

EMILIE Wind S.r.l.

Parco Eolico “EMILIE” sito nel Comune di Casalfiumanese (BO)

Studio sugli effetti di Shadow Flickering

Luglio 2023

Committente:

EMILIE Wind S.r.l.

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Titolo del Progetto:

Parco Eolico "EMILIE" sito nel Comune di Casalfiumanese (BO)

Documento:

**Studio sugli effetti di Shadow
Flickering**

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Progettista:



Ing. Domenico Teta



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ALLEGATO 1 - RISULTATI WindPRO ANALISI WORST CASE

ALLEGATO 2 - RISULTATI WindPRO ANALISI REAL CASE

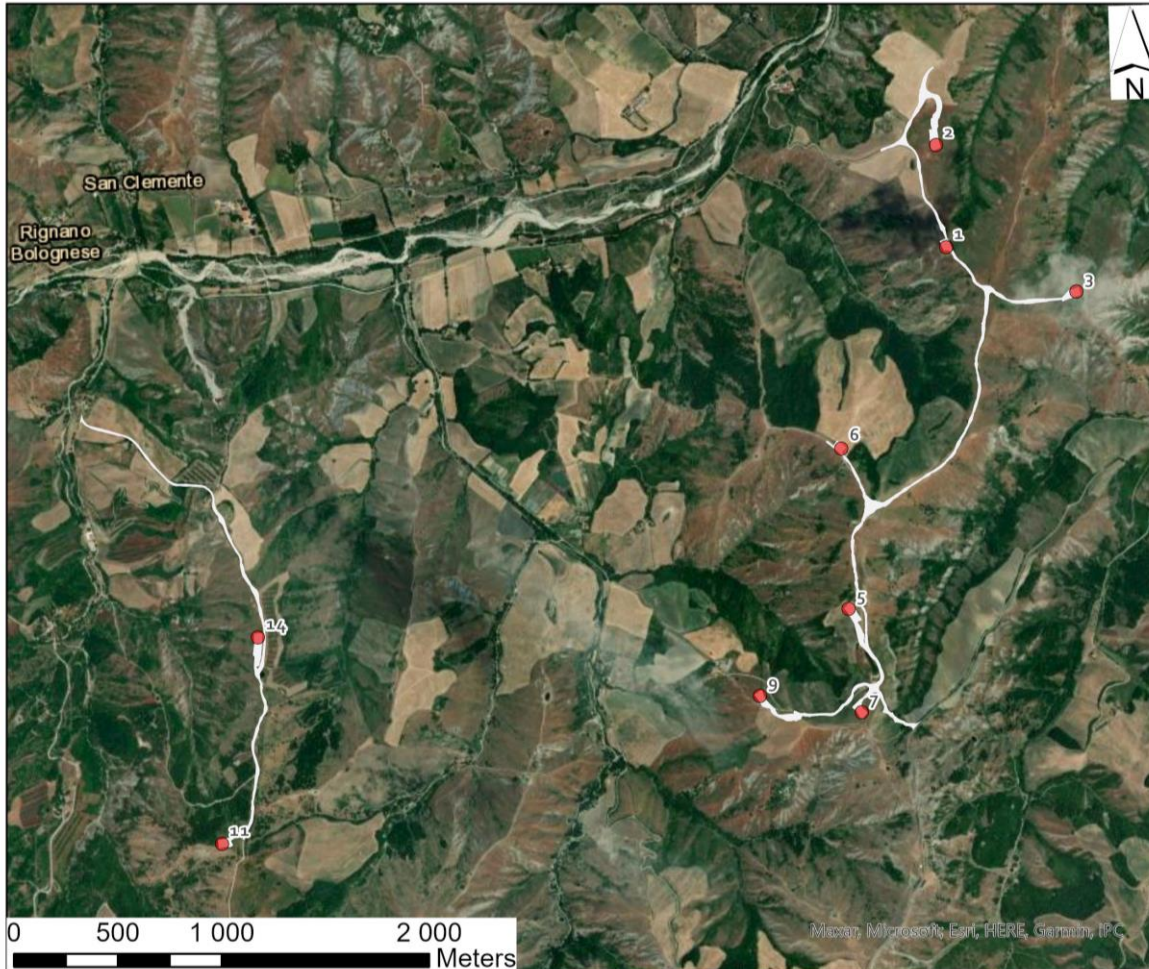
Acronimi

CEI	Comitato Elettrotecnico Italiano
ENAC	Ente Nazionale per l'Aviazione Civile
IGM	Istituto Geografico Militare
WTG	Wind Turbine Generator

1. PREMESSA

Il parco eolico EMILIE sarà realizzato nel comune di Casalfiumanese (provincia di BOLOGNA), sarà costituito da 9 aerogeneratori modello Vestas V163-4,5 MW, della potenza nominale di 4,5 MW, con altezza torre pari a 113 m e diametro di 163 m, per una potenza totale di immissione pari a 40,5 MW.

Figura 1: Localizzazione impianto eolico "Emilie" su ortofoto



2. CENNI SUI PRINCIPI DI FUNZIONAMENTO DI UN AEROGENERATORE

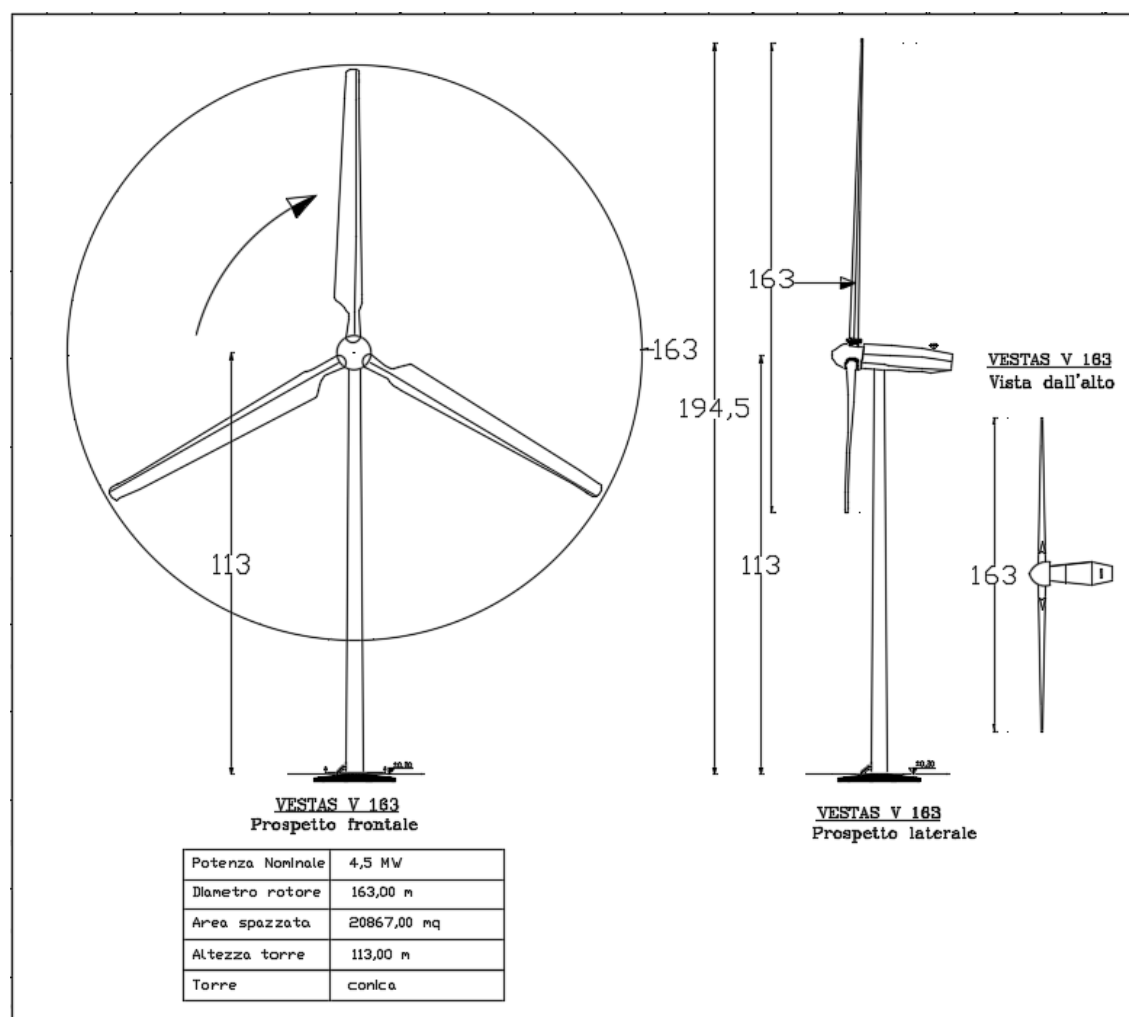
Gli aerogeneratori sono macchine che generano energia elettrica sfruttando la forza del vento, sono costituiti da una torre, di solito formata da più pezzi uniti uno sull'altro, dalla navicella con all'interno il generatore e da tre pale, dette anche vele.

Per il progetto in esame saranno installati nove aerogeneratori Vestas 163-4,5 MW, con potenza nominale pari a 4,5 MW, diametro rotore 163 m e altezza torre fino all'hub 113 m, per un'altezza totale di 194,5 m (Figura 2).

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

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

Figura 2: Profilo aerogeneratore V163-4,5MW



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

Tabella 1 Coordinate e Dati Catastali Aerogeneratori

ID	Comune	Coordinate WGS 1984 UTM 32 Nord		Foglio	Particella	D rotore [m]	Hhub [m]	Htot [m]
		Lat – [m]	Long [m]					
WTG1	Casalfiumanese	4910136.77	702111.50	25	25	163	113	194,5
WTG 2	Casalfiumanese	4910627.22	702063.54	21	40	163	113	194,5
WTG 3	Casalfiumanese	4909922.29	702739.52	22	53	163	113	194,5
WTG 5	Casalfiumanese	4908392.94	701642.90	36	9	163	113	194,5
WTG 6	Casalfiumanese	4909165.91	701607.31	26	21	163	113	194,5
WTG 7	Casalfiumanese	4907895.87	701704.73	36	31	163	113	194,5
WTG 9	Casalfiumanese	4907975.00	701215.38	37	23	163	113	194,5
WTG 11	Casalfiumanese	4907260.71	698623.89	48	7	163	113	194,5
WTG 14	Casalfiumanese	4908255.36	698797.90	32	85	163	113	194,5

3. STANDARD E LINEE GUIDA

La seguente sezione presenta gli standard e le linee guida applicabili rilevanti per la valutazione dell'effetto di ombreggiamento (shadow flickering) derivanti dall'esercizio di impianti eolici.

A livello globale, lo stato della legislazione relativa al fenomeno dello Shadow Flickering non è omogeneo. In diversi paesi, lo shadow flickering non rientra in regolamenti specifici, ma spesso la valutazione dei potenziali impatti è definita esclusivamente da standard di riferimento e linee guida. Solo pochi paesi prevedono normative specifiche che tuttavia analizzano il fenomeno solo con riferimento ai periodi in cui chi dimora nelle abitazioni, localizzate nei pressi degli aerogeneratori, è sveglio, le finestre non sono oscurate (tende, infissi, ecc.) e una o più turbine eoliche sono in vista.

Di seguito si presentano i principali riferimenti internazionali ad oggi esistenti per analizzare il fenomeno del flickering.

3.1 Standard Nazionali in Europa

A livello globale, diversi paesi hanno definito linee guida nazionali per valutare i potenziali impatti derivanti dallo shadow flickering. Poiché tale fenomeno è influenzato in modo rilevante dall'angolo del sole all'orizzonte, è considerato più rilevante alle latitudini più elevate. Va notato che la maggior parte di questi paesi ha basato i propri regolamenti sulla linea guida tedesca "Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen (WEA-Schattenwurf-Hinweise)" (Linea guida per l'identificazione e la valutazione delle emissioni ottiche delle turbine eoliche). Tale riferimento indica un valore limite di 30 ore all'anno e 30 minuti al giorno per l'ombra astronomica massima possibile.

In Italia, dove questo fenomeno è meno importante rispetto alle latitudini più settentrionali (come ad esempio Danimarca, Germania, Olanda e Svezia), non esiste alcuna norma o regolamento che regoli questo aspetto a livello nazionale.

La tabella seguente riporta le linee guida più rilevanti attualmente esistenti in Europa.

Tabella 2 Standard Nazionali in Europa

Paese	Riferimento	Note rilevanti
England	<p>Planning for Renewable Energy - A companion guide to PPS22 – Office of the Deputy Prime Minister 2004</p> <p>Onshore Wind Energy Planning Conditions Guidance notes – Renewables Advisory Board and BERR 2007</p> <p>UK Government Department for Communities and Local Government (March 2012)</p> <p>National Planning Policy Framework</p> <p>UK Government Department for Communities and Local Government (July 2013) Planning practice guidance for renewable and low carbon energy</p>	<p>È stato dimostrato che lo shadow flickering si verifica solo entro una distanza di 10 diametri del rotore dalle turbine.</p> <p>Lo shadow flickering si verifica solo all'interno di edifici in cui il fenomeno appare attraverso le finestre.</p>
Northern Ireland	<p>Best Practice Guidance to Planning Policy Statement 18 'Renewable Energy' – Northern Ireland Department of the Environment 2009</p>	<p>Lo shadow flickering si verifica solo all'interno degli edifici attraverso aperture di finestre strette</p> <p>Il potenziale di shadow flickering a distanze superiori a 10 diametri del rotore è molto basso</p> <p>Si consiglia lo shadow flickering negli edifici residenziali vicini e negli uffici non deve superare le 30 ore all'anno</p>

Paese	Riferimento	Note rilevanti
Ireland	Ireland Government Department of Environment (2013) Wind energy Development Guidelines	<p>Lo shadow flickering si verifica solo all'interno degli edifici attraverso aperture di finestre strette</p> <p>Il potenziale di shadow flickering a distanze superiori a 10 diametri del rotore è molto basso</p> <p>Si consiglia lo shadow flickering negli edifici residenziali vicini e negli uffici non deve superare le 30 ore all'anno</p>
Germany	Länderausschuss für Immissionsschutz (2002) Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen (WEA-Schattenwurf-Hinweise) (Guideline for Identification and Evaluation of the Optical Emissions of Wind Turbines)	<p>Nel caso in cui venga simulato lo scenario peggiore il valore limite di riferimento è pari a un massimo di 30 ore all'anno e 30 minuti al giorno</p> <p>Nel caso sia simulato lo scenario reale il valore limite di riferimento è pari a 8 ore annue.</p>
Denmark	Danish Government - Miljøministeriet Naturstyrelsen (2015) Vejledning om planlægning for og tilladelse til opstilling af vindmøller, 19-20	Nel caso sia simulato lo scenario reale il valore limite di riferimento è pari a 10 ore annue.
Netherlands	Nederlandse overheid - Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer (2017) Regeling algemene regels voor inrichtingen milieubeheer, Art. 3.12	<p>La turbina eolica deve essere dotata di un sistema di controllo automatico dello shadow flickering che blocca la turbina se si verifica uno shadow flickering nei recettori sensibili e:</p> <ul style="list-style-type: none"> • la distanza tra la turbina e il recettore sensibile è inferiore a 12 volte il diametro del rotore; • e se in media lo shadow flickering si verifica più di 17 giorni all'anno per più di 20 minuti al giorno.

4. STUDIO SUGLI EFFETTI DI SHADOW FLICKERING

4.1. Descrizione del fenomeno di Shadow Flickering

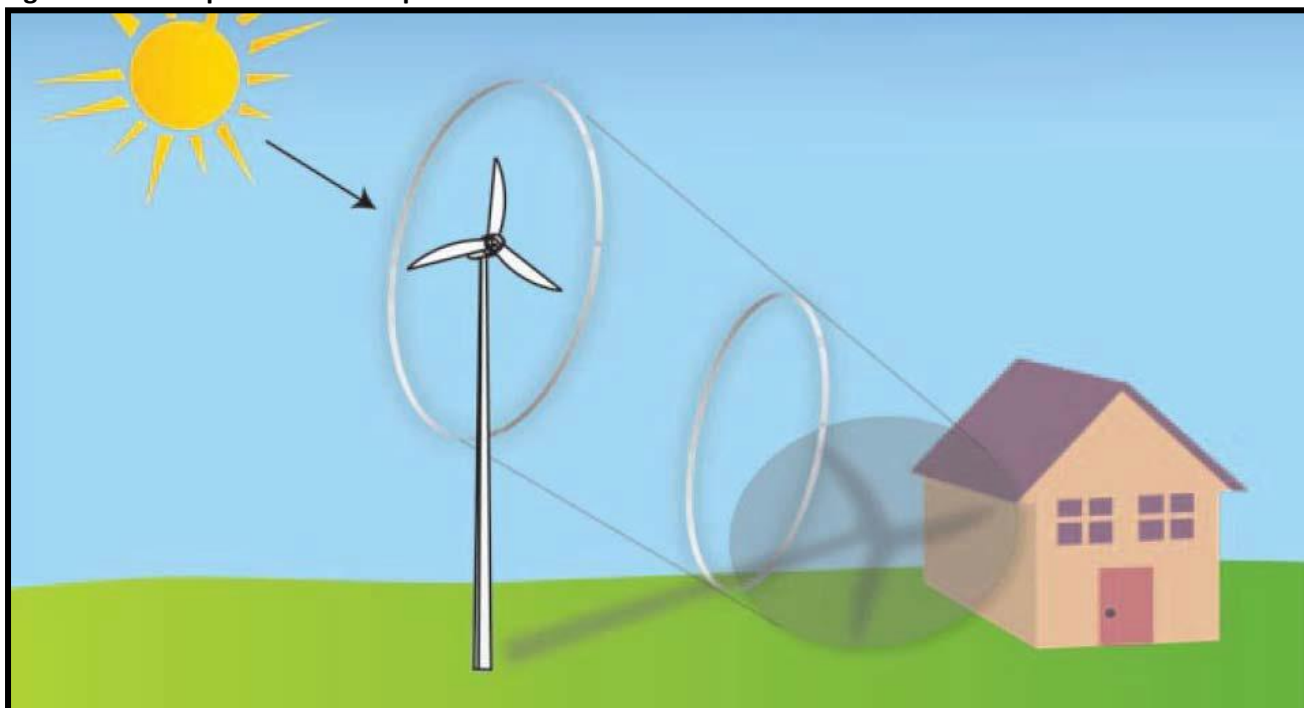
Lo shadow flickering consiste in una variazione periodica dell'intensità luminosa osservata, causata dalla proiezione, su una superficie, dell'ombra indotta da oggetti in movimento. Per un impianto eolico tale fenomeno è generato dalla proiezione, al suolo o su un recettore, dell'ombra prodotta dalle pale in rotazione degli aerogeneratori.

Dal punto di vista di un recettore, lo shadow flickering si manifesta in una variazione ciclica dell'intensità luminosa: in presenza di luce solare diretta, un recettore localizzato nella zona d'ombra indotta dal rotore, sarà investito da un continuo alternarsi di luce diretta ed ombra, causato dalla proiezione delle ombre dalle pale in movimento.

Tale fenomeno se vissuto dal recettore per periodi di tempo non trascurabile può generare un disturbo, quando:

- si sia in presenza di un livello sufficiente di intensità luminosa, ossia in condizioni di cielo sereno sgombro da nubi ed in assenza di nebbia e con sole alto rispetto all'orizzonte;
- la linea recettore-aerogeneratore non incontri ostacoli: in presenza di vegetazione o edifici interposti l'ombra generata da quest'ultimi annulla il fenomeno. Pertanto, ad esempio, qualora il recettore sia un'abitazione, perché si generi lo shadow flickering le finestre dovrebbero essere orientate perpendicolarmente alla linea recettore-aerogeneratore e non affacciarsi su ostacoli (alberi, altri edifici, ecc.);
- la turbina sia orientata in modo che il rotore risulti perpendicolare alla linea sole-recettore: come mostrato in Figura 3, quando il piano del rotore è perpendicolare alla linea sole-recettore, l'ombra proiettata dalle pale risulta muoversi all'interno di un "cerchio" che riferisce alla circonferenza del rotore inducendo uno shadow flickering non trascurabile; per situazioni in cui, dal punto di vista del recettore, il piano del rotore risulti essere in linea con il sole ed il recettore, l'ombra proiettata è sottile, di bassa intensità ed è caratterizzata da un rapido movimento, risultando pertanto lo shadow flickering di entità trascurabile.
- la posizione del sole sia tale da indurre una luminosità sufficiente. Ciò si traduce, in riferimento alla latitudine di progetto, in un'altezza del sole pari ad almeno 15-20°;
- le pale siano in movimento;
- turbina e recettore siano vicini: le ombre proiettate in prossimità dell'aerogeneratore risultano di maggiore intensità e nitidezza rispetto a quelle proiettate lontano. Quando una turbina è posizionata sufficientemente vicino al recettore, così che una porzione ampia di pala copra il sole (così come osservato dal punto di vista del recettore), l'intensità del flicker risulta maggiore. All'aumentare della distanza tra turbina e recettore, le pale coprono una porzione sempre più piccola del sole, inducendo un flicker di minore entità.

Figura 3: Ombre proiettate dalle pale in rotazione di una turbina



Pertanto, in riferimento a quanto sin qui esposto, si può concludere che durata ed entità dello Shadow Flickering sono condizionate:

- dalla distanza tra aerogeneratore e recettore;
- dalla direzione ed intensità del vento;
- dall'orientamento del recettore;
- dalla presenza o meno di ostacoli lungo la linea di vista recettore – aerogeneratore – sole;
- dalle condizioni meteorologiche;
- dall'altezza del sole.

4.2. Ipotesi di calcolo

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

Nell'analisi condotta sono stati considerati 9 aerogeneratori di nuova realizzazione e relativi al progetto del Parco Eolico "Emilie"

La verifica è stata effettuata in corrispondenza di 26 ricettori, rappresentativi di fabbricati di "civile abitazione", riportati nella seguente Tabella e sui quali l'effetto trattato potrebbe avere una certa rilevanza:

Tabella 3 Tabella ricettori

ID su mappa	PROV.	COMUNE	FOGLIO	PART.	CATEG.	DESCRIZIONE	X	Y
A-R1	Bologna	Casaifiumanese	40	61	A4	Abitazione di tipo Popolare	11,55323677000	44,29851065000
B-R2	Bologna	Casaifiumanese	23	60	A4	Abitazione di tipo Popolare	11,55599224000	44,32238892000
C-R3	Bologna	Casaifiumanese	70	148	A5	Abitazione di tipo Ultrapolare	11,50530822000	44,27527419000
D-R4	Bologna	Casalfiumanese	70	150	A5	Abitazione di tipo Ultrapolare	11,50609948000	44,27535773000
E-R5	Bologna	Casalfiumanese	24	280	A3	Abitazione di tipo economico	11,57003305000	44,31696605000
F-R6	Bologna	Casalfiumanese	47	52	A3	Abitazione di tipo economico	11,47748561000	44,28184731000
G-R7	Bologna	Casalfiumanese	68	16	A3	Abitazione di tipo economico	11,48638508000	44,27377422000
H-R8	Bologna	Casalfiumanese	68	14	A4	Abitazione di tipo Popolare	11,49302181000	44,27389152000
I-R9	Bologna	Casalfiumanese	69	216	A4	Abitazione di tipo Popolare	11,49930021000	44,27578106000
J-R10	Bologna	Casalfiumanese	72	79-80-81	A4	Abitazione di tipo Popolare	11,51221616000	44,27147754000
K-R11	Bologna	Casalfiumanese	52	86	A3	Abitazione di tipo economico	11,51708621000	44,28029402000
L-R12	Bologna	Casalfiumanese	71	143	A3	Abitazione di tipo economico	11,52120436000	44,28044229000
M-R13	Bologna	Casalfiumanese	71	122	A4	Abitazione di tipo Popolare	11,52304950000	44,28080645000
N-R14	Bologna	Casalfiumanese	71	106	A3	Abitazione di tipo economico	11,52296826000	44,28031534000
O-R15	Bologna	Casalfiumanese	72	46	A4	Abitazione di tipo Popolare	11,51751842000	44,27323214000
P-R16	Bologna	Casalfiumanese	71	32	A10	Uffici e studi privati	11,52014701000	44,28431058000
Q-R17	Bologna	Casalfiumanese	71	29	A3	Abitazione di tipo economico	11,51927251000	44,28425600000
R-R18	Bologna	Casalfiumanese	71	176	A3	Abitazione di tipo economico	11,52775296000	44,28321536000
S-R19	Bologna	Casalfiumanese	41	96	A4	Abitazione di tipo Popolare	11,55226127000	44,29632675000
T-R20	Bologna	Casalfiumanese	22	65	A4	Abitazione di tipo Popolare	11,55141701000	44,31896311000
U-R21	Bologna	Casalfiumanese	18	12	A3	Abitazione di tipo economico	11,55441216000	44,32130423000
V-R22	Bologna	Casalfiumanese	18	14	A7	Abitazione in villini	11,55413888000	44,32096537000
W-R23	Bologna	Casalfiumanese	23	2	A3	Abitazione di tipo economico	11,55800670000	44,32352492000
X-R24	Bologna	Casalfiumanese	23	33	A7	Abitazione in villini	11,55756473000	44,32420428000
Y-R25	Bologna	Casalfiumanese	37	72	A4	Abitazione di tipo Popolare	11,51956679000	44,29837773000
Z-R26	Bologna	Casalfiumanese	70	148	A5	Abitazione di tipo Ultrapolare	11,50601051000	44,27548456000

Il software impiegato per effettuare la verifica di sicurezza all'effetto shadow flickering è il WindPRO versione 3.6, il quale esegue la valutazione di zone di influenza degli aerogeneratori (ZVI), considerando l'orografia del terreno e altezza dell'osservatore (nel caso specifico altezza della finestra di un'abitazione) pari a 2 m, prima di effettuare il calcolo flicker in modo da escludere il contributo di quegli aerogeneratori che non sono visibili dal ricettore.

Figura 4: Impatto della ZVI della ZVI, l'orografica del territorio può rendere non visibile l'aerogeneratore al ricettore

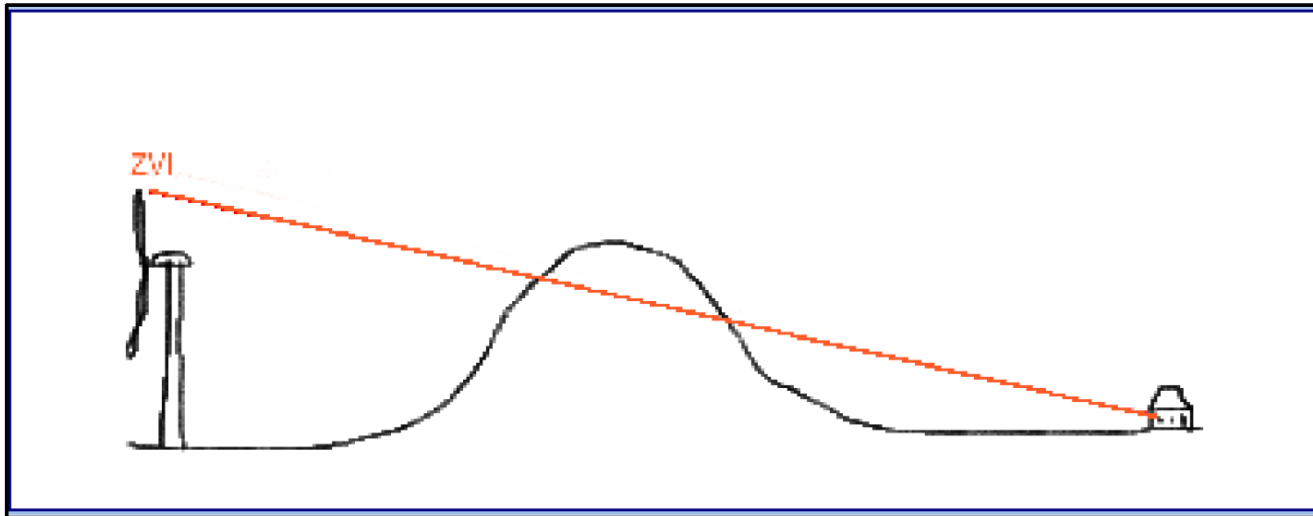
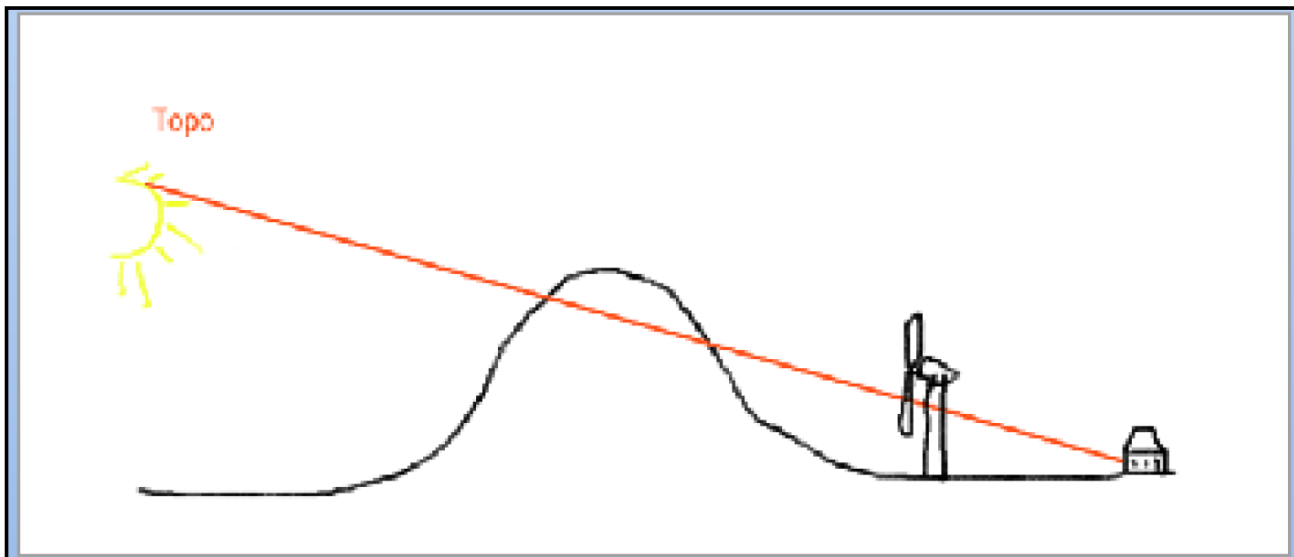


Figura 5: Impatto dell'orografia del territorio sull'ombreggiamento



Nella prima stima effettuata (**worst case**) si assumono le seguenti ipotesi restrittive:

- l'impianto eolico sempre in funzione durante le ore di sole;
- altezza minima del sole sull'orizzonte pari a 3°;
- piano del rotore sempre ortogonale alla congiungente tra l'osservatore e il sole;
- totale assenza di ostacoli o schermi vegetazionali presenti negli spazi circostanti i possibili ricettori e che potrebbero inficiare il fenomeno;
- ricettori in modalità "green house", ovvero le finestre delle abitazioni attenzionate non orientate in una particolare direzione ma omnidirezionali.

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

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

Tabella 4 Probabilità medie di eliofania e ore di funzionamento aerogeneratori in presenza del sole

MESE	gen	feb	mar	apr	mag	giu	lug	ago	set	ott	nov	dic
GIORNI	31	28	31	30	31	30	31	31	30	31	30	31
PROB. MEDIA ELIOFANIA	2,48	3,33	4,51	5,74	7,16	8,35	9,37	8,38	6,67	4,87	2,94	2,55

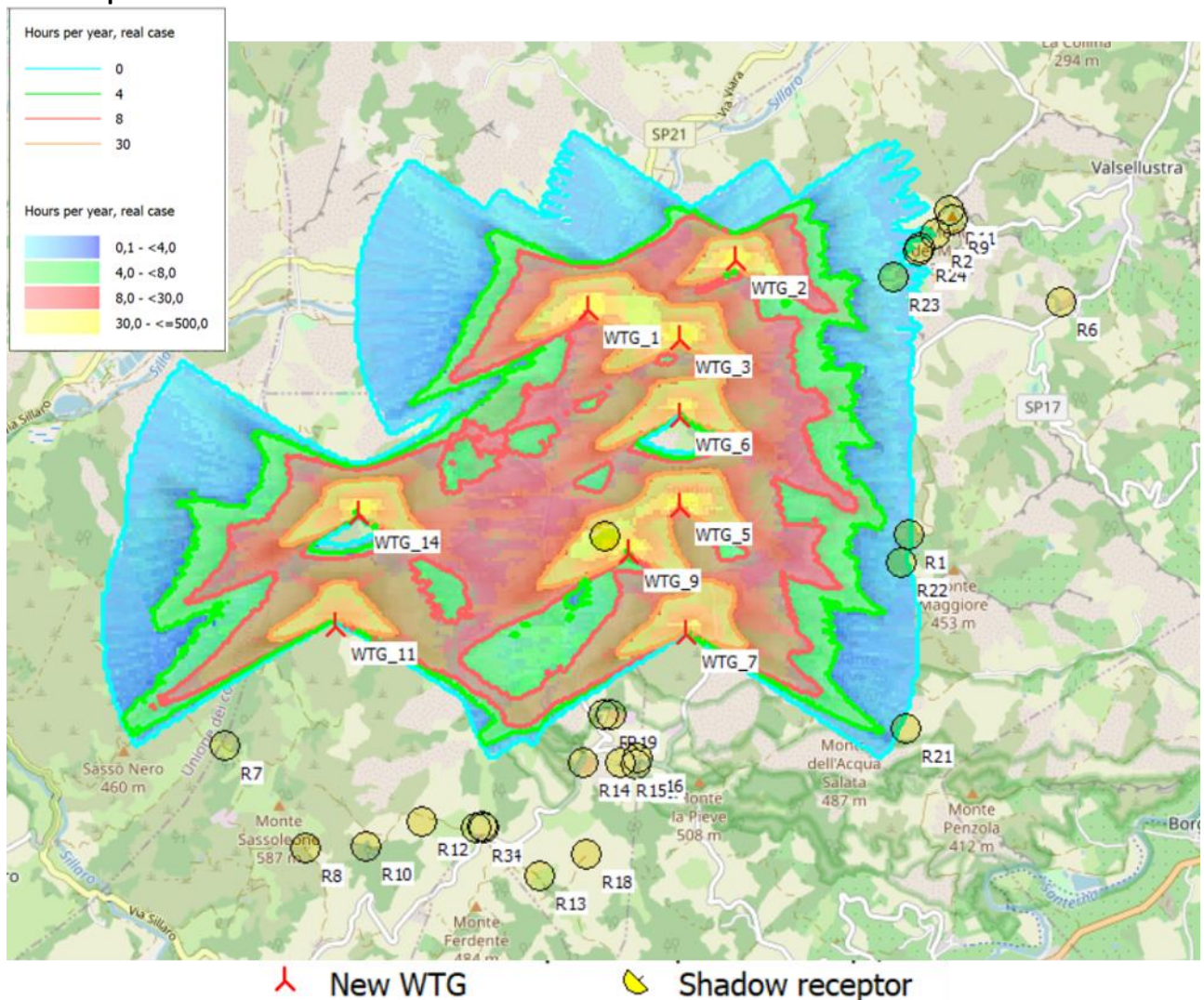
Tabella 5 Ore di funzionamento degli aerogeneratori in presenza del sole in funzione della direzione del vento (ipotesi di funzionamento dell'impianto per circa l'83% del tempo in un anno)

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Somma
446	588	709	537	307	224	366	1786	992	318	487	496	7256

4.3 Conclusioni

Nella seguente Figura sono rappresentati i ricettori esaminati rispetto alle posizioni degli aerogeneratori di progetto e gli intervalli delle ore d'ombra per anno ottenute dalla simulazione effettuata nell'area d'impianto.

Figura 6: Localizzazione dei ricettori attenzionati rispetto agli aerogeneratori di progetto ed esistenti e ore d'ombra per anno



Dai risultati ottenuti si evince che, nelle ipotesi precedentemente elencate, le ore d'ombra intermittente per anno, pur essendo superiori rispetto al parametro di 30 ore/anno in alcuni casi nel worst case, risultano essere inferiori a 30 ore/anno, parametro considerato di qualità a livello internazionale, nel caso più realistico ("expected values") per tutti i ricettori attenzionati tranne che per il recettore, individuato dal codice Y-R25, ovvero quello in prossimità della WTG 9.

Tabella 6 si riportano i valori attesi delle ore d'ombra intermittente per anno relativamente ai ricettori considerati nelle ipotesi precedentemente indicate

Lettera su mappa	PROV.	COMUNE	FOGLIO	PART.	CATEG.	DESCRIZIONE	Shadow, worst case shadow hours per year	Shadow, expected values - shadow hours per year
A-R1	Bologna	Casaifiumanese	40	61	A4	Abitazione di tipo Popolare	0:00	0:00
B-R2	Bologna	Casaifiumanese	23	60	A4	Abitazione di tipo Popolare	1:52	0:24
C-R3	Bologna	Casaifiumanese	70	148	A5	Abitazione di tipo Ultrapopolare	0:00	0:00
D-R4	Bologna	Casalfiumanese	70	150	A5	Abitazione di tipo Ultrapopolare	0:00	0:00
E-R5	Bologna	Casalfiumanese	24	280	A3	Abitazione di tipo economico	0:00	0:00
F-R6	Bologna	Casalfiumanese	47	52	A3	Abitazione di tipo economico	0:00	0:00
G-R7	Bologna	Casalfiumanese	68	16	A3	Abitazione di tipo economico	0:00	0:00
H-R8	Bologna	Casalfiumanese	68	14	A4	Abitazione di tipo Popolare	0:00	0:00
I-R9	Bologna	Casalfiumanese	69	216	A4	Abitazione di tipo Popolare	0:00	0:00
J-R10	Bologna	Casalfiumanese	72	79-80-81	A4	Abitazione di tipo Popolare	0:00	0:00
K-R11	Bologna	Casalfiumanese	52	86	A3	Abitazione di tipo economico	0:00	0:00
L-R12	Bologna	Casalfiumanese	71	143	A3	Abitazione di tipo economico	0:00	0:00
M-R13	Bologna	Casalfiumanese	71	122	A4	Abitazione di tipo Popolare	0:00	0:00
N-R14	Bologna	Casalfiumanese	71	106	A3	Abitazione di tipo economico	0:00	0:00
O-R15	Bologna	Casalfiumanese	72	46	A4	Abitazione di tipo Popolare	0:00	0:00
P-R16	Bologna	Casalfiumanese	71	32	A10	Uffici e studi privati	0:00	0:00
Q-R17	Bologna	Casalfiumanese	71	29	A3	Abitazione di tipo economico	0:00	0:00
R-R18	Bologna	Casalfiumanese	71	176	A3	Abitazione di tipo economico	0:00	0:00
S-R19	Bologna	Casalfiumanese	41	96	A4	Abitazione di tipo Popolare	5:35	1:10
T-R20	Bologna	Casalfiumanese	22	65	A4	Abitazione di tipo Popolare	8:08	1:45
U-R21	Bologna	Casalfiumanese	18	12	A3	Abitazione di tipo economico	2:12	0:29
V-R22	Bologna	Casalfiumanese	18	14	A7	Abitazione in villini	2:42	0:36
W-R23	Bologna	Casalfiumanese	23	2	A3	Abitazione di tipo economico	0:52	0:10
X-R24	Bologna	Casalfiumanese	23	33	A7	Abitazione in villini	1:24	0:17
Y-R25	Bologna	Casalfiumanese	37	72	A4	Abitazione di tipo Popolare	340:55	70:25
Z-R26	Bologna	Casalfiumanese	70	148	A5	Abitazione di tipo Ultrapopolare	0:00	0:00

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

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

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

Pertanto, si può ragionevolmente affermare che l'effetto shadow flickering non abbia un impatto negativo sulla maggior parte dei fabbricati di civile abitazione attenzionati fatta eccezione di quello in prossimità della WTG9.

ALLEGATO 1 – RISULTATI WindPRO ANALISI WORST CASE

SHADOW - Main Result

Assumptions for shadow calculations

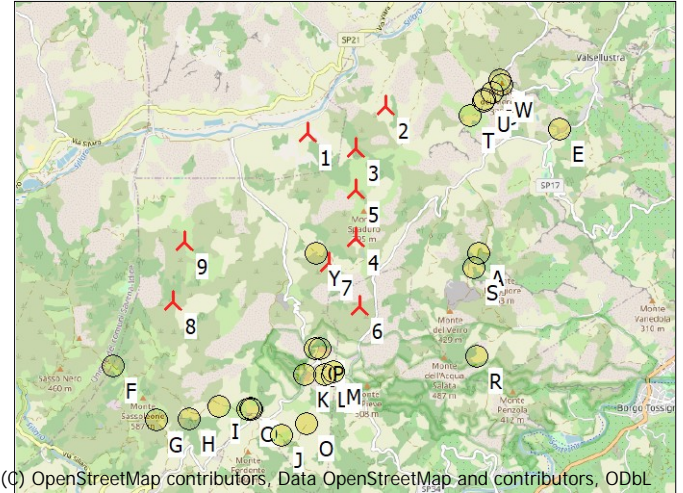
Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

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

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

Topographic shadow included in calculation

All coordinates are in
Geo [deg]-WGS84



Scale 1:125.000
New WTG Shadow receptor

WTGs

Row data/Description	Longitude	Latitude	Z [m]	Valid	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Manufact.	Type-generator	Calculation distance [m]				RPM	
1 VESTAS V162-7.2 7200 16...	11,517600° E	44,316336° N	324,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
2 VESTAS V162-7.2 7200 16...	11,533938° E	44,320280° N	266,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
3 VESTAS V162-7.2 7200 16...	11,527672° E	44,314080° N	318,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
4 VESTAS V162-7.2 7200 16...	11,527755° E	44,300710° N	353,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
5 VESTAS V162-7.2 7200 16...	11,527755° E	44,307852° N	376,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
6 VESTAS V162-7.2 7200 16...	11,528492° E	44,290710° N	387,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
7 VESTAS V162-7.2 7200 16...	11,522100° E	44,297100° N	349,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
8 VESTAS V162-7.2 7200 16...	11,489563° E	44,291297° N	451,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
9 VESTAS V162-7.2 7200 16...	11,492183° E	44,300188° N	344,0	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	

Shadow receptor-Input

No.	Longitude	Latitude	Z [m]	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
A	11,553236° E	44,298510° N	340,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
B	11,555990° E	44,322388° N	320,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
C	11,505308° E	44,275274° N	447,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
D	11,506099° E	44,275358° N	447,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
E	11,570033° E	44,316966° N	170,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
F	11,477486° E	44,281847° N	530,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
G	11,486385° E	44,273774° N	496,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
H	11,493022° E	44,273892° N	449,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
I	11,499300° E	44,275781° N	435,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
J	11,512216° E	44,271477° N	463,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
K	11,517086° E	44,280442° N	439,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
L	11,521204° E	44,280442° N	459,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
M	11,523050° E	44,280806° N	447,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
N	11,522968° E	44,280315° N	452,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
O	11,517518° E	44,273232° N	375,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
P	11,520147° E	44,284310° N	368,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Q	11,519272° E	44,284258° N	379,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R	11,552775° E	44,283218° N	400,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
S	11,552261° E	44,296326° N	390,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
T	11,551417° E	44,318963° N	323,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
U	11,554412° E	44,321304° N	327,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
V	11,554138° E	44,320965° N	323,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
W	11,558006° E	44,323524° N	328,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
X	11,557564° E	44,324204° N	317,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Y	11,519566° E	44,298377° N	310,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Z	11,506010° E	44,275484° N	446,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0

SHADOW - Main Result

Calculation Results

Shadow receptor

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A	0:00	0	0:00
B	1:52	18	0:09
C	0:00	0	0:00
D	0:00	0	0:00
E	0:00	0	0:00
F	0:00	0	0:00
G	0:00	0	0:00
H	0:00	0	0:00
I	0:00	0	0:00
J	0:00	0	0:00
K	0:00	0	0:00
L	0:00	0	0:00
M	0:00	0	0:00
N	0:00	0	0:00
O	0:00	0	0:00
P	0:00	0	0:00
Q	0:00	0	0:00
R	0:00	0	0:00
S	5:35	42	0:15
T	8:08	49	0:15
U	2:12	19	0:10
V	2:42	20	0:11
W	0:52	13	0:06
X	1:24	17	0:08
Y	340:55	298	2:04
Z	0:00	0	0:00

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

No.	Name	Worst case [h/year]
1	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (1)	0:00
2	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (2)	11:23
3	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (3)	3:30
4	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (4)	66:38
5	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (5)	0:00
6	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (6)	28:06
7	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (7)	251:46
8	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (8)	0:00
9	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (9)	0:00

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

SHADOW - Calendar

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:34 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:32 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:37
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:54	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:41	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	05:57 20:25	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	06:59 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:56	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	05:54 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:03 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:15	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:07 16:49	07:42 16:35
15	07:47 17:00	07:15 17:42	06:29 18:19	06:32 19:58	05:48 20:34	05:30 21:00	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:42 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:00	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:29	07:11 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:45	07:45 16:36
19	07:45 17:05	07:09 17:48	06:21 18:24	06:26 20:02	05:44 20:38	05:30 21:01	05:47 20:53	06:21 20:14	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:01	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	07:15 16:44	07:46 16:37
21	07:44 17:08	07:06 17:50	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:15	07:36 18:22	07:17 16:43	07:46 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 20:07	05:40 20:42	05:30 21:02	05:51 20:50	06:26 20:08	07:01 19:12	07:38 18:19	07:19 16:41	07:47 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	06:17 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:20 16:41	07:48 16:39
25	07:40 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:02	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:39	07:49 16:40
27	07:39 17:16	06:57 17:59	06:06 18:34	06:13 20:12	05:37 20:46	05:32 21:02	05:55 20:46	06:30 20:01	07:06 19:04	06:43 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	05:36 20:47	05:32 21:02	05:56 20:45	06:31 19:59	07:07 19:02	06:45 17:11	07:25 16:38	07:49 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02	05:57 20:44	06:33 19:58	07:08 19:01	06:46 17:10	07:27 16:38	07:50 16:42
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:47 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21		06:59 19:39		05:34 20:50		05:59 20:41	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	18:26 (2) 18:33 (2)	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:02	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	18:25 (2) 18:31 (2)	06:51 17:04	07:30 16:36
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	18:25 (2) 18:30 (2)	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	18:25 (2) 18:28 (2)	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	18:24 (2) 18:26 (2)	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:31 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48		06:57 16:58	07:34 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46		06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44		07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	17:47 (2) 06:43	05:56 20:27	05:30 20:57	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42		07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	17:46 (2) 06:41	05:54 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41		07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	17:46 (2) 06:39	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:47 19:34	07:23 18:39		07:04 16:52	07:39 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	17:47 (2) 06:38	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37		07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	17:54 (2) 06:36	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35		07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	17:47 (2) 06:34	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34		07:08 16:49	07:42 16:35
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Potential sun hours	288	292	369	403	458	464	470	435	376	34	23	290	277
Total, worst case			55										

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
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Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:46	07:34 17:23	06:54 18:02	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:06	07:29 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:46	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:06	07:29 16:37
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28	07:38 17:17	06:55 18:00	06:05 18:36	06:12 20:14	05:37 20:47	05:33 21:03	05:56 20:45	06:32 20:00	07:08 19:03	06:45 17:11	07:26 16:39	07:50 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:58 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
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31	07:35 17:22		06:59 19:39		05:35 20:50		06:00 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:46	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:06	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:18	05:34 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:39 19:49	07:13 18:53	06:53 17:03	07:31 16:37
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Table layout: For each day in each month the following matrix apply

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SHADOW - Calendar

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

Assumptions for shadow calculations

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

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SHADOW - Calendar

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

Assumptions for shadow calculations

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

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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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Total, worst case												

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

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

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

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

Shadow receptor: N - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (16)

Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

Shadow receptor: O - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (17)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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SHADOW - Calendar

Shadow receptor: P - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (18)

Assumptions for shadow calculations

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- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

Shadow receptor: Q - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (19)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

Shadow receptor: R - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (20)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:50	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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25	07:40 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:04	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:02	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:39	07:49 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:02	05:55 20:46	06:30 20:01	07:06 19:04	06:43 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	05:37 20:47	05:32 21:02	05:56 20:45	06:31 19:59	07:07 19:02	06:45 17:11	07:25 16:38	07:49 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02	05:57 20:44	06:33 19:58	07:08 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:42	06:34 19:56	07:10 18:59	06:47 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21		06:59 19:39		05:35 20:50		05:59 20:41	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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

Shadow receptor: S - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (21)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:34 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:32 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:37
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:54	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:41	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	05:57 20:25	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	06:59 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:56	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	05:54 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:03 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:15	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:07 16:49	07:42 16:35
15	07:47 17:00	07:15 17:42	06:29 18:19	06:32 19:58	05:48 20:34	05:30 21:00	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	17:54 (6) 18:03 (6)	07:09 16:48
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:17 20:19	19:47 (4) 19:54 (4)	06:53 19:25	17:51 (6) 18:04 (6)	07:10 16:47
17	07:46 17:03	07:13 17:45	2 17:19 (6) 17:21 (6)	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:00	06:19 20:18	8 19:45 (4) 19:53 (4)	06:54 19:23	17:49 (6) 18:01 (6)	07:11 16:46
18	07:46 17:04	07:11 17:46	17:17 (6) 17:22 (6)	06:23 18:23	06:27 20:01	19:37 (4) 19:38 (4)	05:45 20:37	06:20 20:16	9 19:44 (4) 19:53 (4)	06:56 19:21	17:49 (6) 18:03 (6)	07:13 16:45
19	07:45 17:05	07:09 17:48	8 17:25 (6) 17:26 (6)	06:21 18:24	06:26 20:02	3 19:39 (4) 19:40 (4)	05:44 20:38	06:21 20:14	8 19:51 (4) 19:51 (4)	06:57 19:19	17:48 (6) 18:01 (6)	07:14 16:45
20	07:44 17:06	07:08 17:49	9 17:26 (6) 17:26 (6)	06:19 18:26	06:24 20:04	4 19:40 (4) 19:40 (4)	05:43 20:39	06:22 20:13	7 19:42 (4) 19:49 (4)	06:58 19:17	17:47 (6) 17:59 (6)	07:15 16:44
21	07:44 17:08	07:06 17:50	11 17:17 (6) 17:28 (6)	06:18 18:27	06:22 20:05	6 19:41 (4) 19:41 (4)	05:42 20:40	06:23 20:11	7 19:48 (4) 19:48 (4)	06:59 19:15	17:48 (6) 17:58 (6)	07:17 16:38
22	07:43 17:09	07:05 17:52	12 17:17 (6) 17:29 (6)	06:16 18:28	06:21 20:06	7 19:43 (4) 19:43 (4)	05:41 20:41	06:24 20:10	6 19:46 (4) 19:46 (4)	07:00 19:14	17:47 (6) 17:56 (6)	07:18 16:42
23	07:42 17:10	07:03 17:53	13 17:17 (6) 17:30 (6)	06:14 18:29	06:19 20:07	8 19:44 (4) 19:44 (4)	05:40 20:42	06:26 20:08	4 19:44 (4) 19:44 (4)	07:01 19:12	17:48 (6) 17:54 (6)	07:19 16:41
24	07:41 17:12	07:02 17:55	14 17:18 (6) 17:32 (6)	06:12 18:31	06:17 20:09	8 19:45 (4) 19:45 (4)	05:40 20:43	06:27 20:06	2 19:42 (4) 19:42 (4)	07:03 19:10	17:48 (6) 17:53 (6)	07:20 16:41
25	07:40 17:13	07:00 17:56	15 17:18 (6) 17:33 (6)	06:10 18:32	06:16 20:10	9 19:46 (4) 19:46 (4)	05:39 20:44	06:28 20:05	1 19:41 (4) 19:41 (4)	07:04 19:08	16:49 (6) 16:51 (6)	07:22 16:40
26	07:40 17:14	06:58 17:57	12 17:19 (6) 17:33 (6)	06:08 18:33	06:14 20:11	9 19:47 (4) 19:47 (4)	05:38 20:45	06:29 20:03	07:05 19:06	06:42 17:14	16:49 (6) 16:53 (6)	07:23 16:40
27	07:39 17:16	06:57 17:59	6 17:23 (6) 17:29 (6)	06:07 18:34	06:13 20:12	5 19:41 (4) 19:46 (4)	05:37 21:02	06:30 20:46	07:06 19:04	06:43 17:13	16:39 (6) 16:43 (6)	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	06:11 20:13	05:36 20:47	05:32 21:02	06:31 19:59	07:07 19:02	06:45 17:11	16:38 (6) 16:42 (6)	07:49 16:42
29	07:37 17:19	06:54 17:59	07:03 19:37	06:10 20:15	06:10 20:15	05:36 20:48	05:33 21:02	06:33 19:58	07:08 19:01	06:46 17:10	16:38 (6) 16:42 (6)	07:50 16:42
30	07:36 17:20	06:53 17:59	07:01 19:38	06:08 20:16	06:08 20:16	05:35 20:49	05:33 21:02	06:34 19:56	07:10 18:59	06:47 17:08	16:37 (6) 16:43 (6)	07:50 16:43
31	07:35 17:21	06:52 17:58	06:59 19:39	06:07 20:14	06:07 20:14	05:35 20:50	05:33 20:41	06:35 19:54	06:49 17:07	06:49 17:07	16:44 (6) 16:44 (6)	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case		107		60				59		109		

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

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

SHADOW - Calendar

Shadow receptor: T - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (22)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:50 16:45	07:34 17:23	06:53 18:01	17:24 (3) 18:01	06:57 19:16 (2)	05:34 20:07
2	07:50 16:46	07:33 17:24	06:52 18:03	17:26 (3) 17:38 (3)	06:56 19:14 (2)	05:33 20:18
3	07:50 16:47	07:31 17:25	06:50 18:04	17:28 (3) 17:35 (3)	06:54 19:13 (2)	05:33 20:20
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	19:13 (2) 19:21 (2)	05:32 20:21
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	19:13 (2) 19:23 (2)	05:32 20:22
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	19:13 (2) 19:24 (2)	05:31 20:23
7	07:50 16:51	07:27 17:31	06:43 18:09	06:46 19:48	19:13 (2) 19:25 (2)	05:31 20:24
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	19:13 (2) 19:26 (2)	05:31 20:26
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	19:13 (2) 19:27 (2)	05:31 20:27
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	19:14 (2) 19:29 (2)	05:30 20:28
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	19:15 (2) 19:30 (2)	05:30 20:29
12	07:49 16:56	07:20 17:38	06:34 18:15	06:38 19:54	19:16 (2) 19:31 (2)	05:30 20:30
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	19:18 (2) 19:29 (2)	05:30 20:31
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59
15	07:47 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:48 20:34	05:30 21:00
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01
20	07:44 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02
21	07:44 17:08	07:06 17:50	17:26 (3) 17:28 (3)	06:18 18:27	06:22 20:05	05:42 20:40
22	07:43 17:09	07:05 17:52	17:24 (3) 17:29 (3)	06:16 18:28	06:21 20:06	05:41 20:41
23	07:42 17:10	07:03 17:53	17:23 (3) 17:30 (3)	06:14 18:29	06:19 20:07	05:40 20:42
24	07:41 17:12	07:02 17:55	17:23 (3) 17:32 (3)	06:12 18:31	06:17 20:09	05:40 20:43
25	07:41 17:13	07:00 17:56	17:23 (3) 17:33 (3)	06:10 18:32	06:16 20:10	05:39 20:44
26	07:40 17:14	06:58 17:57	17:22 (3) 17:34 (3)	06:08 18:33	06:14 20:11	05:38 20:45
27	07:39 17:16	06:57 17:59	17:23 (3) 17:36 (3)	06:06 18:34	06:13 20:12	05:37 20:46
28	07:38 17:17	06:55 18:00	17:23 (3) 17:37 (3)	06:05 18:35	06:11 20:14	05:36 20:47
29	07:37 17:18		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02
31	07:35 17:21		06:59 19:39		05:34 20:50	
Potential sun hours	288	292	369	403	458	464
Total, worst case		72	33	137		

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

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

Shadow receptor: T - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (22)

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:34 21:02	06:00 20:40	06:36 19:52	19:14 (2) 18:57	07:11 17:05	07:29 16:37
2	05:34 21:02	06:02 20:39	06:37 19:51	19:12 (2) 18:55	07:12 17:04	07:30 16:37
3	05:35 21:02	06:03 20:38	06:38 19:49	19:11 (2) 18:53	07:13 17:02	07:31 16:36
4	05:35 21:02	06:04 20:36	06:39 19:47	19:10 (2) 18:51	07:14 17:01	07:32 16:36
5	05:36 21:01	06:05 20:35	06:41 19:45	19:09 (2) 18:50	07:16 17:00	07:33 16:36
6	05:36 21:01	06:06 20:34	06:42 19:43	19:09 (2) 18:48	07:17 16:59	07:34 16:35
7	05:37 21:01	06:07 20:32	06:43 19:42	19:08 (2) 18:46	07:18 16:57	07:35 16:35
8	05:38 21:00	06:08 20:31	06:44 19:40	19:08 (2) 18:44	07:19 16:56	07:36 16:35
9	05:39 21:00	06:09 20:30	06:45 19:38	19:08 (2) 18:42	07:21 16:55	07:37 16:35
10	05:39 20:59	06:11 20:28	06:46 19:36	19:08 (2) 18:41	07:22 18:41	07:38 16:35
11	05:40 20:59	06:12 20:27	06:48 19:34	19:08 (2) 18:39	07:23 18:11 (3)	07:39 16:35
12	05:41 20:58	06:13 20:25	06:49 19:32	19:08 (2) 18:37	07:24 18:12 (3)	07:40 16:35
13	05:42 20:58	06:14 20:24	06:50 19:30	07:26 18:35	17:57 (3) 18:11 (3)	07:41 16:35
14	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	17:55 (3) 18:09 (3)	07:42 16:35
15	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	17:55 (3) 18:08 (3)	07:43 16:36
16	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	17:55 (3) 18:06 (3)	07:43 16:36
17	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:28	17:54 (3) 18:04 (3)	07:44 16:36
18	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	17:55 (3) 18:03 (3)	07:45 16:36
19	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	17:55 (3) 18:01 (3)	07:45 16:37
20	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	17:55 (3) 17:59 (3)	07:46 16:37
21	05:49 20:52	06:23 20:11	06:59 19:15	07:36 18:22	17:57 (3) 17:58 (3)	07:47 16:38
22	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	05:51 20:50	06:26 20:08	07:01 19:12	07:38 18:19	07:19 16:41	07:48 16:39
24	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:39	07:49 16:40
27	05:55 20:46	06:30 20:01	07:06 19:04	06:43 17:12	07:24 16:39	07:49 16:41
28	05:56 20:45	06:31 19:59	07:07 19:02	06:45 17:11	07:25 16:38	07:49 16:42
29	05:57 20:44	06:32 19:58	07:08 19:01	06:46 17:10	07:27 16:38	07:50 16:42
30	05:58 20:43	06:34 19:56	19:19 (2) 19:30 (2)	07:10 18:59	06:47 17:08	07:50 16:43
31	05:59 20:41	06:35 19:54	19:16 (2) 19:31 (2)	06:49 17:07	07:50 16:44	07:50 16:44
Potential sun hours	470	435	376	342	290	277
Total, worst case		26	115	105		

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

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

Shadow receptor: U - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (24)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37	
2	07:50 16:46	07:33 17:24	06:52 18:02	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:36	
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36	
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36	
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36	
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:31 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:35	
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31	07:35 17:21		06:59 19:39		05:34 20:50		05:59 20:41	06:35 19:54			06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277	
Total, worst case			64						68				

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

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

Shadow receptor: V - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (25)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
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Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Total, worst case			81						81			

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

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

SHADOW - Calendar

Shadow receptor: W - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (26)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37	
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25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40	
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:02	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:39	07:49 16:40	
27	07:39 17:16	06:57 17:58	06:06 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	06:43 17:12	07:24 16:39	07:49 16:41	
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	05:36 20:47	05:32 21:02	05:56 20:45	06:31 19:59	07:07 19:02	06:45 17:11	07:25 16:38	07:49 16:42	
29	07:37 17:18		07:03 19:37	06:10 20:15	05:36 20:48	05:32 21:02	05:57 20:44	06:32 19:58	07:08 19:01	06:46 17:09	07:27 16:38	07:50 16:42	
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:47 17:08	07:28 16:37	07:50 16:43	
31	07:35 17:21		06:59 19:39		05:34 20:50		05:59 20:41	06:35 19:54		06:49 17:07		07:50 16:44	
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277	
Total, worst case			27							25			

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

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

Shadow receptor: X - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (27)

Assumptions for shadow calculations

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	17:34 (2) 17:38 (2)	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:32 17:24	06:52 18:02	17:35 (2) 17:40 (2)	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:36
3	07:50 16:47	07:31 17:25	06:50 18:04	17:35 (2) 17:42 (2)	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	17:35 (2) 17:43 (2)	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	17:36 (2) 17:44 (2)	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	17:38 (2) 17:45 (2)	06:48 19:47	06:00 20:23	05:31 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:58	07:34 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	17:45 (2) 17:31	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46	06:58 18:17 (2)	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	17:32 17:38 (2)	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 18:13 (2)	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	17:34 17:34 (2)	06:43 19:50	05:56 20:27	05:30 20:57	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 18:11 (2)	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	17:35 18:13	06:41 19:51	05:54 20:28	05:30 20:57	05:39 20:59	06:10 20:28	06:46 19:36	07:22 18:41	07:02 18:16 (2)	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	17:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:47 19:34	07:23 18:39	07:04 18:15 (2)	07:39 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	17:37 19:54	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 18:13 (2)	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	17:38 19:55	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 18:11 (2)	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	17:39 19:56	06:34 19:56	05:50 20:32	05:30 20:59	05:42 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 18:09 (2)	07:42 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	17:40 19:58	06:32 19:58	05:48 20:34	05:30 21:00	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	07:09 18:08 (2)	07:43 16:35
16	07:47 17:01	07:14 17:44	06:27 18:21	17:41 19:59	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	07:10 18:09 (2)	07:44 16:36
17	07:46 17:02	07:13 17:45	06:25 18:22	17:42 20:00	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:28	07:12 18:28	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	17:43 20:01	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 18:27	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	17:44 20:02	06:26 20:02	05:44 20:38	05:30 21:01	05:47 20:53	06:21 20:14	06:57 19:19	07:33 18:25	07:14 18:25	07:45 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	17:45 20:04	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:23	07:15 18:20 (2)	07:46 16:37
21	07:44 17:08	07:06 17:50	06:18 18:27	17:46 20:05	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:15	07:36 18:22	07:17 18:22	07:47 16:37
22	07:43 17:09	07:05 17:52	06:16 18:28	17:47 20:06	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	07:18 18:20	07:48 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	17:48 20:07	06:19 20:07	05:40 20:42	05:30 21:02	05:51 20:50	06:25 20:08	07:01 19:12	07:38 18:19	07:19 18:19	07:48 16:38
24	07:41 17:12	07:02 17:54	06:12 18:31	17:49 20:09	06:17 20:09	05:39 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 18:17	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	17:50 20:10	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 17:16	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	17:51 20:11	06:08 20:11	06:14 20:45	05:38 21:02	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 17:14	07:49 16:40
27	07:39 17:16	06:57 17:58	06:06 18:34	17:52 20:12	06:06 20:12	06:13 20:46	05:37 21:03	05:55 20:46	06:30 20:01	07:06 19:04	06:43 17:12	07:24 17:12	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	17:53 (2) 17:37 (2)	06:05 18:35	06:11 20:13	05:36 20:47	05:56 21:03	06:31 19:59	07:07 19:02	06:45 17:11	07:25 17:11	07:49 16:42
29	07:37 17:18	07:03 17:57	06:03 18:37	17:54 (2) 17:37 (2)	06:03 19:43	06:10 20:15	05:36 20:48	05:57 21:02	06:32 19:58	07:08 19:01	06:46 17:09	07:27 17:09	07:50 16:42
30	07:36 17:20	07:02 17:59	06:01 18:38	17:55 (2) 17:38 (2)	06:01 19:43	06:08 20:16	05:35 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:47 17:08	07:28 17:08	07:50 16:43
31	07:35 17:21	06:59 17:59	06:00 19:39	17:56 (2) 17:39 (2)	06:00 19:39	06:09 20:50	05:34 20:50	05:59 20:41	06:35 19:54	06:49 17:07	06:49 17:07	07:50 17:07	07:50 16:44
Potential sun hours	288	292	369	39	403	458	464	470	435	376	342	290	277
Total, worst case		4									41		

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

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

SHADOW - Calendar

Shadow receptor: Y - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (28)

Assumptions for shadow calculations

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

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

	January		February		March		April		May		June	
1	07:50	09:04 (6)	07:34		06:53	08:41 (7)	06:57	09:21 (7)	06:07	09:41 (7)	05:34	06:21 (4)
	16:45	32 09:36 (6)	17:23		18:01	103 10:24 (7)	19:41	116 11:17 (7)	20:17	32 10:13 (7)	20:51	53 07:14 (4)
2	07:50	09:04 (6)	07:33		06:52	08:40 (7)	06:56	09:21 (7)	06:05	09:44 (7)	05:34	06:22 (4)
	16:46	32 09:36 (6)	17:24		18:03	106 10:26 (7)	19:42	114 11:15 (7)	20:18	25 10:09 (7)	20:51	53 07:15 (4)
3	07:50	09:05 (6)	07:31		06:50	08:39 (7)	06:54	09:20 (7)	06:04	09:48 (7)	05:33	06:21 (4)
	16:47	31 09:36 (6)	17:26		18:04	107 10:26 (7)	19:43	114 11:14 (7)	20:20	17 10:05 (7)	20:52	53 07:14 (4)
4	07:50	09:05 (6)	07:30		06:48	08:37 (7)	06:52	09:20 (7)	06:03		05:33	06:22 (4)
	16:48	31 09:36 (6)	17:27		18:05	110 10:27 (7)	19:44	112 11:12 (7)	20:21		20:53	53 07:15 (4)
5	07:50	09:06 (6)	07:29		06:46	08:36 (7)	06:50	09:21 (7)	06:01		05:32	06:21 (4)
	16:49	30 09:36 (6)	17:28		18:07	111 10:27 (7)	19:45	110 11:11 (7)	20:22		20:54	54 07:15 (4)
6	07:50	09:07 (6)	07:28		06:45	08:36 (7)	06:48	09:21 (7)	06:00		05:32	06:21 (4)
	16:50	29 09:36 (6)	17:30		18:08	113 10:29 (7)	19:47	108 11:09 (7)	20:23		20:55	54 07:15 (4)
7	07:50	09:08 (6)	07:27		06:43	08:34 (7)	06:47	09:21 (7)	05:58		05:31	06:22 (4)
	16:51	28 09:36 (6)	17:31		18:09	115 10:29 (7)	19:48	106 11:07 (7)	20:24		20:55	54 07:16 (4)
8	07:50	09:09 (6)	07:25		06:41	08:33 (7)	06:45	09:21 (7)	05:57		05:31	06:22 (4)
	16:52	28 09:37 (6)	17:33		18:10	116 10:29 (7)	19:49	104 11:05 (7)	20:26		20:56	55 07:17 (4)
9	07:50	09:09 (6)	07:24		06:39	08:32 (7)	06:43	09:22 (7)	05:56		05:31	06:21 (4)
	16:53	27 09:36 (6)	17:34		18:12	117 10:29 (7)	19:50	102 11:04 (7)	20:27		20:57	55 07:16 (4)
10	07:49	09:11 (6)	07:23		06:38	08:31 (7)	06:41	09:22 (7)	05:55		05:30	06:22 (4)
	16:54	25 09:36 (6)	17:35		18:13	118 10:29 (7)	19:52	100 11:02 (7)	20:28		20:57	54 07:16 (4)
11	07:49	09:11 (6)	07:21		06:36	08:31 (7)	06:40	09:22 (7)	05:53		05:30	06:22 (4)
	16:55	24 09:35 (6)	17:37		18:14	120 10:31 (7)	19:53	98 11:00 (7)	20:29		20:58	55 07:17 (4)
12	07:49	09:13 (6)	07:20	09:21 (7)	06:34	08:30 (7)	06:38	09:22 (7)	05:52	06:39 (4)	05:30	06:22 (4)
	16:57	22 09:35 (6)	17:38	25 09:46 (7)	18:16	120 10:30 (7)	19:54	96 10:58 (7)	20:30	14 06:53 (4)	20:58	55 07:17 (4)
13	07:48	09:15 (6)	07:19	09:15 (7)	06:32	08:29 (7)	06:36	09:23 (7)	05:51	06:36 (4)	05:30	06:22 (4)
	16:58	20 09:35 (6)	17:40	36 09:51 (7)	18:17	121 10:30 (7)	19:55	93 10:56 (7)	20:31	21 06:57 (4)	20:59	56 07:18 (4)
14	07:48	09:16 (6)	07:17	09:11 (7)	06:30	08:28 (7)	06:34	09:23 (7)	05:50	06:34 (4)	05:30	06:22 (4)
	16:59	17 09:33 (6)	17:41	45 09:56 (7)	18:18	122 10:30 (7)	19:56	91 10:54 (7)	20:33	25 06:59 (4)	20:59	56 07:18 (4)
15	07:47	09:17 (6)	07:16	09:08 (7)	06:29	08:27 (7)	06:33	09:23 (7)	05:49	06:32 (4)	05:30	06:23 (4)
	17:00	15 09:32 (6)	17:42	51 09:59 (7)	18:19	123 10:30 (7)	19:58	89 10:52 (7)	20:34	29 07:01 (4)	21:00	55 07:18 (4)
16	07:47	09:21 (6)	07:14	09:05 (7)	06:27	08:26 (7)	06:31	09:24 (7)	05:47	06:30 (4)	05:30	06:23 (4)
	17:01	9 09:30 (6)	17:44	58 10:03 (7)	18:21	124 10:30 (7)	19:59	86 10:50 (7)	20:35	32 07:02 (4)	21:00	55 07:18 (4)
17	07:46		07:13	09:02 (7)	06:25	08:27 (7)	06:29	09:24 (7)	05:46	06:29 (4)	05:30	06:23 (4)
	17:03		17:45	63 10:05 (7)	18:22	123 10:30 (7)	20:00	84 10:48 (7)	20:36	35 07:04 (4)	21:01	56 07:19 (4)
18	07:46		07:11	09:00 (7)	06:23	08:26 (7)	06:27	09:25 (7)	05:45	06:28 (4)	05:30	06:23 (4)
	17:04		17:47	68 10:08 (7)	18:23	124 10:30 (7)	20:01	80 10:45 (7)	20:37	37 07:05 (4)	21:01	56 07:19 (4)
19	07:45		07:10	08:57 (7)	06:21	08:25 (7)	06:26	09:26 (7)	05:44	06:27 (4)	05:30	06:23 (4)
	17:05		17:48	73 10:10 (7)	18:24	124 10:29 (7)	20:03	78 10:44 (7)	20:38	39 07:06 (4)	21:01	56 07:19 (4)
20	07:45		07:08	08:55 (7)	06:20	08:25 (7)	06:24	09:26 (7)	05:43	06:26 (4)	05:30	06:23 (4)
	17:07		17:49	76 10:11 (7)	18:26	124 10:29 (7)	20:04	75 10:41 (7)	20:39	41 07:07 (4)	21:02	56 07:19 (4)
21	07:44		07:06	08:54 (7)	06:18	08:24 (7)	06:22	09:27 (7)	05:42	06:25 (4)	05:30	06:23 (4)
	17:08		17:51	80 10:14 (7)	18:27	124 10:28 (7)	20:05	72 10:39 (7)	20:40	42 07:07 (4)	21:02	56 07:19 (4)
22	07:43		07:05	08:51 (7)	06:16	08:23 (7)	06:21	09:28 (7)	05:41	06:25 (4)	05:30	06:24 (4)
	17:09		17:52	84 10:15 (7)	18:28	124 10:27 (7)	20:06	69 10:37 (7)	20:41	44 07:09 (4)	21:02	56 07:20 (4)
23	07:42		07:03	08:50 (7)	06:14	08:23 (7)	06:19	09:29 (7)	05:41	06:24 (4)	05:31	06:24 (4)
	17:10		17:53	88 10:18 (7)	18:29	123 10:26 (7)	20:07	65 10:34 (7)	20:42	46 07:10 (4)	21:02	56 07:20 (4)
24	07:41		07:02	08:48 (7)	06:12	08:23 (7)	06:18	09:30 (7)	05:40	06:24 (4)	05:31	06:24 (4)
	17:12		17:55	91 10:19 (7)	18:31	123 10:26 (7)	20:09	63 10:33 (7)	20:43	46 07:10 (4)	21:02	56 07:20 (4)
25	07:41		07:00	08:46 (7)	06:10	08:23 (7)	06:16	09:31 (7)	05:39	06:23 (4)	05:31	06:24 (4)
	17:13		17:56	94 10:20 (7)	18:32	122 10:25 (7)	20:10	59 10:30 (7)	20:44	47 07:10 (4)	21:02	56 07:20 (4)
26	07:40		06:58	08:46 (7)	06:08	08:22 (7)	06:14	09:33 (7)	05:38	06:23 (4)	05:32	06:25 (4)
	17:15		17:57	96 10:22 (7)	18:33	122 10:24 (7)	20:11	55 10:28 (7)	20:45	49 07:12 (4)	21:03	55 07:20 (4)
27	07:39		06:57	08:44 (7)	06:07	08:22 (7)	06:13	09:33 (7)	05:37	06:22 (4)	05:32	06:25 (4)
	17:16		17:59	99 10:23 (7)	18:34	121 10:23 (7)	20:12	52 10:25 (7)	20:46	50 07:12 (4)	21:03	55 07:20 (4)
28	07:38		06:55	08:42 (7)	06:05	08:21 (7)	06:11	09:35 (7)	05:37	06:22 (4)	05:32	06:26 (4)
	17:17		18:00	101 10:23 (7)	18:36	121 10:22 (7)	20:14	47 10:22 (7)	20:47	50 07:12 (4)	21:03	55 07:21 (4)
29	07:37				07:03	09:21 (7)	06:10	09:37 (7)	05:36	06:22 (4)	05:33	06:25 (4)
	17:19				19:37	119 11:20 (7)	20:15	42 10:19 (7)	20:48	51 07:13 (4)	21:03	56 07:21 (4)
30	07:36				07:01	09:22 (7)	06:08	09:39 (7)	05:35	06:22 (4)	05:33	06:26 (4)
	17:20				19:38	118 11:20 (7)	20:16	38 10:17 (7)	20:49	51 07:13 (4)	21:02	55 07:21 (4)
31	07:35				06:59	09:21 (7)			05:35	06:22 (4)		
	17:21				19:39	118 11:19 (7)			20:50	52 07:14 (4)		
Potential sun hours	288		292		369		403		458		464	
Total, worst case	400		1228		3676		2518		875		1650	

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

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

Shadow receptor: Y - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (28)

Assumptions for shadow calculations

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

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

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

The WTG is always operating

	July		August		September		October		November		December		
1	05:34	06:26 (4)	06:01	06:51 (4)	06:36	09:21 (7)	07:11	09:08 (7)	06:50	07:29	08:53 (6)		
	21:02	55 07:21 (4)	20:40	11 07:02 (4)	19:52	98 10:59 (7)	18:57	121 11:09 (7)	17:05	16:37	24 09:17 (6)		
2	05:34	06:27 (4)	06:02		06:37	09:20 (7)	07:12	09:08 (7)	06:52	07:30	08:54 (6)		
	21:02	55 07:22 (4)	20:39		19:51	100 11:00 (7)	18:55	120 11:08 (7)	17:04	16:37	25 09:19 (6)		
3	05:35	06:26 (4)	06:03		06:38	09:19 (7)	07:13	09:09 (7)	06:53	07:31	08:53 (6)		
	21:02	55 07:21 (4)	20:38		19:49	102 11:01 (7)	18:53	119 11:08 (7)	17:03	16:36	27 09:20 (6)		
4	05:35	06:27 (4)	06:04		06:40	09:18 (7)	07:15	09:10 (7)	06:54	07:32	08:53 (6)		
	21:02	55 07:22 (4)	20:37		19:47	104 11:02 (7)	18:52	117 11:07 (7)	17:01	16:36	28 09:21 (6)		
5	05:36	06:27 (4)	06:05		06:41	09:18 (7)	07:16	09:10 (7)	06:56	07:33	08:53 (6)		
	21:01	54 07:21 (4)	20:35		19:45	106 11:04 (7)	18:50	116 11:06 (7)	17:00	16:36	28 09:21 (6)		
6	05:37	06:27 (4)	06:06		06:42	09:17 (7)	07:17	09:10 (7)	06:57	07:34	08:53 (6)		
	21:01	55 07:22 (4)	20:34		19:43	108 11:05 (7)	18:48	115 11:05 (7)	16:59	16:36	29 09:22 (6)		
7	05:37	06:28 (4)	06:07		06:43	09:16 (7)	07:18	09:11 (7)	06:58	07:35	08:53 (6)		
	21:01	54 07:22 (4)	20:33		19:42	110 11:06 (7)	18:46	114 11:05 (7)	16:57	16:35	30 09:23 (6)		
8	05:38	06:28 (4)	06:08		06:44	09:15 (7)	07:19	09:11 (7)	07:00	07:36	08:53 (6)		
	21:00	53 07:21 (4)	20:31		19:40	112 11:07 (7)	18:44	113 11:04 (7)	16:56	16:35	31 09:24 (6)		
9	05:39	06:28 (4)	06:10		10:03 (7)	06:45	09:15 (7)	07:21	09:12 (7)	07:01	07:37	08:53 (6)	
	21:00	54 07:22 (4)	20:30	4	10:07 (7)	19:38	113 11:08 (7)	18:43	110 11:02 (7)	16:55	16:35	32 09:25 (6)	
10	05:40	06:29 (4)	06:11		09:55 (7)	06:46	09:14 (7)	07:22	09:12 (7)	07:02	07:38	08:54 (6)	
	20:59	53 07:22 (4)	20:28	20	10:15 (7)	19:36	114 11:08 (7)	18:41	109 11:01 (7)	16:54	16:35	31 09:25 (6)	
11	05:40	06:30 (4)	06:12		09:51 (7)	06:48	09:13 (7)	07:23	09:13 (7)	07:04	07:39	08:54 (6)	
	20:59	52 07:22 (4)	20:27	28	10:19 (7)	19:34	116 11:09 (7)	18:39	107 11:00 (7)	16:53	16:35	32 09:26 (6)	
12	05:41	06:29 (4)	06:13		09:48 (7)	06:49	09:12 (7)	07:24	09:14 (7)	07:05	07:40	08:54 (6)	
	20:58	52 07:21 (4)	20:25	34	10:22 (7)	19:32	118 11:10 (7)	18:37	105 10:59 (7)	16:52	16:35	33 09:27 (6)	
13	05:42	06:30 (4)	06:14		09:46 (7)	06:50	09:12 (7)	07:26	09:14 (7)	07:06	07:41	08:55 (6)	
	20:58	51 07:21 (4)	20:24	39	10:25 (7)	19:31	118 11:10 (7)	18:35	103 10:57 (7)	16:50	16:35	33 09:28 (6)	
14	05:43	06:30 (4)	06:15		09:44 (7)	06:51	09:12 (7)	07:27	09:16 (7)	07:08	07:42	08:54 (6)	
	20:57	51 07:21 (4)	20:22	43	10:27 (7)	19:29	120 11:12 (7)	18:34	100 10:56 (7)	16:49	16:36	33 09:27 (6)	
15	05:44	06:31 (4)	06:16		09:42 (7)	06:52	09:12 (7)	07:28	09:17 (7)	07:09	07:43	08:55 (6)	
	20:57	50 07:21 (4)	20:21	48	10:30 (7)	19:27	120 11:12 (7)	18:32	98 10:55 (7)	16:48	16:36	33 09:28 (6)	
16	05:44	06:32 (4)	06:18		09:40 (7)	06:53	09:11 (7)	07:29	09:18 (7)	07:10	07:43	08:56 (6)	
	20:56	49 07:21 (4)	20:19	52	10:32 (7)	19:25	121 11:12 (7)	18:30	95 10:53 (7)	16:47	16:36	33 09:29 (6)	
17	05:45	06:32 (4)	06:19		09:39 (7)	06:55	09:10 (7)	07:31	09:18 (7)	07:12	07:44	08:56 (6)	
	20:55	49 07:21 (4)	20:18	56	10:35 (7)	19:23	122 11:12 (7)	18:29	93 10:51 (7)	16:46	16:36	34 09:30 (6)	
18	05:46	06:32 (4)	06:20		09:37 (7)	06:56	09:10 (7)	07:32	09:20 (7)	07:13	07:45	08:56 (6)	
	20:54	48 07:20 (4)	20:16	60	10:37 (7)	19:21	123 11:13 (7)	18:27	90 10:50 (7)	16:46	16:37	34 09:30 (6)	
19	05:47	06:33 (4)	06:21		09:36 (7)	06:57	09:09 (7)	07:33	09:21 (7)	07:14	07:45	08:57 (6)	
	20:54	47 07:20 (4)	20:15	63	10:39 (7)	19:19	124 11:13 (7)	18:25	87 10:48 (7)	16:45	16:37	34 09:31 (6)	
20	05:48	06:33 (4)	06:22		09:34 (7)	06:58	09:09 (7)	07:34	09:22 (7)	07:16	07:46	08:57 (6)	
	20:53	46 07:19 (4)	20:13	66	10:40 (7)	19:17	124 11:13 (7)	18:24	83 10:45 (7)	16:44	16:37	34 09:31 (6)	
21	05:49	06:34 (4)	06:23		09:33 (7)	06:59	09:10 (7)	07:36	09:25 (7)	07:17	07:47	08:58 (6)	
	20:52	45 07:19 (4)	20:11	69	10:42 (7)	19:16	123 11:13 (7)	18:22	79 10:44 (7)	16:43	16:38	34 09:32 (6)	
22	05:50	06:35 (4)	06:25		09:31 (7)	07:00	09:09 (7)	07:37	09:26 (7)	07:18	07:47	08:58 (6)	
	20:51	43 07:18 (4)	20:10	73	10:44 (7)	19:14	124 11:13 (7)	18:20	75 10:41 (7)	16:42	16:38	34 09:32 (6)	
23	05:51	06:36 (4)	06:26		09:30 (7)	07:02	09:09 (7)	07:38	09:29 (7)	07:19	07:48	08:59 (6)	
	20:50	42 07:18 (4)	20:08	75	10:45 (7)	19:12	124 11:13 (7)	18:19	71 10:40 (7)	16:42	16:39	34 09:33 (6)	
24	05:52	06:37 (4)	06:27		09:29 (7)	07:03	09:09 (7)	07:40	09:30 (7)	07:21	07:48	08:59 (6)	
	20:49	40 07:17 (4)	20:06	78	10:47 (7)	19:10	124 11:13 (7)	18:17	67 10:37 (7)	16:41	16:39	34 09:33 (6)	
25	05:53	06:38 (4)	06:28		09:27 (7)	07:04	09:08 (7)	06:41	08:32 (7)	07:22	07:48	09:00 (6)	
	20:48	38 07:16 (4)	20:05	81	10:48 (7)	19:08	124 11:12 (7)	17:16	62 09:34 (7)	16:40	16:40	34 09:34 (6)	
26	05:54	06:39 (4)	06:29		09:27 (7)	07:05	09:08 (7)	06:42	08:35 (7)	07:23	07:49	09:00 (6)	
	20:47	36 07:15 (4)	20:03	84	10:51 (7)	19:06	124 11:12 (7)	17:14	57 09:32 (7)	16:40	9 09:08 (6)	16:40	34 09:34 (6)
27	05:55	06:40 (4)	06:30		09:26 (7)	07:06	09:09 (7)	06:44	08:38 (7)	07:24	07:49	09:00 (6)	
	20:46	34 07:14 (4)	20:01	86	10:52 (7)	19:04	123 11:12 (7)	17:13	50 09:28 (7)	16:39	15 09:12 (6)	16:41	34 09:34 (6)
28	05:56	06:41 (4)	06:31		09:25 (7)	07:07	09:09 (7)	06:45	08:42 (7)	07:26	08:56 (6)	07:49	09:01 (6)
	20:45	31 07:12 (4)	19:59	89	10:54 (7)	19:03	123 11:12 (7)	17:11	43 09:25 (7)	16:38	17 09:13 (6)	16:42	33 09:34 (6)
29	05:57	06:43 (4)	06:33		09:24 (7)	07:09	09:09 (7)	06:46	08:46 (7)	07:27	08:55 (6)	07:50	09:01 (6)
	20:44	28 07:11 (4)	19:58	91	10:55 (7)	19:01	122 11:11 (7)	17:10	34 09:20 (7)	16:38	20 09:15 (6)	16:43	33 09:34 (6)
30	05:58	06:45 (4)	06:34		09:23 (7)	07:10	09:08 (7)	06:48	08:51 (7)	07:28	08:54 (6)	07:50	09:03 (6)
	20:43	24 07:09 (4)	19:56	93	10:56 (7)	18:59	122 11:10 (7)	17:08	23 09:14 (7)	16:38	22 09:16 (6)	16:43	32 09:35 (6)
31	06:00	06:48 (4)	06:35		09:22 (7)			06:49				07:50	09:03 (6)
	20:41	18 07:06 (4)	19:54	96	10:58 (7)			17:07				16:44	33 09:36 (6)
Potential sun hours	470		434		376			342		290		277	
Total, worst case	1417		1439		3506			2676		83		987	

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

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

SHADOW - Calendar

Shadow receptor: Z - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (29)

Assumptions for shadow calculations

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

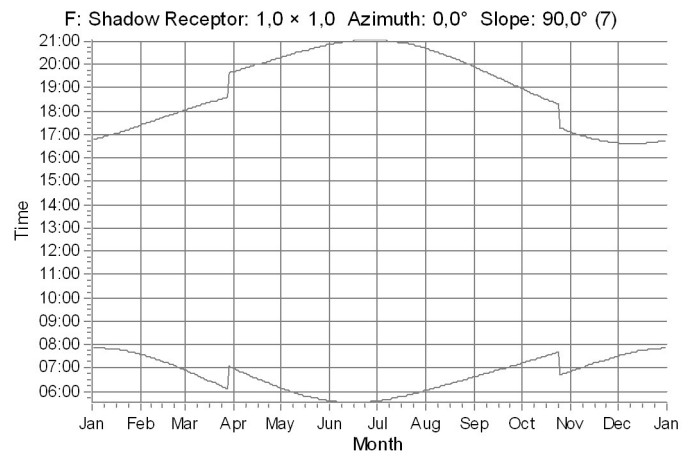
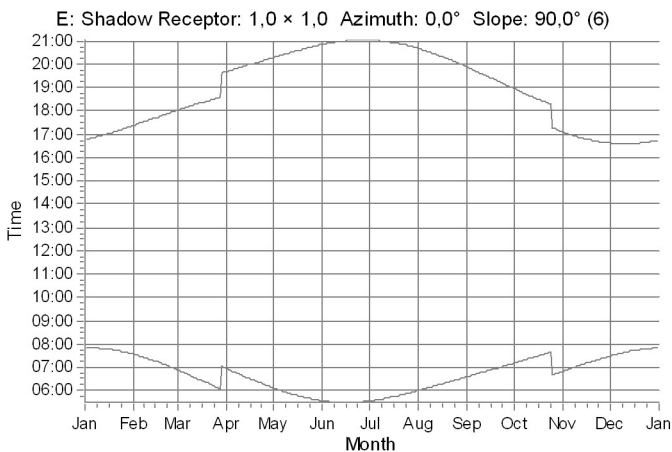
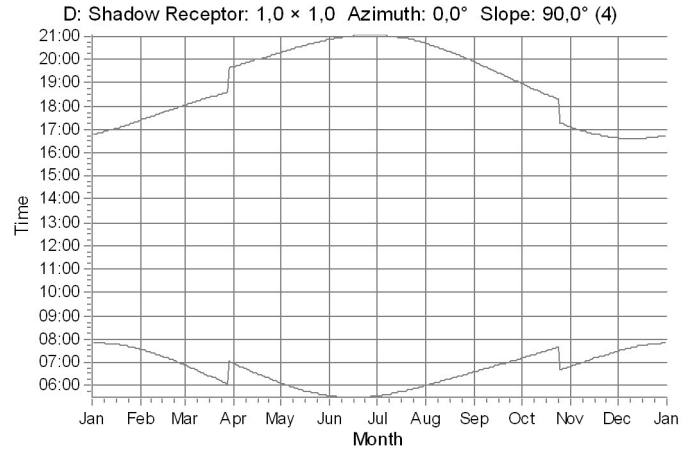
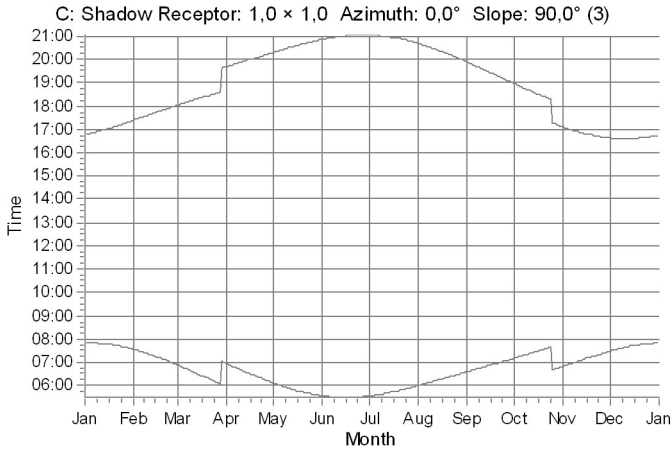
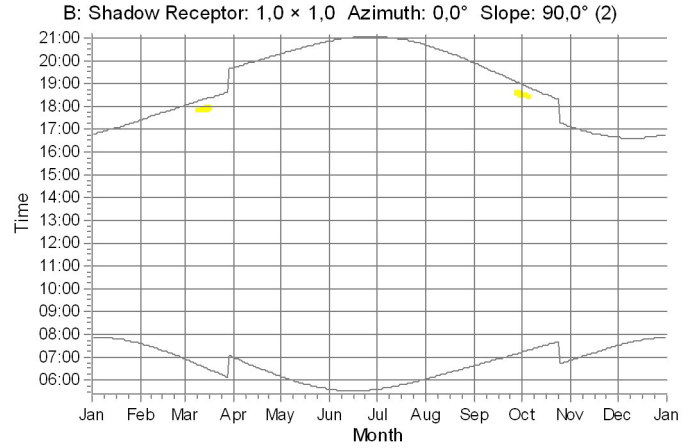
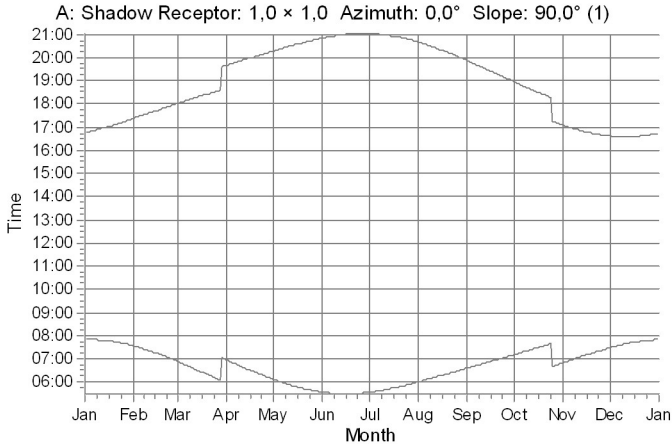
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:37
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:36 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:29	06:47 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:59 20:24	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:58	07:35 16:36
8	07:50 16:52	07:25 17:33	06:41 18:11	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:09 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:36	06:38 18:13	06:41 19:52	05:55 20:28	05:31 20:57	05:40 20:59	06:11 20:28	06:47 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:56	07:21 17:37	06:36 18:14	06:40 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:36	07:06 16:51	07:41 16:36
14	07:48 16:59	07:17 17:41	06:31 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:50	07:42 16:36
15	07:47 17:00	07:16 17:42	06:29 18:19	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:17 20:21	06:52 19:27	07:28 18:32	07:09 16:49	07:43 16:36
16	07:47 17:02	07:14 17:44	06:27 18:21	06:31 19:59	05:48 20:35	05:30 21:00	05:45 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:48	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:47 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:47	07:44 16:36
18	07:46 17:04	07:11 17:47	06:23 18:23	06:28 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:37
19	07:45 17:05	07:10 17:48	06:21 18:25	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:07	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:18	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:23 20:05	05:43 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:42 20:41	05:31 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:21	07:18 16:42	07:47 16:38
23	07:42 17:11	07:03 17:53	06:14 18:29	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:42	07:48 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:15	06:58 17:57	06:09 18:33	06:15 20:11	05:38 20:45	05:32 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:41
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	06:06 19:04	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:32 20:00	07:07 19:03	06:45 17:11	07:26 16:39	07:49 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:59 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:38	07:50 16:44
31	07:35 17:22		06:59 19:39		05:35 20:50		06:00 20:41	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												

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

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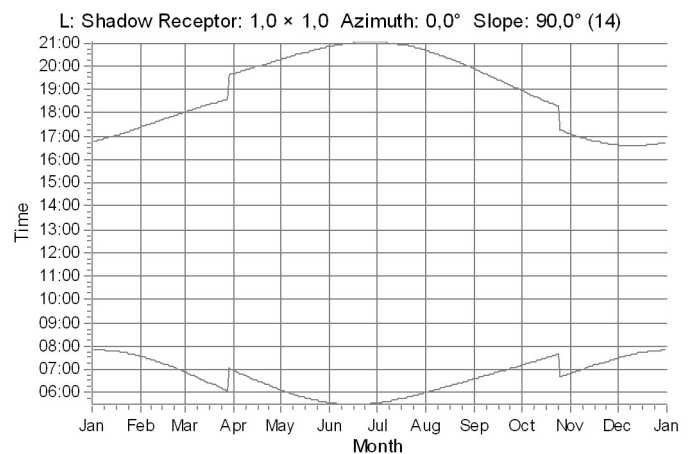
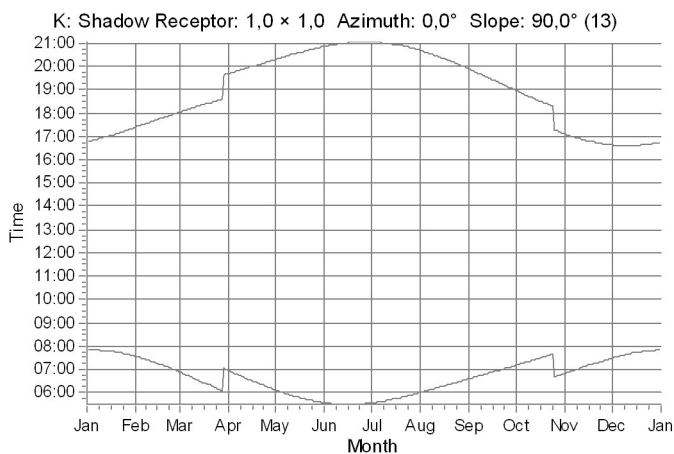
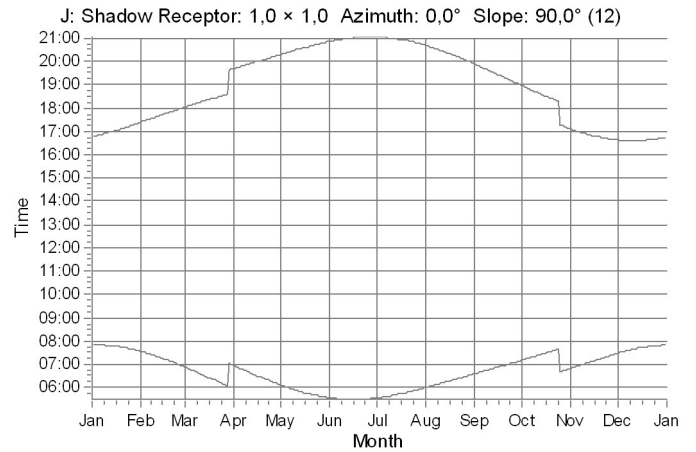
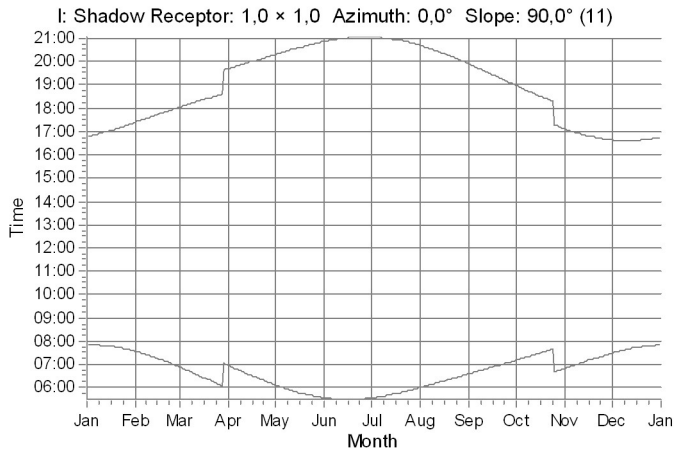
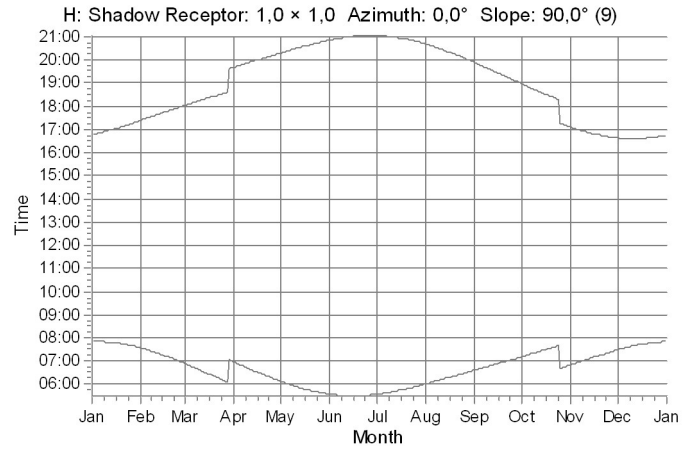
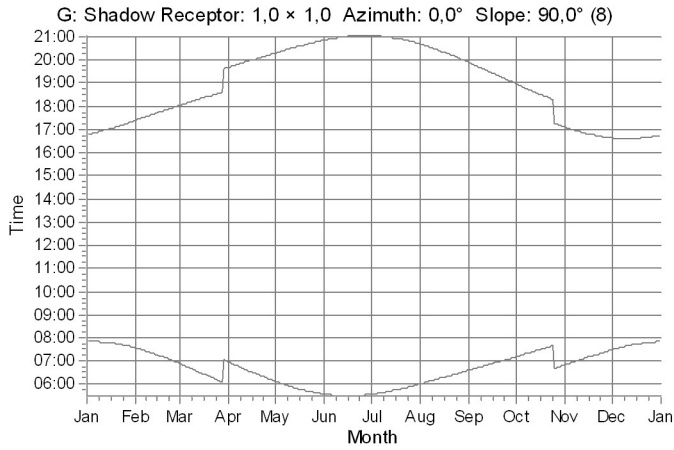
SHADOW - Calendar, graphical



WTGs

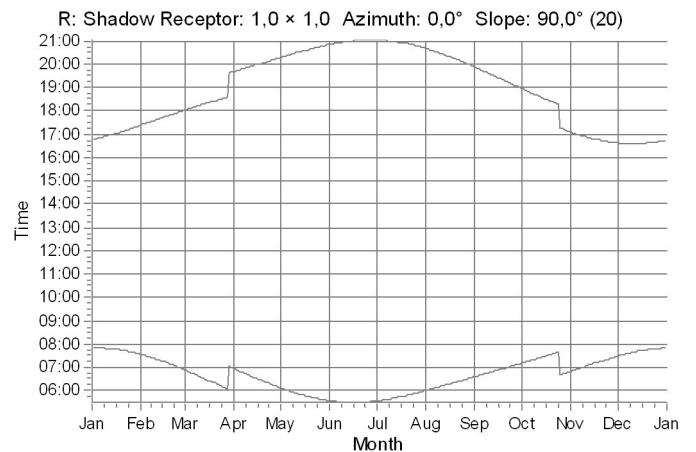
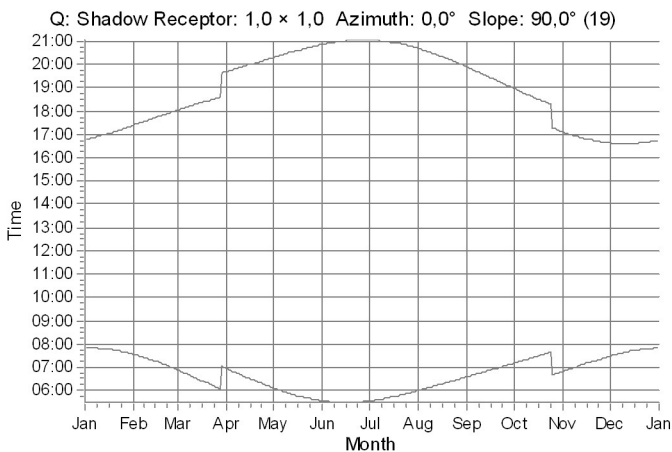
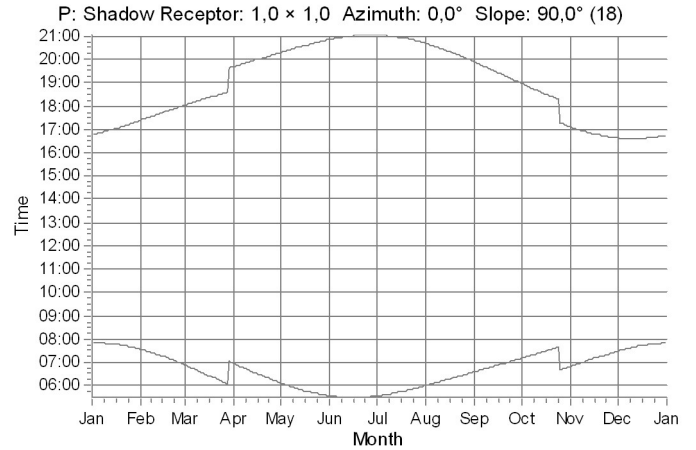
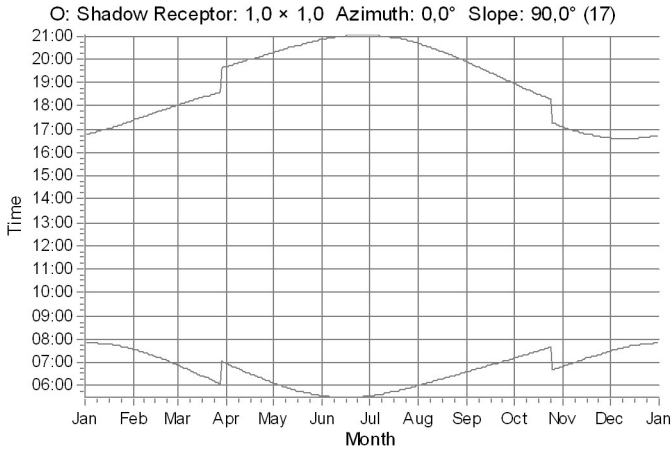
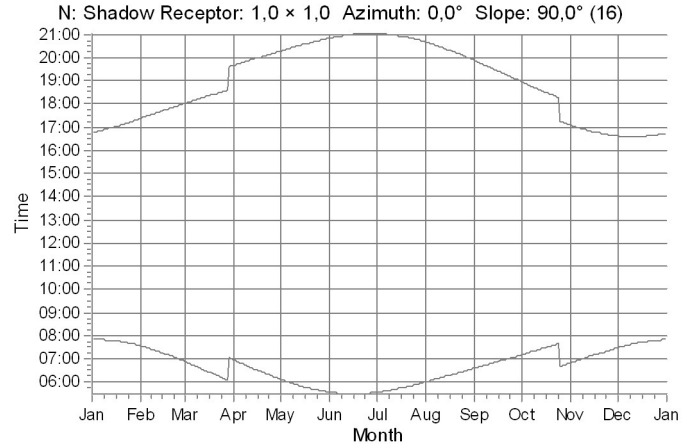
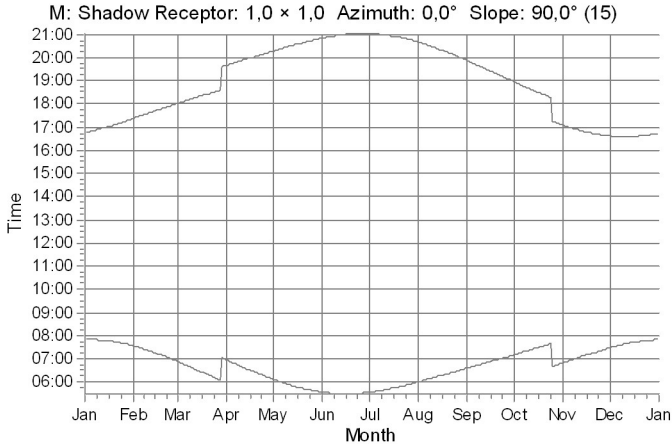
2: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (2)

SHADOW - Calendar, graphical



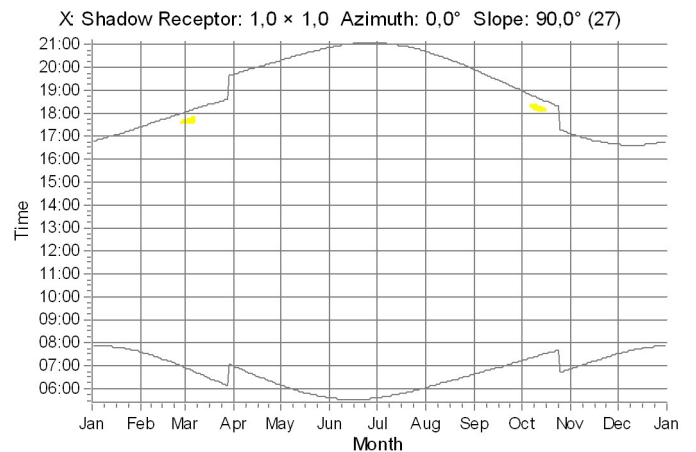
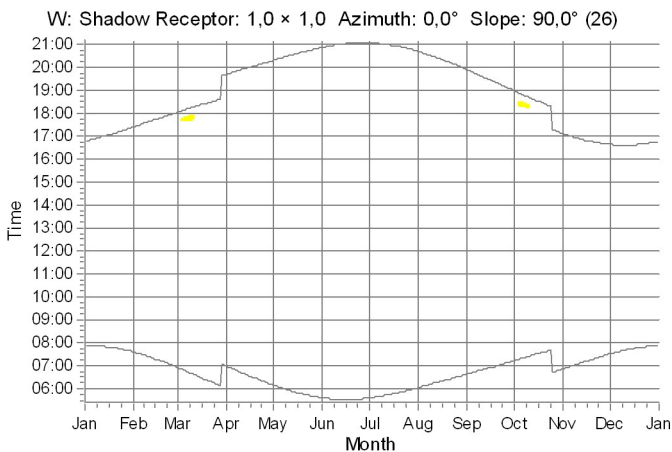
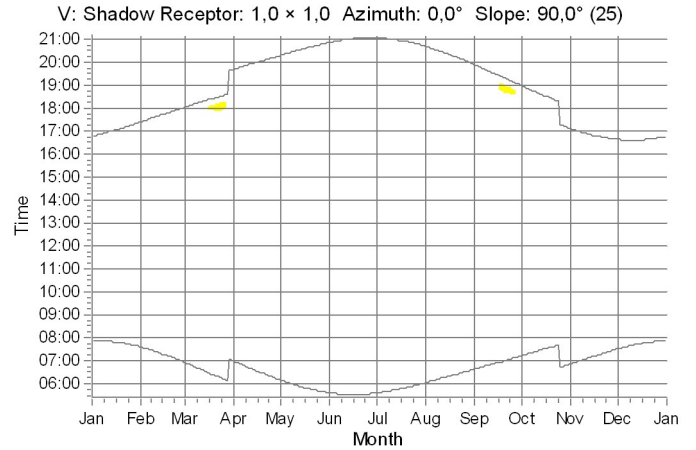
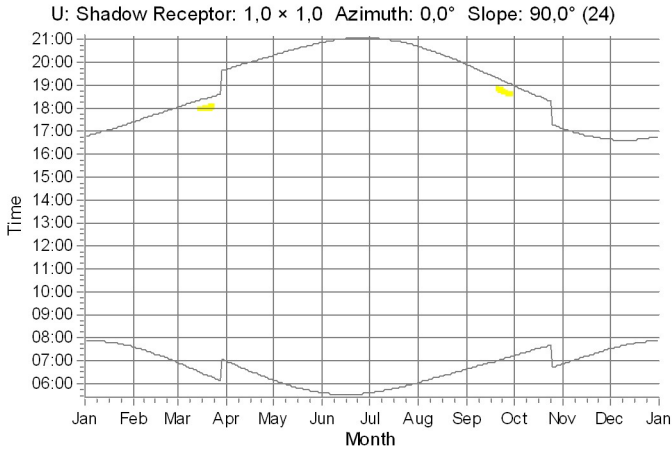
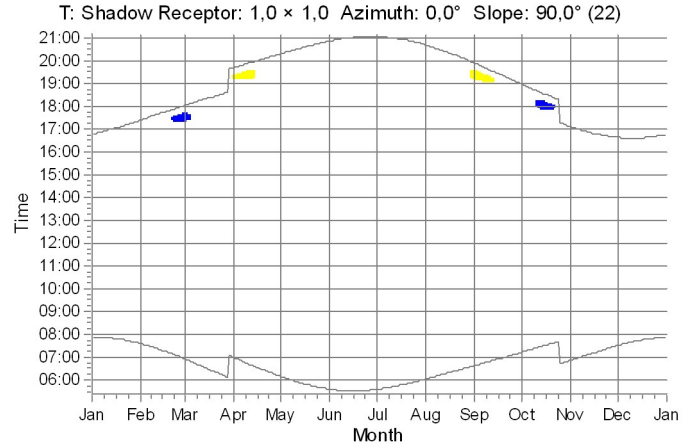
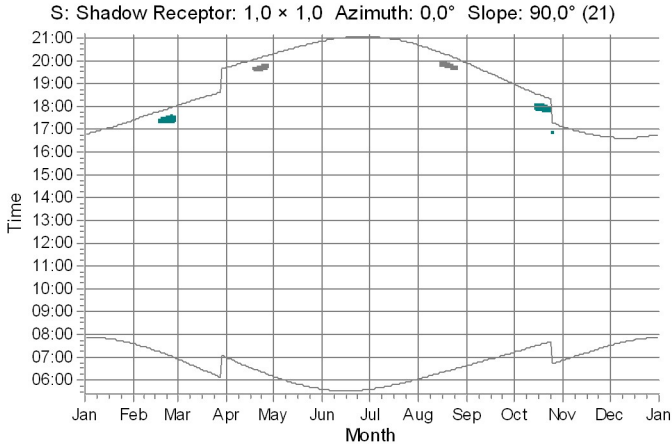
WTGs

SHADOW - Calendar, graphical



WTGs

SHADOW - Calendar, graphical

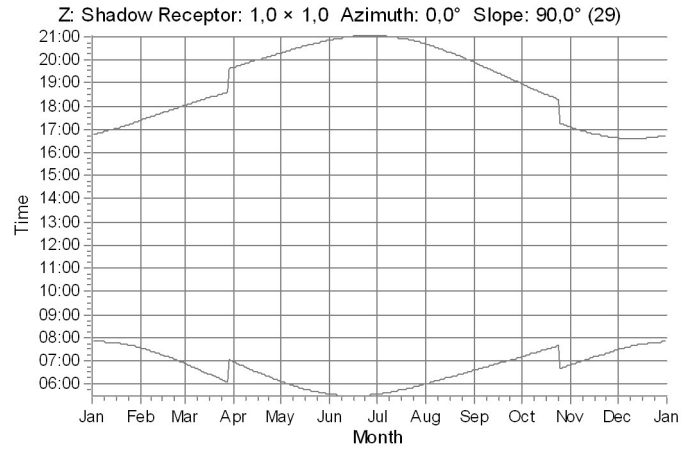
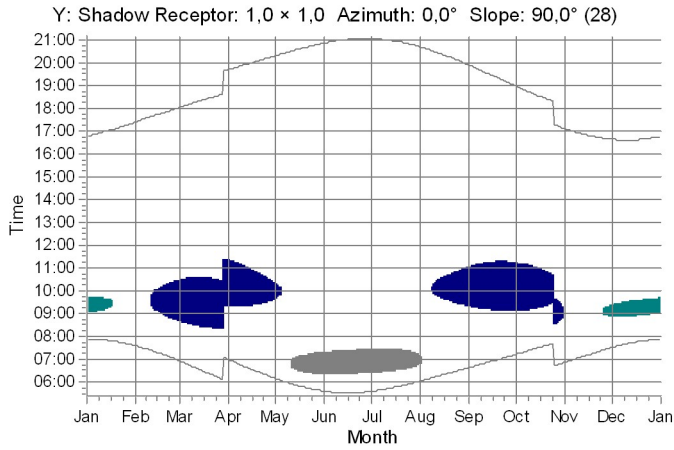


WTGs

2: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (2)
3: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (3)

4: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (4)
6: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (6)

SHADOW - Calendar, graphical



WTGs

4: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (4)

6: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (6)

7: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (7)

SHADOW - Calendar per WTG

WTG: 1 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (1)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 19:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:32 20:53	05:35 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:47 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:34 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:35 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:57	07:36 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:38 16:35
10	07:50 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:55 20:28	05:30 20:57	05:39 21:00	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:48 17:00	07:16 17:42	06:29 18:19	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:06	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:41	07:48 16:39
24	07:42 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:03	05:53 20:48	06:28 20:05	07:04 19:08	07:41 17:16	07:22 16:40	07:49 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	06:59 19:04	07:36 17:13	07:17 16:39	07:47 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:31 20:00	07:07 19:03	07:37 17:11	07:18 16:38	07:47 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21		06:59 19:39		05:35 20:50		05:59 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 2 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (2)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:50 16:45	07:34 17:23	06:53 17:34-17:38/4 18:01	06:57 19:16-19:18/2 19:40	06:07 20:17	05:34 20:51
2	07:50 16:46	07:33 17:24	06:52 17:35-17:40/5 18:03	06:56 19:14-19:19/5 19:42	06:05 20:18	05:33 20:52
3	07:50 16:47	07:31 17:26	06:50 17:35-17:42/7 18:04	06:54 19:14-19:20/6 19:43	06:04 20:20	05:33 20:52
4	07:50 16:48	07:30 17:27	06:48 17:35-17:43/8 18:05	06:52 19:13-19:21/8 19:44	06:02 20:21	05:32 20:53
5	07:50 16:49	07:29 17:28	06:46 17:36-17:44/8 18:07	06:50 19:13-19:23/10 19:45	06:01 20:22	05:32 20:54
6	07:50 16:50	07:28 17:30	06:45 17:38-17:45/7 18:08	06:48 19:13-19:24/11 19:47	06:00 20:23	05:32 20:55
7	07:50 16:51	07:27 17:31	06:43 17:42-17:47/5 18:09	06:47 19:13-19:25/12 19:48	05:58 20:24	05:31 20:55
8	07:50 16:52	07:25 17:33	06:41 17:43-17:48/5 18:10	06:45 19:13-19:26/13 19:49	05:57 20:26	05:31 20:56
9	07:50 16:53	07:24 17:34	06:39 17:44-17:49/5 18:12	06:43 19:13-19:27/14 19:50	05:56 20:27	05:31 20:57
10	07:49 16:54	07:23 17:35	06:38 17:46-17:50/4 18:13	06:41 19:14-19:29/15 19:52	05:54 20:28	05:30 20:57
11	07:49 16:55	07:21 17:37	06:36 17:46-17:52/6 18:14	06:39 19:15-19:30/15 19:53	05:53 20:29	05:30 20:58
12	07:49 16:57	07:20 17:38	06:34 17:47-17:54/7 18:16	06:38 19:16-19:31/15 19:54	05:52 20:30	05:30 20:58
13	07:48 16:58	07:18 17:40	06:32 17:47-17:55/8 18:17	06:36 19:18-19:29/11 19:55	05:51 20:31	05:30 20:59
14	07:48 16:59	07:17 17:41	06:30 17:47-17:56/9 18:18	06:34 19:56	05:50 20:33	05:30 20:59
15	07:48 17:00	07:16 17:42	06:29 17:48-17:57/9 18:19	06:32 19:58	05:48 20:34	05:30 21:00
16	07:47 17:01	07:14 17:44	06:27 17:50-17:58/8 18:21	06:31 19:59	05:47 20:35	05:30 21:00
17	07:46 17:03	07:13 17:45	06:25 17:54-17:59/5 18:22	06:29 20:00	05:46 20:36	05:30 21:01
18	07:46 17:04	07:11 17:46	06:23 17:54-18:01/7 18:23	06:27 20:01	05:45 20:37	05:30 21:01
19	07:45 17:05	07:10 17:48	06:21 17:54-18:02/8 18:24	06:26 20:03	05:44 20:38	05:30 21:01
20	07:45 17:06	07:08 17:49	06:19 17:55-18:04/9 18:26	06:24 20:04	05:43 20:39	05:30 21:02
21	07:44 17:08	07:06 17:51	06:18 17:55-18:05/10 18:27	06:22 20:05	05:42 20:40	05:30 21:02
22	07:43 17:09	07:05 17:52	06:16 17:56-18:06/10 18:28	06:21 20:06	05:41 20:41	05:30 21:02
23	07:42 17:10	07:03 17:53	06:14 17:56-18:07/11 18:29	06:19 20:07	05:40 20:42	05:30 21:02
24	07:41 17:12	07:02 17:55	06:12 17:58-18:09/11 18:31	06:17 20:09	05:40 20:43	05:31 21:02
25	07:41 17:13	07:00 17:56	06:10 17:59-18:10/11 18:32	06:16 20:10	05:39 20:44	05:31 21:02
26	07:40 17:14	06:58 17:57	06:08 18:01-18:11/10 18:33	06:14 20:11	05:38 20:45	05:31 21:03
27	07:39 17:16	06:57 17:35-17:36/1 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03
28	07:38 17:17	06:55 17:34-17:37/3 18:00	06:05 18:36	06:11 20:14	05:36 20:47	05:32 21:03
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02
31	07:35 17:21		06:59 19:39		05:34 20:50	
Potential sun hours	288	292	369	403	458	464
Sum of minutes with flicker	0	4	197	137	0	0

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

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

SHADOW - Calendar per WTG

WTG: 2 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (2)

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:34 21:02	06:00 20:40	06:36 19:14-19:29/15 19:52	07:11 18:26-18:33/7 18:57	06:50 17:05	07:29 16:37
2	05:34 21:02	06:02 20:39	06:37 19:12-19:27/15 19:51	07:12 18:25-18:31/6 18:55	06:52 17:04	07:30 16:37
3	05:35 21:02	06:03 20:38	06:38 19:11-19:25/14 19:49	07:13 18:25-18:30/5 18:53	06:53 17:03	07:31 16:36
4	05:35 21:02	06:04 20:37	06:39 19:10-19:23/13 19:47	07:15 18:23-18:28/5 18:51	06:54 17:01	07:32 16:36
5	05:36 21:01	06:05 20:35	06:41 19:09-19:21/12 19:45	07:16 18:20-18:26/6 18:50	06:56 17:00	07:33 16:36
6	05:37 21:01	06:06 20:34	06:42 19:09-19:20/11 19:43	07:17 18:19-18:24/5 18:48	06:57 16:59	07:34 16:36
7	05:37 21:01	06:07 20:33	06:43 19:08-19:18/10 19:42	07:18 18:17-18:21/4 18:46	06:58 16:57	07:36 16:35
8	05:38 21:00	06:08 20:31	06:44 19:08-19:17/9 19:40	07:19 18:13-18:20/7 18:44	07:00 16:56	07:37 16:35
9	05:39 21:00	06:09 20:30	06:45 19:08-19:15/7 19:38	07:21 18:11-18:18/7 18:42	07:01 16:55	07:37 16:35
10	05:39 20:59	06:11 20:28	06:46 19:08-19:13/5 19:36	07:22 18:09-18:16/7 18:41	07:02 16:54	07:38 16:35
11	05:40 20:59	06:12 20:27	06:48 19:08-19:11/3 19:34	07:23 18:09-18:15/6 18:39	07:04 16:53	07:39 16:35
12	05:41 20:58	06:13 20:25	06:49 19:08-19:09/1 19:32	07:24 18:08-18:13/5 18:37	07:05 16:51	07:40 16:35
13	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:07-18:11/4 18:35	07:06 16:50	07:41 16:35
14	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:07-18:09/2 18:34	07:08 16:49	07:42 16:35
15	05:43 20:57	06:16 20:21	06:52 19:27	07:28 18:07-18:08/1 18:32	07:09 16:48	07:43 16:36
16	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:50-18:59/9 18:29	07:12 16:46	07:44 16:36
18	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:47-18:58/11 18:27	07:13 16:45	07:45 16:36
19	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:45-18:56/11 18:25	07:14 16:45	07:45 16:37
20	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:43-18:54/11 18:24	07:16 16:44	07:46 16:37
21	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:42-18:52/10 18:22	07:17 16:43	07:47 16:38
22	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:41-18:51/10 18:20	07:18 16:42	07:47 16:38
23	05:51 20:50	06:26 20:08	07:01 19:12	07:38 18:39-18:49/10 18:19	07:19 16:41	07:48 16:39
24	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:38-18:46/8 18:17	07:21 16:41	07:48 16:39
25	05:53 20:48	06:28 20:05	07:04 19:08	06:41 18:37-18:44/7 17:16	07:22 16:40	07:48 16:40
26	05:54 20:47	06:29 20:03	07:05 19:06	06:42 18:36-18:42/6 17:14	07:23 16:39	07:49 16:40
27	05:55 20:46	06:30 20:01	07:06 19:04	06:44 18:32-18:40/8 17:13	07:24 16:39	07:49 16:41
28	05:56 20:45	06:31 19:59	07:07 19:03	06:45 18:30-18:39/9 17:11	07:26 16:38	07:50 16:42
29	05:57 20:44	06:33 19:58	07:09 19:01	06:46 18:28-18:37/9 17:10	07:27 16:38	07:50 16:42
30	05:58 20:43	06:34 19:56	07:10 18:59	06:48 18:27-18:35/8 17:08	07:28 16:37	07:50 16:43
31	05:59 20:41	06:35 19:54	19:16-19:31/15	06:49 17:07	07:50 16:44	
Potential sun hours	470	435	376	342	290	277
Sum of minutes with flicker	0	26	242	77	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:

Parco eolico " Emilie"

Licensed user:

Proger SPA
VIA Po 99
IT-66020 San Giovanni Teatino
08544411
Lina Simone / l.simone@proger.it
Calculated:
30/08/2023 12:55/3.6.377

SHADOW - Calendar per WTG

WTG: 3 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (3)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	17:24-17:38/14 19:41	06:57 20:17	06:07 20:51	05:34 21:02	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	17:26-17:38/12 19:42	06:56 20:18	06:05 20:52	05:33 21:02	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	17:28-17:35/7 19:43	06:54 20:20	06:04 20:52	05:33 21:02	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	07:04 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:48 19:44	06:02 20:21	05:32 20:53	05:32 21:02	05:35 21:02	06:04 20:37	06:40 19:47	07:15 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	05:37 21:01	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:57	07:36 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:54 20:28	05:30 20:57	05:39 20:59	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:33	05:30 20:59	05:43 20:57	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:48 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:49 20:34	05:30 21:00	05:44 20:57	05:44 20:57	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	05:44 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:06 17:51	17:26-17:28/2 06:18	06:22 18:27	05:42 20:40	05:30 21:02	05:49 20:52	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	17:24-17:29/5 06:16	06:21 18:28	05:41 20:41	05:30 21:02	05:50 20:51	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	17:23-17:30/7 06:14	06:19 18:29	05:40 20:42	05:31 21:02	05:51 20:50	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:41	07:48 16:39
24	07:41 17:12	07:02 17:55	17:23-17:32/9 06:12	06:18 18:31	05:40 20:43	05:31 21:02	05:52 20:49	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	17:23-17:33/10 06:10	06:16 18:32	05:39 20:44	05:31 21:03	05:53 20:48	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	17:22-17:34/12 06:08	06:14 18:33	05:38 20:45	05:31 21:03	05:54 20:47	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:39	07:49 16:40
27	07:39 17:16	06:57 17:59	17:23-17:36/13 06:07	06:13 18:34	05:37 20:46	05:32 21:03	05:55 20:46	05:55 20:46	06:30 20:01	07:06 19:04	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	17:23-17:37/14 06:05	06:11 18:36	05:37 20:47	05:32 21:03	05:56 20:45	05:56 20:45	06:31 19:59	07:07 19:03	06:45 17:11	07:26 16:38	07:50 16:42
29	07:37 17:19	07:37 17:19	07:03 19:37	06:10 19:37	05:36 20:15	05:33 20:48	05:57 21:03	05:57 21:03	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20	07:36 17:20	07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	05:58 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21	07:35 17:21	06:59 19:39	06:59 19:39	05:35 20:50	05:35 20:50	05:59 20:42	05:59 20:42	06:35 19:54	06:49 17:07	06:49 17:07	07:50 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277	277
Sum of minutes with flicker	0	72	33	0	0	0	0	0	0	105	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 4 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (4)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December					
1	07:50	07:34	06:53	06:57	06:07	05:34	06:21-07:14/53	05:34	06:26-07:21/55	06:01	06:51-07:02/11	06:36	07:11	06:50	07:29		
	16:45	17:23	18:01	19:41	20:17	20:51	21:02	21:02	20:40	20:40	19:52	18:57	17:05	16:37			
2	07:50	07:33	06:52	06:56	06:05	05:33	06:22-07:15/53	05:34	06:27-07:22/55	06:02	06:37	07:12	06:52	07:30			
	16:46	17:24	18:03	19:42	20:18	20:51	21:02	21:02	20:39	20:39	19:51	18:55	17:04	16:37			
3	07:50	07:31	06:50	06:54	06:04	05:33	06:21-07:14/53	05:35	06:26-07:21/55	06:03	06:38	07:13	06:53	07:31			
	16:47	17:26	18:04	19:43	20:20	20:52	21:02	21:02	20:38	20:38	19:49	18:53	17:03	16:36			
4	07:50	07:30	06:48	06:52	06:03	05:32	06:22-07:15/53	05:35	06:27-07:22/55	06:04	06:40	07:15	06:54	07:32			
	16:48	17:27	18:05	19:44	20:21	20:53	21:02	21:02	20:37	20:37	19:47	18:51	17:01	16:36			
5	07:50	07:29	06:46	06:50	06:01	05:32	06:21-07:15/54	05:36	06:27-07:21/54	06:05	06:41	07:16	06:56	07:33			
	16:49	17:28	18:07	19:45	20:22	20:54	21:01	21:01	20:35	20:35	19:45	18:50	17:00	16:36			
6	07:50	07:28	06:45	06:48	06:00	05:32	06:21-07:15/54	05:37	06:27-07:22/55	06:06	06:42	07:17	06:57	07:34			
	16:50	17:30	18:08	19:47	20:23	20:55	21:01	21:01	20:34	20:34	19:43	18:48	16:59	16:36			
7	07:50	07:27	06:43	06:47	05:58	05:31	06:22-07:16/54	05:37	06:28-07:22/54	06:07	06:43	07:18	06:58	07:35			
	16:51	17:31	18:09	19:48	20:24	20:56	21:01	21:01	20:33	20:33	19:42	18:46	16:57	16:35			
8	07:50	07:25	06:41	06:45	05:57	05:31	06:22-07:17/55	05:38	06:28-07:21/53	06:08	06:44	07:19	07:00	07:36			
	16:52	17:33	18:10	19:49	20:26	20:58	21:00	21:00	20:31	20:31	19:40	18:44	16:56	16:35			
9	07:50	07:24	06:39	06:43	05:56	05:31	06:21-07:16/55	05:39	06:28-07:22/54	06:10	06:45	07:21	07:01	07:37			
	16:53	17:34	18:12	19:50	20:27	20:57	21:00	21:00	20:30	20:30	19:38	18:42	16:55	16:35			
10	07:49	07:23	06:38	06:41	05:55	05:30	06:22-07:16/54	05:39	06:29-07:22/53	06:11	06:46	07:22	07:02	07:38			
	16:54	17:35	18:13	19:52	20:28	20:57	20:59	20:59	20:28	20:28	19:36	18:41	16:54	16:35			
11	07:49	07:21	06:36	06:39	05:53	05:30	06:30-07:22/52	06:12	06:30-07:22/52	06:12	06:48	07:23	07:04	07:39			
	16:55	17:37	18:14	19:53	20:29	20:58	20:59	20:59	20:27	20:27	19:34	18:39	16:53	16:35			
12	07:49	07:20	06:34	06:38	05:52	06:39-06:53/14	05:30	06:22-07:17/55	05:41	06:29-07:21/52	06:13	06:49	07:24	07:05	07:40		
	16:57	17:38	18:16	19:54	20:30	20:58	20:58	20:58	20:25	20:25	19:32	18:37	16:52	16:35			
13	07:48	07:18	06:32	06:36	05:51	06:36-06:57/21	05:30	06:22-07:18/56	05:42	06:30-07:21/51	06:14	06:50	07:26	07:06	07:41		
	16:58	17:40	18:17	19:55	20:31	20:59	20:59	20:58	20:24	20:24	19:31	18:35	16:50	16:35			
14	07:48	07:17	06:30	06:34	05:50	06:34-06:59/25	05:30	06:22-07:18/56	05:43	06:30-07:21/51	06:15	06:51	07:27	07:08	07:42		
	16:59	17:41	18:18	19:56	20:33	20:59	20:59	20:57	20:22	20:22	19:29	18:34	16:49	16:36			
15	07:47	07:16	06:29	06:33	05:49	06:32-07:01/29	05:30	06:23-07:18/55	05:44	06:31-07:21/50	06:16	06:52	07:28	07:09	07:43		
	17:00	17:42	18:19	19:58	20:34	21:00	21:00	20:57	20:21	20:21	19:27	18:32	16:48	16:36			
16	07:47	07:14	06:27	06:31	05:47	06:30-07:02/32	05:30	06:23-07:18/55	05:44	06:32-07:21/49	06:18	19:47-19:54/7	06:53	07:29	07:10	07:43	
	17:01	17:44	18:21	19:59	20:35	21:00	21:00	20:56	20:19	20:19	19:25	18:30	16:47	16:36			
17	07:46	07:13	06:25	06:29	05:46	06:29-07:04/35	05:30	06:23-07:19/56	05:45	06:32-07:21/49	06:19	19:45-19:53/8	06:55	07:31	07:12	07:44	
	17:03	17:45	18:22	20:00	20:36	21:01	21:01	20:55	20:18	20:18	19:23	18:29	16:46	16:36			
18	07:46	07:11	06:23	06:27	19:37-19:38/1	05:45	06:28-07:05/37	05:30	06:23-07:19/56	05:46	06:32-07:20/48	06:20	19:44-19:53/9	06:56	07:32	07:13	07:45
	17:04	17:46	18:23	20:01	20:37	21:01	21:01	20:54	20:16	20:16	19:21	18:27	16:46	16:36			
19	07:45	07:10	06:21	06:26	19:36-19:39/3	05:44	06:27-07:06/39	05:30	06:23-07:19/56	05:47	06:33-07:20/47	06:21	19:43-19:51/8	06:57	07:33	07:14	07:45
	17:05	17:48	18:24	20:03	20:38	21:01	21:01	20:54	20:15	20:15	19:19	18:25	16:45	16:37			
20	07:45	07:08	06:19	06:24	19:36-19:40/4	05:43	06:26-07:07/41	05:30	06:23-07:19/56	05:48	06:33-07:19/46	06:22	19:42-19:49/7	06:58	07:34	07:15	07:46
	17:07	17:49	18:26	20:04	20:39	21:02	21:02	20:53	20:13	20:13	19:17	18:24	16:44	16:37			
21	07:44	07:06	06:18	06:22	19:35-19:41/6	05:42	06:25-07:07/42	05:30	06:23-07:19/56	05:49	06:34-07:19/45	06:23	19:41-19:48/7	06:59	07:36	07:17	07:47
	17:08	17:51	18:27	20:05	20:40	21:02	21:02	20:52	20:11	20:11	19:16	18:22	16:43	16:38			
22	07:43	07:05	06:16	06:21	19:36-19:43/7	05:41	06:25-07:09/44	05:30	06:24-07:20/56	05:50	06:35-07:18/43	06:24	19:40-19:46/6	07:00	07:37	07:18	07:47
	17:09	17:52	18:28	20:06	20:41	21:02	21:02	20:51	20:10	20:10	19:14	18:20	16:42	16:38			
23	07:42	07:03	06:14	06:19	19:36-19:44/8	05:41	06:24-07:10/46	05:31	06:24-07:20/56	05:51	06:36-07:18/42	06:26	19:40-19:44/4	07:02	07:38	07:19	07:48
	17:10	17:53	18:29	20:07	20:42	21:00	21:00	20:50	20:08	20:08	19:12	18:19	16:42	16:39			
24	07:41	07:02	06:12	06:18	19:37-19:45/8	05:40	06:24-07:10/46	05:31	06:24-07:20/56	05:52	06:37-07:17/40	06:27	19:40-19:42/2	07:03	07:40	07:21	07:48
	17:12	17:55	18:31	20:09	20:43	21:02	21:02	20:49	20:06	20:06	19:10	18:17	16:41	16:39			
25	07:41	07:00	06:10	06:16	19:37-19:46/9	05:39	06:23-07:10/47	05:31	06:24-07:20/56	05:53	06:38-07:16/38	06:28	19:40-19:41/1	07:04	06:41	07:22	07:48
	17:13	17:56	18:32	20:10	20:44	21:02	21:02	20:48	20:05	20:05	19:08	17:16	16:40	16:40			
26	07:40	06:58	06:08	06:14	19:38-19:47/9	05:38	06:23-07:12/49	05:31	06:25-07:20/55	05:54	06:39-07:15/36	06:29	07:05	06:42	07:23	07:49	
	17:14	17:57	18:33	20:11	20:45	21:03	21:03	20:47	20:03	20:03	19:06	17:14	16:40	16:40			
27	07:39	06:57	06:07	06:13	19:41-19:46/5	05:37	06:22-07:12/50	05:32	06:25-07:20/55	05:55	06:40-07:14/34	06:30	07:06	06:44	07:24	07:49	
	17:16	17:59	18:34	20:12	20:46	21:03	21:03	20:46	20:01	20:01	19:04	17:13	16:39	16:41			
28	07:38	06:55	06:05	06:11	05:37	06:22-07:12/50	05:32	06:26-07:21/55	05:56	06:41-07:12/31	06:31	07:07	06:45	07:25	07:49		
	17:17	18:00	18:36	20:14	20:47	21:03	21:03	20:45	20:00	19:59	19:03	17:11	16:38	16:42			
29	07:37		07:03	06:10	05:36	06:22-07:13/51	05:36	06:25-07:21/56	05:57	06:43-07:11/28	06:33	07:09	06:46	07:27	07:50		
	17:19		17:37	20:15	20:48	21:02	21:02	20:44	20:00	19:58	19:01	17:10	16:38	16:43			
30	07:36		07:01	06:08	05:35	06:22-07:13/51	05:35	06:26-07:21/55	05:58	06:45-07:09/24	06:34	07:10	06:48	07:28	07:50		
	17:20		17:38	20:16	20:49	21:02	21:02	20:43	20:00	19:56	18:59	17:08	16:37	16:43			
31	07:35		06:59		05:35	06:22-07:14/52	05:35	06:48-07:06/18	06:35				06:49	07:50			
	17:21		19:39		20:50			20:41	19:54				17:07	16:44			
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277					
Sum of minutes with flicker	0	0	0	60	801	1650	1417	70	0	0	0	0					

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

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

SHADOW - Calendar per WTG

WTG: 5 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (5)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 19:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:37	06:40 19:47	07:15 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:55 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:18 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:06 17:51	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 20:07	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:41	07:48 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	06:59 19:04	07:36 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:31 19:59	07:07 19:03	06:45 17:11	07:26 16:38	07:49 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21		06:59 19:39		05:35 20:50		05:59 20:41	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 6 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (6)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 09:04-09:36/32 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 08:53-09:17/24 16:37
2	07:50 09:04-09:36/32 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 08:54-09:19/25 16:37
3	07:50 09:05-09:36/31 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 08:53-09:20/27 16:36
4	07:50 09:05-09:36/31 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:35 21:02	06:04 20:36	06:40 19:47	07:15 18:51	06:54 17:01	07:32 08:53-09:21/28 16:36
5	07:50 09:06-09:36/30 16:49	07:29 17:28	06:46 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 08:53-09:21/28 16:36
6	07:50 09:07-09:36/29 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 08:53-09:22/29 16:36
7	07:50 09:08-09:36/28 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46	06:58 16:57	07:35 08:53-09:23/30 16:35
8	07:50 09:09-09:37/28 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 08:53-09:24/31 16:35
9	07:50 09:09-09:36/27 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 08:53-09:25/32 16:35
10	07:49 09:11-09:36/25 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:55 20:28	05:30 20:57	05:40 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 08:54-09:25/31 16:35
11	07:49 09:11-09:35/24 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 08:54-09:26/32 16:35
12	07:49 09:13-09:35/22 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 08:54-09:27/33 16:35
13	07:48 09:15-09:35/20 16:58	07:18 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 08:55-09:28/33 16:35
14	07:48 09:16-09:33/17 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 08:54-09:27/33 16:36
15	07:47 09:17-09:32/15 17:00	07:16 17:42	06:29 18:19	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:56	06:16 20:21	06:52 19:27	07:28 17:54-18:03/9 18:32	07:09 16:48	07:43 08:55-09:28/33 16:36
16	07:47 09:21-09:30/9 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:18 20:19	06:53 19:25	07:29 17:51-18:04/13 18:30	07:10 16:47	07:43 08:56-09:29/33 16:36
17	07:46 17:03 17:03	07:13 17:19-17:21/2 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 17:49-18:04/15 19:23	07:12 16:46	07:44 08:56-09:30/34 16:36
18	07:46 17:04 17:04	07:11 17:17-17:22/5 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 17:49-18:03/14 18:27	07:13 16:46	07:45 08:56-09:30/34 16:37
19	07:45 17:05 17:05	07:10 17:17-17:25/8 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:53	06:21 20:15	06:57 19:19	07:33 17:48-18:01/13 18:25	07:14 16:45	07:45 08:57-09:31/34 16:37
20	07:44 17:07 17:07	07:08 17:17-17:26/9 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 17:47-17:59/12 18:24	07:15 16:44	07:46 08:57-09:31/34 16:37
21	07:44 17:08 17:08	07:06 17:17-17:28/11 17:51	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 17:48-17:58/10 18:22	07:17 16:43	07:47 08:58-09:32/34 16:38
22	07:43 17:09 17:09	07:05 17:17-17:29/12 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 17:47-17:56/9 18:20	07:18 16:42	07:47 08:58-09:32/34 16:38
23	07:42 17:10 17:10	07:03 17:17-17:30/13 17:53	06:14 18:29	06:19 20:07	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 17:47-17:54/7 18:19	07:19 16:42	07:48 08:59-09:33/34 16:39
24	07:41 17:12 17:12	07:02 17:18-17:32/14 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 17:48-17:53/5 18:17	07:21 16:41	07:48 08:59-09:33/34 16:39
25	07:41 17:13 17:13	07:00 17:18-17:33/15 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 16:49-16:51/2 17:16	07:22 16:40	07:48 09:00-09:34/34 16:40
26	07:40 17:15 17:15	06:58 17:19-17:31/12 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:32 21:02	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14 17:14	07:23 08:59-09:08/9 16:40	07:49 09:00-09:34/34 16:40
27	07:39 17:16 17:16	06:57 17:23-17:29/6 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:02	05:55 20:46	06:30 20:01	07:06 19:04	06:44 17:13 17:13	07:24 08:57-09:12/15 16:39	07:49 09:00-09:34/34 16:41
28	07:38 17:17 17:17	06:55 18:00 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:02	05:56 20:45	06:31 19:59	07:07 19:03	06:45 17:11 17:11	07:25 08:56-09:13/17 16:38	07:49 09:01-09:34/33 16:42
29	07:37 17:19 17:19	07:03 19:37	06:10 19:37	06:10 20:15	05:36 20:48	05:33 21:02	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10 17:10	07:27 08:55-09:15/20 16:38	07:50 09:01-09:34/33 16:43
30	07:36 17:20 17:20	07:01 19:38	06:08 19:38	06:15 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:47 17:08 17:08	07:28 08:54-09:16/22 16:37	07:50 09:03-09:35/32 16:43
31	07:35 17:21 17:21	07:02 19:39	06:09 19:39	06:16 20:50	05:36 20:50	05:34 21:01	05:59 20:41	06:35 19:54	07:08 18:54	06:49 17:07 17:07	07:29 08:55-09:16/21 16:44	07:50 09:03-09:36/33 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Sum of minutes with flicker	400	107	0	0	0	0	0	0	0	109	83	987

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

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

SHADOW - Calendar per WTG

WTG: 7 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (7)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June
1	07:50 16:45	07:34 17:23	06:53 08:41-10:24/103 18:01	06:57 09:21-11:17/116 19:41	06:07 09:41-10:13/32 20:17	05:34 20:51
2	07:50 16:46	07:33 17:24	06:52 08:40-10:26/106 18:03	06:56 09:21-11:15/114 19:42	06:05 09:44-10:09/25 20:18	05:33 20:51
3	07:50 16:47	07:31 17:26	06:50 08:39-10:26/107 18:04	06:54 09:20-11:14/114 19:43	06:04 09:48-10:05/17 20:20	05:33 20:52
4	07:50 16:48	07:30 17:27	06:48 08:37-10:27/110 18:05	06:52 09:20-11:12/112 19:44	06:03 09:48-10:05/17 20:21	05:33 20:53
5	07:50 16:49	07:29 17:28	06:46 08:36-10:27/111 18:07	06:50 09:21-11:11/110 19:45	06:01 09:48-10:05/17 20:22	05:32 20:54
6	07:50 16:50	07:28 17:30	06:45 08:36-10:29/113 18:08	06:48 09:21-11:09/108 19:47	06:00 09:48-10:05/17 20:23	05:32 20:55
7	07:50 16:51	07:27 17:31	06:43 08:34-10:29/115 18:09	06:47 09:21-11:07/106 19:48	05:58 09:48-10:05/17 20:24	05:31 20:55
8	07:50 16:52	07:25 17:33	06:41 08:33-10:29/116 18:10	06:45 09:21-11:05/104 19:49	05:57 09:48-10:05/17 20:26	05:31 20:56
9	07:50 16:53	07:24 17:34	06:39 08:32-10:29/117 18:12	06:43 09:22-11:04/102 19:50	05:56 09:48-10:05/17 20:27	05:31 20:57
10	07:49 16:54	07:23 17:35	06:38 08:31-10:29/118 18:13	06:41 09:22-11:02/100 19:52	05:55 09:48-10:05/17 20:28	05:30 20:57
11	07:49 16:55	07:21 17:37	06:36 08:31-10:31/120 18:14	06:39 09:22-11:00/98 19:53	05:53 09:48-10:05/17 20:29	05:30 20:58
12	07:49 16:57	07:20 09:21-09:46/25 17:38	06:34 08:30-10:30/120 18:16	06:38 09:22-10:58/96 19:54	05:52 09:48-10:05/17 20:30	05:30 20:58
13	07:48 16:58	07:18 09:15-09:51/36 17:40	06:32 08:29-10:30/121 18:17	06:36 09:23-10:56/93 19:55	05:51 09:48-10:05/17 20:31	05:30 20:59
14	07:48 16:59	07:17 09:11-09:56/45 17:41	06:30 08:28-10:30/122 18:18	06:34 09:23-10:54/91 19:56	05:50 09:48-10:05/17 20:33	05:30 20:59
15	07:47 17:00	07:16 09:08-09:59/51 17:42	06:29 08:27-10:30/123 18:19	06:33 09:23-10:52/89 19:58	05:49 09:48-10:05/17 20:34	05:30 21:00
16	07:47 17:01	07:14 09:05-10:03/58 17:44	06:27 08:26-10:30/124 18:21	06:31 09:24-10:50/86 19:59	05:47 09:48-10:05/17 20:35	05:30 21:00
17	07:46 17:03	07:13 09:02-10:05/63 17:45	06:25 08:27-10:30/123 18:22	06:29 09:24-10:48/84 20:00	05:46 09:48-10:05/17 20:36	05:30 21:01
18	07:46 17:04	07:11 09:00-10:08/68 17:47	06:23 08:26-10:30/124 18:23	06:27 09:25-10:45/80 20:01	05:45 09:48-10:05/17 20:37	05:30 21:01
19	07:45 17:05	07:10 08:57-10:10/73 17:48	06:21 08:25-10:29/124 18:24	06:26 09:26-10:44/78 20:03	05:44 09:48-10:05/17 20:38	05:30 21:01
20	07:45 17:07	07:08 08:55-10:11/76 17:49	06:19 08:25-10:29/124 18:26	06:24 09:26-10:41/75 20:04	05:43 09:48-10:05/17 20:39	05:30 21:02
21	07:44 17:08	07:06 08:54-10:14/80 17:51	06:18 08:24-10:28/124 18:27	06:22 09:27-10:39/72 20:05	05:42 09:48-10:05/17 20:40	05:30 21:02
22	07:43 17:09	07:05 08:51-10:15/84 17:52	06:16 08:23-10:27/124 18:28	06:21 09:28-10:37/69 20:06	05:41 09:48-10:05/17 20:41	05:30 21:02
23	07:42 17:10	07:03 08:50-10:18/88 17:53	06:14 08:23-10:26/123 18:29	06:19 09:29-10:34/65 20:07	05:41 09:48-10:05/17 20:42	05:31 21:02
24	07:41 17:12	07:02 08:48-10:19/91 17:55	06:12 08:23-10:26/123 18:31	06:18 09:30-10:33/63 20:09	05:40 09:48-10:05/17 20:43	05:31 21:02
25	07:41 17:13	07:00 08:46-10:20/94 17:56	06:10 08:23-10:25/122 18:32	06:16 09:31-10:30/59 20:10	05:39 09:48-10:05/17 20:44	05:31 21:02
26	07:40 17:15	06:58 08:46-10:22/96 17:57	06:08 08:22-10:24/122 18:33	06:14 09:33-10:28/55 20:11	05:38 09:48-10:05/17 20:45	05:32 21:03
27	07:39 17:16	06:57 08:44-10:23/99 17:59	06:07 08:22-10:23/121 18:34	06:13 09:33-10:25/52 20:12	05:37 09:48-10:05/17 20:46	05:32 21:03
28	07:38 17:17	06:55 08:42-10:23/101 18:00	06:05 08:21-10:22/121 18:36	06:11 09:35-10:22/47 20:14	05:37 09:48-10:05/17 20:47	05:32 21:03
29	07:37 17:19		07:03 09:21-11:20/119 19:37	06:10 09:37-10:19/42 20:15	05:36 09:48-10:05/17 20:48	05:33 21:02
30	07:36 17:20		07:01 09:22-11:20/118 19:38	06:08 09:39-10:17/38 20:16	05:35 09:48-10:05/17 20:49	05:33 21:02
31	07:35 17:21		06:59 09:21-11:19/118 19:39		05:35 09:48-10:05/17 20:50	
Potential sun hours	288	292	369	403	458	464
Sum of minutes with flicker	0	1228	3676	2518	74	0

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

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

SHADOW - Calendar per WTG

WTG: 7 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (7)

Assumptions for shadow calculations

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

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

	July	August	September	October	November	December
1	05:34 21:02	06:01 20:40	06:36 09:21-10:59/98 19:52	07:11 09:08-11:09/121 18:57	06:50 17:05	07:29 16:37
2	05:34 21:02	06:02 20:39	06:37 09:20-11:00/100 19:51	07:12 09:08-11:08/120 18:55	06:52 17:04	07:30 16:37
3	05:35 21:02	06:03 20:38	06:38 09:19-11:01/102 19:49	07:13 09:09-11:08/119 18:53	06:53 17:03	07:31 16:36
4	05:35 21:02	06:04 20:37	06:40 09:18-11:02/104 19:47	07:15 09:10-11:07/117 18:52	06:54 17:01	07:32 16:36
5	05:36 21:01	06:05 20:35	06:41 09:18-11:04/106 19:45	07:16 09:10-11:06/116 18:50	06:56 17:00	07:33 16:36
6	05:37 21:01	06:06 20:34	06:42 09:17-11:05/108 19:43	07:17 09:10-11:05/115 18:48	06:57 16:59	07:34 16:36
7	05:37 21:01	06:07 20:33	06:43 09:16-11:06/110 19:42	07:18 09:11-11:05/114 18:46	06:58 16:57	07:35 16:35
8	05:38 21:00	06:08 20:31	06:44 09:15-11:07/112 19:40	07:19 09:11-11:04/113 18:44	07:00 16:56	07:36 16:35
9	05:39 21:00	06:10 10:03-10:07/4 20:30	06:45 09:15-11:08/113 19:38	07:21 09:12-11:02/110 18:43	07:01 16:55	07:37 16:35
10	05:40 20:59	06:11 09:55-10:15/20 20:28	06:46 09:14-11:08/114 19:36	07:22 09:12-11:01/109 18:41	07:02 16:54	07:38 16:35
11	05:40 20:59	06:12 09:51-10:19/28 20:27	06:48 09:13-11:09/116 19:34	07:23 09:13-11:00/107 18:39	07:04 16:53	07:39 16:35
12	05:41 20:58	06:13 09:48-10:22/34 20:25	06:49 09:12-11:10/118 19:32	07:24 09:14-10:59/105 18:37	07:05 16:52	07:40 16:35
13	05:42 20:58	06:14 09:46-10:25/39 20:24	06:50 09:12-11:10/118 19:31	07:26 09:14-10:57/103 18:35	07:06 16:50	07:41 16:35
14	05:43 20:57	06:15 09:44-10:27/43 20:22	06:51 09:12-11:12/120 19:29	07:27 09:16-10:56/100 18:34	07:08 16:49	07:42 16:36
15	05:44 20:57	06:16 09:42-10:30/48 20:21	06:52 09:12-11:12/120 19:27	07:28 09:17-10:55/98 18:32	07:09 16:48	07:43 16:36
16	05:44 20:56	06:18 09:40-10:32/52 20:19	06:53 09:11-11:12/121 19:25	07:29 09:18-10:53/95 18:30	07:10 16:47	07:43 16:36
17	05:45 20:55	06:19 09:39-10:35/56 20:18	06:55 09:10-11:12/122 19:23	07:31 09:18-10:51/93 18:29	07:12 16:46	07:44 16:36
18	05:46 20:54	06:20 09:37-10:37/60 20:16	06:56 09:10-11:13/123 19:21	07:32 09:20-10:50/90 18:27	07:13 16:46	07:45 16:37
19	05:47 20:54	06:21 09:36-10:39/63 20:15	06:57 09:09-11:13/124 19:19	07:33 09:21-10:48/87 18:25	07:14 16:45	07:45 16:37
20	05:48 20:53	06:22 09:34-10:40/66 20:13	06:58 09:09-11:13/124 19:17	07:34 09:22-10:45/83 18:24	07:16 16:44	07:46 16:37
21	05:49 20:52	06:23 09:33-10:42/69 20:11	06:59 09:10-11:13/123 19:16	07:36 09:25-10:44/79 18:22	07:17 16:43	07:47 16:38
22	05:50 20:51	06:25 09:31-10:44/73 20:10	07:00 09:09-11:13/124 19:14	07:37 09:26-10:41/75 18:20	07:18 16:42	07:47 16:38
23	05:51 20:50	06:26 09:30-10:45/75 20:08	07:02 09:09-11:13/124 19:12	07:38 09:29-10:40/71 18:19	07:19 16:42	07:48 16:39
24	05:52 20:49	06:27 09:29-10:47/78 20:06	07:03 09:09-11:13/124 19:10	07:40 09:30-10:37/67 18:17	07:21 16:41	07:48 16:39
25	05:53 20:48	06:28 09:27-10:48/81 20:05	07:04 09:08-11:12/124 19:08	06:41 08:32-09:34/62 17:16	07:22 16:40	07:48 16:40
26	05:54 20:47	06:29 09:27-10:51/84 20:03	07:05 09:08-11:12/124 19:06	06:42 08:35-09:32/57 17:14	07:23 16:40	07:49 16:40
27	05:55 20:46	06:30 09:26-10:52/86 20:01	07:06 09:09-11:12/123 19:04	06:44 08:38-09:28/50 17:13	07:24 16:39	07:49 16:41
28	05:56 20:45	06:31 09:25-10:54/89 19:59	07:07 09:09-11:12/123 19:03	06:45 08:42-09:25/43 17:11	07:26 16:38	07:49 16:42
29	05:57 20:44	06:33 09:24-10:55/91 19:58	07:09 09:09-11:11/122 19:01	06:46 08:46-09:20/34 17:10	07:27 16:38	07:50 16:43
30	05:58 20:43	06:34 09:23-10:56/93 19:56	07:10 09:08-11:10/122 18:59	06:48 08:51-09:14/23 17:08	07:28 16:37	07:50 16:43
31	05:59 20:41	06:35 09:22-10:58/96 19:54		06:49 17:07		07:50 16:44
Potential sun hours	470	434	376	342	290	277
Sum of minutes with flicker	0	1428	3506	2676	0	0

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

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

SHADOW - Calendar per WTG

WTG: 8 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (8)

Assumptions for shadow calculations

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

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 19:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:06	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:19	05:34 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:51 16:47	07:32 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:39 19:49	07:14 18:53	06:53 17:03	07:31 16:37
4	07:51 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:36 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:29	06:47 18:07	06:50 19:46	06:01 20:22	05:32 20:54	05:36 21:02	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:34 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:49 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:44	07:17 18:48	06:57 16:59	07:35 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:59 20:25	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:58	07:36 16:36
8	07:50 16:52	07:25 17:33	06:41 18:11	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:09 20:31	06:44 19:40	07:20 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:40 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:38 16:35
10	07:50 16:54	07:23 17:36	06:38 18:13	06:41 19:52	05:55 20:28	05:31 20:57	05:40 21:00	06:11 20:28	06:47 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:56	07:21 17:37	06:36 18:14	06:40 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:26	06:49 19:33	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:36	07:06 16:51	07:41 16:36
14	07:48 16:59	07:17 17:41	06:31 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:23	06:51 19:29	07:27 18:34	07:08 16:50	07:42 16:36
15	07:48 17:00	07:16 17:43	06:29 18:20	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:17 20:21	06:52 19:27	07:28 18:32	07:09 16:49	07:43 16:36
16	07:47 17:02	07:14 17:44	06:27 18:21	06:31 19:59	05:48 20:35	05:30 21:00	05:45 20:56	06:18 20:19	06:54 19:25	07:29 18:30	07:10 16:48	07:43 16:36
17	07:47 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:47 20:36	05:30 21:01	05:46 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:47	07:44 16:36
18	07:46 17:04	07:11 17:47	06:23 18:23	06:28 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:37
19	07:45 17:05	07:10 17:48	06:21 18:25	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:07	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:18	07:35 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:23 20:05	05:43 20:40	05:30 21:02	05:49 20:52	06:24 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:42 20:41	05:31 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:21	07:18 16:42	07:47 16:38
23	07:42 17:11	07:03 17:53	06:14 18:30	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:42	07:48 16:39
24	07:42 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:03	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:49 16:40
26	07:40 17:15	06:59 17:57	06:09 18:33	06:15 20:11	05:38 20:45	05:32 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:41
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	06:30 19:05	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:32 20:00	07:08 19:03	06:45 17:11	07:26 16:39	07:50 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:03	05:59 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:38	07:50 16:44
31	07:35 17:22		06:59 19:39		05:35 20:50		06:00 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 9 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (9)

Assumptions for shadow calculations

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

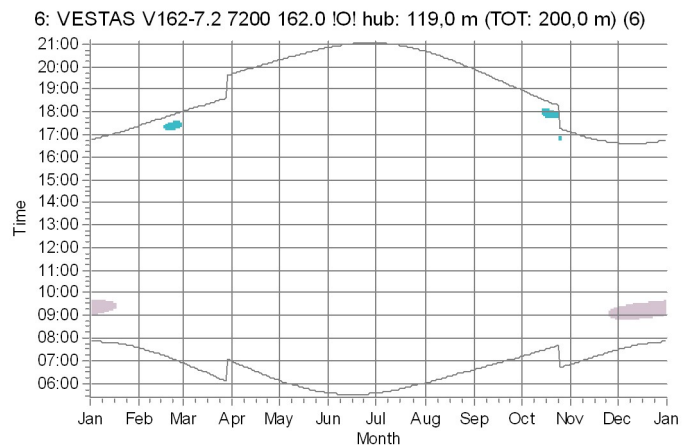
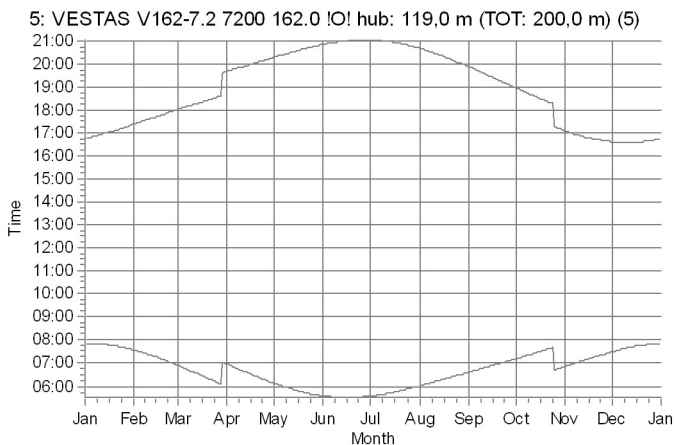
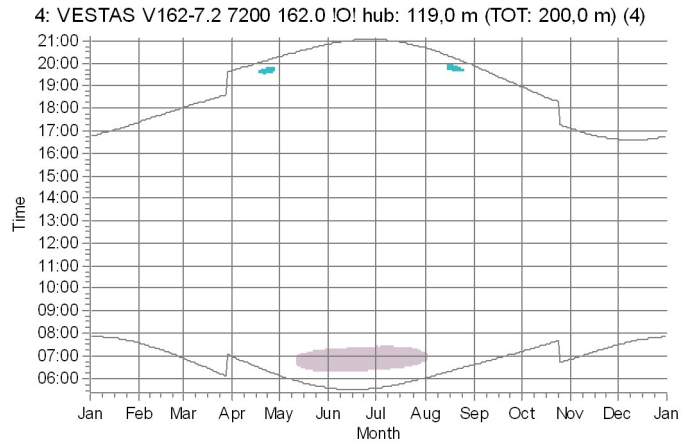
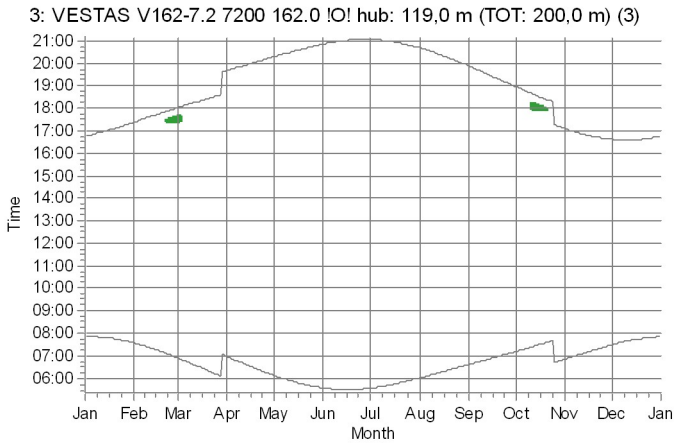
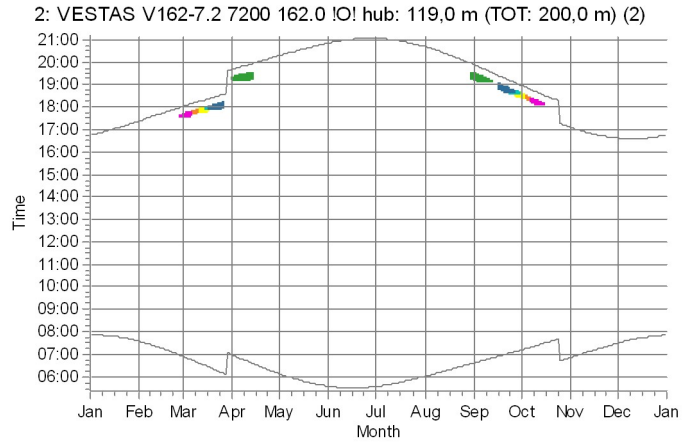
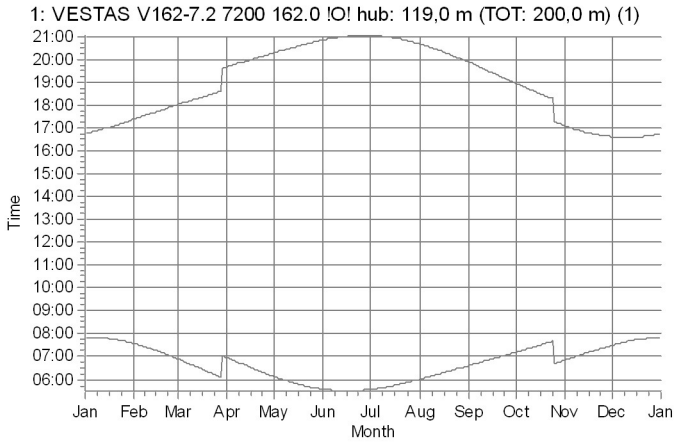
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 19:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:05	07:29 16:37
2	07:51 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:19	05:34 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:51 16:47	07:32 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:39 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:51 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:36 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:29	06:47 18:07	06:50 19:46	06:01 20:22	05:32 20:54	05:36 21:02	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:34 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:49 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:44	07:17 18:48	06:57 16:59	07:35 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:59 20:25	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:58	07:36 16:36
8	07:50 16:52	07:25 17:33	06:41 18:11	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:09 20:31	06:44 19:40	07:20 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:40 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:38 16:35
10	07:50 16:54	07:23 17:36	06:38 18:13	06:41 19:52	05:55 20:28	05:31 20:57	05:40 21:00	06:11 20:28	06:47 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:56	07:21 17:37	06:36 18:14	06:40 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:59	06:13 20:26	06:49 19:33	07:24 18:37	07:05 16:52	07:40 16:35
13	07:49 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:32	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:36	07:06 16:51	07:41 16:36
14	07:48 16:59	07:17 17:41	06:31 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:23	06:51 19:29	07:27 18:34	07:08 16:50	07:42 16:36
15	07:48 17:00	07:16 17:42	06:29 18:20	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:17 20:21	06:52 19:27	07:28 18:32	07:09 16:49	07:43 16:36
16	07:47 17:02	07:14 17:44	06:27 18:21	06:31 19:59	05:48 20:35	05:30 21:00	05:45 20:56	06:18 20:19	06:54 19:25	07:29 18:30	07:10 16:48	07:43 16:36
17	07:47 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:47 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:47	07:44 16:36
18	07:46 17:04	07:11 17:47	06:23 18:23	06:28 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:37
19	07:45 17:05	07:10 17:48	06:21 18:25	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:46 16:37
20	07:45 17:07	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:18	07:35 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:23 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:42 20:41	05:31 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:21	07:18 16:42	07:47 16:38
23	07:42 17:11	07:03 17:53	06:14 18:30	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:42	07:48 16:39
24	07:42 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:03	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:49 16:40
26	07:40 17:15	06:59 17:57	06:09 18:33	06:15 20:11	05:38 20:45	05:32 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:41
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	06:30 19:05	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:32 20:00	07:08 19:03	06:45 17:11	07:26 16:39	07:50 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:03	05:59 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:38	07:50 16:43
31	07:35 17:22		06:59 19:39		05:35 20:50		06:00 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0









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

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

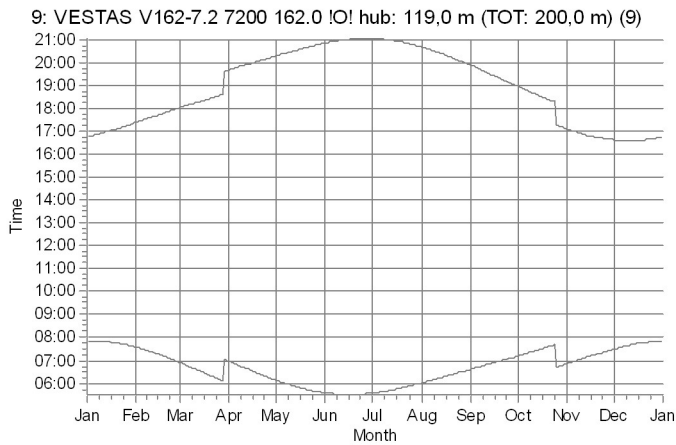
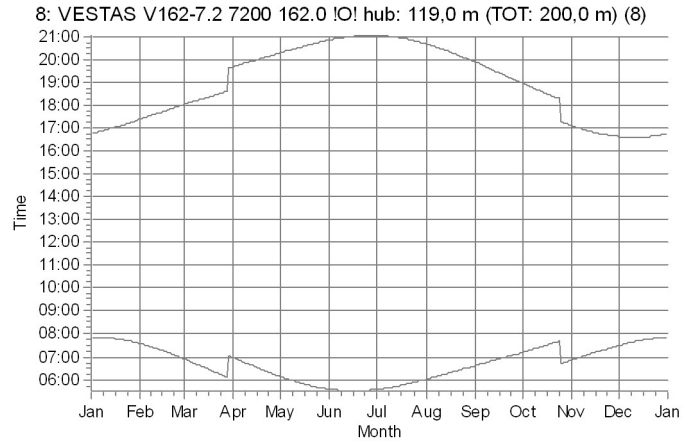
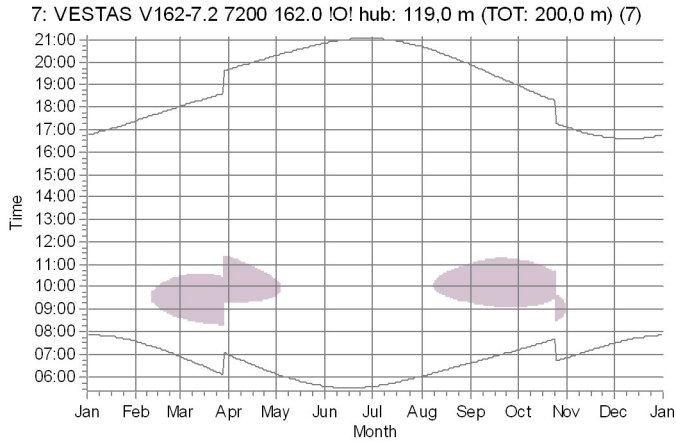
SHADOW - Calendar per WTG, graphical



Shadow receptors

 B: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (2)	 U: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (24)	 X: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (27)
 S: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (21)	 V: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (25)	 Y: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (28)
 T: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (22)	 W: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (26)	

SHADOW - Calendar per WTG, graphical



Shadow receptors

Y: Shadow Receptor: 1.0 x 1.0 Azimuth: 0.0° Slope: 90,0° (28)

ALLEGATO 2 – RISULTATI WindPRO ANALISI REAL CASE

SHADOW - Main Result

Assumptions for shadow calculations

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

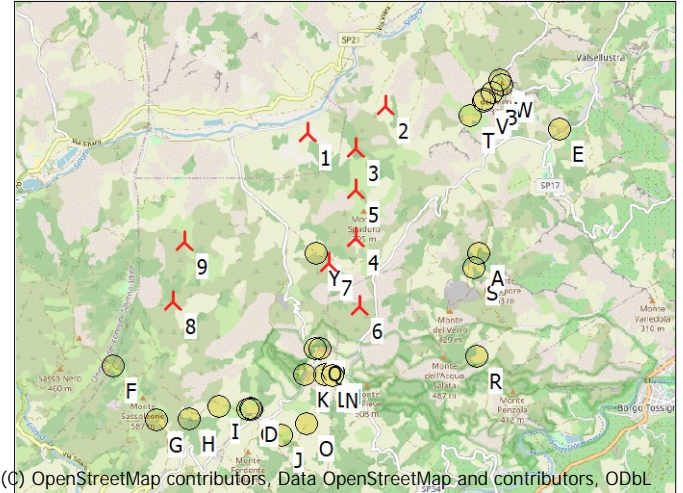
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

Line-of-sight calculation has been deactivated. This means that sheltering from obstacles, areas or hills are not taken into account.

All coordinates are in
Geo [deg]-WGS84



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL
Scale 1:125.000
New WTG Shadow receptor

WTGs

	Longitude	Latitude	Z	Row data/Description	WTG type			Shadow data					
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM	
			[m]										
1	11,517600° E	44,316336° N	324,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
2	11,533938° E	44,320280° N	266,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
3	11,527672° E	44,314080° N	318,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
4	11,527755° E	44,300710° N	353,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
5	11,527755° E	44,307852° N	376,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
6	11,528492° E	44,290710° N	387,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
7	11,522100° E	44,297100° N	349,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
8	11,489563° E	44,291297° N	451,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	
9	11,492183° E	44,300188° N	344,0	VESTAS V162-7.2 7200 16...	Yes	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.041	9,5	

Shadow receptor-Input

No.	Longitude	Latitude	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
			[m]	[m]	[m]	a.g.l.	wind		(ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
A	11,553236° E	44,298510° N	340,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
B	11,555990° E	44,322388° N	320,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
C	11,505308° E	44,275274° N	447,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
D	11,506099° E	44,275358° N	447,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
E	11,570033° E	44,316966° N	170,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
F	11,477486° E	44,281847° N	530,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
G	11,486385° E	44,273774° N	496,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
H	11,493022° E	44,273892° N	449,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
I	11,499300° E	44,275781° N	435,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
J	11,512216° E	44,271477° N	463,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
K	11,517086° E	44,280442° N	439,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
L	11,521204° E	44,280442° N	459,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
M	11,523050° E	44,280806° N	447,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
N	11,522968° E	44,280315° N	452,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
O	11,517518° E	44,273232° N	375,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
P	11,520147° E	44,284310° N	368,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Q	11,519272° E	44,284258° N	379,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
R	11,552775° E	44,283218° N	400,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
S	11,552261° E	44,296326° N	390,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
T	11,551417° E	44,318963° N	323,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
U	11,554412° E	44,321304° N	327,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
V	11,554138° E	44,320965° N	323,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
W	11,558006° E	44,323524° N	328,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
X	11,557564° E	44,324204° N	317,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Y	11,519566° E	44,298377° N	310,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0
Z	11,506010° E	44,275484° N	446,0	1,0	1,0	1,0	90,0	"Green house mode"	2,0

SHADOW - Main Result

Calculation Results

Shadow receptor

Shadow, expected values

No. Shadow hours

	per year [h/year]
A	0:00
B	0:24
C	0:00
D	0:00
E	0:00
F	0:00
G	0:00
H	0:00
I	0:00
J	0:00
K	0:00
L	0:00
M	0:00
N	0:00
O	0:00
P	0:00
Q	0:00
R	0:00
S	1:10
T	1:45
U	0:29
V	0:36
W	0:10
X	0:17
Y	70:25
Z	0:00

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

No.	Name	Expected [h/year]
1	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (1)	0:00
2	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (2)	2:29
3	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (3)	0:43
4	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (4)	20:31
5	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (5)	0:00
6	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (6)	3:48
7	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (7)	48:02
8	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (8)	0:00
9	VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (9)	0:00

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:34 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:32 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:37
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:54	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:41	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	05:57 20:25	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	06:59 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:56	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	05:54 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:03 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:15	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:07 16:49	07:42 16:35
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	18:26 (2) 18:33 (2)	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:02	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	18:25 (2) 18:31 (2)	06:51 17:04	07:30 16:36
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	18:25 (2) 18:30 (2)	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	18:25 (2) 18:28 (2)	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	18:24 (2) 18:26 (2)	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:31 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48		06:57 16:58	07:34 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46		06:58 16:57	07:35 16:35
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10	07:49 16:54	07:23 17:35	06:38 18:13	17:46 (2) 17:50 (2)	06:41 19:51	05:54 20:28	05:39 20:57	06:11 20:28	06:46 19:36	07:22 18:41		07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	17:46 (2) 17:52 (2)	06:39 19:53	05:53 20:29	05:30 20:58	06:12 20:27	06:47 19:34	07:23 18:39		07:04 16:52	07:39 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	17:47 (2) 17:54 (2)	06:38 19:54	05:52 20:30	05:30 20:58	06:13 20:25	06:49 19:32	07:24 18:37		07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	17:47 (2) 17:55 (2)	06:36 19:55	05:51 20:31	05:30 20:59	06:14 20:24	06:50 19:30	07:25 18:35		07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	17:47 (2) 17:56 (2)	06:34 19:56	05:50 20:32	05:30 20:59	06:15 20:22	06:51 19:29	07:27 18:34		07:08 16:49	07:42 16:35
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16	07:47 17:01	07:14 17:44	06:27 18:21	17:50 (2) 17:58 (2)	06:31 19:59	05:47 20:35	05:30 21:00	06:17 20:19	06:53 19:25	07:29 18:30		07:10 16:47	07:43 16:36
17	07:46 17:02	07:13 17:45	06:25 18:22	17:54 (2) 17:56 (2)	06:29 20:00	05:46 20:36	05:30 21:01	06:19 20:18	06:54 19:23	07:31 18:28		07:12 16:46	07:44 16:36
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19	07:45 17:05	07:10 17:48	06:21 18:24	20:02 20:03	06:26 20:38	05:44 21:01	05:30 20:53	06:21 20:14	06:57 19:19	07:33 18:25		07:14 16:44	07:45 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	20:04 20:04	06:24 20:39	05:43 21:02	05:30 20:53	06:22 20:13	06:58 19:17	07:34 18:23		07:15 16:44	07:46 16:37
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22	07:43 17:09	07:05 17:52	06:16 18:28	20:06 20:06	06:21 20:41	05:41 21:02	05:30 20:50	06:24 20:10	07:00 19:14	07:37 18:20		07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	20:07 20:07	06:19 20:42	05:40 21:02	05:30 20:50	06:25 20:08	07:01 19:12	07:38 18:19		07:19 16:41	07:48 16:38
24	07:41 17:12	07:02 17:54	06:12 18:31	20:08 20:09	06:17 20:43	05:39 21:02	05:31 20:49	06:27 20:06	07:03 19:10	07:40 18:17		07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	20:09 20:10	06:16 20:44	05:39 21:02	05:31 20:48	06:28 20:05	07:04 19:08	07:41 17:16		07:22 16:40	07:48 16:40
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Potential sun hours	288	292	369	403	458	464	470	435	376	342		290	277
Total, worst case			55						34		23		
Sun reduction			0,38						0,53		0,44		
Oper. time red.			0,82						0,82		0,82		
Wind dir. red.			0,61						0,61		0,61		
Total reduction			0,19						0,27		0,22		
Total, real			11						9		5		

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

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
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Total, worst case												
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Oper. time red.												
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SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
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	January	February	March	April	May	June	July	August	September	October	November	December
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Total, worst case												
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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)
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SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

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SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:46	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:06	07:29 16:37
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SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
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Table layout: For each day in each month the following matrix apply

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

SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
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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)
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SHADOW - Calendar

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

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
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Table layout: For each day in each month the following matrix apply

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SHADOW - Calendar

Shadow receptor: N - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (16)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
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Table layout: For each day in each month the following matrix apply

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

SHADOW - Calendar

Shadow receptor: O - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (17)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
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Total reduction												
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Table layout: For each day in each month the following matrix apply

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

SHADOW - Calendar

Shadow receptor: P - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (18)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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SHADOW - Calendar

Shadow receptor: Q - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (19)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
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 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Shadow receptor: R - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (20)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:50	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
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Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Shadow receptor: S - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (21)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,48	3,33	4,51	5,74	7,16	8,35	9,37	8,38	6,67	4,87	2,94	2,55

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
446	558	709	537	307	224	366	1.786	992	318	487	496	7.226

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:34 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37	
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20	07:44 17:06	07:08 17:49	9 17:26 (6) 06:19	06:24 18:26	20:04 06:24	4 19:40 (4) 05:43	20:39 05:30	21:01 05:48	19:42 (4) 06:58	07:34 19:17	17:47 (6) 17:59 (6)	07:15 16:44	07:46 16:37
21	07:44 17:08	07:06 17:50	11 17:27 (6) 06:18	06:22 18:27	20:05 06:22	6 19:41 (4) 05:42	20:40 05:30	21:02 05:49	19:41 (4) 06:59	07:36 19:15	17:48 (6) 17:58 (6)	07:17 16:43	07:46 16:38
22	07:43 17:09	07:05 17:52	12 17:28 (6) 06:16	06:21 18:28	20:06 06:21	7 19:43 (4) 05:41	20:41 05:30	21:02 05:50	19:40 (4) 07:00	07:37 19:14	17:47 (6) 17:56 (6)	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	13 17:29 (6) 06:14	06:19 18:29	20:07 06:19	8 19:44 (4) 05:40	20:42 05:31	21:02 05:52	19:40 (4) 07:03	07:38 07:40	17:47 (6) 17:54 (6)	07:19 16:41	07:47 16:39
24	07:41 17:12	07:02 17:55	14 17:30 (6) 06:12	06:17 18:31	20:09 06:16	8 19:45 (4) 05:39	20:43 05:31	21:02 05:53	19:40 (4) 07:03	07:40 19:10	17:48 (6) 17:53 (6)	07:20 16:41	07:48 16:39
25	07:40 17:13	07:00 17:56	15 17:31 (6) 06:10	06:16 18:32	20:10 06:14	9 19:46 (4) 05:38	20:44 05:31	21:02 05:54	19:40 (4) 07:04	06:41 19:08	16:49 (6) 16:51 (6)	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	12 17:32 (6) 06:08	06:14 18:33	20:11 06:14	9 19:47 (4) 05:37	20:45 05:32	20:03 05:55	19:41 (4) 07:05	06:42 19:06	16:51 (6) 17:14	07:23 16:39	07:49 16:40
27	07:39 17:16	06:57 17:59	6 17:33 (6) 06:07	06:13 18:34	20:12 06:11	5 19:48 (4) 05:36	20:46 05:32	21:02 05:56	19:40 (4) 07:06	06:43 19:04	16:49 (6) 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	20:13 06:10	05:36 05:33	05:32 05:57	06:31 06:33	07:07 19:02	06:45 17:11	16:38 17:25	07:49 16:42	
29	07:37 17:19	06:54 18:01	06:04 19:37	06:10 20:15	20:14 06:08	05:36 05:33	05:57 05:58	06:33 06:34	07:08 19:01	06:46 17:10	16:38 17:28	07:50 16:43	
30	07:36 17:20	06:53 18:02	06:03 19:38	06:08 20:16	20:15 06:07	05:35 20:49	05:58 21:02	06:34 20:43	07:10 18:59	06:47 17:08	16:37 17:37	07:50 16:43	
31	07:35 17:21	06:52 18:03	06:02 19:39	06:07 20:17	20:16 06:06	05:35 20:50	05:59 20:41	06:35 19:54	06:49 17:07	17:08 18:42	16:37 17:46	07:50 16:44	
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277	
Total, worst case		107		60				59		109			
Sun reduction		0,32		0,43				0,60		0,44			
Oper. time red.		0,82		0,82				0,82		0,82			
Wind dir. red.		0,66		0,49				0,49		0,66			
Total reduction		0,18		0,18				0,25		0,24			
Total, real		19		11				15		27			

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

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

SHADOW - Calendar

Shadow receptor: T - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (22)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June
1	07:50 16:45	07:34 17:23	06:53 18:01	17:24 (3) 17:38 (3)	06:57 19:40	19:16 (2) 20:17
2	07:50 16:46	07:33 17:24	06:52 18:03	17:26 (3) 17:38 (3)	06:56 19:42	19:14 (2) 20:18
3	07:50 16:47	07:31 17:25	06:50 18:04	17:28 (3) 17:35 (3)	06:54 19:43	19:14 (2) 20:20
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	19:13 (2) 19:21 (2)	06:02 20:21
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	19:13 (2) 19:23 (2)	06:01 20:22
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	19:13 (2) 19:24 (2)	06:00 20:23
7	07:50 16:51	07:27 17:31	06:43 18:09	06:46 19:48	19:13 (2) 19:25 (2)	05:58 20:24
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	19:13 (2) 19:26 (2)	05:57 20:26
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	19:13 (2) 19:27 (2)	05:56 20:27
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	19:14 (2) 19:29 (2)	05:54 20:28
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	19:15 (2) 19:30 (2)	05:53 20:29
12	07:49 16:56	07:20 17:38	06:34 18:15	06:38 19:54	19:16 (2) 19:31 (2)	05:52 20:30
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	19:18 (2) 19:29 (2)	05:51 20:31
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59
15	07:47 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:48 20:34	05:30 21:00
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01
20	07:44 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02
21	07:44 17:08	07:06 17:50	17:26 (3) 17:28 (3)	06:18 18:27	06:22 20:05	05:42 20:40
22	07:43 17:09	07:05 17:52	17:24 (3) 17:29 (3)	06:16 18:28	06:21 20:06	05:41 20:41
23	07:42 17:10	07:03 17:53	17:23 (3) 17:30 (3)	06:14 18:29	06:19 20:07	05:40 20:42
24	07:41 17:12	07:02 17:55	17:23 (3) 17:32 (3)	06:12 18:31	06:17 20:09	05:40 20:43
25	07:41 17:13	07:00 17:56	17:23 (3) 17:33 (3)	06:10 18:32	06:16 20:10	05:39 20:44
26	07:40 17:14	06:58 17:57	17:22 (3) 17:34 (3)	06:08 18:33	06:14 20:11	05:38 20:45
27	07:39 17:16	06:57 17:59	17:23 (3) 17:36 (3)	06:06 18:34	06:13 20:12	05:37 20:46
28	07:38 17:17	06:55 18:00	17:23 (3) 17:37 (3)	06:05 18:35	06:11 20:14	05:36 20:47
29	07:37 17:18		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02
31	07:35 17:21		06:59 19:39		05:34 20:50	
Potential sun hours	288	292	369	403	458	464
Total, worst case		72		33		137
Sun reduction		0,32		0,38		0,43
Oper. time red.		0,82		0,82		0,82
Wind dir. red.		0,65		0,65		0,55
Total reduction		0,17		0,20		0,19
Total, real		12		7		27

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

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

Shadow receptor: T - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (22)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	July	August	September	October	November	December
1	05:34 21:02	06:00 20:40	06:36 19:52	19:14 (2) 18:57	07:11 17:05	07:29 16:37
2	05:34 21:02	06:02 20:39	06:37 19:51	19:12 (2) 18:55	07:12 17:04	07:30 16:37
3	05:35 21:02	06:03 20:38	06:38 19:49	19:11 (2) 18:53	07:13 17:02	07:31 16:36
4	05:35 21:02	06:04 20:36	06:39 19:47	19:10 (2) 18:51	07:14 17:01	07:32 16:36
5	05:36 21:01	06:05 20:35	06:41 19:45	19:09 (2) 18:50	07:16 17:00	07:33 16:36
6	05:36 21:01	06:06 20:34	06:42 19:43	19:09 (2) 18:48	07:17 16:59	07:34 16:35
7	05:37 21:01	06:07 20:32	06:43 19:42	19:08 (2) 18:46	07:18 16:57	07:35 16:35
8	05:38 21:00	06:08 20:31	06:44 19:40	19:08 (2) 18:44	07:19 16:56	07:36 16:35
9	05:39 21:00	06:09 20:30	06:45 19:38	19:08 (2) 18:42	07:21 16:55	07:37 16:35
10	05:39 20:59	06:11 20:28	06:46 19:36	19:08 (2) 18:41	07:22 16:54	07:38 16:35
11	05:40 20:59	06:12 20:27	06:48 19:34	19:08 (2) 18:39	18:01 (3) 16:53	07:04 16:35
12	05:41 20:58	06:13 20:25	06:49 19:32	19:08 (2) 18:37	17:58 (3) 16:51	07:05 16:35
13	05:42 20:58	06:14 20:24	06:50 19:30	19:09 (2) 18:35	18:12 (3) 16:50	07:06 16:35
14	05:43 20:57	06:15 20:22	06:51 19:29	18:34 18:34	17:55 (3) 18:09 (3)	07:08 16:49
15	05:43 20:56	06:16 20:21	06:52 19:27	18:32 18:32	17:55 (3) 18:08 (3)	07:09 16:48
16	05:44 20:56	06:17 20:19	06:53 19:25	18:32 18:30	17:55 (3) 18:06 (3)	07:10 16:47
17	05:45 20:55	06:19 20:18	06:54 19:23	18:31 18:28	17:54 (3) 18:04 (3)	07:12 16:46
18	05:46 20:54	06:20 20:16	06:56 19:21	18:27 18:27	17:55 (3) 18:03 (3)	07:13 16:45
19	05:47 20:54	06:21 20:15	06:57 19:19	18:25 18:25	17:55 (3) 18:01 (3)	07:14 16:45
20	05:48 20:53	06:22 20:13	06:58 19:17	18:24 18:24	17:55 (3) 17:59 (3)	07:15 16:44
21	05:49 20:52	06:23 20:11	06:59 19:15	18:24 18:22	17:57 (3) 17:58 (3)	07:17 16:43
22	05:50 20:51	06:24 20:10	07:00 19:14	18:22 18:20	17:58 (3) 16:42	07:18 16:38
23	05:51 20:50	06:26 20:08	07:01 19:12	18:20 18:19	16:41 16:41	07:19 16:39
24	05:52 20:49	06:27 20:06	07:03 19:10	18:19 18:17	16:41 16:41	07:20 16:39
25	05:53 20:48	06:28 20:05	07:04 19:08	18:17 17:16	16:41 16:40	07:21 16:40
26	05:54 20:47	06:29 20:03	07:05 19:06	17:15 17:14	16:39 16:39	07:22 16:40
27	05:55 20:46	06:30 20:01	07:06 19:04	17:14 17:12	16:39 16:39	07:23 16:41
28	05:56 20:45	06:31 19:59	07:07 19:02	17:12 17:11	16:39 16:38	07:24 16:42
29	05:57 20:44	06:32 19:58	07:08 19:01	17:11 17:10	16:38 16:38	07:25 16:42
30	05:58 20:43	06:34 19:56	19:19 (2) 19:30 (2)	07:10 18:59	16:37 16:37	07:50 16:43
31	05:59 20:41	06:35 19:54	19:16 (2) 19:31 (2)	06:49 17:07	16:37 16:37	07:50 16:44
Potential sun hours	470	435	376	342	290	277
Total, worst case		26	115		105	
Sun reduction		0,60	0,53		0,44	
Oper. time red.		0,82	0,82		0,82	
Wind dir. red.		0,55	0,55		0,65	
Total reduction		0,27	0,24		0,24	
Total, real		7	28		25	

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

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

Shadow receptor: U - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (24)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,48	3,33	4,51	5,74	7,16	8,35	9,37	8,38	6,67	4,87	2,94	2,55

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
446	558	709	537	307	224	366	1.786	992	318	487	496	7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:02	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:36
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:31 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:30 20:57	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	05:54 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:47 19:34	07:23 18:39	07:04 16:52	07:39 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	17:55 (2) 19:58	05:48 20:34	05:30 21:00	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	17:54 (2) 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	17:54 (2) 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:28	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	17:54 (2) 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:45	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	17:54 (2) 20:03	05:44 20:38	05:30 21:01	05:47 20:53	06:21 20:14	06:57 19:19	07:33 18:25	07:14 16:44	07:45 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	17:55 (2) 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	18:45 (2) 18:23	07:34 16:44	07:46 16:37
21	07:44 17:08	07:06 17:50	06:18 18:27	17:55 (2) 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:15	18:42 (2) 18:22	07:36 16:43	07:47 16:37
22	07:43 17:09	07:05 17:52	06:16 18:28	17:56 (2) 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	18:41 (2) 18:20	07:37 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	17:58 (2) 20:07	05:40 20:42	05:30 21:02	05:51 20:50	06:26 20:08	07:01 19:12	18:39 (2) 18:19	07:38 16:41	07:48 16:38
24	07:41 17:12	07:02 17:54	06:12 18:31	18:07 (2) 20:09	05:39 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	18:38 (2) 18:17	07:40 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	18:37 (2) 18:16	06:41 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:02	05:54 20:47	06:29 20:03	07:05 19:06	18:36 (2) 18:42 (2)	06:42 17:14	07:23 16:39
27	07:39 17:16	06:57 17:59	06:06 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	18:36 (2) 18:40 (2)	06:43 17:12	07:24 16:39
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	05:36 20:47	05:32 21:03	05:56 20:45	06:31 19:59	07:07 19:02	18:36 (2) 18:39 (2)	06:45 17:11	07:25 16:38
29	07:37 17:18	07:03 19:37	07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02	05:57 20:44	06:32 19:58	07:08 19:01	18:32 (2) 18:37 (2)	06:46 17:09	07:27 16:38
30	07:36 17:20	07:01 19:38	07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:47 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21	06:59 19:39	06:59 19:39	05:34 20:50	05:34 20:50	05:59 20:41	06:35 19:54	06:35 19:54	06:49 17:07	06:49 17:07	07:50 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Total, worst case			64						68			
Sun reduction			0,38						0,53			
Oper. time red.			0,82						0,82			
Wind dir. red.			0,60						0,60			
Total reduction			0,19						0,26			
Total, real			12						18			

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

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

SHADOW - Calendar

Shadow receptor: V - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (25)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:02	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:37
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:31 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	06:46 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:30 20:57	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:51	05:54 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:47 19:34	07:23 18:39	07:04 16:52	07:39 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:48 20:34	05:30 21:00	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	17:57 (2) 06:29	05:46 20:00	05:30 21:01	05:45 20:55	06:19 20:18	06:54 19:23	18:50 (2) 07:31	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	17:57 (2) 06:27	05:45 20:01	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	18:47 (2) 07:32	07:13 16:45	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	18:01 (2) 06:26	05:44 20:03	05:30 21:01	05:47 20:53	06:21 20:14	06:57 19:19	18:58 (2) 07:33	07:14 16:44	07:45 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	17:56 (2) 06:24	05:43 20:04	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	18:43 (2) 07:34	07:15 16:44	07:46 16:37
21	07:44 17:08	07:06 17:50	06:18 18:27	18:04 (2) 06:22	05:42 20:05	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:15	18:42 (2) 07:36	07:17 16:43	07:47 16:37
22	07:43 17:09	07:05 17:52	06:16 18:28	17:56 (2) 06:21	05:41 20:06	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	18:52 (2) 07:37	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	18:06 (2) 06:19	05:40 20:07	05:30 21:02	05:51 20:50	06:26 20:08	07:01 19:12	18:41 (2) 07:38	07:19 16:41	07:48 16:38
24	07:41 17:12	07:02 17:54	06:12 18:31	18:07 (2) 06:17	05:39 20:09	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	18:49 (2) 07:40	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	18:09 (2) 06:16	05:39 20:04	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	18:40 (2) 07:41	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	18:10 (2) 06:14	05:38 20:05	05:31 21:02	05:54 20:47	06:29 20:03	07:05 19:06	18:40 (2) 07:42	07:23 16:39	07:49 16:40
27	07:39 17:16	06:57 17:59	06:06 18:34	18:11 (2) 06:13	05:37 20:06	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	18:42 (2) 07:43	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	05:36 20:07	05:32 21:03	05:56 20:45	06:31 19:59	07:07 19:02	18:46 (2) 07:44	07:25 16:38	07:49 16:42
29	07:37 17:18	07:03 19:37	07:03 19:37	06:10 20:15	05:36 20:08	05:33 21:02	05:57 20:44	06:32 19:58	07:08 19:01	18:47 (2) 07:45	07:26 16:37	07:50 16:43
30	07:36 17:20	07:01 19:38	07:01 19:38	06:08 20:16	05:35 20:09	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	18:48 (2) 07:46	07:27 16:37	07:50 16:43
31	07:35 17:21	06:59 19:39	06:59 19:39	05:34 20:50	05:34 20:05	05:59 20:41	06:35 19:54	07:11 19:02	07:11 18:59	18:49 (2) 07:47	07:28 16:37	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Total, worst case												
Sun reduction			81						81			
Oper. time red.			0,38						0,53			
Wind dir. red.			0,82						0,82			
Total reduction			0,59						0,59			
Total, real			0,19						0,26			
			15						21			

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

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

Shadow receptor: W - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (26)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:32 17:24	06:52 18:02	06:55 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:36
3	07:50 16:47	07:31 17:25	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	17:41 (2) 19:44	06:52 20:21	06:02 20:53	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	18:23 (2) 17:01	06:54 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	17:41 (2) 19:45	06:50 20:22	06:01 20:54	05:32 21:01	06:05 20:35	06:41 19:45	07:16 18:50	18:20 (2) 17:00	06:55 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	17:41 (2) 19:47	06:48 20:23	06:00 20:55	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48	18:19 (2) 16:58	06:57 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	17:42 (2) 19:48	06:46 20:24	05:58 20:55	05:37 21:01	06:07 20:32	06:43 19:41	07:18 18:46	18:24 (2) 16:57	06:58 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	17:43 (2) 19:49	06:45 20:26	05:57 20:56	05:31 21:00	06:08 20:31	06:44 19:40	07:19 18:44	18:17 (2) 16:56	07:00 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	17:44 (2) 19:50	06:43 20:27	05:56 20:57	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	18:16 (2) 16:55	07:01 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	17:47 (2) 19:51	06:41 20:28	05:54 20:57	05:39 20:59	06:10 20:28	06:46 19:36	07:22 18:41	18:17 (2) 16:54	07:02 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	17:50 (2) 19:53	06:39 20:29	05:53 20:58	05:40 20:59	06:12 20:27	06:47 19:34	07:23 18:39	18:17 (2) 16:52	07:04 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	18:17 (2) 16:51	07:05 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	18:17 (2) 16:50	07:06 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:32	05:30 20:59	05:42 20:57	06:15 20:22	06:51 19:29	07:27 18:34	18:17 (2) 16:49	07:08 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:48 20:34	05:30 21:00	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	18:17 (2) 16:48	07:09 16:35
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	18:17 (2) 16:47	07:10 16:36
17	07:46 17:02	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:28	18:17 (2) 16:46	07:12 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	18:17 (2) 16:45	07:13 16:36
19	07:45 17:05	07:09 17:48	06:21 18:24	06:26 20:02	05:44 20:38	05:30 21:01	05:47 20:53	06:21 20:14	06:57 19:19	07:33 18:25	18:17 (2) 16:44	07:14 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:23	18:17 (2) 16:44	07:15 16:37
21	07:44 17:08	07:06 17:50	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:15	07:36 18:22	18:17 (2) 16:43	07:17 16:37
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	18:17 (2) 16:42	07:18 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 20:07	05:40 20:42	05:30 21:02	05:51 20:50	06:25 20:08	07:01 19:12	07:38 18:19	18:17 (2) 16:41	07:19 16:38
24	07:41 17:12	07:02 17:54	06:12 18:31	06:17 20:09	05:39 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	18:17 (2) 16:41	07:21 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	18:17 (2) 16:40	07:22 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:02	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	18:17 (2) 16:39	07:23 16:40
27	07:39 17:16	06:57 17:58	06:06 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	06:43 17:12	18:17 (2) 16:39	07:24 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	06:11 20:13	05:36 20:47	05:32 21:02	05:56 20:45	06:31 19:59	07:07 19:02	06:45 17:11	18:17 (2) 16:38	07:25 16:42
29	07:37 17:18	07:03 19:37	06:03 19:37	06:10 20:15	05:36 20:48	05:32 21:02	05:57 20:44	06:32 19:58	07:08 19:01	06:46 17:09	18:17 (2) 16:38	07:27 16:42
30	07:36 17:20	07:01 19:38	06:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:47 17:08	18:17 (2) 16:37	07:28 16:43
31	07:35 17:21	06:59 19:39	05:59 19:39	06:07 20:17	05:34 20:50	05:34 20:51	05:59 20:41	06:35 19:54	06:49 17:07	06:49 17:07	18:17 (2) 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Total, worst case										25		
Sun reduction			0,38							0,44		
Oper. time red.			0,82							0,82		
Wind dir. red.			0,62							0,62		
Total reduction			0,19							0,23		
Total, real			5							6		

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

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

SHADOW - Calendar

Shadow receptor: X - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (27)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	17:34 (2) 19:40	06:57 20:17	06:07 20:51	05:34 21:02	05:33 21:02	06:00 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:32 17:24	06:52 18:02	17:35 (2) 19:42	06:55 20:18	06:05 20:51	05:33 21:02	05:34 21:02	06:01 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 16:36
3	07:50 16:47	07:31 17:25	06:50 18:04	17:35 (2) 19:43	06:54 20:20	06:04 20:52	05:33 21:02	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:02	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	17:35 (2) 19:44	06:52 20:21	06:02 20:53	05:32 21:02	05:35 21:02	06:04 20:36	06:39 19:47	07:14 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:06	17:36 (2) 19:45	06:50 20:22	06:01 20:54	05:32 21:01	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:55 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	17:38 (2) 19:47	06:48 20:23	06:00 20:55	05:31 21:01	05:36 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:58	07:34 16:35
7	07:50 16:51	07:26 17:31	06:43 18:09	17:45 (2) 19:48	06:46 20:24	06:00 20:55	05:31 21:01	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:32	06:41 18:10	19:49	06:45 20:26	06:01 20:56	05:31 21:00	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:23	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	19:50	06:43 20:27	06:02 20:57	05:30 21:00	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	19:51	06:41 20:28	06:03 20:57	05:30 21:00	05:39 20:59	06:10 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	19:53	06:39 20:29	06:05 20:58	05:30 21:00	05:40 20:59	06:12 20:27	06:47 19:34	07:23 18:39	07:04 16:52	07:39 16:35
12	07:49 16:56	07:20 17:38	06:34 18:15	19:54	06:38 20:30	06:06 20:58	05:30 21:00	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:51	07:40 16:35
13	07:48 16:58	07:18 17:39	06:32 18:17	19:55	06:36 20:31	06:08 20:59	05:30 21:00	05:42 20:58	06:14 20:24	06:50 19:30	07:25 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	19:56	06:34 20:32	06:09 20:59	05:30 21:00	05:42 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	19:58	06:32 20:34	06:09 21:00	05:30 20:56	05:43 20:56	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:35
16	07:47 17:01	07:14 17:44	06:27 18:21	19:59	06:31 20:35	06:07 21:00	05:47 20:56	05:44 20:56	06:17 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:02	07:13 17:45	06:25 18:22	20:00	06:29 20:36	06:09 21:01	05:46 20:55	05:45 20:55	06:19 20:18	06:54 19:23	07:31 18:28	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	20:01	06:27 20:37	06:07 21:01	05:45 20:54	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:45	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	20:02	06:26 20:38	06:08 21:01	05:44 20:53	05:47 20:54	06:21 20:14	06:57 19:19	07:33 18:25	07:14 16:44	07:45 16:37
20	07:44 17:06	07:08 17:49	06:19 18:26	20:04	06:24 20:39	06:09 21:02	05:43 20:53	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:23	07:15 16:44	07:46 16:37
21	07:44 17:08	07:06 17:50	06:18 18:27	20:05	06:22 20:40	06:10 21:02	05:42 20:52	05:49 20:52	06:23 20:11	06:59 19:15	07:36 18:22	07:17 16:43	07:47 16:37
22	07:43 17:09	07:05 17:52	06:16 18:28	20:06	06:21 20:41	06:08 21:02	05:41 20:51	05:50 20:10	06:24 20:14	07:00 19:15	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	20:07	06:19 20:42	06:09 21:02	05:40 20:50	05:51 20:08	06:25 20:08	07:01 19:12	07:38 18:19	07:19 16:41	07:48 16:38
24	07:41 17:12	07:02 17:54	06:12 18:31	20:09	06:17 20:43	06:10 21:02	05:39 20:49	05:52 20:06	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	20:10	06:16 20:44	06:11 21:02	05:39 20:48	05:53 20:05	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	20:11	06:14 20:45	06:12 21:02	05:38 20:47	05:54 20:03	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:39	07:49 16:40
27	07:39 17:16	06:57 17:58	06:06 18:34	20:12	06:13 20:46	06:13 21:03	05:37 20:46	05:55 20:01	06:30 20:01	07:06 19:04	06:43 17:12	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:35	20:13	06:11 20:47	06:14 21:03	05:36 20:45	05:56 20:03	06:31 19:59	07:07 19:02	06:45 17:11	07:25 16:38	07:49 16:42
29	07:37 17:18	07:00 17:58	06:03 18:37	20:14	06:10 20:48	06:15 21:02	05:36 20:44	05:57 19:58	06:32 19:58	07:08 19:01	06:46 17:09	07:27 16:38	07:50 16:42
30	07:36 17:20	07:01 17:58	06:04 18:38	20:15	06:08 20:49	06:16 21:02	05:35 20:43	05:33 19:56	05:58 18:59	06:34 17:08	07:10 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21	07:02 17:59	06:05 18:39	20:16	06:06 20:50	06:18 21:02	05:34 20:41	05:59 19:54	06:35 20:06	06:49 17:07	07:08 16:41	07:50 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	41	290	277
Total, worst case		4	39										
Sun reduction		0,32	0,38							0,44			
Oper. time red.		0,82	0,82							0,82			
Wind dir. red.		0,63	0,63							0,63			
Total reduction		0,17	0,20							0,23			
Total, real		1	8							9			

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

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

SHADOW - Calendar

Shadow receptor: Y - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (28)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,48	3,33	4,51	5,74	7,16	8,35	9,37	8,38	6,67	4,87	2,94	2,55

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
446	558	709	537	307	224	366	1.786	992	318	487	496	7.226

	January			February			March			April			May			June		
1	07:50	09:04 (6)	07:34				06:53	08:41 (7)	06:57	09:21 (7)	06:07	09:41 (7)	05:34	06:21 (4)				
	16:45	32 09:36 (6)	17:23				18:01	103 10:24 (7)	19:41	116 11:17 (7)	20:17	32 10:13 (7)	20:51	53 07:14 (4)				
2	07:50	09:04 (6)	07:33				06:52	08:40 (7)	06:56	09:21 (7)	06:05	09:44 (7)	05:34	06:22 (4)				
	16:46	32 09:36 (6)	17:24				18:03	106 10:26 (7)	19:42	114 11:15 (7)	20:18	25 10:09 (7)	20:51	53 07:15 (4)				
3	07:50	09:05 (6)	07:31				06:50	08:39 (7)	06:54	09:20 (7)	06:04	09:48 (7)	05:33	06:21 (4)				
	16:47	31 09:36 (6)	17:26				18:04	107 10:26 (7)	19:43	114 11:14 (7)	20:20	17 10:05 (7)	20:52	53 07:14 (4)				
4	07:50	09:05 (6)	07:30				06:48	08:37 (7)	06:52	09:20 (7)	06:03		05:33	06:22 (4)				
	16:48	31 09:36 (6)	17:27				18:05	110 10:27 (7)	19:44	112 11:12 (7)	20:21		20:53	53 07:15 (4)				
5	07:50	09:06 (6)	07:29				06:46	08:36 (7)	06:50	09:21 (7)	06:01		05:32	06:21 (4)				
	16:49	30 09:36 (6)	17:28				18:07	111 10:27 (7)	19:45	110 11:11 (7)	20:22		20:54	54 07:15 (4)				
6	07:50	09:07 (6)	07:28				06:45	08:36 (7)	06:48	09:21 (7)	06:00		05:32	06:21 (4)				
	16:50	29 09:36 (6)	17:30				18:08	113 10:29 (7)	19:47	108 11:09 (7)	20:23		20:55	54 07:15 (4)				
7	07:50	09:08 (6)	07:27				06:43	08:34 (7)	06:47	09:21 (7)	05:58		05:31	06:22 (4)				
	16:51	28 09:36 (6)	17:31				18:09	115 10:29 (7)	19:48	106 11:07 (7)	20:24		20:55	54 07:16 (4)				
8	07:50	09:09 (6)	07:25				06:41	08:33 (7)	06:45	09:21 (7)	05:57		05:31	06:22 (4)				
	16:52	28 09:37 (6)	17:33				18:10	116 10:29 (7)	19:49	104 11:05 (7)	20:26		20:56	55 07:17 (4)				
9	07:50	09:09 (6)	07:24				06:39	08:32 (7)	06:43	09:22 (7)	05:56		05:31	06:21 (4)				
	16:53	27 09:36 (6)	17:34				18:12	117 10:29 (7)	19:50	102 11:04 (7)	20:27		20:57	55 07:16 (4)				
10	07:49	09:11 (6)	07:23				06:38	08:31 (7)	06:41	09:22 (7)	05:55		05:30	06:22 (4)				
	16:54	25 09:36 (6)	17:35				18:13	118 10:29 (7)	19:52	100 11:02 (7)	20:28		20:57	54 07:16 (4)				
11	07:49	09:11 (6)	07:21				06:36	08:31 (7)	06:40	09:22 (7)	05:53		05:30	06:22 (4)				
	16:55	24 09:35 (6)	17:37				18:14	120 10:31 (7)	19:53	98 11:00 (7)	20:29		20:58	55 07:17 (4)				
12	07:49	09:13 (6)	07:20		09:21 (7)	06:34	08:30 (7)	06:38	09:22 (7)	05:52		06:39 (4)	05:30	06:22 (4)				
	16:57	22 09:35 (6)	17:38	25	09:46 (7)	18:16	120 10:30 (7)	19:54	96 10:58 (7)	20:30	14	06:53 (4)	20:58	55 07:17 (4)				
13	07:48	09:15 (6)	07:19		09:15 (7)	06:32	08:29 (7)	06:36	09:23 (7)	05:51		06:36 (4)	05:30	06:22 (4)				
	16:58	20 09:35 (6)	17:40	36	09:51 (7)	18:17	121 10:30 (7)	19:55	93 10:56 (7)	20:31	21	06:57 (4)	20:59	56 07:18 (4)				
14	07:48	09:16 (6)	07:17		09:11 (7)	06:30	08:28 (7)	06:34	09:23 (7)	05:50		06:34 (4)	05:30	06:22 (4)				
	16:59	17 09:33 (6)	17:41	45	09:56 (7)	18:18	122 10:30 (7)	19:56	91 10:54 (7)	20:33	25	06:59 (4)	20:59	56 07:18 (4)				
15	07:47	09:17 (6)	07:16		09:08 (7)	06:29	08:27 (7)	06:33	09:23 (7)	05:49		06:32 (4)	05:30	06:23 (4)				
	17:00	15 09:32 (6)	17:42	51	09:59 (7)	18:19	123 10:30 (7)	19:58	89 10:52 (7)	20:34	29	07:01 (4)	21:00	55 07:18 (4)				
16	07:47	09:21 (6)	07:14		09:05 (7)	06:27	08:26 (7)	06:31	09:24 (7)	05:47		06:30 (4)	05:30	06:23 (4)				
	17:01	9 09:30 (6)	17:44	58	10:03 (7)	18:21	124 10:30 (7)	19:59	86 10:50 (7)	20:35	32	07:02 (4)	21:00	55 07:18 (4)				
17	07:46		07:13		09:02 (7)	06:25	08:27 (7)	06:29	09:24 (7)	05:46		06:29 (4)	05:30	06:23 (4)				
	17:03		17:45	63	10:05 (7)	18:22	123 10:30 (7)	20:00	84 10:48 (7)	20:36	35	07:04 (4)	21:01	56 07:19 (4)				
18	07:46		07:11		09:00 (7)	06:23	08:26 (7)	06:27	09:25 (7)	05:45		06:28 (4)	05:30	06:23 (4)				
	17:04		17:47	68	10:08 (7)	18:23	124 10:30 (7)	20:01	80 10:45 (7)	20:37	37	07:05 (4)	21:01	56 07:19 (4)				
19	07:45		07:10		08:57 (7)	06:21	08:25 (7)	06:26	09:26 (7)	05:44		06:27 (4)	05:30	06:23 (4)				
	17:05		17:48	73	10:10 (7)	18:24	124 10:29 (7)	20:03	78 10:44 (7)	20:38	39	07:06 (4)	21:01	56 07:19 (4)				
20	07:45		07:08		08:55 (7)	06:20	08:25 (7)	06:24	09:26 (7)	05:43		06:26 (4)	05:30	06:23 (4)				
	17:07		17:49	76	10:11 (7)	18:26	124 10:29 (7)	20:04	75 10:41 (7)	20:39	41	07:07 (4)	21:02	56 07:19 (4)				
21	07:44		07:06		08:54 (7)	06:18	08:24 (7)	06:22	09:27 (7)	05:42		06:25 (4)	05:30	06:23 (4)				
	17:08		17:51	80	10:14 (7)	18:27	124 10:28 (7)	20:05	72 10:39 (7)	20:40	42	07:07 (4)	21:02	56 07:19 (4)				
22	07:43		07:05		08:51 (7)	06:16	08:23 (7)	06:21	09:28 (7)	05:41		06:25 (4)	05:30	06:24 (4)				
	17:09		17:52	84	10:15 (7)	18:28	124 10:27 (7)	20:06	69 10:37 (7)	20:41	44	07:09 (4)	21:02	56 07:20 (4)				
23	07:42		07:03		08:50 (7)	06:14	08:23 (7)	06:19	09:29 (7)	05:41		06:24 (4)	05:31	06:24 (4)				
	17:10		17:53	88	10:18 (7)	18:29	123 10:26 (7)	20:07	65 10:34 (7)	20:42	46	07:10 (4)	21:02	56 07:20 (4)				
24	07:41		07:02		08:48 (7)	06:12	08:23 (7)	06:18	09:30 (7)	05:40		06:24 (4)	05:31	06:24 (4)				
	17:12		17:55	91	10:19 (7)	18:31	123 10:26 (7)	20:09	63 10:33 (7)	20:43	46	07:10 (4)	21:02	56 07:20 (4)				
25	07:41		07:00		08:46 (7)	06:10	08:23 (7)	06:16	09:31 (7)	05:39		06:23 (4)	05:31	06:24 (4)				
	17:13		17:56	94	10:20 (7)	18:32	122 10:25 (7)	20:10	59 10:30 (7)	20:44	47	07:10 (4)	21:02	56 07:20 (4)				
26	07:40		06:58		08:46 (7)	06:08	08:22 (7)	06:14	09:33 (7)	05:38		06:23 (4)	05:32	06:25 (4)				
	17:15		17:57	96	10:22 (7)	18:33	122 10:24 (7)	20:11	55 10:28 (7)	20:45	49	07:12 (4)	21:03	55 07:20 (4)				
27	07:39		06:57		08:44 (7)	06:07	08:22 (7)	06:13	09:33 (7)	05:37		06:22 (4)	05:32	06:25 (4)				
	17:16		17:59	99	10:23 (7)	18:34	121 10:23 (7)	20:12	52 10:25 (7)	20:46	50	07:12 (4)	21:03	55 07:20 (4)				
28	07:38		06:55		08:42 (7)	06:05	08:21 (7)	06:11	09:35 (7)	05:37		06:22 (4)	05:32	06:26 (4)				
	17:17		18:00	101	10:23 (7)	18:36	121 10:22 (7)	20:14	47 10:22 (7)	20:47	50	07:12 (4)	21:03	55 07:21 (4)				
29	07:37				07:03		09:21 (7)	06:10	09:37 (7)	05:36		06:22 (4)	05:33	06:25 (4)				
	17:19				19:37	119	11:20 (7)	20:15	42 10:19 (7)	20:48	51	07:13 (4)	21:03	56 07:21 (4)				
30	07:36				07:01		09:22 (7)	06:08	09:39 (7)	05:35		06:22 (4)	05:33	06:26 (4)				
	17:20				19:38	118	11:20 (7)	20:16	38 10:17 (7)	20:49	51	07:13 (4)	21:02	55 07:21 (4)				
31	07:35				06:59		09:21 (7)			05:35		06:22 (4)						
	17:21				19:39	118	11:19 (7)			20:50	52	07:14 (4)						
Potential sun hours	288		292		369		403		458		464		1650					
Total, worst case	400		1228		3676		2518		875		1650							
Sun reduction	0,27		0,32		0,38		0,43		0,49		0,54							
Oper. time red.	0,82		0,82		0,82		0,82		0,82		0,82							
Wind dir. red.	0,54		0,51		0,51		0,51		0,66		0,68							
Total reduction	0,12		0,13		0,16		0,18		0,26		0,30							
Total, real	47		164		584		451		230		492							

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

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

Shadow receptor: Y - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (28)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
446	558	709	537	307	224	366	1.786	992	318	487	496	7.226

	July	August	September	October	November	December						
1	05:34	06:26 (4)	06:01	06:51 (4)	06:36	09:21 (7)	07:11	09:08 (7)	06:50	07:29	08:53 (6)	
	21:02	55 07:21 (4)	20:40	11 07:02 (4)	19:52	98 10:59 (7)	18:57	121 11:09 (7)	17:05	16:37	24 09:17 (6)	
2	05:34	06:27 (4)	06:02	06:37	06:37	09:20 (7)	07:12	09:08 (7)	06:52	07:30	08:54 (6)	
	21:02	55 07:22 (4)	20:39	19:51	100 11:00 (7)	18:55	120 11:08 (7)	17:04	16:37	25 09:19 (6)		
3	05:35	06:26 (4)	06:03	06:38	06:38	09:19 (7)	07:13	09:09 (7)	06:53	07:31	08:53 (6)	
	21:02	55 07:21 (4)	20:38	19:49	102 11:01 (7)	18:53	119 11:08 (7)	17:03	16:36	27 09:20 (6)		
4	05:35	06:27 (4)	06:04	06:40	06:40	09:18 (7)	07:15	09:10 (7)	06:54	07:32	08:53 (6)	
	21:02	55 07:22 (4)	20:37	19:47	104 11:02 (7)	18:52	117 11:07 (7)	17:01	16:36	28 09:21 (6)		
5	05:36	06:27 (4)	06:05	06:41	06:41	09:18 (7)	07:16	09:10 (7)	06:56	07:33	08:53 (6)	
	21:01	54 07:21 (4)	20:35	19:45	106 11:04 (7)	18:50	116 11:06 (7)	17:00	16:36	28 09:21 (6)		
6	05:37	06:27 (4)	06:06	06:42	06:42	09:17 (7)	07:17	09:10 (7)	06:57	07:34	08:53 (6)	
	21:01	55 07:22 (4)	20:34	19:43	108 11:05 (7)	18:48	115 11:05 (7)	16:59	16:36	29 09:22 (6)		
7	05:37	06:28 (4)	06:07	06:43	06:43	09:16 (7)	07:18	09:11 (7)	06:58	07:35	08:53 (6)	
	21:01	54 07:22 (4)	20:33	19:42	110 11:06 (7)	18:46	114 11:05 (7)	16:57	16:35	30 09:23 (6)		
8	05:38	06:28 (4)	06:08	06:44	06:44	09:15 (7)	07:19	09:11 (7)	07:00	07:36	08:53 (6)	
	21:00	53 07:21 (4)	20:31	19:40	112 11:07 (7)	18:44	113 11:04 (7)	16:56	16:35	31 09:24 (6)		
9	05:39	06:28 (4)	06:10	10:03 (7)	06:45	09:15 (7)	07:21	09:12 (7)	07:01	07:37	08:53 (6)	
	21:00	54 07:22 (4)	20:30	4 10:07 (7)	19:38	113 11:08 (7)	18:43	110 11:02 (7)	16:55	16:35	32 09:25 (6)	
10	05:40	06:29 (4)	06:11	09:55 (7)	06:46	09:14 (7)	07:22	09:12 (7)	07:02	07:38	08:54 (6)	
	20:59	53 07:22 (4)	20:28	20 10:15 (7)	19:36	114 11:08 (7)	18:41	109 11:01 (7)	16:54	16:35	31 09:25 (6)	
11	05:40	06:30 (4)	06:12	09:51 (7)	06:48	09:13 (7)	07:23	09:13 (7)	07:04	07:39	08:54 (6)	
	20:59	52 07:22 (4)	20:27	28 10:19 (7)	19:34	116 11:09 (7)	18:39	107 11:00 (7)	16:53	16:35	32 09:26 (6)	
12	05:41	06:29 (4)	06:13	09:48 (7)	06:49	09:12 (7)	07:24	09:14 (7)	07:05	07:40	08:54 (6)	
	20:58	52 07:21 (4)	20:25	34 10:22 (7)	19:32	118 11:10 (7)	18:37	105 10:59 (7)	16:52	16:35	33 09:27 (6)	
13	05:42	06:30 (4)	06:14	09:46 (7)	06:50	09:12 (7)	07:26	09:14 (7)	07:06	07:41	08:55 (6)	
	20:58	51 07:21 (4)	20:24	39 10:25 (7)	19:31	118 11:10 (7)	18:35	103 10:57 (7)	16:50	16:35	33 09:28 (6)	
14	05:43	06:30 (4)	06:15	09:44 (7)	06:51	09:12 (7)	07:27	09:16 (7)	07:08	07:42	08:54 (6)	
	20:57	51 07:21 (4)	20:22	43 10:27 (7)	19:29	120 11:12 (7)	18:34	100 10:56 (7)	16:49	16:36	33 09:27 (6)	
15	05:44	06:31 (4)	06:16	09:42 (7)	06:52	09:12 (7)	07:28	09:17 (7)	07:09	07:43	08:55 (6)	
	20:57	50 07:21 (4)	20:21	48 10:30 (7)	19:27	120 11:12 (7)	18:32	98 10:55 (7)	16:48	16:36	33 09:28 (6)	
16	05:44	06:32 (4)	06:18	09:40 (7)	06:53	09:11 (7)	07:29	09:18 (7)	07:10	07:43	08:56 (6)	
	20:56	49 07:21 (4)	20:19	52 10:32 (7)	19:25	121 11:12 (7)	18:30	95 10:53 (7)	16:47	16:36	33 09:29 (6)	
17	05:45	06:32 (4)	06:19	09:39 (7)	06:55	09:10 (7)	07:31	09:18 (7)	07:12	07:44	08:56 (6)	
	20:55	49 07:21 (4)	20:18	56 10:35 (7)	19:23	122 11:12 (7)	18:29	93 10:51 (7)	16:46	16:36	34 09:30 (6)	
18	05:46	06:32 (4)	06:20	09:37 (7)	06:56	09:10 (7)	07:32	09:20 (7)	07:13	07:45	08:56 (6)	
	20:54	48 07:20 (4)	20:16	60 10:37 (7)	19:21	123 11:13 (7)	18:27	90 10:50 (7)	16:46	16:37	34 09:30 (6)	
19	05:47	06:33 (4)	06:21	09:36 (7)	06:57	09:09 (7)	07:33	09:21 (7)	07:14	07:45	08:57 (6)	
	20:54	47 07:20 (4)	20:15	63 10:39 (7)	19:19	124 11:13 (7)	18:25	87 10:48 (7)	16:45	16:37	34 09:31 (6)	
20	05:48	06:33 (4)	06:22	09:34 (7)	06:58	09:09 (7)	07:34	09:22 (7)	07:16	07:46	08:57 (6)	
	20:53	46 07:19 (4)	20:13	66 10:40 (7)	19:17	124 11:13 (7)	18:24	83 10:45 (7)	16:44	16:37	34 09:31 (6)	
21	05:49	06:34 (4)	06:23	09:33 (7)	06:59	09:10 (7)	07:36	09:25 (7)	07:17	07:47	08:58 (6)	
	20:52	45 07:19 (4)	20:11	69 10:42 (7)	19:16	123 11:13 (7)	18:22	79 10:44 (7)	16:43	16:38	34 09:32 (6)	
22	05:50	06:35 (4)	06:25	09:31 (7)	07:00	09:09 (7)	07:37	09:26 (7)	07:18	07:47	08:58 (6)	
	20:51	43 07:18 (4)	20:10	73 10:44 (7)	19:14	124 11:13 (7)	18:20	75 10:41 (7)	16:42	16:38	34 09:32 (6)	
23	05:51	06:36 (4)	06:26	09:30 (7)	07:02	09:09 (7)	07:38	09:29 (7)	07:19	07:48	08:59 (6)	
	20:50	42 07:18 (4)	20:08	75 10:45 (7)	19:12	124 11:13 (7)	18:19	71 10:40 (7)	16:42	16:39	34 09:33 (6)	
24	05:52	06:37 (4)	06:27	09:29 (7)	07:03	09:09 (7)	07:40	09:30 (7)	07:21	07:48	08:59 (6)	
	20:49	40 07:17 (4)	20:06	78 10:47 (7)	19:10	124 11:13 (7)	18:17	67 10:37 (7)	16:41	16:39	34 09:33 (6)	
25	05:53	06:38 (4)	06:28	09:27 (7)	07:04	09:08 (7)	06:41	08:32 (7)	07:22	07:48	09:00 (6)	
	20:48	38 07:16 (4)	20:05	81 10:48 (7)	19:08	124 11:12 (7)	17:16	62 09:34 (7)	16:40	16:40	34 09:34 (6)	
26	05:54	06:39 (4)	06:29	09:27 (7)	07:05	09:08 (7)	06:42	08:35 (7)	07:23	07:49	09:00 (6)	
	20:47	36 07:15 (4)	20:03	84 10:51 (7)	19:06	124 11:12 (7)	17:14	57 09:32 (7)	16:40	9 09:08 (6)	16:40	34 09:34 (6)
27	05:55	06:40 (4)	06:30	09:26 (7)	07:06	09:09 (7)	06:44	08:38 (7)	07:24	08:57 (6)	07:49	09:00 (6)
	20:46	34 07:14 (4)	20:01	86 10:52 (7)	19:04	123 11:12 (7)	17:13	50 09:28 (7)	16:39	15 09:12 (6)	16:41	34 09:34 (6)
28	05:56	06:41 (4)	06:31	09:25 (7)	07:07	09:09 (7)	06:45	08:42 (7)	07:26	08:56 (6)	07:49	09:01 (6)
	20:45	31 07:12 (4)	19:59	89 10:54 (7)	19:03	123 11:12 (7)	17:11	43 09:25 (7)	16:38	17 09:13 (6)	16:42	33 09:34 (6)
29	05:57	06:43 (4)	06:33	09:24 (7)	07:09	09:09 (7)	06:46	08:46 (7)	07:27	08:55 (6)	07:50	09:01 (6)
	20:44	28 07:11 (4)	19:58	91 10:55 (7)	19:01	122 11:11 (7)	17:10	34 09:20 (7)	16:38	20 09:15 (6)	16:43	33 09:34 (6)
30	05:58	06:45 (4)	06:34	09:23 (7)	07:10	09:08 (7)	06:48	08:51 (7)	07:28	08:54 (6)	07:50	09:03 (6)
	20:43	24 07:09 (4)	19:56	93 10:56 (7)	18:59	122 11:10 (7)	17:08	23 09:14 (7)	16:38	22 09:16 (6)	16:43	32 09:35 (6)
31	06:00	06:48 (4)	06:35	09:22 (7)	07:11		06:49				07:50	09:03 (6)
	20:41	18 07:06 (4)	19:54	96 10:58 (7)			17:07				16:44	33 09:36 (6)
Potential sun hours	470	434		376		342		290		277		
Total, worst case	1417		1439	3506		2676		83			987	
Sun reduction	0,62		0,60	0,53		0,44		0,30			0,29	
Oper. time red.	0,82		0,82	0,82		0,82		0,82			0,82	
Wind dir. red.	0,68		0,52	0,51		0,51		0,54			0,54	
Total reduction	0,34		0,25	0,22		0,19		0,13			0,13	
Total, real	484		362	782		496		11			123	

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

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

Shadow receptor: Z - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (29)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

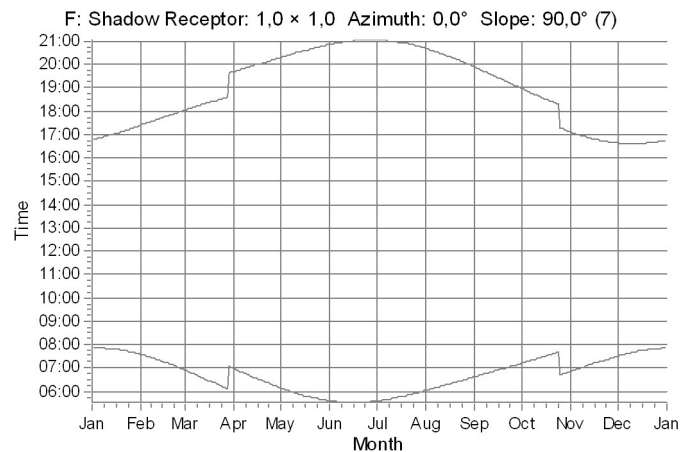
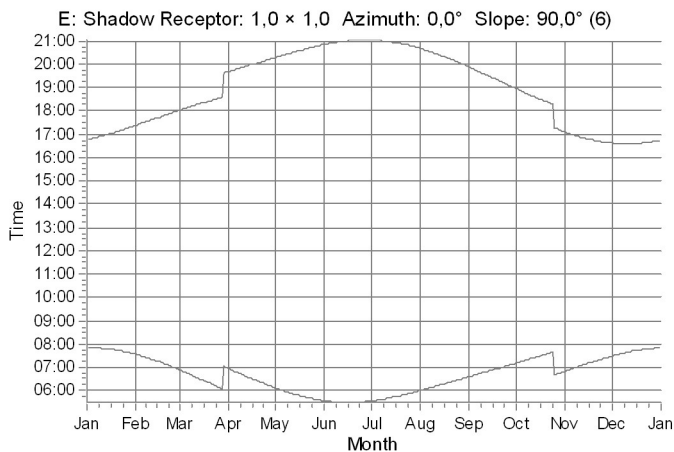
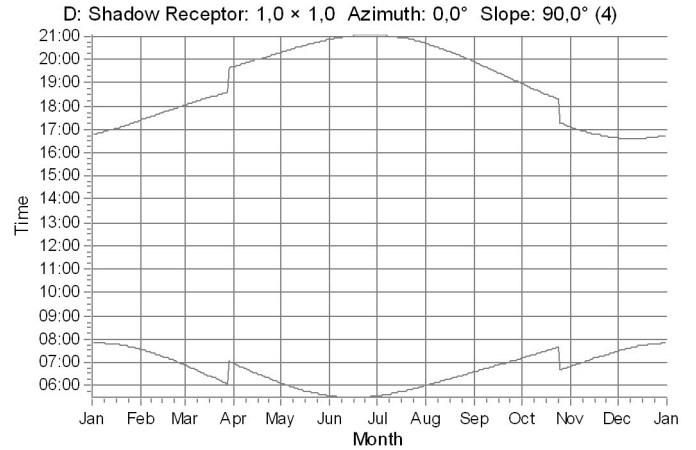
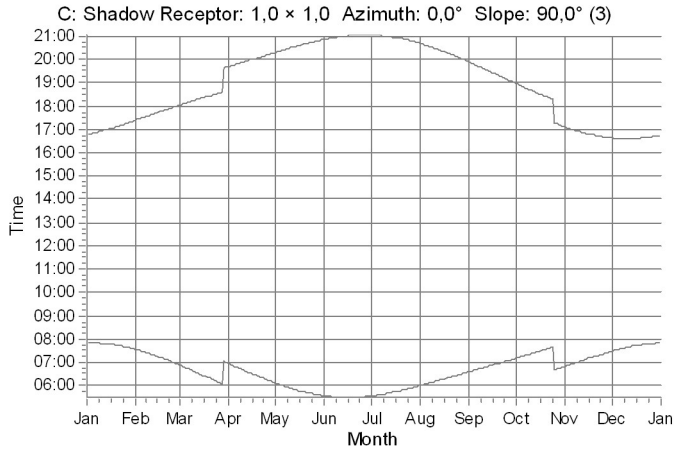
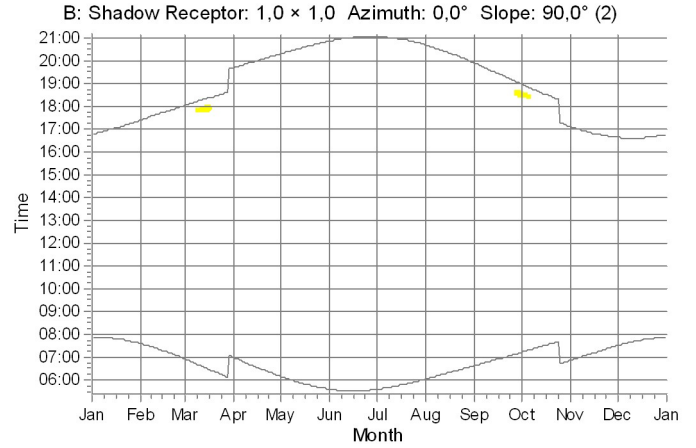
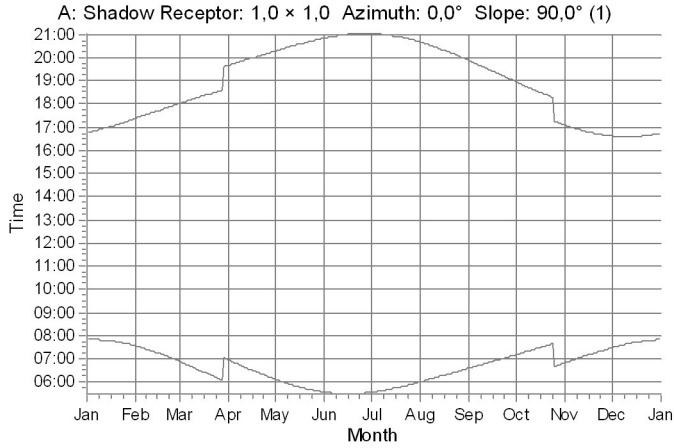
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:18	05:34 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:37
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:36 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:29	06:47 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:59 20:24	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:58	07:35 16:36
8	07:50 16:52	07:25 17:33	06:41 18:11	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:09 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:36	06:38 18:13	06:41 19:52	05:55 20:28	05:31 20:57	05:40 20:59	06:11 20:28	06:47 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:56	07:21 17:37	06:36 18:14	06:40 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:36	07:06 16:51	07:41 16:36
14	07:48 16:59	07:17 17:41	06:31 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:50	07:42 16:36
15	07:47 17:00	07:16 17:42	06:29 18:19	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:17 20:21	06:52 19:27	07:28 18:32	07:09 16:49	07:43 16:36
16	07:47 17:02	07:14 17:44	06:27 18:21	06:31 19:59	05:48 20:35	05:30 21:00	05:45 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:48	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:47 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:47	07:44 16:36
18	07:46 17:04	07:11 17:47	06:23 18:23	06:28 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:37
19	07:45 17:05	07:10 17:48	06:21 18:25	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:07	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:18	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:23 20:05	05:43 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:42 20:41	05:31 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:21	07:18 16:42	07:47 16:38
23	07:42 17:11	07:03 17:53	06:14 18:29	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:42	07:48 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:15	06:58 17:57	06:09 18:33	06:15 20:11	05:38 20:45	05:32 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:41
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:32 20:00	07:07 19:03	06:45 17:11	07:26 16:39	07:49 16:42
29	07:37 17:19	07:37 18:00	07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:02	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20	07:36 19:38	07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:59 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:38	07:50 16:44
31	07:35 17:22	07:35 19:39	06:59 19:39	06:07 20:50	05:35 20:50	05:35 21:02	06:00 20:41	06:35 19:54	06:49 17:07	06:49 17:07	07:50 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

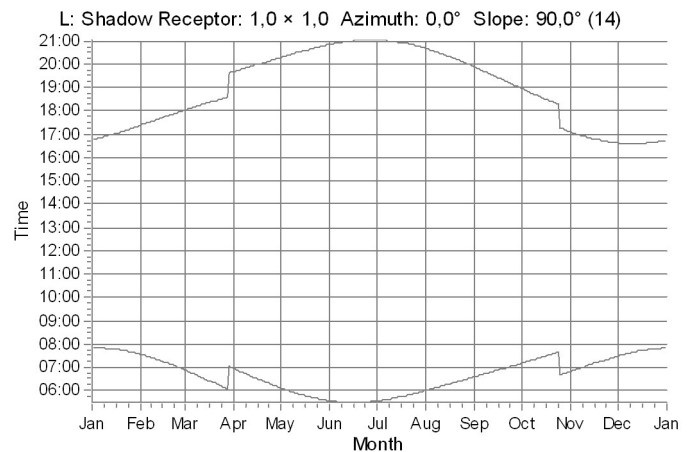
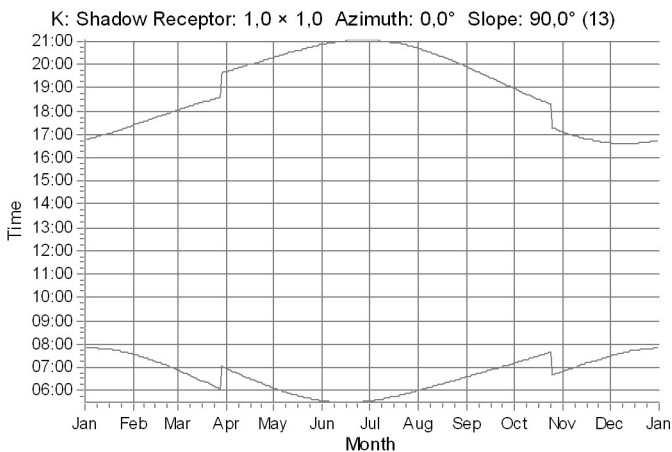
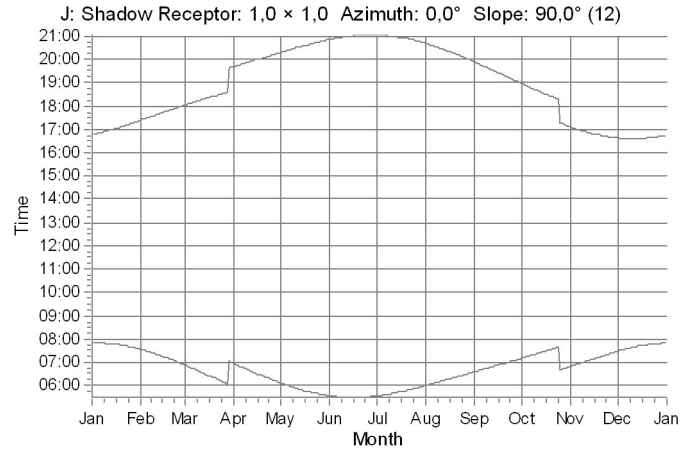
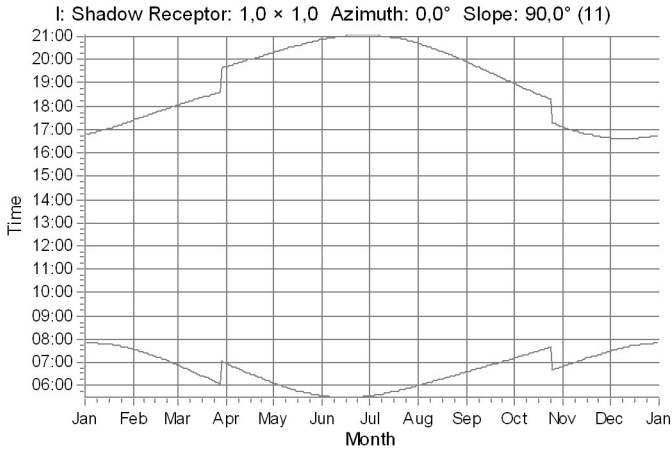
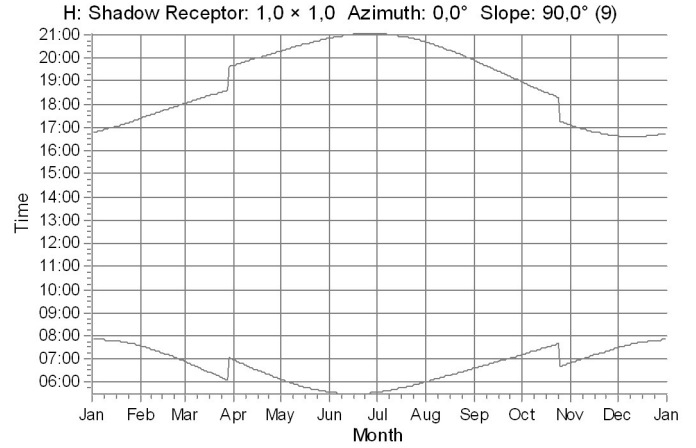
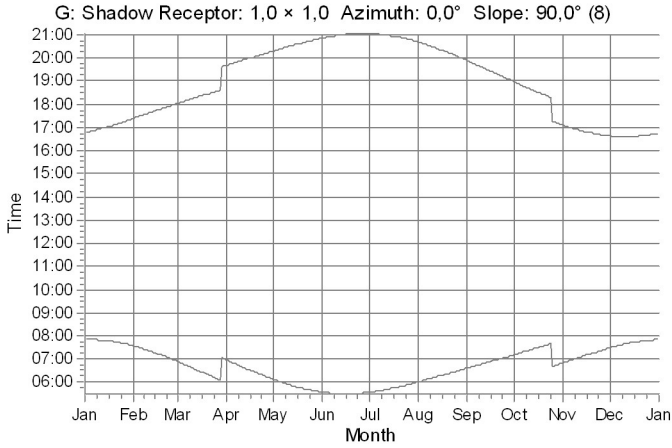
SHADOW - Calendar, graphical



WTGs

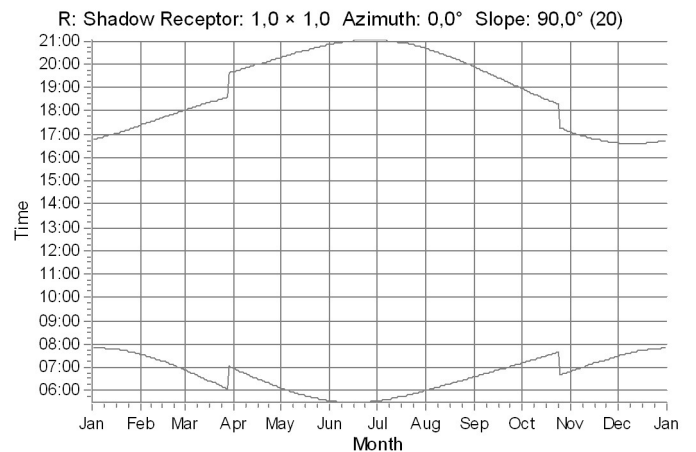
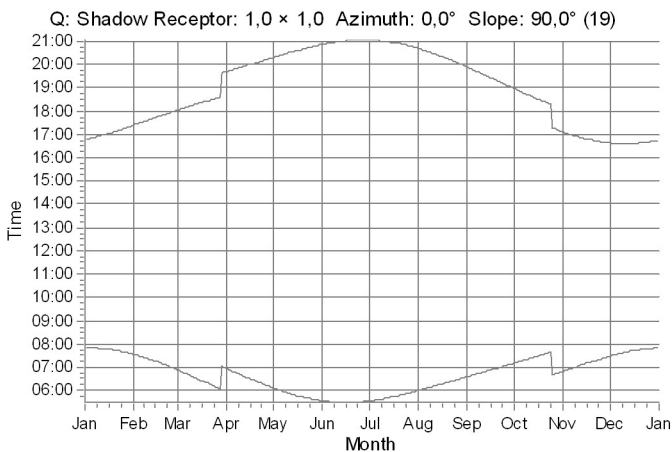
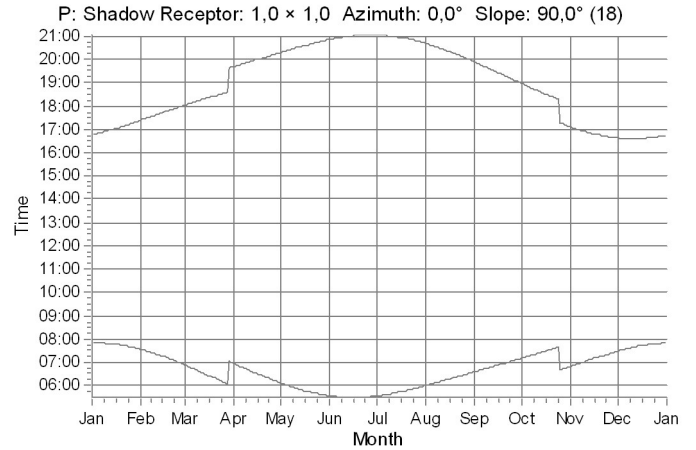
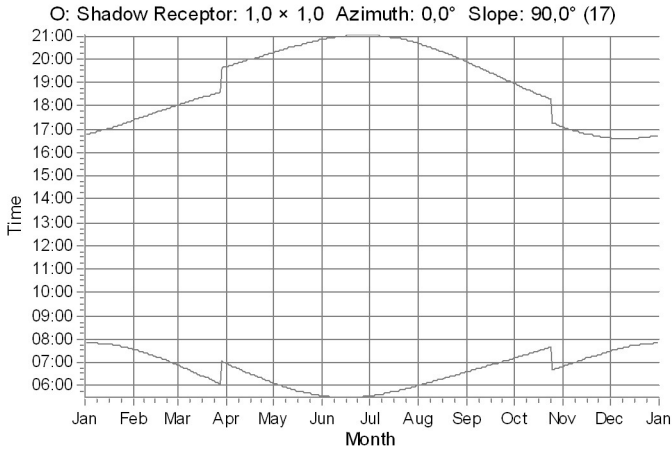
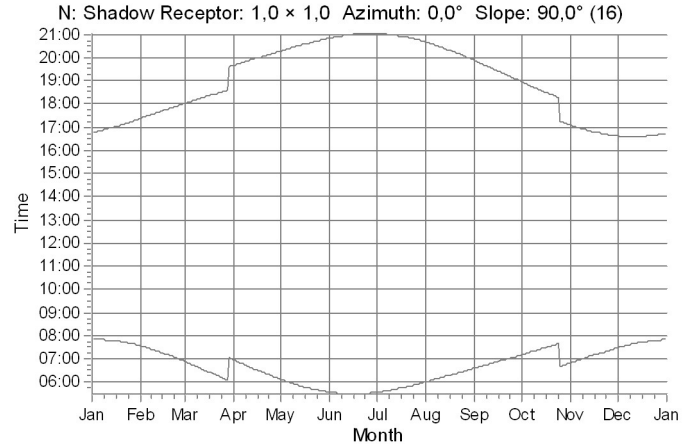
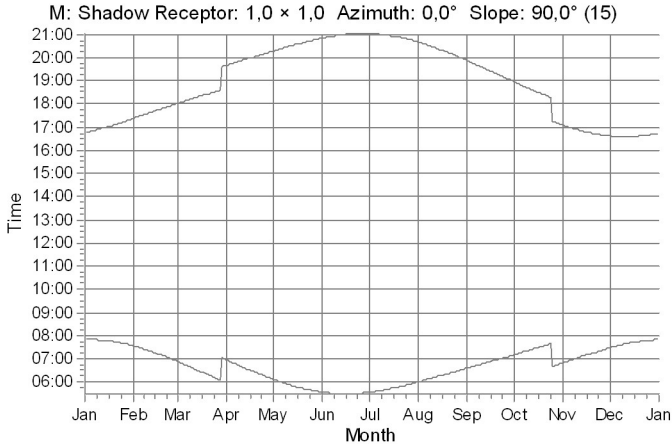
2: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (2)

SHADOW - Calendar, graphical



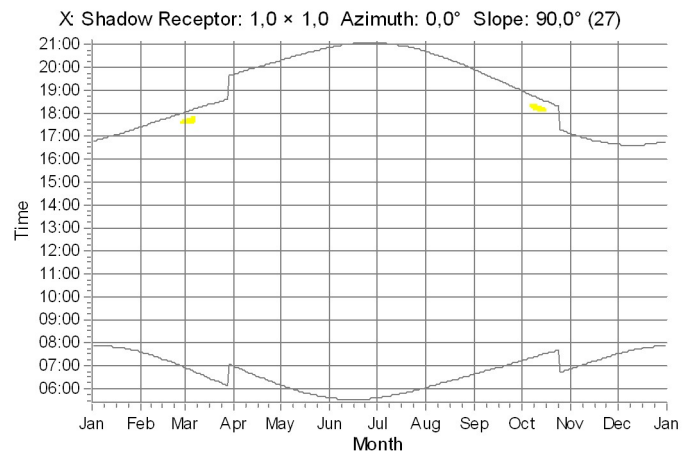
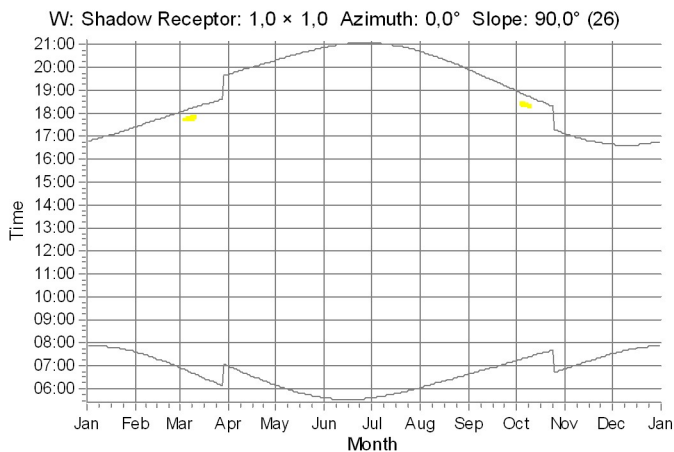
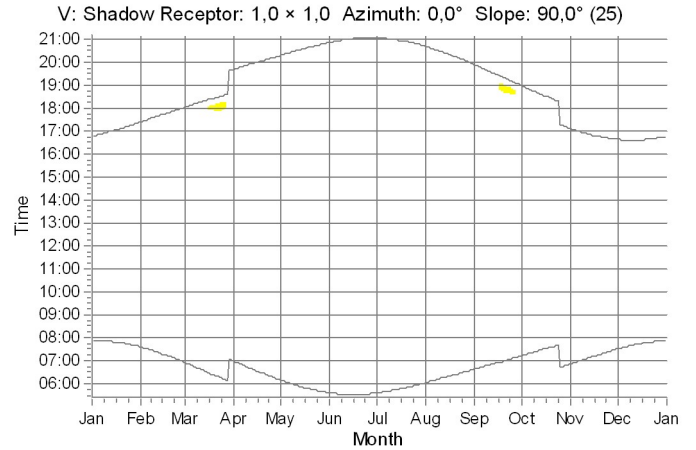
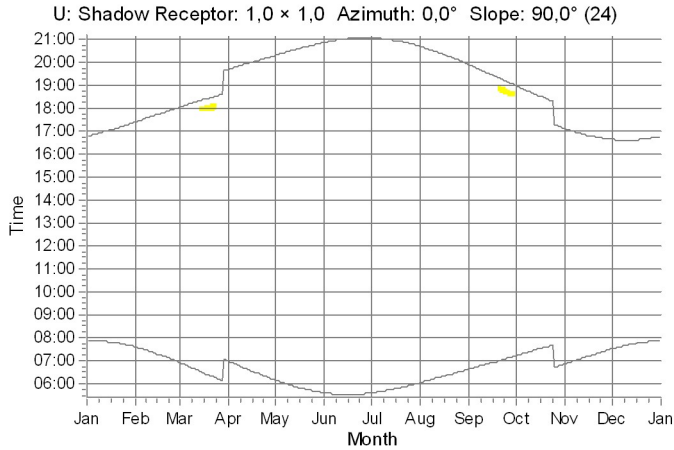
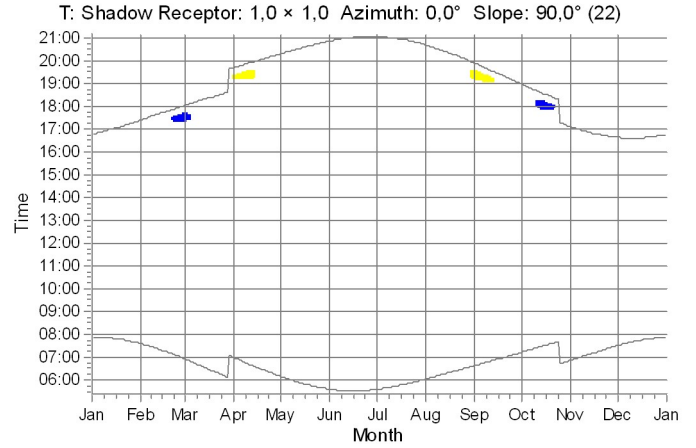
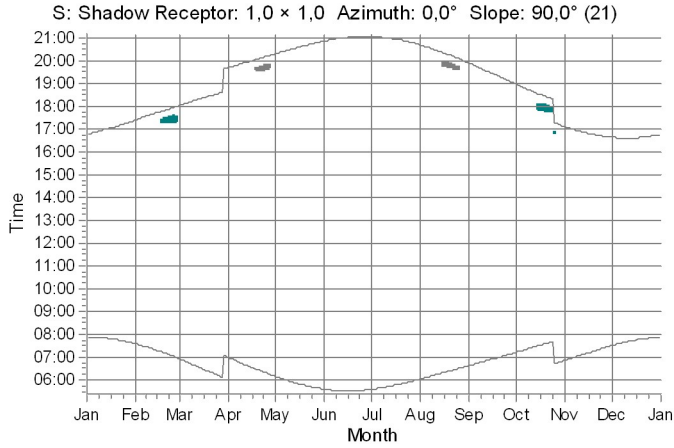
WTGs

SHADOW - Calendar, graphical



WTGs

SHADOW - Calendar, graphical

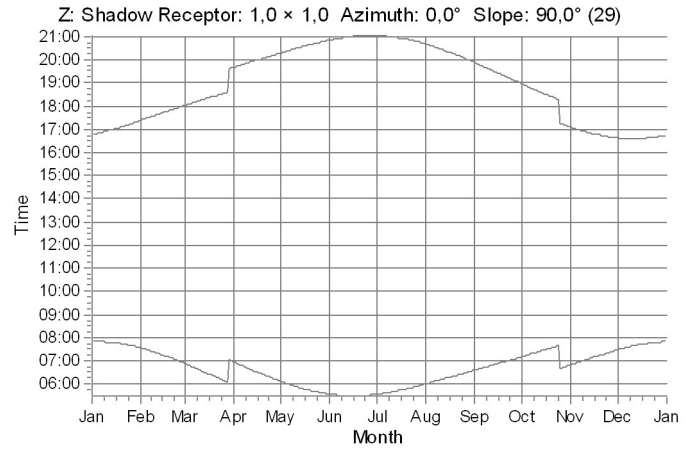
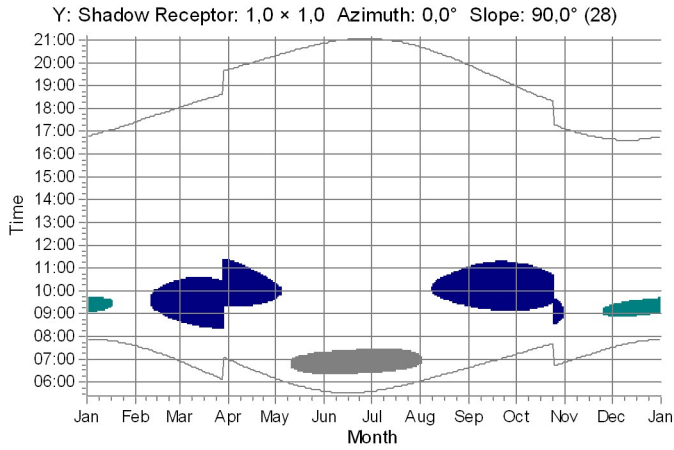


WTGs

- 2: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (2)
- 3: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (3)

- 4: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (4)
- 6: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (6)

SHADOW - Calendar, graphical



WTGs

- 4: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (4)
- 6: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (6)
- 7: VESTAS V162-7.2 7200 162.0 IO! hub: 119,0 m (TOT: 200,0 m) (7)

SHADOW - Calendar per WTG

WTG: 1 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (1)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:32 20:53	05:35 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:47 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:34 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:35 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:57	07:36 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:38 16:35
10	07:50 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:55 20:28	05:30 20:57	05:39 21:00	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:48 17:00	07:16 17:42	06:29 18:19	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:06	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:41	07:48 16:39
24	07:42 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:03	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:49 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:31 20:00	07:07 19:03	06:45 17:11	07:26 16:38	07:50 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21		06:59 19:39		05:35 20:50		05:59 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 2 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (2)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June
1	07:50 16:45	07:34 17:23	06:53 17:34-17:38/4 18:01	06:57 19:16-19:18/2 19:40	06:07 20:17	05:34 20:51
2	07:50 16:46	07:33 17:24	06:52 17:35-17:40/5 18:03	06:56 19:14-19:19/5 19:42	06:05 20:18	05:33 20:52
3	07:50 16:47	07:31 17:26	06:50 17:35-17:42/7 18:04	06:54 19:14-19:20/6 19:43	06:04 20:20	05:33 20:52
4	07:50 16:48	07:30 17:27	06:48 17:35-17:43/8 18:05	06:52 19:13-19:21/8 19:44	06:02 20:21	05:32 20:53
5	07:50 16:49	07:29 17:28	06:46 17:36-17:44/8 18:07	06:50 19:13-19:23/10 19:45	06:01 20:22	05:32 20:54
6	07:50 16:50	07:28 17:30	06:45 17:38-17:45/7 18:08	06:48 19:13-19:24/11 19:47	06:00 20:23	05:32 20:55
7	07:50 16:51	07:27 17:31	06:43 17:42-17:47/5 18:09	06:47 19:13-19:25/12 19:48	05:58 20:24	05:31 20:55
8	07:50 16:52	07:25 17:33	06:41 17:43-17:48/5 18:10	06:45 19:13-19:26/13 19:49	05:57 20:26	05:31 20:56
9	07:50 16:53	07:24 17:34	06:39 17:44-17:49/5 18:12	06:43 19:13-19:27/14 19:50	05:56 20:27	05:31 20:57
10	07:49 16:54	07:23 17:35	06:38 17:46-17:50/4 18:13	06:41 19:14-19:29/15 19:52	05:54 20:28	05:30 20:57
11	07:49 16:55	07:21 17:37	06:36 17:46-17:52/6 18:14	06:39 19:15-19:30/15 19:53	05:53 20:29	05:30 20:58
12	07:49 16:57	07:20 17:38	06:34 17:47-17:54/7 18:16	06:38 19:16-19:31/15 19:54	05:52 20:30	05:30 20:58
13	07:48 16:58	07:18 17:40	06:32 17:47-17:55/8 18:17	06:36 19:18-19:29/11 19:55	05:51 20:31	05:30 20:59
14	07:48 16:59	07:17 17:41	06:30 17:47-17:56/9 18:18	06:34 19:56	05:50 20:33	05:30 20:59
15	07:48 17:00	07:16 17:42	06:29 17:48-17:57/9 18:19	06:32 19:58	05:48 20:34	05:30 21:00
16	07:47 17:01	07:14 17:44	06:27 17:50-17:58/8 18:21	06:31 19:59	05:47 20:35	05:30 21:00
17	07:46 17:03	07:13 17:45	06:25 17:54-17:59/5 18:22	06:29 20:00	05:46 20:36	05:30 21:01
18	07:46 17:04	07:11 17:46	06:23 17:54-18:01/7 18:23	06:27 20:01	05:45 20:37	05:30 21:01
19	07:45 17:05	07:10 17:48	06:21 17:54-18:02/8 18:24	06:26 20:03	05:44 20:38	05:30 21:01
20	07:45 17:06	07:08 17:49	06:19 17:55-18:04/9 18:26	06:24 20:04	05:43 20:39	05:30 21:02
21	07:44 17:08	07:06 17:51	06:18 17:55-18:05/10 18:27	06:22 20:05	05:42 20:40	05:30 21:02
22	07:43 17:09	07:05 17:52	06:16 17:56-18:06/10 18:28	06:21 20:06	05:41 20:41	05:30 21:02
23	07:42 17:10	07:03 17:53	06:14 17:56-18:07/11 18:29	06:19 20:07	05:40 20:42	05:30 21:02
24	07:41 17:12	07:02 17:55	06:12 17:58-18:09/11 18:31	06:17 20:09	05:40 20:43	05:31 21:02
25	07:41 17:13	07:00 17:56	06:10 17:59-18:10/11 18:32	06:16 20:10	05:39 20:44	05:31 21:02
26	07:40 17:14	06:58 17:57	06:08 18:01-18:11/10 18:33	06:14 20:11	05:38 20:45	05:31 21:03
27	07:39 17:16	06:57 17:35-17:36/1 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03
28	07:38 17:17	06:55 17:34-17:37/3 18:00	06:05 18:36	06:11 20:14	05:36 20:47	05:32 21:03
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02
31	07:35 17:21		06:59 19:39		05:34 20:50	
Potential sun hours	288	292	369	403	458	464
Sum of minutes with flicker	0	4	197	137	0	0

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

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

SHADOW - Calendar per WTG

WTG: 2 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (2)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	July	August	September	October	November	December
1	05:34 21:02	06:00 20:40	06:36 19:52	19:14-19:29/15 18:57	07:11 18:26-18:33/7 18:05	07:29 16:37
2	05:34 21:02	06:02 20:39	06:37 19:51	19:12-19:27/15 18:55	07:12 18:25-18:31/6 17:04	07:30 16:37
3	05:35 21:02	06:03 20:38	06:38 19:49	19:11-19:25/14 18:53	07:13 18:25-18:30/5 17:03	07:31 16:36
4	05:35 21:02	06:04 20:37	06:39 19:47	19:10-19:23/13 18:51	07:15 18:23-18:28/5 17:01	07:32 16:36
5	05:36 21:01	06:05 20:35	06:41 19:45	19:09-19:21/12 18:50	07:16 18:20-18:26/6 17:00	07:33 16:36
6	05:37 21:01	06:06 20:34	06:42 19:43	19:09-19:20/11 18:48	07:17 18:19-18:24/5 16:59	07:34 16:36
7	05:37 21:01	06:07 20:33	06:43 19:42	19:08-19:18/10 18:46	07:18 18:17-18:21/4 16:57	07:36 16:35
8	05:38 21:00	06:08 20:31	06:44 19:40	19:08-19:17/9 18:44	07:19 18:13-18:20/7 16:56	07:37 16:35
9	05:39 21:00	06:09 20:30	06:45 19:38	19:08-19:15/7 18:42	07:21 18:11-18:18/7 16:55	07:37 16:35
10	05:39 20:59	06:11 20:28	06:46 19:36	19:08-19:13/5 18:41	07:22 18:09-18:16/7 16:54	07:38 16:35
11	05:40 20:59	06:12 20:27	06:48 19:34	19:08-19:11/3 18:39	07:23 18:09-18:15/6 16:53	07:39 16:35
12	05:41 20:58	06:13 20:25	06:49 19:32	19:08-19:09/1 18:37	07:24 18:08-18:13/5 16:51	07:40 16:35
13	05:42 20:58	06:14 20:24	06:50 19:31	19:07-18:11/4 18:35	07:26 18:07-18:11/4 16:50	07:41 16:35
14	05:43 20:57	06:15 20:22	06:51 19:29	18:07-18:09/2 18:34	07:27 18:07-18:09/2 16:49	07:42 16:35
15	05:43 20:57	06:16 20:21	06:52 19:27	18:07-18:08/1 18:32	07:28 18:07-18:08/1 16:48	07:43 16:36
16	05:44 20:56	06:17 20:19	06:53 19:25	18:07-18:08/1 18:30	07:29 18:07-18:08/1 16:47	07:43 16:36
17	05:45 20:55	06:19 20:18	06:54 19:23	18:50-18:59/9 18:29	07:31 18:29 16:46	07:44 16:36
18	05:46 20:54	06:20 20:16	06:56 19:21	18:47-18:58/11 18:27	07:32 18:27 16:45	07:45 16:36
19	05:47 20:54	06:21 20:15	06:57 19:19	18:45-18:56/11 18:25	07:33 18:25 16:45	07:45 16:37
20	05:48 20:53	06:22 20:13	06:58 19:17	18:43-18:54/11 18:24	07:34 18:24 16:44	07:46 16:37
21	05:49 20:52	06:23 20:11	06:59 19:16	18:42-18:52/10 18:22	07:36 18:22 16:43	07:47 16:38
22	05:50 20:51	06:24 20:10	07:00 19:14	18:41-18:51/10 18:20	07:37 18:20 16:42	07:47 16:38
23	05:51 20:50	06:26 20:08	07:01 19:12	18:39-18:49/10 18:19	07:38 18:19 16:41	07:48 16:39
24	05:52 20:49	06:27 20:06	07:03 19:10	18:38-18:46/8 18:17	07:40 18:17 16:41	07:48 16:39
25	05:53 20:48	06:28 20:05	07:04 19:08	18:37-18:44/7 17:16	06:41 17:16 16:40	07:48 16:40
26	05:54 20:47	06:29 20:03	07:05 19:06	18:36-18:42/6 17:14	06:42 17:14 16:39	07:49 16:40
27	05:55 20:46	06:30 20:01	07:06 19:04	18:32-18:40/8 17:13	06:44 17:13 16:39	07:49 16:41
28	05:56 20:45	06:31 19:59	07:07 19:03	18:30-18:39/9 17:11	06:45 17:11 16:38	07:50 16:42
29	05:57 20:44	06:33 19:58	07:09 19:01	18:28-18:37/9 17:10	06:46 17:10 16:38	07:50 16:42
30	05:58 20:43	06:34 19:56	07:10 18:59	18:27-18:35/8 17:08	06:48 17:08 16:37	07:50 16:43
31	05:59 20:41	06:35 19:54	19:16-19:31/15 17:07		06:49 17:07 16:37	07:50 16:44
Potential sun hours	470	435	376	342	290	277
Sum of minutes with flicker	0	26	242	77	0	0

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

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

SHADOW - Calendar per WTG

WTG: 3 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (3)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,48	3,33	4,51	5,74	7,16	8,35	9,37	8,38	6,67	4,87	2,94	2,55

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
446	558	709	537	307	224	366	1.786	992	318	487	496	7.226

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	17:24-17:38/14 19:41	06:57 20:17	06:07 20:51	05:34 21:02	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	17:26-17:38/12 19:42	06:56 20:18	06:05 20:52	05:33 21:02	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	17:28-17:35/7 19:43	06:54 20:20	06:04 20:52	05:33 21:02	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	19:44	06:52 20:21	06:02 20:53	05:32 21:02	05:35 21:02	06:04 20:37	06:40 19:47	07:15 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:07	19:45	06:50 20:22	06:01 20:52	05:32 21:01	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	19:47	06:48 20:23	06:00 20:55	05:32 21:01	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	19:48	06:47 20:24	05:58 20:55	05:31 21:01	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:57	07:36 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	19:49	06:45 20:26	05:57 20:56	05:31 21:00	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	19:50	06:43 20:27	05:56 20:57	05:31 21:00	05:39 21:00	06:09 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	19:52	06:41 20:28	05:54 20:57	05:30 20:59	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	19:53	06:39 20:29	05:53 20:58	05:30 20:59	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	18:01-18:11/10 16:53	07:04 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	19:54	06:38 20:30	05:52 20:58	05:30 20:58	05:41 20:25	06:13 19:32	06:49 18:37	07:24 18:37	17:58-18:12/14 16:52	07:05 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	19:55	06:36 20:31	05:51 20:59	05:30 20:58	05:42 20:24	06:14 19:31	06:50 18:35	07:26 18:35	17:57-18:11/14 16:50	07:06 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	19:56	06:34 20:33	05:50 20:59	05:30 20:57	05:43 20:22	06:15 19:29	06:51 18:34	07:27 18:34	17:55-18:09/14 16:49	07:08 16:35
15	07:48 17:00	07:16 17:42	06:29 18:19	19:58	06:32 20:34	05:49 21:00	05:30 20:57	05:44 20:21	06:16 19:27	06:52 18:32	07:28 18:32	17:55-18:08/13 16:48	07:09 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	19:59	06:31 20:35	05:47 21:00	05:30 20:56	05:44 20:19	06:18 19:25	06:53 18:30	07:29 18:30	17:55-18:06/11 16:47	07:10 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	19:59	06:29 20:36	05:46 21:01	05:30 20:55	05:45 20:18	06:19 19:23	06:55 18:29	07:31 18:29	17:54-18:04/10 16:46	07:12 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	20:01	06:27 20:37	05:45 21:01	05:30 20:54	05:46 20:16	06:20 19:21	06:56 18:27	07:32 18:27	17:55-18:03/8 16:46	07:13 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	20:02	06:26 20:38	05:44 21:01	05:30 20:54	05:47 20:15	06:21 19:19	06:57 18:25	07:33 18:25	17:55-18:01/6 16:45	07:14 16:37
20	07:45 17:06	07:08 17:49	06:19 18:26	20:04	06:24 20:39	05:43 21:02	05:30 20:53	05:48 20:13	06:22 19:17	06:58 18:24	07:34 18:24	17:55-17:59/4 16:44	07:16 16:37
21	07:44 17:08	07:06 17:51	06:18 18:27	20:05	06:22 20:40	05:42 21:02	05:30 20:52	05:49 20:11	06:23 19:16	06:59 18:22	07:36 18:22	17:57-17:58/1 16:43	07:17 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	20:06	06:21 20:41	05:41 21:02	05:30 20:51	05:50 20:10	06:24 19:14	07:00 18:14	07:37 18:14	17:57-17:58/1 16:42	07:18 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	20:07	06:19 20:42	05:40 21:02	05:31 20:50	05:51 20:08	06:26 19:12	07:02 18:19	07:38 18:19	17:57-17:58/1 16:41	07:19 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	20:09	06:18 20:43	05:40 21:02	05:31 20:49	05:52 20:06	06:27 19:10	07:03 18:17	07:40 18:17	17:55-17:59/4 16:41	07:21 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	20:10	06:16 20:44	05:39 21:03	05:31 20:48	05:53 20:05	06:28 19:08	06:54 18:16	07:04 17:16	17:55-17:59/4 16:40	07:22 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	20:11	06:14 20:45	05:38 21:03	05:31 20:47	05:54 20:33	06:29 19:06	07:05 17:14	07:05 17:14	17:55-17:59/4 16:39	07:23 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	20:12	06:13 20:46	05:37 21:03	05:32 20:46	05:55 20:31	06:30 19:04	07:06 17:13	07:06 17:13	17:55-17:59/4 16:39	07:24 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	20:13	06:11 20:47	05:37 21:03	05:32 20:45	05:56 19:59	06:31 19:03	07:07 17:11	07:07 17:11	17:55-17:59/4 16:38	07:26 16:42
29	07:37 17:19	07:00 17:59	06:04 18:37	20:14	06:10 20:48	05:36 21:03	05:33 20:44	05:57 19:58	06:33 19:01	07:09 17:10	07:09 17:10	17:55-17:59/4 16:38	07:27 16:43
30	07:36 17:20	07:00 17:59	06:03 18:38	20:15	06:08 20:49	05:35 21:02	05:33 20:43	05:58 19:56	06:34 18:59	07:10 17:08	07:10 17:08	17:55-17:59/4 16:37	07:28 16:43
31	07:35 17:21	07:00 17:59	06:02 18:39	20:16	06:07 20:50	05:34 21:03	05:32 20:42	05:59 19:54	06:35 17:07	07:11 17:07	07:11 17:07	17:55-17:59/4 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277	
Sum of minutes with flicker	0	72	33	0	0	0	0	0	0	105	0	0	

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

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

SHADOW - Calendar per WTG

WTG: 4 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (4)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	06:21-07:14/53 21:02	05:34 21:02	06:26-07:21/55 20:40	06:01 19:52	06:51-07:02/11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:45	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	06:22-07:15/53 21:02	05:34 21:02	06:27-07:22/55 20:39	06:02 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	06:21-07:14/53 21:02	05:35 21:02	06:26-07:21/55 20:38	06:03 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:32 20:53	06:22-07:15/53 21:02	05:35 21:02	06:27-07:22/55 20:37	06:04 19:47	07:15 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:07	06:50 19:45	06:01 20:22	05:32 20:54	06:21-07:15/54 21:01	05:36 21:01	06:27-07:21/54 20:35	06:05 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	06:21-07:15/54 21:01	05:37 21:01	06:27-07:22/55 20:34	06:06 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	06:22-07:16/54 21:01	05:37 21:01	06:28-07:22/54 20:33	06:07 19:42	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	06:22-07:17/55 21:00	05:38 21:00	06:28-07:21/53 20:31	06:08 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	06:21-07:16/55 21:00	05:39 21:00	06:28-07:22/54 20:30	06:10 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:55 20:28	05:30 20:57	06:22-07:16/54 21:00	05:39 20:59	06:29-07:22/53 20:28	06:11 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	06:22-07:17/55 21:00	05:40 20:59	06:30-07:22/52 20:27	06:12 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	06:22-07:17/55 21:00	05:41 20:58	06:29-07:21/52 20:25	06:13 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:18 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	06:22-07:18/56 21:00	05:42 20:58	06:30-07:21/51 20:24	06:14 19:31	07:26 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:33	05:30 20:59	06:22-07:18/56 21:00	05:43 20:57	06:30-07:21/51 20:22	06:15 19:29	07:27 18:34	07:08 16:49	07:42 16:36
15	07:47 17:00	07:16 17:42	06:29 18:19	06:33 19:58	05:49 20:34	05:30 21:00	06:23-07:18/55 21:00	05:44 20:57	06:31-07:21/50 20:21	06:16 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	06:30-07:02/32 21:00	05:44 20:56	06:32-07:21/49 20:19	06:18 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	06:23-07:19/56 21:00	05:45 20:55	06:32-07:21/49 20:18	06:19 19:45	07:31 18:29	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 19:37-19:38/1	05:45 20:37	05:30 21:01	06:23-07:19/56 21:01	05:46 20:54	06:32-07:20/48 20:16	06:20 19:44	07:32 18:27	07:13 16:46	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 19:36-19:39/3	05:44 20:38	05:30 21:01	06:27-07:06/39 21:01	05:47 20:54	06:33-07:20/47 20:15	06:21 19:43	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:07	07:08 17:49	06:19 18:26	06:24 19:36-19:40/4	05:43 20:39	05:30 21:02	06:26-07:07/41 21:02	05:48 20:53	06:33-07:19/46 20:13	06:22 19:42	07:34 18:24	07:15 16:44	07:46 16:37
21	07:44 17:08	07:06 17:51	06:18 18:27	06:22 19:35-19:41/6	05:42 20:40	05:30 21:02	06:25-07:07/42 21:02	05:49 20:52	06:34-07:19/45 20:11	06:23 19:41	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 19:36-19:43/7	05:41 20:41	05:30 21:02	06:25-07:09/44 21:02	05:50 20:51	06:35-07:18/43 20:10	06:24 19:40	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 19:36-19:44/8	05:41 20:42	05:31 21:02	06:24-07:10/46 21:02	05:51 20:50	06:36-07:18/42 20:08	06:26 19:40	07:38 18:19	07:19 16:42	07:48 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	06:18 19:37-19:45/8	05:40 20:43	05:31 21:02	06:24-07:10/46 21:02	05:52 20:49	06:37-07:17/40 20:06	06:27 19:40	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 19:37-19:46/9	05:39 20:44	05:31 21:02	06:23-07:10/47 21:02	05:53 20:48	06:38-07:16/38 20:05	06:28 19:40	07:41 18:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 19:38-19:47/9	05:38 20:45	05:31 21:03	06:23-07:12/49 21:03	05:54 20:47	06:39-07:15/36 20:03	06:29 19:06	07:05 17:14	06:42 16:40	07:49 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 19:41-19:46/5	05:37 20:46	05:32 21:03	06:22-07:12/50 21:03	05:55 20:46	06:40-07:14/34 20:01	06:30 19:04	07:06 17:13	06:44 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	06:22-07:12/50 21:03	05:56 20:45	06:41-07:12/31 19:59	06:31 19:03	07:07 17:11	06:45 16:38	07:49 16:42
29	07:37 17:19	07:03 17:37	06:10 18:37	06:10 19:37	05:36 20:48	05:36 21:02	06:22-07:13/51 21:02	05:57 20:44	06:43-07:11/28 19:58	06:33 19:01	07:09 17:10	06:46 16:38	07:50 16:43
30	07:36 17:20	07:01 17:38	06:08 18:38	06:08 19:38	05:35 20:49	05:35 21:02	06:22-07:13/51 21:02	05:58 20:43	06:45-07:09/24 19:56	06:34 18:59	07:10 17:08	06:48 16:37	07:50 16:43
31	07:35 17:21	06:59 17:39	06:09 18:39	06:09 19:39	05:35 20:50	05:35 21:02	06:22-07:14/52 21:02	05:59 20:41	06:48-07:06/18 19:54	06:35 18:59	07:09 17:07	06:49 16:44	07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277	0
Sum of minutes with flicker	0	0	0	60	801	1650	1417	70	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 5 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (5)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:57 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:50 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:50 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:02 20:21	05:32 20:53	05:35 21:02	06:04 20:37	06:40 19:47	07:15 18:51	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:28	06:46 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:58 20:24	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:57	07:35 16:35
8	07:50 16:52	07:25 17:33	06:41 18:10	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 16:35
9	07:50 16:53	07:24 17:34	06:39 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 16:35
10	07:49 16:54	07:23 17:35	06:38 18:13	06:41 19:52	05:55 20:28	05:30 20:57	05:39 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:55	07:21 17:37	06:36 18:14	06:39 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:18 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 16:35
14	07:48 16:59	07:17 17:41	06:30 18:18	06:34 19:56	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 16:35
15	07:47 17:00	07:16 17:42	06:29 18:19	06:32 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:16 20:21	06:52 19:27	07:28 18:32	07:09 16:48	07:43 16:36
16	07:47 17:01	07:14 17:44	06:27 18:21	06:31 19:59	05:47 20:35	05:30 21:00	05:44 20:56	06:18 20:19	06:53 19:25	07:29 18:30	07:10 16:47	07:43 16:36
17	07:46 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:46 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:46	07:44 16:36
18	07:46 17:04	07:11 17:46	06:23 18:23	06:27 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:36
19	07:45 17:05	07:10 17:48	06:21 18:24	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:06	07:08 17:49	06:19 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:17	07:34 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:06 17:51	06:18 18:27	06:22 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:41 20:41	05:30 21:02	05:50 20:51	06:24 20:10	07:00 19:14	07:37 18:20	07:18 16:42	07:47 16:38
23	07:42 17:10	07:03 17:53	06:14 18:29	06:19 20:07	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:41	07:48 16:39
24	07:41 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:02	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:48 16:40
26	07:40 17:14	06:58 17:57	06:08 18:33	06:14 20:11	05:38 20:45	05:31 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:40
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:04	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:31 19:59	07:07 19:03	06:45 17:11	07:26 16:38	07:49 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:02	05:58 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:37	07:50 16:43
31	07:35 17:21		06:59 19:39		05:35 20:50		05:59 20:41	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	435	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 6 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (6)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,48	3,33	4,51	5,74	7,16	8,35	9,37	8,38	6,67	4,87	2,94	2,55

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
446	558	709	537	307	224	366	1.786	992	318	487	496	7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 09:04-09:36/32 16:45	07:34 17:23	06:53 18:01	06:57 19:40	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:52	07:11 18:57	06:50 17:05	07:29 08:53-09:17/24 16:37
2	07:50 09:04-09:36/32 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:05 20:18	05:33 20:51	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:51 17:04	07:30 08:54-09:19/25 16:37
3	07:50 09:05-09:36/31 16:47	07:31 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:38 19:49	07:13 18:53	06:53 17:03	07:31 08:53-09:20/27 16:36
4	07:50 09:05-09:36/31 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:35 21:02	06:04 20:36	06:40 19:47	07:15 18:51	06:54 17:01	07:32 08:53-09:21/28 16:36
5	07:50 09:06-09:36/30 16:49	07:29 17:28	06:46 18:07	06:50 19:45	06:01 20:22	05:32 20:54	05:36 21:01	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:33 08:53-09:21/28 16:36
6	07:50 09:07-09:36/29 16:50	07:28 17:30	06:45 18:08	06:48 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:43	07:17 18:48	06:57 16:59	07:34 08:53-09:22/29 16:36
7	07:50 09:08-09:36/28 16:51	07:27 17:31	06:43 18:09	06:47 19:48	06:00 20:24	05:31 20:55	05:37 21:01	06:07 20:32	06:43 19:42	07:18 18:46	06:58 16:57	07:35 08:53-09:23/30 16:35
8	07:50 09:09-09:37/28 16:52	07:25 17:33	06:41 18:10	06:45 19:49	06:01 20:26	05:31 20:56	05:38 21:00	06:08 20:31	06:44 19:40	07:19 18:44	07:00 16:56	07:36 08:53-09:24/31 16:35
9	07:50 09:09-09:36/27 16:53	07:24 17:34	06:39 18:12	06:43 19:50	06:02 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:42	07:01 16:55	07:37 08:53-09:25/32 16:35
10	07:49 09:11-09:36/25 16:54	07:23 17:35	06:38 18:13	06:41 19:52	06:03 20:28	05:30 20:57	05:40 20:59	06:11 20:28	06:46 19:36	07:22 18:41	07:02 16:54	07:38 08:54-09:25/31 16:35
11	07:49 09:11-09:35/24 16:55	07:22 17:37	06:36 18:14	06:39 19:53	06:03 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 08:54-09:26/32 16:35
12	07:49 09:13-09:35/22 16:57	07:20 17:38	06:34 18:16	06:38 19:54	06:03 20:30	05:30 20:58	05:41 20:58	06:13 20:25	06:49 19:32	07:24 18:37	07:05 16:52	07:40 08:54-09:27/33 16:35
13	07:48 09:15-09:35/20 16:58	07:18 17:40	06:32 18:17	06:36 19:55	06:04 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:35	07:06 16:50	07:41 08:55-09:28/33 16:35
14	07:48 09:16-09:33/17 16:59	07:17 17:41	06:30 18:18	06:34 19:56	06:05 20:32	05:30 20:59	05:43 20:57	06:15 20:22	06:51 19:29	07:27 18:34	07:08 16:49	07:42 08:54-09:27/33 16:36
15	07:47 09:17-09:32/15 17:00	07:16 17:42	06:29 18:19	06:33 19:58	06:05 20:34	05:29 21:00	05:44 20:56	06:16 20:21	06:52 19:27	07:28 17:54-18:03/9 18:32	07:09 16:48	07:43 08:55-09:28/33 16:36
16	07:47 09:21-09:30/9 17:01	07:14 17:44	06:27 18:21	06:31 19:59	06:05 20:35	05:30 21:00	05:44 20:56	06:18 20:19	06:53 19:25	07:29 17:51-18:04/13 18:30	07:10 16:47	07:43 08:56-09:29/33 16:36
17	07:46 17:03 17:03	07:13 17:19-17:21/2 17:45	06:25 18:22 20:00	06:29 20:00 20:36	05:46 21:01 20:55	05:30 20:55 20:18	05:45 20:19 20:23	06:19 19:23 18:29	06:55 07:31 17:49-18:04/15	07:12 18:29	07:11 16:46	07:44 08:56-09:30/34 16:36
18	07:46 17:04 17:04	07:11 17:17-17:22/5 17:46	06:23 18:23 20:01	06:27 20:01 20:37	05:45 21:01 20:54	05:30 20:54 20:16	05:46 20:16 19:21	06:20 19:21 18:27	06:56 07:32 17:49-18:03/14	07:13 18:27	07:12 16:46	07:45 08:56-09:30/34 16:37
19	07:45 17:05 17:05	07:10 17:17-17:25/8 17:48	06:21 18:24 20:03	06:26 20:03 20:38	05:44 21:01 20:53	05:30 20:53 20:15	05:47 20:15 19:19	06:21 19:19 18:25	06:57 07:33 17:48-18:01/13	07:14 18:25	07:11 16:45	07:45 08:57-09:31/34 16:37
20	07:44 17:07 17:07	07:08 17:17-17:26/9 17:49	06:19 18:26 20:04	06:24 20:04 20:39	05:43 21:02 20:53	05:30 20:53 20:13	05:48 20:13 19:17	06:22 18:24 17:47-17:59/12	06:58 07:34	07:15 16:44	07:12 16:37	07:46 08:57-09:31/34 16:37
21	07:44 17:08 17:08	07:06 17:17-17:28/11 17:51	06:18 18:27 20:05	06:22 20:05 20:40	05:42 21:02 20:52	05:30 20:52 20:11	05:49 20:11 19:16	06:23 19:16 18:22	06:59 07:36 17:48-17:58/10	07:17 16:43	07:13 16:38	07:47 08:58-09:32/34 16:38
22	07:43 17:09 17:09	07:05 17:17-17:29/12 17:52	06:16 18:28 20:06	06:21 20:06 20:41	05:41 21:02 20:51	05:30 20:51 20:10	05:50 20:10 19:14	06:25 19:14 18:20	07:00 07:37 17:47-17:56/9	07:18 16:42	07:14 16:38	07:47 08:58-09:32/34 16:38
23	07:42 17:10 17:10	07:03 17:17-17:30/13 17:53	06:14 18:29 20:07	06:19 20:07 20:42	05:41 21:02 20:50	05:31 20:50 20:08	05:51 20:08 19:12	06:26 19:12 18:19	07:02 07:38 17:47-17:54/7	07:19 16:42	07:15 16:39	07:48 08:59-09:33/34 16:39
24	07:41 17:12 17:12	07:02 17:18-17:32/14 17:55	06:12 18:31 20:09	06:18 20:09 20:43	05:40 21:02 20:49	05:31 20:52 20:06	05:52 20:06 19:10	06:27 19:10 18:17	07:03 07:40 17:48-17:53/5	07:20 16:41	07:16 16:39	07:48 08:59-09:33/34 16:41
25	07:41 17:13 17:13	07:00 17:18-17:33/15 17:56	06:10 18:32 20:10	06:16 20:04 20:44	05:39 21:02 20:48	05:31 20:48 20:05	05:53 20:05 19:08	06:28 17:16 16:40	07:04 16:49-16:51/2	07:22 16:40	07:17 16:38	07:48 09:00-09:34/34 16:40
26	07:40 17:15 17:15	06:58 17:19-17:31/12 17:57	06:08 18:33 20:11	06:14 20:05 20:45	05:38 21:02 20:47	05:32 20:47 20:03	05:54 20:03 19:06	06:29 19:06 17:14	07:05 06:42 16:40	07:23 16:40	07:19 16:38	07:49 09:00-09:34/34 16:40
27	07:39 17:16 17:16	06:57 17:23-17:29/6 17:59	06:07 18:34 20:12	06:13 20:06 20:46	05:37 21:02 20:46	05:32 20:46 20:01	05:55 20:01 19:04	06:30 17:13 16:45	07:06 06:44 16:39	07:24 16:41	07:19 16:38	07:49 09:00-09:34/34 16:41
28	07:38 17:17 17:17	06:55 18:00	06:05 18:36 20:14	06:11 20:07 20:47	05:37 21:02 20:45	05:32 20:57 20:33	05:56 20:09 19:03	06:31 17:11 16:42	07:07 06:45 16:38	07:25 16:42	07:19 16:38	07:49 09:01-09:34/33 16:42
29	07:37 17:19 17:19	07:03 17:19-17:28/12 17:59	06:10 18:37 20:15	06:16 20:08 20:48	05:36 21:02 20:44	05:33 20:44 19:58	05:57 20:01 19:01	06:33 17:10 16:41	07:09 06:44 16:39	07:27 16:42	07:20 16:38	07:50 09:01-09:34/33 16:43
30	07:36 17:20 17:20	07:01 17:18-17:33/15 17:58	06:08 18:38 20:16	06:15 20:09 20:49	05:35 21:02 20:43	05:33 20:58 19:56	05:58 20:03 18:59	06:34 17:08 16:49	07:10 06:42 16:37	07:28 16:42	07:19 16:38	07:50 09:03-09:35/32 16:43
31	07:35 17:21 17:21	07:00 17:18-17:33/15 17:59	06:09 18:39 20:17	06:16 20:10 20:50	05:35 21:03 20:41	05:34 20:59 20:11	05:59 20:04 19:54	06:35 17:07 16:49	07:09 06:44 16:37	07:29 16:42	07:20 16:38	07:50 09:03-09:36/33 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Sum of minutes with flicker	400	107	0	0	0	0	0	0	0	109	83	987

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

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

SHADOW - Calendar per WTG

WTG: 7 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (7)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June
1	07:50 16:45	07:34 17:23	06:53 08:41-10:24/103 18:01	06:57 09:21-11:17/116 19:41	06:07 09:41-10:13/32 20:17	05:34 20:51
2	07:50 16:46	07:33 17:24	06:52 08:40-10:26/106 18:03	06:56 09:21-11:15/114 19:42	06:05 09:44-10:09/25 20:18	05:33 20:51
3	07:50 16:47	07:31 17:26	06:50 08:39-10:26/107 18:04	06:54 09:20-11:14/114 19:43	06:04 09:48-10:05/17 20:20	05:33 20:52
4	07:50 16:48	07:30 17:27	06:48 08:37-10:27/110 18:05	06:52 09:20-11:12/112 19:44	06:03 09:48-10:05/17 20:21	05:33 20:53
5	07:50 16:49	07:29 17:28	06:46 08:36-10:27/111 18:07	06:50 09:21-11:11/110 19:45	06:01 09:48-10:05/17 20:22	05:32 20:54
6	07:50 16:50	07:28 17:30	06:45 08:36-10:29/113 18:08	06:48 09:21-11:09/108 19:47	06:00 09:48-10:05/17 20:23	05:32 20:55
7	07:50 16:51	07:27 17:31	06:43 08:34-10:29/115 18:09	06:47 09:21-11:07/106 19:48	05:58 09:48-10:05/17 20:24	05:31 20:55
8	07:50 16:52	07:25 17:33	06:41 08:33-10:29/116 18:10	06:45 09:21-11:05/104 19:49	05:57 09:48-10:05/17 20:26	05:31 20:56
9	07:50 16:53	07:24 17:34	06:39 08:32-10:29/117 18:12	06:43 09:22-11:04/102 19:50	05:56 09:48-10:05/17 20:27	05:31 20:57
10	07:49 16:54	07:23 17:35	06:38 08:31-10:29/118 18:13	06:41 09:22-11:02/100 19:52	05:55 09:48-10:05/17 20:28	05:30 20:57
11	07:49 16:55	07:21 17:37	06:36 08:31-10:31/120 18:14	06:39 09:22-11:00/98 19:53	05:53 09:48-10:05/17 20:29	05:30 20:58
12	07:49 16:57	07:20 09:21-09:46/25 17:38	06:34 08:30-10:30/120 18:16	06:38 09:22-10:58/96 19:54	05:52 09:48-10:05/17 20:30	05:30 20:58
13	07:48 16:58	07:18 09:15-09:51/36 17:40	06:32 08:29-10:30/121 18:17	06:36 09:23-10:56/93 19:55	05:51 09:48-10:05/17 20:31	05:30 20:59
14	07:48 16:59	07:17 09:11-09:56/45 17:41	06:30 08:28-10:30/122 18:18	06:34 09:23-10:54/91 19:56	05:50 09:48-10:05/17 20:33	05:30 20:59
15	07:47 17:00	07:16 09:08-09:59/51 17:42	06:29 08:27-10:30/123 18:19	06:33 09:23-10:52/89 19:58	05:49 09:48-10:05/17 20:34	05:30 21:00
16	07:47 17:01	07:14 09:05-10:03/58 17:44	06:27 08:26-10:30/124 18:21	06:31 09:24-10:50/86 19:59	05:47 09:48-10:05/17 20:35	05:30 21:00
17	07:46 17:03	07:13 09:02-10:05/63 17:45	06:25 08:27-10:30/123 18:22	06:29 09:24-10:48/84 20:00	05:46 09:48-10:05/17 20:36	05:30 21:01
18	07:46 17:04	07:11 09:00-10:08/68 17:47	06:23 08:26-10:30/124 18:23	06:27 09:25-10:45/80 20:01	05:45 09:48-10:05/17 20:37	05:30 21:01
19	07:45 17:05	07:10 08:57-10:10/73 17:48	06:21 08:25-10:29/124 18:24	06:26 09:26-10:44/78 20:03	05:44 09:48-10:05/17 20:38	05:30 21:01
20	07:45 17:07	07:08 08:55-10:11/76 17:49	06:19 08:25-10:29/124 18:26	06:24 09:26-10:41/75 20:04	05:43 09:48-10:05/17 20:39	05:30 21:02
21	07:44 17:08	07:06 08:54-10:14/80 17:51	06:18 08:24-10:28/124 18:27	06:22 09:27-10:39/72 20:05	05:42 09:48-10:05/17 20:40	05:30 21:02
22	07:43 17:09	07:05 08:51-10:15/84 17:52	06:16 08:23-10:27/124 18:28	06:21 09:28-10:37/69 20:06	05:41 09:48-10:05/17 20:41	05:30 21:02
23	07:42 17:10	07:03 08:50-10:18/88 17:53	06:14 08:23-10:26/123 18:29	06:19 09:29-10:34/65 20:07	05:41 09:48-10:05/17 20:42	05:31 21:02
24	07:41 17:12	07:02 08:48-10:19/91 17:55	06:12 08:23-10:26/123 18:31	06:18 09:30-10:33/63 20:09	05:40 09:48-10:05/17 20:43	05:31 21:02
25	07:41 17:13	07:00 08:46-10:20/94 17:56	06:10 08:23-10:25/122 18:32	06:16 09:31-10:30/59 20:10	05:39 09:48-10:05/17 20:44	05:31 21:02
26	07:40 17:15	06:58 08:46-10:22/96 17:57	06:08 08:22-10:24/122 18:33	06:14 09:33-10:28/55 20:11	05:38 09:48-10:05/17 20:45	05:32 21:03
27	07:39 17:16	06:57 08:44-10:23/99 17:59	06:07 08:22-10:23/121 18:34	06:13 09:33-10:25/52 20:12	05:37 09:48-10:05/17 20:46	05:32 21:03
28	07:38 17:17	06:55 08:42-10:23/101 18:00	06:05 08:21-10:22/121 18:36	06:11 09:35-10:22/47 20:14	05:37 09:48-10:05/17 20:47	05:32 21:03
29	07:37 17:19		07:03 09:21-11:20/119 19:37	06:10 09:37-10:19/42 20:15	05:36 09:48-10:05/17 20:48	05:33 21:02
30	07:36 17:20		07:01 09:22-11:20/118 19:38	06:08 09:39-10:17/38 20:16	05:35 09:48-10:05/17 20:49	05:33 21:02
31	07:35 17:21		06:59 09:21-11:19/118 19:39		05:35 09:48-10:05/17 20:50	
Potential sun hours	288	292	369	403	458	464
Sum of minutes with flicker	0	1228	3676	2518	74	0

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

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

SHADOW - Calendar per WTG

WTG: 7 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (7)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	July	August	September	October	November	December
1	05:34 21:02	06:01 20:40	06:36 19:52	09:21-10:59/98 19:52	07:11 18:57	09:08-11:09/121 17:05
2	05:34 21:02	06:02 20:39	06:37 19:51	09:20-11:00/100 19:51	07:12 18:55	09:08-11:08/120 17:04
3	05:35 21:02	06:03 20:38	06:38 19:49	09:19-11:01/102 19:49	07:13 18:53	09:09-11:08/119 17:03
4	05:35 21:02	06:04 20:37	06:40 19:47	09:18-11:02/104 19:47	07:15 18:52	09:10-11:07/117 17:01
5	05:36 21:01	06:05 20:35	06:41 19:45	09:18-11:04/106 19:45	07:16 18:50	09:10-11:06/116 17:00
6	05:37 21:01	06:06 20:34	06:42 19:43	09:17-11:05/108 19:43	07:17 18:48	09:10-11:05/115 16:59
7	05:37 21:01	06:07 20:33	06:43 19:42	09:16-11:06/110 19:42	07:18 18:46	09:11-11:05/114 16:57
8	05:38 21:00	06:08 20:31	06:44 19:40	09:15-11:07/112 19:40	07:19 18:44	09:11-11:04/113 16:56
9	05:39 21:00	06:10 20:30	06:45 19:38	09:15-11:08/113 19:38	07:21 18:43	09:12-11:02/110 16:55
10	05:40 20:59	06:11 20:28	06:46 19:36	09:14-11:08/114 19:36	07:22 18:41	09:12-11:01/109 16:54
11	05:40 20:59	06:12 20:27	06:48 19:34	09:13-11:09/116 19:34	07:23 18:39	09:13-11:00/107 16:53
12	05:41 20:58	06:13 20:25	06:49 19:32	09:12-11:10/118 19:32	07:24 18:37	09:14-10:59/105 16:52
13	05:42 20:58	06:14 20:24	06:50 19:31	09:12-11:10/118 19:31	07:26 18:35	09:14-10:57/103 16:50
14	05:43 20:57	06:15 20:22	06:51 19:29	09:12-11:12/120 19:29	07:27 18:34	09:16-10:56/100 16:49
15	05:44 20:57	06:16 20:21	06:52 19:27	09:12-11:12/120 19:27	07:28 18:32	09:17-10:55/98 16:48
16	05:44 20:56	06:18 20:19	06:53 19:25	09:11-11:12/121 19:25	07:29 18:30	09:18-10:53/95 16:47
17	05:45 20:55	06:19 20:18	06:55 19:23	09:10-11:12/122 19:23	07:31 18:29	09:18-10:51/93 16:46
18	05:46 20:54	06:20 20:16	06:56 19:21	09:10-11:13/123 19:21	07:32 18:27	09:20-10:50/90 16:46
19	05:47 20:54	06:21 20:15	06:57 19:19	09:09-11:13/124 19:19	07:33 18:25	09:21-10:48/87 16:45
20	05:48 20:53	06:22 20:13	06:58 19:17	09:09-11:13/124 19:17	07:34 18:24	09:22-10:45/83 16:44
21	05:49 20:52	06:23 20:11	06:59 19:16	09:10-11:13/123 19:16	07:36 18:22	09:25-10:44/79 16:43
22	05:50 20:51	06:25 20:10	07:00 19:14	09:09-11:13/124 19:14	07:37 18:20	09:26-10:41/75 16:42
23	05:51 20:50	06:26 20:08	07:02 19:12	09:09-11:13/124 19:12	07:38 18:19	09:29-10:40/71 16:42
24	05:52 20:49	06:27 20:06	07:03 19:10	09:09-11:13/124 19:10	07:40 18:17	09:30-10:37/67 16:41
25	05:53 20:48	06:28 20:05	07:04 19:08	09:08-11:12/124 19:08	06:41 17:16	08:32-09:34/62 16:40
26	05:54 20:47	06:29 20:03	07:05 19:06	09:08-11:12/124 19:06	06:42 17:14	08:35-09:32/57 16:40
27	05:55 20:46	06:30 20:01	07:06 19:04	09:09-11:12/123 19:04	06:44 17:13	08:38-09:28/50 16:39
28	05:56 20:45	06:31 19:59	07:07 19:03	09:09-11:12/123 19:03	06:45 17:11	08:42-09:25/43 16:38
29	05:57 20:44	06:33 19:58	07:09 19:01	09:09-11:11/122 19:01	06:46 17:10	08:46-09:20/34 16:38
30	05:58 20:43	06:34 19:56	07:10 18:59	09:08-11:10/122 18:59	06:48 17:08	08:51-09:14/23 16:37
31	05:59 20:41	06:35 19:54	09:22-10:58/96 19:54		06:49 17:07	
Potential sun hours	470	434	376	342	290	277
Sum of minutes with flicker	0	1428	3506	2676	0	0

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

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

SHADOW - Calendar per WTG

WTG: 8 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (8)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [BOLOGNA]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:06	07:29 16:37
2	07:50 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:19	05:34 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:51 16:47	07:32 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:39 19:49	07:14 18:53	06:53 17:03	07:31 16:37
4	07:51 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:36 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:29	06:47 18:07	06:50 19:46	06:01 20:22	05:32 20:54	05:36 21:02	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:34 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:49 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:44	07:17 18:48	06:57 16:59	07:35 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	06:03 20:25	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:58	07:36 16:36
8	07:50 16:52	07:25 17:33	06:41 18:11	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:09 20:31	06:44 19:40	07:20 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:40 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:38 16:35
10	07:50 16:54	07:23 17:36	06:38 18:13	06:41 19:52	05:55 20:28	05:31 20:57	05:40 21:00	06:11 20:28	06:47 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:56	07:21 17:37	06:36 18:14	06:40 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:58	06:13 20:26	06:49 19:33	07:24 18:37	07:05 16:52	07:40 16:35
13	07:48 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:31	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:36	07:06 16:51	07:41 16:36
14	07:48 16:59	07:17 17:41	06:31 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:23	06:51 19:29	07:27 18:34	07:08 16:50	07:42 16:36
15	07:48 17:00	07:16 17:43	06:29 18:20	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:17 20:21	06:52 19:27	07:28 18:32	07:09 16:49	07:43 16:36
16	07:47 17:02	07:14 17:44	06:27 18:21	06:31 19:59	05:48 20:35	05:30 21:00	05:45 20:56	06:18 20:19	06:54 19:25	07:29 18:30	07:10 16:48	07:43 16:36
17	07:47 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:47 20:36	05:30 21:01	05:46 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:47	07:44 16:36
18	07:46 17:04	07:11 17:47	06:23 18:23	06:28 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:37
19	07:45 17:05	07:10 17:48	06:21 18:25	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:45 16:37
20	07:45 17:07	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:18	07:35 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:23 20:05	05:43 20:40	05:30 21:02	05:49 20:52	06:24 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:42 20:41	05:31 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:21	07:18 16:42	07:47 16:38
23	07:42 17:11	07:03 17:53	06:14 18:30	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:42	07:48 16:39
24	07:42 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:03	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:49 16:40
26	07:40 17:15	06:59 17:57	06:09 18:33	06:15 20:11	05:38 20:45	05:32 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:41
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:05	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:32 20:00	07:08 19:03	06:45 17:11	07:26 16:39	07:50 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:03	05:59 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:38	07:50 16:44
31	07:35 17:22		06:59 19:39		05:35 20:50		06:00 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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

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

SHADOW - Calendar per WTG

WTG: 9 - VESTAS V162-7.2 7200 162.0 !O! hub: 119,0 m (TOT: 200,0 m) (9)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2,48 3,33 4,51 5,74 7,16 8,35 9,37 8,38 6,67 4,87 2,94 2,55

Operational time

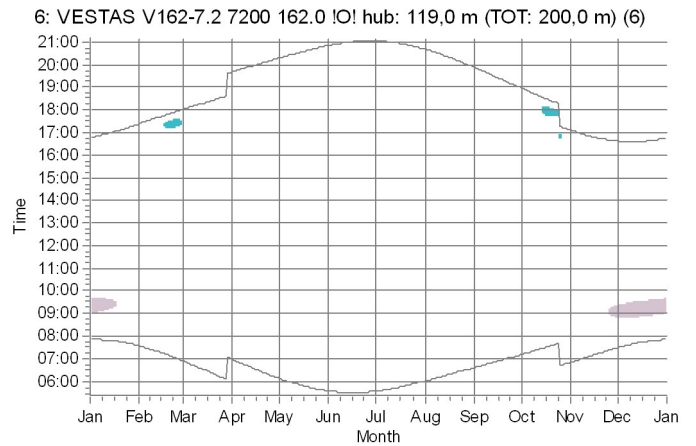
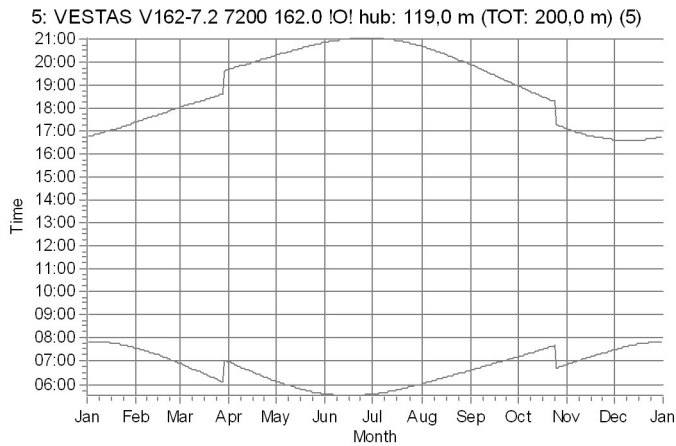
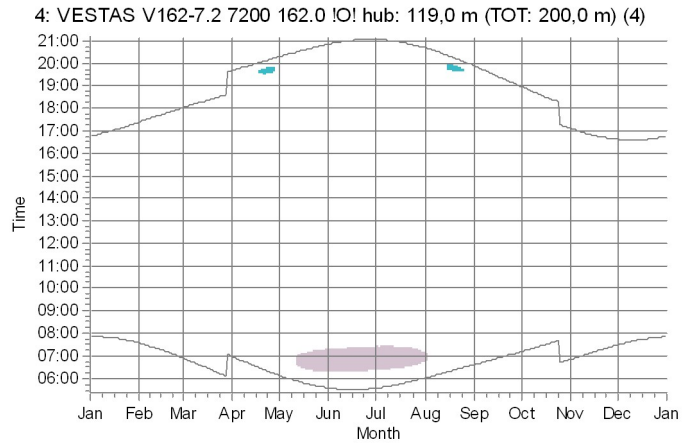
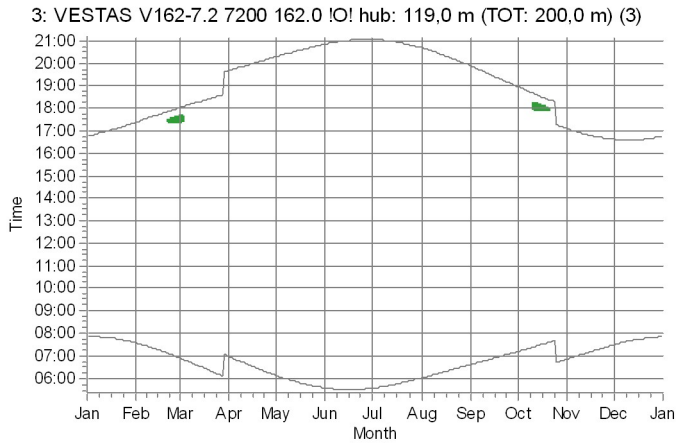
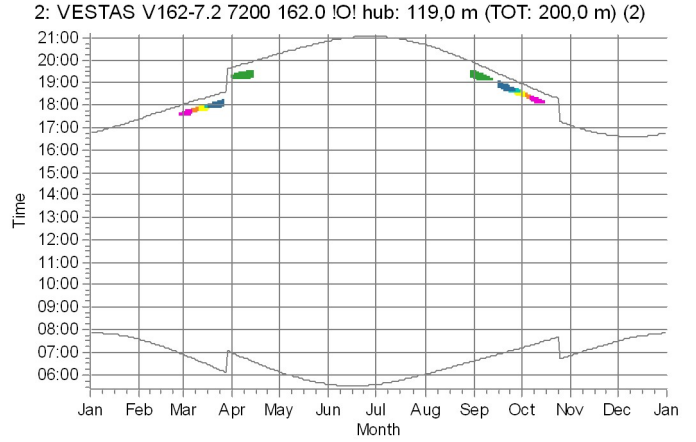
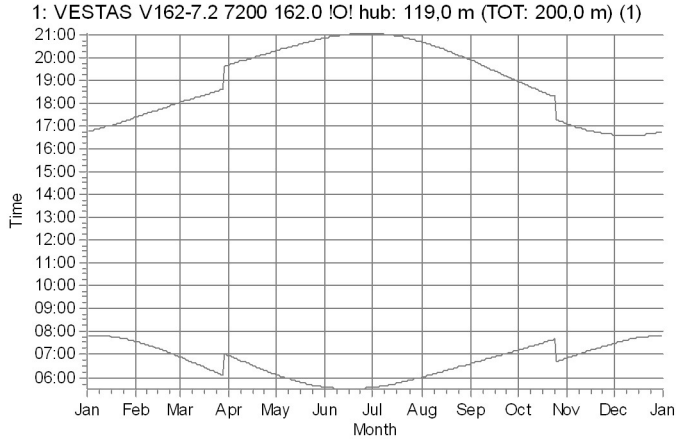
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
446 558 709 537 307 224 366 1.786 992 318 487 496 7.226

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:50 16:45	07:34 17:23	06:53 18:01	06:58 19:41	06:07 20:17	05:34 20:51	05:34 21:02	06:01 20:40	06:36 19:53	07:11 18:57	06:50 17:05	07:29 16:37
2	07:51 16:46	07:33 17:24	06:52 18:03	06:56 19:42	06:06 20:19	05:34 20:52	05:34 21:02	06:02 20:39	06:37 19:51	07:12 18:55	06:52 17:04	07:30 16:37
3	07:51 16:47	07:32 17:26	06:50 18:04	06:54 19:43	06:04 20:20	05:33 20:52	05:35 21:02	06:03 20:38	06:39 19:49	07:13 18:53	06:53 17:03	07:31 16:36
4	07:51 16:48	07:30 17:27	06:48 18:05	06:52 19:44	06:03 20:21	05:33 20:53	05:36 21:02	06:04 20:37	06:40 19:47	07:15 18:52	06:54 17:01	07:32 16:36
5	07:50 16:49	07:29 17:29	06:47 18:07	06:50 19:46	06:01 20:22	05:32 20:54	05:36 21:02	06:05 20:35	06:41 19:45	07:16 18:50	06:56 17:00	07:34 16:36
6	07:50 16:50	07:28 17:30	06:45 18:08	06:49 19:47	06:00 20:23	05:32 20:55	05:37 21:01	06:06 20:34	06:42 19:44	07:17 18:48	06:57 16:59	07:35 16:36
7	07:50 16:51	07:27 17:31	06:43 18:09	06:47 19:48	05:59 20:25	05:31 20:55	05:37 21:01	06:07 20:33	06:43 19:42	07:18 18:46	06:58 16:58	07:36 16:36
8	07:50 16:52	07:25 17:33	06:41 18:11	06:45 19:49	05:57 20:26	05:31 20:56	05:38 21:00	06:09 20:31	06:44 19:40	07:20 18:44	07:00 16:56	07:37 16:35
9	07:50 16:53	07:24 17:34	06:40 18:12	06:43 19:50	05:56 20:27	05:31 20:57	05:39 21:00	06:10 20:30	06:45 19:38	07:21 18:43	07:01 16:55	07:38 16:35
10	07:50 16:54	07:23 17:36	06:38 18:13	06:41 19:52	05:55 20:28	05:31 20:57	05:40 21:00	06:11 20:28	06:47 19:36	07:22 18:41	07:02 16:54	07:38 16:35
11	07:49 16:56	07:21 17:37	06:36 18:14	06:40 19:53	05:53 20:29	05:30 20:58	05:40 20:59	06:12 20:27	06:48 19:34	07:23 18:39	07:04 16:53	07:39 16:35
12	07:49 16:57	07:20 17:38	06:34 18:16	06:38 19:54	05:52 20:30	05:30 20:58	05:41 20:59	06:13 20:26	06:49 19:33	07:24 18:37	07:05 16:52	07:40 16:35
13	07:49 16:58	07:19 17:40	06:32 18:17	06:36 19:55	05:51 20:32	05:30 20:59	05:42 20:58	06:14 20:24	06:50 19:31	07:26 18:36	07:06 16:51	07:41 16:36
14	07:48 16:59	07:17 17:41	06:31 18:18	06:34 19:57	05:50 20:33	05:30 20:59	05:43 20:57	06:15 20:23	06:51 19:29	07:27 18:34	07:08 16:50	07:42 16:36
15	07:48 17:00	07:16 17:42	06:29 18:20	06:33 19:58	05:49 20:34	05:30 21:00	05:44 20:57	06:17 20:21	06:52 19:27	07:28 18:32	07:09 16:49	07:43 16:36
16	07:47 17:02	07:14 17:44	06:27 18:21	06:31 19:59	05:48 20:35	05:30 21:00	05:45 20:56	06:18 20:19	06:54 19:25	07:29 18:30	07:10 16:48	07:43 16:36
17	07:47 17:03	07:13 17:45	06:25 18:22	06:29 20:00	05:47 20:36	05:30 21:01	05:45 20:55	06:19 20:18	06:55 19:23	07:31 18:29	07:12 16:47	07:44 16:36
18	07:46 17:04	07:11 17:47	06:23 18:23	06:28 20:01	05:45 20:37	05:30 21:01	05:46 20:54	06:20 20:16	06:56 19:21	07:32 18:27	07:13 16:46	07:45 16:37
19	07:45 17:05	07:10 17:48	06:21 18:25	06:26 20:03	05:44 20:38	05:30 21:01	05:47 20:54	06:21 20:15	06:57 19:19	07:33 18:25	07:14 16:45	07:46 16:37
20	07:45 17:07	07:08 17:49	06:20 18:26	06:24 20:04	05:43 20:39	05:30 21:02	05:48 20:53	06:22 20:13	06:58 19:18	07:35 18:24	07:16 16:44	07:46 16:37
21	07:44 17:08	07:07 17:51	06:18 18:27	06:23 20:05	05:42 20:40	05:30 21:02	05:49 20:52	06:23 20:11	06:59 19:16	07:36 18:22	07:17 16:43	07:47 16:38
22	07:43 17:09	07:05 17:52	06:16 18:28	06:21 20:06	05:42 20:41	05:31 21:02	05:50 20:51	06:25 20:10	07:00 19:14	07:37 18:21	07:18 16:42	07:47 16:38
23	07:42 17:11	07:03 17:53	06:14 18:30	06:19 20:08	05:41 20:42	05:31 21:02	05:51 20:50	06:26 20:08	07:02 19:12	07:38 18:19	07:19 16:42	07:48 16:39
24	07:42 17:12	07:02 17:55	06:12 18:31	06:18 20:09	05:40 20:43	05:31 21:02	05:52 20:49	06:27 20:06	07:03 19:10	07:40 18:17	07:21 16:41	07:48 16:39
25	07:41 17:13	07:00 17:56	06:10 18:32	06:16 20:10	05:39 20:44	05:31 21:03	05:53 20:48	06:28 20:05	07:04 19:08	06:41 17:16	07:22 16:40	07:49 16:40
26	07:40 17:15	06:59 17:57	06:09 18:33	06:15 20:11	05:38 20:45	05:32 21:03	05:54 20:47	06:29 20:03	07:05 19:06	06:42 17:14	07:23 16:40	07:49 16:41
27	07:39 17:16	06:57 17:59	06:07 18:34	06:13 20:12	05:37 20:46	05:32 21:03	05:55 20:46	06:30 20:01	07:06 19:05	06:44 17:13	07:24 16:39	07:49 16:41
28	07:38 17:17	06:55 18:00	06:05 18:36	06:11 20:14	05:37 20:47	05:32 21:03	05:56 20:45	06:32 20:00	07:08 19:03	06:45 17:11	07:26 16:39	07:50 16:42
29	07:37 17:19		07:03 19:37	06:10 20:15	05:36 20:48	05:33 21:03	05:57 20:44	06:33 19:58	07:09 19:01	06:46 17:10	07:27 16:38	07:50 16:43
30	07:36 17:20		07:01 19:38	06:08 20:16	05:35 20:49	05:33 21:03	05:59 20:43	06:34 19:56	07:10 18:59	06:48 17:08	07:28 16:38	07:50 16:43
31	07:35 17:22		06:59 19:39		05:35 20:50		06:00 20:42	06:35 19:54		06:49 17:07		07:50 16:44
Potential sun hours	288	292	369	403	458	464	470	434	376	342	290	277
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0









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

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

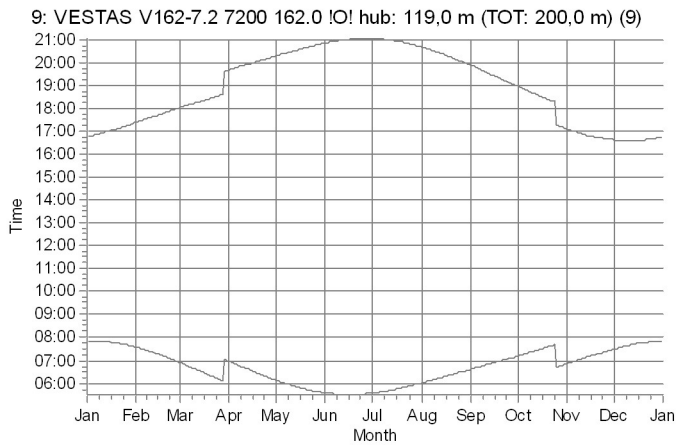
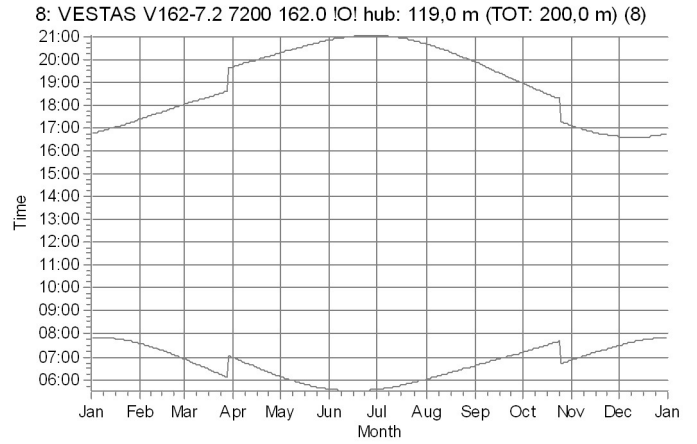
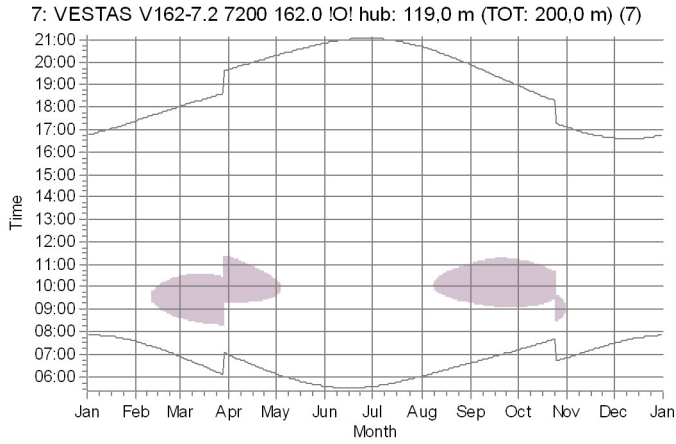
SHADOW - Calendar per WTG, graphical



Shadow receptors

 B: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (2)	 U: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (24)	 X: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (27)
 S: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (21)	 V: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (25)	 Y: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (28)
 T: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (22)	 W: Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (26)	

SHADOW - Calendar per WTG, graphical



Shadow receptors

Y: Shadow Receptor: 1.0 x 1.0 Azimuth: 0.0° Slope: 90,0° (28)