

IMPIANTO DI PRODUZIONE DI ENERGIA DA FONTE EOLICA
POTENZA NOMINALE 34,5 MW

REGIONE PUGLIA
PROVINCIA di BRINDISI
COMUNE di BRINDISI
Località: Santa Teresa, Specchione, Pozzella, Scolpito

PROGETTO DEFINITIVO
Id AU 8G4G710

Tav.:

R29

Titolo:

ANALISI EVOLUZIONE DELL'OMBRA
INDOTTA DAGLI AEROGENERATORI
SHADOW FLICKERING

Scala:

Formato Stampa:

Codice Identificatore Elaborato

N.A.

A4

8G4G710_DocumentazioneSpecialistica_29

Progettazione:

Committente:

STC S.r.l.



Via V. M. STAMPACCHIA, 48 - 73100 Lecce
Tel. +39 0832 1798355
studiocalcarella@gmail.com - fabio.calcarella@gmail.com

Direttore Tecnico: Dott. Ing. Fabio CALCARELLA



TOZZIgreen

Via Brigata Ebraica, 50 - 48123 Mezzano (RA)
Tel. +39 0544 525311 - Fax +39 0544 525319
pec: tozzi.re@legalmail.it - www.tozziholding.com

Data	Motivo della revisione:	Redatto:	Controllato:	Approvato:
31 luglio 2017	Prima emissione	STC	FC	TOZZI GREEN S.p.a.

1. SHADOW FLICKERING

Lo shadowflickering 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 ricettore, dell'ombra prodotta dalle pale in rotazione degli aerogeneratori.

Dal punto di vista di un ricettore, lo *shadowflickering* si manifesta in una variazione ciclica dell'intensità luminosa: in presenza di luce solare diretta, un ricettore 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 ricettore 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 ricettore-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 ricettore sia un'abitazione, perché si generi lo *shadow flickering* le finestre dovrebbero essere orientate perpendicolarmente alla linea ricettore-aerogeneratore e non affacciarsi su ostacoli (alberi, altri edifici, ecc.);
- la turbina sia orientata in modo che il rotore risulti perpendicolare alla linea sole-ricettore: quando il piano del rotore è perpendicolare alla linea sole-ricettore, l'ombra proiettata dalle pale risulta muoversi all'interno di un "cerchio" che riferisce all'circonferenza del rotore inducendo uno *shadow flickering* non trascurabile;
- per situazioni in cui, dal punto di vista del ricettore, il piano del rotore risulti essere in linea con il sole ed il ricettore, 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 $15^\circ - 20^\circ$;
- le pale siano in movimento;
- turbina e ricettore 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 ricettore, così che una porzione ampia di pale copra il sole (così come osservato dal punto di vista del ricettore), l'intensità del flicker risulta maggiore. All'aumentare della distanza tra turbina e ricettore, le pale coprono una porzione sempre più piccola del sole, inducendo un flicker di minore entità. Inoltre il fenomeno risulta di bassa entità quando l'ombra proiettata sul ricettore è indotta dall'estremità delle pale (rotor tip); raggiunge il massimo dell'intensità in corrispondenza dell'attacco di pala all'hub.

Pertanto, in riferimento a quanto sin qui esposto, durata ed entità dello Shadow flickering sono determinate e 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.

2. CALCOLO DELL'OMBRA

Lo shadowflickering consiste in una variazione periodica dell'intensità luminosa osservata, causata dalla

Al fine di verificare la sussistenza del fenomeno dello shadow flickering indotto dalle opere in progetto sono state effettuate simulazioni in considerazione:

- del diagramma solare riferito alla latitudine di installazione del parco;
- dell'altezza complessiva di macchina, intesa quale somma tra l'altezza del mozzo e l'altezza di pala;
- dall'orientamento del rotore rispetto al ricettore;
- della posizione del sole e quindi della proiezione dell'ombra rispetto ai recettori;
- della posizione dei possibili recettori.

Le simulazioni effettuate con l'ausilio del programma windPRO facendo le seguenti assunzioni:

- la massima distanza di influenza pari a 1.720 m è stata calcolata solo quando più del 20% del sole è coperto dalla pala;
- altezza minima del sole sull'orizzonte 3°;
- probabilità di sole per Brindisi (probabilità di ore di sole al giorno), secondo quanto riportato in tabella

Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

- le ore di funzionamento dell'impianto, in relazione anche alla direzione del vento, sono state calcolate sulla base di dati statistici elaborati dallo stesso programma. Si rammenta a tal proposito che windPRO è uno dei programmi più utilizzati per il calcolo della producibilità degli impianti eolici
- un aerogeneratore è stato considerato visibile quando è completamente visibile dalle finestre del ricettore
- sono stati individuati nell'area di impianto 11 ricettori sensibili (edifici rurali abitati), rispetto ai quali è stato effettuato il calcolo
- non sono stati considerati eventuali ostacoli interposti tra i recettori e la turbina eolica

- la simulazione è stata altresì condotta non considerando l'orografia del terreno in quanto non ha una influenza significativa sulla proiezione delle ombre per via dell'andamento piano altimetrico praticamente piatto dell'area di esame.

Il programma effettua il calcolo delle ore del giorno in cui si potrebbe avere l'effetto del flickering sul ricettore, facendo la somma dei minuti. Effettua poi la somma teorica dei minuti di ciascun mese (worst case) che poi viene ridotta in considerazione delle giornate soleggiate, dell'operatività effettiva dell'impianto eolico, della direzione del vento.

Si ottengono così i dati sinteticamente riportati in tabella per ciascun ricettore individuato.

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
A	8	3-25 marzo	6-7 del mattino	37 min	150
A	8	18-30 settembre	7-8 del mattino	37 min	122
A	8	1-11 ottobre	7-8 del mattino	36 min	83

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
B	NESSUNO	NESSUNO			0

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
C	NESSUNO	NESSUNO			0

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
D	4	20-31 gennaio	7-8 del mattino	39 min	85 min
D	4	1-23 febbraio	7-8 del mattino	43 min	216 min
D	5	4-16 aprile	6-7 del mattino	19 min	36 min
D	5	27-31 agosto	6-7 del mattino	19 min	20 min
D	5	1-8 settembre	6-7 del mattino	19 min	28 min
D	4	19-31 ottobre	7-8 del mattino	42 min	139 min
D	4	1-22 novembre	7-8 del mattino	44min	222min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
E	4	1 gen-2feb	7-8 del mattino	47min	373min
E	5	27mar-10 apr	6-7 del mattino	20min	45min
E	5	2-15 settembre	6-7 del mattino	20min	58min
E	4	9nov-31dic	7-8 del mattino	47min	673min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
F	5	4-19 marzo	6-7 del mattino	25min	63min
F	5	24sett-9ott	7-8mattino	25min	84min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
G	5	13mar-5 apr	6-8 del mattino	38min	156min
G	6	16-29apr	6-7mattino	19min	48min
G	6	14-27ago	6-7mattino	18min	47min
G	5	7sett-1ott	7-8 mattino	38min	232min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
H	6	26feb-11mar	6-7 del mattino	21min	47min
H	7	23mar-9apr	5-7 pomeriggio	28min	88min
H	7	3-20sett	6-7pomeriggio	28min	115min
H	6	2-16ott	7-8mattino	22min	61min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
I	6	10-24feb	7-8 del mattino	21min	50min
I	7	3-20mar	5-6 pomeriggio	28min	63min
I	7	24sett-11ott	5-7 pomeriggio	28min	96min
I	6	18ott-1nov	5-7 pomeriggio	21min	54min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
L	6	27gen-27feb	7-8 del mattino	43min	276min
L	8	3giu-10lug	7-8 pomeriggio	19min	239min
L	6	15ott-15nov	8-9 della sera	44min	337min

RICETTORE	AEROGENERATORE (che genera il flickering)	PERIODO	ORARIO	DURATA MASSIMA NEL PERIODO	MINUTI REALI TOTALI NEL PERIODO
M	1	8apr-4mag	6-7 pomeriggio	37min	203min
M	1	8ago-4sett	6-8 pomeriggio	37min	283min

3. CONCLUSIONI

L'effetto dello shadow flickering sui potenziali ricettori presenti nell'area è trascurabile, poiché

- Si presenta per periodi limitati dell'anno;
- Si presenta per un periodo molto limitato di minuti durante la giornata, tipicamente tra le 6 e le 7 del mattino o tra le 7 e le otto del mattino, e tipicamente per circa mezz'ora;
- Inoltre studi scientifici hanno accertato che frequenze inferiori a 10 Hz non hanno alcuna correlazione con attacchi di natura epilettica, mentre nel caso in esame l'effetto dell'ombra ha nel caso peggiore una frequenza di 0.8 Hz.

Infine per quanto attiene all'ombra che si manifesta sulla SP exSS605 notiamo che:

- Date le latitudini l'ombra non può generare ghiaccio sulla sede stradale;
- È interessato dal fenomeno un tratto stradale molto breve (circa 2 km), e solo un tratto di un centinaio di metri per oltre 25 ore l'anno.

Riteniamo, che anche in questo caso l'effetto dello shadow flickering, sia irrilevante.

Project:

Brindisi

Licensed user:

KenTec Denmark ApS
 Rosenstien 12
 DK-8800 Viborg
 +45 8663 8139
 Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk
 Calculated:
 15-07-2017 14:21/3.1.617

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) [BRINDISI]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational hours are calculated from WTGs in calculation and wind distribution:
 Site data: WAsP (2)

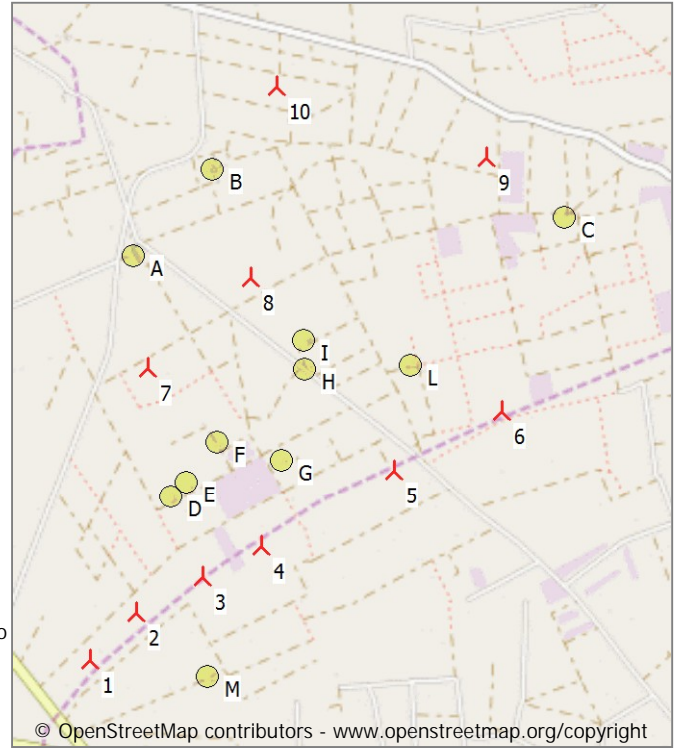
Operational time
 N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373
 Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
 Height contours used: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo
 Obstacles used in calculation
 Eye height: 1,5 m
 Grid resolution: 10,0 m

All coordinates are in
 UTM (north)-WGS84 Zone: 33

WTGs

No.	Easting	Northing	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 [RPM]
1	744.440	4.486.337	70,0	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
2	744.739	4.486.657	70,0	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
3	745.171	4.486.909	68,7	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
4	745.552	4.487.120	65,0	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
5	746.414	4.487.653	63,8	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
6	747.115	4.488.069	60,0	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
7	744.759	4.488.279	65,0	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
8	745.423	4.488.901	62,7	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
9	746.960	4.489.746	60,0	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4
10	745.555	4.490.174	64,4	VESTAS V126-3.45 LTq 3450 12...Yes	Yes	VESTAS	V126-3.45 LTq-3.450	3.450	126,0	117,0	1.720	13,4



Scale 1:50.000
 New WTG Shadow receptor

Shadow receptor-Input

No.	Easting	Northing	Z	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
A	744.643	4.489.019	65,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
B	745.146	4.489.609	65,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
C	747.490	4.489.371	58,6	1,0	1,0	1,0	0,0	90,0	"Green house mode"
D	744.941	4.487.437	65,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
E	745.044	4.487.530	65,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
F	745.235	4.487.804	65,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
G	745.665	4.487.700	65,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
H	745.803	4.488.311	62,5	1,0	1,0	1,0	0,0	90,0	"Green house mode"
I	745.787	4.488.501	61,7	1,0	1,0	1,0	0,0	90,0	"Green house mode"
L	746.500	4.488.358	60,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
M	745.223	4.486.250	70,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Main Result

Calculation Results

Shadow receptor

Shadow, expected values

No. Shadow hours

per year
[h/year]

A	5:54
B	0:00
C	0:00
D	12:25
E	19:08
F	2:27
G	7:54
H	5:08
I	4:21
L	14:12
M	8:06

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (1)	26:28	8:06
2	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (2)	0:00	0:00
3	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (3)	0:00	0:00
4	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (4)	98:51	28:03
5	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (5)	40:50	10:30
6	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (6)	57:01	15:19
7	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (7)	25:48	5:43
8	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (8)	31:44	9:54
9	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (9)	0:00	0:00
10	VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (10)	0:00	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.

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

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) [BRINDISI]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	07:11 (8) 16:47	06:18 16:23
2	07:13 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	07:11 (8) 16:46	06:19 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:46 (8) 06:59 (8)	06:31 19:15	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	07:11 (8) 16:44	06:20 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:42 (8) 07:02 (8)	06:29 19:16	05:46 19:47	05:20 20:15	05:20 20:23	05:48 20:02	06:18 19:18	07:11 (8) 16:43	06:21 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:40 (8) 07:04 (8)	06:28 19:17	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:01	06:19 19:16	07:11 (8) 16:42	06:22 16:22
6	07:13 16:37	06:55 17:12	06:17 17:45	06:38 (8) 07:05 (8)	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:23	05:50 19:59	06:20 19:15	07:12 (8) 16:41	06:24 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:37 (8) 07:07 (8)	06:25 19:19	05:42 19:50	05:20 20:17	05:25 20:22	05:51 19:58	06:21 19:13	07:13 (8) 16:40	06:25 16:22
8	07:13 16:39	06:52 17:15	06:14 17:47	06:36 (8) 07:07 (8)	06:23 19:20	05:41 19:51	05:19 20:18	05:26 20:22	05:52 19:57	06:22 19:11	07:14 (8) 16:39	06:26 16:22
9	07:12 16:40	06:51 17:16	06:12 17:48	06:35 (8) 07:08 (8)	06:21 19:21	05:40 19:52	05:18 20:18	05:26 19:56	05:53 19:10	06:23 18:20	07:17 (8) 16:38	06:27 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:34 (8) 07:08 (8)	06:20 19:22	05:39 19:53	05:18 20:18	05:27 20:21	05:54 19:55	06:24 19:08	07:19 (8) 16:37	06:28 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:33 (8) 07:08 (8)	06:18 19:23	05:37 19:54	05:18 20:19	05:27 20:21	05:55 19:53	06:25 19:06	07:22 (8) 16:36	06:30 16:22
12	07:12 16:43	06:48 17:19	06:07 17:52	06:33 (8) 07:09 (8)	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:05	07:32 (8) 16:31	06:31 16:22
13	07:12 16:44	06:46 17:21	06:06 17:53	06:32 (8) 07:08 (8)	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	07:33 (8) 16:34	06:32 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:31 (8) 07:08 (8)	06:14 19:26	05:34 19:57	05:18 20:20	05:30 20:19	05:58 19:49	06:28 19:01	07:34 (8) 16:33	06:33 16:23
15	07:11 16:46	06:44 17:23	06:02 17:55	06:32 (8) 07:08 (8)	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:59 19:48	06:29 19:00	07:35 (8) 16:32	06:34 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:31 (8) 07:07 (8)	06:11 19:28	05:32 19:59	05:18 20:21	05:31 20:18	06:00 19:47	06:30 18:58	07:36 (8) 16:31	06:35 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:31 (8) 07:06 (8)	06:09 19:29	05:31 20:00	05:18 20:22	05:32 20:18	06:01 19:45	06:31 18:56	07:37 (8) 16:31	06:37 16:23
18	07:10 16:49	06:40 17:27	05:57 17:58	06:32 (8) 07:06 (8)	06:08 19:30	05:31 20:01	05:18 20:22	05:33 20:17	06:02 19:44	06:32 18:55	07:38 (8) 16:30	06:38 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:32 (8) 07:04 (8)	06:06 19:31	05:30 20:02	05:18 20:22	05:34 20:16	06:02 19:42	06:33 18:53	07:39 (8) 16:29	06:39 16:24
20	07:09 16:52	06:37 17:29	05:54 18:00	06:33 (8) 07:04 (8)	06:05 19:32	05:29 20:03	05:18 20:23	05:34 20:16	06:03 19:41	06:34 18:51	07:40 (8) 16:28	06:40 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	06:34 (8) 07:02 (8)	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:41 (8) 16:27	06:41 16:25
22	07:07 16:54	06:35 17:31	05:51 18:02	06:34 (8) 07:00 (8)	06:02 19:34	05:27 20:04	05:19 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:42 (8) 16:27	06:42 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:36 (8) 06:58 (8)	06:00 19:35	05:27 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:43 (8) 16:27	06:43 16:26
24	07:06 16:56	06:32 17:34	05:48 18:04	06:38 (8) 06:55 (8)	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:13	06:07 19:35	06:37 18:44	07:44 (8) 16:26	06:45 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	06:41 (8) 06:51 (8)	05:57 19:38	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	07:45 (8) 16:25	06:46 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	06:51 (8) 06:56 (8)	05:54 19:39	05:24 20:08	05:20 20:24	05:40 20:11	06:09 19:32	06:39 18:41	07:46 (8) 16:25	06:47 16:28
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:54 20:09	05:24 20:24	05:20 20:10	05:40 20:10	06:10 19:30	06:40 18:39	07:47 (8) 16:25	06:48 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:10	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	07:12 (8) 16:52	07:48 (8) 16:24	06:49 16:29
29	07:02 17:02	06:25 19:09	05:40 19:09	05:52 19:42	05:23 20:10	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	07:13 (8) 16:51	07:49 (8) 16:24	06:50 16:30
30	07:01 17:03	06:24 19:11	05:38 19:11	05:51 19:43	05:22 20:11	05:21 20:24	05:43 20:07	06:13 19:26	06:43 18:34	07:14 (8) 16:49	07:50 (8) 16:23	06:51 16:30
31	07:00 17:05	06:23 19:12	05:36 19:12	05:52 20:12	05:21 20:12	05:20 20:24	05:44 20:06	06:14 19:24	06:44 18:24	07:15 (8) 16:48	07:51 (8) 16:23	06:52 16:31
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	290
Total, worst case			663						370	307		
Sun reduction			0,44						0,63	0,52		
Oper. time red.			0,96						0,96	0,96		
Wind dir. red.			0,54						0,54	0,54		
Total reduction			0,23						0,33	0,27		
Total, real			150						122	83		

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS
 Rosenstien 12
 DK-8800 Viborg
 +45 8663 8139
 Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk
 Calculated:
 15-07-2017 14:21/3.1.617

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) [BRINDISI]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	06:18 16:47	06:52 16:23
2	07:13 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	06:20 16:44	06:54 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:45 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	06:55 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:01	06:19 19:16	06:48 18:26	06:22 16:42	06:56 16:22
6	07:13 16:37	06:55 17:12	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:23	05:50 19:59	06:20 19:14	06:49 18:25	06:24 16:41	06:57 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	06:25 16:40	06:58 16:22
8	07:13 16:39	06:52 17:15	06:13 17:47	06:23 19:20	05:41 19:51	05:19 20:17	05:25 20:22	05:52 19:57	06:22 19:11	06:51 18:21	06:26 16:39	06:59 16:22
9	07:12 16:39	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:10	06:53 18:20	06:27 16:38	07:00 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 19:22	05:39 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:54 18:18	06:28 16:37	07:01 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	05:37 19:54	05:18 20:19	05:27 20:21	05:55 19:53	06:25 19:06	06:55 18:17	06:29 16:36	07:01 16:22
12	07:12 16:43	06:48 17:19	06:07 17:52	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:05	06:56 18:15	06:31 16:35	07:02 16:22
13	07:12 16:44	06:46 17:21	06:06 17:53	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	06:57 18:13	06:32 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	05:34 19:57	05:18 20:20	05:30 20:19	05:58 19:49	06:28 19:01	06:58 18:12	06:33 16:33	07:04 16:23
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:59 19:48	06:29 19:00	06:59 18:10	06:34 16:32	07:05 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:11 19:28	05:32 19:59	05:18 20:21	05:31 20:18	06:00 19:47	06:30 18:58	07:00 18:09	06:35 16:31	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:31 20:00	05:18 20:22	05:32 20:18	06:01 19:45	06:31 18:56	07:01 18:07	06:37 16:31	07:06 16:23
18	07:10 16:49	06:40 17:27	05:57 17:58	06:07 19:30	05:31 20:01	05:18 20:22	05:33 20:17	06:01 19:44	06:32 18:55	07:02 18:06	06:38 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	05:18 20:22	05:34 20:16	06:02 19:42	06:33 18:53	07:03 18:04	06:39 16:29	07:07 16:24
20	07:09 16:51	06:37 17:29	05:54 18:00	06:05 19:32	05:29 20:03	05:18 20:23	05:34 20:16	06:03 19:41	06:33 18:51	07:04 18:03	06:40 16:28	07:08 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:02	06:41 16:28	07:08 16:25
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:18 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	06:42 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:26 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:08 17:59	06:43 16:27	07:09 16:26
24	07:06 16:56	06:32 17:34	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:13	06:07 19:35	06:37 18:44	07:09 17:57	06:45 16:26	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	06:10 16:56	06:46 16:25	07:10 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:39	05:24 20:08	05:20 20:24	05:40 20:11	06:09 19:32	06:39 18:41	06:11 16:55	06:47 16:25	07:11 16:28
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:09	05:20 20:24	05:40 20:10	06:10 19:30	06:40 18:39	06:12 16:53	06:48 16:25	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	06:13 16:52	06:49 16:24	07:11 16:29
29	07:02 17:02	06:25 19:09	05:40 19:42	05:52 20:10	05:23 20:24	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	06:14 16:51	06:50 16:24	07:12 16:30
30	07:01 17:03	06:38 19:11	05:51 19:43	05:22 20:11	05:21 20:24	05:21 20:24	05:43 20:07	06:13 19:26	06:43 18:34	06:16 16:49	06:51 16:23	07:12 16:30
31	07:00 17:05	06:36 19:12	05:50 19:42	05:21 20:12	05:21 20:24	05:21 20:24	05:44 20:06	06:14 19:24	06:17 16:48	06:17 16:48	06:51 16:31	07:12 16:31
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

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) [BRINDISI]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	06:59 17:06	06:24 17:39	06:34 19:12	05:49 19:44	05:21 20:12	05:21 20:23	05:45 20:05	06:15 19:22	06:44 18:33	06:18 16:47	06:52 16:23
2	07:12 16:33	06:58 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:20 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:41	06:31 19:15	05:47 19:46	05:20 20:14	05:22 20:23	05:47 20:03	06:17 19:19	06:46 18:29	06:20 16:44	06:54 16:22
4	07:13 16:35	06:57 17:09	06:20 17:43	06:29 19:16	05:45 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	06:55 16:22
5	07:13 16:36	06:55 17:11	06:18 17:44	06:28 19:17	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:00	06:19 19:16	06:48 18:26	06:22 16:42	06:56 16:22
6	07:13 16:36	06:54 17:12	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:22	05:50 19:59	06:20 19:14	06:49 18:24	06:24 16:41	06:57 16:22
7	07:13 16:37	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	06:25 16:40	06:58 16:22
8	07:12 16:38	06:52 17:14	06:13 17:47	06:23 19:20	05:41 19:51	05:18 20:17	05:25 20:22	05:52 19:57	06:22 19:11	06:51 18:21	06:26 16:39	06:59 16:22
9	07:12 16:39	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:09	06:52 18:20	06:27 16:38	07:00 16:22
10	07:12 16:40	06:50 17:17	06:10 17:49	06:20 19:22	05:38 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:53 18:18	06:28 16:37	07:01 16:22
11	07:12 16:41	06:49 17:18	06:09 17:50	06:18 19:23	05:37 19:54	05:18 20:19	05:27 20:21	05:55 19:53	06:25 19:06	06:55 18:16	06:29 16:36	07:01 16:22
12	07:12 16:42	06:48 17:19	06:07 17:51	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:04	06:56 18:15	06:31 16:35	07:02 16:22
13	07:11 16:44	06:46 17:20	06:05 17:52	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:56 19:50	06:27 19:03	06:57 18:13	06:32 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:13 19:26	05:34 19:57	05:18 20:20	05:29 20:19	05:57 19:49	06:28 19:01	06:58 18:12	06:33 16:33	07:04 16:22
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:58 19:48	06:29 18:59	06:59 18:10	06:34 16:32	07:04 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:10 19:28	05:32 19:59	05:18 20:21	05:31 20:18	05:59 19:46	06:30 18:58	07:00 18:09	06:35 16:31	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:31 20:00	05:18 20:21	05:32 20:18	06:00 19:45	06:30 18:56	07:01 18:07	06:36 16:31	07:06 16:23
18	07:09 16:49	06:40 17:26	05:57 17:58	06:07 19:30	05:30 20:01	05:18 20:22	05:33 20:17	06:01 19:44	06:31 18:54	07:02 18:06	06:38 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:01	05:18 20:22	05:33 20:16	06:02 19:42	06:32 18:53	07:03 18:04	06:39 16:29	07:07 16:24
20	07:08 16:51	06:37 17:29	05:54 18:00	06:04 19:32	05:29 20:02	05:18 20:22	05:34 20:16	06:03 19:41	06:33 18:51	07:04 18:03	06:40 16:28	07:08 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:01	06:41 16:28	07:08 16:25
22	07:07 16:54	06:34 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:18 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	06:42 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:26 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:07 17:59	06:43 16:26	07:09 16:26
24	07:06 16:56	06:32 17:33	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:12	06:07 19:35	06:37 18:44	07:09 17:57	06:44 16:26	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	06:10 16:56	06:46 16:25	07:10 16:27
26	07:04 16:58	06:29 17:36	05:44 18:06	05:56 19:38	05:24 20:08	05:19 20:23	05:39 20:11	06:09 19:32	06:39 18:41	06:11 16:54	06:47 16:25	07:11 16:28
27	07:04 17:00	06:27 17:37	05:42 18:07	05:54 19:39	05:24 20:09	05:20 20:23	05:40 20:10	06:10 19:30	06:40 18:39	06:12 16:53	06:48 16:24	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:40	05:23 20:09	05:20 20:23	05:41 20:09	06:11 19:29	06:41 18:38	06:13 16:52	06:49 16:24	07:11 16:29
29	07:02 17:02	06:39 19:09	05:52 19:42	05:22 20:10	05:22 20:23	05:21 20:23	05:42 20:08	06:12 19:27	06:42 18:36	06:14 16:51	06:50 16:24	07:12 16:30
30	07:01 17:03	06:37 19:10	05:50 19:43	05:22 20:11	05:22 20:23	05:21 20:23	05:43 20:07	06:13 19:26	06:43 18:34	06:15 16:49	06:51 16:23	07:12 16:30
31	07:00 17:05	06:36 19:11	05:49 19:11	05:21 20:12	05:21 20:12	05:21 20:12	05:44 20:06	06:14 19:24	06:17 16:48	06:17 16:48	07:12 16:31	07:12 16:31
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	290
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

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) [BRINDISI]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June
1	07:12 16:32	07:00 17:06	07:29 (4) 08:09 (4)	06:24 17:39	06:34 19:13	05:49 20:13
2	07:13 16:33	06:59 17:07	07:29 (4) 08:09 (4)	06:23 17:40	06:33 19:14	05:48 20:13
3	07:13 16:34	06:58 17:08	07:28 (4) 08:10 (4)	06:21 17:42	06:31 19:15	05:47 20:14
4	07:13 16:35	06:57 17:10	07:28 (4) 08:10 (4)	06:20 17:43	06:29 19:16	05:46 20:15
5	07:13 16:36	06:56 17:11	07:28 (4) 08:11 (4)	06:18 17:44	06:28 19:17	05:44 20:15
6	07:13 16:37	06:55 17:12	07:28 (4) 08:11 (4)	06:17 17:45	06:26 19:18	05:43 20:16
7	07:13 16:38	06:53 17:13	07:28 (4) 08:12 (4)	06:15 17:46	06:25 19:19	05:42 20:17
8	07:13 16:39	06:52 17:15	07:29 (4) 08:12 (4)	06:14 17:47	06:23 19:20	05:41 20:17
9	07:12 16:40	06:51 17:16	07:29 (4) 08:12 (4)	06:12 17:48	06:21 19:21	05:40 20:18
10	07:12 16:41	06:50 17:17	07:28 (4) 08:11 (4)	06:10 17:49	06:20 19:22	05:39 20:18
11	07:12 16:42	06:49 17:18	07:29 (4) 08:11 (4)	06:09 17:50	06:18 19:23	05:37 20:19
12	07:12 16:43	06:48 17:19	07:29 (4) 08:11 (4)	06:07 17:52	06:17 19:24	05:36 20:19
13	07:11 16:44	06:46 17:21	07:30 (4) 08:11 (4)	06:06 17:53	06:15 19:25	05:35 20:20
14	07:11 16:45	06:45 17:22	07:30 (4) 08:09 (4)	06:04 17:54	06:14 19:26	05:34 20:20
15	07:11 16:46	06:44 17:23	07:31 (4) 08:09 (4)	06:02 17:55	06:12 19:27	05:33 20:21
16	07:10 16:47	06:43 17:24	07:32 (4) 08:08 (4)	06:01 17:56	06:11 19:28	05:32 20:21
17	07:10 16:48	06:41 17:25	07:32 (4) 08:06 (4)	05:59 17:57	06:09 19:29	05:30 20:22
18	07:10 16:49	06:40 17:27	07:34 (4) 08:06 (4)	05:57 17:58	06:08 19:30	05:31 20:22
19	07:09 16:50	06:39 17:28	07:36 (4) 08:04 (4)	05:56 17:59	06:06 19:31	05:30 20:22
20	07:09 16:52	07:42 (4) 07:51 (4)	06:37 17:29	05:54 18:00	06:05 19:32	05:29 20:22
21	07:08 16:53	07:38 (4) 07:54 (4)	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:23
22	07:07 16:54	07:37 (4) 07:57 (4)	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:23
23	07:07 16:55	07:36 (4) 07:59 (4)	06:33 17:32	05:49 18:03	06:00 19:35	05:27 20:23
24	07:06 16:56	07:34 (4) 08:00 (4)	06:32 17:34	05:48 18:04	05:59 19:36	05:26 20:23
25	07:05 16:57	07:34 (4) 08:03 (4)	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:23
26	07:05 16:59	07:33 (4) 08:04 (4)	06:29 17:36	05:44 18:06	05:56 19:39	05:24 20:23
27	07:04 17:00	07:32 (4) 08:05 (4)	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:24
28	07:03 17:01	07:31 (4) 08:06 (4)	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:24
29	07:02 17:02	07:30 (4) 08:07 (4)	06:25 17:39	05:40 19:09	05:52 19:42	05:23 20:24
30	07:01 17:04	07:30 (4) 08:07 (4)	06:24 17:40	05:39 19:11	05:51 19:43	05:22 20:23
31	07:00 17:05	07:29 (4) 08:08 (4)	06:23 17:41	05:38 19:12	05:50 19:13	05:22 20:12
Potential sun hours	299	298	370	398	447	450
Total, worst case	335	816			172	
Sun reduction	0,39	0,41			0,50	
Oper. time red.	0,96	0,96			0,96	
Wind dir. red.	0,67	0,67			0,43	
Total reduction	0,25	0,26			0,21	
Total, real	85	216			36	

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

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) [BRINDISI]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	July	August	September	October	November	December
1	05:22 20:23	05:45 20:05	06:15 19:23	06:36 (5) 19:06	06:44 18:33	06:18 16:47
2	05:22 20:23	05:46 20:04	06:16 19:21	06:37 (5) 18:59	06:45 18:31	06:19 16:46
3	05:23 20:23	05:47 20:03	06:17 19:19	06:38 (5) 18:57	06:46 18:29	06:20 16:45
4	05:23 20:23	05:48 20:02	06:18 19:18	06:39 (5) 18:56	06:47 18:28	06:21 16:43
5	05:24 20:23	05:49 20:01	06:19 19:16	06:39 (5) 18:54	06:48 18:26	06:22 16:42
6	05:24 20:23	05:50 19:59	06:20 19:14	06:40 (5) 18:53	06:49 18:25	06:24 16:41
7	05:25 20:22	05:51 19:58	06:21 19:13	06:41 (5) 18:51	06:50 18:23	06:25 16:40
8	05:26 20:22	05:52 19:57	06:22 19:11	06:42 (5) 18:50	06:51 18:21	06:26 16:39
9	05:26 20:22	05:53 19:56	06:23 19:10	06:43 (5) 18:48	06:52 18:20	06:27 16:38
10	05:27 20:21	05:54 19:54	06:24 19:08	06:44 (5) 18:47	06:53 18:18	06:28 16:37
11	05:28 20:21	05:55 19:53	06:25 19:06	06:45 (5) 18:45	06:54 18:17	06:29 16:36
12	05:28 20:20	05:56 19:52	06:26 19:05	06:46 (5) 18:44	06:55 18:15	06:30 16:35
13	05:29 20:20	05:57 19:51	06:27 19:03	06:47 (5) 18:42	06:56 18:14	06:31 16:34
14	05:30 20:19	05:58 19:49	06:28 19:01	06:48 (5) 18:41	06:57 18:12	06:32 16:33
15	05:30 20:19	05:59 19:48	06:29 19:00	06:49 (5) 18:39	06:58 18:10	06:33 16:32
16	05:31 20:18	06:00 19:47	06:30 18:58	06:50 (5) 18:38	06:59 18:09	06:34 16:31
17	05:32 20:18	06:01 19:45	06:31 18:56	06:51 (5) 18:37	07:00 18:07	06:35 16:30
18	05:33 20:17	06:02 19:44	06:32 18:55	06:52 (5) 18:35	07:01 18:06	06:36 16:29
19	05:34 20:16	06:03 19:42	06:33 18:53	06:53 (5) 18:34	07:02 18:04	06:37 16:28
20	05:34 20:16	06:03 19:41	06:34 18:51	06:54 (5) 18:33	07:03 18:03	06:38 16:27
21	05:35 20:15	06:04 19:39	06:35 18:49	06:55 (5) 18:31	07:04 18:02	06:39 16:26
22	05:36 20:14	06:05 19:38	06:36 18:48	06:56 (5) 18:30	07:05 18:00	06:40 16:25
23	05:37 20:13	06:06 19:36	06:37 18:46	06:57 (5) 18:28	07:06 17:59	06:41 16:24
24	05:38 20:13	06:07 19:35	06:38 18:44	06:58 (5) 18:27	07:07 17:57	06:42 16:23
25	05:39 20:12	06:08 19:33	06:39 18:43	06:59 (5) 18:25	07:08 17:56	06:43 16:22
26	05:40 20:11	06:09 19:32	06:40 18:41	07:00 (5) 18:24	07:09 17:55	06:44 16:21
27	05:40 20:10	06:10 19:30	06:41 18:39	07:01 (5) 18:22	07:10 17:54	06:45 16:20
28	05:41 20:09	06:11 19:29	06:42 18:38	07:02 (5) 18:21	07:11 17:53	06:46 16:19
29	05:42 20:08	06:12 19:27	06:43 18:36	07:03 (5) 18:19	07:12 17:52	06:47 16:18
30	05:43 20:07	06:13 19:26	06:44 18:34	07:04 (5) 18:18	07:13 17:51	06:48 16:17
31	05:44 20:06	06:14 19:24	06:45 18:33	07:05 (5) 18:16	07:14 17:50	06:49 16:16
Potential sun hours	457	427	375	346	299	290
Total, worst case		68	107	406	759	
Sun reduction		0,71	0,63	0,52	0,45	
Oper. time red.		0,96	0,96	0,96	0,96	
Wind dir. red.		0,43	0,43	0,67	0,67	
Total reduction		0,29	0,26	0,34	0,29	
Total, real		20	28	139	222	

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

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

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June
1	07:12	07:53 (4)	07:00	08:17 (4)	06:24	06:34
	16:32	47 08:40 (4)	17:06	18 08:35 (4)	17:39	19:13
2	07:13	07:54 (4)	06:59	08:20 (4)	06:23	06:33
	16:33	47 08:41 (4)	17:07	11 08:31 (4)	17:40	19:14
3	07:13	07:54 (4)	06:58		06:21	06:31
	16:34	47 08:41 (4)	17:08		17:42	19:15
4	07:13	07:55 (4)	06:57		06:20	06:29
	16:35	47 08:42 (4)	17:10		17:43	19:16
5	07:13	07:55 (4)	06:56		06:18	06:28
	16:36	47 08:42 (4)	17:11		17:44	19:17
6	07:13	07:55 (4)	06:55		06:17	06:26
	16:37	47 08:42 (4)	17:12		17:45	19:18
7	07:13	07:55 (4)	06:53		06:15	06:25
	16:38	47 08:42 (4)	17:13		17:46	19:19
8	07:13	07:56 (4)	06:52		06:13	06:23
	16:39	47 08:43 (4)	17:15		17:47	19:20
9	07:12	07:56 (4)	06:51		06:12	06:21
	16:40	48 08:44 (4)	17:16		17:48	19:21
10	07:12	07:57 (4)	06:50		06:10	06:20
	16:41	47 08:44 (4)	17:17		17:49	19:22
11	07:12	07:57 (4)	06:49		06:09	06:18
	16:42	47 08:44 (4)	17:18		17:50	19:23
12	07:12	07:57 (4)	06:48		06:07	06:17
	16:43	47 08:44 (4)	17:19		17:52	19:24
13	07:11	07:58 (4)	06:46		06:06	06:15
	16:44	47 08:45 (4)	17:21		17:53	19:25
14	07:11	07:58 (4)	06:45		06:04	06:14
	16:45	47 08:45 (4)	17:22		17:54	19:26
15	07:11	07:59 (4)	06:44		06:02	06:12
	16:46	46 08:45 (4)	17:23		17:55	19:27
16	07:10	07:59 (4)	06:43		06:01	06:11
	16:47	46 08:45 (4)	17:24		17:56	19:28
17	07:10	08:00 (4)	06:41		05:59	06:09
	16:48	46 08:46 (4)	17:25		17:57	19:29
18	07:10	08:00 (4)	06:40		05:57	06:08
	16:49	45 08:45 (4)	17:27		17:58	19:30
19	07:09	08:01 (4)	06:39		05:56	06:06
	16:50	45 08:46 (4)	17:28		17:59	19:31
20	07:08	08:02 (4)	06:37		05:54	06:05
	16:52	43 08:45 (4)	17:29		18:00	19:32
21	07:08	08:02 (4)	06:36		05:52	06:03
	16:53	43 08:45 (4)	17:30		18:01	19:33
22	07:07	08:03 (4)	06:35		05:51	06:02
	16:54	42 08:45 (4)	17:31		18:02	19:34
23	07:07	08:04 (4)	06:33		05:49	06:00
	16:55	41 08:45 (4)	17:32		18:03	19:35
24	07:06	08:05 (4)	06:32		05:47	05:59
	16:56	39 08:44 (4)	17:34		18:04	19:36
25	07:05	08:06 (4)	06:30		05:46	05:57
	16:57	38 08:44 (4)	17:35		18:05	19:37
26	07:05	08:07 (4)	06:29		05:44	05:56
	16:59	36 08:43 (4)	17:36		18:06	19:38
27	07:04	08:08 (4)	06:27		05:43	05:55
	17:00	34 08:42 (4)	17:37		18:07	19:40
28	07:03	08:09 (4)	06:26		05:41	05:53
	17:01	32 08:41 (4)	17:38		18:08	19:41
29	07:02	08:11 (4)			06:39	06:58 (5)
	17:02	29 08:40 (4)			19:09	8 07:06 (5)
30	07:01	08:12 (4)			06:38	06:56 (5)
	17:04	27 08:39 (4)			19:11	11 07:07 (5)
31	07:00	08:14 (4)			06:36	06:54 (5)
	17:05	23 08:37 (4)			19:12	13 07:07 (5)
Potential sun hours	299	298	370	398	447	450
Total, worst case	1314	29	35	170		
Sun reduction	0,39	0,41	0,44	0,50		
Oper. time red.	0,96	0,96	0,96	0,96		
Wind dir. red.	0,74	0,74	0,45	0,45		
Total reduction	0,28	0,29	0,19	0,22		
Total, real	365	8	7	38		

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

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

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	July	August	September	October	November	December	
1	05:22	05:45	06:15	06:44	06:18	06:52	07:39 (4)
	20:23	20:05	19:23	18:33	16:47	16:23	47 08:26 (4)
2	05:22	05:46	06:16	06:50 (5)	06:45	06:53	07:39 (4)
	20:23	20:04	19:21	06:59 (5)	18:31	16:23	47 08:26 (4)
3	05:23	05:47	06:17	06:47 (5)	06:46	06:54	07:39 (4)
	20:23	20:03	19:19	07:01 (5)	18:29	16:23	48 08:27 (4)
4	05:23	05:48	06:18	06:46 (5)	06:47	06:55	07:40 (4)
	20:23	20:02	19:18	07:02 (5)	18:28	16:22	47 08:27 (4)
5	05:24	05:49	06:19	06:43 (5)	06:48	06:56	07:40 (4)
	20:23	20:01	19:16	07:02 (5)	18:26	16:22	47 08:27 (4)
6	05:24	05:50	06:20	06:42 (5)	06:49	06:57	07:41 (4)
	20:23	19:59	19:14	07:02 (5)	18:25	16:22	47 08:28 (4)
7	05:25	05:51	06:21	06:42 (5)	06:50	06:58	07:41 (4)
	20:22	19:58	19:13	07:02 (5)	18:23	16:22	47 08:28 (4)
8	05:26	05:52	06:22	06:42 (5)	06:51	06:59	07:42 (4)
	20:22	19:57	19:11	07:02 (5)	18:21	16:22	47 08:29 (4)
9	05:26	05:53	06:23	06:43 (5)	06:53	06:27	07:51 (4) 07:00
	20:22	19:56	19:10	07:02 (5)	18:20	16:38	47 08:29 (4)
10	05:27	05:54	06:24	06:44 (5)	06:54	06:28	07:47 (4) 07:01
	20:21	19:54	19:08	07:02 (5)	18:18	16:37	19 08:06 (4) 16:22
11	05:28	05:55	06:25	06:45 (5)	06:55	06:29	07:46 (4) 07:01
	20:21	19:53	19:06	07:01 (5)	18:17	16:36	23 08:09 (4) 16:22
12	05:28	05:56	06:26	06:46 (5)	06:56	06:31	07:44 (4) 07:02
	20:20	19:52	19:05	07:00 (5)	18:15	16:35	27 08:11 (4) 16:22
13	05:29	05:57	06:27	06:47 (5)	06:57	06:32	07:42 (4) 07:03
	20:20	19:51	19:03	06:58 (5)	18:14	16:34	30 08:12 (4) 16:22
14	05:30	05:58	06:28	06:48 (5)	06:58	06:33	07:41 (4) 07:04
	20:19	19:49	19:01	06:56 (5)	18:12	16:33	32 08:13 (4) 16:23
15	05:30	05:59	06:29	06:49 (5)	06:59	06:34	07:41 (4) 07:05
	20:19	19:48	19:00	06:53 (5)	18:10	16:32	34 08:15 (4) 16:23
16	05:31	06:00	06:30	07:00	06:35	07:40 (4)	07:05
	20:18	19:47	18:58	18:09	16:31	36 08:16 (4)	16:23
17	05:32	06:01	06:31	07:01	06:36	07:39 (4)	07:06
	20:18	19:45	18:56	18:07	16:31	38 08:17 (4)	16:23
18	05:33	06:02	06:32	07:02	06:38	07:39 (4)	07:07
	20:17	19:44	18:55	18:06	16:30	39 08:18 (4)	16:24
19	05:34	06:02	06:33	07:03	06:39	07:39 (4)	07:07
	20:16	19:42	18:53	18:04	16:29	41 08:20 (4)	16:24
20	05:34	06:03	06:34	07:04	06:40	07:38 (4)	07:08
	20:16	19:41	18:51	18:03	16:28	42 08:20 (4)	16:24
21	05:35	06:04	06:34	07:05	06:41	07:38 (4)	07:08
	20:15	19:39	18:49	18:02	16:28	43 08:21 (4)	16:25
22	05:36	06:05	06:35	07:06	06:42	07:38 (4)	07:09
	20:14	19:38	18:48	18:00	16:27	43 08:21 (4)	16:25
23	05:37	06:06	06:36	07:08	06:43	07:37 (4)	07:09
	20:13	19:36	18:46	17:59	16:27	45 08:22 (4)	16:26
24	05:38	06:07	06:37	07:09	06:44	07:38 (4)	07:10
	20:12	19:35	18:44	17:57	16:26	45 08:23 (4)	16:26
25	05:39	06:08	06:38	06:10	06:46	07:38 (4)	07:10
	20:12	19:33	18:43	16:56	16:26	46 08:24 (4)	16:27
26	05:40	06:09	06:39	06:11	06:47	07:38 (4)	07:11
	20:11	19:32	18:41	16:55	16:25	46 08:24 (4)	16:28
27	05:40	06:10	06:40	06:12	06:48	07:38 (4)	07:11
	20:10	19:30	18:39	16:53	16:25	46 08:24 (4)	16:28
28	05:41	06:11	06:41	06:13	06:49	07:38 (4)	07:11
	20:09	19:29	18:38	16:52	16:24	47 08:25 (4)	16:29
29	05:42	06:12	06:42	06:14	06:50	07:38 (4)	07:12
	20:08	19:27	18:36	16:51	16:24	47 08:25 (4)	16:30
30	05:43	06:13	06:43	06:15	06:51	07:39 (4)	07:12
	20:07	19:26	18:34	16:49	16:23	47 08:26 (4)	16:30
31	05:44	06:14		06:17		07:12	07:52 (4)
	20:06	19:24		16:48		16:31	47 08:39 (4)
Potential sun hours	457	427	375	346	299	290	
Total, worst case			208		827		1445
Sun reduction			0,63		0,45		0,39
Oper. time red.			0,96		0,96		0,96
Wind dir. red.			0,45		0,74		0,74
Total reduction			0,28		0,32		0,28
Total, real			58		266		407

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS
 Rosenstien 12
 DK-8800 Viborg
 +45 8663 8139
 Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk
 Calculated:
 15-07-2017 14:21/3.1.617

SHADOW - Calendar

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

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	07:06 (5) 16:47	06:18 16:23
2	07:13 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	07:05 (5) 16:46	06:19 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	07:06 (5) 16:44	06:20 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:46 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	07:07 (5) 16:43	06:21 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:37 (5) 19:17	06:28 19:48	05:44 20:15	05:19 20:23	05:24 20:00	05:49 19:16	06:19 18:26	07:08 (5) 16:42	06:22 16:22
6	07:13 16:37	06:55 17:12	06:17 17:45	06:35 (5) 19:18	06:26 19:49	05:43 20:16	05:19 20:23	05:20 19:59	06:20 19:14	06:49 18:25	07:09 (5) 16:41	06:24 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:34 (5) 19:19	06:25 19:50	05:42 20:17	05:19 20:22	05:21 19:58	06:21 19:13	06:50 18:23	07:10 (5) 16:40	06:25 16:22
8	07:13 16:39	06:52 17:15	06:13 17:47	06:32 (5) 19:20	06:23 19:51	05:41 20:17	05:19 20:22	05:22 19:57	06:22 19:11	06:51 18:21	07:11 (5) 16:39	06:26 16:22
9	07:12 16:40	06:51 17:16	06:12 17:48	06:31 (5) 19:21	06:21 19:52	05:40 20:18	05:18 20:22	05:26 19:56	06:23 19:10	06:53 18:20	07:13 (5) 16:38	06:27 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:29 (5) 19:22	06:20 19:53	05:39 20:18	05:18 20:21	05:27 19:54	06:24 19:08	06:54 18:18	07:20 (5) 16:37	06:28 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:27 (5) 19:23	06:18 19:54	05:37 20:19	05:18 20:21	05:27 19:53	06:25 19:06	06:55 18:17	07:21 (5) 16:36	06:29 16:22
12	07:12 16:43	06:48 17:19	06:07 17:52	06:27 (5) 19:24	06:17 19:55	05:36 20:19	05:28 20:20	06:26 19:52	06:26 19:05	06:56 18:15	07:22 (5) 16:35	06:31 16:22
13	07:11 16:44	06:46 17:21	06:06 17:53	06:27 (5) 19:25	06:15 19:56	05:35 20:20	05:18 20:20	06:27 19:51	06:27 19:03	06:57 18:13	07:23 (5) 16:34	06:32 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:26 (5) 19:26	06:14 19:57	05:34 20:20	05:18 20:19	06:28 19:49	06:28 19:01	06:58 18:12	07:24 (5) 16:33	06:33 16:23
15	07:11 16:46	06:44 17:23	06:02 17:55	06:27 (5) 19:27	06:12 19:58	05:33 20:21	05:18 20:19	06:29 19:48	06:29 19:00	06:59 18:10	07:25 (5) 16:32	06:34 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:27 (5) 19:28	06:11 19:59	05:32 20:21	05:18 20:18	06:30 19:47	06:30 18:58	07:00 18:09	07:26 (5) 16:31	06:35 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:28 (5) 19:29	06:09 20:00	05:31 20:22	05:18 20:18	06:31 19:45	06:31 18:57	07:01 18:07	07:27 (5) 16:30	06:36 16:24
18	07:10 16:49	06:40 17:27	05:57 17:58	06:30 (5) 19:30	06:08 20:01	05:31 20:22	05:18 20:17	06:32 19:44	06:32 18:55	07:02 18:06	07:28 (5) 16:29	06:38 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:32 (5) 19:31	06:06 20:02	05:30 20:22	05:18 20:16	06:34 19:42	06:33 18:53	07:03 18:04	07:29 (5) 16:29	06:39 16:24
20	07:08 16:52	06:37 17:29	05:54 18:00	06:42 (5) 19:32	06:05 20:02	05:29 20:22	05:18 20:16	06:35 19:41	06:33 18:51	07:04 18:03	07:30 (5) 16:28	06:40 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:36 19:39	06:34 18:49	07:05 18:02	07:31 (5) 16:27	06:41 16:25
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:19 20:23	05:36 20:14	06:35 19:38	06:35 18:48	07:06 18:00	07:32 (5) 16:26	06:42 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:27 20:05	05:19 20:23	05:37 20:13	06:36 19:36	06:36 18:46	07:08 17:59	07:33 (5) 16:25	06:43 16:26
24	07:06 16:56	06:32 17:34	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:12	06:37 19:35	06:37 18:44	07:09 17:57	07:34 (5) 16:24	06:44 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:38 19:33	06:38 18:43	07:10 (5) 16:56	07:35 (5) 16:56	06:46 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:38	05:24 20:08	05:20 20:23	05:40 20:11	06:39 19:32	06:39 18:41	07:11 (5) 16:55	07:36 (5) 16:55	06:47 16:28
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:09	05:20 20:24	05:40 20:10	06:40 19:30	06:40 18:39	07:09 (5) 16:53	07:37 (5) 16:53	06:48 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	07:08 (5) 16:52	07:38 (5) 16:50	06:49 16:29
29	07:02 17:02	06:39 19:09	05:39 19:09	05:52 19:42	05:23 20:10	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	07:07 (5) 16:51	07:39 (5) 16:49	06:50 16:30
30	07:01 17:03	06:38 19:10	05:38 19:10	05:51 19:43	05:22 20:11	05:21 20:23	05:43 20:07	06:13 19:26	06:43 18:34	07:06 (5) 16:49	07:40 (5) 16:49	06:51 16:30
31	07:00 17:05	06:36 19:12	05:36 19:12	05:52 20:12	05:22 20:12	05:21 20:24	05:44 20:06	06:14 19:24	06:44 18:48	07:07 (5) 16:48	07:41 (5) 16:48	06:52 16:31
Potential sun hours	299	298	370	398	447	450	457	427	375	346	299	290
Total, worst case			283						127	162		
Sun reduction			0,44						0,63	0,52		
Oper. time red.			0,96						0,96	0,96		
Wind dir. red.			0,53						0,53	0,53		
Total reduction			0,22						0,32	0,27		
Total, real			63						41	43		

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

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

Project:

Brindisi

Licensed user:

Kentec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

Shadow receptor: G - Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (7)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:12	06:59	06:24	06:34	07:18 (5)	05:49	05:21	05:22	05:45	06:15	07:13 (5)	06:18	06:52
2	07:12	06:59	06:23	06:33	07:19 (5)	05:48	05:21	05:22	05:46	06:16	07:22 (5)	06:19	06:53
3	07:13	06:58	06:21	06:31	07:20 (5)	05:47	05:20	05:23	05:47	06:17		06:20	06:54
4	07:13	06:57	06:20	06:29	07:23 (5)	05:46	05:20	05:23	05:48	06:18		06:21	06:55
5	07:13	06:56	06:18	06:28	07:26 (5)	05:44	05:19	05:24	05:49	06:19		06:22	06:56
6	07:13	06:54	06:17	06:26	07:36 (5)	05:48	05:19	05:24	05:50	06:20		06:24	06:57
7	07:13	06:53	06:15	06:25		05:42	05:19	05:25	05:51	06:21	07:21 (5)	06:25	06:58
8	07:12	06:52	06:13	06:23		05:41	05:19	05:25	05:52	06:22	07:17 (5)	06:26	06:59
9	07:12	06:51	06:12	06:21		05:40	05:18	05:26	05:53	06:23	07:14 (5)	06:27	07:00
10	07:12	06:50	06:10	06:20		05:39	05:18	05:27	05:54	06:24	07:12 (5)	06:28	07:01
11	07:12	06:49	06:09	06:18		05:37	05:18	05:27	05:55	06:25	07:11 (5)	06:29	07:01
12	07:12	06:48	06:07	06:17		05:36	05:18	05:28	05:56	06:26	07:09 (5)	06:31	07:02
13	07:11	06:46	06:05	06:31 (5)	06:15	05:35	05:18	05:29	05:57	06:27	07:08 (5)	06:32	07:03
14	07:11	06:45	06:04	06:28 (5)	06:14	05:34	05:18	05:30	05:58	06:28	07:07 (5)	06:33	07:04
15	07:11	06:44	06:02	06:26 (5)	06:12	05:33	05:18	05:30	05:59	06:27 (6)	06:29	06:34	07:05
16	07:10	06:43	06:01	06:24 (5)	06:11	05:32	05:18	05:31	06:00	06:26 (6)	06:30	06:35	07:05
17	07:10	06:41	05:59	06:22 (5)	06:09	05:31	05:18	05:32	06:01	06:25 (6)	06:31	06:36	07:06
18	07:10	06:40	05:57	06:21 (5)	06:08	05:30	05:18	05:33	06:01	06:24 (6)	06:32	06:38	07:07
19	07:09	06:39	05:56	06:19 (5)	06:06	05:29	05:18	05:34	06:02	06:23 (6)	06:33	06:39	07:07
20	07:08	06:37	05:54	06:18 (5)	06:05	05:28	05:18	05:35	06:03	06:22 (6)	06:34	06:40	07:08
21	07:08	06:36	05:52	06:17 (5)	06:03	05:27	05:18	05:36	06:04	06:21 (6)	06:35	06:41	07:08
22	07:07	06:34	05:51	06:16 (5)	06:02	05:26	05:19	05:37	06:05	06:20 (6)	06:36	06:42	07:09
23	07:07	06:33	05:49	06:15 (5)	06:00	05:25	05:19	05:38	06:06	06:19 (6)	06:37	06:43	07:09
24	07:06	06:32	05:47	06:14 (5)	05:59	05:24	05:19	05:39	06:07	06:18 (6)	06:38	06:44	07:10
25	07:05	06:30	05:46	06:13 (5)	05:57	05:23	05:19	05:40	06:08	06:17 (6)	06:39	06:46	07:10
26	07:05	06:29	05:44	06:12 (5)	05:56	05:22	05:19	05:41	06:09	06:16 (6)	06:40	06:47	07:11
27	07:04	06:27	05:43	06:11 (5)	05:55	05:21	05:19	05:42	06:10	06:15 (6)	06:41	06:48	07:11
28	07:03	06:26	05:41	06:10 (5)	05:53	05:20	05:19	05:43	06:11	06:14 (6)	06:42	06:49	07:11
29	07:02	06:24	05:39	06:09 (5)	05:51	05:19	05:19	05:44	06:12	06:13 (6)	06:43	06:50	07:12
30	07:01	06:23	05:38	06:08 (5)	05:50	05:18	05:19	05:45	06:13	06:14 (6)	06:44	06:51	07:12
31	07:00	06:22	05:37	06:07 (5)	05:49	05:17	05:19	05:46	06:14	06:15 (6)	06:45	06:52	07:12
Potential sun hours	299	298	370	398	447	450	457	427	375	346	299	290	
Total, worst case			622	291				184	736	9			
Sun reduction			0,44	0,50				0,71	0,63	0,52			
Oper. time red.			0,96	0,96				0,96	0,96	0,96			
Wind dir. red.			0,51	0,43				0,38	0,51	0,51			
Total reduction			0,22	0,21				0,26	0,31	0,26			
Total, real			134	60				47	230	2			

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

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

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:12 16:32	06:59 17:06	06:24 17:39	06:43 (6) 19:13	06:34 18:47 (7)	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	06:18 16:47	
2	07:12 16:33	06:59 17:07	06:23 17:40	06:42 (6) 19:14	06:33 18:46 (7)	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	
3	07:13 16:34	06:58 17:08	06:21 17:42	06:40 (6) 19:15	06:31 18:45 (7)	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	06:20 16:44	
4	07:13 16:35	06:57 17:10	06:20 17:43	06:38 (6) 19:16	06:29 18:20 (7)	05:45 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	
5	07:13 16:36	06:56 17:11	06:18 17:44	06:37 (6) 19:17	06:28 18:20 (7)	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:00	06:19 19:16	06:48 18:26	06:22 16:42	
6	07:13 16:37	06:54 17:12	06:17 17:45	06:36 (6) 19:18	06:26 18:21 (7)	05:43 19:49	05:19 20:16	05:24 20:23	05:50 20:00	06:20 18:16	06:49 18:25	06:24 16:41	
7	07:13 16:38	06:53 17:13	06:15 17:46	06:37 (6) 19:19	06:25 18:22 (7)	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 18:15	06:50 18:23	06:25 16:40	
8	07:12 16:39	06:52 17:14	06:13 17:47	06:37 (6) 19:20	06:23 18:23 (7)	05:41 19:51	05:19 20:17	05:25 20:22	05:52 19:11	06:22 18:14	06:51 18:21	06:26 16:39	
9	07:12 16:40	06:51 17:16	06:12 17:48	06:37 (6) 19:21	06:21 18:24 (7)	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:10	06:23 18:12	06:52 18:20	06:27 16:38	
10	07:12 16:41	06:50 17:17	06:10 17:49	06:39 (6) 19:22	06:20 18:25 (7)	05:39 19:53	05:18 20:19	05:27 20:22	05:56 19:08	06:24 18:12	06:54 18:19	06:28 16:37	
11	07:12 16:42	06:49 17:18	06:09 17:50	06:40 (6) 19:23	06:18 18:26 (7)	05:38 19:54	05:18 20:19	05:27 20:21	05:55 19:06	06:25 18:12	06:55 18:17	06:29 16:36	
12	07:12 16:43	06:48 17:19	06:07 17:51	06:40 (6) 19:24	06:17 18:27 (7)	05:37 19:55	05:18 20:19	05:28 20:20	05:56 19:05	06:26 18:11	06:56 18:15	06:31 16:35	
13	07:11 16:44	06:46 17:21	06:05 17:53	06:39 (6) 19:25	06:15 18:28 (7)	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:03	06:27 18:11	06:57 18:13	06:32 16:34	
14	07:11 16:45	06:45 17:22	06:04 17:54	06:38 (6) 19:26	06:14 18:29 (7)	05:34 19:57	05:18 20:20	05:30 20:19	05:58 19:01	06:28 18:11	06:58 18:12	06:33 16:33	
15	07:11 16:46	06:44 17:23	06:02 17:55	06:37 (6) 19:27	06:12 18:30 (7)	05:33 19:58	05:18 20:21	05:30 20:19	05:59 19:00	06:29 18:11	06:59 18:10	06:34 16:32	
16	07:10 16:47	06:43 17:24	06:01 17:56	06:36 (6) 19:28	06:11 18:31 (7)	05:32 19:59	05:18 20:21	05:31 20:18	06:00 18:58	06:30 18:12	07:00 18:09	06:35 16:31	
17	07:10 16:48	06:41 17:25	05:59 17:57	06:35 (6) 19:29	06:09 18:32 (7)	05:31 20:00	05:18 20:22	05:32 20:18	06:00 18:56	06:31 18:12	07:01 18:07	06:36 16:30	
18	07:10 16:49	06:40 17:27	05:57 17:58	06:34 (6) 19:30	06:07 18:33 (7)	05:31 20:01	05:18 20:22	05:33 20:17	06:01 18:54	06:32 18:13	07:02 18:06	06:37 16:29	
19	07:09 16:50	06:39 17:28	05:56 17:59	06:33 (6) 19:31	06:06 18:34 (7)	05:30 20:02	05:18 20:22	05:34 20:16	06:02 18:53	06:33 18:14	07:03 18:04	06:38 16:28	
20	07:08 16:51	06:37 17:29	05:54 18:00	06:32 (6) 19:32	06:05 18:35 (7)	05:29 20:02	05:18 20:22	05:34 20:16	06:03 18:51	06:33 18:16	07:04 18:03	06:39 16:27	
21	07:08 16:53	06:36 17:30	05:52 18:01	06:31 (6) 19:33	06:03 18:36 (7)	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:17	07:05 18:02	06:40 16:26	
22	07:07 16:54	06:34 17:31	05:51 18:02	06:30 (6) 19:34	06:02 18:37 (7)	05:27 20:04	05:18 20:23	05:36 20:14	06:05 19:38	06:35 18:18	07:06 18:00	06:41 16:25	
23	07:07 16:55	06:33 17:32	05:49 18:03	06:29 (6) 19:35	06:00 18:38 (7)	05:26 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:19	07:07 17:59	06:42 16:24	
24	07:06 16:56	06:32 17:34	05:47 18:04	06:28 (6) 19:36	05:59 18:39 (7)	05:25 20:06	05:19 20:23	05:38 20:12	06:07 19:35	06:37 18:20	07:08 17:57	06:43 16:23	
25	07:05 16:57	06:30 17:35	05:46 18:05	06:27 (6) 19:37	05:57 18:40 (7)	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:21	07:09 17:56	06:44 16:22	
26	07:05 16:59	06:29 17:36	05:44 18:06	06:26 (6) 19:38	05:55 18:41 (7)	05:24 20:08	05:20 20:23	05:40 20:11	06:09 19:32	06:39 18:22	07:10 17:55	06:45 16:21	
27	07:04 17:00	06:27 17:37	05:43 18:07	06:25 (6) 19:39	05:53 18:42 (7)	05:24 20:09	05:20 20:24	05:41 20:10	06:10 19:30	06:40 18:23	07:11 17:54	06:46 16:20	
28	07:03 17:01	06:26 17:38	05:41 18:08	06:24 (6) 19:40	05:51 18:43 (7)	05:23 20:10	05:20 20:24	05:41 20:10	06:11 19:31	06:41 18:24	07:12 17:53	06:47 16:19	
29	07:02 17:02	06:25 17:39	05:39 18:09	06:23 (6) 19:41	05:49 18:44 (7)	05:23 20:11	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:25	07:13 17:52	06:48 16:18	
30	07:01 17:03	06:24 17:40	05:38 18:10	06:22 (6) 19:42	05:47 18:45 (7)	05:22 20:12	05:21 20:24	05:43 20:07	06:13 19:27	06:43 18:26	07:14 17:51	06:49 16:17	
31	07:00 17:05	06:23 17:41	05:36 18:11	06:21 (6) 19:43	05:45 18:46 (7)	05:21 20:13	05:20 20:25	05:44 20:06	06:14 19:28	06:44 18:27	07:15 17:50	06:50 16:16	
Potential sun hours	299	298	370	398	447	450	457	427	375	346	219	299	290
Total, worst case		24	389	192					394		219		
Sun reduction		0,41	0,44	0,50					0,63		0,52		
Oper. time red.		0,96	0,96	0,96					0,96		0,96		
Wind dir. red.		0,55	0,51	0,48					0,48		0,55		
Total reduction		0,21	0,22	0,23					0,29		0,28		
Total, real		5	84	44					115		61		

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

Shadow receptor: I - Shadow Receptor: 1,0 x 1,0 Azimuth: 0,0° Slope: 90,0° (9)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:12	07:00	06:24	06:34	05:49	05:21	05:22	05:45	06:15	06:44	17:37 (7)	06:18	06:39 (6)	06:52
2	16:33	17:06	17:39	19:13	19:44	20:13	20:23	20:05	19:23	18:33	28	18:05 (7)	16:47	16:23
3	07:12	06:59	06:23	06:33	05:48	05:21	05:22	05:46	06:16	06:45	17:37 (7)	06:19	06:53	06:53
4	16:33	17:07	17:40	19:14	19:45	20:13	20:23	20:04	19:21	18:31	27	18:04 (7)	16:46	16:23
5	07:13	06:58	06:21	06:31	05:47	05:20	05:23	05:47	06:17	06:46	17:36 (7)	06:20	06:54	06:54
6	16:34	17:08	17:42	19:18	19:49	20:14	20:23	20:03	19:19	18:29	28	18:04 (7)	16:44	16:23
7	07:13	06:57	06:20	06:29	05:45	05:20	05:23	05:48	06:18	06:47	17:36 (7)	06:21	06:55	06:55
8	16:35	17:10	17:43	19:16	19:47	20:15	20:23	20:02	19:18	18:28	27	18:03 (7)	16:43	16:22
9	07:13	06:56	06:18	06:28	05:44	05:19	05:24	05:49	06:19	06:48	17:36 (7)	06:22	06:56	06:56
10	16:36	17:11	17:44	19:17	19:48	20:15	20:23	20:00	19:16	18:26	26	18:02 (7)	16:42	16:22
11	07:13	06:54	06:17	06:26	05:43	05:19	05:24	05:50	06:20	06:49	17:37 (7)	06:24	06:57	06:57
12	16:37	17:12	17:45	19:18	19:49	20:16	20:23	19:59	19:14	18:25	24	18:01 (7)	16:41	16:22
13	07:13	06:53	06:15	06:25	05:42	05:19	05:25	05:51	06:21	06:50	17:37 (7)	06:25	06:58	06:58
14	16:38	17:13	17:46	19:19	19:50	20:17	20:22	19:58	19:13	18:23	23	18:00 (7)	16:40	16:22
15	07:13	06:52	06:13	06:23	05:41	05:19	05:25	05:52	06:22	06:51	17:38 (7)	06:26	06:59	06:59
16	16:39	17:14	17:47	19:20	19:51	20:17	20:22	19:57	19:11	18:21	20	17:58 (7)	16:39	16:22
17	07:12	06:51	06:12	06:21	05:40	05:18	05:26	05:53	06:23	06:52	17:39 (7)	06:27	07:00	07:00
18	16:39	17:16	17:48	19:21	19:52	20:18	20:22	19:56	19:10	18:20	18	17:57 (7)	16:38	16:22
19	07:12	06:50	07:09 (6)	06:10	06:59 (7)	06:20	05:39	05:18	05:27	05:54	06:24	17:42 (7)	06:28	07:01
20	16:41	17:17	17:49	19:22	19:53	20:18	20:21	19:54	19:08	18:18	13	17:55 (7)	16:37	16:22
21	07:12	06:49	07:08 (6)	06:09	06:58 (7)	06:18	05:37	05:18	05:27	05:55	06:25	17:47 (7)	06:29	07:01
22	16:42	17:18	17:50	19:23	19:54	20:19	20:21	19:53	19:06	18:17	3	17:50 (7)	16:36	16:22
23	07:12	06:48	07:07 (6)	06:07	06:56 (7)	06:17	05:36	05:18	05:28	05:56	06:26	17:47 (7)	06:31	07:02
24	16:43	17:19	17:51	19:24	19:55	20:19	20:20	19:52	19:05	18:15	15	17:50 (7)	16:35	16:22
25	07:11	06:46	07:06 (6)	06:05	06:55 (7)	06:15	05:35	05:18	05:29	05:57	06:27	17:47 (7)	06:32	07:03
26	16:44	17:21	17:53	19:25	19:56	20:20	20:20	19:51	19:03	18:13	13	17:53 (7)	16:34	16:22
27	07:11	06:45	07:04 (6)	06:04	06:54 (7)	06:14	05:34	05:18	05:30	05:58	06:28	17:47 (7)	06:33	07:04
28	16:45	17:22	17:54	19:26	19:57	20:20	20:19	19:49	19:01	18:12	12	17:52 (7)	16:33	16:23
29	07:11	06:44	07:03 (6)	06:02	06:53 (7)	06:12	05:33	05:18	05:30	05:59	06:29	17:47 (7)	06:34	07:05
30	16:46	17:23	17:55	19:27	19:58	20:21	20:19	19:48	19:00	18:10	10	17:52 (7)	16:32	16:23
31	07:10	06:43	07:02 (6)	06:01	06:52 (7)	06:11	05:32	05:18	05:31	06:00	06:30	17:47 (7)	06:35	07:05
32	16:47	17:24	17:56	19:28	19:59	20:21	20:18	19:46	18:58	18:09	9	17:52 (7)	16:31	16:23
33	07:10	06:41	07:00 (6)	06:09	06:51 (7)	06:10	05:31	05:18	05:32	06:00	06:31	17:47 (7)	06:36	07:06
34	16:48	17:25	17:57	19:29	20:00	20:22	20:18	19:45	18:56	18:07	7	17:52 (7)	16:31	16:23
35	07:10	06:40	06:59 (6)	06:07	06:51 (7)	06:10	05:31	05:18	05:33	06:01	06:32	17:47 (7)	06:37	07:07
36	16:49	17:27	17:58	19:30	20:01	20:22	20:17	19:44	18:54	18:06	11	17:52 (7)	16:30	16:24
37	07:09	06:39	06:58 (6)	06:06	06:50 (7)	06:09	05:30	05:18	05:34	06:02	06:32	17:47 (7)	06:39	07:07
38	16:50	17:28	17:59	19:31	20:02	20:22	20:16	19:42	18:53	18:04	14	17:47 (6)	16:29	16:24
39	07:08	06:37	06:56 (6)	06:05	06:49 (7)	06:08	05:29	05:18	05:34	06:03	06:33	17:47 (7)	06:40	07:08
40	16:51	17:29	18:00	19:32	20:02	20:22	20:16	19:41	18:51	18:03	17	17:48 (6)	16:28	16:24
41	07:08	06:36	07:00 (6)	06:03	06:47 (7)	06:06	05:28	05:18	05:35	06:04	06:34	17:47 (7)	06:41	07:08
42	16:53	17:30	18:01	19:33	20:03	20:23	20:15	19:39	18:49	18:02	19	17:49 (6)	16:28	16:25
43	07:07	06:34	07:00 (6)	06:02	06:46 (7)	06:05	05:27	05:18	05:36	06:05	06:35	17:49 (6)	06:42	07:09
44	16:54	17:31	18:02	19:34	20:04	20:23	20:14	19:38	18:48	18:00	20	17:49 (6)	16:27	16:25
45	07:07	06:33	07:02 (6)	06:00	06:44 (7)	06:03	05:26	05:19	05:37	06:06	06:36	17:49 (6)	06:43	07:09
46	16:55	17:32	18:03	19:35	20:05	20:23	20:13	19:36	18:46	17:59	21	17:49 (6)	16:27	16:26
47	07:06	06:32	07:05 (6)	06:04	06:48 (7)	06:07	05:26	05:19	05:38	06:07	06:37	17:48 (7)	06:44	07:10
48	16:56	17:34	18:04	19:36	20:06	20:23	20:12	19:35	18:44	18:06	11	17:50 (7)	16:26	16:26
49	07:05	06:30	07:04 (6)	06:05	06:49 (7)	06:08	05:25	05:19	05:39	06:08	06:38	17:45 (7)	06:46	07:10
50	16:57	17:35	18:05	19:37	20:07	20:23	20:12	19:33	18:43	18:01	16	18:01 (7)	16:25	16:27
51	07:05	06:29	07:03 (6)	06:04	06:48 (7)	06:07	05:24	05:20	05:40	06:09	06:39	17:43 (7)	06:47	07:11
52	16:59	17:36	18:06	19:38	20:08	20:23	20:11	19:32	18:41	18:03	17	18:03 (7)	16:25	16:28
53	07:04	06:27	07:01 (6)	06:03	06:47 (7)	06:06	05:24	05:20	05:40	06:10	06:40	17:41 (7)	06:48	07:11
54	17:00	17:37	18:07	19:40	20:09	20:24	20:10	19:30	18:39	18:04	23	18:04 (7)	16:25	16:28
55	07:03	06:26	07:00 (6)	06:04	06:48 (7)	06:07	05:23	05:20	05:41	06:11	06:41	17:40 (7)	06:49	07:11
56	17:01	17:38	18:08	19:41	20:09	20:24	20:09	19:29	18:38	18:04	24	18:04 (7)	16:24	16:29
57	07:02	06:29	07:03 (6)	06:05	06:49 (7)	06:08	05:23	05:21	05:42	06:12	06:42	17:39 (7)	06:50	07:12
58	17:02	17:39	18:09	19:42	20:10	20:24	20:08	19:27	18:36	18:05	26	18:05 (7)	16:24	16:30
59	07:01	06:38	07:02 (6)	06:06	06:50 (7)	06:09	05:21	05:18	05:39	06:13	06:43	17:38 (7)	06:51	07:12
60	17:03	17:40	18:10	19:43	20:11	20:23	20:07	19:26	18:34	18:05	27	18:05 (7)	16:23	16:30
61	07:00	06:36	07:00 (6)	06:07	06:51 (7)	06:10	05:21	05:18	05:39	06:13	06:43	17:38 (7)	06:51	07:12
62	17:05	17:42	18:12	19:45	20:12	20:24	20:06	19:24	18:32	18:06	28	18:06 (7)	16:23	16:31
Potential sun hours	299	298	370	398	447	450	457	427	375	346	299	290		
Total, worst case		214	379						147	452	1			
Sun reduction		0,41	0,44						0,63	0,52	0,45			
Oper. time red.		0,96	0,96						0,96	0,96	0,96			
Wind dir. red.		0,60	0,40						0,40	0,49	0,60			
Total reduction		0,23	0,17						0,24	0,25	0,26			
Total, real		50	63						36	113	0			

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

Shadow receptor: L - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June	
1	07:12 16:32	06:59 17:06	07:27 (6) 07:58 (6)	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13
2	07:12 16:33	06:59 17:07	07:26 (6) 08:00 (6)	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13
3	07:13 16:34	06:58 17:08	07:25 (6) 08:01 (6)	06:21 17:42	06:31 19:15	05:47 19:46	05:20 20:14
4	07:13 16:35	06:57 17:10	07:25 (6) 08:02 (6)	06:20 17:43	06:29 19:16	05:45 19:47	05:20 20:15
5	07:13 16:36	06:56 17:11	07:24 (6) 08:03 (6)	06:18 17:44	06:28 19:17	05:44 19:48	05:19 20:15
6	07:13 16:37	06:54 17:12	07:24 (6) 08:03 (6)	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16
7	07:13 16:38	06:53 17:13	07:23 (6) 08:04 (6)	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17
8	07:12 16:38	06:52 17:14	07:23 (6) 08:05 (6)	06:13 17:47	06:23 19:20	05:41 19:51	05:19 20:17
9	07:12 16:39	06:51 17:16	07:23 (6) 08:05 (6)	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18
10	07:12 16:40	06:50 17:17	07:22 (6) 08:05 (6)	06:10 17:49	06:20 19:22	05:38 19:53	05:18 20:18
11	07:12 16:42	06:49 17:18	07:22 (6) 08:05 (6)	06:09 17:50	06:18 19:23	05:37 19:54	05:18 20:19
12	07:12 16:43	06:48 17:19	07:22 (6) 08:06 (6)	06:07 17:51	06:17 19:24	05:36 19:55	05:18 20:19
13	07:11 16:44	06:46 17:21	07:23 (6) 08:06 (6)	06:05 17:53	06:15 19:25	05:35 19:56	05:18 20:20
14	07:11 16:45	06:45 17:22	07:22 (6) 08:05 (6)	06:04 17:54	06:14 19:26	05:34 19:57	05:18 20:20
15	07:11 16:46	06:44 17:23	07:22 (6) 08:05 (6)	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21
16	07:10 16:47	06:43 17:24	07:23 (6) 08:05 (6)	06:01 17:56	06:10 19:28	05:32 19:59	05:18 20:21
17	07:10 16:48	06:41 17:25	07:23 (6) 08:04 (6)	05:59 17:57	06:09 19:29	05:31 20:00	05:18 20:21
18	07:09 16:49	06:40 17:27	07:23 (6) 08:04 (6)	05:57 17:58	06:07 19:30	05:31 20:01	05:18 20:22
19	07:09 16:50	06:39 17:28	07:24 (6) 08:03 (6)	05:56 17:59	06:06 19:31	05:30 20:02	05:18 20:22
20	07:08 16:51	06:37 17:29	07:24 (6) 08:02 (6)	05:54 18:00	06:04 19:32	05:29 20:02	05:18 20:22
21	07:08 16:53	06:36 17:30	07:26 (6) 08:01 (6)	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23
22	07:07 16:54	06:34 17:31	07:26 (6) 08:00 (6)	05:51 18:02	06:02 19:34	05:27 20:04	05:18 20:23
23	07:07 16:55	06:33 17:32	07:28 (6) 07:59 (6)	05:49 18:03	06:00 19:35	05:26 20:05	05:19 20:23
24	07:06 16:56	06:32 17:34	07:30 (6) 07:57 (6)	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23
25	07:05 16:57	06:30 17:35	07:31 (6) 07:55 (6)	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23
26	07:05 16:59	06:29 17:36	07:34 (6) 07:52 (6)	05:44 18:06	05:56 19:38	05:24 20:08	05:20 20:23
27	07:04 17:00	07:36 (6) 07:49 (6)	06:27 07:37 (6)	05:42 07:48 (6)	05:55 18:07	05:24 20:09	05:20 20:23
28	07:03 17:01	07:33 (6) 07:52 (6)	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:23
29	07:02 17:02	07:31 (6) 07:54 (6)		06:39 19:09	05:52 19:42	05:23 20:10	05:21 20:23
30	07:01 17:03	07:29 (6) 07:55 (6)		06:38 19:10	05:51 19:43	05:22 20:11	05:21 20:23
31	07:00 17:05	07:28 (6) 07:57 (6)		06:36 19:11		05:21 20:12	
Potential sun hours	299	298	370	398	447	450	
Total, worst case	110	981				449	
Sun reduction	0,39	0,41				0,65	
Oper. time red.	0,96	0,96				0,96	
Wind dir. red.	0,66	0,66				0,67	
Total reduction	0,24	0,25				0,41	
Total, real	27	249				186	

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

Shadow receptor: L - Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	July	August	September	October	November	December
1	05:22	19:42 (8)	05:45	06:15	06:44	06:18
	20:23	16 19:58 (8)	20:05	19:23	18:33	06:52 (6)
2	05:22	19:42 (8)	05:46	06:16	06:45	06:19
	20:23	16 19:58 (8)	20:04	19:21	18:31	06:52 (6)
3	05:23	19:44 (8)	05:47	06:17	06:46	06:20
	20:23	14 19:58 (8)	20:03	19:19	18:29	06:53 (6)
4	05:23	19:44 (8)	05:48	06:18	06:47	06:21
	20:23	13 19:57 (8)	20:02	19:18	18:28	06:53 (6)
5	05:24	19:45 (8)	05:49	06:19	06:48	06:22
	20:23	13 19:58 (8)	20:00	19:16	18:26	06:54 (6)
6	05:24	19:46 (8)	05:50	06:20	06:49	06:24
	20:22	12 19:58 (8)	19:59	19:14	18:25	06:54 (6)
7	05:25	19:46 (8)	05:51	06:21	06:50	06:25
	20:22	11 19:57 (8)	19:58	19:13	18:23	06:56 (6)
8	05:25	19:48 (8)	05:52	06:22	06:51	06:26
	20:22	9 19:57 (8)	19:57	19:11	18:21	06:56 (6)
9	05:26	19:49 (8)	05:53	06:23	06:52	06:27
	20:22	7 19:56 (8)	19:56	19:09	18:20	06:57 (6)
10	05:27	19:51 (8)	05:54	06:24	06:53	06:28
	20:21	4 19:55 (8)	19:54	19:08	18:18	06:58 (6)
11	05:27		05:55	06:25	06:55	06:29
	20:21		19:53	19:06	18:17	07:00 (6)
12	05:28		05:56	06:26	06:56	06:29
	20:20		19:52	19:05	18:15	07:01 (6)
13	05:29		05:57	06:27	06:57	06:30
	20:20		19:51	19:03	18:13	06:57 (6)
14	05:30		05:58	06:28	06:58	06:31
	20:19		19:49	19:01	18:12	06:58 (6)
15	05:30		05:59	06:29	06:59	06:32
	20:19		19:48	18:59	18:10	06:59 (6)
16	05:31		05:59	06:30	07:00	06:33
	20:18		19:46	18:58	18:09	06:34
17	05:32		06:00	06:31	07:01	06:35
	20:18		19:45	18:56	18:07	06:35 (6)
18	05:33		06:01	06:31	07:02	06:36
	20:17		19:44	18:54	18:06	06:36 (6)
19	05:33		06:02	06:32	07:03	06:37
	20:16		19:42	18:53	18:04	06:37 (6)
20	05:34		06:03	06:33	07:04	06:38
	20:16		19:41	18:51	18:03	06:38 (6)
21	05:35		06:04	06:34	07:05	06:39
	20:15		19:39	18:49	18:01	06:39 (6)
22	05:36		06:05	06:35	07:06	06:40
	20:14		19:38	18:48	18:00	06:40 (6)
23	05:37		06:06	06:36	07:07	06:41
	20:13		19:36	18:46	17:59	06:41 (6)
24	05:38		06:07	06:37	07:09	06:42
	20:12		19:35	18:44	17:57	06:42 (6)
25	05:39		06:08	06:38	07:10	06:43
	20:12		19:33	18:43	16:56	06:43 (6)
26	05:39		06:09	06:39	07:11	06:44
	20:11		19:32	18:41	16:55	06:44 (6)
27	05:40		06:10	06:40	07:12	06:45
	20:10		19:30	18:39	16:53	06:45 (6)
28	05:41		06:11	06:41	07:13	06:46
	20:09		19:29	18:38	16:52	06:46 (6)
29	05:42		06:12	06:42	07:14	06:47
	20:08		19:27	18:36	16:51	06:47 (6)
30	05:43		06:13	06:43	07:15	06:48
	20:07		19:26	18:34	16:49	06:48 (6)
31	05:44		06:14	06:44	07:16	06:49
	20:06		19:24	18:32	16:48	06:49 (6)
Potential sun hours	457	427	375	346	299	290
Total, worst case	115			610	488	
Sun reduction	0,72			0,52	0,45	
Oper. time red.	0,96			0,96	0,96	
Wind dir. red.	0,67			0,66	0,66	
Total reduction	0,46			0,33	0,28	
Total, real	53			200	137	

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar

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

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	06:59 17:06	06:24 17:39	06:34 19:13	05:49 19:44	18:28 (1) 19:44	05:21 20:13	05:45 20:05	06:15 19:23	18:32 (1) 18:33	06:18 16:47	06:52 16:23
2	07:12 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	18:30 (1) 18:51 (1)	05:21 20:13	05:46 20:04	06:16 19:21	18:33 (1) 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	18:32 (1) 18:49 (1)	05:20 20:14	05:47 20:03	06:17 19:19	18:35 (1) 18:52 (1)	06:20 18:29	06:54 16:45
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:46 19:47	18:35 (1) 18:47 (1)	05:20 20:15	05:48 20:02	06:18 19:18	18:39 (1) 18:48 (1)	06:47 18:28	06:55 16:43
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48	18:47 (1) 19:48	05:20 20:15	05:49 20:00	06:19 19:16	18:48 (1) 18:26	06:48 16:42	06:56 16:22
6	07:13 16:37	06:54 17:12	06:17 17:45	06:26 19:18	05:43 19:49	18:56 (1) 19:49	05:20 20:16	05:50 20:02	06:20 19:14	18:31 (1) 18:25	06:49 16:41	06:57 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	18:57 (1) 19:50	05:20 20:17	05:51 20:02	06:21 19:13	18:32 (1) 18:23	06:50 16:40	06:58 16:22
8	07:12 16:39	06:52 17:15	06:13 17:47	06:23 19:20	05:41 19:51	18:58 (1) 19:51	05:19 20:17	05:52 20:05	06:22 19:11	18:33 (1) 18:52 (1)	06:51 16:39	06:59 16:22
9	07:12 16:40	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	18:59 (1) 18:54 (1)	05:18 20:18	05:53 20:02	06:23 19:10	18:43 (1) 18:56 (1)	06:53 16:38	07:00 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 19:22	05:39 19:53	18:34 (1) 18:56 (1)	05:18 20:18	05:54 20:02	06:24 19:08	18:40 (1) 18:59 (1)	06:54 18:18	07:01 16:37
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	05:38 19:54	18:33 (1) 18:58 (1)	05:18 20:19	05:55 20:03	06:25 19:06	18:38 (1) 19:00 (1)	06:55 18:17	07:01 16:36
12	07:12 16:43	06:48 17:19	06:07 17:52	06:17 19:24	05:36 19:55	18:30 (1) 18:59 (1)	05:18 20:19	05:56 20:02	06:26 19:05	18:37 (1) 19:02 (1)	06:56 18:15	07:02 16:35
13	07:11 16:44	06:46 17:21	06:06 17:53	06:15 19:25	05:35 19:56	18:31 (1) 18:50 (1)	05:18 20:20	05:57 20:01	06:27 19:03	18:35 (1) 19:03 (1)	06:57 18:14	07:03 16:34
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	05:34 19:57	18:28 (1) 19:00 (1)	05:18 20:20	05:58 20:02	06:28 19:01	18:34 (1) 19:04 (1)	06:58 18:12	07:04 16:33
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	18:27 (1) 19:01 (1)	05:18 20:21	05:59 20:02	06:29 19:00	18:33 (1) 19:05 (1)	06:59 18:10	07:04 16:32
16	07:10 16:47	06:43 17:24	06:01 17:56	06:11 19:28	05:32 19:59	18:26 (1) 19:01 (1)	05:18 20:21	06:00 20:02	06:30 19:05	18:32 (1) 19:05 (1)	07:00 18:09	07:05 16:32
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:32 20:00	18:26 (1) 19:02 (1)	05:18 20:21	06:01 20:02	06:31 19:06	18:31 (1) 19:06 (1)	07:01 18:07	07:06 16:31
18	07:09 16:49	06:40 17:27	05:57 17:58	06:08 19:30	05:31 20:01	18:25 (1) 19:01 (1)	05:18 20:22	06:02 20:02	06:32 19:06	18:31 (1) 19:06 (1)	07:02 18:06	07:07 16:30
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	18:25 (1) 19:02 (1)	05:18 20:22	06:03 20:02	06:33 19:06	18:30 (1) 19:06 (1)	07:03 18:04	07:07 16:29
20	07:08 16:52	06:37 17:29	05:54 18:00	06:05 19:32	05:29 20:02	18:24 (1) 19:01 (1)	05:18 20:22	06:03 20:02	06:34 19:06	18:30 (1) 19:06 (1)	07:04 18:03	07:08 16:29
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	18:24 (1) 19:01 (1)	05:18 20:23	06:04 20:03	06:34 19:06	18:29 (1) 19:06 (1)	07:05 18:02	07:08 16:28
22	07:07 16:54	06:34 17:31	05:51 18:02	06:02 19:34	05:27 20:04	18:24 (1) 19:00 (1)	05:19 20:23	06:05 20:04	06:35 19:05	18:28 (1) 19:05 (1)	07:06 18:00	07:09 16:27
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:27 20:05	18:24 (1) 19:00 (1)	05:19 20:23	06:06 20:03	06:36 19:05	18:28 (1) 19:05 (1)	07:07 17:59	07:09 16:27
24	07:06 16:56	06:32 17:34	05:47 18:04	06:05 19:36	05:26 20:06	18:25 (1) 19:00 (1)	05:19 20:23	06:07 20:03	06:37 19:05	18:28 (1) 19:05 (1)	07:09 17:57	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	06:04 19:37	05:25 20:07	18:24 (1) 18:59 (1)	05:19 20:23	06:08 20:03	06:38 19:04	18:28 (1) 19:04 (1)	07:10 16:56	07:10 16:26
26	07:05 16:59	06:29 17:36	05:44 18:06	06:03 19:38	05:24 20:08	18:25 (1) 18:59 (1)	05:20 20:23	06:09 20:11	06:39 19:04	18:28 (1) 19:04 (1)	07:11 16:55	07:11 16:25
27	07:04 17:00	06:27 17:37	05:43 18:07	06:02 19:40	05:23 20:09	18:26 (1) 18:58 (1)	05:20 20:23	06:10 20:10	06:40 19:30	18:28 (1) 19:03 (1)	07:12 16:53	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	06:01 19:41	05:22 20:09	18:26 (1) 18:57 (1)	05:20 20:23	06:11 20:09	06:41 19:29	18:28 (1) 19:02 (1)	07:13 16:52	07:11 16:29
29	07:02 17:02	06:25 17:38	05:40 18:08	06:00 19:41	05:21 20:09	18:27 (1) 18:58 (1)	05:21 20:23	06:12 20:09	06:42 19:29	18:29 (1) 19:02 (1)	07:14 16:52	07:12 16:30
30	07:01 17:04	06:24 17:39	05:39 18:09	06:00 19:42	05:20 20:10	18:28 (1) 18:56 (1)	05:21 20:23	06:13 20:08	06:43 19:27	18:30 (1) 19:01 (1)	07:15 16:51	07:12 16:30
31	07:00 17:05	06:23 17:40	05:38 18:10	06:00 19:43	05:19 20:11	18:28 (1) 18:55 (1)	05:21 20:23	06:13 20:07	06:43 19:26	18:30 (1) 19:00 (1)	07:16 16:49	07:12 16:30
Potential sun hours	299	298	370	398	447	450	457	427	375	346	299	290
Total, worst case				711	75			729	73			
Sun reduction				0,50	0,58			0,71	0,63			
Oper. time red.				0,96	0,96			0,96	0,96			
Wind dir. red.				0,53	0,53			0,53	0,53			
Total reduction				0,25	0,29			0,36	0,32			
Total, real				181	22			260	23			

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

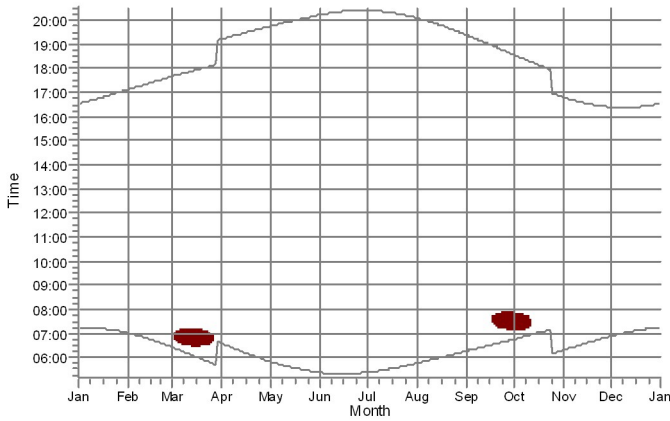
Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

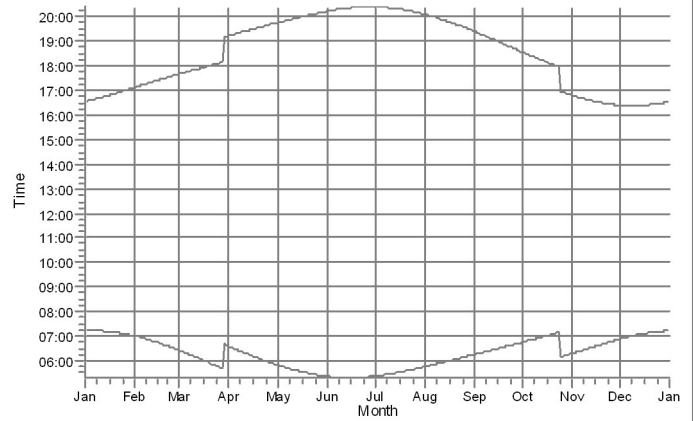
15-07-2017 14:21/3.1.617

SHADOW - Calendar, graphical

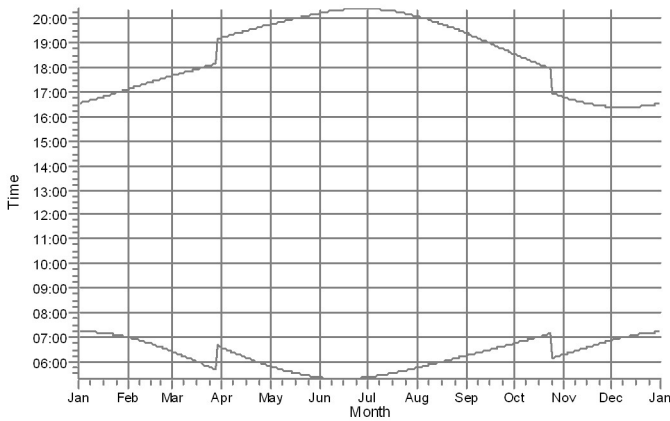
A: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)



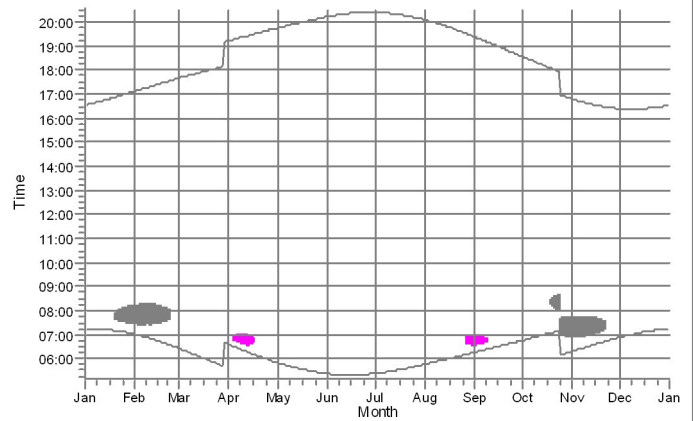
B: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)



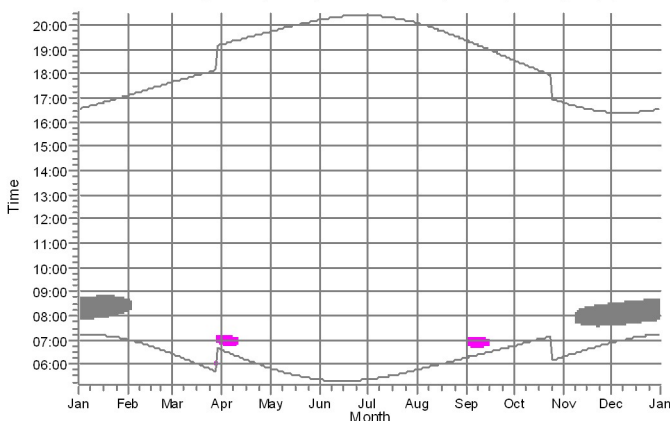
C: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)



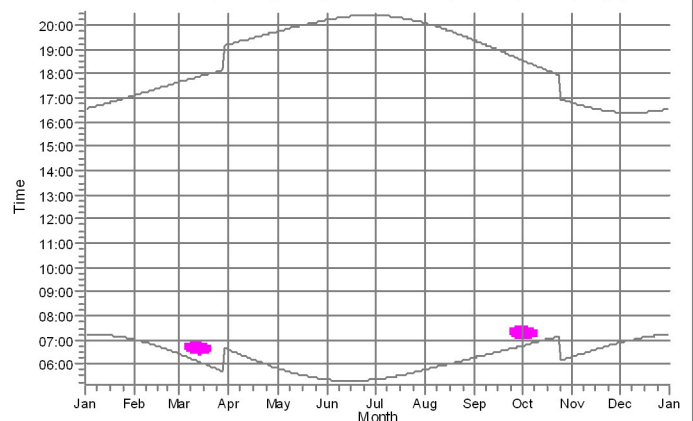
D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)



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



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



WTGs

- 4: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (4)
- 5: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (5)

- 8: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (8)

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

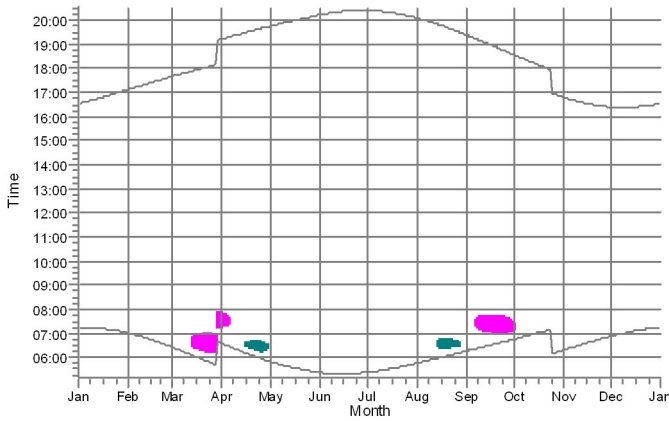
Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

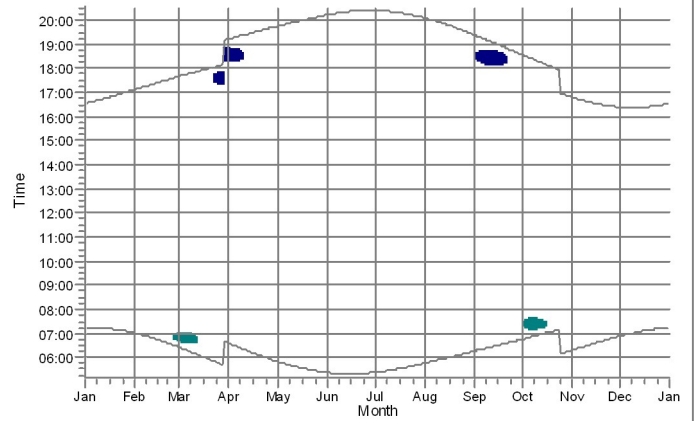
15-07-2017 14:21/3.1.617

SHADOW - Calendar, graphical

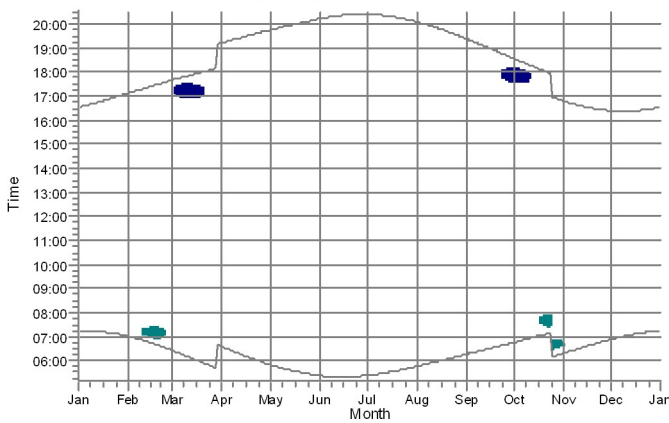
G: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)



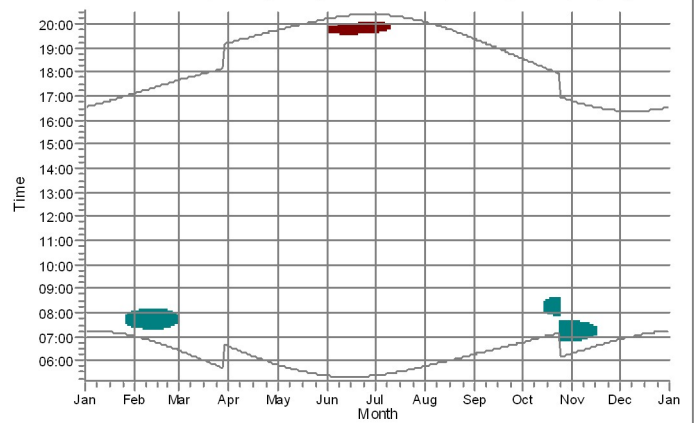
H: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)



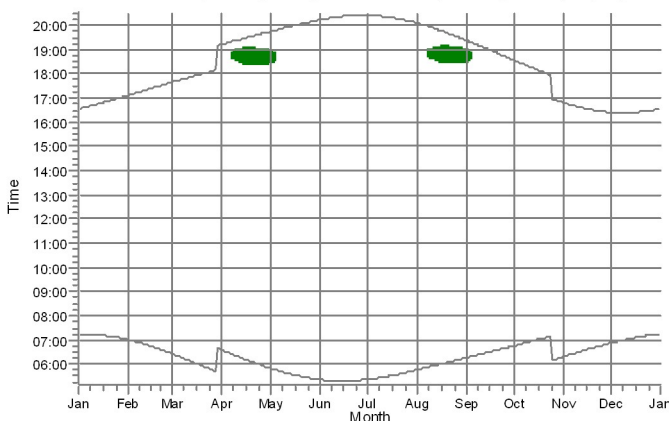
I: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)



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



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



WTGs

- 1: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (1)
- 5: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (5)
- 6: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (6)

- 7: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (7)
- 8: VESTAS V126-3.45 LTq 3450 126.0 IO! hub: 117,0 m (TOT: 180,0 m) (8)

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 1 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (1)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	18:28-18:53/25	05:21 19:44	05:22 20:03	05:45 20:05	06:15 19:23	18:32-18:57/25	06:18 16:47	06:52 16:23
2	07:13 16:33	06:59 17:07	06:23 17:41	06:33 19:14	05:48 19:45	18:30-18:51/21	05:21 19:45	05:22 20:03	05:46 20:04	06:16 19:21	18:33-18:55/22	06:45 18:31	06:53 16:46
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	18:32-18:49/17	05:20 19:46	05:23 20:03	05:47 20:03	06:17 19:19	18:35-18:52/17	06:46 18:30	06:54 16:45
4	07:13 16:35	06:57 17:10	06:20 17:43	06:30 19:16	05:46 19:47	18:35-18:47/12	05:20 19:47	05:23 20:02	05:48 20:02	06:18 19:18	18:39-18:48/9	06:47 18:28	06:55 16:43
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48		05:20 19:48	05:24 20:01	05:49 20:01	06:19 19:16		06:48 18:26	06:56 16:42
6	07:13 16:37	06:55 17:12	06:17 17:45	06:26 19:18	05:43 19:49		05:19 20:16	05:24 20:23	05:50 19:59	06:20 19:15		06:49 18:25	06:57 16:41
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50		05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13		06:50 18:23	06:58 16:40
8	07:13 16:39	06:52 17:15	06:14 17:47	06:23 19:20	05:41 19:51	18:41-18:50/9	05:19 20:17	05:26 20:22	05:52 19:57	06:22 19:11	18:47-18:52/5	06:52 18:21	06:59 16:39
9	07:12 16:40	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	18:37-18:54/17	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:10	18:43-18:56/13	06:53 18:20	06:27 16:38
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 19:22	05:39 19:53	18:34-18:56/22	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	18:40-18:59/19	06:54 18:18	06:28 16:37
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	05:38 19:54	18:33-18:58/25	05:18 20:19	05:28 20:21	05:55 19:53	06:25 19:06	18:38-19:00/22	06:55 18:17	06:29 16:36
12	07:12 16:43	06:48 17:19	06:07 17:52	06:17 19:24	05:36 19:55	18:30-18:59/29	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:05	18:37-19:02/25	06:56 18:15	06:31 16:35
13	07:11 16:44	06:46 17:21	06:06 17:53	06:15 19:25	05:35 19:56	18:30-19:00/30	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	18:35-19:03/28	06:57 18:14	06:32 16:34
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	05:34 19:57	18:28-19:00/32	05:18 20:20	05:30 20:19	05:58 19:49	06:28 19:01	18:34-19:04/30	06:58 18:12	06:33 16:33
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	18:27-19:01/34	05:18 20:21	05:30 20:19	05:59 19:48	06:29 19:00	18:33-19:05/32	06:59 18:10	06:34 16:32
16	07:10 16:47	06:43 17:24	06:01 17:56	06:11 19:28	05:33 19:59	18:26-19:01/35	05:18 20:21	05:31 20:18	06:00 19:47	06:30 18:58	18:32-19:05/33	07:00 18:09	06:35 16:32
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:32 20:00	18:26-19:02/36	05:18 20:22	05:32 20:18	06:01 19:45	06:31 18:56	18:31-19:06/35	07:01 18:07	06:36 16:31
18	07:10 16:49	06:40 17:27	05:57 17:58	06:08 19:30	05:31 20:01	18:25-19:01/36	05:18 20:22	05:33 20:17	06:02 19:44	06:32 18:55	18:31-19:06/35	07:02 18:06	06:38 16:30
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	18:25-19:02/37	05:18 20:22	05:34 20:16	06:03 19:42	06:33 18:53	18:30-19:06/36	07:03 18:04	06:39 16:29
20	07:09 16:52	06:37 17:29	05:54 18:00	06:05 19:32	05:29 20:02	18:24-19:01/37	05:18 20:22	05:34 20:16	06:04 19:41	06:34 18:51	18:30-19:06/36	07:04 18:03	06:40 16:29
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	18:24-19:01/37	05:18 20:23	05:35 20:15	06:04 19:39	06:35 18:50	18:29-19:06/37	07:05 18:02	06:41 16:28
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:04	18:24-19:00/36	05:19 20:23	05:36 20:14	06:05 19:38	06:35 18:48	18:28-19:05/37	07:06 18:00	06:42 16:27
23	07:07 16:55	06:33 17:33	05:49 18:03	06:00 19:35	05:27 20:05	18:24-19:00/36	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	18:28-19:05/37	07:08 17:59	06:43 16:26
24	07:06 16:56	06:32 17:34	05:48 18:04	05:59 19:36	05:26 20:06	18:25-19:00/35	05:19 20:23	05:38 20:12	06:07 19:35	06:37 18:44	18:28-19:05/37	07:09 17:57	06:44 16:26
25	07:05 16:58	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	18:24-18:59/35	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	18:28-19:04/36	07:09 16:56	06:46 16:26
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:39	05:24 20:08	18:25-18:59/34	05:20 20:23	05:40 20:11	06:09 19:32	06:39 18:41	18:28-19:04/36	06:11 16:55	06:47 16:25
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:09	18:26-18:58/32	05:20 20:24	05:41 20:10	06:10 19:30	06:40 18:39	18:28-19:03/35	06:12 16:53	06:48 16:25
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	18:26-18:57/31	05:20 20:24	05:41 20:10	06:11 19:29	06:41 18:38	18:28-19:02/34	06:13 16:52	06:49 16:24
29	07:02 17:02	06:25 19:09	05:40 19:42	05:52 19:42	05:23 20:10	18:27-18:56/29	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	18:29-19:01/32	06:14 16:51	06:50 16:24
30	07:01 17:04	06:38 19:11	05:51 19:43	18:28-18:55/27	05:22 20:11		05:21 20:23	05:43 20:07	06:13 19:26	06:43 18:34	18:30-19:00/30	06:15 16:49	06:51 16:23
31	07:00 17:05	06:36 19:12	06:11 19:12		05:22 20:12		05:22 20:12	05:44 20:06	06:14 19:24	06:44 18:34	18:30-18:59/29	06:17 16:48	06:52 16:31
Potential sun hours	299	298	370	398	447	450	457	427	375	73	346	299	290
Sum of minutes with flicker	0	0	0	711	75	0	0	729	73	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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 2 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (2)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	06:18 16:47	06:52 16:23
2	07:12 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:30	06:20 16:45	06:54 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:46 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	06:55 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48	05:20 20:15	05:24 20:23	05:49 20:01	06:19 19:16	06:48 18:26	06:22 16:42	06:56 16:22
6	07:13 16:37	06:55 17:12	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:23	05:50 19:59	06:20 19:14	06:49 18:25	06:24 16:41	06:57 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	06:25 16:40	06:58 16:22
8	07:13 16:39	06:52 17:15	06:14 17:47	06:23 19:20	05:41 19:51	05:19 20:17	05:26 20:22	05:52 19:57	06:22 19:11	06:52 18:21	06:26 16:39	06:59 16:22
9	07:12 16:40	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:10	06:53 18:20	06:27 16:38	07:00 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 19:22	05:39 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:54 18:18	06:28 16:37	07:01 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	05:38 19:54	05:18 20:19	05:28 20:21	05:55 19:53	06:25 19:06	06:55 18:17	06:29 16:36	07:01 16:22
12	07:12 16:43	06:48 17:19	06:07 17:52	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:05	06:56 18:15	06:31 16:35	07:02 16:22
13	07:11 16:44	06:46 17:21	06:06 17:53	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	06:57 18:14	06:32 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	05:34 19:57	05:18 20:20	05:30 20:19	05:58 19:49	06:28 19:01	06:58 18:12	06:33 16:33	07:04 16:23
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:59 19:48	06:29 19:00	06:59 18:10	06:34 16:32	07:05 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:11 19:28	05:32 19:59	05:18 20:21	05:31 20:18	06:00 19:47	06:30 18:58	07:00 18:09	06:35 16:32	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:32 20:00	05:18 20:22	05:32 20:18	06:01 19:45	06:31 18:56	07:01 18:07	06:36 16:31	07:06 16:23
18	07:10 16:49	06:40 17:27	05:57 17:58	06:08 19:30	05:31 20:01	05:18 20:22	05:33 20:17	06:02 19:44	06:32 18:55	07:02 18:06	06:38 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	05:18 20:22	05:34 20:16	06:03 19:42	06:33 18:53	07:03 18:04	06:39 16:29	07:07 16:24
20	07:08 16:52	06:37 17:29	05:54 18:00	06:05 19:32	05:29 20:02	05:18 20:22	05:34 20:16	06:03 19:41	06:34 18:51	07:04 18:03	06:40 16:29	07:08 16:25
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:02	06:41 16:28	07:08 16:25
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:19 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	06:42 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:27 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:08 17:59	06:43 16:27	07:09 16:26
24	07:06 16:56	06:32 17:34	05:48 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:12	06:07 19:35	06:37 18:44	07:09 17:57	06:44 16:26	07:10 16:27
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	06:10 16:56	06:46 16:26	07:10 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:39	05:24 20:08	05:20 20:23	05:40 20:11	06:09 19:32	06:39 18:41	06:11 16:55	06:47 16:25	07:11 16:28
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:09	05:20 20:24	05:41 20:10	06:10 19:30	06:40 18:39	06:12 16:53	06:48 16:25	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	06:13 16:52	06:49 16:24	07:11 16:29
29	07:02 17:02		06:39 19:09	05:52 19:42	05:23 20:10	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	06:14 16:51	06:50 16:24	07:12 16:30
30	07:01 17:04		06:38 19:11	05:51 19:43	05:22 20:11	05:21 20:23	05:43 20:07	06:13 19:26	06:43 18:34	06:15 16:49	06:51 16:23	07:12 16:30
31	07:00 17:05		06:36 19:12		05:22 20:12		05:44 20:06	06:14 19:24		06:17 16:48		07:12 16:31
Potential sun hours	299	298	370	398	447	450	457	427	375	346	299	290
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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 3 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (3)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	06:18 16:47	06:52 16:23
2	07:12 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	06:20 16:45	06:54 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:46 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	06:55 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48	05:20 20:15	05:24 20:23	05:49 20:00	06:19 19:16	06:48 18:26	06:22 16:42	06:56 16:22
6	07:13 16:37	06:55 17:12	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:23	05:50 19:59	06:20 19:14	06:49 18:25	06:24 16:41	06:57 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	06:25 16:40	06:58 16:22
8	07:12 16:39	06:52 17:15	06:13 17:47	06:23 19:20	05:41 19:51	05:19 20:17	05:26 20:22	05:52 19:57	06:22 19:11	06:51 18:21	06:26 16:39	06:59 16:22
9	07:12 16:40	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:10	06:53 18:20	06:27 16:38	07:00 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 19:22	05:39 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:54 18:18	06:28 16:37	07:01 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	05:37 19:54	05:18 20:19	05:28 20:21	05:55 19:53	06:25 19:06	06:55 18:17	06:29 16:36	07:01 16:22
12	07:12 16:43	06:48 17:19	06:07 17:52	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:05	06:56 18:15	06:31 16:35	07:02 16:22
13	07:11 16:44	06:46 17:21	06:06 17:53	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	06:57 18:14	06:32 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	05:34 19:57	05:18 20:20	05:30 20:19	05:58 19:49	06:28 19:01	06:58 18:12	06:33 16:33	07:04 16:23
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:59 19:48	06:29 19:00	06:59 18:10	06:34 16:32	07:05 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:11 19:28	05:32 19:59	05:18 20:21	05:31 20:18	06:00 19:47	06:30 18:58	07:00 18:09	06:35 16:31	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:32 20:00	05:18 20:22	05:32 20:18	06:01 19:45	06:31 18:56	07:01 18:07	06:36 16:31	07:06 16:23
18	07:10 16:49	06:40 17:27	05:57 17:58	06:08 19:30	05:31 20:01	05:18 20:22	05:33 20:17	06:02 19:44	06:32 18:55	07:02 18:06	06:38 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	05:18 20:22	05:34 20:16	06:02 19:42	06:33 18:53	07:03 18:04	06:39 16:29	07:07 16:24
20	07:08 16:52	06:37 17:29	05:54 18:00	06:05 19:32	05:29 20:02	05:18 20:22	05:34 20:16	06:03 19:41	06:33 18:51	07:04 18:03	06:40 16:29	07:08 16:25
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:02	06:41 16:28	07:08 16:25
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:19 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	06:42 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:27 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:08 17:59	06:43 16:27	07:09 16:26
24	07:06 16:56	06:32 17:34	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:12	06:07 19:35	06:37 18:44	07:09 17:57	06:44 16:26	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	06:10 16:56	06:46 16:26	07:10 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:38	05:24 20:08	05:20 20:23	05:40 20:11	06:09 19:32	06:39 18:41	06:11 16:55	06:47 16:25	07:11 16:28
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:09	05:20 20:23	05:40 20:10	06:10 19:30	06:40 18:39	06:12 16:53	06:48 16:25	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	06:13 16:52	06:49 16:24	07:11 16:29
29	07:02 17:02		06:39 19:09	05:52 19:42	05:23 20:10	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	06:14 16:51	06:50 16:24	07:12 16:30
30	07:01 17:04		06:38 19:11	05:51 19:43	05:22 20:11	05:21 20:23	05:43 20:07	06:13 19:26	06:43 18:34	06:15 16:49	06:51 16:23	07:12 16:30
31	07:00 17:05		06:36 19:12		05:22 20:12		05:44 20:06	06:14 19:24		06:17 16:48		07:12 16:31
Potential sun hours	299	298	370	398	447	450	457	427	375	346	299	290
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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS
Rosenstien 12
DK-8800 Viborg
+45 8663 8139
Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk
Calculated:
15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 4 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (4)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

Table with columns for months (January to December) and rows for each day of the month, showing sunrise and sunset times in hh:mm format. Includes summary rows for 'Potential sun hours' and 'Sum of minutes with flicker'.

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

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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 5 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (5)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	06:59 17:06	06:24 17:39	06:34 17:44	07:18-07:47/29 05:49	05:21 19:13	05:22 20:13	05:45 20:23	06:15 18:33	06:44 18:33	07:06-07:30/24 16:18	06:52 16:23
2	07:12 16:33	06:59 17:07	06:23 17:40	06:33 17:44	07:19-07:45/26 05:48	05:21 19:14	05:22 20:13	05:46 20:23	06:16 18:31	06:37-06:59/22 18:31	07:05-07:30/25 16:19	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 17:42	07:20-07:43/23 05:47	05:20 19:15	05:23 20:14	05:47 20:23	06:17 18:29	06:38-07:01/23 18:29	07:06-07:29/23 16:20	06:54 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 17:43	07:23-07:41/18 05:45	05:20 19:16	05:23 20:15	05:48 20:23	06:18 18:28	06:39-07:02/23 18:28	07:07-07:28/21 16:21	06:55 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 17:44	07:26-07:36/10 05:44	05:19 19:17	05:24 20:15	05:49 20:23	06:19 18:26	06:39-07:02/23 18:26	07:08-07:27/19 16:22	06:56 16:22
6	07:13 16:37	06:54 17:12	06:17 17:45	06:26 17:45	06:45-07:07/22 05:43	05:19 19:18	05:24 20:16	05:50 20:22	06:20 18:25	06:40-07:02/22 18:25	07:09-07:26/17 16:41	06:57 16:22
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 17:46	06:43-07:06/23 05:42	05:19 19:19	05:25 20:17	05:51 20:22	06:21 18:23	07:21-07:31/10 18:23	07:10-07:25/15 16:40	06:58 16:22
8	07:12 16:38	06:52 17:14	06:13 17:47	06:23 17:47	06:41-07:04/23 05:41	05:19 19:20	05:25 20:17	05:52 20:22	06:22 18:21	07:17-07:35/18 18:21	07:11-07:22/11 16:39	06:59 16:22
9	07:12 16:39	06:51 17:16	06:12 17:48	06:21 17:48	06:40-07:03/23 05:40	05:18 19:21	05:26 20:18	05:53 20:22	06:23 18:20	07:14-07:37/23 18:20	07:13-07:20/7 16:27	07:00 16:22
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 17:49	06:38-07:00/22 05:38	05:18 19:22	05:27 20:18	05:54 20:21	06:24 18:18	07:12-07:38/26 18:18	06:53 16:37	07:01 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:09 17:50	06:27-06:51/24 05:37	05:18 19:23	05:27 20:19	05:55 20:21	06:25 18:17	07:11-07:39/28 18:17	06:55 16:36	07:01 16:22
12	07:12 16:43	06:48 17:19	06:07 17:51	06:07 17:51	06:27-06:52/25 05:36	05:18 19:24	05:28 20:19	05:56 20:22	06:26 18:15	07:09-07:40/31 18:15	06:56 16:35	07:02 16:22
13	07:11 16:44	06:46 17:21	06:05 17:53	06:05 17:53	06:27-06:51/24 05:35	05:18 19:25	05:29 20:20	05:57 20:20	06:27 18:13	07:08-07:41/33 18:13	06:57 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:04 17:54	06:26-06:50/24 05:34	05:18 19:26	05:30 20:19	05:58 20:19	06:28 18:12	07:07-07:42/35 18:12	06:58 16:33	07:04 16:23
15	07:11 16:46	06:44 17:23	06:02 17:55	06:02 17:55	06:26-06:51/25 05:33	05:18 19:27	05:30 20:19	05:59 20:19	06:29 18:10	07:06-07:42/36 18:10	06:59 16:32	07:04 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:01 17:56	06:24-06:52/28 05:32	05:18 19:28	05:31 20:18	06:00 20:18	06:30 18:09	07:05-07:42/37 18:09	07:00 16:31	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	05:59 17:57	06:22-06:53/31 06:09	05:18 20:00	05:32 20:18	06:00 19:45	06:31 18:56	07:05-07:42/37 18:56	07:01 16:36	07:06 16:23
18	07:09 16:49	06:40 17:27	05:57 17:58	05:57 17:58	06:21-06:54/33 06:07	05:18 20:01	05:33 20:17	06:01 19:44	06:32 18:54	07:04-07:42/38 18:54	07:02 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	05:56 17:59	06:19-06:54/35 06:06	05:18 20:02	05:34 20:16	06:02 19:42	06:32 18:53	07:03-07:41/38 18:53	07:03 16:39	07:07 16:24
20	07:08 16:51	06:37 17:29	05:54 18:00	05:54 18:00	06:18-06:54/36 06:04	05:18 20:02	05:34 20:16	06:03 19:41	06:33 18:51	07:02-07:40/38 18:51	07:04 16:28	07:08 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	05:52 18:01	06:18-06:55/37 06:03	05:18 20:03	05:35 20:15	06:04 19:39	06:34 18:49	07:02-07:40/38 18:49	07:05 16:28	07:08 16:25
22	07:07 16:54	06:34 17:31	05:51 18:02	05:51 18:02	06:17-06:55/38 06:02	05:18 20:04	05:36 20:14	06:05 19:38	06:35 18:48	07:02-07:39/37 18:48	07:06 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	05:49 18:03	06:16-06:54/38 06:00	05:18 20:05	05:37 20:13	06:06 19:36	06:36 18:46	07:02-07:39/37 18:46	07:07 16:27	07:09 16:26
24	07:06 16:56	06:32 17:34	05:47 18:04	05:47 18:04	06:16-06:55/39 05:59	05:18 20:06	05:38 20:12	06:07 19:35	06:37 18:44	07:03-07:38/35 18:44	07:09 16:26	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:46 18:05	06:16-06:54/38 05:57	05:19 20:07	05:39 20:12	06:08 19:33	06:38 18:43	07:03-07:37/34 18:43	06:10 16:56	07:10 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:44 18:06	06:16-06:54/38 05:56	05:24 20:08	05:40 20:11	06:09 19:32	06:39 18:41	07:04-07:35/31 18:41	06:11 16:55	07:11 16:28
27	07:04 17:00	06:27 17:37	05:42 18:07	05:42 18:07	06:16-06:53/37 05:55	05:24 20:09	05:40 20:10	06:10 19:30	06:40 18:39	07:05-07:34/29 18:39	06:12 16:53	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:41 18:08	06:16-06:52/36 05:53	05:23 20:09	05:41 20:09	06:11 19:29	06:41 18:38	07:06-07:32/26 18:38	06:13 16:52	07:11 16:29
29	07:02 17:02		06:39 17:17	06:39 17:17	07:17-07:51/34 05:52	05:23 20:10	05:42 20:08	06:12 19:27	06:39-06:53/14 18:36	07:07-07:30/23 18:36	06:14 16:51	07:12 16:30
30	07:01 17:03		06:38 17:17	06:38 17:17	07:50/33 05:51	05:22 20:11	05:43 20:07	06:13 19:26	06:37-06:54/17 18:34	07:06-07:30/24 18:34	06:15 16:49	07:12 16:30
31	07:00 17:05		06:36 17:17	06:36 17:17	07:48/31 05:51	05:21 20:12	05:44 20:06	06:14 19:24	06:36-06:55/19 18:34	07:05-07:34/29 18:34	06:17 16:48	07:12 16:31
Potential sun hours	299	298	370	398	447	450	457	427	375	1005	162	299
Sum of minutes with flicker	0	0	818	397	0	0	68	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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS
Rosenstien 12
DK-8800 Viborg
+45 8663 8139
Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk
Calculated:
15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 6 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (6)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June
1	07:12 16:32	06:59 07:27-07:58/31 17:06	06:24 06:43-06:57/14 17:39	06:34 19:12	05:49 19:44	05:21 20:12
2	07:12 16:33	06:58 07:26-08:00/34 17:07	06:23 06:42-06:58/16 17:40	06:33 19:14	05:48 19:45	05:21 20:13
3	07:13 16:34	06:58 07:25-08:01/36 17:08	06:21 06:40-06:58/18 17:42	06:31 19:15	05:47 19:46	05:20 20:14
4	07:13 16:35	06:57 07:25-08:02/37 17:10	06:20 06:38-06:58/20 17:43	06:29 19:16	05:45 19:47	05:20 20:15
5	07:13 16:36	06:55 07:24-08:03/39 17:11	06:18 06:37-06:58/21 17:44	06:28 19:17	05:44 19:48	05:19 20:15
6	07:13 16:37	06:54 07:24-08:03/39 17:12	06:17 06:36-06:57/21 17:45	06:26 19:18	05:43 19:49	05:19 20:16
7	07:13 16:37	06:53 07:23-08:04/41 17:13	06:15 06:37-06:57/20 17:46	06:25 19:19	05:42 19:50	05:19 20:17
8	07:12 16:38	06:52 07:23-08:05/42 17:14	06:13 06:37-06:56/19 17:47	06:23 19:20	05:41 19:51	05:19 20:17
9	07:12 16:39	06:51 07:23-08:05/42 17:16	06:12 06:37-06:54/17 17:48	06:21 19:21	05:40 19:52	05:18 20:18
10	07:12 16:40	06:50 07:22-08:05/43 17:17	06:10 06:39-06:53/14 17:49	06:20 19:22	05:38 19:53	05:18 20:18
11	07:12 16:41	06:49 07:22-08:05/43 17:18	06:09 06:40-06:50/10 17:50	06:18 19:23	05:37 19:54	05:18 20:19
12	07:12 16:43	06:48 07:22-08:06/44 17:19	06:07 17:51	06:17 19:24	05:36 19:55	05:18 20:19
13	07:11 16:44	06:46 07:23-08:06/43 17:21	06:05 17:53	06:15 19:25	05:35 19:56	05:18 20:20
14	07:11 16:45	06:45 07:22-08:05/43 17:22	06:04 17:54	06:14 19:26	05:34 19:57	05:18 20:20
15	07:11 16:46	06:44 07:22-08:05/43 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21
16	07:10 16:47	06:43 07:23-08:05/42 17:24	06:01 17:56	06:10 06:29-06:34/5 19:28	05:32 19:59	05:18 20:21
17	07:10 16:48	06:41 07:23-08:04/41 17:25	05:59 17:57	06:09 06:28-06:36/8 19:29	05:31 20:00	05:18 20:21
18	07:09 16:49	06:40 07:23-08:04/41 17:26	05:57 17:58	06:07 06:26-06:36/10 19:30	05:31 20:01	05:18 20:22
19	07:09 16:50	06:39 07:24-08:03/39 17:28	05:56 17:59	06:06 06:25-06:37/12 19:31	05:30 20:01	05:18 20:22
20	07:08 16:51	06:37 07:24-08:02/38 17:29	05:54 18:00	06:04 06:23-06:37/14 19:32	05:29 20:02	05:18 20:22
21	07:08 16:53	06:36 07:26-08:01/35 17:30	05:52 18:01	06:03 06:22-06:37/15 19:33	05:28 20:03	05:18 20:23
22	07:07 16:54	06:34 07:26-08:00/34 17:31	05:51 18:02	06:02 06:20-06:37/17 19:34	05:27 20:04	05:18 20:23
23	07:07 16:55	06:33 07:28-07:59/31 17:32	05:49 18:03	06:00 06:19-06:37/18 19:35	05:26 20:05	05:19 20:23
24	07:06 16:56	06:32 07:30-07:57/27 17:34	05:47 18:04	05:59 06:18-06:37/19 19:36	05:26 20:06	05:19 20:23
25	07:05 16:57	06:30 07:31-07:55/24 17:35	05:46 18:05	05:57 06:17-06:35/18 19:37	05:25 20:07	05:19 20:23
26	07:04 16:59	06:29 07:34-07:52/18 17:36	05:44 18:06	05:56 06:18-06:35/17 19:38	05:24 20:08	05:20 20:23
27	07:04 07:36-07:49/13 17:00	06:27 07:37-07:48/11 17:37	05:42 18:07	05:55 06:18-06:33/15 19:39	05:24 20:09	05:20 20:23
28	07:03 07:33-07:52/19 17:01	06:26 06:45-06:57/12 17:38	05:41 18:08	05:53 06:20-06:31/11 19:40	05:23 20:09	05:20 20:23
29	07:02 07:31-07:54/23 17:02		06:39 19:09	05:52 06:23-06:29/6 19:42	05:22 20:10	05:21 20:23
30	07:01 07:29-07:55/26 17:03		06:38 19:10	05:51 19:43	05:22 20:11	05:21 20:23
31	07:00 07:28-07:57/29 17:05		06:36 19:11		05:21 20:12	
Potential sun hours	299	298	370	398	447	450
Sum of minutes with flicker	110	1219	190	185	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:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 6 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (6)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	July	August	September	October	November	December	
1	05:22 20:23	05:45 20:05	06:15 19:22	06:44 18:33	06:18 16:47	06:52-07:35/43 06:39-06:40/1	06:52 16:23
2	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	07:21-07:27/6 18:31	06:19 16:46	06:52-07:34/42 16:23
3	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	07:17-07:30/13 18:29	06:20 16:44	06:53-07:35/42 16:23
4	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	07:15-07:31/16 18:28	06:21 16:43	06:53-07:34/41 16:22
5	05:24 20:23	05:49 20:00	06:19 19:16	06:48 18:26	07:14-07:32/18 18:26	06:22 16:42	06:54-07:33/39 16:22
6	05:24 20:22	05:50 19:59	06:20 19:14	06:49 18:24	07:12-07:33/21 18:24	06:24 16:41	06:54-07:32/38 16:22
7	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	07:12-07:33/21 18:23	06:25 16:40	06:56-07:32/36 16:22
8	05:25 20:22	05:52 19:57	06:22 19:11	06:51 18:21	07:11-07:33/22 18:21	06:26 16:39	06:56-07:31/35 16:22
9	05:26 20:22	05:53 19:56	06:23 19:09	06:52 18:20	07:12-07:32/20 18:20	06:27 16:38	06:57-07:30/33 16:22
10	05:27 20:21	05:54 19:54	06:24 19:08	06:53 18:18	07:14-07:33/19 18:18	06:28 16:37	06:58-07:29/31 16:22
11	05:27 20:21	05:55 19:53	06:25 19:06	06:55 18:17	07:15-07:32/17 18:17	06:29 16:36	07:00-07:29/29 16:22
12	05:28 20:20	05:56 19:52	06:26 19:04	06:56 18:15	07:16-07:31/15 18:15	06:31 16:35	07:01-07:27/26 16:22
13	05:29 20:20	05:57 19:50	06:27 19:03	06:57 18:13	07:17-07:30/13 18:13	06:32 16:34	07:03-07:26/23 16:22
14	05:30 20:19	05:58 19:49	06:28 19:01	06:58 18:12	07:18-07:28/10 18:12	06:33 16:33	07:05-07:23/18 16:22
15	05:30 20:19	05:58 19:48	06:28 18:59	06:58 18:10	08:08-08:22/14 18:10	06:34 16:32	07:09-07:21/12 16:23
16	05:31 20:18	05:59 19:46	06:29 18:58	07:00 18:09	08:04-08:25/21 18:09	06:35 16:31	08:04-08:25/21 16:23
17	05:32 20:18	06:00 19:45	06:29 18:56	07:01 18:07	08:02-08:27/25 18:07	06:36 16:31	08:02-08:27/25 16:23
18	05:33 20:17	06:01 19:44	06:30 18:54	07:02 18:06	07:59-08:28/29 18:06	06:38 16:30	07:59-08:28/29 16:24
19	05:33 20:16	06:02 19:42	06:32 18:53	07:03 18:04	07:59-08:31/32 18:04	06:39 16:29	07:59-08:31/32 16:24
20	05:34 20:16	06:03 19:41	06:33 18:51	07:04 18:03	07:57-08:32/35 18:03	06:40 16:28	07:57-08:32/35 16:24
21	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:01	07:56-08:32/36 18:01	06:41 16:28	07:56-08:32/36 16:25
22	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	07:55-08:33/38 18:00	06:42 16:27	07:55-08:33/38 16:25
23	05:37 20:13	06:06 19:36	06:36 18:46	07:07 17:59	07:54-08:33/39 17:59	06:43 16:26	07:54-08:33/39 16:26
24	05:38 20:12	06:07 19:35	06:37 18:44	07:09 17:57	07:53-08:34/41 17:57	06:44 16:26	07:53-08:34/41 16:26
25	05:39 20:12	06:08 19:33	06:38 18:43	07:10 16:56	06:53-07:35/42 16:56	06:46 16:25	06:53-07:35/42 16:27
26	05:39 20:11	06:09 19:32	06:39 18:41	07:11 16:54	06:53-07:35/42 16:54	06:47 16:25	06:53-07:35/42 16:28
27	05:40 20:10	06:10 19:30	06:40 18:39	07:12 16:53	06:52-07:35/43 16:53	06:48 16:24	06:52-07:35/43 16:24
28	05:41 20:09	06:11 19:29	06:41 18:38	07:13 16:52	06:52-07:35/43 16:52	06:49 16:24	06:52-07:35/43 16:29
29	05:42 20:08	06:12 19:27	06:42 18:36	07:14 16:51	06:51-07:35/44 16:51	06:50 16:24	06:51-07:35/44 16:30
30	05:43 20:07	06:13 19:26	06:43 18:34	07:15 16:49	06:52-07:35/43 16:49	06:51 16:23	06:52-07:35/43 16:30
31	05:44 20:06	06:14 19:24		06:17 16:48	06:52-07:35/43 16:48		06:52-07:35/43 16:31
Potential sun hours	457	427	375	346	299	290	
Sum of minutes with flicker	0	184	0	1044	489	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:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 7 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (7)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	18:20-18:47/27	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	17:37-18:05/28	06:18 16:47	06:52 16:23
2	07:13 16:33	06:59 17:07	06:23 17:40	06:33 19:14	18:19-18:46/27	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	17:37-18:04/27	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	18:19-18:45/26	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	18:25-18:33/8	06:46 18:29	06:20 16:44
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	18:20-18:45/25	05:46 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	18:20-18:35/15	06:47 18:28	06:21 16:43
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	18:20-18:43/23	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:01	06:19 19:16	06:48 18:26	18:18-18:37/19	06:48 18:26	06:22 16:42
6	07:13 16:37	06:55 17:12	06:17 17:45	06:26 19:18	18:21-18:43/22	05:43 19:49	05:19 20:16	05:24 20:23	05:50 19:59	06:20 18:25	06:49 18:25	18:16-18:38/22	06:49 18:25	06:24 16:41
7	07:13 16:38	06:53 17:13	06:15 17:46	06:25 19:19	18:22-18:41/19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 18:23	06:50 18:23	18:15-18:38/23	06:50 18:23	06:25 16:40
8	07:13 16:39	06:52 17:15	06:14 17:47	06:23 19:20	18:23-18:38/15	05:41 19:51	05:19 20:17	05:26 20:22	05:52 19:57	06:22 19:11	06:52 18:21	18:14-18:39/25	06:52 18:21	06:26 16:39
9	07:12 16:40	06:51 17:16	06:12 17:48	06:21 19:21	16:59-17:25/26	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:10	06:53 18:20	18:13-18:39/26	06:53 18:20	06:27 16:38
10	07:12 16:41	06:50 17:17	06:10 17:49	06:20 19:22	16:59-17:26/27	05:39 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:54 18:18	18:12-18:39/27	06:54 18:18	06:28 16:37
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	16:58-17:26/28	05:37 19:54	05:18 20:19	05:28 20:21	05:55 19:53	06:25 19:06	06:55 18:17	18:12-18:39/27	06:55 18:17	06:29 16:36
12	07:12 16:43	06:48 17:19	06:07 17:52	06:17 19:24	16:59-17:26/27	06:17 19:25	05:36 20:20	05:28 20:20	05:56 19:51	06:26 19:05	06:56 18:15	18:11-18:39/28	06:56 18:15	06:31 16:35
13	07:12 16:44	06:46 17:21	06:06 17:53	06:15 19:25	16:58-17:25/27	06:15 19:26	05:35 20:20	05:29 20:20	05:57 19:51	06:27 19:03	06:57 18:14	18:11-18:39/28	06:57 18:14	06:32 16:34
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	16:58-17:24/26	06:14 19:27	05:34 20:20	05:30 20:19	05:58 19:49	06:28 19:01	06:58 18:12	18:11-18:38/27	06:58 18:12	06:33 16:33
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	16:59-17:24/25	06:12 19:28	05:33 20:21	05:30 20:19	05:59 19:48	06:29 19:00	06:59 18:10	18:11-18:37/26	06:59 18:10	06:34 16:32
16	07:10 16:47	06:43 17:24	06:01 17:56	06:11 19:28	16:59-17:22/23	06:11 19:29	05:32 20:21	05:31 20:18	06:00 19:47	06:30 18:58	07:00 18:09	18:12-18:36/24	07:00 18:09	06:35 16:31
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	17:00-17:21/21	06:09 20:00	05:32 20:22	05:32 20:18	06:01 19:45	06:31 18:56	07:01 18:07	18:12-18:34/22	07:01 18:07	06:37 16:31
18	07:10 16:49	06:40 17:27	05:57 17:58	06:08 19:30	17:02-17:19/17	06:08 20:01	05:31 20:22	05:33 20:17	06:02 19:44	06:32 18:55	07:02 18:06	18:13-18:33/20	07:02 18:06	06:38 16:30
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	17:03-17:17/14	06:06 20:02	05:30 20:22	05:34 20:16	06:02 19:42	06:33 18:53	07:03 18:04	18:14-18:30/16	07:03 18:04	06:39 16:29
20	07:09 16:52	06:37 17:29	05:54 18:00	06:05 19:32	17:07-17:11/4	06:05 20:03	05:29 20:22	05:34 20:16	06:03 19:41	06:34 18:51	07:04 18:03	18:16-18:27/11	07:04 18:03	06:40 16:28
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33		06:03 20:03	05:28 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:02		07:05 18:02	06:41 16:28
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34		06:02 20:04	05:27 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00		07:06 18:00	06:42 16:27
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	17:30-17:40/10	06:00 20:05	05:27 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:08 17:59		07:08 17:59	06:43 16:26
24	07:06 16:56	06:32 17:34	05:48 18:04	05:59 19:36	17:28-17:44/16	05:59 20:06	05:26 20:23	05:38 20:13	06:07 19:35	06:37 18:44	07:09 17:57	17:48-17:59/11	07:09 17:57	06:45 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	17:25-17:44/19	05:57 20:07	05:25 20:23	05:39 20:12	06:08 19:33	06:38 18:43	07:10 16:56	17:45-18:01/16	07:10 16:56	06:46 16:26
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:39	17:24-17:46/22	05:56 20:08	05:24 20:23	05:40 20:11	06:09 19:32	06:39 18:41	07:11 16:55	17:43-18:03/20	07:11 16:55	06:47 16:26
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	17:23-17:47/24	05:55 20:09	05:24 20:24	05:40 20:10	06:10 19:30	06:40 18:39	07:12 16:53	17:41-18:04/23	07:12 16:53	06:48 16:25
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	17:21-17:47/26	05:53 20:09	05:23 20:24	05:41 20:09	06:11 19:29	06:41 18:38	07:13 16:52	17:40-18:04/24	07:13 16:52	06:49 16:24
29	07:02 17:02	06:25 19:09	05:41 18:09	05:52 19:42	18:21-18:48/27	05:52 19:42	05:23 20:10	05:42 20:08	06:12 19:27	06:42 18:36	07:14 16:51	17:39-18:05/26	07:14 16:51	06:50 16:24
30	07:01 17:04	06:24 19:11	05:41 18:10	05:51 19:43	18:20-18:47/27	05:51 19:43	05:22 20:11	05:43 20:07	06:13 19:26	06:43 18:34	07:15 16:49	17:38-18:05/27	07:15 16:49	06:51 16:23
31	07:00 17:05	06:23 19:12	05:41 18:11	05:51 19:43	18:19-18:47/28	05:51 20:12	05:22 20:12	05:44 20:06	06:14 19:24	06:44 18:34	07:16 16:48		07:16 16:48	06:52 16:31
Potential sun hours	299	298	370	398	192	447	450	457	427	375	541	346	237	299
Sum of minutes with flicker	0	0	578	398	192	0	0	0	0	0	541	346	237	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:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 8 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (8)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum

2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:12	07:00	06:24	06:34	05:49	05:21	05:22	19:42-19:58/16	05:45	06:15	06:44	07:11-07:47/36	06:18	06:52
2	16:32	17:06	17:39	19:13	19:44	20:13	20:23	20:23	20:05	18:33	18:33	16:47	16:23	
3	07:13	06:59	06:23	06:33	05:48	05:21	05:22	19:42-19:58/16	05:46	06:16	06:45	07:11-07:47/36	06:19	06:53
4	16:33	17:07	17:40	19:14	19:45	20:13	20:23	20:23	20:04	18:31	18:31	16:46	16:23	
5	07:13	06:58	06:21	06:46-06:59/13	06:31	05:47	05:20	19:42-19:49/7	05:23	06:46	06:46	07:11-07:46/35	06:20	06:54
6	16:34	17:08	17:42	19:15	19:46	20:14	20:23	19:44-19:58/14	20:03	18:29	18:29	16:44	16:23	
7	07:13	06:57	06:20	06:42-07:02/20	06:29	05:45	05:20	19:41-19:50/9	05:23	06:48	06:47	07:11-07:45/34	06:21	06:55
8	16:35	17:10	17:43	19:16	19:47	20:15	20:23	20:23	20:02	18:28	18:28	16:43	16:22	
9	07:13	06:56	06:18	06:40-07:04/24	06:28	05:44	05:19	19:40-19:51/11	05:24	06:49	06:48	07:12-07:44/32	06:22	06:56
10	16:36	17:11	17:44	19:17	19:48	20:15	20:24	19:45-19:58/13	20:01	18:26	18:26	16:42	16:22	
11	07:13	06:55	06:17	06:38-07:05/27	06:26	05:43	05:19	19:40-19:51/11	05:24	06:50	06:49	07:12-07:43/31	06:24	06:57
12	16:37	17:12	17:45	19:18	19:49	20:16	20:23	19:46-19:58/12	20:03	18:25	18:25	16:41	16:22	
13	07:13	06:53	06:15	06:37-07:07/30	06:25	05:42	05:19	19:39-19:51/12	05:25	06:51	06:50	07:13-07:41/28	06:25	06:58
14	16:38	17:13	17:46	19:19	19:50	20:17	20:22	19:46-19:57/11	20:02	18:23	18:23	16:40	16:22	
15	07:13	06:52	06:13	06:36-07:07/31	06:23	05:41	05:19	19:39-19:52/13	05:25	06:52	06:51	07:14-07:40/26	06:26	06:59
16	16:39	17:15	17:47	19:20	19:51	20:17	20:22	19:49-19:56/7	20:02	18:21	18:21	16:39	16:22	
17	07:12	06:51	06:12	06:35-07:08/33	06:21	05:40	05:18	19:39-19:53/14	05:26	06:53	06:53	07:17-07:39/22	06:27	07:00
18	16:40	17:16	17:48	19:21	19:52	20:18	20:22	19:51-19:55/4	20:06	18:20	18:20	16:38	16:22	
19	07:12	06:50	06:10	06:34-07:08/34	06:20	05:39	05:18	19:38-19:53/15	05:27	06:54	06:54	07:19-07:36/17	06:28	07:01
20	16:41	17:17	17:49	19:22	19:53	20:18	20:21	19:54	20:08	18:18	18:18	16:37	16:22	
21	07:12	06:49	06:09	06:33-07:08/35	06:18	05:37	05:18	19:38-19:54/16	05:27	06:55	06:55	07:22-07:32/10	06:29	07:01
22	16:42	17:18	17:50	19:23	19:54	20:19	20:21	19:53	20:06	18:17	18:17	16:36	16:22	
23	07:12	06:48	06:07	06:33-07:09/36	06:17	05:36	05:18	19:38-19:55/17	05:28	06:56	06:56	06:31	07:02	
24	16:43	17:19	17:52	19:24	19:55	20:19	20:20	19:52	20:05	18:15	18:15	16:35	16:22	
25	07:12	06:46	06:05	06:32-07:08/36	06:15	05:35	05:18	19:38-19:55/17	05:29	06:57	06:57	06:32	07:03	
26	16:44	17:21	17:53	19:25	19:56	20:20	20:20	19:51	20:03	18:13	18:13	16:34	16:22	
27	07:11	06:45	06:04	06:31-07:08/37	06:14	05:34	05:18	19:38-19:55/17	05:30	06:58	06:58	06:33	07:04	
28	16:45	17:22	17:54	19:26	19:57	20:20	20:19	19:49	20:01	18:12	18:12	16:33	16:23	
29	07:11	06:44	06:02	06:32-07:08/36	06:12	05:33	05:18	19:38-19:56/18	05:30	06:59	06:59	06:34	07:05	
30	16:46	17:23	17:55	19:27	19:58	20:21	20:19	19:48	20:00	18:10	18:10	16:32	16:23	
31	07:10	06:43	06:01	06:31-07:07/36	06:11	05:32	05:18	19:38-19:56/18	05:31	06:00	06:00	06:35	07:05	
32	16:47	17:24	17:56	19:28	19:59	20:21	20:18	19:47	20:01	18:09	18:09	16:31	16:23	
33	07:10	06:41	06:00	06:31-07:06/35	06:09	05:31	05:18	19:38-19:56/18	05:32	06:01	06:01	06:36	07:06	
34	16:48	17:25	17:57	19:29	20:00	20:22	20:18	19:45	20:02	18:07	18:07	16:31	16:23	
35	07:10	06:40	06:00	06:32-07:06/34	06:07	05:31	05:18	19:38-19:57/19	05:33	06:01	06:32	07:31-07:38/7	07:02	06:38
36	16:49	17:27	17:58	19:30	20:01	20:22	20:17	19:44	20:03	18:06	18:06	16:30	16:24	
37	07:09	06:39	06:00	06:32-07:04/32	06:06	05:30	05:18	19:38-19:57/19	05:34	06:02	06:33	07:26-07:42/16	07:03	06:39
38	16:50	17:28	17:59	19:31	20:02	20:22	20:16	19:42	20:04	18:04	18:04	16:29	16:24	
39	07:09	06:37	06:00	06:33-07:04/31	06:05	05:29	05:18	19:39-19:57/18	05:34	06:03	06:33	07:22-07:43/21	07:04	06:40
40	16:51	17:29	18:00	19:32	20:03	20:22	20:16	19:41	20:05	18:03	18:03	16:28	16:24	
41	07:08	06:36	06:00	06:34-07:02/28	06:03	05:28	05:18	19:39-19:57/18	05:35	06:04	06:34	07:20-07:45/25	07:05	06:41
42	16:53	17:30	18:01	19:33	20:03	20:23	20:15	19:39	20:06	18:02	18:02	16:28	16:25	
43	07:07	06:35	06:00	06:34-07:00/26	06:02	05:27	05:18	19:40-19:58/18	05:36	06:05	06:35	07:18-07:46/28	07:06	06:42
44	16:54	17:31	18:02	19:34	20:04	20:23	20:14	19:38	20:07	18:00	18:00	16:27	16:25	
45	07:07	06:33	06:00	06:36-06:58/22	06:00	05:26	05:19	19:40-19:58/18	05:37	06:06	06:36	07:17-07:47/30	07:08	06:43
46	16:55	17:32	18:03	19:35	20:05	20:23	20:13	19:36	20:08	18:00	18:00	16:27	16:26	
47	07:06	06:32	06:00	06:38-06:55/17	05:59	05:26	05:19	19:39-19:58/19	05:38	06:07	06:37	07:16-07:48/32	07:09	06:44
48	16:56	17:34	18:04	19:36	20:06	20:23	20:13	19:35	20:09	18:00	18:00	16:26	16:26	
49	07:05	06:30	06:00	06:41-06:51/10	05:57	05:25	05:19	19:40-19:59/19	05:39	06:08	06:38	07:15-07:48/33	06:10	06:46
50	16:57	17:35	18:05	19:37	20:07	20:23	20:12	19:33	20:10	18:00	18:00	16:25	16:27	
51	07:05	06:29	06:00	06:39-06:54	05:56	05:24	05:20	19:40-19:58/18	05:40	06:09	06:39	07:14-07:48/34	06:11	06:47
52	16:59	17:36	18:06	19:39	20:08	20:23	20:11	19:32	20:11	18:00	18:00	16:25	16:28	
53	07:04	06:27	06:00	06:39-06:54	05:55	05:24	05:20	19:40-19:58/18	05:40	06:10	06:40	07:13-07:48/35	06:12	06:48
54	17:00	17:37	18:07	19:40	20:09	20:24	20:10	19:30	20:12	18:00	18:00	16:25	16:28	
55	07:03	06:26	06:00	06:39-06:54	05:53	05:23	05:20	19:41-19:59/18	05:41	06:11	06:41	07:12-07:48/36	06:13	06:49
56	17:01	17:38	18:08	19:41	20:09	20:24	20:09	19:29	20:13	18:00	18:00	16:24	16:29	
57	07:02	06:29	06:00	06:39-06:54	05:52	05:23	05:21	19:41-19:58/17	05:42	06:12	06:42	07:12-07:48/36	06:14	06:50
58	17:02	17:39	18:09	19:42	20:10	20:24	20:08	19:27	20:14	18:00	18:00	16:24	16:30	
59	07:01	06:28	06:00	06:39-06:54	05:51	05:22	05:21	19:41-19:58/17	05:43	06:13	06:43	07:11-07:48/37	06:15	06:51
60	17:03	17:40	18:10	19:43	20:11	20:24	20:07	19:26	20:14	18:00	18:00	16:23	16:30	
61	07:00	06:26	06:00	06:39-06:54	05:50	05:21	05:20	19:41-19:58/17	05:44	06:14	06:44	07:11-07:48/37	06:16	07:12
62	17:05	17:42	18:12	19:44	20:12	20:25	20:06	19:24	20:16	18:00	18:00	16:23	16:31	
63	Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	290	
64	Sum of minutes with flicker	0	0	663	0	0	449	115	0	370	307	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:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 9 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (9)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3,74 4,31 5,21 6,68 8,38 9,76 10,61 9,72 7,93 5,84 4,48 3,68

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
2.034 327 242 189 300 533 1.435 870 421 187 372 1.463 8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	06:59 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:21 20:23	05:45 20:05	06:15 19:22	06:44 18:33	06:18 16:47	06:52 16:23
2	07:12 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:20 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:41	06:31 19:15	05:47 19:46	05:20 20:14	05:22 20:23	05:47 20:03	06:17 19:19	06:46 18:29	06:20 16:44	06:54 16:22
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:45 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	06:55 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:00	06:19 19:16	06:48 18:26	06:22 16:42	06:56 16:22
6	07:13 16:36	06:54 17:12	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:22	05:50 19:59	06:20 19:14	06:49 18:24	06:24 16:41	06:57 16:22
7	07:13 16:37	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	06:25 16:40	06:58 16:22
8	07:12 16:38	06:52 17:14	06:13 17:47	06:23 19:20	05:41 19:51	05:18 20:17	05:25 20:22	05:52 19:57	06:22 19:11	06:51 18:21	06:26 16:39	06:59 16:22
9	07:12 16:39	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:09	06:52 18:20	06:27 16:38	07:00 16:22
10	07:12 16:40	06:50 17:17	06:10 17:49	06:20 19:22	05:38 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:53 18:18	06:28 16:37	07:01 16:22
11	07:12 16:41	06:49 17:18	06:09 17:50	06:18 19:23	05:37 19:54	05:18 20:19	05:27 20:21	05:55 19:53	06:25 19:06	06:55 18:17	06:29 16:36	07:01 16:22
12	07:12 16:42	06:48 17:19	06:07 17:51	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:04	06:56 18:15	06:31 16:35	07:02 16:22
13	07:11 16:44	06:46 17:20	06:05 17:53	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	06:57 18:13	06:32 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:13 19:26	05:34 19:57	05:18 20:20	05:30 20:19	05:57 19:49	06:28 19:01	06:58 18:12	06:33 16:33	07:04 16:22
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:58 19:48	06:29 18:59	06:59 18:10	06:34 16:32	07:04 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:10 19:28	05:32 19:59	05:18 20:21	05:31 20:18	05:59 19:46	06:30 18:58	07:00 18:09	06:35 16:31	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:31 20:00	05:18 20:22	05:32 20:18	06:00 19:45	06:30 18:56	07:01 18:07	06:36 16:31	07:06 16:23
18	07:09 16:49	06:40 17:26	05:57 17:58	06:07 19:30	05:30 20:01	05:18 20:22	05:33 20:17	06:01 19:44	06:31 18:54	07:02 18:06	06:38 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	05:18 20:22	05:33 20:16	06:02 19:42	06:32 18:53	07:03 18:04	06:39 16:29	07:07 16:24
20	07:08 16:51	06:37 17:29	05:54 18:00	06:04 19:32	05:29 20:02	05:18 20:22	05:34 20:16	06:03 19:41	06:33 18:51	07:04 18:03	06:40 16:28	07:08 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:01	06:41 16:28	07:08 16:25
22	07:07 16:54	06:34 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:18 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	06:42 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:26 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:07 17:59	06:43 16:26	07:09 16:26
24	07:06 16:56	06:32 17:34	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:12	06:07 19:35	06:37 18:44	07:09 17:57	06:44 16:26	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	06:10 16:56	06:46 16:25	07:10 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:38	05:24 20:08	05:19 20:23	05:39 20:11	06:09 19:32	06:39 18:41	06:11 16:54	06:47 16:25	07:11 16:28
27	07:04 17:00	06:27 17:37	05:42 18:07	05:54 19:39	05:24 20:09	05:20 20:23	05:40 20:10	06:10 19:30	06:40 18:39	06:12 16:53	06:48 16:24	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	06:13 16:52	06:49 16:24	07:11 16:29
29	07:02 17:02		06:39 19:09	05:52 19:42	05:22 20:10	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	06:14 16:51	06:50 16:24	07:12 16:30
30	07:01 17:03		06:38 19:10	05:50 19:43	05:22 20:11	05:21 20:23	05:43 20:07	06:13 19:26	06:43 18:34	06:15 16:49	06:51 16:23	07:12 16:30
31	07:00 17:05		06:36 19:11		05:21 20:12		05:44 20:06	06:14 19:24		06:17 16:48		07:12 16:31
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG

WTG: 10 - VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (10)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3,74	4,31	5,21	6,68	8,38	9,76	10,61	9,72	7,93	5,84	4,48	3,68

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
2.034	327	242	189	300	533	1.435	870	421	187	372	1.463	8.373

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:12 16:32	07:00 17:06	06:24 17:39	06:34 19:13	05:49 19:44	05:21 20:13	05:22 20:23	05:45 20:05	06:15 19:23	06:44 18:33	06:18 16:47	06:52 16:23
2	07:13 16:33	06:59 17:07	06:23 17:40	06:33 19:14	05:48 19:45	05:21 20:13	05:22 20:23	05:46 20:04	06:16 19:21	06:45 18:31	06:19 16:46	06:53 16:23
3	07:13 16:34	06:58 17:08	06:21 17:42	06:31 19:15	05:47 19:46	05:20 20:14	05:23 20:23	05:47 20:03	06:17 19:19	06:46 18:29	06:20 16:44	06:54 16:23
4	07:13 16:35	06:57 17:10	06:20 17:43	06:29 19:16	05:45 19:47	05:20 20:15	05:23 20:23	05:48 20:02	06:18 19:18	06:47 18:28	06:21 16:43	06:55 16:22
5	07:13 16:36	06:56 17:11	06:18 17:44	06:28 19:17	05:44 19:48	05:19 20:15	05:24 20:23	05:49 20:01	06:19 19:16	06:48 18:26	06:22 16:42	06:56 16:22
6	07:13 16:37	06:55 17:12	06:17 17:45	06:26 19:18	05:43 19:49	05:19 20:16	05:24 20:23	05:50 19:59	06:20 19:14	06:49 18:25	06:24 16:41	06:57 16:22
7	07:13 16:37	06:53 17:13	06:15 17:46	06:25 19:19	05:42 19:50	05:19 20:17	05:25 20:22	05:51 19:58	06:21 19:13	06:50 18:23	06:25 16:40	06:58 16:22
8	07:13 16:38	06:52 17:14	06:13 17:47	06:23 19:20	05:41 19:51	05:19 20:17	05:25 20:22	05:52 19:57	06:22 19:11	06:51 18:21	06:26 16:39	06:59 16:22
9	07:12 16:39	06:51 17:16	06:12 17:48	06:21 19:21	05:40 19:52	05:18 20:18	05:26 20:22	05:53 19:56	06:23 19:10	06:53 18:20	06:27 16:38	07:00 16:22
10	07:12 16:40	06:50 17:17	06:10 17:49	06:20 19:22	05:38 19:53	05:18 20:18	05:27 20:21	05:54 19:54	06:24 19:08	06:54 18:18	06:28 16:37	07:01 16:22
11	07:12 16:42	06:49 17:18	06:09 17:50	06:18 19:23	05:37 19:54	05:18 20:19	05:27 20:21	05:55 19:53	06:25 19:06	06:55 18:17	06:29 16:36	07:01 16:22
12	07:12 16:43	06:48 17:19	06:07 17:51	06:17 19:24	05:36 19:55	05:18 20:19	05:28 20:20	05:56 19:52	06:26 19:05	06:56 18:15	06:31 16:35	07:02 16:22
13	07:12 16:44	06:46 17:21	06:05 17:53	06:15 19:25	05:35 19:56	05:18 20:20	05:29 20:20	05:57 19:51	06:27 19:03	06:57 18:13	06:32 16:34	07:03 16:22
14	07:11 16:45	06:45 17:22	06:04 17:54	06:14 19:26	05:34 19:57	05:18 20:20	05:30 20:19	05:58 19:49	06:28 19:01	06:58 18:12	06:33 16:33	07:04 16:22
15	07:11 16:46	06:44 17:23	06:02 17:55	06:12 19:27	05:33 19:58	05:18 20:21	05:30 20:19	05:59 19:48	06:29 19:00	06:59 18:10	06:34 16:32	07:05 16:23
16	07:10 16:47	06:43 17:24	06:01 17:56	06:10 19:28	05:32 19:59	05:18 20:21	05:31 20:18	05:59 19:47	06:30 18:58	07:00 18:09	06:35 16:31	07:05 16:23
17	07:10 16:48	06:41 17:25	05:59 17:57	06:09 19:29	05:31 20:00	05:18 20:22	05:32 20:18	06:00 19:45	06:31 18:56	07:01 18:07	06:37 16:31	07:06 16:23
18	07:10 16:49	06:40 17:27	05:57 17:58	06:07 19:30	05:31 20:01	05:18 20:22	05:33 20:17	06:01 19:44	06:32 18:54	07:02 18:06	06:38 16:30	07:07 16:24
19	07:09 16:50	06:39 17:28	05:56 17:59	06:06 19:31	05:30 20:02	05:18 20:22	05:33 20:16	06:02 19:42	06:32 18:53	07:03 18:04	06:39 16:29	07:07 16:24
20	07:09 16:51	06:37 17:29	05:54 18:00	06:04 19:32	05:29 20:03	05:18 20:23	05:34 20:16	06:03 19:41	06:33 18:51	07:04 18:03	06:40 16:28	07:08 16:24
21	07:08 16:53	06:36 17:30	05:52 18:01	06:03 19:33	05:28 20:03	05:18 20:23	05:35 20:15	06:04 19:39	06:34 18:49	07:05 18:01	06:41 16:28	07:08 16:25
22	07:07 16:54	06:35 17:31	05:51 18:02	06:02 19:34	05:27 20:04	05:18 20:23	05:36 20:14	06:05 19:38	06:35 18:48	07:06 18:00	06:42 16:27	07:09 16:25
23	07:07 16:55	06:33 17:32	05:49 18:03	06:00 19:35	05:26 20:05	05:19 20:23	05:37 20:13	06:06 19:36	06:36 18:46	07:08 17:59	06:43 16:27	07:09 16:26
24	07:06 16:56	06:32 17:34	05:47 18:04	05:59 19:36	05:26 20:06	05:19 20:23	05:38 20:13	06:07 19:35	06:37 18:44	07:09 17:57	06:45 16:26	07:10 16:26
25	07:05 16:57	06:30 17:35	05:46 18:05	05:57 19:37	05:25 20:07	05:19 20:23	05:39 20:12	06:08 19:33	06:38 18:43	06:10 16:56	06:46 16:25	07:10 16:27
26	07:05 16:59	06:29 17:36	05:44 18:06	05:56 19:39	05:24 20:08	05:20 20:24	05:39 20:11	06:09 19:32	06:39 18:41	06:11 16:55	06:47 16:25	07:11 16:28
27	07:04 17:00	06:27 17:37	05:43 18:07	05:55 19:40	05:24 20:09	05:20 20:24	05:40 20:10	06:10 19:30	06:40 18:39	06:12 16:53	06:48 16:24	07:11 16:28
28	07:03 17:01	06:26 17:38	05:41 18:08	05:53 19:41	05:23 20:09	05:20 20:24	05:41 20:09	06:11 19:29	06:41 18:38	06:13 16:52	06:49 16:24	07:11 16:29
29	07:02 17:02		06:39 19:09	05:52 19:42	05:23 20:10	05:21 20:24	05:42 20:08	06:12 19:27	06:42 18:36	06:14 16:51	06:50 16:24	07:12 16:30
30	07:01 17:03		06:38 19:10	05:51 19:43	05:22 20:11	05:21 20:24	05:43 20:07	06:13 19:26	06:43 18:34	06:15 16:49	06:51 16:23	07:12 16:30
31	07:00 17:05		06:36 19:12		05:21 20:12		05:44 20:06	06:14 19:24		06:17 16:48		07:12 16:31
Potential sun hours	299	298	370	398	447	451	457	427	375	346	299	289
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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

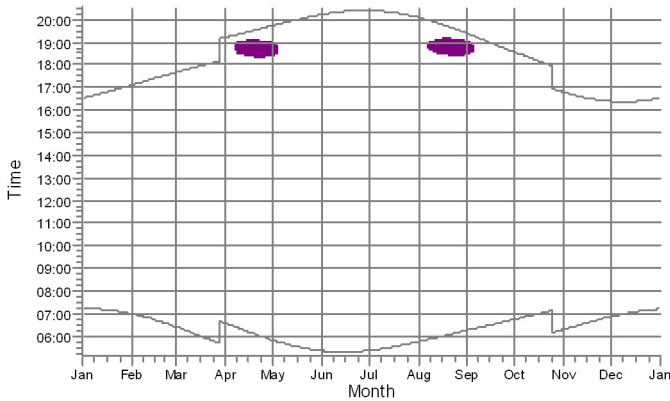
Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

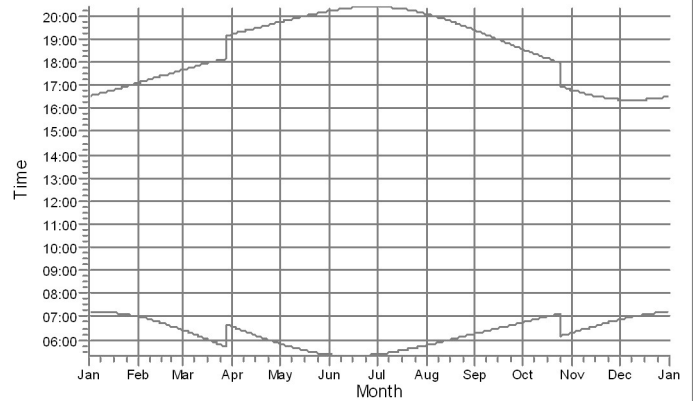
15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG, graphical

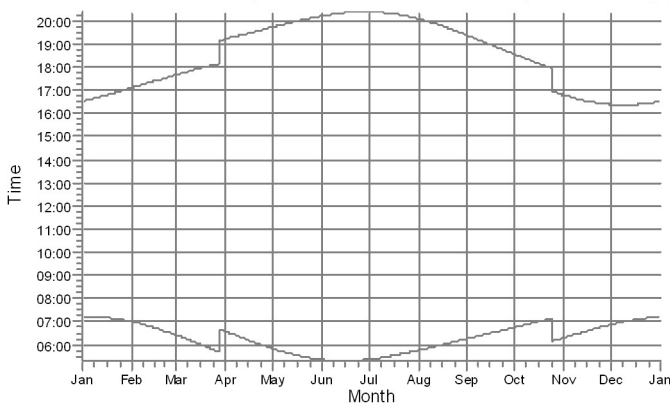
1: VESTAS V126-3.45 LTq 3450 126.0 ! hub: 117,0 m (TOT: 180,0 m) (1



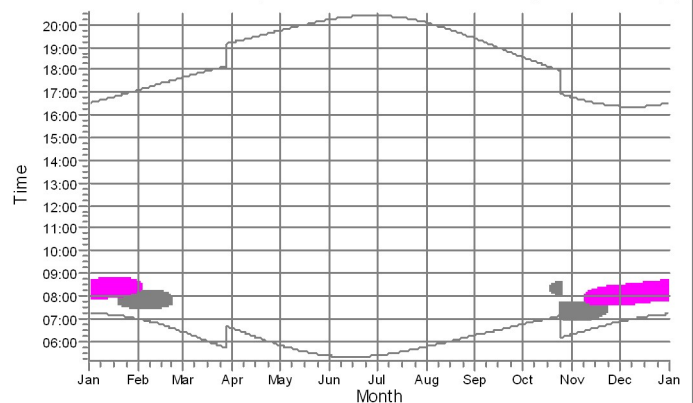
2: VESTAS V126-3.45 LTq 3450 126.0 ! hub: 117,0 m (TOT: 180,0 m) (2



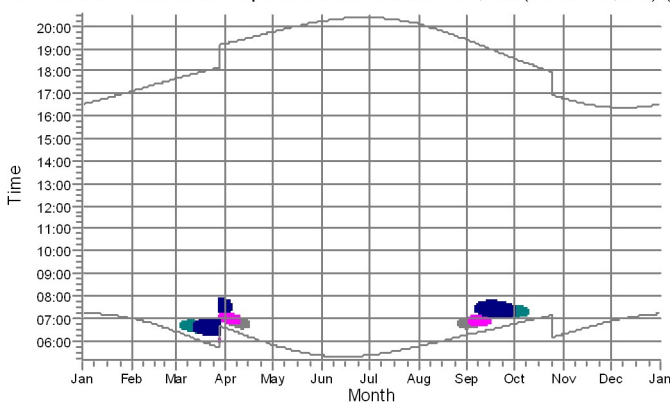
3: VESTAS V126-3.45 LTq 3450 126.0 ! hub: 117,0 m (TOT: 180,0 m) (3



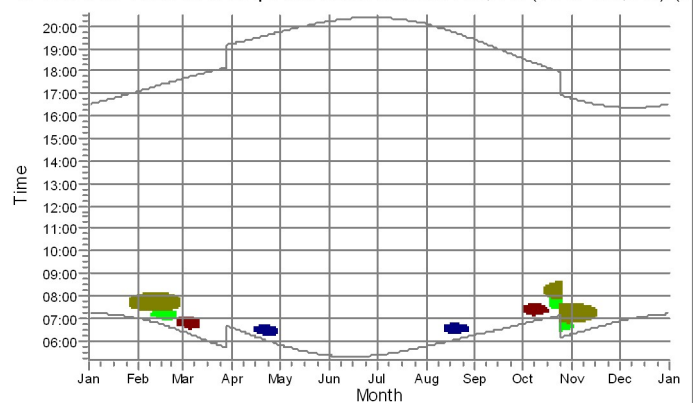
4: VESTAS V126-3.45 LTq 3450 126.0 ! hub: 117,0 m (TOT: 180,0 m) (4



5: VESTAS V126-3.45 LTq 3450 126.0 ! hub: 117,0 m (TOT: 180,0 m) (5



6: VESTAS V126-3.45 LTq 3450 126.0 ! hub: 117,0 m (TOT: 180,0 m) (6



Shadow receptors

- D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)
- E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)
- F: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (6)
- G: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)

- H: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)
- I: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)
- L: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)
- M: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

+45 8663 8139

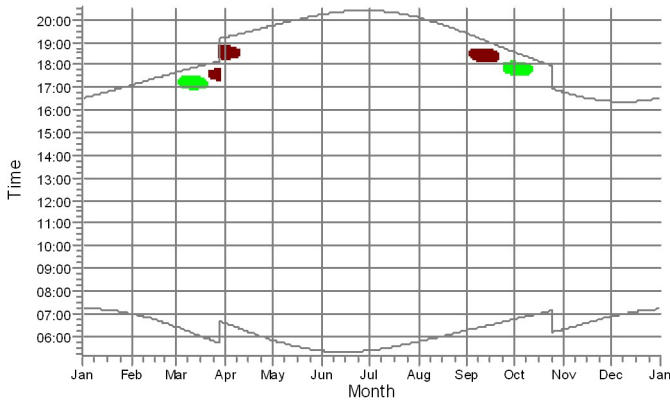
Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

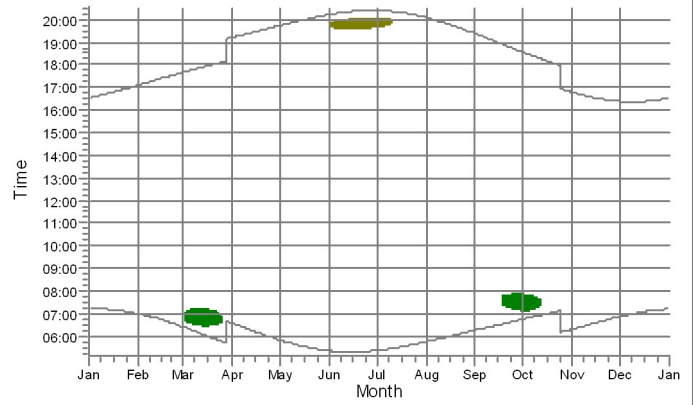
15-07-2017 14:21/3.1.617

SHADOW - Calendar per WTG, graphical

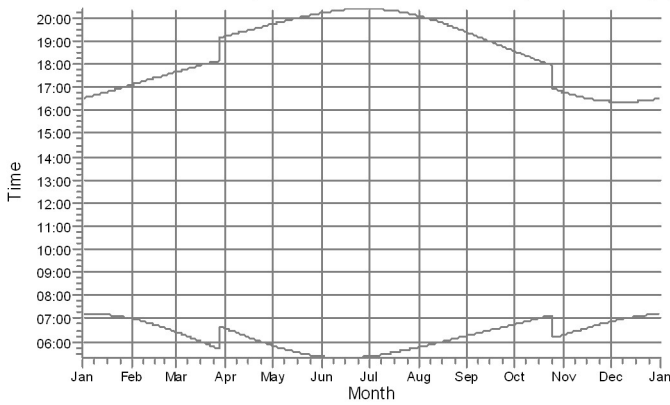
7: VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (7



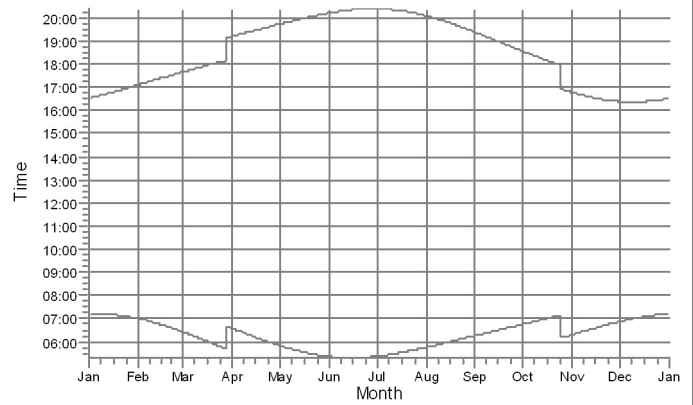
8: VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (8



9: VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (9



10: VESTAS V126-3.45 LTq 3450 126.0 !O! hub: 117,0 m (TOT: 180,0 m) (10



Shadow receptors



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



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



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

Project:

Brindisi

Licensed user:

KenTec Denmark ApS

Rosenstien 12

DK-8800 Viborg

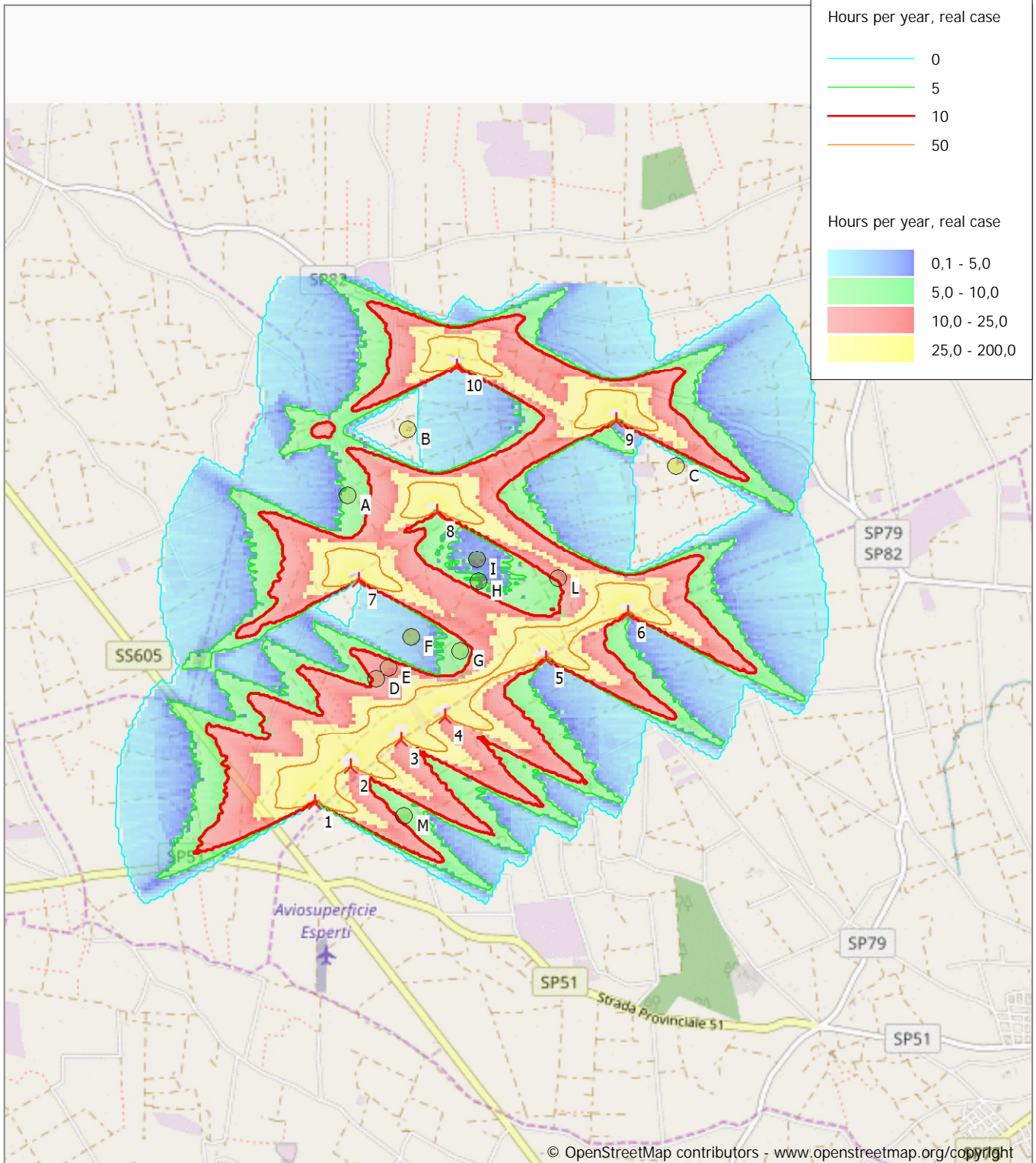
+45 8663 8139

Kent Larsen / kent.larsen@kentec.dk / www.kentec.dk

Calculated:

15-07-2017 14:21/3.1.617

SHADOW - Map



0 500 1000 1500 2000 m

Map: Open Street Map 001 , Print scale 1:50.000, Map center UTM (north)-WGS84 Zone: 33 East: 745.980 North: 4.488.150

New WTG

Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo (1)