07:16	06:35	06:46		06:09	05:55
	17:24	16 08:45 (2)	18:00	18:31	20:02		20:31	20:53
17	07:43	08:30 (2)	07:15	06:34	07:16 (1)	06:45	06:08	05:55
	17:25	14 08:44 (2)	18:01	18:32	11 07:27 (1)	20:03	20:32	20:54
18	07:42	08:32 (2)	07:14	06:32	07:11 (1)	06:43	06:08	05:56
	17:26	11 08:43 (2)	18:03	18:33	19 07:30 (1)	20:04	20:33	20:54
19	07:42	08:35 (2)	07:12	06:31	07:09 (1)	06:42	06:07	05:56
	17:27	4 08:39 (2)	18:04	18:34	24 07:33 (1)	20:05	20:34	20:54
20	07:41		07:11	06:29	07:07 (1)	06:41	06:06	05:56
	17:29		18:05	18:35	27 07:34 (1)	20:06	20:35	20:55
21	07:41		07:10	06:27	07:06 (1)	06:39	06:05	05:56
	17:30		18:06	18:36	29 07:35 (1)	20:07	20:36	20:55
22	07:40		07:08	06:26	07:04 (1)	06:38	06:04	05:56
	17:31		18:07	18:37	32 07:36 (1)	20:08	20:37	20:55
23	07:39		07:07	06:24	07:02 (1)	06:36	06:04	05:56
	17:32		18:08	18:38	34 07:36 (1)	20:09	20:38	20:55
24	07:39		07:06	06:22	07:02 (1)	06:35	06:03	05:57
	17:33		18:09	18:39	35 07:37 (1)	20:10	20:39	20:55
25	07:38		07:04	06:21	07:00 (1)	06:34	06:02	05:57
	17:34		18:11	18:40	37 07:37 (1)	20:11	20:39	20:55
26	07:37		07:03	06:19	06:59 (1)	06:32	06:02	05:57
	17:35		18:12	18:41	38 07:37 (1)	20:12	20:40	20:56
27	07:37		07:01	06:18	06:59 (1)	06:31	06:01	05:58
	17:37		18:13	18:42	38 07:37 (1)	20:13	20:41	20:56
28	07:36		07:00	06:16	06:58 (1)	06:30	06:00	05:58
	17:38		18:14	18:43	38 07:36 (1)	20:14	20:42	20:56
29	07:35			07:14	07:59 (1)	06:28	06:00	05:58
	17:39			19:44	38 08:37 (1)	20:15	20:43	20:56
30	07:34			07:13	07:58 (1)	06:27	05:59	05:59
	17:40			19:45	38 08:36 (1)	20:16	20:43	20:56
31	07:33			07:11	07:57 (1)		05:59	
	17:41			19:46	38 08:35 (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:

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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
	20:56	20:38	19:56	19:08	17:23	17:00
2	06:00	06:23	06:52	08:08 (1)	07:20	06:52
	20:55	20:37	19:55	08:14 (1)	19:06	17:22
3	06:00	06:24	06:53	08:03 (1)	07:21	06:53
	20:55	20:36	19:53	08:19 (1)	19:05	17:21
4	06:01	06:25	06:54	08:01 (1)	07:22	06:55
	20:55	20:35	19:52	08:21 (1)	19:03	17:20
5	06:01	06:26	06:55	07:58 (1)	07:23	06:56
	20:55	20:33	19:50	08:23 (1)	19:01	17:19
6	06:02	06:27	06:56	07:57 (1)	07:24	06:57
	20:55	20:32	19:49	08:24 (1)	19:00	17:18
7	06:02	06:28	06:57	07:55 (1)	07:25	06:58
	20:54	20:31	19:47	08:25 (1)	18:58	17:16
8	06:03	06:28	06:57	07:53 (1)	07:26	06:59
	20:54	20:30	19:45	08:25 (1)	18:57	17:15
9	06:04	06:29	06:58	07:52 (1)	07:27	07:00
	20:54	20:29	19:44	08:26 (1)	18:55	17:14
10	06:04	06:30	06:59	07:51 (1)	07:28	07:01
	20:53	20:28	19:42	08:26 (1)	18:54	17:13
11	06:05	06:31	07:00	07:50 (1)	07:29	07:03
	20:53	20:26	19:41	08:27 (1)	18:52	17:13
12	06:06	06:32	07:01	07:50 (1)	07:30	07:04
	20:53	20:25	19:39	08:27 (1)	18:51	17:12
13	06:06	06:33	07:02	07:49 (1)	07:31	07:05
	20:52	20:24	19:37	08:27 (1)	18:49	17:11
14	06:07	06:34	07:03	07:49 (1)	07:32	07:06
	20:52	20:22	19:36	08:27 (1)	18:48	17:10
15	06:08	06:35	07:04	07:49 (1)	07:33	07:07
	20:51	20:21	19:34	08:27 (1)	18:46	17:09
16	06:09	06:36	07:05	07:48 (1)	07:34	07:08
	20:51	20:20	19:32	08:26 (1)	18:45	17:08
17	06:09	06:37	07:06	07:48 (1)	07:35	07:09
	20:50	20:18	19:31	08:26 (1)	18:43	17:07
18	06:10	06:38	07:07	07:47 (1)	07:36	07:11
	20:49	20:17	19:29	08:24 (1)	18:42	17:07
19	06:11	06:39	07:08	07:48 (1)	07:37	07:12
	20:49	20:16	19:27	08:23 (1)	18:40	17:06
20	06:12	06:40	07:09	07:48 (1)	07:38	07:13
	20:48	20:14	19:26	08:23 (1)	18:39	17:05
21	06:12	06:41	07:09	07:49 (1)	07:39	07:14
	20:47	20:13	19:24	08:21 (1)	18:37	17:05
22	06:13	06:42	07:10	07:50 (1)	07:40	07:15
	20:47	20:11	19:23	08:20 (1)	18:36	17:04
23	06:14	06:43	07:11	07:51 (1)	07:41	07:16
	20:46	20:10	19:21	08:18 (1)	18:35	17:04
24	06:15	06:43	07:12	07:52 (1)	07:42	07:17
	20:45	20:09	19:19	08:17 (1)	18:33	17:03
25	06:16	06:44	07:13	07:54 (1)	06:44	07:18
	20:44	20:07	19:18	08:14 (1)	17:32	17:03
26	06:17	06:45	07:14	07:57 (1)	06:45	07:19
	20:43	20:06	19:16	08:11 (1)	17:31	17:02
27	06:18	06:46	07:15	06:46	07:20	08:06 (2)
	20:43	20:04	19:14	17:29	17:02	19 08:25 (2)
28	06:18	06:47	07:16	06:47	07:21	08:05 (2)
	20:42	20:03	19:13	17:28	17:01	21 08:26 (2)
29	06:19	06:48	07:17	06:48	07:23	08:05 (2)
	20:41	20:01	19:11	17:27	17:01	22 08:27 (2)
30	06:20	06:49	07:18	06:49	07:24	08:04 (2)
	20:40	20:00	19:09	17:26	17:01	24 08:28 (2)
31	06:21	06:50		06:50		07:44
	20:39	19:58		17:24		17:09
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:

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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	07:33	06:58	07:53 (2)	07:10	06:26	
	17:10	17:43	18:15	08:14 (2)	19:47	20:17	
2	07:45	07:32	06:57	07:54 (2)	07:08	06:25	
	17:10	17:44	18:16	08:12 (2)	19:48	20:18	
3	07:45	07:31	06:55	07:58 (2)	07:06	06:23	
	17:11	17:45	18:17	08:09 (2)	19:49	20:19	
4	07:45	07:30	06:54	07:05	06:22	05:57	
	17:12	17:46	18:18	19:50	20:20	20:47	
5	07:45	07:29	06:52	07:03	06:21	05:57	
	17:13	17:47	18:19	19:51	20:21	20:48	
6	07:45	07:28	06:51	07:02	06:20	05:57	
	17:14	17:49	18:20	19:52	20:22	20:48	
7	07:45	07:27	06:49	07:00	06:19	05:56	
	17:15	17:50	18:21	19:53	20:23	20:49	
8	07:45	07:26	06:48	06:59	06:17	05:56	
	17:16	17:51	18:22	19:54	20:24	20:49	
9	07:45	07:25	08:00 (2)	06:46	06:57	06:16	
	17:17	17:52	08:12 (2)	18:24	19:55	20:25	
10	07:45	07:23	07:57 (2)	06:45	06:55	06:15	
	17:18	17:53	08:15 (2)	18:25	19:56	20:26	
11	07:44	07:22	07:54 (2)	06:43	06:54	06:14	
	17:19	17:54	08:16 (2)	18:26	19:57	20:27	
12	07:44	07:21	07:53 (2)	06:42	06:52	06:13	
	17:20	17:56	08:17 (2)	18:27	19:58	20:28	
13	07:44	07:20	07:52 (2)	06:40	06:51	06:12	
	17:21	17:57	08:19 (2)	18:28	19:59	20:29	
14	07:44	07:19	07:51 (2)	06:38	06:49	06:11	
	17:22	17:58	08:20 (2)	18:29	20:00	20:30	
15	07:43	07:17	07:50 (2)	06:37	06:48	06:10	
	17:23	17:59	08:20 (2)	18:30	20:01	20:31	
16	07:43	07:16	07:49 (2)	06:35	06:46	06:09	
	17:24	18:00	08:21 (2)	18:31	20:02	20:31	
17	07:43	07:15	07:49 (2)	06:34	06:45	06:08	
	17:25	18:01	08:22 (2)	18:32	20:03	20:32	
18	07:42	07:14	07:49 (2)	06:32	06:43	06:08	
	17:26	18:03	08:22 (2)	18:33	20:04	20:33	
19	07:42	07:12	07:48 (2)	06:31	06:42	06:07	
	17:27	18:04	08:22 (2)	18:34	20:05	20:34	
20	07:41	07:11	07:48 (2)	06:29	06:41	06:06	
	17:29	18:05	08:22 (2)	18:35	20:06	20:35	
21	07:41	07:10	07:48 (2)	06:27	06:39	06:05	
	17:30	18:06	08:22 (2)	18:36	20:07	20:36	
22	07:40	07:08	07:48 (2)	06:26	06:38	06:04	
	17:31	18:07	08:22 (2)	18:37	20:08	20:37	
23	07:39	07:07	07:49 (2)	06:24	06:36	06:04	
	17:32	18:08	08:22 (2)	18:38	20:09	20:38	
24	07:39	07:06	07:48 (2)	06:22	06:35	06:03	
	17:33	18:09	08:20 (2)	18:39	20:10	20:39	
25	07:38	07:04	07:49 (2)	06:21	06:34	06:02	
	17:34	18:11	08:20 (2)	18:40	20:11	20:39	
26	07:37	07:03	07:49 (2)	06:19	06:32	06:02	
	17:35	18:12	08:19 (2)	18:41	20:12	20:40	
27	07:37	07:01	07:51 (2)	06:18	06:31	06:01	
	17:37	18:13	08:18 (2)	18:42	20:13	20:41	
28	07:36	07:00	07:51 (2)	06:16	06:30	06:00	
	17:38	18:14	08:16 (2)	18:43	20:14	20:42	
29	07:35		07:14		06:28	06:00	
	17:39		19:44		20:15	20:43	
30	07:34		07:13		06:27	05:59	
	17:40		19:45		20:16	20:43	
31	07:33		07:11			05:59	
	17:41		19:46			20:44	
Potential sun hours	301	299	370	397	445	448	
Total, worst case			574	50		333	1191
Sun reduction			0,47	0,49		0,59	0,66
Oper. time red.			0,93	0,93		0,93	0,93
Wind dir. red.			0,76	0,76		0,68	0,68
Total reduction			0,34	0,35		0,38	0,42
Total, real			193	18		125	504

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:

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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 / 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	06:56 (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	2 08:39 (2)
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	14 08:45 (2)
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	19 08:47 (2)
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	23 08:49 (2)
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	26 08:50 (2)
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	28 08:51 (2)
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	29 08:51 (2)
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	31 08:52 (2)
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	32 08:52 (2)
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	33 08:52 (2)
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	33 08:52 (2)
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	34 08:52 (2)
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	34 08:53 (2)
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	34 08:53 (2)
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	33 08:52 (2)
25	06:16		06:44	07:13	06:44	07:19 (2)
	20:44		20:07	19:18	17:32	32 07:51 (2)
26	06:17	06:45	07:14	06:45	07:19 (2)	07:19
	20:43	20:06	19:16	17:31	32 07:51 (2)	17:02
27	06:18	06:46	07:15	06:46	07:20 (2)	07:20
	20:43	20:04	19:14	17:29	30 07:50 (2)	17:02
28	06:18	06:47	07:16	06:47	07:20 (2)	07:21
	20:42	20:03	19:13	17:28	29 07:49 (2)	17:01
29	06:19	06:48	07:17	06:48	07:22 (2)	07:23
	20:41	20:01	19:11	17:27	26 07:48 (2)	17:01
30	06:20	06:49	07:18	06:49	07:23 (2)	07:24
	20:40	20:00	19:09	17:26	24 07:47 (2)	17:01
31	06:21	06:50		06:50	07:24 (2)	
	20:39	19:58		17:24	21 07:45 (2)	
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	(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 / 8

Licensed user:

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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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01/02/2023 11:46 / 9

Licensed user:

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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	06:22	06:51	07:19	07:39 (4)	06:51	07:25	07:48 (3)
	20:56	20:38	19:56	19:08	07:54 (4)	17:23	17:00	08:18 (3)
2	06:00	06:23	06:52	07:20	07:41 (4)	06:52	07:26	07:49 (3)
	20:55	20:37	19:55	19:06	07:51 (4)	17:22	17:00	08:19 (3)
3	06:00	06:24	06:53	07:21		06:54	07:27	07:50 (3)
	20:55	20:36	19:53	19:05		17:21	17:00	08:19 (3)
4	06:01	06:25	06:54	07:22		06:55	07:28	07:51 (3)
	20:55	20:35	19:52	19:03		17:20	17:00	08:19 (3)
5	06:01	06:26	06:55	07:23		06:56	07:29	07:52 (3)
	20:55	20:33	19:50	19:01		17:19	17:00	08:19 (3)
6	06:02	06:27	06:56	07:24		06:57	07:29	07:52 (3)
	20:55	20:32	19:49	19:00		17:17	16:59	08:18 (3)
7	06:02	06:28	06:57	07:25		06:58	07:30	07:53 (3)
	20:55	20:31	19:47	18:58		17:16	16:59	08:19 (3)
8	06:03	06:28	06:57	07:26		06:59	07:31	07:54 (3)
	20:54	20:30	19:45	18:57		17:15	16:59	08:19 (3)
9	06:04	06:29	06:58	07:27		07:00	07:32	07:55 (3)
	20:54	20:29	19:44	18:55		17:14	16:59	08:19 (3)
10	06:04	06:30	06:59	07:28		07:01	07:33	07:56 (3)
	20:54	20:28	19:42	18:54		17:13	16:59	08:19 (3)
11	06:05	06:31	07:00	07:29	4	07:59 (3)	07:34	07:57 (3)
	20:53	20:26	19:41	18:52		17:12	16:59	08:20 (3)
12	06:06	06:32	07:01	07:30	13	08:03 (3)	07:35	07:58 (3)
	20:53	20:25	19:39	18:51		17:12	17:00	08:20 (3)
13	06:06	06:33	07:02	07:31	17	08:06 (3)	07:35	07:58 (3)
	20:52	20:24	19:37	18:49		17:11	17:00	08:20 (3)
14	06:07	06:34	07:03	07:32	20	08:08 (3)	07:36	07:59 (3)
	20:52	20:23	19:36	18:48		17:10	17:00	08:20 (3)
15	06:08	06:35	07:04	07:33	23	08:09 (3)	07:37	08:00 (3)
	20:51	20:21	19:34	18:46		17:09	17:00	08:21 (3)
16	06:08	06:36	07:05	07:34	25	08:10 (3)	07:38	08:00 (3)
	20:51	20:20	19:32	18:45		17:08	17:00	08:20 (3)
17	06:09	06:37	07:06	07:35	27	08:11 (3)	07:38	08:01 (3)
	20:50	20:18	19:31	18:43		17:07	17:01	08:21 (3)
18	06:10	06:38	07:07	07:36	27	08:12 (3)	07:39	08:02 (3)
	20:49	20:17	19:29	18:42		17:07	17:01	08:22 (3)
19	06:11	06:39	07:08	07:37	29	08:13 (3)	07:40	08:02 (3)
	20:49	20:16	19:27	18:40		17:06	17:01	08:22 (3)
20	06:12	06:40	07:09	07:41 (4)	29	08:13 (3)	07:40	08:03 (3)
	20:48	20:14	19:26	18:39		17:05	17:02	08:22 (3)
21	06:12	06:41	07:09	07:40 (4)	31	08:14 (3)	07:41	08:03 (3)
	20:47	20:13	19:24	18:37		17:05	17:02	08:22 (3)
22	06:13	06:42	07:10	07:39 (4)	31	08:14 (3)	07:41	08:04 (3)
	20:47	20:11	19:22	18:36		17:04	17:03	08:23 (3)
23	06:14	06:43	07:11	07:38 (4)	32	08:16 (3)	07:42	08:04 (3)
	20:46	20:10	19:21	18:35		17:04	17:03	08:23 (3)
24	06:15	06:43	07:12	07:37 (4)	32	08:16 (3)	07:42	08:05 (3)
	20:45	20:09	19:19	18:33		17:03	17:04	08:24 (3)
25	06:16	06:44	07:13	07:37 (4)	32	08:16 (3)	07:43	08:05 (3)
	20:44	20:07	19:18	18:32		17:03	17:04	08:25 (3)
26	06:17	06:45	07:14	07:36 (4)	32	08:16 (3)	07:43	08:05 (3)
	20:43	20:06	19:16	18:31		17:02	17:05	08:25 (3)
27	06:18	06:46	07:15	07:36 (4)	33	08:17 (3)	07:43	08:06 (3)
	20:43	20:04	19:14	18:29		17:02	17:06	08:26 (3)
28	06:18	06:47	07:16	07:37 (4)	32	08:17 (3)	07:44	08:06 (3)
	20:42	20:03	19:13	18:28		17:01	17:06	08:27 (3)
29	06:19	06:48	07:17	07:37 (4)	32	08:17 (3)	07:44	08:06 (3)
	20:41	20:01	19:11	18:27		17:01	17:07	08:27 (3)
30	06:20	06:49	07:18	07:38 (4)	32	08:17 (3)	07:44	08:06 (3)
	20:40	20:00	19:09	18:26		17:01	17:08	08:27 (3)
31	06:21	06:50		06:50	31	08:17 (3)	07:44	08:06 (3)
	20:39	19:58		17:24			17:09	08:28 (3)
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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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 20:26	06:15 20:26
11	07:44 17:19	08:20 (2) 17:54	07:22 18:26	06:43 19:57	06:54 20:27	06:14 20:27
12	07:44 17:20	08:21 (2) 17:56	07:21 18:27	06:42 19:58	06:52 20:28	06:13 20:28
13	07:44 17:21	08:21 (2) 17:57	07:20 18:28	06:40 19:59	06:51 20:29	06:12 20:29
14	07:44 17:22	08:21 (2) 17:58	07:19 18:29	06:38 20:00	06:49 20:00	06:11 20:30
15	07:43 17:23	08:22 (2) 17:59	07:17 18:30	06:37 20:01	06:48 20:01	06:10 20:31
16	07:43 17:24	08:23 (2) 18:00	07:16 18:31	06:35 20:02	06:46 20:02	06:09 20:31
17	07:43 17:25	08:23 (2) 18:01	07:15 18:32	06:34 20:03	06:45 20:03	06:08 20:32
18	07:42 17:26	08:24 (2) 18:03	07:14 18:33	06:32 20:04	06:43 20:04	06:08 20:33
19	07:42 17:27	08:24 (2) 18:04	07:12 18:34	06:30 20:05	06:42 20:05	06:07 20:34
20	07:41 17:29	08:24 (2) 18:05	07:11 18:35	06:29 20:06	06:41 20:06	06:06 20:35
21	07:41 17:30	08:25 (2) 18:06	07:10 18:36	06:27 20:07	06:39 20:07	06:05 20:36
22	07:40 17:31	08:26 (2) 18:07	07:08 18:37	06:26 20:08	06:38 20:08	06:04 20:37
23	07:39 17:32	08:27 (2) 18:08	07:07 18:38	06:24 20:09	06:36 20:09	06:04 20:38
24	07:39 17:33	08:28 (2) 18:09	07:06 18:39	06:22 20:10	06:35 20:10	06:03 20:39
25	07:38 17:34	08:29 (2) 18:11	07:04 18:40	06:21 20:11	06:34 20:11	06:02 20:39
26	07:37 17:35	08:30 (2) 18:12	07:03 18:41	06:19 20:12	06:32 20:12	06:02 20:40
27	07:37 17:37	08:32 (2) 18:13	07:01 18:42	06:18 20:13	06:31 20:13	06:01 20:41
28	07:36 17:38	08:34 (2) 18:14	07:00 18:43	06:16 20:14	06:30 20:14	06:00 20:42
29	07:35 17:39	08:36 (2) 18:15	06:59 18:44	06:15 20:15	06:29 20:15	06:00 20:43
30	07:34 17:40	08:39 (2) 18:16	06:58 19:45	06:14 20:16	06:28 20:16	06:00 20:43
31	07:33 17:41		06:57 19:46	06:13 20:17	06:27 20:17	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	(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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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 08:04 (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 08:19 (1)	07:25 18:58	06:58 17:16
8	06:03 20:54	06:28 20:30	07:52 (1) 19:45	06:57 08:20 (1)	07:26 18:57	06:59 17:15
9	06:04 20:54	06:29 20:29	07:51 (1) 19:44	06:58 08:21 (1)	07:27 18:55	07:00 17:14
10	06:04 20:53	06:30 20:28	07:50 (1) 19:42	06:59 08:23 (1)	07:28 18:54	07:01 17:13
11	06:05 20:53	06:31 20:26	07:48 (1) 19:41	07:00 08:23 (1)	07:29 18:52	07:03 17:13
12	06:06 20:53	06:32 20:25	07:47 (1) 19:39	07:01 08:23 (1)	07:30 18:51	07:04 17:12
13	06:06 20:52	06:33 20:24	07:46 (1) 19:37	07:02 08:24 (1)	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 08:25 (1)	07:32 18:48	13 08:08 (2) 17:00
15	06:08 20:51	06:35 20:21	07:45 (1) 19:34	07:04 08:25 (1)	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 08:26 (1)	07:34 18:45	21 08:04 (2) 17:00
17	06:09 20:50	06:37 20:18	07:44 (1) 19:31	07:06 08:26 (1)	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 08:27 (1)	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 08:27 (1)	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 08:27 (1)	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 08:26 (1)	07:39 18:37	31 08:01 (2) 17:02
22	06:13 20:47	06:42 20:11	07:41 (1) 19:22	07:10 08:26 (1)	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 08:26 (1)	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 08:26 (1)	07:42 18:33	32 08:01 (2) 17:04
25	06:16 20:44	06:44 20:07	07:41 (1) 19:18	07:13 08:25 (1)	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 08:25 (1)	06:45 17:31	33 08:31 (2) 17:05
27	06:18 20:43	06:46 20:04	07:42 (1) 19:14	07:15 08:24 (1)	06:46 17:29	33 08:01 (2) 17:06
28	06:18 20:42	06:47 20:03	07:42 (1) 19:13	07:16 08:24 (1)	06:47 17:28	34 08:01 (2) 17:06
29	06:19 20:41	06:48 20:01	07:43 (1) 19:11	07:17 08:23 (1)	06:48 17:27	34 08:01 (2) 17:07
30	06:20 20:40	06:49 20:00	07:42 (1) 19:09	07:18 08:21 (1)	06:49 17:26	34 08:35 (2) 17:08
31	06:21 20:39	06:50 19:58	07:43 (1) 19:08	07:19 08:20 (1)	06:50 17:24	33 08:01 (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)	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 / 12

Licensed user:

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 IT-09028 Sestu
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 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 17:10	08:30 (1) 09:04 (1)	07:33 17:43	08:45 (1) 09:07 (1)	06:58 19:47	07:10 19:47	06:26 13
2	07:45 17:10	08:30 (1) 09:05 (1)	07:32 17:44	08:47 (1) 09:05 (1)	06:57 19:48	07:08 19:48	06:24 24
3	07:45 17:11	08:30 (1) 09:06 (1)	07:31 17:45	08:50 (1) 09:03 (1)	06:55 18:17	07:06 19:49	06:23 23
4	07:45 17:12	08:31 (1) 09:06 (1)	07:30 17:46	06:54 18:18	07:05 19:50	07:29 (3) 07:37 (3)	06:22 20
5	07:45 17:13	08:31 (1) 09:07 (1)	07:29 17:47	06:52 18:19	07:03 19:51	07:23 (3) 07:41 (3)	06:21 20
6	07:45 17:14	08:30 (1) 09:07 (1)	07:28 17:49	06:51 18:20	07:02 19:52	07:21 (3) 07:44 (3)	06:20 23
7	07:45 17:15	08:31 (1) 09:07 (1)	07:27 17:50	06:49 18:21	07:00 19:53	07:18 (3) 07:45 (3)	06:19 20
8	07:45 17:16	08:31 (1) 09:08 (1)	07:26 17:51	06:48 18:22	06:59 19:54	07:17 (3) 07:47 (3)	06:17 20
9	07:45 17:17	08:31 (1) 09:09 (1)	07:25 17:52	06:46 18:24	06:57 19:55	07:15 (3) 07:47 (3)	06:16 20
10	07:45 17:18	08:32 (1) 09:10 (1)	07:23 17:53	06:45 18:25	06:55 19:56	07:14 (3) 07:48 (3)	06:15 34
11	07:44 17:19	08:31 (1) 09:10 (1)	07:22 17:54	06:43 18:26	06:54 19:57	07:13 (3) 07:48 (3)	06:14 35
12	07:44 17:20	08:32 (1) 09:10 (1)	07:21 17:56	06:42 18:27	06:52 19:58	07:12 (3) 07:49 (3)	06:13 37
13	07:44 17:21	08:33 (1) 09:11 (1)	07:20 17:57	06:40 18:28	06:51 19:59	07:11 (3) 07:49 (3)	06:12 38
14	07:44 17:22	08:32 (1) 09:11 (1)	07:19 17:58	06:38 18:29	06:49 20:00	07:11 (3) 07:50 (3)	06:11 9
15	07:43 17:23	08:33 (1) 09:12 (1)	07:17 17:59	06:37 18:30	06:48 20:01	07:10 (3) 07:49 (3)	06:10 13
16	07:43 17:24	08:34 (1) 09:13 (1)	07:16 18:00	06:35 18:31	06:46 20:02	07:10 (3) 07:49 (3)	06:09 15
17	07:43 17:25	08:34 (1) 09:12 (1)	07:15 18:01	06:34 18:32	06:45 20:03	07:09 (3) 07:49 (3)	06:08 17
18	07:42 17:26	08:34 (1) 09:13 (1)	07:14 18:03	06:32 18:33	06:43 20:04	07:09 (3) 07:49 (3)	06:08 19
19	07:42 17:27	08:34 (1) 09:13 (1)	07:12 18:04	06:30 18:34	06:42 20:05	07:08 (3) 07:48 (3)	06:07 20
20	07:41 17:29	08:35 (1) 09:14 (1)	07:11 18:05	06:29 18:35	06:41 20:06	07:09 (3) 07:48 (3)	06:06 22
21	07:41 17:30	08:35 (1) 09:13 (1)	07:10 18:06	06:27 18:36	06:39 20:07	07:09 (3) 07:47 (3)	06:05 23
22	07:40 17:31	08:36 (1) 09:13 (1)	07:08 18:07	06:26 18:37	06:38 20:08	07:09 (3) 07:46 (3)	06:04 23
23	07:39 17:32	08:37 (1) 09:14 (1)	07:07 18:08	06:24 18:38	06:36 20:09	07:10 (3) 07:46 (3)	06:04 24
24	07:39 17:33	08:37 (1) 09:13 (1)	07:06 18:09	06:22 18:39	06:35 20:10	07:10 (3) 07:44 (3)	06:03 24
25	07:38 17:34	08:38 (1) 09:13 (1)	07:04 18:11	06:21 18:40	06:34 20:11	07:10 (3) 07:43 (3)	06:02 25
26	07:37 17:35	08:38 (1) 09:12 (1)	07:03 18:12	06:19 18:41	06:32 20:12	07:12 (3) 07:42 (3)	06:02 24
27	07:37 17:37	08:40 (1) 09:12 (1)	07:01 18:13	06:18 18:42	06:31 20:13	07:13 (3) 07:41 (3)	06:01 25
28	07:36 17:38	08:40 (1) 09:12 (1)	07:00 18:14	06:16 18:43	06:30 20:14	07:13 (3) 07:39 (3)	06:00 25
29	07:35 17:39	08:41 (1) 09:11 (1)		07:14 19:44	06:28 20:15	07:15 (3) 07:38 (3)	06:00 24
30	07:34 17:40	08:42 (1) 09:10 (1)		07:13 19:45	06:27 20:16	07:17 (3) 07:36 (3)	05:59 25
31	07:33 17:41	08:44 (1) 09:09 (1)		07:11 19:46		05:59 20:44	06:26 (4) 24
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

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01/02/2023 11:46 / 13

Licensed user:

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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
	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
	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
	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
	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
	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
	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
	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
	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)
9	06:04	06:34 (4) 06:29	06:58	07:27	07:00	08:18 (1) 07:32
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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	07:11	07:44
	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 / 15

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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	06:21 20:21	07:28 (4) 20:48
7	07:45 17:15	07:27 17:50	06:49 18:21	07:40 (3) 07:00	06:20 20:22	07:02 (4) 05:57
8	07:45 17:16	07:26 17:51	06:48 18:22	07:40 (3) 06:59	06:19 20:23	07:03 (4) 05:56
9	07:45 17:17	07:25 17:52	06:46 18:24	07:41 (3) 06:57	06:17 20:23	07:04 (4) 05:56
10	07:45 17:18	07:23 17:53	06:45 18:25	07:41 (3) 06:55	06:16 20:24	07:05 (4) 05:56
11	07:44 17:19	07:22 17:54	06:43 18:26	07:43 (3) 06:54	06:15 20:25	07:06 (4) 05:56
12	07:44 17:20	07:21 17:56	07:59 (3) 08:12 (3)	06:42 18:27	07:43 (3) 06:52	06:14 20:26
13	07:44 17:21	07:20 17:57	07:56 (3) 08:16 (3)	06:40 18:28	07:44 (3) 06:51	12 07:20 (4)
14	07:44 17:22	07:19 17:58	07:53 (3) 08:19 (3)	06:38 18:29	07:47 (3) 06:49	3 07:16 (4)
15	07:43 17:23	07:17 17:59	07:50 (3) 08:21 (3)	06:37 18:30	07:48 (3) 06:48	06:12 20:28
16	07:43 17:24	07:16 18:00	07:49 (3) 08:23 (3)	06:35 18:31	07:52 (3) 06:46	06:11 20:29
17	07:43 17:25	07:15 18:01	07:48 (3) 08:24 (3)	06:34 18:32	08:08 (3) 20:02	06:10 20:30
18	07:42 17:26	07:14 18:03	07:47 (3) 08:26 (3)	06:32 18:33	06:45 20:03	06:09 20:31
19	07:42 17:27	07:12 18:04	07:45 (3) 08:26 (3)	06:30 18:34	06:42 20:05	06:08 20:32
20	07:41 17:29	07:11 18:05	07:44 (3) 08:27 (3)	06:29 18:35	06:41 20:06	06:07 20:33
21	07:41 17:30	07:10 18:06	07:43 (3) 08:28 (3)	06:27 18:36	06:39 20:07	06:06 20:34
22	07:40 17:31	07:08 18:07	07:42 (3) 08:29 (3)	06:26 18:37	06:38 20:08	06:05 20:35
23	07:39 17:32	07:07 18:08	07:42 (3) 08:29 (3)	06:24 18:38	06:42 (5) 06:36	06:04 20:36
24	07:39 17:33	07:06 18:09	07:41 (3) 08:29 (3)	06:22 18:39	06:52 (5) 20:09	06:04 20:37
25	07:38 17:34	07:04 18:11	07:41 (3) 08:30 (3)	06:21 18:40	06:41 (5) 06:35	06:03 20:38
26	07:37 17:35	07:03 18:12	07:40 (3) 08:29 (3)	06:19 18:41	06:54 (5) 20:10	06:02 20:39
27	07:37 17:37	07:01 18:13	07:40 (3) 08:30 (3)	06:18 18:42	06:37 (5) 06:32	07:01 (4) 06:02
28	07:36 17:38	07:00 18:14	07:39 (3) 08:29 (3)	06:16 18:43	06:36 (5) 20:12	07:02 (4) 20:39
29	07:35 17:39		07:39 (3) 19:44	06:16 19:45	06:55 (5) 20:13	07:02 (4) 20:40
30	07:34 17:40		07:39 (3) 19:45	06:16 19:46	06:55 (5) 20:14	07:01 (4) 20:41
31	07:33 17:41		07:38 (3) 19:46	06:16 19:47	07:00 (4) 20:15	07:01 (4) 20:42
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:

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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	07:28	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	07:29	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	07:30	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	07:31	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	07:32	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	07:33	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	07:34	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	07:35	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	07:36	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	07:37	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	07:38	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	07:39	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	43 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	41 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	38 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	06:46	07:21 (3)
	20:43	20:04	19:14	13 08:48 (3)	17:29	29 07:50 (3)
28	06:18	06:47	07:16	07:16	06:47	07:23 (3)
	20:42	20:03	19:13	21 08:52 (3)	17:28	24 07:47 (3)
29	06:19	06:48	07:17	07:17	06:48	07:26 (3)
	20:41	20:01	19:11	27 08:55 (3)	17:27	19 07:45 (3)
30	06:20	06:49	07:18	07:18	06:49	07:30 (3)
	20:40	20:00	19:09	30 08:56 (3)	17:26	11 07:41 (3)
31	06:21	06:50	07:19	07:19	06:50	07:31 (3)
	20:39	19:58	19:07	17:24	347	301
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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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 17:10	07:33 17:43	06:58 18:15	07:10 19:47	06:26 20:17	05:58 20:45	05:59 20:55	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 20:46	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	06:52 17:22	07:26 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 17:00
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 19:49	07:24 19:00	06:57 17:18	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	06:28 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 18:24	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 20:51	06:04 20:53	06:30 20:28	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	07:03 17:13	07:34 17:00
12	07:44 17:20	07:21 17:56	06:42 18:27	06:52 19:58	06:13 20:28	05:56 20:52	06:06 20:53	06:32 20:25	07:01 19:39	07:30 18:51	07:04 17:12	07:35 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 20:30	05:55 20:52	06:07 20:52	06:34 20:22	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	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	06:09 20:51	06:36 20:20	07:05 19:32	07:34 18:45	07:08 17:08	07:37 17:00
17	07:43 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	05:56 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 17:02
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	07:09 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	06:43 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 20:39	05:57 20:55	06:15 20:45	06:43 20:09	07:12 19:19	07:42 18:33	07:17 17:03	07:42 17:04
25	07:38 17:34	07:04 18:11	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 17:03	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	06:18 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**

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 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	135	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	133	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	132	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			06:58 (4)
	17:12	146	13:57 (3)	17:46	130	13:58 (3)	18:18	19:50	32	08:05 (5)	20:20	20:47
5	07:45	11:31 (3)	07:29	11:49 (3)	06:52	07:03	07:33 (5)	06:21	05:57			06:55 (4)
	17:13	146	13:57 (3)	17:47	129	13:58 (3)	18:19	19:51	31	08:04 (5)	20:21	20:48
6	07:45	11:31 (3)	07:28	11:50 (3)	06:51	07:02	07:34 (5)	06:20	05:57			06:53 (4)
	17:14	146	13:57 (3)	17:48	127	13:57 (3)	18:20	19:52	30	08:04 (5)	20:22	20:48
7	07:45	11:31 (3)	07:27	11:51 (3)	06:49	07:00	07:34 (5)	06:19	05:56			06:51 (4)
	17:15	146	13:57 (3)	17:50	126	13:57 (3)	18:21	19:53	28	08:02 (5)	20:23	20:49
8	07:45	11:32 (3)	07:26	11:52 (3)	06:48	06:59	07:35 (5)	06:17	05:56			06:50 (4)
	17:16	146	13:58 (3)	17:51	124	13:56 (3)	18:22	19:54	26	08:01 (5)	20:24	20:49
9	07:45	11:33 (3)	07:24	11:54 (3)	06:46	06:57	07:35 (5)	06:16	05:56			06:49 (4)
	17:17	145	13:58 (3)	17:52	121	13:55 (3)	18:23	19:55	24	07:59 (5)	20:25	20:50
10	07:45	11:33 (3)	07:23	11:55 (3)	06:45	06:55	07:37 (5)	06:15	05:56			06:49 (4)
	17:18	146	13:59 (3)	17:53	119	13:54 (3)	18:25	19:56	21	07:58 (5)	20:26	20:51
11	07:44	11:33 (3)	07:22	11:56 (3)	06:43	06:54	07:39 (5)	06:14	05:56			06:48 (4)
	17:19	145	13:58 (3)	17:54	116	13:52 (3)	18:26	19:57	16	07:55 (5)	20:27	20:51
12	07:44	11:34 (3)	07:21	11:58 (3)	06:42	06:52	07:42 (5)	06:13	05:55			06:48 (4)
	17:20	145	13:59 (3)	17:56	113	13:51 (3)	18:27	19:58	10	07:52 (5)	20:28	20:52
13	07:44	11:35 (3)	07:20	12:00 (3)	06:40	06:51		06:12	05:55			06:48 (4)
	17:21	145	14:00 (3)	17:57	110	11:55 (3)	18:28	19:59		20:29	20:52	31
14	07:44	11:35 (3)	07:19	12:02 (3)	06:38	06:49		06:11	05:55			06:48 (4)
	17:22	144	13:59 (3)	17:58	107	13:49 (3)	18:29	20:00		20:30	20:52	31
15	07:43	11:35 (3)	07:17	12:04 (3)	06:37	06:48		06:10	05:55			06:47 (4)
	17:23	145	14:00 (3)	17:59	102	13:46 (3)	18:30	20:01		20:31	20:53	33
16	07:43	11:36 (3)	07:16	12:07 (3)	06:35	06:46		06:09	05:55			06:47 (4)
	17:24	145	14:01 (3)	18:00	98	13:45 (3)	18:31	20:02		20:31	20:53	33
17	07:43	11:36 (3)	07:15	12:10 (3)	06:34	06:45		06:08	05:55			06:47 (4)
	17:25	144	14:00 (3)	18:01	92	13:42 (3)	18:32	20:03		20:32	20:54	34
18	07:42	11:37 (3)	07:14	12:14 (3)	06:32	06:43		06:07	05:55			06:47 (4)
	17:26	144	14:01 (3)	18:03	86	13:40 (3)	18:33	20:04		20:33	20:54	34
19	07:42	11:37 (3)	07:12	12:18 (3)	06:30	06:42		06:05	05:56			06:47 (4)
	17:27	144	14:01 (3)	18:04	78	13:36 (3)	18:34	20:05		20:34	20:54	34
20	07:41	11:37 (3)	07:11	12:23 (3)	06:29	06:41		06:06	05:56			06:47 (4)
	17:28	143	14:00 (3)	18:05	69	13:32 (3)	18:35	20:06		20:35	20:55	34
21	07:41	11:39 (3)	07:10	12:30 (3)	06:27	06:39		06:05	05:56			06:48 (4)
	17:30	142	14:01 (3)	18:06	56	13:26 (3)	18:36	20:07		20:36	20:55	34
22	07:40	11:39 (3)	07:08	12:41 (3)	06:26	06:50	06:51 (5)	06:38		06:04	05:56	06:48 (4)
	17:31	142	14:01 (3)	18:07	38	13:19 (3)	18:37	5	06:56 (5)	20:08	20:37	20:55
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
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
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
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
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
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
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
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
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	(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:

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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	06:51	11:24 (3) 07:25
	20:56	29 07:21 (4) 20:38	19:56	16 07:54 (5) 19:08	17:23	119 13:23 (3) 17:00
2	06:00	06:54 (4) 06:23	06:52	07:35 (5) 07:20	06:52	11:22 (3) 07:26
	20:55	27 07:21 (4) 20:37	19:55	21 07:56 (5) 19:06	17:22	122 13:24 (3) 17:00
3	06:00	06:54 (4) 06:24	06:53	07:33 (5) 07:21	06:53	11:22 (3) 07:27
	20:55	26 07:20 (4) 20:36	19:53	24 07:57 (5) 19:05	17:21	124 13:26 (3) 17:00
4	06:01	06:56 (4) 06:25	06:54	07:32 (5) 07:22	06:55	11:21 (3) 07:28
	20:55	24 07:20 (4) 20:35	19:52	26 07:58 (5) 19:03	17:20	126 13:27 (3) 17:00
5	06:01	06:57 (4) 06:26	06:55	07:31 (5) 07:23	06:56	11:19 (3) 07:28
	20:55	21 07:18 (4) 20:33	19:50	28 07:59 (5) 19:01	17:19	128 13:27 (3) 16:59
6	06:02	06:59 (4) 06:27	06:56	07:30 (5) 07:24	06:57	11:18 (3) 07:29
	20:55	19 07:18 (4) 20:32	19:49	30 08:00 (5) 19:00	17:17	130 13:28 (3) 16:59
7	06:02	07:00 (4) 06:27	06:56	07:29 (5) 07:25	06:58	11:17 (3) 07:30
	20:54	15 07:15 (4) 20:31	19:47	31 08:00 (5) 18:58	17:16	131 13:28 (3) 16:59
8	06:03	07:03 (4) 06:28	06:57	07:27 (5) 07:26	06:59	11:18 (3) 07:31
	20:54	11 07:14 (4) 20:30	19:45	32 07:59 (5) 18:57	17:15	132 13:30 (3) 16:59
9	06:04	06:29	06:58	07:27 (5) 07:27	07:00	11:17 (3) 07:32
	20:54	20:29	19:44	33 08:00 (5) 18:55	17:14	133 13:30 (3) 16:59
10	06:04	06:30	06:59	07:26 (5) 07:28	07:01	11:16 (3) 07:33
	20:53	20:28	19:42	33 07:59 (5) 18:54	17:13	135 13:31 (3) 16:59
11	06:05	06:31	07:00	07:26 (5) 07:29	07:03	11:15 (3) 07:34
	20:53	20:26	19:40	33 07:59 (5) 18:52	17:12	136 13:31 (3) 16:59
12	06:06	06:32	07:01	07:26 (5) 07:30	07:04	11:16 (3) 07:35
	20:53	20:25	19:39	33 07:59 (5) 18:50	17:12	136 13:32 (3) 17:00
13	06:06	06:33	07:02	07:26 (5) 07:31	07:05	11:15 (3) 07:35
	20:52	20:24	19:37	32 07:58 (5) 18:49	17:11	138 13:33 (3) 17:00
14	06:07	06:34	07:03	07:26 (5) 07:32	07:06	11:15 (3) 07:36
	20:52	20:22	19:36	32 07:58 (5) 18:47	17:10	138 13:33 (3) 17:00
15	06:08	06:35	07:04	07:26 (5) 07:33	07:07	11:14 (3) 07:37
	20:51	20:21	19:34	31 07:57 (5) 18:46	17:09	139 13:33 (3) 17:00
16	06:08	06:36	07:05	07:27 (5) 07:34	07:08	11:14 (3) 07:38
	20:51	20:20	19:32	29 07:56 (5) 18:44	17:08	140 13:34 (3) 17:00
17	06:09	06:37	07:06	07:27 (5) 07:35	07:09	11:14 (3) 07:38
	20:50	20:18	19:31	27 07:54 (5) 18:43	17:07	141 13:35 (3) 17:01
18	06:10	06:38	07:07	07:28 (5) 07:36	07:10	11:14 (3) 07:39
	20:49	20:17	19:29	24 07:52 (5) 18:42	17:07	141 13:35 (3) 17:01
19	06:11	06:39	07:08	07:29 (5) 07:37	07:12	11:14 (3) 07:39
	20:49	20:16	19:27	21 07:50 (5) 18:40	10 13:37 (3) 17:06	142 13:36 (3) 17:01
20	06:12	06:40	07:09	07:31 (5) 07:38	07:13	11:14 (3) 07:40
	20:48	20:14	19:26	17 07:48 (5) 18:39	45 13:52 (3) 17:05	142 13:36 (3) 17:02
21	06:12	06:41	07:09	07:34 (5) 07:39	07:14	11:14 (3) 07:41
	20:47	20:13	19:24	10 07:44 (5) 18:37	61 13:59 (3) 17:05	142 13:36 (3) 17:02
22	06:13	06:42	07:10	07:40	07:15	11:14 (3) 07:41
	20:47	20:11	19:22	18:36	72 14:04 (3) 17:04	144 13:38 (3) 17:03
23	06:14	06:42	07:11	07:41	07:16	11:14 (3) 07:42
	20:46	20:10	19:21	18:35	81 14:08 (3) 17:04	144 13:38 (3) 17:03
24	06:15	06:43	07:12	07:42	07:17	11:14 (3) 07:42
	20:45	20:09	19:19	18:33	88 14:10 (3) 17:03	144 13:38 (3) 17:04
25	06:16	06:44	07:13	06:43	07:18	11:14 (3) 07:43
	20:44	20:07	19:18	17:32	94 13:13 (3) 17:02	144 13:38 (3) 17:04
26	06:17	06:45	07:14	06:45	07:19	11:14 (3) 07:43
	20:43	20:06	19:16	17:31	99 13:15 (3) 17:02	145 13:39 (3) 17:05
27	06:17	06:46	07:15	06:46	07:20	11:14 (3) 07:43
	20:42	20:04	19:14	17:29	103 13:16 (3) 17:02	145 13:39 (3) 17:06
28	06:18	06:47	07:16	06:47	07:21	11:15 (3) 07:44
	20:42	20:03	19:13	17:28	108 13:18 (3) 17:01	144 13:39 (3) 17:06
29	06:19	06:48	07:17	06:48	07:22	11:15 (3) 07:44
	20:41	20:01	19:11	17:27	111 13:20 (3) 17:01	145 13:40 (3) 17:07
30	06:20	06:49	07:18	06:49	07:24	11:15 (3) 07:44
	20:40	20:00	19:09	17:25	114 13:21 (3) 17:01	145 13:40 (3) 17:08
31	06:21	06:50	07:19	06:50	07:25	11:15 (3) 07:44
	20:39	19:58	10 07:51 (5) 07:51 (5)	17:24	117 13:22 (3) 17:01	146 13:54 (3)
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 11:35/2.8.579

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

Table with columns for months (January to December) and rows for each day of the month, showing sun rise/set times, shadow reduction percentages, and total reduction. Includes summary rows at the bottom.

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

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

Project:

Nurri_seconda presentazione

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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) 19:54	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) 19:56	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) 19:57	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) 19:58	08:05 (4) 06:13	08:20 (4) 05:55
13	07:44 17:21	07:20 17:57	06:40 18:28	07:50 (5) 19:59	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) 20:00	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) 20:01	08:03 (4) 06:10	08:28 (4) 05:55
16	07:43 17:24	07:16 18:00	06:35 18:31	07:16 (6) 20:02	08:04 (4) 06:09	08:30 (4) 05:55
17	07:43 17:25	07:15 18:01	06:34 18:32	07:16 (6) 20:03	08:03 (4) 06:08	08:32 (4) 05:55
18	07:42 17:26	07:14 18:03	06:32 18:33	07:15 (6) 20:04	08:03 (4) 06:08	08:34 (4) 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	08:36 (4) 05:55
20	07:41 17:28	07:11 18:05	06:29 18:35	07:13 (6) 20:05	08:03 (4) 06:06	08:38 (4) 05:55
21	07:41 17:30	07:10 18:06	06:27 18:36	07:11 (6) 20:06	08:03 (4) 06:05	08:40 (4) 05:55
22	07:40 17:31	07:08 18:07	06:26 18:37	07:00 (6) 20:07	08:03 (4) 06:04	08:42 (4) 05:55
23	07:39 17:32	07:07 18:08	06:24 18:38	07:59 (5) 20:08	08:03 (4) 06:04	08:44 (4) 05:55
24	07:39 17:33	07:06 18:09	06:22 18:39	07:58 (5) 20:09	08:03 (4) 06:03	08:46 (4) 05:55
25	07:38 17:34	07:04 18:10	06:21 18:40	07:57 (5) 20:10	08:03 (4) 06:03	08:48 (4) 05:55
26	07:37 17:35	07:03 18:12	06:19 18:41	07:56 (5) 20:11	08:04 (4) 06:02	08:50 (4) 05:55
27	07:37 17:37	07:01 18:13	06:18 18:42	07:24 (4) 20:12	08:05 (4) 06:01	08:52 (4) 05:55
28	07:36 17:38	07:00 18:14	06:16 18:43	07:23 (4) 20:13	08:05 (4) 06:00	08:54 (4) 05:55
29	07:35 17:39	06:59 18:15	06:15 18:44	07:20 (4) 20:14	08:05 (4) 06:00	08:56 (4) 05:55
30	07:34 17:40	06:58 18:16	06:14 18:45	07:19 (4) 20:15	08:06 (4) 06:00	08:58 (4) 05:55
31	07:33 17:41	06:57 18:17	06:13 18:46	07:18 (4) 20:16	08:06 (4) 06:00	09:00 (4) 05:55
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)	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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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
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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	06:24 06:43 (6)
3	07:45	14:09 (1)	07:31	06:55	07:06	20:18 06:56 (6)
	17:11	57 15:06 (1)	17:45	18:17	19:49	06:23 06:42 (6)
4	07:45	14:10 (1)	07:30	06:54	07:05	20:19 06:57 (6)
	17:12	56 15:06 (1)	17:46	18:18	19:50	06:22 06:41 (6)
5	07:45	14:10 (1)	07:29	06:52	07:03	20:20 06:57 (6)
	17:13	56 15:06 (1)	17:47	18:19	19:51	06:21 06:40 (6)
6	07:45	14:10 (1)	07:28	06:51	07:02	20:21 06:57 (6)
	17:14	55 15:05 (1)	17:48	18:20	19:52	06:20 06:39 (6)
7	07:45	14:11 (1)	07:27	06:49	07:00	20:22 06:57 (6)
	17:15	54 15:05 (1)	17:50	18:21	19:53	06:19 06:38 (6)
8	07:45	14:13 (1)	07:26	06:48	06:59	20:23 06:57 (6)
	17:16	52 15:05 (1)	17:51	18:22	19:54	06:17 06:38 (6)
9	07:45	14:14 (1)	07:24	06:46	06:57	20:24 06:56 (6)
	17:17	52 15:06 (1)	17:52	18:23	19:55	06:16 06:38 (6)
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	06:15 06:39 (6)
11	07:44	14:16 (1)	07:22	06:43	06:54	20:26 06:55 (6)
	17:19	49 15:05 (1)	17:54	18:26	19:57	06:14 06:40 (6)
12	07:44	14:17 (1)	07:21	06:42	06:52	20:27 06:54 (6)
	17:20	48 15:05 (1)	17:56	18:27	19:58	06:13 06:41 (6)
13	07:44	14:19 (1)	07:20	06:40	06:51	20:28 06:53 (6)
	17:21	46 15:05 (1)	17:57	18:28	19:59	06:12 06:43 (6)
14	07:44	14:19 (1)	07:19	06:38	06:49	20:29 06:51 (6)
	17:22	45 15:04 (1)	17:58	18:29	20:00	06:11 05:55
15	07:43	14:21 (1)	07:17	06:37	06:48	20:30 06:52 (6)
	17:23	43 15:04 (1)	17:59	18:30	20:01	06:10 05:55
16	07:43	14:23 (1)	07:16	06:35	06:46	20:30 06:53 (6)
	17:24	40 15:03 (1)	18:00	18:31	20:02	06:09 05:55
17	07:43	14:25 (1)	07:15	06:34	06:45	20:31 06:52 (6)
	17:25	37 15:02 (1)	18:01	18:32	20:03	06:08 05:55
18	07:42	14:27 (1)	07:14	06:32	06:43	20:32 06:54 (6)
	17:26	35 15:02 (1)	18:03	18:33	20:04	06:08 05:55
19	07:42	14:29 (1)	07:12	06:30	06:42	20:33 06:54 (6)
	17:27	31 15:00 (1)	18:04	18:34	20:05	06:07 05:56
20	07:41	14:31 (1)	07:11	06:29	06:41	20:34 06:54 (6)
	17:28	27 14:58 (1)	18:05	18:35	20:06	06:06 05:56
21	07:41	14:35 (1)	07:10	06:27	06:39	20:35 06:55 (6)
	17:30	21 14:56 (1)	18:06	18:36	20:07	06:05 05:56
22	07:40	14:38 (1)	07:08	06:26	06:38	20:36 06:55 (6)
	17:31	15 14:53 (1)	18:07	18:37	20:08	06:04 06:27 (5)
23	07:39	07:07	06:24	06:36	06:04	20:37 06:34 (5)
	17:32	18:08	18:38	20:09	20:38 06:24 (5)	
24	07:39	07:05	06:22	06:35	06:03	06:37 (5)
	17:33	18:09	18:39	20:10	20:39 06:23 (5)	
25	07:38	07:04	06:21	06:34	06:02	06:39 (5)
	17:34	18:10	18:40	20:11	20:39 06:23 (5)	
26	07:37	07:03	06:19	06:32	06:02	06:39 (5)
	17:35	18:12	18:41	20:12	20:40 06:22 (5)	
27	07:37	07:01	06:18	06:31	06:01	06:41 (5)
	17:37	18:13	18:42	20:13	2 06:50 (6)	
28	07:36	07:00	06:16	06:30	06:00	20:41 06:43 (5)
	17:38	18:14	18:43	20:14	5 06:53 (6)	
29	07:35	07:14	06:28	06:47 (6)	06:00	06:21 (5)
	17:39	19:44	20:15	8 06:55 (6)		
30	07:34	07:13	06:27	06:46 (6)	05:59	20:43 06:45 (5)
	17:40	19:45	20:16	10 06:56 (6)		
31	07:33	07:11	06:25	06:39	05:59	20:43 06:45 (5)
	17:41	19:46	20:17	11 06:57 (6)		
Potential sun hours	301	299	370	397	445	26 06:46 (5)
Total, worst case	985			25	387	448
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:

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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:

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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	20:56
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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01/02/2023 11:46 / 28

Licensed user:

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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 18:25	09:55 (4) 11:28 (4)	06:49 17:00
31	06:21 20:39	06:50 19:58		07:49 18:24	06:50 10:28 (4)	
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)	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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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]

Table with 12 columns (Jan-Dec) and 2 rows of sunshine probability values.

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 2 rows of operational time values.

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

Main shadow calculation table with columns for months (January-December) and rows for each day of the month, including sun rise/set times and reduction percentages.

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

Matrix layout table with 2 rows: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.

Project:

Nurri_seconda presentazione

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01/02/2023 11:46 / 32

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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 / 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	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 17:00
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 20:50	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	05:56 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 17:03	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	06:44 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 20:55	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 20:41	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		07:14 19:44	06:28 20:15	06:00 20:43	05:58 20:56	06:19 20:41	06:48 20:01	07:17 19:11	06:48 17:27	07:22 17:01	07:44 17:07
30	07:34 17:40		07:13 19:45	06:27 20:16	05:59 20:43	05:59 20:55	06:20 20:40	06:49 19:59	07:18 19:09	06:49 17:25	07:23 17:01	07:44 17:08
31	07:33 17:41		07:11 19:46		05:59 20:44		06:21 20:39	06:50 19:58		06:50 17:24		07:44 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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SHADOW - Calendar

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

Assumptions for shadow calculations

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

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 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

Main shadow calculation table with columns for months (July-December) and rows for time intervals (05:59 to 20:39). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

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

Matrix layout table with 2 rows and 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.

Project:

Nurri_seconda presentazione

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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

Table with 12 columns for months (January to December) and 24 rows of shadow data including sun hours, reduction percentages, and real values.

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

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

Project:

Nurri_seconda presentazione

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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
	17:09	4	16:44 (1)	17:42	18:15	19:47	06:54 (6)
2	07:45	16:40 (1)	07:32	06:57	07:08	18:01 (5)	06:24
	17:10	5	16:45 (1)	17:44	18:16	19:05 (5)	06:28
3	07:45	16:40 (1)	07:31	06:55	17:53 (3)	07:06	06:54 (6)
	17:11	6	16:46 (1)	17:45	18:17	19:07 (5)	06:23
4	07:45	16:40 (1)	07:30	06:54	17:51 (3)	07:05	06:54 (6)
	17:12	7	16:47 (1)	17:46	18:18	19:10 (5)	06:22
5	07:45	16:39 (1)	07:29	06:52	17:50 (3)	07:03	06:54 (6)
	17:13	8	16:47 (1)	17:47	18:19	19:11 (5)	06:21
6	07:45	16:39 (1)	07:28	06:51	17:48 (3)	07:02	06:54 (6)
	17:14	9	16:48 (1)	17:48	18:20	19:14 (5)	06:20
7	07:45	16:39 (1)	07:27	06:49	17:48 (3)	07:00	06:54 (6)
	17:15	10	16:49 (1)	17:50	18:21	19:15 (5)	06:18
8	07:45	16:39 (1)	07:26	06:48	17:47 (3)	06:58	06:54 (6)
	17:16	11	16:50 (1)	17:51	18:22	19:17 (5)	06:17
9	07:45	16:39 (1)	07:24	06:46	17:47 (3)	06:57	06:54 (6)
	17:17	13	16:52 (1)	17:52	18:23	19:18 (5)	06:16
10	07:45	16:39 (1)	07:23	06:45	17:47 (3)	06:55	06:54 (6)
	17:18	14	16:53 (1)	17:53	18:24	19:20 (5)	06:15
11	07:44	16:38 (1)	07:22	06:43	17:46 (3)	06:54	06:54 (6)
	17:19	15	16:53 (1)	17:54	18:26	19:21 (5)	06:14
12	07:44	16:39 (1)	07:21	06:42	17:47 (3)	06:52	06:54 (6)
	17:20	16	16:55 (1)	17:56	18:27	19:22 (5)	06:13
13	07:44	16:39 (1)	07:20	06:40	17:47 (3)	06:51	06:55 (6)
	17:21	17	16:56 (1)	17:57	18:28	19:23 (5)	06:12
14	07:44	16:39 (1)	07:19	06:38	17:48 (3)	06:49	06:55 (6)
	17:22	18	16:57 (1)	17:58	18:29	19:24 (5)	06:11
15	07:43	16:39 (1)	07:17	06:37	17:48 (3)	06:48	06:55 (6)
	17:23	19	16:58 (1)	17:59	18:30	19:25 (5)	06:10
16	07:43	16:40 (1)	07:16	06:35	17:49 (3)	06:46	06:55 (6)
	17:24	20	17:00 (1)	18:00	18:31	19:26 (5)	06:09
17	07:43	16:40 (1)	07:15	06:34	17:52 (3)	06:45	06:55 (6)
	17:25	20	17:00 (1)	18:01	18:32	19:27 (5)	06:08
18	07:42	16:41 (1)	07:14	06:32	18:04 (3)	20:03	06:56 (6)
	17:26	21	17:02 (1)	18:02	18:33	19:28 (5)	06:07
19	07:42	16:40 (1)	07:12	06:30	17:47 (3)	06:52	06:56 (6)
	17:27	22	17:02 (1)	18:04	18:34	19:28 (5)	06:06
20	07:41	16:41 (1)	07:11	06:29	20:04	07:02 (6)	06:05
	17:28	21	17:02 (1)	18:05	18:35	19:29 (5)	06:04
21	07:41	16:42 (1)	07:10	06:27	20:07	07:00 (6)	06:58 (6)
	17:30	21	17:03 (1)	18:06	18:36	19:29 (5)	06:05
22	07:40	16:42 (1)	07:08	06:26	20:07	07:00 (6)	06:58 (6)
	17:31	20	17:02 (1)	18:07	18:37	19:30 (5)	06:04
23	07:39	16:42 (1)	07:07	06:24	20:08	06:59 (6)	06:57 (6)
	17:32	20	17:02 (1)	18:08	18:38	19:31 (5)	06:04
24	07:39	16:44 (1)	07:05	06:22	20:09	06:58 (6)	06:56 (6)
	17:33	18	17:02 (1)	18:09	18:39	19:30 (5)	06:03
25	07:38	16:45 (1)	07:04	06:21	20:10	06:57 (6)	06:02
	17:34	16	17:01 (1)	18:10	18:40	19:31 (5)	06:02
26	07:37	16:46 (1)	07:03	06:19	20:11	06:57 (6)	06:01
	17:35	14	17:00 (1)	18:12	18:41	19:32 (5)	06:00
27	07:37	16:47 (1)	07:01	06:18	20:12	06:56 (6)	06:00
	17:37	12	16:59 (1)	18:13	18:42	19:32 (5)	06:00
28	07:36	16:50 (1)	07:00	06:16	20:13	06:55 (6)	06:00
	17:38	8	16:58 (1)	18:14	18:43	19:32 (5)	06:00
29	07:35			06:14	20:14	06:55 (6)	06:00
	17:39			18:21 (5)	06:28	06:55 (6)	06:00
30	07:34			06:13	20:15	19:33 (5)	06:00
	17:40			18:14 (5)	06:27	19:33 (5)	06:00
31	07:33			06:11	20:16	19:34 (5)	06:00
	17:41			18:09 (5)	06:26	19:34 (5)	06:00
Potential sun hours	301	299	370	397	4206	445	205
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	Last time (hh:mm) with flicker
	Sun set (hh:mm)		(WTG causing flicker first time)	(WTG causing flicker last time)

Project:

Nurri_seconda presentazione

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SHADOW - Calendar

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

Assumptions for shadow calculations

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

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 2 rows of values: 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

Main shadow calculation table with columns for months (July-December) and rows for various time intervals (05:59 to 20:39). Includes summary rows for sun hours and wind reduction.

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

2x2 matrix defining columns for Day in month, Sun rise/set, Minutes with flicker, and Last time with flicker.

Project:

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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) 19:47
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) 19:48
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) 19:49
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) 19:50
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) 19:51
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) 19:52
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) 19:53
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) 19:54
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) 19:55
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) 19:56
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) 19:57
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) 19:58
13	07:44 17:21	15:38 (5) 16:50 (5)	07:20 17:57	15:32 (5) 17:35 (3)	06:40 18:28	07:12 (6) 19:59
14	07:44 17:22	15:37 (5) 16:51 (5)	07:19 17:58	15:33 (5) 17:36 (3)	06:38 18:29	07:12 (6) 20:00
15	07:43 17:23	15:37 (5) 16:52 (5)	07:17 17:59	15:32 (5) 17:37 (3)	06:37 18:30	07:11 (6) 20:01
16	07:43 17:24	15:37 (5) 16:54 (5)	07:16 18:00	15:33 (5) 17:38 (3)	06:35 18:31	07:11 (6) 20:02
17	07:43 17:25	15:36 (5) 16:54 (5)	07:15 18:01	15:33 (5) 17:40 (3)	06:34 18:32	07:11 (6) 20:03
18	07:42 17:26	15:37 (5) 16:56 (5)	07:14 18:02	15:33 (5) 17:40 (3)	06:32 18:33	07:11 (6) 20:04
19	07:42 17:27	15:36 (5) 16:56 (5)	07:12 18:04	15:34 (5) 17:42 (3)	06:30 18:34	07:11 (6) 20:05
20	07:41 17:28	15:35 (5) 16:57 (5)	07:11 18:05	07:46 (6) 17:43 (3)	06:29 18:35	07:11 (6) 20:06
21	07:41 17:30	15:35 (5) 16:58 (5)	07:10 18:06	07:39 (6) 17:44 (3)	06:27 18:36	07:11 (6) 20:07
22	07:40 17:31	15:35 (5) 16:59 (5)	07:08 18:07	07:36 (6) 17:46 (3)	06:26 18:37	07:12 (6) 20:08
23	07:39 17:32	15:34 (5) 16:59 (5)	07:07 18:08	07:33 (6) 17:47 (3)	06:24 18:38	07:12 (6) 20:09
24	07:39 17:33	15:34 (5) 17:01 (5)	07:05 18:09	07:30 (6) 17:48 (3)	06:22 18:39	07:12 (6) 20:10
25	07:38 17:34	15:34 (5) 17:01 (5)	07:04 18:10	07:29 (6) 17:49 (3)	06:21 18:40	07:13 (6) 20:11
26	07:37 17:35	15:33 (5) 17:02 (5)	07:03 18:12	07:26 (6) 17:49 (3)	06:19 18:41	07:13 (6) 20:12
27	07:37 17:37	15:33 (5) 17:02 (5)	07:01 18:13	07:25 (6) 17:47 (3)	06:18 18:42	07:14 (6) 20:13
28	07:36 17:38	15:34 (5) 17:04 (5)	07:00 18:14	07:23 (6) 17:43 (3)	06:16 18:43	07:14 (6) 20:14
29	07:35 17:39	15:33 (5) 17:05 (5)		07:14		08:15 (6)
30	07:34 17:40	15:33 (5) 17:05 (5)		07:13		08:17 (6)
31	07:33 17:41	15:33 (5) 17:06 (5)		07:11		08:18 (6)
Potential sun hours	301	299	370	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	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

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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	7 19:17 (4) 19:29	08:59 (6) 18:42	147 18:19 (3) 17:07	87 16:35 (5) 17:01
20	06:11 20:48	06:40 20:14	19:06 (4) 07:08	07:59 (6) 07:37	08:05 (6) 07:12	15:09 (5) 07:39
21	06:12 20:47	06:41 20:13	16 19:22 (4) 19:27	09:00 (6) 18:40	142 18:17 (3) 17:06	85 16:34 (5) 17:01
22	06:13 20:47	06:41 20:11	19:02 (4) 07:08	07:58 (6) 07:38	08:08 (6) 07:13	15:10 (5) 07:40
23	06:14 20:46	06:42 20:10	21 19:23 (4) 19:26	09:00 (6) 18:39	137 18:16 (3) 17:05	84 16:34 (5) 17:02
24	06:15 20:45	06:43 20:08	19:00 (4) 07:09	07:57 (6) 07:39	08:11 (6) 07:14	15:10 (5) 07:41
25	06:16 20:44	06:44 20:07	25 19:25 (4) 19:24	09:01 (6) 18:37	128 18:14 (3) 17:05	83 16:33 (5) 17:02
26	06:17 20:43	06:45 20:06	18:58 (4) 07:10	07:56 (6) 07:40	16:04 (5) 07:15	15:11 (5) 07:41
27	06:17 20:42	06:46 20:04	28 19:26 (4) 19:22	09:01 (6) 18:36	110 18:13 (3) 17:04	82 16:33 (5) 17:03
28	06:18 20:42	06:47 20:03	18:57 (4) 07:11	07:56 (6) 07:41	16:04 (5) 07:16	15:13 (5) 07:42
29	06:19 20:41	06:48 20:01	30 19:27 (4) 19:21	09:01 (6) 18:34	108 18:12 (3) 17:03	80 16:33 (5) 17:03
30	06:20 20:40	06:49 19:59	18:55 (4) 07:12	07:55 (6) 07:42	16:03 (5) 07:17	15:14 (5) 07:42
31	06:21 20:39	06:50 19:58	33 19:28 (4) 19:19	09:02 (6) 18:33	108 18:11 (3) 17:03	79 16:33 (5) 17:04
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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Licensed user:

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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	16:08 (5) 18:15	07:30 (6) 17:19 (5)	07:10 19:47	08:37 (6) 20:17
2	07:45 17:10	07:32 17:44	16:08 (5) 18:16	07:29 (6) 17:17 (5)	07:08 19:48	08:39 (6) 20:18
3	07:45 17:11	07:31 17:45	16:07 (5) 18:17	07:29 (6) 17:17 (5)	07:06 19:49	08:41 (6) 20:19
4	07:45 17:12	07:30 17:46	16:07 (5) 18:18	07:28 (6) 17:15 (5)	07:05 19:50	08:44 (6) 20:20
5	07:45 17:13	07:29 17:47	16:06 (5) 18:19	07:28 (6) 17:14 (5)	07:03 19:51	08:49 (6) 20:21
6	07:45 17:14	07:28 17:48	16:06 (5) 18:20	07:27 (6) 17:12 (5)	07:02 19:52	18:53 (4) 20:22
7	07:45 17:15	07:27 17:50	16:06 (5) 18:21	07:27 (6) 17:11 (5)	07:00 19:53	18:52 (4) 20:23
8	07:45 17:16	07:26 17:51	16:06 (5) 18:22	07:26 (6) 17:09 (5)	06:58 19:54	18:52 (4) 20:24
9	07:45 17:17	07:24 17:52	16:06 (5) 18:23	07:26 (6) 17:08 (5)	06:57 19:55	18:52 (4) 20:25
10	07:45 17:18	07:23 17:53	08:06 (6) 18:24	07:26 (6) 17:05 (5)	06:55 19:56	18:52 (4) 20:26
11	07:44 17:19	07:22 17:54	07:59 (6) 18:26	07:25 (6) 17:02 (5)	06:54 19:57	18:52 (4) 20:27
12	07:44 17:20	07:21 17:56	07:55 (6) 18:27	07:25 (6) 17:00 (5)	06:52 19:58	18:52 (4) 20:28
13	07:44 17:21	16:30 (5) 17:57	07:53 (6) 18:28	07:25 (6) 16:56 (5)	06:51 19:59	18:53 (4) 20:29
14	07:44 17:22	16:27 (5) 17:58	07:50 (6) 18:29	07:25 (6) 16:52 (5)	06:49 20:00	18:53 (4) 20:29
15	07:43 17:23	16:25 (5) 17:59	07:47 (6) 18:30	07:25 (6) 08:45 (6)	06:48 20:01	18:55 (4) 20:30
16	07:43 17:24	16:24 (5) 18:00	07:46 (6) 18:31	07:25 (6) 08:44 (6)	06:46 20:02	18:56 (4) 20:31
17	07:43 17:25	16:22 (5) 18:01	07:44 (6) 18:32	07:25 (6) 08:44 (6)	06:45 20:03	18:57 (4) 20:32
18	07:42 17:26	16:56 (5) 18:02	140 17:40 (3) 07:42 (6) 18:33	79 08:44 (6) 07:25 (6) 18:33	22 20:03 08:42 (6) 20:04	20:32 19:00 (4) 20:33
19	07:42 17:27	16:21 (5) 18:04	144 17:40 (3) 07:41 (6) 18:34	77 08:42 (6) 07:26 (6) 20:05	17 20:04 08:42 (6) 20:05	20:33 19:02 (4) 20:34
20	07:41 17:28	16:19 (5) 18:05	149 17:40 (3) 07:40 (6) 18:35	76 08:42 (6) 07:26 (6) 20:06	11 20:05 08:40 (6) 20:06	20:34 20:35 20:35
21	07:41 17:30	16:17 (5) 18:06	156 17:38 (6) 17:44 (3) 18:36	73 07:26 (6) 08:39 (6) 20:07	20:35 20:36 20:36	20:36 20:36 20:36
22	07:40 17:31	16:16 (5) 18:07	159 07:37 (6) 17:45 (3) 18:37	71 07:27 (6) 08:38 (6) 20:08	20:36 20:37 20:08	20:36 20:37 20:37
23	07:39 17:32	16:15 (5) 18:08	162 07:36 (6) 17:47 (3) 18:38	69 07:27 (6) 08:36 (6) 20:09	20:37 20:38 20:09	20:37 20:38 20:38
24	07:39 17:33	16:14 (5) 18:09	164 07:34 (6) 16:14 (5) 18:39	67 07:28 (6) 08:35 (6) 20:10	20:38 20:39 20:10	20:38 20:39 20:39
25	07:38 17:34	16:13 (5) 18:10	164 07:34 (6) 16:13 (5) 18:40	66 07:28 (6) 08:34 (6) 20:11	20:39 20:40 20:11	20:39 20:40 20:40
26	07:37 17:35	16:12 (5) 18:12	165 07:32 (6) 17:50 (3) 18:41	72 07:29 (6) 18:19 (4) 20:12	20:40 20:41 20:12	20:40 20:41 20:41
27	07:37 17:37	16:11 (5) 18:13	162 07:32 (6) 17:50 (3) 18:42	75 07:30 (6) 18:21 (4) 20:13	20:41 20:42 20:13	20:41 20:42 20:42
28	07:36 17:38	16:11 (5) 18:14	156 07:31 (6) 17:46 (3) 18:43	76 07:31 (6) 18:22 (4) 20:14	20:42 20:43 20:14	20:42 20:43 20:43
29	07:35 17:39	16:10 (5) 18:15	156 07:31 (6) 17:46 (3) 18:44	76 07:31 (6) 18:22 (4) 20:14	20:43 20:44 20:14	20:43 20:44 20:44
30	07:34 17:40	16:10 (5) 18:16	156 07:31 (6) 17:46 (3) 18:45	76 07:31 (6) 18:22 (4) 20:14	20:44 20:45 20:14	20:44 20:45 20:45
31	07:33 17:41	16:09 (5) 18:17	156 07:31 (6) 17:46 (3) 18:46	76 07:31 (6) 18:22 (4) 20:14	20:45 20:46 20:14	20:45 20:46 20:46
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:

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

Licensed user:

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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	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	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	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	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	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	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	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	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	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	17:06 (5) 18:24	55 09:03 (6) 19:56	06:26	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	17:32 (3) 18:26	51 09:00 (6) 19:57	06:27	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	17:33 (3) 18:27	46 08:58 (6) 19:58	06:28	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	17:35 (3) 18:28	42 08:55 (6) 19:59	06:29	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	17:36 (3) 18:29	36 08:52 (6) 20:00	06:29	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	17:37 (3) 18:30	29 08:48 (6) 20:01	06:30	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	17:38 (3) 18:31	21 08:43 (6) 20:02	06:31	20:53
17	07:43	08:16 (6) 07:15	07:59 (6) 06:34	06:45	06:08	05:55
	17:25	105 16:59 (5) 18:01	17:40 (3) 18:32	20:03	06:32	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	17:40 (3) 18:33	12 18:12 (4) 20:04	06:33	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	17:42 (3) 18:34	17 18:14 (4) 20:05	06:34	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	17:43 (3) 18:35	19 18:14 (4) 20:06	06:35	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	17:44 (3) 18:36	23 18:15 (4) 20:07	06:36	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	17:45 (3) 18:37	25 18:16 (4) 20:08	06:37	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	17:43 (3) 18:38	28 18:17 (4) 20:09	06:38	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	16:51 (5) 18:39	30 18:19 (4) 20:10	06:38	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	16:49 (5) 18:40	31 18:19 (4) 20:11	06:39	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	16:45 (5) 18:41	33 18:20 (4) 20:12	06:40	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	16:40 (5) 18:42	34 18:21 (4) 20:13	06:41	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	06:42	20:56
29	07:35	08:06 (6) 07:00	07:14	18:45 (4) 06:28	06:00	05:58
	17:39	140 17:07 (5) 18:15	19:44	36 19:21 (4) 20:15	06:43	20:56
30	07:34	08:05 (6) 07:00	07:13	18:45 (4) 06:27	05:59	05:59
	17:40	142 17:07 (5) 18:16	19:45	36 19:21 (4) 20:16	06:43	20:56
31	07:33	08:05 (6) 07:00	07:11	18:45 (4) 06:27	05:59	
	17:41	143 17:07 (5) 18:17	19:46	35 19:20 (4) 20:16	06:44	20:56
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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 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
2	06:00 20:55	06:23 20:37	06:52 19:55	07:20 19:06	08:49 (6) 09:38 (6)	06:52 17:22
3	06:00 20:55	06:24 20:36	06:53 19:53	18:53 (4) 19:03 (4)	07:21 19:04	06:53 17:21
4	06:01 20:55	06:25 20:34	06:54 19:52	18:49 (4) 19:06 (4)	07:22 19:03	06:55 17:20
5	06:01 20:55	06:26 20:33	06:55 19:50	18:47 (4) 19:08 (4)	07:23 19:01	06:56 17:18
6	06:02 20:55	06:26 20:32	06:55 19:48	18:45 (4) 19:10 (4)	07:24 19:00	06:57 17:17
7	06:02 20:54	06:27 20:31	06:56 19:47	18:42 (4) 19:10 (4)	07:25 18:58	06:58 17:16
8	06:03 20:54	06:28 20:30	06:57 19:45	18:41 (4) 19:11 (4)	07:26 18:57	06:59 17:15
9	06:03 20:54	06:29 20:29	06:58 19:44	18:40 (4) 19:11 (4)	07:27 18:55	07:00 17:14
10	06:04 20:53	06:30 20:27	06:59 19:42	18:39 (4) 19:12 (4)	07:28 18:53	07:01 17:13
11	06:05 20:53	06:31 20:26	07:00 19:40	18:38 (4) 19:12 (4)	07:29 18:52	07:02 17:12
12	06:05 20:53	06:32 20:25	07:01 19:39	18:37 (4) 19:12 (4)	07:30 18:50	07:04 17:11
13	06:06 20:52	06:33 20:24	07:02 19:37	18:37 (4) 19:12 (4)	07:31 18:49	07:05 17:11
14	06:07 20:52	06:34 20:22	07:03 19:36	18:36 (4) 19:12 (4)	07:32 18:47	07:06 17:10
15	06:08 20:51	06:35 20:21	07:04 19:34	18:36 (4) 19:12 (4)	07:33 18:46	07:07 17:09
16	06:08 20:51	06:36 20:20	07:05 19:32	18:35 (4) 19:10 (4)	07:34 18:44	07:08 17:08
17	06:09 20:50	06:37 20:18	07:06 19:31	18:35 (4) 19:08 (4)	07:35 18:43	07:09 17:07
18	06:10 20:49	06:38 20:17	07:07 19:29	18:35 (4) 19:07 (4)	07:36 18:42	07:10 17:07
19	06:11 20:49	06:39 20:16	07:08 19:27	18:35 (4) 19:05 (4)	07:37 18:40	07:12 17:06
20	06:11 20:48	06:40 20:14	07:08 19:26	18:36 (4) 19:04 (4)	07:38 18:39	07:13 17:05
21	06:12 20:47	06:41 20:13	07:09 19:24	18:36 (4) 19:02 (4)	07:39 18:37	07:14 17:05
22	06:13 20:47	06:41 20:11	07:10 19:22	18:37 (4) 19:01 (4)	07:40 18:36	07:15 17:04
23	06:14 20:46	06:42 20:10	07:11 19:21	18:38 (4) 18:59 (4)	07:41 18:34	07:16 17:03
24	06:15 20:45	06:43 20:08	07:12 19:19	18:40 (4) 18:57 (4)	07:42 18:33	07:17 17:03
25	06:16 20:44	06:44 20:07	07:13 19:17	18:42 (4) 18:56 (4)	06:43 17:32	07:18 17:02
26	06:17 20:43	06:45 20:06	07:14 19:16	18:48 (4) 18:51 (4)	06:44 17:30	07:19 17:02
27	06:17 20:42	06:46 20:04	07:15 19:14	09:07 (6) 09:23 (6)	06:46 17:29	07:20 17:02
28	06:18 20:42	06:47 20:02	07:16 19:13	09:01 (6) 09:28 (6)	06:47 17:28	07:21 17:01
29	06:19 20:41	06:48 20:01	07:17 19:11	08:58 (6) 09:31 (6)	06:48 17:27	07:22 17:01
30	06:20 20:40	06:49 19:59	07:18 19:09	08:54 (6) 09:33 (6)	06:49 17:25	07:23 17:00
31	06:21 20:39	06:50 19:58		06:50 17:24		
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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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 17:09	07:32 17:42		06:58 18:15	07:09 19:47	06:26 20:17	19:13 (5) 20:20 (4)
2	07:45 17:10	07:32 17:44	3	17:17 (1) 18:16	06:57 19:48	06:24 20:18	19:13 (5) 20:21 (4)
3	07:45 17:11	07:31 17:45	7	17:15 (1) 18:17	06:55 19:49	06:23 20:19	19:12 (5) 20:21 (4)
4	07:45 17:12	07:30 17:46	9	17:14 (1) 18:18	06:54 19:50	06:22 20:20	19:13 (5) 20:22 (4)
5	07:45 17:13	07:29 17:47	11	17:13 (1) 18:19	06:52 19:51	06:21 20:21	19:13 (5) 20:22 (4)
6	07:45 17:14	07:28 17:48	13	17:13 (1) 18:20	06:51 19:52	06:20 20:22	19:13 (5) 20:23 (4)
7	07:45 17:15	07:27 17:50	15	17:12 (1) 18:21	07:00 19:53	06:18 20:23	19:13 (5) 20:22 (4)
8	07:45 17:16	07:26 17:51	16	17:12 (1) 18:22	06:58 19:54	06:17 20:24	19:13 (5) 20:22 (4)
9	07:45 17:17	07:24 17:52	18	17:12 (1) 18:23	06:57 19:55	06:16 20:25	19:13 (5) 20:23 (4)
10	07:45 17:18	07:23 17:53	18	17:12 (1) 18:24	06:55 19:56	06:15 20:26	19:13 (5) 20:23 (4)
11	07:44 17:19	07:22 17:54	19	17:12 (1) 18:26	06:54 19:57	06:14 20:27	19:14 (5) 20:23 (4)
12	07:44 17:20	07:21 17:56	18	17:13 (1) 18:27	06:52 19:58	06:13 20:28	19:14 (5) 20:23 (4)
13	07:44 17:21	07:20 17:57	16	17:14 (1) 18:28	06:51 19:59	06:12 20:29	19:14 (5) 20:24 (5)
14	07:44 17:22	07:19 17:58	15	17:15 (1) 18:29	06:49 20:00	06:11 20:29	19:14 (5) 20:24 (5)
15	07:43 17:23	07:17 17:59	11	17:16 (1) 18:30	06:48 20:01	06:10 20:30	19:14 (5) 20:24 (4)
16	07:43 17:24	07:16 18:00	6	17:19 (1) 18:31	06:35 20:02	06:09 20:31	19:14 (5) 20:24 (4)
17	07:42 17:25	07:15 18:01		06:34 18:32	06:45 20:03	06:08 20:32	19:15 (5) 20:25 (5)
18	07:42 17:26	07:14 18:02		06:32 18:33	06:43 20:04	06:07 20:33	19:15 (5) 20:25 (5)
19	07:42 17:27	07:12 18:04		06:30 18:34	06:42 20:05	06:07 20:34	19:15 (5) 20:25 (5)
20	07:41 17:28	07:11 18:05	3	18:14 (3) 18:35	06:40 20:06	06:06 20:35	19:15 (5) 20:25 (5)
21	07:41 17:30	07:10 18:06	5	18:08 (3) 18:36	06:39 20:07	06:05 20:36	19:16 (5) 20:26 (5)
22	07:40 17:31	07:08 18:07	7	18:15 (3) 18:37	06:38 20:08	06:04 20:37	19:16 (5) 20:26 (5)
23	07:39 17:32	07:07 18:08	8	18:16 (3) 18:38	06:38 20:09	06:04 20:38	19:16 (5) 20:26 (5)
24	07:39 17:33	07:05 18:09	10	18:17 (3) 18:39	06:35 20:10	06:03 20:38	19:16 (5) 20:26 (5)
25	07:38 17:34	07:04 18:10	12	18:19 (3) 18:40	06:33 20:11	06:02 20:39	19:17 (5) 20:27 (5)
26	07:37 17:35	07:03 18:12	13	18:06 (3) 18:41	06:32 20:12	06:02 20:40	19:16 (5) 20:27 (5)
27	07:37 17:37	07:01 18:13	14	18:07 (3) 18:42	06:31 20:13	06:01 20:41	19:16 (5) 20:26 (4)
28	07:36 17:38	07:00 18:14	14	18:07 (3) 18:43	06:29 20:14	06:00 20:42	19:17 (5) 20:27 (4)
29	07:35 17:39		15	19:08 (3) 19:23 (3)	06:28 20:15	06:00 20:43	19:17 (5) 20:27 (5)
30	07:34 17:40		15	19:10 (3) 19:45	06:27 20:16	05:59 20:43	19:18 (5) 20:28 (5)
31	07:33 17:41		12	19:13 (3) 19:46		05:59 20:44	19:13 (5) 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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Licensed user:

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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)	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:

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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	12:41 (6) 07:32	13:20 (6) 06:58	07:09	06:26	05:58
	17:09	118 14:39 (6) 17:42	78 17:19 (5) 18:15	19:47	20:17	20:45
2	07:45	12:41 (6) 07:32	13:23 (6) 06:57	07:08	06:24	05:58
	17:10	119 14:40 (6) 17:44	78 17:20 (5) 18:16	19:48	20:18	20:45
3	07:45	12:43 (6) 07:31	13:27 (6) 06:55	07:06	06:23	05:57
	17:11	118 14:41 (6) 17:45	76 17:22 (5) 18:17	19:49	20:19	20:46
4	07:45	12:42 (6) 07:30	13:30 (6) 06:54	07:05	06:22	05:57
	17:12	118 14:40 (6) 17:46	72 17:23 (5) 18:18	19:50	20:20	20:47
5	07:45	12:43 (6) 07:29	13:35 (6) 06:52	07:03	06:21	05:57
	17:13	118 14:41 (6) 17:47	67 17:24 (5) 18:19	19:51	20:21	20:48
6	07:45	12:44 (6) 07:28	13:40 (6) 06:51	07:02	06:20	05:56
	17:14	117 14:41 (6) 17:48	61 17:26 (5) 18:20	19:52	20:22	20:48
7	07:45	12:45 (6) 07:27	13:46 (6) 06:49	07:00	06:18	05:56
	17:15	116 14:41 (6) 17:50	52 17:27 (5) 18:21	19:53	20:23	20:49
8	07:45	12:46 (6) 07:25	17:03 (5) 06:48	06:58	06:17	05:56
	17:16	115 14:41 (6) 17:51	25 17:28 (5) 18:22	19:54	20:24	20:49
9	07:45	12:47 (6) 07:24	17:02 (5) 06:46	06:57	06:16	05:56
	17:17	115 14:42 (6) 17:52	28 17:30 (5) 18:23	19:55	20:25	20:50
10	07:45	12:48 (6) 07:23	17:01 (5) 06:45	06:55	06:15	05:56
	17:18	114 14:42 (6) 17:53	29 17:30 (5) 18:24	19:56	20:26	20:50
11	07:44	12:48 (6) 07:22	17:01 (5) 06:43	06:54	06:14	05:55
	17:19	114 14:42 (6) 17:54	31 17:32 (5) 18:25	19:57	20:27	20:51
12	07:44	12:49 (6) 07:21	17:01 (5) 06:41	06:52	06:13	05:55
	17:20	113 14:42 (6) 17:55	32 17:33 (5) 18:27	19:58	20:28	20:51
13	07:44	12:50 (6) 07:20	17:01 (5) 06:40	18:03 (4) 06:51	06:12	05:55
	17:21	112 14:42 (6) 17:57	34 17:35 (5) 18:28	4 18:07 (4) 19:59	20:29	20:52
14	07:44	12:51 (6) 07:19	17:01 (5) 06:38	18:00 (4) 06:49	06:11	05:55
	17:22	111 14:42 (6) 17:58	35 17:36 (5) 18:29	8 18:08 (4) 20:00	20:29	20:52
15	07:43	12:52 (6) 07:17	17:00 (5) 06:37	17:58 (4) 06:48	06:10	05:55
	17:23	110 14:42 (6) 17:59	37 17:37 (5) 18:30	11 18:09 (4) 20:01	20:30	20:53
16	07:43	12:54 (6) 07:16	17:00 (5) 06:35	17:56 (4) 06:46	06:09	05:55
	17:24	108 14:42 (6) 18:00	38 17:38 (5) 18:31	14 18:10 (4) 20:02	20:31	20:53
17	07:42	12:54 (6) 07:15	17:01 (5) 06:34	17:56 (4) 06:45	06:08	05:55
	17:25	108 14:42 (6) 18:01	38 17:39 (5) 18:32	15 18:11 (4) 20:03	20:32	20:54
18	07:42	12:56 (6) 07:14	17:00 (5) 06:32	17:54 (4) 06:43	06:07	05:55
	17:26	106 14:42 (6) 18:02	38 17:38 (5) 18:33	18 18:12 (4) 20:04	20:33	20:54
19	07:42	12:57 (6) 07:12	17:01 (5) 06:30	17:54 (4) 06:42	06:07	05:55
	17:27	104 14:41 (6) 18:04	37 17:38 (5) 18:34	20 18:14 (4) 20:05	20:34	20:54
20	07:41	12:57 (6) 07:11	17:02 (5) 06:29	17:54 (4) 06:40	06:06	05:56
	17:28	104 14:41 (6) 18:05	35 17:37 (5) 18:35	20 18:14 (4) 20:06	20:35	20:54
21	07:41	12:59 (6) 07:10	17:02 (5) 06:27	17:53 (4) 06:39	06:05	05:56
	17:30	102 14:41 (6) 18:06	34 17:36 (5) 18:36	22 18:15 (4) 20:07	20:36	20:55
22	07:40	13:00 (6) 07:08	17:03 (5) 06:26	17:54 (4) 06:38	06:04	05:56
	17:31	100 14:40 (6) 18:07	32 17:35 (5) 18:37	22 18:16 (4) 20:08	20:37	20:55
23	07:39	13:01 (6) 07:07	17:05 (5) 06:24	17:53 (4) 06:36	06:03	05:56
	17:32	98 14:39 (6) 18:08	30 17:35 (5) 18:38	24 18:17 (4) 20:09	20:38	20:55
24	07:39	13:04 (6) 07:05	17:05 (5) 06:22	17:55 (4) 06:35	06:03	05:56
	17:33	96 14:40 (6) 18:09	28 17:33 (5) 18:39	21 18:16 (4) 20:10	20:38	20:55
25	07:38	13:05 (6) 07:04	17:07 (5) 06:21	17:55 (4) 06:33	06:02	05:57
	17:34	94 14:39 (6) 18:10	24 17:31 (5) 18:40	19 18:14 (4) 20:11	20:39	20:55
26	07:37	13:07 (6) 07:03	17:09 (5) 06:19	17:56 (4) 06:32	06:01	05:57
	17:35	91 14:38 (6) 18:11	20 17:29 (5) 18:41	16 18:12 (4) 20:12	20:40	20:55
27	07:37	13:08 (6) 07:01	17:12 (5) 06:17	17:58 (4) 06:31	06:01	05:57
	17:36	89 14:37 (6) 18:13	14 17:26 (5) 18:42	12 18:10 (4) 20:13	20:41	20:56
28	07:36	13:11 (6) 07:00	06:16	18:03 (4) 06:29	06:00	05:58
	17:38	86 14:37 (6) 18:14	18:43	2 18:04 (4) 20:14	20:42	20:56
29	07:35	13:13 (6) 07:00	07:14	06:28	06:00	05:58
	17:39	82 14:35 (6) 18:15	19:44	20:15	20:43	20:56
30	07:34	13:15 (6) 07:00	07:13	06:27	05:59	05:59
	17:40	79 14:34 (6) 18:16	19:45	20:16	20:43	20:56
31	07:33	13:18 (6) 07:00	07:11	06:26	05:59	05:59
	17:41	75 14:33 (6) 18:17	19:46	20:17	20:44	20:56
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:
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 +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) 17:00
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) 17:00
3	06:00 20:55	06:24 20:36	06:53 19:53	07:21 19:04	06:53 17:21	07:26 13:26 (6) 17:00
4	06:01 20:55	06:25 20:34	06:54 19:52	07:22 19:03	06:54 17:20	07:27 13:15 (6) 16:59
5	06:01 20:55	06:26 20:33	06:55 19:50	07:23 19:01	06:56 17:18	07:28 13:09 (6) 16:59
6	06:02 20:55	06:26 20:32	06:55 19:48	07:24 19:00	06:57 17:17	07:29 13:04 (6) 16:59
7	06:02 20:54	06:27 20:31	06:56 19:47	07:25 18:58	06:58 17:16	07:30 13:00 (6) 16:59
8	06:03 20:54	06:28 20:30	06:57 19:45	07:26 18:57	06:59 17:15	07:31 12:57 (6) 16:59
9	06:03 20:54	06:29 20:29	06:58 19:44	07:27 18:55	07:00 17:14	07:32 12:54 (6) 16:59
10	06:04 20:53	06:30 20:27	06:59 19:42	07:28 18:53	07:01 17:13	07:33 12:51 (6) 16:59
11	06:05 20:53	06:31 20:26	07:00 19:40	07:29 18:52	07:02 17:12	07:34 12:48 (6) 16:59
12	06:05 20:53	06:32 20:25	07:01 19:39	07:30 18:50	07:04 17:11	07:34 12:46 (6) 16:59
13	06:06 20:52	06:33 20:24	07:02 19:37	07:31 18:49	07:05 17:11	07:35 12:45 (6) 17:00
14	06:07 20:52	06:34 20:22	07:03 19:35	07:32 18:47	07:06 17:10	07:36 12:43 (6) 17:00
15	06:08 20:51	06:35 20:21	07:04 19:34	07:33 18:46	07:07 18:00 (5) 17:09	07:37 12:41 (6) 17:00
16	06:08 20:51	06:36 20:20	07:05 19:32	07:34 18:44 (4) 18:44	07:08 17:40 (5) 17:08	07:37 12:40 (6) 17:00
17	06:09 20:50	06:37 20:18	07:06 19:31	07:35 18:43 (4) 18:43	07:09 17:38 (5) 17:07	07:38 14:11 (6) 17:01
18	06:10 20:49	06:38 20:17	07:07 19:29	07:36 18:41 (4) 18:41	07:10 17:36 (5) 17:06	07:39 12:38 (6) 17:01
19	06:11 20:49	06:39 20:16	07:07 19:27	07:37 18:40 (4) 18:40	07:12 17:35 (5) 17:05	07:39 12:36 (6) 17:01
20	06:11 20:48	06:40 20:14	07:08 19:26	07:38 18:40 (4) 18:39	07:13 17:33 (5) 17:04	07:40 12:35 (6) 17:02
21	06:12 20:47	06:40 20:13	07:09 19:24	07:39 18:39 (4) 18:37	07:14 17:32 (5) 17:03	07:41 12:34 (6) 17:02
22	06:13 20:47	06:41 20:11	07:10 19:22	07:40 18:38 (4) 18:36	07:15 17:31 (5) 17:02	07:41 12:33 (6) 17:03
23	06:14 20:46	06:42 20:10	07:11 19:21	07:41 18:38 (4) 18:34	07:16 17:32 (5) 17:01	07:42 12:34 (6) 17:03
24	06:15 20:45	06:43 20:08	07:12 19:19	07:42 18:38 (4) 18:33	07:17 17:31 (5) 17:00	07:42 12:33 (6) 17:04
25	06:16 20:44	06:44 20:07	07:13 19:17	07:43 18:38 (4) 18:33	07:18 16:30 (5) 17:00	07:42 12:32 (6) 17:04
26	06:16 20:43	06:45 20:05	07:14 19:16	07:44 18:38 (4) 18:30	07:19 16:30 (5) 17:00	07:43 12:32 (6) 17:05
27	06:17 20:42	06:46 20:04	07:15 19:14	07:46 18:38 (4) 18:29	07:20 16:30 (5) 17:00	07:43 12:31 (6) 17:06
28	06:18 20:41	06:47 20:02	07:16 19:13	07:47 18:39 (4) 18:28	07:21 16:30 (5) 17:00	07:44 12:31 (6) 17:06
29	06:19 20:41	06:48 20:01	07:17 19:11	07:48 18:39 (4) 18:27	07:22 16:30 (5) 17:00	07:44 12:31 (6) 17:07
30	06:20 20:40	06:49 19:59	07:18 19:09	07:49 18:41 (4) 18:25	07:23 16:30 (5) 17:00	07:44 12:30 (6) 17:08
31	06:21 20:39	06:50 19:58		07:50 17:24	07:24 16:31 (5) 17:00	07:44 12:40 (6) 17:08
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:

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

Table with 12 columns (Jan-Dec) and 2 rows of sunshine probability values.

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 2 rows of operational time values.

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and shadow reduction percentages.

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

Matrix defining table layout: Day in month, Sun rise/set times, Minutes with flicker, First/Last time with flicker (WTG causing flicker).

Project:

Nurri_seconda presentazione

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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 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

	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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 17:24	06:50 07:24-07:45/21 17:24	07:24 11:58-13:37/99 17:01	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

Printed/Page
 01/02/2023 11:48 / 5
 Licensed user:
Ing. Bruno Manca
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 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	06:15 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	06:58 07:37-08:27/47 18:16 17:36-17:45/9	06:14 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	06:57 07:36-08:26/46 18:17 17:35-17:44/9	06:13 19:13-19:17/4 19:46	06:26 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:

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

SHADOW - Calendar per WTG

Calculation: Nurri seconda presentazione 6WTGWTG: 3 - N07

Assumptions for shadow calculations

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

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144

Main shadow calculation table with columns for months (July-December) and rows for minutes of the day (1-31). Includes summary rows for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table 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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SHADOW - Calendar per WTG

Calculation: Nurri_seconda presentazione 6WTGWGTG: 4 - N08

Assumptions for shadow calculations

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

Table with columns for months (Jan to Dec) and values: 4,40, 5,05, 5,88, 7,00, 8,45, 9,88, 10,82, 10,03, 8,08, 6,09, 5,07, 4,27

Operational time

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

Main data table with columns for months (January to June) and rows for individual days, containing sunrise/set times and shadow flicker minutes.

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

Matrix with 2 rows: Day in month, Sun rise/set times; First time with flicker; Last time with flicker; Minutes with flicker

Project: Nurri_seconda presentazione

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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]

Table with 12 columns (Jan-Dec) and 1 row of values: 4,40 5,05 5,88 7,00 8,45 9,88 10,82 10,03 8,08 6,09 5,07 4,27

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 324 376 415 483 626 572 481 398 478 800 2.208 983 8.144. Below: Idle start wind speed: Cut in wind speed from power curve

Main shadow calculation table with columns for months (January-June) and rows for days (1-31). Includes columns for start/end times and minutes with flicker.

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

Matrix layout table with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

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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

Table with columns for months (July-December) and rows for days (1-31). Columns include time intervals (e.g., 07:19-07:45/26) and potential sun hours. Summary rows at the bottom show totals for 'Potential sun hours' and 'Sum of minutes with flicker' for each month.

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

Matrix layout with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.