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Windpark Autena te Vianen

Slagschaduw onderzoek

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Kenmerk
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Versie
04_001
Datum
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Inhoudsopgave

1 Inleiding en samenvatting 3

2 Uitgangspunten 4

2.1 Locatie windturbines 4
2.2 Type windturbine 5
2.3 Normstelling 5

3 Slagschaduw 6

3.1 Schaduweffecten en hinderaspecten 6
3.2 Flikkerfrequenties 6
3.3 Schaduwgebied 6
3.4 Afvang door beplanting 6

4 Berekeningen 7

4.1 Variabelen op de slagschaduwberekening 7
4.1.1 Kans op zonneschijn 7
4.1.2 Intensiteit zonlicht 7
4.1.3 Rotorstilstand 7
4.1.4 Windrichtingcorrectie 7
4.2 Rekenmodel 8

5 Rekenresultaten 9

5.1 Rekenresultaten bij woningen 9

6 Beoordeling en conclusie 13

Bijlagen

Bijlage I Rekenmodel en resultaten
Bijlage II Slagschaduwkalender
Bijlage III Grafische kalender

1 Inleiding en samenvatting

In opdracht van Eneco Wind B.V., de heer F. de Jong, is een prognose uitgevoerd naar de verwachte slagschaduwduur in de omgeving vanwege windpark Autena. Doel van het onderzoek is te bepalen of ter plaatse van de omliggende woningen voldaan wordt aan de norm voor slagschaduwhinder uit het Besluit algemene regels voor inrichtingen milieubeheer.

Windpark Autena bestaat uit drie windturbines. In het slagschaduwonderzoek is uitgegaan van vier mogelijke varianten.
- Variant 1: Nordex N100 2,5 MW met een ashoogte van 100 m en een rotordiameter van 100 m.
- Variant 2: Ecotecnia ECO122 2,7 MW met een ashoogte van 89 m en een rotordiameter van 122 m.
- Variant 3: Nordex N131 3 MW met een ashoogte van 99 m en een rotordiameter van 131 m.
- Variant 4: Gamesa G128 4,5 MW met een ashoogte van 95 m en een rotordiameter van 128 m.

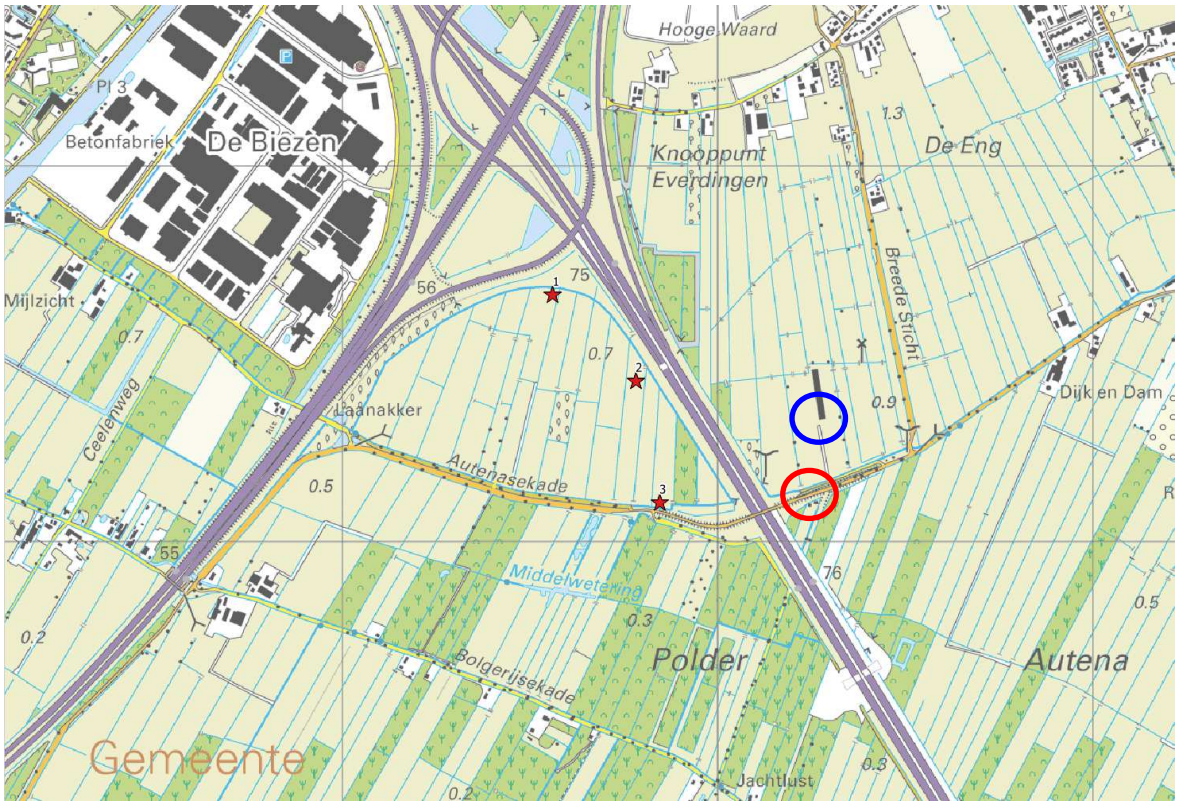
Uit de schaduwberekeningen blijkt dat gedurende meer dan 17 dagen meer dan 20 minuten per dag slagschaduw kan optreden bij enkele woningen in de omgeving. Voor alle vier de varianten betreffen dit de woningen aan de Autenasekade 5, 9 en de Nieuwbouw (respectievelijk punten 7, 2 en 1). Voor de Nordex N131 en de Gamesa G128 betreffen dit aanvullend Breede Sticht 1 en 16 en Bolgerijnsekade 24 (respectievelijk punten 3, 4 en 10).

De turbines dienen, ten behoeve van deze woningen, voorzien te worden van een automatische stilstandvoorziening.

2 Uitgangspunten

2.1 Locatie windturbines

In onderstaande figuur 2.1 wordt globaal de situatie weergegeven. De drie windturbines staan in een kleine boogopstelling ten zuiden van de kruising tussen de A27 en A2, ten oosten van het gezoneerde industrieterrein De Biezen. In de omgeving van het windpark zijn woningen van derden gelegen. De meest nabijgelegen woning betreft Autenasekade 9 op een afstand van circa 380 meter ten oosten van turbine 3 (rode cirkel). Daarnaast komt er een nieuwe woning ten zuiden van de kippenschuur die ten oosten van het windpark ligt (blauwe cirkel).



Figuur 2.1
Situatie met windturbines (bron achtergrond: topografische kaart kadaster 2010).

2.2 Type windturbine

In het slagschaduwonderzoek is uitgegaan van vier mogelijke varianten.
- Variant 1: Nordex N100 2,5 MW met een ashoogte van 100 m en een rotordiameter van 100 m.
- Variant 2: Ecotecnia ECO122 2,7 MW met een ashoogte van 89 m en een rotordiameter van 122 m.
- Variant 3: Nordex N131 3 MW met een ashoogte van 99 m en een rotordiameter van 131 m.
- Variant 4: Gamesa G128 4,5 MW met een ashoogte van 95 m en een rotordiameter van 128 m.

2.3 Normstelling

Het windpark valt onder het Besluit algemene regels voor inrichtingen milieubeheer (Activiteitenbesluit). Bij de beoordeling van het slagschaduweffect wordt uitgegaan van artikel 3.14 lid 4 uit het Activiteitenbesluit, betreffende slagschaduw en lichtschittering. Hierin wordt verwezen naar de bij de ministeriële regeling[1] te stellen maatregelen. De betreffende tekst, artikel 3.12 lid 1, is als volgt.

Artikel 3.12
1. Ten behoeve van het voorkomen of beperken van slagschaduw en lichtschittering is de windturbine voorzien van een automatische stilstandvoorziening die de windturbine afschakelt indien slagschaduw optreedt ter plaatse van gevoelige objecten voorzover de afstand tussen de windturbine en de geluidgevoelige objecten minder dan 12 maal de rotordiameter bedraagt en gemiddeld meer dan 17 dagen per jaar gedurende meer dan 20 minuten per dag slagschaduw kan optreden en voorzover zich in de door de slagschaduw getroffen uitwendige scheidingsconstructie van geluidgevoelige gebouwen of woonwagens ramen bevinden. De afstand geldt van een punt op ashoogte van de windturbine tot de gevel van het geluidgevoelige object.

1 Regeling van de Minister van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer van 9 november 2007, nr. DJZ 2007104180 houdende algemene regels voor inrichtingen (Regeling algemene regels voor inrichtingen milieubeheer)

3 Slagschaduw

3.1 Schaduweffecten en hinderaspecten

De schaduw van de draaiende wieken van een windturbine kan op bepaalde plaatsen en onder bepaalde omstandigheden een hinderlijke flikkering (wisseling van lichtsterkte) veroorzaken. Dit kan vooral hinderlijk zijn als de schaduw over ramen valt en zich bijvoorbeeld over een plek beweegt waar gewerkt of gelezen wordt. De mate van hinder wordt onder andere bepaald door de frequentie van de flikker (rotortoerental), door de blootstellingduur (tijdsduur op een dag en periode in een jaar) en door de intensiteit van de wisselingen in lichtsterkte (schaduwscherpte).

3.2 Flikkerfrequenties

Flikkerfrequenties tussen 2,5 en 14 Hz (flikkeringen per seconde) kunnen aanzienlijke hinder (ook psychische storingen) veroorzaken. Bij de huidige generatie windturbines is het toerental echter zo laag dat de flikkerfrequenties (aanzienlijk) lager dan 2,5 Hz liggen. In onderhavig geval bedraagt de flikkerfrequentie maximaal 0,75 Hz (Nordex N100 met een RPM van 14,9). Schadelijke gevolgen voor de gezondheid kunnen daarbij niet optreden. Maar ook bij deze lage toerentallen kunnen de lichtsterktewisselingen (slagschaduwhinder) hinderlijk zijn.

3.3 Schaduwgebied

Ten zuiden van elke turbine ligt een gebied waar de schaduw nooit kan komen, omdat de zon nooit in noordelijke richting staat. Ten noorden is een gebied waar de schaduw niet kan komen omdat de zon, als deze in het zuiden staat, te hoog staat. Door zonsopkomst en zonsondergang kan de schaduw van een windturbine ver reiken. Echter, bij afstanden groter dan twaalf maal de rotor-diameter wordt slagschaduw niet meer als hinderlijk beoordeeld.

3.4 Afvang door beplanting

Beplanting kan ervoor zorgen dat er minder of geen slagschaduw van de windturbines op de omliggende woningen optreedt. Dit kan het geval zijn als er tussen de hindergevoelige gevels en het rotorvlak bomen(rijen) staan. Als deze dicht bebladerd zijn of als het gaat om groenblijvende coniferen, en de schaduw zich voordoet in een periode waarin de bladeren nog aan de bomen zitten, kan dit de schaduwscherpte verminderen of de schaduw zelfs geheel afvangen. Uiteraard moeten de bomen wel voldoende hoog zijn, hetgeen zich bij hogere ashoogten van de turbine alleen voor kan doen als de bomen vrij dichtbij de gevel staan.
Daarnaast moet rekening gehouden worden met de relatief lange levensduur van een windturbine (tot 20 jaar). Het is niet zeker of de bomen er gedurende al die tijd zullen staan. Bij schaduw-perioden in de winter zal in het geval van bladverliezende loofbomen, de schaduwhinder niet verminderd worden. De afvang door beplanting is om deze redenen niet in de berekeningen meegenomen. Hierdoor is sprake van een worstcase benadering.

4 Berekeningen

4.1 Variabelen op de slagschaduwberekening

4.1.1 Kans op zonneschijn

Als de zon niet schijnt is er geen slagschaduw en zal er dus geen hinder kunnen optreden. Hieronder staan de gemiddelde percentages per maand voor De Bilt over het tijdvak 1981-2010, die worden gehanteerd voor de zonneschijnduur in de betrokken periode op de berekende locatie.

Tabel 4.1
Gemiddelde zonuren per dag (De Bilt, bron KNMI).

	Jan	Febr	Mrt	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Dec
Gemiddelde zonuren	2,0	3,0	3,9	5,8	6,7	6,5	6,6	6,1	4,6	3,6	2,1	1,6

4.1.2 Intensiteit zonlicht

De scherpte van de schaduw en dus de intensiteit van de lichtwisselingen is bij lage zonnestanden gemiddeld minder dan bij een hogere stand aan de hemel. Laag aan de horizon wordt het zonlicht immers relatief vaak getemperd door sluierbewolking, smog en nevel. Bovendien is de kans dan groot dat de zon achter bomen of bebouwing schuil gaat. Aangenomen mag worden dat bij een zonnestand van 3 graden of lager geen hinder veroorzaakt kan worden.

4.1.3 Rotorstilstand

Als de rotor stilstaat, is er geen wisseling van lichtsterkte en kan er dus geen schaduwhinder optreden. Stilstand treedt voornamelijk op door gebrek aan wind. Als uitgangspunt wordt gehanteerd dat de turbine in werking treedt bij windsnelheden vanaf 3 m/s op ashoogte. Uit windfrequentieverdelingen op ashoogte (KNMI gegevens) blijkt dat windsnelheden lager dan 3 m/s in De Bilt, gemiddeld over een jaar, circa 5% van de tijd voorkomen. Aangenomen wordt dat gedurende deze tijd de rotor stilstaat of zo langzaam draait dat niet van hinder gesproken kan worden. De tijdsduur van de potentiële schaduwtijden is dus met 5% verminderd, wat neerkomt op een bedrijfstijd van de windturbine van 95%. Er wordt niet gecorrigeerd voor het feit dat het 's winters vaker en gemiddeld harder waait dan 's zomers.

4.1.4 Windrichtingcorrectie

De duur van de schaduwwerking (op een bepaalde dag en per jaar) wordt ook bepaald door de stand van het rotorvlak ten opzichte van de zonrichting, waarbij de hinder zich kan voordoen. Als het rotorvlak loodrecht op de zonrichting staat, is de duur op een bepaalde dag maximaal.
Bij minder dan een loodrechte stand ten opzichte van de zonrichting wordt de duur van de schaduwpassage op een dag bekort, omdat niet de gehele diameter van de rotor over de gevel schuift, maar de projectie ervan. De stand van de rotor heeft te maken met de windrichting. De correctie voor de stand van het rotorvlak is meegenomen in de windrichtingcorrectie.
De oriëntatie van het rotorvlak is afhankelijk van de windrichting. Per sector van 30 graden is het aantal uren per jaar berekend dat de wind uit die richting komt. Hiervoor is gebruikgemaakt van frequentietabellen van het KNMI, gebaseerd op meerjarige meteodata (1981-2000) te De Bilt. Bij de berekening van de winddistributie is gebruikgemaakt van de eerder genoemde bedrijfstijd van 95% uit paragraaf 4.1.3.

Tabel 4.2
Distributie windrichtingen in sectoren van 30 graden (De Bilt, bron KNMI) uren per jaar.

Uren wind per jaar	N	NNO	ONO	O	OZO	ZZO	Z	ZZW	WZW	W	WNW	NNW
95%	366	637	526	516	436	729	819	1192	1173	804	576	523

4.2 Rekenmodel

Om te kunnen bepalen of er hinder door slagschaduw optreedt, is het allereerst nodig om te weten uit welke richting de zon moet schijnen en op welke hoogte hij moet staan, opdat de schaduw de te onderzoeken plek kan bereiken (zonoriëntatie en zonhoogte). Vervolgens wordt bepaald in welke perioden van het jaar deze situatie zich voordoet en op welk tijdstip van de dag. Met deze gegevens wordt de *potentiële* schaduwduur bepaald. Vervolgens wordt met de overige bepalende factoren voor de duur en intensiteit van de schaduwwerkingen (het aantal uren zonneschijn, draai-duur van de rotor, oriëntatie van de rotor en de intensiteit van het zonlicht) berekend tijdens welk gedeelte van de *potentiële* schaduwduur ook *werkelijk* hinder kan optreden.

De benodigde hoeken en oriëntaties kunnen voldoende nauwkeurig bepaald worden met behulp van een plattegrond van de locaties, de hoogte en de diameter van de rotor van de windturbines. Deze hoeken en oriëntaties leggen de tijdstippen vast van begin en eind van de schaduw (gedurende alle dagen van het jaar).

Met behulp van het computerprogramma Windpro kan worden bepaald op welke tijdstippen van de dag en in welke periode van het jaar de oriëntaties en hoogtes bereikt worden. Tenslotte wordt bepaald hoe lang de schaduw er maximaal over doet om de volledige gevel of het oppervlak te passeren en wat de gemiddelde tijdsduur van de passage is. Met het programma is per minuut de slagschaduwsituatie berekend.

Beoordeling slagschaduwhinder
Bij de beoordeling van de slagschaduwhinder ter plaatse van de omliggende woningen en bij de berekening of een stilstandvoorziening noodzakelijk is, worden alleen die woningen geselecteerd waar de gemiddelde schaduwduur naar verwachting hoger is dan zes uur per jaar. Hiermee worden alle tijden dat er sprake is van slagschaduw meegenomen en niet alleen die dagen met meer dan 20 minuten. Vervolgens zal bij deze woningen onderzocht worden of naar verwachting gemiddeld meer dan zeventien dagen met meer dan 20 minuten slagschaduw op zal treden.

5 Rekenresultaten

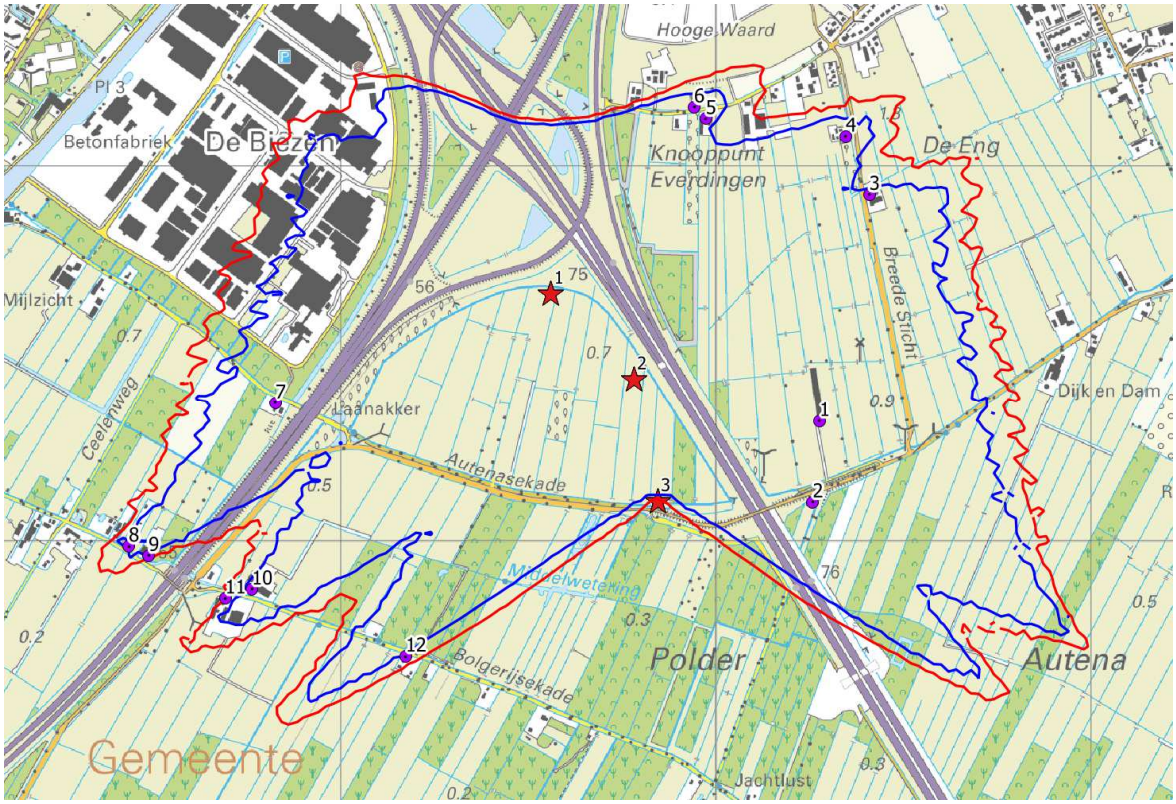
5.1 Rekenresultaten bij woningen

Met behulp van de correcties uit hoofdstuk 4 zijn de slagschaduwuren berekend ten gevolge van de windturbine. In figuur 5.1 zijn voor de variant 1: Nordex N100 en variant 2: Ecotecnia ECO122 de contouren opgenomen van de verwachte zes slagschaduwuren per jaar. In figuur 5.2 zijn de contouren opgenomen voor variant 3: Nordex N131 en variant 4: Gamesa G128. Binnen of op de contouren liggen enkele woningen waar mogelijk meer dan zeventien dagen met meer dan 20 minuten slagschaduw kan optreden. Voor deze woningen is het gemiddeld aantal dagen berekend met meer dan 20 minuten slagschaduw (zie tabel 5.1 t/m 5.4). Voor de twee laatste varianten zijn meer woningen meegenomen, aangezien deze contouren groter zijn en meer woningen binnen de zes uurscontour gelegen zijn.

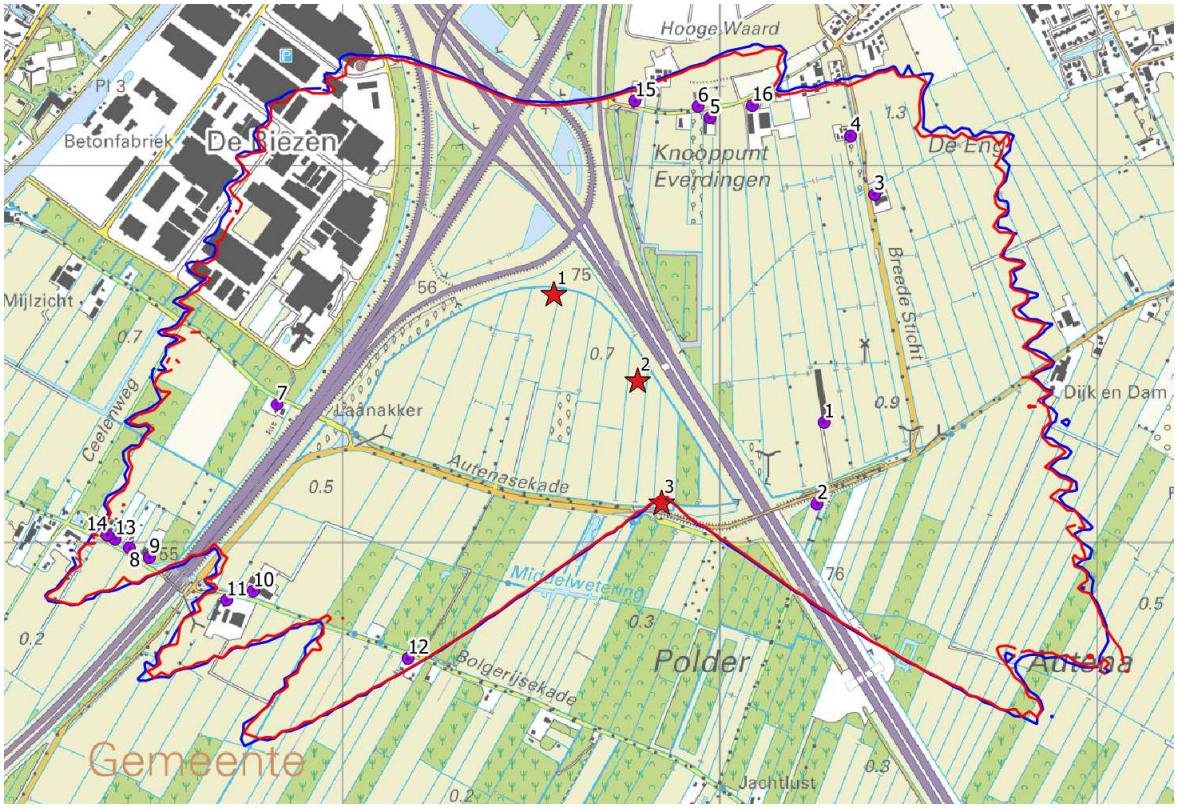
Bij de beoordeling ter plaatse van de woningen wordt uitgegaan van een gevel in de richting van de turbine die geheel uit ramen bestaat. Vanwege de afmetingen van dat vlak, duurt de schaduw-passage langs dit vlak wat langer dan de passage langs een punt (of enkel raam). Er zijn op basis van waarnemingen met Google Earth en inschattingen meerdere type gevels en raamopeningen aangehouden (vanaf een hoogte van 1 meter):

- 4 meter breed en 4 meter hoog voor gevels met een begane grond en 1ste verdieping;
- 4 meter breed en 2 meter hoog voor gevels met alleen een begane grond.

In bijlage I zijn de invoergegevens en uitvoer van het rekenmodel opgenomen.



Figuur 5.1
Contouren zes uur verwachte slagschaduw variant 1 en 2. Blauw = variant 1: Nordex N100, Rood = Variant 2: Ecotecnia ECO 122. (bron achtergrond: topografische kaart kadaster 2010).



Figuur 5.2
Contouren zes uur verwachte slagschaduw variant 3 en 4. Blauw = variant 3: Nordex N131, Rood = variant 4: Gamesa G128. (bron achtergrond: topografische kaart kadaster 2010).

Tabel 5.1
Berekend aantal dagen met meer dan 20 minuten slagschaduw bij omliggende woningen.
Variant 1: Nordex N100

punt	Beoordelings-punt	Max uren per jaar [u:m]	Verw acht uren per jaar [u:m]	Max dagen per jaar [#]	Verw acht dagen per jaar >20 min. [#]	Maximale stilstand per jaar
1	Nieuw bouw Autenasekade	135:04	30:13	195	***42***	1,5%
2	Autenasekade 9	61:42	14:46	95	***18***	0,7%
3	Breede Sticht 1	40:51	7:02	119	11	
4	Breede Sticht 16	45:34	7:19	110	14	
5	Biezenw eg 51	51:38	7:45	98	14	
6	Biezenw eg 16	51:26	7:34	86	12	
7	Autenasekade 05	47:11	11:19	135	***19***	0,5%
8	Bolgerijsekade 16	25:12	6:21	113	0	
9	Bolgerijsekade 18	22:47	5:43	101	1	
10	Bolgerijsekade 24	29:05	7:25	108	8	
11	Bolgerijsekade 1	21:09	5:26	88	2	
12	Bolgerijsekade 9	23:43	6:01	55	11	

Tabel 5.2

Berekend aantal dagen met meer dan 20 minuten slagschaduw bij omliggende woningen.
Variant 2: Ecotecnia ECO 122

punt	Omschrijving	Max uren per jaar [u:m]	Verw acht uren per jaar [u:m]	Max dagen per jaar [#]	Verw acht dagen per jaar >20 min. [#]	Maximale stilstand per jaar
1	Nieuw bouw Autenasekade	189:02	42:08	225	***48***	2,2%
2	Autenasekade 9	111:57	26:00	149	***31***	1,3%
3	Breede Sticht 1	54:14	9:17	140	15	
4	Breede Sticht 16	56:56	9:08	119	15	
5	Biezenw eg 51	70:18	10:27	98	14	
6	Biezenw eg 16	63:36	9:21	86	12	
7	Autenasekade 05	61:23	14:44	157	***24***	0,7%
8	Bolgerijsekade 16	29:32	7:26	120	5	
9	Bolgerijsekade 18	26:24	6:38	112	4	
10	Bolgerijsekade 24	34:46	8:52	117	12	
11	Bolgerijsekade 1	25:40	6:35	100	7	
12	Bolgerijsekade 9	33:48	8:37	69	14	

Tabel 5.3

Berekend aantal dagen met meer dan 20 minuten slagschaduw bij omliggende woningen.
Variant 3: Nordex N131

punt	Omschrijving	Max uren per jaar [u:m]	Verw acht uren per jaar [u:m]	Max dagen per jaar [#]	Verw acht dagen per jaar >20 min. [#]	Maximale stilstand per jaar
1	Nieuw bouw Autenasekade	228:30	50:58	226	***49***	2,6%
2	Autenasekade 9	126:44	29:42	155	***33***	1,4%
3	Breede Sticht 1	69:16	11:52	157	***20***	0,8%
4	Breede Sticht 16	66:51	10:49	129	***18***	0,8%
5	Biezenw eg 51	78:36	11:53	106	15	
6	Biezenw eg 16	73:46	10:59	94	14	
7	Autenasekade 05	81:37	19:37	189	***31***	0,9%
8	Bolgerijsekade 16	35:35	8:58	128	12	
9	Bolgerijsekade 18	31:35	7:57	120	9	
10	Bolgerijsekade 24	42:16	10:45	121	***21***	0,5%
11	Bolgerijsekade 1	36:10	9:13	120	13	
12	Bolgerijsekade 9	35:33	9:04	67	14	
13	Bolgerijsekade 10	34:15	8:38	134	7	
14	Bolgerijsekade 11	29:43	7:30	127	5	
15	Bolgerijsekade 12	58:31	8:26	72	10	
16	Bolgerijsekade 13	58:06	8:49	107	14	

Tabel 5.4
Berekend aantal dagen met meer dan 20 minuten slagschaduw bij omliggende woningen.
Variant 4: Gamesa G128

punt	Omschrijving	Max uren per jaar [u:m]	Verw acht uren per jaar [u:m]	Max dagen per jaar [#]	Verw acht dagen per jaar >20 min. [#]	Maximale stilstand per jaar
1	Nieuw bouw Autenasekade	216:50	48:24	223	***48***	2,5%
2	Autenasekade 9	119:47	28:06	150	***32***	1,4%
3	Breede Sticht 1	66:32	11:24	154	***19***	0,8%
4	Breede Sticht 16	64:40	10:27	127	***17***	0,7%
5	Biezenw eg 51	76:05	11:29	104	15	
6	Biezenw eg 16	71:30	10:38	94	13	
7	Autenasekade 05	78:06	18:46	186	***30***	0,9%
8	Bolgerijsekade 16	34:33	8:42	125	11	
9	Bolgerijsekade 18	30:38	7:42	118	8	
10	Bolgerijsekade 24	40:53	10:24	120	***20***	0,5%
11	Bolgerijsekade 1	34:37	8:50	119	12	
12	Bolgerijsekade 9	34:36	8:49	66	14	
13	Bolgerijsekade 10	32:52	8:17	133	5	
14	Bolgerijsekade 11	28:04	7:06	121	5	
15	Bolgerijsekade 12	56:08	8:05	71	10	
16	Bolgerijsekade 13	54:56	8:21	106	13	

Uit bovenstaande tabellen blijkt dat voor alle varianten ter plaatse van enkele woningen de norm van ten hoogste 17 dagen met meer dan 20 minuten slagschaduw wordt overschreden. Derhalve dienen, ten behoeve van deze woningen, de turbines van een automatische stilstandvoorziening te worden voorzien. Voor de berekening van de maximale stilstand per woning is uitgegaan van de maximaal mogelijke slagschaduwuren per jaar.

6 Beoordeling en conclusie

Uit de schaduwberekeningen blijkt dat gedurende meer dan 17 dagen meer dan 20 minuten per dag slagschaduw kan optreden bij enkele woningen in de omgeving. Voor alle vier de varianten betreffen dit de woningen aan de Autenasekade 5, 9 en de Nieuwbouw (respectievelijk punten 7, 2 en 1). Voor de Nordex N131 en de Gamesa G128 betreffen dit aanvullend Breede Sticht 1 en 16 en Bolgerijnsekade 24 (respectievelijk punten 3, 4 en 10).

De turbines dienen, ten behoeve van deze woningen, voorzien te worden van een automatische stilstandvoorziening.

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Bijlage I

Rekenmodel en resultaten

Project:
068379aa - WP Autena

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Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Main Result

Calculation: Nordex N100 woningen

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) []

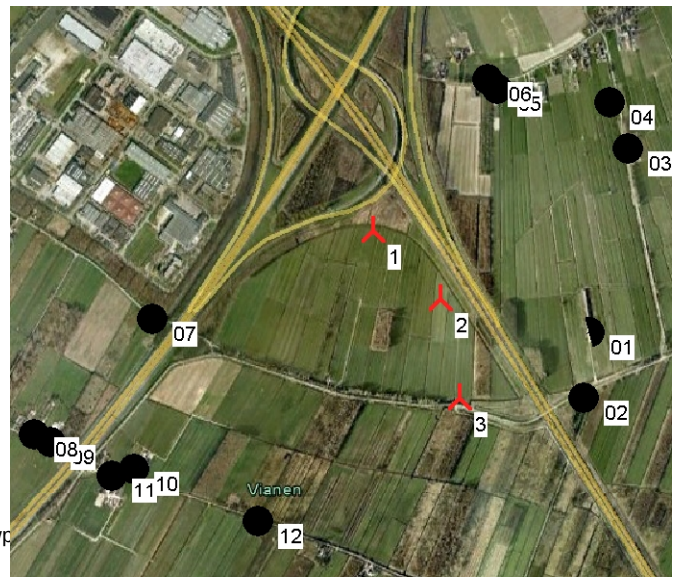
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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.wp
Obstacles not used in calculation
Eye height: 1,5 m
Grid resolution: 10 m



Scale 1:25.000
New WTG
Shadow receptor

WTGs

	Netherlands RD Amersfoort East	North	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
	Netherlands RD Amersfoort		[m]					[kW]	[m]	[m]	[m]	[RPM]
1	135.561	442.659	0,0	Nordex N100	Yes	NORDEX	N100-2.500	2.500	99,8	100,0	1.700	14,9
2	135.782	442.431	0,0	Nordex N100	Yes	NORDEX	N100-2.500	2.500	99,8	100,0	1.700	14,9
3	135.845	442.105	0,0	Nordex N100	Yes	NORDEX	N100-2.500	2.500	99,8	100,0	1.700	14,9

Shadow receptor-Input

No.	Name	Netherlands RD Amersfoort East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
01	Nieuwbouw Autenasekade	136.276	442.319	0,0	4,0	4,0	1,0	76,8	90,0	Fixed direction
02	Autenasekade 9	136.258	442.103	0,0	4,0	2,0	1,0	73,3	90,0	"Green house mode"
03	Breede Sticht 1	136.409	442.924	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
04	Breede Sticht 16	136.346	443.079	0,0	4,0	4,0	1,0	77,0	90,0	"Green house mode"
05	Biezenweg 51	135.973	443.126	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
06	Biezenweg 16	135.942	443.157	0,0	4,0	4,0	1,0	4,6	90,0	"Green house mode"
07	Autenasekade 05	134.826	442.368	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
08	Bolgerijsekade 16	134.435	441.986	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
09	Bolgerijsekade 18	134.488	441.961	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
10	Bolgerijsekade 24	134.763	441.872	0,0	4,0	4,0	1,0	-153,9	90,0	"Green house mode"
11	Bolgerijsekade 1	134.692	441.848	0,0	4,0	4,0	1,0	-148,9	90,0	"Green house mode"
12	Bolgerijsekade 9	135.173	441.694	0,0	4,0	4,0	1,0	-156,1	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values Shadow hours per year [h/year]
01	Nieuwbouw Autenasekade	135:04	195	1:10	30:13
02	Autenasekade 9	61:42	95	0:57	14:46

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SHADOW - Main Result

Calculation: Nordex N100 woningen

...continued from previous page

		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
03	Breede Sticht 1	40:51	119	0:31	7:02
04	Breede Sticht 16	45:34	110	0:30	7:19
05	Biezenweg 51	51:38	98	0:41	7:45
06	Biezenweg 16	51:26	86	0:41	7:34
07	Autenasekade 05	47:11	135	0:32	11:19
08	Bolgerijsekade 16	25:12	113	0:20	6:21
09	Bolgerijsekade 18	22:47	101	0:21	5:43
10	Bolgerijsekade 24	29:05	108	0:23	7:25
11	Bolgerijsekade 1	21:09	88	0:21	5:26
12	Bolgerijsekade 9	23:43	55	0:32	6:01

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	Nordex N100	189:38	37:58
2	Nordex N100	148:56	31:06
3	Nordex N100	154:54	34:57

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Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Main Result

Calculation: ECO 122 woningen

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) []

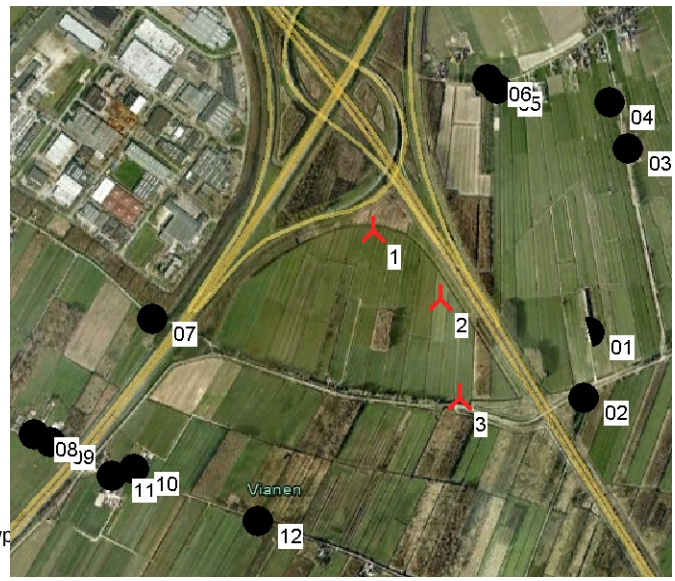
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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.wp
Obstacles not used in calculation
Eye height: 1,5 m
Grid resolution: 10 m



Scale 1:25.000
New WTG
Shadow receptor

WTGs

	Netherlands RD Amersfoort				WTG type						Shadow data	
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
	Netherlands RD Amersfoort		[m]					[kW]	[m]	[m]	[m]	[RPM]
1	135.561	442.659	0,0	Ecotecnia ECO1...	Yes	Alstom Wind	ECO 122-2.700	2.700	122,0	89,0	2.000	7,0
2	135.782	442.431	0,0	Ecotecnia ECO1...	Yes	Alstom Wind	ECO 122-2.700	2.700	122,0	89,0	2.000	7,0
3	135.845	442.105	0,0	Ecotecnia ECO1...	Yes	Alstom Wind	ECO 122-2.700	2.700	122,0	89,0	2.000	7,0

Shadow receptor-Input

		Netherlands RD Amersfoort								
No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
01	Nieuwbouw Autenasekade	136.276	442.319	0,0	4,0	4,0	1,0	76,8	90,0	Fixed direction
02	Autenasekade 9	136.258	442.103	0,0	4,0	2,0	1,0	73,3	90,0	"Green house mode"
03	Breede Sticht 1	136.409	442.924	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
04	Breede Sticht 16	136.346	443.079	0,0	4,0	4,0	1,0	77,0	90,0	"Green house mode"
05	Biezenweg 51	135.973	443.126	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
06	Biezenweg 16	135.942	443.157	0,0	4,0	4,0	1,0	4,6	90,0	"Green house mode"
07	Autenasekade 05	134.826	442.368	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
08	Bolgerijsekade 16	134.435	441.986	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
09	Bolgerijsekade 18	134.488	441.961	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
10	Bolgerijsekade 24	134.763	441.872	0,0	4,0	4,0	1,0	-153,9	90,0	"Green house mode"
11	Bolgerijsekade 1	134.692	441.848	0,0	4,0	4,0	1,0	-148,9	90,0	"Green house mode"
12	Bolgerijsekade 9	135.173	441.694	0,0	4,0	4,0	1,0	-156,1	90,0	"Green house mode"

Calculation Results

Shadow receptor

		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
01	Nieuwbouw Autenasekade	189:02	225	1:24	42:08
02	Autenasekade 9	111:57	149	1:09	26:00

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Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Main Result

Calculation: ECO 122 woningen

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		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
03	Breede Sticht 1	54:14	140	0:38	9:17
04	Breede Sticht 16	56:56	119	0:37	9:08
05	Biezenweg 51	70:18	98	0:49	10:27
06	Biezenweg 16	63:36	86	0:50	9:21
07	Autenasekade 05	61:23	157	0:39	14:44
08	Bolgerijsekade 16	29:32	120	0:23	7:26
09	Bolgerijsekade 18	26:24	112	0:22	6:38
10	Bolgerijsekade 24	34:46	117	0:26	8:52
11	Bolgerijsekade 1	25:40	100	0:24	6:35
12	Bolgerijsekade 9	33:48	69	0:40	8:37

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	Ecotecnia ECO122	233:49	46:49
2	Ecotecnia ECO122	217:44	45:36
3	Ecotecnia ECO122	219:38	49:13

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SHADOW - Main Result

Calculation: Gamesa G128

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) []

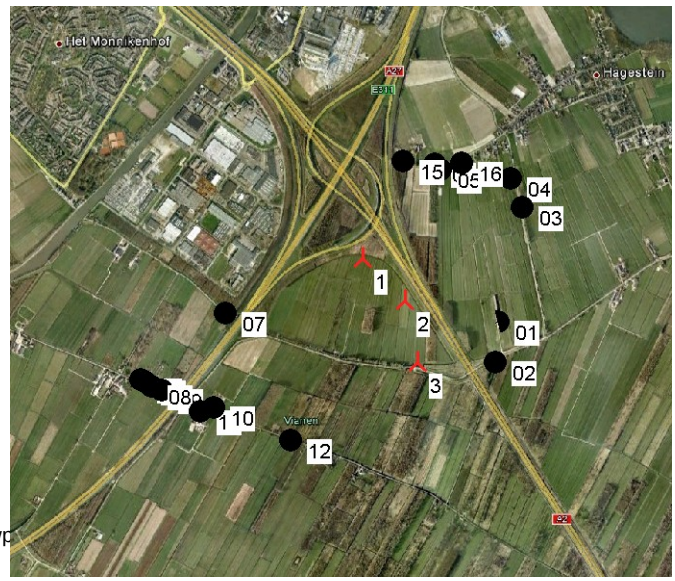
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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 not used in calculation
Eye height: 1,5 m
Grid resolution: 10 m



Scale 1:40.000
New WTG
Shadow receptor

WTGs

	Netherlands RD Amersfoort				WTG type						Shadow data	
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
	Netherlands RD Amersfoort		[m]					[kW]	[m]	[m]	[m]	[RPM]
1	135.561	442.659	0,0	Gamesa G128 4.5MW	Yes	GAMESA	G128-4.500	4.500	128,0	99,0	2.000	12,0
2	135.782	442.431	0,0	Gamesa G128 4.5MW	Yes	GAMESA	G128-4.500	4.500	128,0	99,0	2.000	12,0
3	135.845	442.105	0,0	Gamesa G128 4.5MW	Yes	GAMESA	G128-4.500	4.500	128,0	99,0	2.000	12,0

Shadow receptor-Input

		Netherlands RD Amersfoort								
No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
01	Nieuwbouw Autenasekade	136.276	442.319	0,0	4,0	4,0	1,0	76,8	90,0	Fixed direction
02	Autenasekade 9	136.258	442.103	0,0	4,0	2,0	1,0	73,3	90,0	"Green house mode"
03	Breede Sticht 1	136.409	442.924	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
04	Breede Sticht 16	136.346	443.079	0,0	4,0	4,0	1,0	77,0	90,0	"Green house mode"
05	Biezenweg 51	135.973	443.126	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
06	Biezenweg 16	135.942	443.157	0,0	4,0	4,0	1,0	4,6	90,0	"Green house mode"
07	Autenasekade 05	134.826	442.368	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
08	Bolgerijsekade 16	134.435	441.986	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
09	Bolgerijsekade 18	134.488	441.961	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
10	Bolgerijsekade 24	134.763	441.872	0,0	4,0	4,0	1,0	-153,9	90,0	"Green house mode"
11	Bolgerijsekade 1	134.692	441.848	0,0	4,0	4,0	1,0	-148,9	90,0	"Green house mode"
12	Bolgerijsekade 9	135.173	441.694	0,0	4,0	4,0	1,0	-156,1	90,0	"Green house mode"
13	Bolgerijsekade 8	134.397	442.010	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
14	Bolgerijsekade 6	134.376	442.020	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
15	Biezenweg 24	135.775	443.171	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
16	Biezenweg 49	136.085	443.159	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"

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Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Main Result

Calculation: Gamesa G128

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
01	Nieuwbouw Autenasekade	216:50	223	1:33	48:24
02	Autenasekade 9	119:47	150	1:12	28:06
03	Breede Sticht 1	66:32	154	0:40	11:24
04	Breede Sticht 16	64:40	127	0:39	10:27
05	Biezenweg 51	76:05	104	0:51	11:29
06	Biezenweg 16	71:30	94	0:52	10:38
07	Autenasekade 05	78:06	186	0:40	18:46
08	Bolgerijsekade 16	34:33	125	0:25	8:42
09	Bolgerijsekade 18	30:38	118	0:24	7:42
10	Bolgerijsekade 24	40:53	120	0:28	10:24
11	Bolgerijsekade 1	34:37	119	0:27	8:50
12	Bolgerijsekade 9	34:36	66	0:41	8:49
13	Bolgerijsekade 8	32:52	133	0:24	8:17
14	Bolgerijsekade 6	28:04	121	0:24	7:06
15	Biezenweg 24	56:08	71	0:58	8:05
16	Biezenweg 49	54:56	106	0:44	8:21

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	Gamesa G128 4.5MW	352:54	67:38
2	Gamesa G128 4.5MW	254:05	53:28
3	Gamesa G128 4.5MW	248:58	55:43

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Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Main Result

Calculation: Nordex N131

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) []

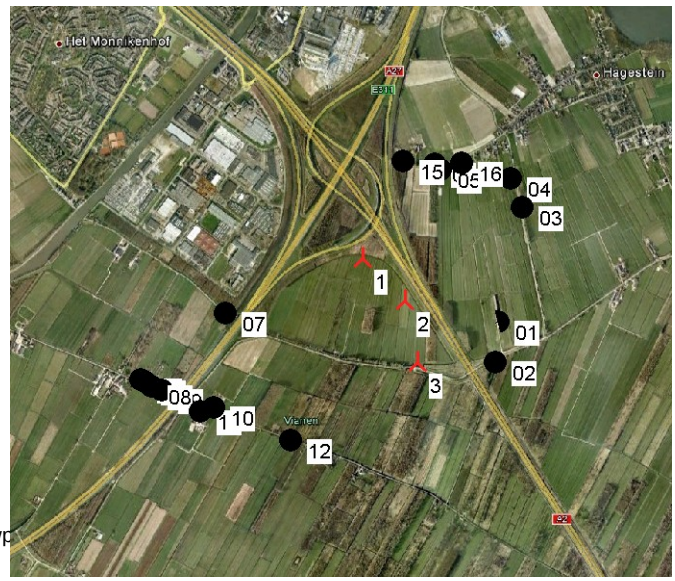
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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.wp
Obstacles not used in calculation
Eye height: 1,5 m
Grid resolution: 10 m



Scale 1:40.000
New WTG
Shadow receptor

WTGs

	Netherlands RD Amersfoort				WTG type						Shadow data	
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
	Netherlands RD Amersfoort		[m]					[kW]	[m]	[m]	[m]	[RPM]
1	135.561	442.659	0,0	Nordex N131	Yes	NORDEX	N131/3000-3.000	3.000	131,0	99,0	1.724	10,3
2	135.782	442.431	0,0	Nordex N131	Yes	NORDEX	N131/3000-3.000	3.000	131,0	99,0	1.724	10,3
3	135.845	442.105	0,0	Nordex N131	Yes	NORDEX	N131/3000-3.000	3.000	131,0	99,0	1.724	10,3

Shadow receptor-Input

		Netherlands RD Amersfoort								
No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
01	Nieuwbouw Autenasekade	136.276	442.319	0,0	4,0	4,0	1,0	76,8	90,0	Fixed direction
02	Autenasekade 9	136.258	442.103	0,0	4,0	2,0	1,0	73,3	90,0	"Green house mode"
03	Breede Sticht 1	136.409	442.924	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
04	Breede Sticht 16	136.346	443.079	0,0	4,0	4,0	1,0	77,0	90,0	"Green house mode"
05	Biezenweg 51	135.973	443.126	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
06	Biezenweg 16	135.942	443.157	0,0	4,0	4,0	1,0	4,6	90,0	"Green house mode"
07	Autenasekade 05	134.826	442.368	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
08	Bolgerijsekade 16	134.435	441.986	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
09	Bolgerijsekade 18	134.488	441.961	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"
10	Bolgerijsekade 24	134.763	441.872	0,0	4,0	4,0	1,0	-153,9	90,0	"Green house mode"
11	Bolgerijsekade 1	134.692	441.848	0,0	4,0	4,0	1,0	-148,9	90,0	"Green house mode"
12	Bolgerijsekade 9	135.173	441.694	0,0	4,0	4,0	1,0	-156,1	90,0	"Green house mode"
13	Bolgerijsekade 8	134.397	442.010	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
14	Bolgerijsekade 6	134.376	442.020	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
15	Biezenweg 24	135.775	443.171	0,0	4,0	4,0	1,0	-180,0	90,0	"Green house mode"
16	Biezenweg 49	136.085	443.159	0,0	4,0	2,0	1,0	-180,0	90,0	"Green house mode"

Project:
068379aa - WP Autena

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SHADOW - Main Result

Calculation: Nordex N131

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
01	Nieuwbouw Autenasekade	228:30	226	1:36	50:58
02	Autenasekade 9	126:44	155	1:14	29:42
03	Breede Sticht 1	69:16	157	0:41	11:52
04	Breede Sticht 16	66:51	129	0:39	10:49
05	Biezenweg 51	78:36	106	0:52	11:53
06	Biezenweg 16	73:46	94	0:53	10:59
07	Autenasekade 05	81:37	189	0:41	19:37
08	Bolgerijsekade 16	35:35	128	0:25	8:58
09	Bolgerijsekade 18	31:35	120	0:24	7:57
10	Bolgerijsekade 24	42:16	121	0:29	10:45
11	Bolgerijsekade 1	36:10	120	0:27	9:13
12	Bolgerijsekade 9	35:33	67	0:42	9:04
13	Bolgerijsekade 8	34:15	134	0:25	8:38
14	Bolgerijsekade 6	29:43	127	0:24	7:30
15	Biezenweg 24	58:31	72	0:59	8:26
16	Biezenweg 49	58:06	107	0:45	8:49

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	Nordex N131	363:35	69:46
2	Nordex N131	268:57	56:34
3	Nordex N131	259:58	58:07

Bijlage II

Slagschaduwkalender

Project:

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19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 01 - Nieuwbouw Autenasekade

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March		April		May		June		July		August		September		October		November	December
1	08:48		08:21		07:28		16:35 (3)	07:17		06:12		19:25 (2)	05:27		20:26 (1)	05:24		20:34 (1)	06:00		19:35 (2)	06:50		07:39		17:18 (3)	07:33	08:24
	16:39		17:27		18:18	49	17:24 (3)	20:12		21:03	48	20:13 (2)	21:49	30	20:56 (1)	22:03	26	21:00 (1)	21:31	67	21:00 (1)	20:29		19:20	39	17:57 (3)	17:13	16:33
2	08:48		08:20		07:26		16:35 (3)	07:15		06:10		19:25 (2)	05:26		20:26 (1)	05:25		20:34 (1)	06:02		19:35 (2)	06:52		07:41		17:15 (3)	07:35	08:26
	16:40		17:28		18:20	49	17:24 (3)	20:14		21:05	48	20:13 (2)	21:50	30	20:56 (1)	22:03	26	21:00 (1)	21:30	65	20:59 (1)	20:27		19:17	42	17:57 (3)	17:12	16:32
3	08:48		08:18		07:23		16:35 (3)	07:13		06:08		19:24 (2)	05:25		20:26 (1)	05:25		20:34 (1)	06:04		19:34 (2)	06:54		07:43		17:14 (3)	07:37	08:27
	16:41		17:30		18:22	49	17:24 (3)	20:16		21:07	48	20:12 (2)	21:51	30	20:56 (1)	22:03	26	21:00 (1)	21:28	61	20:56 (1)	20:25		19:15	44	17:58 (3)	17:10	16:32
4	08:48		08:17		07:21		16:35 (3)	07:10		06:07		19:24 (2)	05:25		20:27 (1)	05:26		20:34 (1)	06:05		19:35 (2)	06:55		07:44		17:14 (3)	07:39	08:29
	16:42		17:32		18:24	49	17:24 (3)	20:17		21:08	48	20:12 (2)	21:53	29	20:56 (1)	22:02	27	21:01 (1)	21:26	55	20:54 (1)	20:22		19:13	45	17:59 (3)	17:08	16:31
5	08:48		08:15		07:19		16:34 (3)	07:08		06:05		19:24 (2)	05:24		20:27 (1)	05:27		20:34 (1)	06:07		19:34 (2)	06:57		07:46		17:12 (3)	07:40	08:30
	16:43		17:34		18:25	49	17:23 (3)	20:19		21:10	49	20:13 (2)	21:54	29	20:56 (1)	22:02	28	21:02 (1)	21:25	48	20:22 (2)	20:20		19:10	46	17:58 (3)	17:06	16:31
6	08:47		08:13		07:17		16:35 (3)	07:06		06:03		19:24 (2)	05:23		20:27 (1)	05:28		20:33 (1)	06:08		19:34 (2)	06:58		07:48		17:11 (3)	07:42	08:31
	16:44		17:36		18:27	48	17:23 (3)	20:21		21:12	48	20:12 (2)	21:54	28	20:55 (1)	22:01	28	21:01 (1)	21:23	49	20:23 (2)	20:18		19:08	48	17:59 (3)	17:04	16:30
7	08:47		08:12		07:15		16:35 (3)	07:03		06:01		19:24 (2)	05:23		20:28 (1)	05:29		20:33 (1)	06:10		19:34 (2)	07:00		07:49		17:11 (3)	07:44	08:32
	16:46		17:38		18:29	48	17:23 (3)	20:23		21:13	48	20:12 (2)	21:55	27	20:55 (1)	22:01	29	21:02 (1)	21:21	48	20:22 (2)	20:16		19:06	48	17:59 (3)	17:03	16:30
8	08:46		08:10		07:12		16:35 (3)	07:01		05:59		19:25 (2)	05:22		20:29 (1)	05:30		20:33 (1)	06:11		19:34 (2)	07:02		07:51		17:10 (3)	07:46	08:34
	16:47		17:40		18:31	46	17:21 (3)	20:24		21:15	47	20:12 (2)	21:56	27	20:56 (1)	22:00	29	21:02 (1)	21:19	48	20:22 (2)	20:13		19:04	49	17:59 (3)	17:01	16:29
9	08:46		08:08		07:10		16:35 (3)	06:59		05:58		19:24 (2)	05:22		20:28 (1)	05:30		20:33 (1)	06:13		19:33 (2)	07:03		07:53		17:09 (3)	07:48	08:35
	16:48		17:41		18:33	46	17:21 (3)	20:26		21:17	59	20:45 (1)	21:57	27	20:55 (1)	21:59	30	21:03 (1)	21:17	49	20:22 (2)	20:11		19:01	49	17:58 (3)	16:59	16:29
10	08:45		08:06		07:08		16:36 (3)	06:57		05:56		19:24 (2)	05:21		20:29 (1)	05:31		20:33 (1)	06:15		19:34 (2)	07:05		07:55		17:09 (3)	07:49	08:36
	16:50		17:43		18:34	44	17:20 (3)	20:28		21:18	63	20:47 (1)	21:58	26	20:55 (1)	21:59	30	21:03 (1)	21:15	48	20:22 (2)	20:09		18:59	49	17:58 (3)	16:58	16:29
11	08:45		08:04		07:06		16:37 (3)	06:54		05:54		19:25 (2)	05:21		20:30 (1)	05:33		20:33 (1)	06:16		19:33 (2)	07:07		07:56		17:09 (3)	07:51	08:37
	16:51		17:45		18:36	43	17:20 (3)	20:29		21:20	65	20:49 (1)	21:59	26	20:56 (1)	21:58	31	21:04 (1)	21:13	48	20:21 (2)	20:06		18:57	49	17:58 (3)	16:56	16:29
12	08:44		08:03		07:03		16:37 (3)	06:52		05:53		19:25 (2)	05:20		20:30 (1)	05:34		20:33 (1)	06:18		19:34 (2)	07:08		07:58		17:09 (3)	07:53	08:38
	16:53		17:47		18:38	41	17:18 (3)	20:31		21:21	67	20:50 (1)	21:59	25	20:55 (1)	21:57	31	21:04 (1)	21:12	47	20:21 (2)	20:04		18:55	49	17:58 (3)	16:55	16:29
13	08:43		08:01		07:01		16:39 (3)	06:50		05:51		19:26 (2)	05:20		20:30 (1)	05:35		19:53 (2)	06:19		19:34 (2)	07:10		08:00		17:08 (3)	07:55	08:39
	16:54		17:49		18:40	38	17:17 (3)	20:33		21:23	68	20:51 (1)	22:00	25	20:55 (1)	21:56	41	21:04 (1)	21:10	46	20:20 (2)	20:02		18:52	49	17:57 (3)	16:53	16:29
14	08:43		07:59		06:59		16:40 (3)	06:48		05:49		19:26 (2)	05:20		20:31 (1)	05:36		19:51 (2)	06:21		19:34 (2)	07:11		08:01		17:09 (3)	07:57	08:40
	16:56		17:51		18:41	35	17:15 (3)	20:35		21:25	69	20:52 (1)	22:01	24	20:55 (1)	21:55	47	21:05 (1)	21:08	46	20:20 (2)	19:59		18:50	47	17:56 (3)	16:52	16:29
15	08:42		07:57		16:58 (3)	06:56	16:41 (3)	06:46		05:48		19:27 (2)	05:20		20:31 (1)	05:37		19:49 (2)	06:23		19:34 (2)	07:13		08:03		17:09 (3)	07:58	08:41
	16:57		17:53	5	17:03 (3)	18:43	32	17:13 (3)	20:36		21:26	69	20:53 (1)	22:01	24	20:55 (1)	21:54	50	21:05 (1)	21:06	45	20:19 (2)	19:57		18:48	47	17:56 (3)	16:50	16:29
16	08:41		07:55		16:52 (3)	06:54		16:43 (3)	06:43		05:46		19:28 (2)	05:20		20:32 (1)	05:38		19:48 (2)	06:24		19:35 (2)	07:15		08:05		17:10 (3)	08:00	08:42
	16:59		17:54	17	17:09 (3)	18:45	28	17:11 (3)	20:38		21:28	69	20:54 (1)	22:02	24	20:56 (1)	21:53	53	21:05 (1)	21:04	43	20:18 (2)	19:55		18:46	45	17:55 (3)	16:49	16:29
17	08:40		07:53		16:49 (3)	06:52		16:46 (3)	06:41	19:48 (2)	05:45		19:28 (2)	05:20		20:32 (1)	05:39		19:46 (2)	06:26		19:35 (2)	07:16		08:07		17:10 (3)	08:02	08:43
	17:00		17:56	23	17:12 (3)	18:47	23	17:09 (3)	20:40	5	19:53 (2)	21:29	69	20:54 (1)	22:02	24	20:56 (1)	21:52	56	21:05 (1)	21:02	42	20:17 (2)	19:52		18:44	45	17:55 (3)	16:47	16:29
18	08:39		07:51		16:47 (3)	06:50		16:48 (3)	06:39		19:42 (2)	05:43		19:29 (2)	05:20		20:32 (1)	05:41		19:46 (2)	06:27		19:36 (2)	07:18		08:08		17:10 (3)	08:03	08:43
	17:02		17:58	27	17:14 (3)	18:48	17	17:05 (3)	20:41	17	19:59 (2)	21:31	69	20:55 (1)	22:03	24	20:56 (1)	21:51	58	21:06 (1)	21:00	40	20:16 (2)	19:50		18:42	43	17:53 (3)	16:46	16:29
19	08:38		07:49		16:45 (3)	06:47			06:37		19:39 (2)	05:42		19:30 (2)	05:20		20:32 (1)	05:42		19:45 (2)	06:29		19:36 (2)	07:20		08:10		17:11 (3)	08:05	08:44
	17:04		18:00	31	17:16 (3)	18:50			20:43	23	20:02 (2)	21:32	67	20:55 (1)	22:03	24	20:56 (1)	21:50	61	21:06 (1)	20:57	39	20:15 (2)	19:48		18:39	41	17:52 (3)	16:45	16:29
20	08:37		07:47		16:43 (3)	06:45			06:35		19:37 (2)	05:40		19:30 (2)	05:20		20:33 (1)	05:43		19:44 (2)	06:31		19:38 (2)	07:21		08:12		17:12 (3)	08:07	08:45
	17:05		18:02	35	17:18 (3)	18:52			20:45	27	20:04 (2)	21:34	67	20:55 (1)	22:03	23	20:56 (1)	21:49	63	21:06 (1)	20:55	36	20:14 (2)	19:45		18:37	39	17:51 (3)	16:44	16:30
21	08:36		07:45		16:42 (3)	06:43			06:33		19:35 (2)	05:39		19:31 (2)	05:20		20:33 (1)	05:45		19:42 (2)	06:32		19:38 (2)	07:23		08:14		17:13 (3)	08:09	08:45
	17:07		18:04	37	17:19 (3)	18:53			20:46	31	20:06 (2)	21:35	66	20:55 (1)	22:04	23	20:56 (1)	21:47	64	21:05 (1)	20:53	34	20:12 (2)	19:43		18:35	36	17:49 (3)	16:42	16:30
22	08:35		07:43		16:41 (3)	06:40			06:30		19:33 (2)	05:38		19:32 (2)	05:20		20:34 (1)	05:46		19:42 (2)	06:34		19:40 (2)	07:24		08:15		17:14 (3)	08:10	08:46
	17:09		18:06	40	17:21 (3)	18:55			20:48	34	20:07 (2)	21:36	65	20:56 (1)	22:04	23	20:57 (1)	21:46	66	21:06 (1)	20:51	30	20:10 (2)	19:41		18:33	34	17:48 (3)	16:41	16:31
23	08:34		07:41		16:40 (3)	06:38			06:28		19:32 (2)	05:36		19:33 (2)	05:20		20:34 (1)	05:47		19:41 (2)	06:36		19:41 (2)	07:26		08:17		17:16 (3)	08:12	08:46
	17:10		18:07	42	17:22 (3)	18:57			20:50	36	20:08 (2)	21:38	63	20:56 (1)	22:04	23	20:57 (1)	21:45	67	21:06 (1)	20:49	26	20:07 (2)	19:38		18:31	30	17:46 (3)	16:40	16:31
24	08:33		07:39		16:38 (3)	06:36			06:26		19:31 (2)	05:35		19:35 (2)	05:20		20:33 (1)	05:49		19:40 (2)	06:37		19:43 (2)	07:28		08:19		17:18 (3)	08:14	08:47
	17:12		18:09	44	17:22 (3)	18:59			20:52	38	20:09 (2)	21:39	61	20:56 (1)	22:04	24	20:57 (1)	21:43	68	21:05 (1)	20:47	22	20:05 (2)	19:36		18:29	26	17:44 (3)	16:39	16:32
25	08:31		07:36		16:38 (3)	06:33			06:24		19:29 (2)	05:34		19:36 (2)	05:21		20:34 (1)	05:50		19:40 (2)	06:39		19:47 (2)	07:29	17:33 (3)	07:21		16:20 (3)	08:15	08:47
	17:14		18:11	45	17:23 (3)	19:00			20:53	41	20:10 (2)	21:41	59	20:56 (1)	22:04	24	20:58 (1)	21:42	68	21:05 (1)	20:45	15	20:02 (2)	19:34	14	17:47 (3)	17:27	22	16:42 (3)	16:38	16:32
26	08:30		07:34		16:37 (3)	06:31			06:22		19:28 (2)	05:33		19:37 (2)	05:21		20:34 (1)	05:52		19:39 (2)	06:40			07:31		17:28 (3)	07:22		16:22 (3)	08:17	08:47
	17:16		18:13	46	17:23 (3)	19:02			20:55	43	20:11 (2)	21:42	57	20:56 (1)	22:04	24	20:58 (1)	21:41	69	21:05 (1)	20:43			19:31	22	17:50 (3)	17:25	15	16:37 (3)	16:37	16:33
27	08:29		07:32		16:37 (3)	06:29			06:20		19:27 (2)	05:32		19:39 (2)	05:22		20:33 (1)	05:53		19:38 (2)	06:42			07:33		17:26 (3)	07:24			08:18	08:48
	17:17		18:15	47	17:24 (3)	19:04			20:57	44	20:11 (2)	21:43	54	20:56 (1)	22:04	24	20:57 (1)	21:39	70	21:04 (1)	20:40			19:29	26	17:52 (3)	17:23			16:36	16:34
28	08:27		07:30		16:36 (3)	06:26			06:18		19:26 (2)	05:31		19:40 (2)	05:22		20:34 (1)	05:54		19:38 (2)	06:44			07:34		17:23 (3)	07:26			08:20	08:48
	17:19		18:16	48	17:24 (3)	19:06			20:58	45	20:11 (2)	21:44	51	20:56 (1)	22:04	24	20:58 (1)	21:38	69	21:04 (1)	20:38			19:27	30	17:53 (3)	17:21			16:35	16:35
29	08:26						07:24		06:16		19:26 (2)	05:30		19:42 (2)	05:23		20:33 (1)	05:56		19:37 (2)	06:45			07:36		17:21 (3)	07:28			08:21	08:48
	17:21						20:07		21:00	46	20:12 (2)	21:46	47	20:56 (1)	22:04	25	20:58 (1)	21:36	69	21:03 (1)	20:36			19:24	34	17:55 (3)	17:19			16:34	16:36
30	08:24						07:22		06:14		19:25 (2)	05:29		19:44 (2)	05:23		20:34 (1)	05:57		19:36 (2)	06:47			07:38		17:19 (3)	07:30			08:23	08:48
	17:23						20:09		21:02	47	20:12 (2)	21:47	43	20:56 (1)	22:04	25	20:59 (1)	21:35	69	21:02 (1)	20:34			19:22	37	17:56 (3)	17:17			16:34	16:36
31	08:23						07:19					05:28		19:46 (2)				05:59		19:36 (2)	06:49						07:31				08:48
	17:25						20:11					21:48	38	20:56 (1)				21:33	67	21:01 (1)	20:31						17:15				16:37
Potential sun hours	259		277		367		416		485		499		502		454		381		331		266	243
Total, worst case				487		734		477		1789		765		1516		1097		163		1076		
Sun reduction				0,30		0,33		0,42		0,43		0,39		0,41		0,42		0,36		0,34		
Oper. time red.				0,95		0,95		0,95		0,95		0,95		0,95		0,95		0,95		0,95		
Wind dir. red.				0,67		0,67		0,58		0,58		0,58		0,58		0,58		0,67		0,67		
Total reduction				0,19		0,21		0,23		0,24		0,22		0,23		0,23		0,23		0,21		
Total, real				94		154		111		425		166		343		254		38		230		

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 2

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Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 02 - Autenasekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	18:56 (3)	06:12	18:44 (3)	05:27	05:24	06:00	06:50	18:39 (3)	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	28 19:24 (3)	21:03	41 19:25 (3)	21:49	22:03	21:31	20:29	54 19:33 (3)	19:20	17:13	16:33
2	08:48	08:20	07:26	07:15	18:52 (3)	06:10	18:45 (3)	05:26	05:25	06:02	06:52	18:40 (3)	07:41	07:35	08:26
	16:40	17:28	18:20	20:14	34 19:26 (3)	21:05	39 19:24 (3)	21:50	22:03	21:30	20:27	52 19:32 (3)	19:17	17:12	16:32
3	08:48	08:18	07:23	07:13	18:50 (3)	06:08	18:46 (3)	05:25	05:25	06:04	06:54	18:40 (3)	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	37 19:27 (3)	21:07	36 19:22 (3)	21:51	22:03	21:28	20:25	52 19:32 (3)	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	18:49 (3)	06:07	18:48 (3)	05:25	05:26	06:05	19:11 (3)	06:55	18:40 (3)	07:44	07:39	08:28
	16:42	17:32	18:24	20:17	40 19:29 (3)	21:08	33 19:21 (3)	21:52	22:02	21:26	8 19:19 (3)	20:22	50 19:30 (3)	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	18:47 (3)	06:05	18:50 (3)	05:24	05:27	06:07	19:06 (3)	06:57	18:41 (3)	07:46	07:40	08:30
	16:43	17:34	18:25	20:19	44 19:31 (3)	21:10	30 19:20 (3)	21:54	22:02	21:25	17 19:23 (3)	20:20	48 19:29 (3)	19:10	17:06	16:31
6	08:47	08:13	07:17	07:06	18:45 (3)	06:03	18:52 (3)	05:23	05:28	06:08	19:03 (3)	06:58	18:41 (3)	07:48	07:42	08:31
	16:44	17:36	18:27	20:21	46 19:31 (3)	21:12	25 19:17 (3)	21:54	22:01	21:23	23 19:26 (3)	20:18	46 19:27 (3)	19:08	17:04	16:30
7	08:47	08:11	07:15	07:03	18:44 (3)	06:01	18:54 (3)	05:23	05:29	06:10	19:00 (3)	07:00	18:43 (3)	07:49	07:44	08:32
	16:46	17:38	18:29	20:23	48 19:32 (3)	21:13	21 19:15 (3)	21:55	22:01	21:21	28 19:28 (3)	20:16	43 19:26 (3)	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	18:43 (3)	05:59	18:57 (3)	05:22	05:30	06:11	18:59 (3)	07:02	18:43 (3)	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	50 19:33 (3)	21:15	15 19:12 (3)	21:56	22:00	21:19	31 19:30 (3)	20:13	40 19:23 (3)	19:04	17:01	16:29
9	08:46	08:08	07:10	06:59	18:42 (3)	05:58		05:22	05:30	06:13	18:57 (3)	07:03	18:44 (3)	07:53	07:48	08:35
	16:48	17:41	18:33	20:26	52 19:34 (3)	21:17		21:57	21:59	21:17	34 19:31 (3)	20:11	38 19:22 (3)	19:01	16:59	16:29
10	08:45	08:06	07:08	06:57	18:41 (3)	05:56		05:21	05:31	06:15	18:56 (3)	07:05	18:45 (3)	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	52 19:33 (3)	21:18		21:58	21:59	21:15	36 19:32 (3)	20:09	34 19:19 (3)	18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	18:40 (3)	05:54		05:21	05:33	06:16	18:53 (3)	07:07	18:48 (3)	07:56	07:51	08:37
	16:51	17:45	18:36	20:29	54 19:34 (3)	21:20		21:59	21:58	21:13	40 19:33 (3)	20:06	29 19:17 (3)	18:57	16:56	16:29
12	08:44	08:02	07:03	06:52	18:40 (3)	05:53		05:20	05:34	06:18	18:52 (3)	07:08	18:50 (3)	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	54 19:34 (3)	21:21		21:59	21:57	21:12	42 19:34 (3)	20:04	24 19:14 (3)	18:55	16:55	16:29
13	08:43	08:01	07:01	06:50	18:39 (3)	05:51		05:20	05:35	06:19	18:50 (3)	07:10	18:54 (3)	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	56 19:35 (3)	21:23		22:00	21:56	21:10	44 19:34 (3)	20:02	15 19:09 (3)	18:52	16:53	16:29
14	08:43	07:59	06:59	06:48	18:39 (3)	05:49		05:20	05:36	06:21	18:50 (3)	07:11		08:01	07:57	08:40
	16:56	17:51	18:41	20:35	56 19:35 (3)	21:25		22:01	21:55	21:08	46 19:36 (3)	19:59		18:50	16:52	16:29
15	08:42	07:57	06:56	06:46	18:39 (3)	05:48		05:20	21:05 (2)	05:37	06:23	18:48 (3)	07:13		08:03	07:58	08:41
	16:57	17:53	18:43	20:36	56 19:35 (3)	21:26		22:01	6 21:11 (2)	21:54	21:06	48 19:36 (3)	19:57		18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	18:37 (3)	05:46		05:20	21:04 (2)	05:38	06:24	18:47 (3)	07:15		08:05	08:00	08:42
	16:59	17:54	18:45	20:38	57 19:34 (3)	21:28		22:02	8 21:12 (2)	21:53	21:04	50 19:37 (3)	19:55		18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	18:37 (3)	05:45		05:20	21:04 (2)	05:39	06:26	18:46 (3)	07:16		08:07	08:02	08:43
	17:00	17:56	18:47	20:40	57 19:34 (3)	21:29		22:02	9 21:13 (2)	21:52	21:02	50 19:36 (3)	19:52		18:44	16:47	16:29
18	08:39	07:51	06:50	06:39	18:37 (3)	05:43		05:20	21:04 (2)	05:41	06:27	18:45 (3)	07:18		08:08	08:03	08:43
	17:02	17:58	18:48	20:41	57 19:34 (3)	21:31		22:03	10 21:14 (2)	21:51	21:00	52 19:37 (3)	19:50		18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	18:37 (3)	05:42		05:20	21:03 (2)	05:42	06:29	18:44 (3)	07:20		08:10	08:05	08:44
	17:04	18:00	18:50	20:43	57 19:34 (3)	21:32		22:03	11 21:14 (2)	21:50	20:57	53 19:37 (3)	19:48		18:39	16:45	16:29
20	08:37	07:47	06:45	06:35	18:37 (3)	05:40		05:20	21:03 (2)	05:43	06:31	18:44 (3)	07:21		08:12	08:07	08:45
	17:05	18:02	18:52	20:45	56 19:33 (3)	21:34		22:03	12 21:15 (2)	21:49	20:55	54 19:38 (3)	19:45		18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	18:38 (3)	05:39		05:20	21:03 (2)	05:45	06:32	18:42 (3)	07:23		08:14	08:09	08:45
	17:07	18:04	18:53	20:46	55 19:33 (3)	21:35		22:04	12 21:15 (2)	21:47	20:53	55 19:37 (3)	19:43		18:35	16:42	16:30
22	08:35	07:43	06:40	06:30	18:38 (3)	05:38		05:20	21:04 (2)	05:46	06:34	18:42 (3)	07:24		08:15	08:10	08:46
	17:09	18:06	18:55	20:48	54 19:32 (3)	21:36		22:04	12 21:16 (2)	21:46	20:51	56 19:38 (3)	19:41		18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	18:38 (3)	05:36		05:20	21:04 (2)	05:47	06:36	18:41 (3)	07:26		08:17	08:12	08:46
	17:10	18:07	18:57	20:50	54 19:32 (3)	21:38		22:04	12 21:16 (2)	21:45	20:49	56 19:37 (3)	19:38		18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	18:38 (3)	05:35		05:20	21:05 (2)	05:49	06:37	18:41 (3)	07:28		08:19	08:14	08:47
	17:12	18:09	18:59	20:52	53 19:31 (3)	21:39		22:04	10 21:15 (2)	21:43	20:47	56 19:37 (3)	19:36		18:29	16:39	16:32
25	08:31	07:36	06:33	06:24	18:39 (3)	05:34		05:21	21:06 (2)	05:50	06:39	18:41 (3)	07:29		07:21	08:15	08:47
	17:14	18:11	19:00	20:53	52 19:31 (3)	21:41		22:04	10 21:16 (2)	21:42	20:45	57 19:38 (3)	19:34		17:27	16:38	16:32
26	08:30	07:34	06:31	06:22	18:39 (3)	05:33		05:21	21:06 (2)	05:52	06:41	18:40 (3)	07:31		07:22	08:17	08:47
	17:16	18:13	19:02	20:55	51 19:30 (3)	21:42		22:04	9 21:15 (2)	21:41	20:43	57 19:37 (3)	19:31		17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	18:40 (3)	05:32		05:22	21:07 (2)	05:53	06:42	18:40 (3)	07:33		07:24	08:18	08:48
	17:17	18:15	19:04	20:57	49 19:29 (3)	21:43		22:04	7 21:14 (2)	21:39	20:40	57 19:37 (3)	19:29		17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	18:41 (3)	05:31		05:22	21:09 (2)	05:54	06:44	18:39 (3)	07:34		07:26	08:20	08:48
	17:19	18:16	19:06	20:58	47 19:28 (3)	21:44		22:04	4 21:13 (2)	21:38	20:38	57 19:36 (3)	19:27		17:21	16:35	16:35
29	08:26		07:24	06:16	18:41 (3)	05:30		05:23		05:56	06:45	18:40 (3)	07:36		07:28	08:21	08:48
	17:21		20:07	21:00	46 19:27 (3)	21:46		22:04		21:36	20:36	56 19:36 (3)	19:24		17:19	16:34	16:36
30	08:24		07:22	19:03 (3)	06:14	18:42 (3)	05:29	05:23		05:57	06:47	18:39 (3)	07:38		07:30	08:23	08:48
	17:23		20:09	14 19:17 (3)	21:02	44 19:26 (3)	21:47	22:04		21:35	20:34	55 19:34 (3)	19:22		17:17	16:34	16:36
31	08:23		07:19	18:59 (3)			05:28			05:59	06:49	18:39 (3)			07:31		08:48
	17:25		20:11	22 19:21 (3)			21:48			21:33	20:31	55 19:34 (3)			17:15		16:37
Potential sun hours	259	277	367	416		485		499	502	454		381		331	266	243
Total, worst case			36		1496		240		132			1273		525			
Sun reduction			0,33		0,42		0,43		0,39			0,42		0,36			
Oper. time red.			0,95		0,95		0,95		0,95			0,95		0,95			
Wind dir. red.			0,62		0,62		0,62		0,59			0,62		0,62			
Total reduction			0,19		0,25		0,25		0,22			0,24		0,21			
Total, real			7		367		60		29			312		112			

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

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

Project:

068379aa - WP Autena

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19-9-2013 15:02 / 3

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Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 03 - Breede Sticht 1

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March		April	May	June	July	August	September		October		November		December		
1	08:48	15:09 (3)	08:21		16:14 (2)	07:28	17:29 (1)	07:17	06:12	05:27	05:24	06:00	06:50	07:39		18:10 (1)	07:33	15:47 (2)	08:24		
	16:39	15 15:24 (3)	17:27	31	16:45 (2)	18:18	22 17:51 (1)	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17	18:27 (1)	17:13	25 16:12 (2)	16:33		
2	08:48	15:09 (3)	08:20		16:14 (2)	07:26	17:29 (1)	07:15	06:10	05:26	05:25	06:02	06:52	07:41		18:07 (1)	07:35	15:46 (2)	08:26		
	16:40	14 15:23 (3)	17:28	31	16:45 (2)	18:20	23 17:52 (1)	20:14	21:05	21:50	22:03	21:30	20:27	19:17	20	18:27 (1)	17:12	27 16:13 (2)	16:32		
3	08:48	15:11 (3)	08:18		16:14 (2)	07:23	17:28 (1)	07:13	06:08	05:25	05:25	06:04	06:54	07:43		18:06 (1)	07:37	15:45 (2)	08:27		
	16:41	12 15:23 (3)	17:30	31	16:45 (2)	18:22	25 17:53 (1)	20:16	21:07	21:51	22:03	21:28	20:25	19:15	22	18:28 (1)	17:10	29 16:14 (2)	16:32		
4	08:48	15:12 (3)	08:17		16:14 (2)	07:21	17:27 (1)	07:10	06:07	05:25	05:26	06:05	06:55	07:44		18:05 (1)	07:39	15:45 (2)	08:29		
	16:42	11 15:23 (3)	17:32	30	16:44 (2)	18:24	27 17:54 (1)	20:17	21:08	21:53	22:02	21:26	20:22	19:13	24	18:29 (1)	17:08	29 16:14 (2)	16:31		
5	08:48	15:14 (3)	08:15		16:15 (2)	07:19	17:26 (1)	07:08	06:05	05:24	05:27	06:07	06:57	07:46		18:03 (1)	07:40	15:45 (2)	08:30		
	16:43	7 15:21 (3)	17:34	30	16:45 (2)	18:25	27 17:53 (1)	20:19	21:10	21:54	22:02	21:25	20:20	19:10	26	18:29 (1)	17:06	30 16:15 (2)	16:31		
6	08:47	15:17 (3)	08:13		16:15 (2)	07:17	17:26 (1)	07:06	06:03	05:23	05:28	06:08	06:58	07:48		18:03 (1)	07:42	15:44 (2)	08:31		15:03 (3)
	16:44	3 15:20 (3)	17:36	30	16:45 (2)	18:27	27 17:53 (1)	20:21	21:12	21:54	22:01	21:23	20:18	19:08	26	18:29 (1)	17:04	31 16:15 (2)	16:30	2	15:05 (3)
7	08:47		08:12		16:15 (2)	07:15	17:26 (1)	07:03	06:01	05:23	05:29	06:10	07:00	07:49		18:02 (1)	07:44	15:44 (2)	08:32		15:01 (3)
	16:46		17:38	29	16:44 (2)	18:29	27 17:53 (1)	20:23	21:13	21:55	22:01	21:21	20:16	19:06	27	18:29 (1)	17:03	31 16:15 (2)	16:30	7	15:08 (3)
8	08:46		08:10		16:16 (2)	07:12	17:26 (1)	07:01	05:59	05:22	05:29	06:11	07:02	07:51		18:02 (1)	07:46	15:44 (2)	08:34		15:00 (3)
	16:47		17:40	28	16:44 (2)	18:31	26 17:52 (1)	20:24	21:15	21:56	22:00	21:19	20:13	19:04	27	18:29 (1)	17:01	31 16:15 (2)	16:29	10	15:10 (3)
9	08:46		08:08		16:17 (2)	07:10	17:26 (1)	06:59	05:58	05:22	05:30	06:13	07:03	07:53		18:01 (1)	07:48	15:45 (2)	08:35		15:00 (3)
	16:48		17:41	26	16:43 (2)	18:33	25 17:51 (1)	20:26	21:17	21:57	21:59	21:17	20:11	19:01	27	18:28 (1)	16:59	30 16:15 (2)	16:29	12	15:12 (3)
10	08:45		08:06		16:17 (2)	07:08	17:27 (1)	06:57	05:56	05:21	05:31	06:15	07:05	07:55		18:02 (1)	07:49	15:45 (2)	08:36		14:59 (3)
	16:50		17:43	25	16:42 (2)	18:34	24 17:51 (1)	20:28	21:18	21:58	21:59	21:15	20:09	18:59	25	18:27 (1)	16:58	30 16:15 (2)	16:29	14	15:13 (3)
11	08:45		08:04		16:19 (2)	07:06	17:28 (1)	06:54	05:54	05:21	05:32	06:16	07:07	07:56		18:02 (1)	07:51	15:45 (2)	08:37		14:59 (3)
	16:51		17:45	22	16:41 (2)	18:36	22 17:50 (1)	20:29	21:20	21:59	21:58	21:13	20:06	18:57	25	18:27 (1)	16:56	30 16:15 (2)	16:29	15	15:14 (3)
12	08:44		08:03		16:20 (2)	07:03	17:29 (1)	06:52	05:52	05:20	05:34	06:18	07:08	07:58		18:03 (1)	07:53	15:46 (2)	08:38		14:59 (3)
	16:53		17:47	20	16:40 (2)	18:38	19 17:48 (1)	20:31	21:21	21:59	21:57	21:12	20:04	18:55	23	18:26 (1)	16:55	29 16:15 (2)	16:29	15	15:14 (3)
13	08:43		08:01		16:23 (2)	07:01	17:31 (1)	06:50	05:51	05:20	05:35	06:19	07:10	08:00		18:03 (1)	07:55	15:45 (2)	08:39		14:59 (3)
	16:54		17:49	15	16:38 (2)	18:40	15 17:46 (1)	20:33	21:23	22:00	21:56	21:10	20:02	18:52	21	18:24 (1)	16:53	29 16:14 (2)	16:29	16	15:15 (3)
14	08:43		07:59		16:26 (2)	06:59	17:34 (1)	06:48	05:49	05:20	05:36	06:21	07:11	08:01		18:04 (1)	07:57	15:46 (2)	08:40		14:59 (3)
	16:56		17:51	9	16:35 (2)	18:41	9 17:43 (1)	20:35	21:25	22:01	21:55	21:08	19:59	18:50	18	18:22 (1)	16:52	28 16:14 (2)	16:29	17	15:16 (3)
15	08:42		07:57			06:56		06:46	05:48	05:20	05:37	06:23	07:13	08:03		18:06 (1)	07:58	15:47 (2)	08:41		14:59 (3)
	16:57		17:53			18:43		20:36	21:26	22:01	21:54	21:06	19:57	18:48	14	18:20 (1)	16:50	26 16:13 (2)	16:29	18	15:17 (3)
16	08:41		07:55			06:54		06:43	05:46	05:20	05:38	06:24	07:15	08:05		18:10 (1)	08:00	15:48 (2)	08:42		14:59 (3)
	16:59		17:54			18:45		20:38	21:28	22:02	21:53	21:04	19:55	18:46	7	18:17 (1)	16:49	25 16:13 (2)	16:29	19	15:18 (3)
17	08:40		07:53			06:52		06:41	05:45	05:19	05:39	06:26	07:16	08:07			08:02	15:49 (2)	08:43		14:59 (3)
	17:00		17:56			18:47		20:40	21:29	22:02	21:52	21:02	19:52	18:44			16:47	23 16:12 (2)	16:29	18	15:17 (3)
18	08:39		07:51			06:50		06:39	05:43	05:19	05:41	06:27	07:18	08:08			08:03	15:50 (2)	08:43		14:59 (3)
	17:02		17:58			18:48		20:41	21:31	22:03	21:51	21:00	19:50	18:42			16:46	21 16:11 (2)	16:29	19	15:18 (3)
19	08:38		07:49			06:47		06:37	05:42	05:20	05:42	06:29	07:20	08:10			08:05	15:52 (2)	08:44		15:00 (3)
	17:04		18:00			18:50		20:43	21:32	22:03	21:50	20:57	19:48	18:39			16:45	18 16:10 (2)	16:29	19	15:19 (3)
20	08:37	16:23 (2)	07:47			06:45		06:35	05:40	05:20	05:43	06:31	07:21	08:12			08:07	15:54 (2)	08:45		15:00 (3)
	17:05	5 16:28 (2)	18:02			18:52		20:45	21:34	22:03	21:49	20:55	19:45	18:37			16:44	15 16:09 (2)	16:30	19	15:19 (3)
21	08:36	16:20 (2)	07:45			06:43		06:33	05:39	05:20	05:45	06:32	07:23	08:14			08:09	15:56 (2)	08:45		15:01 (3)
	17:07	12 16:32 (2)	18:04			18:53		20:46	21:35	22:04	21:47	20:53	19:43	18:35			16:42	12 16:08 (2)	16:30	19	15:20 (3)
22	08:35	16:19 (2)	07:43			06:40		06:30	05:38	05:20	05:46	06:34	07:24	08:15			08:10	15:59 (2)	08:46		15:01 (3)
	17:09	15 16:34 (2)	18:06			18:55		20:48	21:36	22:04	21:46	20:51	19:41	18:33			16:41	5 16:04 (2)	16:31	19	15:20 (3)
23	08:34	16:17 (2)	07:41			06:38		06:28	05:36	05:20	05:47	06:36	07:26	08:17			08:12		08:46		15:02 (3)
	17:10	18 16:35 (2)	18:07			18:57		20:50	21:38	22:04	21:45	20:49	19:38	18:31			16:40		16:31	19	15:21 (3)
24	08:33	16:17 (2)	07:39			06:36		06:26	05:35	05:20	05:49	06:37	07:28	08:19			08:14		08:47		15:02 (3)
	17:12	20 16:37 (2)	18:09			18:59		20:52	21:39	22:04	21:43	20:47	19:36	18:29			16:39		16:32	19	15:21 (3)
25	08:31	16:16 (2)	07:36			06:33		06:24	05:34	05:21	05:50	06:39	07:29	07:21			08:15		08:47		15:03 (3)
	17:14	23 16:39 (2)	18:11			19:00		20:53	21:41	22:04	21:42	20:45	19:34	17:27			16:38		16:32	19	15:22 (3)
26	08:30	16:15 (2)	07:34		17:36 (1)	06:31		06:22	05:33	05:21	05:51	06:40	07:31	07:22			08:17		08:47		15:04 (3)
	17:16	25 16:40 (2)	18:13	10	17:46 (1)	19:02		20:55	21:42	22:04	21:41	20:43	19:31	17:25			16:37		16:33	18	15:22 (3)
27	08:29	16:15 (2)	07:32		17:33 (1)	06:29		06:20	05:32	05:22	05:53	06:42	07:33	07:24			08:18		08:48		15:04 (3)
	17:17	26 16:41 (2)	18:15	15	17:48 (1)	19:04		20:57	21:43	22:04	21:39	20:40	19:29	17:23			16:36		16:34	19	15:23 (3)
28	08:27	16:14 (2)	07:30		17:32 (1)	06:26		06:18	05:31	05:22	05:54	06:44	07:34	07:26		15:54 (2)	08:20		08:48		15:05 (3)
	17:19	28 16:42 (2)	18:16	19	17:51 (1)	19:06		20:58	21:45	22:04	21:38	20:38	19:27	17:21	11	16:05 (2)	16:35		16:35	18	15:23 (3)
29	08:26	16:15 (2)				07:24		06:16	05:30	05:23	05:56	06:45	07:36	07:28		15:52 (2)	08:21		08:48		15:05 (3)
	17:21	28 16:43 (2)				20:07		21:00	21:46	22:04	21:36	20:36	19:24	3 18:20 (1)	17:19	16	16:08 (2)	16:34		16:35	18	15:23 (3)
30	08:24	16:14 (2)				07:22		06:14	05:29	05:23	05:57	06:47	07:38	18:12 (1)	07:30		15:50 (2)	08:23		08:48		15:06 (3)
	17:23	29 16:43 (2)				20:09		21:02	21:47	22:04	21:35	20:34	19:22	13 18:25 (1)	17:17	20	16:10 (2)	16:34		16:36	17	15:23 (3)
31	08:23	16:13 (2)				07:19			05:28		05:59	06:49			07:31		15:48 (2)			08:48		15:07 (3)
	17:25	31 16:44 (2)				20:11			21:48		21:33	20:31			17:15	23	16:11 (2)			16:37	16	15:23 (3)
Potential sun hours	259		277		367		416	485	499	502	454	381		331			266		243		
Total, worst case		322		401		318							16		419		554			421	
Sun reduction		0,24		0,30		0,33							0,36		0,34		0,24			0,20	
Oper. time red.		0,95		0,95		0,95							0,95		0,95		0,95			0,95	
Wind dir. red.		0,68		0,67		0,64							0,64		0,65		0,67			0,69	
Total reduction		0,15		0,19		0,20							0,22		0,21		0,15			0,13	
Total, real		50		77		64							4		87		84			57	

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 4

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 04 - Breede Sticht 16

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December		
1	08:48	15:26 (2)	08:21		07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	16:27 (1)	08:24		15:12 (2)
	16:39	29 15:55 (2)	17:27		18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13	17 16:44 (1)	16:33	29	15:41 (2)
2	08:48	15:25 (2)	08:20		07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	16:29 (1)	08:26		15:11 (2)
	16:40	29 15:54 (2)	17:28		18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12	13 16:42 (1)	16:32	30	15:41 (2)
3	08:48	15:26 (2)	08:18		07:23	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	16:31 (1)	08:27		15:12 (2)
	16:41	29 15:55 (2)	17:30		18:22	20:16	21:07	21:51	22:03	21:28	20:25	19:15		17:10	9 16:40 (1)	16:32	30	15:42 (2)
4	08:48	15:27 (2)	08:17		07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39		08:29		15:12 (2)
	16:42	29 15:56 (2)	17:32		18:24	20:17	21:08	21:53	22:02	21:26	20:22	19:13		17:08		16:31	30	15:42 (2)
5	08:48	15:26 (2)	08:15		07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40		08:30		15:12 (2)
	16:43	30 15:56 (2)	17:34		18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06		16:31	30	15:42 (2)
6	08:47	15:27 (2)	08:13		07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42		08:31		15:13 (2)
	16:44	30 15:57 (2)	17:36		18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04		16:30	30	15:43 (2)
7	08:47	15:27 (2)	08:12		07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44		08:32		15:13 (2)
	16:46	30 15:57 (2)	17:38		18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03		16:30	30	15:43 (2)
8	08:46	15:28 (2)	08:10		17:01 (1)	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46		08:34		15:14 (2)
	16:47	30 15:58 (2)	17:40	9	17:10 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01		16:29	29	15:43 (2)
9	08:46	15:28 (2)	08:08		16:59 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48		08:35		15:15 (2)
	16:48	30 15:58 (2)	17:41	13	17:12 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59		16:29	29	15:44 (2)
10	08:45	15:28 (2)	08:06		16:57 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49		08:36		15:15 (2)
	16:50	30 15:58 (2)	17:43	17	17:14 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58		16:29	29	15:44 (2)
11	08:45	15:29 (2)	08:04		16:56 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51		08:37		15:16 (2)
	16:51	30 15:59 (2)	17:45	20	17:16 (1)	18:36	20:29	21:20	21:59	21:58	21:13	20:06	18:57		16:56		16:29	29	15:45 (2)
12	08:44	15:30 (2)	08:03		16:55 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53		08:38		15:16 (2)
	16:53	30 16:00 (2)	17:47	23	17:18 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55		16:29	29	15:45 (2)
13	08:43	15:30 (2)	08:01		16:54 (1)	07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00		07:55		08:39		15:17 (2)
	16:54	30 16:00 (2)	17:49	25	17:19 (1)	18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52		16:53		16:29	28	15:45 (2)
14	08:43	15:31 (2)	07:59		16:53 (1)	06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01		07:57		08:40		15:17 (2)
	16:56	29 16:00 (2)	17:51	26	17:19 (1)	18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50		16:52		16:29	29	15:46 (2)
15	08:42	15:31 (2)	07:57		16:53 (1)	06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03		07:58		08:41		15:18 (2)
	16:57	29 16:00 (2)	17:53	27	17:20 (1)	18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48		16:50		16:29	28	15:46 (2)
16	08:41	15:32 (2)	07:55		16:53 (1)	06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	17:33 (1)	08:00	15:18 (2)	08:42	15:19 (2)
	16:59	28 16:00 (2)	17:54	27	17:20 (1)	18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	11 17:44 (1)	16:49	8 15:26 (2)	16:29	28 15:47 (2)
17	08:40	15:32 (2)	07:53		16:53 (1)	06:52	06:41	05:45	05:19	05:39	06:26	07:16	08:07	17:30 (1)	08:02	15:16 (2)	08:43	15:18 (2)
	17:00	28 16:00 (2)	17:56	27	17:20 (1)	18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16 17:46 (1)	16:47	13 15:29 (2)	16:29	28 15:46 (2)
18	08:39	15:33 (2)	07:51		16:53 (1)	06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	17:27 (1)	08:03	15:14 (2)	08:43	15:19 (2)
	17:02	27 16:00 (2)	17:58	27	17:20 (1)	18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	20 17:47 (1)	16:46	17 15:31 (2)	16:29	28 15:47 (2)
19	08:38	15:34 (2)	07:49		16:53 (1)	06:47	06:37	05:42	05:19	05:42	06:29	07:20	08:10	17:26 (1)	08:05	15:13 (2)	08:44	15:20 (2)
	17:04	26 16:00 (2)	18:00	27	17:20 (1)	18:50	20:43	21:32	22:03	21:50	20:57	19:48	18:39	22 17:48 (1)	16:45	20 15:33 (2)	16:29	28 15:48 (2)
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21	08:36	15:36 (2)	07:45		16:54 (1)	06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	17:24 (1)	08:09	15:12 (2)	08:45	15:21 (2)
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	17:09	22 15:59 (2)	18:06	23	17:18 (1)	18:55	20:48	21:36	22:04	21:46	20:51	19:41	18:33	26 17:50 (1)	16:41	24 15:35 (2)	16:31	27 15:49 (2)
23	08:34	15:38 (2)	07:41		16:56 (1)	06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	17:23 (1)	08:12	15:10 (2)	08:46	15:22 (2)
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24	08:33	15:40 (2)	07:39		16:57 (1)	06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	17:23 (1)	08:14	15:10 (2)	08:47	15:22 (2)
	17:12	17 15:57 (2)	18:09	18	17:15 (1)	18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	28 17:51 (1)	16:39	27 15:37 (2)	16:32	28 15:50 (2)
25	08:31	15:43 (2)	07:36		16:59 (1)	06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	16:23 (1)	08:15	15:11 (2)	08:47	15:23 (2)
	17:14	13 15:56 (2)	18:11	14	17:13 (1)	19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	28 16:51 (1)	16:38	27 15:38 (2)	16:32	28 15:51 (2)
26	08:30	15:45 (2)	07:34		17:02 (1)	06:31	06:22	05:33	05:21	05:51	06:40	07:31	07:22	16:23 (1)	08:17	15:10 (2)	08:48	15:23 (2)
	17:16	8 15:53 (2)	18:13	9	17:11 (1)	19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	27 16:50 (1)	16:37	28 15:38 (2)	16:33	28 15:51 (2)
27	08:29		07:32			06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	16:23 (1)	08:18	15:10 (2)	08:48	15:24 (2)
	17:17		18:15			19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	26 16:49 (1)	16:36	29 15:39 (2)	16:34	27 15:51 (2)
28	08:27		07:30			06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	16:23 (1)	08:20	15:11 (2)	08:48	15:24 (2)
	17:19		18:16			19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	26 16:49 (1)	16:35	29 15:40 (2)	16:35	28 15:52 (2)
29	08:26					07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	16:24 (1)	08:21	15:10 (2)	08:48	15:24 (2)
	17:21					20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	24 16:48 (1)	16:34	30 15:40 (2)	16:35	28 15:52 (2)
30	08:24					07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	16:25 (1)	08:23	15:11 (2)	08:48	15:25 (2)
	17:23					20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	22 16:47 (1)	16:34	30 15:41 (2)	16:36	28 15:53 (2)
31	08:23					07:19		05:28		05:59	06:49		07:31	16:26 (1)			08:48	15:25 (2)
	17:25					20:11		21:48		21:33	20:31		17:15	20 16:46 (1)			16:37	29 15:54 (2)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243		
Total, worst case		681		405									373		392		883	
Sun reduction		0,24		0,30									0,34		0,24		0,20	
Oper. time red.		0,95		0,95									0,95		0,95		0,95	
Wind dir. red.		0,68		0,67									0,67		0,68		0,68	
Total reduction		0,16		0,19									0,21		0,15		0,13	
Total, real		106		78									80		60		117	

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

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

Project:
068379aa - WP Autena

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19-9-2013 15:02 / 5

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Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 05 - Biezenweg 51

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:48	15:23 (1)	08:21	15:31 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33		08:24	15:06 (1)
	16:39 28	15:51 (1)	17:27 34	16:05 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13		16:33 35	15:41 (1)
2	08:48	15:22 (1)	08:20	15:32 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35		08:26	15:06 (1)
	16:40 29	15:51 (1)	17:28 32	16:04 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12		16:32 35	15:41 (1)
3	08:48	15:23 (1)	08:18	15:33 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37	15:15 (1)	08:27	15:07 (1)
	16:41 29	15:52 (1)	17:30 30	16:03 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10 7	15:22 (1)	16:32 34	15:41 (1)
4	08:48	15:23 (1)	08:17	15:34 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39	15:11 (1)	08:29	15:07 (1)
	16:42 30	15:53 (1)	17:32 27	16:01 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08 15	15:26 (1)	16:31 34	15:41 (1)
5	08:48	15:23 (1)	08:15	15:37 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40	15:08 (1)	08:30	15:08 (1)
	16:43 31	15:54 (1)	17:34 24	16:01 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06 21	15:29 (1)	16:31 32	15:40 (1)
6	08:47	15:23 (1)	08:13	15:39 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42	15:06 (1)	08:31	15:09 (1)
	16:44 32	15:55 (1)	17:36 20	15:59 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04 25	15:31 (1)	16:30 32	15:41 (1)
7	08:47	15:23 (1)	08:12	15:42 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44	15:05 (1)	08:32	15:10 (1)
	16:46 32	15:55 (1)	17:38 14	15:56 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03 27	15:32 (1)	16:30 31	15:41 (1)
8	08:46	15:23 (1)	08:10	15:47 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46	15:04 (1)	08:34	15:10 (1)
	16:47 34	15:57 (1)	17:40 4	15:51 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01 29	15:33 (1)	16:29 30	15:40 (1)
9	08:46	15:23 (1)	08:08		07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48	15:03 (1)	08:35	15:12 (1)
	16:48 34	15:57 (1)	17:41		18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59 31	15:34 (1)	16:29 29	15:41 (1)
10	08:45	15:23 (1)	08:06		07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49	15:02 (1)	08:36	15:12 (1)
	16:50 35	15:58 (1)	17:43		18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58 33	15:35 (1)	16:29 29	15:41 (1)
11	08:45	15:24 (1)	08:04		07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51	15:01 (1)	08:37	15:13 (1)
	16:51 35	15:59 (1)	17:45		18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56 35	15:36 (1)	16:29 28	15:41 (1)
12	08:44	15:24 (1)	08:03		07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53	15:01 (1)	08:38	15:14 (1)
	16:53 36	16:00 (1)	17:47		18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55 36	15:37 (1)	16:29 27	15:41 (1)
13	08:43	15:24 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55	15:00 (1)	08:39	15:15 (1)
	16:54 36	16:00 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53 38	15:38 (1)	16:29 26	15:41 (1)
14	08:43	15:24 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57	14:59 (1)	08:40	15:15 (1)
	16:56 37	16:01 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52 38	15:37 (1)	16:29 26	15:41 (1)
15	08:42	15:24 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58	14:59 (1)	08:41	15:16 (1)
	16:57 38	16:02 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50 39	15:38 (1)	16:29 25	15:41 (1)
16	08:41	15:24 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00	14:59 (1)	08:42	15:17 (1)
	16:59 38	16:02 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49 39	15:38 (1)	16:29 25	15:42 (1)
17	08:40	15:24 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02	14:59 (1)	08:43	15:18 (1)
	17:00 39	16:03 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47 40	15:39 (1)	16:29 24	15:42 (1)
18	08:39	15:24 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04	14:59 (1)	08:43	15:18 (1)
	17:02 40	16:04 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46 40	15:39 (1)	16:29 23	15:41 (1)
19	08:38	15:25 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05	15:00 (1)	08:44	15:19 (1)
	17:04 39	16:04 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45 40	15:40 (1)	16:29 23	15:42 (1)
20	08:37	15:24 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07	15:00 (1)	08:45	15:20 (1)
	17:05 40	16:04 (1)	18:02		18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44 40	15:40 (1)	16:30 23	15:43 (1)
21	08:36	15:24 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09	15:00 (1)	08:45	15:20 (1)
	17:07 41	16:05 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42 41	15:41 (1)	16:30 23	15:43 (1)
22	08:35	15:25 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10	15:00 (1)	08:46	15:21 (1)
	17:09 40	16:05 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41 40	15:40 (1)	16:31 23	15:44 (1)
23	08:34	15:25 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12	15:01 (1)	08:46	15:21 (1)
	17:10 40	16:05 (1)	18:07		18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40 39	15:40 (1)	16:31 23	15:44 (1)
24	08:33	15:25 (1)	07:39		06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14	15:01 (1)	08:47	15:21 (1)
	17:12 40	16:05 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	16:39 40	15:41 (1)	16:32 23	15:44 (1)
25	08:31	15:26 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15	15:02 (1)	08:47	15:22 (1)
	17:14 40	16:06 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38 39	15:41 (1)	16:32 23	15:45 (1)
26	08:30	15:26 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17	15:02 (1)	08:48	15:22 (1)
	17:16 40	16:06 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37 38	15:40 (1)	16:33 24	15:46 (1)
27	08:29	15:27 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18	15:03 (1)	08:48	15:22 (1)
	17:17 39	16:06 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36 38	15:41 (1)	16:34 24	15:46 (1)
28	08:27	15:27 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20	15:04 (1)	08:48	15:22 (1)
	17:19 38	16:05 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35 37	15:41 (1)	16:35 25	15:47 (1)
29	08:26	15:29 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21	15:04 (1)	08:48	15:22 (1)
	17:21 37	16:06 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34 37	15:41 (1)	16:36 26	15:48 (1)
30	08:24	15:29 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23	15:05 (1)	08:48	15:23 (1)
	17:23 36	16:05 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34 36	15:41 (1)	16:36 26	15:49 (1)
31	08:23	15:29 (1)			07:19		05:28		05:59	06:49		07:31			08:48	15:23 (1)
	17:25 35	16:04 (1)			20:11		21:48		21:33	20:31		17:15			16:37 26	15:49 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331	266		243	
Total, worst case		1118		185										958		837
Sun reduction		0,24		0,30										0,24		0,20
Oper. time red.		0,95		0,95										0,95		0,95
Wind dir. red.		0,68		0,68										0,68		0,68
Total reduction		0,15		0,20										0,15		0,13
Total, real		173		36										146		110

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

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

Project:
068379aa - WP Autena

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19-9-2013 15:02 / 6

Licensed user:
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Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 06 - Biezenweg 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:48	15:03 (1)	08:21	15:25 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33		08:24	14:48 (1)
	16:39 38	15:41 (1)	17:27 16	15:41 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13		16:33 41	15:29 (1)
2	08:48	15:02 (1)	08:20	15:29 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35		08:26	14:48 (1)
	16:40 39	15:41 (1)	17:28 8	15:37 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12		16:32 41	15:29 (1)
3	08:48	15:03 (1)	08:18		07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37		08:27	14:49 (1)
	16:41 39	15:42 (1)	17:30		18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10		16:32 40	15:29 (1)
4	08:48	15:04 (1)	08:17		07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39		08:29	14:49 (1)
	16:42 39	15:43 (1)	17:32		18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08		16:31 40	15:29 (1)
5	08:48	15:03 (1)	08:15		07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40		08:30	14:49 (1)
	16:43 40	15:43 (1)	17:34		18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06		16:31 40	15:29 (1)
6	08:47	15:04 (1)	08:13		07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42		08:31	14:50 (1)
	16:44 40	15:44 (1)	17:36		18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04		16:30 40	15:30 (1)
7	08:47	15:04 (1)	08:12		07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44		08:32	14:51 (1)
	16:46 40	15:44 (1)	17:38		18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03		16:30 39	15:30 (1)
8	08:46	15:05 (1)	08:10		07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46		08:34	14:51 (1)
	16:47 40	15:45 (1)	17:40		18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01		16:29 39	15:30 (1)
9	08:46	15:05 (1)	08:08		07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48	14:59 (1)	08:35	14:52 (1)
	16:48 40	15:45 (1)	17:41		18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59 9	15:08 (1)	16:29 39	15:31 (1)
10	08:45	15:05 (1)	08:06		07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49	14:56 (1)	08:36	14:53 (1)
	16:50 40	15:45 (1)	17:43		18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58 16	15:12 (1)	16:29 38	15:31 (1)
11	08:45	15:06 (1)	08:04		07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51	14:54 (1)	08:37	14:53 (1)
	16:51 41	15:47 (1)	17:45		18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56 20	15:14 (1)	16:29 38	15:31 (1)
12	08:44	15:06 (1)	08:03		07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53	14:52 (1)	08:38	14:54 (1)
	16:53 41	15:47 (1)	17:47		18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55 24	15:16 (1)	16:29 38	15:32 (1)
13	08:43	15:06 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55	14:50 (1)	08:39	14:54 (1)
	16:54 41	15:47 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53 28	15:18 (1)	16:29 38	15:32 (1)
14	08:43	15:07 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57	14:48 (1)	08:40	14:55 (1)
	16:56 40	15:47 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52 30	15:18 (1)	16:29 37	15:32 (1)
15	08:42	15:07 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58	14:48 (1)	08:41	14:55 (1)
	16:57 41	15:48 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50 31	15:19 (1)	16:29 38	15:33 (1)
16	08:41	15:08 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00	14:47 (1)	08:42	14:56 (1)
	16:59 40	15:48 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49 33	15:20 (1)	16:29 37	15:33 (1)
17	08:40	15:08 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02	14:47 (1)	08:43	14:57 (1)
	17:00 40	15:48 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47 34	15:21 (1)	16:29 37	15:34 (1)
18	08:39	15:09 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04	14:46 (1)	08:43	14:56 (1)
	17:02 40	15:49 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46 36	15:22 (1)	16:29 37	15:33 (1)
19	08:38	15:09 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05	14:46 (1)	08:44	14:57 (1)
	17:04 40	15:49 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45 37	15:23 (1)	16:29 37	15:34 (1)
20	08:37	15:09 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07	14:46 (1)	08:45	14:58 (1)
	17:05 39	15:48 (1)	18:02		18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44 38	15:24 (1)	16:30 37	15:35 (1)
21	08:36	15:10 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09	14:46 (1)	08:45	14:58 (1)
	17:07 38	15:48 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42 38	15:24 (1)	16:30 37	15:35 (1)
22	08:35	15:11 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10	14:45 (1)	08:46	14:59 (1)
	17:09 38	15:49 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41 39	15:24 (1)	16:31 37	15:36 (1)
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25	08:31	15:14 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15	14:46 (1)	08:47	15:00 (1)
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26	08:30	15:14 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17	14:46 (1)	08:48	15:01 (1)
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	17:17 31	15:47 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36 41	15:27 (1)	16:34 37	15:38 (1)
28	08:27	15:17 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20	14:47 (1)	08:48	15:01 (1)
	17:19 29	15:46 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35 41	15:28 (1)	16:35 37	15:38 (1)
29	08:26	15:19 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21	14:47 (1)	08:48	15:01 (1)
	17:21 27	15:46 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34 40	15:27 (1)	16:36 38	15:39 (1)
30	08:24	15:20 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23	14:47 (1)	08:48	15:02 (1)
	17:23 24	15:44 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34 41	15:28 (1)	16:36 38	15:40 (1)
31	08:23	15:22 (1)			07:19		05:28		05:59	06:49		07:31			08:48	15:02 (1)
	17:25 20	15:42 (1)			20:11		21:48		21:33	20:31		17:15			16:37 38	15:40 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331	266		243	
Total, worst case	1145		24										736		1181	
Sun reduction	0,24		0,30										0,24		0,20	
Oper. time red.	0,95		0,95										0,95		0,95	
Wind dir. red.	0,69		0,69										0,69		0,69	
Total reduction	0,16		0,20										0,15		0,13	
Total, real	179		5										114		157	

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 7

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 07 - Autenasekade 05

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18	07:17 / 20:12 12	07:40 (2) 07:52 (2) 21:03	06:12 / 21:49 17	05:27 / 06:35 (1) 05:24 / 06:52 (1) 22:03	06:01 / 21:31 31	06:37 (1) 07:08 (1) 20:29 23	07:29 (2) 07:52 (2) 19:20 20	07:39 / 08:37 (3) 17:14	08:17 (3) / 08:24 / 16:33
2	08:48 / 16:40	08:20 / 17:28	07:26 / 18:20 3	07:49 (3) 07:52 (3) 20:14 16	07:38 (2) 07:54 (2) 21:05 9	06:10 / 06:39 (1) 06:48 (1) 21:50 15	05:26 / 06:36 (1) 06:51 (1) 22:03	06:02 / 21:30 30	06:52 / 07:08 (1) 20:27 24	07:29 (2) 07:53 (2) 19:17 22	07:41 / 08:37 (3) 17:12	08:15 (3) / 08:26 / 16:32
3	08:48 / 16:41	08:18 / 17:30	07:24 / 18:22 9	07:47 (3) 07:56 (3) 20:16 20	07:13 / 07:35 (2) 07:55 (2) 21:07 15	06:09 / 06:36 (1) 06:51 (1) 21:52 13	05:25 / 06:37 (1) 06:50 (1) 22:03	06:04 / 21:28 29	06:38 (1) 07:07 (1) 20:25 24	07:29 (2) 07:53 (2) 19:15 22	07:43 / 08:37 (3) 17:10	08:15 (3) / 08:27 / 16:32
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24 13	07:45 (3) 07:58 (3) 20:18 22	07:10 / 07:33 (2) 07:55 (2) 21:08 18	06:07 / 06:34 (1) 06:52 (1) 21:53 10	05:25 / 06:39 (1) 06:49 (1) 22:02	06:05 / 21:26 28	06:39 (1) 06:55 / 07:07 (1) 20:23 25	07:28 (2) 07:53 (2) 19:13 22	07:44 / 08:37 (3) 17:08	08:15 (3) / 08:29 / 16:31
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:26 16	07:42 (3) 07:58 (3) 20:19 23	07:08 / 07:33 (2) 07:56 (2) 21:10 21	06:05 / 06:33 (1) 06:54 (1) 21:54 8	05:24 / 06:40 (1) 06:48 (1) 22:02	06:07 / 21:25 27	06:39 (1) 06:57 / 07:06 (1) 20:20 25	07:28 (2) 07:53 (2) 19:11 22	07:46 / 08:36 (3) 17:06	08:14 (3) / 08:30 / 16:31
6	08:47 / 16:44	08:13 / 17:36	07:17 / 18:27 19	07:40 (3) 07:59 (3) 20:21 24	07:06 / 07:31 (2) 07:55 (2) 21:12 24	06:03 / 06:31 (1) 06:55 (1) 21:55 2	05:23 / 06:44 (1) 06:45 (1) 22:01	06:08 / 21:23 25	06:41 (1) 06:59 / 07:06 (1) 20:18 25	07:27 (2) 07:52 (2) 19:08 22	07:48 / 08:36 (3) 17:05	08:14 (3) / 08:31 / 16:30
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29 22	07:38 (3) 08:00 (3) 20:23 25	07:04 / 07:31 (2) 07:56 (2) 21:13 25	06:01 / 06:30 (1) 06:55 (1) 21:55	05:23 / 05:29 / 22:01 6	06:47 (1) 06:53 (1) 21:21 23	06:10 / 06:41 (1) 07:00 / 07:04 (1) 20:16 23	07:28 (2) 07:51 (2) 19:06 21	07:50 / 08:36 (3) 17:03	08:15 (3) / 08:32 / 16:30
8	08:46 / 16:47	08:10 / 17:40	07:12 / 18:31 22	07:38 (3) 08:00 (3) 20:24 25	07:01 / 07:31 (2) 07:56 (2) 21:15 27	05:59 / 06:30 (1) 06:57 (1) 21:56	05:22 / 05:30 / 22:00 9	06:46 (1) 06:55 (1) 21:19 20	06:11 / 06:43 (1) 07:02 / 07:03 (1) 20:13 23	07:27 (2) 07:50 (2) 19:04 18	07:51 / 08:35 (3) 17:01	08:17 (3) / 08:34 / 16:30
9	08:46 / 16:48	08:08 / 17:42	07:10 / 18:33 22	07:37 (3) 07:59 (3) 20:26 24	06:59 / 07:31 (2) 07:55 (2) 21:17 28	05:58 / 06:29 (1) 06:57 (1) 21:57	05:22 / 05:31 / 21:59 12	06:45 (1) 06:57 (1) 21:17 17	06:13 / 06:44 (1) 07:03 / 07:01 (1) 20:11 20	07:29 (2) 07:53 / 07:49 (2) 19:01 15	07:53 / 08:33 (3) 17:00	08:18 (3) / 08:35 / 16:29
10	08:45 / 16:50	08:06 / 17:43	07:08 / 18:34 22	07:37 (3) 07:59 (3) 20:28 24	06:57 / 07:31 (2) 07:55 (2) 21:18 29	05:56 / 06:28 (1) 06:57 (1) 21:58	05:21 / 05:32 / 21:59 14	06:44 (1) 06:58 (1) 21:15 13	06:15 / 06:46 (1) 07:05 / 06:59 (1) 20:09 17	07:31 (2) 07:48 (2) 18:59 11	07:55 / 08:31 (3) 16:58	08:20 (3) / 08:36 / 16:29
11	08:45 / 16:51	08:04 / 17:45	07:06 / 18:36 22	07:37 (3) 07:59 (3) 20:30 23	06:54 / 07:30 (2) 07:53 (2) 21:20 30	05:54 / 06:28 (1) 06:58 (1) 21:59	05:21 / 05:33 / 21:58 16	06:43 (1) 06:59 (1) 21:14 6	06:16 / 06:49 (1) 07:07 / 06:55 (1) 20:06 13	07:32 (2) 07:45 (2) 18:57 7	07:56 / 08:29 (3) 16:56	08:22 (3) / 08:37 / 16:29
12	08:44 / 16:53	08:03 / 17:47	07:03 / 18:38 21	07:37 (3) 07:58 (3) 20:31 21	06:52 / 07:31 (2) 07:52 (2) 21:21 31	05:53 / 06:27 (1) 06:58 (1) 21:59	05:21 / 05:34 / 21:57 18	06:42 (1) 06:59 (1) 21:12	06:18 / 07:00 (1) 20:04 8	07:08 / 07:34 (2) 07:42 (2) 18:55	07:58 / 07:53 / 16:55	08:24 (3) / 08:38 / 16:29
13	08:44 / 16:54	08:01 / 17:49	07:01 / 18:40 19	07:38 (3) 07:57 (3) 20:33 19	06:50 / 07:32 (2) 07:51 (2) 21:23 31	05:51 / 06:27 (1) 06:58 (1) 22:00	05:20 / 05:35 / 21:56 19	06:42 (1) 06:19 / 07:01 (1) 21:10	07:10 / 20:02	08:00 / 18:53	07:55 / 16:53	08:39 / 16:29
14	08:43 / 16:56	07:59 / 17:51	06:59 / 18:41 16	07:39 (3) 07:55 (3) 20:35 16	06:48 / 07:33 (2) 07:49 (2) 21:25 32	05:49 / 06:26 (1) 06:58 (1) 22:01	05:20 / 05:36 / 21:55 21	06:41 (1) 06:21 / 07:02 (1) 21:08	07:12 / 19:59	08:01 / 18:50	07:57 / 16:52	08:40 / 16:29
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16	08:41 / 16:59	07:55 / 17:55	06:54 / 18:45 6	07:43 (3) 07:49 (3) 20:38 4	06:43 / 07:39 (2) 07:43 (2) 21:28 32	05:46 / 06:27 (1) 06:59 (1) 22:02	05:20 / 05:38 / 21:53 23	06:40 (1) 06:24 / 07:03 (1) 21:04	07:15 / 19:55	08:05 / 18:46	08:00 / 16:49	08:42 / 16:29
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25	08:31 / 17:14	07:37 / 18:11	06:33 / 19:00	06:24 / 20:53	05:34 / 21:41 26	06:30 (1) 05:21 / 06:56 (1) 22:04	05:50 / 21:42 31	06:38 (1) 06:39 / 07:09 (1) 20:45	07:29 / 19:34	08:21 / 17:27	08:15 / 16:38	08:47 / 16:33
26	08:30 / 17:16	07:34 / 18:13	06:31 / 19:02	06:22 / 20:55	05:33 / 21:42 26	06:30 (1) 05:21 / 06:56 (1) 22:04	05:52 / 21:41 32	06:37 (1) 06:41 / 07:09 (1) 20:43	07:31 / 19:31	08:23 / 17:25	08:17 / 16:37	08:48 / 16:33
27	08:29 / 17:18	07:32 / 18:15	06:29 / 19:04	06:20 / 20:57	05:32 / 21:43 24	06:31 (1) 05:22 / 06:55 (1) 22:04	05:53 / 21:39 31	06:37 (1) 06:42 / 07:08 (1) 20:40 5	07:40 (2) 07:33 / 07:45 (2) 19:29	07:24 / 17:23	08:18 / 16:36	08:48 / 16:34
28	08:27 / 17:19	07:30 / 18:17	06:26 / 19:06	06:18 / 20:58	05:31 / 21:45 23	06:32 (1) 05:22 / 06:55 (1) 22:04	05:55 / 21:38 32	06:37 (1) 06:44 / 07:09 (1) 20:38 12	07:36 (2) 07:34 / 07:48 (2) 19:27 10	08:23 (3) 07:26 / 08:33 (3) 17:21	08:20 / 16:35	08:48 / 16:35
29	08:26 / 17:21		07:24 / 20:07	06:16 / 21:00	05:30 / 21:46 22	06:32 (1) 05:23 / 06:54 (1) 22:04	05:56 / 21:36 32	06:37 (1) 06:45 / 07:09 (1) 20:36 16	07:34 (2) 07:36 / 07:50 (2) 19:24 15	08:19 (3) 07:28 / 08:34 (3) 17:19	08:21 / 16:35	08:48 / 16:36
30	08:24 / 17:23		07:22 / 20:09	06:14 / 21:02	05:29 / 21:47 20	06:33 (1) 05:23 / 06:53 (1) 22:04	05:58 / 21:35 31	06:38 (1) 06:47 / 07:09 (1) 20:34 19	07:32 (2) 07:38 / 07:51 (2) 19:22 18	08:18 (3) 07:30 / 08:36 (3) 17:17	08:23 / 16:34	08:48 / 16:37
31	08:23 / 17:25		07:20 / 20:11 7	07:42 (2) 07:49 (2)	05:28 / 21:48 18	06:34 (1) / 06:52 (1)	05:59 / 21:33 31	06:38 (1) 06:49 / 07:09 (1) 20:32 21	07:31 (2) / 07:52 (2)	07:32 / 17:15	/	08:48 / 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			251	310	781	65	607	322	293	202		
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34		
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95		
Wind dir. red.			0,58	0,63	0,66	0,66	0,66	0,65	0,62	0,58		
Total reduction			0,18	0,25	0,27	0,24	0,25	0,26	0,21	0,18		
Total, real			45	77	207	16	153	82	62	37		

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

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

Project:
068379aa - WP Autena

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19-9-2013 15:02 / 8

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Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 08 - Bolgerijsekade 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17 07:40 (3)	06:12 06:39 (2)	05:27 05:56 (1)	05:24 06:03 (1)	06:01	06:50 07:31 (3)	07:39	07:33	08:24
	16:39	17:27	18:18	20:12 3 07:43 (3)	21:03 16 06:55 (2)	21:49 19 06:15 (1)	22:03 17 06:20 (1)	21:31	20:29 3 07:34 (3)	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15 07:38 (3)	06:10 06:39 (2)	05:26 05:55 (1)	05:25 06:02 (1)	06:02	06:52 07:28 (3)	07:41	07:35	08:26
	16:40	17:29	18:20	20:14 6 07:44 (3)	21:05 15 06:54 (2)	21:50 20 06:15 (1)	22:03 18 06:20 (1)	21:30	20:27 10 07:38 (3)	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13 07:35 (3)	06:09 06:39 (2)	05:25 05:55 (1)	05:25 06:02 (1)	06:04	06:54 07:27 (3)	07:43	07:37	08:27
	16:41	17:30	18:22	20:16 9 07:44 (3)	21:07 14 06:53 (2)	21:52 20 06:15 (1)	22:03 18 06:20 (1)	21:28	20:25 12 07:39 (3)	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10 07:33 (3)	06:07 06:40 (2)	05:25 05:56 (1)	05:26 06:03 (1)	06:05	06:55 07:25 (3)	07:44	07:39	08:29
	16:42	17:32	18:24	20:18 12 07:45 (3)	21:08 12 06:52 (2)	21:53 20 06:16 (1)	22:02 18 06:21 (1)	21:26	20:23 15 07:40 (3)	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08 07:31 (3)	06:05 06:42 (2)	05:24 05:56 (1)	05:27 06:03 (1)	06:07	06:57 07:24 (3)	07:46	07:41	08:30
	16:43	17:34	18:26	20:19 14 07:45 (3)	21:10 9 06:51 (2)	21:54 19 06:15 (1)	22:02 19 06:22 (1)	21:25	20:20 16 07:40 (3)	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06 07:29 (3)	06:03 06:45 (2)	05:23 05:57 (1)	05:28 06:02 (1)	06:08	06:59 07:24 (3)	07:48	07:42	08:31
	16:45	17:36	18:27	20:21 16 07:45 (3)	21:12 2 06:47 (2)	21:55 19 06:16 (1)	22:01 19 06:21 (1)	21:23	20:18 16 07:40 (3)	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04 07:27 (3)	06:01	05:23 05:57 (1)	05:29 06:02 (1)	06:10 06:53 (2)	07:00 07:26 (3)	07:50	07:44	08:32
	16:46	17:38	18:29	20:23 16 07:43 (3)	21:13	21:55 18 06:15 (1)	22:01 19 06:21 (1)	21:21 5 06:58 (2)	20:16 14 07:40 (3)	19:06	17:03	16:30
8	08:47	08:10	07:12	07:01 07:28 (3)	05:59	05:22 05:57 (1)	05:30 06:02 (1)	06:12 06:51 (2)	07:02 07:27 (3)	07:51	07:46	08:34
	16:47	17:40	18:31	20:24 15 07:43 (3)	21:15	21:56 19 06:16 (1)	22:00 20 06:22 (1)	21:19 10 07:01 (2)	20:13 12 07:39 (3)	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59 07:29 (3)	05:58	05:22 05:57 (1)	05:31 06:03 (1)	06:13 06:49 (2)	07:03 07:29 (3)	07:53	07:48	08:35
	16:48	17:42	18:33	20:26 12 07:41 (3)	21:17	21:57 18 06:15 (1)	21:59 19 06:22 (1)	21:17 13 07:02 (2)	20:11 9 07:38 (3)	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57 07:30 (3)	05:56	05:21 05:58 (1)	05:32 06:03 (1)	06:15 06:48 (2)	07:05 07:31 (3)	07:55	07:50	08:36
	16:50	17:43	18:34	20:28 10 07:40 (3)	21:18	21:58 18 06:16 (1)	21:59 19 06:22 (1)	21:15 15 07:03 (2)	20:09 6 07:37 (3)	18:59	16:58	16:29
11	08:45	08:04	07:06	06:55 07:32 (3)	05:54	05:21 05:58 (1)	05:33 06:03 (1)	06:16 06:47 (2)	07:07 07:32 (3)	07:56	07:51	08:37
	16:51	17:45	18:36	20:30 3 07:35 (3)	21:20	21:59 18 06:16 (1)	21:58 20 06:23 (1)	21:14 16 07:03 (2)	20:06 3 07:35 (3)	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	05:53	05:21 05:58 (1)	05:34 06:04 (1)	06:18 06:47 (2)	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	21:21	21:59 17 06:15 (1)	21:57 19 06:23 (1)	21:12 17 07:04 (2)	20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	05:51	05:20 05:58 (1)	05:35 06:05 (1)	06:20 06:47 (2)	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	21:23	22:00 17 06:15 (1)	21:56 18 06:23 (1)	21:10 16 07:03 (2)	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	05:49	05:20 05:59 (1)	05:36 06:06 (1)	06:21 06:49 (2)	07:12	08:02	07:57	08:40
	16:56	17:51	18:41	20:35	21:25	22:01 17 06:16 (1)	21:55 17 06:23 (1)	21:08 15 07:04 (2)	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	05:48	05:20 05:59 (1)	05:37 06:07 (1)	06:23 06:50 (2)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36	21:26	22:01 17 06:16 (1)	21:54 16 06:23 (1)	21:06 13 07:03 (2)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	05:46	05:20 06:00 (1)	05:38 06:08 (1)	06:24 06:52 (2)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38	21:28	22:02 16 06:16 (1)	21:53 14 06:22 (1)	21:04 11 07:03 (2)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	05:45	05:20 06:00 (1)	05:40 06:10 (1)	06:26 06:53 (2)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40	21:29	22:02 16 06:16 (1)	21:52 13 06:23 (1)	21:02 9 07:02 (2)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	05:43	05:20 06:00 (1)	05:41 06:11 (1)	06:28 06:55 (2)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41	21:31	22:03 16 06:16 (1)	21:51 12 06:23 (1)	21:00 6 07:01 (2)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	05:42	05:20 06:01 (1)	05:42 06:12 (1)	06:29 06:56 (2)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43	21:32	22:03 15 06:16 (1)	21:50 10 06:22 (1)	20:58 3 06:59 (2)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	05:41 06:07 (1)	05:20 06:01 (1)	05:43 06:13 (1)	06:31	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45	21:34 2 06:08 (1)	22:03 15 06:16 (1)	21:49 8 06:21 (1)	20:55	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	05:39 06:06 (1)	05:20 06:01 (1)	05:45 06:14 (1)	06:32	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47	21:35 3 06:09 (1)	22:04 15 06:16 (1)	21:47 7 06:21 (1)	20:53	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	05:38 06:05 (1)	05:20 06:02 (1)	05:46 06:16 (1)	06:34	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48	21:37 5 06:10 (1)	22:04 15 06:17 (1)	21:46 4 06:20 (1)	20:51	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	05:37 06:04 (1)	05:20 06:02 (1)	05:47 06:17 (1)	06:36	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50	21:38 7 06:11 (1)	22:04 15 06:17 (1)	21:45 2 06:19 (1)	20:49	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26 06:50 (2)	05:35 06:03 (1)	05:21 06:01 (1)	05:49	06:37	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52 3 06:53 (2)	21:39 9 06:12 (1)	22:04 16 06:17 (1)	21:44	20:47	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24 06:48 (2)	05:34 06:02 (1)	05:21 06:02 (1)	05:50	06:39	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53 6 06:54 (2)	21:41 11 06:13 (1)	22:04 16 06:18 (1)	21:42	20:45	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22 06:46 (2)	05:33 06:01 (1)	05:21 06:02 (1)	05:52	06:41	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55 9 06:55 (2)	21:42 12 06:13 (1)	22:04 16 06:18 (1)	21:41	20:43	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20 06:44 (2)	05:32 06:00 (1)	05:22 06:03 (1)	05:53	06:42	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57 11 06:55 (2)	21:43 14 06:14 (1)	22:04 16 06:19 (1)	21:39	20:40	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18 06:42 (2)	05:31 05:59 (1)	05:22 06:02 (1)	05:55	06:44	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58 13 06:55 (2)	21:45 15 06:14 (1)	22:04 17 06:19 (1)	21:38	20:38	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16 06:40 (2)	05:30 05:58 (1)	05:23 06:03 (1)	05:56	06:46	07:36	07:28	08:21	08:48
	17:21		20:07	21:00 15 06:55 (2)	21:46 16 06:14 (1)	22:04 17 06:20 (1)	21:36	20:36	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14 06:39 (2)	05:29 05:57 (1)	05:23 06:02 (1)	05:58	06:47	07:38	07:30	08:23	08:48
	17:23		20:09	21:02 17 06:56 (2)	21:47 17 06:14 (1)	22:04 17 06:19 (1)	21:35	20:34	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28 05:56 (1)		05:59	06:49		07:32		08:48
	17:25		20:11		21:48 18 06:14 (1)		21:33	20:32		17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				190	197	514	346	149	116			
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.				0,63	0,66	0,67	0,67	0,65	0,63			
Total reduction				0,25	0,27	0,25	0,26	0,26	0,22			
Total, real				48	53	128	90	38	25			

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 9

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 09 - Bolgerijsekade 18

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	06:37 (2)	05:27	05:56 (1)	05:24	05:55 (1)	06:01	06:50	07:22 (3)	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03 13	06:50 (2)	21:49 10	06:06 (1)	22:03 19	06:14 (1)	21:31	20:29 15	07:37 (3)	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	06:35 (2)	05:26	05:55 (1)	05:25	05:55 (1)	06:02	06:52	07:21 (3)	07:41	07:35	08:26
	16:40	17:29	18:20	20:14	21:05 15	06:50 (2)	21:50 11	06:06 (1)	22:03 18	06:13 (1)	21:30	20:27 17	07:38 (3)	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13 07:35 (3)	06:09	06:33 (2)	05:25	05:54 (1)	05:25	05:56 (1)	06:04	06:47 (2)	06:54	07:21 (3)	07:43	07:37	08:27
	16:41	17:30	18:22	20:16 3 07:38 (3)	21:07 17	06:50 (2)	21:52 12	06:06 (1)	22:03 18	06:14 (1)	21:28 7	06:54 (2)	20:25 17	07:38 (3)	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10 07:33 (3)	06:07	06:32 (2)	05:25	05:54 (1)	05:26	05:57 (1)	06:05	06:46 (2)	06:55	07:21 (3)	07:44	07:39	08:29
	16:42	17:32	18:24	20:18 6 07:39 (3)	21:08 17	06:49 (2)	21:53 14	06:08 (1)	22:02 17	06:14 (1)	21:26 10	06:56 (2)	20:23 16	07:37 (3)	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08 07:31 (3)	06:05	06:33 (2)	05:24	05:53 (1)	05:27	05:58 (1)	06:07	06:44 (2)	06:57	07:23 (3)	07:46	07:41	08:30
	16:43	17:34	18:26	20:19 10 07:41 (3)	21:10 17	06:50 (2)	21:54 14	06:07 (1)	22:02 16	06:14 (1)	21:25 13	06:57 (2)	20:20 14	07:37 (3)	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06 07:28 (3)	06:03	06:33 (2)	05:23	05:53 (1)	05:28	05:58 (1)	06:08	06:43 (2)	06:59	07:24 (3)	07:48	07:42	08:31
	16:45	17:36	18:27	20:21 12 07:40 (3)	21:12 16	06:49 (2)	21:55 15	06:08 (1)	22:01 16	06:14 (1)	21:23 15	06:58 (2)	20:18 12	07:36 (3)	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04 07:26 (3)	06:01	06:33 (2)	05:23	05:52 (1)	05:29	05:59 (1)	06:10	06:42 (2)	07:00	07:26 (3)	07:50	07:44	08:32
	16:46	17:38	18:29	20:23 14 07:40 (3)	21:13 15	06:48 (2)	21:55 16	06:08 (1)	22:01 15	06:14 (1)	21:21 17	06:59 (2)	20:16 10	07:36 (3)	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01 07:24 (3)	05:59	06:35 (2)	05:22	05:52 (1)	05:30	06:00 (1)	06:11	06:42 (2)	07:02	07:27 (3)	07:51	07:46	08:34
	16:47	17:40	18:31	20:24 16 07:40 (3)	21:15 12	06:47 (2)	21:56 17	06:09 (1)	22:00 14	06:14 (1)	21:19 17	06:59 (2)	20:13 7	07:34 (3)	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59 07:23 (3)	05:58	06:36 (2)	05:22	05:51 (1)	05:31	06:01 (1)	06:13	06:41 (2)	07:03	07:29 (3)	07:53	07:48	08:35
	16:48	17:42	18:33	20:26 17 07:40 (3)	21:17 9	06:45 (2)	21:57 18	06:09 (1)	21:59 13	06:14 (1)	21:17 18	06:59 (2)	20:11 3	07:32 (3)	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57 07:23 (3)	05:56	06:37 (2)	05:21	05:51 (1)	05:32	06:02 (1)	06:15	06:43 (2)	07:05		07:55	07:50	08:36
	16:50	17:43	18:34	20:28 17 07:40 (3)	21:18 6	06:43 (2)	21:58 18	06:09 (1)	21:59 12	06:14 (1)	21:15 17	07:00 (2)	20:09		18:59	16:58	16:29
11	08:45	08:04	07:06	06:55 07:23 (3)	05:54		05:21	05:51 (1)	05:33	06:03 (1)	06:16	06:44 (2)	07:07		07:56	07:51	08:37
	16:51	17:45	18:36	20:30 15 07:38 (3)	21:20		21:59 19	06:10 (1)	21:58 11	06:14 (1)	21:14 15	06:59 (2)	20:06		18:57	16:56	16:29
12	08:44	08:03	07:03	06:52 07:24 (3)	05:53		05:21	05:50 (1)	05:34	06:04 (1)	06:18	06:46 (2)	07:08		07:58	07:53	08:38
	16:53	17:47	18:38	20:31 12 07:36 (3)	21:21		21:59 19	06:09 (1)	21:57 9	06:13 (1)	21:12 13	06:59 (2)	20:04		18:55	16:55	16:29
13	08:44	08:01	07:01	06:50 07:26 (3)	05:51		05:20	05:50 (1)	05:35	06:05 (1)	06:20	06:47 (2)	07:10		08:00	07:55	08:39
	16:54	17:49	18:40	20:33 8 07:34 (3)	21:23		22:00 20	06:10 (1)	21:56 8	06:13 (1)	21:10 11	06:58 (2)	20:02		18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	05:49		05:20	05:50 (1)	05:36	06:06 (1)	06:21	06:49 (2)	07:12		08:01	07:57	08:40
	16:56	17:51	18:41	20:35	21:25		22:01 20	06:10 (1)	21:55 6	06:12 (1)	21:08 8	06:57 (2)	19:59		18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	05:48		05:20	05:50 (1)	05:37	06:07 (1)	06:23	06:50 (2)	07:13		08:03	07:58	08:41
	16:57	17:53	18:43	20:36	21:26		22:01 20	06:10 (1)	21:54 5	06:12 (1)	21:06 6	06:56 (2)	19:57		18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	05:46		05:20	05:50 (1)	05:38	06:08 (1)	06:24	06:52 (2)	07:15		08:05	08:00	08:42
	16:59	17:55	18:45	20:38	21:28		22:02 21	06:11 (1)	21:53 2	06:10 (1)	21:04 2	06:54 (2)	19:55		18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	05:45		05:20	05:51 (1)	05:40		06:26		07:16		08:07	08:02	08:43
	17:00	17:56	18:47	20:40	21:29		22:02 20	06:11 (1)	21:52		21:02		19:52		18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	05:43		05:20	05:51 (1)	05:41		06:28		07:18		08:08	08:04	08:43
	17:02	17:58	18:48	20:41	21:31		22:03 20	06:11 (1)	21:51		21:00		19:50		18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	05:42		05:20	05:51 (1)	05:42		06:29		07:20		08:10	08:05	08:44
	17:04	18:00	18:50	20:43	21:32		22:03 20	06:11 (1)	21:50		20:58		19:48		18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	05:41		05:20	05:51 (1)	05:43		06:31		07:21		08:12	08:07	08:45
	17:05	18:02	18:52	20:45	21:34		22:03 20	06:11 (1)	21:49		20:55		19:45		18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	05:39		05:20	05:51 (1)	05:45		06:32		07:23		08:14	08:09	08:45
	17:07	18:04	18:54	20:47	21:35		22:04 20	06:11 (1)	21:47		20:53		19:43		18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	05:38		05:20	05:52 (1)	05:46		06:34		07:25		08:15	08:10	08:46
	17:09	18:06	18:55	20:48	21:37		22:04 20	06:12 (1)	21:46		20:51		19:41		18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	05:37		05:20	05:52 (1)	05:47		06:36		07:26		08:17	08:12	08:46
	17:11	18:07	18:57	20:50	21:38		22:04 20	06:12 (1)	21:45		20:49		19:38		18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	05:35		05:21	05:52 (1)	05:49		06:37		07:28		08:19	08:14	08:47
	17:12	18:09	18:59	20:52	21:39		22:04 20	06:12 (1)	21:44		20:47		19:36		18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	05:34		05:21	05:53 (1)	05:50		06:39		07:30		07:21	08:15	08:47
	17:14	18:11	19:00	20:53	21:41		22:04 20	06:13 (1)	21:42		20:45		19:34		17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	05:33		05:21	05:52 (1)	05:52		06:41		07:31		07:23	08:17	08:48
	17:16	18:13	19:02	20:55	21:42		22:04 21	06:13 (1)	21:41		20:43		19:31		17:25	16:37	16:33
27	08:29	07:32	06:29	06:20 06:44 (2)	05:32	06:00 (1)	05:22	05:53 (1)	05:53		06:42		07:33		07:24	08:18	08:48
	17:18	18:15	19:04	20:57 3 06:47 (2)	21:43 2	06:01 (1)	22:04 20	06:13 (1)	21:39		20:40		19:29		17:23	16:36	16:34
28	08:27	07:30	06:26	06:18 06:42 (2)	05:31	05:59 (1)	05:22	05:53 (1)	05:55		06:44		07:34		07:26	08:20	08:48
	17:19	18:17	19:06	20:58 6 06:48 (2)	21:45 4	06:03 (1)	22:04 20	06:13 (1)	21:38		20:38		19:27		17:21	16:35	16:35
29	08:26		07:24	06:16 06:40 (2)	05:30	05:58 (1)	05:23	05:54 (1)	05:56		06:46		07:36		07:28	08:21	08:48
	17:21		20:07	21:00 9 06:49 (2)	21:46 6	06:04 (1)	22:04 20	06:14 (1)	21:36		20:36		19:24		17:19	16:35	16:36
30	08:24		07:22	06:14 06:39 (2)	05:29	05:57 (1)	05:23	05:54 (1)	05:58		06:47	07:26 (3)	07:38		07:30	08:23	08:48
	17:23		20:09	21:02 11 06:50 (2)	21:47 7	06:04 (1)	22:04 19	06:13 (1)	21:35		20:34 8	07:34 (3)	19:22		17:17	16:34	16:37
31	08:23		07:20		05:28	05:56 (1)			05:59		06:49	07:24 (3)			07:32		08:48
	17:25		20:11		21:48 9	06:05 (1)			21:33		20:32 12	07:36 (3)			17:15		16:37
Potential sun hours	259	277	367	416	485		499		502		454		381		331	266	244
Total, worst case				159	165		544		199		189		111				
Sun reduction				0,42	0,43		0,39		0,41		0,42		0,36				
Oper. time red.				0,95	0,95		0,95		0,95		0,95		0,95				
Wind dir. red.				0,63	0,66		0,67		0,67		0,65		0,63				
Total reduction				0,25	0,27		0,25		0,26		0,26		0,22				
Total, real				40	44		136		52		48		24				

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 10

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 10 - Bolgerijsekade 24

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	05:24	06:12 (2)	06:01	06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49	06:25 (2) / 22:03	06:28 (2) / 21:31	20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:04 (2) / 05:25	06:12 (2) / 06:02	06:52	07:41	07:35	08:26
	16:40	17:28	18:20	20:14	21:05	21:50	06:24 (2) / 22:03	06:28 (2) / 21:30	20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:04 (2) / 05:25	06:12 (2) / 06:04	06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52	06:24 (2) / 22:03	06:28 (2) / 21:28	20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:05 (2) / 05:26	06:12 (2) / 06:05	06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53	06:25 (2) / 22:02	06:29 (2) / 21:26	20:23	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:05 (2) / 05:27	06:12 (2) / 06:07	06:57	07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54	06:24 (2) / 22:02	06:30 (2) / 21:25	20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:06 (2) / 05:28	06:11 (2) / 06:08	06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55	06:24 (2) / 22:01	06:30 (2) / 21:23	20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:06 (2) / 05:29	06:11 (2) / 06:10	07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55	06:24 (2) / 22:01	06:30 (2) / 21:21	20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:07 (2) / 05:30	06:11 (2) / 06:11	07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56	06:24 (2) / 22:00	06:31 (2) / 21:19	20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:07 (2) / 05:31	06:11 (2) / 06:13	07:03	07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57	06:23 (2) / 21:59	06:31 (2) / 21:17	20:11	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	06:07 (2) / 05:32	06:11 (2) / 06:15	07:05	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58	06:24 (2) / 21:59	06:32 (2) / 21:15	20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	05:54	05:21	06:08 (2) / 05:33	06:11 (2) / 06:16	07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:30	21:20	21:59	06:24 (2) / 21:58	06:32 (2) / 21:14	20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	05:53	05:21	06:08 (2) / 05:34	06:11 (2) / 06:18	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	21:21	21:59	06:23 (2) / 21:57	06:32 (2) / 21:12	20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	07:13 (3) / 05:51	05:20	06:08 (2) / 05:35	06:11 (2) / 06:19	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	4 07:17 (3) / 21:23	22:00	15 06:23 (2) / 21:56	22 06:33 (2) / 21:10	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) / 05:49	05:20	06:09 (2) / 05:36	06:11 (2) / 06:21	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35	9 07:20 (3) / 21:25	22:01	14 06:23 (2) / 21:55	22 06:33 (2) / 21:08	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) / 05:48	06:14 (2) / 05:20	06:10 (2) / 05:37	06:11 (2) / 06:23	07:13 (3)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36	12 07:21 (3) / 21:26	2 06:16 (2) / 22:01	13 06:23 (2) / 21:54	22 06:33 (2) / 21:06	8 07:21 (3)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) / 05:46	06:13 (2) / 05:20	06:10 (2) / 05:38	06:11 (2) / 06:24	07:11 (3)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38	15 07:22 (3) / 21:28	6 06:19 (2) / 22:02	13 06:23 (2) / 21:53	22 06:33 (2) / 21:04	12 07:23 (3)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	07:04 (3) / 05:45	06:11 (2) / 05:20	06:11 (2) / 05:40	06:12 (2) / 06:26	07:09 (3)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40	18 07:22 (3) / 21:29	8 06:19 (2) / 22:02	12 06:23 (2) / 21:52	22 06:34 (2) / 21:02	15 07:24 (3)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	07:02 (3) / 05:43	06:10 (2) / 05:20	06:11 (2) / 05:41	06:12 (2) / 06:28	07:08 (3)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41	20 07:22 (3) / 21:31	11 06:21 (2) / 22:03	12 06:23 (2) / 21:51	22 06:34 (2) / 21:00	18 07:26 (3)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	07:00 (3) / 05:42	06:09 (2) / 05:20	06:11 (2) / 05:42	06:12 (2) / 06:29	07:06 (3)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43	22 07:22 (3) / 21:32	13 06:22 (2) / 22:03	12 06:23 (2) / 21:50	22 06:34 (2) / 20:58	20 07:26 (3)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	07:00 (3) / 05:41	06:07 (2) / 05:20	06:11 (2) / 05:43	06:13 (2) / 06:31	07:06 (3)	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45	22 07:22 (3) / 21:34	15 06:22 (2) / 22:03	12 06:23 (2) / 21:49	20 06:33 (2) / 20:55	21 07:27 (3)	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	07:00 (3) / 05:39	06:06 (2) / 05:20	06:11 (2) / 05:45	06:14 (2) / 06:32	07:05 (3)	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47	22 07:22 (3) / 21:35	16 06:22 (2) / 22:04	12 06:23 (2) / 21:47	19 06:33 (2) / 20:53	21 07:26 (3)	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	07:00 (3) / 05:38	06:05 (2) / 05:20	06:12 (2) / 05:46	06:16 (2) / 06:34	07:05 (3)	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48	22 07:22 (3) / 21:37	18 06:23 (2) / 22:04	12 06:24 (2) / 21:46	17 06:33 (2) / 20:51	22 07:27 (3)	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	07:00 (3) / 05:37	06:04 (2) / 05:20	06:12 (2) / 05:47	06:17 (2) / 06:36	07:05 (3)	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50	21 07:21 (3) / 21:38	20 06:24 (2) / 22:04	12 06:24 (2) / 21:45	16 06:33 (2) / 20:49	22 07:27 (3)	19:38	18:31	16:40	16:31
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	17:12	18:09	18:59	20:52	19 07:20 (3) / 21:39	21 06:24 (2) / 22:04	12 06:24 (2) / 21:44	14 06:32 (2) / 20:47	22 07:26 (3)	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	07:01 (3) / 05:34	06:02 (2) / 05:21	06:13 (2) / 05:50	06:20 (2) / 06:39	07:06 (3)	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53	18 07:19 (3) / 21:41	22 06:24 (2) / 22:04	12 06:25 (2) / 21:42	12 06:32 (2) / 20:45	20 07:26 (3)	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	07:02 (3) / 05:33	06:02 (2) / 05:21	06:12 (2) / 05:52	06:21 (2) / 06:41	07:07 (3)	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55	15 07:17 (3) / 21:42	22 06:24 (2) / 22:04	13 06:25 (2) / 21:41	10 06:31 (2) / 20:43	17 07:24 (3)	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	07:04 (3) / 05:32	06:02 (2) / 05:22	06:13 (2) / 05:53	06:22 (2) / 06:42	07:09 (3)	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57	11 07:15 (3) / 21:43	22 06:24 (2) / 22:04	13 06:26 (2) / 21:39	7 06:29 (2) / 20:40	15 07:24 (3)	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	07:06 (3) / 05:31	06:02 (2) / 05:22	06:12 (2) / 05:55	06:24 (2) / 06:44	07:10 (3)	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58	6 07:12 (3) / 21:45	23 06:25 (2) / 22:04	14 06:26 (2) / 21:38	5 06:29 (2) / 20:38	12 07:22 (3)	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	05:30	06:02 (2) / 05:23	06:13 (2) / 05:56	06:25 (2) / 06:45	07:12 (3)	07:36	07:28	08:21	08:48
	17:21		20:07	21:00	21:46	22 06:24 (2) / 22:04	14 06:27 (2) / 21:36	2 06:26 (2) / 20:36	8 07:20 (3)	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	05:29	06:03 (2) / 05:23	06:12 (2) / 05:58	06:47	07:13 (3)	07:38	07:30	08:23	08:48
	17:23		20:09	21:02	21:47	21 06:24 (2) / 22:04	15 06:27 (2) / 21:35	20:34	4 07:17 (3)	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	06:03 (2)	05:59	06:49			07:32		08:48
	17:25		20:11		21:48	21 06:24 (2)	21:33	20:32			17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				256	283	449	500	257				
Sun reduction				0,42	0,43	0,39	0,41	0,42				
Oper. time red.				0,95	0,95	0,95	0,95	0,95				
Wind dir. red.				0,63	0,67	0,67	0,67	0,63				
Total reduction				0,25	0,27	0,25	0,26	0,25				
Total, real				64	77	111	129	64				

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 11

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 11 - Bolgerijsekade 1

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	06:07 (2) 05:24	06:20 (2) 06:01	06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49	17 06:24 (2) 22:03	3 06:23 (2) 21:31	20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:07 (2) 05:25	06:18 (2) 06:02	06:52	07:41	07:35	08:26
	16:40	17:29	18:20	20:14	21:05	21:50	17 06:24 (2) 22:03	6 06:24 (2) 21:30	20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:07 (2) 05:25	06:18 (2) 06:04	06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52	16 06:23 (2) 22:03	7 06:25 (2) 21:28	20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:09 (2) 05:26	06:17 (2) 06:05	06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53	14 06:23 (2) 22:02	9 06:26 (2) 21:26	20:23	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:09 (2) 05:27	06:17 (2) 06:07	06:57	07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54	13 06:22 (2) 22:02	10 06:27 (2) 21:25	20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:10 (2) 05:28	06:16 (2) 06:08	06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55	12 06:22 (2) 22:01	11 06:27 (2) 21:23	20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:10 (2) 05:29	06:16 (2) 06:10	07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55	11 06:21 (2) 22:01	12 06:28 (2) 21:21	20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:12 (2) 05:30	06:15 (2) 06:11	07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56	9 06:21 (2) 22:00	14 06:29 (2) 21:19	20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:12 (2) 05:31	06:15 (2) 06:13	07:03	07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57	8 06:20 (2) 21:59	15 06:30 (2) 21:17	20:11	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	06:13 (2) 05:32	06:15 (2) 06:15	07:05	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58	7 06:20 (2) 21:59	16 06:31 (2) 21:15	20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:55	05:54	05:21	06:15 (2) 05:33	06:15 (2) 06:16	07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:30	21:20	21:59	4 06:19 (2) 21:58	16 06:31 (2) 21:14	20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	05:53	05:21	05:34	06:14 (2) 06:18	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	21:21	21:59	21:57	18 06:32 (2) 21:12	20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	05:51	05:20	05:35	06:14 (2) 06:19	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	21:23	22:00	21:56	18 06:32 (2) 21:10	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) 05:49	06:15 (2) 05:20	05:36	06:14 (2) 06:21	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35	5 07:16 (3) 21:25	4 06:19 (2) 22:01	21:55	19 06:33 (2) 21:08	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) 05:48	06:14 (2) 05:20	05:37	06:14 (2) 06:23	07:13 (3)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36	9 07:18 (3) 21:26	6 06:20 (2) 22:01	21:54	19 06:33 (2) 21:06	4 07:17 (3)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) 05:46	06:13 (2) 05:20	05:38	06:13 (2) 06:24	07:10 (3)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38	12 07:19 (3) 21:28	9 06:22 (2) 22:02	21:53	20 06:33 (2) 21:04	10 07:20 (3)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	07:04 (3) 05:45	06:11 (2) 05:20	05:40	06:14 (2) 06:26	07:07 (3)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40	15 07:19 (3) 21:29	11 06:22 (2) 22:02	21:52	20 06:34 (2) 21:02	14 07:21 (3)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	07:02 (3) 05:43	06:10 (2) 05:20	05:41	06:14 (2) 06:28	07:07 (3)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41	17 07:19 (3) 21:31	13 06:23 (2) 22:03	21:51	20 06:34 (2) 21:00	16 07:23 (3)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	07:00 (3) 05:42	06:09 (2) 05:20	05:42	06:14 (2) 06:29	07:05 (3)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43	19 07:19 (3) 21:32	15 06:24 (2) 22:03	21:50	20 06:34 (2) 20:58	18 07:23 (3)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	06:59 (3) 05:41	06:07 (2) 05:20	05:43	06:13 (2) 06:31	07:04 (3)	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45	20 07:19 (3) 21:34	16 06:23 (2) 22:03	21:49	21 06:34 (2) 20:55	20 07:24 (3)	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	06:58 (3) 05:39	06:06 (2) 05:20	05:45	06:14 (2) 06:32	07:03 (3)	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47	21 07:19 (3) 21:35	18 06:24 (2) 22:04	21:47	20 06:34 (2) 20:53	20 07:23 (3)	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	06:59 (3) 05:38	06:05 (2) 05:20	05:46	06:16 (2) 06:34	07:03 (3)	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48	20 07:19 (3) 21:37	19 06:24 (2) 22:04	21:46	19 06:35 (2) 20:51	21 07:24 (3)	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	06:59 (3) 05:37	06:04 (2) 05:20	05:47	06:17 (2) 06:36	07:03 (3)	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50	19 07:18 (3) 21:38	21 06:25 (2) 22:04	21:45	17 06:34 (2) 20:49	21 07:24 (3)	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	06:59 (3) 05:35	06:04 (2) 05:21	05:49	06:18 (2) 06:37	07:04 (3)	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52	18 07:17 (3) 21:39	21 06:25 (2) 22:04	21:44	16 06:34 (2) 20:47	19 07:23 (3)	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	07:00 (3) 05:34	06:04 (2) 05:21	05:50	06:20 (2) 06:39	07:06 (3)	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53	16 07:16 (3) 21:41	21 06:25 (2) 22:04	21:42	14 06:34 (2) 20:45	17 07:23 (3)	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	07:01 (3) 05:33	06:04 (2) 05:21	05:52	06:21 (2) 06:41	07:07 (3)	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55	13 07:14 (3) 21:42	21 06:25 (2) 22:04	21:41	12 06:33 (2) 20:43	14 07:21 (3)	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	07:03 (3) 05:32	06:05 (2) 05:22	05:53	06:22 (2) 06:42	07:09 (3)	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57	9 07:12 (3) 21:43	20 06:25 (2) 22:04	21:39	10 06:32 (2) 20:40	12 07:21 (3)	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	05:31	06:05 (2) 05:22	05:55	06:24 (2) 06:44	07:10 (3)	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58	21:45	20 06:25 (2) 22:04	21:38	8 06:32 (2) 20:38	9 07:19 (3)	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	05:30	06:05 (2) 05:23	05:56	06:25 (2) 06:45	07:12 (3)	07:36	07:28	08:21	08:48
	17:21		20:07	21:00	21:46	19 06:24 (2) 22:04	21:36	5 06:30 (2) 20:36	5 07:17 (3)	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	05:29	06:05 (2) 05:23	05:58	06:27 (2) 06:47		07:38	07:30	08:23	08:48
	17:23		20:09	21:02	21:47	19 06:24 (2) 22:04	21:35	2 06:29 (2) 20:34		19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	06:06 (2)	05:59	06:49			07:32		08:48
	17:25		20:11		21:48	18 06:24 (2)	21:33	20:32			17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				213	291	128	417	220				
Sun reduction				0,42	0,43	0,39	0,41	0,42				
Oper. time red.				0,95	0,95	0,95	0,95	0,95				
Wind dir. red.				0,63	0,67	0,67	0,67	0,63				
Total reduction				0,25	0,27	0,25	0,26	0,25				
Total, real				53	79	32	108	55				

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:02 / 12

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:25/2.7.490

SHADOW - Calendar

Calculation: Nordex N100 woningen**Shadow receptor:** 12 - Bolgerijsekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12	06:12 - 21:03	05:27 - 21:49	05:58 (3) - 06:22 (3)	05:24 - 22:03	06:01 (3) - 06:31 (3)	06:01 - 21:31	06:50 - 20:29	07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:28	07:26 - 18:20	07:15 - 20:14	06:10 - 21:05	05:26 - 21:50	05:58 (3) - 06:22 (3)	05:25 - 22:03	06:01 (3) - 06:30 (3)	06:02 - 21:30	06:52 - 20:27	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 20:16	06:09 - 21:07	05:25 - 21:51	05:57 (3) - 06:22 (3)	05:25 - 22:03	06:01 (3) - 06:31 (3)	06:04 - 21:28	06:54 - 20:25	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:18	06:07 - 21:08	05:25 - 21:53	05:57 (3) - 06:24 (3)	05:26 - 22:02	06:02 (3) - 06:31 (3)	06:05 - 21:26	06:55 - 20:22	07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 20:19	06:05 - 21:10	05:24 - 21:54	05:57 (3) - 06:24 (3)	05:27 - 22:02	06:03 (3) - 06:31 (3)	06:07 - 21:25	06:57 - 20:20	07:46 - 19:11	07:40 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21	06:03 - 21:12	05:23 - 21:55	05:57 (3) - 06:25 (3)	05:28 - 22:01	06:02 (3) - 06:30 (3)	06:08 - 21:23	06:59 - 20:18	07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:03 - 20:23	06:01 - 21:13	05:23 - 21:55	05:56 (3) - 06:25 (3)	05:29 - 22:01	06:03 (3) - 06:30 (3)	06:10 - 21:21	07:00 - 20:16	07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:46 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24	05:59 - 21:15	05:22 - 21:56	05:57 (3) - 06:26 (3)	05:30 - 22:00	06:04 (3) - 06:30 (3)	06:11 - 21:19	07:02 - 20:13	07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:41	07:10 - 18:33	06:59 - 20:26	05:58 - 21:17	05:22 - 21:57	05:56 (3) - 06:25 (3)	05:31 - 21:59	06:04 (3) - 06:30 (3)	06:13 - 21:17	07:03 - 20:11	07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28	05:56 - 21:18	05:21 - 21:58	05:56 (3) - 06:26 (3)	05:32 - 21:59	06:05 (3) - 06:30 (3)	06:15 - 21:15	07:05 - 20:09	07:55 - 18:59	07:49 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:54 - 20:29	05:54 - 21:20	05:21 - 21:59	05:57 (3) - 06:27 (3)	05:33 - 21:58	06:06 (3) - 06:29 (3)	06:16 - 21:14	07:07 - 20:06	07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31	05:53 - 21:21	05:21 - 21:59	05:56 (3) - 06:26 (3)	05:34 - 21:57	06:06 (3) - 06:29 (3)	06:18 - 21:12	07:08 - 20:04	07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:43 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 21:23	05:20 - 22:00	05:56 (3) - 06:27 (3)	05:35 - 21:56	06:07 (3) - 06:28 (3)	06:19 - 21:10	07:10 - 20:02	08:00 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 21:25	05:20 - 22:01	05:57 (3) - 06:27 (3)	05:36 - 21:55	06:08 (3) - 06:28 (3)	06:21 - 21:08	07:12 - 19:59	08:01 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 21:26	05:20 - 22:01	05:57 (3) - 06:28 (3)	05:37 - 21:54	06:09 (3) - 06:27 (3)	06:23 - 21:06	07:13 - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 21:28	05:20 - 22:02	05:57 (3) - 06:28 (3)	05:38 - 21:53	06:10 (3) - 06:26 (3)	06:24 - 21:04	07:15 - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 21:29	05:20 - 22:02	05:57 (3) - 06:28 (3)	05:40 - 21:52	06:13 (3) - 06:25 (3)	06:26 - 21:02	07:16 - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41	05:43 - 21:31	05:20 - 22:03	05:57 (3) - 06:29 (3)	05:41 - 21:51	06:15 (3) - 06:23 (3)	06:28 - 21:00	07:18 - 19:50	08:08 - 18:42	08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43	05:42 - 21:32	05:20 - 22:03	05:57 (3) - 06:29 (3)	05:42 - 21:50		06:29 - 20:58	07:20 - 19:48	08:10 - 18:40	08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45	05:40 - 21:34	05:20 - 22:03	05:57 (3) - 06:29 (3)	05:43 - 21:49		06:31 - 20:55	07:21 - 19:45	08:12 - 18:37	08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 20:47	05:39 - 21:35	05:20 - 22:04	05:58 (3) - 06:29 (3)	05:45 - 21:47		06:32 - 20:53	07:23 - 19:43	08:14 - 18:35	08:09 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 20:48	05:38 - 21:36	05:20 - 22:04	05:58 (3) - 06:30 (3)	05:46 - 21:46		06:34 - 20:51	07:25 - 19:41	08:15 - 18:33	08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:10	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50	05:37 - 21:38	05:20 - 22:04	05:58 (3) - 06:30 (3)	05:47 - 21:45		06:36 - 20:49	07:26 - 19:38	08:17 - 18:31	08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 20:52	05:35 - 21:39	05:21 - 22:04	05:58 (3) - 06:30 (3)	05:49 - 21:43		06:37 - 20:47	07:28 - 19:36	08:19 - 18:29	08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 20:53	05:34 - 21:41	06:07 (3) - 06:12 (3) 5	05:59 (3) - 06:30 (3)	05:50 - 21:42		06:39 - 20:45	07:29 - 19:34	07:21 - 17:27	08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 20:55	05:33 - 21:42	06:04 (3) - 06:15 (3) 11	05:59 (3) - 06:30 (3)	05:52 - 21:41		06:41 - 20:43	07:31 - 19:31	07:23 - 17:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 20:57	05:32 - 21:43	06:02 (3) - 06:17 (3) 15	05:59 (3) - 06:30 (3)	05:53 - 21:39		06:42 - 20:40	07:33 - 19:29	07:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 20:58	05:31 - 21:45	06:01 (3) - 06:18 (3) 17	06:00 (3) - 06:30 (3)	05:55 - 21:38		06:44 - 20:38	07:34 - 19:27	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07	06:16 - 21:00	05:30 - 21:46	06:00 (3) - 06:19 (3) 19	06:00 (3) - 06:31 (3)	05:56 - 21:36		06:45 - 20:36	07:36 - 19:24	07:28 - 17:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09	06:14 - 21:02	05:29 - 21:47	05:59 (3) - 06:20 (3) 21	06:00 (3) - 06:31 (3)	05:58 - 21:35		06:47 - 20:34	07:38 - 19:22	07:30 - 17:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11		05:28 - 21:48 22	05:58 (3) - 06:20 (3)		05:59 - 21:33		06:49 - 20:32		07:31 - 17:15		08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244		
Total, worst case					110	894	419							
Sun reduction					0,43	0,39	0,41							
Oper. time red.					0,95	0,95	0,95							
Wind dir. red.					0,67	0,67	0,67							
Total reduction					0,27	0,25	0,26							
Total, real					30	223	109							

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

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

Project:

068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 1

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 01 - Nieuwbouw Autenasekade

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

January	February	March	April	May	June	July	August	September	October	November	December
1 | 08:48 | 16:39	08:21 | 17:27	07:28 | 18:18 60 | 07:26 | 18:20 60	16:32 (3) | 07:17 | 17:32 (3) | 20:12 | 16:32 (3) | 07:15 | 17:32 (3) | 20:14	06:12 | 21:03 59 | 06:10 | 21:05 58	19:23 (2) | 05:27 | 20:22 (2) | 21:49 50 | 19:23 (2) | 05:26 | 20:21 (2) | 21:50 45	19:47 (2) | 05:24 | 21:01 (1) | 22:03 30 | 19:49 (2) | 05:25 | 21:01 (1) | 22:03 31	20:34 (1) | 06:00 | 21:04 (1) | 21:31 80 | 20:33 (1) | 06:02 | 21:04 (1) | 21:30 79	19:34 (2) | 06:50 | 21:01 (1) | 20:29 9 | 19:34 (2) | 06:52 | 21:00 (1) | 20:27	19:50 (2) | 07:39 | 19:59 (2) | 19:20 46 | 07:41 | 19:17 48	17:17 (3) | 07:33 | 18:03 (3) | 17:13 24 | 07:41 | 18:03 (3) | 17:12 19	16:20 (3) | 08:24 | 16:44 (3) | 16:33 | 16:23 (3) | 08:26 | 16:42 (3) | 16:32
2 | 08:48 | 16:41	08:20 | 17:30	07:23 | 18:22 59	16:33 (3) | 07:13 | 17:32 (3) | 20:16	06:08 | 21:07 59	19:22 (2) | 05:25 | 20:21 (2) | 21:51 35	20:25 (1) | 05:25 | 21:00 (1) | 22:03 31	20:34 (1) | 06:04 | 21:05 (1) | 21:28 77	19:34 (2) | 06:54 | 20:58 (1) | 20:25	07:43 | 19:15 50	17:14 (3) | 07:37 | 18:04 (3) | 17:10 8	16:29 (3) | 08:27 | 16:37 (3) | 16:32
3 | 08:48 | 16:42	08:17 | 17:32	07:21 | 18:24 59	16:33 (3) | 07:10 | 17:32 (3) | 20:17	06:07 | 21:08 62	19:22 (2) | 05:25 | 20:39 (1) | 21:53 34	20:27 (1) | 05:26 | 21:01 (1) | 22:02 31	20:34 (1) | 06:05 | 21:05 (1) | 21:26 75	19:34 (2) | 06:55 | 20:57 (1) | 20:22	07:44 | 19:13 52	17:13 (3) | 07:39 | 18:05 (3) | 17:08	08:29 | 16:31
4 | 08:48 | 16:43	08:15 | 17:34	07:19 | 18:25 59	16:32 (3) | 07:08 | 17:31 (3) | 20:19	06:05 | 21:10 67	19:23 (2) | 05:24 | 20:42 (1) | 21:54 33	20:27 (1) | 05:27 | 21:00 (1) | 22:02 32	20:34 (1) | 06:07 | 21:06 (1) | 21:25 74	19:34 (2) | 06:57 | 20:55 (1) | 20:20	07:46 | 19:10 54	17:11 (3) | 07:40 | 18:05 (3) | 17:06	08:30 | 16:31
5 | 08:47 | 16:44	08:13 | 17:36	07:17 | 18:27 57	16:33 (3) | 07:06 | 17:30 (3) | 20:21	06:03 | 21:12 69	19:23 (2) | 05:23 | 20:43 (1) | 21:54 32	20:27 (1) | 05:28 | 20:59 (1) | 22:01 33	20:33 (1) | 06:08 | 21:06 (1) | 21:23 71	19:33 (2) | 06:58 | 20:54 (1) | 20:18	07:48 | 19:08 56	17:10 (3) | 07:42 | 18:06 (3) | 17:04	08:31 | 16:30
6 | 08:47 | 16:46	08:12 | 17:38	07:15 | 18:29 56	16:34 (3) | 07:03 | 17:30 (3) | 20:23	06:01 | 21:13 73	19:22 (2) | 05:23 | 20:44 (1) | 21:55 33	20:27 (1) | 05:29 | 21:00 (1) | 22:01 33	20:33 (1) | 06:10 | 21:06 (1) | 21:21 69	19:32 (2) | 07:00 | 20:52 (1) | 20:16	07:49 | 19:06 57	17:09 (3) | 07:44 | 18:06 (3) | 17:03	08:32 | 16:30
8 | 08:46 | 16:47	08:10 | 17:40 11	16:58 (3) | 07:12 | 17:09 (3) | 18:31 55	16:33 (3) | 07:01 | 17:28 (3) | 20:24	05:59 | 21:15 75	19:23 (2) | 05:22 | 20:46 (1) | 21:56 32	20:28 (1) | 05:30 | 21:00 (1) | 22:00 34	20:33 (1) | 06:11 | 21:07 (1) | 21:19 65	19:32 (2) | 07:02 | 20:50 (1) | 20:13	07:51 | 19:04 58	17:09 (3) | 07:46 | 18:07 (3) | 17:01	08:34 | 16:29
9 | 08:46 | 16:48	08:08 | 17:41 19	16:53 (3) | 07:10 | 17:12 (3) | 18:33 54	16:34 (3) | 06:59 | 17:28 (3) | 20:26	05:58 | 21:17 76	19:23 (2) | 05:22 | 20:47 (1) | 21:57 31	20:28 (1) | 05:30 | 20:59 (1) | 21:59 34	20:33 (1) | 06:13 | 21:07 (1) | 21:17 61	19:31 (2) | 07:03 | 20:48 (1) | 20:11	07:53 | 19:01 59	17:07 (3) | 07:48 | 18:06 (3) | 16:59	08:35 | 16:29
10 | 08:45 | 16:50	08:06 | 17:43 24	16:50 (3) | 07:08 | 17:14 (3) | 18:34 52	16:35 (3) | 06:57 | 17:27 (3) | 20:28	05:56 | 21:18 77	19:23 (2) | 05:21 | 20:48 (1) | 21:58 31	20:29 (1) | 05:31 | 21:00 (1) | 21:59 41	19:58 (2) | 06:15 | 21:08 (1) | 21:15 58	19:32 (2) | 07:05 | 20:30 (2) | 20:09	07:55 | 18:59 59	17:07 (3) | 07:49 | 18:06 (3) | 16:58	08:36 | 16:29
11 | 08:45 | 16:51	08:04 | 17:45 28	16:48 (3) | 07:06 | 17:16 (3) | 18:36 50	16:36 (3) | 06:54 | 17:26 (3) | 20:29 9	19:51 (2) | 05:54 | 20:00 (2) | 21:20 80	19:24 (2) | 05:21 | 20:50 (1) | 21:59 30	20:30 (1) | 05:33 | 21:00 (1) | 21:58 48	19:55 (2) | 06:16 | 21:08 (1) | 21:13 59	19:31 (2) | 07:07 | 20:30 (2) | 20:06	07:56 | 18:57 59	17:07 (3) | 07:51 | 18:06 (3) | 16:56	08:37 | 16:29
12 | 08:44 | 16:53	08:03 | 17:47 32	16:46 (3) | 07:03 | 17:18 (3) | 18:38 47	16:37 (3) | 06:52 | 17:24 (3) | 20:31 19	19:46 (2) | 05:53 | 20:05 (2) | 21:21 81	19:24 (2) | 05:20 | 20:51 (1) | 21:59 30	20:29 (1) | 05:34 | 20:59 (1) | 21:57 53	19:53 (2) | 06:18 | 21:09 (1) | 21:12 59	19:31 (2) | 07:08 | 20:30 (2) | 20:04	07:58 | 18:55 60	17:06 (3) | 07:53 | 18:06 (3) | 16:55	08:38 | 16:29
13 | 08:43 | 16:54	08:01 | 17:49 36	16:44 (3) | 07:01 | 17:20 (3) | 18:40 45	16:38 (3) | 06:50 | 17:23 (3) | 20:33 24	19:42 (2) | 05:51 | 20:06 (2) | 21:23 82	19:25 (2) | 05:20 | 20:53 (1) | 22:00 29	20:30 (1) | 05:35 | 20:59 (1) | 21:56 56	19:52 (2) | 06:19 | 21:09 (1) | 21:10 58	19:31 (2) | 07:10 | 20:29 (2) | 20:02	08:00 | 18:52 60	17:05 (3) | 07:55 | 18:05 (3) | 16:53	08:39 | 16:29
14 | 08:43 | 16:56	07:59 | 17:51 39	16:43 (3) | 06:59 | 17:22 (3) | 18:41 42	16:40 (3) | 06:48 | 17:22 (3) | 20:35 28	19:40 (2) | 05:49 | 20:08 (2) | 21:25 83	19:25 (2) | 05:20 | 20:54 (1) | 22:01 29	20:31 (1) | 05:36 | 21:00 (1) | 21:55 60	19:50 (2) | 06:21 | 21:09 (1) | 21:08 58	19:31 (2) | 07:11 | 20:29 (2) | 19:59	08:01 | 18:50 60	17:05 (3) | 07:57 | 18:05 (3) | 16:52	08:40 | 16:29
15 | 08:42 | 16:57	07:57 | 17:53 43	16:41 (3) | 06:56 | 17:24 (3) | 18:43 38	16:41 (3) | 06:46 | 17:19 (3) | 20:36 32	19:38 (2) | 05:48 | 20:10 (2) | 21:26 83	19:26 (2) | 05:20 | 20:56 (1) | 22:01 29	20:31 (1) | 05:37 | 21:00 (1) | 21:54 62	19:49 (2) | 06:23 | 21:09 (1) | 21:06 58	19:31 (2) | 07:13 | 20:29 (2) | 19:57	08:03 | 18:48 60	17:05 (3) | 07:58 | 18:05 (3) | 16:50	08:41 | 16:29
16 | 08:41 | 16:59	07:55 | 17:54 46	16:40 (3) | 06:54 | 17:26 (3) | 18:45 34	16:43 (3) | 06:43 | 17:17 (3) | 20:38 36	19:35 (2) | 05:46 | 20:11 (2) | 21:28 84	19:27 (2) | 05:20 | 20:58 (1) | 22:02 28	20:32 (1) | 05:38 | 21:00 (1) | 21:53 67	19:47 (2) | 06:24 | 21:10 (1) | 21:04 58	19:31 (2) | 07:15 | 20:29 (2) | 19:55	08:05 | 18:46 59	17:06 (3) | 08:00 | 18:05 (3) | 16:49	08:42 | 16:29
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18 | 08:39 | 17:02	07:51 | 17:58 51	16:38 (3) | 06:50 | 17:29 (3) | 18:48 23	16:48 (3) | 06:39 | 17:11 (3) | 20:41 42	19:32 (2) | 05:43 | 20:14 (2) | 21:31 84	19:29 (2) | 05:20 | 21:00 (1) | 22:03 28	20:32 (1) | 05:41 | 21:00 (1) | 21:51 72	19:46 (2) | 06:27 | 21:11 (1) | 21:00 55	19:32 (2) | 07:18 | 20:27 (2) | 19:50	08:08 | 18:42 58	17:05 (3) | 08:03 | 18:03 (3) | 16:46	08:43 | 16:29
19 | 08:38 | 17:04	07:49 | 18:00 53	16:37 (3) | 06:47 | 17:30 (3) | 18:50 15	16:52 (3) | 06:37 | 17:07 (3) | 20:43 45	19:31 (2) | 05:42 | 20:16 (2) | 21:32 82	19:30 (2) | 05:20 | 21:01 (1) | 22:03 28	20:32 (1) | 05:42 | 21:00 (1) | 21:50 73	19:45 (2) | 06:29 | 21:11 (1) | 20:57 55	19:31 (2) | 07:20 | 20:26 (2) | 19:48	08:10 | 18:39 57	17:06 (3) | 08:05 | 18:03 (3) | 16:45	08:44 | 16:29
20 | 08:37 | 17:05	07:47 | 18:02 54	16:37 (3) | 06:45 | 17:31 (3) | 18:52	06:35 | 20:45 48	19:29 (2) | 05:40 | 20:17 (2) | 21:34 82	19:30 (2) | 05:20 | 21:01 (1) | 22:03 27	20:33 (1) | 05:43 | 21:00 (1) | 21:49 76	19:43 (2) | 06:31 | 21:11 (1) | 20:55 54	19:32 (2) | 07:21 | 20:26 (2) | 19:45	08:12 | 18:37 56	17:06 (3) | 08:07 | 18:02 (3) | 16:44	08:45 | 16:30
21 | 08:36 | 17:07	07:45 | 18:04 56	16:36 (3) | 06:43 | 17:32 (3) | 18:53	06:33 | 20:46 51	19:28 (2) | 05:39 | 20:19 (2) | 21:35 80	19:31 (2) | 05:20 | 21:01 (1) | 22:04 27	20:33 (1) | 05:45 | 21:00 (1) | 21:47 78	19:42 (2) | 06:32 | 21:11 (1) | 20:53 52	19:32 (2) | 07:23 | 20:24 (2) | 19:43	08:14 | 18:35 55	17:07 (3) | 08:09 | 18:02 (3) | 16:42	08:45 | 16:30
22 | 08:35 | 17:09	07:43 | 18:06 56	16:36 (3) | 06:40 | 17:32 (3) | 18:55	06:30 | 20:48 53	19:27 (2) | 05:38 | 20:20 (2) | 21:36 79	19:32 (2) | 05:20 | 21:01 (1) | 22:04 27	20:34 (1) | 05:46 | 21:01 (1) | 21:46 79	19:42 (2) | 06:34 | 21:12 (1) | 20:51 51	19:33 (2) | 07:24 | 20:24 (2) | 19:41	08:15 | 18:33 54	17:07 (3) | 08:10 | 18:01 (3) | 16:41	08:46 | 16:31
23 | 08:34 | 17:10	07:41 | 18:07 58	16:35 (3) | 06:38 | 17:33 (3) | 18:57	06:28 | 20:50 54	19:26 (2) | 05:36 | 20:20 (2) | 21:38 77	19:33 (2) | 05:20 | 21:01 (1) | 22:04 28	20:33 (1) | 05:47 | 21:01 (1) | 21:45 81	19:41 (2) | 06:36 | 21:11 (1) | 20:49 48	19:33 (2) | 07:26 | 20:21 (2) | 19:38	08:17 | 18:31 52	17:08 (3) | 08:12 | 18:00 (3) | 16:40	08:46 | 16:31
24 | 08:33 | 17:12	07:39 | 18:09 58	16:34 (3) | 06:36 | 17:32 (3) | 18:59	06:26 | 20:52 54	19:26 (2) | 05:35 | 20:20 (2) | 21:39 73	19:35 (2) | 05:20 | 21:01 (1) | 22:04 28	20:33 (1) | 05:49 | 21:01 (1) | 21:43 82	19:40 (2) | 06:37 | 21:11 (1) | 20:47 45	19:34 (2) | 07:28 | 20:19 (2) | 19:36 11	17:38 (3) | 08:19 | 17:49 (3) | 18:29 50	17:09 (3) | 08:14 | 17:59 (3) | 16:39	08:47 | 16:32
25 | 08:31 | 17:14	07:36 | 18:11 60	16:33 (3) | 06:33 | 17:33 (3) | 19:00	06:24 | 20:53 56	19:25 (2) | 05:34 | 20:21 (2) | 21:41 71	19:36 (2) | 05:21 | 21:01 (1) | 22:04 28	20:34 (1) | 05:50 | 21:02 (1) | 21:42 84	19:40 (2) | 06:39 | 21:12 (1) | 20:45 42	19:36 (2) | 07:29 | 20:18 (2) | 19:34 21	17:33 (3) | 07:21 | 17:54 (3) | 17:27 48	16:10 (3) | 08:15 | 16:58 (3) | 16:38	08:47 | 16:32
26 | 08:30 | 17:16	07:34 | 18:13 60	16:33 (3) | 06:31 | 17:33 (3) | 19:02	06:22 | 20:55 57	19:24 (2) | 05:33 | 20:21 (2) | 21:42 70	19:37 (2) | 05:21 | 21:01 (1) | 22:04 28	20:34 (1) | 05:52 | 21:02 (1) | 21:41 83	19:39 (2) | 06:40 | 21:10 (1) | 20:43 39	19:36 (2) | 07:31 | 20:15 (2) | 19:31 28	17:28 (3) | 07:22 | 17:56 (3) | 17:25 45	16:10 (3) | 08:17 | 16:55 (3) | 16:37	08:47 | 16:33
27 | 08:29 | 17:17	07:32 | 18:15 60	16:33 (3) | 06:29 | 17:33 (3) | 19:04	06:20 | 20:57 57	19:24 (2) | 05:32 | 20:21 (2) | 21:43 68	19:38 (2) | 05:22 | 21:01 (1) | 22:04 29	20:33 (1) | 05:53 | 21:02 (1) | 21:39 83	19:38 (2) | 06:42 | 21:08 (1) | 20:40 35	19:38 (2) | 07:33 | 20:13 (2) | 19:29 32	17:26 (3) | 07:24 | 17:58 (3) | 17:23 42	16:11 (3) | 08:18 | 16:53 (3) | 16:36	08:48 | 16:34
28 | 08:27 | 17:19	07:30 | 18:16 60	16:33 (3) | 06:26 | 17:33 (3) | 19:06	06:18 | 20:58 58	19:23 (2) | 05:31 | 20:21 (2) | 21:44 63	19:40 (2) | 05:22 | 21:01 (1) | 22:04 29	20:34 (1) | 05:54 | 21:03 (1) | 21:38 84	19:37 (2) | 06:44 | 21:08 (1) | 20:38 32	19:39 (2) | 07:34 | 20:11 (2) | 19:27 36	17:23 (3) | 07:26 | 17:59 (3) | 17:21 39	16:12 (3) | 08:20 | 16:51 (3) | 16:35	08:48 | 16:35
29 | 08:26 | 17:21		07:24 | 20:07	06:16 | 21:00 58	19:23 (2) | 05:30 | 20:21 (2) | 21:46 61	19:41 (2) | 05:23 | 21:01 (1) | 22:04 29	20:33 (1) | 05:56 | 21:02 (1) | 21:36 83	19:36 (2) | 06:45 | 21:06 (1) | 20:36 28	19:41 (2) | 07:36 | 20:09 (2) | 19:24 40	17:21 (3) | 07:28 | 18:01 (3) | 17:19 35	16:14 (3) | 08:21 | 16:49 (3) | 16:34	08:48 | 16:36
30 | 08:24 | 17:23		07:22 | 20:09	06:14 | 21:02 59	19:22 (2) | 05:29 | 20:21 (2) | 21:47 59	19:42 (2) | 05:23 | 21:01 (1) | 22:04 29	20:34 (1) | 05:57 | 21:03 (1) | 21:35 82	19:35 (2) | 06:47 | 21:04 (1) | 20:34 24	19:42 (2) | 07:38 | 20:06 (2) | 19:22 43	17:19 (3) | 07:30 | 18:02 (3) | 17:17 32	16:16 (3) | 08:23 | 16:48 (3) | 16:34	08:48 | 16:36
31 | 08:23 | 17:25		07:19 | 20:11		05:28 | 21:48 54	19:44 (2) | 21:00 (1)	05:59 | 21:33 81	19:35 (2) | 06:49 | 21:03 (1) | 20:31 18	19:46 (2) | 20:04 (2)	07:31 | 17:15 28	16:18 (3) | 16:46 (3)	08:48 | 16:37
Potential sun hours 259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case	953	894	879	2255	924	1866	1693	220	1607	51	
Sun reduction	0,30	0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34	0,24	
Oper. time red.	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	
Wind dir. red.	0,67	0,67	0,58	0,58	0,58	0,58	0,58	0,66	0,67	0,67	
Total reduction	0,19	0,21	0,23	0,24	0,22	0,23	0,23	0,23	0,21	0,15	
Total, real	184	187	204	536	201	422	392	50	344	8	

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:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 2

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 02 - Autenasekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	18:46 (3) 06:12	18:44 (3) 05:27	20:56 (2) 05:24	20:56 (2) 06:00	06:50	18:35 (3) 07:39	07:33	08:24
	16:39	17:27	18:18	20:12 56	19:42 (3) 21:03 49	19:33 (3) 21:49 21	21:17 (2) 22:03 34	21:30 (2) 21:31	20:29 69	19:44 (3) 19:20	17:13	16:33
2	08:48	08:20	07:26	07:15	18:44 (3) 06:10	18:45 (3) 05:26	20:55 (2) 05:25	20:55 (2) 06:02	06:52	18:36 (3) 07:41	07:35	08:26
	16:40	17:28	18:20	20:14 58	19:42 (3) 21:05 47	19:32 (3) 21:50 23	21:18 (2) 22:03 34	21:29 (2) 21:30	20:27 68	19:44 (3) 19:17	17:12	16:32
3	08:48	08:18	07:23	07:13	18:43 (3) 06:08	18:46 (3) 05:25	20:54 (2) 05:25	20:56 (2) 06:04	19:11 (3) 06:54	18:36 (3) 07:43	07:37	08:27
	16:41	17:30	18:22	20:16 60	19:43 (3) 21:07 44	19:30 (3) 21:51 25	21:19 (2) 22:03 33	21:29 (2) 21:28 15	19:26 (3) 20:25 68	19:44 (3) 19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	18:42 (3) 06:07	18:48 (3) 05:25	20:54 (2) 05:26	20:57 (2) 06:05	19:08 (3) 06:55	18:36 (3) 07:44	07:39	08:28
	16:42	17:32	18:24	20:17 62	19:44 (3) 21:08 41	19:29 (3) 21:52 26	21:20 (2) 22:02 32	21:29 (2) 21:26 22	19:30 (3) 20:22 66	19:42 (3) 19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	18:41 (3) 06:05	18:50 (3) 05:24	20:53 (2) 05:27	20:58 (2) 06:07	19:05 (3) 06:57	18:36 (3) 07:46	07:40	08:30
	16:43	17:34	18:25	20:19 64	19:45 (3) 21:10 38	19:28 (3) 21:54 28	21:21 (2) 22:02 31	21:29 (2) 21:25 27	19:32 (3) 20:20 66	19:42 (3) 19:10	17:06	16:31
6	08:47	08:13	07:17	07:06	18:40 (3) 06:03	18:51 (3) 05:23	20:52 (2) 05:28	20:58 (2) 06:08	19:03 (3) 06:58	18:36 (3) 07:48	07:42	08:31
	16:44	17:36	18:27	20:21 65	19:45 (3) 21:12 35	19:26 (3) 21:54 29	21:21 (2) 22:01 30	21:28 (2) 21:23 32	19:35 (3) 20:18 65	19:41 (3) 19:08	17:04	16:30
7	08:47	08:11	07:15	07:03	18:39 (3) 06:01	18:53 (3) 05:23	20:52 (2) 05:29	20:59 (2) 06:10	19:00 (3) 07:00	18:36 (3) 07:49	07:44	08:32
	16:46	17:38	18:29	20:23 66	19:45 (3) 21:13 30	19:23 (3) 21:55 30	21:22 (2) 22:01 28	21:27 (2) 21:21 36	19:36 (3) 20:16 64	19:40 (3) 19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	18:39 (3) 05:59	18:56 (3) 05:22	20:52 (2) 05:30	21:00 (2) 06:11	18:59 (3) 07:02	18:36 (3) 07:51	07:46	08:34
	16:47	17:40	18:31	20:24 66	19:45 (3) 21:15 26	19:22 (3) 21:56 32	21:24 (2) 22:00 27	21:27 (2) 21:19 39	19:38 (3) 20:13 62	19:38 (3) 19:04	17:01	16:29
9	08:46	08:08	07:10	06:59	18:38 (3) 05:58	18:59 (3) 05:22	20:51 (2) 05:30	21:01 (2) 06:13	18:57 (3) 07:03	18:37 (3) 07:53	07:48	08:35
	16:48	17:41	18:33	20:26 68	19:46 (3) 21:17 19	19:18 (3) 21:57 33	21:24 (2) 21:59 25	21:26 (2) 21:17 42	19:39 (3) 20:11 61	19:38 (3) 19:01	16:59	16:29
10	08:45	08:06	07:08	06:57	18:37 (3) 05:56	19:03 (3) 05:21	20:51 (2) 05:31	21:02 (2) 06:15	18:55 (3) 07:05	18:37 (3) 07:55	07:49	08:36
	16:50	17:43	18:34	20:28 68	19:45 (3) 21:18 11	19:14 (3) 21:58 34	21:25 (2) 21:59 24	21:26 (2) 21:15 45	19:40 (3) 20:09 59	19:36 (3) 18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	18:37 (3) 05:54	05:21	20:51 (2) 05:33	21:03 (2) 06:16	18:53 (3) 07:07	18:38 (3) 07:56	07:51	08:37
	16:51	17:45	18:36	20:29 68	19:45 (3) 21:20	21:59 35	21:26 (2) 21:58 22	21:25 (2) 21:13 48	19:41 (3) 20:06 57	19:35 (3) 18:57	16:56	16:29
12	08:44	08:02	07:03	06:52	18:36 (3) 05:53	05:20	20:51 (2) 05:34	21:04 (2) 06:18	18:52 (3) 07:08	18:39 (3) 07:58	07:53	08:38
	16:53	17:47	18:38	20:31 69	19:45 (3) 21:21	21:59 35	21:26 (2) 21:57 20	21:24 (2) 21:12 50	19:42 (3) 20:04 55	19:34 (3) 18:55	16:55	16:29
13	08:43	08:01	07:01	06:50	18:36 (3) 05:51	05:20	20:51 (2) 05:35	21:05 (2) 06:19	18:50 (3) 07:10	18:39 (3) 08:00	07:55	08:39
	16:54	17:49	18:40	20:33 69	19:45 (3) 21:23	22:00 35	21:26 (2) 21:56 19	21:24 (2) 21:10 52	19:42 (3) 20:02 52	19:31 (3) 18:52	16:53	16:29
14	08:43	07:59	06:59	06:48	18:36 (3) 05:49	05:20	20:51 (2) 05:36	21:07 (2) 06:21	18:49 (3) 07:11	18:41 (3) 08:01	07:57	08:40
	16:56	17:51	18:41	20:35 69	19:45 (3) 21:25	22:01 36	21:27 (2) 21:55 16	21:23 (2) 21:08 55	19:44 (3) 19:59 49	19:30 (3) 18:50	16:52	16:29
15	08:42	07:57	06:56	06:46	18:36 (3) 05:48	05:20	20:51 (2) 05:37	21:09 (2) 06:23	18:48 (3) 07:13	18:41 (3) 08:03	07:58	08:41
	16:57	17:53	18:43	20:36 69	19:45 (3) 21:26	22:01 37	21:28 (2) 21:54 13	21:22 (2) 21:06 56	19:44 (3) 19:57 46	19:27 (3) 18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	18:35 (3) 05:46	05:20	20:51 (2) 05:38	21:12 (2) 06:24	18:47 (3) 07:15	18:43 (3) 08:05	08:00	08:42
	16:59	17:54	18:45	20:38 69	19:44 (3) 21:28	22:02 37	21:28 (2) 21:53 9	21:21 (2) 21:04 58	19:45 (3) 19:55 42	19:25 (3) 18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	18:35 (3) 05:45	05:20	20:51 (2) 05:39	06:26	18:45 (3) 07:16	18:45 (3) 08:07	08:02	08:43
	17:00	17:56	18:47	20:40 69	19:44 (3) 21:29	22:02 38	21:29 (1) 21:52	21:02 60	19:45 (3) 19:52 38	19:23 (3) 18:44	16:47	16:29
18	08:39	07:51	06:50	06:39	18:36 (3) 05:43	05:20	20:51 (2) 05:41	06:27	18:45 (3) 07:18	18:47 (3) 08:08	08:03	08:43
	17:02	17:58	18:48	20:41 67	19:43 (3) 21:31	22:03 38	21:29 (1) 21:51	21:00 61	19:46 (3) 19:50 33	19:20 (3) 18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	18:36 (3) 05:42	05:20	20:51 (2) 05:42	06:29	18:43 (3) 07:20	18:50 (3) 08:10	08:05	08:44
	17:04	18:00	18:50	20:43 67	19:43 (3) 21:32	22:03 38	21:29 (1) 21:50	20:57 63	19:46 (3) 19:48 27	19:17 (3) 18:39	16:45	16:29
20	08:37	07:47	06:45	06:35	18:36 (3) 05:40	05:20	20:51 (2) 05:43	06:31	18:43 (3) 07:21	18:53 (3) 08:12	08:07	08:45
	17:05	18:02	18:52	20:45 66	19:42 (3) 21:34	22:03 38	21:29 (1) 21:49	20:55 63	19:46 (3) 19:45 18	19:11 (3) 18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	18:36 (3) 05:39	05:20	20:51 (2) 05:45	06:32	18:41 (3) 07:23	08:14	08:09	08:45
	17:07	18:04	18:53	20:46 66	19:42 (3) 21:35	22:04 38	21:29 (1) 21:47	20:53 65	19:46 (3) 19:43	18:35	16:42	16:30
22	08:35	07:43	06:40	06:30	18:37 (3) 05:38	05:20	20:52 (2) 05:46	06:34	18:41 (3) 07:24	08:15	08:10	08:46
	17:09	18:06	18:55	20:48 64	19:41 (3) 21:36	22:04 38	21:30 (1) 21:46	20:51 66	19:47 (3) 19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	18:10 (3) 06:28	18:37 (3) 05:36	05:20	20:52 (2) 05:47	06:36	18:40 (3) 07:26	08:17	08:12	08:46
	17:10	18:07	18:57 14	18:24 (3) 20:50 64	19:41 (3) 21:38	22:04 38	21:30 (1) 21:45	20:49 66	19:46 (3) 19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	18:03 (3) 06:26	18:38 (3) 05:35	05:20	20:52 (2) 05:49	06:37	18:39 (3) 07:28	08:19	08:14	08:47
	17:12	18:09	18:59 25	18:28 (3) 20:52 62	19:40 (3) 21:39	22:04 38	21:30 (1) 21:43	20:47 68	19:47 (3) 19:36	18:29	16:39	16:32
25	08:31	07:36	06:33	18:00 (3) 06:24	18:38 (3) 05:34	05:21	20:53 (2) 05:50	06:39	18:39 (3) 07:29	07:21	08:15	08:47
	17:14	18:11	19:00 32	18:32 (3) 20:53 61	19:39 (3) 21:41	22:04 38	21:31 (1) 21:42	20:45 68	19:47 (3) 19:34	17:27	16:38	16:32
26	08:30	07:34	06:31	17:57 (3) 06:22	18:39 (3) 05:33	05:21	20:53 (2) 05:52	06:41	18:38 (3) 07:31	07:22	08:17	08:47
	17:16	18:13	19:02 37	18:34 (3) 20:55 59	19:38 (3) 21:42	22:04 37	21:30 (2) 21:41	20:43 69	19:47 (3) 19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	17:54 (3) 06:20	18:40 (3) 05:32	21:06 (2) 05:22	20:53 (2) 05:53	06:42	18:38 (3) 07:33	07:24	08:18	08:48
	17:17	18:15	19:04 41	18:35 (3) 20:57 57	19:37 (3) 21:43 4	21:10 (2) 22:04 37	21:30 (2) 21:39	20:40 69	19:47 (3) 19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	17:52 (3) 06:18	18:40 (3) 05:31	21:02 (2) 05:22	20:54 (2) 05:54	06:44	18:37 (3) 07:34	07:26	08:20	08:48
	17:19	18:16	19:06 45	18:37 (3) 20:58 56	19:36 (3) 21:44 11	21:13 (2) 22:04 36	21:30 (2) 21:38	20:38 69	19:46 (3) 19:27	17:21	16:35	16:35
29	08:26		07:24	18:51 (3) 06:16	18:41 (3) 05:30	20:59 (2) 05:23	20:54 (2) 05:56	06:45	18:37 (3) 07:36	07:28	08:21	08:48
	17:21		20:07 48	19:39 (3) 21:00 54	19:35 (3) 21:46 15	21:14 (2) 22:04 36	21:30 (2) 21:36	20:36 69	19:46 (3) 19:24	17:19	16:34	16:36
30	08:24		07:22	18:48 (3) 06:14	18:42 (3) 05:29	20:58 (2) 05:23	20:55 (2) 05:57	06:47	18:36 (3) 07:38	07:30	08:23	08:48
	17:23		20:09 52	19:40 (3) 21:02 52	19:34 (3) 21:47 17	21:15 (2) 22:04 35	21:30 (2) 21:35	20:34 69	19:45 (3) 19:22	17:17	16:34	16:36
31	08:23		07:19	18:47 (3)	05:28	20:56 (2)	05:59	06:49	18:36 (3)	07:31		08:48
	17:25		20:11 54	19:41 (3)	21:48 20	21:16 (2)	21:33	20:31 69	19:45 (3)	17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			348	1910	407	1019	397	1571	1065			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,62	0,62	0,61	0,59	0,59	0,62	0,62			
Total reduction			0,19	0,25	0,25	0,22	0,23	0,24	0,21			
Total, real			67	469	101	221	90	384	227			

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

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

Project:

068379aa - WP Autena

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19-9-2013 15:04 / 3

Licensed user:

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Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 03 - Breede Sticht 1

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March		April	May	June	July	August	September	October		November		December	
1	08:48	15:09 (3)	08:21		16:12 (2)	07:28	17:27 (1)	07:17	06:12	05:27	05:24	06:00	06:50	07:39		18:10 (1)	07:33	15:47 (2)	08:24	
	16:39	17 15:26 (3)	17:27	38	16:50 (2)	18:18	25 17:52 (1)	20:12	21:03	21:49	22:03	21:31	20:29	19:20	20	18:30 (1)	17:13	29 16:16 (2)	16:33	
2	08:48	15:09 (3)	08:20		16:12 (2)	07:26	17:26 (1)	07:15	06:10	05:26	05:25	06:02	06:52	07:41		18:07 (1)	07:35	15:46 (2)	08:26	
	16:40	16 15:25 (3)	17:28	38	16:50 (2)	18:20	28 17:54 (1)	20:14	21:05	21:50	22:03	21:30	20:27	19:17	24	18:31 (1)	17:12	31 16:17 (2)	16:32	
3	08:48	15:10 (3)	08:18		16:12 (2)	07:23	17:26 (1)	07:13	06:08	05:25	05:25	06:04	06:54	07:43		18:05 (1)	07:37	15:45 (2)	08:27	
	16:41	15 15:25 (3)	17:30	37	16:49 (2)	18:22	30 17:56 (1)	20:16	21:07	21:51	22:03	21:28	20:25	19:15	27	18:32 (1)	17:10	33 16:18 (2)	16:32	
4	08:48	15:12 (3)	08:17		16:12 (2)	07:21	17:26 (1)	07:10	06:07	05:25	05:26	06:05	06:55	07:44		18:04 (1)	07:39	15:44 (2)	08:29	
	16:42	13 15:25 (3)	17:32	37	16:49 (2)	18:24	32 17:58 (1)	20:17	21:08	21:53	22:02	21:26	20:22	19:13	29	18:33 (1)	17:08	34 16:18 (2)	16:31	
5	08:48	15:13 (3)	08:15		16:14 (2)	07:19	17:25 (1)	07:08	06:05	05:24	05:27	06:07	06:57	07:46		18:03 (1)	07:40	15:44 (2)	08:30	
	16:43	11 15:24 (3)	17:34	36	16:50 (2)	18:25	33 17:58 (1)	20:19	21:10	21:54	22:02	21:25	20:20	19:10	30	18:33 (1)	17:06	35 16:19 (2)	16:31	
6	08:47	15:16 (3)	08:13		16:14 (2)	07:17	17:25 (1)	07:06	06:03	05:23	05:28	06:08	06:58	07:48		18:02 (1)	07:42	15:43 (2)	08:31	15:03 (3)
	16:44	7 15:23 (3)	17:36	35	16:49 (2)	18:27	33 17:58 (1)	20:21	21:12	21:54	22:01	21:23	20:18	19:08	31	18:33 (1)	17:04	36 16:19 (2)	16:30	5 15:08 (3)
7	08:47		08:12		16:15 (2)	07:15	17:26 (1)	07:03	06:01	05:23	05:29	06:10	07:00	07:49		18:01 (1)	07:44	15:43 (2)	08:32	15:01 (3)
	16:46		17:38	34	16:49 (2)	18:29	31 17:57 (1)	20:23	21:13	21:55	22:01	21:21	20:16	19:06	32	18:33 (1)	17:03	37 16:20 (2)	16:30	9 15:10 (3)
8	08:46		08:10		16:15 (2)	07:12	17:25 (1)	07:01	05:59	05:22	05:29	06:11	07:02	07:51		18:01 (1)	07:46	15:43 (2)	08:34	15:00 (3)
	16:47		17:40	33	16:48 (2)	18:31	31 17:56 (1)	20:24	21:15	21:56	22:00	21:19	20:13	19:04	33	18:34 (1)	17:01	37 16:20 (2)	16:29	12 15:12 (3)
9	08:46		08:08		16:16 (2)	07:10	17:26 (1)	06:59	05:58	05:22	05:30	06:13	07:03	07:53		18:00 (1)	07:48	15:43 (2)	08:35	15:00 (3)
	16:48		17:41	31	16:47 (2)	18:33	29 17:55 (1)	20:26	21:17	21:57	21:59	21:17	20:11	19:01	33	18:33 (1)	16:59	38 16:21 (2)	16:29	14 15:14 (3)
10	08:45		08:06		16:17 (2)	07:08	17:27 (1)	06:57	05:56	05:21	05:31	06:15	07:05	07:55		18:00 (1)	07:49	15:43 (2)	08:36	14:59 (3)
	16:50		17:43	29	16:46 (2)	18:34	27 17:54 (1)	20:28	21:18	21:58	21:59	21:15	20:09	18:59	31	18:31 (1)	16:58	38 16:21 (2)	16:29	16 15:15 (3)
11	08:45		08:04		16:18 (2)	07:06	17:28 (1)	06:54	05:54	05:21	05:32	06:16	07:07	07:56		18:00 (1)	07:51	15:43 (2)	08:37	14:59 (3)
	16:51		17:45	27	16:45 (2)	18:36	25 17:53 (1)	20:29	21:20	21:59	21:58	21:13	20:06	18:57	29	18:29 (1)	16:56	38 16:21 (2)	16:29	17 15:16 (3)
12	08:44		08:03		16:20 (2)	07:03	17:29 (1)	06:52	05:52	05:20	05:34	06:18	07:08	07:58		18:01 (1)	07:53	15:43 (2)	08:38	14:58 (3)
	16:53		17:47	23	16:43 (2)	18:38	22 17:51 (1)	20:31	21:21	21:59	21:57	21:12	20:04	18:55	26	18:27 (1)	16:55	38 16:21 (2)	16:29	19 15:17 (3)
13	08:43	16:20 (2)	08:01		16:22 (2)	07:01	17:31 (1)	06:50	05:51	05:20	05:35	06:19	07:10	08:00		18:00 (1)	07:55	15:43 (2)	08:39	14:58 (3)
	16:54	2 16:21 (2)	17:49	19	16:41 (2)	18:40	18 17:49 (1)	20:33	21:23	22:00	21:56	21:10	20:02	18:52	24	18:24 (1)	16:53	37 16:20 (2)	16:29	20 15:18 (3)
14	08:43	16:18 (2)	07:59		16:25 (2)	06:59	17:34 (1)	06:48	05:49	05:20	05:36	06:21	07:11	08:01		18:01 (1)	07:57	15:43 (2)	08:40	14:58 (3)
	16:56	4 16:22 (2)	17:51	14	16:39 (2)	18:41	13 17:47 (1)	20:35	21:25	22:01	21:55	21:08	19:59	18:50	21	18:22 (1)	16:52	37 16:20 (2)	16:29	20 15:18 (3)
15	08:42	16:17 (2)	07:57			06:56		06:46	05:48	05:20	05:37	06:23	07:13	08:03		18:02 (1)	07:58	15:44 (2)	08:41	14:59 (3)
	16:57	7 16:24 (2)	17:53			18:43		20:36	21:26	22:01	21:54	21:06	19:57	18:48	18	18:20 (1)	16:50	35 16:19 (2)	16:29	20 15:19 (3)
16	08:41	16:16 (2)	07:55			06:54		06:43	05:46	05:20	05:38	06:24	07:15	08:05		18:03 (1)	08:00	15:44 (2)	08:42	14:59 (3)
	16:59	10 16:26 (2)	17:54			18:45		20:38	21:28	22:02	21:53	21:04	19:55	18:46	15	18:18 (1)	16:49	33 16:17 (2)	16:29	21 15:20 (3)
17	08:40	16:15 (2)	07:53			06:52		06:41	05:45	05:19	05:39	06:26	07:16	08:07		18:04 (1)	08:02	15:45 (2)	08:43	14:58 (3)
	17:00	13 16:28 (2)	17:56			18:47		20:40	21:29	22:02	21:52	21:02	19:52	18:44	12	18:16 (1)	16:47	31 16:16 (2)	16:29	22 15:20 (3)
18	08:39	16:15 (2)	07:51			06:50		06:39	05:43	05:19	05:41	06:27	07:18	08:08		18:05 (1)	08:03	15:46 (2)	08:43	14:59 (3)
	17:02	14 16:29 (2)	17:58			18:48		20:41	21:31	22:03	21:51	21:00	19:50	18:42	8	18:13 (1)	16:46	28 16:14 (2)	16:29	22 15:21 (3)
19	08:38	16:14 (2)	07:49			06:47		06:37	05:42	05:20	05:42	06:29	07:20	08:10		18:07 (1)	08:05	15:47 (2)	08:44	15:00 (3)
	17:04	17 16:31 (2)	18:00			18:50		20:43	21:32	22:03	21:50	20:57	19:48	18:39	4	18:11 (1)	16:45	26 16:13 (2)	16:29	22 15:22 (3)
20	08:37	16:13 (2)	07:47			06:45		06:35	05:40	05:20	05:43	06:31	07:21	08:12			08:07	15:48 (2)	08:45	15:00 (3)
	17:05	20 16:33 (2)	18:02			18:52		20:45	21:34	22:03	21:49	20:55	19:45	18:37			16:44	24 16:12 (2)	16:30	22 15:22 (3)
21	08:36	16:13 (2)	07:45			06:43		06:33	05:39	05:20	05:45	06:32	07:23	08:14			08:09	15:49 (2)	08:45	15:00 (3)
	17:07	22 16:35 (2)	18:04			18:53		20:46	21:35	22:04	21:47	20:53	19:43	18:35			16:42	22 16:11 (2)	16:30	23 15:23 (3)
22	08:35	16:13 (2)	07:43			06:40		06:30	05:38	05:20	05:46	06:34	07:24	08:15			08:10	15:49 (2)	08:46	15:00 (3)
	17:09	24 16:37 (2)	18:06			18:55		20:48	21:36	22:04	21:46	20:51	19:41	18:33			16:41	20 16:09 (2)	16:31	23 15:23 (3)
23	08:34	16:12 (2)	07:41		17:36 (1)	06:38		06:28	05:36	05:20	05:47	06:36	07:26	08:17			08:12	15:50 (2)	08:46	15:01 (3)
	17:10	26 16:38 (2)	18:07	5	17:41 (1)	18:57		20:50	21:38	22:04	21:45	20:49	19:38	18:31			16:40	18 16:08 (2)	16:31	23 15:24 (3)
24	08:33	16:12 (2)	07:39		17:33 (1)	06:36		06:26	05:35	05:20	05:49	06:37	07:28	08:19			08:14	15:52 (2)	08:47	15:02 (3)
	17:12	28 16:40 (2)	18:09	9	17:42 (1)	18:59		20:52	21:39	22:04	21:43	20:47	19:36	18:29			16:39	15 16:07 (2)	16:32	22 15:24 (3)
25	08:31	16:12 (2)	07:36		17:31 (1)	06:33		06:24	05:34	05:21	05:50	06:39	07:29	07:21			08:15	15:53 (2)	08:47	15:03 (3)
	17:14	31 16:43 (2)	18:11	13	17:44 (1)	19:00		20:53	21:41	22:04	21:42	20:45	19:34	17:27			16:38	13 16:06 (2)	16:32	22 15:25 (3)
26	08:30	16:11 (2)	07:34		17:30 (1)	06:31		06:22	05:33	05:21	05:51	06:40	07:31	07:22			08:17	15:54 (2)	08:47	15:03 (3)
	17:16	33 16:44 (2)	18:13	16	17:46 (1)	19:02		20:55	21:42	22:04	21:41	20:43	19:31	17:25			16:37	10 16:04 (2)	16:33	22 15:25 (3)
27	08:29	16:12 (2)	07:32		17:29 (1)	06:29		06:20	05:32	05:22	05:53	06:42	07:33	07:24		15:59 (2)	08:18	15:56 (2)	08:48	15:04 (3)
	17:17	35 16:47 (2)	18:15	19	17:48 (1)	19:04		20:57	21:43	22:04	21:39	20:40	19:29	17:23	5	16:04 (2)	16:36	7 16:03 (2)	16:34	21 15:25 (3)
28	08:27	16:11 (2)	07:30		17:28 (1)	06:26		06:18	05:31	05:22	05:54	06:44	07:34	07:26		15:54 (2)	08:20	15:58 (2)	08:48	15:04 (3)
	17:19	37 16:48 (2)	18:16	23	17:51 (1)	19:06		20:58	21:45	22:04	21:38	20:38	19:27	17:21	15	16:09 (2)	16:35	4 16:02 (2)	16:35	21 15:25 (3)
29	08:26	16:12 (2)				07:24		06:16	05:30	05:23	05:56	06:45	07:36	07:28	18:15 (1)	15:52 (2)	08:21	16:00 (2)	08:48	15:05 (3)
	17:21	37 16:49 (2)				20:07		21:00	21:46	22:04	21:36	20:36	19:24	10 18:25 (1)	17:19	19 16:11 (2)	16:34	2 16:01 (2)	16:35	20 15:25 (3)
30	08:24	16:11 (2)				07:22		06:14	05:29	05:23	05:57	06:47	07:38	18:12 (1)	07:30	15:49 (2)	08:23		08:48	15:06 (3)
	17:23	38 16:49 (2)				20:09		21:02	21:47	22:04	21:35	20:34	19:22	16 18:28 (1)	17:17	24 16:13 (2)	16:34		16:36	20 15:26 (3)
31	08:23	16:11 (2)				07:19			05:28		05:59	06:49			07:31	15:48 (2)			08:48	15:07 (3)
	17:25	38 16:49 (2)				20:11			21:48		21:33	20:31			17:15	27 16:15 (2)			16:37	19 15:26 (3)
Potential sun hours	259		277		367		416	485	499	502	454	381	331		266		243			
Total, worst case		515		516		377						26		537		786		497		
Sun reduction		0,24		0,30		0,33						0,36		0,34		0,24		0,20		
Oper. time red.		0,95		0,95		0,95						0,95		0,95		0,95		0,95		
Wind dir. red.		0,68		0,67		0,64						0,64		0,65		0,67		0,69		
Total reduction		0,15		0,19		0,20						0,22		0,21		0,15		0,13		
Total, real		79		99		76						6		112		119		67		

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 4

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 04 - Breede Sticht 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December		
1	08:48	15:23 (2)	08:21		07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	16:23 (1)	08:24		15:10 (2)
	16:39 37	16:00 (2)	17:27		18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13 21	16:44 (1)	16:33	36	15:46 (2)
2	08:48	15:23 (2)	08:20		07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	16:24 (1)	08:26		15:10 (2)
	16:40 36	15:59 (2)	17:28		18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12 18	16:42 (1)	16:32	36	15:46 (2)
3	08:48	15:24 (2)	08:18		07:23	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	16:25 (1)	08:27		15:11 (2)
	16:41 36	16:00 (2)	17:30		18:22	20:16	21:07	21:51	22:03	21:28	20:25	19:15		17:10 15	16:40 (1)	16:32	36	15:47 (2)
4	08:48	15:24 (2)	08:17	17:01 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39	16:26 (1)	08:29		15:10 (2)
	16:42 37	16:01 (2)	17:32 2	17:02 (1)	18:24	20:17	21:08	21:53	22:02	21:26	20:22	19:13		17:08 12	16:38 (1)	16:31	37	15:47 (2)
5	08:48	15:24 (2)	08:15	16:59 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40	16:27 (1)	08:30		15:10 (2)
	16:43 37	16:01 (2)	17:34 6	17:05 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06 9	16:36 (1)	16:31	37	15:47 (2)
6	08:47	15:25 (2)	08:13	16:57 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42	16:29 (1)	08:31		15:11 (2)
	16:44 37	16:02 (2)	17:36 10	17:07 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04 5	16:34 (1)	16:30	37	15:48 (2)
7	08:47	15:25 (2)	08:12	16:56 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44	16:32 (1)	08:32		15:11 (2)
	16:46 37	16:02 (2)	17:38 13	17:09 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03 2	16:33 (1)	16:30	37	15:48 (2)
8	08:46	15:26 (2)	08:10	16:55 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46		08:34		15:11 (2)
	16:47 37	16:03 (2)	17:40 15	17:10 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01		16:29	37	15:48 (2)
9	08:46	15:26 (2)	08:08	16:54 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48		08:35		15:13 (2)
	16:48 37	16:03 (2)	17:41 18	17:12 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59		16:29	36	15:49 (2)
10	08:45	15:27 (2)	08:06	16:53 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49		08:36		15:13 (2)
	16:50 36	16:03 (2)	17:43 21	17:14 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58		16:29	37	15:50 (2)
11	08:45	15:28 (2)	08:04	16:52 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51		08:37		15:13 (2)
	16:51 36	16:04 (2)	17:45 24	17:16 (1)	18:36	20:29	21:20	21:59	21:58	21:13	20:06	18:57		16:56		16:29	37	15:50 (2)
12	08:44	15:28 (2)	08:03	16:52 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53		08:38		15:14 (2)
	16:53 36	16:04 (2)	17:47 26	17:18 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55		16:29	36	15:50 (2)
13	08:43	15:29 (2)	08:01	16:52 (1)	07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00		07:55		08:39		15:14 (2)
	16:54 35	16:04 (2)	17:49 28	17:20 (1)	18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52		16:53		16:29	37	15:51 (2)
14	08:43	15:29 (2)	07:59	16:51 (1)	06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01		07:57		08:40		15:15 (2)
	16:56 35	16:04 (2)	17:51 31	17:22 (1)	18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50		16:52		16:29	36	15:51 (2)
15	08:42	15:30 (2)	07:57	16:51 (1)	06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	17:37 (1)	07:58		08:41		15:15 (2)
	16:57 34	16:04 (2)	17:53 33	17:24 (1)	18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48 6	17:43 (1)	16:50		16:29	37	15:52 (2)
16	08:41	15:31 (2)	07:55	16:51 (1)	06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	17:32 (1)	08:00	15:18 (2)	08:42		15:16 (2)
	16:59 33	16:04 (2)	17:54 34	17:25 (1)	18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46 15	17:47 (1)	16:49 11	15:29 (2)	16:29	36	15:52 (2)
17	08:40	15:32 (2)	07:53	16:51 (1)	06:52	06:41	05:45	05:19	05:39	06:26	07:16	08:07	17:30 (1)	08:02	15:16 (2)	08:43		15:16 (2)
	17:00 32	16:04 (2)	17:56 34	17:25 (1)	18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44 20	17:50 (1)	16:47 16	15:32 (2)	16:29	36	15:52 (2)
18	08:39	15:33 (2)	07:51	16:52 (1)	06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	17:27 (1)	08:03	15:14 (2)	08:43		15:16 (2)
	17:02 31	16:04 (2)	17:58 32	17:24 (1)	18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42 23	17:50 (1)	16:46 20	15:34 (2)	16:29	36	15:52 (2)
19	08:38	15:34 (2)	07:49	16:52 (1)	06:47	06:37	05:42	05:19	05:42	06:29	07:20	08:10	17:26 (1)	08:05	15:13 (2)	08:44		15:17 (2)
	17:04 30	16:04 (2)	18:00 32	17:24 (1)	18:50	20:43	21:32	22:03	21:50	20:57	19:48	18:39 25	17:51 (1)	16:45 23	15:36 (2)	16:29	36	15:53 (2)
20	08:37	15:34 (2)	07:47	16:53 (1)	06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	17:25 (1)	08:07	15:12 (2)	08:45		15:17 (2)
	17:05 29	16:03 (2)	18:02 30	17:23 (1)	18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37 27	17:52 (1)	16:44 25	15:37 (2)	16:30	36	15:53 (2)
21	08:36	15:35 (2)	07:45	16:54 (1)	06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	17:24 (1)	08:09	15:11 (2)	08:45		15:18 (2)
	17:07 27	16:02 (2)	18:04 29	17:23 (1)	18:53	20:46	21:35	22:04	21:47	20:53	19:43	18:35 29	17:53 (1)	16:42 27	15:38 (2)	16:30	36	15:54 (2)
22	08:35	15:37 (2)	07:43	16:55 (1)	06:40	06:30	05:38	05:20	05:46	06:34	07:24	08:15	17:23 (1)	08:10	15:10 (2)	08:46		15:19 (2)
	17:09 25	16:02 (2)	18:06 27	17:22 (1)	18:55	20:48	21:36	22:04	21:46	20:51	19:41	18:33 31	17:54 (1)	16:41 29	15:39 (2)	16:31	36	15:55 (2)
23	08:34	15:38 (2)	07:41	16:56 (1)	06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	17:22 (1)	08:12	15:10 (2)	08:46		15:19 (2)
	17:10 23	16:01 (2)	18:07 25	17:21 (1)	18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31 32	17:54 (1)	16:40 30	15:40 (2)	16:31	36	15:55 (2)
24	08:33	15:40 (2)	07:39	16:56 (1)	06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	17:22 (1)	08:14	15:10 (2)	08:47		15:19 (2)
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25	08:31	15:43 (2)	07:36	16:59 (1)	06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	16:22 (1)	08:15	15:10 (2)	08:47		15:20 (2)
	17:14 16	15:59 (2)	18:11 18	17:17 (1)	19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27 33	16:55 (1)	16:38 32	15:42 (2)	16:32	36	15:56 (2)
26	08:30	15:45 (2)	07:34	17:01 (1)	06:31	06:22	05:33	05:21	05:51	06:40	07:31	07:22	16:22 (1)	08:17	15:09 (2)	08:48		15:20 (2)
	17:16 11	15:56 (2)	18:13 13	17:14 (1)	19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25 33	16:55 (1)	16:37 33	15:42 (2)	16:33	37	15:57 (2)
27	08:29		07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	16:21 (1)	08:18	15:09 (2)	08:48		15:21 (2)
	17:17		18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23 32	16:53 (1)	16:36 34	15:43 (2)	16:34	36	15:57 (2)
28	08:27		07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	16:21 (1)	08:20	15:09 (2)	08:48		15:21 (2)
	17:19		18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21 30	16:51 (1)	16:35 35	15:44 (2)	16:35	36	15:57 (2)
29	08:26				07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	16:21 (1)	08:21	15:09 (2)	08:48		15:21 (2)
	17:21				20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19 28	16:49 (1)	16:34 35	15:44 (2)	16:35	37	15:58 (2)
30	08:24				07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	16:22 (1)	08:23	15:09 (2)	08:48		15:22 (2)
	17:23				20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17 25	16:47 (1)	16:34 36	15:45 (2)	16:36	36	15:58 (2)
31	08:23				07:19		05:28		05:59	06:49		07:31	16:22 (1)			08:48		15:22 (2)
	17:25				20:11		21:48		21:33	20:31		17:15 24	16:46 (1)			16:37	37	15:59 (2)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243		
Total, worst case		820		523									446		499		1128	
Sun reduction		0,24		0,30									0,34		0,24		0,20	
Oper. time red.		0,95		0,95									0,95		0,95		0,95	
Wind dir. red.		0,68		0,67									0,67		0,68		0,68	
Total reduction		0,16		0,19									0,21		0,15		0,13	
Total, real		127		101									95		76		149	

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 5

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 05 - Biezenweg 51

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:48	15:17 (1)	08:21	15:30 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33		08:24	15:01 (1)
	16:39 44	16:01 (1)	17:27 39	16:09 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13		16:33 48	15:49 (1)
2	08:48	15:16 (1)	08:20	15:31 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35		08:26	15:01 (1)
	16:40 45	16:01 (1)	17:28 37	16:08 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12		16:32 48	15:49 (1)
3	08:48	15:17 (1)	08:18	15:32 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37	15:14 (1)	08:27	15:02 (1)
	16:41 45	16:02 (1)	17:30 35	16:07 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10 13	15:27 (1)	16:32 48	15:50 (1)
4	08:48	15:17 (1)	08:17	15:34 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39	15:11 (1)	08:29	15:03 (1)
	16:42 46	16:03 (1)	17:32 31	16:05 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08 19	15:30 (1)	16:31 47	15:50 (1)
5	08:48	15:17 (1)	08:15	15:37 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40	15:08 (1)	08:30	15:03 (1)
	16:43 46	16:03 (1)	17:34 28	16:05 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06 25	15:33 (1)	16:31 46	15:49 (1)
6	08:47	15:18 (1)	08:13	15:39 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42	15:06 (1)	08:31	15:04 (1)
	16:44 46	16:04 (1)	17:36 24	16:03 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04 29	15:35 (1)	16:30 46	15:50 (1)
7	08:47	15:18 (1)	08:12	15:42 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44	15:04 (1)	08:32	15:04 (1)
	16:46 46	16:04 (1)	17:38 18	16:00 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03 32	15:36 (1)	16:30 46	15:50 (1)
8	08:46	15:18 (1)	08:10	15:46 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46	15:03 (1)	08:34	15:05 (1)
	16:47 47	16:05 (1)	17:40 10	15:56 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01 35	15:38 (1)	16:29 45	15:50 (1)
9	08:46	15:18 (1)	08:08		07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48	15:02 (1)	08:35	15:06 (1)
	16:48 48	16:06 (1)	17:41		18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59 37	15:39 (1)	16:29 45	15:51 (1)
10	08:45	15:18 (1)	08:06		07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49	15:01 (1)	08:36	15:06 (1)
	16:50 48	16:06 (1)	17:43		18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58 39	15:40 (1)	16:29 45	15:51 (1)
11	08:45	15:19 (1)	08:04		07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51	15:00 (1)	08:37	15:07 (1)
	16:51 48	16:07 (1)	17:45		18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56 41	15:41 (1)	16:29 44	15:51 (1)
12	08:44	15:19 (1)	08:03		07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53	15:00 (1)	08:38	15:07 (1)
	16:53 49	16:08 (1)	17:47		18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55 42	15:42 (1)	16:29 44	15:51 (1)
13	08:43	15:20 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55	14:59 (1)	08:39	15:08 (1)
	16:54 48	16:08 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53 44	15:43 (1)	16:29 44	15:52 (1)
14	08:43	15:20 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57	14:58 (1)	08:40	15:09 (1)
	16:56 49	16:09 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52 44	15:42 (1)	16:29 43	15:52 (1)
15	08:42	15:20 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58	14:58 (1)	08:41	15:09 (1)
	16:57 49	16:09 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50 45	15:43 (1)	16:29 43	15:52 (1)
16	08:41	15:20 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00	14:57 (1)	08:42	15:10 (1)
	16:59 49	16:09 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49 47	15:44 (1)	16:29 43	15:53 (1)
17	08:40	15:21 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02	14:57 (1)	08:43	15:11 (1)
	17:00 49	16:10 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47 48	15:45 (1)	16:29 43	15:54 (1)
18	08:39	15:21 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04	14:57 (1)	08:43	15:10 (1)
	17:02 49	16:10 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46 48	15:45 (1)	16:29 43	15:53 (1)
19	08:38	15:22 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05	14:58 (1)	08:44	15:11 (1)
	17:04 49	16:11 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45 48	15:46 (1)	16:29 43	15:54 (1)
20	08:37	15:21 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07	14:58 (1)	08:45	15:12 (1)
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	17:09 48	16:11 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41 49	15:46 (1)	16:31 43	15:56 (1)
23	08:34	15:23 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12	14:58 (1)	08:46	15:13 (1)
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	17:12 48	16:11 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	16:39 49	15:47 (1)	16:32 43	15:56 (1)
25	08:31	15:24 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15	14:59 (1)	08:47	15:14 (1)
	17:14 48	16:12 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38 49	15:48 (1)	16:32 43	15:57 (1)
26	08:30	15:25 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17	14:58 (1)	08:48	15:15 (1)
	17:16 46	16:11 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37 49	15:47 (1)	16:33 42	15:57 (1)
27	08:29	15:26 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18	14:59 (1)	08:48	15:15 (1)
	17:17 45	16:11 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36 49	15:48 (1)	16:34 43	15:58 (1)
28	08:27	15:26 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20	15:00 (1)	08:48	15:15 (1)
	17:19 45	16:11 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35 49	15:49 (1)	16:35 43	15:58 (1)
29	08:26	15:27 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21	15:00 (1)	08:48	15:15 (1)
	17:21 44	16:11 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34 48	15:48 (1)	16:36 44	15:59 (1)
30	08:24	15:28 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23	15:00 (1)	08:48	15:16 (1)
	17:23 42	16:10 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34 49	15:49 (1)	16:36 43	15:59 (1)
31	08:23	15:29 (1)			07:19		05:28		05:59	06:49		07:31			08:48	15:16 (1)
	17:25 40	16:09 (1)			20:11		21:48		21:33	20:31		17:15			16:37 44	16:00 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331	266		243	
Total, worst case	1452		222										1173		1371	
Sun reduction	0,24		0,30										0,24		0,20	
Oper. time red.	0,95		0,95										0,95		0,95	
Wind dir. red.	0,68		0,68										0,68		0,68	
Total reduction	0,15		0,20										0,15		0,13	
Total, real	225		43										179		180	

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 6

Licensed user:
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Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 06 - Biezenweg 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January			February			March	April	May	June	July	August	September	October	November			December		
1	08:48		14:59 (1)	08:21		15:25 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33			08:24		14:45 (1)
	16:39	49	15:48 (1)	17:27	20	15:45 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13			16:33	50	15:35 (1)
2	08:48		14:59 (1)	08:20		15:29 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35			08:26		14:45 (1)
	16:40	49	15:48 (1)	17:28	12	15:41 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12			16:32	50	15:35 (1)
3	08:48		14:59 (1)	08:18			07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37			08:27		14:46 (1)
	16:41	50	15:49 (1)	17:30			18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10			16:32	50	15:36 (1)
4	08:48		15:00 (1)	08:17			07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39			08:29		14:46 (1)
	16:42	50	15:50 (1)	17:32			18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08			16:31	50	15:36 (1)
5	08:48		15:00 (1)	08:15			07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40			08:30		14:46 (1)
	16:43	50	15:50 (1)	17:34			18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06			16:31	50	15:36 (1)
6	08:47		15:01 (1)	08:13			07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42			08:31		14:47 (1)
	16:44	50	15:51 (1)	17:36			18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04			16:30	50	15:37 (1)
7	08:47		15:01 (1)	08:12			07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44			08:32		14:47 (1)
	16:46	50	15:51 (1)	17:38			18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03			16:30	50	15:37 (1)
8	08:46		15:02 (1)	08:10			07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46			08:34		14:47 (1)
	16:47	50	15:52 (1)	17:40			18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01			16:29	50	15:37 (1)
9	08:46		15:02 (1)	08:08			07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48		14:59 (1)	08:35		14:48 (1)
	16:48	50	15:52 (1)	17:41			18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59	13	15:12 (1)	16:29	50	15:38 (1)
10	08:45		15:02 (1)	08:06			07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49		14:56 (1)	08:36		14:49 (1)
	16:50	50	15:52 (1)	17:43			18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58	20	15:16 (1)	16:29	49	15:38 (1)
11	08:45		15:03 (1)	08:04			07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51		14:53 (1)	08:37		14:49 (1)
	16:51	50	15:53 (1)	17:45			18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56	25	15:18 (1)	16:29	50	15:39 (1)
12	08:44		15:04 (1)	08:03			07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53		14:52 (1)	08:38		14:49 (1)
	16:53	49	15:53 (1)	17:47			18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55	28	15:20 (1)	16:29	50	15:39 (1)
13	08:43		15:04 (1)	08:01			07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55		14:50 (1)	08:39		14:50 (1)
	16:54	49	15:53 (1)	17:49			18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53	32	15:22 (1)	16:29	49	15:39 (1)
14	08:43		15:04 (1)	07:59			06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57		14:48 (1)	08:40		14:50 (1)
	16:56	49	15:53 (1)	17:51			18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52	34	15:22 (1)	16:29	50	15:40 (1)
15	08:42		15:05 (1)	07:57			06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58		14:47 (1)	08:41		14:51 (1)
	16:57	48	15:53 (1)	17:53			18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50	36	15:23 (1)	16:29	49	15:40 (1)
16	08:41		15:05 (1)	07:55			06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00		14:46 (1)	08:42		14:52 (1)
	16:59	49	15:54 (1)	17:54			18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49	39	15:25 (1)	16:29	49	15:41 (1)
17	08:40		15:06 (1)	07:53			06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02		14:46 (1)	08:43		14:52 (1)
	17:00	48	15:54 (1)	17:56			18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47	40	15:26 (1)	16:29	49	15:41 (1)
18	08:39		15:07 (1)	07:51			06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04		14:45 (1)	08:43		14:52 (1)
	17:02	47	15:54 (1)	17:58			18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46	42	15:27 (1)	16:29	49	15:41 (1)
19	08:38		15:08 (1)	07:49			06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05		14:45 (1)	08:44		14:53 (1)
	17:04	46	15:54 (1)	18:00			18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45	43	15:28 (1)	16:29	49	15:42 (1)
20	08:37		15:08 (1)	07:47			06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07		14:45 (1)	08:45		14:54 (1)
	17:05	45	15:53 (1)	18:02			18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44	43	15:28 (1)	16:30	49	15:43 (1)
21	08:36		15:09 (1)	07:45			06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09		14:45 (1)	08:45		14:54 (1)
	17:07	44	15:53 (1)	18:04			18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42	44	15:29 (1)	16:30	49	15:43 (1)
22	08:35		15:10 (1)	07:43			06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10		14:44 (1)	08:46		14:55 (1)
	17:09	43	15:53 (1)	18:06			18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41	45	15:29 (1)	16:31	49	15:44 (1)
23	08:34		15:10 (1)	07:41			06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12		14:44 (1)	08:46		14:55 (1)
	17:10	43	15:53 (1)	18:07			18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40	46	15:30 (1)	16:31	49	15:44 (1)
24	08:33		15:11 (1)	07:39			06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14		14:44 (1)	08:47		14:55 (1)
	17:12	42	15:53 (1)	18:09			18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	16:39	47	15:31 (1)	16:32	49	15:44 (1)
25	08:31		15:13 (1)	07:36			06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15		14:44 (1)	08:47		14:56 (1)
	17:14	40	15:53 (1)	18:11			19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38	48	15:32 (1)	16:32	49	15:45 (1)
26	08:30		15:13 (1)	07:34			06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17		14:44 (1)	08:48		14:56 (1)
	17:16	39	15:52 (1)	18:13			19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37	48	15:32 (1)	16:33	49	15:45 (1)
27	08:29		15:15 (1)	07:32			06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18		14:44 (1)	08:48		14:57 (1)
	17:17	36	15:51 (1)	18:15			19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36	48	15:32 (1)	16:34	49	15:46 (1)
28	08:27		15:16 (1)	07:30			06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20		14:44 (1)	08:48		14:57 (1)
	17:19	34	15:50 (1)	18:16			19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35	49	15:33 (1)	16:35	49	15:46 (1)
29	08:26		15:18 (1)				07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21		14:44 (1)	08:48		14:57 (1)
	17:21	32	15:50 (1)				20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34	49	15:33 (1)	16:36	50	15:47 (1)
30	08:24		15:20 (1)				07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23		14:45 (1)	08:48		14:58 (1)
	17:23	28	15:48 (1)				20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34	49	15:34 (1)	16:36	49	15:47 (1)
31	08:23		15:22 (1)				07:19		05:28		05:59	06:49		07:31				08:48		14:58 (1)
	17:25	24	15:46 (1)				20:11		21:48		21:33	20:31		17:15				16:37	50	15:48 (1)
Potential sun hours	259			277			367	416	485	499	502	454	381	331	266			243		
Total, worst case		1383			32											868			1533	
Sun reduction		0,24			0,30											0,24			0,20	
Oper. time red.		0,95			0,95											0,95			0,95	
Wind dir. red.		0,69			0,69											0,69			0,69	
Total reduction		0,16			0,20											0,15			0,13	
Total, real		217			6											134			204	

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

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

Project:

068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 7

Licensed user:
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Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 07 - Autenasekade 05

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18	07:51 (3) 6 / 07:57 (3)	07:17 / 20:12	07:40 (2) 16 / 07:56 (2)	06:12 / 21:03	06:37 (1) 18 / 06:55 (1)	05:27 / 21:49	06:31 (1) 21 / 06:52 (1)	05:24 / 22:03	06:01 / 21:31	06:31 (1) 39 / 07:10 (1)	06:50 / 20:29	07:26 (2) 26 / 07:52 (2)	07:39 / 19:20	08:14 (3) 23 / 08:37 (3)	07:33 / 17:14	08:24 / 16:33
2	08:48 / 16:40	08:20 / 17:28	07:26 / 18:20	07:49 (3) 10 / 07:59 (3)	07:15 / 20:14	07:38 (2) 19 / 07:57 (2)	06:10 / 21:05	06:35 (1) 21 / 06:56 (1)	05:26 / 21:50	06:32 (1) 19 / 06:51 (1)	05:25 / 22:03	06:02 / 21:30	06:32 (1) 38 / 07:10 (1)	06:52 / 20:27	07:25 (2) 28 / 07:53 (2)	07:41 / 19:17	08:12 (3) 25 / 08:37 (3)	07:35 / 17:12	08:26 / 16:32
3	08:48 / 16:41	08:18 / 17:30	07:24 / 18:22	07:47 (3) 13 / 08:00 (3)	07:13 / 20:16	07:35 (2) 22 / 07:57 (2)	06:09 / 21:07	06:33 (1) 23 / 06:56 (1)	05:25 / 21:52	06:33 (1) 17 / 06:50 (1)	05:25 / 22:03	06:04 / 21:28	06:32 (1) 37 / 07:09 (1)	06:54 / 20:25	07:25 (2) 29 / 07:54 (2)	07:43 / 19:15	08:11 (3) 27 / 08:38 (3)	07:37 / 17:10	08:27 / 16:32
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24	07:45 (3) 16 / 08:01 (3)	07:10 / 20:18	07:33 (2) 24 / 07:57 (2)	06:07 / 21:08	06:31 (1) 26 / 06:57 (1)	05:25 / 21:53	06:34 (1) 16 / 06:50 (1)	05:26 / 22:02	06:05 / 21:26	06:34 (1) 36 / 07:10 (1)	06:55 / 20:23	07:24 (2) 29 / 07:53 (2)	07:44 / 19:13	08:11 (3) 27 / 08:38 (3)	07:39 / 17:08	08:29 / 16:31
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:26	07:42 (3) 18 / 08:00 (3)	07:08 / 20:19	07:31 (2) 27 / 07:58 (2)	06:05 / 21:10	06:30 (1) 28 / 06:58 (1)	05:24 / 21:54	06:35 (1) 13 / 06:48 (1)	05:27 / 22:02	06:46 (1) 5 / 06:51 (1)	06:07 / 21:25	06:35 (1) 34 / 07:09 (1)	06:57 / 20:20	07:23 (2) 31 / 07:54 (2)	07:46 / 19:11	08:11 (3) 26 / 08:37 (3)	07:41 / 17:06	08:30 / 16:31
6	08:47 / 16:44	08:13 / 17:36	07:17 / 18:27	07:40 (3) 21 / 08:01 (3)	07:06 / 20:21	07:28 (2) 29 / 07:57 (2)	06:03 / 21:12	06:28 (1) 30 / 06:58 (1)	05:23 / 21:55	06:37 (1) 11 / 06:48 (1)	05:28 / 22:01	06:43 (1) 9 / 06:52 (1)	06:08 / 21:23	06:37 (1) 32 / 07:09 (1)	06:59 / 20:18	07:24 (2) 29 / 07:53 (2)	07:48 / 19:08	08:13 (3) 24 / 08:37 (3)	07:42 / 17:05	08:31 / 16:30
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29	07:38 (3) 23 / 08:01 (3)	07:04 / 20:23	07:26 (2) 31 / 07:57 (2)	06:01 / 21:13	06:26 (1) 33 / 06:59 (1)	05:23 / 21:55	06:39 (1) 7 / 06:46 (1)	05:29 / 22:01	06:42 (1) 12 / 06:54 (1)	06:10 / 21:21	06:38 (1) 30 / 07:08 (1)	07:00 / 20:16	07:26 (2) 27 / 07:53 (2)	07:50 / 19:06	08:15 (3) 22 / 08:37 (3)	07:44 / 17:03	08:32 / 16:30
8	08:46 / 16:47	08:10 / 17:40	07:12 / 18:31	07:36 (3) 25 / 08:01 (3)	07:01 / 20:24	07:27 (2) 29 / 07:56 (2)	05:59 / 21:15	06:25 (1) 35 / 07:00 (1)	05:22 / 21:56	05:30 / 22:00	06:41 (1) 15 / 06:56 (1)	06:11 / 21:19	06:40 (1) 28 / 07:08 (1)	07:02 / 20:13	07:27 (2) 25 / 07:52 (2)	07:51 / 19:04	08:17 (3) 20 / 08:37 (3)	07:46 / 17:01	08:34 / 16:30
9	08:46 / 16:48	08:08 / 17:42	07:10 / 18:33	07:33 (3) 27 / 08:00 (3)	06:59 / 20:26	07:27 (2) 29 / 07:56 (2)	05:58 / 21:17	06:23 (1) 36 / 06:59 (1)	05:22 / 21:57	05:31 / 21:59	06:40 (1) 17 / 06:57 (1)	06:13 / 21:17	06:41 (1) 25 / 07:03 (1)	07:03 / 20:11	07:29 (2) 22 / 07:51 (2)	07:53 / 19:01	08:18 (3) 17 / 08:35 (3)	07:48 / 17:00	08:35 / 16:29
10	08:45 / 16:50	08:06 / 17:43	07:08 / 18:34	07:33 (3) 27 / 08:00 (3)	06:57 / 20:28	07:27 (2) 28 / 07:55 (2)	05:56 / 21:18	06:21 (1) 38 / 06:59 (1)	05:21 / 21:58	05:32 / 21:59	06:40 (1) 18 / 06:58 (1)	06:15 / 21:15	06:43 (1) 23 / 07:06 (1)	07:05 / 20:09	07:31 (2) 20 / 07:51 (2)	07:55 / 18:59	08:20 (3) 14 / 08:34 (3)	07:50 / 16:58	08:36 / 16:29
11	08:45 / 16:51	08:04 / 17:45	07:06 / 18:36	07:34 (3) 26 / 08:00 (3)	06:54 / 20:30	07:27 (2) 26 / 07:53 (2)	05:54 / 21:20	06:22 (1) 38 / 07:00 (1)	05:21 / 21:59	05:33 / 21:58	06:39 (1) 20 / 06:59 (1)	06:16 / 21:14	06:44 (1) 20 / 07:04 (1)	07:07 / 20:06	07:32 (2) 17 / 07:49 (2)	07:56 / 18:57	08:22 (3) 11 / 08:33 (3)	07:51 / 16:56	08:37 / 16:29
12	08:44 / 16:53	08:03 / 17:47	07:03 / 18:38	07:34 (3) 24 / 07:58 (3)	06:52 / 20:31	07:28 (2) 24 / 07:52 (2)	05:53 / 21:21	06:21 (1) 38 / 06:59 (1)	05:21 / 21:59	05:34 / 21:57	06:38 (1) 22 / 07:00 (1)	06:18 / 21:12	06:46 (1) 17 / 07:03 (1)	07:08 / 20:04	07:34 (2) 14 / 07:48 (2)	07:58 / 18:55	08:24 (3) 8 / 08:32 (3)	07:53 / 16:55	08:38 / 16:29
13	08:44 / 16:54	08:01 / 17:49	07:01 / 18:40	07:35 (3) 22 / 07:57 (3)	06:50 / 20:33	07:29 (2) 22 / 07:51 (2)	05:51 / 21:23	06:21 (1) 39 / 07:00 (1)	05:20 / 22:00	05:35 / 21:56	06:37 (1) 24 / 07:01 (1)	06:19 / 21:10	06:47 (1) 14 / 07:01 (1)	07:10 / 20:02	07:35 (2) 10 / 07:45 (2)	08:00 / 18:53	08:25 (3) 4 / 08:29 (3)	07:55 / 16:53	08:39 / 16:29
14	08:43 / 16:56	07:59 / 17:51	06:59 / 18:41	07:36 (3) 19 / 07:55 (3)	06:48 / 20:35	07:30 (2) 19 / 07:49 (2)	05:49 / 21:25	06:21 (1) 38 / 06:59 (1)	05:20 / 22:01	05:36 / 21:55	06:37 (1) 25 / 07:02 (1)	06:21 / 21:08	06:49 (1) 10 / 06:59 (1)	07:12 / 19:59	07:37 (2) 7 / 07:44 (2)	08:01 / 18:50		07:57 / 16:52	08:40 / 16:29
15	08:42 / 16:57	07:57 / 17:53	06:57 / 18:43	07:37 (3) 15 / 07:52 (3)	06:46 / 20:36	07:32 (2) 15 / 07:47 (2)	05:48 / 21:26	06:21 (1) 38 / 06:59 (1)	05:20 / 22:01	05:37 / 21:54	06:36 (1) 27 / 07:03 (1)	06:23 / 21:06	06:50 (1) 6 / 06:56 (1)	07:13 / 19:57	07:38 (2) 2 / 07:40 (2)	08:03 / 18:48		07:58 / 16:50	08:41 / 16:29
16	08:41 / 16:59	07:55 / 17:55	06:54 / 18:45	07:40 (3) 10 / 07:50 (3)	06:43 / 20:38	07:35 (2) 9 / 07:44 (2)	05:46 / 21:28	06:22 (1) 38 / 07:00 (1)	05:20 / 22:02	05:38 / 21:53	06:36 (1) 28 / 07:04 (1)	06:24 / 21:04		07:15 / 19:55		08:05 / 18:46		08:00 / 16:49	08:42 / 16:29
17	08:40 / 17:00	07:53 / 17:56	06:52 / 18:47		06:41 / 20:40		05:45 / 21:29	06:21 (1) 38 / 06:59 (1)	05:20 / 22:02	05:39 / 21:52	06:36 (1) 29 / 07:05 (1)	06:26 / 21:02		07:16 / 19:52		08:07 / 18:44		08:02 / 16:48	08:43 / 16:29
18	08:39 / 17:02	07:51 / 17:58	06:50 / 18:48		06:39 / 20:41		05:43 / 21:31	06:22 (1) 37 / 06:59 (1)	05:20 / 22:03	05:41 / 21:51	06:35 (1) 31 / 07:06 (1)	06:28 / 21:00		07:18 / 19:50		08:08 / 18:42		08:04 / 16:46	08:43 / 16:29
19	08:38 / 17:04	07:49 / 18:00	06:47 / 18:50		06:37 / 20:43		05:42 / 21:32	06:23 (1) 36 / 06:59 (1)	05:20 / 22:03	05:42 / 21:50	06:35 (1) 31 / 07:06 (1)	06:29 / 20:58		07:20 / 19:48		08:10 / 18:40		08:05 / 16:45	08:44 / 16:30
20	08:37 / 17:05	07:47 / 18:02	06:45 / 18:52		06:35 / 20:45		05:40 / 21:34	06:22 (1) 36 / 06:58 (1)	05:20 / 22:03	05:43 / 21:49	06:34 (1) 33 / 07:07 (1)	06:31 / 20:55		07:21 / 19:45		08:12 / 18:37		08:07 / 16:44	08:45 / 16:30
21	08:36 / 17:07	07:45 / 18:04	06:43 / 18:54		06:33 / 20:47		05:39 / 21:35	06:23 (1) 35 / 06:58 (1)	05:20 / 22:04	05:45 / 21:47	06:33 (1) 34 / 07:07 (1)	06:32 / 20:53		07:23 / 19:43		08:14 / 18:35		08:09 / 16:43	08:45 / 16:30
22	08:35 / 17:09	07:43 / 18:06	06:40 / 18:55		06:31 / 20:48		05:38 / 21:37	06:23 (1) 35 / 06:58 (1)	05:20 / 22:04	05:46 / 21:46	06:34 (1) 34 / 07:08 (1)	06:34 / 20:51		07:25 / 19:41		08:15 / 18:33		08:10 / 16:41	08:46 / 16:31
23	08:34 / 17:10	07:41 / 18:07	06:38 / 18:57		06:28 / 20:50		05:37 / 21:38	06:24 (1) 33 / 06:57 (1)	05:20 / 22:04	05:47 / 21:45	06:33 (1) 35 / 07:08 (1)	06:36 / 20:49		07:26 / 19:38		08:17 / 18:31		08:12 / 16:40	08:46 / 16:31
24	08:33 / 17:12	07:39 / 18:09	06:36 / 18:59		06:26 / 20:52		05:35 / 21:39	06:25 (1) 32 / 06:57 (1)	05:21 / 22:04	05:49 / 21:44	06:33 (1) 35 / 07:08 (1)	06:37 / 20:47		07:28 / 19:36		08:19 / 18:29		08:14 / 16:39	08:47 / 16:32
25	08:31 / 17:14	07:37 / 18:11	06:33 / 19:00		06:24 / 20:53		05:34 / 21:41	06:25 (1) 31 / 06:56 (1)	05:21 / 22:04	05:50 / 21:42	06:33 (1) 37 / 07:10 (1)	06:39 / 20:45		07:29 / 19:34		08:21 / 18:27		08:15 / 16:38	08:47 / 16:33
26	08:30 / 17:16	07:34 / 18:13	06:31 / 19:02		06:22 / 20:55		05:33 / 21:42	06:26 (1) 30 / 06:56 (1)	05:21 / 22:04	05:52 / 21:41	06:32 (1) 37 / 07:09 (1)	06:41 / 20:43		07:31 / 19:31		08:23 / 18:25		08:17 / 16:37	08:48 / 16:33
27	08:29 / 17:18	07:32 / 18:15	06:29 / 19:04		06:20 / 20:57 2	06:44 (1) 05:32 / 06:45 (1) 21:43	28	06:27 (1) 05:22 / 06:55 (1) 22:04		05:53 / 21:39	06:32 (1) 37	06:42 / 20:40	10	07:33 / 19:29	7	08:23 (3) 07:24 / 08:30 (3) 17:23		08:18 / 16:36	08:48 / 16:34
28	08:27 / 17:19	07:30 / 18:17 2	07:54 (3) / 07:55 (3)	06:26 / 19:06	06:18 / 20:58 7	06:42 (1) 05:31 / 06:49 (1) 21:45	28	06:27 (1) 05:22 / 06:55 (1) 22:04		05:55 / 21:38	06:32 (1) 38	06:44 / 20:38	16	07:32 (2) 27:34 / 07:48 (2) 19:27	13	08:20 (3) 07:26 / 08:33 (3) 17:21		08:20 / 16:35	08:48 / 16:35
29	08:26 / 17:21			07:24 / 20:07 6	07:47 (2) / 07:53 (2)	06:16 / 21:00 11	06:40 (1) 05:30 / 06:51 (1) 21:46	26	06:28 (1) 05:23 / 06:54 (1) 22:04		05:56 / 21:36	06:32 (1) 38	06:45 / 20:36	19	07:31 (2) 07:36 / 07:50 (2) 19:24	18	08:16 (3) 07:28 / 08:34 (3) 17:19		08:21 / 16:35	08:48 / 16:36
30	08:24 / 17:23			07:22 / 20:09 10	07:44 (2) / 07:54 (2)	06:14 / 21:02 15	06:39 (1) 05:29 / 06:54 (1) 21:47	24	06:29 (1) 05:23 / 06:53 (1) 22:04		05:58 / 21:35	06:32 (1) 39	06:47 / 20:34	23	07:28 (2) 07:38 / 07:51 (2) 19:22	21	08:15 (3) 07:30 / 08:36 (3) 17:17		08:23 / 16:34	08:48 / 16:37
31	08:23 / 17:25			07:20 / 20:11 13	07:42 (2) / 07:55 (2)		05:28 / 21:48 23		06:29 (1) / 06:52 (1)		05:59 / 21:33	06:32 (1) 38	06:49 / 20:32	25	07:27 (2) / 07:52 (2)		07:32 / 17:15		08:48 / 16:37	
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case		2	331	404	989	104	748	482	375	248		
Sun reduction		0,30	0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34		
Oper. time red.		0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95		
Wind dir. red.		0,58	0,58	0,63	0,66	0,66	0,66	0,65	0,62	0,58		
Total reduction		0,16	0,18	0,25	0,27	0,24	0,25	0,26	0,21	0,18		
Total, real		0	60	100	262	25	189	123	79	45		

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 8

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 08 - Bolgerijsekade 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18	07:17 / 20:12 5	07:40 (3) / 21:03 18	06:37 (2) / 21:49 20	05:27 / 05:56 (1) / 22:03 20	05:24 / 06:00 (1) / 21:31	06:01 / 06:50 / 20:29 7	07:28 (3) / 07:35 (3) / 19:20	07:39 / 17:14	07:33 / 16:33	08:24
2	08:48 / 16:40	08:20 / 17:29	07:26 / 18:20	07:15 / 20:14 8	07:38 (3) / 06:10 / 07:46 (3) / 21:05 19	06:36 (2) / 05:26 / 06:55 (2) / 21:50 21	05:55 (1) / 05:25 / 06:16 (1) / 22:03 21	05:59 (1) / 06:02 / 06:20 (1) / 21:30	06:52 / 20:27 12	07:26 (3) / 07:38 (3) / 19:17	07:41 / 17:12	07:35 / 16:32	08:26
3	08:48 / 16:41	08:18 / 17:30	07:24 / 18:22	07:13 / 20:16 10	07:35 (3) / 06:09 / 07:45 (3) / 21:07 16	06:37 (2) / 05:25 / 06:53 (2) / 21:52 22	05:54 (1) / 05:25 / 06:16 (1) / 22:03 21	06:00 (1) / 06:04 / 06:21 (1) / 21:28	06:54 / 20:25 16	07:24 (3) / 07:40 (3) / 19:15	07:43 / 17:10	07:37 / 16:32	08:27
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24	07:10 / 20:18 13	07:33 (3) / 06:07 / 07:46 (3) / 21:08 14	06:38 (2) / 05:25 / 06:52 (2) / 21:53 22	05:54 (1) / 05:26 / 06:16 (1) / 22:02 21	06:00 (1) / 06:05 / 06:21 (1) / 21:26	06:55 / 20:23 18	07:22 (3) / 07:40 (3) / 19:13	07:44 / 17:08	07:39 / 16:31	08:29
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:26	07:08 / 20:19 14	07:31 (3) / 06:05 / 07:45 (3) / 21:10 11	06:40 (2) / 05:24 / 06:51 (2) / 21:54 23	05:53 (1) / 05:27 / 06:16 (1) / 22:02 22	06:00 (1) / 06:07 / 06:22 (1) / 21:25	06:57 / 20:20 18	07:23 (3) / 07:41 (3) / 19:11	07:46 / 17:06	07:41 / 16:31	08:30
6	08:47 / 16:45	08:13 / 17:36	07:17 / 18:27	07:06 / 20:21 16	07:29 (3) / 06:03 / 07:45 (3) / 21:12 6	06:42 (2) / 05:23 / 06:48 (2) / 21:55 22	05:54 (1) / 05:28 / 06:16 (1) / 22:01 22	05:59 (1) / 06:08 / 06:21 (1) / 21:23	06:59 / 20:18 16	07:24 (3) / 07:40 (3) / 19:08	07:48 / 17:05	07:42 / 16:30	08:31
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29	07:04 / 20:23 18	07:26 (3) / 06:01 / 07:44 (3) / 21:13	05:23 / 05:54 (1) / 21:55 22	05:29 / 06:16 (1) / 22:01 23	05:59 (1) / 06:10 / 06:22 (1) / 21:21 8	06:50 (2) / 07:00 / 06:58 (2) / 20:16 15	07:26 (3) / 07:50 / 07:41 (3) / 19:06	07:44 / 17:03	07:32 / 16:30	08:32
8	08:47 / 16:47	08:10 / 17:40	07:12 / 18:31	07:01 / 20:24 18	07:25 (3) / 05:59 / 07:43 (3) / 21:15	05:22 / 05:55 (1) / 21:56 21	05:30 / 06:16 (1) / 22:00 22	06:00 (1) / 06:12 / 06:22 (1) / 21:19 12	06:49 (2) / 07:02 / 07:01 (2) / 20:13 13	07:27 (3) / 07:51 / 07:40 (3) / 19:04	07:46 / 17:01	07:34 / 16:30	08:34
9	08:46 / 16:48	08:08 / 17:42	07:10 / 18:33	06:59 / 20:26 16	07:26 (3) / 05:58 / 07:42 (3) / 21:17	05:22 / 05:54 (1) / 21:57 22	05:31 / 06:16 (1) / 21:59 22	06:01 (1) / 06:13 / 06:23 (1) / 21:17 15	06:47 (2) / 07:03 / 07:02 (2) / 20:11 11	07:29 (3) / 07:53 / 07:40 (3) / 19:01	07:48 / 17:00	07:35 / 16:29	08:35
10	08:45 / 16:50	08:06 / 17:43	07:08 / 18:34	06:57 / 20:28 12	07:28 (3) / 05:56 / 07:40 (3) / 21:18	05:21 / 06:16 (1) / 21:58 21	05:55 (1) / 05:32 / 06:16 (1) / 21:59 21	06:02 (1) / 06:15 / 06:23 (1) / 21:15 17	06:46 (2) / 07:05 / 07:03 (2) / 20:09 8	07:31 (3) / 07:55 / 07:39 (3) / 18:59	07:50 / 16:58	07:36 / 16:29	08:36
11	08:45 / 16:51	08:04 / 17:45	07:06 / 18:36	06:55 / 20:30 6	07:30 (3) / 05:54 / 07:36 (3) / 21:20	05:21 / 06:16 (1) / 21:59 20	05:56 (1) / 05:33 / 06:16 (1) / 21:58 20	06:03 (1) / 06:16 / 06:23 (1) / 21:14 18	06:45 (2) / 07:07 / 07:03 (2) / 20:06 5	07:32 (3) / 07:56 / 07:37 (3) / 18:57	07:51 / 16:56	07:37 / 16:29	08:37
12	08:44 / 16:53	08:03 / 17:47	07:03 / 18:38	06:52 / 20:31	05:53 / 21:21	05:21 / 06:15 (1) / 21:59 20	05:55 (1) / 05:34 / 06:15 (1) / 21:57 20	06:04 (1) / 06:18 / 06:24 (1) / 21:12 18	06:46 (2) / 07:08 / 07:04 (2) / 20:04 2	07:34 (3) / 07:58 / 07:36 (3) / 18:55	07:53 / 16:55	07:38 / 16:29	08:38
13	08:44 / 16:54	08:01 / 17:49	07:01 / 18:40	06:50 / 20:33	05:51 / 21:23	05:20 / 06:16 (1) / 22:00 20	05:56 (1) / 05:35 / 06:16 (1) / 21:56 19	06:05 (1) / 06:20 / 06:24 (1) / 21:10 17	06:47 (2) / 07:10 / 07:04 (2) / 20:02	08:00 / 18:53	07:55 / 16:53	07:39 / 16:29	08:39
14	08:43 / 16:56	07:59 / 17:51	06:59 / 18:41	06:48 / 20:35	05:49 / 21:25	05:20 / 06:16 (1) / 22:01 20	05:56 (1) / 05:36 / 06:16 (1) / 21:55 18	06:06 (1) / 06:21 / 06:24 (1) / 21:08 15	06:49 (2) / 07:12 / 07:04 (2) / 19:59	08:02 / 18:50	07:57 / 16:52	07:40 / 16:29	08:40
15	08:42 / 16:57	07:57 / 17:53	06:57 / 18:43	06:46 / 20:36	05:48 / 21:26	05:20 / 06:16 (1) / 22:01 19	05:57 (1) / 05:37 / 06:16 (1) / 21:54 17	06:07 (1) / 06:23 / 06:24 (1) / 21:06 14	06:50 (2) / 07:13 / 07:04 (2) / 19:57	08:03 / 18:48	07:58 / 16:50	07:41 / 16:29	08:41
16	08:41 / 16:59	07:55 / 17:55	06:54 / 18:45	06:43 / 20:38	05:46 / 21:28	05:20 / 06:16 (1) / 22:02 19	05:57 (1) / 05:38 / 06:16 (1) / 21:53 16	06:08 (1) / 06:24 / 06:24 (1) / 21:04 12	06:52 (2) / 07:15 / 07:04 (2) / 19:55	08:05 / 18:46	08:00 / 16:49	07:42 / 16:29	08:42
17	08:40 / 17:00	07:53 / 17:56	06:52 / 18:47	06:41 / 20:40	05:45 / 21:29	05:20 / 06:16 (1) / 22:02 18	05:58 (1) / 05:40 / 06:16 (1) / 21:52 15	06:10 (1) / 06:26 / 06:25 (1) / 21:02 10	06:53 (2) / 07:16 / 07:03 (2) / 19:52	08:07 / 18:44	08:02 / 16:48	07:43 / 16:29	08:43
18	08:39 / 17:02	07:51 / 17:58	06:50 / 18:48	06:39 / 20:41	05:43 / 21:31	05:20 / 06:16 (1) / 22:03 18	05:58 (1) / 05:41 / 06:16 (1) / 21:51 13	06:11 (1) / 06:28 / 06:24 (1) / 21:00 8	06:55 (2) / 07:18 / 07:03 (2) / 19:50	08:08 / 18:42	08:04 / 16:46	07:43 / 16:29	08:43
19	08:38 / 17:04	07:49 / 18:00	06:47 / 18:50	06:37 / 20:43	05:42 / 21:32 2	06:09 (1) / 05:20 / 06:11 (1) / 22:03 18	05:58 (1) / 05:42 / 06:16 (1) / 21:50 12	06:12 (1) / 06:29 / 06:24 (1) / 20:58 5	06:56 (2) / 07:20 / 07:01 (2) / 19:48	08:10 / 18:40	08:05 / 16:45	07:44 / 16:30	08:44
20	08:37 / 17:05	07:47 / 18:02	06:45 / 18:52	06:35 / 20:45	05:41 / 21:34 5	06:07 (1) / 05:20 / 06:12 (1) / 22:03 18	05:58 (1) / 05:43 / 06:16 (1) / 21:49 11	06:13 (1) / 06:31 / 06:24 (1) / 20:55 3	06:58 (2) / 07:21 / 07:01 (2) / 19:45	08:12 / 18:37	08:07 / 16:44	07:45 / 16:30	08:45
21	08:36 / 17:07	07:45 / 18:04	06:43 / 18:54	06:33 / 20:47	05:39 / 21:35 6	06:06 (1) / 05:20 / 06:12 (1) / 22:04 18	05:58 (1) / 05:45 / 06:16 (1) / 21:47 9	06:14 (1) / 06:32 / 06:23 (1) / 20:53	07:23 / 19:43	08:14 / 18:35	08:09 / 16:43	07:45 / 16:30	08:45
22	08:35 / 17:09	07:43 / 18:06	06:40 / 18:55	06:31 / 20:48	05:38 / 21:37 8	06:05 (1) / 05:20 / 06:13 (1) / 22:04 18	05:59 (1) / 05:46 / 06:17 (1) / 21:46 7	06:16 (1) / 06:34 / 06:23 (1) / 20:51	07:25 / 19:41	08:15 / 18:33	08:10 / 16:41	07:46 / 16:31	08:46
23	08:34 / 17:11	07:41 / 18:07	06:38 / 18:57	06:28 / 20:50 3	06:52 (2) / 05:37 / 06:55 (2) / 21:38 10	06:04 (1) / 05:20 / 06:14 (1) / 22:04 18	05:59 (1) / 05:47 / 06:17 (1) / 21:45 6	06:17 (1) / 06:36 / 06:23 (1) / 20:49	07:26 / 19:38	08:17 / 18:31	08:12 / 16:40	07:48 / 16:31	08:46
24	08:33 / 17:12	07:39 / 18:09	06:36 / 18:59	06:26 / 20:52 6	06:50 (2) / 05:35 / 06:56 (2) / 21:39 11	06:03 (1) / 05:21 / 06:14 (1) / 22:04 18	05:59 (1) / 05:49 / 06:17 (1) / 21:44 4	06:18 (1) / 06:37 / 06:22 (1) / 20:47	07:28 / 19:36	08:19 / 18:29	08:14 / 16:39	07:47 / 16:32	08:47
25	08:31 / 17:14	07:37 / 18:11	06:33 / 19:00	06:24 / 20:53 8	06:48 (2) / 05:34 / 06:56 (2) / 21:41 13	06:02 (1) / 05:21 / 06:15 (1) / 22:04 18	06:00 (1) / 05:50 / 06:18 (1) / 21:42 2	06:20 (1) / 06:39 / 06:21 (1) / 20:45	07:30 / 19:34	08:21 / 17:27	08:15 / 16:38	07:47 / 16:33	08:47
26	08:30 / 17:16	07:34 / 18:13	06:31 / 19:02	06:22 / 20:55 10	06:46 (2) / 05:33 / 06:56 (2) / 21:42 14	06:01 (1) / 05:21 / 06:15 (1) / 22:04 19	05:59 (1) / 05:52 / 06:18 (1) / 21:41	06:41 / 20:43	07:31 / 19:31	08:23 / 17:25	08:17 / 16:37	07:48 / 16:33	08:48
27	08:29 / 17:18	07:32 / 18:15	06:29 / 19:04	06:20 / 20:57 12	06:44 (2) / 05:32 / 06:56 (2) / 21:43 15	06:00 (1) / 05:22 / 06:15 (1) / 22:04 19	06:00 (1) / 05:53 / 06:19 (1) / 21:39	06:42 / 20:40	07:33 / 19:29	08:24 / 17:23	08:18 / 16:36	07:48 / 16:34	08:48
28	08:27 / 17:19	07:30 / 18:17	06:26 / 19:06	06:18 / 20:58 14	06:42 (2) / 05:31 / 06:56 (2) / 21:45 16	05:59 (1) / 05:22 / 06:15 (1) / 22:04 19	06:00 (1) / 05:55 / 06:19 (1) / 21:38	06:44 / 20:38	07:34 / 19:27	08:26 / 17:21	08:20 / 16:35	07:48 / 16:35	08:48
29	08:26 / 17:21		07:24 / 20:07	06:16 / 21:00 16	06:40 (2) / 05:30 / 06:56 (2) / 21:46 17	05:58 (1) / 05:23 / 06:15 (1) / 22:04 20	06:00 (1) / 05:56 / 06:20 (1) / 21:36	06:46 / 20:36	07:36 / 19:24	08:28 / 17:19	08:21 / 16:35	07:48 / 16:36	08:48
30	08:24 / 17:23		07:22 / 20:09	06:14 / 21:02 17	06:39 (2) / 05:29 / 06:56 (2) / 21:47 18	05:57 (1) / 05:23 / 06:15 (1) / 22:04 20	06:00 (1) / 05:58 / 06:20 (1) / 21:35	06:47 / 20:34	07:38 / 19:22	08:30 / 17:17	08:23 / 16:34	07:48 / 16:37	08:48
31	08:23 / 17:25		07:20 / 20:11 2	07:42 (3) / 07:44 (3)	05:28 / 21:48 19	05:56 (1) / 06:15 (1)	05:59 / 21:33	06:49 / 20:32		07:32 / 17:15		07:48 / 16:37	
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244	
Total, worst case			2	222	238	593	404	172	141				
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36				
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95				
Wind dir. red.			0,63	0,63	0,66	0,67	0,67	0,65	0,63				
Total reduction			0,20	0,25	0,27	0,25	0,26	0,26	0,22				
Total, real			0	56	64	148	105	44	30				

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 9

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 09 - Bolgerijsekade 18

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18	07:17 / 20:12	06:12 / 21:03 14	06:37 (2) / 06:51 (2)	05:27 / 21:49 12	05:56 (1) / 06:08 (1)	05:24 / 22:03 20	05:55 (1) / 06:15 (1)	06:01 / 21:31	06:50 / 20:29 17	07:20 (3) / 07:37 (3)	07:39 / 19:20	07:33 / 17:14	08:24 / 16:33
2	08:48 / 16:40	08:20 / 17:29	07:26 / 18:20	07:15 / 20:14 2	07:38 (3) / 07:40 (3)	06:10 / 21:05 16	06:35 (2) / 06:51 (2)	05:26 / 21:50 13	05:55 (1) / 06:08 (1)	05:25 / 22:03 19	05:55 (1) / 06:14 (1)	06:02 / 21:30 3	06:48 (2) / 06:51 (2)	06:52 / 20:27 19	07:19 (3) / 07:38 (3)	07:41 / 19:17	07:35 / 17:12	08:26 / 16:32
3	08:48 / 16:41	08:18 / 17:30	07:24 / 18:22	07:13 / 20:16 6	07:35 (3) / 07:41 (3)	06:09 / 21:07 18	06:33 (2) / 06:51 (2)	05:25 / 21:52 14	05:54 (1) / 06:08 (1)	05:25 / 22:03 19	05:56 (1) / 06:15 (1)	06:04 / 21:28 10	06:44 (2) / 06:54 (2)	06:54 / 20:25 19	07:20 (3) / 07:39 (3)	07:43 / 19:15	07:37 / 17:10	08:27 / 16:32
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24	07:10 / 20:18 8	07:33 (3) / 07:41 (3)	06:07 / 21:08 19	06:31 (2) / 06:50 (2)	05:25 / 21:53 15	05:54 (1) / 06:09 (1)	05:26 / 22:02 18	05:57 (1) / 06:15 (1)	06:05 / 21:26 13	06:43 (2) / 06:56 (2)	06:55 / 20:23 17	07:21 (3) / 07:38 (3)	07:44 / 19:13	07:39 / 17:08	08:29 / 16:31
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:26	07:08 / 20:19 11	07:31 (3) / 07:42 (3)	06:05 / 21:10 20	06:30 (2) / 06:50 (2)	05:24 / 21:54 16	05:53 (1) / 06:09 (1)	05:27 / 22:02 18	05:58 (1) / 06:16 (1)	06:07 / 21:25 16	06:41 (2) / 06:57 (2)	06:57 / 20:20 15	07:23 (3) / 07:38 (3)	07:46 / 19:11	07:41 / 17:06	08:30 / 16:31
6	08:47 / 16:45	08:13 / 17:36	07:17 / 18:27	07:06 / 20:21 13	07:28 (3) / 07:41 (3)	06:03 / 21:12 19	06:30 (2) / 06:49 (2)	05:23 / 21:55 17	05:53 (1) / 06:10 (1)	05:28 / 22:01 17	05:58 (1) / 06:15 (1)	06:08 / 21:23 18	06:41 (2) / 06:59 (2)	06:59 / 20:18 13	07:24 (3) / 07:37 (3)	07:48 / 19:08	07:42 / 17:05	08:31 / 16:30
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29	07:04 / 20:23 15	07:26 (3) / 07:41 (3)	06:01 / 21:13 17	06:31 (2) / 06:48 (2)	05:23 / 21:55 17	05:52 (1) / 06:09 (1)	05:29 / 22:01 16	05:59 (1) / 06:15 (1)	06:10 / 21:21 19	06:40 (2) / 06:59 (2)	07:00 / 20:16 11	07:26 (3) / 07:37 (3)	07:50 / 19:06	07:44 / 17:03	08:32 / 16:30
8	08:46 / 16:47	08:10 / 17:40	07:12 / 18:31	07:01 / 20:24 17	07:24 (3) / 07:41 (3)	05:59 / 21:15 15	06:32 (2) / 06:47 (2)	05:22 / 21:56 18	05:52 (1) / 06:10 (1)	05:30 / 22:00 16	06:00 (1) / 06:16 (1)	06:11 / 21:19 20	06:40 (2) / 07:00 (2)	07:02 / 20:13 9	07:27 (3) / 07:36 (3)	07:51 / 19:04	07:46 / 17:01	08:34 / 16:30
9	08:46 / 16:48	08:08 / 17:42	07:10 / 18:33	06:59 / 20:26 19	07:22 (3) / 07:41 (3)	05:58 / 21:17 12	06:33 (2) / 06:45 (2)	05:22 / 21:57 19	05:51 (1) / 06:10 (1)	05:31 / 21:59 15	06:01 (1) / 06:16 (1)	06:13 / 21:17 19	06:41 (2) / 07:00 (2)	07:03 / 20:11 6	07:29 (3) / 07:35 (3)	07:53 / 19:01	07:48 / 17:00	08:35 / 16:29
10	08:45 / 16:50	08:06 / 17:43	07:08 / 18:34	06:57 / 20:28 19	07:21 (3) / 07:40 (3)	05:56 / 21:18 8	06:35 (2) / 06:43 (2)	05:21 / 21:58 19	05:51 (1) / 06:10 (1)	05:32 / 21:59 14	06:02 (1) / 06:16 (1)	06:15 / 21:15 17	06:43 (2) / 07:00 (2)	07:05 / 20:09 3	07:31 (3) / 07:34 (3)	07:55 / 18:59	07:50 / 16:58	08:36 / 16:29
11	08:45 / 16:51	08:04 / 17:45	07:06 / 18:36	06:55 / 20:30 17	07:21 (3) / 07:38 (3)	05:54 / 21:20	05:21 / 21:59 20	05:51 (1) / 06:11 (1)	05:33 / 21:58 13	06:03 (1) / 06:16 (1)	06:16 / 21:14 16	06:44 (2) / 07:00 (2)	07:07 / 20:06	07:56 / 18:57	07:51 / 16:56	08:37 / 16:29
12	08:44 / 16:53	08:03 / 17:47	07:03 / 18:38	06:52 / 20:31 14	07:22 (3) / 07:36 (3)	05:53 / 21:21	05:21 / 21:59 20	05:50 (1) / 06:10 (1)	05:34 / 21:57 12	06:04 (1) / 06:16 (1)	06:18 / 21:12 14	06:46 (2) / 07:00 (2)	07:08 / 20:04	07:58 / 18:55	07:53 / 16:55	08:38 / 16:29
13	08:44 / 16:54	08:01 / 17:49	07:01 / 18:40	06:50 / 20:33 10	07:24 (3) / 07:34 (3)	05:51 / 21:23	05:20 / 22:00 21	05:50 (1) / 06:11 (1)	05:35 / 21:56 10	06:05 (1) / 06:15 (1)	06:20 / 21:10 12	06:47 (2) / 06:59 (2)	07:10 / 20:02	08:00 / 18:53	07:55 / 16:53	08:39 / 16:29
14	08:43 / 16:56	07:59 / 17:51	06:59 / 18:41	06:48 / 20:35	05:49 / 21:25	05:20 / 22:01 21	05:50 (1) / 06:11 (1)	05:36 / 21:55 9	06:06 (1) / 06:15 (1)	06:21 / 21:08 10	06:49 (2) / 06:59 (2)	07:12 / 19:59	08:01 / 18:50	07:57 / 16:52	08:40 / 16:29
15	08:42 / 16:57	07:57 / 17:53	06:57 / 18:43	06:46 / 20:36	05:48 / 21:26	05:20 / 22:01 21	05:50 (1) / 06:11 (1)	05:37 / 21:54 8	06:07 (1) / 06:15 (1)	06:23 / 21:06 8	06:50 (2) / 06:58 (2)	07:13 / 19:57	08:03 / 18:48	07:58 / 16:50	08:41 / 16:29
16	08:41 / 16:59	07:55 / 17:55	06:54 / 18:45	06:43 / 20:38	05:46 / 21:28	05:20 / 22:02 21	05:50 (1) / 06:11 (1)	05:38 / 21:53 6	06:08 (1) / 06:14 (1)	06:24 / 21:04 5	06:52 (2) / 06:57 (2)	07:15 / 19:55	08:05 / 18:46	08:00 / 16:49	08:42 / 16:29
17	08:40 / 17:00	07:53 / 17:56	06:52 / 18:47	06:41 / 20:40	05:45 / 21:29	05:20 / 22:02 22	05:50 (1) / 06:12 (1)	05:40 / 21:52 5	06:10 (1) / 06:15 (1)	06:26 / 21:02 3	06:53 (2) / 06:56 (2)	07:16 / 19:52	08:07 / 18:44	08:02 / 16:48	08:43 / 16:29
18	08:39 / 17:02	07:51 / 17:58	06:50 / 18:48	06:39 / 20:41	05:43 / 21:31	05:20 / 22:03 22	05:50 (1) / 06:12 (1)	05:41 / 21:51 3	06:11 (1) / 06:14 (1)	06:28 / 21:00	07:18 / 19:50	08:08 / 18:42	08:04 / 16:46	08:43 / 16:29
19	08:38 / 17:04	07:49 / 18:00	06:47 / 18:50	06:37 / 20:43	05:42 / 21:32	05:20 / 22:03 22	05:50 (1) / 06:12 (1)	05:42 / 21:50 2	06:12 (1) / 06:13 (1)	06:29 / 20:58	07:20 / 19:48	08:10 / 18:40	08:05 / 16:45	08:44 / 16:30
20	08:37 / 17:05	07:47 / 18:02	06:45 / 18:52	06:35 / 20:45	05:41 / 21:34	05:20 / 22:03 22	05:50 (1) / 06:12 (1)	05:43 / 21:49	06:31 / 20:55	07:21 / 19:45	08:12 / 18:37	08:07 / 16:44	08:45 / 16:30
21	08:36 / 17:07	07:45 / 18:04	06:43 / 18:54	06:33 / 20:47	05:39 / 21:35	05:20 / 22:04 22	05:50 (1) / 06:12 (1)	05:45 / 21:47	06:32 / 20:53	07:23 / 19:43	08:14 / 18:35	08:09 / 16:43	08:45 / 16:30
22	08:35 / 17:09	07:43 / 18:06	06:40 / 18:55	06:31 / 20:48	05:38 / 21:37	05:20 / 22:04 22	05:51 (1) / 06:13 (1)	05:46 / 21:46	06:34 / 20:51	07:25 / 19:41	08:15 / 18:33	08:10 / 16:41	08:46 / 16:31
23	08:34 / 17:11	07:41 / 18:07	06:38 / 18:57	06:28 / 20:50	05:37 / 21:38	05:20 / 22:04 22	05:51 (1) / 06:13 (1)	05:47 / 21:45	06:36 / 20:49	07:26 / 19:38	08:17 / 18:31	08:12 / 16:40	08:46 / 16:31
24	08:33 / 17:12	07:39 / 18:09	06:36 / 18:59	06:26 / 20:52	05:35 / 21:39	05:21 / 22:04 22	05:51 (1) / 06:13 (1)	05:49 / 21:44	06:37 / 20:47	07:28 / 19:36	08:19 / 18:29	08:14 / 16:39	08:47 / 16:32
25	08:31 / 17:14	07:37 / 18:11	06:33 / 19:00	06:24 / 20:53	05:34 / 21:41 2	06:02 (1) / 06:04 (1)	05:21 / 22:04 22	05:52 (1) / 06:14 (1)	05:50 / 21:42	06:39 / 20:45	07:30 / 19:34	07:21 / 17:27	08:15 / 16:38	08:47 / 16:33
26	08:30 / 17:16	07:34 / 18:13	06:31 / 19:02	06:22 / 20:55 3	06:46 (2) / 06:49 (2)	05:33 / 21:42 4	06:01 (1) / 06:05 (1)	05:21 / 22:04 21	05:52 (1) / 06:13 (1)	05:52 / 21:41	06:41 / 20:43	07:31 / 19:31	07:23 / 17:25	08:17 / 16:37	08:48 / 16:33
27	08:29 / 17:18	07:32 / 18:15	06:29 / 19:04	06:20 / 20:57 6	06:44 (2) / 06:50 (2)	05:32 / 21:43 6	06:00 (1) / 06:06 (1)	05:22 / 22:04 21	05:53 (1) / 06:14 (1)	05:53 / 21:39	06:42 / 20:40	07:33 / 19:29	07:24 / 17:23	08:18 / 16:36	08:48 / 16:34
28	08:27 / 17:19	07:30 / 18:17	06:26 / 19:06	06:18 / 20:58 8	06:42 (2) / 06:50 (2)	05:31 / 21:45 7	05:59 (1) / 06:06 (1)	05:22 / 22:04 21	05:53 (1) / 06:14 (1)	05:55 / 21:38	06:44 / 20:38	07:34 / 19:27	07:26 / 17:21	08:20 / 16:35	08:48 / 16:35
29	08:26 / 17:21		07:24 / 20:07	06:16 / 21:00 11	06:40 (2) / 06:51 (2)	05:30 / 21:46 9	05:58 (1) / 06:07 (1)	05:23 / 22:04 21	05:54 (1) / 06:15 (1)	05:56 / 21:36	06:46 / 20:36 2	07:29 (3) / 07:31 (3)	07:36 / 19:24	07:28 / 17:19	08:21 / 16:35	08:48 / 16:36
30	08:24 / 17:23		07:22 / 20:09	06:14 / 21:02 13	06:39 (2) / 06:52 (2)	05:29 / 21:47 10	05:57 (1) / 06:07 (1)	05:23 / 22:04 20	05:54 (1) / 06:14 (1)	05:58 / 21:35	06:47 / 20:34 11	07:23 (3) / 07:34 (3)	07:38 / 19:22	07:30 / 17:17	08:23 / 16:34	08:48 / 16:37
31	08:23 / 17:25		07:20 / 20:11		05:28 / 21:48 11	05:56 (1) / 06:07 (1)		05:59 / 21:33	06:49 / 20:32 14	07:22 (3) / 07:36 (3)			07:32 / 17:15		08:48 / 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				192	207	586	240	230	129			
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.				0,63	0,66	0,67	0,67	0,65	0,63			
Total reduction				0,25	0,27	0,25	0,26	0,26	0,22			
Total, real				48	55	146	62	59	28			

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

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

Project:

068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 10
Licensed user:
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 10 - Bolgerijsekade 24

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 16:39	08:21 17:27	07:28 18:18	07:17 20:12	06:12 21:03	05:27 21:49 24	06:01 (2) 06:25 (2)	05:24 22:03 18	06:10 (2) 06:28 (2)	06:01 21:31	06:50 20:29 2	07:16 (3) 07:18 (3)	07:39 19:20	07:33 17:14	08:24 16:33
2	08:48 16:40	08:20 17:28	07:26 18:20	07:15 20:14	06:10 21:05	05:26 21:50 24	06:01 (2) 06:25 (2)	05:25 22:03 19	06:09 (2) 06:28 (2)	06:02 21:30	06:52 20:27		07:41 19:17	07:35 17:12	08:26 16:32
3	08:48 16:41	08:18 17:30	07:24 18:22	07:13 20:16	06:09 21:07	05:25 21:52 23	06:01 (2) 06:24 (2)	05:25 22:03 19	06:09 (2) 06:28 (2)	06:04 21:28	06:54 20:25		07:43 19:15	07:37 17:10	08:27 16:32
4	08:48 16:42	08:17 17:32	07:21 18:24	07:10 20:18	06:07 21:08	05:25 21:53 23	06:02 (2) 06:25 (2)	05:26 22:02 20	06:09 (2) 06:29 (2)	06:05 21:26	06:55 20:23		07:44 19:13	07:39 17:08	08:29 16:31
5	08:48 16:43	08:15 17:34	07:19 18:26	07:08 20:19	06:05 21:10	05:24 21:54 22	06:02 (2) 06:24 (2)	05:27 22:02 21	06:09 (2) 06:30 (2)	06:07 21:25	06:57 20:20		07:46 19:11	07:41 17:06	08:30 16:31
6	08:47 16:45	08:13 17:36	07:17 18:27	07:06 20:21	06:03 21:12	05:23 21:55 22	06:03 (2) 06:25 (2)	05:28 22:01 22	06:08 (2) 06:30 (2)	06:08 21:23	06:59 20:18		07:48 19:08	07:42 17:05	08:31 16:30
7	08:47 16:46	08:12 17:38	07:15 18:29	07:04 20:23	06:01 21:13	05:23 21:55 21	06:03 (2) 06:24 (2)	05:29 22:01 22	06:08 (2) 06:30 (2)	06:10 21:21	07:00 20:16		07:50 19:06	07:44 17:03	08:32 16:30
8	08:46 16:47	08:10 17:40	07:12 18:31	07:01 20:24	05:59 21:15	05:22 21:56 20	06:04 (2) 06:24 (2)	05:30 22:00 23	06:08 (2) 06:31 (2)	06:11 21:19	07:02 20:13		07:51 19:04	07:46 17:01	08:34 16:30
9	08:46 16:48	08:08 17:42	07:10 18:33	06:59 20:26	05:58 21:17	05:22 21:57 19	06:04 (2) 06:23 (2)	05:31 21:59 24	06:08 (2) 06:32 (2)	06:13 21:17	07:03 20:11		07:53 19:01	07:48 17:00	08:35 16:29
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11	08:45 16:51	08:04 17:45	07:06 18:36	06:54 20:30 2	07:17 (3) 07:19 (3)	05:54 21:59 19	05:21 06:05 (2) 06:24 (2)	05:33 21:58 25	06:08 (2) 06:33 (2)	06:16 21:14	07:07 20:06		07:56 18:57	07:51 16:56	08:37 16:29
12	08:44 16:53	08:03 17:47	07:03 18:38	06:52 20:31 6	07:15 (3) 07:21 (3)	05:53 21:59 18	05:21 06:05 (2) 06:23 (2)	05:34 21:57 25	06:08 (2) 06:33 (2)	06:18 21:12	07:08 20:04		07:58 18:55	07:53 16:55	08:38 16:29
13	08:44 16:54	08:01 17:49	07:01 18:40	06:50 20:33 9	07:13 (3) 07:22 (3)	05:51 06:17 (2) 22:00 17	05:20 06:06 (2) 06:23 (2)	05:35 21:56 25	06:08 (2) 06:33 (2)	06:19 21:10	07:10 20:02		08:00 18:53	07:55 16:53	08:39 16:29
14	08:43 16:56	07:59 17:51	06:59 18:41	06:48 20:35 12	07:11 (3) 07:23 (3)	05:49 06:15 (2) 06:20 (2) 5	05:20 22:01 17	06:06 (2) 06:23 (2)	05:36 21:55 25	06:08 (2) 06:33 (2)	06:21 07:15 (3) 21:08 2	07:12 07:17 (3)	08:01 18:50	07:57 16:52	08:40 16:29
15	08:42 16:57	07:57 17:53	06:57 18:43	06:46 20:36 15	07:09 (3) 07:24 (3)	05:48 06:14 (2) 06:21 (2) 7	05:20 22:01 16	06:07 (2) 06:23 (2)	05:37 21:54 26	06:08 (2) 06:34 (2)	06:23 07:10 (3) 21:06 11	07:13 07:21 (3)	08:03 18:48	07:58 16:50	08:41 16:29
16	08:41 16:59	07:55 17:55	06:54 18:45	06:43 20:38 17	07:07 (3) 07:24 (3)	05:46 06:13 (2) 06:23 (2) 10	05:20 22:02 16	06:07 (2) 06:23 (2)	05:38 21:53 26	06:08 (2) 06:34 (2)	06:24 07:08 (3) 21:04 15	07:15 07:23 (3)	08:05 18:46	08:00 16:49	08:42 16:29
17	08:40 17:00	07:53 17:56	06:52 18:47	06:41 20:40 19	07:04 (3) 07:23 (3)	05:45 06:11 (2) 06:23 (2) 12	05:20 22:02 15	06:08 (2) 06:23 (2)	05:40 21:52 25	06:10 (2) 06:35 (2)	06:26 07:06 (3) 21:02 18	07:16 07:24 (3)	08:07 18:44	08:02 16:48	08:43 16:29
18	08:39 17:02	07:51 17:58	06:50 18:48	06:39 20:41 21	07:02 (3) 07:23 (3)	05:43 06:10 (2) 06:23 (2) 13	05:20 22:03 15	06:08 (2) 06:23 (2)	05:41 21:51 24	06:11 (2) 06:35 (2)	06:28 07:05 (3) 21:00 21	07:18 07:26 (3)	08:08 18:42	08:04 16:46	08:43 16:29
19	08:38 17:04	07:49 18:00	06:47 18:50	06:37 20:43 23	07:00 (3) 07:23 (3)	05:42 06:09 (2) 06:24 (2) 15	05:20 22:03 15	06:08 (2) 06:23 (2)	05:42 21:50 23	06:12 (2) 06:35 (2)	06:29 07:03 (3) 20:58 23	07:20 07:26 (3)	08:10 18:40	08:05 16:45	08:44 16:30
20	08:37 17:05	07:47 18:02	06:45 18:52	06:35 20:45 25	06:58 (3) 07:23 (3)	05:41 06:07 (2) 06:24 (2) 17	05:20 22:03 15	06:08 (2) 06:23 (2)	05:43 21:49 22	06:13 (2) 06:35 (2)	06:31 07:03 (3) 20:55 24	07:21 07:27 (3)	08:12 18:37	08:07 16:44	08:45 16:30
21	08:36 17:07	07:45 18:04	06:43 18:54	06:33 20:47 26	06:57 (3) 07:23 (3)	05:39 06:06 (2) 06:24 (2) 18	05:20 22:04 14	06:09 (2) 06:23 (2)	05:45 21:47 20	06:14 (2) 06:34 (2)	06:32 07:01 (3) 20:53 26	07:23 07:27 (3)	08:14 18:35	08:09 16:43	08:45 16:30
22	08:35 17:09	07:43 18:06	06:40 18:55	06:31 20:48 25	06:57 (3) 07:22 (3)	05:38 06:05 (2) 06:25 (2) 20	05:20 22:04 14	06:10 (2) 06:24 (2)	05:46 21:46 19	06:16 (2) 06:35 (2)	06:34 07:01 (3) 20:51 26	07:25 07:27 (3)	08:15 18:33	08:10 16:41	08:46 16:31
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24	08:33 17:12	07:39 18:09	06:36 18:59	06:26 20:52 22	06:58 (3) 07:20 (3)	05:35 06:03 (2) 06:25 (2) 22	05:21 22:04 15	06:09 (2) 06:24 (2)	05:49 21:44 16	06:18 (2) 06:34 (2)	06:37 07:04 (3) 20:47 23	07:28 07:27 (3)	08:19 18:29	08:14 16:39	08:47 16:32
25	08:31 17:14	07:37 18:11	06:33 19:00	06:24 20:53 20	06:59 (3) 07:19 (3)	05:34 06:02 (2) 06:25 (2) 23	05:21 22:04 15	06:10 (2) 06:25 (2)	05:50 21:42 14	06:20 (2) 06:34 (2)	06:39 07:06 (3) 20:45 21	07:30 07:27 (3)	08:21 17:27	08:15 16:38	08:47 16:33
26	08:30 17:16	07:34 18:13	06:31 19:02	06:22 20:55 18	06:59 (3) 07:17 (3)	05:33 06:01 (2) 06:25 (2) 24	05:21 22:04 15	06:10 (2) 06:25 (2)	05:52 21:41 13	06:21 (2) 06:34 (2)	06:41 07:07 (3) 20:43 19	07:31 07:26 (3)	08:23 17:25	08:17 16:37	08:48 16:33
27	08:29 17:18	07:32 18:15	06:29 19:04	06:20 20:57 14	07:01 (3) 07:15 (3)	05:32 06:00 (2) 06:25 (2) 25	05:22 22:04 16	06:10 (2) 06:26 (2)	05:53 21:39 11	06:22 (2) 06:33 (2)	06:42 07:09 (3) 20:40 17	07:33 07:26 (3)	08:24 17:23	08:18 16:36	08:48 16:34
28	08:27 17:19	07:30 18:17	06:26 19:06	06:18 20:58 10	07:03 (3) 07:13 (3)	05:31 05:59 (2) 06:25 (2) 26	05:22 22:04 16	06:10 (2) 06:26 (2)	05:55 21:38 9	06:24 (2) 06:33 (2)	06:44 07:10 (3) 20:38 14	07:34 07:24 (3)	08:26 17:21	08:20 16:35	08:48 16:35
29	08:26 17:21		07:24 20:07	06:16 21:00	05:30 21:46 26	05:59 (2) 06:25 (2) 17	05:23 22:04	06:10 (2) 06:27 (2)	05:56 21:36 6	06:25 (2) 06:31 (2)	06:45 07:12 (3) 20:36 12	07:36 07:24 (3)	08:28 17:19	08:21 16:35	08:48 16:36
30	08:24 17:23		07:22 20:09	06:14 21:02	05:29 21:47 26	05:59 (2) 06:25 (2) 18	05:23 22:04	06:09 (2) 06:27 (2)	05:58 21:35 4	06:27 (2) 06:31 (2)	06:47 07:13 (3) 20:34 9	07:38 07:22 (3)	08:30 17:17	08:23 16:34	08:48 16:37
31	08:23 17:25		07:20 20:11		05:28 21:48 26	05:59 (2) 06:25 (2)		05:59 21:33 2	06:28 (2) 06:29 (2)	06:49 20:32 6	07:15 (3) 07:21 (3)		07:32 17:15		08:48 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				308	339	535	590	312	2			
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.				0,63	0,67	0,67	0,67	0,63	0,63			
Total reduction				0,25	0,27	0,25	0,26	0,25	0,22			
Total, real				77	92	133	153	77	0			

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:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 11

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 11 - Bolgerijsekade 1

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	06:04 (2)	05:24	06:17 (2)	06:01	06:29 (2)	06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49 20	06:24 (2)	22:03 7	06:24 (2)	21:31 2	06:31 (2)	20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:05 (2)	05:25	06:15 (2)	06:02		06:52	07:41	07:35	08:26
	16:40	17:29	18:20	20:14	21:05	21:50 19	06:24 (2)	22:03 9	06:24 (2)	21:30		20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:05 (2)	05:25	06:15 (2)	06:04		06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52 18	06:23 (2)	22:03 10	06:25 (2)	21:28		20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:06 (2)	05:26	06:15 (2)	06:05		06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53 17	06:23 (2)	22:02 11	06:26 (2)	21:26		20:23	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:06 (2)	05:27	06:14 (2)	06:07		06:57	07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54 16	06:22 (2)	22:02 13	06:27 (2)	21:25		20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:08 (2)	05:28	06:13 (2)	06:08		06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55 14	06:22 (2)	22:01 14	06:27 (2)	21:23		20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:08 (2)	05:29	06:13 (2)	06:10		07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55 13	06:21 (2)	22:01 15	06:28 (2)	21:21		20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:09 (2)	05:30	06:13 (2)	06:11		07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56 12	06:21 (2)	22:00 16	06:29 (2)	21:19		20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:09 (2)	05:31	06:12 (2)	06:13		07:03	07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57 11	06:20 (2)	21:59 18	06:30 (2)	21:17		20:11	19:01	17:00	16:29
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	16:50	17:43	18:34	20:28	21:18	21:58 9	06:20 (2)	21:59 19	06:31 (2)	21:15		20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:55	05:54	05:21	06:12 (2)	05:33	06:12 (2)	06:16		07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:30	21:20	21:59 8	06:20 (2)	21:58 19	06:31 (2)	21:14		20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	07:15 (3) 05:53	06:18 (2) 05:21	06:12 (2)	05:34	06:12 (2)	06:18		07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31 2	07:17 (3) 21:21 3	06:21 (2) 21:59 6	06:18 (2)	21:57 20	06:32 (2)	21:12		20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	07:13 (3) 05:51	06:17 (2) 05:20	06:14 (2)	05:35	06:11 (2)	06:19		07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33 6	07:19 (3) 21:23 5	06:22 (2) 22:00 3	06:17 (2)	21:56 22	06:33 (2)	21:10		20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) 05:49	06:15 (2) 05:20		05:36	06:11 (2)	06:21		07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35 9	07:20 (3) 21:25 7	06:22 (2) 22:01		21:55 22	06:33 (2)	21:08		19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) 05:48	06:14 (2) 05:20		05:37	06:11 (2)	06:23	07:09 (3)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36 11	07:20 (3) 21:26 9	06:23 (2) 22:01		21:54 22	06:33 (2)	21:06 8	07:17 (3)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) 05:46	06:13 (2) 05:20		05:38	06:10 (2)	06:24	07:07 (3)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38 14	07:21 (3) 21:28 11	06:24 (2) 22:02		21:53 24	06:34 (2)	21:04 13	07:20 (3)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	07:04 (3) 05:45	06:11 (2) 05:20		05:40	06:11 (2)	06:26	07:05 (3)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40 16	07:20 (3) 21:29 13	06:24 (2) 22:02		21:52 24	06:35 (2)	21:02 16	07:21 (3)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	07:02 (3) 05:43	06:10 (2) 05:20		05:41	06:11 (2)	06:28	07:04 (3)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41 18	07:20 (3) 21:31 15	06:25 (2) 22:03		21:51 24	06:35 (2)	21:00 19	07:23 (3)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	07:00 (3) 05:42	06:09 (2) 05:20		05:42	06:12 (2)	06:29	07:02 (3)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43 20	07:20 (3) 21:32 16	06:25 (2) 22:03		21:50 23	06:35 (2)	20:58 21	07:23 (3)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	06:58 (3) 05:41	06:07 (2) 05:20		05:43	06:13 (2)	06:31	07:01 (3)	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45 22	07:20 (3) 21:34 18	06:25 (2) 22:03		21:49 22	06:35 (2)	20:55 23	07:24 (3)	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	06:56 (3) 05:39	06:06 (2) 05:20		05:45	06:14 (2)	06:32	07:00 (3)	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47 24	07:20 (3) 21:35 19	06:25 (2) 22:04		21:47 21	06:35 (2)	20:53 24	07:24 (3)	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	06:55 (3) 05:38	06:05 (2) 05:20		05:46	06:16 (2)	06:34	07:01 (3)	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48 24	07:19 (3) 21:37 20	06:25 (2) 22:04		21:46 20	06:36 (2)	20:51 23	07:24 (3)	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	06:56 (3) 05:37	06:04 (2) 05:20		05:47	06:17 (2)	06:36	07:03 (3)	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50 22	07:18 (3) 21:38 22	06:26 (2) 22:04		21:45 19	06:36 (2)	20:49 22	07:25 (3)	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	06:57 (3) 05:35	06:03 (2) 05:21		05:49	06:18 (2)	06:37	07:04 (3)	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52 20	07:17 (3) 21:39 23	06:26 (2) 22:04		21:44 17	06:35 (2)	20:47 20	07:24 (3)	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	06:57 (3) 05:34	06:02 (2) 05:21		05:50	06:20 (2)	06:39	07:06 (3)	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53 19	07:16 (3) 21:41 24	06:26 (2) 22:04		21:42 16	06:36 (2)	20:45 18	07:24 (3)	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	06:58 (3) 05:33	06:01 (2) 05:21		05:52	06:21 (2)	06:41	07:07 (3)	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55 16	07:14 (3) 21:42 24	06:25 (2) 22:04		21:41 14	06:35 (2)	20:43 16	07:23 (3)	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	07:00 (3) 05:32	06:02 (2) 05:22		05:53	06:22 (2)	06:42	07:09 (3)	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57 12	07:12 (3) 21:43 23	06:25 (2) 22:04		21:39 12	06:34 (2)	20:40 14	07:23 (3)	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	07:03 (3) 05:31	06:02 (2) 05:22		05:55	06:24 (2)	06:44	07:10 (3)	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58 6	07:09 (3) 21:45 23	06:25 (2) 22:04		21:38 11	06:35 (2)	20:38 11	07:21 (3)	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	05:30	06:02 (2) 05:23		05:56	06:25 (2)	06:45	07:12 (3)	07:36	07:28	08:21	08:48
	17:21		20:07	21:00	21:46 23	06:25 (2) 22:04		21:36 9	06:34 (2)	20:36 8	07:20 (3)	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	05:29	06:03 (2) 05:23	06:17 (2)	05:58	06:27 (2)	06:47	07:13 (3)	07:38	07:30	08:23	08:48
	17:23		20:09	21:02	21:47 21	06:24 (2) 22:04 5	06:22 (2)	21:35 6	06:33 (2)	20:34 5	07:18 (3)	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	06:03 (2)		05:59	06:28 (2)	06:49	07:15 (3)		07:32		08:48
	17:25		20:11		21:48 21	06:24 (2)		21:33 4	06:32 (2)	20:32 2	07:17 (3)		17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				261	340	171	503	265				
Sun reduction				0,42	0,43	0,39	0,41	0,42				
Oper. time red.				0,95	0,95	0,95	0,95	0,95				
Wind dir. red.				0,63	0,67	0,67	0,67	0,63				
Total reduction				0,25	0,27	0,25	0,26	0,25				
Total, real				65	92	42	130	66				

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

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

Project:
068379aa - WP Autena

Printed/Page
19-9-2013 15:04 / 12

Licensed user:
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Kelvinbaan 40, PO box 1475
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
19-9-2013 14:26/2.7.490

SHADOW - Calendar

Calculation: ECO 122 woningen**Shadow receptor:** 12 - Bolgerijsekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	05:56 (3)	05:24	05:55 (3)	06:01	06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49	06:26 (3)	22:03	06:34 (3)	21:31	20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	05:55 (3)	05:25	05:55 (3)	06:02	06:52	07:41	07:35	08:26
	16:40	17:28	18:20	20:14	21:05	21:50	06:26 (3)	22:03	06:33 (3)	21:30	20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	05:54 (3)	05:25	05:56 (3)	06:04	06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:51	06:26 (3)	22:03	06:34 (3)	21:28	20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	05:54 (3)	05:26	05:57 (3)	06:05	06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53	06:27 (3)	22:02	06:34 (3)	21:26	20:22	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	05:53 (3)	05:27	05:58 (3)	06:07	06:57	07:46	07:40	08:30
	16:43	17:34	18:26	20:19	21:10	21:54	06:27 (3)	22:02	06:34 (3)	21:25	20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	05:53 (3)	05:28	05:58 (3)	06:08	06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55	06:28 (3)	22:01	06:33 (3)	21:23	20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:03	06:01	05:23	05:52 (3)	05:29	05:59 (3)	06:10	07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55	06:28 (3)	22:01	06:34 (3)	21:21	20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	05:52 (3)	05:30	06:00 (3)	06:11	07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56	06:29 (3)	22:00	06:34 (3)	21:19	20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	05:51 (3)	05:31	06:01 (3)	06:13	07:03	07:53	07:48	08:35
	16:48	17:41	18:33	20:26	21:17	21:57	06:28 (3)	21:59	06:34 (3)	21:17	20:11	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	05:51 (3)	05:32	06:02 (3)	06:15	07:05	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58	06:29 (3)	21:59	06:34 (3)	21:15	20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	05:54	05:21	05:51 (3)	05:33	06:03 (3)	06:16	07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:29	21:20	21:59	06:29 (3)	21:58	06:34 (3)	21:14	20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	05:53	05:21	05:50 (3)	05:34	06:04 (3)	06:18	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	21:21	21:59	06:29 (3)	21:57	06:33 (3)	21:12	20:04	18:55	16:55	16:29
13	08:43	08:01	07:01	06:50	05:51	05:20	05:50 (3)	05:35	06:05 (3)	06:19	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	21:23	22:00	06:29 (3)	21:56	06:33 (3)	21:10	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	05:49	05:20	05:50 (3)	05:36	06:06 (3)	06:21	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35	21:25	22:01	06:30 (3)	21:55	06:33 (3)	21:08	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	05:48	05:20	05:50 (3)	05:37	06:07 (3)	06:23	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36	21:26	22:01	06:30 (3)	21:54	06:32 (3)	21:06	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	05:46	05:20	05:51 (3)	05:38	06:08 (3)	06:24	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38	21:28	22:02	06:30 (3)	21:53	06:32 (3)	21:04	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	05:45	05:20	05:51 (3)	05:40	06:10 (3)	06:26	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40	21:29	22:02	06:31 (3)	21:52	06:32 (3)	21:02	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	05:43	06:10 (3)	05:20	05:51 (3)	05:41	06:11 (3)	06:28	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41	21:31	2 06:11 (3)	22:03	40 06:31 (3)	21:51	21 06:32 (3)	21:00	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	05:42	06:09 (3)	05:20	05:51 (3)	05:42	06:12 (3)	06:29	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43	21:32	5 06:14 (3)	22:03	40 06:31 (3)	21:50	19 06:31 (3)	20:58	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	05:40	06:07 (3)	05:20	05:51 (3)	05:43	06:13 (3)	06:31	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45	21:34	8 06:15 (3)	22:03	40 06:31 (3)	21:49	17 06:30 (3)	20:55	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	05:39	06:06 (3)	05:20	05:51 (3)	05:45	06:14 (3)	06:32	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47	21:35	11 06:17 (3)	22:04	40 06:31 (3)	21:47	15 06:29 (3)	20:53	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	05:38	06:05 (3)	05:20	05:52 (3)	05:46	06:16 (3)	06:34	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48	21:36	14 06:19 (3)	22:04	40 06:32 (3)	21:46	12 06:28 (3)	20:51	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	05:37	06:04 (3)	05:20	05:52 (3)	05:47	06:17 (3)	06:36	07:26	08:17	08:12	08:46
	17:10	18:07	18:57	20:50	21:38	16 06:20 (3)	22:04	40 06:32 (3)	21:45	10 06:27 (3)	20:49	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	05:35	06:03 (3)	05:21	05:52 (3)	05:49	06:18 (3)	06:37	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52	21:39	18 06:21 (3)	22:04	40 06:32 (3)	21:43	7 06:25 (3)	20:47	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	05:34	06:02 (3)	05:21	05:53 (3)	05:50	06:20 (3)	06:39	07:29	07:21	08:15	08:47
	17:14	18:11	19:00	20:53	21:41	20 06:22 (3)	22:04	40 06:33 (3)	21:42	3 06:23 (3)	20:45	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	05:33	06:01 (3)	05:21	05:53 (3)	05:52		06:41	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55	21:42	21 06:22 (3)	22:04	40 06:33 (3)	21:41		20:43	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	05:32	06:00 (3)	05:22	05:53 (3)	05:53		06:42	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57	21:43	23 06:23 (3)	22:04	39 06:32 (3)	21:39		20:40	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	05:31	05:59 (3)	05:22	05:53 (3)	05:55		06:44	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58	21:45	25 06:24 (3)	22:04	40 06:33 (3)	21:38		20:38	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	05:30	05:58 (3)	05:23	05:54 (3)	05:56		06:45	07:36	07:28	08:21	08:48
	17:21		20:07	21:00	21:46	26 06:24 (3)	22:04	40 06:34 (3)	21:36		20:36	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	05:29	05:57 (3)	05:23	05:54 (3)	05:58		06:47	07:38	07:30	08:23	08:48
	17:23		20:09	21:02	21:47	27 06:24 (3)	22:04	39 06:33 (3)	21:35		20:34	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	05:56 (3)			05:59		06:49		07:31		08:48
	17:25		20:11		21:48	29 06:25 (3)			21:33		20:32		17:15		16:37
Potential sun hours	259	277	367	416	485		499		502		454	381	331	266	244
Total, worst case						245		1136		647					
Sun reduction						0,43		0,39		0,41					
Oper. time red.						0,95		0,95		0,95					
Wind dir. red.						0,67		0,67		0,67					
Total reduction						0,27		0,25		0,26					
Total, real						67		283		168					

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 1

Licensed user:
LBP SIGHT
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David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 01 - Nieuwbouw Autenasekade

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18 64	16:28 (3) / 17:32 (3) / 20:12	07:17 / 21:03 62	06:12 / 20:20 (2) / 21:49 79	19:18 (2) / 21:02 (1) / 22:03 58	19:32 (2) / 21:06 (1) / 21:31 89	19:47 (2) / 21:01 (1) / 20:29	19:28 (2) / 06:50	07:39 / 19:20 56	17:10 (3) / 18:06 (3) / 17:13 16	07:33 / 16:38 (3) / 16:33	16:22 (3) / 08:24
2	08:48 / 16:40	08:20 / 17:28	07:26 / 18:20 64	16:28 (3) / 17:32 (3) / 20:14	06:10 / 21:05 62	19:18 (2) / 05:26 / 20:20 (2) / 21:50 76	19:33 (2) / 05:25 / 21:01 (1) / 22:03 60	19:45 (2) / 06:02 / 21:05 (1) / 21:30 88	19:28 (2) / 06:52 / 21:00 (1) / 20:27		07:41 / 19:17 57	17:08 (3) / 07:35 / 18:05 (3) / 17:12		08:26 / 16:32
3	08:48 / 16:41	08:18 / 17:30	07:23 / 18:22 64	16:28 (3) / 17:13 / 17:32 (3) / 20:16	06:08 / 21:07 63	19:17 (2) / 05:25 / 20:20 (2) / 21:51 74	19:34 (2) / 05:25 / 21:01 (1) / 22:03 61	19:45 (2) / 06:04 / 21:06 (1) / 21:28 84	19:28 (2) / 06:54 / 20:58 (1) / 20:25		07:43 / 19:15 59	17:07 (3) / 07:37 / 18:06 (3) / 17:10		08:27 / 16:32
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24 64	16:28 (3) / 17:10 / 17:32 (3) / 20:17	06:07 / 21:08 65	19:17 (2) / 05:25 / 20:39 (1) / 21:53 72	19:35 (2) / 05:26 / 21:01 (1) / 22:02 64	19:45 (2) / 06:05 / 21:07 (1) / 21:26 83	19:28 (2) / 06:55 / 20:57 (1) / 20:22		07:44 / 19:13 61	17:06 (3) / 07:39 / 18:07 (3) / 17:08		08:29 / 16:31
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:25 64	16:27 (3) / 17:08 / 17:31 (3) / 20:19	06:05 / 21:10 71	19:18 (2) / 05:24 / 20:42 (1) / 21:54 70	19:36 (2) / 05:27 / 21:01 (1) / 22:02 66	19:44 (2) / 06:07 / 21:07 (1) / 21:25 81	19:27 (2) / 06:57 / 20:55 (1) / 20:20		07:46 / 19:10 61	17:05 (3) / 07:40 / 18:06 (3) / 17:06		08:30 / 16:31
6	08:47 / 16:44	08:13 / 17:36	07:17 / 18:27 63	16:28 (3) / 17:06 / 17:31 (3) / 20:21	06:03 / 21:12 76	19:17 (2) / 05:23 / 20:43 (1) / 21:54 69	19:36 (2) / 05:28 / 21:01 (1) / 22:01 68	19:43 (2) / 06:08 / 21:07 (1) / 21:23 78	19:27 (2) / 06:58 / 20:54 (1) / 20:18		07:48 / 19:08 62	17:04 (3) / 07:42 / 18:06 (3) / 17:04		08:31 / 16:30
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29 63	16:28 (3) / 17:03 / 17:31 (3) / 20:23	06:01 / 21:13 79	19:17 (2) / 05:23 / 20:44 (1) / 21:55 66	19:38 (2) / 05:29 / 21:01 (1) / 22:01 69	19:43 (2) / 06:10 / 21:07 (1) / 21:21 74	19:27 (2) / 07:00 / 20:52 (1) / 20:16		07:49 / 19:06 63	17:04 (3) / 07:44 / 18:07 (3) / 17:03		08:32 / 16:30
8	08:46 / 16:47	08:10 / 17:40	07:12 / 18:31 62	16:27 (3) / 17:01 / 17:29 (3) / 20:24	05:59 / 21:15 81	19:18 (2) / 05:22 / 20:46 (1) / 21:56 64	19:39 (2) / 05:30 / 21:01 (1) / 22:00 72	19:42 (2) / 06:11 / 21:08 (1) / 21:19 69	19:27 (2) / 07:02 / 20:50 (1) / 20:13		07:51 / 19:04 64	17:03 (3) / 07:46 / 18:07 (3) / 17:01		08:34 / 16:29
9	08:46 / 16:48	08:08 / 17:41	07:10 / 18:33 61	16:28 (3) / 16:59 / 17:29 (3) / 20:26	05:58 / 21:17 84	19:17 (2) / 05:22 / 20:47 (1) / 21:57 62	19:40 (2) / 05:30 / 21:01 (1) / 21:59 73	19:41 (2) / 06:13 / 21:08 (1) / 21:17 63	19:26 (2) / 07:03 / 20:29 (2) / 20:11		07:53 / 19:01 64	17:02 (3) / 07:48 / 18:06 (3) / 16:59		08:35 / 16:29
10	08:45 / 16:50	08:06 / 17:43 17	16:52 (3) / 07:08 / 17:09 (3) / 18:34 59	16:29 (3) / 06:57 / 17:28 (3) / 20:28	05:56 / 21:18 86	19:17 (2) / 05:21 / 20:48 (1) / 21:58 60	19:41 (2) / 05:31 / 21:01 (1) / 21:59 75	19:41 (2) / 06:15 / 21:09 (1) / 21:15 63	19:27 (2) / 07:05 / 20:30 (2) / 20:09		07:55 / 18:59 64	17:02 (3) / 07:49 / 18:06 (3) / 16:58		08:36 / 16:29
11	08:45 / 16:51	08:04 / 17:45 25	16:48 (3) / 07:06 / 17:13 (3) / 18:36 58	16:30 (3) / 06:54 / 17:28 (3) / 20:29	05:54 / 21:20 87	19:18 (2) / 05:21 / 20:50 (1) / 21:59 58	19:42 (2) / 05:33 / 21:01 (1) / 21:58 77	19:40 (2) / 06:16 / 21:09 (1) / 21:13 63	19:26 (2) / 07:07 / 20:29 (2) / 20:06		07:56 / 18:57 64	17:02 (3) / 07:51 / 18:06 (3) / 16:56		08:37 / 16:29
12	08:44 / 16:53	08:03 / 17:47 31	16:45 (3) / 07:03 / 17:16 (3) / 18:38 57	16:29 (3) / 06:52 / 17:26 (3) / 20:31 9 19:48 (2)	05:53 / 19:57 (2) / 21:21 89	19:18 (2) / 05:20 / 20:51 (1) / 21:59 58	19:42 (2) / 05:34 / 21:01 (1) / 21:57 79	19:39 (2) / 06:18 / 21:09 (1) / 21:12 62	19:27 (2) / 07:08 / 20:29 (2) / 20:04		07:58 / 18:55 64	17:02 (3) / 07:53 / 18:06 (3) / 16:55		08:38 / 16:29
13	08:43 / 16:54	08:01 / 17:49 35	16:43 (3) / 07:01 / 17:18 (3) / 18:40 55	16:30 (3) / 06:50 / 17:25 (3) / 20:33 21 19:42 (2)	05:51 / 20:03 (2) / 21:23 90	19:19 (2) / 05:20 / 20:53 (1) / 22:00 54	19:44 (2) / 05:35 / 21:01 (1) / 21:56 79	19:39 (2) / 06:19 / 21:09 (1) / 21:10 62	19:26 (2) / 07:10 / 20:28 (2) / 20:02		08:00 / 18:52 64	17:01 (3) / 07:55 / 18:05 (3) / 16:53		08:39 / 16:29
14	08:43 / 16:56	07:59 / 17:51 39	16:41 (3) / 06:59 / 17:20 (3) / 18:41 52	16:32 (3) / 06:48 / 17:24 (3) / 20:35 27 19:39 (2)	05:49 / 20:06 (2) / 21:25 93	19:18 (2) / 05:20 / 20:54 (1) / 22:01 53	19:45 (2) / 05:36 / 21:01 (1) / 21:55 83	19:38 (2) / 06:21 / 21:10 (1) / 21:08 61	19:27 (2) / 07:11 / 20:28 (2) / 19:59		08:01 / 18:50 63	17:01 (3) / 07:57 / 18:04 (3) / 16:52		08:40 / 16:29
15	08:42 / 16:57	07:57 / 17:53 42	16:40 (3) / 06:56 / 17:22 (3) / 18:43 50	16:32 (3) / 06:46 / 17:22 (3) / 20:36 33 19:36 (2)	05:48 / 20:09 (2) / 21:26 94	19:19 (2) / 05:20 / 20:56 (1) / 22:01 51	19:46 (2) / 05:37 / 21:01 (1) / 21:54 85	19:37 (2) / 06:23 / 21:10 (1) / 21:06 60	19:27 (2) / 07:13 / 20:27 (2) / 19:57		08:03 / 18:48 63	17:01 (3) / 07:58 / 18:04 (3) / 16:50		08:41 / 16:29
16	08:41 / 16:59	07:55 / 17:54 45	16:38 (3) / 06:54 / 17:23 (3) / 18:45 48	16:33 (3) / 06:43 / 17:21 (3) / 20:38 37 19:33 (2)	05:46 / 20:10 (2) / 21:28 95	19:20 (2) / 05:20 / 20:58 (1) / 22:02 51	19:46 (2) / 05:38 / 21:02 (1) / 21:53 86	19:36 (2) / 06:24 / 21:10 (1) / 21:04 60	19:27 (2) / 07:15 / 20:27 (2) / 19:55		08:05 / 18:46 62	17:02 (3) / 08:00 / 18:04 (3) / 16:49		08:42 / 16:29
17	08:40 / 17:00	07:53 / 17:56 48	16:37 (3) / 06:52 / 17:25 (3) / 18:47 45	16:35 (3) / 06:41 / 17:20 (3) / 20:40 40 19:31 (2)	05:45 / 20:11 (2) / 21:29 95	19:20 (2) / 05:20 / 20:58 (1) / 22:02 50	19:47 (2) / 05:39 / 21:02 (1) / 21:52 87	19:36 (2) / 06:26 / 21:10 (1) / 21:02 59	19:27 (2) / 07:16 / 20:26 (2) / 19:52		08:07 / 18:44 61	17:02 (3) / 08:02 / 18:03 (3) / 16:47		08:43 / 16:29
18	08:39 / 17:02	07:51 / 17:58 50	16:36 (3) / 06:50 / 17:26 (3) / 18:48 42	16:36 (3) / 06:39 / 17:18 (3) / 20:41 44 19:29 (2)	05:43 / 20:13 (2) / 21:31 95	19:21 (2) / 05:20 / 21:00 (1) / 22:03 48	19:48 (2) / 05:41 / 21:02 (1) / 21:51 88	19:36 (2) / 06:27 / 21:11 (1) / 21:00 57	19:28 (2) / 07:18 / 20:25 (2) / 19:50		08:08 / 18:42 60	17:02 (3) / 08:03 / 18:02 (3) / 16:46		08:43 / 16:29
19	08:38 / 17:04	07:49 / 18:00 52	16:35 (3) / 06:47 / 17:27 (3) / 18:50 38	16:38 (3) / 06:37 / 17:16 (3) / 20:43 46 20:14 (2)	05:42 / 21:32 94	19:22 (2) / 05:20 / 21:00 (1) / 22:03 48	19:48 (2) / 05:42 / 21:02 (1) / 21:50 90	19:35 (2) / 06:29 / 21:11 (1) / 20:57 56	19:28 (2) / 07:20 / 20:24 (2) / 19:48		08:10 / 18:39 59	17:02 (3) / 08:05 / 18:01 (3) / 16:45		08:44 / 16:29
20	08:37 / 17:05	07:47 / 18:02 54	16:34 (3) / 06:45 / 17:28 (3) / 18:52 34	16:40 (3) / 06:35 / 17:14 (3) / 20:45 48 20:15 (2)	05:40 / 21:34 94	19:22 (2) / 05:20 / 21:00 (1) / 22:03 46	19:49 (2) / 05:43 / 21:02 (1) / 21:49 90	19:34 (2) / 06:31 / 21:10 (1) / 20:55 54	19:29 (2) / 07:21 / 20:23 (2) / 19:45		08:12 / 18:37 57	17:03 (3) / 08:07 / 18:00 (3) / 16:44		08:45 / 16:30
21	08:36 / 17:07	07:45 / 18:04 56	16:33 (3) / 06:43 / 17:29 (3) / 18:53 28	16:42 (3) / 06:33 / 17:10 (3) / 20:46 51 19:25 (2)	05:39 / 20:16 (2) / 21:35 94	19:22 (2) / 05:20 / 21:00 (1) / 22:04 46	19:49 (2) / 05:45 / 21:03 (1) / 21:46 93	19:33 (2) / 06:32 / 21:11 (1) / 20:51 51	19:29 (2) / 07:23 / 20:21 (2) / 19:41 26	17:33 (3) / 08:14 / 17:55 (3) / 18:33 53	17:04 (3) / 08:09 / 17:58 (3) / 16:41		08:45 / 16:31
22	08:35 / 17:09	07:43 / 18:06 57	16:33 (3) / 06:40 / 17:30 (3) / 18:55 21	16:46 (3) / 06:30 / 17:07 (3) / 20:48 53 19:24 (2)	05:38 / 20:17 (2) / 21:36 93	19:23 (2) / 05:20 / 21:01 (1) / 22:04 46	19:50 (2) / 05:46 / 21:03 (1) / 21:46 93	19:33 (2) / 06:34 / 21:11 (1) / 20:51 51	19:30 (2) / 07:24 / 20:21 (2) / 19:41 26	17:29 (3) / 08:15 / 17:55 (3) / 18:33 53	17:05 (3) / 08:10 / 17:58 (3) / 16:41		08:46 / 16:31
23	08:34 / 17:10	07:41 / 18:07 59	16:32 (3) / 06:38 / 17:31 (3) / 18:57 8	16:53 (3) / 06:28 / 17:01 (3) / 20:50 55	05:36 / 20:18 (2) / 21:38 92	19:24 (2) / 05:20 / 21:01 (1) / 22:04 46	19:50 (2) / 05:47 / 21:03 (1) / 21:45 94	19:33 (2) / 06:36 / 21:11 (1) / 20:49 49	19:30 (2) / 07:26 / 20:19 (2) / 19:38 32	17:25 (3) / 08:17 / 17:57 (3) / 18:31 51	17:06 (3) / 08:12 / 17:57 (3) / 16:40		08:46 / 16:31
24	08:33 / 17:12	07:39 / 18:09 60	16:30 (3) / 06:36 / 17:30 (3) / 18:59	06:26 / 20:52 56	05:35 / 20:18 (2) / 21:39 91	19:25 (2) / 05:20 / 21:01 (1) / 22:04 48	19:49 (2) / 05:49 / 21:03 (1) / 21:43 95	19:32 (2) / 06:37 / 21:10 (1) / 20:47 46	19:27 (2) / 07:28 / 20:18 (2) / 19:36 37	17:22 (3) / 08:19 / 17:59 (3) / 18:29 49	17:07 (3) / 08:14 / 17:56 (3) / 16:39		08:47 / 16:32
25	08:31 / 17:14	07:36 / 18:11 61	16:30 (3) / 06:33 / 17:31 (3) / 19:00	06:24 / 20:53 58	19:21 (2) / 05:34 / 20:19 (2) / 21:41 89	19:26 (2) / 05:21 / 21:01 (1) / 22:04 49	19:50 (2) / 05:50 / 21:04 (1) / 21:42 96	19:32 (2) / 06:39 / 21:11 (1) / 20:45 44	19:33 (2) / 07:29 / 20:17 (2) / 19:34 41	17:20 (3) / 08:21 / 18:01 (3) / 17:27 47	16:08 (3) / 08:15 / 16:55 (3) / 16:38		08:47 / 16:32
26	08:30 / 17:16	07:34 / 18:13 63	16:29 (3) / 06:31 / 17:32 (3) / 19:02	06:22 / 20:55 59	19:20 (2) / 05:33 / 20:19 (2) / 21:42 87	19:27 (2) / 05:21 / 21:01 (1) / 22:04 50	19:49 (2) / 05:52 / 21:04 (1) / 21:41 96	19:31 (2) / 06:40 / 21:10 (1) / 20:43 40	19:34 (2) / 07:31 / 20:14 (2) / 19:31 44	17:17 (3) / 07:22 / 18:01 (3) / 17:25 45	16:08 (3) / 08:17 / 16:53 (3) / 16:37		08:47 / 16:33
27	08:29 / 17:17	07:32 / 18:15 63	16:29 (3) / 06:29 / 17:32 (3) / 19:04	06:20 / 20:57 59	19:20 (2) / 05:32 / 20:19 (2) / 21:43 85	19:28 (2) / 05:22 / 21:01 (1) / 22:04 51	19:48 (2) / 05:53 / 21:03 (1) / 21:39 95	19:30 (2) / 06:42 / 21:08 (1) / 20:40 36	19:36 (2) / 07:33 / 20:12 (2) / 19:29 47	17:16 (3) / 07:24 / 18:03 (3) / 17:23 41	16:10 (3) / 08:18 / 16:51 (3) / 16:36		08:48 / 16:34
28	08:27 / 17:19	07:30 / 18:16 63	16:29 (3) / 06:26 / 17:32 (3) / 19:06	06:18 / 20:58 60	19:19 (2) / 05:31 / 20:19 (2) / 21:44 85	19:28 (2) / 05:22 / 21:01 (1) / 22:04 53	19:48 (2) / 05:54 / 21:04 (1) / 21:38 95	19:30 (2) / 06:44 / 21:08 (1) / 20:38 32	19:37 (2) / 07:34 / 20:09 (2) / 19:27 50	17:13 (3) / 07:26 / 18:03 (3) / 17:21 38	16:11 (3) / 08:20 / 16:49 (3) / 16:35		08:48 / 16:35
29	08:26 / 17:21		07:24 / 20:07	06:16 / 21:00 61	19:18 (2) / 05:30 / 20:19 (2) / 21:46 83	19:29 (2) / 05:23 / 21:01 (1) / 22:04 54	19:47 (2) / 05:56 / 21:04 (1) / 21:36 93	19:30 (2) / 06:45 / 21:06 (1) / 20:36 27	19:40 (2) / 07:36 / 20:07 (2) / 19:24 52	17:12 (3) / 07:28 / 18:04 (3) / 17:19 34	16:13 (3) / 08:21 / 16:47 (3) / 16:34		08:48 / 16:36
30	08:24 / 17:23		07:22 / 20:09	06:14 / 21:02 61	19:18 (2) / 05:29 / 20:19 (2) / 21:47 81	19:30 (2) / 05:23 / 21:01 (1) / 22:04 57	19:47 (2) / 05:57 / 21:05 (1) / 21:35 92	19:29 (2) / 06:47 / 21:04 (1) / 20:34 21	19:42 (2) / 07:38 / 20:03 (2) / 19:22 54	17:11 (3) / 07:30 / 18:05 (3) / 17:17 29	16:16 (3) / 08:23 / 16:45 (3) / 16:34		08:48 / 16:36
31	08:23 / 17:25		07:19 / 20:11		05:28 / 21:48 79	19:31 (2) / 21:01 (1)	05:59 / 21:33 90	19:29 (2) / 06:49 / 21:03 (1) / 20:31 8	19:49 (2) / 19:57 (2)		07:31 / 17:15 24	16:18 (3) / 16:42 (3)		08:48 / 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266		243	
Total, worst case		920	1164	878	2614	1709	2541	1773	401	1694	16			
Sun reduction		0,30	0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34	0,24			
Oper. time red.		0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.		0,67	0,67	0,58	0,58	0,58	0,58	0,58	0,67	0,67	0,67			
Total reduction		0,19	0,21	0,23	0,24	0,22	0,23	0,23	0,23	0,21	0,15			
Total, real		177	244	204	621	371	575	410	92	363	2			

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 2

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 02 - Autenasekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12 (56)	18:43 (3) - 06:12 - 19:39 (3) - 21:03 (62)	18:34 (3) - 05:27 - 19:36 (3) - 21:49 (20)	20:56 (2) - 05:24 - 21:16 (2) - 22:03 (36)	20:54 (2) - 06:00 - 21:30 (2) - 21:31 (37)	18:57 (3) - 06:50 - 19:34 (3) - 20:29 (72)	18:30 (3) - 07:39 - 19:42 (3) - 19:20	07:33 - 17:13	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:28	07:26 - 18:20	07:15 - 20:14 (59)	18:40 (3) - 06:10 - 19:39 (3) - 21:05 (60)	18:35 (3) - 05:26 - 19:35 (3) - 21:50 (22)	20:55 (2) - 05:25 - 21:17 (2) - 22:03 (35)	20:54 (2) - 06:02 - 21:29 (2) - 21:30 (40)	18:56 (3) - 06:52 - 19:36 (3) - 20:27 (71)	18:31 (3) - 07:41 - 19:42 (3) - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:23 - 18:22	07:13 - 20:16 (61)	18:39 (3) - 06:08 - 19:40 (3) - 21:07 (58)	18:36 (3) - 05:25 - 19:34 (3) - 21:51 (25)	20:53 (2) - 05:25 - 21:18 (2) - 22:03 (34)	20:55 (2) - 06:04 - 21:29 (2) - 21:28 (42)	18:54 (3) - 06:54 - 19:36 (3) - 20:25 (71)	18:31 (3) - 07:43 - 19:42 (3) - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:17 (63)	18:38 (3) - 06:07 - 19:41 (3) - 21:08 (57)	18:36 (3) - 05:25 - 19:33 (3) - 21:52 (27)	20:53 (2) - 05:26 - 21:20 (2) - 22:02 (33)	20:56 (2) - 06:05 - 21:29 (2) - 21:26 (45)	18:53 (3) - 06:55 - 19:38 (3) - 20:22 (69)	18:31 (3) - 07:44 - 19:40 (3) - 19:13	07:39 - 17:08	08:28 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:25	07:08 - 20:19 (65)	18:37 (3) - 06:05 - 19:42 (3) - 21:10 (54)	18:38 (3) - 05:24 - 19:32 (3) - 21:54 (29)	20:52 (2) - 05:27 - 21:21 (2) - 22:02 (32)	20:57 (2) - 06:07 - 21:29 (2) - 21:25 (48)	18:51 (3) - 06:57 - 19:39 (3) - 20:20 (68)	18:32 (3) - 07:46 - 19:40 (3) - 19:10	07:40 - 17:06	08:30 - 16:31
6	08:47 - 16:44	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21 (67)	18:35 (3) - 06:03 - 19:42 (3) - 21:12 (52)	18:39 (3) - 05:23 - 19:31 (3) - 21:54 (30)	20:51 (2) - 05:28 - 21:21 (2) - 22:01 (31)	20:57 (2) - 06:08 - 21:28 (2) - 21:23 (50)	18:50 (3) - 06:58 - 19:40 (3) - 20:18 (67)	18:31 (3) - 07:48 - 19:38 (3) - 19:08	07:42 - 17:04	08:31 - 16:30
7	08:47 - 16:46	08:11 - 17:38	07:15 - 18:29	07:03 - 20:23 (68)	18:35 (3) - 06:01 - 19:43 (3) - 21:13 (49)	18:40 (3) - 05:23 - 19:29 (3) - 21:55 (31)	20:51 (2) - 05:29 - 21:22 (2) - 22:01 (29)	20:58 (2) - 06:10 - 21:27 (2) - 21:21 (53)	18:48 (3) - 07:00 - 19:41 (3) - 20:16 (65)	18:32 (3) - 07:49 - 19:37 (3) - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:46 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24 (69)	18:34 (3) - 05:59 - 19:43 (3) - 21:15 (47)	18:42 (3) - 05:22 - 19:29 (3) - 21:56 (33)	20:51 (2) - 05:30 - 21:24 (2) - 22:00 (28)	20:59 (2) - 06:11 - 21:27 (2) - 21:19 (55)	18:47 (3) - 07:02 - 19:42 (3) - 20:13 (63)	18:32 (3) - 07:51 - 19:35 (3) - 19:04	07:46 - 17:01	08:34 - 16:29
9	08:46 - 16:48	08:08 - 17:41	07:10 - 18:33	06:59 - 20:26 (71)	18:33 (3) - 05:58 - 19:44 (3) - 21:17 (44)	18:43 (3) - 05:22 - 19:27 (3) - 21:57 (34)	20:50 (2) - 05:30 - 21:24 (2) - 21:59 (26)	21:00 (2) - 06:13 - 21:26 (2) - 21:17 (56)	18:46 (3) - 07:03 - 19:42 (3) - 20:11 (61)	18:33 (3) - 07:53 - 19:34 (3) - 19:01	07:48 - 16:59	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28 (71)	18:32 (3) - 05:56 - 19:43 (3) - 21:18 (41)	18:44 (3) - 05:21 - 19:25 (3) - 21:58 (35)	20:50 (2) - 05:31 - 21:25 (2) - 21:59 (23)	21:02 (2) - 06:15 - 21:25 (2) - 21:15 (59)	18:45 (3) - 07:05 - 19:44 (3) - 20:09 (59)	18:33 (3) - 07:55 - 19:32 (3) - 18:59	07:49 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:54 - 20:29 (72)	18:31 (3) - 05:54 - 19:43 (3) - 21:20 (39)	18:46 (3) - 05:21 - 19:25 (3) - 21:59 (36)	20:50 (2) - 05:33 - 21:26 (2) - 21:58 (21)	21:03 (2) - 06:16 - 21:24 (2) - 21:13 (61)	18:43 (3) - 07:07 - 19:44 (3) - 20:06 (56)	18:35 (3) - 07:56 - 19:31 (3) - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:02 - 17:47	07:03 - 18:38	06:52 - 20:31 (73)	18:31 (3) - 05:53 - 19:44 (3) - 21:21 (34)	18:48 (3) - 05:20 - 19:22 (3) - 21:59 (37)	20:49 (2) - 05:34 - 21:26 (2) - 21:57 (18)	21:05 (2) - 06:18 - 21:23 (2) - 21:12 (62)	18:43 (3) - 07:08 - 19:45 (3) - 20:04 (54)	18:36 (3) - 07:58 - 19:30 (3) - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:43 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33 (73)	18:31 (3) - 05:51 - 19:44 (3) - 21:23 (31)	18:50 (3) - 05:20 - 19:21 (3) - 22:00 (37)	20:49 (2) - 05:35 - 21:26 (2) - 21:56 (14)	21:07 (2) - 06:19 - 21:21 (2) - 21:10 (64)	18:41 (3) - 07:10 - 19:45 (3) - 20:02 (50)	18:37 (3) - 08:00 - 19:27 (3) - 18:52	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35 (73)	18:31 (3) - 05:49 - 19:44 (3) - 21:25 (26)	18:52 (3) - 05:20 - 19:18 (3) - 22:01 (38)	20:49 (2) - 05:36 - 21:27 (2) - 21:55 (6)	21:11 (2) - 06:21 - 21:17 (2) - 21:08 (65)	18:41 (3) - 07:11 - 19:46 (3) - 19:59 (47)	18:38 (3) - 08:01 - 19:25 (3) - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:56 - 18:43	06:46 - 20:36 (74)	18:30 (3) - 05:48 - 19:44 (3) - 21:26 (21)	18:55 (3) - 05:20 - 19:16 (3) - 22:01 (39)	20:49 (2) - 05:37 - 21:28 (2) - 21:54	06:23 - 21:06 (67)	18:39 (3) - 07:13 - 19:46 (3) - 19:57 (43)	18:39 (3) - 08:03 - 19:22 (3) - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:54	06:54 - 18:45	06:43 - 20:38 (74)	18:29 (3) - 05:46 - 19:43 (3) - 21:28 (14)	18:59 (3) - 05:20 - 19:13 (3) - 22:02 (39)	20:49 (2) - 05:38 - 21:28 (2) - 21:53	06:24 - 21:04 (67)	18:39 (3) - 07:15 - 19:46 (3) - 19:55 (38)	18:42 (3) - 08:05 - 19:20 (3) - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40 (74)	18:29 (3) - 05:45 - 19:43 (3) - 21:29	05:20 - 22:02 (40)	20:49 (2) - 05:39 - 21:29 (2) - 21:52	06:26 - 21:02 (69)	18:37 (3) - 07:16 - 19:46 (3) - 19:52 (33)	18:44 (3) - 08:07 - 19:17 (3) - 18:44	08:02 - 16:47	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41 (74)	18:29 (3) - 05:43 - 19:43 (3) - 21:31	05:20 - 22:03 (40)	20:49 (2) - 05:41 - 21:29 (2) - 21:51	06:27 - 21:00 (70)	18:37 (3) - 07:18 - 19:47 (3) - 19:50 (26)	18:47 (3) - 08:08 - 19:13 (3) - 18:42	08:03 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43 (74)	18:29 (3) - 05:42 - 19:43 (3) - 21:32	05:20 - 22:03 (40)	20:49 (2) - 05:42 - 21:29 (2) - 21:50	06:29 - 20:57 (70)	18:36 (3) - 07:20 - 19:46 (3) - 19:48 (16)	18:52 (3) - 08:10 - 19:08 (3) - 18:39	08:05 - 16:45	08:44 - 16:29
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45 (73)	18:29 (3) - 05:40 - 19:42 (3) - 21:34	05:20 - 22:03 (39)	20:50 (2) - 05:43 - 21:29 (2) - 21:49	06:31 - 20:55 (72)	18:35 (3) - 07:21 - 19:47 (3) - 19:45	08:12 - 18:37	08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:53	06:33 - 20:46 (73)	18:29 (3) - 05:39 - 19:42 (3) - 21:35	05:20 - 22:04 (39)	20:50 (2) - 05:45 - 21:29 (2) - 21:47	06:32 - 20:53 (72)	18:34 (3) - 07:23 - 19:46 (3) - 19:43	08:14 - 18:35	08:09 - 16:42	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:30 - 20:48 (72)	18:30 (3) - 05:38 - 19:42 (3) - 21:36	05:20 - 22:04 (39)	20:51 (2) - 05:46 - 21:30 (2) - 21:46	06:34 - 20:51 (73)	18:34 (3) - 07:24 - 19:47 (3) - 19:41	08:15 - 18:33	08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:10	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50 (71)	18:30 (3) - 05:36 - 19:41 (3) - 21:38	05:20 - 22:04 (40)	20:50 (2) - 05:47 - 21:30 (2) - 21:45	06:36 - 20:49 (73)	18:33 (3) - 07:26 - 19:46 (3) - 19:38	08:17 - 18:31	08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59 (11)	18:07 (3) - 06:26 - 18:18 (3) - 20:52 (71)	18:30 (3) - 05:35 - 19:41 (3) - 21:39	05:20 - 22:04 (40)	20:50 (2) - 05:49 - 21:30 (2) - 21:43	06:37 - 20:47 (73)	18:33 (3) - 07:28 - 19:46 (3) - 19:36	08:19 - 18:29	08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:36 - 18:11	06:33 - 19:00 (24)	18:00 (3) - 06:24 - 18:24 (3) - 20:53 (70)	18:30 (3) - 05:34 - 19:40 (3) - 21:41	05:21 - 22:04 (40)	20:51 (2) - 05:50 - 21:31 (2) - 21:42	06:39 - 20:45 (74)	18:33 (3) - 07:29 - 19:47 (3) - 19:34	07:21 - 17:27	08:15 - 16:38	08:47 - 16:32
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02 (31)	17:57 (3) - 06:22 - 18:28 (3) - 20:55 (68)	18:31 (3) - 05:33 - 19:39 (3) - 21:42	05:21 - 22:04 (39)	20:51 (2) - 05:52 - 21:30 (2) - 21:41	06:41 - 20:43 (74)	18:32 (3) - 07:31 - 19:46 (3) - 19:31	07:22 - 17:25	08:17 - 16:37	08:47 - 16:33
27	08:29 - 17:17	07:32 - 18:15	06:29 - 19:04 (37)	17:53 (3) - 06:20 - 18:30 (3) - 20:57 (68)	18:31 (3) - 05:32 - 19:39 (3) - 21:43	05:22 - 22:04 (39)	20:51 (2) - 05:53 - 21:30 (2) - 21:39 (8)	19:12 (3) - 06:42 - 19:20 (3) - 20:40 (74)	18:32 (3) - 07:33 - 19:46 (3) - 19:29	07:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:16	06:26 - 19:06 (42)	17:50 (3) - 06:18 - 18:32 (3) - 20:58 (66)	18:32 (3) - 05:31 - 19:38 (3) - 21:44	05:22 - 22:04 (38)	20:52 (2) - 05:54 - 21:30 (2) - 21:38 (17)	19:08 (3) - 06:44 - 19:25 (3) - 20:38 (74)	18:31 (3) - 07:34 - 19:45 (3) - 19:27	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07 (46)	18:48 (3) - 06:16 - 19:34 (3) - 21:00 (65)	18:32 (3) - 05:30 - 19:37 (3) - 21:46	05:23 - 22:04 (38)	20:52 (2) - 05:56 - 21:30 (2) - 21:36 (24)	19:04 (3) - 06:45 - 19:28 (3) - 20:36 (74)	18:31 (3) - 07:36 - 19:45 (3) - 19:24	07:28 - 17:19	08:21 - 16:34	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09 (49)	18:46 (3) - 06:14 - 19:35 (3) - 21:02 (63)	18:33 (3) - 05:29 - 19:36 (3) - 21:47 (11)	21:00 (2) - 05:23 - 21:11 (2) - 22:04 (37)	20:53 (2) - 05:57 - 21:30 (2) - 21:35 (29)	19:01 (3) - 06:47 - 19:30 (3) - 20:34 (73)	18:31 (3) - 07:38 - 19:44 (3) - 19:22	07:30 - 17:17	08:23 - 16:34	08:48 - 16:36
31	08:23 - 17:25		07:19 - 20:11 (53)	18:44 (3) - 19:37 (3)	05:28 - 21:48 (16)	20:57 (2) - 21:13 (2)	05:59 - 21:33 (32)	19:00 (3) - 06:49 - 19:32 (3) - 20:31 (73)	18:31 (3) - 19:44 (3)	07:31 - 17:15	08:48 - 16:37	
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			293	2071	716	1060	476	1959	1029			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,62	0,62	0,62	0,59	0,59	0,62	0,62			
Total reduction			0,19	0,25	0,25	0,22	0,23	0,24	0,21			
Total, real			57	509	180	230	109	479	219			

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 3

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 03 - Breede Sticht 1

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March		April	May	June	July	August	September		October		November		December	
1	08:48	15:03 (3)	08:21		16:09 (2)	07:28	17:25 (1)	07:17	06:12	05:27	05:24	06:00	06:50	07:39		18:04 (1)	07:33	15:42 (2)	08:24	14:58 (3)
	16:39	26 15:29 (3)	17:27	41	16:50 (2)	18:18	27 17:52 (1)	20:12	21:03	21:49	22:03	21:31	20:29	19:20	28	18:32 (1)	17:13	35 16:17 (2)	16:33	9 15:07 (3)
2	08:48	15:03 (3)	08:20		16:09 (2)	07:26	17:24 (1)	07:15	06:10	05:26	05:25	06:02	06:52	07:41		18:02 (1)	07:35	15:41 (2)	08:26	14:56 (3)
	16:40	25 15:28 (3)	17:28	40	16:49 (2)	18:20	30 17:54 (1)	20:14	21:05	21:50	22:03	21:30	20:27	19:17	30	18:32 (1)	17:12	37 16:18 (2)	16:32	13 15:09 (3)
3	08:48	15:04 (3)	08:18		16:09 (2)	07:23	17:24 (1)	07:13	06:08	05:25	05:25	06:04	06:54	07:43		18:01 (1)	07:37	15:41 (2)	08:27	14:56 (3)
	16:41	25 15:29 (3)	17:30	40	16:49 (2)	18:22	32 17:56 (1)	20:16	21:07	21:51	22:03	21:28	20:25	19:15	32	18:33 (1)	17:10	38 16:19 (2)	16:32	15 15:11 (3)
4	08:48	15:06 (3)	08:17		16:09 (2)	07:21	17:24 (1)	07:10	06:07	05:25	05:26	06:05	06:55	07:44		18:01 (1)	07:39	15:40 (2)	08:29	14:54 (3)
	16:42	23 15:29 (3)	17:32	40	16:49 (2)	18:24	34 17:58 (1)	20:17	21:08	21:53	22:02	21:26	20:22	19:13	32	18:33 (1)	17:08	39 16:19 (2)	16:31	18 15:12 (3)
5	08:48	15:06 (3)	08:15		16:10 (2)	07:19	17:22 (1)	07:08	06:05	05:24	05:27	06:07	06:57	07:46		17:59 (1)	07:40	15:40 (2)	08:30	14:53 (3)
	16:43	23 15:29 (3)	17:34	40	16:50 (2)	18:25	35 17:57 (1)	20:19	21:10	21:54	22:02	21:25	20:20	19:10	34	18:33 (1)	17:06	39 16:19 (2)	16:31	20 15:13 (3)
6	08:47	15:08 (3)	08:13		16:10 (2)	07:17	17:22 (1)	07:06	06:03	05:23	05:28	06:08	06:58	07:48		17:59 (1)	07:42	15:40 (2)	08:31	14:54 (3)
	16:44	21 15:29 (3)	17:36	40	16:50 (2)	18:27	35 17:57 (1)	20:21	21:12	21:54	22:01	21:23	20:18	19:08	34	18:33 (1)	17:04	40 16:20 (2)	16:30	21 15:15 (3)
7	08:47	15:08 (3)	08:12		16:11 (2)	07:15	17:23 (1)	07:03	06:01	05:23	05:29	06:10	07:00	07:49		17:59 (1)	07:44	15:40 (2)	08:32	14:53 (3)
	16:46	20 15:28 (3)	17:38	38	16:49 (2)	18:29	34 17:57 (1)	20:23	21:13	21:55	22:01	21:21	20:16	19:06	34	18:33 (1)	17:03	40 16:20 (2)	16:30	23 15:16 (3)
8	08:46	15:10 (3)	08:10		16:11 (2)	07:12	17:22 (1)	07:01	05:59	05:22	05:29	06:11	07:02	07:51		17:58 (1)	07:46	15:40 (2)	08:34	14:53 (3)
	16:47	18 15:28 (3)	17:40	38	16:49 (2)	18:31	34 17:56 (1)	20:24	21:15	21:56	22:00	21:19	20:13	19:04	35	18:33 (1)	17:01	40 16:20 (2)	16:29	23 15:16 (3)
9	08:46	15:11 (3)	08:08		16:12 (2)	07:10	17:22 (1)	06:59	05:58	05:22	05:30	06:13	07:03	07:53		17:57 (1)	07:48	15:40 (2)	08:35	14:53 (3)
	16:48	16 15:27 (3)	17:41	36	16:48 (2)	18:33	34 17:56 (1)	20:26	21:17	21:57	21:59	21:17	20:11	19:01	35	18:32 (1)	16:59	40 16:20 (2)	16:29	25 15:18 (3)
10	08:45	15:13 (3)	08:06		16:12 (2)	07:08	17:23 (1)	06:57	05:56	05:21	05:31	06:15	07:05	07:55		17:58 (1)	07:49	15:40 (2)	08:36	14:53 (3)
	16:50	13 15:26 (3)	17:43	36	16:48 (2)	18:34	32 17:55 (1)	20:28	21:18	21:58	21:59	21:15	20:09	18:59	33	18:31 (1)	16:58	40 16:20 (2)	16:29	25 15:18 (3)
11	08:45	15:16 (3)	08:04		16:13 (2)	07:06	17:24 (1)	06:54	05:54	05:21	05:32	06:16	07:07	07:56		17:58 (1)	07:51	15:41 (2)	08:37	14:53 (3)
	16:51	10 15:26 (3)	17:45	34	16:47 (2)	18:36	31 17:55 (1)	20:29	21:20	21:59	21:58	21:13	20:06	18:57	31	18:29 (1)	16:56	39 16:20 (2)	16:29	26 15:19 (3)
12	08:44		08:03		16:14 (2)	07:03	17:24 (1)	06:52	05:52	05:20	05:34	06:18	07:08	07:58		17:59 (1)	07:53	15:41 (2)	08:38	14:53 (3)
	16:53		17:47	32	16:46 (2)	18:38	29 17:53 (1)	20:31	21:21	21:59	21:57	21:12	20:04	18:55	28	18:27 (1)	16:55	39 16:20 (2)	16:29	27 15:20 (3)
13	08:43		08:01		16:15 (2)	07:01	17:25 (1)	06:50	05:51	05:20	05:35	06:19	07:10	08:00		17:58 (1)	07:55	15:41 (2)	08:39	14:53 (3)
	16:54		17:49	30	16:45 (2)	18:40	27 17:52 (1)	20:33	21:23	22:00	21:56	21:10	20:02	18:52	26	18:24 (1)	16:53	38 16:19 (2)	16:29	27 15:20 (3)
14	08:43	16:21 (2)	07:59		16:17 (2)	06:59	17:27 (1)	06:48	05:49	05:20	05:36	06:21	07:11	08:01		17:59 (1)	07:57	15:41 (2)	08:40	14:54 (3)
	16:56	2 16:22 (2)	17:51	26	16:43 (2)	18:41	23 17:50 (1)	20:35	21:25	22:01	21:55	21:08	19:59	18:50	23	18:22 (1)	16:52	38 16:19 (2)	16:29	27 15:21 (3)
15	08:42	16:18 (2)	07:57		16:19 (2)	06:56	17:28 (1)	06:46	05:48	05:20	05:37	06:23	07:13	08:03		18:00 (1)	07:58	15:42 (2)	08:41	14:54 (3)
	16:57	6 16:24 (2)	17:53	23	16:42 (2)	18:43	19 17:47 (1)	20:36	21:26	22:01	21:54	21:06	19:57	18:48	20	18:20 (1)	16:50	37 16:19 (2)	16:29	28 15:22 (3)
16	08:41	16:16 (2)	07:55		16:22 (2)	06:54	17:31 (1)	06:43	05:46	05:20	05:38	06:24	07:15	08:05		18:01 (1)	08:00	15:43 (2)	08:42	14:54 (3)
	16:59	10 16:26 (2)	17:54	17	16:39 (2)	18:45	13 17:44 (1)	20:38	21:28	22:02	21:53	21:04	19:55	18:46	17	18:18 (1)	16:49	34 16:17 (2)	16:29	29 15:23 (3)
17	08:40	16:15 (2)	07:53		16:25 (2)	06:52		06:41	05:45	05:19	05:39	06:26	07:16	08:07		18:03 (1)	08:02	15:43 (2)	08:43	14:54 (3)
	17:00	13 16:28 (2)	17:56	11	16:36 (2)	18:47		20:40	21:29	22:02	21:52	21:02	19:52	18:44	13	18:16 (1)	16:47	33 16:16 (2)	16:29	28 15:22 (3)
18	08:39	16:14 (2)	07:51			06:50		06:39	05:43	05:19	05:41	06:27	07:18	08:08		18:05 (1)	08:03	15:44 (2)	08:43	14:55 (3)
	17:02	15 16:29 (2)	17:58			18:48		20:41	21:31	22:03	21:51	21:00	19:50	18:42	8	18:13 (1)	16:46	30 16:14 (2)	16:29	28 15:23 (3)
19	08:38	16:14 (2)	07:49			06:47		06:37	05:42	05:20	05:42	06:29	07:20	08:10		18:09 (1)	08:05	15:45 (2)	08:44	14:55 (3)
	17:04	17 16:31 (2)	18:00			18:50		20:43	21:32	22:03	21:50	20:57	19:48	18:39	2	18:11 (1)	16:45	28 16:13 (2)	16:29	29 15:24 (3)
20	08:37	16:12 (2)	07:47			06:45		06:35	05:40	05:20	05:43	06:31	07:21	08:12			08:07	15:47 (2)	08:45	14:55 (3)
	17:05	21 16:33 (2)	18:02			18:52		20:45	21:34	22:03	21:49	20:55	19:45	18:37			16:44	25 16:12 (2)	16:30	29 15:24 (3)
21	08:36	16:12 (2)	07:45			06:43		06:33	05:39	05:20	05:45	06:32	07:23	08:14			08:09	15:48 (2)	08:45	14:56 (3)
	17:07	23 16:35 (2)	18:04			18:53		20:46	21:35	22:04	21:47	20:53	19:43	18:35			16:42	23 16:11 (2)	16:30	29 15:25 (3)
22	08:35	16:12 (2)	07:43			06:40		06:30	05:38	05:20	05:46	06:34	07:24	08:15			08:10	15:48 (2)	08:46	14:56 (3)
	17:09	25 16:37 (2)	18:06			18:55		20:48	21:36	22:04	21:46	20:51	19:41	18:33			16:41	21 16:09 (2)	16:31	29 15:25 (3)
23	08:34	16:10 (2)	07:41		17:37 (1)	06:38		06:28	05:36	05:20	05:47	06:36	07:26	08:17			08:12	15:50 (2)	08:46	14:57 (3)
	17:10	28 16:38 (2)	18:07	4	17:41 (1)	18:57		20:50	21:38	22:04	21:45	20:49	19:38	18:31			16:40	18 16:08 (2)	16:31	29 15:26 (3)
24	08:33	16:10 (2)	07:39		17:32 (1)	06:36		06:26	05:35	05:20	05:49	06:37	07:28	08:19			08:14	15:51 (2)	08:47	14:57 (3)
	17:12	30 16:40 (2)	18:09	10	17:42 (1)	18:59		20:52	21:39	22:04	21:43	20:47	19:36	18:29			16:39	16 16:07 (2)	16:32	29 15:26 (3)
25	08:31	16:10 (2)	07:36		17:30 (1)	06:33		06:24	05:34	05:21	05:50	06:39	07:29	07:21		15:55 (2)	08:15	15:53 (2)	08:47	14:58 (3)
	17:14	33 16:43 (2)	18:11	14	17:44 (1)	19:00		20:53	21:41	22:04	21:42	20:45	19:34	17:27	13	16:08 (2)	16:38	13 16:06 (2)	16:32	29 15:27 (3)
26	08:30	16:10 (2)	07:34		17:29 (1)	06:31		06:22	05:33	05:21	05:51	06:40	07:31	07:22		15:51 (2)	08:17	15:54 (2)	08:47	14:59 (3)
	17:16	34 16:44 (2)	18:13	17	17:46 (1)	19:02		20:55	21:42	22:04	21:41	20:43	19:31	17:25	20	16:11 (2)	16:37	10 16:04 (2)	16:33	28 15:27 (3)
27	08:29	16:10 (2)	07:32		17:28 (1)	06:29		06:20	05:32	05:22	05:53	06:42	07:33	18:15 (1)	07:24	15:48 (2)	08:18	15:57 (2)	08:48	14:59 (3)
	17:17	37 16:47 (2)	18:15	20	17:48 (1)	19:04		20:57	21:43	22:04	21:39	20:40	19:29	10 18:25 (1)	17:23	24 16:12 (2)	16:36	6 16:03 (2)	16:34	28 15:27 (3)
28	08:27	16:09 (2)	07:30		17:27 (1)	06:26		06:18	05:31	05:22	05:54	06:44	07:34	18:10 (1)	07:26	15:46 (2)	08:20	16:01 (2)	08:48	15:00 (3)
	17:19	38 16:47 (2)	18:16	24	17:51 (1)	19:06		20:58	21:45	22:04	21:38	20:38	19:27	17 18:27 (1)	17:21	27 16:13 (2)	16:35	2 16:02 (2)	16:35	28 15:28 (3)
29	08:26	16:10 (2)				07:24		06:16	05:30	05:23	05:56	06:45	07:36	18:08 (1)	07:28	15:45 (2)	08:21		08:48	15:00 (3)
	17:21	38 16:48 (2)				20:07		21:00	21:46	22:04	21:36	20:36	19:24	21 18:29 (1)	17:19	30 16:15 (2)	16:34		16:35	28 15:28 (3)
30	08:24	16:09 (2)				07:22		06:14	05:29	05:23	05:57	06:47	07:38	18:06 (1)	07:30	15:44 (2)	08:23		08:48	15:01 (3)
	17:23	39 16:48 (2)				20:09		21:02	21:47	22:04	21:35	20:34	19:22	25 18:31 (1)	17:17	32 16:16 (2)	16:34		16:36	27 15:28 (3)
31	08:23	16:09 (2)				07:19			05:28		05:59	06:49			07:31	15:43 (2)			08:48	15:02 (3)
	17:25	40 16:49 (2)				20:11			21:48		21:33	20:31			17:15	34 16:17 (2)			16:37	27 15:29 (3)
Potential sun hours	259		277		367		416	485	499	502	454	381		331			266		243	
Total, worst case		669		651		469							73		675		838		781	
Sun reduction		0,24		0,30		0,33							0,36		0,34		0,24		0,20	
Oper. time red.		0,95		0,95		0,95							0,95		0,95		0,95		0,95	
Wind dir. red.		0,68		0,67		0,64							0,64		0,65		0,67		0,69	
Total reduction		0,15		0,19		0,20							0,22		0,21		0,15		0,13	
Total, real		104		125		95							16		141		127		105	

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

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

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 4

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 04 - Breede Sticht 16

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December		
1	08:48	15:21 (2)	08:21		07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	16:22 (1)	08:24		15:07 (2)
	16:39 38	15:59 (2)	17:27		18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13 22	16:44 (1)	16:33	39	15:46 (2)
2	08:48	15:21 (2)	08:20		07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	16:23 (1)	08:26		15:07 (2)
	16:40 38	15:59 (2)	17:28		18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12 19	16:42 (1)	16:32	39	15:46 (2)
3	08:48	15:21 (2)	08:18		07:23	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	16:24 (1)	08:27		15:08 (2)
	16:41 39	16:00 (2)	17:30		18:22	20:16	21:07	21:51	22:03	21:28	20:25	19:15		17:10 16	16:40 (1)	16:32	39	15:47 (2)
4	08:48	15:22 (2)	08:17		07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39	16:25 (1)	08:29		15:08 (2)
	16:42 39	16:01 (2)	17:32		18:24	20:17	21:08	21:53	22:02	21:26	20:22	19:13		17:08 13	16:38 (1)	16:31	39	15:47 (2)
5	08:48	15:22 (2)	08:15	16:59 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40	16:27 (1)	08:30		15:08 (2)
	16:43 39	16:01 (2)	17:34 6	17:05 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06 9	16:36 (1)	16:31	39	15:47 (2)
6	08:47	15:23 (2)	08:13	16:57 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42	16:30 (1)	08:31		15:09 (2)
	16:44 39	16:02 (2)	17:36 10	17:07 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04 4	16:34 (1)	16:30	39	15:48 (2)
7	08:47	15:23 (2)	08:12	16:55 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44		08:32		15:09 (2)
	16:46 39	16:02 (2)	17:38 14	17:09 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03		16:30	39	15:48 (2)
8	08:46	15:24 (2)	08:10	16:54 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46		08:34		15:09 (2)
	16:47 39	16:03 (2)	17:40 16	17:10 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01		16:29	39	15:48 (2)
9	08:46	15:24 (2)	08:08	16:53 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48		08:35		15:10 (2)
	16:48 39	16:03 (2)	17:41 19	17:12 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59		16:29	39	15:49 (2)
10	08:45	15:24 (2)	08:06	16:52 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49		08:36		15:11 (2)
	16:50 39	16:03 (2)	17:43 22	17:14 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58		16:29	38	15:49 (2)
11	08:45	15:25 (2)	08:04	16:51 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51		08:37		15:11 (2)
	16:51 39	16:04 (2)	17:45 25	17:16 (1)	18:36	20:29	21:20	21:59	21:58	21:13	20:06	18:57		16:56		16:29	38	15:49 (2)
12	08:44	15:25 (2)	08:03	16:50 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53	15:19 (2)	08:38		15:12 (2)
	16:53 39	16:04 (2)	17:47 28	17:18 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55 7	15:26 (2)	16:29	38	15:50 (2)
13	08:43	15:26 (2)	08:01	16:50 (1)	07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	17:34 (1)	07:55	15:14 (2)	08:39		15:12 (2)
	16:54 38	16:04 (2)	17:49 30	17:20 (1)	18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52 9	17:43 (1)	16:53 15	15:29 (2)	16:29	38	15:50 (2)
14	08:43	15:26 (2)	07:59	16:49 (1)	06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	17:30 (1)	07:57	15:12 (2)	08:40		15:13 (2)
	16:56 38	16:04 (2)	17:51 33	17:22 (1)	18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50 17	17:47 (1)	16:52 19	15:31 (2)	16:29	38	15:51 (2)
15	08:42	15:27 (2)	07:57	16:49 (1)	06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	17:28 (1)	07:58	15:11 (2)	08:41		15:13 (2)
	16:57 38	16:05 (2)	17:53 35	17:24 (1)	18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48 21	17:49 (1)	16:50 22	15:33 (2)	16:29	38	15:51 (2)
16	08:41	15:27 (2)	07:55	16:49 (1)	06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	17:26 (1)	08:00	15:09 (2)	08:42		15:14 (2)
	16:59 38	16:05 (2)	17:54 35	17:24 (1)	18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46 25	17:51 (1)	16:49 26	15:35 (2)	16:29	38	15:52 (2)
17	08:40	15:28 (2)	07:53	16:49 (1)	06:52	06:41	05:45	05:19	05:39	06:26	07:16	08:07	17:25 (1)	08:02	15:09 (2)	08:43		15:14 (2)
	17:00 37	16:05 (2)	17:56 35	17:24 (1)	18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44 27	17:52 (1)	16:47 27	15:36 (2)	16:29	37	15:51 (2)
18	08:39	15:29 (2)	07:51	16:49 (1)	06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	17:22 (1)	08:03	15:08 (2)	08:43		15:14 (2)
	17:02 36	16:05 (2)	17:58 35	17:24 (1)	18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42 30	17:52 (1)	16:46 29	15:37 (2)	16:29	38	15:52 (2)
19	08:38	15:30 (2)	07:49	16:49 (1)	06:47	06:37	05:42	05:19	05:42	06:29	07:20	08:10	17:21 (1)	08:05	15:07 (2)	08:44		15:15 (2)
	17:04 35	16:05 (2)	18:00 35	17:24 (1)	18:50	20:43	21:32	22:03	21:50	20:57	19:48	18:39 32	17:53 (1)	16:45 31	15:38 (2)	16:29	38	15:53 (2)
20	08:37	15:30 (2)	07:47	16:49 (1)	06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	17:21 (1)	08:07	15:07 (2)	08:45		15:15 (2)
	17:05 34	16:04 (2)	18:02 35	17:24 (1)	18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37 32	17:53 (1)	16:44 32	15:39 (2)	16:30	38	15:53 (2)
21	08:36	15:31 (2)	07:45	16:50 (1)	06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	17:20 (1)	08:09	15:07 (2)	08:45		15:16 (2)
	17:07 33	16:04 (2)	18:04 33	17:23 (1)	18:53	20:46	21:35	22:04	21:47	20:53	19:43	18:35 34	17:54 (1)	16:42 33	15:40 (2)	16:30	37	15:53 (2)
22	08:35	15:32 (2)	07:43	16:51 (1)	06:40	06:30	05:38	05:20	05:46	06:34	07:24	08:15	17:20 (1)	08:10	15:06 (2)	08:46		15:17 (2)
	17:09 32	16:04 (2)	18:06 32	17:23 (1)	18:55	20:48	21:36	22:04	21:46	20:51	19:41	18:33 34	17:54 (1)	16:41 34	15:40 (2)	16:31	37	15:54 (2)
23	08:34	15:32 (2)	07:41	16:51 (1)	06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	17:19 (1)	08:12	15:06 (2)	08:46		15:17 (2)
	17:10 31	16:03 (2)	18:07 31	17:22 (1)	18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31 36	17:55 (1)	16:40 35	15:41 (2)	16:31	37	15:54 (2)
24	08:33	15:34 (2)	07:39	16:51 (1)	06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	17:19 (1)	08:14	15:06 (2)	08:47		15:17 (2)
	17:12 29	16:03 (2)	18:09 29	17:20 (1)	18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29 36	17:55 (1)	16:39 36	15:42 (2)	16:32	38	15:55 (2)
25	08:31	15:36 (2)	07:36	16:53 (1)	06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	16:19 (1)	08:15	15:06 (2)	08:47		15:18 (2)
	17:14 27	16:03 (2)	18:11 26	17:19 (1)	19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27 36	16:55 (1)	16:38 37	15:43 (2)	16:32	38	15:56 (2)
26	08:30	15:36 (2)	07:34	16:54 (1)	06:31	06:22	05:33	05:21	05:51	06:40	07:31	07:22	16:19 (1)	08:17	15:05 (2)	08:48		15:19 (2)
	17:16 26	16:02 (2)	18:13 24	17:18 (1)	19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25 36	16:55 (1)	16:37 38	15:43 (2)	16:33	37	15:56 (2)
27	08:29	15:39 (2)	07:32	16:57 (1)	06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	16:18 (1)	08:18	15:06 (2)	08:48		15:19 (2)
	17:17 22	16:01 (2)	18:15 19	17:16 (1)	19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23 35	16:53 (1)	16:36 38	15:44 (2)	16:34	37	15:56 (2)
28	08:27	15:40 (2)	07:30	16:59 (1)	06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	16:19 (1)	08:20	15:06 (2)	08:48		15:19 (2)
	17:19 19	15:59 (2)	18:16 14	17:13 (1)	19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21 32	16:51 (1)	16:35 39	15:45 (2)	16:35	38	15:57 (2)
29	08:26	15:44 (2)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	16:19 (1)	08:21	15:06 (2)	08:48		15:20 (2)
	17:21 14	15:58 (2)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19 30	16:49 (1)	16:34 38	15:44 (2)	16:35	37	15:57 (2)
30	08:24	15:48 (2)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	16:20 (1)	08:23	15:07 (2)	08:48		15:20 (2)
	17:23 5	15:53 (2)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17 27	16:47 (1)	16:34 38	15:45 (2)	16:36	38	15:58 (2)
31	08:23				07:19		05:28		05:59	06:49		07:31	16:21 (1)			08:48		15:20 (2)
	17:25				20:11		21:48		21:33	20:31		17:15 25	16:46 (1)			16:37	39	15:59 (2)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243		
Total, worst case		998		621									554		657		1181	
Sun reduction		0,24		0,30									0,34		0,24		0,20	
Oper. time red.		0,95		0,95									0,95		0,95		0,95	
Wind dir. red.		0,68		0,67									0,67		0,68		0,68	
Total reduction		0,16		0,19									0,21		0,15		0,13	
Total, real		155		119									119		101		156	

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

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

Project:

068379aa - WP Autena

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15-5-2014 15:37 / 5

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Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 05 - Biezenweg 51

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December	
1	08:48	15:15 (1)	08:21	15:25 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	15:07 (1)	08:24	14:59 (1)
	16:39 44	15:59 (1)	17:27 46	16:11 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13 24	15:31 (1)	16:33 49	15:48 (1)
2	08:48	15:15 (1)	08:20	15:25 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	15:04 (1)	08:26	14:59 (1)
	16:40 44	15:59 (1)	17:28 46	16:11 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12 29	15:33 (1)	16:32 49	15:48 (1)
3	08:48	15:15 (1)	08:18	15:26 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	15:02 (1)	08:27	15:00 (1)
	16:41 45	16:00 (1)	17:30 44	16:10 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15		17:10 33	15:35 (1)	16:32 49	15:49 (1)
4	08:48	15:16 (1)	08:17	15:27 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39	15:01 (1)	08:29	15:01 (1)
	16:42 45	16:01 (1)	17:32 42	16:09 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13		17:08 35	15:36 (1)	16:31 47	15:48 (1)
5	08:48	15:15 (1)	08:15	15:29 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40	14:59 (1)	08:30	15:01 (1)
	16:43 46	16:01 (1)	17:34 40	16:09 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06 39	15:38 (1)	16:31 47	15:48 (1)
6	08:47	15:16 (1)	08:13	15:30 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42	14:58 (1)	08:31	15:02 (1)
	16:44 47	16:03 (1)	17:36 38	16:08 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04 41	15:39 (1)	16:30 47	15:49 (1)
7	08:47	15:16 (1)	08:12	15:31 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44	14:57 (1)	08:32	15:02 (1)
	16:46 47	16:03 (1)	17:38 35	16:06 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03 43	15:40 (1)	16:30 47	15:49 (1)
8	08:46	15:16 (1)	08:10	15:33 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46	14:57 (1)	08:34	15:03 (1)
	16:47 48	16:04 (1)	17:40 32	16:05 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01 44	15:41 (1)	16:29 45	15:48 (1)
9	08:46	15:16 (1)	08:08	15:35 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48	14:56 (1)	08:35	15:04 (1)
	16:48 49	16:05 (1)	17:41 28	16:03 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59 45	15:41 (1)	16:29 45	15:49 (1)
10	08:45	15:16 (1)	08:06	15:38 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49	14:55 (1)	08:36	15:05 (1)
	16:50 49	16:05 (1)	17:43 23	16:01 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58 47	15:42 (1)	16:29 44	15:49 (1)
11	08:45	15:17 (1)	08:04	15:41 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51	14:55 (1)	08:37	15:05 (1)
	16:51 49	16:06 (1)	17:45 17	15:58 (1)	18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57		16:56 48	15:43 (1)	16:29 44	15:49 (1)
12	08:44	15:17 (1)	08:03	15:47 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53	14:55 (1)	08:38	15:06 (1)
	16:53 50	16:07 (1)	17:47 4	15:51 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55 49	15:44 (1)	16:29 44	15:50 (1)
13	08:43	15:17 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00		07:55	14:54 (1)	08:39	15:06 (1)
	16:54 50	16:07 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52		16:53 50	15:44 (1)	16:29 44	15:50 (1)
14	08:43	15:17 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01		07:57	14:53 (1)	08:40	15:07 (1)
	16:56 51	16:08 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50		16:52 51	15:44 (1)	16:29 43	15:50 (1)
15	08:42	15:17 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03		07:58	14:53 (1)	08:41	15:08 (1)
	16:57 51	16:08 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48		16:50 51	15:44 (1)	16:29 42	15:50 (1)
16	08:41	15:18 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05		08:00	14:53 (1)	08:42	15:09 (1)
	16:59 51	16:09 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46		16:49 52	15:45 (1)	16:29 42	15:51 (1)
17	08:40	15:18 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07		08:02	14:53 (1)	08:43	15:09 (1)
	17:00 51	16:09 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44		16:47 52	15:45 (1)	16:29 42	15:51 (1)
18	08:39	15:18 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08		08:04	14:54 (1)	08:43	15:09 (1)
	17:02 52	16:10 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42		16:46 52	15:46 (1)	16:29 42	15:51 (1)
19	08:38	15:19 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10		08:05	14:54 (1)	08:44	15:10 (1)
	17:04 52	16:11 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39		16:45 52	15:46 (1)	16:29 42	15:52 (1)
20	08:37	15:18 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12		08:07	14:54 (1)	08:45	15:11 (1)
	17:05 52	16:10 (1)	18:02		18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37		16:44 52	15:46 (1)	16:30 42	15:53 (1)
21	08:36	15:19 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14		08:09	14:55 (1)	08:45	15:11 (1)
	17:07 52	16:11 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35		16:42 52	15:47 (1)	16:30 41	15:52 (1)
22	08:35	15:19 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15		08:10	14:54 (1)	08:46	15:12 (1)
	17:09 52	16:11 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33		16:41 52	15:46 (1)	16:31 41	15:53 (1)
23	08:34	15:19 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17		08:12	14:55 (1)	08:46	15:12 (1)
	17:10 52	16:11 (1)	18:07		18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31		16:40 52	15:47 (1)	16:31 42	15:54 (1)
24	08:33	15:20 (1)	07:39		06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19		08:14	14:55 (1)	08:47	15:12 (1)
	17:12 52	16:12 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29		16:39 52	15:47 (1)	16:32 42	15:54 (1)
25	08:31	15:20 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21		08:15	14:56 (1)	08:47	15:13 (1)
	17:14 52	16:12 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27		16:38 51	15:47 (1)	16:32 42	15:55 (1)
26	08:30	15:20 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23		08:17	14:56 (1)	08:48	15:13 (1)
	17:16 52	16:12 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25		16:37 51	15:47 (1)	16:33 42	15:55 (1)
27	08:29	15:21 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24		08:18	14:56 (1)	08:48	15:13 (1)
	17:17 51	16:12 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23		16:36 51	15:47 (1)	16:34 43	15:56 (1)
28	08:27	15:21 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26		08:20	14:57 (1)	08:48	15:14 (1)
	17:19 51	16:12 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21		16:35 51	15:48 (1)	16:35 42	15:56 (1)
29	08:26	15:23 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28		08:21	14:57 (1)	08:48	15:14 (1)
	17:21 49	16:12 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19		16:34 50	15:47 (1)	16:36 43	15:57 (1)
30	08:24	15:23 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	15:15 (1)	08:23	14:58 (1)	08:48	15:14 (1)
	17:23 49	16:12 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17 8	15:23 (1)	16:34 50	15:48 (1)	16:36 44	15:58 (1)
31	08:23	15:23 (1)			07:19		05:28		05:59	06:49		07:31	15:10 (1)			08:48	15:15 (1)
	17:25 48	16:11 (1)			20:11		21:48		21:33	20:31		17:15 18	15:28 (1)			16:37 43	15:58 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243	
Total, worst case		1533		395									26		1401		1361
Sun reduction		0,24		0,30									0,34		0,24		0,20
Oper. time red.		0,95		0,95									0,95		0,95		0,95
Wind dir. red.		0,68		0,68									0,68		0,68		0,68
Total reduction		0,15		0,20									0,22		0,15		0,13
Total, real		237		77									6		214		179

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

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

Project:

068379aa - WP Autena

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15-5-2014 15:37 / 6

Licensed user:
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Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 06 - Biezenweg 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:48	14:56 (1)	08:21	15:15 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33		08:24	14:42 (1)
	16:39 52	15:48 (1)	17:27 36	15:51 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13		16:33 53	15:35 (1)
2	08:48	14:56 (1)	08:20	15:16 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35		08:26	14:42 (1)
	16:40 52	15:48 (1)	17:28 33	15:49 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12		16:32 53	15:35 (1)
3	08:48	14:57 (1)	08:18	15:18 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37		08:27	14:43 (1)
	16:41 52	15:49 (1)	17:30 30	15:48 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10		16:32 53	15:36 (1)
4	08:48	14:57 (1)	08:17	15:20 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39		08:29	14:43 (1)
	16:42 52	15:49 (1)	17:32 26	15:46 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08		16:31 53	15:36 (1)
5	08:48	14:57 (1)	08:15	15:24 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40		08:30	14:43 (1)
	16:43 52	15:49 (1)	17:34 20	15:44 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06	14 15:11 (1)	16:31 52	15:35 (1)
6	08:47	14:58 (1)	08:13	15:28 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42		08:31	14:44 (1)
	16:44 52	15:50 (1)	17:36 12	15:40 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04	21 15:14 (1)	16:30 52	15:36 (1)
7	08:47	14:58 (1)	08:12		07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44		08:32	14:44 (1)
	16:46 52	15:50 (1)	17:38		18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03	26 15:17 (1)	16:30 52	15:36 (1)
8	08:46	14:59 (1)	08:10		07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46		08:34	14:45 (1)
	16:47 52	15:51 (1)	17:40		18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01	30 15:19 (1)	16:29 52	15:37 (1)
9	08:46	14:59 (1)	08:08		07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48		08:35	14:46 (1)
	16:48 53	15:52 (1)	17:41		18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59	33 15:20 (1)	16:29 52	15:38 (1)
10	08:45	14:59 (1)	08:06		07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49		08:36	14:46 (1)
	16:50 53	15:52 (1)	17:43		18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58	36 15:22 (1)	16:29 52	15:38 (1)
11	08:45	15:00 (1)	08:04		07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51		08:37	14:47 (1)
	16:51 53	15:53 (1)	17:45		18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56	38 15:23 (1)	16:29 51	15:38 (1)
12	08:44	15:00 (1)	08:03		07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53		08:38	14:47 (1)
	16:53 53	15:53 (1)	17:47		18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55	40 15:24 (1)	16:29 51	15:38 (1)
13	08:43	15:01 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55		08:39	14:48 (1)
	16:54 52	15:53 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53	42 15:25 (1)	16:29 51	15:39 (1)
14	08:43	15:01 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57		08:40	14:48 (1)
	16:56 53	15:54 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52	44 15:25 (1)	16:29 51	15:39 (1)
15	08:42	15:01 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58		08:41	14:49 (1)
	16:57 53	15:54 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50	45 15:26 (1)	16:29 51	15:40 (1)
16	08:41	15:02 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00		08:42	14:49 (1)
	16:59 52	15:54 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49	47 15:27 (1)	16:29 51	15:40 (1)
17	08:40	15:02 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02		08:43	14:50 (1)
	17:00 53	15:55 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47	48 15:28 (1)	16:29 51	15:41 (1)
18	08:39	15:03 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04		08:43	14:50 (1)
	17:02 52	15:55 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46	49 15:29 (1)	16:29 50	15:40 (1)
19	08:38	15:03 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05		08:44	14:51 (1)
	17:04 52	15:55 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45	49 15:29 (1)	16:29 50	15:41 (1)
20	08:37	15:03 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07		08:45	14:52 (1)
	17:05 52	15:55 (1)	18:02		18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44	50 15:30 (1)	16:30 50	15:42 (1)
21	08:36	15:04 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09		08:45	14:52 (1)
	17:07 51	15:55 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42	51 15:31 (1)	16:30 50	15:42 (1)
22	08:35	15:05 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10		08:46	14:53 (1)
	17:09 50	15:55 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41	52 15:31 (1)	16:31 50	15:43 (1)
23	08:34	15:05 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12		08:46	14:53 (1)
	17:10 49	15:54 (1)	18:07		18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40	51 15:31 (1)	16:31 50	15:43 (1)
24	08:33	15:06 (1)	07:39		06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14		08:47	14:53 (1)
	17:12 49	15:55 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	16:39	52 15:32 (1)	16:32 50	15:43 (1)
25	08:31	15:07 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15		08:47	14:54 (1)
	17:14 48	15:55 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38	53 15:33 (1)	16:32 50	15:44 (1)
26	08:30	15:08 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17		08:48	14:54 (1)
	17:16 46	15:54 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37	52 15:32 (1)	16:33 51	15:45 (1)
27	08:29	15:09 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18		08:48	14:54 (1)
	17:17 45	15:54 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36	53 15:33 (1)	16:34 51	15:45 (1)
28	08:27	15:09 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20		08:48	14:55 (1)
	17:19 44	15:53 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35	53 15:34 (1)	16:35 50	15:45 (1)
29	08:26	15:11 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21		08:48	14:55 (1)
	17:21 42	15:53 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34	52 15:33 (1)	16:36 51	15:46 (1)
30	08:24	15:12 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23		08:48	14:55 (1)
	17:23 40	15:52 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34	53 15:34 (1)	16:36 51	15:46 (1)
31	08:23	15:13 (1)			07:19		05:28		05:59	06:49		07:31			08:48	14:56 (1)
	17:25 38	15:51 (1)			20:11		21:48		21:33	20:31		17:15			16:37 51	15:47 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331	266		243	
Total, worst case	1549		157										1134		1586	
Sun reduction	0,24		0,30										0,24		0,20	
Oper. time red.	0,95		0,95										0,95		0,95	
Wind dir. red.	0,69		0,69										0,69		0,69	
Total reduction	0,16		0,20										0,15		0,13	
Total, real	243		31										175		211	

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 7

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 07 - Autenasekade 05

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:51 (3) - 07:57 (3)	07:17 - 20:12	07:40 (2) - 07:58 (2)	06:12 - 21:03	06:37 (1) - 06:56 (1)	05:27 - 21:49	06:28 (1) - 06:59 (1)	05:24 - 22:03	06:40 (1) - 06:59 (1)	06:01 - 21:31	06:32 (1) - 07:13 (1)	06:50 - 20:29	07:25 (2) - 07:56 (2)	07:39 - 19:20	08:13 (3) - 08:41 (3)	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:28	07:26 - 18:20	07:49 (3) - 07:59 (3)	07:15 - 20:14	07:38 (2) - 07:59 (2)	06:10 - 21:05	06:35 (1) - 06:57 (1)	05:26 - 21:50	06:29 (1) - 06:58 (1)	05:25 - 22:03	06:39 (1) - 06:59 (1)	06:02 - 21:30	06:33 (1) - 07:13 (1)	06:52 - 20:27	07:25 (2) - 07:56 (2)	07:41 - 19:17	08:12 (3) - 08:40 (3)	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:47 (3) - 08:01 (3)	07:13 - 20:16	07:35 (2) - 07:59 (2)	06:09 - 21:07	06:33 (1) - 06:58 (1)	05:25 - 21:52	06:29 (1) - 06:58 (1)	05:25 - 22:03	06:39 (1) - 07:00 (1)	06:04 - 21:28	06:33 (1) - 07:12 (1)	06:54 - 20:25	07:25 (2) - 07:57 (2)	07:43 - 19:15	08:11 (3) - 08:40 (3)	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:45 (3) - 08:02 (3)	07:10 - 20:18	07:33 (2) - 07:59 (2)	06:07 - 21:08	06:31 (1) - 06:59 (1)	05:25 - 21:53	06:30 (1) - 06:58 (1)	05:26 - 22:02	06:38 (1) - 07:01 (1)	06:05 - 21:26	06:34 (1) - 07:12 (1)	06:55 - 20:23	07:24 (2) - 07:56 (2)	07:44 - 19:13	08:11 (3) - 08:41 (3)	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:42 (3) - 08:02 (3)	07:08 - 20:19	07:31 (2) - 08:00 (2)	06:05 - 21:10	06:30 (1) - 07:00 (1)	05:24 - 21:54	06:30 (1) - 06:57 (1)	05:27 - 22:02	06:38 (1) - 07:02 (1)	06:07 - 21:25	06:35 (1) - 07:11 (1)	06:57 - 20:20	07:24 (2) - 07:56 (2)	07:46 - 19:11	08:11 (3) - 08:40 (3)	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:44	08:13 - 17:36	07:17 - 18:27	07:40 (3) - 08:03 (3)	07:06 - 20:21	07:28 (2) - 07:59 (2)	06:03 - 21:12	06:28 (1) - 07:01 (1)	05:23 - 21:55	06:32 (1) - 06:57 (1)	05:28 - 22:01	06:37 (1) - 07:02 (1)	06:08 - 21:23	06:37 (1) - 07:11 (1)	06:59 - 20:18	07:24 (2) - 07:55 (2)	07:48 - 19:08	08:13 (3) - 08:39 (3)	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:38 (3) - 08:03 (3)	07:04 - 20:23	07:27 (2) - 07:59 (2)	06:01 - 21:13	06:26 (1) - 07:01 (1)	05:23 - 21:55	06:32 (1) - 06:56 (1)	05:29 - 22:01	06:37 (1) - 07:03 (1)	06:10 - 21:21	06:38 (1) - 07:10 (1)	07:00 - 20:16	07:26 (2) - 07:55 (2)	07:50 - 19:06	08:15 (3) - 08:39 (3)	07:44 - 17:03	08:32 - 16:30
8	08:46 - 16:47	08:10 - 17:40	07:12 - 18:31	07:36 (3) - 08:04 (3)	07:01 - 20:24	07:27 (2) - 07:59 (2)	05:59 - 21:15	06:25 (1) - 07:02 (1)	05:22 - 21:56	06:33 (1) - 06:56 (1)	05:30 - 22:00	06:37 (1) - 07:04 (1)	06:11 - 21:19	06:40 (1) - 07:09 (1)	07:02 - 20:13	07:27 (2) - 07:54 (2)	07:51 - 19:04	08:17 (3) - 08:38 (3)	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	07:33 (3) - 08:03 (3)	06:59 - 20:26	07:27 (2) - 07:59 (2)	05:58 - 21:17	06:23 (1) - 07:02 (1)	05:22 - 21:57	06:33 (1) - 06:55 (1)	05:31 - 21:59	06:36 (1) - 07:05 (1)	06:13 - 21:17	06:41 (1) - 07:08 (1)	07:03 - 20:11	07:29 (2) - 07:53 (2)	07:53 - 19:01	08:18 (3) - 08:37 (3)	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	07:33 (3) - 08:03 (3)	06:57 - 20:28	07:27 (2) - 07:59 (2)	05:56 - 21:18	06:22 (1) - 07:02 (1)	05:21 - 21:58	06:34 (1) - 06:55 (1)	05:32 - 21:59	06:36 (1) - 07:05 (1)	06:15 - 21:15	06:43 (1) - 07:07 (1)	07:05 - 20:09	07:31 (2) - 07:52 (2)	07:55 - 18:59	08:20 (3) - 08:36 (3)	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	07:34 (3) - 08:02 (3)	06:54 - 20:30	07:26 (2) - 07:57 (2)	05:54 - 21:20	06:22 (1) - 07:03 (1)	05:21 - 21:59	06:35 (1) - 06:55 (1)	05:33 - 21:58	06:36 (1) - 07:06 (1)	06:16 - 21:14	06:44 (1) - 07:05 (1)	07:07 - 20:06	07:32 (2) - 07:50 (2)	07:56 - 18:57	08:22 (3) - 08:34 (3)	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	07:33 (3) - 08:01 (3)	06:52 - 20:31	07:27 (2) - 07:56 (2)	05:53 - 21:21	06:22 (1) - 06:55 (1)	05:21 - 21:59	06:35 (1) - 06:54 (1)	05:34 - 21:57	06:36 (1) - 07:07 (1)	06:18 - 21:12	06:46 (1) - 07:04 (1)	07:08 - 20:04	07:34 (2) - 07:49 (2)	07:58 - 18:55	08:24 (3) - 08:33 (3)	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	07:34 (3) - 08:00 (3)	06:50 - 20:33	07:27 (2) - 07:55 (2)	05:51 - 21:23	06:22 (1) - 07:03 (1)	05:20 - 22:00	06:36 (1) - 06:54 (1)	05:35 - 21:56	06:35 (1) - 07:07 (1)	06:19 - 21:10	06:47 (1) - 07:02 (1)	07:10 - 20:02	07:35 (2) - 07:46 (2)	08:00 - 18:53	08:25 (3) - 08:29 (3)	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	07:35 (3) - 07:59 (3)	06:48 - 20:35	07:28 (2) - 07:54 (2)	05:49 - 21:25	06:21 (1) - 07:02 (1)	05:20 - 22:01	06:37 (1) - 06:54 (1)	05:36 - 21:55	06:35 (1) - 07:08 (1)	06:21 - 21:08	06:49 (1) - 07:12 (1)	07:12 - 19:59	07:37 (2) - 07:44 (2)	08:01 - 18:50		07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	07:35 (3) - 07:57 (3)	06:46 - 20:36	07:29 (2) - 07:53 (2)	05:48 - 21:26	06:22 (1) - 07:03 (1)	05:20 - 22:01	06:38 (1) - 06:54 (1)	05:37 - 21:54	06:34 (1) - 07:09 (1)	06:23 - 21:06	06:50 (1) - 07:13			08:03		07:58 - 16:50	08:41 - 16:29
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17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	07:39 (3) - 07:53 (3)	06:41 - 20:40	07:31 (2) - 07:48 (2)	05:45 - 21:29	06:22 (1) - 07:03 (1)	05:20 - 22:02	06:39 (1) - 06:53 (1)	05:39 - 21:52	06:34 (1) - 07:10 (1)	06:26 - 21:02	07:16			08:07		08:00 - 16:48	08:43 - 16:29
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19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50		06:37 - 20:43		05:42 - 21:32	06:22 (1) - 07:03 (1)	05:20 - 22:03	06:40 (1) - 06:53 (1)	05:42 - 21:50	06:34 (1) - 07:11 (1)	06:29 - 20:58	07:20			08:10		08:02 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52		06:35 - 20:45		05:40 - 21:34	06:22 (1) - 07:02 (1)	05:20 - 22:03	06:40 (1) - 06:53 (1)	05:43 - 21:49	06:33 (1) - 07:11 (1)	06:31 - 20:55	07:21			08:12		08:03 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54		06:33 - 20:47		05:39 - 21:35	06:22 (1) - 07:02 (1)	05:20 - 22:04	06:40 (1) - 06:53 (1)	05:45 - 21:47	06:33 (1) - 07:11 (1)	06:32 - 20:53	07:23			08:14		08:04 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55		06:31 - 20:48		05:38 - 21:37	06:23 (1) - 07:02 (1)	05:20 - 22:04	06:41 (1) - 06:54 (1)	05:46 - 21:46	06:33 (1) - 07:12 (1)	06:34 - 20:51	07:25			08:15		08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:10	07:41 - 18:07	06:38 - 18:57		06:28 - 20:50		05:37 - 21:38	06:23 (1) - 07:02 (1)	05:20 - 22:04	06:41 (1) - 06:54 (1)	05:47 - 21:45	06:33 (1) - 07:13 (1)	06:36 - 20:49	07:26			08:17		08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59		06:26 - 20:52		05:35 - 21:39	06:24 (1) - 07:02 (1)	05:21 - 22:04	06:40 (1) - 06:54 (1)	05:49 - 21:44	06:32 (1) - 07:12 (1)	06:37 - 20:47	07:28			08:19		08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00		06:24 - 20:53		05:34 - 21:41	06:24 (1) - 07:01 (1)	05:21 - 22:04	06:41 (1) - 06:55 (1)	05:50 - 21:42	06:33 (1) - 06:39 (1)	06:39 - 20:45	07:38 (2) - 07:49 (2)	07:29 - 19:34		08:18		08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02		06:22 - 20:55		05:33 - 21:42	06:25 (1) - 07:01 (1)	05:21 - 22:04	06:40 (1) - 06:55 (1)	05:52 - 21:41	06:32 (1) - 07:13 (1)	06:41 - 20:43	07:34 (2) - 07:51 (2)	07:31 - 19:31	08:21 (3) - 08:34 (3)	07:23 - 17:25		08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04		06:20 - 20:57		05:32 - 21:43	06:25 (1) - 07:01 (1)	05:22 - 22:04	06:40 (1) - 06:56 (1)	05:53 - 21:39	06:32 (1) - 07:13 (1)	06:42 - 20:40	07:32 (2) - 07:53 (2)	07:33 - 19:29	08:19 (3) - 08:37 (3)	07:24 - 17:23		08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	07:54 (3) - 07:55 (3)	06:18 - 19:06	06:42 (1) - 20:58	05:31 - 21:45	06:26 (1) - 07:00 (1)	05:22 - 22:04	06:40 (1) - 06:57 (1)	05:55 - 21:38	06:33 (1) - 07:14 (1)	06:44 - 20:38	07:30 (2) - 07:54 (2)	07:34 - 19:27	08:17 (3) - 08:38 (3)	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35		
29	08:26 - 17:21		07:24 - 20:07	07:47 (2) - 07:53 (2)	06:16 - 21:00	06:40 (1) - 06:52 (1)	05:30 - 21:46	06:26 (1) - 07:00 (1)	05:23 - 22:04	06:40 (1) - 06:58 (1)	05:56 - 21:36	06:32 (1) - 07:13 (1)	06:45 - 20:36	07:29 (2) - 07:55 (2)	07:36 - 19:24	08:15 (3) - 08:39 (3)	07:28 - 17:19	08:21 - 16:35	08:48 - 16:36		
30	08:24 - 17:23		07:22 - 20:09	07:44 (2) - 07:55 (2)	06:14 - 21:02	06:39 (1) - 06:55 (1)	05:29 - 21:47	06:26 (1) - 06:59 (1)	05:23 - 22:04	06:39 (1) - 06:58 (1)	05:58 - 21:35	06:33 (1) - 07:14 (1)	06:47 - 20:34	07:27 (2) - 07:55 (2)	07:38 - 19:22	08:14 (3) - 08:40 (3)	07:30 - 17:17	08:23 - 16:34	08:48 - 16:37		
31	08:23 - 17:25		07:20 - 20:11	07:42 (2) - 07:57 (2)		05:28 - 21:48	06:27 (1) - 06:59 (1)		05:59 - 21:33	06:33 (1) - 07:13 (1)	06:49 - 20:32	07:27 (2) - 07:56 (2)			07:32 - 17:15		08:48 - 16:37			
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243								
Total, worst case		2	403	497	1114	570	1029	564	443	275										
Sun reduction		0,30	0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34										
Oper. time red.		0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95										
Wind dir. red.		0,58	0,58	0,63	0,66	0,66	0,66	0,65	0,61	0,58										
Total reduction		0,16	0,18	0,25	0,27	0,24	0,25	0,26	0,21	0,18										
Total, real		0	73	123	296	138	260	144	93	50										

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 8

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 08 - Bolgerijsekade 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12 (6)	06:12 - 21:03 (21)	06:37 (2) - 06:58 (2) (21)	05:27 - 05:56 (1) (22)	05:24 - 06:18 (1) (24)	05:59 (1) - 06:23 (1) (24)	06:01 - 21:31	06:50 - 20:29 (14)	07:26 (3) - 07:40 (3)	07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:29	07:26 - 18:20	07:15 - 20:14 (9)	07:38 (3) - 21:05 (21)	06:36 (2) - 06:57 (2) (23)	05:26 - 05:55 (1) (24)	05:25 - 06:18 (1) (24)	05:59 (1) - 06:23 (1) (24)	06:02 - 21:30	06:52 - 20:27 (17)	07:24 (3) - 07:41 (3)	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 20:16 (12)	07:35 (3) - 21:07 (20)	06:36 (2) - 06:56 (2) (24)	05:25 - 05:54 (1) (24)	05:25 - 06:18 (1) (24)	05:59 (1) - 06:23 (1) (24)	06:04 - 21:28	06:54 - 20:25 (19)	07:23 (3) - 07:42 (3)	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:18 (14)	07:33 (3) - 21:08 (18)	06:37 (2) - 06:55 (2) (24)	05:25 - 05:54 (1) (25)	05:26 - 06:18 (1) (25)	05:59 (1) - 06:24 (1) (25)	06:05 - 21:26	06:55 - 20:23 (20)	07:22 (3) - 07:42 (3)	07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 20:19 (16)	07:31 (3) - 21:10 (17)	06:38 (2) - 06:55 (2) (25)	05:24 - 05:53 (1) (25)	05:27 - 06:18 (1) (24)	06:00 (1) - 06:24 (1) (25)	06:07 - 21:25 (7)	06:52 (2) - 06:59 (2) (20)	06:57 - 07:43 (3) (20)	07:46 - 19:11	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21 (18)	07:29 (3) - 21:12 (14)	06:39 (2) - 06:53 (2) (25)	05:23 - 05:54 (1) (25)	05:28 - 06:19 (1) (25)	05:59 (1) - 06:24 (1) (25)	06:08 - 21:23 (12)	06:50 (2) - 06:59 (2) (18)	07:24 (3) - 07:42 (3)	07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:04 - 20:23 (20)	07:26 (3) - 21:13 (11)	06:40 (2) - 06:51 (2) (25)	05:23 - 05:53 (1) (25)	05:29 - 06:18 (1) (25)	05:59 (1) - 06:24 (1) (25)	06:10 - 21:21 (15)	06:48 (2) - 07:03 (16)	07:00 - 07:42 (3) (16)	07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:47 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24 (20)	07:25 (3) - 21:15 (4)	06:44 (2) - 06:48 (2) (25)	05:22 - 05:54 (1) (25)	05:30 - 06:19 (1) (25)	06:00 (1) - 06:25 (1) (25)	06:12 - 21:19 (17)	06:47 (2) - 07:04 (2) (14)	07:02 - 07:41 (3) (14)	07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	06:59 - 20:26 (19)	07:25 (3) - 21:17	05:22 - 21:57 (24)	05:54 (1) - 06:18 (1) (25)	05:31 - 21:59 (24)	06:01 (1) - 06:25 (1) (25)	06:13 - 21:17 (19)	06:46 (2) - 07:05 (2) (12)	07:03 - 07:41 (3) (12)	07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28 (17)	07:26 (3) - 05:56	05:21 - 21:58 (25)	05:54 (1) - 06:19 (1) (25)	05:32 - 21:59 (23)	06:02 (1) - 06:25 (1) (25)	06:15 - 21:15 (21)	06:45 (2) - 07:06 (2) (9)	07:05 - 07:31 (3) (9)	07:55 - 18:59	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:55 - 20:30 (14)	07:27 (3) - 05:54	05:21 - 21:59 (24)	05:55 (1) - 06:19 (1) (24)	05:33 - 21:58 (22)	06:03 (1) - 06:25 (1) (25)	06:16 - 21:14 (22)	06:44 (2) - 07:06 (2) (6)	07:07 - 07:38 (3) (6)	07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31 (9)	07:29 (3) - 05:53	05:21 - 21:59 (23)	05:55 (1) - 06:18 (1) (24)	05:34 - 21:57 (22)	06:04 (1) - 06:26 (1) (25)	06:18 - 21:12 (20)	06:46 (2) - 07:06 (2) (3)	07:08 - 07:37 (3) (3)	07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 21:23	05:20 - 22:00 (24)	05:55 (1) - 06:19 (1) (25)	05:35 - 21:56 (21)	06:05 (1) - 06:26 (1) (25)	06:20 - 21:10 (19)	06:47 (2) - 07:06 (2) (3)	07:10 - 20:02	08:00 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 21:25	05:20 - 22:01 (23)	05:56 (1) - 06:19 (1) (25)	05:36 - 21:55 (20)	06:06 (1) - 06:26 (1) (25)	06:21 - 21:08 (17)	06:49 (2) - 07:06 (2) (3)	07:12 - 19:59	08:02 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 21:26	05:20 - 22:01 (23)	05:56 (1) - 06:19 (1) (25)	05:37 - 21:54 (19)	06:07 (1) - 06:26 (1) (25)	06:23 - 21:06 (15)	06:50 (2) - 07:05 (2) (3)	07:13 - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 21:28	05:20 - 22:02 (23)	05:56 (1) - 06:19 (1) (25)	05:38 - 21:53 (17)	06:08 (1) - 06:25 (1) (25)	06:24 - 21:04 (14)	06:52 (2) - 07:06 (2) (3)	07:15 - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 21:29	05:20 - 22:02 (22)	05:57 (1) - 06:19 (1) (25)	05:40 - 21:52 (16)	06:10 (1) - 06:26 (1) (25)	06:26 - 21:02 (11)	06:53 (2) - 07:04 (2) (3)	07:16 - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41	05:43 - 21:31 (2)	06:10 (1) - 05:20 - 06:11 (1) (22)	05:57 (1) - 06:19 (1) (25)	05:41 - 21:51 (15)	06:11 (1) - 06:26 (1) (25)	06:28 - 21:00 (9)	06:55 (2) - 07:04 (2) (3)	07:18 - 19:50	08:08 - 18:42	08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43	05:42 - 21:32 (3)	06:09 (1) - 05:20 - 06:12 (1) (23)	05:57 (1) - 06:20 (1) (23)	05:42 - 21:50 (13)	06:12 (1) - 06:25 (1) (25)	06:29 - 20:58 (6)	06:56 (2) - 07:02 (2) (3)	07:20 - 19:48	08:10 - 18:40	08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45	05:41 - 21:34 (5)	06:07 (1) - 05:20 - 06:12 (1) (23)	05:57 (1) - 06:20 (1) (23)	05:43 - 21:49 (12)	06:13 (1) - 06:25 (1) (25)	06:31 - 20:55 (3)	06:58 (2) - 07:01 (2) (3)	07:21 - 19:45	08:12 - 18:37	08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 20:47	05:39 - 21:35 (7)	06:06 (1) - 05:20 - 06:13 (1) (23)	05:57 (1) - 06:20 (1) (23)	05:45 - 21:47 (10)	06:14 (1) - 06:24 (1) (25)	06:32 - 20:53	07:23 - 19:43		08:14 - 18:35	08:09 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 20:48 (2)	05:38 - 21:37 (9)	06:04 (1) - 05:20 - 06:14 (1) (23)	05:58 (1) - 06:21 (1) (23)	05:46 - 21:46 (8)	06:16 (1) - 06:24 (1) (25)	06:34 - 20:51	07:25 - 19:41		08:15 - 18:33	08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:11	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50 (4)	06:52 (2) - 05:37 - 06:56 (2) (11)	06:04 (1) - 05:20 - 06:15 (1) (23)	05:58 (1) - 06:21 (1) (23)	05:47 - 21:45 (7)	06:17 (1) - 06:24 (1) (25)	06:36 - 20:49	07:26 - 19:38		08:17 - 18:31	08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 20:52 (7)	06:50 (2) - 05:35 - 06:57 (2) (13)	06:03 (1) - 05:21 - 06:16 (1) (22)	05:58 (1) - 06:20 (1) (22)	05:49 - 21:44 (4)	06:18 (1) - 06:22 (1) (25)	06:37 - 20:47	07:28 - 19:36		08:19 - 18:29	08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 20:53 (9)	06:48 (2) - 05:34 - 06:57 (2) (14)	06:02 (1) - 05:21 - 06:16 (1) (22)	05:59 (1) - 06:21 (1) (22)	05:50 - 21:42 (2)	06:20 (1) - 06:22 (1) (25)	06:39 - 20:45	07:30 - 19:34		08:21 - 17:27	08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 20:55 (12)	06:46 (2) - 05:33 - 06:58 (2) (16)	06:01 (1) - 05:21 - 06:17 (1) (23)	05:58 (1) - 06:21 (1) (23)	05:52 - 21:41		06:41 - 20:43	07:31 - 19:31		07:23 - 17:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 20:57 (14)	06:44 (2) - 05:32 - 06:58 (2) (17)	06:00 (1) - 05:22 - 06:17 (1) (23)	05:59 (1) - 06:22 (1) (23)	05:53 - 21:39		06:42 - 20:40	07:33 - 19:29		07:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 20:58 (16)	06:42 (2) - 05:31 - 06:58 (2) (18)	05:59 (1) - 06:17 (1) (23)	05:59 (1) - 06:22 (1) (23)	05:55 - 21:38		06:44 - 20:38	07:34 - 19:27		07:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07	06:16 - 21:00 (18)	06:40 (2) - 05:30 - 06:58 (2) (19)	05:58 (1) - 06:17 (1) (24)	05:59 (1) - 06:23 (1) (24)	05:56 - 21:36		06:46 - 20:36	07:36 - 19:24		07:28 - 17:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09	06:14 - 21:02 (19)	06:39 (2) - 05:29 - 06:58 (2) (20)	05:57 (1) - 06:17 (1) (23)	05:59 (1) - 06:22 (1) (23)	05:58 - 21:35		06:47 - 20:34	07:38 - 19:22		07:30 - 17:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11 (3)	07:42 (3) - 07:45 (3)	05:28 - 21:48 (21)	05:56 (1) - 06:17 (1)		05:59 - 21:33		06:49 - 20:32 (9)	07:29 (3) - 07:38 (3)		07:32 - 17:15		08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244			
Total, worst case			3	275	301	701	451	236	168						
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36						
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95						
Wind dir. red.			0,63	0,63	0,66	0,67	0,67	0,65	0,63						
Total reduction			0,20	0,25	0,27	0,25	0,26	0,26	0,22						
Total, real			1	69	81	174	117	60	36						

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

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

Project:

068379aa - WP Autena

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15-5-2014 15:37 / 9

Licensed user:
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 09 - Bolgerijsekade 18

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18	07:17 / 20:12	06:12 / 21:03 16	06:37 (2) / 06:53 (2)	05:27 / 21:49 14	05:56 (1) / 06:10 (1)	05:24 / 22:03 22	05:55 (1) / 06:17 (1)	06:01 / 21:31 10	06:45 (2) / 06:55 (2)	06:50 / 20:29 20	07:19 (3) / 07:39 (3)	07:39 / 19:20	07:33 / 17:14	08:24 / 16:33
2	08:48 / 16:40	08:20 / 17:29	07:26 / 18:20	07:15 / 20:14 3	07:38 (3) / 07:41 (3)	06:10 / 21:05 18	06:35 (2) / 06:53 (2)	05:26 / 21:50 15	05:55 (1) / 06:10 (1)	05:25 / 22:03 21	05:55 (1) / 06:16 (1)	06:02 / 21:30 14	06:44 (2) / 06:58 (2)	06:52 / 20:27 22	07:18 (3) / 07:40 (3)	07:41 / 19:17	07:35 / 17:12	08:26 / 16:32
3	08:48 / 16:41	08:18 / 17:30	07:24 / 18:22	07:13 / 20:16 7	07:35 (3) / 07:42 (3)	06:09 / 21:07 20	06:33 (2) / 06:53 (2)	05:25 / 21:52 16	05:54 (1) / 06:10 (1)	05:25 / 22:03 21	05:56 (1) / 06:17 (1)	06:04 / 21:28 16	06:42 (2) / 06:58 (2)	06:54 / 20:25 21	07:20 (3) / 07:41 (3)	07:43 / 19:15	07:37 / 17:10	08:27 / 16:32
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24	07:10 / 20:18 10	07:33 (3) / 07:43 (3)	06:07 / 21:08 21	06:31 (2) / 06:52 (2)	05:25 / 21:53 17	05:54 (1) / 06:11 (1)	05:26 / 22:02 20	05:57 (1) / 06:17 (1)	06:05 / 21:26 18	06:42 (2) / 07:00 (2)	06:55 / 20:23 19	07:21 (3) / 07:40 (3)	07:44 / 19:13	07:39 / 17:08	08:29 / 16:31
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:26	07:08 / 20:19 12	07:31 (3) / 07:43 (3)	06:05 / 21:10 22	06:30 (2) / 06:52 (2)	05:24 / 21:54 18	05:53 (1) / 06:11 (1)	05:27 / 22:02 20	05:58 (1) / 06:18 (1)	06:07 / 21:25 20	06:40 (2) / 07:00 (2)	06:57 / 20:20 17	07:23 (3) / 07:40 (3)	07:46 / 19:11	07:41 / 17:06	08:30 / 16:31
6	08:47 / 16:45	08:13 / 17:36	07:17 / 18:27	07:06 / 20:21 15	07:28 (3) / 07:43 (3)	06:03 / 21:12 22	06:30 (2) / 06:52 (2)	05:23 / 21:55 18	05:53 (1) / 06:11 (1)	05:28 / 22:01 19	05:58 (1) / 06:17 (1)	06:08 / 21:23 21	06:40 (2) / 07:01 (2)	06:59 / 20:18 15	07:24 (3) / 07:39 (3)	07:48 / 19:08	07:42 / 17:05	08:31 / 16:30
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29	07:04 / 20:23 17	07:26 (3) / 07:43 (3)	06:01 / 21:13 21	06:30 (2) / 06:51 (2)	05:23 / 21:55 19	05:52 (1) / 06:11 (1)	05:29 / 22:01 18	05:59 (1) / 06:17 (1)	06:10 / 21:21 22	06:39 (2) / 07:01 (2)	07:00 / 20:16 13	07:26 (3) / 07:39 (3)	07:50 / 19:06	07:44 / 17:03	08:32 / 16:30
8	08:46 / 16:47	08:10 / 17:40	07:12 / 18:31	07:01 / 20:24 19	07:24 (3) / 07:43 (3)	05:59 / 21:15 20	06:31 (2) / 06:51 (2)	05:22 / 21:56 20	05:52 (1) / 06:12 (1)	05:30 / 22:00 17	06:00 (1) / 06:17 (1)	06:11 / 21:19 22	06:40 (2) / 07:02 (2)	07:02 / 20:13 10	07:27 (3) / 07:37 (3)	07:51 / 19:04	07:46 / 17:01	08:34 / 16:30
9	08:46 / 16:48	08:08 / 17:42	07:10 / 18:33	06:59 / 20:26 21	07:22 (3) / 07:43 (3)	05:58 / 21:17 17	06:32 (2) / 06:49 (2)	05:22 / 21:57 21	05:51 (1) / 06:12 (1)	05:31 / 21:59 16	06:01 (1) / 06:17 (1)	06:13 / 21:17 21	06:41 (2) / 07:02 (2)	07:03 / 20:11 7	07:29 (3) / 07:36 (3)	07:53 / 19:01	07:48 / 17:00	08:35 / 16:29
10	08:45 / 16:50	08:06 / 17:43	07:08 / 18:34	06:57 / 20:28 22	07:20 (3) / 07:42 (3)	05:56 / 21:18 16	06:32 (2) / 06:48 (2)	05:21 / 21:58 21	05:51 (1) / 06:12 (1)	05:32 / 21:59 15	06:02 (1) / 06:17 (1)	06:15 / 21:15 19	06:43 (2) / 07:02 (2)	07:05 / 20:09 4	07:31 (3) / 07:35 (3)	07:55 / 18:59	07:50 / 16:58	08:36 / 16:29
11	08:45 / 16:51	08:04 / 17:45	07:06 / 18:36	06:55 / 20:30 20	07:20 (3) / 07:40 (3)	05:54 / 21:20 13	06:34 (2) / 06:47 (2)	05:21 / 21:59 22	05:51 (1) / 06:13 (1)	05:33 / 21:58 14	06:03 (1) / 06:17 (1)	06:16 / 21:14 17	06:44 (2) / 07:01 (2)	07:07 / 20:06		07:56 / 18:57	07:51 / 16:56	08:37 / 16:29
12	08:44 / 16:53	08:03 / 17:47	07:03 / 18:38	06:52 / 20:31 18	07:21 (3) / 07:39 (3)	05:53 / 21:21 8	06:36 (2) / 06:44 (2)	05:21 / 21:59 22	05:50 (1) / 06:12 (1)	05:34 / 21:57 13	06:04 (1) / 06:17 (1)	06:18 / 21:12 16	06:46 (2) / 07:02 (2)	07:08 / 20:04		07:58 / 18:55	07:53 / 16:55	08:38 / 16:29
13	08:44 / 16:54	08:01 / 17:49	07:01 / 18:40	06:50 / 20:33 16	07:22 (3) / 07:38 (3)	05:51 / 21:23	05:20 / 22:00 23	05:50 (1) / 06:13 (1)	05:35 / 21:56 12	06:05 (1) / 06:17 (1)	06:20 / 21:10 14	06:47 (2) / 07:01 (2)	07:10 / 20:02			08:00 / 18:53	07:55 / 16:53	08:39 / 16:29
14	08:43 / 16:56	07:59 / 17:51	06:59 / 18:41	06:48 / 20:35 13	07:23 (3) / 07:36 (3)	05:49 / 21:25	05:20 / 22:01 23	05:50 (1) / 06:13 (1)	05:36 / 21:55 10	06:06 (1) / 06:16 (1)	06:21 / 21:08 11	06:49 (2) / 07:00 (2)	07:12 / 19:59			08:01 / 18:50	07:57 / 16:52	08:40 / 16:29
15	08:42 / 16:57	07:57 / 17:53	06:57 / 18:43	06:46 / 20:36 7	07:26 (3) / 07:33 (3)	05:48 / 21:26	05:20 / 22:01 23	05:50 (1) / 06:13 (1)	05:37 / 21:54 9	06:07 (1) / 06:16 (1)	06:23 / 21:06 9	06:50 (2) / 06:59 (2)	07:13 / 19:57			08:03 / 18:48	07:58 / 16:50	08:41 / 16:29
16	08:41 / 16:59	07:55 / 17:55	06:54 / 18:45	06:43 / 20:38	05:46 / 21:28	05:20 / 22:02 23	05:50 (1) / 06:13 (1)	05:38 / 21:53 7	06:08 (1) / 06:15 (1)	06:24 / 21:04 6	06:52 (2) / 06:58 (2)	07:15 / 19:55				08:05 / 18:46	08:00 / 16:49	08:42 / 16:29
17	08:40 / 17:00	07:53 / 17:56	06:52 / 18:47	06:41 / 20:40	05:45 / 21:29	05:20 / 22:02 24	05:50 (1) / 06:14 (1)	05:40 / 21:52 6	06:10 (1) / 06:16 (1)	06:26 / 21:02 3	06:53 (2) / 06:56 (2)	07:16 / 19:52				08:07 / 18:44	08:02 / 16:48	08:43 / 16:29
18	08:39 / 17:02	07:51 / 17:58	06:50 / 18:48	06:39 / 20:41	05:43 / 21:31	05:20 / 22:03 24	05:50 (1) / 06:14 (1)	05:41 / 21:51 4	06:11 (1) / 06:15 (1)	06:28 / 21:00		07:18 / 19:50				08:08 / 18:42	08:04 / 16:46	08:43 / 16:29
19	08:38 / 17:04	07:49 / 18:00	06:47 / 18:50	06:37 / 20:43	05:42 / 21:32	05:20 / 22:03 24	05:50 (1) / 06:14 (1)	05:42 / 21:50 2	06:12 (1) / 06:14 (1)	06:29 / 20:58		07:20 / 19:48				08:10 / 18:40	08:05 / 16:45	08:44 / 16:30
20	08:37 / 17:05	07:47 / 18:02	06:45 / 18:52	06:35 / 20:45	05:41 / 21:34	05:20 / 22:03 24	05:50 (1) / 06:14 (1)	05:43 / 21:49		06:31 / 20:55		07:21 / 19:45				08:12 / 18:37	08:07 / 16:44	08:45 / 16:30
21	08:36 / 17:07	07:45 / 18:04	06:43 / 18:54	06:33 / 20:47	05:39 / 21:35	05:20 / 22:04 24	05:50 (1) / 06:14 (1)	05:45 / 21:47		06:32 / 20:53		07:23 / 19:43				08:14 / 18:35	08:09 / 16:43	08:45 / 16:30
22	08:35 / 17:09	07:43 / 18:06	06:40 / 18:55	06:31 / 20:48	05:38 / 21:37	05:20 / 22:04 24	05:51 (1) / 06:15 (1)	05:46 / 21:46		06:34 / 20:51		07:25 / 19:41				08:15 / 18:33	08:10 / 16:41	08:46 / 16:31
23	08:34 / 17:11	07:41 / 18:07	06:38 / 18:57	06:28 / 20:50	05:37 / 21:38	05:20 / 22:04 24	05:51 (1) / 06:15 (1)	05:47 / 21:45		06:36 / 20:49		07:26 / 19:38				08:17 / 18:31	08:12 / 16:40	08:46 / 16:31
24	08:33 / 17:12	07:39 / 18:09	06:36 / 18:59	06:26 / 20:52	05:35 / 21:39	05:21 / 22:04 24	05:51 (1) / 06:15 (1)	05:49 / 21:44		06:37 / 20:47		07:28 / 19:36				08:19 / 18:29	08:14 / 16:39	08:47 / 16:32
25	08:31 / 17:14	07:37 / 18:11	06:33 / 19:00	06:24 / 20:53 2	06:48 (2) / 06:49 (2)	05:34 / 21:41 3	06:02 (1) / 06:05 (1)	05:21 / 22:04 24	05:52 (1) / 06:16 (1)	05:50 / 21:42		06:39 / 20:45		07:30 / 19:34		07:21 / 17:27	08:15 / 16:38	08:47 / 16:33
26	08:30 / 17:16	07:34 / 18:13	06:31 / 19:02	06:22 / 20:55 4	06:46 (2) / 06:50 (2)	05:33 / 21:42 5	06:01 (1) / 06:06 (1)	05:21 / 22:04 24	05:52 (1) / 06:16 (1)	05:52 / 21:41		06:41 / 20:43		07:31 / 19:31		07:23 / 17:25	08:17 / 16:37	08:48 / 16:33
27	08:29 / 17:18	07:32 / 18:15	06:29 / 19:04	06:20 / 20:57 7	06:44 (2) / 06:51 (2)	05:32 / 21:43 6	06:00 (1) / 06:06 (1)	05:22 / 22:04 23	05:53 (1) / 06:16 (1)	05:53 / 21:39		06:42 / 20:40		07:33 / 19:29		07:24 / 17:23	08:18 / 16:36	08:48 / 16:34
28	08:27 / 17:19	07:30 / 18:17	06:26 / 19:06	06:18 / 20:58 10	06:42 (2) / 06:52 (2)	05:31 / 21:45 8	05:59 (1) / 06:07 (1)	05:22 / 22:04 23	05:53 (1) / 06:16 (1)	05:55 / 21:38		06:44 / 20:38 7	07:27 (3) / 07:34 (3)	07:34 / 19:27		07:26 / 17:21	08:20 / 16:35	08:48 / 16:35
29	08:26 / 17:21		07:24 / 20:07	06:16 / 21:00 12	06:40 (2) / 06:52 (2)	05:30 / 21:46 10	05:58 (1) / 06:08 (1)	05:23 / 22:04 23	05:54 (1) / 06:17 (1)	05:56 / 21:36		06:46 / 20:36 13	07:24 (3) / 07:37 (3)	07:36 / 19:24		07:28 / 17:19	08:21 / 16:35	08:48 / 16:36
30	08:24 / 17:23		07:22 / 20:09	06:14 / 21:02 14	06:39 (2) / 06:53 (2)	05:29 / 21:47 11	05:57 (1) / 06:08 (1)	05:23 / 22:04 22	05:54 (1) / 06:16 (1)	05:58 / 21:35		06:47 / 20:34 16	07:22 (3) / 07:38 (3)	07:38 / 19:22		07:30 / 17:17	08:23 / 16:34	08:48 / 16:37
31	08:23 / 17:25		07:20 / 20:11		05:28 / 21:48 12	05:56 (1) / 06:08 (1)			05:59 / 21:33 4	06:49 (2) / 06:53 (2)	06:49 / 20:32 18	07:21 (3) / 07:39 (3)				07:32 / 17:15		08:48 / 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				249	269	646	270	313	148			
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.				0,63	0,66	0,67	0,67	0,65	0,63			
Total reduction				0,25	0,27	0,25	0,26	0,26	0,22			
Total, real				62	72	161	70	80	32			

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 10
Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 10 - Bolgerijsekade 24

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	06:00 (2)	05:24	06:08 (2)	06:01	06:50	07:16 (3)	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49 28	06:28 (2)	22:03 24	06:32 (2)	21:31	20:29 2	07:18 (3)	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:00 (2)	05:25	06:08 (2)	06:02	06:52		07:41	07:35	08:26
	16:40	17:28	18:20	20:14	21:05	21:50 28	06:28 (2)	22:03 24	06:32 (2)	21:30	20:27		19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:00 (2)	05:25	06:08 (2)	06:04	06:54		07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52 27	06:27 (2)	22:03 24	06:32 (2)	21:28	20:25		19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:01 (2)	05:26	06:08 (2)	06:05	06:55		07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53 27	06:28 (2)	22:02 25	06:33 (2)	21:26	20:23		19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:01 (2)	05:27	06:08 (2)	06:07	06:57		07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54 27	06:28 (2)	22:02 26	06:34 (2)	21:25	20:20		19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:02 (2)	05:28	06:07 (2)	06:08	06:59		07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55 26	06:28 (2)	22:01 26	06:33 (2)	21:23	20:18		19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:02 (2)	05:29	06:07 (2)	06:10	07:00		07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55 25	06:27 (2)	22:01 27	06:34 (2)	21:21	20:16		19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:03 (2)	05:30	06:08 (2)	06:11	07:02		07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56 25	06:28 (2)	22:00 26	06:34 (2)	21:19	20:13		19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:02 (2)	05:31	06:08 (2)	06:13	07:03		07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57 25	06:27 (2)	21:59 27	06:35 (2)	21:17	20:11		19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	06:03 (2)	05:32	06:08 (2)	06:15	07:05		07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58 24	06:27 (2)	21:59 27	06:35 (2)	21:15	20:09		18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	07:17 (3) 05:54	05:21	06:04 (2)	05:33	06:08 (2)	06:16	07:07		07:56	07:51	08:37
	16:51	17:45	18:36	20:30 2	07:19 (3) 21:20	21:59 24	06:28 (2)	21:58 27	06:35 (2)	21:14	20:06		18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	07:15 (3) 05:53	05:21	06:04 (2)	05:34	06:08 (2)	06:18	07:16 (3)	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31 6	07:21 (3) 21:21	21:59 23	06:27 (2)	21:57 28	06:36 (2)	21:12 4	07:20 (3)	20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	07:13 (3) 05:51	06:17 (2) 05:20	06:04 (2)	05:35	06:08 (2)	06:19	07:11 (3)	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33 10	07:23 (3) 21:23 3	06:20 (2) 22:00 23	06:27 (2)	21:56 28	06:36 (2)	21:10 12	07:23 (3)	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) 05:49	06:15 (2) 05:20	06:05 (2)	05:36	06:08 (2)	06:21	07:09 (3)	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35 13	07:24 (3) 21:25 6	06:21 (2) 22:01 22	06:27 (2)	21:55 28	06:36 (2)	21:08 17	07:26 (3)	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) 05:48	06:14 (2) 05:20	06:05 (2)	05:37	06:07 (2)	06:23	07:07 (3)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36 16	07:25 (3) 21:26 8	06:22 (2) 22:01 22	06:27 (2)	21:54 29	06:36 (2)	21:06 19	07:26 (3)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) 05:46	06:13 (2) 05:20	06:05 (2)	05:38	06:08 (2)	06:24	07:06 (3)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38 19	07:26 (3) 21:28 11	06:24 (2) 22:02 23	06:28 (2)	21:53 28	06:36 (2)	21:04 22	07:28 (3)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	07:04 (3) 05:45	06:11 (2) 05:20	06:06 (2)	05:40	06:10 (2)	06:26	07:05 (3)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40 21	07:25 (3) 21:29 13	06:24 (2) 22:02 22	06:28 (2)	21:52 27	06:37 (2)	21:02 23	07:28 (3)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	07:02 (3) 05:43	06:10 (2) 05:20	06:06 (2)	05:41	06:11 (2)	06:28	07:04 (3)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41 23	07:25 (3) 21:31 15	06:25 (2) 22:03 22	06:28 (2)	21:51 26	06:37 (2)	21:00 25	07:29 (3)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	07:00 (3) 05:42	06:09 (2) 05:20	06:06 (2)	05:42	06:12 (2)	06:29	07:03 (3)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43 25	07:25 (3) 21:32 17	06:26 (2) 22:03 22	06:28 (2)	21:50 25	06:37 (2)	20:58 26	07:29 (3)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	06:58 (3) 05:41	06:07 (2) 05:20	06:06 (2)	05:43	06:13 (2)	06:31	07:02 (3)	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45 27	07:25 (3) 21:34 18	06:25 (2) 22:03 22	06:28 (2)	21:49 24	06:37 (2)	20:55 28	07:30 (3)	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	06:57 (3) 05:39	06:06 (2) 05:20	06:06 (2)	05:45	06:14 (2)	06:32	07:01 (3)	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47 28	07:25 (3) 21:35 20	06:26 (2) 22:04 22	06:28 (2)	21:47 22	06:36 (2)	20:53 29	07:30 (3)	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	06:57 (3) 05:38	06:05 (2) 05:20	06:07 (2)	05:46	06:16 (2)	06:34	07:01 (3)	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48 28	07:25 (3) 21:37 21	06:26 (2) 22:04 22	06:29 (2)	21:46 21	06:37 (2)	20:51 29	07:30 (3)	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	06:57 (3) 05:37	06:04 (2) 05:20	06:07 (2)	05:47	06:17 (2)	06:36	07:03 (3)	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50 27	07:24 (3) 21:38 23	06:27 (2) 22:04 22	06:29 (2)	21:45 19	06:36 (2)	20:49 27	07:30 (3)	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	06:57 (3) 05:35	06:03 (2) 05:21	06:07 (2)	05:49	06:18 (2)	06:37	07:04 (3)	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52 26	07:23 (3) 21:39 24	06:27 (2) 22:04 22	06:29 (2)	21:44 18	06:36 (2)	20:47 25	07:29 (3)	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	06:57 (3) 05:34	06:02 (2) 05:21	06:08 (2)	05:50	06:20 (2)	06:39	07:06 (3)	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53 26	07:23 (3) 21:41 25	06:27 (2) 22:04 22	06:30 (2)	21:42 16	06:36 (2)	20:45 23	07:29 (3)	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	06:58 (3) 05:33	06:01 (2) 05:21	06:08 (2)	05:52	06:21 (2)	06:41	07:07 (3)	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55 23	07:21 (3) 21:42 27	06:28 (2) 22:04 22	06:30 (2)	21:41 14	06:35 (2)	20:43 21	07:28 (3)	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	06:59 (3) 05:32	06:00 (2) 05:22	06:08 (2)	05:53	06:22 (2)	06:42	07:09 (3)	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57 21	07:20 (3) 21:43 28	06:28 (2) 22:04 23	06:31 (2)	21:39 12	06:34 (2)	20:40 19	07:28 (3)	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	07:00 (3) 05:31	05:59 (2) 05:22	06:08 (2)	05:55	06:24 (2)	06:44	07:10 (3)	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58 18	07:18 (3) 21:45 29	06:28 (2) 22:04 22	06:30 (2)	21:38 10	06:34 (2)	20:38 16	07:26 (3)	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	07:01 (3) 05:30	05:59 (2) 05:23	06:08 (2)	05:56	06:25 (2)	06:45	07:12 (3)	07:36	07:28	08:21	08:48
	17:21		20:07	21:00 15	07:16 (3) 21:46 29	06:28 (2) 22:04 23	06:31 (2)	21:36 7	06:32 (2)	20:36 13	07:25 (3)	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	07:04 (3) 05:29	05:59 (2) 05:23	06:08 (2)	05:58	06:27 (2)	06:47	07:13 (3)	07:38	07:30	08:23	08:48
	17:23		20:09	21:02 11	07:15 (3) 21:47 28	06:27 (2) 22:04 23	06:31 (2)	21:35 5	06:32 (2)	20:34 10	07:23 (3)	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	05:59 (2)		05:59	06:28 (2)	06:49	07:15 (3)		07:32		08:48
	17:25		20:11		21:48 28	06:27 (2)		21:33 2	06:30 (2)	20:32 6	07:21 (3)		17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				385	373	710	672	394	2			
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.				0,63	0,67	0,67	0,67	0,63	0,63			
Total reduction				0,25	0,27	0,25	0,26	0,25	0,22			
Total, real				96	101	176	174	98	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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 11

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 11 - Bolgerijsekade 1

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	06:03 (2)	05:24	06:13 (2)	06:01	06:29 (2)	06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49	25 06:28 (2)	22:03	17 06:30 (2)	21:31	2 06:31 (2)	20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:04 (2)	05:25	06:12 (2)	06:02		06:52	07:41	07:35	08:26
	16:40	17:29	18:20	20:14	21:05	21:50	23 06:27 (2)	22:03	17 06:29 (2)	21:30		20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:04 (2)	05:25	06:12 (2)	06:04		06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52	23 06:27 (2)	22:03	18 06:30 (2)	21:28		20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:05 (2)	05:26	06:12 (2)	06:05		06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53	22 06:27 (2)	22:02	19 06:31 (2)	21:26		20:23	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:05 (2)	05:27	06:12 (2)	06:07		06:57	07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54	21 06:26 (2)	22:02	20 06:32 (2)	21:25		20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:06 (2)	05:28	06:11 (2)	06:08		06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55	21 06:27 (2)	22:01	21 06:32 (2)	21:23		20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:06 (2)	05:29	06:11 (2)	06:10		07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55	20 06:26 (2)	22:01	22 06:33 (2)	21:21		20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:07 (2)	05:30	06:11 (2)	06:11		07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56	19 06:26 (2)	22:00	22 06:33 (2)	21:19		20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:07 (2)	05:31	06:11 (2)	06:13		07:03	07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57	18 06:25 (2)	21:59	23 06:34 (2)	21:17		20:11	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	06:08 (2)	05:32	06:11 (2)	06:15		07:05	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58	17 06:25 (2)	21:59	23 06:34 (2)	21:15		20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:55	05:54	05:21	06:09 (2)	05:33	06:11 (2)	06:16		07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:30	21:20	21:59	17 06:26 (2)	21:58	24 06:35 (2)	21:14		20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	07:15 (3) 05:53	06:18 (2)	05:21	06:08 (2)	05:34	06:11 (2)	06:18		07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	3 07:18 (3) 21:21	3 06:21 (2)	21:59	17 06:25 (2)	21:57	24 06:35 (2)	21:12		20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	07:13 (3) 05:51	06:17 (2)	05:20	06:09 (2)	05:35	06:11 (2)	06:19	07:11 (3)	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	6 07:19 (3) 21:23	6 06:23 (2)	22:00	16 06:25 (2)	21:56	25 06:36 (2)	21:10	8 07:19 (3)	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) 05:49	06:15 (2)	05:20	06:10 (2)	05:36	06:10 (2)	06:21		07:09 (3)	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35	10 07:21 (3) 21:25	8 06:23 (2)	22:01	15 06:25 (2)	21:55	26 06:36 (2)	21:08	13 07:22 (3)	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) 05:48	06:14 (2)	05:20	06:10 (2)	05:37	06:10 (2)	06:23		07:06 (3)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36	13 07:22 (3) 21:26	11 06:25 (2)	22:01	15 06:25 (2)	21:54	26 06:36 (2)	21:06	17 07:23 (3)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) 05:46	06:13 (2)	05:20	06:11 (2)	05:38	06:10 (2)	06:24		07:05 (3)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38	16 07:23 (3) 21:28	13 06:26 (2)	22:02	14 06:25 (2)	21:53	26 06:36 (2)	21:04	20 07:25 (3)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	07:04 (3) 05:45	06:11 (2)	05:20	06:11 (2)	05:40	06:11 (2)	06:26		07:03 (3)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40	18 07:22 (3) 21:29	15 06:26 (2)	22:02	14 06:25 (2)	21:52	26 06:37 (2)	21:02	22 07:25 (3)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	07:02 (3) 05:43	06:10 (2)	05:20	06:12 (2)	05:41	06:11 (2)	06:28		07:03 (3)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41	20 07:22 (3) 21:31	16 06:26 (2)	22:03	13 06:25 (2)	21:51	26 06:37 (2)	21:00	23 07:26 (3)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	07:00 (3) 05:42	06:09 (2)	05:20	06:12 (2)	05:42	06:12 (2)	06:29		07:01 (3)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43	22 07:22 (3) 21:32	18 06:27 (2)	22:03	13 06:25 (2)	21:50	25 06:37 (2)	20:58	25 07:26 (3)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	06:58 (3) 05:41	06:07 (2)	05:20	06:12 (2)	05:43	06:13 (2)	06:31		07:01 (3)	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45	24 07:22 (3) 21:34	20 06:27 (2)	22:03	13 06:25 (2)	21:49	24 06:37 (2)	20:55	26 07:27 (3)	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	06:56 (3) 05:39	06:06 (2)	05:20	06:12 (2)	05:45	06:14 (2)	06:32		07:00 (3)	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47	26 07:22 (3) 21:35	21 06:27 (2)	22:04	13 06:25 (2)	21:47	23 06:37 (2)	20:53	26 07:26 (3)	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	06:55 (3) 05:38	06:05 (2)	05:20	06:13 (2)	05:46	06:16 (2)	06:34		07:01 (3)	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48	27 07:22 (3) 21:37	22 06:27 (2)	22:04	13 06:26 (2)	21:46	22 06:38 (2)	20:51	26 07:27 (3)	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	06:55 (3) 05:37	06:04 (2)	05:20	06:13 (2)	05:47	06:17 (2)	06:36		07:03 (3)	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50	26 07:21 (3) 21:38	24 06:28 (2)	22:04	13 06:26 (2)	21:45	20 06:37 (2)	20:49	24 07:27 (3)	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	06:56 (3) 05:35	06:03 (2)	05:21	06:13 (2)	05:49	06:18 (2)	06:37		07:04 (3)	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52	24 07:20 (3) 21:39	25 06:28 (2)	22:04	13 06:26 (2)	21:44	19 06:37 (2)	20:47	22 07:26 (3)	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	06:56 (3) 05:34	06:02 (2)	05:21	06:13 (2)	05:50	06:20 (2)	06:39		07:06 (3)	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53	23 07:19 (3) 21:41	26 06:28 (2)	22:04	14 06:27 (2)	21:42	17 06:37 (2)	20:45	20 07:26 (3)	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	06:57 (3) 05:33	06:01 (2)	05:21	06:13 (2)	05:52	06:21 (2)	06:41		07:07 (3)	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55	21 07:18 (3) 21:42	27 06:28 (2)	22:04	14 06:27 (2)	21:41	16 06:37 (2)	20:43	18 07:25 (3)	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	06:58 (3) 05:32	06:01 (2)	05:22	06:13 (2)	05:53	06:22 (2)	06:42		07:09 (3)	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57	19 07:17 (3) 21:43	27 06:28 (2)	22:04	15 06:28 (2)	21:39	14 06:36 (2)	20:40	15 07:24 (3)	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	06:59 (3) 05:31	06:02 (2)	05:22	06:13 (2)	05:55	06:24 (2)	06:44		07:10 (3)	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58	16 07:15 (3) 21:45	26 06:28 (2)	22:04	15 06:28 (2)	21:38	12 06:36 (2)	20:38	13 07:23 (3)	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	07:01 (3) 05:30	06:02 (2)	05:23	06:13 (2)	05:56	06:25 (2)	06:45		07:12 (3)	07:36	07:28	08:21	08:48
	17:21		20:07	21:00	12 07:13 (3) 21:46	26 06:28 (2)	22:04	16 06:29 (2)	21:36	10 06:35 (2)	20:36	10 07:22 (3)	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	07:05 (3) 05:29	06:02 (2)	05:23	06:13 (2)	05:58	06:27 (2)	06:47		07:13 (3)	07:38	07:30	08:23	08:48
	17:23		20:09	21:02	5 07:10 (3) 21:47	25 06:27 (2)	22:04	16 06:29 (2)	21:35	7 06:34 (2)	20:34	6 07:19 (3)	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	06:02 (2)			05:59	06:28 (2)	06:49	07:15 (3)		07:32		08:48
	17:25		20:11		21:48	25 06:27 (2)			21:33	5 06:33 (2)	20:32	2 07:17 (3)		17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				331	384	498	619	338				
Sun reduction				0,42	0,43	0,39	0,41	0,42				
Oper. time red.				0,95	0,95	0,95	0,95	0,95				
Wind dir. red.				0,63	0,67	0,67	0,67	0,63				
Total reduction				0,25	0,27	0,25	0,26	0,25				
Total, real				82	104	123	160	84				

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

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

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 12
Licensed user:
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David Vrolijk / dv@lbpsight.nl
Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 12 - Bolgerijsekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May		June		July		August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12		05:27		05:24	05:55 (3)	06:01	06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03		21:49	32	06:28 (3)	22:03 41	06:36 (3)	21:31	20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10		05:26		05:55 (3)	05:25	05:55 (3)	06:02	06:52	07:41	07:35	08:26
	16:40	17:28	18:20	20:14	21:05		21:50	33	06:28 (3)	22:03 41	06:36 (3)	21:30	20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09		05:25		05:54 (3)	05:25	05:56 (3)	06:04	06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07		21:51	34	06:28 (3)	22:03 40	06:36 (3)	21:28	20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07		05:25		05:54 (3)	05:26	05:57 (3)	06:05	06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08		21:53	35	06:29 (3)	22:02 39	06:36 (3)	21:26	20:22	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05		05:24		05:53 (3)	05:27	05:58 (3)	06:07	06:57	07:46	07:40	08:30
	16:43	17:34	18:26	20:19	21:10		21:54	36	06:29 (3)	22:02 39	06:37 (3)	21:25	20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03		05:23		05:53 (3)	05:28	05:58 (3)	06:08	06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12		21:55	37	06:30 (3)	22:01 38	06:36 (3)	21:23	20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:03	06:01		05:23		05:52 (3)	05:29	05:59 (3)	06:10	07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13		21:55	38	06:30 (3)	22:01 37	06:36 (3)	21:21	20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59		05:22		05:52 (3)	05:30	06:00 (3)	06:11	07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15		21:56	39	06:31 (3)	22:00 36	06:36 (3)	21:19	20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58		05:22		05:51 (3)	05:31	06:01 (3)	06:13	07:03	07:53	07:48	08:35
	16:48	17:41	18:33	20:26	21:17		21:57	40	06:31 (3)	21:59 35	06:36 (3)	21:17	20:11	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56		05:21		05:51 (3)	05:32	06:02 (3)	06:15	07:05	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18		21:58	40	06:31 (3)	21:59 34	06:36 (3)	21:15	20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	05:54		05:21		05:51 (3)	05:33	06:03 (3)	06:16	07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:29	21:20		21:59	41	06:32 (3)	21:58 33	06:36 (3)	21:14	20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	05:53		05:21		05:51 (3)	05:34	06:04 (3)	06:18	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31	21:21		21:59	41	06:32 (3)	21:57 31	06:35 (3)	21:12	20:04	18:55	16:55	16:29
13	08:43	08:01	07:01	06:50	05:51		05:20		05:51 (3)	05:35	06:05 (3)	06:19	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33	21:23		22:00	41	06:32 (3)	21:56 30	06:35 (3)	21:10	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	05:49		05:20		05:51 (3)	05:36	06:06 (3)	06:21	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35	21:25		22:01	41	06:32 (3)	21:55 29	06:35 (3)	21:08	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	05:48		05:20		05:51 (3)	05:37	06:07 (3)	06:23	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36	21:26		22:01	42	06:33 (3)	21:54 27	06:34 (3)	21:06	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	05:46		05:20		05:52 (3)	05:38	06:08 (3)	06:24	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38	21:28		22:02	41	06:33 (3)	21:53 25	06:33 (3)	21:04	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	05:45		05:20		05:52 (3)	05:40	06:10 (3)	06:26	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40	21:29		22:02	41	06:33 (3)	21:52 24	06:34 (3)	21:02	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	05:43		05:20		05:52 (3)	05:41	06:11 (3)	06:28	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41	21:31		22:03	42	06:34 (3)	21:51 22	06:33 (3)	21:00	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	05:42	06:09 (3)	05:20		05:52 (3)	05:42	06:12 (3)	06:29	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43	21:32 3	06:12 (3)	22:03	42	06:34 (3)	21:50 20	06:32 (3)	20:58	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	05:40	06:07 (3)	05:20		05:52 (3)	05:43	06:13 (3)	06:31	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45	21:34 8	06:15 (3)	22:03	42	06:34 (3)	21:49 18	06:31 (3)	20:55	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	05:39	06:06 (3)	05:20		05:52 (3)	05:45	06:14 (3)	06:32	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47	21:35 11	06:17 (3)	22:04	42	06:34 (3)	21:47 15	06:29 (3)	20:53	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	05:38	06:05 (3)	05:20		05:53 (3)	05:46	06:16 (3)	06:34	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48	21:36 14	06:19 (3)	22:04	42	06:35 (3)	21:46 13	06:29 (3)	20:51	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	05:37	06:04 (3)	05:20		05:53 (3)	05:47	06:17 (3)	06:36	07:26	08:17	08:12	08:46
	17:10	18:07	18:57	20:50	21:38 17	06:21 (3)	22:04	42	06:35 (3)	21:45 10	06:27 (3)	20:49	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	05:35	06:03 (3)	05:21		05:53 (3)	05:49	06:18 (3)	06:37	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52	21:39 19	06:22 (3)	22:04	42	06:35 (3)	21:43 6	06:24 (3)	20:47	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	05:34	06:02 (3)	05:21		05:54 (3)	05:50		06:39	07:29	07:21	08:15	08:47
	17:14	18:11	19:00	20:53	21:41 21	06:23 (3)	22:04	42	06:36 (3)	21:42		20:45	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	05:33	06:01 (3)	05:21		05:54 (3)	05:52		06:41	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55	21:42 23	06:24 (3)	22:04	41	06:35 (3)	21:41		20:43	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	05:32	06:00 (3)	05:22		05:53 (3)	05:53		06:42	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57	21:43 25	06:25 (3)	22:04	42	06:35 (3)	21:39		20:40	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	05:31	05:59 (3)	05:22		05:54 (3)	05:55		06:44	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58	21:45 26	06:25 (3)	22:04	42	06:36 (3)	21:38		20:38	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	05:30	05:58 (3)	05:23		05:55 (3)	05:56		06:45	07:36	07:28	08:21	08:48
	17:21		20:07	21:00	21:46 28	06:26 (3)	22:04	41	06:36 (3)	21:36		20:36	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	05:29	05:57 (3)	05:23		05:55 (3)	05:58		06:47	07:38	07:30	08:23	08:48
	17:23		20:09	21:02	21:47 29	06:26 (3)	22:04	41	06:36 (3)	21:35		20:34	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	05:56 (3)				05:59		06:49		07:31		08:48
	17:25		20:11		21:48 31	06:27 (3)				21:33		20:32		17:15		16:37
Potential sun hours	259	277	367	416	485		499		502		454	381	331	266	244
Total, worst case					255		1195		683						
Sun reduction					0,43		0,39		0,41						
Oper. time red.					0,95		0,95		0,95						
Wind dir. red.					0,67		0,67		0,67						
Total reduction					0,27		0,25		0,26						
Total, real					70		298		177						

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 13

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 13 - Bolgerijsekade 8

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12	06:12 - 21:03	05:27 - 21:49	05:24 - 22:03	06:01 - 21:31	06:50 - 20:29	07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:29	07:26 - 18:20	07:15 - 20:14	06:10 - 21:05	05:26 - 21:50	05:25 - 22:03	06:02 - 21:30	06:52 - 20:27	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 20:16	06:09 - 21:07	05:25 - 21:52	05:25 - 22:03	06:04 - 21:28	06:54 - 20:25	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:18	06:07 - 21:08	05:25 - 21:53	05:25 - 22:02	06:05 - 21:26	06:55 - 20:23	07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 20:19	06:05 - 21:10	05:24 - 21:54	05:27 - 22:02	06:07 - 21:25	06:57 - 20:20	07:46 - 19:11	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21	06:03 - 21:12	05:23 - 21:55	05:28 - 22:01	06:08 - 21:23	06:59 - 20:18	07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:04 - 20:23	06:01 - 21:13	05:23 - 21:55	05:29 - 22:01	06:10 - 21:21	07:00 - 20:16	07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:47 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24	05:59 - 21:15	05:22 - 21:56	05:30 - 22:00	06:12 - 21:19	06:58 (2) - 07:02 (2) - 20:13	07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	06:59 - 20:26	05:58 - 21:17	05:22 - 21:57	05:31 - 21:59	06:13 - 21:17	07:03 - 20:11	07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28	05:56 - 21:18	05:21 - 21:58	05:32 - 21:59	06:07 - 21:15	06:53 (2) - 07:05 - 20:09	07:55 - 18:59	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:55 - 20:30	05:54 - 21:20	05:21 - 21:59	05:33 - 21:58	06:07 - 21:14	06:51 (2) - 07:07 - 20:06	07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31	05:53 - 21:22	05:21 - 21:59	05:34 - 21:57	06:07 - 21:12	06:50 (2) - 07:08 - 20:04	07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 21:23	05:20 - 22:00	05:35 - 21:56	06:07 - 21:10	06:49 (2) - 07:10 - 20:02	08:00 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 21:25	05:20 - 22:01	06:05 - 21:55	06:07 - 21:08	06:49 (2) - 07:12 - 19:59	08:02 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 21:26	05:20 - 22:01	06:06 - 21:54	06:07 - 21:06	06:50 (2) - 07:13 - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 21:28	05:20 - 22:02	06:06 - 21:53	06:08 - 21:04	06:52 (2) - 07:15 - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 21:29	05:20 - 22:02	06:07 - 21:52	06:10 - 21:02	06:53 (2) - 07:16 - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41	05:43 - 21:31	05:20 - 22:03	06:07 - 21:51	06:11 - 21:00	06:55 (2) - 07:18 - 19:50	08:08 - 18:42	08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43	05:42 - 21:32	05:20 - 22:03	06:07 - 21:50	06:12 - 20:58	06:56 (2) - 07:20 - 19:48	08:10 - 18:40	08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45	06:58 (2) - 05:41 - 21:34	05:20 - 22:03	06:07 - 21:49	06:13 - 20:55	06:58 (2) - 07:21 - 19:45	08:12 - 18:37	08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 20:47	06:56 (2) - 05:39 - 21:35	05:20 - 22:04	06:07 - 21:47	06:14 - 20:53	06:59 (2) - 07:23 - 19:43	08:14 - 18:35	08:09 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 20:48	06:54 (2) - 05:38 - 21:37	05:20 - 22:04	06:08 - 21:46	06:16 - 20:51	07:01 (2) - 07:25 - 19:41	08:15 - 18:33	08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:11	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50	06:52 (2) - 05:37 - 21:38	05:20 - 22:04	06:08 - 21:45	06:17 - 20:49	07:03 (2) - 07:26 - 19:38	08:17 - 18:31	08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 20:52	06:50 (2) - 05:35 - 21:39	05:20 - 22:04	06:08 - 21:44	06:18 - 20:47	07:28 - 19:36	08:19 - 18:29	08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 20:53	06:48 (2) - 05:34 - 21:41	05:21 - 22:04	06:09 - 21:42	06:20 - 20:45	07:30 - 19:34	07:21 - 17:27	08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 20:55	06:46 (2) - 05:33 - 21:42	05:21 - 22:04	06:08 - 21:41	06:21 - 20:43	07:31 - 19:31	07:23 - 17:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 20:57	06:44 (2) - 05:32 - 21:43	05:22 - 22:04	06:09 - 21:39	06:22 - 20:40	07:33 - 19:29	07:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 20:58	06:42 (2) - 05:31 - 21:45	05:22 - 22:04	06:08 - 21:38	06:24 - 20:38	07:34 - 19:27	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07 (2)	07:47 (3) - 07:48 (3) - 21:00	06:40 (2) - 05:30 - 21:46	05:23 - 22:04	06:09 (1) - 05:56 - 21:36	06:25 (1) - 06:46 - 20:36	07:36 - 19:24	07:28 - 17:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09 (5)	07:44 (3) - 07:49 (3) - 21:02	06:42 (2) - 05:29 - 21:47	05:23 - 22:04	06:08 (1) - 05:58 - 21:35	06:28 (1) - 06:47 - 20:34	07:38 - 19:22	07:30 - 17:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11 (8)	07:42 (3) - 07:50 (3) - 21:01	05:28 - 21:48	05:18 (1) - 06:22 (1) - 22:04	05:59 - 21:33	06:49 - 20:32		07:32 - 17:15		08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			15	298	344	506	519	208	165			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,63	0,63	0,67	0,67	0,67	0,64	0,63			
Total reduction			0,20	0,25	0,27	0,25	0,26	0,25	0,21			
Total, real			3	75	93	126	134	53	35			

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

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

Project:

068379aa - WP Autena

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15-5-2014 15:37 / 14

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Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 14 - Bolgerijsekade 6

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 07:40 (3) - 20:12	06:12 - 06:46 (2) - 21:03	05:27 - 07:00 (2) - 21:49	06:04 (1) - 22:03	05:24 - 06:25 (1) - 21:31	06:15 (1) - 06:50 - 20:29	06:01 - 07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:29	07:26 - 18:20	07:15 - 07:38 (3) - 20:14	06:10 - 06:47 (2) - 21:05	05:26 - 06:58 (2) - 21:50	06:04 (1) - 22:03	05:25 - 06:25 (1) - 21:30	06:14 (1) - 06:52 - 20:27	06:02 - 07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 07:35 (3) - 20:16	06:09 - 06:50 (2) - 21:07	05:25 - 06:55 (2) - 21:52	06:04 (1) - 22:03	05:25 - 06:23 (1) - 21:28	06:13 (1) - 06:54 - 20:25	06:04 - 07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 07:33 (3) - 20:18	06:07 - 06:55 (2) - 21:08	05:25 - 06:53 (2) - 21:53	06:05 (1) - 22:02	05:26 - 06:23 (1) - 21:26	06:13 (1) - 06:55 - 20:23	06:05 - 07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 07:31 (3) - 20:19	06:05 - 06:50 (2) - 21:10	05:24 - 06:54 (2) - 21:54	06:05 (1) - 22:02	05:27 - 06:23 (1) - 21:25	06:13 (1) - 06:57 - 20:20	06:07 - 07:46 - 19:11	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 07:31 (3) - 20:21	06:03 - 06:50 (2) - 21:12	05:23 - 06:55 (2) - 21:55	06:07 (1) - 22:01	05:28 - 06:23 (1) - 21:23	06:12 (1) - 06:59 - 20:18	06:08 - 07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:04 - 07:31 (3) - 20:23	06:01 - 06:50 (2) - 21:13	05:23 - 06:55 (2) - 21:55	06:07 (1) - 22:01	05:29 - 06:22 (1) - 21:21	06:12 (1) - 07:00 - 20:16	06:10 - 07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:47 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 07:33 (3) - 20:24	05:59 - 06:48 (2) - 21:15	05:22 - 06:56 (2) - 21:56	06:08 (1) - 22:00	05:30 - 06:22 (1) - 21:19	06:12 (1) - 07:02 - 20:13	06:12 - 07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	06:59 - 07:35 (3) - 20:26	05:58 - 06:47 (2) - 21:17	05:22 - 06:57 (2) - 21:57	06:08 (1) - 22:00	05:31 - 06:22 (1) - 21:17	06:13 - 07:03 - 20:11	06:13 - 07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 07:43 (3) - 20:28	05:56 - 06:46 (2) - 21:18	05:21 - 06:58 (2) - 21:58	06:09 (1) - 22:00	05:32 - 06:21 (1) - 21:17	06:11 (1) - 06:58 (2) - 20:11	07:05 - 07:31 (3) - 20:09	07:55 - 18:59	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:55 - 07:45 (3) - 20:30	05:54 - 06:45 (2) - 21:20	05:21 - 06:59 (2) - 21:59	06:10 (1) - 22:00	05:33 - 06:21 (1) - 21:59	06:11 (1) - 07:05 - 20:06	07:05 (2) - 07:32 (3) - 20:06	07:50 - 18:57	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 07:47 (3) - 20:31	05:53 - 06:44 (2) - 21:22	05:21 - 06:59 (2) - 21:59	06:10 (1) - 22:00	05:34 - 06:21 (1) - 21:58	06:11 (1) - 07:07 (2) - 20:04	07:07 (2) - 07:34 (3) - 20:04	07:46 - 18:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 07:49 (3) - 20:33	05:51 - 06:43 (2) - 21:23	05:20 - 06:59 (2) - 21:59	06:11 (1) - 22:00	05:35 - 06:20 (1) - 21:57	06:11 (1) - 07:09 (2) - 20:02	07:09 (2) - 07:35 (3) - 20:02	07:42 (3) - 18:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 07:51 (3) - 20:35	05:49 - 06:41 (2) - 21:25	05:20 - 06:59 (2) - 22:01	06:12 (1) - 22:00	05:36 - 06:19 (1) - 21:56	06:10 (1) - 06:52 (2) - 20:01	06:21 - 07:37 (3) - 20:01	07:40 - 18:50	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 07:53 (3) - 20:36	05:48 - 06:40 (2) - 21:26	05:20 - 06:59 (2) - 22:01	06:13 (1) - 22:00	05:37 - 06:19 (1) - 21:55	06:10 (1) - 06:52 (2) - 20:00	06:23 - 07:41 (3) - 20:00	07:41 - 18:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 07:55 (3) - 20:38	05:46 - 06:38 (2) - 21:28	05:20 - 06:59 (2) - 22:02	06:15 (1) - 22:00	05:38 - 06:18 (1) - 21:53	06:10 (1) - 06:52 (2) - 19:59	06:24 - 07:38 (3) - 19:59	07:40 - 18:48	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 07:57 (3) - 20:40	05:45 - 06:36 (2) - 21:29	05:20 - 06:59 (2) - 22:02	06:16 (1) - 22:00	05:40 - 06:33 (1) - 21:52	06:11 (1) - 06:53 (2) - 19:55	06:26 - 07:39 (3) - 19:55	07:40 - 18:44	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 07:59 (3) - 20:41	05:43 - 06:35 (2) - 21:31	05:20 - 06:59 (2) - 22:03	06:17 (1) - 22:00	05:41 - 06:33 (1) - 21:51	06:11 (1) - 06:55 (2) - 19:52	06:28 - 07:37 (3) - 19:52	07:39 - 18:42	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 08:01 (3) - 20:43	05:42 - 06:33 (2) - 21:32	05:20 - 06:59 (2) - 22:03	06:18 (1) - 22:00	05:42 - 06:33 (1) - 21:50	06:12 (1) - 06:56 (2) - 19:50	06:29 - 07:36 (3) - 19:50	07:38 - 18:42	08:44 - 16:29
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 08:03 (3) - 20:45	05:41 - 06:31 (2) - 21:34	05:20 - 06:59 (2) - 22:03	06:19 (1) - 22:00	05:43 - 06:33 (1) - 21:49	06:13 (1) - 06:56 (2) - 19:48	06:31 - 07:35 (3) - 19:48	07:38 - 18:40	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 08:05 (3) - 20:47	05:39 - 06:30 (2) - 21:35	05:20 - 06:59 (2) - 22:04	06:20 (1) - 22:00	05:45 - 06:33 (1) - 21:47	06:14 (1) - 06:58 (2) - 19:45	06:32 - 07:34 (3) - 19:45	07:37 - 18:38	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 08:07 (3) - 20:48	05:38 - 06:28 (2) - 21:37	05:20 - 06:59 (2) - 22:04	06:21 (1) - 22:00	05:46 - 06:33 (1) - 21:46	06:16 (1) - 06:59 (2) - 19:43	06:34 - 07:33 (3) - 19:43	07:35 - 18:35	08:46 - 16:30
23	08:34 - 17:11	07:41 - 18:07	06:38 - 18:57	06:28 - 08:09 (3) - 20:50	05:37 - 06:26 (2) - 21:38	05:20 - 06:59 (2) - 22:04	06:22 (1) - 22:00	05:47 - 06:33 (1) - 21:45	06:17 (1) - 07:01 (2) - 19:41	06:36 - 07:31 (3) - 19:41	07:33 - 18:33	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 08:11 (3) - 20:52	05:35 - 06:24 (2) - 21:39	05:20 - 06:59 (2) - 22:04	06:23 (1) - 22:00	05:49 - 06:33 (1) - 21:44	06:18 (1) - 07:03 (2) - 19:38	06:37 - 07:29 (3) - 19:38	07:32 - 18:31	08:47 - 16:31
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 08:13 (3) - 20:53	05:34 - 06:22 (2) - 21:41	05:21 - 06:59 (2) - 22:04	06:24 (1) - 22:00	05:50 - 06:33 (1) - 21:42	06:20 (1) - 07:04 (2) - 19:36	06:39 - 07:28 (3) - 19:36	07:30 - 18:29	08:47 - 16:32
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 08:15 (3) - 20:55	05:33 - 06:20 (2) - 21:42	05:21 - 06:59 (2) - 22:04	06:25 (1) - 22:00	05:52 - 06:35 (1) - 21:41	06:21 (1) - 07:04 (2) - 19:34	06:41 - 07:27 (3) - 19:34	07:31 - 18:27	08:47 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 08:17 (3) - 20:57	05:32 - 06:18 (2) - 21:43	05:22 - 06:59 (2) - 22:04	06:25 (1) - 22:00	05:53 - 06:34 (1) - 21:39	06:22 (1) - 07:04 (2) - 19:31	06:43 - 07:25 (3) - 19:31	07:33 - 18:25	08:48 - 16:33
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 08:20 (3) - 20:58	05:31 - 06:16 (2) - 21:45	05:22 - 06:59 (2) - 22:04	06:26 (1) - 22:00	05:55 - 06:33 (1) - 21:38	06:24 (1) - 07:03 (2) - 19:29	06:44 - 07:23 (3) - 19:29	07:34 - 18:23	08:48 - 16:34
29	08:26 - 17:21		07:24 - 20:07 (3) - 21:00	07:47 (3) - 07:51 (3) - 19	06:16 - 06:43 (2) - 21:46	05:30 - 06:02 (1) - 22:04	06:27 (1) - 22:00	05:56 - 06:33 (1) - 21:36	06:25 (1) - 07:04 (2) - 19:27	06:46 - 07:23 (3) - 19:27	07:36 - 18:21	08:48 - 16:35
30	08:24 - 17:23		07:22 - 20:09 (3) - 21:02	07:44 (3) - 07:51 (3) - 17	06:14 - 06:45 (2) - 21:47	05:29 - 06:02 (1) - 22:04	06:28 (1) - 22:00	05:58 - 06:32 (1) - 21:35	06:27 (1) - 07:04 (2) - 19:22	06:47 - 07:23 (3) - 19:22	07:38 - 18:19	08:48 - 16:36
31	08:23 - 17:25		07:20 - 20:11 (3) - 21:48	07:42 (3) - 07:52 (3) - 22	05:28 - 06:02 (1) - 22:04	06:24 (1) - 22:04	06:29 (1) - 22:00	05:59 - 06:31 (1) - 21:33	06:28 (1) - 06:49 - 20:32		07:32 - 18:17	08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			21	299	361	236	511	195	160			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,63	0,63	0,67	0,67	0,67	0,64	0,63			
Total reduction			0,19	0,25	0,27	0,25	0,26	0,25	0,21			
Total, real			4	75	98	58	132	49	34			

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

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

Project:
068379aa - WP Autena

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15-5-2014 15:37 / 15

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 15 - Biezenweg 24

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February	March	April	May	June	July	August	September	October	November	December
1	08:48	13:52 (1)	08:21	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33	08:24 13:41 (1)
	16:39 57	14:49 (1)	17:27	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13	16:33 52 14:33 (1)
2	08:48	13:52 (1)	08:20	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35	08:26 13:41 (1)
	16:40 57	14:49 (1)	17:28	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12	16:32 52 14:33 (1)
3	08:48	13:53 (1)	08:18	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37	08:27 13:41 (1)
	16:41 56	14:49 (1)	17:30	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10	16:32 54 14:35 (1)
4	08:48	13:54 (1)	08:17	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39	08:29 13:41 (1)
	16:42 56	14:50 (1)	17:32	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08	16:31 54 14:35 (1)
5	08:48	13:54 (1)	08:15	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40	08:30 13:40 (1)
	16:43 56	14:50 (1)	17:34	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06	16:31 55 14:35 (1)
6	08:47	13:55 (1)	08:13	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42	08:31 13:41 (1)
	16:44 55	14:50 (1)	17:36	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04	16:30 55 14:36 (1)
7	08:47	13:55 (1)	08:12	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44	08:32 13:41 (1)
	16:46 55	14:50 (1)	17:38	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03	16:30 56 14:37 (1)
8	08:46	13:57 (1)	08:10	07:12	07:01	05:59	05:22	05:30	06:11	07:02	07:51	07:46	08:34 13:41 (1)
	16:47 54	14:51 (1)	17:40	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01	16:29 56 14:37 (1)
9	08:46	13:57 (1)	08:08	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48	08:35 13:42 (1)
	16:48 54	14:51 (1)	17:41	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59	16:29 56 14:38 (1)
10	08:45	13:57 (1)	08:06	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49	08:36 13:42 (1)
	16:50 53	14:50 (1)	17:43	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58	16:29 57 14:39 (1)
11	08:45	13:59 (1)	08:04	07:06	06:54	05:54	05:21	05:33	06:16	07:07	07:56	07:51	08:37 13:42 (1)
	16:51 52	14:51 (1)	17:45	18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56	16:29 57 14:39 (1)
12	08:44	14:00 (1)	08:03	07:03	06:52	05:53	05:20	05:34	06:18	07:08	07:58	07:53	08:38 13:42 (1)
	16:53 51	14:51 (1)	17:47	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55	16:29 58 14:40 (1)
13	08:44	14:01 (1)	08:01	07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55	08:39 13:43 (1)
	16:54 50	14:51 (1)	17:49	18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53	16:29 57 14:40 (1)
14	08:43	14:01 (1)	07:59	06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57	08:40 13:43 (1)
	16:56 49	14:50 (1)	17:51	18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52	16:29 58 14:41 (1)
15	08:42	14:02 (1)	07:57	06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58	08:41 13:43 (1)
	16:57 48	14:50 (1)	17:53	18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50	16:29 58 14:41 (1)
16	08:41	14:04 (1)	07:55	06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00 13:57 (1)	08:42 13:44 (1)
	16:59 46	14:50 (1)	17:54	18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49 13 14:10 (1)	16:29 58 14:42 (1)
17	08:40	14:05 (1)	07:53	06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02 13:54 (1)	08:43 13:45 (1)
	17:00 45	14:50 (1)	17:56	18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47 20 14:14 (1)	16:29 58 14:43 (1)
18	08:39	14:06 (1)	07:51	06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04 13:51 (1)	08:43 13:44 (1)
	17:02 43	14:49 (1)	17:58	18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46 26 14:17 (1)	16:29 59 14:43 (1)
19	08:38	14:08 (1)	07:49	06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05 13:49 (1)	08:44 13:45 (1)
	17:04 41	14:49 (1)	18:00	18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45 30 14:19 (1)	16:29 58 14:43 (1)
20	08:37	14:08 (1)	07:47	06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07 13:48 (1)	08:45 13:46 (1)
	17:05 39	14:47 (1)	18:02	18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44 33 14:21 (1)	16:30 58 14:44 (1)
21	08:36	14:10 (1)	07:45	06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09 13:46 (1)	08:45 13:46 (1)
	17:07 37	14:47 (1)	18:04	18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42 37 14:23 (1)	16:30 58 14:44 (1)
22	08:35	14:12 (1)	07:43	06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10 13:44 (1)	08:46 13:47 (1)
	17:09 34	14:46 (1)	18:06	18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41 39 14:23 (1)	16:31 58 14:45 (1)
23	08:34	14:14 (1)	07:41	06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12 13:44 (1)	08:46 13:47 (1)
	17:10 30	14:44 (1)	18:07	18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40 41 14:25 (1)	16:31 58 14:45 (1)
24	08:33	14:17 (1)	07:39	06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14 13:43 (1)	08:47 13:47 (1)
	17:12 26	14:43 (1)	18:09	18:59	20:52	21:39	22:04	21:44	20:47	19:36	18:29	16:39 43 14:26 (1)	16:32 58 14:45 (1)
25	08:31	14:21 (1)	07:36	06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15 13:43 (1)	08:47 13:48 (1)
	17:14 20	14:41 (1)	18:11	19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38 45 14:28 (1)	16:32 59 14:47 (1)
26	08:30	14:25 (1)	07:34	06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17 13:42 (1)	08:48 13:48 (1)
	17:16 12	14:37 (1)	18:13	19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37 46 14:28 (1)	16:33 59 14:47 (1)
27	08:29		07:32	06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18 13:42 (1)	08:48 13:49 (1)
	17:17		18:15	19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36 47 14:29 (1)	16:34 58 14:47 (1)
28	08:27		07:30	06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20 13:42 (1)	08:48 13:49 (1)
	17:19		18:16	19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35 49 14:31 (1)	16:35 58 14:47 (1)
29	08:26			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21 13:41 (1)	08:48 13:50 (1)
	17:21			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34 50 14:31 (1)	16:36 58 14:48 (1)
30	08:24			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23 13:41 (1)	08:48 13:50 (1)
	17:23			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34 51 14:32 (1)	16:36 58 14:48 (1)
31	08:23			07:19		05:28		05:59	06:49		07:31		08:48 13:51 (1)
	17:25			20:11		21:48		21:33	20:32		17:15		16:37 57 14:48 (1)
Potential sun hours	259		277	367	416	485	499	502	454	381	331	266	243
Total, worst case	1176											570	1765
Sun reduction	0,24											0,24	0,20
Oper. time red.	0,95											0,95	0,95
Wind dir. red.	0,69											0,69	0,69
Total reduction	0,16											0,15	0,13
Total, real	184											88	235

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 15:37 / 16

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:47/2.7.490

SHADOW - Calendar

Calculation: Nordex N131**Shadow receptor:** 16 - Biezenweg 49

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December	
1	08:48	15:45 (1)	08:21	15:47 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	15:26 (1)	08:24	15:26 (1)
	16:39	19 16:04 (1)	17:27	43 16:30 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13	26 15:52 (1)	16:33	34 16:00 (1)
2	08:48	15:44 (1)	08:20	15:47 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	15:24 (1)	08:26	15:27 (1)
	16:40	20 16:04 (1)	17:28	42 16:29 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12	30 15:54 (1)	16:32	32 15:59 (1)
3	08:48	15:45 (1)	08:18	15:48 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	15:23 (1)	08:27	15:28 (1)
	16:41	21 16:06 (1)	17:30	41 16:29 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15		17:10	32 15:55 (1)	16:32	30 15:58 (1)
4	08:48	15:45 (1)	08:17	15:48 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39	15:21 (1)	08:29	15:28 (1)
	16:42	22 16:07 (1)	17:32	40 16:28 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13		17:08	35 15:56 (1)	16:31	29 15:57 (1)
5	08:48	15:44 (1)	08:15	15:50 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40	15:20 (1)	08:30	15:29 (1)
	16:43	24 16:08 (1)	17:34	38 16:28 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06	37 15:57 (1)	16:31	27 15:56 (1)
6	08:47	15:45 (1)	08:13	15:51 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42	15:20 (1)	08:31	15:31 (1)
	16:44	25 16:10 (1)	17:36	36 16:27 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04	38 15:58 (1)	16:30	25 15:56 (1)
7	08:47	15:44 (1)	08:12	15:52 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44	15:19 (1)	08:32	15:31 (1)
	16:46	27 16:11 (1)	17:38	34 16:26 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03	40 15:59 (1)	16:30	24 15:55 (1)
8	08:46	15:44 (1)	08:10	15:53 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46	15:18 (1)	08:34	15:32 (1)
	16:47	29 16:13 (1)	17:40	32 16:25 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01	41 15:59 (1)	16:29	23 15:55 (1)
9	08:46	15:44 (1)	08:08	15:55 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48	15:18 (1)	08:35	15:34 (1)
	16:48	30 16:14 (1)	17:41	29 16:24 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59	42 16:00 (1)	16:29	21 15:55 (1)
10	08:45	15:44 (1)	08:06	15:56 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49	15:18 (1)	08:36	15:34 (1)
	16:50	31 16:15 (1)	17:43	26 16:22 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58	43 16:01 (1)	16:29	21 15:55 (1)
11	08:45	15:44 (1)	08:04	15:59 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51	15:18 (1)	08:37	15:35 (1)
	16:51	34 16:18 (1)	17:45	21 16:20 (1)	18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57		16:56	43 16:01 (1)	16:29	19 15:54 (1)
12	08:44	15:44 (1)	08:03	16:02 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53	15:18 (1)	08:38	15:36 (1)
	16:53	35 16:19 (1)	17:47	15 16:17 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55	44 16:02 (1)	16:29	18 15:54 (1)
13	08:43	15:44 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00		07:55	15:17 (1)	08:39	15:37 (1)
	16:54	37 16:21 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52		16:53	44 16:01 (1)	16:29	17 15:54 (1)
14	08:43	15:44 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01		07:57	15:17 (1)	08:40	15:38 (1)
	16:56	38 16:22 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50		16:52	44 16:01 (1)	16:29	16 15:54 (1)
15	08:42	15:44 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03		07:58	15:17 (1)	08:41	14:14 (2)
	16:57	39 16:23 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48		16:50	45 16:02 (1)	16:29	20 15:54 (1)
16	08:41	15:44 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05		08:00	15:17 (1)	08:42	14:13 (2)
	16:59	40 16:24 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46		16:49	45 16:02 (1)	16:29	22 15:54 (1)
17	08:40	15:44 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07		08:02	15:17 (1)	08:43	14:13 (2)
	17:00	41 16:25 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44		16:47	45 16:02 (1)	16:29	22 15:54 (1)
18	08:39	15:44 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08		08:04	15:18 (1)	08:43	14:12 (2)
	17:02	41 16:25 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42		16:46	44 16:02 (1)	16:29	24 15:54 (1)
19	08:38	15:44 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10		08:05	15:18 (1)	08:44	14:12 (2)
	17:04	42 16:26 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:57	19:48	18:39		16:45	45 16:03 (1)	16:29	24 15:54 (1)
20	08:37	15:43 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12		08:07	15:19 (1)	08:45	14:13 (2)
	17:05	43 16:26 (1)	18:02		18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37		16:44	44 16:03 (1)	16:30	24 15:55 (1)
21	08:36	15:43 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14		08:09	15:19 (1)	08:45	14:12 (2)
	17:07	44 16:27 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35		16:42	44 16:03 (1)	16:30	25 15:55 (1)
22	08:35	15:44 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:24	08:15		08:10	15:19 (1)	08:46	14:13 (2)
	17:09	44 16:28 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33		16:41	43 16:02 (1)	16:31	25 15:56 (1)
23	08:34	15:43 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17		08:12	15:20 (1)	08:46	14:14 (2)
	17:10	45 16:28 (1)	18:07		18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31		16:40	42 16:02 (1)	16:31	24 15:56 (1)
24	08:33	15:44 (1)	07:39		06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19		08:14	15:21 (1)	08:47	14:14 (2)
	17:12	44 16:28 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29		16:39	42 16:03 (1)	16:32	24 15:56 (1)
25	08:31	15:44 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21		08:15	15:22 (1)	08:47	14:15 (2)
	17:14	45 16:29 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27		16:38	41 16:03 (1)	16:32	25 15:58 (1)
26	08:30	15:44 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:40	07:31	07:23		08:17	15:22 (1)	08:48	14:16 (2)
	17:16	45 16:29 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25		16:37	40 16:02 (1)	16:33	24 15:58 (1)
27	08:29	15:45 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24		08:18	15:23 (1)	08:48	14:17 (2)
	17:17	45 16:30 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23		16:36	39 16:02 (1)	16:34	23 15:59 (1)
28	08:27	15:45 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26		08:20	15:24 (1)	08:48	14:19 (2)
	17:19	44 16:29 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21		16:35	38 16:02 (1)	16:35	20 15:59 (1)
29	08:26	15:46 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	15:36 (1)	08:21	15:24 (1)	08:48	14:22 (2)
	17:21	44 16:30 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	6 15:42 (1)	16:34	37 16:01 (1)	16:35	17 16:00 (1)
30	08:24	15:46 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	15:31 (1)	08:23	15:25 (1)	08:48	15:45 (1)
	17:23	44 16:30 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16 15:47 (1)	16:34	35 16:00 (1)	16:36	16 16:01 (1)
31	08:23	15:46 (1)			07:19		05:28		05:59	06:49		07:31	15:28 (1)			08:48	15:45 (1)
	17:25	43 16:29 (1)			20:11		21:48		21:33	20:31		17:15	22 15:50 (1)			16:37	17 16:02 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243	
Total, worst case		1125		397									44		1208		712
Sun reduction		0,24		0,30									0,34		0,24		0,20
Oper. time red.		0,95		0,95									0,95		0,95		0,95
Wind dir. red.		0,67		0,67									0,67		0,67		0,67
Total reduction		0,15		0,19									0,21		0,15		0,13
Total, real		171		76									9		181		92

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 1

Licensed user:
LBP SIGHT
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 01 - Nieuwbouw Autenasekade

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	16:29 (3) 07:17	06:12	19:19 (2) 05:27	19:34 (2) 05:24	19:49 (2) 06:00	19:29 (2) 06:50	07:39	17:10 (3) 07:33	16:26 (3) 08:24
	16:39	17:27	18:18 62	17:31 (3) 20:12	21:03 61	20:20 (2) 21:49 74	21:01 (1) 22:03 53	21:05 (1) 21:31 86	21:01 (1) 20:29	19:20 55	18:05 (3) 17:13 8	16:34 (3) 16:33
2	08:48	08:20	07:26	16:29 (3) 07:15	06:10	19:18 (2) 05:26	19:34 (2) 05:25	19:47 (2) 06:02	19:29 (2) 06:52	07:41	17:09 (3) 07:35	08:26
	16:40	17:28	18:20 62	17:31 (3) 20:14	21:05 62	20:20 (2) 21:50 73	21:01 (1) 22:03 55	21:05 (1) 21:30 85	21:00 (1) 20:27	19:17 56	18:05 (3) 17:12	16:32
3	08:48	08:18	07:23	16:29 (3) 07:13	06:08	19:18 (2) 05:25	19:35 (2) 05:25	19:47 (2) 06:04	19:28 (2) 06:54	07:43	17:08 (3) 07:37	08:27
	16:41	17:30	18:22 62	17:31 (3) 20:16	21:07 61	20:19 (2) 21:51 70	21:00 (1) 22:03 57	21:05 (1) 21:28 84	20:58 (1) 20:25	19:15 57	18:05 (3) 17:10	16:32
4	08:48	08:17	07:21	16:29 (3) 07:10	06:07	19:18 (2) 05:25	19:37 (2) 05:26	19:46 (2) 06:05	19:29 (2) 06:55	07:44	17:07 (3) 07:39	08:29
	16:42	17:32	18:24 62	17:31 (3) 20:17	21:08 61	20:19 (2) 21:53 68	21:01 (1) 22:02 60	21:06 (1) 21:26 80	20:57 (1) 20:22	19:13 59	18:06 (3) 17:08	16:31
5	08:48	08:15	07:19	16:28 (3) 07:08	06:05	19:18 (2) 05:24	19:37 (2) 05:27	19:46 (2) 06:07	19:28 (2) 06:57	07:46	17:05 (3) 07:40	08:30
	16:43	17:34	18:25 62	17:30 (3) 20:19	21:10 69	20:42 (1) 21:54 68	21:01 (1) 22:02 61	21:07 (1) 21:25 78	20:55 (1) 20:20	19:10 60	18:05 (3) 17:06	16:31
6	08:47	08:13	07:17	16:28 (3) 07:06	06:03	19:18 (2) 05:23	19:38 (2) 05:28	19:44 (2) 06:08	19:28 (2) 06:58	07:48	17:05 (3) 07:42	08:31
	16:44	17:36	18:27 62	17:30 (3) 20:21	21:12 73	20:43 (1) 21:54 64	21:00 (1) 22:01 63	21:06 (1) 21:23 75	20:54 (1) 20:18	19:08 61	18:06 (3) 17:04	16:30
7	08:47	08:12	07:15	16:29 (3) 07:03	06:01	19:18 (2) 05:23	19:39 (2) 05:29	19:44 (2) 06:10	19:27 (2) 07:00	07:49	17:04 (3) 07:44	08:32
	16:46	17:38	18:29 61	17:30 (3) 20:23	21:13 76	20:44 (1) 21:55 62	21:00 (1) 22:01 66	21:07 (1) 21:21 72	20:52 (1) 20:16	19:06 62	18:06 (3) 17:03	16:30
8	08:46	08:10	07:12	16:28 (3) 07:01	05:59	19:18 (2) 05:22	19:41 (2) 05:30	19:43 (2) 06:11	19:28 (2) 07:02	07:51	17:04 (3) 07:46	08:34
	16:47	17:40	18:31 60	17:28 (3) 20:24	21:15 79	20:46 (1) 21:56 60	21:01 (1) 22:00 68	21:07 (1) 21:19 65	20:50 (1) 20:13	19:04 62	18:06 (3) 17:01	16:29
9	08:46	08:08	07:10	16:29 (3) 06:59	05:58	19:18 (2) 05:22	19:41 (2) 05:30	19:43 (2) 06:13	19:27 (2) 07:03	07:53	17:03 (3) 07:48	08:35
	16:48	17:41	18:33 59	17:28 (3) 20:26	21:17 82	20:47 (1) 21:57 58	21:00 (1) 21:59 70	21:08 (1) 21:17 62	20:29 (2) 20:11	19:01 62	18:05 (3) 16:59	16:29
10	08:45	08:06 16:55 (3)	07:08	16:29 (3) 06:57	05:56	19:18 (2) 05:21	19:43 (2) 05:31	19:42 (2) 06:15	19:28 (2) 07:05	07:55	17:03 (3) 07:49	08:36
	16:50	17:43 11 17:06 (3)	18:34 59	17:28 (3) 20:28	21:18 83	20:48 (1) 21:58 56	21:01 (1) 21:59 72	21:08 (1) 21:15 61	20:29 (2) 20:09	18:59 62	18:05 (3) 16:58	16:29
11	08:45	08:04 16:50 (3)	07:06	16:30 (3) 06:54	05:54	19:19 (2) 05:21	19:44 (2) 05:33	19:41 (2) 06:16	19:27 (2) 07:07	07:56	17:03 (3) 07:51	08:37
	16:51	17:45 21 17:11 (3)	18:36 57	17:27 (3) 20:29	21:20 85	20:50 (1) 21:59 54	21:01 (1) 21:58 74	21:08 (1) 21:13 61	20:28 (2) 20:06	18:57 62	18:05 (3) 16:56	16:29
12	08:44	08:03 16:47 (3)	07:03	16:30 (3) 06:52	05:53	19:19 (2) 05:20	19:45 (2) 05:34	19:41 (2) 06:18	19:28 (2) 07:08	07:58	17:03 (3) 07:53	08:38
	16:53	17:47 27 17:14 (3)	18:38 55	17:25 (3) 20:31	21:21 87	20:51 (1) 21:59 50	21:00 (1) 21:57 75	21:09 (1) 21:12 60	20:28 (2) 20:04	18:55 62	18:05 (3) 16:55	16:29
13	08:43	08:01 16:45 (3)	07:01	16:31 (3) 06:50 19:45 (2)	05:51	19:19 (2) 05:20	19:46 (2) 05:35	19:40 (2) 06:19	19:27 (2) 07:10	08:00	17:02 (3) 07:55	08:39
	16:54	17:49 32 17:17 (3)	18:40 54	17:25 (3) 20:33 16	20:01 (2) 21:23 89	20:53 (1) 22:00 49	21:00 (1) 21:56 77	21:09 (1) 21:10 60	20:27 (2) 20:02	18:52 62	18:04 (3) 16:53	16:29
14	08:43	07:59 16:43 (3)	06:59	16:32 (3) 06:48	19:40 (2) 05:49	19:19 (2) 05:20	19:47 (2) 05:36	19:39 (2) 06:21	19:28 (2) 07:11	08:01	17:02 (3) 07:57	08:40
	16:56	17:51 36 17:19 (3)	18:41 52	17:24 (3) 20:35 25	20:05 (2) 21:25 91	20:54 (1) 22:01 47	21:01 (1) 21:55 79	21:09 (1) 21:08 59	20:27 (2) 19:59	18:50 62	18:04 (3) 16:52	16:29
15	08:42	07:57 16:41 (3)	06:56	16:33 (3) 06:46	19:37 (2) 05:48	19:20 (2) 05:20	19:49 (2) 05:37	19:38 (2) 06:23	19:27 (2) 07:13	08:03	17:02 (3) 07:58	08:41
	16:57	17:53 40 17:21 (3)	18:43 49	17:22 (3) 20:36 30	20:07 (2) 21:26 92	20:56 (1) 22:01 45	21:01 (1) 21:54 81	21:09 (1) 21:06 59	20:26 (2) 19:57	18:48 61	18:03 (3) 16:50	16:29
16	08:41	07:55 16:39 (3)	06:54	16:34 (3) 06:43	19:34 (2) 05:46	19:21 (2) 05:20	19:50 (2) 05:38	19:37 (2) 06:24	19:28 (2) 07:15	08:05	17:03 (3) 08:00	08:42
	16:59	17:54 43 17:22 (3)	18:45 46	17:20 (3) 20:38 35	20:09 (2) 21:28 93	20:58 (1) 22:02 42	21:01 (1) 21:53 82	21:09 (1) 21:04 58	20:26 (2) 19:55	18:46 60	18:03 (3) 16:49	16:29
17	08:40	07:53 16:38 (3)	06:52	16:36 (3) 06:41	19:32 (2) 05:45	19:21 (2) 05:20	19:51 (2) 05:39	19:37 (2) 06:26	19:28 (2) 07:16	08:07	17:03 (3) 08:02	08:43
	17:00	17:56 46 17:24 (3)	18:47 43	17:19 (3) 20:40 38	20:10 (2) 21:29 93	20:58 (1) 22:02 40	21:01 (1) 21:52 83	21:09 (1) 21:02 57	20:25 (2) 19:52	18:44 59	18:02 (3) 16:47	16:29
18	08:39	07:51 16:37 (3)	06:50	16:37 (3) 06:39	19:30 (2) 05:43	19:22 (2) 05:20	19:53 (2) 05:41	19:37 (2) 06:27	19:29 (2) 07:18	08:08	17:03 (3) 08:03	08:43
	17:02	17:58 48 17:25 (3)	18:48 40	17:17 (3) 20:41 42	20:12 (2) 21:31 93	20:59 (1) 22:03 36	21:01 (1) 21:51 86	21:10 (1) 21:00 55	20:24 (2) 19:50	18:42 58	18:01 (3) 16:46	16:29
19	08:38	07:49 16:36 (3)	06:47	16:39 (3) 06:37	19:29 (2) 05:42	19:23 (2) 05:20	20:27 (1) 05:42	19:36 (2) 06:29	19:29 (2) 07:20	08:10	17:03 (3) 08:05	08:44
	17:04	18:00 50 17:26 (3)	18:50 36	17:15 (3) 20:43 44	20:13 (2) 21:32 93	21:00 (1) 22:03 34	21:01 (1) 21:50 87	21:10 (1) 20:57 54	20:23 (2) 19:48	18:39 57	18:00 (3) 16:45	16:29
20	08:37	07:47 16:35 (3)	06:45	16:42 (3) 06:35	19:27 (2) 05:40	19:22 (2) 05:20	20:27 (1) 05:43	19:35 (2) 06:31	19:30 (2) 07:21	08:12	17:04 (3) 08:07	08:45
	17:05	18:02 52 17:27 (3)	18:52 31	17:13 (3) 20:45 47	20:14 (2) 21:34 92	20:59 (1) 22:03 34	21:01 (1) 21:49 88	21:10 (1) 20:55 52	20:22 (2) 19:45	18:37 55	17:59 (3) 16:44	16:30
21	08:36	07:45 16:34 (3)	06:43	16:44 (3) 06:33	19:26 (2) 05:39	19:23 (2) 05:20	20:27 (1) 05:45	19:34 (2) 06:32	19:30 (2) 07:23 17:35 (3)	08:14	17:05 (3) 08:09	08:45
	17:07	18:04 54 17:28 (3)	18:53 25	17:09 (3) 20:46 49	20:15 (2) 21:35 92	21:00 (1) 22:04 34	21:01 (1) 21:47 90	21:10 (1) 20:53 51	20:21 (2) 19:43 14	17:49 (3) 18:35 53	17:58 (3) 16:42	16:30
22	08:35	07:43 16:33 (3)	06:40	16:48 (3) 06:30	19:25 (2) 05:38	19:24 (2) 05:20	20:28 (1) 05:46	19:34 (2) 06:34	19:31 (2) 07:24 17:30 (3)	08:15	17:06 (3) 08:10	08:46
	17:09	18:06 56 17:29 (3)	18:55 17	17:05 (3) 20:48 51	20:16 (2) 21:36 90	21:00 (1) 22:04 34	21:02 (1) 21:46 91	21:11 (1) 20:51 49	20:20 (2) 19:41 23	17:53 (3) 18:33 52	17:58 (3) 16:41	16:31
23	08:34	07:41 16:33 (3)	06:38	06:28	19:24 (2) 05:36	19:25 (2) 05:20	20:28 (1) 05:47	19:33 (2) 06:36	19:31 (2) 07:26 17:26 (3)	08:17	17:07 (3) 08:12	08:46
	17:10	18:07 57 17:30 (3)	18:57	20:50 53	20:17 (2) 21:38 88	21:00 (1) 22:04 34	21:02 (1) 21:45 92	21:10 (1) 20:49 47	20:18 (2) 19:38 29	17:55 (3) 18:31 49	17:56 (3) 16:40	16:31
24	08:33	07:39 16:31 (3)	06:36	06:26	19:23 (2) 05:35	19:26 (2) 05:20	20:28 (1) 05:49	19:33 (2) 06:37	19:33 (2) 07:28 17:24 (3)	08:19	17:08 (3) 08:14	08:47
	17:12	18:09 59 17:30 (3)	18:59	20:52 54	20:17 (2) 21:39 88	21:01 (1) 22:04 34	21:02 (1) 21:43 92	21:10 (1) 20:47 44	20:17 (2) 19:36 34	17:58 (3) 18:29 47	17:55 (3) 16:39	16:32
25	08:31	07:36 16:31 (3)	06:33	06:24	19:22 (2) 05:34	19:27 (2) 05:21	19:54 (2) 05:50	19:33 (2) 06:39	19:34 (2) 07:29 17:21 (3)	07:21	16:09 (3) 08:15	08:47
	17:14	18:11 59 17:30 (3)	19:00	20:53 56	20:18 (2) 21:41 86	21:01 (1) 22:04 38	21:03 (1) 21:42 92	21:10 (1) 20:45 42	20:16 (2) 19:34 39	18:00 (3) 17:27 45	16:54 (3) 16:38	16:32
26	08:30	07:34 16:30 (3)	06:31	06:22	19:21 (2) 05:33	19:28 (2) 05:21	19:53 (2) 05:52	19:32 (2) 06:40	19:35 (2) 07:31	17:18 (3) 07:22	16:09 (3) 08:17	08:47
	17:16	18:13 61 17:31 (3)	19:02	20:55 57	20:18 (2) 21:42 85	21:01 (1) 22:04 40	21:03 (1) 21:41 93	21:10 (1) 20:43 38	20:13 (2) 19:31 42	18:00 (3) 17:25 42	16:51 (3) 16:37	16:33
27	08:29	07:32 16:30 (3)	06:29	06:20	19:20 (2) 05:32	19:28 (2) 05:22	19:51 (2) 05:53	19:31 (2) 06:42	19:37 (2) 07:33	17:17 (3) 07:24	16:11 (3) 08:18	08:48
	17:17	18:15 61 17:31 (3)	19:04	20:57 59	20:19 (2) 21:43 84	21:01 (1) 22:04 44	21:03 (1) 21:39 92	21:08 (1) 20:40 34	20:11 (2) 19:29 45	18:02 (3) 17:23 39	16:50 (3) 16:36	16:34
28	08:27	07:30 16:30 (3)	06:26	06:18	19:20 (2) 05:31	19:29 (2) 05:22	19:51 (2) 05:54	19:31 (2) 06:44	19:39 (2) 07:34	17:14 (3) 07:26	16:13 (3) 08:20	08:48
	17:19	18:16 62 17:32 (3)	19:06	20:58 59	20:19 (2) 21:44 83	21:01 (1) 22:04 46	21:04 (1) 21:38 92	21:08 (1) 20:38 29	20:08 (2) 19:27 48	18:02 (3) 17:21 35	16:48 (3) 16:35	16:35
29	08:26		07:24	06:16	19:19 (2) 05:30	19:30 (2) 05:23	19:50 (2) 05:56	19:30 (2) 06:45	19:42 (2) 07:36	17:13 (3) 07:28	16:15 (3) 08:21	08:48
	17:21		20:07	21:00 60	20:19 (2) 21:46 81	21:01 (1) 22:04 48	21:04 (1) 21:36 91	21:06 (1) 20:36 23	20:05 (2) 19:24 50	18:03 (3) 17:19 31	16:46 (3) 16:34	16:36
30	08:24		07:22	06:14	19:18 (2) 05:29	19:31 (2) 05:23	19:49 (2) 05:57	19:29 (2) 06:47	19:45 (2) 07:38	17:12 (3) 07:30	16:17 (3) 08:23	08:48
	17:23		20:09	21:02 61	20:19 (2) 21:47 79	21:01 (1) 22:04 50	21:04 (1) 21:35 90	21:04 (1) 20:34 15	20:00 (2) 19:22 52	18:04 (3) 17:17 26	16:43 (3) 16:34	16:36
31	08:23		07:19		05:28	19:32 (2)	05:59	19:30 (2) 06:49		07:31	16:21 (3)	08:48
	17:25		20:11		21:48 75	21:00 (1)	21:33 88	21:03 (1) 20:31		17:15 19	16:40 (3)	16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case		875	1116	836	2546	1486	2440	1695	376	1632	8	
Sun reduction		0,30	0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34	0,24	
Oper. time red.		0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95	
Wind dir. red.		0,67	0,67	0,58	0,58	0,58	0,58	0,58	0,67	0,67	0,67	
Total reduction		0,19	0,21	0,23	0,24	0,22	0,23	0,23	0,23	0,21	0,15	
Total, real		168	234	194	605	322	552	392	87	349	1	

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 2

Licensed user:
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 02 - Autenasekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12 (53)	18:44 (3) - 19:37 (3) (60)	06:12 - 21:03 (60)	18:35 (3) - 19:35 (3) (16)	05:27 - 21:49 (16)	20:58 (2) - 21:14 (2) (34)	05:24 - 22:03 (34)	20:55 (2) - 21:29 (2) (33)	06:00 - 21:31 (33)	18:59 (3) - 19:32 (3) (70)	06:50 - 20:29 (70)	18:31 (3) - 19:41 (3)	07:39 - 19:20	07:33 - 17:13	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:28	07:26 - 18:20	07:15 - 20:14 (57)	18:41 (3) - 19:38 (3) (58)	06:10 - 21:05 (58)	18:36 (3) - 19:34 (3) (20)	05:26 - 21:50 (20)	20:56 (2) - 21:16 (2) (33)	05:25 - 22:03 (33)	20:55 (2) - 21:28 (2) (37)	06:02 - 21:30 (37)	18:57 (3) - 19:34 (3) (69)	06:52 - 20:27 (69)	18:32 (3) - 19:41 (3)	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:23 - 18:22	07:13 - 20:16 (59)	18:40 (3) - 19:39 (3) (56)	06:08 - 21:07 (56)	18:37 (3) - 19:33 (3) (22)	05:25 - 21:51 (22)	20:55 (2) - 21:17 (2) (32)	05:25 - 22:03 (32)	20:56 (2) - 21:28 (2) (40)	06:04 - 21:28 (40)	18:55 (3) - 19:35 (3) (69)	06:54 - 20:25 (69)	18:32 (3) - 19:41 (3)	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:17 (61)	18:39 (3) - 19:40 (3) (54)	06:07 - 21:08 (54)	18:38 (3) - 19:32 (3) (24)	05:25 - 21:52 (24)	20:55 (2) - 21:19 (2) (31)	05:26 - 22:02 (31)	20:57 (2) - 21:28 (2) (43)	06:05 - 21:26 (43)	18:54 (3) - 19:37 (3) (67)	06:55 - 20:22 (67)	18:32 (3) - 19:39 (3)	07:44 - 19:13	07:39 - 17:08	08:28 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:25	07:08 - 20:19 (63)	18:38 (3) - 19:41 (3) (52)	06:05 - 21:10 (52)	18:39 (3) - 19:31 (3) (27)	05:24 - 21:54 (27)	20:53 (2) - 21:20 (2) (30)	05:27 - 22:02 (30)	20:58 (2) - 21:28 (2) (46)	06:07 - 21:25 (46)	18:52 (3) - 19:38 (3) (66)	06:57 - 20:20 (66)	18:33 (3) - 19:39 (3)	07:46 - 19:10	07:40 - 17:06	08:30 - 16:31
6	08:47 - 16:44	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21 (65)	18:36 (3) - 19:41 (3) (50)	06:03 - 21:12 (50)	18:40 (3) - 19:30 (3) (28)	05:23 - 21:54 (28)	20:52 (2) - 21:20 (2) (29)	05:28 - 22:01 (29)	20:58 (2) - 21:27 (2) (48)	06:08 - 21:23 (48)	18:51 (3) - 19:39 (3) (65)	06:58 - 20:18 (65)	18:32 (3) - 19:37 (3)	07:48 - 19:08	07:42 - 17:04	08:31 - 16:30
7	08:47 - 16:46	08:11 - 17:38	07:15 - 18:29	07:03 - 20:23 (66)	18:36 (3) - 19:42 (3) (47)	06:01 - 21:13 (47)	18:41 (3) - 19:28 (3) (30)	05:23 - 21:55 (30)	20:52 (2) - 21:22 (2) (27)	05:29 - 22:01 (27)	20:59 (2) - 21:26 (2) (51)	06:10 - 21:21 (51)	18:49 (3) - 19:40 (3) (63)	07:00 - 20:16 (63)	18:33 (3) - 19:36 (3)	07:49 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:46 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24 (67)	18:35 (3) - 19:42 (3) (45)	05:59 - 21:15 (45)	18:43 (3) - 19:28 (3) (31)	05:22 - 21:56 (31)	20:52 (2) - 21:23 (2) (26)	05:30 - 22:00 (26)	21:00 (2) - 21:26 (2) (53)	06:11 - 21:19 (53)	18:48 (3) - 19:41 (3) (61)	07:02 - 20:13 (61)	18:33 (3) - 19:34 (3)	07:51 - 19:04	07:46 - 17:01	08:34 - 16:29
9	08:46 - 16:48	08:08 - 17:41	07:10 - 18:33	06:59 - 20:26 (69)	18:34 (3) - 19:43 (3) (42)	05:58 - 21:17 (42)	18:44 (3) - 19:26 (3) (32)	05:22 - 21:57 (32)	20:51 (2) - 21:23 (2) (23)	05:30 - 21:59 (23)	21:02 (2) - 21:25 (2) (54)	06:13 - 21:17 (54)	18:47 (3) - 19:41 (3) (59)	07:03 - 20:11 (59)	18:34 (3) - 19:33 (3)	07:53 - 19:01	07:48 - 16:59	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28 (69)	18:33 (3) - 19:42 (3) (39)	05:56 - 21:18 (39)	18:45 (3) - 19:24 (3) (33)	05:21 - 21:58 (33)	20:51 (2) - 21:24 (2) (21)	05:31 - 21:59 (21)	21:03 (2) - 21:24 (2) (57)	06:15 - 21:15 (57)	18:46 (3) - 19:43 (3) (57)	07:05 - 20:09 (57)	18:34 (3) - 19:31 (3)	07:55 - 18:59	07:49 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:54 - 20:29 (71)	18:32 (3) - 19:43 (3) (35)	05:54 - 21:20 (35)	18:48 (3) - 19:23 (3) (34)	05:21 - 21:59 (34)	20:51 (2) - 21:25 (2) (17)	05:33 - 21:58 (17)	21:05 (2) - 21:22 (2) (59)	06:16 - 21:13 (59)	18:44 (3) - 19:43 (3) (54)	07:07 - 20:06 (54)	18:36 (3) - 19:30 (3)	07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:02 - 17:47	07:03 - 18:38	06:52 - 20:31 (71)	18:32 (3) - 19:43 (3) (32)	05:53 - 21:21 (32)	18:49 (3) - 19:21 (3) (35)	05:20 - 21:59 (35)	20:50 (2) - 21:25 (2) (13)	05:34 - 21:57 (13)	21:07 (2) - 21:11 (2) (60)	06:18 - 21:12 (60)	18:44 (3) - 19:44 (3) (51)	07:08 - 20:04 (51)	18:37 (3) - 19:28 (3)	07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:43 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33 (71)	18:32 (3) - 19:43 (3) (27)	05:51 - 21:23 (27)	18:52 (3) - 19:19 (3) (36)	05:20 - 22:00 (36)	20:50 (2) - 21:26 (2) (6)	05:35 - 21:56 (6)	21:11 (2) - 21:17 (2) (62)	06:19 - 21:10 (62)	18:42 (3) - 19:44 (3) (48)	07:10 - 20:02 (48)	18:38 (3) - 19:26 (3)	08:00 - 18:52	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35 (72)	18:31 (3) - 19:43 (3) (22)	05:49 - 21:25 (22)	18:54 (3) - 19:16 (3) (36)	05:20 - 22:01 (36)	20:50 (2) - 21:26 (2)	05:36 - 21:55	06:21 - 21:08 (64)	18:41 (3) - 19:45 (3) (44)	07:11 - 19:59 (44)	18:40 (3) - 19:24 (3)	08:01 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:56 - 18:43	06:46 - 20:36 (72)	18:31 (3) - 19:43 (3) (15)	05:48 - 21:26 (15)	18:58 (3) - 19:13 (3) (37)	05:20 - 22:01 (37)	20:50 (2) - 21:27 (2)	05:37 - 21:54	06:23 - 21:06 (65)	18:40 (3) - 19:45 (3) (40)	07:13 - 19:57 (40)	18:41 (3) - 19:21 (3)	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:54	06:54 - 18:45	06:43 - 20:38 (72)	18:30 (3) - 19:42 (3) (37)	05:46 - 21:28 (37)	05:20 - 22:02 (37)	20:50 (2) - 21:27 (2)	05:38 - 21:53	06:24 - 21:04 (65)	18:40 (3) - 19:45 (3) (35)	07:15 - 19:55 (35)	18:43 (3) - 19:18 (3)	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29		
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40 (72)	18:30 (3) - 19:42 (3) (38)	05:45 - 21:29 (38)	05:20 - 22:02 (38)	20:50 (2) - 21:28 (2)	05:39 - 21:52	06:26 - 21:02 (67)	18:38 (3) - 19:45 (3) (29)	07:16 - 19:52 (29)	18:46 (3) - 19:15 (3)	08:07 - 18:44	08:02 - 16:47	08:43 - 16:29		
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41 (72)	18:30 (3) - 19:42 (3) (38)	05:43 - 21:31 (38)	05:20 - 22:03 (38)	20:50 (2) - 21:28 (2)	05:41 - 21:51	06:27 - 21:00 (68)	18:38 (3) - 19:46 (3) (21)	07:18 - 19:50 (21)	18:49 (3) - 19:10 (3)	08:08 - 18:42	08:03 - 16:46	08:43 - 16:29		
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43 (72)	18:30 (3) - 19:42 (3) (38)	05:42 - 21:32 (38)	05:20 - 22:03 (38)	20:50 (2) - 21:28 (2)	05:42 - 21:50	06:29 - 20:57 (68)	18:37 (3) - 19:45 (3) (2)	07:20 - 19:48 (2)	18:59 (3) - 19:01 (3)	08:10 - 18:39	08:05 - 16:45	08:44 - 16:29		
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45 (71)	18:30 (3) - 19:41 (3) (38)	05:40 - 21:34 (38)	05:20 - 22:03 (38)	20:50 (2) - 21:28 (2)	05:43 - 21:49	06:31 - 20:55 (70)	18:36 (3) - 19:46 (3)	07:21 - 19:45		08:12 - 18:37	08:07 - 16:44	08:45 - 16:30		
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:53	06:33 - 20:46 (71)	18:30 (3) - 19:41 (3) (38)	05:39 - 21:35 (38)	05:20 - 22:04 (38)	20:50 (2) - 21:28 (2)	05:45 - 21:47	06:32 - 20:53 (70)	18:35 (3) - 19:45 (3)	07:23 - 19:43		08:14 - 18:35	08:09 - 16:42	08:45 - 16:30		
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:30 - 20:48 (71)	18:30 (3) - 19:41 (3) (38)	05:38 - 21:36 (38)	05:20 - 22:04 (38)	20:51 (2) - 21:29 (2)	05:46 - 21:46	06:34 - 20:51 (71)	18:35 (3) - 19:46 (3)	07:24 - 19:41		08:15 - 18:33	08:10 - 16:41	08:46 - 16:31		
23	08:34 - 17:10	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50 (69)	18:31 (3) - 19:40 (3) (38)	05:36 - 21:38 (38)	05:20 - 22:04 (38)	20:51 (2) - 21:29 (2)	05:47 - 21:45	06:36 - 20:49 (71)	18:34 (3) - 19:45 (3)	07:26 - 19:38		08:17 - 18:31	08:12 - 16:40	08:46 - 16:31		
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 20:52 (69)	18:31 (3) - 19:40 (3) (38)	05:35 - 21:39 (38)	05:20 - 22:04 (38)	20:51 (2) - 21:29 (2)	05:49 - 21:43	06:37 - 20:47 (71)	18:34 (3) - 19:45 (3)	07:28 - 19:36		08:19 - 18:29	08:14 - 16:39	08:47 - 16:32		
25	08:31 - 17:14	07:36 - 18:11	06:33 - 19:00 (19)	18:03 (3) - 18:22 (3) (53)	06:24 - 18:31 (3) (68)	05:34 - 19:39 (3) (21:41)	05:21 - 22:04 (38)	20:52 (2) - 21:30 (2)	05:50 - 21:42	06:39 - 20:45 (72)	18:34 (3) - 19:46 (3)	07:29 - 19:34		07:21 - 17:27	08:15 - 16:38	08:47 - 16:32		
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02 (27)	17:59 (3) - 18:26 (3) (66)	06:22 - 18:32 (3) (66)	05:33 - 19:38 (3) (21:42)	05:21 - 22:04 (37)	20:52 (2) - 21:29 (2)	05:52 - 21:41	06:41 - 20:43 (72)	18:33 (3) - 19:45 (3)	07:31 - 19:31		07:22 - 17:25	08:17 - 16:37	08:47 - 16:33		
27	08:29 - 17:17	07:32 - 18:15	06:29 - 19:04 (34)	17:54 (3) - 18:28 (3) (66)	06:20 - 18:32 (3) (66)	05:32 - 19:38 (3) (21:43)	05:22 - 22:04 (37)	20:52 (2) - 21:29 (2)	05:53 - 21:39	06:42 - 20:40 (72)	18:33 (3) - 19:45 (3)	07:33 - 19:29		07:24 - 17:23	08:18 - 16:36	08:48 - 16:34		
28	08:27 - 17:19	07:30 - 18:16	06:26 - 19:06 (39)	17:52 (3) - 18:31 (3) (58)	06:18 - 18:33 (3) (64)	05:31 - 19:37 (3) (21:44)	05:22 - 22:04 (36)	20:53 (2) - 21:29 (2)	05:54 - 21:38 (9)	19:12 (3) - 19:21 (3)	06:44 - 20:38 (72)	18:32 (3) - 19:44 (3)	07:34 - 19:27	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35		
29	08:26 - 17:21		07:24 - 20:07 (43)	18:50 (3) - 19:33 (3) (63)	06:16 - 18:33 (3) (63)	05:30 - 19:36 (3) (21:46)	05:23 - 22:04 (36)	20:53 (2) - 21:29 (2)	05:56 - 21:36 (18)	19:07 (3) - 19:25 (3)	06:45 - 20:36 (72)	18:32 (3) - 19:44 (3)	07:36 - 19:24	07:28 - 17:19	08:21 - 16:34	08:48 - 16:36		
30	08:24 - 17:23		07:22 - 20:09 (47)	18:47 (3) - 19:34 (3) (61)	06:14 - 18:34 (3) (61)	05:29 - 19:35 (3) (21:47)	05:23 - 22:04 (35)	20:54 (2) - 21:29 (2)	05:57 - 21:35 (25)	19:03 (3) - 19:28 (3)	06:47 - 20:34 (71)	18:32 (3) - 19:43 (3)	07:38 - 19:22	07:30 - 17:17	08:23 - 16:34	08:48 - 16:36		
31	08:23 - 17:25		07:19 - 20:11 (51)	18:45 (3) - 19:36 (3)	05:28 - 21:48 (11)	21:00 (2) - 21:11 (2)		05:59 - 21:33 (29)	19:01 (3) - 19:30 (3)	06:49 - 20:31 (71)	18:32 (3) - 19:43 (3)			07:31 - 17:15		08:48 - 16:37		
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243						
Total, worst case			260	2013	645	1001	403	1895	970									
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36									
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95									
Wind dir. red.			0,62	0,62	0,62	0,59	0,59	0,62	0,62									
Total reduction			0,19	0,25	0,25	0,22	0,23	0,24	0,21									
Total, real			50	494	162	217	92	464	206									

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 3

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 03 - Breede Sticht 1

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March		April	May	June	July	August	September		October		November		December	
1	08:48	15:04 (3)	08:21		16:10 (2)	07:28	17:25 (1)	07:17	06:12	05:27	05:24	06:00	06:50	07:39		18:05 (1)	07:33	15:42 (2)	08:24	15:00 (3)
	16:39 25	15:29 (3)	17:27 39		16:49 (2)	18:18 27	17:52 (1)	20:12	21:03	21:49	22:03	21:31	20:29	19:20	27	18:32 (1)	17:13 35	16:17 (2)	16:33 6	15:06 (3)
2	08:48	15:04 (3)	08:20		16:10 (2)	07:26	17:25 (1)	07:15	06:10	05:26	05:25	06:02	06:52	07:41		18:03 (1)	07:35	15:42 (2)	08:26	14:57 (3)
	16:40 24	15:28 (3)	17:28 39		16:49 (2)	18:20 29	17:54 (1)	20:14	21:05	21:50	22:03	21:30	20:27	19:17	29	18:32 (1)	17:12 36	16:18 (2)	16:32 11	15:08 (3)
3	08:48	15:05 (3)	08:18		16:10 (2)	07:23	17:24 (1)	07:13	06:08	05:25	05:25	06:04	06:54	07:43		18:02 (1)	07:37	15:41 (2)	08:27	14:57 (3)
	16:41 23	15:28 (3)	17:30 39		16:49 (2)	18:22 32	17:56 (1)	20:16	21:07	21:51	22:03	21:28	20:25	19:15	30	18:32 (1)	17:10 37	16:18 (2)	16:32 14	15:11 (3)
4	08:48	15:06 (3)	08:17		16:10 (2)	07:21	17:24 (1)	07:10	06:07	05:25	05:26	06:05	06:55	07:44		18:01 (1)	07:39	15:41 (2)	08:29	14:55 (3)
	16:42 23	15:29 (3)	17:32 39		16:49 (2)	18:24 34	17:58 (1)	20:17	21:08	21:53	22:02	21:26	20:22	19:13	32	18:33 (1)	17:08 38	16:19 (2)	16:31 17	15:12 (3)
5	08:48	15:07 (3)	08:15		16:11 (2)	07:19	17:23 (1)	07:08	06:05	05:24	05:27	06:07	06:57	07:46		18:00 (1)	07:40	15:41 (2)	08:30	14:54 (3)
	16:43 21	15:28 (3)	17:34 39		16:50 (2)	18:25 34	17:57 (1)	20:19	21:10	21:54	22:02	21:25	20:20	19:10	33	18:33 (1)	17:06 38	16:19 (2)	16:31 18	15:12 (3)
6	08:47	15:08 (3)	08:13		16:11 (2)	07:17	17:23 (1)	07:06	06:03	05:23	05:28	06:08	06:58	07:48		17:59 (1)	07:42	15:40 (2)	08:31	14:54 (3)
	16:44 20	15:28 (3)	17:36 38		16:49 (2)	18:27 34	17:57 (1)	20:21	21:12	21:54	22:01	21:23	20:18	19:08	34	18:33 (1)	17:04 39	16:19 (2)	16:30 20	15:14 (3)
7	08:47	15:09 (3)	08:12		16:11 (2)	07:15	17:23 (1)	07:03	06:01	05:23	05:29	06:10	07:00	07:49		17:59 (1)	07:44	15:40 (2)	08:32	14:54 (3)
	16:46 18	15:27 (3)	17:38 38		16:49 (2)	18:29 34	17:57 (1)	20:23	21:13	21:55	22:01	21:21	20:16	19:06	34	18:33 (1)	17:03 40	16:20 (2)	16:30 21	15:15 (3)
8	08:46	15:11 (3)	08:10		16:12 (2)	07:12	17:22 (1)	07:01	05:59	05:22	05:29	06:11	07:02	07:51		17:59 (1)	07:46	15:40 (2)	08:34	14:53 (3)
	16:47 17	15:28 (3)	17:40 36		16:48 (2)	18:31 34	17:56 (1)	20:24	21:15	21:56	22:00	21:19	20:13	19:04	34	18:33 (1)	17:01 40	16:20 (2)	16:29 23	15:16 (3)
9	08:46	15:12 (3)	08:08		16:12 (2)	07:10	17:23 (1)	06:59	05:58	05:22	05:30	06:13	07:03	07:53		17:58 (1)	07:48	15:40 (2)	08:35	14:54 (3)
	16:48 15	15:27 (3)	17:41 36		16:48 (2)	18:33 32	17:55 (1)	20:26	21:17	21:57	21:59	21:17	20:11	19:01	34	18:32 (1)	16:59 40	16:20 (2)	16:29 23	15:17 (3)
10	08:45	15:14 (3)	08:06		16:13 (2)	07:08	17:24 (1)	06:57	05:56	05:21	05:31	06:15	07:05	07:55		17:58 (1)	07:49	15:41 (2)	08:36	14:54 (3)
	16:50 11	15:25 (3)	17:43 34		16:47 (2)	18:34 31	17:55 (1)	20:28	21:18	21:58	21:59	21:15	20:09	18:59	33	18:31 (1)	16:58 39	16:20 (2)	16:29 24	15:18 (3)
11	08:45	15:18 (3)	08:04		16:14 (2)	07:06	17:24 (1)	06:54	05:54	05:21	05:32	06:16	07:07	07:56		17:58 (1)	07:51	15:41 (2)	08:37	14:54 (3)
	16:51 6	15:24 (3)	17:45 32		16:46 (2)	18:36 30	17:54 (1)	20:29	21:20	21:59	21:58	21:13	20:06	18:57	31	18:29 (1)	16:56 39	16:20 (2)	16:29 25	15:19 (3)
12	08:44		08:03		16:15 (2)	07:03	17:25 (1)	06:52	05:52	05:20	05:34	06:18	07:08	07:58		17:59 (1)	07:53	15:41 (2)	08:38	14:54 (3)
	16:53		17:47 30		16:45 (2)	18:38 27	17:52 (1)	20:31	21:21	21:59	21:57	21:12	20:04	18:55	28	18:27 (1)	16:55 39	16:20 (2)	16:29 25	15:19 (3)
13	08:43		08:01		16:16 (2)	07:01	17:26 (1)	06:50	05:51	05:20	05:35	06:19	07:10	08:00		17:59 (1)	07:55	15:41 (2)	08:39	14:54 (3)
	16:54		17:49 28		16:44 (2)	18:40 25	17:51 (1)	20:33	21:23	22:00	21:56	21:10	20:02	18:52	25	18:24 (1)	16:53 38	16:19 (2)	16:29 26	15:20 (3)
14	08:43		07:59		16:18 (2)	06:59	17:28 (1)	06:48	05:49	05:20	05:36	06:21	07:11	08:01		18:00 (1)	07:57	15:42 (2)	08:40	14:54 (3)
	16:56		17:51 25		16:43 (2)	18:41 22	17:50 (1)	20:35	21:25	22:01	21:55	21:08	19:59	18:50	22	18:22 (1)	16:52 37	16:19 (2)	16:29 27	15:21 (3)
15	08:42	16:20 (2)	07:57		16:20 (2)	06:56	17:29 (1)	06:46	05:48	05:20	05:37	06:23	07:13	08:03		18:01 (1)	07:58	15:42 (2)	08:41	14:54 (3)
	16:57 4	16:24 (2)	17:53 21		16:41 (2)	18:43 18	17:47 (1)	20:36	21:26	22:01	21:54	21:06	19:57	18:48	19	18:20 (1)	16:50 36	16:18 (2)	16:29 27	15:21 (3)
16	08:41	16:18 (2)	07:55		16:23 (2)	06:54	17:32 (1)	06:43	05:46	05:20	05:38	06:24	07:15	08:05		18:02 (1)	08:00	15:43 (2)	08:42	14:55 (3)
	16:59 8	16:26 (2)	17:54 15		16:38 (2)	18:45 11	17:43 (1)	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16	18:18 (1)	16:49 34	16:17 (2)	16:29 27	15:22 (3)
17	08:40	16:16 (2)	07:53		16:27 (2)	06:52		06:41	05:45	05:19	05:39	06:26	07:16	08:07		18:04 (1)	08:02	15:44 (2)	08:43	14:54 (3)
	17:00 12	16:28 (2)	17:56 7		16:34 (2)	18:47		20:40	21:29	22:02	21:52	21:02	19:52	18:44	12	18:16 (1)	16:47 32	16:16 (2)	16:29 28	15:22 (3)
18	08:39	16:15 (2)	07:51			06:50		06:39	05:43	05:19	05:41	06:27	07:18	08:08		18:06 (1)	08:03	15:45 (2)	08:43	14:55 (3)
	17:02 14	16:29 (2)	17:58			18:48		20:41	21:31	22:03	21:51	21:00	19:50	18:42	7	18:13 (1)	16:46 29	16:14 (2)	16:29 28	15:23 (3)
19	08:38	16:14 (2)	07:49			06:47		06:37	05:42	05:20	05:42	06:29	07:20	08:10			08:05	15:46 (2)	08:44	14:56 (3)
	17:04 17	16:31 (2)	18:00			18:50		20:43	21:32	22:03	21:50	20:57	19:48	18:39			16:45 27	16:13 (2)	16:29 28	15:24 (3)
20	08:37	16:13 (2)	07:47			06:45		06:35	05:40	05:20	05:43	06:31	07:21	08:12			08:07	15:47 (2)	08:45	14:56 (3)
	17:05 20	16:33 (2)	18:02			18:52		20:45	21:34	22:03	21:49	20:55	19:45	18:37			16:44 25	16:12 (2)	16:30 28	15:24 (3)
21	08:36	16:12 (2)	07:45			06:43		06:33	05:39	05:20	05:45	06:32	07:23	08:14			08:09	15:48 (2)	08:45	14:56 (3)
	17:07 23	16:35 (2)	18:04			18:53		20:46	21:35	22:04	21:47	20:53	19:43	18:35			16:42 23	16:11 (2)	16:30 28	15:24 (3)
22	08:35	16:12 (2)	07:43			06:40		06:30	05:38	05:20	05:46	06:34	07:24	08:15			08:10	15:49 (2)	08:46	14:56 (3)
	17:09 25	16:37 (2)	18:06			18:55		20:48	21:36	22:04	21:46	20:51	19:41	18:33			16:41 20	16:09 (2)	16:31 28	15:24 (3)
23	08:34	16:11 (2)	07:41		17:38 (1)	06:38		06:28	05:36	05:20	05:47	06:36	07:26	08:17			08:12	15:50 (2)	08:46	14:58 (3)
	17:10 27	16:38 (2)	18:07 3		17:41 (1)	18:57		20:50	21:38	22:04	21:45	20:49	19:38	18:31			16:40 18	16:08 (2)	16:31 27	15:25 (3)
24	08:33	16:11 (2)	07:39		17:33 (1)	06:36		06:26	05:35	05:20	05:49	06:37	07:28	08:19			08:14	15:52 (2)	08:47	14:58 (3)
	17:12 29	16:40 (2)	18:09 9		17:42 (1)	18:59		20:52	21:39	22:04	21:43	20:47	19:36	18:29			16:39 15	16:07 (2)	16:32 28	15:26 (3)
25	08:31	16:11 (2)	07:36		17:31 (1)	06:33		06:24	05:34	05:21	05:50	06:39	07:29	07:21		15:56 (2)	08:15	15:54 (2)	08:47	14:59 (3)
	17:14 32	16:43 (2)	18:11 13		17:44 (1)	19:00		20:53	21:41	22:04	21:42	20:45	19:34	17:27	10	16:06 (2)	16:38 12	16:06 (2)	16:32 28	15:27 (3)
26	08:30	16:10 (2)	07:34		17:29 (1)	06:31		06:22	05:33	05:21	05:51	06:40	07:31	07:22		15:52 (2)	08:17	15:56 (2)	08:47	14:59 (3)
	17:16 34	16:44 (2)	18:13 17		17:46 (1)	19:02		20:55	21:42	22:04	21:41	20:43	19:31	17:25	18	16:10 (2)	16:37 8	16:04 (2)	16:33 28	15:27 (3)
27	08:29	16:10 (2)	07:32		17:28 (1)	06:29		06:20	05:32	05:22	05:53	06:42	07:33	18:16 (1)		15:49 (2)	08:18	15:59 (2)	08:48	15:00 (3)
	17:17 37	16:47 (2)	18:15 20		17:48 (1)	19:04		20:57	21:43	22:04	21:39	20:40	19:29 7	18:23 (1)	22	16:11 (2)	16:36 4	16:03 (2)	16:34 27	15:27 (3)
28	08:27	16:10 (2)	07:30		17:27 (1)	06:26		06:18	05:31	05:22	05:54	06:44	07:34	18:11 (1)		15:47 (2)	08:20		08:48	15:00 (3)
	17:19 37	16:47 (2)	18:16 24		17:51 (1)	19:06		20:58	21:45	22:04	21:38	20:38	19:27 15	18:26 (1)	26	16:13 (2)	16:35		16:35 27	15:27 (3)
29	08:26	16:10 (2)				07:24		06:16	05:30	05:23	05:56	06:45	07:36	18:08 (1)		15:45 (2)	08:21		08:48	15:01 (3)
	17:21 38	16:48 (2)				20:07		21:00	21:46	22:04	21:36	20:36	19:24 21	18:29 (1)	29	16:14 (2)	16:34		16:35 27	15:28 (3)
30	08:24	16:10 (2)				07:22		06:14	05:29	05:23	05:57	06:47	07:38	18:06 (1)		15:44 (2)	08:23		08:48	15:02 (3)
	17:23 38	16:48 (2)				20:09		21:02	21:47	22:04	21:35	20:34	19:22 24	18:30 (1)	31	16:15 (2)	16:34		16:36 26	15:28 (3)
31	08:23	16:09 (2)				07:19			05:28		05:59	06:49				15:43 (2)			08:48	15:02 (3)
	17:25 39	16:48 (2)				20:11			21:48		21:33	20:31			33	16:16 (2)			16:37 26	15:28 (3)
Potential sun hours	259		277		367		416	485	499	502	454	381		331			266		243	
Total, worst case		637		621		454							67		649		818		746	
Sun reduction		0,24		0,30		0,33							0,36		0,34		0,24		0,20	
Oper. time red.		0,95		0,95		0,95							0,95		0,95		0,95		0,95	
Wind dir. red.		0,68		0,67		0,64							0,64		0,65		0,67		0,69	
Total reduction		0,15		0,19		0,20							0,22		0,21		0,15		0,13	
Total, real		99		120		92							15		135		124		100	

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

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

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 4

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 04 - Breede Sticht 16

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December		
1	08:48	15:22 (2)	08:21		07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	16:22 (1)	08:24		15:08 (2)
	16:39 37	15:59 (2)	17:27		18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13 22	16:44 (1)	16:33	38	15:46 (2)
2	08:48	15:21 (2)	08:20		07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	16:23 (1)	08:26		15:07 (2)
	16:40 38	15:59 (2)	17:28		18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12 19	16:42 (1)	16:32	39	15:46 (2)
3	08:48	15:22 (2)	08:18		07:23	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	16:24 (1)	08:27		15:08 (2)
	16:41 38	16:00 (2)	17:30		18:22	20:16	21:07	21:51	22:03	21:28	20:25	19:15		17:10 16	16:40 (1)	16:32	38	15:46 (2)
4	08:48	15:23 (2)	08:17		07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39	16:26 (1)	08:29		15:08 (2)
	16:42 37	16:00 (2)	17:32		18:24	20:17	21:08	21:53	22:02	21:26	20:22	19:13		17:08 12	16:38 (1)	16:31	38	15:46 (2)
5	08:48	15:22 (2)	08:15	17:00 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40	16:28 (1)	08:30		15:08 (2)
	16:43 38	16:00 (2)	17:34 5	17:05 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06 8	16:36 (1)	16:31	38	15:46 (2)
6	08:47	15:23 (2)	08:13	16:58 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42	16:31 (1)	08:31		15:09 (2)
	16:44 38	16:01 (2)	17:36 9	17:07 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04 3	16:34 (1)	16:30	38	15:47 (2)
7	08:47	15:23 (2)	08:12	16:56 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44		08:32		15:09 (2)
	16:46 38	16:01 (2)	17:38 13	17:09 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03		16:30	38	15:47 (2)
8	08:46	15:24 (2)	08:10	16:54 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46		08:34		15:10 (2)
	16:47 38	16:02 (2)	17:40 16	17:10 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01		16:29	37	15:47 (2)
9	08:46	15:24 (2)	08:08	16:53 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48		08:35		15:11 (2)
	16:48 38	16:02 (2)	17:41 19	17:12 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59		16:29	38	15:49 (2)
10	08:45	15:24 (2)	08:06	16:52 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49		08:36		15:11 (2)
	16:50 38	16:02 (2)	17:43 22	17:14 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58		16:29	38	15:49 (2)
11	08:45	15:26 (2)	08:04	16:51 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51		08:37		15:12 (2)
	16:51 38	16:04 (2)	17:45 25	17:16 (1)	18:36	20:29	21:20	21:59	21:58	21:13	20:06	18:57		16:56		16:29	37	15:49 (2)
12	08:44	15:26 (2)	08:03	16:51 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53		08:38		15:12 (2)
	16:53 38	16:04 (2)	17:47 27	17:18 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55		16:29	37	15:49 (2)
13	08:43	15:26 (2)	08:01	16:50 (1)	07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	17:36 (1)	07:55	15:16 (2)	08:39		15:13 (2)
	16:54 38	16:04 (2)	17:49 30	17:20 (1)	18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52 5	17:41 (1)	16:53 11	15:27 (2)	16:29	37	15:50 (2)
14	08:43	15:27 (2)	07:59	16:50 (1)	06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	17:31 (1)	07:57	15:13 (2)	08:40		15:13 (2)
	16:56 37	16:04 (2)	17:51 32	17:22 (1)	18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50 15	17:46 (1)	16:52 17	15:30 (2)	16:29	37	15:50 (2)
15	08:42	15:27 (2)	07:57	16:49 (1)	06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	17:29 (1)	07:58	15:11 (2)	08:41		15:14 (2)
	16:57 37	16:04 (2)	17:53 35	17:24 (1)	18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48 19	17:48 (1)	16:50 21	15:32 (2)	16:29	37	15:51 (2)
16	08:41	15:28 (2)	07:55	16:49 (1)	06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	17:27 (1)	08:00	15:10 (2)	08:42		15:14 (2)
	16:59 36	16:04 (2)	17:54 35	17:24 (1)	18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46 23	17:50 (1)	16:49 24	15:34 (2)	16:29	37	15:51 (2)
17	08:40	15:28 (2)	07:53	16:49 (1)	06:52	06:41	05:45	05:19	05:39	06:26	07:16	08:07	17:25 (1)	08:02	15:09 (2)	08:43		15:14 (2)
	17:00 36	16:04 (2)	17:56 35	17:24 (1)	18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44 26	17:51 (1)	16:47 26	15:35 (2)	16:29	37	15:51 (2)
18	08:39	15:29 (2)	07:51	16:49 (1)	06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	17:23 (1)	08:03	15:08 (2)	08:43		15:15 (2)
	17:02 36	16:05 (2)	17:58 35	17:24 (1)	18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42 28	17:51 (1)	16:46 29	15:37 (2)	16:29	36	15:51 (2)
19	08:38	15:30 (2)	07:49	16:49 (1)	06:47	06:37	05:42	05:19	05:42	06:29	07:20	08:10	17:22 (1)	08:05	15:08 (2)	08:44		15:16 (2)
	17:04 35	16:05 (2)	18:00 35	17:24 (1)	18:50	20:43	21:32	22:03	21:50	20:57	19:48	18:39 30	17:52 (1)	16:45 30	15:38 (2)	16:29	36	15:52 (2)
20	08:37	15:30 (2)	07:47	16:50 (1)	06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	17:21 (1)	08:07	15:07 (2)	08:45		15:16 (2)
	17:05 34	16:04 (2)	18:02 34	17:24 (1)	18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37 32	17:53 (1)	16:44 32	15:39 (2)	16:30	36	15:52 (2)
21	08:36	15:31 (2)	07:45	16:50 (1)	06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	17:20 (1)	08:09	15:07 (2)	08:45		15:17 (2)
	17:07 33	16:04 (2)	18:04 33	17:23 (1)	18:53	20:46	21:35	22:04	21:47	20:53	19:43	18:35 34	17:54 (1)	16:42 33	15:40 (2)	16:30	36	15:53 (2)
22	08:35	15:32 (2)	07:43	16:51 (1)	06:40	06:30	05:38	05:20	05:46	06:34	07:24	08:15	17:20 (1)	08:10	15:06 (2)	08:46		15:18 (2)
	17:09 32	16:04 (2)	18:06 32	17:23 (1)	18:55	20:48	21:36	22:04	21:46	20:51	19:41	18:33 34	17:54 (1)	16:41 34	15:40 (2)	16:31	36	15:54 (2)
23	08:34	15:33 (2)	07:41	16:52 (1)	06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	17:20 (1)	08:12	15:06 (2)	08:46		15:18 (2)
	17:10 30	16:03 (2)	18:07 30	17:22 (1)	18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31 34	17:54 (1)	16:40 35	15:41 (2)	16:31	36	15:54 (2)
24	08:33	15:34 (2)	07:39	16:52 (1)	06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	17:20 (1)	08:14	15:06 (2)	08:47		15:18 (2)
	17:12 29	16:03 (2)	18:09 28	17:20 (1)	18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29 34	17:54 (1)	16:39 36	15:42 (2)	16:32	36	15:54 (2)
25	08:31	15:36 (2)	07:36	16:53 (1)	06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	16:20 (1)	08:15	15:07 (2)	08:47		15:19 (2)
	17:14 26	16:02 (2)	18:11 26	17:19 (1)	19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27 34	16:54 (1)	16:38 36	15:43 (2)	16:32	36	15:55 (2)
26	08:30	15:37 (2)	07:34	16:55 (1)	06:31	06:22	05:33	05:21	05:51	06:40	07:31	07:22	16:20 (1)	08:17	15:06 (2)	08:48		15:19 (2)
	17:16 24	16:01 (2)	18:13 22	17:17 (1)	19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25 34	16:54 (1)	16:37 36	15:42 (2)	16:33	37	15:56 (2)
27	08:29	15:40 (2)	07:32	16:57 (1)	06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	16:19 (1)	08:18	15:06 (2)	08:48		15:19 (2)
	17:17 20	16:00 (2)	18:15 18	17:15 (1)	19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23 34	16:53 (1)	16:36 37	15:43 (2)	16:34	37	15:56 (2)
28	08:27	15:41 (2)	07:30	17:00 (1)	06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	16:19 (1)	08:20	15:07 (2)	08:48		15:20 (2)
	17:19 17	15:58 (2)	18:16 12	17:12 (1)	19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21 32	16:51 (1)	16:35 37	15:44 (2)	16:35	36	15:56 (2)
29	08:26	15:45 (2)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	16:20 (1)	08:21	15:06 (2)	08:48		15:20 (2)
	17:21 11	15:56 (2)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19 29	16:49 (1)	16:34 38	15:44 (2)	16:35	37	15:57 (2)
30	08:24				07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	16:20 (1)	08:23	15:07 (2)	08:48		15:20 (2)
	17:23				20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17 27	16:47 (1)	16:34 38	15:45 (2)	16:36	37	15:57 (2)
31	08:23				07:19		05:28		05:59	06:49		07:31	16:21 (1)			08:48		15:21 (2)
	17:25				20:11		21:48		21:33	20:31		17:15 25	16:46 (1)			16:37	37	15:58 (2)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243		
Total, worst case		965		608									529		630		1148	
Sun reduction		0,24		0,30									0,34		0,24		0,20	
Oper. time red.		0,95		0,95									0,95		0,95		0,95	
Wind dir. red.		0,68		0,67									0,67		0,68		0,68	
Total reduction		0,16		0,19									0,21		0,15		0,13	
Total, real		150		117									113		96		151	

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

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

Project:
068379aa - WP Autena

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15-5-2014 16:27 / 5

Licensed user:
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Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 05 - Biezenweg 51

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October	November	December
1	08:48	15:16 (1)	08:21	15:25 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33	08:24
	16:39 43	15:59 (1)	17:27 46	16:11 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13 22	15:30 (1)	16:33 48	15:48 (1)	15:00 (1)
2	08:48	15:15 (1)	08:20	15:26 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35	15:05 (1)	08:26	15:00 (1)
	16:40 44	15:59 (1)	17:28 44	16:10 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12 27	15:32 (1)	16:32 47	15:47 (1)	
3	08:48	15:16 (1)	08:18	15:26 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37	15:03 (1)	08:27	15:01 (1)	
	16:41 44	16:00 (1)	17:30 43	16:09 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10 31	15:34 (1)	16:32 47	15:48 (1)	
4	08:48	15:16 (1)	08:17	15:27 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39	15:02 (1)	08:29	15:01 (1)	
	16:42 45	16:01 (1)	17:32 41	16:08 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08 34	15:36 (1)	16:31 47	15:48 (1)	
5	08:48	15:16 (1)	08:15	15:29 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40	15:00 (1)	08:30	15:01 (1)	
	16:43 45	16:01 (1)	17:34 39	16:08 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06 37	15:37 (1)	16:31 46	15:47 (1)	
6	08:47	15:17 (1)	08:13	15:31 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42	14:59 (1)	08:31	15:03 (1)	
	16:44 45	16:02 (1)	17:36 36	16:07 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04 39	15:38 (1)	16:30 45	15:48 (1)	
7	08:47	15:16 (1)	08:12	15:32 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44	14:58 (1)	08:32	15:03 (1)	
	16:46 46	16:02 (1)	17:38 34	16:06 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03 41	15:39 (1)	16:30 45	15:48 (1)	
8	08:46	15:17 (1)	08:10	15:34 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46	14:57 (1)	08:34	15:03 (1)	
	16:47 47	16:04 (1)	17:40 30	16:04 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01 43	15:40 (1)	16:29 45	15:48 (1)	
9	08:46	15:17 (1)	08:08	15:36 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48	14:57 (1)	08:35	15:05 (1)	
	16:48 47	16:04 (1)	17:41 26	16:02 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59 44	15:41 (1)	16:29 44	15:49 (1)	
10	08:45	15:17 (1)	08:06	15:39 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49	14:56 (1)	08:36	15:05 (1)	
	16:50 47	16:04 (1)	17:43 21	16:00 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58 46	15:42 (1)	16:29 44	15:49 (1)	
11	08:45	15:18 (1)	08:04	15:43 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51	14:56 (1)	08:37	15:06 (1)	
	16:51 48	16:06 (1)	17:45 13	15:56 (1)	18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56 46	15:42 (1)	16:29 43	15:49 (1)	
12	08:44	15:18 (1)	08:03		07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53	14:55 (1)	08:38	15:06 (1)	
	16:53 48	16:06 (1)	17:47		18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55 48	15:43 (1)	16:29 43	15:49 (1)	
13	08:43	15:18 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55	14:55 (1)	08:39	15:07 (1)	
	16:54 49	16:07 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53 49	15:44 (1)	16:29 42	15:49 (1)	
14	08:43	15:18 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57	14:54 (1)	08:40	15:08 (1)	
	16:56 49	16:07 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52 49	15:43 (1)	16:29 41	15:49 (1)	
15	08:42	15:18 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58	14:54 (1)	08:41	15:08 (1)	
	16:57 50	16:08 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50 50	15:44 (1)	16:29 42	15:50 (1)	
16	08:41	15:18 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00	14:54 (1)	08:42	15:09 (1)	
	16:59 50	16:08 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49 50	15:44 (1)	16:29 41	15:50 (1)	
17	08:40	15:18 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02	14:54 (1)	08:43	15:10 (1)	
	17:00 51	16:09 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47 51	15:45 (1)	16:29 41	15:51 (1)	
18	08:39	15:19 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04	14:54 (1)	08:43	15:10 (1)	
	17:02 50	16:09 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46 51	15:45 (1)	16:29 40	15:50 (1)	
19	08:38	15:19 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05	14:54 (1)	08:44	15:11 (1)	
	17:04 51	16:10 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45 51	15:45 (1)	16:29 40	15:51 (1)	
20	08:37	15:19 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07	14:55 (1)	08:45	15:12 (1)	
	17:05 51	16:10 (1)	18:02		18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44 51	15:46 (1)	16:30 40	15:52 (1)	
21	08:36	15:19 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09	14:55 (1)	08:45	15:12 (1)	
	17:07 51	16:10 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42 51	15:46 (1)	16:30 40	15:52 (1)	
22	08:35	15:20 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10	14:55 (1)	08:46	15:13 (1)	
	17:09 51	16:11 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41 51	15:46 (1)	16:31 40	15:53 (1)	
23	08:34	15:19 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12	14:55 (1)	08:46	15:13 (1)	
	17:10 51	16:10 (1)	18:07		18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40 51	15:46 (1)	16:31 40	15:53 (1)	
24	08:33	15:20 (1)	07:39		06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14	14:56 (1)	08:47	15:13 (1)	
	17:12 51	16:11 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	16:39 50	15:46 (1)	16:32 40	15:53 (1)	
25	08:31	15:21 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15	14:56 (1)	08:47	15:14 (1)	
	17:14 51	16:12 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38 51	15:47 (1)	16:32 40	15:54 (1)	
26	08:30	15:21 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17	14:56 (1)	08:48	15:14 (1)	
	17:16 50	16:11 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37 50	15:46 (1)	16:33 41	15:55 (1)	
27	08:29	15:22 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18	14:57 (1)	08:48	15:14 (1)	
	17:17 50	16:12 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36 50	15:47 (1)	16:34 41	15:55 (1)	
28	08:27	15:22 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20	14:58 (1)	08:48	15:14 (1)	
	17:19 49	16:11 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35 49	15:47 (1)	16:35 41	15:55 (1)	
29	08:26	15:23 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21	14:58 (1)	08:48	15:15 (1)	
	17:21 49	16:12 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34 49	15:47 (1)	16:36 41	15:56 (1)	
30	08:24	15:23 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23	14:59 (1)	08:48	15:15 (1)	
	17:23 48	16:11 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34 48	15:47 (1)	16:36 42	15:57 (1)	
31	08:23	15:24 (1)			07:19		05:28		05:59	06:49		07:31 15:11 (1)			08:48	15:15 (1)	
	17:25 46	16:10 (1)			20:11		21:48		21:33	20:31		17:15 15 15:26 (1)			16:37 43	15:58 (1)	
Potential sun hours	259		277		367	416	485	499	502	454	381	331	266	243
Total, worst case		1497		373								15		1360		1320	
Sun reduction		0,24		0,30								0,34		0,24		0,20	
Oper. time red.		0,95		0,95								0,95		0,95		0,95	
Wind dir. red.		0,68		0,68								0,68		0,68		0,68	
Total reduction		0,15		0,20								0,22		0,15		0,13	
Total, real		232		73								3		208		174	

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

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

Project:
068379aa - WP Autena

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15-5-2014 16:27 / 6

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Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 06 - Biezenweg 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January			February			March	April	May	June	July	August	September	October	November			December		
1	08:48		14:57 (1)	08:21		15:16 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33			08:24		14:43 (1)
	16:39	50	15:47 (1)	17:27	34	15:50 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13			16:33	51	15:34 (1)
2	08:48		14:57 (1)	08:20		15:17 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35			08:26		14:43 (1)
	16:40	50	15:47 (1)	17:28	32	15:49 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12			16:32	51	15:34 (1)
3	08:48		14:57 (1)	08:18		15:19 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37			08:27		14:44 (1)
	16:41	51	15:48 (1)	17:30	28	15:47 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10			16:32	51	15:35 (1)
4	08:48		14:58 (1)	08:17		15:22 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39			08:29		14:44 (1)
	16:42	51	15:49 (1)	17:32	23	15:45 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08			16:31	51	15:35 (1)
5	08:48		14:58 (1)	08:15		15:26 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40		14:59 (1)	08:30		14:44 (1)
	16:43	51	15:49 (1)	17:34	17	15:43 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06	9	15:08 (1)	16:31	51	15:35 (1)
6	08:47		14:59 (1)	08:13		15:31 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42		14:55 (1)	08:31		14:45 (1)
	16:44	51	15:50 (1)	17:36	6	15:37 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04	18	15:13 (1)	16:30	51	15:36 (1)
7	08:47		14:59 (1)	08:12			07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44		14:52 (1)	08:32		14:45 (1)
	16:46	51	15:50 (1)	17:38			18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03	24	15:16 (1)	16:30	51	15:36 (1)
8	08:46		14:59 (1)	08:10			07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51	07:46		14:50 (1)	08:34		14:45 (1)
	16:47	52	15:51 (1)	17:40			18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01	28	15:18 (1)	16:29	51	15:36 (1)
9	08:46		14:59 (1)	08:08			07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48		14:48 (1)	08:35		14:46 (1)
	16:48	52	15:51 (1)	17:41			18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59	32	15:20 (1)	16:29	51	15:37 (1)
10	08:45		15:00 (1)	08:06			07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49		14:47 (1)	08:36		14:47 (1)
	16:50	51	15:51 (1)	17:43			18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58	34	15:21 (1)	16:29	50	15:37 (1)
11	08:45		15:01 (1)	08:04			07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56	07:51		14:45 (1)	08:37		14:47 (1)
	16:51	51	15:52 (1)	17:45			18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56	37	15:22 (1)	16:29	50	15:37 (1)
12	08:44		15:01 (1)	08:03			07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58	07:53		14:44 (1)	08:38		14:48 (1)
	16:53	52	15:53 (1)	17:47			18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55	40	15:24 (1)	16:29	50	15:38 (1)
13	08:43		15:01 (1)	08:01			07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55		14:44 (1)	08:39		14:48 (1)
	16:54	52	15:53 (1)	17:49			18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53	41	15:25 (1)	16:29	50	15:38 (1)
14	08:43		15:01 (1)	07:59			06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57		14:42 (1)	08:40		14:49 (1)
	16:56	52	15:53 (1)	17:51			18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52	43	15:25 (1)	16:29	49	15:38 (1)
15	08:42		15:02 (1)	07:57			06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58		14:42 (1)	08:41		14:49 (1)
	16:57	51	15:53 (1)	17:53			18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50	43	15:25 (1)	16:29	50	15:39 (1)
16	08:41		15:02 (1)	07:55			06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00		14:41 (1)	08:42		14:50 (1)
	16:59	52	15:54 (1)	17:54			18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49	45	15:26 (1)	16:29	49	15:39 (1)
17	08:40		15:03 (1)	07:53			06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02		14:41 (1)	08:43		14:51 (1)
	17:00	51	15:54 (1)	17:56			18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47	46	15:27 (1)	16:29	49	15:40 (1)
18	08:39		15:03 (1)	07:51			06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04		14:41 (1)	08:43		14:51 (1)
	17:02	51	15:54 (1)	17:58			18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46	47	15:28 (1)	16:29	49	15:40 (1)
19	08:38		15:04 (1)	07:49			06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05		14:41 (1)	08:44		14:51 (1)
	17:04	51	15:55 (1)	18:00			18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45	48	15:29 (1)	16:29	50	15:41 (1)
20	08:37		15:04 (1)	07:47			06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07		14:41 (1)	08:45		14:52 (1)
	17:05	50	15:54 (1)	18:02			18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44	49	15:30 (1)	16:30	49	15:41 (1)
21	08:36		15:05 (1)	07:45			06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09		14:41 (1)	08:45		14:52 (1)
	17:07	49	15:54 (1)	18:04			18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42	49	15:30 (1)	16:30	49	15:41 (1)
22	08:35		15:06 (1)	07:43			06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10		14:40 (1)	08:46		14:53 (1)
	17:09	48	15:54 (1)	18:06			18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41	50	15:30 (1)	16:31	49	15:42 (1)
23	08:34		15:06 (1)	07:41			06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12		14:40 (1)	08:46		14:53 (1)
	17:10	48	15:54 (1)	18:07			18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40	51	15:31 (1)	16:31	49	15:42 (1)
24	08:33		15:07 (1)	07:39			06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14		14:40 (1)	08:47		14:53 (1)
	17:12	47	15:54 (1)	18:09			18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29	16:39	51	15:31 (1)	16:32	49	15:42 (1)
25	08:31		15:08 (1)	07:36			06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15		14:41 (1)	08:47		14:54 (1)
	17:14	46	15:54 (1)	18:11			19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38	51	15:32 (1)	16:32	50	15:44 (1)
26	08:30		15:08 (1)	07:34			06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17		14:40 (1)	08:48		14:55 (1)
	17:16	45	15:53 (1)	18:13			19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37	52	15:32 (1)	16:33	49	15:44 (1)
27	08:29		15:10 (1)	07:32			06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18		14:41 (1)	08:48		14:55 (1)
	17:17	44	15:54 (1)	18:15			19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36	51	15:32 (1)	16:34	49	15:44 (1)
28	08:27		15:10 (1)	07:30			06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20		14:42 (1)	08:48		14:55 (1)
	17:19	43	15:53 (1)	18:16			19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35	51	15:33 (1)	16:35	50	15:45 (1)
29	08:26		15:12 (1)				07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21		14:41 (1)	08:48		14:56 (1)
	17:21	41	15:53 (1)				20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34	52	15:33 (1)	16:36	49	15:45 (1)
30	08:24		15:13 (1)				07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23		14:42 (1)	08:48		14:56 (1)
	17:23	39	15:52 (1)				20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34	52	15:34 (1)	16:36	50	15:46 (1)
31	08:23		15:14 (1)				07:19		05:28		05:59	06:49		07:31				08:48		14:56 (1)
	17:25	36	15:50 (1)				20:11		21:48		21:33	20:31		17:15				16:37	50	15:46 (1)
Potential sun hours	259			277			367	416	485	499	502	454	381	331	266			243		
Total, worst case		1509			140											1094			1547	
Sun reduction		0,24			0,30											0,24			0,20	
Oper. time red.		0,95			0,95											0,95			0,95	
Wind dir. red.		0,69			0,69											0,69			0,69	
Total reduction		0,16			0,20											0,15			0,13	
Total, real		236			28											169			206	

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 7

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 07 - Autenasekade 05

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:51 (3) - 07:57 (3)	07:17 - 20:12	07:40 (2) - 07:57 (2)	06:12 - 21:03	06:37 (1) - 06:55 (1)	05:27 - 21:49	06:29 (1) - 06:58 (1)	05:24 - 22:03	06:41 (1) - 06:58 (1)	06:01 - 21:31	06:33 (1) - 07:12 (1)	06:50 - 20:29	07:26 (2) - 07:56 (2)	07:39 - 19:20	08:14 (3) - 08:40 (3)	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:28	07:26 - 18:20	07:49 (3) - 07:59 (3)	07:15 - 20:14	07:38 (2) - 07:59 (2)	06:10 - 21:05	06:35 (1) - 06:57 (1)	05:26 - 21:50	06:29 (1) - 06:58 (1)	05:25 - 22:03	06:39 (1) - 06:58 (1)	06:02 - 21:30	06:33 (1) - 07:12 (1)	06:52 - 20:27	07:25 (2) - 07:56 (2)	07:41 - 19:17	08:12 (3) - 08:40 (3)	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:47 (3) - 08:01 (3)	07:13 - 20:16	07:35 (2) - 07:58 (2)	06:09 - 21:07	06:33 (1) - 06:58 (1)	05:25 - 21:52	06:30 (1) - 06:57 (1)	05:25 - 22:03	06:39 (1) - 06:59 (1)	06:04 - 21:28	06:33 (1) - 07:12 (1)	06:54 - 20:25	07:25 (2) - 07:57 (2)	07:43 - 19:15	08:12 (3) - 08:40 (3)	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:45 (3) - 08:02 (3)	07:10 - 20:18	07:33 (2) - 07:59 (2)	06:07 - 21:08	06:31 (1) - 06:58 (1)	05:25 - 21:53	06:31 (1) - 06:57 (1)	05:26 - 22:02	06:39 (1) - 07:00 (1)	06:05 - 21:26	06:34 (1) - 07:12 (1)	06:55 - 20:23	07:24 (2) - 07:56 (2)	07:44 - 19:13	08:12 (3) - 08:40 (3)	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:42 (3) - 08:02 (3)	07:08 - 20:19	07:31 (2) - 07:59 (2)	06:05 - 21:10	06:30 (1) - 07:00 (1)	05:24 - 21:54	06:31 (1) - 06:56 (1)	05:27 - 22:02	06:39 (1) - 07:01 (1)	06:07 - 21:25	06:35 (1) - 07:11 (1)	06:57 - 20:20	07:24 (2) - 07:56 (2)	07:46 - 19:11	08:11 (3) - 08:39 (3)	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:44	08:13 - 17:36	07:17 - 18:27	07:40 (3) - 08:02 (3)	07:06 - 20:21	07:28 (2) - 07:59 (2)	06:03 - 21:12	06:28 (1) - 07:00 (1)	05:23 - 21:55	06:32 (1) - 06:56 (1)	05:28 - 22:01	06:38 (1) - 07:01 (1)	06:08 - 21:23	06:37 (1) - 07:11 (1)	06:59 - 20:18	07:24 (2) - 07:55 (2)	07:48 - 19:08	08:13 (3) - 08:39 (3)	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:38 (3) - 08:03 (3)	07:04 - 20:23	07:27 (2) - 07:59 (2)	06:01 - 21:13	06:26 (1) - 07:00 (1)	05:23 - 21:55	06:33 (1) - 06:55 (1)	05:29 - 22:01	06:38 (1) - 07:02 (1)	06:10 - 21:21	06:38 (1) - 07:09 (1)	07:00 - 20:16	07:26 (2) - 07:55 (2)	07:50 - 19:06	08:15 (3) - 08:39 (3)	07:44 - 17:03	08:32 - 16:30
8	08:46 - 16:47	08:10 - 17:40	07:12 - 18:31	07:36 (3) - 08:03 (3)	07:01 - 20:24	07:27 (2) - 07:59 (2)	05:59 - 21:15	06:25 (1) - 07:00 (1)	05:22 - 21:56	06:34 (1) - 07:00 (1)	05:30 - 22:02	06:37 (1) - 07:04 (1)	06:11 - 21:17	06:40 (1) - 07:09 (1)	07:02 - 20:13	07:27 (2) - 07:53 (2)	07:51 - 19:04	08:17 (3) - 08:38 (3)	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	07:34 (3) - 08:02 (3)	06:59 - 20:26	07:27 (2) - 07:59 (2)	05:58 - 21:17	06:24 (1) - 07:01 (1)	05:22 - 21:57	06:34 (1) - 06:54 (1)	05:31 - 21:59	06:37 (1) - 06:54 (1)	06:13 - 21:59	06:41 (1) - 07:07 (1)	07:03 - 20:11	07:29 (2) - 07:53 (2)	07:53 - 19:01	08:18 (3) - 08:36 (3)	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	07:34 (3) - 08:02 (3)	06:57 - 20:28	07:27 (2) - 07:58 (2)	05:56 - 21:18	06:23 (1) - 07:01 (1)	05:21 - 21:58	06:35 (1) - 06:54 (1)	05:32 - 21:59	06:37 (1) - 06:54 (1)	06:15 - 21:59	06:43 (1) - 07:04 (1)	07:05 - 20:09	07:31 (2) - 07:52 (2)	07:55 - 18:59	08:20 (3) - 08:35 (3)	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	07:34 (3) - 08:02 (3)	06:54 - 20:30	07:27 (2) - 07:57 (2)	05:54 - 21:20	06:23 (1) - 07:02 (1)	05:21 - 21:59	06:36 (1) - 06:54 (1)	05:33 - 21:58	06:36 (1) - 07:06 (1)	06:16 - 21:14	06:44 (1) - 07:05 (1)	07:07 - 20:06	07:32 (2) - 07:50 (2)	07:56 - 18:57	08:22 (3) - 08:34 (3)	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	07:34 (3) - 08:01 (3)	06:52 - 20:31	07:27 (2) - 07:56 (2)	05:53 - 21:21	06:22 (1) - 07:02 (1)	05:21 - 21:59	06:36 (1) - 06:53 (1)	05:34 - 21:57	06:36 (1) - 07:06 (1)	06:18 - 21:12	06:46 (1) - 07:03 (1)	07:08 - 20:04	07:34 (2) - 07:49 (2)	07:58 - 18:55	08:24 (3) - 08:32 (3)	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	07:34 (3) - 08:00 (3)	06:50 - 20:33	07:28 (2) - 07:55 (2)	05:51 - 21:23	06:23 (1) - 07:02 (1)	05:20 - 22:00	06:37 (1) - 06:53 (1)	05:35 - 21:56	06:36 (1) - 07:07 (1)	06:19 - 21:10	06:47 (1) - 07:01 (1)	07:10 - 20:02	07:35 (2) - 07:46 (2)	08:00 - 18:53	08:25 (3) - 08:29 (3)	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	07:35 (3) - 07:59 (3)	06:48 - 20:35	07:29 (2) - 07:54 (2)	05:49 - 21:25	06:22 (1) - 07:02 (1)	05:20 - 22:01	06:38 (1) - 06:53 (1)	05:36 - 21:55	06:35 (1) - 07:07 (1)	06:21 - 21:08	06:49 (1) - 06:58 (1)	07:12 - 19:59	07:37 (2) - 07:43 (2)	08:01 - 18:50		07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	07:35 (3) - 07:57 (3)	06:46 - 20:36	07:30 (2) - 07:52 (2)	05:48 - 21:26	06:22 (1) - 07:02 (1)	05:20 - 22:01	06:39 (1) - 06:52 (1)	05:37 - 21:54	06:35 (1) - 07:08 (1)	06:23 - 21:06		07:13 - 19:57		08:03 - 18:48		07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	07:37 (3) - 07:55 (3)	06:43 - 20:38	07:31 (2) - 07:50 (2)	05:46 - 21:28	06:23 (1) - 07:03 (1)	05:20 - 22:02	06:39 (1) - 06:52 (1)	05:38 - 21:53	06:34 (1) - 07:08 (1)	06:24 - 21:04		07:15 - 19:55		08:05 - 18:46		08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	07:39 (3) - 07:53 (3)	06:41 - 20:40	07:32 (2) - 07:47 (2)	05:45 - 21:29	06:22 (1) - 07:02 (1)	05:20 - 22:02	06:40 (1) - 06:52 (1)	05:39 - 21:52	06:35 (1) - 07:10 (1)	06:26 - 21:02		07:16 - 19:52		08:07 - 18:44		08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	07:43 (3) - 07:47 (3)	06:39 - 20:41	07:36 (2) - 07:43 (2)	05:43 - 21:31	06:22 (1) - 07:02 (1)	05:20 - 22:03	06:41 (1) - 06:52 (1)	05:41 - 21:51	06:34 (1) - 07:10 (1)	06:28 - 21:00		07:18 - 19:50		08:08 - 18:42		08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50		06:37 - 20:43		05:42 - 21:32	06:23 (1) - 07:02 (1)	05:20 - 22:03	06:41 (1) - 06:52 (1)	05:42 - 21:50	06:34 (1) - 07:11 (1)	06:29 - 20:58		07:20 - 19:48		08:10 - 18:40		08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52		06:35 - 20:45		05:40 - 21:34	06:22 (1) - 07:01 (1)	05:20 - 22:03	06:41 (1) - 06:52 (1)	05:43 - 21:49	06:34 (1) - 07:11 (1)	06:31 - 20:55		07:21 - 19:45		08:12 - 18:37		08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54		06:33 - 20:47		05:39 - 21:35	06:23 (1) - 07:01 (1)	05:20 - 22:04	06:41 (1) - 06:51 (1)	05:45 - 21:47	06:33 (1) - 07:11 (1)	06:32 - 20:53		07:23 - 19:43		08:14 - 18:35		08:09 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55		06:31 - 20:48		05:38 - 21:37	06:23 (1) - 07:01 (1)	05:20 - 22:04	06:42 (1) - 06:53 (1)	05:46 - 21:46	06:34 (1) - 07:12 (1)	06:34 - 20:51		07:25 - 19:41		08:15 - 18:33		08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:10	07:41 - 18:07	06:38 - 18:57		06:28 - 20:50		05:37 - 21:38	06:24 (1) - 07:01 (1)	05:20 - 22:04	06:42 (1) - 06:53 (1)	05:47 - 21:45	06:33 (1) - 07:12 (1)	06:36 - 20:49		07:26 - 19:38		08:17 - 18:31		08:12 - 16:40	08:46 - 16:31
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27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04		06:20 - 20:57		05:32 - 21:43	06:26 (1) - 07:00 (1)	05:22 - 22:04	06:41 (1) - 06:54 (1)	05:53 - 21:39	06:32 (1) - 07:12 (1)	06:42 - 20:40	07:33 (2) - 07:52 (2)	07:33 - 19:29	08:19 (3) - 08:36 (3)	07:24 - 17:23		08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06		06:18 - 20:58		05:31 - 21:45	06:26 (1) - 07:00 (1)	05:22 - 22:04	06:41 (1) - 06:56 (1)	05:55 - 21:38	06:33 (1) - 07:13 (1)	06:44 - 20:38	07:31 (2) - 07:53 (2)	07:34 - 19:27	08:18 (3) - 08:38 (3)	07:26 - 17:21		08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07	07:47 (2) - 07:52 (2)	06:16 - 21:00	06:40 (1) - 06:50 (1)	05:30 - 21:46	06:27 (1) - 06:59 (1)	05:23 - 22:04	06:41 (1) - 06:57 (1)	05:56 - 21:36	06:33 (1) - 07:13 (1)	06:45 - 20:36	07:30 (2) - 07:55 (2)	07:36 - 19:24	08:15 (3) - 08:38 (3)	07:28 - 17:19		08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09	07:44 (2) - 07:54 (2)	06:14 - 21:02	06:39 (1) - 06:54 (1)	05:29 - 21:47	06:27 (1) - 06:59 (1)	05:23 - 22:04	06:40 (1) - 06:57 (1)	05:58 - 21:35	06:33 (1) - 07:13 (1)	06:47 - 20:34	07:28 (2) - 07:55 (2)	07:38 - 19:22	08:14 (3) - 08:39 (3)	07:30 - 17:17		08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11	07:42 (2) - 07:56 (2)	06:12 - 21:03	05:28 - 21:48	06:27 (1) - 06:58 (1)	06:59 (1) -	22:04	06:57 (1) -	05:59 - 21:33	06:33 (1) - 07:13 (1)	06:49 - 20:32	07:27 (2) - 07:56 (2)			07:32 - 17:15			08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243								
Total, worst case			389	472	1080	507	996	542	434	266										
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36	0,34										
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95	0,95										
Wind dir. red.			0,58	0,63	0,66	0,66	0,66	0,65	0,61	0,58										
Total reduction			0,18	0,25	0,27	0,24	0,25	0,26	0,21	0,18										
Total, real			70	117	287	123	252	138	91	49										

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 8

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 08 - Bolgerijsekade 16

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12 (6)	06:12 - 21:03 (20)	06:37 (2) - 21:49 (22)	05:27 - 05:56 (1)	05:24 - 06:00 (1) - 06:01 - 21:31 (23)	06:50 - 20:29 (13)	07:26 (3) - 07:39 (3) - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:29	07:26 - 18:20	07:15 - 20:14 (9)	07:40 (3) - 07:47 (3) - 21:05 (21)	06:36 (2) - 21:50 (23)	05:26 - 05:55 (1) - 05:25 - 06:18 (1) - 22:03 (23)	05:59 (1) - 06:02 - 21:30 (23)	06:52 - 20:27 (16)	07:25 (3) - 07:41 (3) - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 20:16 (11)	07:35 (3) - 07:46 (3) - 21:07 (20)	06:36 (2) - 21:52 (23)	05:25 - 05:54 (1) - 05:25 - 06:17 (1) - 22:03 (24)	05:59 (1) - 06:04 - 21:28 (24)	06:54 - 20:25 (18)	07:24 (3) - 07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:18 (14)	07:33 (3) - 07:47 (3) - 21:08 (18)	06:37 (2) - 21:53 (24)	05:25 - 05:54 (1) - 05:26 - 06:18 (1) - 22:02 (24)	06:00 (1) - 06:05 - 21:26 (24)	06:55 - 20:23 (20)	07:22 (3) - 07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 20:19 (16)	07:31 (3) - 07:47 (3) - 21:10 (16)	06:38 (2) - 21:54 (25)	05:24 - 05:53 (1) - 05:27 - 06:18 (1) - 22:02 (24)	06:00 (1) - 06:07 - 21:25 (5)	06:53 (2) - 06:57 - 20:20 (20)	07:23 (3) - 07:46 - 19:11	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21 (18)	07:29 (3) - 07:47 (3) - 21:12 (13)	06:39 (2) - 21:55 (24)	05:23 - 05:54 (1) - 05:28 - 06:18 (1) - 22:01 (25)	05:59 (1) - 06:08 - 21:23 (10)	06:51 (2) - 06:59 - 07:01 (2) - 20:18 (18)	07:24 (3) - 07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:04 - 20:23 (20)	07:26 (3) - 07:46 (3) - 21:13 (9)	06:41 (2) - 21:55 (24)	05:23 - 05:54 (1) - 05:29 - 06:18 (1) - 22:01 (25)	05:59 (1) - 06:10 - 21:21 (14)	06:48 (2) - 07:00 - 07:02 (2) - 20:16 (16)	07:26 (3) - 07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:47 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24 (20)	07:25 (3) - 07:45 (3) - 21:15	06:50 (2) - 21:56 (24)	05:22 - 05:54 (1) - 05:30 - 06:18 (1) - 22:00 (24)	06:00 (1) - 06:12 - 21:19 (16)	06:48 (2) - 07:02 - 07:04 (2) - 20:13 (14)	07:27 (3) - 07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	06:59 - 20:26 (18)	07:26 (3) - 07:44 (3) - 21:17	06:52 - 21:57 (24)	05:22 - 05:54 (1) - 05:31 - 06:18 (1) - 21:59 (24)	06:01 (1) - 06:13 - 21:17 (18)	06:46 (2) - 07:03 - 07:04 (2) - 20:11 (12)	07:29 (3) - 07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28 (16)	07:27 (3) - 07:56 - 07:43 (3) - 21:18	05:21 - 21:58 (23)	05:55 (1) - 05:32 - 06:18 (1) - 21:59 (23)	06:02 (1) - 06:15 - 06:25 (1) - 21:15 (20)	06:46 (2) - 07:05 - 07:06 (2) - 20:09 (9)	07:31 (3) - 07:55 - 07:40 (3) - 18:59	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:55 - 20:30 (13)	07:27 (3) - 07:54 - 07:40 (3) - 21:20	05:21 - 21:59 (24)	05:55 (1) - 05:33 - 06:19 (1) - 21:58 (22)	06:03 (1) - 06:16 - 06:25 (1) - 21:14 (20)	06:45 (2) - 07:07 - 07:05 (2) - 20:06 (6)	07:32 (3) - 07:56 - 07:38 (3) - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31 (8)	07:30 (3) - 07:53 - 07:38 (3) - 21:21	05:21 - 21:59 (23)	05:55 (1) - 05:34 - 06:18 (1) - 21:57 (21)	06:04 (1) - 06:18 - 06:25 (1) - 21:12 (20)	06:46 (2) - 07:08 - 07:06 (2) - 20:04 (3)	07:34 (3) - 07:58 - 07:37 (3) - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 21:23	05:20 - 22:00 (23)	05:55 (1) - 05:35 - 06:18 (1) - 21:56 (20)	06:05 (1) - 06:20 - 06:25 (1) - 21:10 (19)	06:47 (2) - 07:10 - 07:06 (2) - 20:02	08:00 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 21:25	05:20 - 22:01 (22)	05:56 (1) - 05:36 - 06:18 (1) - 21:55 (19)	06:06 (1) - 06:21 - 06:25 (1) - 21:08 (17)	06:49 (2) - 07:12 - 07:06 (2) - 19:59	08:02 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 21:26	05:20 - 22:01 (23)	05:56 (1) - 05:37 - 06:19 (1) - 21:54 (18)	06:07 (1) - 06:23 - 06:25 (1) - 21:06 (15)	06:50 (2) - 07:13 - 07:05 (2) - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 21:28	05:20 - 22:02 (22)	05:57 (1) - 05:38 - 06:19 (1) - 21:53 (17)	06:08 (1) - 06:24 - 06:25 (1) - 21:04 (13)	06:52 (2) - 07:15 - 07:05 (2) - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 21:29	05:20 - 22:02 (22)	05:57 (1) - 05:40 - 06:19 (1) - 21:52 (16)	06:10 (1) - 06:26 - 06:26 (1) - 21:02 (11)	06:53 (2) - 07:16 - 07:04 (2) - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
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25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 20:53 (9)	06:48 (2) - 05:34 - 06:57 (2) - 21:41 (14)	06:02 (1) - 05:21 - 06:16 (1) - 22:04 (22)	05:59 (1) - 05:50 - 06:21 (1) - 21:42 (2)	06:20 (1) - 06:39 - 06:22 (1) - 20:45	07:30 - 19:34	08:21 - 17:27	08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 20:55 (12)	06:46 (2) - 05:33 - 06:58 (2) - 21:42 (15)	06:01 (1) - 05:21 - 06:16 (1) - 22:04 (22)	05:59 (1) - 05:52 - 06:21 (1) - 21:41	06:41 - 20:43	07:31 - 19:31	08:23 - 17:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 20:57 (14)	06:44 (2) - 05:32 - 06:58 (2) - 21:43 (17)	06:00 (1) - 05:22 - 06:17 (1) - 22:04 (23)	05:59 (1) - 05:53 - 06:22 (1) - 21:39	06:42 - 20:40	07:33 - 19:29	08:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 20:58 (16)	06:42 (2) - 05:31 - 06:58 (2) - 21:45 (18)	05:59 (1) - 05:22 - 06:17 (1) - 22:04 (23)	05:59 (1) - 05:55 - 06:22 (1) - 21:38	06:44 - 20:38	07:34 - 19:27	08:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07	06:16 - 21:00 (17)	06:40 (2) - 05:30 - 06:57 (2) - 21:46 (19)	05:58 (1) - 05:23 - 06:17 (1) - 22:04 (22)	06:00 (1) - 05:56 - 06:22 (1) - 21:36	06:46 - 20:36	07:36 - 19:24	08:28 - 17:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09	06:14 - 21:02 (19)	06:39 (2) - 05:29 - 06:58 (2) - 21:47 (20)	05:57 (1) - 05:23 - 06:17 (1) - 22:04 (23)	05:59 (1) - 05:58 - 06:22 (1) - 21:35	06:47 - 20:34	07:38 - 19:22	08:30 - 17:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11 (2)	07:42 (3) - 07:44 (3)	05:28 - 21:48 (21)	05:56 (1) - 06:17 (1)	05:59 - 21:33	06:49 - 20:32 (9)	07:29 (3) - 07:38 (3)	07:32 - 17:15	16:37	
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case			2	267	288	684	442	225	165			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,63	0,63	0,66	0,67	0,67	0,65	0,63			
Total reduction			0,20	0,25	0,27	0,25	0,26	0,26	0,22			
Total, real			0	67	77	170	115	57	36			

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

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

Project:
068379aa - WP Autena

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15-5-2014 16:27 / 9

Licensed user:
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David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 09 - Bolgerijsekade 18

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 / 16:39	08:21 / 17:27	07:28 / 18:18	07:17 / 20:12	06:12 / 21:03 16	06:37 (2) / 06:53 (2) / 21:49 13	05:27 / 06:09 (1) / 22:03 22	05:56 (1) / 06:17 (1) / 21:31 9	05:24 / 05:55 (1) / 06:46 (2) / 20:29 20	06:50 / 07:39 (3) / 19:20	07:19 (3) / 17:14	07:39 / 16:33	07:33 / 08:24
2	08:48 / 16:40	08:20 / 17:29	07:26 / 18:20	07:15 / 20:14 3	07:38 (3) / 06:10 / 21:05 18	06:35 (2) / 06:53 (2) / 21:50 14	05:26 / 05:55 (1) / 06:09 (1) / 22:03 21	05:55 (1) / 06:16 (1) / 21:30 13	06:02 / 06:44 (2) / 06:57 (2) / 20:27 21	06:52 / 07:40 (3) / 19:17	07:19 (3) / 17:12	07:41 / 16:32	07:35 / 08:26
3	08:48 / 16:41	08:18 / 17:30	07:24 / 18:22	07:13 / 20:16 6	07:35 (3) / 06:09 / 07:41 (3) / 21:07 19	06:33 (2) / 06:52 (2) / 21:52 15	05:25 / 05:54 (1) / 06:09 (1) / 22:03 21	05:56 (1) / 06:17 (1) / 21:28 15	06:04 / 06:43 (2) / 06:58 (2) / 20:25 20	06:54 / 07:40 (3) / 19:15	07:20 (3) / 17:10	07:43 / 16:32	07:37 / 08:27
4	08:48 / 16:42	08:17 / 17:32	07:21 / 18:24	07:10 / 20:18 9	07:33 (3) / 06:07 / 07:42 (3) / 21:08 21	06:31 (2) / 06:52 (2) / 21:53 16	05:25 / 05:54 (1) / 06:10 (1) / 22:02 20	05:57 (1) / 06:17 (1) / 21:26 18	06:05 / 06:42 (2) / 07:00 (2) / 20:23 19	06:55 / 07:21 (3) / 07:40 (3) / 19:13	07:44 / 17:08	07:39 / 16:31	08:29
5	08:48 / 16:43	08:15 / 17:34	07:19 / 18:26	07:08 / 20:19 12	07:31 (3) / 06:05 / 07:43 (3) / 21:10 22	06:30 (2) / 06:52 (2) / 21:54 17	05:24 / 05:53 (1) / 06:10 (1) / 22:02 19	05:58 (1) / 06:07 / 06:17 (1) / 21:25 19	06:41 (2) / 06:57 / 07:00 (2) / 20:20 17	07:23 (3) / 07:40 (3) / 19:11	07:46 / 17:06	07:41 / 16:31	08:30
6	08:47 / 16:45	08:13 / 17:36	07:17 / 18:27	07:06 / 20:21 15	07:28 (3) / 06:03 / 07:43 (3) / 21:12 21	06:30 (2) / 06:51 (2) / 21:55 18	05:23 / 05:53 (1) / 06:11 (1) / 22:01 19	05:58 (1) / 06:08 / 06:17 (1) / 21:23 20	06:41 (2) / 06:59 / 07:01 (2) / 20:18 15	07:24 (3) / 07:48 / 07:39 (3) / 19:08	07:42 / 17:05	07:43 / 16:30	08:31
7	08:47 / 16:46	08:12 / 17:38	07:15 / 18:29	07:04 / 20:23 17	07:26 (3) / 06:01 / 07:43 (3) / 21:13 20	06:30 (2) / 06:50 (2) / 21:55 19	05:23 / 05:52 (1) / 06:11 (1) / 22:01 18	05:59 (1) / 06:10 / 06:17 (1) / 21:21 21	06:40 (2) / 07:00 / 07:01 (2) / 20:16 12	07:26 (3) / 07:50 / 07:38 (3) / 19:06	07:44 / 17:03	07:42 / 16:30	08:32
8	08:46 / 16:47	08:10 / 17:40	07:12 / 18:31	07:01 / 20:24 19	07:24 (3) / 05:59 / 07:43 (3) / 21:15 18	06:32 (2) / 06:50 (2) / 21:56 20	05:22 / 05:52 (1) / 06:12 (1) / 22:00 17	06:00 (1) / 06:11 / 06:17 (1) / 21:19 22	06:40 (2) / 07:02 / 07:02 (2) / 20:13 10	07:27 (3) / 07:51 / 07:37 (3) / 19:04	07:46 / 17:01	08:34 / 16:30	
9	08:46 / 16:48	08:08 / 17:42	07:10 / 18:33	06:59 / 20:26 20	07:22 (3) / 05:58 / 07:42 (3) / 21:17 17	06:32 (2) / 06:49 (2) / 21:57 20	05:22 / 05:51 (1) / 06:11 (1) / 21:59 16	06:01 (1) / 06:13 / 06:17 (1) / 21:17 20	06:41 (2) / 07:03 / 07:01 (2) / 20:11 7	07:29 (3) / 07:53 / 07:36 (3) / 19:01	07:48 / 17:00	08:35 / 16:29	
10	08:45 / 16:50	08:06 / 17:43	07:08 / 18:34	06:57 / 20:28 21	07:21 (3) / 05:56 / 07:42 (3) / 21:18 14	06:33 (2) / 06:47 (2) / 21:58 21	05:21 / 05:51 (1) / 06:12 (1) / 21:59 15	06:02 (1) / 06:15 / 06:17 (1) / 21:15 19	06:43 (2) / 07:05 / 07:02 (2) / 20:09 3	07:31 (3) / 07:55 / 07:34 (3) / 18:59	07:50 / 16:58	08:36 / 16:29	
11	08:45 / 16:51	08:04 / 17:45	07:06 / 18:36	06:55 / 20:30 20	07:20 (3) / 05:54 / 07:40 (3) / 21:20 11	06:35 (2) / 06:46 (2) / 21:59 21	05:21 / 05:51 (1) / 06:12 (1) / 21:58 14	06:03 (1) / 06:16 / 06:17 (1) / 21:14 17	06:44 (2) / 07:07 / 07:01 (2) / 20:06	07:56 / 18:57	07:51 / 16:56	08:37 / 16:29	
12	08:44 / 16:53	08:03 / 17:47	07:03 / 18:38	06:52 / 20:31 18	07:21 (3) / 05:53 / 07:39 (3) / 21:21 7	06:36 (2) / 06:43 (2) / 21:59 22	05:21 / 05:50 (1) / 06:12 (1) / 21:57 13	06:04 (1) / 06:18 / 06:17 (1) / 21:12 15	06:46 (2) / 07:08 / 07:01 (2) / 20:04	07:58 / 18:55	07:53 / 16:55	08:38 / 16:29	
13	08:44 / 16:54	08:01 / 17:49	07:01 / 18:40	06:50 / 20:33 16	07:22 (3) / 05:51 / 07:38 (3) / 21:23	05:20 / 22:00 22	05:50 (1) / 05:35 / 06:12 (1) / 21:56 11	06:05 (1) / 06:20 / 06:16 (1) / 21:10 13	06:47 (2) / 07:10 / 07:00 (2) / 20:02	08:00 / 18:53	07:55 / 16:53	08:39 / 16:29	
14	08:43 / 16:56	07:59 / 17:51	06:59 / 18:41	06:48 / 20:35 12	07:24 (3) / 05:49 / 07:36 (3) / 21:25	05:20 / 22:01 23	05:50 (1) / 05:36 / 06:13 (1) / 21:55 10	06:06 (1) / 06:21 / 06:16 (1) / 21:08 11	06:49 (2) / 07:12 / 07:00 (2) / 19:59	08:01 / 18:50	07:57 / 16:52	08:40 / 16:29	
15	08:42 / 16:57	07:57 / 17:53	06:57 / 18:43	06:46 / 20:36 5	07:27 (3) / 05:48 / 07:32 (3) / 21:26	05:20 / 22:01 23	05:50 (1) / 05:37 / 06:13 (1) / 21:54 9	06:07 (1) / 06:23 / 06:16 (1) / 21:06 9	06:50 (2) / 07:13 / 06:59 (2) / 19:57	08:03 / 18:48	07:58 / 16:50	08:41 / 16:29	
16	08:41 / 16:59	07:55 / 17:55	06:54 / 18:45	06:43 / 20:38	05:46 / 21:28	05:20 / 22:02 23	05:50 (1) / 05:38 / 06:13 (1) / 21:53 7	06:08 (1) / 06:24 / 06:15 (1) / 21:04 6	06:52 (2) / 07:15 / 06:58 (2) / 19:55	08:05 / 18:46	08:00 / 16:49	08:42 / 16:29	
17	08:40 / 17:00	07:53 / 17:56	06:52 / 18:47	06:41 / 20:40	05:45 / 21:29	05:20 / 22:02 23	05:50 (1) / 05:40 / 06:13 (1) / 21:52 5	06:10 (1) / 06:26 / 06:15 (1) / 21:02 3	06:53 (2) / 07:16 / 06:56 (2) / 19:52	08:07 / 18:44	08:02 / 16:48	08:43 / 16:29	
18	08:39 / 17:02	07:51 / 17:58	06:50 / 18:48	06:39 / 20:41	05:43 / 21:31	05:20 / 22:03 24	05:50 (1) / 05:41 / 06:14 (1) / 21:51 3	06:11 (1) / 06:28 / 06:14 (1) / 21:00	07:18 / 19:50	08:08 / 18:42	08:04 / 16:46	08:43 / 16:29	
19	08:38 / 17:04	07:49 / 18:00	06:47 / 18:50	06:37 / 20:43	05:42 / 21:32	05:20 / 22:03 24	05:50 (1) / 05:42 / 06:14 (1) / 21:50 2	06:12 (1) / 06:29 / 06:13 (1) / 20:58	07:20 / 19:48	08:10 / 18:40	08:05 / 16:45	08:44 / 16:30	
20	08:37 / 17:05	07:47 / 18:02	06:45 / 18:52	06:35 / 20:45	05:41 / 21:34	05:20 / 22:03 24	05:50 (1) / 05:43 / 06:14 (1) / 21:49	06:31 / 20:55	07:21 / 19:45	08:12 / 18:37	08:07 / 16:44	08:45 / 16:30	
21	08:36 / 17:07	07:45 / 18:04	06:43 / 18:54	06:33 / 20:47	05:39 / 21:35	05:20 / 22:04 24	05:50 (1) / 05:45 / 06:14 (1) / 21:47	06:32 / 20:53	07:23 / 19:43	08:14 / 18:35	08:09 / 16:43	08:45 / 16:30	
22	08:35 / 17:09	07:43 / 18:06	06:40 / 18:55	06:31 / 20:48	05:38 / 21:37	05:20 / 22:04 24	05:51 (1) / 05:46 / 06:15 (1) / 21:46	06:34 / 20:51	07:25 / 19:41	08:15 / 18:33	08:10 / 16:41	08:46 / 16:31	
23	08:34 / 17:11	07:41 / 18:07	06:38 / 18:57	06:28 / 20:50	05:37 / 21:38	05:20 / 22:04 24	05:51 (1) / 05:47 / 06:15 (1) / 21:45	06:36 / 20:49	07:26 / 19:38	08:17 / 18:31	08:12 / 16:40	08:46 / 16:31	
24	08:33 / 17:12	07:39 / 18:09	06:36 / 18:59	06:26 / 20:52	05:35 / 21:39	05:21 / 22:04 24	05:51 (1) / 05:49 / 06:15 (1) / 21:44	06:37 / 20:47	07:28 / 19:36	08:19 / 18:29	08:14 / 16:39	08:47 / 16:32	
25	08:31 / 17:14	07:37 / 18:11	06:33 / 19:00	06:24 / 20:53	05:34 / 21:41 2	06:02 (1) / 05:21 / 06:04 (1) / 22:04 23	05:52 (1) / 05:50 / 06:15 (1) / 21:42	06:39 / 20:45	07:30 / 19:34	07:21 / 17:27	08:15 / 16:38	08:47 / 16:33	
26	08:30 / 17:16	07:34 / 18:13	06:31 / 19:02	06:22 / 20:55 4	06:46 (2) / 05:33 / 06:50 (2) / 21:42 4	06:01 (1) / 05:21 / 06:05 (1) / 22:04 23	05:52 (1) / 05:52 / 06:15 (1) / 21:41	06:41 / 20:43	07:31 / 19:31	07:23 / 17:25	08:17 / 16:37	08:48 / 16:33	
27	08:29 / 17:18	07:32 / 18:15	06:29 / 19:04	06:20 / 20:57 7	06:44 (2) / 05:32 / 06:51 (2) / 21:43 6	06:00 (1) / 05:22 / 06:06 (1) / 22:04 23	05:53 (1) / 05:53 / 06:16 (1) / 21:39	06:42 / 20:40	07:33 / 19:29	07:24 / 17:23	08:18 / 16:36	08:48 / 16:34	
28	08:27 / 17:19	07:30 / 18:17	06:26 / 19:06	06:18 / 20:58 9	06:42 (2) / 05:31 / 06:51 (2) / 21:45 8	05:59 (1) / 05:22 / 06:07 (1) / 22:04 23	05:53 (1) / 05:55 / 06:16 (1) / 21:38	06:44 / 20:38 7	07:27 (3) / 07:34 / 07:34 (3) / 19:27	07:26 / 17:21	08:20 / 16:35	08:48 / 16:35	
29	08:26 / 17:21		07:24 / 20:07	06:16 / 21:00 12	06:40 (2) / 05:30 / 06:52 (2) / 21:46 9	05:58 (1) / 05:23 / 06:07 (1) / 22:04 22	05:54 (1) / 05:56 / 06:16 (1) / 21:36	06:46 / 20:36 12	07:25 (3) / 07:36 / 07:37 (3) / 19:24	07:28 / 17:19	08:21 / 16:35	08:48 / 16:36	
30	08:24 / 17:23		07:22 / 20:09	06:14 / 21:02 14	06:39 (2) / 05:29 / 06:53 (2) / 21:47 11	05:57 (1) / 05:23 / 06:08 (1) / 22:04 22	05:54 (1) / 05:58 / 06:16 (1) / 21:35	06:47 / 20:34 16	07:22 (3) / 07:38 / 07:38 (3) / 19:22	07:30 / 17:17	08:23 / 16:34	08:48 / 16:37	
31	08:23 / 17:25		07:20 / 20:11		05:28 / 21:48 12	05:56 (1) / 06:08 (1)	05:59 / 21:33	06:49 / 20:32 18	07:21 (3) / 07:39 (3)	07:32 / 17:15		08:48 / 16:37	
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244	
Total, worst case				239	256	634	262	303	144				
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36				
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95				
Wind dir. red.				0,63	0,66	0,67	0,67	0,65	0,63				
Total reduction				0,25	0,27	0,25	0,26	0,26	0,22				
Total, real				60	68	158	68	78	31				

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 10
Licensed user:
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David Vrolijk / dv@lbpsight.nl
Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 10 - Bolgerijsekade 24

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	06:00 (2)	05:24	06:09 (2)	06:01	06:50	07:16 (3)	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49 28	06:28 (2)	22:03 22	06:31 (2)	21:31	20:29 2	07:17 (3)	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:00 (2)	05:25	06:08 (2)	06:02	06:52		07:41	07:35	08:26
	16:40	17:28	18:20	20:14	21:05	21:50 27	06:27 (2)	22:03 23	06:31 (2)	21:30	20:27		19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:00 (2)	05:25	06:08 (2)	06:04	06:54		07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52 27	06:27 (2)	22:03 24	06:32 (2)	21:28	20:25		19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:01 (2)	05:26	06:08 (2)	06:05	06:55		07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53 27	06:28 (2)	22:02 25	06:33 (2)	21:26	20:23		19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:01 (2)	05:27	06:09 (2)	06:07	06:57		07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54 26	06:27 (2)	22:02 24	06:33 (2)	21:25	20:20		19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:02 (2)	05:28	06:08 (2)	06:08	06:59		07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55 26	06:28 (2)	22:01 25	06:33 (2)	21:23	20:18		19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:02 (2)	05:29	06:08 (2)	06:10	07:00		07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55 25	06:27 (2)	22:01 25	06:33 (2)	21:21	20:16		19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:03 (2)	05:30	06:08 (2)	06:11	07:02		07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56 24	06:27 (2)	22:00 26	06:34 (2)	21:19	20:13		19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:03 (2)	05:31	06:08 (2)	06:13	07:03		07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57 24	06:27 (2)	21:59 26	06:34 (2)	21:17	20:11		19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	06:04 (2)	05:32	06:08 (2)	06:15	07:05		07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58 23	06:27 (2)	21:59 27	06:35 (2)	21:15	20:09		18:59	16:58	16:29
11	08:45	08:04	07:06	06:54	07:17 (3) 05:54	05:21	06:04 (2)	05:33	06:08 (2)	06:16	07:07		07:56	07:51	08:37
	16:51	17:45	18:36	20:30 2	07:18 (3) 21:20	21:59 23	06:27 (2)	21:58 27	06:35 (2)	21:14	20:06		18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	07:15 (3) 05:53	05:21	06:04 (2)	05:34	06:08 (2)	06:18	07:08		07:58	07:53	08:38
	16:53	17:47	18:38	20:31 6	07:21 (3) 21:21	21:59 23	06:27 (2)	21:57 27	06:35 (2)	21:12	20:04		18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	07:13 (3) 05:51	06:17 (2) 05:20	06:05 (2)	05:35	06:08 (2)	06:19	07:12 (3)	07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33 10	07:23 (3) 21:23 2	06:19 (2) 22:00 22	06:27 (2)	21:56 28	06:36 (2)	21:10 10	07:22 (3)	20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) 05:49	06:15 (2) 05:20	06:05 (2)	05:36	06:08 (2)	06:21	07:10 (3)	07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35 13	07:24 (3) 21:25 5	06:20 (2) 22:01 22	06:27 (2)	21:55 28	06:36 (2)	21:08 15	07:25 (3)	19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) 05:48	06:14 (2) 05:20	06:06 (2)	05:37	06:08 (2)	06:23	07:08 (3)	07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36 16	07:25 (3) 21:26 8	06:22 (2) 22:01 21	06:27 (2)	21:54 28	06:36 (2)	21:06 18	07:26 (3)	19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) 05:46	06:13 (2) 05:20	06:06 (2)	05:38	06:08 (2)	06:24	07:07 (3)	07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38 18	07:25 (3) 21:28 10	06:23 (2) 22:02 21	06:27 (2)	21:53 28	06:36 (2)	21:04 21	07:28 (3)	19:55	18:46	16:49	16:29
17	08:40	07:53	06:52	06:41	07:04 (3) 05:45	06:11 (2) 05:20	06:06 (2)	05:40	06:10 (2)	06:26	07:05 (3)	07:16	08:07	08:02	08:43
	17:00	17:56	18:47	20:40 21	07:25 (3) 21:29 12	06:23 (2) 22:02 21	06:27 (2)	21:52 27	06:37 (2)	21:02 23	07:28 (3)	19:52	18:44	16:48	16:29
18	08:39	07:51	06:50	06:39	07:02 (3) 05:43	06:10 (2) 05:20	06:06 (2)	05:41	06:11 (2)	06:28	07:04 (3)	07:18	08:08	08:04	08:43
	17:02	17:58	18:48	20:41 23	07:25 (3) 21:31 14	06:24 (2) 22:03 21	06:27 (2)	21:51 26	06:37 (2)	21:00 25	07:29 (3)	19:50	18:42	16:46	16:29
19	08:38	07:49	06:47	06:37	07:00 (3) 05:42	06:09 (2) 05:20	06:07 (2)	05:42	06:12 (2)	06:29	07:03 (3)	07:20	08:10	08:05	08:44
	17:04	18:00	18:50	20:43 25	07:25 (3) 21:32 16	06:25 (2) 22:03 20	06:27 (2)	21:50 24	06:36 (2)	20:58 26	07:29 (3)	19:48	18:40	16:45	16:30
20	08:37	07:47	06:45	06:35	06:58 (3) 05:41	06:07 (2) 05:20	06:07 (2)	05:43	06:13 (2)	06:31	07:03 (3)	07:21	08:12	08:07	08:45
	17:05	18:02	18:52	20:45 27	07:25 (3) 21:34 18	06:25 (2) 22:03 20	06:27 (2)	21:49 23	06:36 (2)	20:55 27	07:30 (3)	19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	06:57 (3) 05:39	06:06 (2) 05:20	06:07 (2)	05:45	06:14 (2)	06:32	07:02 (3)	07:23	08:14	08:09	08:45
	17:07	18:04	18:54	20:47 28	07:25 (3) 21:35 20	06:26 (2) 22:04 20	06:27 (2)	21:47 22	06:36 (2)	20:53 27	07:29 (3)	19:43	18:35	16:43	16:30
22	08:35	07:43	06:40	06:31	06:57 (3) 05:38	06:05 (2) 05:20	06:08 (2)	05:46	06:16 (2)	06:34	07:02 (3)	07:25	08:15	08:10	08:46
	17:09	18:06	18:55	20:48 27	07:24 (3) 21:37 21	06:26 (2) 22:04 20	06:28 (2)	21:46 20	06:36 (2)	20:51 28	07:30 (3)	19:41	18:33	16:41	16:31
23	08:34	07:41	06:38	06:28	06:57 (3) 05:37	06:04 (2) 05:20	06:08 (2)	05:47	06:17 (2)	06:36	07:03 (3)	07:26	08:17	08:12	08:46
	17:11	18:07	18:57	20:50 27	07:24 (3) 21:38 23	06:27 (2) 22:04 20	06:28 (2)	21:45 19	06:36 (2)	20:49 27	07:30 (3)	19:38	18:31	16:40	16:31
24	08:33	07:39	06:36	06:26	06:57 (3) 05:35	06:03 (2) 05:21	06:08 (2)	05:49	06:18 (2)	06:37	07:04 (3)	07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52 26	07:23 (3) 21:39 24	06:27 (2) 22:04 20	06:28 (2)	21:44 17	06:35 (2)	20:47 25	07:29 (3)	19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	06:58 (3) 05:34	06:02 (2) 05:21	06:08 (2)	05:50	06:20 (2)	06:39	07:06 (3)	07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53 24	07:22 (3) 21:41 25	06:27 (2) 22:04 21	06:29 (2)	21:42 15	06:35 (2)	20:45 23	07:29 (3)	19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	06:59 (3) 05:33	06:01 (2) 05:21	06:08 (2)	05:52	06:21 (2)	06:41	07:07 (3)	07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55 22	07:21 (3) 21:42 26	06:27 (2) 22:04 21	06:29 (2)	21:41 13	06:34 (2)	20:43 21	07:28 (3)	19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	06:59 (3) 05:32	06:00 (2) 05:22	06:09 (2)	05:53	06:22 (2)	06:42	07:09 (3)	07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57 21	07:20 (3) 21:43 27	06:27 (2) 22:04 21	06:30 (2)	21:39 11	06:33 (2)	20:40 18	07:27 (3)	19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	07:00 (3) 05:31	05:59 (2) 05:22	06:08 (2)	05:55	06:24 (2)	06:44	07:10 (3)	07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58 18	07:18 (3) 21:45 28	06:27 (2) 22:04 22	06:30 (2)	21:38 9	06:33 (2)	20:38 16	07:26 (3)	19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	07:02 (3) 05:30	05:59 (2) 05:23	06:09 (2)	05:56	06:25 (2)	06:45	07:12 (3)	07:36	07:28	08:21	08:48
	17:21		20:07	21:00 14	07:16 (3) 21:46 28	06:27 (2) 22:04 22	06:31 (2)	21:36 7	06:32 (2)	20:36 13	07:25 (3)	19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	07:05 (3) 05:29	05:59 (2) 05:23	06:08 (2)	05:58	06:27 (2)	06:47	07:13 (3)	07:38	07:30	08:23	08:48
	17:23		20:09	21:02 9	07:14 (3) 21:47 28	06:27 (2) 22:04 23	06:31 (2)	21:35 4	06:31 (2)	20:34 9	07:22 (3)	19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	05:59 (2)		05:59	06:28 (2)	06:49	07:15 (3)		07:32		08:48
	17:25		20:11		21:48 28	06:27 (2)		21:33 2	06:29 (2)	20:32 6	07:21 (3)		17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				377	363	681	652	378	2			
Sun reduction				0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.				0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.				0,63	0,67	0,67	0,67	0,63	0,63			
Total reduction				0,25	0,27	0,25	0,26	0,25	0,22			
Total, real				94	99	169	169	94	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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 11

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 11 - Bolgerijsekade 1

Assumptions for shadow calculations

Maximum distance for influence	2.000 m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48	08:21	07:28	07:17	06:12	05:27	06:04 (2) 05:24	06:13 (2) 06:01	06:29 (2) 06:50	07:39	07:33	08:24
	16:39	17:27	18:18	20:12	21:03	21:49 23	06:27 (2) 22:03 16	06:29 (2) 21:31 2	06:31 (2) 20:29	19:20	17:14	16:33
2	08:48	08:20	07:26	07:15	06:10	05:26	06:04 (2) 05:25	06:12 (2) 06:02	06:52	07:41	07:35	08:26
	16:40	17:29	18:20	20:14	21:05	21:50 23	06:27 (2) 22:03 17	06:29 (2) 21:30	20:27	19:17	17:12	16:32
3	08:48	08:18	07:24	07:13	06:09	05:25	06:04 (2) 05:25	06:13 (2) 06:04	06:54	07:43	07:37	08:27
	16:41	17:30	18:22	20:16	21:07	21:52 22	06:26 (2) 22:03 17	06:30 (2) 21:28	20:25	19:15	17:10	16:32
4	08:48	08:17	07:21	07:10	06:07	05:25	06:05 (2) 05:26	06:13 (2) 06:05	06:55	07:44	07:39	08:29
	16:42	17:32	18:24	20:18	21:08	21:53 22	06:27 (2) 22:02 18	06:31 (2) 21:26	20:23	19:13	17:08	16:31
5	08:48	08:15	07:19	07:08	06:05	05:24	06:05 (2) 05:27	06:13 (2) 06:07	06:57	07:46	07:41	08:30
	16:43	17:34	18:26	20:19	21:10	21:54 21	06:26 (2) 22:02 19	06:32 (2) 21:25	20:20	19:11	17:06	16:31
6	08:47	08:13	07:17	07:06	06:03	05:23	06:06 (2) 05:28	06:12 (2) 06:08	06:59	07:48	07:42	08:31
	16:45	17:36	18:27	20:21	21:12	21:55 20	06:26 (2) 22:01 19	06:31 (2) 21:23	20:18	19:08	17:05	16:30
7	08:47	08:12	07:15	07:04	06:01	05:23	06:06 (2) 05:29	06:12 (2) 06:10	07:00	07:50	07:44	08:32
	16:46	17:38	18:29	20:23	21:13	21:55 20	06:26 (2) 22:01 20	06:32 (2) 21:21	20:16	19:06	17:03	16:30
8	08:46	08:10	07:12	07:01	05:59	05:22	06:07 (2) 05:30	06:12 (2) 06:11	07:02	07:51	07:46	08:34
	16:47	17:40	18:31	20:24	21:15	21:56 19	06:26 (2) 22:00 21	06:33 (2) 21:19	20:13	19:04	17:01	16:30
9	08:46	08:08	07:10	06:59	05:58	05:22	06:07 (2) 05:31	06:12 (2) 06:13	07:03	07:53	07:48	08:35
	16:48	17:42	18:33	20:26	21:17	21:57 18	06:25 (2) 21:59 21	06:33 (2) 21:17	20:11	19:01	17:00	16:29
10	08:45	08:06	07:08	06:57	05:56	05:21	06:08 (2) 05:32	06:11 (2) 06:15	07:05	07:55	07:49	08:36
	16:50	17:43	18:34	20:28	21:18	21:58 17	06:25 (2) 21:59 23	06:34 (2) 21:15	20:09	18:59	16:58	16:29
11	08:45	08:04	07:06	06:55	05:54	05:21	06:09 (2) 05:33	06:11 (2) 06:16	07:07	07:56	07:51	08:37
	16:51	17:45	18:36	20:30	21:20	21:59 16	06:25 (2) 21:58 23	06:34 (2) 21:14	20:06	18:57	16:56	16:29
12	08:44	08:03	07:03	06:52	07:15 (3) 05:53	06:18 (2) 05:21	06:09 (2) 05:34	06:11 (2) 06:18	07:08	07:58	07:53	08:38
	16:53	17:47	18:38	20:31 2	07:17 (3) 21:21 3	06:21 (2) 21:59 15	06:24 (2) 21:57 24	06:35 (2) 21:12	20:04	18:55	16:55	16:29
13	08:44	08:01	07:01	06:50	07:13 (3) 05:51	06:17 (2) 05:20	06:10 (2) 05:35	06:11 (2) 06:19	07:12 (3) 07:10	08:00	07:55	08:39
	16:54	17:49	18:40	20:33 6	07:19 (3) 21:23 6	06:23 (2) 22:00 14	06:24 (2) 21:56 24	06:35 (2) 21:10 6	07:18 (3) 20:02	18:53	16:53	16:29
14	08:43	07:59	06:59	06:48	07:11 (3) 05:49	06:15 (2) 05:20	06:10 (2) 05:36	06:11 (2) 06:21	07:09 (3) 07:12	08:01	07:57	08:40
	16:56	17:51	18:41	20:35 9	07:20 (3) 21:25 8	06:23 (2) 22:01 14	06:24 (2) 21:55 25	06:36 (2) 21:08 12	07:21 (3) 19:59	18:50	16:52	16:29
15	08:42	07:57	06:57	06:46	07:09 (3) 05:48	06:14 (2) 05:20	06:11 (2) 05:37	06:10 (2) 06:23	07:07 (3) 07:13	08:03	07:58	08:41
	16:57	17:53	18:43	20:36 12	07:21 (3) 21:26 10	06:24 (2) 22:01 13	06:24 (2) 21:54 26	06:36 (2) 21:06 15	07:22 (3) 19:57	18:48	16:50	16:29
16	08:41	07:55	06:54	06:43	07:07 (3) 05:46	06:13 (2) 05:20	06:11 (2) 05:38	06:10 (2) 06:24	07:06 (3) 07:15	08:05	08:00	08:42
	16:59	17:55	18:45	20:38 15	07:22 (3) 21:28 12	06:25 (2) 22:02 13	06:24 (2) 21:53 26	06:36 (2) 21:04 18	07:24 (3) 19:55	18:46	16:49	16:29
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	17:00	17:56	18:47	20:40 18	07:22 (3) 21:29 14	06:25 (2) 22:02 12	06:24 (2) 21:52 26	06:37 (2) 21:02 21	07:25 (3) 19:52	18:44	16:48	16:29
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	17:04	18:00	18:50	20:43 22	07:22 (3) 21:32 18	06:27 (2) 22:03 12	06:24 (2) 21:50 25	06:37 (2) 20:58 24	07:26 (3) 19:48	18:40	16:45	16:30
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	17:05	18:02	18:52	20:45 24	07:22 (3) 21:34 19	06:26 (2) 22:03 11	06:24 (2) 21:49 24	06:37 (2) 20:55 26	07:27 (3) 19:45	18:37	16:44	16:30
21	08:36	07:45	06:43	06:33	06:56 (3) 05:39	06:06 (2) 05:20	06:13 (2) 05:45	06:14 (2) 06:32	07:00 (3) 07:23	08:14	08:09	08:45
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24	08:33	07:39	06:36	06:26	06:56 (3) 05:35	06:03 (2) 05:21	06:13 (2) 05:49	06:18 (2) 06:37	07:04 (3) 07:28	08:19	08:14	08:47
	17:12	18:09	18:59	20:52 24	07:20 (3) 21:39 24	06:27 (2) 22:04 12	06:25 (2) 21:44 19	06:37 (2) 20:47 22	07:26 (3) 19:36	18:29	16:39	16:32
25	08:31	07:37	06:33	06:24	06:57 (3) 05:34	06:02 (2) 05:21	06:14 (2) 05:50	06:20 (2) 06:39	07:06 (3) 07:30	07:21	08:15	08:47
	17:14	18:11	19:00	20:53 22	07:19 (3) 21:41 26	06:28 (2) 22:04 12	06:26 (2) 21:42 17	06:37 (2) 20:45 20	07:26 (3) 19:34	17:27	16:38	16:33
26	08:30	07:34	06:31	06:22	06:57 (3) 05:33	06:01 (2) 05:21	06:14 (2) 05:52	06:21 (2) 06:41	07:07 (3) 07:31	07:23	08:17	08:48
	17:16	18:13	19:02	20:55 21	07:18 (3) 21:42 27	06:28 (2) 22:04 12	06:26 (2) 21:41 15	06:36 (2) 20:43 17	07:24 (3) 19:31	17:25	16:37	16:33
27	08:29	07:32	06:29	06:20	06:58 (3) 05:32	06:02 (2) 05:22	06:14 (2) 05:53	06:22 (2) 06:42	07:09 (3) 07:33	07:24	08:18	08:48
	17:18	18:15	19:04	20:57 18	07:16 (3) 21:43 26	06:28 (2) 22:04 13	06:27 (2) 21:39 13	06:35 (2) 20:40 15	07:24 (3) 19:29	17:23	16:36	16:34
28	08:27	07:30	06:26	06:18	06:59 (3) 05:31	06:02 (2) 05:22	06:13 (2) 05:55	06:24 (2) 06:44	07:10 (3) 07:34	07:26	08:20	08:48
	17:19	18:17	19:06	20:58 16	07:15 (3) 21:45 25	06:27 (2) 22:04 14	06:27 (2) 21:38 11	06:35 (2) 20:38 12	07:22 (3) 19:27	17:21	16:35	16:35
29	08:26		07:24	06:16	07:01 (3) 05:30	06:02 (2) 05:23	06:14 (2) 05:56	06:25 (2) 06:45	07:12 (3) 07:36	07:28	08:21	08:48
	17:21		20:07	21:00 11	07:12 (3) 21:46 25	06:27 (2) 22:04 14	06:28 (2) 21:36 9	06:34 (2) 20:36 9	07:21 (3) 19:24	17:19	16:35	16:36
30	08:24		07:22	06:14	05:29	06:02 (2) 05:23	06:13 (2) 05:58	06:27 (2) 06:47	07:13 (3) 07:38	07:30	08:23	08:48
	17:23		20:09	21:02	21:47 25	06:27 (2) 22:04 15	06:28 (2) 21:35 7	06:34 (2) 20:34 6	07:19 (3) 19:22	17:17	16:34	16:37
31	08:23		07:20		05:28	06:03 (2)	05:59	06:28 (2) 06:49	07:15 (3)	07:32		08:48
	17:25		20:11		21:48 24	06:27 (2)	21:33 4	06:32 (2) 20:32 2	07:17 (3)	17:15		16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case				316	374	462	599	326				
Sun reduction				0,42	0,43	0,39	0,41	0,42				
Oper. time red.				0,95	0,95	0,95	0,95	0,95				
Wind dir. red.				0,63	0,67	0,67	0,67	0,63				
Total reduction				0,25	0,27	0,25	0,26	0,25				
Total, real				79	102	115	155	81				

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

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

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 12

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 12 - Bolgerijsekade 9

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12	06:12 - 21:03	05:27 - 21:49	05:24 - 22:03	06:01 - 21:31	06:50 - 20:29	07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:28	07:26 - 18:20	07:15 - 20:14	06:10 - 21:05	05:26 - 21:50	05:25 - 22:03	06:02 - 21:30	06:52 - 20:27	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 20:16	06:09 - 21:07	05:25 - 21:51	05:25 - 22:03	06:04 - 21:28	06:54 - 20:25	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:18	06:07 - 21:08	05:25 - 21:53	05:26 - 22:02	05:57 (3) - 21:26	06:55 - 20:22	07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 20:19	06:05 - 21:10	05:24 - 21:54	05:27 - 22:02	05:58 (3) - 21:25	06:57 - 20:20	07:46 - 19:11	07:40 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21	06:03 - 21:12	05:23 - 21:55	05:28 - 22:01	05:58 (3) - 21:23	06:59 - 20:18	07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:03 - 20:23	06:01 - 21:13	05:23 - 21:55	05:29 - 22:01	05:59 (3) - 21:21	07:00 - 20:16	07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:46 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24	05:59 - 21:15	05:22 - 21:56	05:30 - 22:00	06:00 (3) - 21:19	07:02 - 20:13	07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:41	07:10 - 18:33	06:59 - 20:26	05:58 - 21:17	05:22 - 21:57	05:31 - 21:59	06:01 (3) - 21:17	07:03 - 20:11	07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28	05:56 - 21:18	05:21 - 21:58	05:32 - 21:59	06:02 (3) - 21:15	07:05 - 20:09	07:55 - 18:59	07:49 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:54 - 20:29	05:54 - 21:20	05:21 - 21:59	05:33 - 21:58	06:03 (3) - 21:14	07:07 - 20:06	07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31	05:53 - 21:21	05:21 - 21:59	05:34 - 21:57	06:04 (3) - 21:12	07:08 - 20:04	07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:43 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 21:23	05:20 - 22:00	05:35 - 21:56	06:05 (3) - 21:10	07:10 - 20:02	08:00 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 21:25	05:20 - 22:01	05:36 - 21:55	06:06 (3) - 21:08	07:12 - 19:59	08:01 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 21:26	05:20 - 22:01	05:37 - 21:54	06:07 (3) - 21:06	07:13 - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 21:28	05:20 - 22:02	05:38 - 21:53	06:08 (3) - 21:04	07:15 - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 21:29	05:20 - 22:02	05:40 - 21:52	06:10 (3) - 21:02	07:16 - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41	05:43 - 21:31	05:20 - 22:03	05:41 - 21:51	06:11 (3) - 21:00	07:18 - 19:50	08:08 - 18:42	08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43	05:42 - 21:32	05:20 - 22:03	05:42 - 21:50	06:12 (3) - 20:58	07:20 - 19:48	08:10 - 18:40	08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45	05:40 - 21:34 (6)	06:07 (3) - 06:13 (3)	05:43 - 22:03	06:13 (3) - 20:55	06:31 - 19:45	07:21 - 18:37	08:12 - 16:44	08:07 - 16:30	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 20:47	05:39 - 21:35 (10)	06:06 (3) - 06:16 (3)	05:45 - 22:04	06:14 (3) - 20:53	06:32 - 19:43	07:23 - 18:35	08:14 - 16:43	08:09 - 16:30	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 20:48	05:38 - 21:36 (13)	06:05 (3) - 06:18 (3)	05:46 - 22:04	06:16 (3) - 20:51	06:34 - 19:41	07:25 - 18:33	08:15 - 16:41	08:10 - 16:31	08:46 - 16:31
23	08:34 - 17:10	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50	05:37 - 21:38 (16)	06:04 (3) - 06:20 (3)	05:47 - 22:04	06:17 (3) - 20:49	06:36 - 19:38	07:26 - 18:31	08:17 - 16:40	08:12 - 16:31	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 20:52	05:35 - 21:39 (18)	06:03 (3) - 06:21 (3)	05:49 - 22:04	06:18 (3) - 20:47	06:37 - 19:36	07:28 - 18:29	08:19 - 16:39	08:14 - 16:32	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 20:53	05:34 - 21:41 (20)	06:02 (3) - 06:22 (3)	05:50 - 22:04	06:39 - 20:45	07:29 - 19:34	07:21 - 17:27	08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 20:55	05:33 - 21:42 (22)	06:01 (3) - 06:23 (3)	05:52 - 22:04	06:41 - 20:43	07:31 - 19:31	07:23 - 17:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 20:57	05:32 - 21:43 (24)	06:00 (3) - 06:24 (3)	05:53 - 22:04	06:42 - 20:40	07:33 - 19:29	07:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 20:58	05:31 - 21:45 (26)	05:59 (3) - 06:25 (3)	05:54 - 22:04	06:44 - 20:38	07:34 - 19:27	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07	06:16 - 21:00	05:30 - 21:46 (27)	05:58 (3) - 06:25 (3)	05:55 - 22:04	06:45 - 20:36	07:36 - 19:24	07:28 - 17:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09	06:14 - 21:02	05:29 - 21:47 (29)	05:57 (3) - 06:26 (3)	05:55 - 22:04	06:47 - 20:34	07:38 - 19:22	07:30 - 17:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11		05:28 - 21:48 (30)	05:56 (3) - 06:26 (3)	05:59 - 21:33	06:49 - 20:32		07:31 - 17:15		08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	244
Total, worst case					241	1173	662					
Sun reduction					0,43	0,39	0,41					
Oper. time red.					0,95	0,95	0,95					
Wind dir. red.					0,67	0,67	0,67					
Total reduction					0,27	0,25	0,26					
Total, real					66	292	172					

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 13
Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 13 - Bolgerijsekade 8

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 20:12	06:12 - 21:03	05:27 - 21:49	05:24 - 22:03	06:01 - 21:31	06:50 - 20:29	07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:29	07:26 - 18:20	07:15 - 20:14	06:10 - 21:05	05:26 - 21:50	05:25 - 22:03	06:02 - 21:30	06:52 - 20:27	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 20:16	06:09 - 21:07	05:25 - 21:52	05:25 - 22:03	06:04 - 21:28	06:54 - 20:25	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 20:18	06:07 - 21:08	05:25 - 21:53	05:25 - 22:02	06:05 - 21:26	06:55 - 20:23	07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 20:19	06:05 - 21:10	05:24 - 21:54	05:27 - 22:02	06:07 - 21:25	06:57 - 20:20	07:46 - 19:11	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 20:21	06:03 - 21:12	05:23 - 21:55	05:28 - 22:01	06:08 - 21:23	06:59 - 20:18	07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:04 - 20:23	06:01 - 21:13	05:23 - 21:55	05:29 - 22:01	06:08 - 21:21	07:00 - 20:16	07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:47 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 20:24	05:59 - 21:15	05:22 - 21:56	05:30 - 22:00	06:12 - 21:19	07:02 - 20:13	07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	06:59 - 20:26	05:58 - 21:17	05:22 - 21:57	05:31 - 22:00	06:13 - 21:17	06:55 (2) - 07:04 (2) - 20:11	07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28	05:56 - 21:18	05:21 - 21:58	05:32 - 22:00	06:15 - 21:15	06:53 (2) - 07:05 - 20:09	07:55 - 18:59	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:55 - 20:30	05:54 - 21:20	05:21 - 21:59	05:33 - 22:00	06:16 - 21:14	06:51 (2) - 07:07 - 20:06	07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31	05:53 - 21:22	05:21 - 21:59	05:34 - 22:00	06:18 - 21:12	06:51 (2) - 07:08 - 20:04	07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 21:23	05:20 - 22:00	05:35 - 21:58	06:20 - 21:10	06:49 (2) - 07:09 (2) - 20:02	07:59 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 21:25	05:20 - 22:01	05:36 - 21:55	06:21 - 21:08	07:12 - 19:59	08:02 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 21:26	05:20 - 22:01	05:37 - 21:54	06:23 - 21:06	07:13 - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 21:28	05:20 - 22:02	05:38 - 21:53	06:24 - 21:04	07:15 - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 21:29	05:20 - 22:02	05:40 - 21:52	06:26 - 21:02	07:16 - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41	05:43 - 21:31	05:20 - 22:03	05:41 - 21:51	06:28 - 21:00	07:18 - 19:50	08:08 - 18:42	08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 20:43	05:42 - 21:32	05:20 - 22:03	05:42 - 21:50	06:29 - 20:58	07:20 - 19:48	08:10 - 18:40	08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 20:45	06:58 (2) - 07:00 (2) - 21:34	05:41 - 22:03	05:43 - 21:49	06:31 - 20:55	07:21 - 19:45	08:12 - 18:37	08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 20:47	06:56 (2) - 07:01 (2) - 21:35	05:39 - 22:04	05:45 - 21:47	06:32 - 20:53	07:23 - 19:43	08:14 - 18:35	08:09 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 20:48	06:54 (2) - 07:02 (2) - 21:37	05:38 - 22:04	05:46 - 21:46	06:34 - 20:51	07:25 - 19:41	08:15 - 18:33	08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:11	07:41 - 18:07	06:38 - 18:57	06:28 - 20:50	06:52 (2) - 07:02 (2) - 21:38	05:37 - 22:04	06:04 (1) - 06:22 (1) - 21:45	06:36 - 20:49	07:26 - 19:38	08:17 - 18:31	08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 20:52	06:50 (2) - 07:02 (2) - 21:39	05:35 - 22:04	06:03 (1) - 06:22 (1) - 21:44	06:37 - 20:47	07:28 - 19:36	08:19 - 18:29	08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 20:53	06:48 (2) - 07:02 (2) - 21:41	05:34 - 22:04	06:02 (1) - 06:22 (1) - 21:42	06:39 - 20:45	07:30 - 19:34	08:21 - 18:27	08:17 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 20:55	06:46 (2) - 07:02 (2) - 21:42	05:33 - 22:04	06:01 (1) - 06:22 (1) - 21:41	06:41 - 20:43	07:31 - 19:31	08:23 - 18:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 20:57	06:44 (2) - 07:02 (2) - 21:43	05:32 - 22:04	06:00 (1) - 06:22 (1) - 21:39	06:42 - 20:40	07:33 - 19:29	08:24 - 18:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 20:58	06:42 (2) - 07:01 (2) - 21:45	05:31 - 22:04	05:59 (1) - 06:22 (1) - 21:38	06:44 - 20:38	07:34 - 19:27	08:26 - 18:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07 (2)	07:47 (3) - 07:48 (3) - 21:00	06:41 (2) - 07:01 (2) - 21:46	05:30 - 22:04	05:58 (1) - 06:22 (1) - 21:36	06:45 - 20:36	07:36 - 19:24	08:28 - 18:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09 (4)	07:44 (3) - 07:48 (3) - 21:02	06:42 (2) - 07:01 (2) - 21:47	05:29 - 22:04	05:59 (1) - 06:22 (1) - 21:35	06:47 - 20:34	07:38 - 19:22	08:30 - 18:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11 (8)	07:42 (3) - 07:50 (3)	05:28 - 21:48	05:59 (1) - 06:22 (1) - 23	05:59 - 21:33	06:49 - 20:32	07:32 - 17:15	08:48 - 16:37		
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			14	289	332	471	508	197	161			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,63	0,63	0,67	0,67	0,67	0,64	0,63			
Total reduction			0,20	0,25	0,27	0,25	0,26	0,25	0,21			
Total, real			3	73	90	117	131	50	35			

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

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

Project:

068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 14
Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 14 - Bolgerijsekade 6

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:48 - 16:39	08:21 - 17:27	07:28 - 18:18	07:17 - 07:40 (3) - 20:12	06:12 - 06:46 (2) - 21:03	05:27 - 06:04 (1) - 21:49	05:24 - 06:24 (1) - 22:03	06:15 (1) - 06:24 (1) - 21:31	06:01 - 06:50 - 20:29	07:39 - 19:20	07:33 - 17:14	08:24 - 16:33
2	08:48 - 16:40	08:20 - 17:29	07:26 - 18:20	07:15 - 07:38 (3) - 20:14	06:10 - 06:47 (2) - 21:05	05:26 - 06:04 (1) - 21:50	05:25 - 06:23 (1) - 22:03	06:14 (1) - 06:24 (1) - 21:30	06:02 - 06:52 - 20:27	07:41 - 19:17	07:35 - 17:12	08:26 - 16:32
3	08:48 - 16:41	08:18 - 17:30	07:24 - 18:22	07:13 - 07:35 (3) - 20:16	06:09 - 06:51 (2) - 21:07	05:25 - 06:04 (1) - 21:52	05:25 - 06:23 (1) - 22:03	06:14 (1) - 06:25 (1) - 21:28	06:04 - 06:54 - 20:25	07:43 - 19:15	07:37 - 17:10	08:27 - 16:32
4	08:48 - 16:42	08:17 - 17:32	07:21 - 18:24	07:10 - 07:33 (3) - 20:18	06:07 - 06:51 (3) - 21:08	05:25 - 06:23 (1) - 21:53	05:26 - 06:26 (1) - 22:02	06:14 (1) - 06:26 (1) - 21:26	06:05 - 06:55 - 20:23	07:44 - 19:13	07:39 - 17:08	08:29 - 16:31
5	08:48 - 16:43	08:15 - 17:34	07:19 - 18:26	07:08 - 07:31 (3) - 20:19	06:05 - 06:50 (3) - 21:10	05:24 - 06:22 (1) - 21:54	05:27 - 06:27 (1) - 22:02	06:14 (1) - 06:27 (1) - 21:25	06:07 - 06:57 - 20:20	07:46 - 19:11	07:41 - 17:06	08:30 - 16:31
6	08:47 - 16:45	08:13 - 17:36	07:17 - 18:27	07:06 - 07:32 (3) - 20:21	06:03 - 06:49 (3) - 21:12	05:23 - 06:22 (1) - 21:55	05:28 - 06:27 (1) - 22:01	06:13 (1) - 06:27 (1) - 21:23	06:08 - 06:59 - 20:18	07:48 - 19:08	07:42 - 17:05	08:31 - 16:30
7	08:47 - 16:46	08:12 - 17:38	07:15 - 18:29	07:04 - 07:32 (3) - 20:23	06:01 - 06:47 (3) - 21:13	05:23 - 06:21 (1) - 21:55	05:29 - 06:28 (1) - 22:01	06:12 (1) - 06:28 (1) - 21:21	06:10 - 07:00 - 20:16	07:50 - 19:06	07:44 - 17:03	08:32 - 16:30
8	08:47 - 16:47	08:10 - 17:40	07:12 - 18:31	07:01 - 07:33 (3) - 20:24	05:59 - 06:45 (3) - 21:15	05:22 - 06:21 (1) - 21:56	05:30 - 06:29 (1) - 22:00	06:12 (1) - 06:29 (1) - 21:19	06:12 - 07:02 - 20:13	07:51 - 19:04	07:46 - 17:01	08:34 - 16:30
9	08:46 - 16:48	08:08 - 17:42	07:10 - 18:33	06:59 - 07:32 (3) - 20:26	05:58 - 06:43 (3) - 21:17	05:22 - 06:20 (1) - 21:57	05:31 - 06:30 (1) - 21:59	06:12 (1) - 06:30 (1) - 21:17	06:13 - 07:03 - 20:11	07:53 - 19:01	07:48 - 17:00	08:35 - 16:29
10	08:45 - 16:50	08:06 - 17:43	07:08 - 18:34	06:57 - 20:28	05:56 - 21:18	05:21 - 06:10 (1) - 21:58	05:32 - 06:30 (1) - 21:59	06:12 (1) - 06:15 - 06:30 (1) - 21:15	06:59 (2) - 07:05 - 20:09	07:31 (3) - 07:55 - 18:59	07:50 - 16:58	08:36 - 16:29
11	08:45 - 16:51	08:04 - 17:45	07:06 - 18:36	06:55 - 20:30	05:54 - 21:20	05:21 - 06:11 (1) - 21:59	05:33 - 06:31 (1) - 21:58	06:11 (1) - 06:16 - 06:31 (1) - 21:14	06:55 (2) - 07:07 - 20:06	07:32 (3) - 07:56 - 18:57	07:51 - 16:56	08:37 - 16:29
12	08:44 - 16:53	08:03 - 17:47	07:03 - 18:38	06:52 - 20:31	05:53 - 21:22	05:21 - 06:11 (1) - 21:59	05:34 - 06:32 (1) - 21:57	06:11 (1) - 06:18 - 06:32 (1) - 21:12	06:54 (2) - 07:08 - 20:04	07:34 (3) - 07:58 - 18:55	07:53 - 16:55	08:38 - 16:29
13	08:44 - 16:54	08:01 - 17:49	07:01 - 18:40	06:50 - 20:33	05:51 - 06:17 (1) - 21:23	05:20 - 06:12 (1) - 22:00	05:35 - 06:33 (1) - 21:56	06:11 (1) - 06:20 - 06:32 (1) - 21:10	06:52 (2) - 07:10 - 20:02	07:35 (3) - 08:00 - 18:53	07:55 - 16:53	08:39 - 16:29
14	08:43 - 16:56	07:59 - 17:51	06:59 - 18:41	06:48 - 20:35	05:49 - 06:15 (1) - 21:25	05:20 - 06:14 (1) - 22:01	05:36 - 06:34 (1) - 21:55	06:11 (1) - 06:21 - 06:32 (1) - 21:08	06:52 (2) - 07:12 - 20:09	07:37 (3) - 08:02 - 18:50	07:57 - 16:52	08:40 - 16:29
15	08:42 - 16:57	07:57 - 17:53	06:57 - 18:43	06:46 - 20:36	05:48 - 06:14 (1) - 21:26	05:20 - 06:18 (1) - 22:01	05:37 - 06:35 (1) - 21:54	06:10 (1) - 06:23 - 06:33 (1) - 21:06	06:51 (2) - 07:13 - 19:57	08:03 - 18:48	07:58 - 16:50	08:41 - 16:29
16	08:41 - 16:59	07:55 - 17:55	06:54 - 18:45	06:43 - 20:38	05:46 - 06:13 (1) - 21:28	05:20 - 06:23 (1) - 22:02	05:38 - 06:36 (1) - 21:53	06:10 (1) - 06:24 - 06:33 (1) - 21:04	06:52 (2) - 07:15 - 19:55	08:05 - 18:46	08:00 - 16:49	08:42 - 16:29
17	08:40 - 17:00	07:53 - 17:56	06:52 - 18:47	06:41 - 20:40	05:45 - 06:11 (1) - 21:29	05:20 - 06:23 (1) - 22:02	05:40 - 06:37 (1) - 21:52	06:11 (1) - 06:26 - 06:34 (1) - 21:02	06:53 (2) - 07:16 - 19:52	08:07 - 18:44	08:02 - 16:48	08:43 - 16:29
18	08:39 - 17:02	07:51 - 17:58	06:50 - 18:48	06:39 - 20:41	05:43 - 06:10 (1) - 21:31	05:20 - 06:24 (1) - 22:03	05:41 - 06:38 (1) - 21:51	06:11 (1) - 06:28 - 06:34 (1) - 21:00	06:55 (2) - 07:18 - 19:50	08:08 - 18:42	08:04 - 16:46	08:43 - 16:29
19	08:38 - 17:04	07:49 - 18:00	06:47 - 18:50	06:37 - 07:00 (2) - 20:43	05:42 - 06:09 (1) - 21:32	05:20 - 06:24 (1) - 22:03	05:42 - 06:39 (1) - 21:50	06:12 (1) - 06:29 - 06:34 (1) - 20:58	06:56 (2) - 07:20 - 19:48	08:10 - 18:40	08:05 - 16:45	08:44 - 16:30
20	08:37 - 17:05	07:47 - 18:02	06:45 - 18:52	06:35 - 06:58 (2) - 20:45	05:41 - 06:07 (1) - 21:34	05:20 - 06:24 (1) - 22:03	05:43 - 06:41 (1) - 21:49	06:13 (1) - 06:31 - 06:34 (1) - 20:55	06:58 (2) - 07:21 - 19:45	08:12 - 18:37	08:07 - 16:44	08:45 - 16:30
21	08:36 - 17:07	07:45 - 18:04	06:43 - 18:54	06:33 - 06:56 (2) - 20:47	05:39 - 06:06 (1) - 21:35	05:20 - 06:24 (1) - 22:04	05:45 - 06:44 (1) - 21:47	06:14 (1) - 06:32 - 06:34 (1) - 20:53	06:59 (2) - 07:23 - 19:43	08:14 - 18:35	08:09 - 16:43	08:45 - 16:30
22	08:35 - 17:09	07:43 - 18:06	06:40 - 18:55	06:31 - 06:54 (2) - 20:48	05:38 - 06:05 (1) - 21:37	05:20 - 06:24 (1) - 22:04	05:46 - 06:46 (1) - 21:46	06:16 (1) - 06:34 - 06:35 (1) - 20:51	07:01 (2) - 07:25 - 19:41	08:15 - 18:33	08:10 - 16:41	08:46 - 16:31
23	08:34 - 17:11	07:41 - 18:07	06:38 - 18:57	06:28 - 06:52 (2) - 20:50	05:37 - 06:04 (1) - 21:38	05:20 - 06:25 (1) - 22:04	05:47 - 06:48 (1) - 21:45	06:17 (1) - 06:36 - 06:35 (1) - 20:49	07:03 (2) - 07:26 - 19:38	08:17 - 18:31	08:12 - 16:40	08:46 - 16:31
24	08:33 - 17:12	07:39 - 18:09	06:36 - 18:59	06:26 - 06:50 (2) - 20:52	05:35 - 06:03 (1) - 21:39	05:21 - 06:25 (1) - 22:04	05:49 - 06:50 (1) - 21:44	06:18 (1) - 06:37 - 06:34 (1) - 20:47	07:04 (2) - 07:28 - 19:36	08:19 - 18:29	08:14 - 16:39	08:47 - 16:32
25	08:31 - 17:14	07:37 - 18:11	06:33 - 19:00	06:24 - 06:48 (2) - 20:53	05:34 - 06:02 (1) - 21:41	05:21 - 06:25 (1) - 22:04	05:50 - 06:52 (1) - 21:42	06:20 (1) - 06:39 - 06:35 (1) - 20:45	07:30 - 19:34	07:21 - 17:27	08:15 - 16:38	08:47 - 16:33
26	08:30 - 17:16	07:34 - 18:13	06:31 - 19:02	06:22 - 06:46 (2) - 20:55	05:33 - 06:01 (1) - 21:42	05:21 - 06:25 (1) - 22:04	05:52 - 06:53 (1) - 21:41	06:21 (1) - 06:41 - 06:34 (1) - 20:43	07:31 - 19:31	07:23 - 17:25	08:17 - 16:37	08:48 - 16:33
27	08:29 - 17:18	07:32 - 18:15	06:29 - 19:04	06:20 - 06:44 (2) - 20:57	05:32 - 06:01 (1) - 21:43	05:22 - 06:25 (1) - 22:04	05:53 - 06:55 (1) - 21:39	06:22 (1) - 06:42 - 06:33 (1) - 20:40	07:33 - 19:29	07:24 - 17:23	08:18 - 16:36	08:48 - 16:34
28	08:27 - 17:19	07:30 - 18:17	06:26 - 19:06	06:18 - 06:43 (2) - 20:58	05:31 - 06:02 (1) - 21:45	05:22 - 06:17 (1) - 22:04	05:55 - 06:56 (1) - 21:38	06:24 (1) - 06:44 - 06:33 (1) - 20:38	07:34 - 19:27	07:26 - 17:21	08:20 - 16:35	08:48 - 16:35
29	08:26 - 17:21		07:24 - 20:07	07:47 (3) - 07:50 (3) - 21:00	05:30 - 06:02 (1) - 21:46	05:23 - 06:24 (1) - 22:04	06:20 (1) - 06:40 (1) - 21:36	06:25 (1) - 06:46 - 06:32 (1) - 20:36	07:36 - 19:24	07:28 - 17:19	08:21 - 16:35	08:48 - 16:36
30	08:24 - 17:23		07:22 - 20:09	07:44 (3) - 07:50 (3) - 21:02	05:29 - 06:01 (1) - 21:47	05:23 - 06:24 (1) - 22:04	06:17 (1) - 06:36 (1) - 21:35	06:27 (1) - 06:47 - 06:32 (1) - 20:34	07:38 - 19:22	07:30 - 17:17	08:23 - 16:34	08:48 - 16:37
31	08:23 - 17:25		07:20 - 20:11	07:42 (3) - 07:51 (3) -	05:28 - 06:03 (1) - 21:48	05:22 - 06:23 (1) -	05:58 - 06:59 (1) - 21:33	06:28 (1) - 06:49 - 06:30 (1) - 20:32		07:32 - 17:15		08:48 - 16:37
Potential sun hours	259	277	367	416	485	499	502	454	381	331	266	243
Total, worst case			18	288	350	197	491	189	151			
Sun reduction			0,33	0,42	0,43	0,39	0,41	0,42	0,36			
Oper. time red.			0,95	0,95	0,95	0,95	0,95	0,95	0,95			
Wind dir. red.			0,63	0,63	0,67	0,67	0,67	0,64	0,63			
Total reduction			0,19	0,25	0,27	0,25	0,26	0,25	0,21			
Total, real			4	72	95	49	127	48	32			

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

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

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 15

Licensed user:
LBP SIGHT
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NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 15 - Biezenweg 24

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:48		13:53 (1)	08:21	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39	07:33			08:24		13:42 (1)
	16:39	55	14:48 (1)	17:27	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20	17:13			16:33	50	14:32 (1)
2	08:48		13:53 (1)	08:20	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41	07:35			08:26		13:41 (1)
	16:40	55	14:48 (1)	17:28	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17	17:12			16:32	52	14:33 (1)
3	08:48		13:53 (1)	08:18	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43	07:37			08:27		13:42 (1)
	16:41	56	14:49 (1)	17:30	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15	17:10			16:32	52	14:34 (1)
4	08:48		13:54 (1)	08:17	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44	07:39			08:29		13:41 (1)
	16:42	55	14:49 (1)	17:32	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13	17:08			16:31	53	14:34 (1)
5	08:48		13:55 (1)	08:15	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46	07:40			08:30		13:41 (1)
	16:43	54	14:49 (1)	17:34	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10	17:06			16:31	53	14:34 (1)
6	08:47		13:56 (1)	08:13	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48	07:42			08:31		13:42 (1)
	16:44	54	14:50 (1)	17:36	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08	17:04			16:30	54	14:36 (1)
7	08:47		13:56 (1)	08:12	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49	07:44			08:32		13:42 (1)
	16:46	53	14:49 (1)	17:38	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06	17:03			16:30	54	14:36 (1)
8	08:46		13:57 (1)	08:10	07:12	07:01	05:59	05:22	05:30	06:11	07:02	07:51	07:46			08:34		13:42 (1)
	16:47	53	14:50 (1)	17:40	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04	17:01			16:29	54	14:36 (1)
9	08:46		13:58 (1)	08:08	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53	07:48			08:35		13:43 (1)
	16:48	52	14:50 (1)	17:41	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01	16:59			16:29	55	14:38 (1)
10	08:45		13:58 (1)	08:06	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55	07:49			08:36		13:43 (1)
	16:50	52	14:50 (1)	17:43	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59	16:58			16:29	55	14:38 (1)
11	08:45		14:00 (1)	08:04	07:06	06:54	05:54	05:21	05:33	06:16	07:07	07:56	07:51			08:37		13:43 (1)
	16:51	50	14:50 (1)	17:45	18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57	16:56			16:29	55	14:38 (1)
12	08:44		14:01 (1)	08:03	07:03	06:52	05:53	05:20	05:34	06:18	07:08	07:58	07:53			08:38		13:43 (1)
	16:53	49	14:50 (1)	17:47	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55	16:55			16:29	56	14:39 (1)
13	08:44		14:01 (1)	08:01	07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00	07:55			08:39		13:43 (1)
	16:54	49	14:50 (1)	17:49	18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52	16:53			16:29	56	14:39 (1)
14	08:43		14:02 (1)	07:59	06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01	07:57			08:40		13:44 (1)
	16:56	48	14:50 (1)	17:51	18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50	16:52			16:29	56	14:40 (1)
15	08:42		14:03 (1)	07:57	06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03	07:58			08:41		13:44 (1)
	16:57	46	14:49 (1)	17:53	18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48	16:50			16:29	57	14:41 (1)
16	08:41		14:04 (1)	07:55	06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05	08:00		14:03 (1)	08:42		13:45 (1)
	16:59	45	14:49 (1)	17:54	18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46	16:49	2	14:04 (1)	16:29	56	14:41 (1)
17	08:40		14:06 (1)	07:53	06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07	08:02		13:56 (1)	08:43		13:45 (1)
	17:00	43	14:49 (1)	17:56	18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44	16:47	16	14:12 (1)	16:29	57	14:42 (1)
18	08:39		14:07 (1)	07:51	06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08	08:04		13:53 (1)	08:43		13:45 (1)
	17:02	41	14:48 (1)	17:58	18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42	16:46	22	14:15 (1)	16:29	57	14:42 (1)
19	08:38		14:09 (1)	07:49	06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10	08:05		13:50 (1)	08:44		13:46 (1)
	17:04	39	14:48 (1)	18:00	18:50	20:43	21:32	22:03	21:50	20:58	19:48	18:39	16:45	28	14:18 (1)	16:29	57	14:43 (1)
20	08:37		14:09 (1)	07:47	06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12	08:07		13:49 (1)	08:45		13:47 (1)
	17:05	37	14:46 (1)	18:02	18:52	20:45	21:34	22:03	21:49	20:55	19:45	18:37	16:44	31	14:20 (1)	16:30	57	14:44 (1)
21	08:36		14:11 (1)	07:45	06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14	08:09		13:48 (1)	08:45		13:46 (1)
	17:07	35	14:46 (1)	18:04	18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35	16:42	34	14:22 (1)	16:30	58	14:44 (1)
22	08:35		14:14 (1)	07:43	06:40	06:30	05:38	05:20	05:46	06:34	07:25	08:15	08:10		13:46 (1)	08:46		13:47 (1)
	17:09	31	14:45 (1)	18:06	18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33	16:41	36	14:22 (1)	16:31	58	14:45 (1)
23	08:34		14:15 (1)	07:41	06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17	08:12		13:45 (1)	08:46		13:48 (1)
	17:10	28	14:43 (1)	18:07	18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31	16:40	39	14:24 (1)	16:31	57	14:45 (1)
24	08:33		14:19 (1)	07:39	06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19	08:14		13:44 (1)	08:47		13:48 (1)
	17:12	22	14:41 (1)	18:09	18:59	20:52	21:39	22:04	21:44	20:47	19:36	18:29	16:39	41	14:25 (1)	16:32	57	14:45 (1)
25	08:31		14:23 (1)	07:36	06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21	08:15		13:44 (1)	08:47		13:49 (1)
	17:14	16	14:39 (1)	18:11	19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27	16:38	43	14:27 (1)	16:32	57	14:46 (1)
26	08:30			07:34	06:31	06:22	05:33	05:21	05:52	06:41	07:31	07:23	08:17		13:43 (1)	08:48		13:49 (1)
	17:16			18:13	19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25	16:37	44	14:27 (1)	16:33	57	14:46 (1)
27	08:29			07:32	06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24	08:18		13:42 (1)	08:48		13:50 (1)
	17:17			18:15	19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23	16:36	46	14:28 (1)	16:34	56	14:46 (1)
28	08:27			07:30	06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26	08:20		13:42 (1)	08:48		13:50 (1)
	17:19			18:16	19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21	16:35	48	14:30 (1)	16:35	57	14:47 (1)
29	08:26				07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28	08:21		13:41 (1)	08:48		13:50 (1)
	17:21				20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19	16:34	49	14:30 (1)	16:36	57	14:47 (1)
30	08:24				07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	08:23		13:42 (1)	08:48		13:51 (1)
	17:23				20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	16:34	49	14:31 (1)	16:36	56	14:47 (1)
31	08:23				07:19		05:28		05:59	06:49		07:31				08:48		13:52 (1)
	17:25				20:11		21:48		21:33	20:32		17:15				16:37	56	14:48 (1)
Potential sun hours	259			277	367	416	485	499	502	454	381	331	266			243		
Total, worst case		1118												528			1722	
Sun reduction		0,24												0,24			0,20	
Oper. time red.		0,95												0,95			0,95	
Wind dir. red.		0,69												0,69			0,69	
Total reduction		0,16												0,15			0,13	
Total, real		175												82			229	

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

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

Project:
068379aa - WP Autena

Printed/Page
15-5-2014 16:27 / 16

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

SHADOW - Calendar

Calculation: Gamesa G128**Shadow receptor:** 16 - Biezenweg 49

Assumptions for shadow calculations

Maximum distance for influence	2.000	m
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) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,00	3,00	3,90	5,80	6,70	6,50	6,60	6,10	4,60	3,60	2,10	1,60

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
366	637	526	516	436	729	819	1.192	1.173	804	576	523	8.297

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

	January		February		March	April	May	June	July	August	September	October		November		December	
1	08:48	15:46 (1)	08:21	15:47 (1)	07:28	07:17	06:12	05:27	05:24	06:00	06:50	07:39		07:33	15:27 (1)	08:24	15:27 (1)
	16:39	18 16:04 (1)	17:27	42 16:29 (1)	18:18	20:12	21:03	21:49	22:03	21:31	20:29	19:20		17:13	24 15:51 (1)	16:33	33 16:00 (1)
2	08:48	15:45 (1)	08:20	15:48 (1)	07:26	07:15	06:10	05:26	05:25	06:02	06:52	07:41		07:35	15:25 (1)	08:26	15:27 (1)
	16:40	19 16:04 (1)	17:28	41 16:29 (1)	18:20	20:14	21:05	21:50	22:03	21:30	20:27	19:17		17:12	28 15:53 (1)	16:32	32 15:59 (1)
3	08:48	15:45 (1)	08:18	15:48 (1)	07:24	07:13	06:08	05:25	05:25	06:04	06:54	07:43		07:37	15:23 (1)	08:27	15:29 (1)
	16:41	21 16:06 (1)	17:30	40 16:28 (1)	18:22	20:16	21:07	21:52	22:03	21:28	20:25	19:15		17:10	31 15:54 (1)	16:32	29 15:58 (1)
4	08:48	15:46 (1)	08:17	15:49 (1)	07:21	07:10	06:07	05:25	05:26	06:05	06:55	07:44		07:39	15:22 (1)	08:29	15:29 (1)
	16:42	21 16:07 (1)	17:32	38 16:27 (1)	18:24	20:18	21:08	21:53	22:02	21:26	20:22	19:13		17:08	33 15:55 (1)	16:31	28 15:57 (1)
5	08:48	15:45 (1)	08:15	15:51 (1)	07:19	07:08	06:05	05:24	05:27	06:07	06:57	07:46		07:40	15:21 (1)	08:30	15:30 (1)
	16:43	23 16:08 (1)	17:34	36 16:27 (1)	18:25	20:19	21:10	21:54	22:02	21:25	20:20	19:10		17:06	35 15:56 (1)	16:31	26 15:56 (1)
6	08:47	15:45 (1)	08:13	15:51 (1)	07:17	07:06	06:03	05:23	05:28	06:08	06:58	07:48		07:42	15:20 (1)	08:31	15:31 (1)
	16:44	25 16:10 (1)	17:36	36 16:27 (1)	18:27	20:21	21:12	21:55	22:01	21:23	20:18	19:08		17:04	37 15:57 (1)	16:30	25 15:56 (1)
7	08:47	15:45 (1)	08:12	15:52 (1)	07:15	07:03	06:01	05:23	05:29	06:10	07:00	07:49		07:44	15:20 (1)	08:32	15:32 (1)
	16:46	26 16:11 (1)	17:38	34 16:26 (1)	18:29	20:23	21:13	21:55	22:01	21:21	20:16	19:06		17:03	38 15:58 (1)	16:30	23 15:55 (1)
8	08:46	15:45 (1)	08:10	15:54 (1)	07:12	07:01	05:59	05:22	05:29	06:11	07:02	07:51		07:46	15:19 (1)	08:34	15:33 (1)
	16:47	28 16:13 (1)	17:40	30 16:24 (1)	18:31	20:24	21:15	21:56	22:00	21:19	20:13	19:04		17:01	40 15:59 (1)	16:29	22 15:55 (1)
9	08:46	15:45 (1)	08:08	15:55 (1)	07:10	06:59	05:58	05:22	05:30	06:13	07:03	07:53		07:48	15:19 (1)	08:35	15:35 (1)
	16:48	29 16:14 (1)	17:41	28 16:23 (1)	18:33	20:26	21:17	21:57	21:59	21:17	20:11	19:01		16:59	41 16:00 (1)	16:29	20 15:55 (1)
10	08:45	15:44 (1)	08:06	15:57 (1)	07:08	06:57	05:56	05:21	05:31	06:15	07:05	07:55		07:49	15:18 (1)	08:36	15:35 (1)
	16:50	31 16:15 (1)	17:43	24 16:21 (1)	18:34	20:28	21:18	21:58	21:59	21:15	20:09	18:59		16:58	42 16:00 (1)	16:29	20 15:55 (1)
11	08:45	15:45 (1)	08:04	16:00 (1)	07:06	06:54	05:54	05:21	05:32	06:16	07:07	07:56		07:51	15:18 (1)	08:37	15:36 (1)
	16:51	33 16:18 (1)	17:45	19 16:19 (1)	18:36	20:29	21:20	21:59	21:58	21:14	20:06	18:57		16:56	43 16:01 (1)	16:29	18 15:54 (1)
12	08:44	15:45 (1)	08:03	16:03 (1)	07:03	06:52	05:52	05:20	05:34	06:18	07:08	07:58		07:53	15:18 (1)	08:38	15:37 (1)
	16:53	34 16:19 (1)	17:47	12 16:15 (1)	18:38	20:31	21:21	21:59	21:57	21:12	20:04	18:55		16:55	43 16:01 (1)	16:29	17 15:54 (1)
13	08:43	15:44 (1)	08:01		07:01	06:50	05:51	05:20	05:35	06:19	07:10	08:00		07:55	15:17 (1)	08:39	15:38 (1)
	16:54	37 16:21 (1)	17:49		18:40	20:33	21:23	22:00	21:56	21:10	20:02	18:52		16:53	43 16:00 (1)	16:29	16 15:54 (1)
14	08:43	15:44 (1)	07:59		06:59	06:48	05:49	05:20	05:36	06:21	07:11	08:01		07:57	15:17 (1)	08:40	15:39 (1)
	16:56	38 16:22 (1)	17:51		18:41	20:35	21:25	22:01	21:55	21:08	19:59	18:50		16:52	44 16:01 (1)	16:29	15 15:54 (1)
15	08:42	15:44 (1)	07:57		06:56	06:46	05:48	05:20	05:37	06:23	07:13	08:03		07:58	15:17 (1)	08:41	15:40 (1)
	16:57	38 16:22 (1)	17:53		18:43	20:36	21:26	22:01	21:54	21:06	19:57	18:48		16:50	44 16:01 (1)	16:29	14 15:54 (1)
16	08:41	15:44 (1)	07:55		06:54	06:43	05:46	05:20	05:38	06:24	07:15	08:05		08:00	15:18 (1)	08:42	15:41 (1)
	16:59	39 16:23 (1)	17:54		18:45	20:38	21:28	22:02	21:53	21:04	19:55	18:46		16:49	43 16:01 (1)	16:29	13 15:54 (1)
17	08:40	15:44 (1)	07:53		06:52	06:41	05:45	05:20	05:39	06:26	07:16	08:07		08:02	15:18 (1)	08:43	14:15 (2)
	17:00	40 16:24 (1)	17:56		18:47	20:40	21:29	22:02	21:52	21:02	19:52	18:44		16:47	44 16:02 (1)	16:29	16 15:54 (1)
18	08:39	15:44 (1)	07:51		06:50	06:39	05:43	05:19	05:41	06:27	07:18	08:08		08:04	15:18 (1)	08:43	14:14 (2)
	17:02	41 16:25 (1)	17:58		18:48	20:41	21:31	22:03	21:51	21:00	19:50	18:42		16:46	44 16:02 (1)	16:29	18 15:54 (1)
19	08:38	15:44 (1)	07:49		06:47	06:37	05:42	05:20	05:42	06:29	07:20	08:10		08:05	15:19 (1)	08:44	14:14 (2)
	17:04	42 16:26 (1)	18:00		18:50	20:43	21:32	22:03	21:50	20:57	19:48	18:39		16:45	43 16:02 (1)	16:29	18 15:54 (1)
20	08:37	15:44 (1)	07:47		06:45	06:35	05:40	05:20	05:43	06:31	07:21	08:12		08:07	15:19 (1)	08:45	14:15 (2)
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21	08:36	15:44 (1)	07:45		06:43	06:33	05:39	05:20	05:45	06:32	07:23	08:14		08:09	15:20 (1)	08:45	14:14 (2)
	17:07	42 16:26 (1)	18:04		18:54	20:47	21:35	22:04	21:47	20:53	19:43	18:35		16:42	42 16:02 (1)	16:30	19 15:55 (1)
22	08:35	15:44 (1)	07:43		06:40	06:30	05:38	05:20	05:46	06:34	07:24	08:15		08:10	15:20 (1)	08:46	14:15 (2)
	17:09	43 16:27 (1)	18:06		18:55	20:48	21:37	22:04	21:46	20:51	19:41	18:33		16:41	42 16:02 (1)	16:31	19 15:56 (1)
23	08:34	15:44 (1)	07:41		06:38	06:28	05:36	05:20	05:47	06:36	07:26	08:17		08:12	15:20 (1)	08:46	14:15 (2)
	17:10	43 16:27 (1)	18:07		18:57	20:50	21:38	22:04	21:45	20:49	19:38	18:31		16:40	42 16:02 (1)	16:31	19 15:56 (1)
24	08:33	15:44 (1)	07:39		06:36	06:26	05:35	05:20	05:49	06:37	07:28	08:19		08:14	15:21 (1)	08:47	14:16 (2)
	17:12	44 16:28 (1)	18:09		18:59	20:52	21:39	22:04	21:43	20:47	19:36	18:29		16:39	41 16:02 (1)	16:32	18 15:56 (1)
25	08:31	15:45 (1)	07:36		06:33	06:24	05:34	05:21	05:50	06:39	07:29	07:21		08:15	15:22 (1)	08:47	14:18 (2)
	17:14	44 16:29 (1)	18:11		19:00	20:53	21:41	22:04	21:42	20:45	19:34	17:27		16:38	40 16:02 (1)	16:32	19 15:58 (1)
26	08:30	15:45 (1)	07:34		06:31	06:22	05:33	05:21	05:52	06:40	07:31	07:23		08:17	15:22 (1)	08:48	14:19 (2)
	17:16	43 16:28 (1)	18:13		19:02	20:55	21:42	22:04	21:41	20:43	19:31	17:25		16:37	39 16:01 (1)	16:33	17 15:58 (1)
27	08:29	15:45 (1)	07:32		06:29	06:20	05:32	05:22	05:53	06:42	07:33	07:24		08:18	15:23 (1)	08:48	15:46 (1)
	17:17	44 16:29 (1)	18:15		19:04	20:57	21:43	22:04	21:39	20:40	19:29	17:23		16:36	39 16:02 (1)	16:34	13 15:59 (1)
28	08:27	15:45 (1)	07:30		06:26	06:18	05:31	05:22	05:54	06:44	07:34	07:26		08:20	15:24 (1)	08:48	15:46 (1)
	17:19	44 16:29 (1)	18:16		19:06	20:58	21:45	22:04	21:38	20:38	19:27	17:21		16:35	38 16:02 (1)	16:35	13 15:59 (1)
29	08:26	15:46 (1)			07:24	06:16	05:30	05:23	05:56	06:45	07:36	07:28		08:21	15:24 (1)	08:48	15:46 (1)
	17:21	44 16:30 (1)			20:07	21:00	21:46	22:04	21:36	20:36	19:24	17:19		16:34	37 16:01 (1)	16:35	14 16:00 (1)
30	08:24	15:46 (1)			07:22	06:14	05:29	05:23	05:57	06:47	07:38	07:30	15:32 (1)	08:23	15:26 (1)	08:48	15:46 (1)
	17:23	43 16:29 (1)			20:09	21:02	21:47	22:04	21:35	20:34	19:22	17:17	14 15:46 (1)	16:34	34 16:00 (1)	16:36	15 16:01 (1)
31	08:23	15:46 (1)			07:19		05:28		05:59	06:49		07:31	15:29 (1)			08:48	15:46 (1)
	17:25	43 16:29 (1)			20:11		21:48		21:33	20:31		17:15	20 15:49 (1)			16:37	16 16:02 (1)
Potential sun hours	259		277		367	416	485	499	502	454	381	331		266		243	
Total, worst case		1102		380									34		1177		603
Sun reduction		0,24		0,30									0,34		0,24		0,20
Oper. time red.		0,95		0,95									0,95		0,95		0,95
Wind dir. red.		0,67		0,67									0,67		0,67		0,67
Total reduction		0,15		0,19									0,21		0,15		0,13
Total, real		167		73									7		176		78

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

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

Bijlage III

Grafische kalender

Project:
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19-9-2013 15:06 / 1

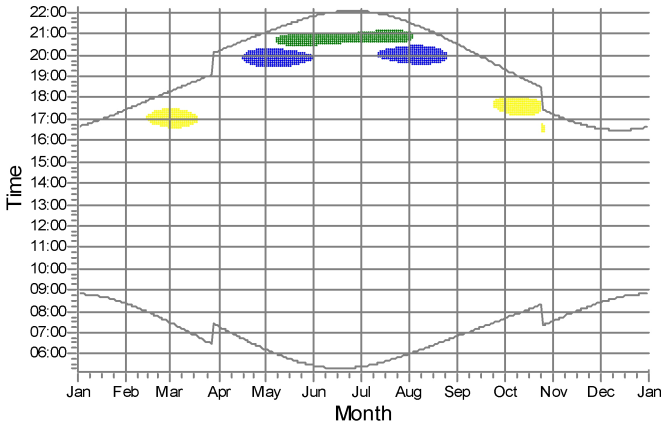
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+31 3023 11377
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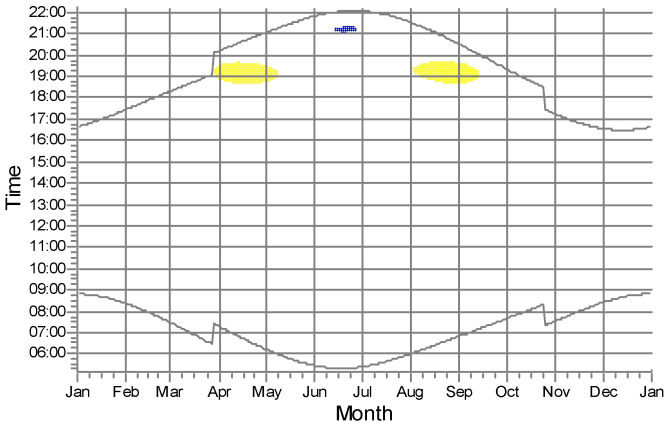
SHADOW - Calendar, graphical

Calculation: Nordex N100 woningen

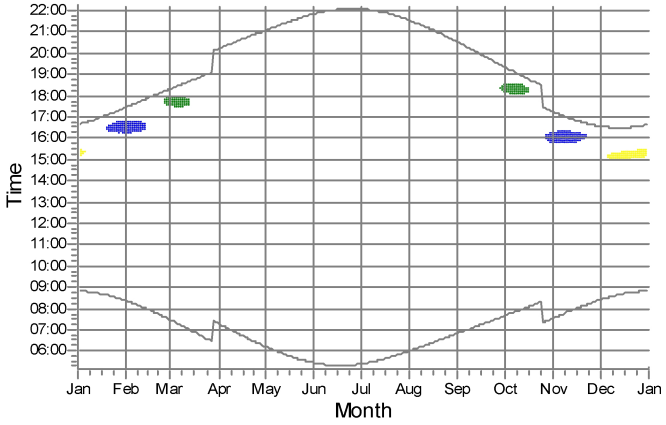
01: Nieuw bouw Autenasekade



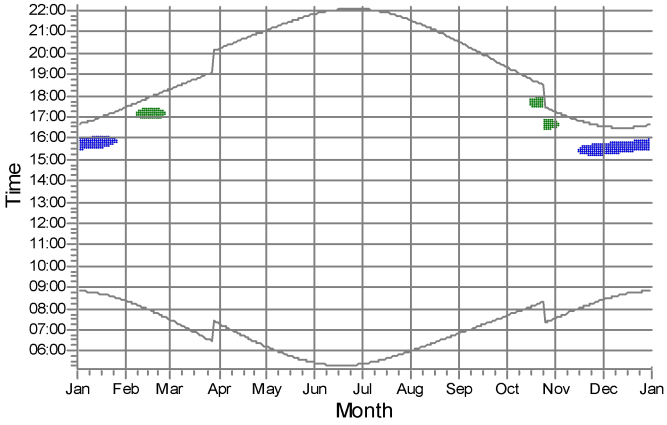
02: Autenasekade 9



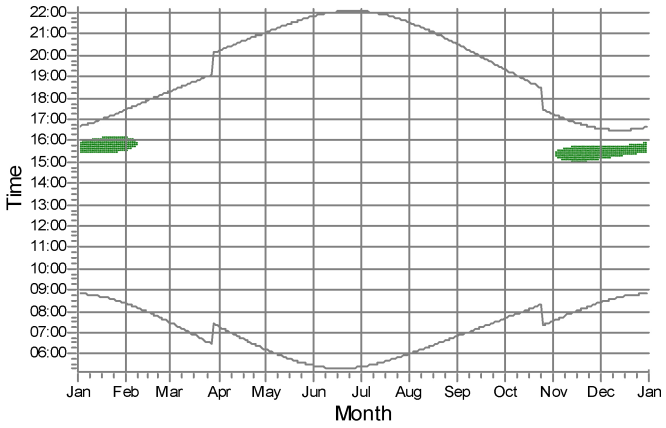
03: Breede Sticht 1



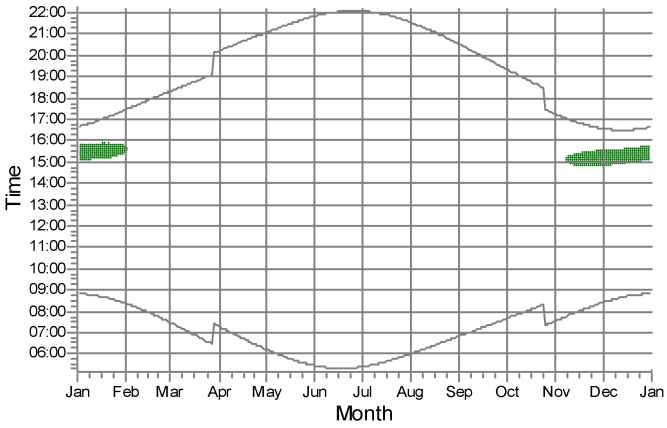
04: Breede Sticht 16



05: Biezenweg 51



06: Biezenweg 16



WTGs

1: Nordex N100

3: Nordex N100

2: Nordex N100

Project:
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19-9-2013 15:06 / 2

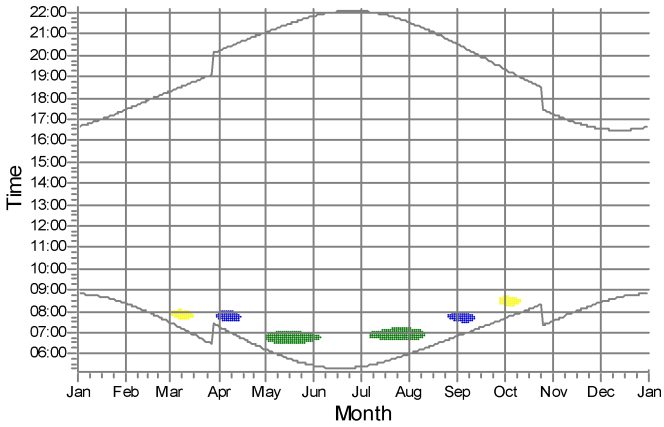
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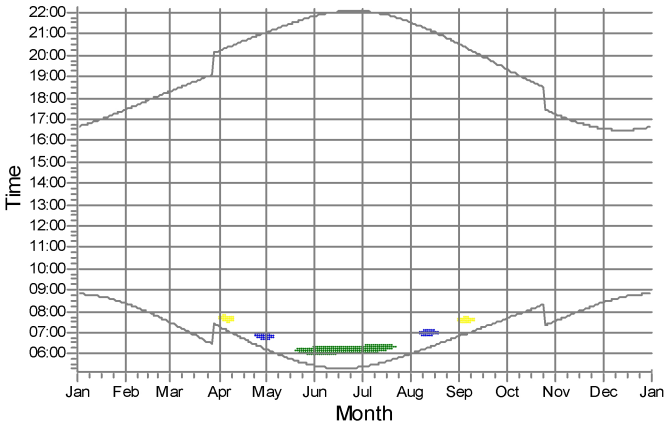
SHADOW - Calendar, graphical

Calculation: Nordex N100 woningen

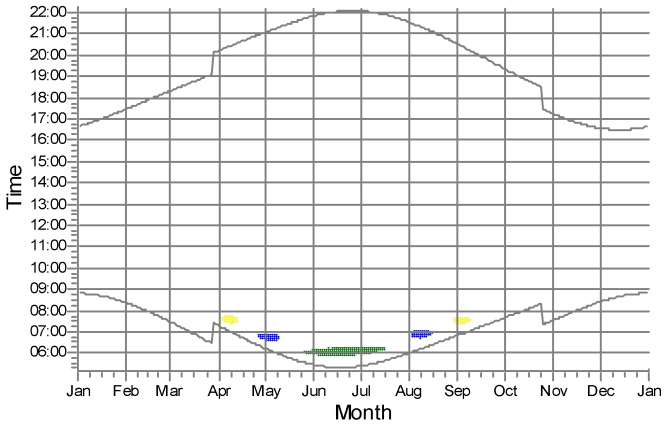
07: Autenasekade 05



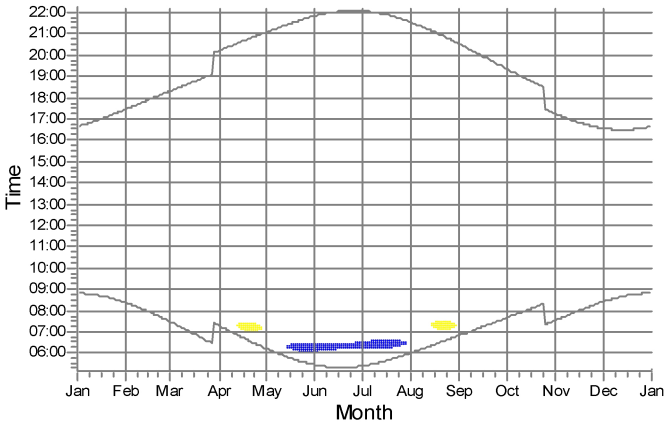
08: Bolgerijsekade 16



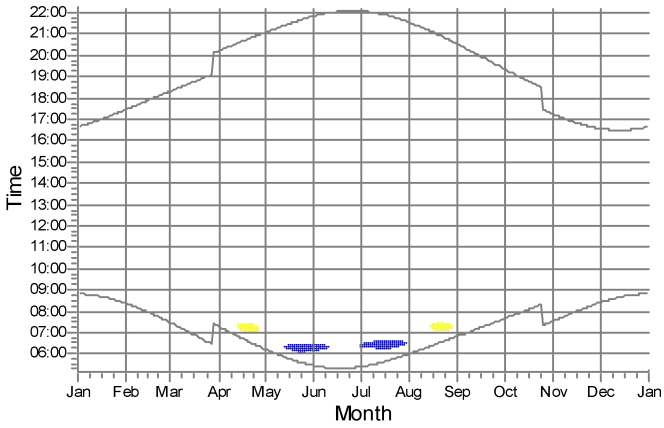
09: Bolgerijsekade 18



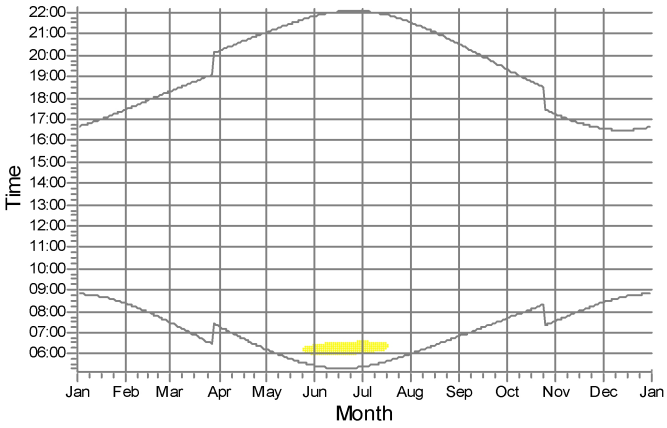
10: Bolgerijsekade 24



11: Bolgerijsekade 1



12: Bolgerijsekade 9



WTGs

1: Nordex N100

3: Nordex N100

2: Nordex N100

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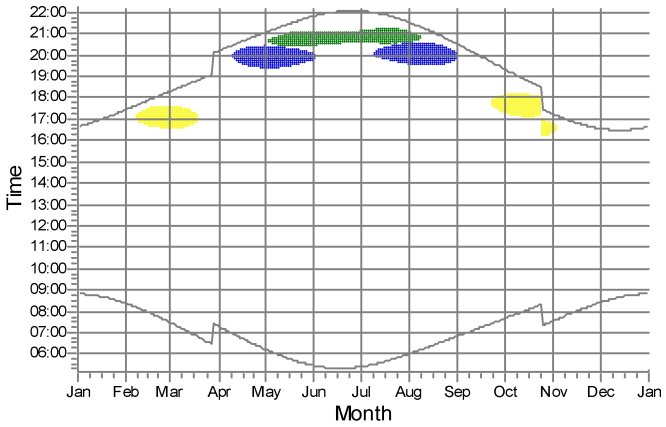
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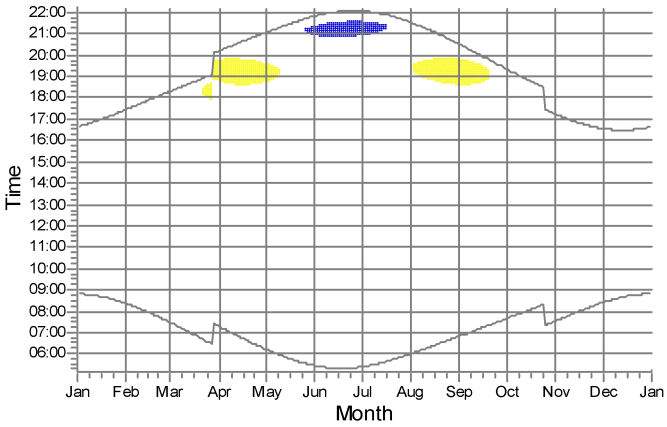
SHADOW - Calendar, graphical

Calculation: ECO 122 woningen

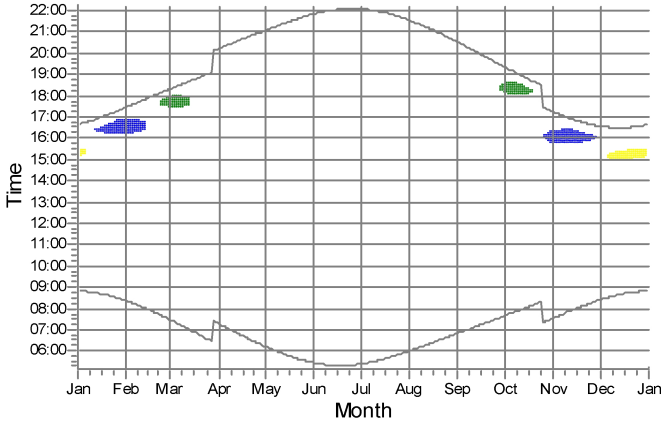
01: Nieuw bouw Autenasekade



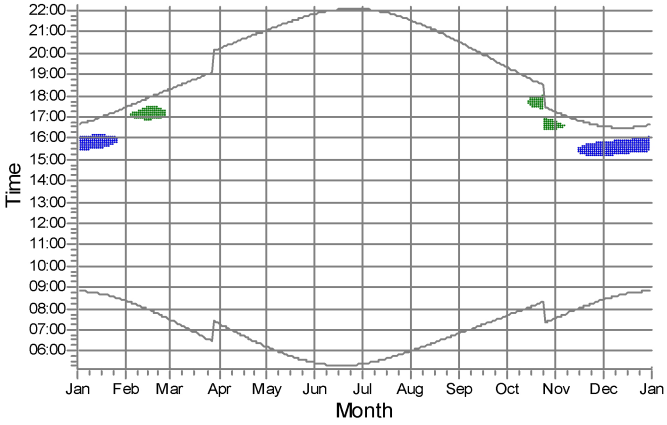
02: Autenasekade 9



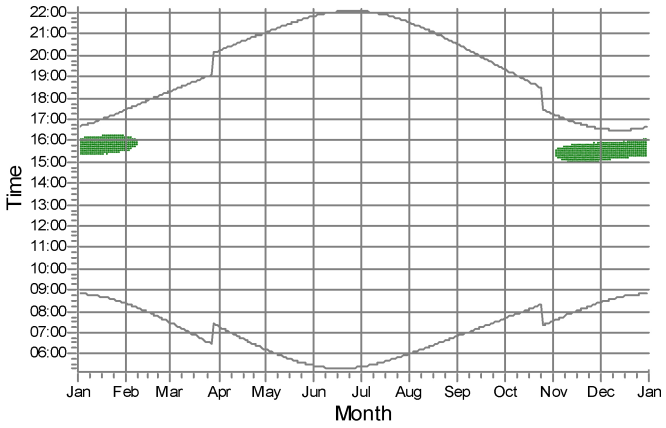
03: Breede Sticht 1



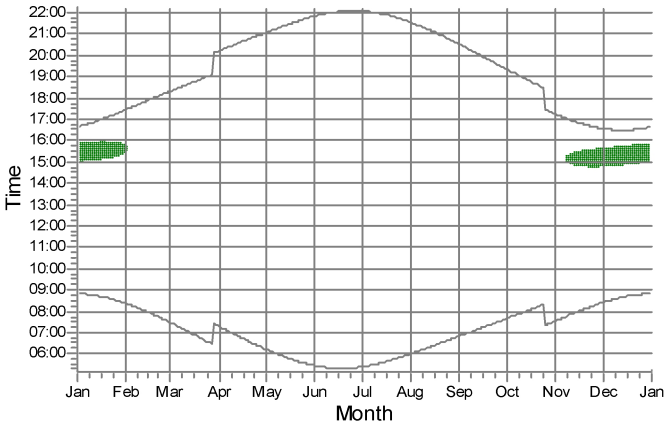
04: Breede Sticht 16



05: Biezenweg 51



06: Biezenweg 16



WTGs

1: Ecotecnia ECO122

3: Ecotecnia ECO122

2: Ecotecnia ECO122

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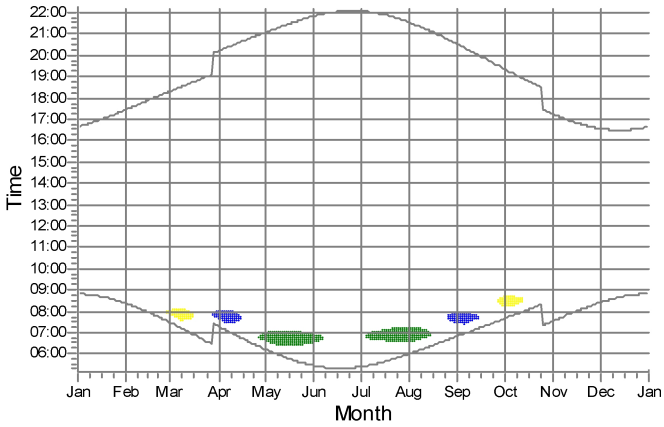
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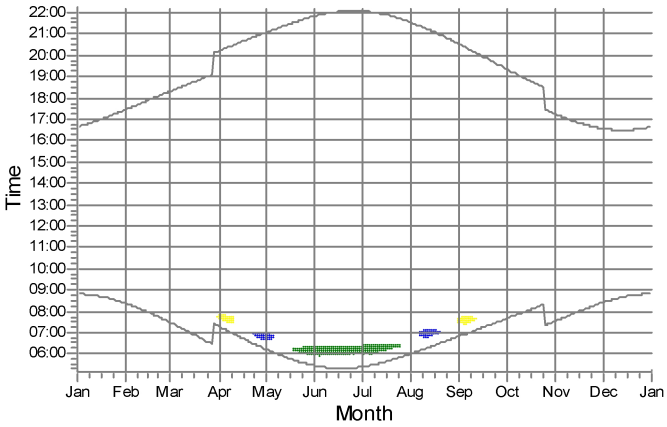
SHADOW - Calendar, graphical

Calculation: ECO 122 woningen

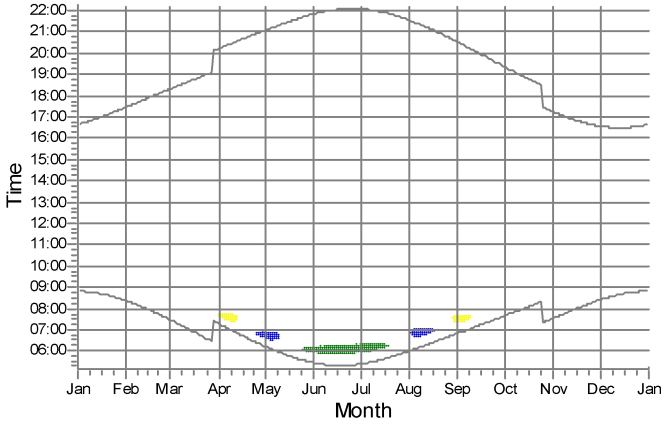
07: Autenasekade 05



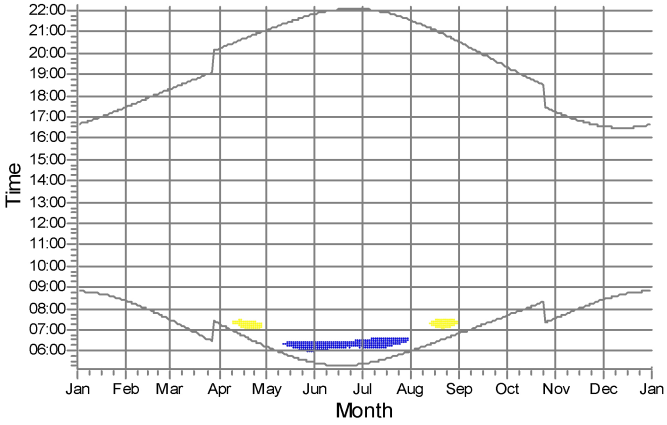
08: Bolgerijsekade 16



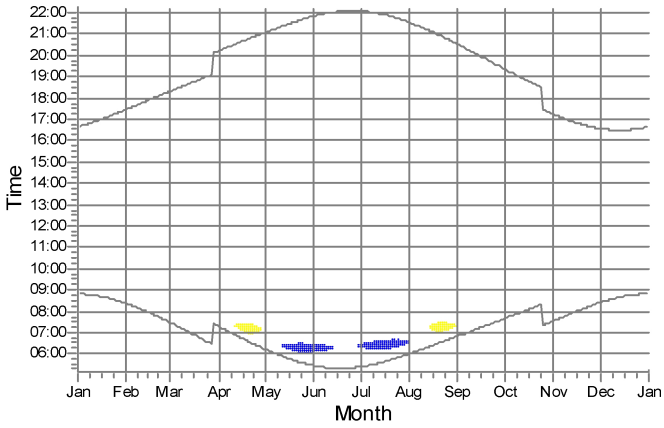
09: Bolgerijsekade 18



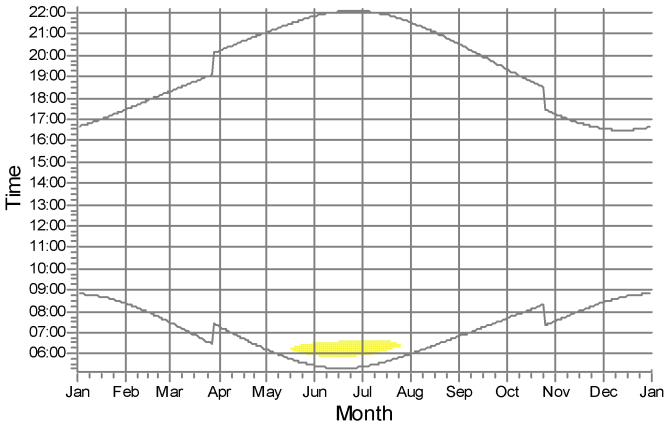
10: Bolgerijsekade 24



11: Bolgerijsekade 1



12: Bolgerijsekade 9



WTGs

1: Ecotecnia ECO122

3: Ecotecnia ECO122

2: Ecotecnia ECO122

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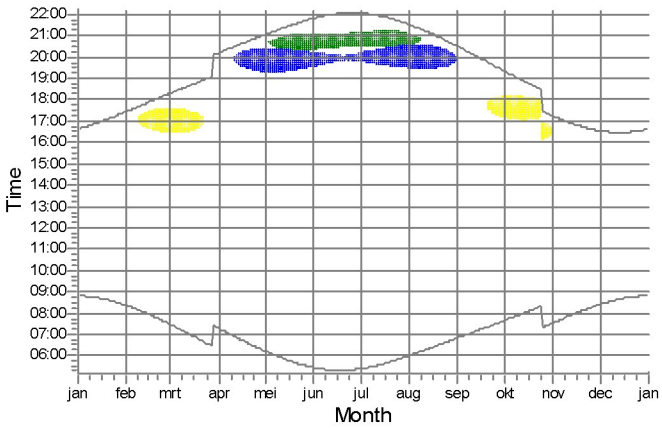
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NL-3430BL Nieuwegein
+31 3023 11377
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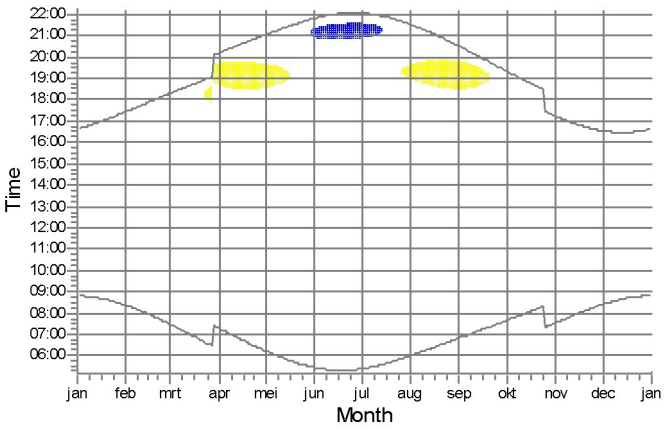
SHADOW - Calendar, graphical

Calculation: Nordex N131

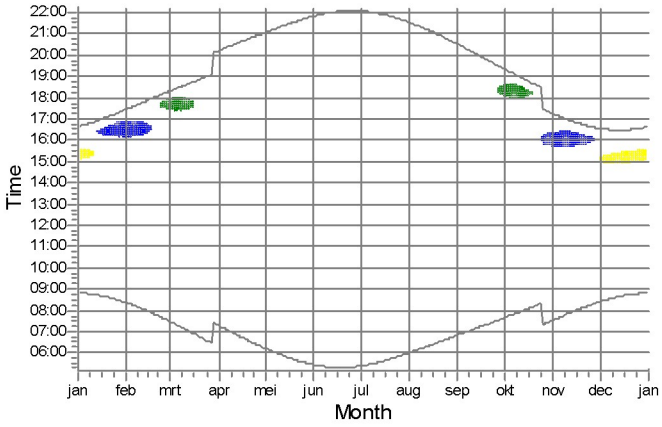
01: Nieuw bouw Autenasekade



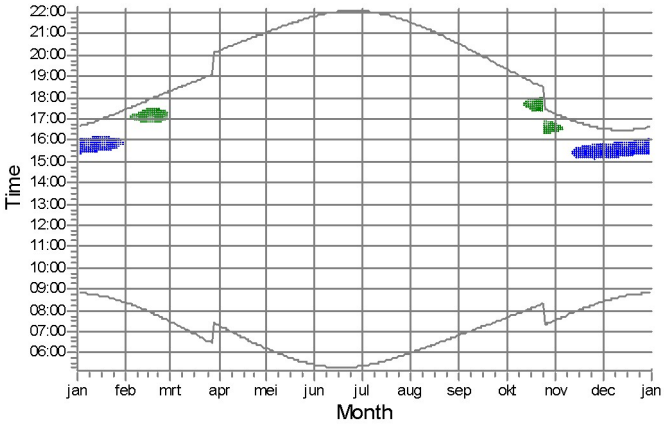
02: Autenasekade 9



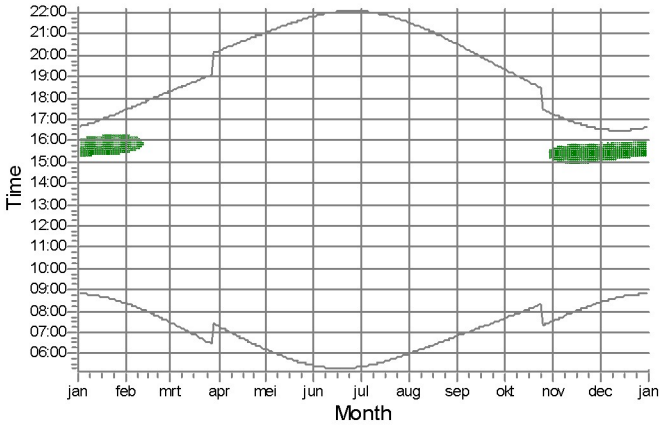
03: Breede Sticht 1



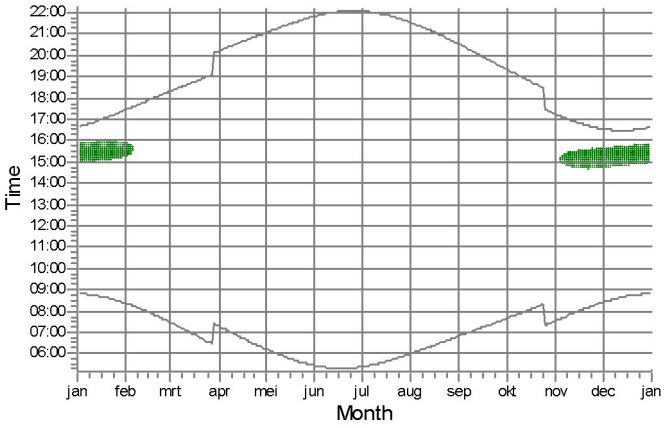
04: Breede Sticht 16



05: Biezenw eg 51



06: Biezenw eg 16



WTGs

1: Nordex N131

3: Nordex N131

2: Nordex N131

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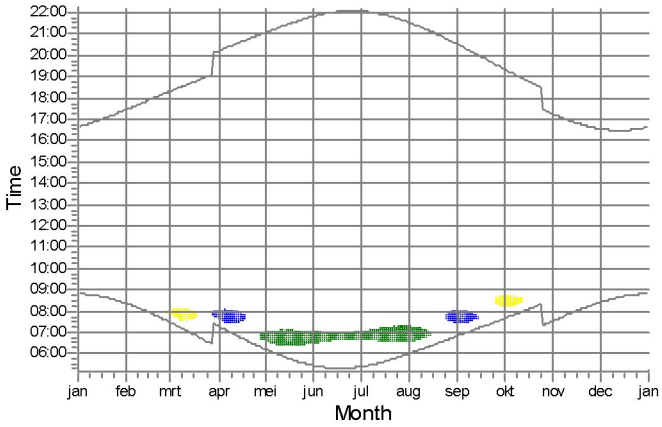
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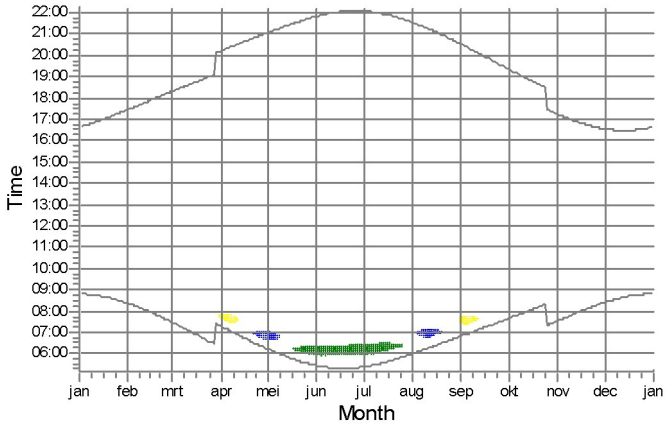
SHADOW - Calendar, graphical

Calculation: Nordex N131

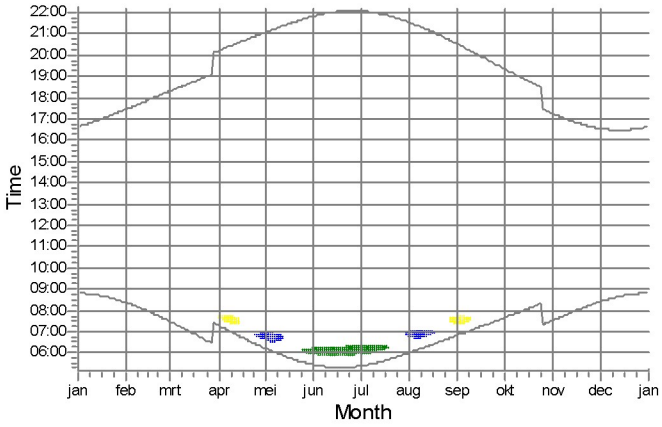
07: Autenasekade 05



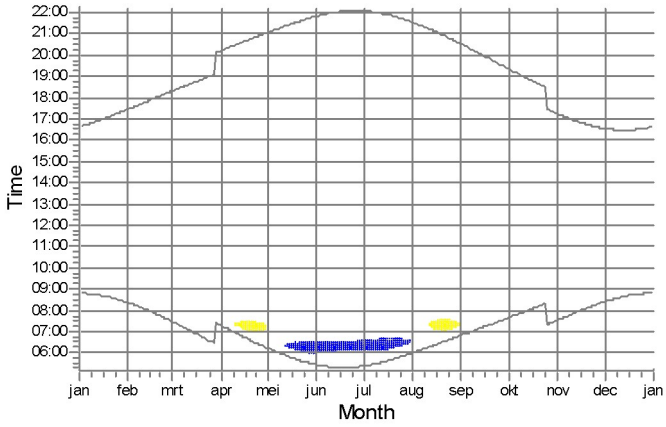
08: Bolgerijsekade 16



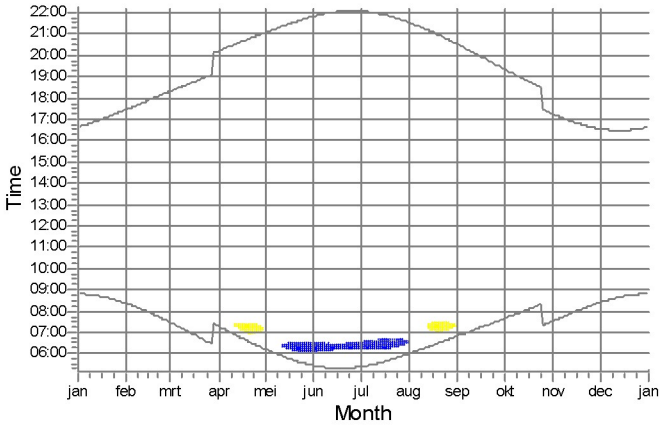
09: Bolgerijsekade 18



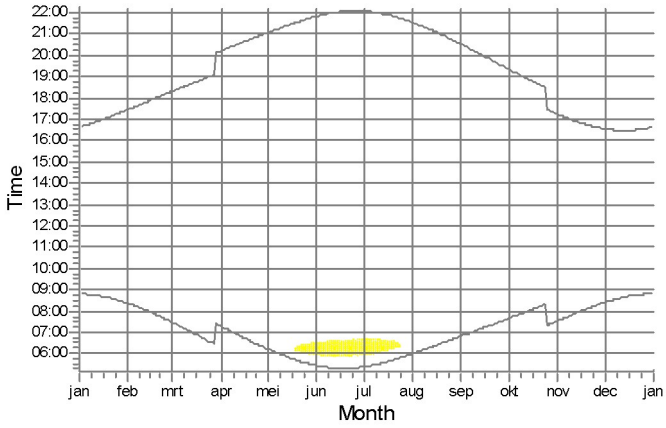
10: Bolgerijsekade 24



11: Bolgerijsekade 1



12: Bolgerijsekade 9



WTGs

1: Nordex N131

3: Nordex N131

2: Nordex N131

Project:
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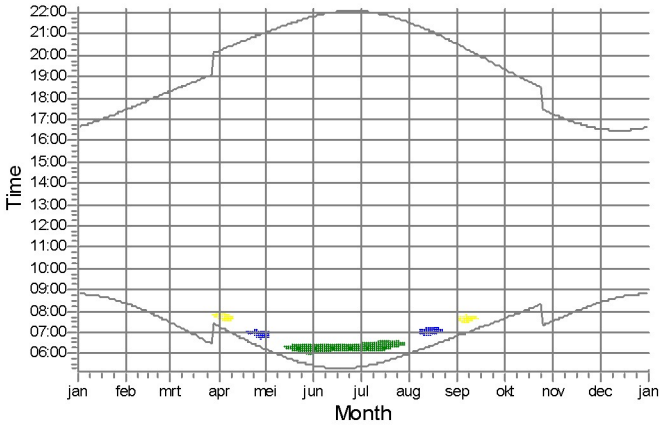
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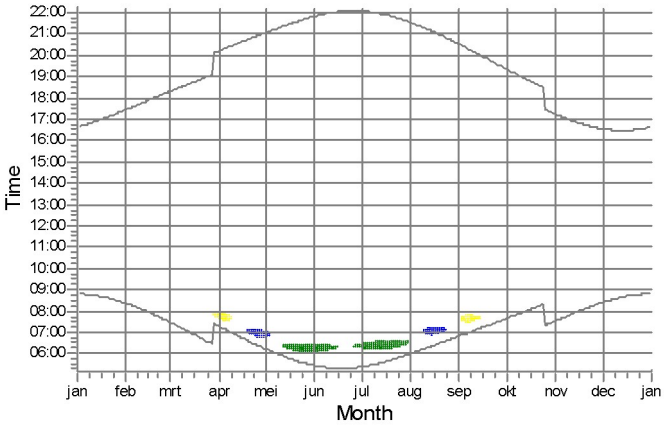
SHADOW - Calendar, graphical

Calculation: Nordex N131

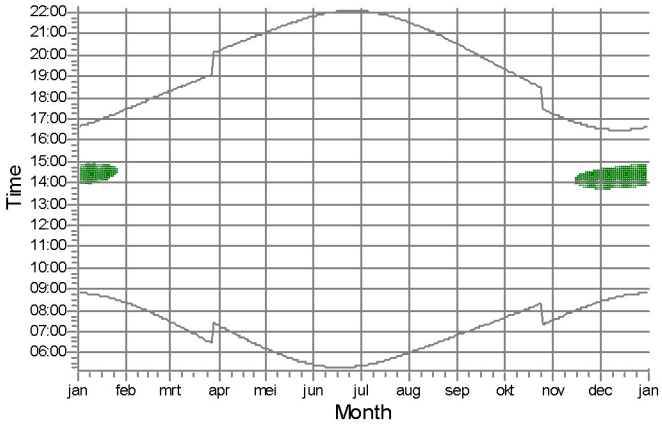
13: Bolgerijsekade 8



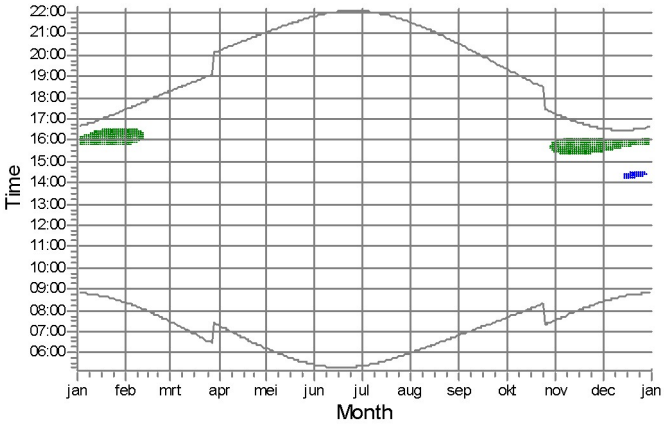
14: Bolgerijsekade 6



15: Biezenw eg 24



16: Biezenw eg 49



WTGs

1: Nordex N131

3: Nordex N131

2: Nordex N131

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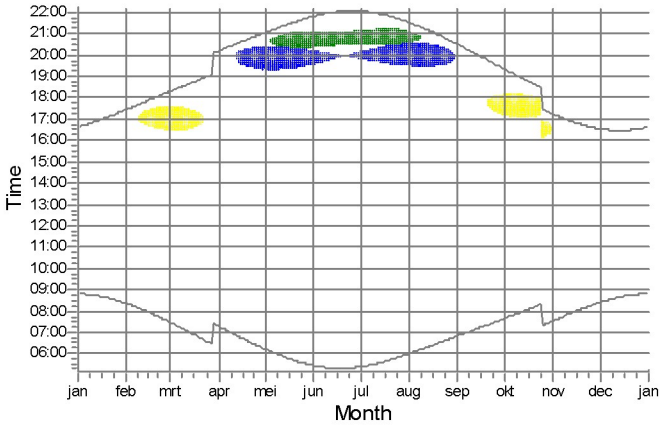
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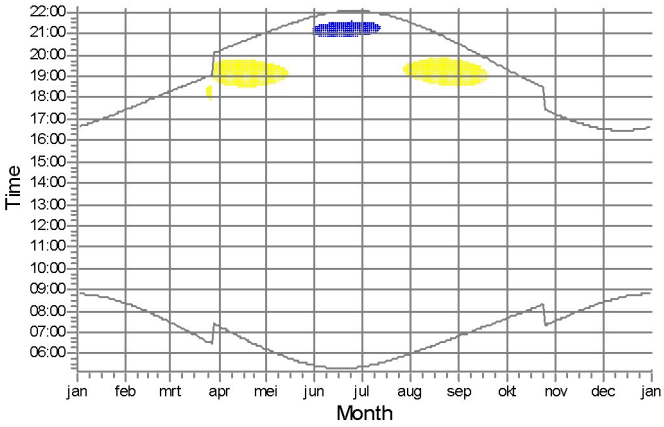
SHADOW - Calendar, graphical

Calculation: Gamesa G128

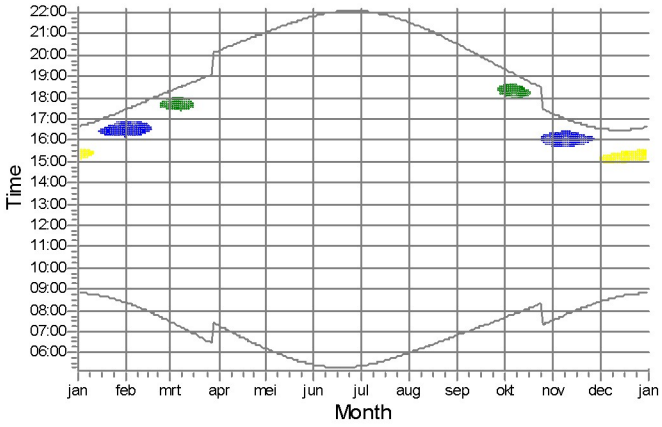
01: Nieuw bouw Autenasekade



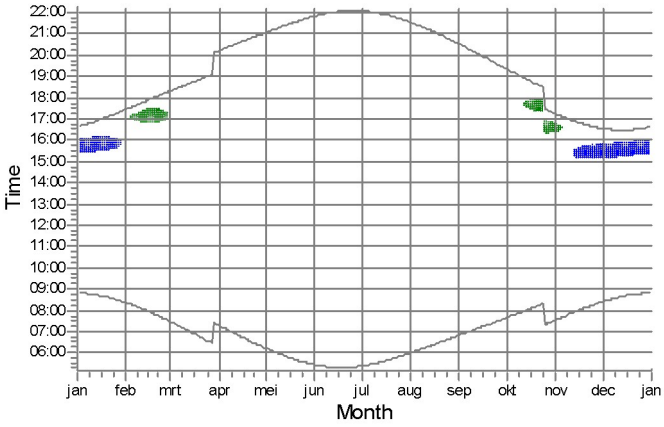
02: Autenasekade 9



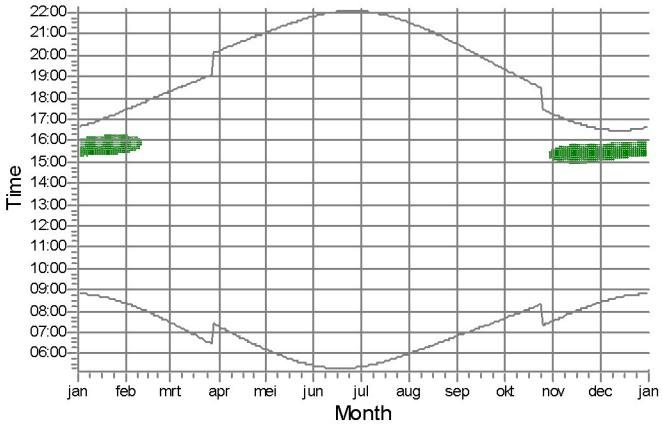
03: Breede Sticht 1



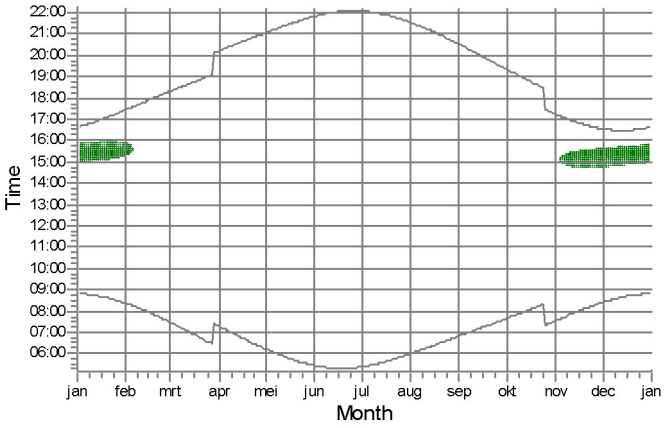
04: Breede Sticht 16



05: Biezenw eg 51



06: Biezenw eg 16



WTGs

1: Gamesa G128 4.5MW

3: Gamesa G128 4.5MW

2: Gamesa G128 4.5MW

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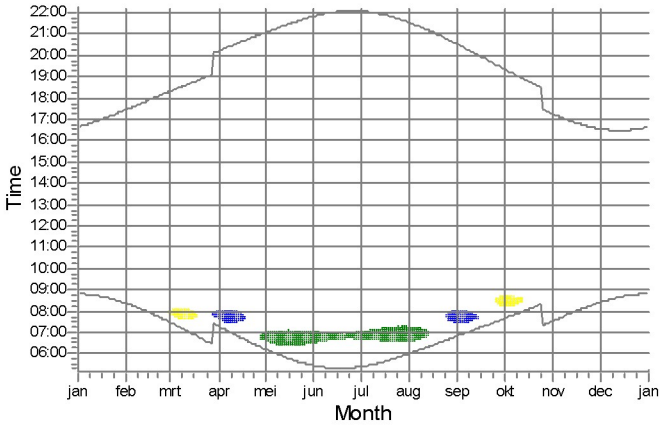
Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

Calculated:
15-5-2014 14:45/2.7.490

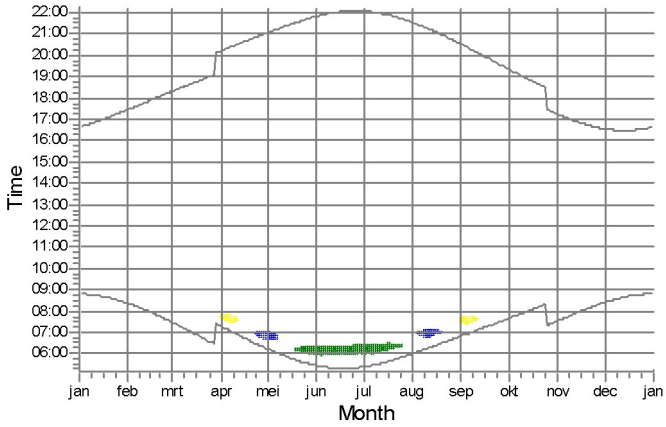
SHADOW - Calendar, graphical

Calculation: Gamesa G128

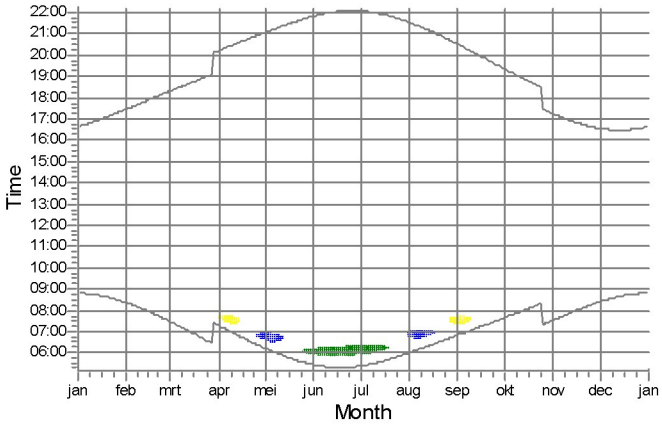
07: Autenasekade 05



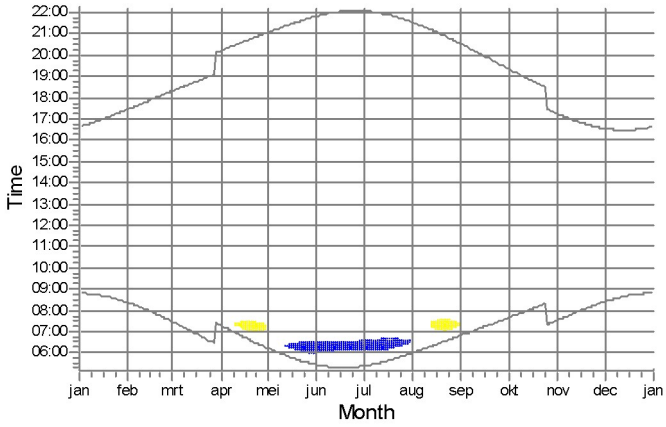
08: Bolgerijsekade 16



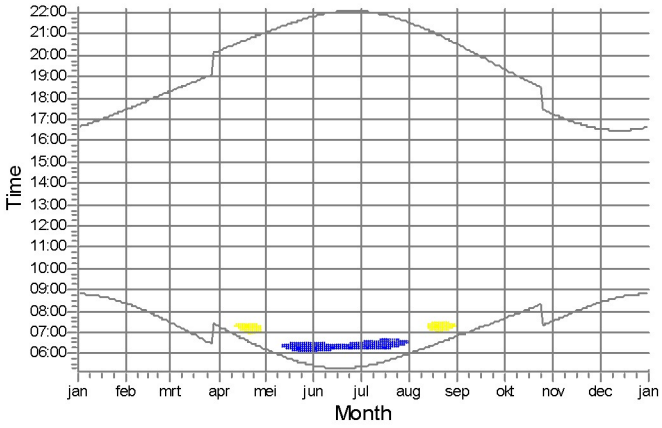
09: Bolgerijsekade 18



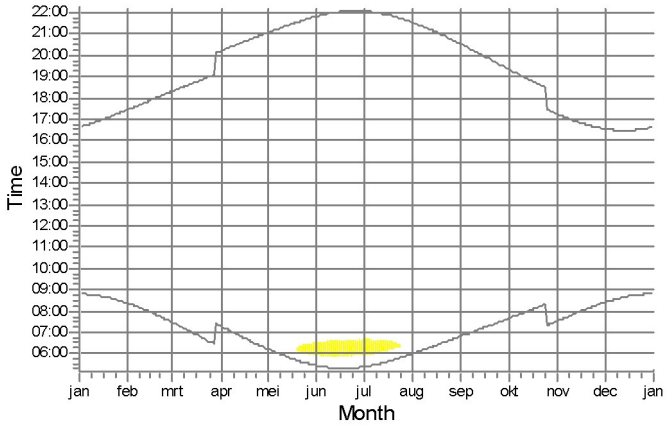
10: Bolgerijsekade 24



11: Bolgerijsekade 1



12: Bolgerijsekade 9



WTGs

1: Gamesa G128 4.5MW

3: Gamesa G128 4.5MW

2: Gamesa G128 4.5MW

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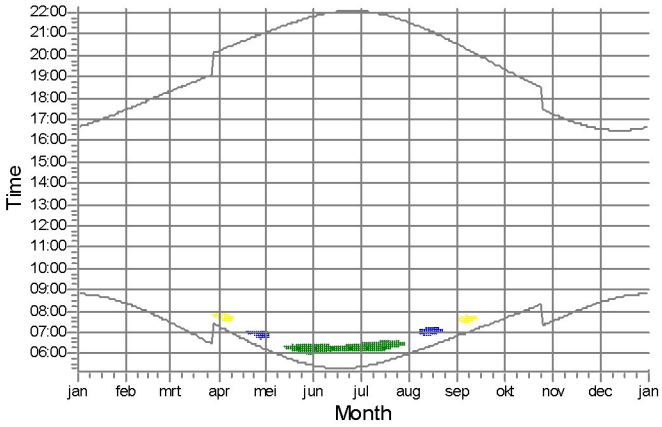
Licensed user:
LBP SIGHT
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NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl

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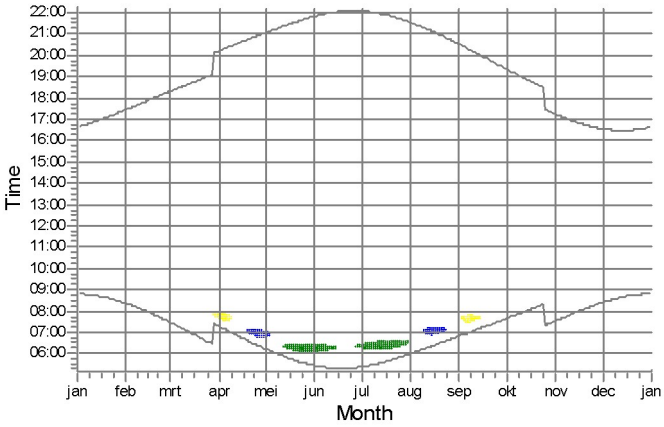
SHADOW - Calendar, graphical

Calculation: Gamesa G128

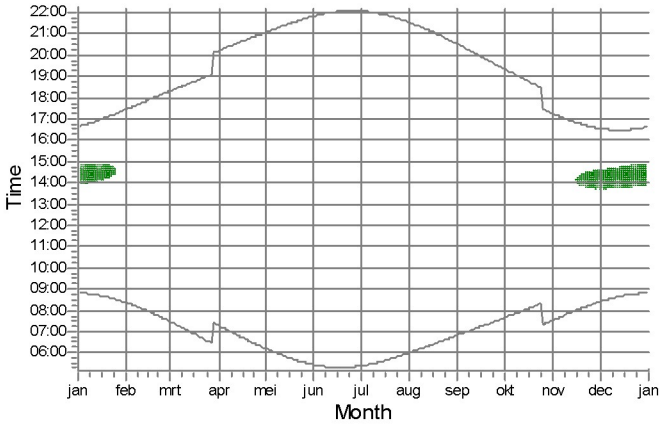
13: Bolgerijsekade 8



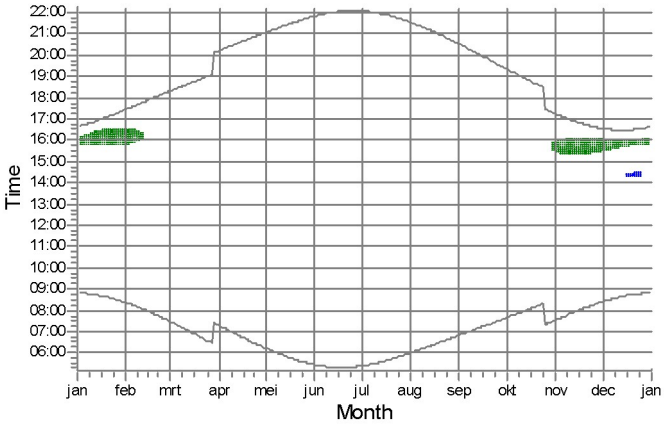
14: Bolgerijsekade 6



15: Biezenw eg 24



16: Biezenw eg 49



WTGs

1: Gamesa G128 4.5MW

3: Gamesa G128 4.5MW

2: Gamesa G128 4.5MW