

SLAGSCHADUWONDERZOEK WINDPARK GREENPORT VENLO

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1 INLEIDING

Etriplus is voornemens om het Windpark Greenport Venlo te ontwikkelen. Dit windpark omvat 9 windturbines langs de spoorlijn Eindhoven-Venlo aan de westkant van Venlo. Het beoogde windpark ligt deels op bedrijventerrein Trade Port Noord (TPN) en deels in Parc Zaarderheiken.

Het doel van het voorliggende onderzoek is om de slagschaduweffecten van de 9 turbines op de omgeving in beeld te brengen. Slagschaduw betreft de lichtflikkeringen die optreden vanwege de passerende schaduw van de draaiende rotorbladen van een windturbine. Deze lichtflikkeringen treden op als vanaf de ontvanger gezien de rotorbladen van een windturbine de zonnestralen onderbreken.

Het voorliggende rapport beschrijft allereerst de situatie en de uitgangspunten voor het windpark (hoofdstuk 2). Hoofdstuk 3 beschrijft het beoordelingskader. De berekeningsmethode is beschreven in hoofdstuk 4 en de berekeningsresultaten in hoofdstuk 5. Hoofdstuk 6 gaat in op mitigerende maatregelen. De conclusie van het onderzoek is opgenomen in hoofdstuk 7.

2 SITUATIE EN UITGANGSPUNTEN

2.1 Situatie

Het beoogde Windpark Greenport Venlo omvat 9 windturbines langs de spoorlijn Eindhoven-Venlo aan de westkant van Venlo. Het beoogde windpark ligt deels op bedrijventerrein Trade Port Noord (TPN) en deels in Parc Zaarderheiken. Een overzicht van het onderzoeksgebied en de posities van de windturbines is weergegeven in Afbeelding 1.

De dichtstbijzijnde woningen bevinden zich aan de Heierkerkweg op circa 340 meter ten oosten van windturbine WT04. Elders in het gebied liggen de woningen op ruimere afstand. De meeste woningen in de omgeving van het windpark bevinden zich in het dorp Boekend en het buurtschap Wielder nabij de A73 ten zuiden van de A67 en het industrieterrein Trade Port West. De dichtstbijzijnde woning bevindt zich hier op circa 660 meter van het windpark. De meeste woningen liggen aan deze zijde echter op meer dan 800 meter afstand van het windpark. Ten noorden van het windpark liggen de meeste woningen langs de Grubbenvorsterweg op meer dan 900 meter van het windpark.



Afbeelding 1: Overzicht van het onderzoeksgebied en de posities van de windturbines

2.2 Uitgangspunten

In het projectgebied worden 9 windturbines mogelijk gemaakt. Het precieze type turbine, de rotordiameter en de ashoogte zijn nog niet bekend. Er wordt echter uitgegaan van een maximale ashoogte van 140 meter met een maximale rotordiameter van 142 meter voor de zes meest noordelijke turbines en van 122 meter voor de drie meest zuidelijke turbines.

De coördinaten en de overige uitgangspunten voor de windturbines zijn vermeld in Tabel 1. De posities van de turbines zijn grafisch weergegeven in Afbeelding 1.

Tabel 1: Overzicht coördinaten en kenmerken windturbines Windpark Greenport Venlo

Nr.	Coördinaten		Maximale ashoogte	Maximale rotordiameter
	X	Y	[m]	[m]
WT01	203011	380463	140	142
WT02	203353	380202	140	142
WT03	203740	379906	140	142
WT04	204124	379614	140	142
WT05	204861	379050	140	142
WT06	205184	378802	140	142
WT07	205728	378386	140	122
WT08	205969	378202	140	122
WT09	206231	378003	140	122

3 BEOORDELINGSKADER

Slagschaduw betreft de lichtflikkeringen die optreden vanwege de passerende schaduw van de draaiende rotorbladen van een windturbine. Deze lichtflikkeringen treden op als vanaf de ontvanger gezien de rotorbladen van een windturbine de zonnestralen onderbreken. De slagschaduw reikt het verste bij een laagstaande zon. Afhankelijk van hoe lang en hoe vaak de slagschaduw optreedt, de frequentie van de flikkeringen en de intensiteit van de wisselingen in lichtsterkte kan dit tot hinder leiden. De hinder doet zich vooral voor als de slagschaduw op het raam van een woning valt en hierdoor binnen in de woning sterke wisselingen in de lichtsterkte optreden. Windturbines zullen geen slagschaduw veroorzaken als de lucht volledig bewolkt is, het (vrijwel) windstil is of als rotorbladen parallel staan met de lijn tussen de ontvanger en de zon.

Uit onderzoek is gebleken dat de hinder van lichtflikkeringen het grootst is bij een frequentie van 2,5 tot 14 Hz. Er kunnen dan verschijnselen als zeeziekte of - bij hiervoor gevoelige mensen - een epileptische aanval optreden. Voor moderne windturbines is het toerental van de rotor echter dermate laag dat de flikkerfrequentie minder dan 1 Hz bedraagt. Bij deze frequentie worden voornoemde gezondheidseffecten niet verwacht¹.

Naast de wisselingen in lichtsterkte door de slagschaduw kunnen er ook wisselingen in lichtsterkte optreden door de rechtstreekse reflectie van het zonnelicht op de draaiende rotorbladen, vaak aangeduid als lichtschilderingen. De reflectie van licht wordt bij moderne windturbines echter zo veel mogelijk uitgesloten door de rotorbladen uit te voeren met een veelal matte, lichtgrijze kleur.

In Nederland is voor het voorkomen of beperken van slagschaduw in artikel 3.14, lid 4, van het 'Besluit algemene regels voor inrichtingen milieubeheer', het zogenaamde Activiteitenbesluit, opgenomen dat bij het in werking hebben van een windturbine de bij ministeriële regeling te stellen maatregelen worden toegepast. Deze maatregelen zijn beschreven in artikel 3.12 van de 'Regeling algemene regels voor inrichtingen milieubeheer', vaak aangeduid als de Activiteitenregeling. Dit artikel luidt als volgt:

1. Ten behoeve van het voorkomen of beperken van slagschaduw en lichtschildering 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 gevoelige 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 gevoelige gebouwen of woonwagens ramen bevinden. De afstand geldt van een punt op ashoogte van de windturbine tot de gevel van het gevoelige object.
2. Het bevoegd gezag kan met betrekking tot het in werking hebben van een windturbine aanvullend maatwerkvoorschriften stellen ten behoeve van het voorkomen of beperken van hinder door slagschaduw indien het eerste lid in een specifiek geval niet toereikend is.

De Activiteitenregeling is geënt op het voorkomen en beperken van slagschaduw-hinder tijdens de operationele fase en bevat geen duidelijke normstelling voor prognose-onderzoeken. Voor het onderhavige onderzoek is er als 'worst case' benadering van uitgegaan dat er geen stilstandvoorziening nodig is, als bij een gevoelig object de gemiddelde slagschaduwduur per jaar niet meer bedraagt dan 5:40 uur (17 x 20 minuten is 5 uur en 40 minuten). Dit is in feite een strengere beoordeling dan volgens voornoemde regeling, omdat volgens deze regeling slagschaduw van minder dan 20 minuten per dag of van minder dan 17 dagen met meer dan 20 minuten per dag aanvaardbaar wordt geacht. Voor een exacte beoordeling moet voor alle woningen de slagschaduw per dag worden beoordeeld. Deze analyse zal plaatsvinden voor het instellen van de stilstandsregeling, maar voert te ver voor het huidige onderzoek.

¹ RIVM Briefrapport 60933002/2008, Windturbines: invloed op de beleving en gezondheid van omwonenden

4 BEREKENINGSMETHODE

4.1 Simulatiemodel

De slagschaduwberekeningen zijn verricht met het softwarepakket WindPRO, versie 3.1. De potentiële slagschaduw effecten bij een specifieke ontvanger zijn berekend door de situatie te simuleren. De positie van de zon in relatie tot het vlak waarin de rotor beweegt en de resulterende slagschaduw is voor een geheel jaar berekend in intervallen van 1 minuut. Als in een bepaalde minuut het vlak waarin de rotor beweegt een schaduw op het raam kan werpen dat als ontvangerpunt is gedefinieerd, dan wordt dit geregistreerd als 1 minuut potentiële slagschaduwduur. Hierbij wordt het rotorvlak beschouwd als een gesloten vlak. Voor het onderhavige onderzoek zijn de beoordelingspunten bij woningen zodanig gemodelleerd dat deze uit alle richtingen slagschaduw kunnen ontvangen en is als 'worst case' benadering uitgegaan van een (fictief) raam dat een gevelvlak omvat van 8 meter breed en 5 meter hoog vanaf 0,5 meter hoogte. Een dergelijk gevelvlak omvat gewoonlijk alle ramen in de gevel van een woning.

Bij de slagschaduwberekeningen wordt rekening gehouden met gegevens zoals de posities van de windturbines, de ashoogte, de rotordiameter, de bladbreedte, relevante hoogteverschillen in het landschap, de geografische positie op aarde (lengte- en breedtegraad), de tijdzone en zomer- en wintertijd. Het simulatiemodel bevat ook informatie over de baan en de rotatie van de aarde ten opzichte van de zon.

4.2 Uitgangspunten berekeningen

Artikel 3.12 van de 'Regeling algemene regels voor inrichtingen milieubeheer' geeft aan dat de slagschaduw alleen hoeft te worden beschouwd als de afstand tussen de windturbine en de gevoelige objecten minder dan 12 maal de rotordiameter bedraagt. Op grotere afstanden zullen de veranderingen in lichtintensiteit dermate gering zijn, dat de slagschaduw niet als hinderlijk wordt ervaren. Ook bij een zonnestand van minder dan 3 graden wordt de slagschaduw niet als hinderlijk beschouwd. De reden hiervoor is dat bij een lage stand van de zon, bij zonsopkomst en -ondergang, het licht vrij diffuus en minder sterk is en vaak afscherming plaatsvindt door aanwezige begroeiing en bebouwing. Op basis van het bovenstaande is in de berekeningen de eventuele slagschaduw op een afstand van meer dan 12 maal de rotordiameter en/of bij een zonnestand van minder dan 3 graden buiten beschouwing gelaten.

De beplanting en gebouwen in het gebied zijn als 'worst case' benadering in de berekeningen buiten beschouwing gelaten. Deze kunnen de slagschaduwduur lokaal wel verminderen, omdat ze het zicht op de windturbines plaatselijk kunnen belemmeren.

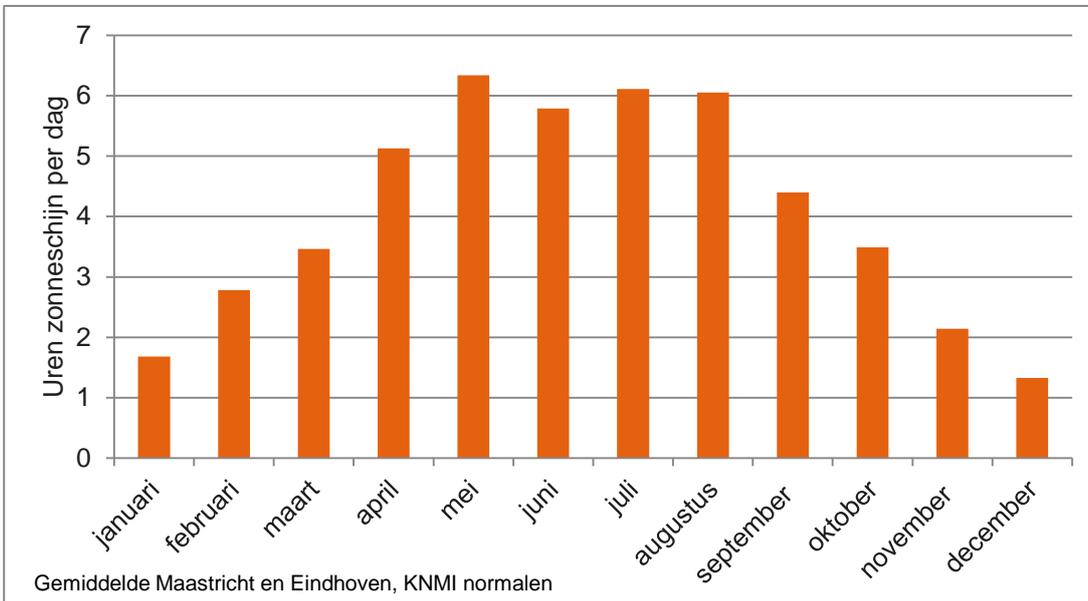
4.3 Correcties op basis van langjarige zonnenschijnduur- en windstatistieken

Op basis van de beschreven uitgangspunten wordt in eerste instantie de astronomisch maximaal mogelijke slagschaduwduur berekend. Dit is de slagschaduwduur die optreedt als de zon altijd schijnt, de hemel altijd helder is, de windturbines altijd draaien en de rotor altijd dwars op de lijn van de zon naar de ontvanger staat. Dit is een theoretisch maximale situatie die in werkelijkheid nooit zal optreden.

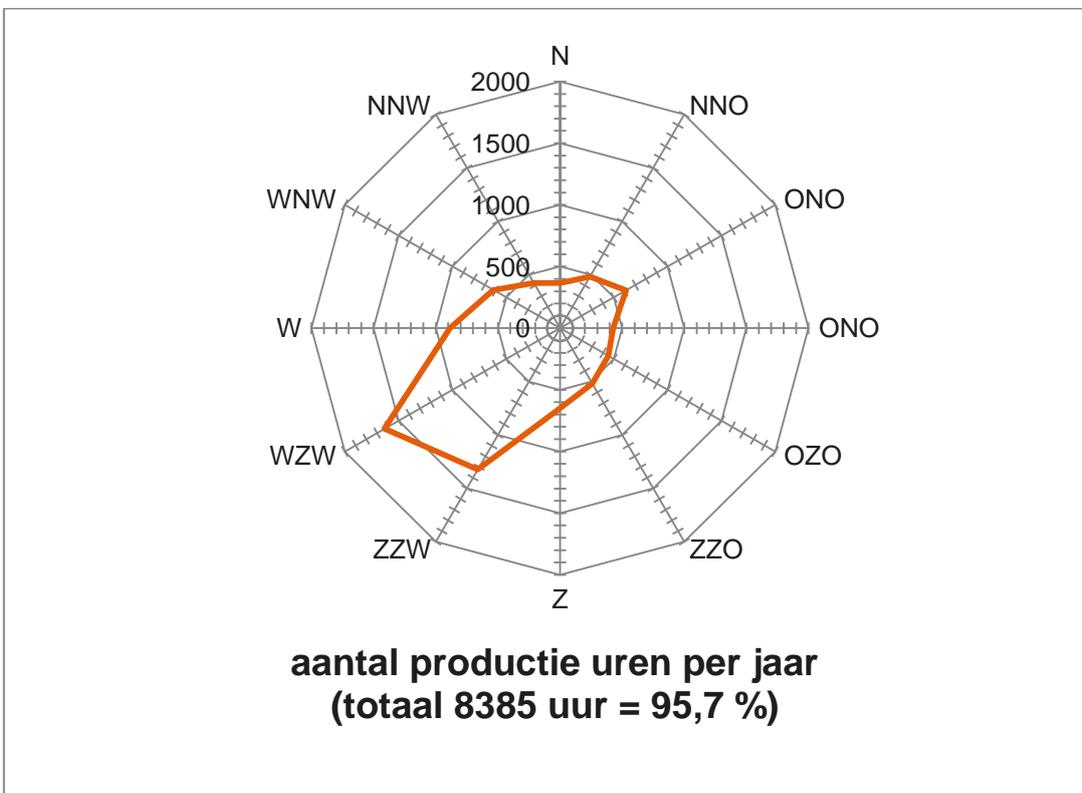
Slagschaduw treedt alleen op als de zon schijnt en de windturbines in bedrijf zijn. Het is echter regelmatig bewolkt en de windturbines draaien ook niet altijd. Daarnaast staat de rotor van een windturbine niet altijd dwars op de lijn van de zon naar de ontvanger. Om de werkelijk te verwachten slagschaduwduur te berekenen is een correctie toegepast op basis van de langjarige zonnenschijnduur- en windstatistieken. De gehanteerde zonnenschijnduur is weergegeven in Afbeelding 2. Hierbij is uitgegaan van het gemiddelde van KNMI gegevens voor de periode 1971-2000 voor de meteorostations Maastricht en Eindhoven.

Op basis van de langjarige windstatistieken is een correctie toegepast voor het aantal productie uren van de windturbines per windrichtingssector. Hierbij is uitgegaan van historische weerdata gegenereerd met het op het WRF NMM mesoschaal weermodel gebaseerde door Arcadis ontwikkelde FReSH Wind model. De met dit model gegenereerde data is met behulp van het softwarepakket WindPro/WAsP is gecorrigeerd –

gedownscaled - voor de ruwheid in de wijde omgeving van het windpark. Het vastgestelde aantal productie uren per windrichtingsector is weergegeven in Afbeelding 3 en bedraagt in totaal circa 8.400 uur per jaar. Dit betekent dat ervan uit is gegaan dat de windturbine circa 96% van de tijd in werking is.



Afbeelding 2: Gemiddeld aantal zonneshijjn uren per dag op basis van KNMI meteostations Maastricht en Eindhoven



Afbeelding 3: Gemiddeld aantal productie uren per jaar, berekend op basis van met het FReSH Wind weermodel genereerde windstatistieken voor Windpark Greenport Venlo

5 BEREKENINGSRESULTATEN

De slagschaduw vanwege het Windpark Greenport Venlo is beoordeeld op de gevels van de woningen in de omgeving van het windpark. De posities van de beoordelingspunten zijn weergegeven in bijlage 1.

De berekeningsresultaten zijn vermeld in bijlage 2 en voor de meest relevante beoordelingspunten samengevat in Tabel 2. Hierin zijn de volgende gegevens weergegeven:

- Astronomisch maximale aantal uren slagschaduw per jaar.
- Astronomisch maximale aantal dagen met slagschaduw per jaar.
- Astronomisch maximale aantal uren slagschaduw per dag.
- Verwachte aantal uren slagschaduw per jaar. Hierbij wordt rekening gehouden met het langjarig gemiddelde aantal uren zonneshijns per maand en het gemiddelde aantal draaiuren van de windturbines per windrichtingsector.

De astronomische slagschaduw is de slagschaduwduur die optreedt als de zon altijd schijnt, de hemel altijd helder is, de windturbines altijd draaien en de rotor altijd dwars op de lijn van de zon naar de ontvanger staat. Dit is een theoretisch maximale situatie die in werkelijkheid nooit zal optreden. Voor de beoordeling van de effecten wordt derhalve uitgegaan van de werkelijk verwachte slagschaduwduur.

De slagschaduwcontouren – het verwachte aantal uren slagschaduw per jaar - zijn weergegeven in Afbeelding 4.

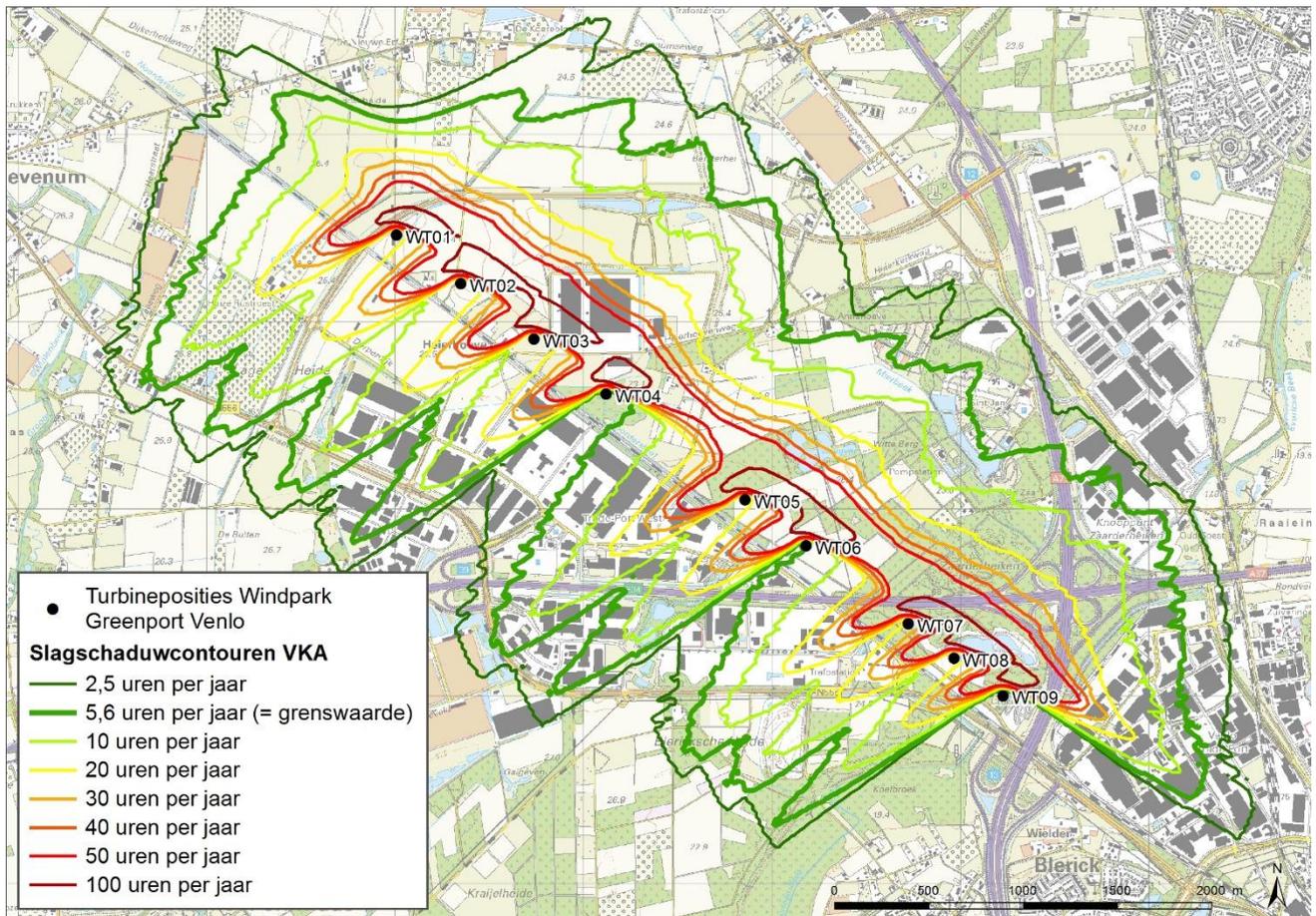
Uit Tabel 2 blijkt dat bij 15 woningen een slagschaduwduur van meer dan 5 uur en 40 minuten per jaar wordt verwacht. Dit betreft 11 woningen aan de Heierkerkweg, 3 woningen aan De Zaar en 1 woning aan de Dorperdijk. De meeste slagschaduw treedt op bij de woning Heierkerkweg 14. Hier wordt in totaal 80 uur en 7 minuten per jaar slagschaduw verwacht. Dit betekent dat mitigerende maatregelen noodzakelijk zijn.

Tabel 2: Slagschaduwduur bij gevoelige gebouwen (woningen) vanwege Windpark Greenport Venlo

Beoordelingspunt		Astronomisch maximale slagschaduwduur			Verwachte slagschaduwduur
Nr.	Straatnaam en huisnummer	Aantal uren per jaar	Aantal dagen per jaar	Maximale duur per dag	Aantal uren per jaar
110	Grubbenvorsterweg 64	0:00	0	0:00	0:00
113	Grubbenvorsterweg 58	53:38	83	0:47	5:23
121	Dorperdijk 20	31:06	79	0:34	6:42
150	Heierkerkweg 16	365:39	282	1:58	70:48
151	Heierkerkweg 14	411:28	268	2:24	80:07
152	Heierkerkweg 12	245:08	233	1:30	44:13
153	Heierkerkweg 10	142:18	195	1:07	26:08
154	Heierkerkweg 15	108:13	177	0:55	20:42
155	Heierkerkweg 13/11	44:14	113	0:38	9:02
156	Heierkerkweg 9	41:10	111	0:36	8:22
157	Heierkerkweg 7A	31:34	79	0:34	6:18

Beoordelingspunt		Astronomisch maximale slagschaduwduur			Verwachte slagschaduw- duur
Nr.	Straatnaam en huisnummer	Aantal uren per jaar	Aantal dagen per jaar	Maximale duur per dag	Aantal uren per jaar
158	Heierkerkweg 5B	28:38	75	0:33	5:41
159	Heierkerkweg 5A	27:47	74	0:33	5:31
160	Heierkerkweg 7	41:59	110	0:33	7:26
161	Heierhoevenweg 8	28:36	78	0:31	5:31
162	Heierhoevenweg 8B	23:51	70	0:30	4:47
163	Heierhoevenweg 8A	21:52	66	0:28	4:22
164	Heierhoevenweg 8	17:04	60	0:25	3:24
165	Heierhoevenweg 4	23:08	78	0:26	3:57
500	Venloseweg 38	21:39	80	0:24	5:29
501	Zeesweg 14	13:51	50	0:24	3:38
502	Zeesweg 10	13:22	45	0:24	3:31
503	Zeesweg 4	22:21	69	0:29	5:02
504	Dorperdijk 14	21:49	66	0:29	4:12
505	Venloseweg 43	8:28	34	0:22	2:09
520	Zonneveld 1-7	0:03	3	0:01	0:00
521	Geliskensdijkweg 73	11:53	40	0:24	3:04
522	Geliskensdijkweg 71	13:44	44	0:25	3:35
523	Kleine Koelbroekweg 58	0:00	0	0:00	0:00
524	Geliskendijkweg 61	0:00	0	0:00	0:00
525	Sitterskampweg 48	0:00	0	0:00	0:00
526	Sitterskampweg 41	0:00	0	0:00	0:00
527	Sitterskampweg 48	0:00	0	0:00	0:00
527-2	Sitterskampweg 44	0:00	0	0:00	0:00
528	Sitterskampweg 38	0:00	0	0:00	0:00
528-2	Sitterskampweg 40	0:00	0	0:00	0:00
528-3	Sitterskampweg 42	0:00	0	0:00	0:00
529	Kleine Beulterhofweg 88	0:00	0	0:00	0:00
530	Vielierstraat 32	0:00	0	0:00	0:00

Beoordelingspunt		Astronomisch maximale slagschaduwduur			Verwachte slagschaduw- duur
Nr.	Straatnaam en huisnummer	Aantal uren per jaar	Aantal dagen per jaar	Maximale duur per dag	Aantal uren per jaar
531	Boekenderhofweg 88	0:00	0	0:00	0:00
532	Buelterhofweg 66	0:00	0	0:00	0:00
533	Boekenderhofweg 60	0:00	0	0:00	0:00
534	Grote Koelbroekweg 6	0:00	0	0:00	0:00
535	Boekenderhofweg 40	0:00	0	0:00	0:00
536	Grote koelbroekweg 30	0:00	0	0:00	0:00
537	Voltastraat 28	0:00	0	0:00	0:00
538	Voltastraat 25	0:00	0	0:00	0:00
545	De Zaar 2	61:25	166	0:33	10:04
546	De Zaar 3/4	94:06	164	0:47	15:38
1001	Sevenumseweg 27	1:46	13	0:10	0:12
1003a	Sevenumseweg 41	0:00	0	0:00	0:00
1004	Sevenumseg 66	0:00	0	0:00	0:00
1007	Berkter Hei 1a	27:00	87	0:25	3:50
1008	Berkter Hei 1c	30:01	91	0:25	4:19



Afbeelding 4: Slagschaduwcontouren Windpark Greenport Venlo [uren per jaar]

6 MITIGERENDE MAATREGELEN

Uit Tabel 2 blijkt dat bij 15 woningen een slagschaduwduur van meer dan 5 uur en 40 minuten per jaar wordt verwacht. Dit betekent dat mitigerende maatregelen noodzakelijk zijn.

De hinder vanwege de optredende slagschaduw kan worden voorkomen c.q. beperkt door een automatische stilstandsregeling, die de windturbine afschakelt op de momenten dat deze slagschaduw bij woningen kan veroorzaken. Dit houdt in dat in de besturingssoftware van de windturbine een kalender van dagen en tijden wordt geprogrammeerd, waarmee de turbine wordt stilgezet als de zonneshijnsensor aangeeft dat de zon schijnt. Op grond van de 'Regeling algemene regels voor inrichtingen milieubeheer' is het verplicht om deze stilstandsregeling toe te passen. Hiermee wordt de slagschaduwduur op gevoelige gebouwen tot de wettelijke norm beperkt. Het toepassen van een stilstandsregeling gaat wel ten koste van de energieopbrengst van het windpark.

In Tabel 3 is de totale slagschaduwduur per turbine weergegeven. Het weergegeven verlies is berekend door het aantal uren slagschaduw te delen door het totale aantal uren in een jaar (8.760 uren/jaar). Dit is het verlies dat zou optreden als de turbine iedere keer zou worden stilgezet wanneer er daadwerkelijk slagschaduw op woningen optreedt. Door de stilstandsregeling te combineren met een zonneshijnsensor kan de stilstandsduur met circa 70% worden beperkt, omdat de zon gedurende daglichturen gemiddeld circa 30% van de tijd schijnt. Het productieverlies bedraagt dan gemiddeld circa 0,6 %.

Tabel 3: Totale slagschaduwduur en bijbehorend productieverlies per windturbine bij toepassing van een automatische stilstandsregeling

Windturbine	Astronomisch maximale slagschaduwduur (uren/jaar)	Productieverlies uitgaande van astronomisch maximale slagschaduwduur (%)	Productieverlies rekening houdend met zonneshijnsensor (%)
WT01	290:57	3,3	1,0
WT02	192:57	2,2	0,7
WT03	182:00	2,1	0,6
WT04	392:41	4,5	1,3
WT05	176:44	2,0	0,6
WT06	85:53	1,0	0,3
WT07	99:11	1,1	0,3
WT08	16:45	0,2	0,1
WT09	30:49	0,4	0,1
Gemiddeld productieverlies		1,9	0,6

7 CONCLUSIE

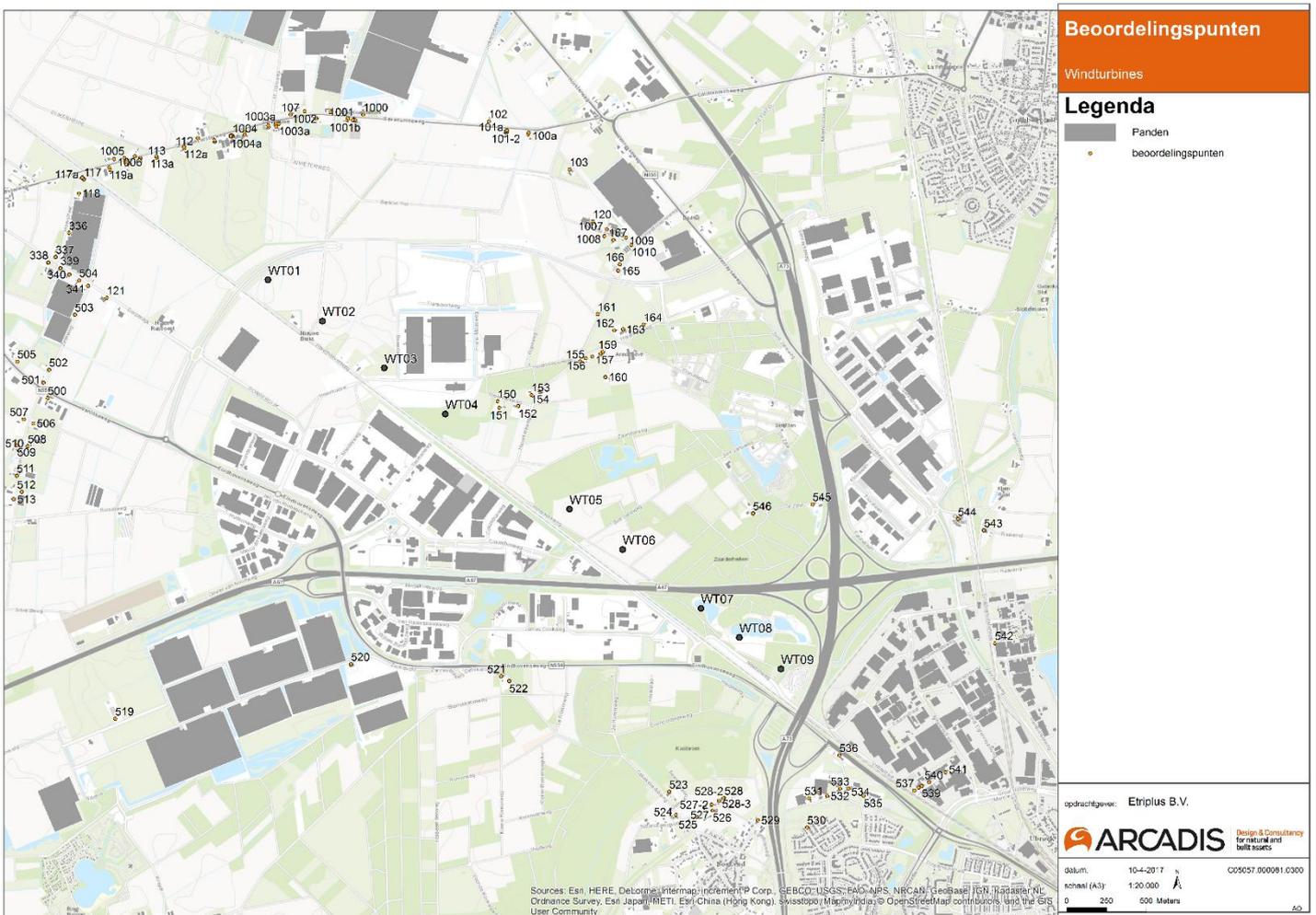
Het Windpark Greenport Venlo omvat 9 windturbines. Het precieze type turbine, de rotordiameter en de ashoogte zijn nog niet bekend. Er wordt echter uitgegaan van windturbines met de volgende eigenschappen:

- Een ashoogte van maximaal 140 meter;
- Een rotordiameter van maximaal 142 meter voor de zes meest noordelijke turbines en van maximaal 122 meter voor de drie meest zuidelijke turbines

Uit het onderzoek blijkt dat bij 15 woningen een slagschaduwduur van meer dan 5 uur en 40 minuten per jaar wordt verwacht. Dit betreft 11 woningen aan de Heierkerkweg, 3 woningen aan De Zaar en 1 woning aan de Dorperdijk. De meeste slagschaduw treedt op bij de woning Heierkerkweg 14. Hier wordt in totaal 80 uur en 7 minuten per jaar slagschaduw verwacht. Dit betekent dat mitigerende maatregelen noodzakelijk zijn.

De hinder vanwege de optredende slagschaduw kan en moet worden beperkt - dit is wettelijk verplicht - door een automatische stilstandsregeling, die de windturbine afschakelt op de momenten dat deze slagschaduw bij woningen kan veroorzaken. Dit houdt in dat in de besturingssoftware van de windturbine een kalender van dagen en tijden wordt geprogrammeerd, waarmee de turbine wordt stilgezet als de zonneshijnsensor aangeeft dat de zon schijnt. Hiermee wordt de slagschaduwduur op gevoelige gebouwen tot de wettelijke norm beperkt. Het toepassen van een stilstandsregeling gaat wel ten koste van de energieopbrengst van het windpark. Voor het beoogde windpark wordt een productieverlies van 0,6 % verwacht.

BIJLAGE 1 POSITIES VAN DE BEOORDELINGSPUNTEN



BIJLAGE 2 WINDPRO RAPPORT

SHADOW - Main Result

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

Assumptions for shadow calculations

Maximum distance for influence 1. WTG distance circle radius
 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
1,68	2,78	3,46	5,13	6,34	5,79	6,11	6,05	4,40	3,49	2,14	1,33

Operational hours are calculated from WTGs in calculation and wind distribution:

Site data: Wind Statistics Venlo WASP 11

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
365	482	613	427	449	518	650	1.322	1.626	887	623	424	8.387

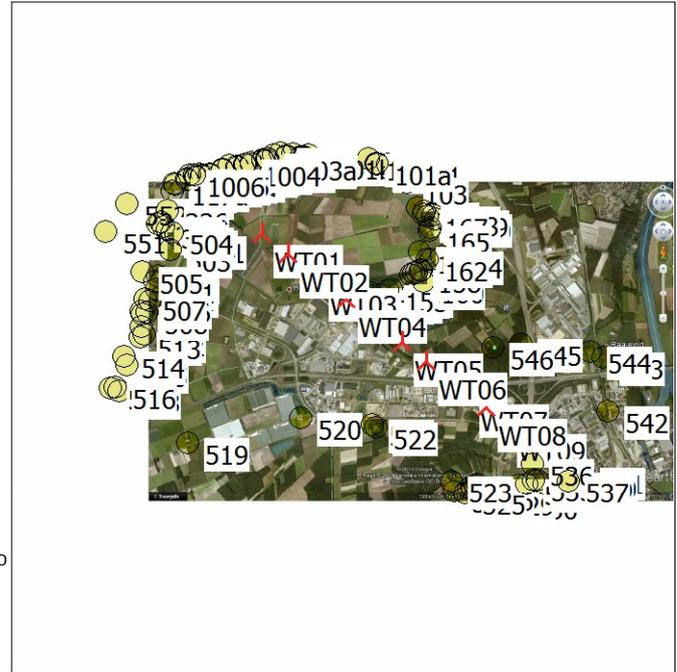
Idle start wind speed: Cut in wind speed from power curve

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: CONTOURLINE_ONLINEDATA_7.wpo
 Obstacles not used in calculation
 Eye height: 1,5 m
 Grid resolution: 10,0 m

All coordinates are in Dutch Stereo-RD/NAP 2000

WTGs

WTG	X (east)	Y (north)	Z [m]	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
WT01	203.011	380.463	24,0	Siemens SWT-3.15-142 3150 ...	Yes	Siemens	SWT-3.15-142-3.150	3.150	142,0	140,0	1.704	10,6
WT02	203.353	380.202	24,0	Siemens SWT-3.15-142 3150 ...	Yes	Siemens	SWT-3.15-142-3.150	3.150	142,0	140,0	1.704	10,6
WT03	203.740	379.906	24,0	Siemens SWT-3.15-142 3150 ...	Yes	Siemens	SWT-3.15-142-3.150	3.150	142,0	140,0	1.704	10,6
WT04	204.124	379.614	24,0	Siemens SWT-3.15-142 3150 ...	Yes	Siemens	SWT-3.15-142-3.150	3.150	142,0	140,0	1.704	10,6
WT05	204.861	379.050	24,0	Siemens SWT-3.15-142 3150 ...	Yes	Siemens	SWT-3.15-142-3.150	3.150	142,0	140,0	1.704	10,6
WT06	205.184	378.802	24,0	Siemens SWT-3.15-142 3150 ...	Yes	Siemens	SWT-3.15-142-3.150	3.150	142,0	140,0	1.704	10,6
WT07	205.728	378.386	24,0	SENVION 3.2M122 NES 3200 ...	Yes	SENVION	3.2M122 NES-3.200	3.200	122,0	140,0	1.464	11,2
WT08	205.969	378.202	24,0	SENVION 3.2M122 NES 3200 ...	Yes	SENVION	3.2M122 NES-3.200	3.200	122,0	140,0	1.464	11,2
WT09	206.231	378.003	24,0	SENVION 3.2M122 NES 3200 ...	Yes	SENVION	3.2M122 NES-3.200	3.200	122,0	140,0	1.464	11,2



New WTG

Scale 1:100.000
 Shadow receptor

Shadow receptor-Input

No.	Name	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
		[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
100	Sevenumseweg 11	204.645	381.383	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
102	Sevenumseweg 2	204.397	381.465	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
103	Berkter Hei 3	204.904	381.161	23,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
104	Sevenumseweg 29	203.510	381.473	25,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
105	Sevenumseweg 6	203.403	381.523	25,8	8,0	5,0	0,5	0,0	90,0	"Green house mode"
106	Sevenumseweg 35	203.315	381.481	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
107	Sevenumseweg 10	203.153	381.507	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
108	Grubbenvorsterweg 68	203.014	381.430	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
109	Grubbenvorsterweg 68	202.865	381.381	26,7	8,0	5,0	0,5	0,0	90,0	"Green house mode"
110	Grubbenvorsterweg 64	202.677	381.336	26,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
111	Grubbenvorsterweg 57	202.571	381.359	25,9	8,0	5,0	0,5	0,0	90,0	"Green house mode"
112	Grubbenvorsterweg 62	202.486	381.295	25,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
113	Grubbenvorsterweg 58	202.313	381.235	25,7	8,0	5,0	0,5	0,0	90,0	"Green house mode"
114	Grubbenvorsterweg 54	202.208	381.220	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
115	Grubbenvorsterweg 50	202.137	381.197	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
116	Grubbenvorsterweg 53	202.175	381.245	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
117	Heerstraat 1	201.856	381.098	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"

To be continued on next page...

SHADOW - Main Result

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

...continued from previous page

No.	Name	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south	Slope of window	Direction mode
		[m]	[m]	[m]	[m]	[m]	[m]	[°]	[°]	
118	Heerstraat 3	201.824	381.010	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
119	Grubbenvorsterweg 48	202.020	381.158	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
120	Berkter Hei 2	205.050	380.831	25,5	8,0	5,0	0,5	0,0	90,0	"Green house mode"
121	Dorperdijk 20	201.999	380.348	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
150	Heierkerkweg 16	204.453	379.695	25,1	8,0	5,0	0,5	0,0	90,0	"Green house mode"
151	Heierkerkweg 14	204.463	379.654	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
152	Heierkerkweg 12	204.582	379.665	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
153	Heierkerkweg 10	204.665	379.736	26,8	8,0	5,0	0,5	0,0	90,0	"Green house mode"
154	Heierkerkweg 15	204.720	379.754	26,5	8,0	5,0	0,5	0,0	90,0	"Green house mode"
155	Heierkerkweg 13/11	204.969	379.946	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
156	Heierkerkweg 9	205.004	379.967	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
157	Heierkerkweg 7A	205.045	379.978	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
158	Heierkerkweg 5B	205.098	379.996	25,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
159	Heierkerkweg 5A	205.113	380.007	25,1	8,0	5,0	0,5	0,0	90,0	"Green house mode"
160	Heierkerkweg 7	205.129	379.848	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
161	Heierhoevenweg 8	205.080	380.245	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
162	Heierhoevenweg 8B	205.183	380.144	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
163	Heierhoevenweg 8A	205.239	380.150	24,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
164	Heierhoevenweg 8	205.368	380.179	27,1	8,0	5,0	0,5	0,0	90,0	"Green house mode"
165	Heierhoevenweg 4	205.208	380.521	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
166	Heierhoevenweg 2a	205.218	380.561	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
167	Berkterhei 1B	205.179	380.715	24,8	8,0	5,0	0,5	0,0	90,0	"Green house mode"
336	Heerstraat 11	201.762	380.759	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
337	Dorperdijk 9	201.679	380.607	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
338	Dorperdijk 8	201.632	380.572	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
339	Dorperdijk 10	201.708	380.536	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
340	Dorperdijk 12	201.764	380.497	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
341	Dorperdijk 16	201.882	380.424	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
500	Venloseweg 38	201.629	379.716	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
501	Zeesweg 14	201.602	379.812	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
502	Zeesweg 10	201.637	379.894	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
503	Zeesweg 4	201.799	380.242	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
504	Dorperdijk 14	201.826	380.459	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
505	Venloseweg 43	201.438	379.946	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
506	Zeesweg 3	201.539	379.556	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
507	Zeesweg 18	201.479	379.581	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
508	Zeesweg 5	201.503	379.410	27,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
509	Klassenweg 59	201.437	379.419	27,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
510	Klassenweg 42	201.450	379.384	27,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
511	Zeesweg 24	201.434	379.224	26,2	8,0	5,0	0,5	0,0	90,0	"Green house mode"
512	Zeesweg 15	201.466	379.122	27,7	8,0	5,0	0,5	0,0	90,0	"Green house mode"
513	Zeesweg 30	201.416	379.076	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
514	Romerweg 16	201.204	378.822	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
515	Romerweg 14	201.243	378.708	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
516	Siberiëweg5	201.098	378.413	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
517	Siberiëweg 3	201.037	378.407	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
518	Siberiëweg 6	201.149	378.368	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
519	Het Rosendaal 5	202.051	377.688	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
520	Zonneveld 1-7	203.533	378.033	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
521	Geliskensdijkweg 73	204.476	377.956	29,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
522	Geliskensdijkweg 71	204.526	377.926	30,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
523	Kleine Koelbroekweg 58	205.529	377.226	21,7	8,0	5,0	0,5	0,0	90,0	"Green house mode"
524	Geliskendijkweg 61	205.571	377.080	21,5	8,0	5,0	0,5	0,0	90,0	"Green house mode"
525	Sitterskampweg 48	205.705	377.065	21,2	8,0	5,0	0,5	0,0	90,0	"Green house mode"
526	Sitterskampweg 41	205.802	377.109	20,5	8,0	5,0	0,5	0,0	90,0	"Green house mode"
527	Sitterskampweg 48	205.751	377.127	21,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
528	Sitterskampweg 38	205.875	377.186	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
529	Kleine Beulterhofweg 88	206.085	377.046	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
530	Vielierstraat 32	206.395	377.001	22,1	8,0	5,0	0,5	0,0	90,0	"Green house mode"
531	Boekenderhofweg 88	206.408	377.185	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
532	Buelterhofweg 66	206.521	377.200	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
533	Boekenderhofweg 60	206.602	377.246	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
534	Grote Koelbroekweg 6	206.651	377.246	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
535	Boekenderhofweg 40	206.750	377.200	21,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"

To be continued on next page...

SHADOW - Main Result

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

...continued from previous page

No.	Name	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	°	°	
536	Grote koelbroekweg 30	206.597	377.457	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
537	Voltastraat 28	207.066	377.234	20,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
538	Voltastraat 25	207.095	377.252	20,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
539	Voltastraat 24	207.116	377.263	20,1	8,0	5,0	0,5	0,0	90,0	"Green house mode"
540	Voltastraat 16	207.161	377.286	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
541	Voltastraat 10	207.264	377.349	20,9	8,0	5,0	0,5	0,0	90,0	"Green house mode"
542	Grubbenvorsterweg 6	207.573	378.165	21,8	8,0	5,0	0,5	0,0	90,0	"Green house mode"
543	Raaieind 3	207.505	378.878	22,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
544	Raaieind 2	207.341	378.950	21,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
545	De Zaar 2	206.429	379.044	25,1	8,0	5,0	0,5	0,0	90,0	"Green house mode"
546	De Zaar 3/4	206.055	378.985	27,5	8,0	5,0	0,5	0,0	90,0	"Green house mode"
551	Rand kern Sevenum	200.946	380.467	28,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
552	Rand kern Sevenum	201.229	380.845	27,2	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1000	Sevenumseweg 4	203.609	381.507	24,9	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1001	Sevenumseweg 27 (kant Grubbenvorsterweg)	203.551	381.478	25,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1002	Sevenumseweg 8	203.241	381.528	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1004	Sevenumseweg 66	202.788	381.374	27,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1005	Grubbenvorsterweg 49	202.110	381.232	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1006	Grubbenvorsterweg 47	202.045	381.226	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1007	Berkter Hei 1a	205.137	380.784	25,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1008	Berkter Hei 1c	205.122	380.739	25,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1009	Berkter Hei 1	205.258	380.730	24,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1010	Berkter Hei 2	205.292	380.684	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1001a	Sevenumseweg 27	203.557	381.473	25,7	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1001b	Sevenumseweg 27	203.544	381.473	25,6	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1003a	Sevenumseweg 41 (kant Sevenumseweg)	203.061	381.450	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1003a	Sevenumseweg 41	203.063	381.432	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1003a	Sevenumseweg 41	203.079	381.450	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1004a	Sevenumseweg 66	202.777	381.372	27,3	8,0	5,0	0,5	0,0	90,0	"Green house mode"
1004a	Grubbenvorsterweg 66 (kant Grubbenvorsterweg)	202.782	381.378	27,2	8,0	5,0	0,5	0,0	90,0	"Green house mode"
100a	Sevenumseweg 11 (kant Grubbenvorsterweg)	204.648	381.393	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
101-1	Sevenumseweg 15	204.512	381.400	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
101-2	Sevenumseweg 15	204.504	381.402	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
101-3	Sevenumseweg 15	204.507	381.394	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
101a	Sevenumseweg 15 (kant Grubbenvorsterweg)	204.511	381.408	24,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
104a	Sevenumseweg 29 (kant Grubbenvorsterweg)	203.513	381.485	25,5	8,0	5,0	0,5	0,0	90,0	"Green house mode"
106a	Sevenumseweg 35 (kant Grubbenvorsterweg)	203.311	381.491	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
108a	Grubbenvorsterweg 68 (kant Grubbenvorsterweg)	203.012	381.440	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
109a	Grubbenvorsterweg 68 (kant Grubbenvorsterweg)	202.862	381.400	26,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
110a	Grubbenvorsterweg 64 (kant Grubbenvorsterweg)	202.674	381.346	26,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
112a	Grubbenvorsterweg 62 (kant Grubbenvorsterweg)	202.484	381.303	24,9	8,0	5,0	0,5	0,0	90,0	"Green house mode"
113a	Grubbenvorsterweg 58 (kant Grubbenvorsterweg)	202.310	381.244	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
114a	Grubbenvorsterweg 54 (kant Grubbenvorsterweg)	202.210	381.232	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
115a	Grubbenvorsterweg 50 (kant Grubbenvorsterweg)	202.124	381.208	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
117a	Heerstraat 1 (kant Grubbenvorsterweg)	201.845	381.109	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
119a	Grubbenvorsterweg 48 (kant Grubbenvorsterweg)	202.015	381.173	26,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
527-2	Sitterskampweg 44	205.796	377.145	20,4	8,0	5,0	0,5	0,0	90,0	"Green house mode"
528-2	Sitterskampweg 40	205.868	377.184	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"
528-3	Sitterskampweg 42	205.841	377.170	20,0	8,0	5,0	0,5	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		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]	
100	Sevenumseweg 11	0:00	0	0:00	0:00	
102	Sevenumseweg 2	13:13	43	0:22	1:35	
103	Berkter Hei 3	0:00	0	0:00	0:00	
104	Sevenumseweg 29	0:00	0	0:00	0:00	
105	Sevenumseweg 6	0:00	0	0:00	0:00	
106	Sevenumseweg 35	0:00	0	0:00	0:00	
107	Sevenumseweg 10	0:00	0	0:00	0:00	

To be continued on next page...

SHADOW - Main Result

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

...continued from previous page

No.	Name	Shadow, worst case			Shadow, expected values	
		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]	
108	Grubbenvorsterweg 68	0:00	0	0:00	0:00	
109	Grubbenvorsterweg 68	0:00	0	0:00	0:00	
110	Grubbenvorsterweg 64	0:00	0	0:00	0:00	
111	Grubbenvorsterweg 57	9:31	27	0:32	0:54	
112	Grubbenvorsterweg 62	43:12	55	1:00	4:15	
113	Grubbenvorsterweg 58	53:38	83	0:47	5:23	
114	Grubbenvorsterweg 54	36:48	84	0:39	3:52	
115	Grubbenvorsterweg 50	25:52	62	0:34	2:58	
116	Grubbenvorsterweg 53	34:08	82	0:37	3:35	
117	Heerstraat 1	13:07	39	0:27	2:00	
118	Heerstraat 3	12:27	36	0:27	2:00	
119	Grubbenvorsterweg 48	18:50	54	0:30	2:27	
120	Berkter Hei 2	19:36	73	0:23	2:49	
121	Dorperdijk 20	31:06	79	0:34	6:42	
150	Heierkerkweg 16	365:39	282	1:58	70:48	
151	Heierkerkweg 14	411:28	268	2:24	80:07	
152	Heierkerkweg 12	245:08	233	1:30	44:13	
153	Heierkerkweg 10	142:18	195	1:07	26:08	
154	Heierkerkweg 15	108:13	177	0:55	20:42	
155	Heierkerkweg 13/11	44:14	113	0:38	9:02	
156	Heierkerkweg 9	41:10	111	0:36	8:22	
157	Heierkerkweg 7A	31:34	79	0:34	6:18	
158	Heierkerkweg 5B	28:38	75	0:33	5:41	
159	Heierkerkweg 5A	27:47	74	0:33	5:31	
160	Heierkerkweg 7	41:59	110	0:33	7:26	
161	Heierhoevenweg 8	28:36	78	0:31	5:31	
162	Heierhoevenweg 8B	23:51	70	0:30	4:47	
163	Heierhoevenweg 8A	21:52	66	0:28	4:22	
164	Heierhoevenweg 8	17:04	60	0:25	3:24	
165	Heierhoevenweg 4	23:08	78	0:26	3:57	
166	Heierhoevenweg 2a	23:04	80	0:26	3:53	
167	Berkterhei 1B	30:28	98	0:25	4:29	
336	Heerstraat 11	18:09	55	0:27	2:59	
337	Dorperdijk 9	10:36	33	0:26	1:54	
338	Dorperdijk 8	9:51	32	0:25	1:48	
339	Dorperdijk 10	17:28	59	0:27	3:09	
340	Dorperdijk 12	19:23	62	0:28	3:37	
341	Dorperdijk 16	24:08	69	0:31	4:50	
500	Venloseweg 38	21:39	80	0:24	5:29	
501	Zeesweg 14	13:51	50	0:24	3:38	
502	Zeesweg 10	13:22	45	0:24	3:31	
503	Zeesweg 4	22:21	69	0:29	5:02	
504	Dorperdijk 14	21:49	66	0:29	4:12	
505	Venloseweg 43	8:28	34	0:22	2:09	
506	Zeesweg 3	0:00	0	0:00	0:00	
507	Zeesweg 18	0:00	0	0:00	0:00	
508	Zeesweg 5	0:00	0	0:00	0:00	
509	Klassenweg 59	0:00	0	0:00	0:00	
510	Klassenweg 42	0:00	0	0:00	0:00	
511	Zeesweg 24	0:00	0	0:00	0:00	
512	Zeesweg 15	0:00	0	0:00	0:00	
513	Zeesweg 30	0:00	0	0:00	0:00	
514	Romerweg 16	0:00	0	0:00	0:00	
515	Romerweg 14	0:00	0	0:00	0:00	
516	Siberiëweg5	0:00	0	0:00	0:00	
517	Siberiëweg 3	0:00	0	0:00	0:00	
518	Siberiëweg 6	0:00	0	0:00	0:00	
519	Het Rosendaal 5	0:00	0	0:00	0:00	
520	Zonneveld 1-7	0:03	3	0:01	0:00	
521	Geliskensdijkweg 73	11:53	40	0:24	3:04	
522	Geliskensdijkweg 71	13:44	44	0:25	3:35	
523	Kleine Koelbroekweg 58	0:00	0	0:00	0:00	
524	Geliskendijkweg 61	0:00	0	0:00	0:00	

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SHADOW - Main Result

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

...continued from previous page

No.	Name	Shadow, worst case			Shadow, expected values	
		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]	
525	Sitterskampweg 48	0:00	0	0:00	0:00	
526	Sitterskampweg 41	0:00	0	0:00	0:00	
527	Sitterskampweg 48	0:00	0	0:00	0:00	
528	Sitterskampweg 38	0:00	0	0:00	0:00	
529	Kleine Beulterhofweg 88	0:00	0	0:00	0:00	
530	Viellerstraat 32	0:00	0	0:00	0:00	
531	Boekenderhofweg 88	0:00	0	0:00	0:00	
532	Buelterhofweg 66	0:00	0	0:00	0:00	
533	Boekenderhofweg 60	0:00	0	0:00	0:00	
534	Grote Koelbroekweg 6	0:00	0	0:00	0:00	
535	Boekenderhofweg 40	0:00	0	0:00	0:00	
536	Grote koelbroekweg 30	0:00	0	0:00	0:00	
537	Voltastraat 28	0:00	0	0:00	0:00	
538	Voltastraat 25	0:00	0	0:00	0:00	
539	Voltastraat 24	0:00	0	0:00	0:00	
540	Voltastraat 16	0:00	0	0:00	0:00	
541	Voltastraat 10	11:00	38	0:21	2:02	
542	Grubbenvorsterweg 6	8:03	28	0:23	1:35	
543	Raaieind 3	0:00	0	0:00	0:00	
544	Raaieind 2	11:46	42	0:22	1:48	
545	De Zaar 2	61:25	166	0:33	10:04	
546	De Zaar 3/4	94:06	164	0:47	15:38	
551	Rand kern Sevenum	0:00	0	0:00	0:00	
552	Rand kern Sevenum	0:00	0	0:00	0:00	
1000	Sevenumseweg 4	3:46	20	0:15	0:26	
1001	Sevenumseweg 27 (kant Grubbenvorsterweg)	1:46	13	0:10	0:12	
1002	Sevenumseweg 8	0:00	0	0:00	0:00	
1004	Sevenumseweg 66	0:00	0	0:00	0:00	
1005	Grubbenvorsterweg 49	24:50	61	0:33	2:48	
1006	Grubbenvorsterweg 47	20:15	55	0:30	2:23	
1007	Berkter Hei 1a	27:00	87	0:25	3:50	
1008	Berkter Hei 1c	30:01	91	0:25	4:19	
1009	Berkter Hei 1	19:14	71	0:24	2:36	
1010	Berkter Hei 2	14:45	56	0:24	2:09	
1001a	Sevenumseweg 27	3:10	19	0:13	0:22	
1001b	Sevenumseweg 27	1:47	13	0:10	0:12	
1003a	Sevenumseweg 41 (kant Sevenumseweg)	0:00	0	0:00	0:00	
1003a	Sevenumseweg 41	0:00	0	0:00	0:00	
1003a	Sevenumseweg 41	0:00	0	0:00	0:00	
1004a	Sevenumseweg 66	0:00	0	0:00	0:00	
1004a	Grubbenvorsterweg 66 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
100a	Sevenumseweg 11 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
101-1	Sevenumseweg 15	19:14	63	0:23	2:29	
101-2	Sevenumseweg 15	19:25	62	0:23	2:30	
101-3	Sevenumseweg 15	19:21	63	0:23	2:30	
101a	Sevenumseweg 15 (kant Grubbenvorsterweg)	19:16	62	0:23	2:29	
104a	Sevenumseweg 29 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
106a	Sevenumseweg 35 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
108a	Grubbenvorsterweg 68 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
109a	Grubbenvorsterweg 68 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
110a	Grubbenvorsterweg 64 (kant Grubbenvorsterweg)	0:00	0	0:00	0:00	
112a	Grubbenvorsterweg 62 (kant Grubbenvorsterweg)	41:14	54	0:59	4:02	
113a	Grubbenvorsterweg 58 (kant Grubbenvorsterweg)	52:57	81	0:46	5:19	
114a	Grubbenvorsterweg 54 (kant Grubbenvorsterweg)	39:58	91	0:39	4:07	
115a	Grubbenvorsterweg 50 (kant Grubbenvorsterweg)	25:04	61	0:33	2:52	
117a	Heerstraat 1 (kant Grubbenvorsterweg)	12:49	38	0:27	1:57	
119a	Grubbenvorsterweg 48 (kant Grubbenvorsterweg)	18:31	53	0:30	2:22	
527-2	Sitterskampweg 44	0:00	0	0:00	0:00	
528-2	Sitterskampweg 40	0:00	0	0:00	0:00	
528-3	Sitterskampweg 42	0:00	0	0:00	0:00	

SHADOW - Main Result

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

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

No.	Name	Worst case [h/year]	Expected [h/year]
WT01	Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m (TOT: 211,0 m) (490)	290:57	47:59
WT02	Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m (TOT: 211,0 m) (489)	192:57	29:39
WT03	Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m (TOT: 211,0 m) (484)	182:00	36:57
WT04	Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m (TOT: 211,0 m) (492)	392:41	83:24
WT05	Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m (TOT: 211,0 m) (488)	178:42	21:24
WT06	Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m (TOT: 211,0 m) (487)	87:54	11:24
WT07	SENVION 3.2M122 NES 3200 122.0 !O! hub: 140,0 m (TOT: 201,0 m) (486)	99:11	16:16
WT08	SENVION 3.2M122 NES 3200 122.0 !O! hub: 140,0 m (TOT: 201,0 m) (491)	16:45	2:01
WT09	SENVION 3.2M122 NES 3200 122.0 !O! hub: 140,0 m (TOT: 201,0 m) (485)	30:49	5:26

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 121 - Dorperdijk 20

Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January	February	March	April	May	June
1	08:40 16:35	08:14 17:22	07:22 18:13	07:12 20:06	06:09 20:55	05:24 21:40
2	08:40 16:36	08:12 17:24	07:20 18:15	07:10 20:07	06:07 20:57	05:23 21:41
3	08:39 16:38	08:11 17:26	07:18 18:16	07:08 20:09	06:05 20:59	05:23 21:42
4	08:39 16:39	08:09 17:28	07:15 18:18	07:06 20:11	07:34 (WT01) 21:00	05:22 21:44
5	08:39 16:40	08:08 17:29	07:13 18:20	07:03 20:12	07:31 (WT01) 21:02	06:01 21:45
6	08:39 16:41	08:06 17:31	07:11 18:22	07:01 20:14	07:28 (WT01) 21:04	05:59 21:45
7	08:38 16:42	08:04 17:33	07:09 18:23	06:59 20:16	07:49 (WT01) 21:05	05:20 21:46
8	08:38 16:44	08:03 17:35	07:07 18:25	06:57 20:17	07:26 (WT01) 21:07	05:58 21:47
9	08:38 16:45	08:01 17:37	07:04 18:27	06:54 20:19	07:23 (WT01) 21:08	05:54 21:48
10	08:37 16:46	07:59 17:39	07:02 18:28	06:52 20:21	07:22 (WT01) 21:10	05:53 21:49
11	08:36 16:48	07:57 17:40	07:00 18:30	06:50 20:22	07:53 (WT01) 21:11	05:51 21:50
12	08:36 16:49	07:56 17:42	06:58 18:32	06:48 20:24	07:54 (WT01) 21:13	05:49 21:50
13	08:35 16:50	07:54 17:44	06:55 18:34	06:46 20:26	07:20 (WT01) 21:15	05:48 21:51
14	08:34 16:52	07:52 17:46	06:53 18:35	07:18 (WT02) 07:26 (WT02)	06:43 20:27	07:19 (WT01) 21:16
15	08:34 16:53	07:50 17:48	06:51 18:37	07:15 (WT02) 07:27 (WT02)	06:41 20:29	07:19 (WT01) 21:18
16	08:33 16:55	07:48 17:49	06:49 18:39	07:13 (WT02) 07:29 (WT02)	06:39 20:31	07:19 (WT01) 21:19
17	08:32 16:57	07:46 17:51	06:46 18:40	07:11 (WT02) 07:30 (WT02)	06:37 20:32	07:19 (WT01) 21:21
18	08:31 16:58	07:44 17:53	06:44 18:42	07:09 (WT02) 07:31 (WT02)	06:35 20:34	07:19 (WT01) 21:22
19	08:30 17:00	07:42 17:55	06:42 18:44	07:06 (WT02) 07:31 (WT02)	06:33 20:36	07:19 (WT01) 21:24
20	08:29 17:01	07:40 17:57	06:40 18:46	07:06 (WT02) 07:31 (WT02)	06:31 20:37	07:20 (WT01) 21:25
21	08:28 17:03	07:38 17:58	06:37 18:47	07:06 (WT02) 07:31 (WT02)	06:29 20:39	07:20 (WT01) 21:26
22	08:27 17:05	07:36 18:00	06:35 18:49	07:05 (WT02) 07:30 (WT02)	06:27 20:41	07:21 (WT01) 21:28
23	08:26 17:06	07:34 18:02	06:33 18:51	07:05 (WT02) 07:30 (WT02)	06:24 20:42	07:22 (WT01) 21:29
24	08:25 17:08	07:32 18:04	06:31 18:52	07:05 (WT02) 07:29 (WT02)	06:22 20:44	07:23 (WT01) 21:30
25	08:24 17:10	07:30 18:06	06:28 18:54	07:06 (WT02) 07:28 (WT02)	06:20 20:46	07:25 (WT01) 21:32
26	08:22 17:12	07:28 18:07	07:26 19:56	08:06 (WT02) 08:26 (WT02)	06:18 20:47	07:27 (WT01) 21:33
27	08:21 17:13	07:26 18:09	07:24 19:57	08:07 (WT02) 08:25 (WT02)	06:16 20:49	05:29 21:34
28	08:20 17:15	07:24 18:11	07:21 19:59	08:09 (WT02) 08:23 (WT02)	06:14 20:51	05:28 21:36
29	08:18 17:17		07:19 20:01	08:11 (WT02) 08:18 (WT02)	06:12 20:52	05:27 21:37
30	08:17 17:19		07:17 20:02		06:11 20:54	05:26 21:38
31	08:15 17:20		07:15 20:04			05:25 21:39
Potential sun hours	261	278	367	415	483	496
Total, worst case				307		621
Sun reduction				0,29		0,37
Oper. time red.				0,96		0,96
Wind dir. red.				0,59		0,64
Total reduction				0,16		0,23
Total, real				50		141

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 121 - Dorperdijk 20

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December
1	05:21 21:54	05:57 21:24	06:45 20:23	07:20 (WT01) 07:53 (WT01)	07:33 19:15	08:16 16:30
2	05:22 21:54	05:58 21:22	06:47 20:21	07:20 (WT01) 07:51 (WT01)	07:35 19:12	08:17 16:29
3	05:22 21:54	06:00 21:20	06:48 20:19	07:21 (WT01) 07:51 (WT01)	07:36 19:10	08:18 16:29
4	05:23 21:53	06:01 21:19	06:50 20:16	07:21 (WT01) 07:49 (WT01)	07:38 19:08	08:20 16:28
5	05:24 21:53	06:03 21:17	06:51 20:14	07:22 (WT01) 07:48 (WT01)	07:40 19:06	08:21 16:28
6	05:25 21:52	06:04 21:15	06:53 20:12	07:23 (WT01) 07:46 (WT01)	07:41 19:03	08:22 16:27
7	05:26 21:52	06:06 21:14	06:55 20:10	07:25 (WT01) 07:44 (WT01)	07:43 19:01	08:24 16:27
8	05:27 21:51	06:07 21:12	06:56 20:07	07:27 (WT01) 07:41 (WT01)	07:44 18:59	08:25 16:26
9	05:27 21:51	06:09 21:10	06:58 20:05	07:31 (WT01) 07:36 (WT01)	07:46 18:57	08:26 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	07:36 (WT01)	18:57 18:54	16:26 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	07:49 18:52	07:43 16:53	08:28 16:26
12	05:30 21:48	06:13 21:04	07:03 19:58	07:51 18:50	07:45 16:51	08:29 16:26
13	05:32 21:48	06:15 21:03	07:04 19:56	07:53 18:48	07:47 16:50	08:30 16:26
14	05:33 21:47	06:17 21:01	07:06 19:54	07:54 18:46	07:48 16:48	08:31 16:26
15	05:34 21:46	06:18 20:59	07:07 19:51	08:00 (WT02) 08:10 (WT02)	07:56 18:44	08:32 16:26
16	05:35 21:45	06:20 20:57	07:09 19:49	07:58 (WT02) 08:13 (WT02)	07:58 18:41	08:33 16:26
17	05:36 21:44	06:21 20:55	07:11 19:47	07:55 (WT02) 08:14 (WT02)	08:00 18:39	08:34 16:26
18	05:37 21:43	06:23 20:53	07:12 19:44	07:54 (WT02) 08:15 (WT02)	08:01 18:37	08:34 16:26
19	05:39 21:42	06:24 20:51	07:14 19:42	07:52 (WT02) 08:15 (WT02)	08:03 18:35	08:35 16:26
20	05:40 21:40	06:26 20:49	07:15 19:40	07:52 (WT02) 08:16 (WT02)	08:05 18:33	08:36 16:27
21	05:41 21:39	06:28 20:47	07:17 19:38	07:51 (WT02) 08:16 (WT02)	08:06 18:31	08:36 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	07:50 (WT02) 08:16 (WT02)	08:08 18:29	08:37 16:28
23	05:44 21:37	06:31 20:42	07:20 19:33	07:50 (WT02) 08:16 (WT02)	08:10 18:27	08:38 16:28
24	05:45 21:35	06:32 20:40	07:22 19:31	07:50 (WT02) 08:14 (WT02)	08:12 18:25	08:38 16:29
25	05:47 21:34	06:34 20:38	07:23 19:28	07:50 (WT02) 08:14 (WT02)	08:13 18:23	08:38 16:29
26	05:48 21:33	06:36 20:36	07:25 19:26	07:52 (WT02) 08:13 (WT02)	08:15 18:21	08:39 16:30
27	05:49 21:31	06:37 20:34	07:27 19:24	07:53 (WT02) 08:11 (WT02)	08:17 18:19	08:39 16:31
28	05:51 21:30	06:39 20:32	07:28 19:21	07:55 (WT02) 08:10 (WT02)	08:19 18:17	08:39 16:32
29	05:52 21:28	06:40 20:30	07:30 19:19	07:56 (WT02) 08:08 (WT02)	08:20 17:15	08:39 16:32
30	05:54 21:27	06:42 20:27	07:31 19:17	07:58 (WT02) 08:05 (WT02)	08:22 17:13	08:40 16:33
31	05:55 21:25	06:44 20:25	07:20 (WT01) 07:53 (WT01)		07:24 17:11	08:40 16:34
Potential sun hours	500	453	381		333	246
Total, worst case		419	519			
Sun reduction		0,41	0,35			
Oper. time red.		0,96	0,96			
Wind dir. red.		0,64	0,61			
Total reduction		0,25	0,20			
Total, real		106	105			

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 150 - Heierkerkweg 16
 Assumptions for shadow calculations
 Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January			February			March			April			May			June		
1	08:39	09:31 (WT06)	08:14	07:22	07:12	17:21 (WT04)	06:09	17:23 (WT04)	05:24	19:41 (WT03)								
	16:35	74	10:45 (WT05)	17:22	18:13	20:05	87	18:48 (WT04)	20:55	111	20:17 (WT03)	21:40	79	21:04 (WT01)				
2	08:39	09:32 (WT06)	08:12	07:20	07:10	17:19 (WT04)	06:07	17:25 (WT04)	05:23	19:42 (WT03)								
	16:36	74	10:46 (WT05)	17:24	18:14	20:07	88	18:47 (WT04)	20:57	111	20:19 (WT03)	21:41	77	21:04 (WT01)				
3	08:39	09:33 (WT06)	08:11	07:17	07:08	17:18 (WT04)	06:05	17:25 (WT04)	05:23	19:43 (WT03)								
	16:37	74	10:47 (WT05)	17:26	18:16	20:09	90	18:48 (WT04)	20:59	112	20:19 (WT03)	21:42	75	21:04 (WT01)				
4	08:39	09:33 (WT06)	08:09	07:15	07:05	17:18 (WT04)	06:03	17:26 (WT04)	05:22	19:43 (WT03)								
	16:39	73	10:46 (WT05)	17:27	18:18	20:10	91	18:49 (WT04)	21:00	112	20:20 (WT03)	21:43	75	21:04 (WT01)				
5	08:39	09:34 (WT06)	08:08	07:13	07:03	17:17 (WT04)	06:01	17:28 (WT04)	05:21	19:45 (WT03)								
	16:40	73	10:47 (WT05)	17:29	18:20	20:12	92	18:49 (WT04)	21:02	111	20:21 (WT03)	21:44	72	21:04 (WT01)				
6	08:39	09:34 (WT06)	08:06	07:11	07:01	17:16 (WT04)	05:59	17:29 (WT04)	05:20	19:45 (WT03)								
	16:41	74	10:48 (WT05)	17:31	18:21	20:14	92	18:48 (WT04)	21:03	109	20:21 (WT03)	21:45	71	21:04 (WT01)				
7	08:38	09:35 (WT06)	08:04	07:09	06:59	17:16 (WT04)	05:58	17:30 (WT04)	05:20	19:46 (WT03)								
	16:42	73	10:48 (WT05)	17:33	18:23	20:15	93	18:49 (WT04)	21:05	108	20:21 (WT03)	21:46	70	21:04 (WT01)				
8	08:38	09:36 (WT06)	08:03	07:06	06:57	17:16 (WT04)	05:56	17:32 (WT04)	05:19	19:46 (WT03)								
	16:43	73	10:49 (WT05)	17:35	18:25	20:17	93	18:49 (WT04)	21:07	107	20:22 (WT03)	21:47	68	21:03 (WT01)				
9	08:37	09:36 (WT06)	08:01	07:04	06:54	17:15 (WT04)	05:54	17:33 (WT04)	05:19	19:47 (WT03)								
	16:45	73	10:49 (WT05)	17:37	18:27	20:19	94	18:49 (WT04)	21:08	114	20:41 (WT02)	21:48	66	21:03 (WT01)				
10	08:37	09:36 (WT06)	07:59	07:02	06:52	17:15 (WT04)	05:52	17:34 (WT04)	05:18	19:48 (WT03)								
	16:46	73	10:49 (WT05)	17:38	18:28	20:20	94	18:49 (WT04)	21:10	117	20:42 (WT02)	21:49	65	21:04 (WT01)				
11	08:36	09:37 (WT06)	07:57	07:00	06:50	17:14 (WT04)	05:51	17:36 (WT04)	05:18	19:48 (WT03)								
	16:47	73	10:50 (WT05)	17:40	18:30	20:22	94	18:48 (WT04)	21:11	118	20:44 (WT02)	21:49	63	21:03 (WT01)				
12	08:36	09:38 (WT06)	07:56	06:58	06:48	17:14 (WT04)	05:49	17:37 (WT04)	05:18	19:49 (WT03)								
	16:49	72	10:50 (WT05)	17:42	18:32	20:24	94	18:48 (WT04)	21:13	117	20:45 (WT02)	21:50	61	21:03 (WT01)				
13	08:35	09:38 (WT06)	07:54	06:55	06:46	17:14 (WT04)	05:48	17:39 (WT04)	05:17	19:50 (WT03)								
	16:50	72	10:50 (WT05)	17:44	18:33	20:25	94	18:48 (WT04)	21:14	118	20:47 (WT02)	21:51	61	21:03 (WT01)				
14	08:34	09:39 (WT06)	07:52	06:53	06:43	17:06 (WT04)	06:43	17:14 (WT04)	05:46	19:50 (WT03)								
	16:52	71	10:50 (WT05)	17:46	18:35	5	17:11 (WT04)	20:27	94	18:48 (WT04)	21:16	117	20:49 (WT02)	21:51	60	21:03 (WT01)		
15	08:34	09:40 (WT06)	07:50	06:51	06:51	16:56 (WT04)	06:41	17:14 (WT04)	05:44	19:51 (WT03)								
	16:53	70	10:50 (WT05)	17:48	18:37	24	17:20 (WT04)	20:29	94	18:48 (WT04)	21:17	117	20:50 (WT01)	21:52	58	21:03 (WT01)		
16	08:33	09:41 (WT06)	07:48	06:49	06:49	16:51 (WT04)	06:39	17:15 (WT04)	05:43	19:51 (WT03)								
	16:55	69	10:50 (WT05)	17:49	18:39	34	17:25 (WT04)	20:30	93	18:48 (WT04)	21:19	113	20:51 (WT01)	21:52	58	21:03 (WT01)		
17	08:32	09:42 (WT06)	07:46	06:46	06:46	16:47 (WT04)	06:37	17:15 (WT04)	05:41	19:52 (WT03)								
	16:56	68	10:50 (WT05)	17:51	18:40	41	17:28 (WT04)	20:32	93	18:48 (WT04)	21:20	112	20:52 (WT01)	21:53	57	21:03 (WT01)		
18	08:31	09:43 (WT06)	07:44	06:44	06:44	16:43 (WT04)	06:35	17:15 (WT04)	05:40	19:52 (WT03)								
	16:58	67	10:50 (WT05)	17:53	18:42	47	17:30 (WT04)	20:34	92	18:47 (WT04)	21:22	108	20:54 (WT01)	21:53	56	21:03 (WT01)		
19	08:30	09:44 (WT06)	07:42	06:42	06:42	16:41 (WT04)	06:33	17:16 (WT04)	05:39	19:52 (WT03)								
	17:00	65	10:50 (WT05)	17:55	18:44	51	17:32 (WT04)	20:35	91	18:47 (WT04)	21:23	104	20:55 (WT01)	21:54	57	21:04 (WT01)		
20	08:29	09:45 (WT06)	07:40	06:40	06:40	16:39 (WT04)	06:31	17:16 (WT04)	05:37	19:52 (WT03)								
	17:01	63	10:50 (WT05)	17:57	18:45	55	17:34 (WT04)	20:37	91	18:47 (WT04)	21:25	100	20:57 (WT01)	21:54	57	21:04 (WT01)		
21	08:28	09:47 (WT06)	07:38	06:37	06:37	16:37 (WT04)	06:28	17:16 (WT04)	05:36	19:53 (WT03)								
	17:03	59	10:50 (WT05)	17:58	18:47	60	17:37 (WT04)	20:39	90	18:46 (WT04)	21:26	90	20:58 (WT01)	21:54	56	21:04 (WT01)		
22	08:27	09:49 (WT06)	07:36	06:35	06:35	16:34 (WT04)	06:26	17:17 (WT04)	05:35	19:53 (WT03)								
	17:05	52	10:49 (WT05)	18:00	18:49	64	17:38 (WT04)	20:40	89	18:46 (WT04)	21:28	83	20:59 (WT01)	21:55	56	21:04 (WT01)		
23	08:26	09:52 (WT06)	07:34	06:33	06:33	16:32 (WT04)	06:24	17:17 (WT04)	05:33	19:52 (WT03)								
	17:06	46	10:49 (WT05)	18:02	18:50	67	17:39 (WT04)	20:42	88	18:45 (WT04)	21:29	84	21:00 (WT01)	21:55	57	21:04 (WT01)		
24	08:25	10:11 (WT05)	07:32	06:30	06:30	16:31 (WT04)	06:22	17:18 (WT04)	05:32	19:53 (WT03)								
	17:08	37	10:48 (WT05)	18:04	18:52	70	17:41 (WT04)	20:44	86	18:44 (WT04)	21:30	84	21:01 (WT01)	21:55	57	21:05 (WT01)		
25	08:23	10:12 (WT05)	07:30	06:28	06:28	16:29 (WT04)	06:20	17:18 (WT04)	05:31	19:53 (WT03)								
	17:10	35	10:47 (WT05)	18:06	18:54	73	17:42 (WT04)	20:45	95	20:05 (WT03)	21:32	84	21:02 (WT01)	21:55	56	21:04 (WT01)		
26	08:22	10:13 (WT05)	07:28	06:26	06:26	17:27 (WT04)	06:18	17:19 (WT04)	05:30	19:54 (WT03)								
	17:11	33	10:46 (WT05)	18:07	19:55	76	18:43 (WT04)	20:47	102	20:09 (WT03)	21:33	85	21:04 (WT01)	21:55	57	21:05 (WT01)		
27	08:21	10:14 (WT05)	07:26	06:24	06:24	17:26 (WT04)	06:16	17:20 (WT04)	05:29	19:53 (WT03)								
	17:13	31	10:45 (WT05)	18:09	19:57	78	18:44 (WT04)	20:49	105	20:11 (WT03)	21:34	85	21:04 (WT01)	21:55	58	21:05 (WT01)		
28	08:20	10:16 (WT05)	07:24	06:21	06:21	17:25 (WT04)	06:14	17:20 (WT04)	05:28	19:53 (WT03)								
	17:15	28	10:44 (WT05)	18:11	19:59	80	18:45 (WT04)	20:50	108	20:13 (WT03)	21:35	84	21:04 (WT01)	21:55	59	21:05 (WT01)		
29	08:18	10:18 (WT05)	07:19	06:17	06:17	17:23 (WT04)	06:12	17:21 (WT04)	05:27	19:53 (WT03)								
	17:17	23	10:41 (WT05)	20:00	20:00	82	18:45 (WT04)	20:52	109	20:14 (WT03)	21:37	83	21:04 (WT01)	21:55	60	21:06 (WT01)		
30	08:17	10:21 (WT05)	07:17	06:15	06:15	17:22 (WT04)	06:10	17:22 (WT04)	05:26	19:53 (WT03)								
	17:18	18	10:39 (WT05)	20:02	20:02	84	18:46 (WT04)	20:54	112	20:16 (WT03)	21:38	81	21:04 (WT01)	21:54	62	21:07 (WT01)		
31	08:15	10:24 (WT05)	07:15	06:13	06:13	17:21 (WT04)	06:05	17:21 (WT04)	05:25	19:53 (WT03)								
	17:20	11	10:35 (WT05)	20:04	20:04	86	18:47 (WT04)	20:54	112	21:39	79	21:04 (WT01)						
Potential sun hours	26																	

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 150 - Heierkerkweg 16

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July		August		September		October	November	December		
1	05:21	19:53 (WT03)	05:56	17:48 (WT04)	06:45	17:14 (WT04)	07:33	07:25	08:15	09:19 (WT06)	
	21:54	62 21:07 (WT01)	21:24	117 20:56 (WT02)	20:23	94 18:48 (WT04)	19:14	17:09	16:30	72 10:31 (WT05)	
2	05:22	19:53 (WT03)	05:58	17:46 (WT04)	06:47	94 17:13 (WT04)	07:34	07:27	08:17	09:20 (WT06)	
	21:54	63 21:08 (WT01)	21:22	118 20:54 (WT02)	20:21	94 18:47 (WT04)	19:12	17:08	16:29	72 10:32 (WT05)	
3	05:22	19:52 (WT03)	05:59	17:45 (WT04)	06:48	94 17:13 (WT04)	07:36	07:29	08:18	09:19 (WT06)	
	21:54	65 21:08 (WT01)	21:20	117 20:53 (WT02)	20:18	94 18:47 (WT04)	19:10	17:06	16:29	73 10:32 (WT05)	
4	05:23	19:52 (WT03)	06:01	17:43 (WT04)	06:50	94 17:12 (WT04)	07:38	07:31	08:20	09:19 (WT06)	
	21:53	66 21:08 (WT01)	21:19	114 20:51 (WT02)	20:16	94 18:46 (WT04)	19:08	17:04	16:28	73 10:32 (WT05)	
5	05:24	19:52 (WT03)	06:02	17:42 (WT04)	06:51	93 17:13 (WT04)	07:39	07:32	08:21	09:20 (WT06)	
	21:53	68 21:09 (WT01)	21:17	106 20:31 (WT03)	20:14	93 18:46 (WT04)	19:05	17:02	16:28	73 10:33 (WT05)	
6	05:25	19:52 (WT03)	06:04	17:41 (WT04)	06:53	93 17:12 (WT04)	07:41	07:34	08:22	09:20 (WT06)	
	21:52	70 21:10 (WT01)	21:15	107 20:31 (WT03)	20:12	93 18:45 (WT04)	19:03	17:01	16:27	73 10:33 (WT05)	
7	05:26	19:52 (WT03)	06:06	17:39 (WT04)	06:55	92 17:12 (WT04)	07:43	07:36	08:23	09:20 (WT06)	
	21:52	70 21:10 (WT01)	21:13	109 20:30 (WT03)	20:09	92 18:44 (WT04)	19:01	16:59	16:27	74 10:34 (WT05)	
8	05:26	19:51 (WT03)	06:07	17:38 (WT04)	06:56	91 17:12 (WT04)	07:44	07:38	08:25	09:21 (WT06)	
	21:51	72 21:10 (WT01)	21:12	110 20:30 (WT03)	20:07	91 18:43 (WT04)	18:59	16:57	16:26	74 10:35 (WT05)	
9	05:27	19:50 (WT03)	06:09	17:36 (WT04)	06:58	90 17:12 (WT04)	07:46	07:39	08:26	09:21 (WT06)	
	21:50	75 21:11 (WT01)	21:10	111 20:29 (WT03)	20:05	90 18:42 (WT04)	18:57	16:56	16:26	74 10:35 (WT05)	
10	05:28	19:50 (WT03)	06:10	17:35 (WT04)	06:59	89 17:12 (WT04)	07:48	07:41	08:27	09:22 (WT06)	
	21:50	75 21:11 (WT01)	21:08	112 20:29 (WT03)	20:03	89 18:41 (WT04)	18:54	16:54	16:26	73 10:35 (WT05)	
11	05:29	19:50 (WT03)	06:12	17:33 (WT04)	07:01	88 17:12 (WT04)	07:49	07:43	08:28	09:22 (WT06)	
	21:49	76 21:11 (WT01)	21:06	112 20:27 (WT03)	20:00	88 18:40 (WT04)	18:52	16:53	7 10:05 (WT05)	16:26	74 10:36 (WT05)
12	05:30	19:49 (WT03)	06:13	17:32 (WT04)	07:02	87 17:12 (WT04)	07:51	07:45	09:53 (WT05)	08:29	09:22 (WT06)
	21:48	79 21:12 (WT01)	21:04	112 20:26 (WT03)	19:58	87 18:39 (WT04)	18:50	16:51	16 10:09 (WT05)	16:26	74 10:36 (WT05)
13	05:31	19:49 (WT03)	06:15	17:30 (WT04)	07:04	85 17:13 (WT04)	07:53	07:46	09:51 (WT05)	08:30	09:23 (WT06)
	21:47	79 21:12 (WT01)	21:02	111 20:24 (WT03)	19:56	85 18:38 (WT04)	18:48	16:50	22 10:13 (WT05)	16:26	73 10:36 (WT05)
14	05:33	19:49 (WT03)	06:16	17:30 (WT04)	07:06	83 17:14 (WT04)	07:54	07:48	09:49 (WT05)	08:31	09:23 (WT06)
	21:47	81 21:12 (WT01)	21:00	110 20:23 (WT03)	19:53	83 18:37 (WT04)	18:46	16:48	25 10:14 (WT05)	16:26	74 10:37 (WT05)
15	05:34	19:48 (WT03)	06:18	17:28 (WT04)	07:07	81 17:14 (WT04)	07:56	07:50	09:47 (WT05)	08:32	09:24 (WT06)
	21:46	82 21:12 (WT01)	20:58	109 20:21 (WT03)	19:51	81 18:35 (WT04)	18:43	16:47	30 10:17 (WT05)	16:26	73 10:37 (WT05)
16	05:35	19:48 (WT03)	06:20	17:27 (WT04)	07:09	79 17:15 (WT04)	07:58	07:52	09:46 (WT05)	08:33	09:24 (WT06)
	21:45	84 21:13 (WT01)	20:57	106 20:19 (WT03)	19:49	79 18:34 (WT04)	18:41	16:45	32 10:18 (WT05)	16:26	74 10:38 (WT05)
17	05:36	19:48 (WT03)	06:21	17:26 (WT04)	07:10	77 17:15 (WT04)	07:59	07:53	09:46 (WT05)	08:34	09:25 (WT06)
	21:44	85 21:14 (WT01)	20:55	102 20:16 (WT03)	19:47	77 18:32 (WT04)	18:39	16:44	34 10:20 (WT05)	16:26	73 10:38 (WT05)
18	05:37	19:48 (WT03)	06:23	17:25 (WT04)	07:12	75 17:16 (WT04)	08:01	07:55	09:45 (WT05)	08:34	09:26 (WT06)
	21:43	84 21:13 (WT01)	20:53	97 20:13 (WT03)	19:44	75 18:31 (WT04)	18:37	16:43	37 10:22 (WT05)	16:26	73 10:39 (WT05)
19	05:38	19:47 (WT03)	06:24	17:24 (WT04)	07:14	73 17:16 (WT04)	08:03	07:57	09:45 (WT05)	08:35	09:25 (WT06)
	21:41	84 21:12 (WT01)	20:51	86 18:50 (WT04)	19:42	73 18:29 (WT04)	18:35	16:41	38 10:23 (WT05)	16:26	74 10:39 (WT05)
20	05:40	19:47 (WT03)	06:26	17:23 (WT04)	07:15	69 17:18 (WT04)	08:05	07:58	09:25 (WT06)	08:36	09:26 (WT06)
	21:40	84 21:11 (WT01)	20:48	87 18:50 (WT04)	19:40	69 18:27 (WT04)	18:33	16:40	50 10:24 (WT05)	16:27	74 10:40 (WT05)
21	05:41	19:46 (WT03)	06:28	17:22 (WT04)	07:17	66 17:18 (WT04)	08:06	08:00	09:23 (WT06)	08:36	09:26 (WT06)
	21:39	84 21:10 (WT01)	20:46	88 18:50 (WT04)	19:37	66 18:24 (WT04)	18:31	16:39	55 10:24 (WT05)	16:27	74 10:40 (WT05)
22	05:42	19:47 (WT03)	06:29	17:21 (WT04)	07:18	63 17:20 (WT04)	08:08	08:02	09:22 (WT06)	08:37	09:27 (WT06)
	21:38	83 21:10 (WT01)	20:44	89 18:50 (WT04)	19:35	63 18:23 (WT04)	18:29	16:38	60 10:25 (WT05)	16:28	74 10:41 (WT05)
23	05:44	18:11 (WT04)	06:31	17:20 (WT04)	07:20	59 17:22 (WT04)	08:10	08:03	09:21 (WT06)	08:37	09:27 (WT06)
	21:37	90 21:08 (WT01)	20:42	90 18:50 (WT04)	19:33	59 18:21 (WT04)	18:27	16:37	63 10:26 (WT05)	16:28	74 10:41 (WT05)
24	05:45	18:05 (WT04)	06:32	17:19 (WT04)	07:22	55 17:23 (WT04)	08:11	08:05	09:21 (WT06)	08:38	09:28 (WT06)
	21:35	100 21:07 (WT01)	20:40	91 18:50 (WT04)	19:31	55 18:18 (WT04)	18:25	16:36	65 10:27 (WT05)	16:29	74 10:42 (WT05)
25	05:46	18:02 (WT04)	06:34	17:18 (WT04)	07:23	50 17:25 (WT04)	08:13	08:06	09:20 (WT06)	08:38	09:29 (WT06)
	21:34	104 21:05 (WT01)	20:38	92 18:50 (WT04)	19:28	50 18:15 (WT04)	18:23	16:35	67 10:27 (WT05)	16:29	73 10:42 (WT05)
26	05:48	18:00 (WT04)	06:35	17:18 (WT04)	07:25	46 17:26 (WT04)	08:15	08:08	09:20 (WT06)	08:39	09:29 (WT06)
	21:33	108 21:05 (WT01)	20:36	92 18:50 (WT04)	19:26	46 18:12 (WT04)	18:21	16:34	68 10:28 (WT05)	16:30	73 10:42 (WT05)
27	05:49	17:57 (WT04)	06:37	17:16 (WT04)	07:26	40 17:29 (WT04)	08:17	08:10	09:20 (WT06)	08:39	09:29 (WT06)
	21:31	112 21:03 (WT01)	20:34	93 18:49 (WT04)	19:24	40 18:09 (WT04)	18:19	16:33	69 10:29 (WT05)	16:31	74 10:43 (WT05)
28	05:51	17:55 (WT04)	06:39	17:16 (WT04)	07:28	32 17:33 (WT04)	08:18	08:11	09:19 (WT06)	08:39	09:29 (WT06)
	21:30	113 21:01 (WT01)	20:32	94 18:50 (WT04)	19:21	32 18:05 (WT04)	18:17	16:32	70 10:29 (WT05)	16:31	74 10:43 (WT05)
29	05:52	17:54 (WT04)	06:40	17:15 (WT04)	07:30	23 17:37 (WT04)	07:20	08:13	09:19 (WT06)	08:39	09:31 (WT06)
	21:28	116 21:01 (WT01)	20:29	94 18:49 (WT04)	19:19	23 18:00 (WT04)	17:15	16:31	71 10:30 (WT05)	16:32	73 10:44 (WT05)
30	05:54	17:51 (WT04)	06:42	17:15 (WT04)	07:31	17:13	07:22	08:14	09:19 (WT06)	08:39	09:31 (WT06)
	21:27	117 20:59 (WT02)	20:27	94 18:49 (WT04)	19:17	17:13	07:22	16:31	71 10:30 (WT05)	16:33	74 10:45 (WT05)
31	05:55	17:49 (WT04)	06:43	17:14 (WT04)	07:32	07:24	07:24	08:15	08:39	09:31 (WT06)	09:31 (WT06)
	21:25	118 20:57 (WT02)	20:25	94 18:48 (WT04)	19:16	17:11	07:24	16:34	73 10:44 (WT05)	16:34	73 10:44 (WT05)
Potential sun hours	500		453		381		333	269		247	
Total, worst case	2649		3164		2155			950		2277	
Sun reduction	0,38		0,41		0,35			0,24		0,17	
Oper. time red.	0,96		0,96		0,96			0,96		0,96	
Wind dir. red.	0,57		0,64		0,66			0,57		0,57	
Total reduction	0,20		0,25		0,22			0,13		0,09	
Total, real	542		793		468			124		206	

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 151 - Heierkerkweg 14
 Assumptions for shadow calculations

Reference year for calendar 2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	08:39	09:28 (WT06)	08:14	10:13 (WT05)	07:22	07:12	17:54 (WT04)	06:09	17:33 (WT04)	05:24	17:58 (WT04)	
	16:35	74	10:42 (WT05)	17:22	30	10:43 (WT05)	18:13	20:05	61	18:55 (WT04)	20:55	107
2	08:39	09:29 (WT06)	08:12	10:14 (WT05)	07:20	07:10	17:51 (WT04)	06:07	17:34 (WT04)	05:23	17:59 (WT04)	134
	16:36	74	10:43 (WT05)	17:24	26	10:40 (WT05)	18:14	20:07	64	18:55 (WT04)	20:57	113
3	08:39	09:29 (WT06)	08:11	10:16 (WT05)	07:17	07:08	17:50 (WT04)	06:05	17:34 (WT04)	05:23	18:00 (WT04)	131
	16:37	75	10:44 (WT05)	17:26	21	10:37 (WT05)	18:16	20:09	67	18:57 (WT04)	20:59	116
4	08:39	09:29 (WT06)	08:09	10:20 (WT05)	07:15	07:05	17:48 (WT04)	06:03	17:36 (WT04)	05:22	18:01 (WT04)	131
	16:39	75	10:44 (WT05)	17:27	14	10:34 (WT05)	18:18	20:10	71	18:59 (WT04)	21:00	119
5	08:39	09:30 (WT06)	08:08		07:13	07:03	17:47 (WT04)	06:01	17:37 (WT04)	05:21	18:03 (WT04)	128
	16:40	75	10:45 (WT05)	17:29		18:20	20:12	73	19:00 (WT04)	21:02	120	126
6	08:39	09:31 (WT06)	08:06		07:11	07:01	17:45 (WT04)	05:59	17:38 (WT04)	05:20	18:03 (WT04)	126
	16:41	75	10:46 (WT05)	17:31		18:21	20:14	75	19:00 (WT04)	21:03	121	124
7	08:38	09:31 (WT06)	08:04		07:09	06:59	17:43 (WT04)	05:58	17:38 (WT04)	05:20	18:04 (WT04)	124
	16:42	75	10:46 (WT05)	17:33		18:23	20:15	79	19:02 (WT04)	21:05	124	124
8	08:38	09:32 (WT06)	08:03		07:06	06:57	17:42 (WT04)	05:56	17:37 (WT04)	05:19	18:05 (WT04)	124
	16:43	75	10:47 (WT05)	17:35		18:25	20:17	81	19:03 (WT04)	21:07	124	121
9	08:37	09:32 (WT06)	08:01		07:04	06:54	17:41 (WT04)	05:54	17:37 (WT04)	05:19	18:06 (WT04)	121
	16:45	75	10:47 (WT05)	17:37		18:27	20:19	83	19:04 (WT04)	21:08	126	120
10	08:37	09:32 (WT06)	07:59		07:02	06:52	17:40 (WT04)	05:52	17:38 (WT04)	05:18	18:07 (WT04)	120
	16:46	75	10:47 (WT05)	17:38		18:28	20:20	84	19:04 (WT04)	21:10	125	118
11	08:36	09:33 (WT06)	07:57		07:00	06:50	17:39 (WT04)	05:51	17:39 (WT04)	05:18	18:07 (WT04)	118
	16:47	75	10:48 (WT05)	17:40		18:30	20:22	86	19:04 (WT04)	21:11	125	116
12	08:36	09:33 (WT06)	07:56		06:58	06:48	17:38 (WT04)	05:49	17:39 (WT04)	05:18	18:08 (WT04)	116
	16:49	75	10:48 (WT05)	17:42		18:32	20:24	87	19:05 (WT04)	21:13	131	116
13	08:35	09:34 (WT06)	07:54		06:55	06:46	17:37 (WT04)	05:48	17:40 (WT04)	05:17	18:09 (WT04)	116
	16:50	74	10:48 (WT05)	17:44		18:33	20:25	88	19:05 (WT04)	21:14	136	113
14	08:34	09:34 (WT06)	07:52		06:53	06:43	17:36 (WT04)	05:46	17:42 (WT04)	05:17	18:10 (WT04)	113
	16:52	74	10:48 (WT05)	17:46		18:35	20:27	90	19:06 (WT04)	21:16	139	112
15	08:34	09:35 (WT06)	07:50		06:51	06:41	17:36 (WT04)	05:44	17:42 (WT04)	05:17	18:11 (WT04)	112
	16:53	74	10:49 (WT05)	17:48		18:37	20:29	90	19:06 (WT04)	21:17	141	109
16	08:33	09:35 (WT06)	07:48		06:49	06:39	17:35 (WT04)	05:43	17:43 (WT04)	05:17	18:12 (WT04)	109
	16:55	74	10:49 (WT05)	17:49		18:39	20:30	92	19:07 (WT04)	21:19	142	110
17	08:32	09:36 (WT06)	07:46		06:46	06:37	17:35 (WT04)	05:41	17:43 (WT04)	05:17	18:12 (WT04)	110
	16:56	73	10:49 (WT05)	17:51		18:40	20:32	92	19:07 (WT04)	21:20	144	109
18	08:31	09:37 (WT06)	07:44		06:44	06:35	17:34 (WT04)	05:40	17:45 (WT04)	05:17	18:12 (WT04)	109
	16:58	72	10:49 (WT05)	17:53		18:42	20:34	93	19:07 (WT04)	21:22	143	108
19	08:30	09:38 (WT06)	07:42		06:42	06:33	17:34 (WT04)	05:39	17:46 (WT04)	05:17	18:13 (WT04)	108
	17:00	72	10:50 (WT05)	17:55		18:44	20:35	93	19:07 (WT04)	21:23	142	107
20	08:29	09:39 (WT06)	07:40		06:40	06:31	17:34 (WT04)	05:37	17:47 (WT04)	05:17	18:13 (WT04)	107
	17:01	71	10:50 (WT05)	17:57		18:45	20:37	93	19:07 (WT04)	21:25	143	107
21	08:28	09:40 (WT06)	07:38		06:37	06:28	17:33 (WT04)	05:36	17:48 (WT04)	05:17	18:13 (WT04)	107
	17:03	70	10:50 (WT05)	17:58		18:47	20:39	95	19:08 (WT04)	21:26	143	107
22	08:27	09:41 (WT06)	07:36		06:35	06:26	17:33 (WT04)	05:35	17:48 (WT04)	05:17	18:13 (WT04)	107
	17:05	68	10:49 (WT05)	18:00		18:49	20:40	95	19:08 (WT04)	21:28	142	107
23	08:26	09:42 (WT06)	07:34		06:33	06:24	17:33 (WT04)	05:33	17:49 (WT04)	05:17	18:13 (WT04)	107
	17:06	67	10:49 (WT05)	18:02		18:50	20:42	94	19:07 (WT04)	21:29	142	107
24	08:25	09:44 (WT06)	07:32		06:30	06:22	17:33 (WT04)	05:32	17:50 (WT04)	05:18	18:14 (WT04)	107
	17:08	63	10:49 (WT05)	18:04		18:52	20:44	94	19:07 (WT04)	21:30	141	107
25	08:23	09:46 (WT06)	07:30		06:28	06:20	17:33 (WT04)	05:31	17:51 (WT04)	05:18	18:13 (WT04)	107
	17:10	58	10:48 (WT05)	18:06		18:54	13	17:32 (WT04)	20:45	94	19:07 (WT04)	21:32
26	08:22	09:49 (WT06)	07:28		06:26	06:18	18:12 (WT04)	06:18	17:33 (WT04)	05:30	17:52 (WT04)	05:18
	17:11	51	10:48 (WT05)	18:07		19:55	27	18:39 (WT04)	20:47	94	19:07 (WT04)	21:33
27	08:21	10:06 (WT05)	07:26		06:24	06:16	18:08 (WT04)	06:16	17:33 (WT04)	05:29	17:53 (WT04)	05:19
	17:13	41	10:47 (WT05)	18:09		19:57	35	18:43 (WT04)	20:49	94	19:07 (WT04)	21:34
28	08:20	10:07 (WT05)	07:24		06:22	06:14	18:04 (WT04)	06:14	17:33 (WT04)	05:28	17:54 (WT04)	05:19
	17:15	40	10:47 (WT05)	18:11		19:59	43	18:47 (WT04)	20:50	93	19:06 (WT04)	21:35
29	08:18	10:08 (WT05)			06:20	06:12	18:00 (WT04)	06:12	17:33 (WT04)	05:27	17:55 (WT04)	05:20
	17:17	38	10:46 (WT05)		20:00	48	18:48 (WT04)	20:52	19:06 (WT04)	21:37	138	21:07 (WT04)
30	08:17	10:10 (WT05)			06:17	06:10	17:58 (WT04)	06:10	17:33 (WT04)	05:26	17:57 (WT04)	05:20
	17:18	35	10:45 (WT05)		20:02	53	18:51 (WT04)	20:54	19:06 (WT04)	21:38	137	21:08 (WT04)
31	08:15	10:11 (WT05)			06:15	06:08	17:56 (WT04)	06:08	20:10 (WT03)	21:38	137	21:08 (WT04)
	17:20	32	10:43 (WT05)		20:04	57	18:53 (WT04)	20:54		05:25	21:39	135
Potential sun hours	261		278		367		415		483		496	
Total, worst case	2045		91		276		2584		4119		3453	
Sun reduction	0,20		0,28		0,29		0,37		0,41		0,35	
Oper. time red.	0,96		0,96		0,96		0,96		0,96		0,96	
Wind dir. red.	0,57		0,58		0,64		0,64		0,60		0,58	
Total reduction	0,11		0,15		0,18		0,23		0,23		0,19	
Total, real	220		14		49		585		962		670	

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 151 - Heierkerkweg 14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July		August		September		October	November	December							
1	05:21	18:12 (WT04)	05:56	17:50 (WT04)	06:45	17:38 (WT04)	07:33	07:25	08:15	09:15 (WT06)						
	21:54	116	21:13 (WT01)	21:24	131	20:55 (WT02)	20:23	86	19:04 (WT04)	19:14	17:09	16:30	75	10:30 (WT05)		
2	05:22	18:12 (WT04)	05:58	17:49 (WT04)	06:47	17:38 (WT04)	07:34	07:27	08:17	09:15 (WT06)						
	21:54	117	21:13 (WT01)	21:22	125	20:39 (WT03)	20:21	85	19:03 (WT04)	19:12	17:08	16:29	75	10:30 (WT05)		
3	05:22	18:11 (WT04)	05:59	17:49 (WT04)	06:48	17:39 (WT04)	07:36	07:29	08:18	09:15 (WT06)						
	21:54	118	21:13 (WT01)	21:20	125	20:39 (WT03)	20:18	83	19:02 (WT04)	19:10	17:06	16:29	75	10:30 (WT05)		
4	05:23	18:11 (WT04)	06:01	17:48 (WT04)	06:50	17:39 (WT04)	07:38	07:31	08:20	09:15 (WT06)						
	21:53	120	21:14 (WT01)	21:19	124	20:38 (WT03)	20:16	81	19:00 (WT04)	19:08	17:04	16:28	75	10:30 (WT05)		
5	05:24	18:11 (WT04)	06:02	17:46 (WT04)	06:51	17:40 (WT04)	07:39	07:32	08:21	09:16 (WT06)						
	21:53	121	21:14 (WT01)	21:17	125	20:37 (WT03)	20:14	79	18:59 (WT04)	19:05	17:02	16:28	75	10:31 (WT05)		
6	05:25	18:10 (WT04)	06:04	17:46 (WT04)	06:53	17:40 (WT04)	07:41	07:34	08:22	09:16 (WT06)						
	21:52	124	21:15 (WT01)	21:15	124	20:36 (WT03)	20:12	77	18:57 (WT04)	19:03	17:01	16:27	75	10:31 (WT05)		
7	05:26	18:10 (WT04)	06:06	17:45 (WT04)	06:55	17:41 (WT04)	07:43	07:36	08:23	09:16 (WT06)						
	21:52	125	21:15 (WT01)	21:13	122	20:35 (WT03)	20:09	75	18:56 (WT04)	19:01	16:59	11	10:02 (WT05)	16:27	75	10:31 (WT05)
8	05:26	18:08 (WT04)	06:07	17:45 (WT04)	06:56	17:42 (WT04)	07:44	07:38	08:25	09:17 (WT06)						
	21:51	127	21:15 (WT01)	21:12	121	20:34 (WT03)	20:07	72	18:54 (WT04)	18:59	16:57	19	10:07 (WT05)	16:26	75	10:32 (WT05)
9	05:27	18:08 (WT04)	06:09	17:44 (WT04)	06:58	17:43 (WT04)	07:46	07:39	08:26	09:18 (WT06)						
	21:50	128	21:15 (WT01)	21:10	119	20:32 (WT03)	20:05	69	18:52 (WT04)	18:57	16:56	24	10:10 (WT05)	16:26	74	10:32 (WT05)
10	05:28	18:07 (WT04)	06:10	17:44 (WT04)	06:59	17:43 (WT04)	07:48	07:41	08:27	09:18 (WT06)						
	21:50	131	21:16 (WT01)	21:08	115	20:30 (WT03)	20:03	67	18:50 (WT04)	18:54	16:54	28	10:12 (WT05)	16:26	75	10:33 (WT05)
11	05:29	18:07 (WT04)	06:12	17:43 (WT04)	07:01	17:45 (WT04)	07:49	07:43	08:28	09:18 (WT06)						
	21:49	132	21:16 (WT01)	21:06	113	20:28 (WT03)	20:00	63	18:48 (WT04)	18:52	16:53	32	10:15 (WT05)	16:26	75	10:33 (WT05)
12	05:30	18:06 (WT04)	06:13	17:42 (WT04)	07:02	17:46 (WT04)	07:51	07:45	08:29	09:19 (WT06)						
	21:48	134	21:16 (WT01)	21:04	109	20:25 (WT03)	19:58	59	18:45 (WT04)	18:50	16:51	34	10:16 (WT05)	16:26	74	10:33 (WT05)
13	05:31	18:05 (WT04)	06:15	17:41 (WT04)	07:04	17:48 (WT04)	07:53	07:46	08:30	09:19 (WT06)						
	21:47	136	21:16 (WT01)	21:02	100	20:20 (WT03)	19:56	55	18:43 (WT04)	18:48	16:50	37	10:18 (WT05)	16:26	74	10:33 (WT05)
14	05:33	18:05 (WT04)	06:16	17:41 (WT04)	07:06	17:50 (WT04)	07:54	07:48	08:31	09:20 (WT06)						
	21:47	137	21:16 (WT01)	21:00	93	19:14 (WT04)	19:53	51	18:41 (WT04)	18:46	16:48	39	10:18 (WT05)	16:26	74	10:34 (WT05)
15	05:34	18:04 (WT04)	06:18	17:40 (WT04)	07:07	17:52 (WT04)	07:56	07:50	08:32	09:20 (WT06)						
	21:46	138	21:16 (WT01)	20:58	94	19:14 (WT04)	19:51	46	18:38 (WT04)	18:43	16:47	41	10:20 (WT05)	16:26	74	10:34 (WT05)
16	05:35	18:03 (WT04)	06:20	17:40 (WT04)	07:09	17:55 (WT04)	07:58	07:52	08:33	09:21 (WT06)						
	21:45	139	21:15 (WT01)	20:57	94	19:14 (WT04)	19:49	40	18:35 (WT04)	18:41	16:45	47	10:21 (WT05)	16:26	74	10:35 (WT05)
17	05:36	18:03 (WT04)	06:21	17:39 (WT04)	07:10	17:57 (WT04)	07:59	07:53	08:34	09:22 (WT06)						
	21:44	139	21:15 (WT01)	20:55	94	19:13 (WT04)	19:47	33	18:30 (WT04)	18:39	16:44	56	10:22 (WT05)	16:26	73	10:35 (WT05)
18	05:37	18:02 (WT04)	06:23	17:39 (WT04)	07:12	18:02 (WT04)	08:01	07:55	08:34	09:23 (WT06)						
	21:43	140	21:13 (WT01)	20:53	95	19:14 (WT04)	19:44	24	18:26 (WT04)	18:37	16:43	61	10:23 (WT05)	16:26	73	10:36 (WT05)
19	05:38	18:01 (WT04)	06:24	17:38 (WT04)	07:14	18:03 (WT04)	08:03	07:57	08:35	09:22 (WT06)						
	21:41	141	21:12 (WT01)	20:51	95	19:13 (WT04)	19:42	18:35	16:41	65	10:24 (WT05)	16:26	74	10:36 (WT05)		
20	05:40	18:00 (WT04)	06:26	17:39 (WT04)	07:15	18:05 (WT04)	08:05	07:58	08:36	09:23 (WT06)						
	21:40	141	21:11 (WT01)	20:48	94	19:13 (WT04)	19:40	18:33	16:40	68	10:25 (WT05)	16:27	74	10:37 (WT05)		
21	05:41	17:59 (WT04)	06:28	17:38 (WT04)	07:17	18:06 (WT04)	08:06	08:00	08:36	09:23 (WT06)						
	21:39	142	21:10 (WT01)	20:46	94	19:12 (WT04)	19:37	18:31	16:39	70	10:25 (WT05)	16:27	74	10:37 (WT05)		
22	05:42	17:59 (WT04)	06:29	17:38 (WT04)	07:18	18:08 (WT04)	08:08	08:02	08:37	09:24 (WT06)						
	21:38	142	21:09 (WT01)	20:44	94	19:12 (WT04)	19:35	18:29	16:38	70	10:25 (WT05)	16:28	74	10:38 (WT05)		
23	05:44	17:58 (WT04)	06:31	17:37 (WT04)	07:20	18:10 (WT04)	08:10	08:03	08:37	09:24 (WT06)						
	21:37	143	21:08 (WT01)	20:42	94	19:11 (WT04)	19:33	18:27	16:37	71	10:26 (WT05)	16:28	74	10:38 (WT05)		
24	05:45	17:57 (WT04)	06:32	17:38 (WT04)	07:22	18:11 (WT04)	08:11	08:05	08:38	09:25 (WT06)						
	21:35	143	21:07 (WT01)	20:40	93	19:11 (WT04)	19:31	18:25	16:36	72	10:27 (WT05)	16:29	74	10:39 (WT05)		
25	05:46	17:56 (WT04)	06:34	17:37 (WT04)	07:23	18:13 (WT04)	08:13	08:06	08:38	09:25 (WT06)						
	21:34	142	21:05 (WT02)	20:38	93	19:10 (WT04)	19:28	18:23	16:35	73	10:27 (WT05)	16:29	74	10:39 (WT05)		
26	05:48	17:56 (WT04)	06:35	17:37 (WT04)	07:25	18:15 (WT04)	08:15	08:08	08:39	09:26 (WT06)						
	21:33	143	21:05 (WT02)	20:36	93	19:10 (WT04)	19:26	18:21	16:34	74	10:28 (WT05)	16:30	73	10:39 (WT05)		
27	05:49	17:54 (WT04)	06:37	17:37 (WT04)	07:26	18:17 (WT04)	08:17	08:10	08:39	09:26 (WT06)						
	21:31	144	21:03 (WT02)	20:34	92	19:09 (WT04)	19:24	18:19	16:33	73	10:28 (WT05)	16:31	74	10:40 (WT05)		
28	05:51	17:53 (WT04)	06:39	17:37 (WT04)	07:28	18:18 (WT04)	08:18	08:11	08:39	09:26 (WT06)						
	21:30	142	21:01 (WT02)	20:32	91	19:08 (WT04)	19:21	18:17	16:32	74	10:28 (WT05)	16:31	74	10:40 (WT05)		
29	05:52	17:53 (WT04)	06:40	17:37 (WT04)	07:30	18:20 (WT04)	08:13	08:13	08:39	09:27 (WT06)						
	21:28	142	21:01 (WT02)	20:29	90	19:07 (WT04)	19:19	17:15	16:31	75	10:29 (WT05)	16:32	74	10:41 (WT05)		
30	05:54	17:52 (WT04)	06:42	17:37 (WT04)	07:31	18:22 (WT04)	08:14	08:14	08:39	09:28 (WT06)						
	21:27	139	20:59 (WT02)	20:27	89	19:06 (WT04)	19:17	17:13	16:31	75	10:29 (WT05)	16:33	74	10:42 (WT05)		
31	05:55	17:51 (WT04)	06:43	17:37 (WT04)	07:32	18:24 (WT04)	08:15	08:15	08:39	09:27 (WT06)						
	21:25	135	20:57 (WT02)	20:25	88	19:05 (WT04)	19:15	17:11	16:30	75	10:29 (WT05)	16:34	75	10:42 (WT05)		
Potential sun hours	500		453		381		333	269		247		2302		0,17		
Total, worst case	4161		3223		1145		1289		1289		2302		0,17			
Sun reduction	0,38		0,41		0,35		0,24		0,24		0,17		0,17			
Oper. time red.	0,96		0,96		0,96		0,96		0,96		0,96		0,96			
Wind dir. red.	0,59		0,63		0,64		0,57		0,57		0,57		0,57			
Total reduction	0,21		0,25		0,21		0,13		0,13		0,09		0,09			
Total, real	887		803		243		167		167		207		207			

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 152 - Heierkerkweg 12

Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January		February		March		April		May		June	
1	08:39	09:50 (WT06)	08:14	07:22	07:12	18:09 (WT04)	06:09	18:09 (WT04)	05:24	20:01 (WT03)		
	16:35	87 11:22 (WT05)	17:22	18:13	20:05	60 19:09 (WT04)	20:55	88 20:19 (WT03)	21:40	20	20:44 (WT02)	
2	08:39	09:50 (WT06)	08:12	07:20	07:10	18:08 (WT04)	06:07	18:11 (WT04)	05:23	20:28 (WT02)		
	16:36	88 11:23 (WT05)	17:24	18:14	20:07	62 19:10 (WT04)	20:57	86 20:20 (WT03)	21:41	15	20:43 (WT02)	
3	08:39	09:51 (WT06)	08:11	07:17	07:08	18:07 (WT04)	06:05	18:12 (WT04)	05:22	20:30 (WT02)		
	16:37	88 11:24 (WT05)	17:26	18:16	20:09	64 19:11 (WT04)	20:59	86 20:21 (WT03)	21:42	13	20:43 (WT02)	
4	08:39	09:51 (WT06)	08:09	07:15	07:05	18:06 (WT04)	06:03	18:13 (WT04)	05:22	20:31 (WT02)		
	16:39	87 11:23 (WT05)	17:27	18:18	20:10	66 19:12 (WT04)	21:00	83 20:21 (WT03)	21:43	10	20:41 (WT02)	
5	08:39	09:52 (WT06)	08:08	07:13	07:03	18:06 (WT04)	06:01	18:15 (WT04)	05:21	20:33 (WT02)		
	16:40	87 11:24 (WT05)	17:29	18:20	20:12	67 19:13 (WT04)	21:02	82 20:22 (WT03)	21:44	8	20:41 (WT02)	
6	08:39	09:53 (WT06)	08:06	07:11	07:01	18:04 (WT04)	05:59	18:17 (WT04)	05:20	20:34 (WT02)		
	16:41	86 11:25 (WT05)	17:31	18:21	20:14	68 19:12 (WT04)	21:03	86 20:37 (WT02)	21:45	5	20:39 (WT02)	
7	08:38	09:53 (WT06)	08:04	07:09	06:59	18:03 (WT04)	05:58	18:18 (WT04)	05:20			
	16:42	85 11:24 (WT05)	17:33	18:23	20:15	70 19:13 (WT04)	21:05	86 20:38 (WT02)	21:46			
8	08:38	09:55 (WT06)	08:03	07:06	06:57	18:03 (WT04)	05:56	18:21 (WT04)	05:19			
	16:43	83 11:25 (WT05)	17:35	18:25	20:17	70 19:13 (WT04)	21:07	85 20:40 (WT02)	21:47			
9	08:37	09:55 (WT06)	08:01	07:04	06:54	18:03 (WT04)	05:54	18:23 (WT04)	05:19			
	16:45	82 11:25 (WT05)	17:37	18:27	20:19	70 19:13 (WT04)	21:08	83 20:41 (WT02)	21:48			
10	08:37	09:55 (WT06)	07:59	07:02	06:52	18:02 (WT04)	05:52	18:25 (WT04)	05:18			
	16:46	82 11:25 (WT05)	17:38	18:28	20:20	71 19:13 (WT04)	21:10	81 20:42 (WT02)	21:49			
11	08:36	09:57 (WT06)	07:57	07:00	06:50	18:01 (WT04)	05:51	18:30 (WT04)	05:18			
	16:47	81 11:26 (WT05)	17:40	18:30	20:22	72 19:13 (WT04)	21:11	73 20:44 (WT02)	21:49			
12	08:36	09:58 (WT06)	07:55	06:58	06:48	18:01 (WT04)	05:49	19:41 (WT03)	05:18			
	16:49	78 11:26 (WT05)	17:42	18:32	20:24	72 19:13 (WT04)	21:13	64 20:45 (WT02)	21:50			
13	08:35	09:58 (WT06)	07:54	06:55	06:46	18:01 (WT04)	05:48	19:41 (WT03)	05:17			
	16:50	78 11:26 (WT05)	17:44	18:33	20:25	72 19:13 (WT04)	21:14	66 20:47 (WT02)	21:51			
14	08:34	09:59 (WT06)	07:52	06:53	06:43	18:01 (WT04)	05:46	19:42 (WT03)	05:17			
	16:52	74 11:25 (WT05)	17:46	18:35	20:27	72 19:13 (WT04)	21:16	65 20:47 (WT02)	21:51			
15	08:34	10:01 (WT06)	07:50	06:51	06:41	18:01 (WT04)	05:44	19:42 (WT03)	05:17			
	16:53	71 11:25 (WT05)	17:48	18:37	20:29	72 19:13 (WT04)	21:17	65 20:47 (WT02)	21:52			
16	08:33	10:02 (WT06)	07:48	06:49	06:39	18:01 (WT04)	05:43	19:43 (WT03)	05:17			
	16:55	69 11:25 (WT05)	17:49	18:39	20:30	71 19:12 (WT04)	21:19	64 20:48 (WT02)	21:52			
17	08:32	10:03 (WT06)	07:46	06:46	06:37	18:01 (WT04)	05:41	19:42 (WT03)	05:17			
	16:56	65 11:25 (WT05)	17:51	18:40	20:32	71 19:12 (WT04)	21:20	64 20:47 (WT02)	21:53			
18	08:31	10:05 (WT06)	07:44	06:44	06:35	18:01 (WT04)	05:40	19:43 (WT03)	05:17			
	16:58	61 11:25 (WT05)	17:53	18:42	20:34	71 19:12 (WT04)	21:22	63 20:47 (WT02)	21:53			
19	08:30	10:08 (WT06)	07:42	06:42	06:33	18:01 (WT04)	05:39	19:44 (WT03)	05:17			
	17:00	55 11:25 (WT05)	17:55	18:44	20:35	70 19:11 (WT04)	21:23	62 20:48 (WT02)	21:54			
20	08:29	10:41 (WT05)	07:40	06:40	06:31	18:02 (WT04)	05:37	19:45 (WT03)	05:17			
	17:01	43 11:24 (WT05)	17:57	18:45	20:37	69 19:11 (WT04)	21:25	60 20:48 (WT02)	21:54			
21	08:28	10:42 (WT05)	07:38	06:37	06:28	18:02 (WT04)	05:36	19:46 (WT03)	05:17			
	17:03	42 11:24 (WT05)	17:58	18:47	20:39	68 19:10 (WT04)	21:26	59 20:48 (WT02)	21:54			
22	08:27	10:43 (WT05)	07:36	06:35	06:26	18:02 (WT04)	05:35	19:46 (WT03)	05:17			
	17:05	40 11:23 (WT05)	18:00	18:49	12 17:36 (WT04)	06:26	68 19:10 (WT04)	21:28	57 20:47 (WT02)	21:55		
23	08:26	10:44 (WT05)	07:34	06:33	06:24	18:03 (WT04)	05:33	19:47 (WT03)	05:17			
	17:06	38 11:22 (WT05)	18:02	18:50	24 17:54 (WT04)	20:42	73 20:07 (WT03)	21:29	55 20:47 (WT02)	21:55		
24	08:25	10:46 (WT05)	07:32	06:30	06:22	18:03 (WT04)	05:32	19:48 (WT03)	05:18			
	17:08	35 11:21 (WT05)	18:04	18:52	30 17:57 (WT04)	20:44	81 20:11 (WT03)	21:30	52 20:47 (WT02)	21:55		
25	08:23	10:47 (WT05)	07:30	06:28	06:20	18:04 (WT04)	05:31	19:49 (WT03)	05:18			
	17:10	32 11:19 (WT05)	18:06	18:54	36 17:59 (WT04)	20:45	84 20:13 (WT03)	21:32	50 20:46 (WT02)	21:55		
26	08:22	10:49 (WT05)	07:28	06:26	06:18	18:05 (WT04)	05:30	19:50 (WT03)	05:18			
	17:11	29 11:18 (WT05)	18:07	19:55	41 19:01 (WT04)	20:47	86 20:15 (WT03)	21:33	47 20:46 (WT02)	21:55		
27	08:21	10:51 (WT05)	07:26	06:24	06:16	18:18 (WT04)	05:29	19:51 (WT03)	05:19			
	17:13	24 11:15 (WT05)	18:09	19:57	45 19:03 (WT04)	20:49	89 20:16 (WT03)	21:34	45 20:46 (WT02)	21:55		
28	08:20	10:54 (WT05)	07:24	06:21	06:14	18:06 (WT04)	05:28	19:53 (WT03)	05:19			
	17:15	19 11:13 (WT05)	18:11	19:59	48 19:05 (WT04)	20:50	88 20:17 (WT03)	21:35	40 20:45 (WT02)	21:55		
29	08:18	10:57 (WT05)	07:19	06:17	06:12	18:14 (WT04)	05:27	19:54 (WT03)	05:20			
	17:17	11 11:08 (WT05)	18:11	20:00	52 19:06 (WT04)	20:52	88 20:18 (WT03)	21:37	37 20:45 (WT02)	21:55		
30	08:17		07:17	06:17	06:10	18:13 (WT04)	05:26	19:56 (WT03)	05:20			
	17:18		20:02	20:02	55 19:08 (WT04)	20:54	89 20:19 (WT03)	21:38	33 20:45 (WT02)	21:54		
31	08:15		07:15	06:15	06:08	18:12 (WT04)	05:25	19:58 (WT03)				
	17:20		20:04	20:04	57 19:09 (WT04)	20:56	21:39	27 20:44 (WT02)				
Potential sun hours	261		278	367	415		483		496			
Total, worst case	1800			400	2194		1994		71			
Sun reduction	0,20			0,29	0,37		0,41		0,35			
Oper. time red.	0,96			0,96	0,96		0,96		0,96			
Wind dir. red.	0,59			0,64	0,63		0,57		0,56			
Total reduction	0,11			0,18	0,22		0,22		0,19			
Total, real	202			72	492		445		13			

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 152 - Heierkerkweg 12
 Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21	05:56	19:52 (WT03) 06:45	18:01 (WT04) 07:33	07:25	08:15
	21:54	21:24	64 20:56 (WT02) 20:23	72 19:13 (WT04) 19:14	17:09	16:30
2	05:22	05:58	18:40 (WT04) 06:47	18:00 (WT04) 07:34	07:27	08:17
	21:54	21:22	73 20:54 (WT02) 20:21	71 19:11 (WT04) 19:12	17:08	16:29
3	05:22	05:59	18:36 (WT04) 06:48	18:00 (WT04) 07:36	07:29	08:18
	21:54	21:20	81 20:53 (WT02) 20:18	71 19:11 (WT04) 19:10	17:06	16:29
4	05:23	06:01	18:33 (WT04) 06:50	18:00 (WT04) 07:38	07:31	08:20
	21:53	21:19	84 20:51 (WT02) 20:16	70 19:10 (WT04) 19:08	17:04	16:28
5	05:24	06:02	18:30 (WT04) 06:51	18:00 (WT04) 07:39	07:32	08:21
	21:53	21:17	85 20:49 (WT02) 20:14	70 19:10 (WT04) 19:05	17:02	16:28
6	05:25	06:04	18:28 (WT04) 06:53	18:00 (WT04) 07:41	07:34	08:22
	21:52	21:15	86 20:48 (WT02) 20:12	68 19:08 (WT04) 19:03	17:01	16:27
7	05:26	20:41 (WT02) 06:06	18:26 (WT04) 06:55	18:00 (WT04) 07:43	07:36	08:23
	21:52	5 20:46 (WT02) 21:13	86 20:46 (WT02) 20:09	68 19:08 (WT04) 19:01	16:59	16:27
8	05:26	20:38 (WT02) 06:07	18:25 (WT04) 06:56	18:00 (WT04) 07:44	07:38	08:25
	21:51	9 20:47 (WT02) 21:12	81 20:31 (WT03) 20:07	66 19:06 (WT04) 18:59	16:57	16:26
9	05:27	20:38 (WT02) 06:09	18:23 (WT04) 06:58	18:01 (WT04) 07:46	07:39	08:26
	21:50	10 20:48 (WT02) 21:10	82 20:30 (WT03) 20:05	65 19:06 (WT04) 18:57	16:56	16:26
10	05:28	20:37 (WT02) 06:10	18:22 (WT04) 06:59	18:01 (WT04) 07:48	07:41	08:27
	21:50	13 20:50 (WT02) 21:08	84 20:30 (WT03) 20:03	63 19:04 (WT04) 18:54	16:54	16:26
11	05:29	20:36 (WT02) 06:12	18:20 (WT04) 07:01	18:02 (WT04) 07:49	07:43	08:28
	21:49	15 20:51 (WT02) 21:06	85 20:29 (WT03) 20:00	61 19:03 (WT04) 18:52	16:53	16:26
12	05:30	20:09 (WT03) 06:13	18:18 (WT04) 07:02	18:02 (WT04) 07:51	07:45	08:29
	21:48	21 20:52 (WT02) 21:04	89 20:29 (WT03) 19:58	59 19:01 (WT04) 18:50	16:51	16:26
13	05:31	20:06 (WT03) 06:15	18:16 (WT04) 07:04	18:03 (WT04) 07:53	07:46	08:30
	21:47	27 20:52 (WT02) 21:02	88 20:27 (WT03) 19:56	57 19:00 (WT04) 18:48	16:50	16:25
14	05:33	20:04 (WT03) 06:16	18:16 (WT04) 07:06	18:04 (WT04) 07:54	07:48	08:31
	21:47	33 20:53 (WT02) 21:00	88 20:27 (WT03) 19:53	54 18:58 (WT04) 18:46	16:48	16:26
15	05:34	20:03 (WT03) 06:18	18:14 (WT04) 07:07	18:05 (WT04) 07:56	07:50	08:32
	21:46	38 20:54 (WT02) 20:58	89 20:25 (WT03) 19:51	51 18:56 (WT04) 18:43	16:47	16:26
16	05:35	20:01 (WT03) 06:20	18:13 (WT04) 07:09	18:06 (WT04) 07:58	07:52	08:33
	21:45	41 20:54 (WT02) 20:57	88 20:24 (WT03) 19:49	48 18:54 (WT04) 18:41	16:45	16:26
17	05:36	20:01 (WT03) 06:21	18:11 (WT04) 07:10	18:07 (WT04) 07:59	07:53	08:34
	21:44	45 20:56 (WT02) 20:55	87 20:21 (WT03) 19:47	44 18:51 (WT04) 18:39	16:44	16:26
18	05:37	20:00 (WT03) 06:23	18:11 (WT04) 07:12	18:09 (WT04) 08:01	07:55	08:34
	21:43	47 20:56 (WT02) 20:53	85 20:20 (WT03) 19:44	40 18:49 (WT04) 18:37	16:43	16:26
19	05:38	19:59 (WT03) 06:24	18:09 (WT04) 07:14	18:11 (WT04) 08:03	07:57	08:35
	21:41	50 20:56 (WT02) 20:51	82 20:17 (WT03) 19:42	35 18:46 (WT04) 18:35	16:41	16:26
20	05:40	19:58 (WT03) 06:26	18:09 (WT04) 07:15	18:14 (WT04) 08:05	07:58	08:36
	21:40	52 20:57 (WT02) 20:48	75 20:14 (WT03) 19:40	29 18:43 (WT04) 18:33	16:40	16:27
21	05:41	19:57 (WT03) 06:28	18:07 (WT04) 07:17	18:17 (WT04) 08:06	08:00	08:36
	21:39	55 20:57 (WT02) 20:46	67 19:14 (WT04) 19:37	21 18:38 (WT04) 18:31	16:39	16:27
22	05:42	19:57 (WT03) 06:29	18:07 (WT04) 07:18	18:25 (WT04) 08:08	08:02	08:37
	21:38	57 20:58 (WT02) 20:44	68 19:15 (WT04) 19:35	5 18:30 (WT04) 18:29	16:38	16:28
23	05:44	19:56 (WT03) 06:31	18:05 (WT04) 07:20	08:10	08:03	08:37
	21:37	59 20:58 (WT02) 20:42	69 19:14 (WT04) 19:33	18:27	16:37	16:28
24	05:45	19:55 (WT03) 06:32	18:05 (WT04) 07:22	08:11	08:05	08:38
	21:35	60 20:58 (WT02) 20:40	70 19:15 (WT04) 19:30	18:25	16:36	16:29
25	05:46	19:54 (WT03) 06:34	18:04 (WT04) 07:23	08:13	08:06	08:38
	21:34	62 20:58 (WT02) 20:38	70 19:14 (WT04) 19:28	18:23	16:35	16:29
26	05:48	19:54 (WT03) 06:35	18:04 (WT04) 07:25	08:15	08:08	08:39
	21:33	63 20:58 (WT02) 20:36	71 19:15 (WT04) 19:26	18:21	16:34	16:30
27	05:49	19:53 (WT03) 06:37	18:03 (WT04) 07:26	08:17	08:10	08:39
	21:31	64 20:58 (WT02) 20:34	71 19:14 (WT04) 19:24	18:19	16:33	16:31
28	05:51	19:53 (WT03) 06:39	18:02 (WT04) 07:28	08:18	08:11	08:39
	21:30	64 20:58 (WT02) 20:32	72 19:14 (WT04) 19:21	18:17	16:32	16:31
29	05:52	19:53 (WT03) 06:40	18:01 (WT04) 07:30	07:20	08:13	08:39
	21:28	64 20:58 (WT02) 20:29	72 19:13 (WT04) 19:19	17:15	16:31	16:32
30	05:54	19:52 (WT03) 06:42	18:02 (WT04) 07:31	07:22	08:14	08:39
	21:27	65 20:57 (WT02) 20:27	72 19:14 (WT04) 19:17	17:13	16:31	16:33
31	05:55	19:51 (WT03) 06:43	18:01 (WT04) 07:32	07:24	08:15	08:39
	21:25	66 20:57 (WT02) 20:25	72 19:13 (WT04) 19:16	17:11	16:30	16:34
Potential sun hours	500	453	381	333	269	247
Total, worst case	1085	2436	1188		828	2712
Sun reduction	0,38	0,41	0,35		0,24	0,17
Oper. time red.	0,96	0,96	0,96		0,96	0,96
Wind dir. red.	0,56	0,61	0,64		0,59	0,59
Total reduction	0,20	0,24	0,21		0,14	0,09
Total, real	219	592	252		112	254

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 153 - Heierkerkweg 10
 Assumptions for shadow calculations

Reference year for calendar 2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June			
1	08:39		10:21 (WT06)	08:14	07:22		07:12		17:58 (WT04)	06:09		19:29 (WT03)	05:24	
	16:35	58	11:51 (WT05)	17:22	18:13		20:05	60	18:58 (WT04)	20:55	52	20:29 (WT02)	21:40	
2	08:39		10:23 (WT06)	08:12	07:20		07:10		17:59 (WT04)	06:07		19:30 (WT03)	05:23	
	16:36	55	11:51 (WT05)	17:24	18:14		20:07	58	18:57 (WT04)	20:57	53	20:31 (WT02)	21:41	
3	08:39		10:24 (WT06)	08:11	07:17		07:08		17:59 (WT04)	06:05		19:31 (WT03)	05:22	
	16:37	52	11:51 (WT05)	17:26	18:16		20:09	58	18:57 (WT04)	20:59	53	20:32 (WT02)	21:42	
4	08:39		10:26 (WT06)	08:09	07:15		07:05		18:00 (WT04)	06:03		19:31 (WT03)	05:22	
	16:39	49	11:51 (WT05)	17:27	18:18		20:10	56	18:56 (WT04)	21:00	55	20:34 (WT02)	21:43	
5	08:39		10:29 (WT06)	08:08	07:13		07:03		18:01 (WT04)	06:01		19:33 (WT03)	05:21	
	16:40	43	11:51 (WT05)	17:29	18:20		20:12	55	18:56 (WT04)	21:02	52	20:35 (WT02)	21:44	
6	08:39		11:13 (WT05)	08:06	07:11		07:01		18:00 (WT04)	05:59		19:34 (WT03)	05:20	
	16:41	38	11:51 (WT05)	17:31	18:21		20:14	54	18:54 (WT04)	21:03	51	20:35 (WT02)	21:45	
7	08:38		11:14 (WT05)	08:04	07:09		06:59		18:01 (WT04)	05:58		19:35 (WT03)	05:20	
	16:42	37	11:51 (WT05)	17:33	18:23		20:15	52	18:53 (WT04)	21:05	47	20:34 (WT02)	21:46	
8	08:38		11:15 (WT05)	08:03	07:06		06:57		18:02 (WT04)	05:56		19:37 (WT03)	05:19	
	16:43	36	11:51 (WT05)	17:35	18:25		20:17	50	18:52 (WT04)	21:07	45	20:35 (WT02)	21:47	
9	08:37		11:16 (WT05)	08:01	07:04		06:54		18:03 (WT04)	05:54		19:39 (WT03)	05:19	
	16:45	34	11:50 (WT05)	17:37	18:27		20:19	48	18:51 (WT04)	21:08	40	20:34 (WT02)	21:48	
10	08:37		11:17 (WT05)	07:59	07:02		17:29 (WT04)	06:52	18:05 (WT04)	05:52		19:41 (WT03)	05:18	
	16:46	32	11:49 (WT05)	17:38	18:28	10	17:39 (WT04)	20:20	45	18:50 (WT04)	21:10	34	20:34 (WT02)	21:49
11	08:36		11:19 (WT05)	07:57	07:00		17:23 (WT04)	06:50	18:05 (WT04)	05:51		20:09 (WT02)	05:18	
	16:47	30	11:49 (WT05)	17:40	18:30	21	17:44 (WT04)	20:22	43	18:48 (WT04)	21:11	25	20:34 (WT02)	21:49
12	08:36		11:20 (WT05)	07:55	06:58		17:19 (WT04)	06:48	18:07 (WT04)	05:49		20:09 (WT02)	05:18	
	16:49	28	11:48 (WT05)	17:42	18:32	28	17:47 (WT04)	20:24	39	18:46 (WT04)	21:13	24	20:33 (WT02)	21:50
13	08:35		11:22 (WT05)	07:54	06:55		17:17 (WT04)	06:45	18:09 (WT04)	05:48		20:10 (WT02)	05:17	
	16:50	25	11:47 (WT05)	17:44	18:33	33	17:50 (WT04)	20:25	48	19:56 (WT03)	21:14	23	20:33 (WT02)	21:51
14	08:34		11:24 (WT05)	07:52	06:53		17:15 (WT04)	06:43	18:10 (WT04)	05:46		20:12 (WT02)	05:17	
	16:52	21	11:45 (WT05)	17:46	18:35	37	17:52 (WT04)	20:27	52	19:59 (WT03)	21:16	20	20:32 (WT02)	21:51
15	08:34		11:26 (WT05)	07:50	06:51		17:12 (WT04)	06:41	18:13 (WT04)	05:44		20:12 (WT02)	05:17	
	16:53	17	11:43 (WT05)	17:47	18:37	41	17:53 (WT04)	20:29	49	20:00 (WT03)	21:17	19	20:31 (WT02)	21:52
16	08:33		11:29 (WT05)	07:48	06:49		17:11 (WT04)	06:39	18:15 (WT04)	05:43		20:13 (WT02)	05:17	
	16:55	10	11:39 (WT05)	17:49	18:39	44	17:55 (WT04)	20:30	48	20:02 (WT03)	21:19	17	20:30 (WT02)	21:52
17	08:32			07:46	06:46		17:09 (WT04)	06:37	18:20 (WT04)	05:41		20:14 (WT02)	05:17	
	16:56			17:51	18:40	47	17:56 (WT04)	20:32	41	20:03 (WT03)	21:20	15	20:29 (WT02)	21:53
18	08:31			07:44	06:44		17:07 (WT04)	06:35	19:33 (WT03)	05:40		20:16 (WT02)	05:17	
	16:58			17:53	18:42	49	17:56 (WT04)	20:34	31	20:04 (WT03)	21:22	12	20:28 (WT02)	21:53
19	08:30			07:42	06:42		17:06 (WT04)	06:33	19:32 (WT03)	05:39		20:18 (WT02)	05:17	
	17:00			17:55	18:44	52	17:58 (WT04)	20:35	33	20:05 (WT03)	21:23	8	20:26 (WT02)	21:54
20	08:29			07:40	06:39		17:05 (WT04)	06:31	19:31 (WT03)	05:37			05:17	
	17:01			17:57	18:45	54	17:59 (WT04)	20:37	35	20:06 (WT03)	21:25		21:54	
21	08:28			07:38	06:37		17:04 (WT04)	06:28	19:31 (WT03)	05:36			05:17	
	17:03			17:58	18:47	55	17:59 (WT04)	20:39	35	20:06 (WT03)	21:26		21:54	
22	08:27			07:36	06:35		17:03 (WT04)	06:26	19:30 (WT03)	05:35			05:17	
	17:05			18:00	18:49	56	17:59 (WT04)	20:40	36	20:06 (WT03)	21:28		21:55	
23	08:26			07:34	06:33		17:02 (WT04)	06:24	19:30 (WT03)	05:33			05:17	
	17:06			18:02	18:50	58	18:00 (WT04)	20:42	36	20:06 (WT03)	21:29		21:55	
24	08:25			07:32	06:30		17:02 (WT04)	06:22	19:29 (WT03)	05:32			05:18	
	17:08			18:04	18:52	58	18:00 (WT04)	20:44	37	20:06 (WT03)	21:30		21:55	
25	08:23			07:30	06:28		17:00 (WT04)	06:20	19:29 (WT03)	05:31			05:18	
	17:10			18:06	18:54	60	18:00 (WT04)	20:45	37	20:06 (WT03)	21:32		21:55	
26	08:22			07:28	07:26		18:00 (WT04)	06:18	19:29 (WT03)	05:30			05:18	
	17:11			18:07	19:55	60	19:00 (WT04)	20:47	37	20:06 (WT03)	21:33		21:55	
27	08:21			07:26	07:24		18:00 (WT04)	06:16	19:29 (WT03)	05:29			05:19	
	17:13			18:09	19:57	60	19:00 (WT04)	20:49	40	20:23 (WT02)	21:34		21:55	
28	08:20			07:24	07:21		18:00 (WT04)	06:14	19:28 (WT03)	05:28			05:19	
	17:15			18:11	19:59	60	19:00 (WT04)	20:50	45	20:25 (WT02)	21:35		21:55	
29	08:18				07:19		17:59 (WT04)	06:12	19:29 (WT03)	05:27			05:20	
	17:17				20:00	60	18:59 (WT04)	20:52	47	20:26 (WT02)	21:37		21:55	
30	08:17				07:17		17:59 (WT04)	06:10	19:29 (WT03)	05:26			05:20	
	17:18				20:02	60	18:59 (WT04)	20:54	49	20:27 (WT02)	21:38		21:54	
31	08:15				07:14		17:59 (WT04)			05:25				
	17:20				20:04	60	18:59 (WT04)			21:39				
Potential sun hours	261		278		367		415		483				496	
Total, worst case		565				1063		1354			645			
Sun reduction		0,20				0,29		0,37			0,41			
Oper. time red.		0,96				0,96		0,96			0,96			
Wind dir. red.		0,61				0,66		0,62			0,56			
Total reduction		0,12				0,18		0,22			0,22			
Total, real		66				196		297			142			

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 153 - Heierkerkweg 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December					
1	05:21 21:54	05:56 21:24	20:20 (WT02) 20:23	06:45 41	18:06 (WT04) 18:47 (WT04)	07:33 19:14	17:57 (WT04) 18:29 (WT04)	07:25 17:09	08:15 16:30	11:01 (WT05) 29	11:30 (WT05)
2	05:22 21:54	05:58 21:22	20:20 (WT02) 20:21	06:47 44	18:03 (WT04) 18:47 (WT04)	07:34 19:12	17:59 (WT04) 18:26 (WT04)	07:27 17:08	08:17 16:29	11:01 (WT05) 31	11:32 (WT05)
3	05:22 21:54	05:59 21:20	19:53 (WT03) 20:18	06:48 46	18:02 (WT04) 18:48 (WT04)	07:36 19:10	18:02 (WT04) 18:22 (WT04)	07:29 17:06	08:18 16:29	11:00 (WT05) 33	11:33 (WT05)
4	05:23 21:53	06:01 21:19	19:49 (WT03) 20:16	06:50 49	18:00 (WT04) 18:49 (WT04)	07:38 19:08	18:08 (WT04) 18:16 (WT04)	07:31 17:04	08:20 16:28	10:59 (WT05) 35	11:34 (WT05)
5	05:24 21:53	06:02 21:17	19:46 (WT03) 20:14	06:51 51	17:52 (WT04) 18:50 (WT04)	07:39 19:05	17:52 (WT04) 19:05	07:32 17:02	08:21 16:27	11:00 (WT05) 36	11:34 (WT05)
6	05:25 21:52	06:04 21:15	19:45 (WT03) 20:12	06:53 53	17:52 (WT04) 18:50 (WT04)	07:41 19:03	17:52 (WT04) 19:03	07:34 17:01	08:22 16:27	10:59 (WT05) 38	11:36 (WT05)
7	05:26 21:52	06:06 21:13	19:43 (WT03) 20:09	06:54 54	17:56 (WT04) 18:50 (WT04)	07:43 19:01	17:56 (WT04) 19:01	07:36 16:59	08:23 16:27	10:59 (WT05) 38	11:37 (WT05)
8	05:26 21:51	06:07 21:12	19:42 (WT03) 20:07	06:56 56	17:54 (WT04) 18:50 (WT04)	07:44 18:59	17:54 (WT04) 18:59	07:38 16:57	08:25 16:26	10:15 (WT06) 46	11:37 (WT05)
9	05:27 21:50	06:09 21:10	19:41 (WT03) 20:05	06:58 57	17:54 (WT04) 18:51 (WT04)	07:46 18:57	17:54 (WT04) 18:57	07:39 16:56	08:26 16:26	10:14 (WT06) 51	11:39 (WT05)
10	05:28 21:50	06:10 21:08	19:40 (WT03) 20:03	06:59 58	17:52 (WT04) 18:50 (WT04)	07:48 18:54	17:52 (WT04) 18:54	07:41 16:54	08:27 16:26	10:13 (WT06) 53	11:40 (WT05)
11	05:29 21:49	06:12 21:06	19:39 (WT03) 20:00	07:01 59	17:52 (WT04) 18:51 (WT04)	07:49 18:52	17:52 (WT04) 18:52	07:43 16:53	08:28 16:26	10:12 (WT06) 57	11:41 (WT05)
12	05:30 21:48	06:13 21:04	19:38 (WT03) 20:00	07:02 60	17:50 (WT04) 18:50 (WT04)	07:51 18:50	17:50 (WT04) 18:50	07:45 16:51	08:29 16:26	10:12 (WT06) 59	11:42 (WT05)
13	05:31 21:47	06:15 21:02	19:37 (WT03) 20:06	07:04 60	17:50 (WT04) 18:50 (WT04)	07:53 18:48	17:50 (WT04) 18:48	07:46 16:50	08:30 16:25	10:12 (WT06) 59	11:42 (WT05)
14	05:33 21:46	06:16 21:00	19:37 (WT03) 20:35 (WT02)	07:06 60	17:50 (WT04) 18:50 (WT04)	07:54 18:46	17:50 (WT04) 18:46	07:48 16:48	08:31 16:25	10:12 (WT06) 61	11:43 (WT05)
15	05:34 21:46	06:18 20:58	19:36 (WT03) 20:32 (WT02)	07:07 60	17:49 (WT04) 18:49 (WT04)	07:56 18:43	17:49 (WT04) 18:43	07:50 16:47	08:32 16:26	10:12 (WT06) 63	11:44 (WT05)
16	05:35 21:45	06:20 20:57	19:36 (WT03) 20:31 (WT02)	07:09 60	17:49 (WT04) 18:49 (WT04)	07:58 18:41	17:49 (WT04) 18:41	07:52 16:45	08:33 16:26	10:12 (WT06) 63	11:44 (WT05)
17	05:36 21:44	06:21 20:55	19:35 (WT03) 20:12 (WT03)	07:10 60	17:48 (WT04) 18:48 (WT04)	07:59 18:39	17:48 (WT04) 18:39	07:53 16:44	08:34 16:26	10:13 (WT06) 64	11:45 (WT05)
18	05:37 21:43	06:23 20:53	19:35 (WT03) 20:13 (WT03)	07:12 60	17:48 (WT04) 18:48 (WT04)	08:01 18:37	17:48 (WT04) 18:37	07:55 16:43	08:34 16:26	10:12 (WT06) 65	11:45 (WT05)
19	05:38 21:41	06:24 20:51	19:35 (WT03) 20:12 (WT03)	07:14 59	17:48 (WT04) 18:47 (WT04)	08:03 18:35	17:48 (WT04) 18:35	07:57 16:41	08:35 16:26	10:13 (WT06) 66	11:46 (WT05)
20	05:40 21:40	06:26 20:48	19:35 (WT03) 20:12 (WT03)	07:15 58	17:48 (WT04) 18:46 (WT04)	08:05 18:33	17:48 (WT04) 18:33	07:58 16:40	08:36 16:27	10:13 (WT06) 67	11:47 (WT05)
21	05:41 21:39	06:28 20:46	19:35 (WT03) 20:11 (WT03)	07:17 57	17:48 (WT04) 18:45 (WT04)	08:06 18:31	17:48 (WT04) 18:31	08:00 16:39	08:36 16:27	10:13 (WT06) 67	11:47 (WT05)
22	05:42 21:38	06:29 20:44	19:35 (WT03) 20:11 (WT03)	07:18 56	17:48 (WT04) 18:44 (WT04)	08:08 18:29	17:48 (WT04) 18:29	08:02 16:38	08:37 16:28	10:14 (WT06) 67	11:48 (WT05)
23	05:44 21:37	06:31 20:42	19:35 (WT03) 20:09 (WT03)	07:20 55	17:49 (WT04) 18:44 (WT04)	08:10 18:27	17:49 (WT04) 18:27	08:03 16:37	08:37 16:28	10:14 (WT06) 67	11:48 (WT05)
24	05:45 21:35	06:32 20:40	19:36 (WT03) 20:09 (WT03)	07:22 53	17:49 (WT04) 18:42 (WT04)	08:11 18:25	17:49 (WT04) 18:25	08:05 16:36	08:38 16:29	10:15 (WT06) 67	11:49 (WT05)
25	05:46 21:34	20:28 (WT02) 06:34	19:36 (WT03) 20:07 (WT03)	07:23 51	17:50 (WT04) 18:41 (WT04)	08:13 18:23	17:50 (WT04) 18:23	08:06 16:35	08:38 16:29	10:16 (WT06) 65	11:49 (WT05)
26	05:48 21:33	20:27 (WT02) 06:35	18:25 (WT04) 20:06 (WT03)	07:25 49	17:50 (WT04) 18:39 (WT04)	08:15 18:21	17:50 (WT04) 18:21	08:08 16:34	08:39 11:12 (WT05)	10:16 (WT06) 65	11:49 (WT05)
27	05:49 21:31	20:25 (WT02) 06:37	18:18 (WT04) 20:04 (WT03)	07:26 46	17:51 (WT04) 18:37 (WT04)	08:17 18:19	17:51 (WT04) 18:19	08:10 16:33	08:39 11:07 (WT05)	10:17 (WT06) 64	11:49 (WT05)
28	05:51 21:30	20:23 (WT02) 06:39	18:15 (WT04) 20:03 (WT03)	07:28 43	17:53 (WT04) 18:36 (WT04)	08:18 18:17	17:53 (WT04) 18:17	08:11 16:32	08:39 11:04 (WT05)	10:17 (WT06) 63	11:49 (WT05)
29	05:52 21:28	20:23 (WT02) 06:40	18:12 (WT04) 20:00 (WT03)	07:30 40	17:53 (WT04) 18:33 (WT04)	07:20 17:15	17:53 (WT04) 17:15	08:13 16:31	08:39 11:03 (WT05)	10:19 (WT06) 63	11:51 (WT05)
30	05:54 21:27	20:22 (WT02) 06:42	18:10 (WT04) 20:27	07:31 36	17:55 (WT04) 18:31 (WT04)	07:22 17:13	17:55 (WT04) 17:13	08:14 16:31	08:39 11:02 (WT05)	10:20 (WT06) 61	11:51 (WT05)
31	05:55 21:25	20:21 (WT02) 06:43	18:07 (WT04) 19:53 (WT03)	07:32 381	18:07 (WT04) 19:53 (WT03)	07:24 17:11	18:07 (WT04) 17:11	16:31 26	08:39 11:28 (WT05)	10:20 (WT06) 59	11:50 (WT05)
Potential sun hours	500	453		381		333		269		247	
Total, worst case	113	1312		1591		87		86		1722	
Sun reduction	0,38	0,41		0,35		0,33		0,24		0,17	
Oper. time red.	0,96	0,96		0,96		0,96		0,96		0,96	
Wind dir. red.	0,56	0,57		0,66		0,66		0,61		0,61	
Total reduction	0,20	0,23		0,22		0,21		0,14		0,10	
Total, real	23	300		348		18		12		168	

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 154 - Heierkerkweg 15
 Assumptions for shadow calculations

Reference year for calendar 2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June			
1	08:39 16:35 35	11:32 (WT05) 12:07 (WT05)	08:14 17:22	07:22 18:13	07:12 20:05 51	18:04 (WT04) 18:55 (WT04)	06:09 20:55 47	19:30 (WT03) 20:29 (WT02)	05:24 21:40
2	08:39 16:36 34	11:33 (WT05) 12:07 (WT05)	08:12 17:24	07:19 18:14	07:10 20:07 49	18:05 (WT04) 18:54 (WT04)	06:07 20:57 44	19:33 (WT03) 20:30 (WT02)	05:23 21:41
3	08:39 16:37 32	11:35 (WT05) 12:07 (WT05)	08:11 17:26	07:17 18:16	07:08 20:09 47	18:06 (WT04) 18:53 (WT04)	06:05 20:59 42	19:34 (WT03) 20:30 (WT02)	05:22 21:42
4	08:39 16:39 32	11:35 (WT05) 12:07 (WT05)	08:09 17:27	07:15 18:18	07:05 20:10 45	18:07 (WT04) 18:52 (WT04)	06:03 21:00 37	19:36 (WT03) 20:30 (WT02)	05:22 21:43
5	08:39 16:40 31	11:36 (WT05) 12:07 (WT05)	08:08 17:29	07:13 18:20	07:03 20:12 43	18:08 (WT04) 18:51 (WT04)	06:01 21:02 24	20:06 (WT02) 20:30 (WT02)	05:21 21:44
6	08:39 16:41 29	11:38 (WT05) 12:07 (WT05)	08:06 17:31	07:11 18:21	07:01 20:14 40	18:09 (WT04) 18:49 (WT04)	05:59 21:03 24	20:06 (WT02) 20:30 (WT02)	05:20 21:45
7	08:38 16:42 27	11:39 (WT05) 12:06 (WT05)	08:04 17:33	07:09 18:23	06:59 20:15 37	18:10 (WT04) 18:47 (WT04)	05:58 21:05 24	20:05 (WT02) 20:29 (WT02)	05:20 21:46
8	08:38 16:43 24	11:41 (WT05) 12:05 (WT05)	08:03 17:35	07:06 18:25	06:57 20:17 34	18:12 (WT04) 18:46 (WT04)	05:56 21:07 22	20:07 (WT02) 20:29 (WT02)	05:19 21:47
9	08:37 16:45 22	11:42 (WT05) 12:04 (WT05)	08:01 17:37	07:04 18:27	06:54 20:19 30	18:14 (WT04) 18:44 (WT04)	05:54 21:08 21	20:07 (WT02) 20:28 (WT02)	05:19 21:48
10	08:37 16:46 18	11:44 (WT05) 12:02 (WT05)	07:59 17:38	07:02 18:28	06:52 20:20 37	18:16 (WT04) 19:53 (WT03)	05:52 21:10 20	20:07 (WT02) 20:27 (WT02)	05:18 21:49
11	08:36 16:47 12	11:48 (WT05) 12:00 (WT05)	07:57 17:40	07:00 18:30	06:50 20:22 36	18:19 (WT04) 19:55 (WT03)	05:51 21:11 17	20:09 (WT02) 20:26 (WT02)	05:18 21:49
12	08:36 16:49 13	11:48 (WT05) 12:00 (WT05)	07:55 17:42	06:58 18:32	06:48 20:24 31	18:24 (WT04) 19:57 (WT03)	05:49 21:13 16	20:09 (WT02) 20:25 (WT02)	05:18 21:50
13	08:35 16:50 16	11:48 (WT05) 12:00 (WT05)	07:54 17:44	06:55 18:33	06:45 20:25 25	19:33 (WT03) 19:58 (WT03)	05:48 21:14 13	20:11 (WT02) 20:24 (WT02)	05:17 21:51
14	08:34 16:52 15	11:48 (WT05) 12:00 (WT05)	07:52 17:46	06:53 18:35	06:43 20:27 27	19:32 (WT03) 19:59 (WT03)	05:46 21:16 8	20:14 (WT02) 20:22 (WT02)	05:17 21:51
15	08:34 16:53 16	11:48 (WT05) 12:00 (WT05)	07:50 17:47	06:51 18:37	06:41 20:29 30	19:30 (WT03) 20:00 (WT03)	05:44 21:17 17	20:09 (WT02) 20:07 (WT02)	05:17 21:52
16	08:33 16:55 17	11:48 (WT05) 12:00 (WT05)	07:48 17:49	06:49 18:39	06:39 20:30 32	19:29 (WT03) 20:01 (WT03)	05:43 21:19 17	20:09 (WT02) 20:07 (WT02)	05:17 21:52
17	08:32 16:56 18	11:48 (WT05) 12:00 (WT05)	07:46 17:51	06:46 18:40	06:37 20:32 33	19:29 (WT03) 20:02 (WT03)	05:41 21:20 18	20:09 (WT02) 20:07 (WT02)	05:17 21:53
18	08:31 16:58 19	11:48 (WT05) 12:00 (WT05)	07:44 17:53	06:44 18:42	06:35 20:34 34	19:28 (WT03) 20:02 (WT03)	05:40 21:22 19	20:09 (WT02) 20:07 (WT02)	05:17 21:53
19	08:30 17:00 20	11:48 (WT05) 12:00 (WT05)	07:42 17:55	06:42 18:44	06:33 20:35 35	19:27 (WT03) 20:02 (WT03)	05:39 21:23 20	20:09 (WT02) 20:07 (WT02)	05:17 21:54
20	08:29 17:01 21	11:48 (WT05) 12:00 (WT05)	07:40 17:57	06:39 18:45	06:31 20:37 35	19:27 (WT03) 20:02 (WT03)	05:37 21:25 21	20:09 (WT02) 20:07 (WT02)	05:17 21:54
21	08:28 17:03 22	11:48 (WT05) 12:00 (WT05)	07:38 17:58	06:37 18:47	06:28 20:39 35	19:27 (WT03) 20:02 (WT03)	05:36 21:26 22	20:09 (WT02) 20:07 (WT02)	05:17 21:54
22	08:27 17:05 23	11:48 (WT05) 12:00 (WT05)	07:36 18:00	06:35 18:49	06:26 20:40 35	19:27 (WT03) 20:02 (WT03)	05:35 21:28 23	20:09 (WT02) 20:07 (WT02)	05:17 21:55
23	08:26 17:06 24	11:48 (WT05) 12:00 (WT05)	07:34 18:02	06:33 18:50	06:24 20:42 35	19:26 (WT03) 20:01 (WT03)	05:33 21:29 24	20:09 (WT02) 20:07 (WT02)	05:17 21:55
24	08:25 17:08 25	11:48 (WT05) 12:00 (WT05)	07:32 18:04	06:30 18:52	06:22 20:44 34	19:27 (WT03) 20:01 (WT03)	05:32 21:30 25	20:09 (WT02) 20:07 (WT02)	05:18 21:55
25	08:23 17:10 26	11:48 (WT05) 12:00 (WT05)	07:30 18:06	06:28 18:54	06:20 20:45 39	19:27 (WT03) 20:20 (WT02)	05:31 21:32 26	20:09 (WT02) 20:07 (WT02)	05:18 21:55
26	08:22 17:11 27	11:48 (WT05) 12:00 (WT05)	07:28 18:07	06:26 19:55	06:18 20:47 44	19:27 (WT03) 20:22 (WT02)	05:30 21:33 27	20:09 (WT02) 20:07 (WT02)	05:18 21:55
27	08:21 17:13 28	11:48 (WT05) 12:00 (WT05)	07:26 18:09	06:24 19:57	06:16 20:49 45	19:27 (WT03) 20:23 (WT02)	05:29 21:34 28	20:09 (WT02) 20:07 (WT02)	05:19 21:55
28	08:20 17:15 29	11:48 (WT05) 12:00 (WT05)	07:24 18:11	06:21 19:59	06:14 20:50 47	19:28 (WT03) 20:25 (WT02)	05:28 21:35 29	20:09 (WT02) 20:07 (WT02)	05:19 21:55
29	08:18 17:17 30	11:48 (WT05) 12:00 (WT05)	07:19 20:00	06:19 20:00	06:12 20:52 48	19:28 (WT03) 20:26 (WT02)	05:27 21:37 30	20:09 (WT02) 20:07 (WT02)	05:20 21:55
30	08:17 17:18 31	11:48 (WT05) 12:00 (WT05)	07:17 20:02	06:17 20:02	06:10 20:54 47	19:29 (WT03) 20:27 (WT02)	05:26 21:38 31	20:09 (WT02) 20:07 (WT02)	05:20 21:54
Potential sun hours	261	278	367	415	483	496			
Total, worst case	296		1062	1140	359				
Sun reduction	0,20		0,29	0,37	0,41				
Oper. time red.	0,96		0,96	0,96	0,96				
Wind dir. red.	0,64		0,66	0,60	0,56				
Total reduction	0,12		0,19	0,22	0,22				
Total, real	36		197	247	79				

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 154 - Heierkerkweg 15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December				
1	05:21	05:56	20:20 (WT02)	06:45	18:20 (WT04)	07:33	17:56 (WT04)	07:25	08:15	11:31 (WT05)
	21:54	21:24	16 20:36 (WT02)	20:23	35 19:55 (WT03)	19:14	37 18:33 (WT04)	17:09	16:30	7 11:38 (WT05)
2	05:22	05:58	20:19 (WT02)	06:47	18:16 (WT04)	07:34	17:57 (WT04)	07:27	08:17	11:29 (WT05)
	21:54	21:22	17 20:36 (WT02)	20:21	37 19:52 (WT03)	19:12	33 18:30 (WT04)	17:08	16:29	15 11:44 (WT05)
3	05:22	05:59	20:18 (WT02)	06:48	18:13 (WT04)	07:36	17:59 (WT04)	07:29	08:18	11:27 (WT05)
	21:54	21:20	20 20:38 (WT02)	20:18	35 19:48 (WT03)	19:10	29 18:28 (WT04)	17:06	16:29	19 11:46 (WT05)
4	05:23	06:01	20:17 (WT02)	06:50	18:10 (WT04)	07:38	18:02 (WT04)	07:31	08:20	11:25 (WT05)
	21:53	21:19	21 20:38 (WT02)	20:16	32 18:42 (WT04)	19:08	23 18:25 (WT04)	17:04	16:28	23 11:48 (WT05)
5	05:24	06:02	20:16 (WT02)	06:51	18:08 (WT04)	07:39	18:04 (WT04)	07:32	08:21	11:25 (WT05)
	21:53	21:17	22 20:38 (WT02)	20:14	35 18:43 (WT04)	19:05	16 18:20 (WT04)	17:02	16:27	25 11:50 (WT05)
6	05:25	06:04	20:16 (WT02)	06:53	18:05 (WT04)	07:41		07:34	08:22	11:24 (WT05)
	21:52	21:15	23 20:39 (WT02)	20:12	39 18:44 (WT04)	19:03		17:01	16:27	28 11:52 (WT05)
7	05:26	06:06	20:15 (WT02)	06:54	18:04 (WT04)	07:43		07:36	08:23	11:23 (WT05)
	21:52	21:13	24 20:39 (WT02)	20:09	41 18:45 (WT04)	19:01		16:59	16:27	30 11:53 (WT05)
8	05:26	06:07	20:15 (WT02)	06:56	18:02 (WT04)	07:44		07:38	08:25	11:24 (WT05)
	21:51	21:12	25 20:40 (WT02)	20:07	43 18:45 (WT04)	18:59		16:57	16:26	31 11:55 (WT05)
9	05:27	06:09	19:46 (WT03)	06:58	18:01 (WT04)	07:46		07:39	08:26	11:23 (WT05)
	21:50	21:10	36 20:39 (WT02)	20:05	46 18:47 (WT04)	18:57		16:56	16:26	33 11:56 (WT05)
10	05:28	06:10	19:44 (WT03)	06:59	17:59 (WT04)	07:48		07:41	08:27	11:23 (WT05)
	21:50	21:08	41 20:40 (WT02)	20:03	48 18:47 (WT04)	18:54		16:54	16:26	33 11:56 (WT05)
11	05:29	06:12	19:41 (WT03)	07:01	17:58 (WT04)	07:49		07:43	08:28	11:23 (WT05)
	21:49	21:06	45 20:39 (WT02)	20:00	49 18:47 (WT04)	18:52		16:53	16:26	34 11:57 (WT05)
12	05:30	06:13	19:40 (WT03)	07:02	17:56 (WT04)	07:51		07:45	08:29	11:23 (WT05)
	21:48	21:04	46 20:38 (WT02)	19:58	51 18:47 (WT04)	18:50		16:51	16:26	35 11:58 (WT05)
13	05:31	06:15	19:38 (WT03)	07:04	17:56 (WT04)	07:53		07:46	08:30	11:23 (WT05)
	21:47	21:02	46 20:36 (WT02)	19:56	52 18:48 (WT04)	18:48		16:50	16:25	36 11:59 (WT05)
14	05:33	06:16	19:37 (WT03)	07:06	17:55 (WT04)	07:54		07:48	08:31	11:23 (WT05)
	21:46	21:00	48 20:35 (WT02)	19:53	53 18:48 (WT04)	18:46		16:48	16:25	37 12:00 (WT05)
15	05:34	06:18	19:35 (WT03)	07:07	17:54 (WT04)	07:56		07:50	08:32	11:23 (WT05)
	21:46	20:58	46 20:32 (WT02)	19:51	54 18:48 (WT04)	18:43		16:47	16:26	38 12:01 (WT05)
16	05:35	06:20	19:35 (WT03)	07:09	17:53 (WT04)	07:58		07:52	08:33	11:24 (WT05)
	21:45	20:57	45 20:31 (WT02)	19:49	55 18:48 (WT04)	18:41		16:45	16:26	37 12:01 (WT05)
17	05:36	06:21	19:33 (WT03)	07:10	17:52 (WT04)	07:59		07:53	08:34	11:24 (WT05)
	21:44	20:55	45 20:29 (WT02)	19:47	55 18:47 (WT04)	18:39		16:44	16:26	38 12:02 (WT05)
18	05:37	06:23	19:33 (WT03)	07:12	17:52 (WT04)	08:01		07:55	08:34	11:24 (WT05)
	21:43	20:53	41 20:27 (WT02)	19:44	55 18:47 (WT04)	18:37		16:43	16:26	38 12:02 (WT05)
19	05:38	06:24	19:32 (WT03)	07:14	17:51 (WT04)	08:03		07:57	08:35	11:24 (WT05)
	21:41	20:50	37 20:25 (WT02)	19:42	55 18:46 (WT04)	18:35		16:41	16:26	39 12:03 (WT05)
20	05:40	06:26	19:32 (WT03)	07:15	17:51 (WT04)	08:05		07:58	08:36	11:25 (WT05)
	21:40	20:48	35 20:07 (WT03)	19:40	55 18:46 (WT04)	18:33		16:40	16:27	39 12:04 (WT05)
21	05:41	06:28	19:31 (WT03)	07:17	17:50 (WT04)	08:06		08:00	08:36	11:25 (WT05)
	21:39	20:46	35 20:06 (WT03)	19:37	55 18:45 (WT04)	18:31		16:39	16:27	39 12:04 (WT05)
22	05:42	06:29	19:31 (WT03)	07:18	17:51 (WT04)	08:08		08:02	08:37	11:26 (WT05)
	21:38	20:44	36 20:07 (WT03)	19:35	54 18:45 (WT04)	18:29		16:38	16:28	39 12:05 (WT05)
23	05:44	06:31	19:30 (WT03)	07:20	17:51 (WT04)	08:10		08:03	08:37	11:26 (WT05)
	21:37	20:42	36 20:06 (WT03)	19:33	53 18:44 (WT04)	18:27		16:37	16:28	39 12:05 (WT05)
24	05:45	06:32	19:31 (WT03)	07:22	17:51 (WT04)	08:11		08:05	08:38	11:27 (WT05)
	21:35	20:40	35 20:06 (WT03)	19:30	52 18:43 (WT04)	18:25		16:36	16:29	39 12:06 (WT05)
25	05:46	06:34	19:30 (WT03)	07:23	17:51 (WT04)	08:13		08:06	08:38	11:27 (WT05)
	21:34	20:38	35 20:05 (WT03)	19:28	51 18:42 (WT04)	18:23		16:35	16:29	39 12:06 (WT05)
26	05:48	06:35	19:31 (WT03)	07:25	17:51 (WT04)	08:15		08:08	08:39	11:28 (WT05)
	21:33	20:36	33 20:04 (WT03)	19:26	49 18:40 (WT04)	18:21		16:34	16:30	38 12:06 (WT05)
27	05:49	06:37	19:31 (WT03)	07:26	17:52 (WT04)	08:17		08:10	08:39	11:28 (WT05)
	21:31	20:34	32 20:03 (WT03)	19:24	47 18:39 (WT04)	18:19		16:33	16:31	38 12:06 (WT05)
28	05:51	06:39	19:32 (WT03)	07:28	17:53 (WT04)	08:18		08:11	08:39	11:29 (WT05)
	21:30	20:32	30 20:02 (WT03)	19:21	45 18:38 (WT04)	18:17		16:32	16:31	37 12:06 (WT05)
29	05:52	06:40	19:32 (WT03)	07:30	17:53 (WT04)	08:20		08:13	08:39	11:30 (WT05)
	21:28	20:29	29 20:01 (WT03)	19:19	43 18:36 (WT04)	17:15		16:31	16:32	38 12:08 (WT05)
30	05:54	8 20:24 (WT02)	06:42	19:33 (WT03)	07:31	17:55 (WT04)	07:22	08:14	08:39	11:31 (WT05)
	21:27	20:27	26 19:59 (WT03)	19:17	40 18:35 (WT04)	17:13		16:31	16:33	37 12:08 (WT05)
31	05:55	13 20:21 (WT02)	06:43	19:34 (WT03)		07:24		08:39		11:31 (WT05)
	21:25	20:25	23 19:57 (WT03)			17:11		16:34	16:34	36 12:07 (WT05)
Potential sun hours	500	453		381		333		269	247	
Total, worst case	21	1029		1414		138				1034
Sun reduction	0,38	0,41		0,35		0,33				0,17
Oper. time red.	0,96	0,96		0,96		0,96				0,96
Wind dir. red.	0,56	0,57		0,65		0,66				0,64
Total reduction	0,20	0,23		0,22		0,21				0,10
Total, real	4	235		310		29				106

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 155 - Heierkerkweg 13/11
 Assumptions for shadow calculations
 Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar 2017
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	
1	08:39 16:35	08:14 17:22	07:22 18:13	17:04 (WT04) 35 17:39 (WT04)	07:12 20:05	19:05 (WT03) 20:55	05:24 21:40
2	08:39 16:36	08:12 17:24	07:19 18:14	17:03 (WT04) 37 17:40 (WT04)	07:10 20:07	19:06 (WT03) 20:57	05:23 21:41
3	08:39 16:37	08:11 17:26	07:17 18:16	17:02 (WT04) 37 17:39 (WT04)	07:08 20:09	19:06 (WT03) 20:59	05:22 21:42
4	08:39 16:39	08:09 17:27	07:15 18:18	17:02 (WT04) 37 17:39 (WT04)	07:05 20:10	19:07 (WT03) 21:00	05:22 21:43
5	08:39 16:40	08:08 17:29	07:13 18:20	17:02 (WT04) 38 17:40 (WT04)	07:03 20:12	19:08 (WT03) 21:02	05:21 21:44
6	08:39 16:41	08:06 17:31	07:11 18:21	17:02 (WT04) 38 17:40 (WT04)	07:01 20:14	19:08 (WT03) 21:03	05:20 21:45
7	08:38 16:42	08:04 17:33	07:09 18:23	17:01 (WT04) 37 17:38 (WT04)	06:59 20:15	19:09 (WT03) 21:05	05:20 21:46
8	08:38 16:43	08:03 17:35	07:06 18:25	17:01 (WT04) 37 17:38 (WT04)	06:56 20:17	19:12 (WT03) 21:07	05:19 21:47
9	08:37 16:45	08:01 17:37	07:04 18:27	17:02 (WT04) 36 17:38 (WT04)	06:54 20:19	19:15 (WT03) 21:08	05:19 21:48
10	08:37 16:46	07:59 17:38	07:02 18:28	17:03 (WT04) 34 17:37 (WT04)	06:52 20:20	19:48 (WT02) 21:10	05:18 21:49
11	08:36 16:47	07:57 17:40	07:00 18:30	17:03 (WT04) 32 17:35 (WT04)	06:50 20:22	19:45 (WT02) 21:11	05:18 21:49
12	08:36 16:49	07:55 17:42	06:58 18:32	17:04 (WT04) 30 17:34 (WT04)	06:48 20:24	19:44 (WT02) 21:13	05:18 21:50
13	08:35 16:50	07:54 17:44	06:55 18:33	17:05 (WT04) 28 17:33 (WT04)	06:45 20:25	19:44 (WT02) 21:14	05:17 21:51
14	08:34 16:52	07:52 17:46	06:53 18:35	17:07 (WT04) 25 17:32 (WT04)	06:43 20:27	19:43 (WT02) 21:16	05:17 21:51
15	08:34 16:53	07:50 17:47	06:51 18:37	17:08 (WT04) 21 17:29 (WT04)	06:41 20:29	19:43 (WT02) 21:17	05:17 21:52
16	08:33 16:55	07:48 17:49	06:49 18:39	17:11 (WT04) 15 17:26 (WT04)	06:39 20:30	19:43 (WT02) 21:19	05:17 21:52
17	08:32 16:56	07:46 17:51	06:46 18:40	17:16 (WT04) 5 17:21 (WT04)	06:37 20:32	19:43 (WT02) 21:20	05:17 21:53
18	08:31 16:58	07:44 17:53	06:44 18:42	06:35 20:34	19:44 (WT02) 19 20:03 (WT02)	05:40 21:22	05:17 21:53
19	08:30 17:00	07:42 17:55	06:42 18:44	06:33 20:35	19:44 (WT02) 18 20:02 (WT02)	05:39 21:23	05:17 21:54
20	08:29 17:01	07:40 17:57	06:39 18:45	06:31 20:37	19:45 (WT02) 16 20:01 (WT02)	05:37 21:25	05:17 21:54
21	08:28 17:03	07:38 17:58	17:18 (WT04) 06:37 18:47	06:28 20:39	19:46 (WT02) 12 19:58 (WT02)	05:36 21:26	05:17 21:54
22	08:27 17:05	07:36 18:00	17:14 (WT04) 16 17:30 (WT04)	06:35 18:49	06:26 20:40	19:48 (WT02) 7 19:55 (WT02)	05:35 21:28
23	08:26 17:06	07:34 18:02	17:12 (WT04) 20 17:32 (WT04)	06:33 18:50	18:17 (WT03) 10 18:27 (WT03)	06:24 20:42	05:33 21:29
24	08:25 17:08	07:32 18:04	17:10 (WT04) 24 17:34 (WT04)	06:30 18:52	18:14 (WT03) 15 18:29 (WT03)	06:22 20:44	05:32 21:30
25	08:23 17:10	07:30 18:06	17:07 (WT04) 28 17:35 (WT04)	06:28 18:54	18:11 (WT03) 19 18:30 (WT03)	06:20 20:45	05:31 21:32
26	08:22 17:11	07:28 18:07	17:06 (WT04) 30 17:36 (WT04)	07:26 19:55	19:10 (WT03) 22 19:32 (WT03)	06:18 20:47	05:30 21:33
27	08:21 17:13	07:26 18:09	17:05 (WT04) 33 17:38 (WT04)	07:24 19:57	19:09 (WT03) 25 19:34 (WT03)	06:16 20:49	05:29 21:34
28	08:19 17:15	07:24 18:11	17:04 (WT04) 34 17:38 (WT04)	07:21 19:59	19:08 (WT03) 27 19:35 (WT03)	06:14 20:50	05:28 21:35
29	08:18 17:17		07:19 20:00	19:07 (WT03) 27 19:34 (WT03)	06:12 20:52	05:27 21:37	05:20 21:55
30	08:17 17:18		07:17 20:02	19:06 (WT03) 28 19:34 (WT03)	06:10 20:54	05:26 21:38	05:20 21:54
31	08:15 17:20		07:14 20:04	19:06 (WT03) 28 19:34 (WT03)		05:25 21:39	
Potential sun hours	261	278	367	415		483	496
Total, worst case			192	723		401	
Sun reduction			0,28	0,29		0,37	
Oper. time red.			0,96	0,96		0,96	
Wind dir. red.			0,68	0,66		0,60	
Total reduction			0,18	0,19		0,21	
Total, real			35	135		86	

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 155 - Heierkerkweg 13/11
 Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December	
1	05:21 21:54	05:56 21:24	06:45 20:23	19:45 (WT02) 19:14	07:33 28	17:45 (WT04) 17:09	08:15 16:30
2	05:22 21:54	05:58 21:22	06:47 20:21	19:45 (WT02) 19:12	07:34 31	17:42 (WT04) 17:08	08:17 16:29
3	05:22 21:54	05:59 21:20	06:48 20:18	19:46 (WT02) 19:10	07:36 33	17:41 (WT04) 17:06	08:18 16:29
4	05:23 21:53	06:01 21:19	06:50 20:16	19:10 (WT03) 19:51 (WT02)	07:38 35	17:39 (WT04) 17:04	08:20 16:28
5	05:24 21:53	06:02 21:17	06:51 20:14	19:07 (WT03) 19:23 (WT03)	07:39 36	17:39 (WT04) 17:02	08:21 16:27
6	05:25 21:52	06:04 21:15	06:53 20:12	19:05 (WT03) 19:24 (WT03)	07:41 37	17:38 (WT04) 17:01	08:22 16:27
7	05:25 21:52	06:06 21:13	06:54 20:09	19:03 (WT03) 19:25 (WT03)	07:43 37	17:38 (WT04) 16:59	08:23 16:27
8	05:26 21:51	06:07 21:12	06:56 20:07	19:01 (WT03) 19:25 (WT03)	07:44 37	17:37 (WT04) 16:57	08:25 16:26
9	05:27 21:50	06:09 21:10	06:58 20:05	19:00 (WT03) 19:26 (WT03)	07:46 37	17:37 (WT04) 16:56	08:26 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	18:59 (WT03) 19:26 (WT03)	07:48 37	17:37 (WT04) 16:54	08:27 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	18:59 (WT03) 19:26 (WT03)	07:49 37	17:36 (WT04) 16:53	08:28 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	18:58 (WT03) 18:50	07:51 37	17:36 (WT04) 16:51	08:29 16:26
13	05:31 21:47	06:15 21:02	07:04 19:56	18:58 (WT03) 18:48	07:53 35	17:37 (WT04) 16:50	08:30 16:25
14	05:32 21:46	06:16 21:00	07:06 19:53	18:58 (WT03) 19:25 (WT03)	07:54 35	17:37 (WT04) 16:48	08:31 16:25
15	05:34 21:46	06:18 20:58	07:07 19:51	18:57 (WT03) 19:24 (WT03)	07:56 33	17:37 (WT04) 16:47	08:32 16:26
16	05:35 21:45	06:20 20:57	07:09 19:49	18:58 (WT03) 18:41	07:58 31	17:38 (WT04) 16:45	08:33 16:26
17	05:36 21:44	06:21 20:55	07:10 19:47	18:58 (WT03) 18:39	07:59 28	17:39 (WT04) 16:44	08:34 16:26
18	05:37 21:43	06:23 20:53	07:12 19:44	18:59 (WT03) 19:20 (WT03)	08:01 25	17:41 (WT04) 16:43	08:34 16:26
19	05:38 21:41	06:24 20:50	07:14 19:42	18:59 (WT03) 19:17 (WT03)	08:03 21	17:43 (WT04) 16:41	08:35 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	19:01 (WT03) 19:15 (WT03)	08:04 16	17:44 (WT04) 16:40	08:36 16:27
21	05:41 21:39	06:27 20:46	07:17 19:55 (WT02)	19:03 (WT03) 19:12 (WT03)	08:06 9	17:48 (WT04) 16:39	08:36 16:27
22	05:42 21:38	06:29 20:44	07:18 20:03 (WT02)	19:37 19:35	08:08 18:29	08:02 16:38	08:37 16:28
23	05:44 21:37	06:31 20:42	07:20 20:04 (WT02)	19:49 19:33	08:10 18:27	08:03 16:37	08:37 16:28
24	05:45 21:35	06:32 20:40	07:22 20:05 (WT02)	19:48 19:30	08:11 18:25	08:05 16:36	08:38 16:29
25	05:46 21:34	06:34 20:38	07:23 20:05 (WT02)	19:46 19:28	08:13 18:23	08:06 16:35	08:38 16:29
26	05:48 21:33	06:35 20:36	07:25 20:06 (WT02)	19:46 (WT02) 19:26	08:15 18:21	08:08 16:34	08:39 16:30
27	05:49 21:31	06:37 20:34	07:26 20:06 (WT02)	19:45 (WT02) 19:24	17:56 (WT04) 8	08:17 18:19	08:39 16:31
28	05:51 21:30	06:39 20:32	07:28 20:06 (WT02)	19:45 (WT02) 19:21	17:52 (WT04) 16	08:18 18:17	08:39 16:32
29	05:52 21:28	06:40 20:29	07:30 20:04 (WT02)	19:44 (WT02) 19:19	17:48 (WT04) 22	08:12 17:15	08:39 16:32
30	05:53 21:27	06:42 20:27	07:31 20:03 (WT02)	19:44 (WT02) 19:17	17:46 (WT04) 26	08:14 17:13	08:39 16:33
31	05:55 21:25	06:43 20:25	07:31 20:00 (WT02)	19:44 (WT02) 17:11	07:24 17:11	16:30 16:34	08:39 16:34
Potential sun hours	500	453	381	333		269	246
Total, worst case		183	500	655			
Sun reduction		0,41	0,35	0,33			
Oper. time red.		0,96	0,96	0,96			
Wind dir. red.		0,57	0,63	0,68			
Total reduction		0,23	0,21	0,21			
Total, real		42	105	139			

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 156 - Heierkerkweg 9
 Assumptions for shadow calculations

Reference year for calendar 2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 16:35	08:14 17:22	07:22 18:13	17:03 (WT04) 20:05	07:12 19:04 (WT03)	06:08 21:40
2	08:39 16:36	08:12 17:24	07:19 18:14	17:03 (WT04) 20:07	07:10 19:05 (WT03)	06:07 21:41
3	08:39 16:37	08:11 17:26	07:17 18:16	17:02 (WT04) 20:09	07:08 19:06 (WT03)	06:05 21:42
4	08:39 16:39	08:09 17:27	07:15 18:18	17:02 (WT04) 20:10	07:05 19:07 (WT03)	06:03 21:43
5	08:39 16:40	08:08 17:29	07:13 18:20	17:02 (WT04) 20:12	07:03 19:09 (WT03)	06:01 21:44
6	08:39 16:41	08:06 17:31	07:11 18:21	17:02 (WT04) 20:14	07:01 19:10 (WT03)	05:59 21:45
7	08:38 16:42	08:04 17:33	07:09 18:23	17:02 (WT04) 20:15	06:59 19:14 (WT03)	05:58 21:46
8	08:38 16:43	08:03 17:35	07:06 18:25	17:03 (WT04) 20:17	06:56 19:46 (WT02)	05:56 21:47
9	08:37 16:45	08:01 17:37	07:04 18:27	17:03 (WT04) 20:19	06:54 19:45 (WT02)	05:54 21:48
10	08:37 16:46	07:59 17:38	07:02 18:28	17:04 (WT04) 20:20	06:52 19:43 (WT02)	05:52 21:49
11	08:36 16:47	07:57 17:40	07:00 18:30	17:05 (WT04) 20:22	06:50 19:42 (WT02)	05:51 21:49
12	08:36 16:49	07:55 17:42	06:58 18:32	17:06 (WT04) 20:24	06:48 19:41 (WT02)	05:49 21:50
13	08:35 16:50	07:54 17:44	06:55 18:33	17:08 (WT04) 20:25	06:45 20:01 (WT02)	05:48 21:51
14	08:34 16:52	07:52 17:46	06:53 18:35	17:11 (WT04) 20:27	06:43 20:02 (WT02)	05:46 21:51
15	08:34 16:53	07:50 17:47	06:51 18:37	17:14 (WT04) 20:29	06:41 20:01 (WT02)	05:44 21:52
16	08:33 16:55	07:48 17:49	06:49 18:39	17:23 (WT04) 20:30	20:29 20:01 (WT02)	21:17 05:43
17	08:32 16:56	07:46 17:51	06:46 18:40	06:39 20:32	19:41 (WT02) 20:00 (WT02)	05:43 21:20
18	08:31 16:58	07:44 17:53	06:44 18:42	06:35 20:34	19:43 (WT02) 19:58 (WT02)	05:40 21:22
19	08:30 17:00	07:42 17:55	06:42 18:44	06:33 20:35	19:45 (WT02) 19:57 (WT02)	05:39 21:23
20	08:29 17:01	07:40 17:57	17:19 (WT04) 18:45	06:39 20:37	06:31 19:53 (WT02)	05:37 21:25
21	08:28 17:03	07:38 17:58	17:14 (WT04) 18:47	06:37 18:17 (WT03)	06:28 18:24 (WT03)	05:36 21:26
22	08:27 17:05	07:36 18:00	17:12 (WT04) 18:49	06:35 18:25 (WT03)	06:26 20:40	05:35 21:28
23	08:26 17:06	07:34 18:02	17:10 (WT04) 18:50	06:33 18:27 (WT03)	06:24 20:42	05:33 21:29
24	08:25 17:08	07:32 18:04	17:08 (WT04) 18:52	06:30 18:29 (WT03)	06:22 20:44	05:32 21:30
25	08:23 17:10	07:30 18:06	17:06 (WT04) 18:54	06:28 18:30 (WT03)	06:20 20:45	05:31 21:32
26	08:22 17:11	07:28 18:07	17:05 (WT04) 19:55	07:26 19:32 (WT03)	06:18 20:47	05:30 21:33
27	08:21 17:13	07:26 18:09	17:05 (WT04) 19:57	07:24 19:32 (WT03)	06:16 20:49	05:29 21:34
28	08:19 17:15	07:24 18:11	17:04 (WT04) 19:59	07:21 19:33 (WT03)	06:14 20:50	05:28 21:35
29	08:18 17:17		07:19 20:00	19:05 (WT03) 27	06:12 19:32 (WT03)	05:27 21:37
30	08:17 17:18		07:17 20:02	19:05 (WT03) 27	06:10 19:32 (WT03)	05:26 21:38
31	08:15 17:20		07:14 20:04	19:05 (WT03) 26	06:09 19:31 (WT03)	05:25 21:39
Potential sun hours	261	278	367	415	483	496
Total, worst case		216	682	327		
Sun reduction		0,28	0,29	0,37		
Oper. time red.		0,96	0,96	0,96		
Wind dir. red.		0,68	0,66	0,60		
Total reduction		0,18	0,19	0,21		
Total, real		39	127	70		

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 156 - Heierkerkweg 9
 Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December		
1	05:21 21:54	05:56 21:24	06:45 20:23	19:41 (WT02) 19:14	07:33 22	17:48 (WT04) 17:09	08:15 16:30	
2	05:22 21:54	05:58 21:22	06:47 20:21	19:41 (WT02) 19:56 (WT02)	07:34 19:12	17:45 (WT04) 18:10 (WT04)	07:27 17:08	08:17 16:29
3	05:22 21:54	05:59 21:20	06:48 20:18	19:42 (WT02) 19:54 (WT02)	07:36 19:10	17:43 (WT04) 18:11 (WT04)	07:29 17:06	08:18 16:29
4	05:23 21:53	06:01 21:19	06:50 20:16	19:42 (WT02) 19:51 (WT02)	07:38 19:08	17:41 (WT04) 18:12 (WT04)	07:31 17:04	08:20 16:28
5	05:24 21:53	06:02 21:17	06:51 20:14	19:44 (WT02) 19:49 (WT02)	07:39 19:05	17:40 (WT04) 18:13 (WT04)	07:32 17:02	08:21 16:27
6	05:25 21:52	06:04 21:15	06:53 20:12	19:07 (WT03) 19:47 (WT02)	07:41 19:03	17:39 (WT04) 18:13 (WT04)	07:34 17:01	08:22 16:27
7	05:25 21:52	06:06 21:13	06:54 20:09	19:05 (WT03) 19:20 (WT03)	07:43 19:01	17:39 (WT04) 18:14 (WT04)	07:36 16:59	08:23 16:27
8	05:26 21:51	06:07 21:12	06:56 20:07	19:02 (WT03) 19:20 (WT03)	07:44 18:59	17:37 (WT04) 18:13 (WT04)	07:38 16:57	08:25 16:26
9	05:27 21:50	06:09 21:10	06:58 20:05	19:00 (WT03) 19:22 (WT03)	07:46 18:56	17:37 (WT04) 18:13 (WT04)	07:39 16:56	08:26 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	18:58 (WT03) 19:22 (WT03)	07:48 18:54	17:37 (WT04) 18:13 (WT04)	07:41 16:54	08:27 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	18:58 (WT03) 19:23 (WT03)	07:49 18:52	17:36 (WT04) 18:12 (WT04)	07:43 16:53	08:28 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	18:56 (WT03) 19:22 (WT03)	07:51 18:50	17:36 (WT04) 18:12 (WT04)	07:45 16:51	08:29 16:26
13	05:31 21:47	06:15 21:02	07:04 19:56	18:56 (WT03) 19:23 (WT03)	07:53 18:48	17:37 (WT04) 18:12 (WT04)	07:46 16:50	08:30 16:25
14	05:32 21:46	06:16 21:00	07:06 19:53	18:56 (WT03) 19:23 (WT03)	07:54 18:46	17:37 (WT04) 18:11 (WT04)	07:48 16:48	08:31 16:25
15	05:34 21:46	06:18 20:58	07:07 19:51	18:55 (WT03) 19:22 (WT03)	07:56 18:43	17:37 (WT04) 18:10 (WT04)	07:50 16:47	08:32 16:26
16	05:35 21:45	06:20 20:57	07:09 19:49	18:55 (WT03) 19:22 (WT03)	07:58 18:41	17:37 (WT04) 18:09 (WT04)	07:52 16:45	08:33 16:26
17	05:36 21:44	06:21 20:55	07:10 19:47	18:55 (WT03) 19:20 (WT03)	07:59 18:39	17:38 (WT04) 18:08 (WT04)	07:53 16:44	08:34 16:26
18	05:37 21:43	06:23 20:53	07:12 19:44	18:55 (WT03) 19:20 (WT03)	08:01 18:37	17:40 (WT04) 18:06 (WT04)	07:55 16:43	08:34 16:26
19	05:38 21:41	06:24 20:50	07:14 19:42	18:55 (WT03) 19:17 (WT03)	08:03 18:35	17:41 (WT04) 18:05 (WT04)	07:57 16:41	08:35 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	18:56 (WT03) 19:15 (WT03)	08:04 18:33	17:42 (WT04) 18:02 (WT04)	07:58 16:40	08:36 16:27
21	05:41 21:39	06:27 20:46	07:17 19:37	18:57 (WT03) 19:12 (WT03)	08:06 18:31	17:44 (WT04) 18:00 (WT04)	08:00 16:39	08:36 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	18:59 (WT03) 19:10 (WT03)	08:08 18:29	17:48 (WT04) 17:55 (WT04)	08:02 16:38	08:37 16:28
23	05:44 21:37	06:31 20:42	07:20 19:52 (WT02) 19:56 (WT02)	19:04 (WT03) 19:33	08:10 3	08:03 16:37	08:37 16:28	
24	05:45 21:35	06:32 20:40	07:22 20:00 (WT02)	18:11 18:25	08:11 18:25	08:05 16:36	08:38 16:29	
25	05:46 21:34	06:34 20:38	07:23 20:01 (WT02)	08:13 18:23	08:13 18:23	08:06 16:35	08:38 16:29	
26	05:48 21:33	06:35 20:36	07:25 20:02 (WT02)	08:15 18:21	08:15 18:21	08:08 16:34	08:39 16:30	
27	05:49 21:31	06:37 20:34	07:26 20:02 (WT02)	08:17 18:19	08:17 18:19	08:09 16:33	08:39 16:31	
28	05:51 21:30	06:39 20:32	07:28 20:03 (WT02)	08:18 18:17	08:18 18:17	08:11 16:32	08:39 16:31	
29	05:52 21:28	06:40 20:29	07:30 20:02 (WT02)	17:54 (WT04) 18:04 (WT04)	07:20 17:15	08:12 16:31	08:39 16:32	
30	05:53 21:27	06:42 20:27	07:31 20:03 (WT02)	17:50 (WT04) 18:07 (WT04)	07:22 17:13	08:14 16:30	08:39 16:33	
31	05:55 21:25	06:43 20:25	07:31 20:00 (WT02)	17:13 17:11	17:13 17:11	16:30 16:34	16:33 16:34	
Potential sun hours	500	453	381	333		269	246	
Total, worst case		146	454	645				
Sun reduction		0,41	0,35	0,33				
Oper. time red.		0,96	0,96	0,96				
Wind dir. red.		0,58	0,63	0,68				
Total reduction		0,23	0,21	0,21				
Total, real		34	95	137				

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 157 - Heierkerkweg 7A

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 16:35	08:14 17:22	07:22 18:13	17:06 (WT04) 20:05	07:12 19:05 (WT03)	06:08 20:55
2	08:39 16:36	08:12 17:24	07:19 18:14	17:06 (WT04) 20:07	07:10 19:06 (WT03)	06:07 20:57
3	08:39 16:37	08:11 17:26	07:17 18:16	17:05 (WT04) 20:09	07:08 19:07 (WT03)	06:05 20:59
4	08:39 16:39	08:09 17:27	07:15 18:18	17:05 (WT04) 20:10	07:05 19:09 (WT03)	06:03 21:00
5	08:39 16:40	08:08 17:29	07:13 18:20	17:05 (WT04) 20:12	07:03 19:11 (WT03)	06:01 21:02
6	08:39 16:41	08:06 17:31	07:11 18:21	17:05 (WT04) 20:14	07:01 19:24 (WT03)	05:59 21:03
7	08:38 16:42	08:04 17:33	07:09 18:23	17:05 (WT04) 20:15	06:59 19:22 (WT03)	05:58 21:02
8	08:38 16:43	08:03 17:35	07:06 18:25	17:05 (WT04) 20:17	06:56 19:27 (WT03)	05:56 21:04
9	08:37 16:45	08:01 17:37	07:04 18:27	17:06 (WT04) 20:19	06:54 19:22 (WT03)	05:54 21:06
10	08:37 16:46	07:59 17:38	07:02 18:28	17:07 (WT04) 20:20	06:52 19:26 (WT03)	05:52 21:08
11	08:36 16:47	07:57 17:40	07:00 18:30	17:08 (WT04) 20:22	06:50 19:27 (WT03)	05:51 21:10
12	08:36 16:49	07:55 17:42	06:58 18:32	17:10 (WT04) 20:24	06:48 19:28 (WT03)	05:49 21:12
13	08:35 16:50	07:54 17:44	06:55 18:33	17:12 (WT04) 20:25	06:45 19:30 (WT03)	05:48 21:14
14	08:34 16:52	07:52 17:46	06:53 18:35	17:15 (WT04) 20:27	06:43 19:31 (WT03)	05:46 21:16
15	08:34 16:53	07:50 17:47	06:51 18:37	17:17 (WT04) 20:29	06:41 19:32 (WT03)	05:44 21:18
16	08:33 16:55	07:48 17:49	06:49 18:39	17:20 (WT04) 20:30	06:39 19:33 (WT03)	05:43 21:20
17	08:32 16:56	07:46 17:51	06:46 18:40	17:23 (WT04) 20:32	06:37 19:34 (WT03)	05:41 21:22
18	08:31 16:58	07:44 17:53	06:44 18:42	17:26 (WT04) 20:34	06:35 19:35 (WT03)	05:40 21:24
19	08:30 17:00	07:42 17:55	06:42 18:44	17:29 (WT04) 20:35	06:33 19:36 (WT03)	05:39 21:26
20	08:29 17:01	07:40 17:57	06:39 18:45	17:32 (WT04) 20:37	06:30 19:37 (WT03)	05:37 21:28
21	08:28 17:03	07:38 17:58	17:17 (WT04) 06:37	18:14 (WT03) 20:38	06:28 19:38 (WT03)	05:36 21:30
22	08:27 17:05	07:36 18:00	17:14 (WT04) 17:32 (WT04)	06:35 18:49	18:11 (WT03) 18:25 (WT03)	06:26 20:40
23	08:26 17:06	07:34 18:02	17:12 (WT04) 17:34 (WT04)	06:33 18:50	18:10 (WT03) 18:27 (WT03)	06:24 20:42
24	08:25 17:08	07:32 18:04	17:11 (WT04) 17:36 (WT04)	06:30 18:52	18:08 (WT03) 18:29 (WT03)	06:22 20:44
25	08:23 17:10	07:30 18:06	17:09 (WT04) 17:37 (WT04)	06:28 18:54	18:06 (WT03) 18:30 (WT03)	06:20 20:45
26	08:22 17:11	07:28 18:07	17:08 (WT04) 17:38 (WT04)	07:26 19:55	19:06 (WT03) 19:31 (WT03)	06:18 20:47
27	08:21 17:13	07:26 18:09	17:07 (WT04) 17:39 (WT04)	07:24 19:57	19:05 (WT03) 19:32 (WT03)	06:16 20:49
28	08:19 17:15	07:24 18:11	17:06 (WT04) 17:39 (WT04)	07:21 19:59	19:05 (WT03) 19:32 (WT03)	06:14 20:50
29	08:18 17:17			07:19 20:00	19:04 (WT03) 19:31 (WT03)	06:12 20:52
30	08:17 17:18			07:17 20:02	19:05 (WT03) 19:30 (WT03)	06:10 20:54
31	08:15 17:20			07:14 20:04	19:05 (WT03) 19:30 (WT03)	05:25 21:39
Potential sun hours	261	278	367	415	483	496
Total, worst case		201	649	89		
Sun reduction		0,28	0,29	0,37		
Oper. time red.		0,96	0,96	0,96		
Wind dir. red.		0,68	0,66	0,63		
Total reduction		0,18	0,19	0,22		
Total, real		37	120	20		

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 157 - Heierkerkweg 7A
 Assumptions for shadow calculations
 Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar 2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21 21:54	05:56 21:24	06:45 20:23	07:33 19:14	17:51 (WT04) 18:10 (WT04)	07:25 16:30
2	05:22 21:54	05:58 21:22	06:47 20:21	07:34 19:12	17:48 (WT04) 18:11 (WT04)	07:27 16:29
3	05:22 21:54	05:59 21:20	06:48 20:18	07:36 19:10	17:46 (WT04) 18:12 (WT04)	07:29 16:29
4	05:23 21:53	06:01 21:19	06:50 20:16	07:38 19:08	17:44 (WT04) 18:12 (WT04)	07:31 16:28
5	05:24 21:53	06:02 21:17	06:51 20:14	07:39 19:05	17:43 (WT04) 18:13 (WT04)	07:32 16:27
6	05:25 21:52	06:04 21:15	06:53 20:12	07:41 19:03	17:42 (WT04) 18:14 (WT04)	07:34 16:27
7	05:25 21:52	06:06 21:13	06:54 20:09	7 19:08 (WT03) 19:15 (WT03)	07:43 19:01	07:36 16:27
8	05:26 21:51	06:07 21:12	06:56 20:07	13 19:04 (WT03) 19:17 (WT03)	07:44 18:59	07:38 16:26
9	05:27 21:50	06:09 21:10	06:58 20:05	17 19:02 (WT03) 19:19 (WT03)	07:46 18:56	07:39 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	21 19:19 (WT03) 19:20 (WT03)	07:48 18:54	07:41 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	23 18:58 (WT03) 19:21 (WT03)	07:49 18:52	07:43 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	24 18:57 (WT03) 19:21 (WT03)	07:51 18:50	07:45 16:26
13	05:31 21:47	06:15 21:02	07:04 19:56	25 18:56 (WT03) 19:21 (WT03)	07:53 18:48	07:46 16:25
14	05:32 21:46	06:16 21:00	07:06 19:53	26 18:56 (WT03) 19:22 (WT03)	07:54 18:46	07:48 16:25
15	05:34 21:46	06:18 20:58	07:07 19:51	26 18:55 (WT03) 19:21 (WT03)	07:56 18:43	07:50 16:26
16	05:35 21:45	06:20 20:56	07:09 19:49	26 18:55 (WT03) 19:21 (WT03)	07:58 18:41	07:52 16:26
17	05:36 21:44	06:21 20:55	07:10 19:47	26 18:54 (WT03) 19:20 (WT03)	07:59 18:39	07:53 16:26
18	05:37 21:43	06:23 20:53	07:12 19:44	25 18:54 (WT03) 19:19 (WT03)	08:01 18:37	07:55 16:26
19	05:38 21:41	06:24 20:50	07:14 19:42	23 18:54 (WT03) 19:17 (WT03)	08:03 18:35	07:57 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	20 18:55 (WT03) 19:15 (WT03)	08:04 18:33	07:58 16:27
21	05:41 21:39	06:27 20:46	07:17 19:37	17 18:55 (WT03) 19:12 (WT03)	08:06 18:31	08:00 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	13 18:57 (WT03) 19:10 (WT03)	08:08 18:29	08:02 16:28
23	05:44 21:37	06:31 20:42	07:20 19:33	9 18:59 (WT03) 19:08 (WT03)	08:10 18:27	08:03 16:28
24	05:45 21:35	06:32 20:40	07:22 19:30	08:11 18:25	08:05 16:36	08:38 16:29
25	05:46 21:34	06:34 20:38	07:23 19:28	08:13 18:23	08:06 16:35	08:38 16:29
26	05:48 21:33	06:35 20:36	07:25 19:26	08:15 18:21	08:08 16:34	08:39 16:30
27	05:49 21:31	06:37 20:34	07:26 19:24	08:17 18:19	08:09 16:33	08:39 16:31
28	05:51 21:30	06:39 20:32	07:28 19:21	08:18 18:17	08:11 16:32	08:39 16:31
29	05:52 21:28	06:40 20:29	07:30 19:19	07:20 17:15	08:12 16:31	08:39 16:32
30	05:53 21:27	06:42 20:27	07:31 19:17	13 17:54 (WT04) 18:07 (WT04)	07:22 17:13	08:14 16:33
31	05:55 21:25	06:43 20:25	07:33 17:11	07:24 17:11	08:15 16:34	08:39 16:34
Potential sun hours	500	453	381	333	269	246
Total, worst case			354	601		
Sun reduction			0,35	0,33		
Oper. time red.			0,96	0,96		
Wind dir. red.			0,63	0,68		
Total reduction			0,21	0,21		
Total, real			75	127		

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

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

SHADOW - Calendar

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 158 - Heierkerkweg 5B

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 16:35	08:14 17:22	07:22 18:13	17:08 (WT04) 17:40 (WT04)	07:12 20:05	19:05 (WT03) 20:55
2	08:39 16:36	08:12 17:24	07:19 18:14	17:08 (WT04) 17:41 (WT04)	07:10 20:07	19:07 (WT03) 20:57
3	08:39 16:37	08:11 17:26	07:17 18:16	17:07 (WT04) 17:40 (WT04)	07:08 20:09	19:09 (WT03) 20:59
4	08:39 16:39	08:09 17:27	07:15 18:18	17:07 (WT04) 17:40 (WT04)	07:05 20:10	06:03 21:00
5	08:39 16:40	08:08 17:29	07:13 18:20	17:07 (WT04) 17:39 (WT04)	07:03 20:12	06:01 21:02
6	08:39 16:41	08:06 17:31	07:11 18:21	17:07 (WT04) 17:39 (WT04)	07:01 20:14	05:59 21:03
7	08:38 16:42	08:04 17:33	07:09 18:23	17:07 (WT04) 17:38 (WT04)	06:59 20:15	05:58 21:05
8	08:38 16:43	08:03 17:35	07:06 18:25	17:08 (WT04) 17:37 (WT04)	06:56 20:17	05:56 21:07
9	08:37 16:45	08:01 17:37	07:04 18:27	17:09 (WT04) 17:36 (WT04)	06:54 20:19	05:54 21:08
10	08:37 16:46	07:59 17:38	07:02 18:28	17:11 (WT04) 17:35 (WT04)	06:52 20:20	05:52 21:10
11	08:36 16:47	07:57 17:40	07:00 18:30	17:11 (WT04) 17:32 (WT04)	06:50 20:22	05:51 21:11
12	08:36 16:49	07:55 17:42	06:58 18:32	17:14 (WT04) 17:30 (WT04)	06:48 20:24	05:49 21:13
13	08:35 16:50	07:54 17:44	06:55 18:33	17:17 (WT04) 17:27 (WT04)	06:45 20:25	05:48 21:14
14	08:34 16:52	07:52 17:46	06:53 18:35	06:43 20:27	06:43 20:27	05:46 21:16
15	08:34 16:53	07:50 17:47	06:51 18:37	06:41 20:29	06:41 20:29	05:44 21:17
16	08:33 16:55	07:48 17:49	06:49 18:39	06:39 20:30	06:39 20:30	05:43 21:19
17	08:32 16:56	07:46 17:51	06:46 18:40	06:37 20:32	06:37 20:32	05:41 21:20
18	08:31 16:58	07:44 17:53	06:44 18:42	06:35 20:34	06:35 20:34	05:40 21:22
19	08:30 17:00	07:42 17:55	06:42 18:44	18:16 (WT03) 18:20 (WT03)	06:33 20:35	05:39 21:23
20	08:29 17:01	07:40 17:57	06:39 18:45	18:12 (WT03) 18:22 (WT03)	06:30 20:37	05:37 21:25
21	08:28 17:03	07:38 17:58	06:37 17:18 (WT04)	18:10 (WT03) 18:24 (WT03)	06:28 20:39	05:36 21:26
22	08:27 17:05	07:36 18:00	06:35 17:33 (WT04)	18:08 (WT03) 18:25 (WT03)	06:26 20:40	05:35 21:28
23	08:26 17:06	07:34 18:02	06:33 17:14 (WT04)	18:07 (WT03) 18:27 (WT03)	06:24 20:42	05:33 21:29
24	08:25 17:08	07:32 18:04	06:30 17:12 (WT04)	18:06 (WT03) 18:29 (WT03)	06:22 20:44	05:32 21:30
25	08:23 17:10	07:30 18:05	06:28 17:10 (WT04)	18:05 (WT03) 18:29 (WT03)	06:20 20:45	05:31 21:32
26	08:22 17:11	07:28 18:07	06:26 17:09 (WT04)	19:04 (WT03) 19:30 (WT03)	06:18 20:47	05:30 21:33
27	08:21 17:13	07:26 18:09	06:24 17:09 (WT04)	19:04 (WT03) 19:30 (WT03)	06:16 20:49	05:29 21:34
28	08:19 17:15	07:24 18:11	06:21 17:08 (WT04)	19:04 (WT03) 19:29 (WT03)	06:14 20:50	05:28 21:35
29	08:18 17:17		07:19 20:00	19:04 (WT03) 19:28 (WT03)	06:12 20:52	05:27 21:37
30	08:17 17:18		07:17 20:02	19:04 (WT03) 19:27 (WT03)	06:10 20:54	05:26 21:38
31	08:15 17:20		07:14 20:04	19:05 (WT03) 19:27 (WT03)		05:25 21:39
Potential sun hours	261	278	367	415		483
Total, worst case		194	611		47	
Sun reduction		0,28	0,29		0,37	
Oper. time red.		0,96	0,96		0,96	
Wind dir. red.		0,68	0,66		0,63	
Total reduction		0,18	0,18		0,23	
Total, real		35	113		11	

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 158 - Heierkerkweg 5B
 Assumptions for shadow calculations
 Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21 21:54	05:56 21:24	06:45 20:23	07:33 19:14	17:56 (WT04) 18:07 (WT04)	07:25 16:30
2	05:22 21:54	05:58 21:22	06:47 20:21	07:34 19:12	17:52 (WT04) 18:09 (WT04)	07:27 16:29
3	05:22 21:54	05:59 21:20	06:48 20:18	07:36 19:10	17:50 (WT04) 18:11 (WT04)	07:29 16:29
4	05:23 21:53	06:01 21:19	06:50 20:16	07:38 19:08	17:47 (WT04) 18:12 (WT04)	07:31 16:28
5	05:24 21:53	06:02 21:17	06:51 20:14	07:39 19:05	17:46 (WT04) 18:13 (WT04)	07:32 16:27
6	05:25 21:52	06:04 21:15	06:53 20:12	07:41 19:03	17:45 (WT04) 18:14 (WT04)	07:34 16:27
7	05:25 21:52	06:06 21:13	06:54 20:09	07:43 19:01	17:44 (WT04) 18:14 (WT04)	07:36 16:27
8	05:26 21:51	06:07 21:12	06:56 20:07	07:44 18:59	17:42 (WT04) 18:14 (WT04)	07:38 16:26
9	05:27 21:50	06:09 21:10	06:58 20:05	19:05 (WT03) 19:13 (WT03)	07:46 18:56	07:39 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	19:01 (WT03) 19:15 (WT03)	07:48 18:54	07:41 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	18:59 (WT03) 19:17 (WT03)	07:49 18:52	07:43 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	18:57 (WT03) 19:17 (WT03)	07:51 18:50	07:45 16:26
13	05:31 21:47	06:15 21:02	07:04 19:56	18:56 (WT03) 19:18 (WT03)	07:53 18:48	07:46 16:25
14	05:32 21:46	06:16 21:00	07:06 19:53	18:54 (WT03) 19:18 (WT03)	07:54 18:46	07:48 16:25
15	05:34 21:46	06:18 20:58	07:07 19:51	18:54 (WT03) 19:19 (WT03)	07:56 18:43	07:50 16:26
16	05:35 21:45	06:20 20:56	07:09 19:49	18:54 (WT03) 19:19 (WT03)	07:58 18:41	07:52 16:26
17	05:36 21:44	06:21 20:55	07:10 19:47	18:53 (WT03) 19:18 (WT03)	07:59 18:39	07:53 16:26
18	05:37 21:43	06:23 20:53	07:12 19:44	18:53 (WT03) 19:18 (WT03)	08:01 18:37	07:55 16:26
19	05:38 21:41	06:24 20:50	07:14 19:42	18:52 (WT03) 19:17 (WT03)	08:03 18:35	07:57 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	18:53 (WT03) 19:15 (WT03)	08:04 18:33	07:58 16:27
21	05:41 21:39	06:27 20:46	07:17 19:37	18:53 (WT03) 19:12 (WT03)	08:06 18:31	08:00 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	18:54 (WT03) 19:10 (WT03)	08:08 18:29	08:02 16:28
23	05:44 21:37	06:31 20:42	07:20 19:33	18:55 (WT03) 19:08 (WT03)	08:10 18:27	08:03 16:28
24	05:45 21:35	06:32 20:40	07:22 19:30	18:57 (WT03) 19:05 (WT03)	08:11 18:25	08:05 16:29
25	05:46 21:34	06:34 20:38	07:23 19:28	08:13 18:23	08:13 18:23	08:06 16:29
26	05:48 21:33	06:35 20:36	07:25 19:26	08:15 18:21	08:15 18:21	08:08 16:30
27	05:49 21:31	06:37 20:34	07:26 19:24	08:17 18:19	08:17 18:19	08:09 16:31
28	05:51 21:30	06:39 20:32	07:28 19:21	08:18 18:17	08:18 18:17	08:11 16:31
29	05:52 21:28	06:40 20:29	07:30 19:19	07:20 17:15	07:20 17:15	08:12 16:32
30	05:53 21:27	06:42 20:27	07:31 19:17	07:22 17:13	07:22 17:13	08:14 16:33
31	05:55 21:25	06:43 20:25	07:30 19:15	07:24 17:11	07:24 17:11	08:14 16:34
Potential sun hours	500	453	381	333	269	246
Total, worst case			309	557		
Sun reduction			0,35	0,33		
Oper. time red.			0,96	0,96		
Wind dir. red.			0,63	0,68		
Total reduction			0,21	0,21		
Total, real			65	118		

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 160 - Heierkerkweg 7
 Assumptions for shadow calculations

Reference year for calendar 2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time
 N NNE ENE E SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June			
1	08:39	13:51 (WT05)	08:14	07:22	07:12	19:24 (WT03)	06:08	05:24	
	16:35	25 14:16 (WT05)	17:22	18:13	20:05	18 19:42 (WT03)	20:55	21:40	
2	08:39	13:53 (WT05)	08:12	07:19	07:10	19:23 (WT03)	06:07	05:23	
	16:36	23 14:16 (WT05)	17:24	18:14	20:07	20 19:43 (WT03)	20:57	21:41	
3	08:39	13:54 (WT05)	08:11	07:17	07:08	19:22 (WT03)	06:05	05:22	
	16:37	22 14:16 (WT05)	17:26	18:16	20:09	23 19:45 (WT03)	20:59	21:42	
4	08:39	13:55 (WT05)	08:09	07:15	07:05	19:22 (WT03)	06:03	05:22	
	16:39	20 14:15 (WT05)	17:27	18:18	20:10	24 19:46 (WT03)	21:00	21:43	
5	08:39	13:57 (WT05)	08:08	07:13	07:03	19:22 (WT03)	06:01	05:21	
	16:40	18 14:15 (WT05)	17:29	18:20	20:12	24 19:46 (WT03)	21:02	21:44	
6	08:39	14:00 (WT05)	08:06	07:11	17:44 (WT04)	07:01	19:20 (WT03)	05:59	05:20
	16:41	14 14:14 (WT05)	17:31	18:21	10 17:54 (WT04)	20:14	25 19:45 (WT03)	21:03	21:45
7	08:38	14:02 (WT05)	08:04	07:09	17:40 (WT04)	06:59	19:20 (WT03)	05:58	05:20
	16:42	10 14:12 (WT05)	17:33	18:23	16 17:56 (WT04)	20:15	25 19:45 (WT03)	21:05	21:46
8	08:38	14:07 (WT05)	08:03	07:06	17:38 (WT04)	06:56	19:21 (WT03)	05:56	05:19
	16:43	2 14:09 (WT05)	17:35	18:25	20 17:58 (WT04)	20:17	24 19:45 (WT03)	21:07	21:47
9	08:37	14:01 (WT05)	08:01	07:04	17:36 (WT04)	06:54	19:21 (WT03)	05:54	05:19
	16:45	17:37	18:27	24 18:00 (WT04)	20:19	23 19:44 (WT03)	21:08	21:48	
10	08:37	14:02 (WT05)	07:59	07:02	17:35 (WT04)	06:52	19:22 (WT03)	05:52	05:18
	16:46	17:38	18:28	27 18:02 (WT04)	20:20	21 19:43 (WT03)	21:10	21:49	
11	08:36	14:03 (WT05)	07:57	07:00	17:33 (WT04)	06:50	19:22 (WT03)	05:51	05:18
	16:47	17:40	18:30	29 18:02 (WT04)	20:22	19 19:41 (WT03)	21:11	21:49	
12	08:36	14:04 (WT05)	07:55	06:58	17:32 (WT04)	06:48	19:24 (WT03)	05:49	05:18
	16:49	17:42	18:32	31 18:03 (WT04)	20:24	15 19:39 (WT03)	21:13	21:50	
13	08:35	14:05 (WT05)	07:54	06:55	17:32 (WT04)	06:45	19:26 (WT03)	05:48	05:17
	16:50	17:44	18:33	31 18:03 (WT04)	20:25	11 19:37 (WT03)	21:14	21:51	
14	08:34	14:06 (WT05)	07:52	06:53	17:31 (WT04)	06:43	19:30 (WT03)	05:46	05:17
	16:52	17:46	18:35	33 18:04 (WT04)	20:27	3 19:33 (WT03)	21:16	21:51	
15	08:34	14:07 (WT05)	07:50	06:51	17:30 (WT04)	06:41	19:31 (WT03)	05:44	05:17
	16:53	17:47	18:37	33 18:03 (WT04)	20:29	19:32 (WT03)	21:17	21:52	
16	08:33	14:08 (WT05)	07:48	06:49	17:30 (WT04)	06:39	19:32 (WT03)	05:43	05:17
	16:55	17:49	18:39	33 18:03 (WT04)	20:30	19:33 (WT03)	21:19	21:52	
17	08:32	14:09 (WT05)	07:46	06:46	17:30 (WT04)	06:37	19:33 (WT03)	05:41	05:17
	16:56	17:51	18:40	33 18:03 (WT04)	20:32	19:34 (WT03)	21:20	21:53	
18	08:31	14:10 (WT05)	07:44	06:44	17:29 (WT04)	06:35	19:34 (WT03)	05:40	05:17
	16:58	17:53	18:42	33 18:02 (WT04)	20:34	19:35 (WT03)	21:22	21:53	
19	08:30	14:11 (WT05)	07:42	06:42	17:30 (WT04)	06:33	19:35 (WT03)	05:39	05:17
	17:00	17:55	18:44	32 18:02 (WT04)	20:35	19:36 (WT03)	21:23	21:54	
20	08:29	14:12 (WT05)	07:40	06:39	17:30 (WT04)	06:30	19:36 (WT03)	05:37	05:17
	17:01	17:57	18:45	31 18:01 (WT04)	20:37	19:37 (WT03)	21:25	21:54	
21	08:28	14:13 (WT05)	07:38	06:37	17:31 (WT04)	06:28	19:37 (WT03)	05:36	05:17
	17:03	17:58	18:47	29 18:00 (WT04)	20:39	19:38 (WT03)	21:26	21:54	
22	08:27	14:14 (WT05)	07:36	06:35	17:31 (WT04)	06:26	19:38 (WT03)	05:35	05:17
	17:05	18:00	18:49	27 17:58 (WT04)	20:40	19:39 (WT03)	21:28	21:55	
23	08:26	14:15 (WT05)	07:34	06:33	17:33 (WT04)	06:24	19:39 (WT03)	05:33	05:17
	17:06	18:02	18:50	24 17:57 (WT04)	20:42	19:40 (WT03)	21:29	21:55	
24	08:25	14:16 (WT05)	07:32	06:30	17:34 (WT04)	06:22	19:40 (WT03)	05:32	05:18
	17:08	18:04	18:52	21 17:55 (WT04)	20:44	19:41 (WT03)	21:30	21:55	
25	08:23	14:17 (WT05)	07:30	06:28	17:36 (WT04)	06:20	19:41 (WT03)	05:31	05:18
	17:10	18:05	18:54	16 17:52 (WT04)	20:45	19:42 (WT03)	21:32	21:55	
26	08:22	14:18 (WT05)	07:28	06:26	18:39 (WT04)	06:18	19:42 (WT03)	05:30	05:18
	17:11	18:07	19:55	10 18:49 (WT04)	20:47	19:43 (WT03)	21:33	21:55	
27	08:21	14:19 (WT05)	07:26	06:24	17:37 (WT04)	06:16	19:43 (WT03)	05:29	05:19
	17:13	18:09	19:57	10 18:49 (WT04)	20:49	19:44 (WT03)	21:34	21:55	
28	08:19	14:20 (WT05)	07:24	06:21	17:38 (WT04)	06:14	19:44 (WT03)	05:28	05:19
	17:15	18:11	19:59	10 18:49 (WT04)	20:50	19:45 (WT03)	21:35	21:55	
29	08:18	14:21 (WT05)	07:19	06:19	19:32 (WT03)	06:12	19:45 (WT03)	05:27	05:20
	17:17	18:12	20:00	5 19:37 (WT03)	20:52	19:46 (WT03)	21:37	21:55	
30	08:17	14:22 (WT05)	07:17	06:17	19:29 (WT03)	06:10	19:46 (WT03)	05:26	05:20
	17:18	18:13	20:02	10 19:39 (WT03)	20:54	19:47 (WT03)	21:38	21:54	
31	08:15	14:23 (WT05)	07:14	06:14	19:27 (WT03)	06:08	19:47 (WT03)	05:25	05:19
	17:20	18:14	20:04	14 19:41 (WT03)	20:56	19:48 (WT03)	21:39	21:55	
Potential sun hours	261	278	367	415	483	496			
Total, worst case	134		572		275				
Sun reduction	0,20		0,29		0,37				
Oper. time red.	0,96		0,96		0,96				
Wind dir. red.	0,71		0,65		0,61				
Total reduction	0,14		0,19		0,22				
Total, real	18		106		60				

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 160 - Heierkerkweg 7
 Assumptions for shadow calculations

Reference year for calendar 2017

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time
 N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December		
1	05:21 21:54	05:56 21:24	06:45 20:23	19:23 (WT03) 19:40 (WT03)	07:33 19:14	18:11 (WT04) 17:09	08:15 16:30	
2	05:22 21:54	05:58 21:22	06:47 20:21	19:20 (WT03) 19:40 (WT03)	07:34 19:12	18:11 (WT04) 17:08	08:17 16:29	
3	05:22 21:54	05:59 21:20	06:48 20:18	19:20 (WT03) 19:42 (WT03)	07:36 19:10	18:12 (WT04) 17:06	08:18 16:29	
4	05:23 21:53	06:01 21:19	06:50 20:16	19:18 (WT03) 19:41 (WT03)	07:38 19:08	18:12 (WT04) 17:04	08:20 16:28	
5	05:24 21:53	06:02 21:17	06:51 20:14	19:18 (WT03) 19:42 (WT03)	07:39 19:05	18:13 (WT04) 17:02	08:21 16:27	13:49 (WT05)
6	05:25 21:52	06:04 21:15	06:53 20:12	19:16 (WT03) 19:41 (WT03)	07:41 19:03	18:15 (WT04) 17:01	08:22 16:27	13:47 (WT05)
7	05:25 21:52	06:06 21:13	06:54 20:09	19:16 (WT03) 19:41 (WT03)	07:43 19:01	18:17 (WT04) 16:59	08:23 16:27	13:45 (WT05)
8	05:26 21:51	06:07 21:12	06:56 20:07	19:16 (WT03) 19:40 (WT03)	07:44 18:59	18:20 (WT04) 16:57	08:25 16:26	13:44 (WT05)
9	05:27 21:50	06:09 21:10	06:58 20:05	19:16 (WT03) 19:40 (WT03)	07:46 18:56	18:28 (WT04) 16:56	08:26 16:26	13:43 (WT05)
10	05:28 21:50	06:10 21:08	06:59 20:03	19:16 (WT03) 19:38 (WT03)	07:48 18:54	17:41 16:54	08:27 16:26	13:43 (WT05)
11	05:29 21:49	06:12 21:06	07:01 20:00	19:17 (WT03) 19:36 (WT03)	07:49 18:52	17:43 16:53	08:28 16:26	13:42 (WT05)
12	05:30 21:48	06:13 21:04	07:02 19:58	19:17 (WT03) 19:33 (WT03)	07:51 18:50	17:45 16:51	08:29 16:26	13:42 (WT05)
13	05:31 21:47	06:15 21:02	07:04 19:56	19:18 (WT03) 19:31 (WT03)	07:53 18:48	17:46 16:50	08:30 16:25	13:42 (WT05)
14	05:32 21:46	06:16 21:00	07:06 19:53	19:20 (WT03) 19:28 (WT03)	07:54 18:46	17:48 16:48	08:31 16:25	13:42 (WT05)
15	05:34 21:46	06:18 20:58	07:07 19:51	19:20 (WT03) 19:28 (WT03)	07:56 18:43	17:50 16:47	08:32 16:26	13:42 (WT05)
16	05:35 21:45	06:20 20:56	07:09 19:49	19:20 (WT03) 19:28 (WT03)	07:58 18:41	17:52 16:45	08:33 16:26	13:42 (WT05)
17	05:36 21:44	06:21 20:55	07:10 19:47	19:20 (WT03) 19:28 (WT03)	07:59 18:39	17:53 16:44	08:33 16:26	13:43 (WT05)
18	05:37 21:42	06:23 20:53	07:12 19:44	18:26 (WT04) 18:39 (WT04)	08:01 18:37	16:44 16:43	16:26 16:26	14:11 (WT05)
19	05:38 21:41	06:24 20:50	07:14 19:42	18:22 (WT04) 18:41 (WT04)	08:03 18:35	16:43 16:41	16:26 16:26	14:11 (WT05)
20	05:40 21:40	06:26 20:48	07:15 19:40	18:20 (WT04) 18:42 (WT04)	08:04 18:33	16:43 16:40	16:26 16:27	14:11 (WT05)
21	05:41 21:39	06:27 20:46	07:17 19:37	18:18 (WT04) 18:43 (WT04)	08:06 18:31	16:43 16:39	16:26 16:27	14:11 (WT05)
22	05:42 21:38	06:29 20:44	07:18 19:35	18:16 (WT04) 18:44 (WT04)	08:08 18:29	16:38 16:38	16:28 16:28	14:14 (WT05)
23	05:44 21:37	06:31 20:42	07:20 19:33	18:15 (WT04) 18:45 (WT04)	08:10 18:27	16:38 16:37	16:28 16:28	14:14 (WT05)
24	05:45 21:35	06:32 20:40	07:22 19:30	18:14 (WT04) 18:45 (WT04)	08:11 18:25	16:37 16:36	16:28 16:29	14:15 (WT05)
25	05:46 21:34	06:34 20:38	07:23 19:28	18:13 (WT04) 18:45 (WT04)	08:13 18:23	16:37 16:35	16:28 16:29	14:15 (WT05)
26	05:48 21:33	06:35 20:36	07:25 19:26	18:12 (WT04) 18:45 (WT04)	08:15 18:21	16:37 16:34	16:28 16:30	14:15 (WT05)
27	05:49 21:31	06:37 20:34	07:26 19:24	18:12 (WT04) 18:45 (WT04)	08:17 18:19	16:37 16:33	16:28 16:31	14:15 (WT05)
28	05:51 21:30	06:39 20:32	07:28 19:21	18:12 (WT04) 18:45 (WT04)	08:18 18:17	16:37 16:32	16:28 16:31	14:15 (WT05)
29	05:52 21:28	06:40 20:29	07:30 19:19	18:11 (WT04) 18:44 (WT04)	07:20 17:15	16:37 16:31	16:28 16:32	14:15 (WT05)
30	05:53 21:27	06:42 20:27	19:28 (WT03) 19:37 (WT03)	07:31 19:17	18:11 (WT04) 17:13	16:37 16:30	16:28 16:33	14:17 (WT05)
31	05:55 21:25	06:43 20:25	19:24 (WT03) 19:38 (WT03)	07:31 17:11	18:43 (WT04) 17:11	16:37 16:34	16:28 16:34	14:17 (WT05)
Potential sun hours	500	453	381	333	269	247	685	
Total, worst case		23	646	184			0,17	
Sun reduction		0,41	0,35	0,33			0,96	
Oper. time red.		0,96	0,96	0,96			0,71	
Wind dir. red.		0,61	0,64	0,66			0,12	
Total reduction		0,25	0,21	0,21			79	
Total, real		6	138	38				

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 545 - De Zaar 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January		February		March		April		May		June	
1	08:39	14:34 (WT08)	08:14	15:53 (WT07)	07:22	07:12	19:18 (WT05)	06:08	05:24			
	16:35	27 15:01 (WT08)	17:22 32	16:25 (WT07)	18:13	20:05	22 19:40 (WT05)	20:55	21:40			
2	08:39	14:35 (WT08)	08:12	15:53 (WT07)	07:19	07:10	19:18 (WT05)	06:07	05:23			
	16:36	26 15:01 (WT08)	17:24 31	16:24 (WT07)	18:14	20:07	22 19:40 (WT05)	20:57	21:41			
3	08:39	14:36 (WT08)	08:11	15:53 (WT07)	07:17	07:08	19:19 (WT05)	06:05	05:22			
	16:37	25 15:01 (WT08)	17:26 30	16:23 (WT07)	18:16	20:09	21 19:40 (WT05)	20:58	21:42			
4	08:39	14:37 (WT08)	08:09	15:55 (WT07)	07:15	07:05	19:19 (WT05)	06:03	05:22			
	16:38	24 15:01 (WT08)	17:27 29	16:24 (WT07)	18:18	20:10	20 19:39 (WT05)	21:00	21:43			
5	08:39	14:38 (WT08)	08:07	15:56 (WT07)	07:13	07:03	19:19 (WT05)	06:01	05:21			
	16:40	23 15:01 (WT08)	17:29 27	16:23 (WT07)	18:20	20:12	18 19:37 (WT05)	21:02	21:44			
6	08:38	14:40 (WT08)	08:06	15:56 (WT07)	07:11	07:01	19:21 (WT05)	05:59	05:20			
	16:41	21 15:01 (WT08)	17:31 26	16:22 (WT07)	18:21	20:14	14 19:35 (WT05)	21:03	21:45			
7	08:38	14:40 (WT08)	08:04	15:58 (WT07)	07:09	06:59	19:23 (WT05)	05:57	05:20			
	16:42	21 15:01 (WT08)	17:33 23	16:21 (WT07)	18:23	20:15	10 19:33 (WT05)	21:05	21:46			
8	08:38	14:41 (WT08)	08:02	15:59 (WT07)	07:06	17:56 (WT06)	06:56	19:27 (WT05)	05:56	05:19		
	16:43	19 15:00 (WT08)	17:35 20	16:19 (WT07)	18:25	4 18:00 (WT06)	20:17	2 19:29 (WT05)	21:06	21:47		
9	08:37	14:44 (WT08)	08:01	16:02 (WT07)	07:04	17:52 (WT06)	06:54		05:54	05:19		
	16:45	16 15:00 (WT08)	17:36 17	16:19 (WT07)	18:27	11 18:03 (WT06)	20:19		21:08	21:48		
10	08:37	14:45 (WT08)	07:59	16:05 (WT07)	07:02	17:50 (WT06)	06:52		05:52	05:18		
	16:46	14 14:59 (WT08)	17:38 11	16:16 (WT07)	18:28	15 18:05 (WT06)	20:20		21:10	21:49		
11	08:36	14:47 (WT08)	07:57		07:00	17:47 (WT06)	06:50		05:51	05:18		
	16:47	10 14:57 (WT08)	17:40		18:30	19 18:06 (WT06)	20:22		21:11	21:49		
12	08:36	14:52 (WT08)	07:55		06:57	17:46 (WT06)	06:48		05:49	05:18		
	16:49	11 16:06 (WT07)	17:42		18:32	22 18:08 (WT06)	20:24		21:13	21:50		
13	08:35	15:57 (WT07)	07:54		06:55	17:45 (WT06)	06:45		05:47	05:17		
	16:50	12 16:09 (WT07)	17:44		18:33	25 18:10 (WT06)	20:25		21:14	21:51		
14	08:34	15:55 (WT07)	07:52		06:53	17:44 (WT06)	06:43		05:46	05:17		
	16:52	15 16:10 (WT07)	17:46		18:35	26 18:10 (WT06)	20:27		21:16	21:51		
15	08:33	15:54 (WT07)	07:50		06:51	17:43 (WT06)	06:41		05:44	05:17		
	16:53	18 16:12 (WT07)	17:47		18:37	27 18:10 (WT06)	20:29		21:17	21:52		
16	08:33	15:54 (WT07)	07:48		06:48	17:43 (WT06)	06:39		05:43	05:17		
	16:55	20 16:14 (WT07)	17:49		18:38	27 18:10 (WT06)	20:30		21:19	21:52		
17	08:32	15:53 (WT07)	07:46		06:46	17:43 (WT06)	06:37		05:41	05:17		
	16:56	22 16:15 (WT07)	17:51		18:40	27 18:10 (WT06)	20:32		21:20	21:53		
18	08:31	15:53 (WT07)	07:44		06:44	17:42 (WT06)	06:35		05:40	05:17		
	16:58	24 16:17 (WT07)	17:53		18:42	27 18:09 (WT06)	20:34		21:22	21:53		
19	08:30	15:53 (WT07)	07:42		06:42	17:43 (WT06)	06:33		05:39	05:17		
	17:00	25 16:18 (WT07)	17:55		18:44	26 18:09 (WT06)	20:35		21:23	21:54		
20	08:29	15:52 (WT07)	07:40		06:39	17:44 (WT06)	06:30		05:37	05:17		
	17:01	27 16:19 (WT07)	17:56		18:45	24 18:08 (WT06)	20:37		21:25	21:54		
21	08:28	15:51 (WT07)	07:38		06:37	17:43 (WT06)	06:28		05:36	05:17		
	17:03	28 16:19 (WT07)	17:58		18:47	23 18:06 (WT06)	20:39		21:26	21:54		
22	08:27	15:51 (WT07)	07:36		06:35	17:45 (WT06)	06:26		05:35	05:17		
	17:04	29 16:20 (WT07)	18:00		18:49	20 18:05 (WT06)	20:40		21:27	21:54		
23	08:26	15:51 (WT07)	07:34		06:33	17:47 (WT06)	06:24		05:33	05:17		
	17:06	30 16:21 (WT07)	18:02		18:50	16 18:03 (WT06)	20:42		21:29	21:55		
24	08:24	15:52 (WT07)	07:32		06:30	17:49 (WT06)	06:22		05:32	05:18		
	17:08	30 16:22 (WT07)	18:04		18:52	12 18:01 (WT06)	20:44		21:30	21:55		
25	08:23	15:51 (WT07)	07:30		06:28	17:53 (WT06)	06:20		05:31	05:18		
	17:10	31 16:22 (WT07)	18:05		18:54	3 18:30 (WT05)	20:45		21:32	21:55		
26	08:22	15:51 (WT07)	07:28		07:26	19:25 (WT05)	06:18		05:30	05:18		
	17:11	32 16:23 (WT07)	18:07		19:55	7 19:32 (WT05)	20:47		21:33	21:55		
27	08:21	15:51 (WT07)	07:26		07:23	19:23 (WT05)	06:16		05:29	05:19		
	17:13	32 16:23 (WT07)	18:09		19:57	11 19:34 (WT05)	20:49		21:34	21:55		
28	08:19	15:51 (WT07)	07:24		07:21	19:21 (WT05)	06:14		05:28	05:19		
	17:15	33 16:24 (WT07)	18:11		19:59	14 19:35 (WT05)	20:50		21:35	21:55		
29	08:18	15:51 (WT07)			07:19	19:20 (WT05)	06:12		05:27	05:20		
	17:17	33 16:24 (WT07)			20:00	17 19:37 (WT05)	20:52		21:37	21:55		
30	08:17	15:52 (WT07)			07:17	19:20 (WT05)	06:10		05:26	05:20		
	17:18	32 16:24 (WT07)			20:02	19 19:39 (WT05)	20:54		21:38	21:54		
31	08:15	15:52 (WT07)			07:14	19:19 (WT05)			05:25			
	17:20	32 16:24 (WT07)			20:04	22 19:41 (WT05)			21:39			
Potential sun hours	261		278		367		415		483		496	
Total, worst case	742		246		444		129					
Sun reduction	0,20		0,28		0,29		0,37					
Oper. time red.	0,96		0,96		0,96		0,96					
Wind dir. red.	0,72		0,72		0,65		0,62					
Total reduction	0,14		0,19		0,18		0,22					
Total, real	103		48		81		29					

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 545 - De Zaar 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December
1	05:21 21:54	05:56 21:23	06:45 20:23	07:33 19:14	18:24 (WT06) 17:09	08:15 16:30
2	05:22 21:54	05:58 21:22	06:46 20:21	07:34 19:12	18:25 (WT06) 17:08	08:17 16:29
3	05:22 21:53	05:59 21:20	06:48 20:18	07:36 19:10	18:26 (WT06) 17:06	08:18 16:28
4	05:23 21:53	06:01 21:19	06:50 20:16	07:38 19:08	18:27 (WT06) 17:04	08:19 16:28
5	05:24 21:53	06:02 21:17	06:51 20:14	19:21 (WT05) 19:05	07:39 17:02	08:21 16:27
6	05:25 21:52	06:04 21:15	06:53 20:12	19:18 (WT05) 19:03	07:41 17:01	08:22 16:27
7	05:25 21:52	06:05 21:13	06:54 20:09	19:16 (WT05) 19:01	07:43 16:59	08:23 16:27
8	05:26 21:51	06:07 21:12	06:56 20:07	19:14 (WT05) 18:59	07:44 16:57	08:24 16:26
9	05:27 21:50	06:09 21:10	06:58 20:05	19:13 (WT05) 18:56	07:46 16:56	08:26 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	19:12 (WT05) 18:54	07:47 16:54	08:27 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	19:11 (WT05) 18:52	07:49 16:52	08:28 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	19:10 (WT05) 18:50	07:51 16:51	08:29 16:25
13	05:31 21:47	06:15 21:02	07:04 19:56	19:11 (WT05) 18:48	07:53 16:49	08:30 16:25
14	05:32 21:46	06:16 21:00	07:05 19:53	19:10 (WT05) 18:45	07:54 16:48	08:31 16:25
15	05:34 21:45	06:18 20:58	07:07 19:51	19:11 (WT05) 18:43	07:56 16:47	08:32 16:25
16	05:35 21:44	06:19 20:56	07:09 19:49	19:12 (WT05) 18:41	07:58 16:45	08:33 16:26
17	05:36 21:43	06:21 20:54	07:10 19:46	19:12 (WT05) 18:39	07:59 16:44	08:33 16:26
18	05:37 21:42	06:23 20:52	07:12 19:44	19:14 (WT05) 18:37	08:01 16:43	08:34 16:26
19	05:38 21:41	06:24 20:50	07:13 19:42	19:20 (WT05) 18:35	08:03 16:41	08:35 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	18:34 (WT06) 18:33	08:04 16:40	08:36 16:27
21	05:41 21:39	06:27 20:46	07:17 19:37	18:31 (WT06) 18:31	08:06 16:39	08:36 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	18:30 (WT06) 18:29	08:08 16:38	08:37 16:27
23	05:44 21:36	06:31 20:42	07:20 19:33	18:29 (WT06) 18:27	08:10 16:37	08:37 16:28
24	05:45 21:35	06:32 20:40	07:21 19:30	18:27 (WT06) 18:25	08:11 16:36	08:38 16:29
25	05:46 21:34	06:34 20:38	07:23 19:28	18:26 (WT06) 18:23	08:13 16:35	08:38 16:29
26	05:48 21:32	06:35 20:36	07:25 19:26	18:25 (WT06) 18:21	08:15 16:34	08:38 16:30
27	05:49 21:31	06:37 20:34	07:26 19:24	18:25 (WT06) 18:19	08:17 16:33	08:39 16:31
28	05:51 21:30	06:39 20:31	07:28 19:21	18:25 (WT06) 18:17	08:18 16:32	08:39 16:31
29	05:52 21:28	06:40 20:29	07:29 19:19	18:24 (WT06) 17:15	08:20 16:31	08:39 16:32
30	05:53 21:27	06:42 20:27	07:31 19:17	18:24 (WT06) 17:13	08:22 16:30	08:39 16:33
31	05:55 21:25	06:43 20:25		07:24 17:11		08:39 16:34
Potential sun hours	500	453	381	333	269	247
Total, worst case			490	94	758	782
Sun reduction			0,35	0,33	0,24	0,17
Oper. time red.			0,96	0,96	0,96	0,96
Wind dir. red.			0,64	0,65	0,72	0,73
Total reduction			0,21	0,21	0,17	0,12
Total, real			105	19	126	92

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 546 - De Zaar 3/4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	08:39	14:19 (WT07)	08:14	07:22			07:12	18:42 (WT06)	06:08	05:24		
	16:35	47 15:06 (WT07)	17:22	18:13			20:05	19 19:42 (WT05)	20:55	21:40		
2	08:39	14:20 (WT07)	08:12	07:19			07:10	19:24 (WT05)	06:07	05:23		
	16:36	47 15:07 (WT07)	17:24	18:14			20:07	19 19:43 (WT05)	20:57	21:41		
3	08:39	14:21 (WT07)	08:11	07:17			07:08	19:23 (WT05)	06:05	05:22		
	16:37	46 15:07 (WT07)	17:26	18:16			20:09	22 19:45 (WT05)	20:58	21:42		
4	08:39	14:20 (WT07)	08:09	07:15			07:05	19:22 (WT05)	06:03	05:22		
	16:38	47 15:07 (WT07)	17:27	18:18			20:10	25 19:47 (WT05)	21:00	21:43		
5	08:39	14:21 (WT07)	08:07	07:13			07:03	19:20 (WT05)	06:01	05:21		
	16:40	47 15:08 (WT07)	17:29	18:20			20:12	27 19:47 (WT05)	21:02	21:44		
6	08:38	14:22 (WT07)	08:06	07:11			07:01	19:19 (WT05)	05:59	05:20		
	16:41	47 15:09 (WT07)	17:31	18:21			20:14	28 19:47 (WT05)	21:03	21:45		
7	08:38	14:22 (WT07)	08:04	07:09			06:59	19:19 (WT05)	05:58	05:20		
	16:42	47 15:09 (WT07)	17:33	18:23			20:15	28 19:47 (WT05)	21:05	21:46		
8	08:38	14:22 (WT07)	08:02	07:06		7 17:46 (WT06)	06:56	19:18 (WT05)	05:56	05:19		
	16:43	47 15:09 (WT07)	17:35	18:25		7 17:53 (WT06)	20:17	29 19:47 (WT05)	21:06	21:47		
9	08:37	14:23 (WT07)	08:01	07:04			07:04	17:41 (WT06)	06:54	05:19		
	16:45	47 15:10 (WT07)	17:37	18:27	17 17:58 (WT06)	20:19	29 19:47 (WT05)	21:08	21:48			
10	08:37	14:23 (WT07)	07:59	07:02			06:52	17:39 (WT06)	06:52	05:18		
	16:46	47 15:10 (WT07)	17:38	18:28	21 18:00 (WT06)	20:20	29 19:46 (WT05)	21:10	21:49			
11	08:36	14:24 (WT07)	07:57	07:00			06:50	17:36 (WT06)	06:50	05:18		
	16:47	46 15:10 (WT07)	17:40	18:30	25 18:01 (WT06)	20:22	28 19:46 (WT05)	21:11	21:49			
12	08:36	14:25 (WT07)	07:55	06:57			06:48	17:34 (WT06)	06:48	05:18		
	16:49	46 15:11 (WT07)	17:42	18:32	29 18:03 (WT06)	20:24	27 19:45 (WT05)	21:13	21:50			
13	08:35	14:25 (WT07)	07:54	06:55			06:45	17:33 (WT06)	06:45	05:17		
	16:50	46 15:11 (WT07)	17:44	18:33	31 18:04 (WT06)	20:25	25 19:44 (WT05)	21:14	21:51			
14	08:34	14:26 (WT07)	07:52	06:53			06:43	17:32 (WT06)	06:43	05:17		
	16:52	45 15:11 (WT07)	17:46	18:35	33 18:05 (WT06)	20:27	23 19:43 (WT05)	21:16	21:51			
15	08:33	14:26 (WT07)	07:50	06:51			06:41	17:30 (WT06)	06:41	05:17		
	16:53	45 15:11 (WT07)	17:47	18:37	35 18:05 (WT06)	20:29	21 19:42 (WT05)	21:17	21:52			
16	08:33	14:27 (WT07)	07:48	06:48			06:39	17:30 (WT06)	06:39	05:17		
	16:55	44 15:11 (WT07)	17:49	18:38	36 18:06 (WT06)	20:30	18 19:40 (WT05)	21:19	21:52			
17	08:32	14:28 (WT07)	07:46	06:46			06:37	17:29 (WT06)	06:37	05:17		
	16:56	43 15:11 (WT07)	17:51	18:40	38 18:07 (WT06)	20:32	14 19:38 (WT05)	21:20	21:53			
18	08:31	14:28 (WT07)	07:44	06:44			06:35	17:28 (WT06)	06:35	05:17		
	16:58	43 15:11 (WT07)	17:53	18:42	38 18:06 (WT06)	20:34	6 19:34 (WT05)	21:22	21:53			
19	08:30	14:29 (WT07)	07:42	06:42			06:33	17:28 (WT06)	06:33	05:17		
	17:00	42 15:11 (WT07)	17:55	18:44	38 18:06 (WT06)	20:35		21:23	21:54			
20	08:29	14:30 (WT07)	07:40	06:39			06:30	17:28 (WT06)	06:30	05:17		
	17:01	41 15:11 (WT07)	17:56	18:45	38 18:06 (WT06)	20:37		21:25	21:54			
21	08:28	14:30 (WT07)	07:38	06:37			06:28	17:27 (WT06)	06:28	05:17		
	17:03	40 15:10 (WT07)	17:58	18:47	38 18:05 (WT06)	20:39		21:26	21:54			
22	08:27	14:32 (WT07)	07:36	06:35			06:26	17:27 (WT06)	06:26	05:17		
	17:05	38 15:10 (WT07)	18:00	18:49	38 18:05 (WT06)	20:40		21:27	21:54			
23	08:26	14:33 (WT07)	07:34	06:33			06:24	17:28 (WT06)	06:24	05:17		
	17:06	37 15:10 (WT07)	18:02	18:50	36 18:04 (WT06)	20:42		21:29	21:55			
24	08:24	14:35 (WT07)	07:32	06:30			06:22	17:28 (WT06)	06:22	05:18		
	17:08	35 15:10 (WT07)	18:04	18:52	36 18:04 (WT06)	20:44		21:30	21:55			
25	08:23	14:35 (WT07)	07:30	06:28			06:20	17:28 (WT06)	06:20	05:18		
	17:10	34 15:09 (WT07)	18:05	18:54	34 18:02 (WT06)	20:45		21:32	21:55			
26	08:22	14:37 (WT07)	07:28	07:26			06:18	18:29 (WT06)	06:18	05:18		
	17:11	31 15:08 (WT07)	18:07	19:55	32 19:01 (WT06)	20:47		21:33	21:55			
27	08:21	14:39 (WT07)	07:26	07:24			06:16	18:30 (WT06)	06:16	05:19		
	17:13	28 15:07 (WT07)	18:09	19:57	30 19:00 (WT06)	20:49		21:34	21:55			
28	08:19	14:41 (WT07)	07:24	07:21			06:14	18:30 (WT06)	06:14	05:19		
	17:15	25 15:06 (WT07)	18:11	19:59	28 18:58 (WT06)	20:50		21:35	21:55			
29	08:18	14:44 (WT07)		07:19			06:12	18:32 (WT06)	06:12	05:20		
	17:17	20 15:04 (WT07)		20:00	24 18:56 (WT06)	20:52		21:37	21:55			
30	08:17	14:48 (WT07)		07:17			06:10	18:34 (WT06)	06:10	05:20		
	17:18	14 15:02 (WT07)		20:02	21 18:55 (WT06)	20:54		21:38	21:54			
31	08:15			07:14			06:08	18:37 (WT06)	06:08	05:25		
	17:20			20:04	27 19:41 (WT05)			21:39				
Potential sun hours	261		278	367		415		483		496		
Total, worst case	1212			730		417						
Sun reduction	0,20			0,29		0,37						
Oper. time red.	0,96			0,96		0,96						
Wind dir. red.	0,73			0,65		0,61						
Total reduction	0,14			0,19		0,22						
Total, real	171			136		91						

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 Shadow receptor: 546 - De Zaar 3/4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

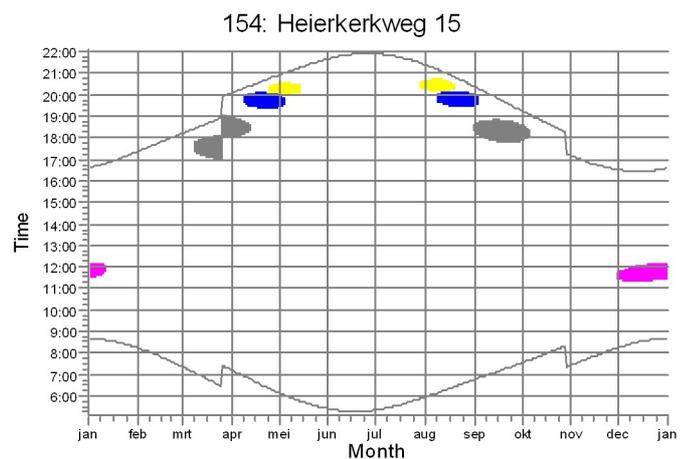
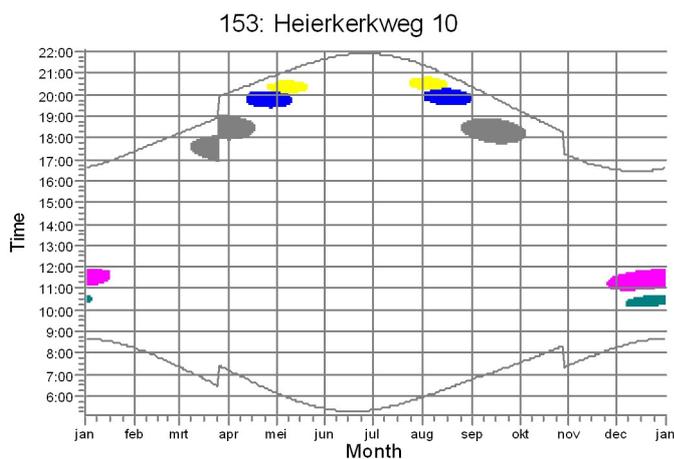
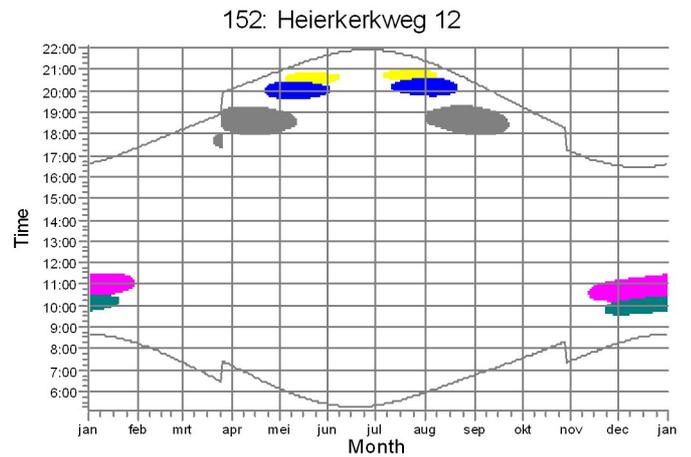
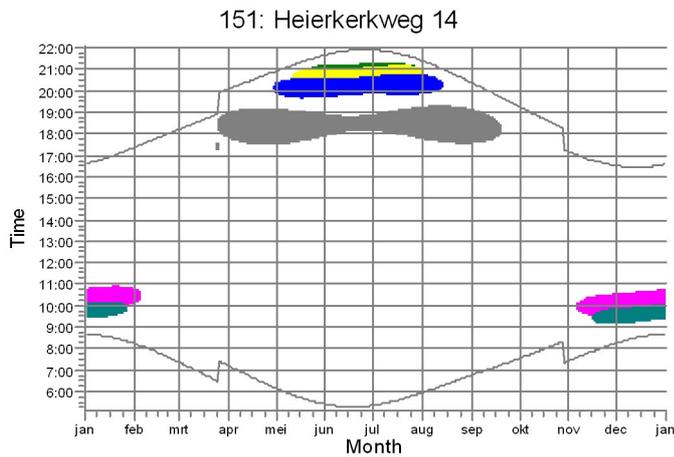
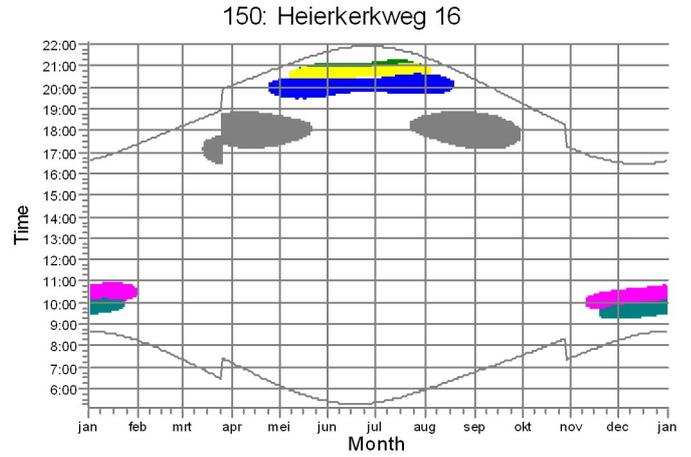
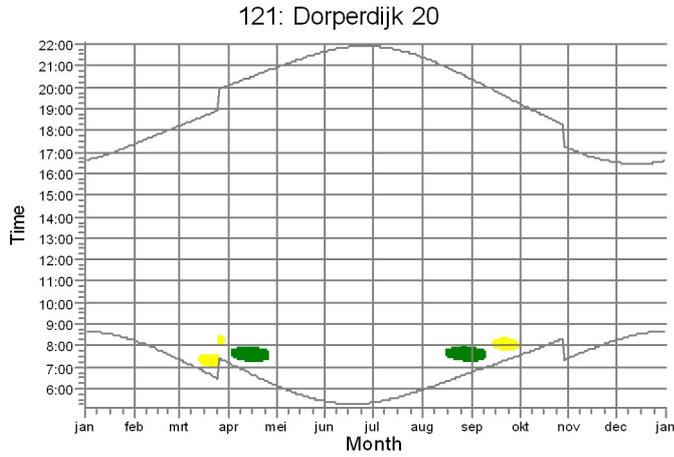
	July	August	September	October	November	December		
1	05:21 21:54	05:56 21:23	06:45 20:23	19:18 (WT05) 19:45 (WT05)	07:33 19:14	18:12 (WT06) 17:09	08:15 16:30	14:06 (WT07) 46 14:52 (WT07)
2	05:22 21:54	05:58 21:22	06:47 20:21	19:16 (WT05) 19:45 (WT05)	07:34 19:12	18:13 (WT06) 17:08	08:17 16:29	14:06 (WT07) 46 14:52 (WT07)
3	05:22 21:53	05:59 21:20	06:48 20:18	19:16 (WT05) 19:45 (WT05)	07:36 19:10	18:15 (WT06) 17:06	08:18 16:28	14:07 (WT07) 46 14:53 (WT07)
4	05:23 21:53	06:01 21:19	06:50 20:16	19:15 (WT05) 19:44 (WT05)	07:38 19:08	18:16 (WT06) 17:04	08:19 16:28	14:07 (WT07) 46 14:53 (WT07)
5	05:24 21:53	06:02 21:17	06:51 20:14	19:16 (WT05) 19:44 (WT05)	07:39 19:05	18:18 (WT06) 17:02	08:21 16:27	14:08 (WT07) 46 14:54 (WT07)
6	05:25 21:52	06:04 21:15	06:53 20:12	19:15 (WT05) 19:43 (WT05)	07:41 19:03	18:23 (WT06) 17:01	08:22 16:27	14:08 (WT07) 46 14:54 (WT07)
7	05:25 21:52	06:05 21:13	06:54 20:09	19:15 (WT05) 19:43 (WT05)	07:43 19:01	18:30 (WT06) 16:59	08:23 16:27	14:08 (WT07) 47 14:55 (WT07)
8	05:26 21:51	06:07 21:12	06:56 20:07	19:15 (WT05) 19:41 (WT05)	07:44 18:59	18:30 (WT06) 16:57	08:24 16:26	14:09 (WT07) 47 14:56 (WT07)
9	05:27 21:50	06:09 21:10	06:58 20:05	19:16 (WT05) 19:40 (WT05)	07:46 18:56	18:30 (WT06) 16:56	08:26 16:26	14:09 (WT07) 47 14:56 (WT07)
10	05:28 21:50	06:10 21:08	06:59 20:03	19:16 (WT05) 19:38 (WT05)	07:48 18:54	18:30 (WT06) 16:54	08:27 16:26	14:09 (WT07) 47 14:56 (WT07)
11	05:29 21:49	06:12 21:06	07:01 20:00	19:18 (WT05) 19:36 (WT05)	07:49 18:52	18:30 (WT06) 16:52	08:28 16:26	14:10 (WT07) 46 14:56 (WT07)
12	05:30 21:48	06:13 21:04	07:02 19:58	18:31 (WT06) 19:33 (WT05)	07:51 18:50	14:21 (WT07) 16:51	08:29 16:25	14:10 (WT07) 47 14:57 (WT07)
13	05:31 21:47	06:15 21:02	07:04 19:56	18:27 (WT06) 19:31 (WT05)	07:53 18:48	14:17 (WT07) 16:49	08:30 16:25	14:11 (WT07) 46 14:57 (WT07)
14	05:32 21:46	06:16 21:00	07:06 19:53	18:24 (WT06) 18:46 (WT06)	07:54 18:46	14:14 (WT07) 16:48	08:31 16:25	14:11 (WT07) 47 14:58 (WT07)
15	05:34 21:45	06:18 20:58	07:07 19:51	18:22 (WT06) 18:47 (WT06)	07:56 18:43	14:12 (WT07) 16:47	08:32 16:26	14:12 (WT07) 46 14:58 (WT07)
16	05:35 21:44	06:20 20:56	07:09 19:49	18:20 (WT06) 18:49 (WT06)	07:58 18:41	14:11 (WT07) 16:45	08:33 16:26	14:12 (WT07) 47 14:59 (WT07)
17	05:36 21:43	06:21 20:54	07:10 19:47	18:18 (WT06) 18:49 (WT06)	07:59 18:39	14:10 (WT07) 16:44	08:33 16:26	14:13 (WT07) 46 14:59 (WT07)
18	05:37 21:42	06:23 20:52	07:12 19:44	18:17 (WT06) 18:50 (WT06)	08:01 18:37	14:09 (WT07) 16:43	08:34 16:26	14:13 (WT07) 46 14:59 (WT07)
19	05:38 21:41	06:24 20:50	07:13 19:42	18:15 (WT06) 18:50 (WT06)	08:03 18:35	14:08 (WT07) 16:41	08:35 16:26	14:14 (WT07) 46 15:00 (WT07)
20	05:40 21:40	06:26 20:48	07:15 19:40	18:14 (WT06) 18:51 (WT06)	08:04 18:33	14:07 (WT07) 16:40	08:36 16:27	14:14 (WT07) 47 15:01 (WT07)
21	05:41 21:39	06:27 20:46	07:17 19:37	18:13 (WT06) 18:50 (WT06)	08:06 18:31	14:06 (WT07) 16:39	08:36 16:27	14:14 (WT07) 47 15:01 (WT07)
22	05:42 21:38	06:29 20:44	07:18 19:35	18:13 (WT06) 18:50 (WT06)	08:08 18:29	14:06 (WT07) 16:38	08:37 16:28	14:15 (WT07) 47 15:02 (WT07)
23	05:44 21:36	06:31 20:42	07:20 19:33	18:12 (WT06) 18:51 (WT06)	08:10 18:27	14:06 (WT07) 16:37	08:37 16:28	14:15 (WT07) 47 15:02 (WT07)
24	05:45 21:35	06:32 20:40	07:21 19:30	18:11 (WT06) 18:50 (WT06)	08:11 18:25	14:06 (WT07) 16:36	08:38 16:29	14:16 (WT07) 47 15:03 (WT07)
25	05:46 21:34	06:34 20:38	07:23 19:28	18:11 (WT06) 18:50 (WT06)	08:13 18:23	14:05 (WT07) 16:35	08:38 16:29	14:17 (WT07) 46 15:03 (WT07)
26	05:48 21:32	06:35 20:36	12 19:28 (WT05) 19:40 (WT05)	07:25 19:26	18:11 (WT06) 18:21	14:06 (WT07) 16:34	08:38 16:30	14:17 (WT07) 46 15:03 (WT07)
27	05:49 21:31	06:37 20:34	16 19:25 (WT05) 19:41 (WT05)	07:26 19:24	18:11 (WT06) 18:19	14:06 (WT07) 16:33	08:39 16:31	14:17 (WT07) 46 15:03 (WT07)
28	05:51 21:30	06:39 20:31	20 19:23 (WT05) 19:43 (WT05)	07:28 19:21	18:11 (WT06) 18:17	14:05 (WT07) 16:32	08:39 16:31	14:17 (WT07) 47 15:04 (WT07)
29	05:52 21:28	06:40 20:29	22 19:21 (WT05) 19:43 (WT05)	07:30 19:19	18:11 (WT06) 17:15	14:06 (WT07) 16:31	08:39 16:32	14:18 (WT07) 46 15:04 (WT07)
30	05:53 21:27	06:42 20:27	25 19:20 (WT05) 19:45 (WT05)	07:31 19:17	18:12 (WT06) 17:13	14:06 (WT07) 16:30	08:39 16:33	14:18 (WT07) 47 15:05 (WT07)
31	05:55 21:25	06:43 20:25	26 19:18 (WT05) 19:44 (WT05)	07:31 17:11	18:12 (WT06) 17:11	14:06 (WT07) 16:30	08:39 16:34	14:19 (WT07) 46 15:05 (WT07)
Potential sun hours	500	453	381	333	269	247		
Total, worst case		121	919	129	678	1440		
Sun reduction		0,41	0,35	0,33	0,24	0,17		
Oper. time red.		0,96	0,96	0,96	0,96	0,96		
Wind dir. red.		0,61	0,64	0,65	0,73	0,73		
Total reduction		0,25	0,22	0,21	0,17	0,12		
Total, real		30	199	27	115	171		

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

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

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017



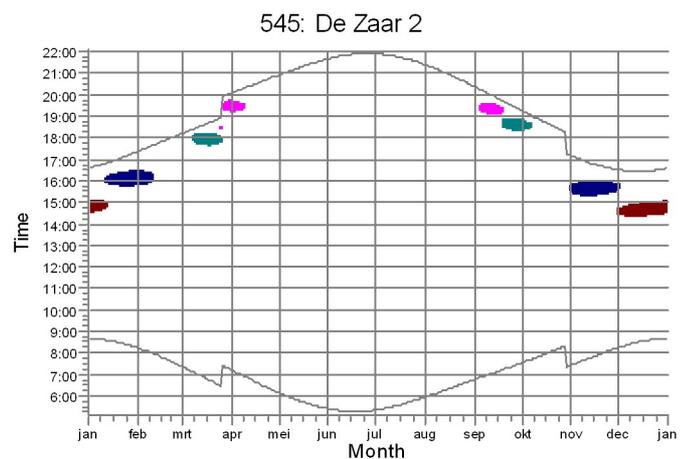
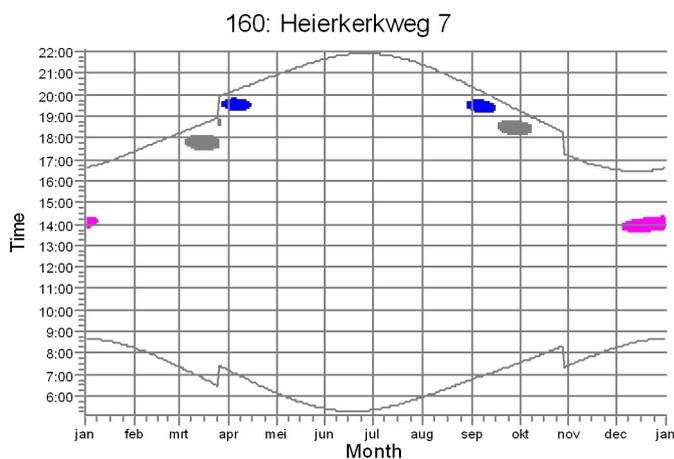
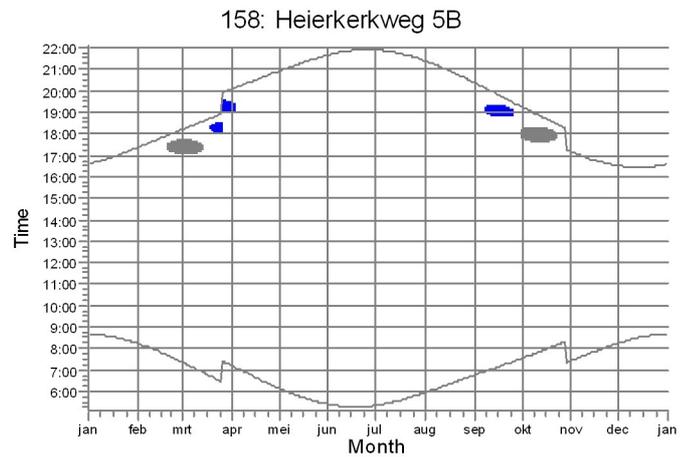
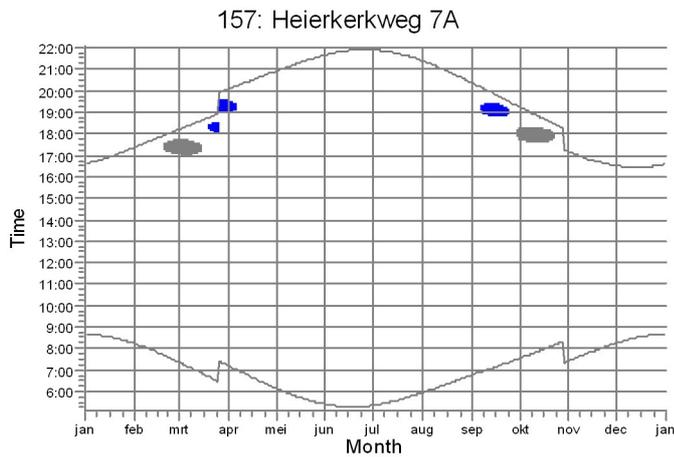
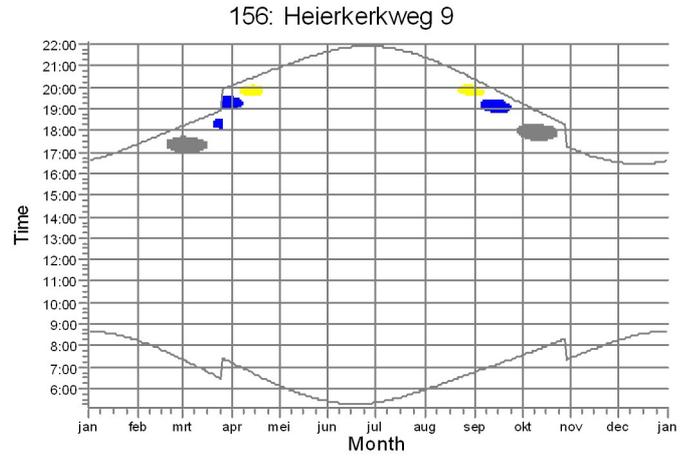
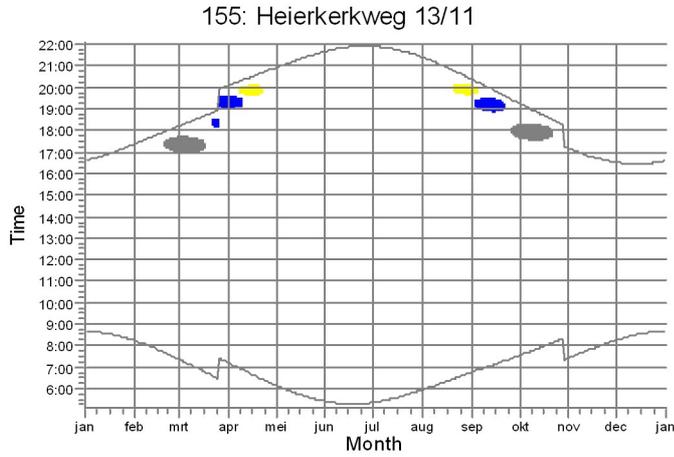
WTGs

- WT01: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (490)
- WT02: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (489)
- WT03: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (484)

- WT04: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (492)
- WT05: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (488)
- WT06: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (487)

SHADOW - Calendar, graphical

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017



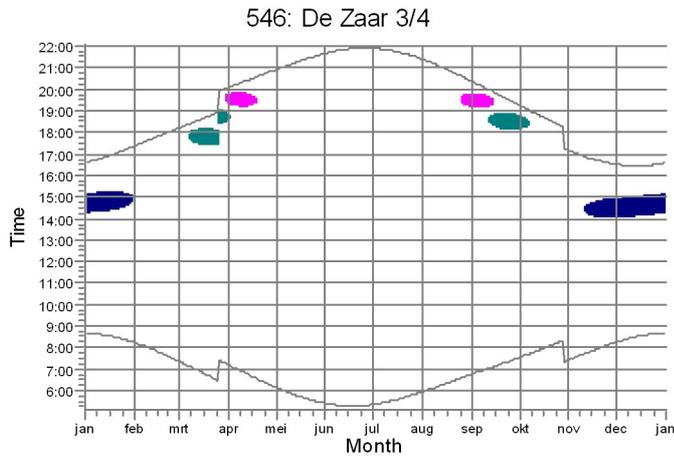
WTGs

- WT02: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (489)
- WT03: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (484)
- WT04: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (492)
- WT05: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (488)

- WT06: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (487)
- WT07: SENVION 3.2M122 NES 3200 122.0 IO! hub: 140,0 m (TOT: 201,0 m) (486)
- WT08: SENVION 3.2M122 NES 3200 122.0 IO! hub: 140,0 m (TOT: 201,0 m) (491)

SHADOW - Calendar, graphical

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017



WTGs

 WT05: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (488)
 WT06: Siemens SWT-3.15-142 3150 142.0 IO! hub: 140,0 m (TOT: 211,0 m) (487)

 WT07: SENVION 3.2M122 NES 3200 122.0 IO! hub: 140,0 m (TOT: 201,0 m) (486)

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT01 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (490

Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January	February	March	April	May	June
1	08:40 09:14-09:56/42	08:14 08:46-09:44/58	07:22 08:17-08:28/11	07:12 07:39-08:16/37	06:09 06:35-06:59/24	05:24 06:04-06:25/21
	16:35 10:00-10:49/49	17:22 09:47-09:49/2	18:13	20:06	20:55	21:40 20:42-21:08/26
2	08:39 09:13-09:56/43	08:12 08:45-09:42/57	07:20	07:10 07:37-08:13/36	06:07 06:33-06:58/25	05:23 06:05-06:26/21
	16:36 10:01-10:36/35	17:24	18:14	20:07	20:57	21:41 20:42-21:08/26
3	08:39 09:13-09:56/43	08:11 08:46-09:41/55	07:17 07:43-07:52/9	07:08 07:37-08:13/36	06:05 06:31-06:57/26	05:23 06:05-06:25/20
	16:37 10:02-10:36/34	17:26	18:16	20:09	20:59	21:42 20:43-21:09/26
4	08:39 09:13-09:57/44	08:09 08:45-09:39/54	07:15 07:40-07:54/14	07:06 07:34-08:11/37	06:03 06:29-06:56/27	05:22 06:05-06:25/20
	16:39 10:03-10:37/34	17:28 08:37-08:41/4	18:18	20:11	21:00	21:43 20:43-21:08/25
5	08:39 09:12-09:57/45	08:08 08:45-09:37/52	07:13 07:38-07:55/17	07:03 07:31-08:10/39	06:01 06:28-06:56/28	05:21 06:06-06:25/19
	16:40 10:03-10:36/33	17:29 08:35-08:44/9	18:20	20:12	21:02	21:44 20:44-21:09/25
6	08:39 09:12-09:58/46	08:06 08:33-09:31/58	07:11 07:36-07:57/21	07:01 07:28-08:08/40	05:59 06:26-06:55/29	05:21 06:06-06:24/18
	16:41 10:04-10:37/33	17:31	18:21	20:14	21:04	21:45 20:44-21:08/24
7	08:38 09:11-09:58/47	08:04 08:32-09:30/58	07:09 07:34-07:58/24	06:59 07:26-08:07/41	05:58 06:24-06:53/29	05:20 06:07-06:25/18
	16:42 10:04-10:36/32	17:33	18:23	20:16	21:05	21:46 20:45-21:09/24
8	08:38 09:11-10:00/49	08:03 08:30-09:27/57	07:07 07:32-07:57/25	06:57 07:24-08:06/42	05:56 06:23-06:51/28	05:19 06:07-06:24/17
	16:43 10:06-10:37/31	17:35	18:25	20:17	21:07	21:47 20:45-21:08/23
9	08:37 09:11-10:00/49	08:01 08:28-09:25/57	07:04 07:32-07:58/26	06:54 07:23-08:04/41	05:54 06:21-06:46/25	05:19 06:08-06:24/16
	16:45 10:06-10:36/30	17:37	18:27	20:19	21:08	21:48 20:46-21:09/23
10	08:37 09:09-10:01/52	07:59 08:26-09:16/50	07:02 07:31-07:58/27	06:52 07:17-08:03/46	05:52 06:20-06:47/27	05:18 06:09-06:24/15
	16:46 10:08-10:37/29	17:38 09:17-09:20/3	18:28	20:21	21:10	21:49 20:47-21:09/22
11	08:36 09:08-10:01/53	07:57 08:25-09:13/48	07:00 07:31-07:58/27	06:50 07:15-08:02/47	05:51 06:18-06:46/28	05:18 06:09-06:23/14
	16:48 10:08-10:36/28	17:40	18:30	20:22	21:11	21:50 20:47-21:08/21
12	08:36 09:07-10:01/54	07:56 08:22-09:12/50	06:58 07:31-07:57/26	06:48 07:12-08:00/48	05:49 06:17-06:47/30	05:18 06:10-06:23/13
	16:49 10:09-10:36/27	17:42	18:32	20:24	21:13	21:50 20:48-21:09/21
13	08:35 09:06-10:02/56	07:54 08:20-09:10/50	06:55 07:31-07:57/26	06:46 07:10-07:58/48	05:48 06:15-06:46/31	05:17 06:10-06:23/13
	16:50 10:10-10:35/25	17:44	18:34	20:26	21:15	21:51 20:48-21:09/21
14	08:34 09:05-10:02/57	07:52 08:18-09:09/51	06:53 07:18-07:26/8	06:43 07:08-07:56/48	05:46 06:14-06:46/32	05:17 06:11-06:23/12
	16:52 10:11-10:34/23	17:46	18:35 07:31-07:56/25	20:27	21:16	21:51 20:49-21:09/20
15	08:34 09:04-10:02/58	07:50 08:53-09:06/13	06:51 07:15-07:27/12	06:41 07:07-07:53/46	05:45 06:12-06:45/33	05:17 06:12-06:23/11
	16:53 10:13-10:33/20	17:48 08:16-08:51/35	18:37 07:31-07:54/23	20:29	21:18 20:47-20:50/3	21:52 20:50-21:09/19
16	08:33 09:03-10:02/59	07:48 08:58-09:02/4	06:49 07:13-07:29/16	06:39 07:07-07:53/46	05:43 06:11-06:45/34	05:17 06:12-06:23/11
	16:55 10:14-10:32/18	17:49 08:14-08:51/37	18:39 07:32-07:53/21	20:31	21:19 20:46-20:51/5	21:53 20:50-21:09/19
17	08:32 09:02-10:03/61	07:46 08:12-08:51/39	06:46 07:11-07:30/19	06:37 07:06-07:52/46	05:42 06:10-06:44/34	05:17 06:13-06:23/10
	16:56 10:16-10:30/14	17:51	18:40 07:34-07:52/18	20:32	21:21 20:44-20:52/8	21:53 20:50-21:10/20
18	08:31 09:01-10:03/62	07:44 08:12-08:50/38	06:44 07:09-07:31/22	06:35 07:06-07:52/46	05:40 06:08-06:43/35	05:17 06:13-06:23/10
	16:58 10:20-10:28/8	17:53	18:42 07:35-07:49/14	20:34	21:22 20:43-20:54/11	21:53 20:51-21:10/19
19	08:30 09:00-10:03/63	07:42 08:11-08:49/38	06:42 07:06-07:31/25	06:33 07:06-07:51/45	05:39 06:07-06:42/35	05:17 06:13-06:23/10
	17:00	17:55	18:44 07:38-07:45/7	20:36	21:23 20:43-20:55/12	21:54 20:51-21:10/19
20	08:29 08:59-10:03/64	07:40 08:11-08:48/37	06:40 07:04-07:31/27	06:31 07:05-07:50/45	05:37 06:06-06:41/35	05:17 06:14-06:23/9
	17:01	17:57	18:45	20:37	21:25 20:43-20:57/14	21:54 20:51-21:10/19
21	08:28 08:58-10:03/65	07:38 08:11-08:46/35	06:37 07:02-07:32/30	06:29 07:05-07:49/44	05:36 06:05-06:40/35	05:17 06:14-06:23/9
	17:03	17:58	18:47	20:39	21:26 20:42-20:58/16	21:54 20:51-21:10/19
22	08:27 08:57-10:03/66	07:36 08:11-08:44/33	06:35 06:59-07:30/31	06:26 06:52-06:53/1	05:35 06:04-06:39/35	05:17 06:14-06:23/9
	17:05	18:00	18:49	20:41 07:06-07:48/42	21:28 20:41-20:59/18	21:55 20:51-21:10/19
23	08:26 08:55-10:03/68	07:34 08:11-08:42/31	06:33 06:57-07:30/33	06:24 06:50-06:56/6	05:33 06:02-06:35/33	05:17 06:14-06:24/10
	17:06	18:02	18:50	20:42 07:06-07:46/40	21:29 20:41-21:00/19	21:55 20:51-21:10/19
24	08:25 08:54-10:02/68	07:32 08:12-08:37/25	06:30 06:55-07:30/35	06:22 06:48-06:57/9	05:32 06:02-06:34/32	05:18 06:14-06:24/10
	17:08	18:04	18:52	20:44 07:06-07:44/38	21:30 20:41-21:01/20	21:55 20:52-21:11/19
25	08:24 08:53-10:02/69	07:30 08:12-08:36/24	06:28 06:53-07:29/36	06:20 06:46-06:58/12	05:31 06:02-06:34/32	05:18 06:14-06:24/10
	17:10	18:06	18:54	20:46 07:07-07:42/35	21:32 20:41-21:02/21	21:55 20:52-21:11/19
26	08:22 08:51-10:01/70	07:28 08:13-08:35/22	07:26 07:50-08:27/37	06:18 06:44-06:58/14	05:30 06:02-06:33/31	05:18 06:15-06:25/10
	17:11	18:07	19:56	20:47 07:08-07:39/31	21:33 20:41-21:04/23	21:55 20:52-21:12/20
27	08:21 08:50-10:01/71	07:26 08:13-08:33/20	07:24 07:48-08:25/37	06:16 06:42-06:59/17	05:29 06:02-06:32/30	05:19 06:14-06:25/11
	17:13	18:09	19:57	20:49 07:09-07:26/17	21:34 20:41-21:05/24	21:55 20:52-21:11/19
28	08:20 08:48-09:59/71	07:24 08:15-08:31/16	07:21 07:47-08:24/37	06:14 06:40-06:59/19	05:28 06:03-06:31/28	05:19 06:14-06:26/12
	17:15	18:11	19:59	20:50 07:11-07:23/12	21:36 20:41-21:06/25	21:55 20:51-21:11/20
29	08:18 08:48-09:58/70		07:19 07:44-08:20/36	06:12 06:38-06:59/21	05:27 06:03-06:29/26	05:20 06:14-06:26/12
	17:17		20:01	20:52 07:14-07:20/6	21:37 20:41-21:07/26	21:55 20:52-21:12/20
30	08:17 08:47-09:56/69		07:17 07:42-08:18/36	06:10 06:37-06:58/21	05:26 06:04-06:26/22	05:20 06:14-06:27/13
	17:19		20:02	20:54	21:38 20:42-21:08/26	21:55 20:52-21:13/21
31	08:15 08:47-09:53/66		07:15 07:40-08:17/37		05:25 06:04-06:26/22	
	17:20		20:04		21:39 20:42-21:08/26	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	2326	1220	875	1245	1218	1041

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT01 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (490) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21 06:13-06:27/14	05:57 06:27-06:57/30	06:45 07:13-08:01/48	07:33 08:11-08:37/26	07:25 07:55-08:45/50	08:16 08:49-09:43/54
	21:54 20:51-21:13/22	21:24	20:23	19:15	17:09	16:30 09:50-10:17/27
2	05:22 06:14-06:28/14	05:58 06:28-06:56/28	06:47 07:14-08:01/47	07:35 08:09-08:36/27	07:27 07:57-08:54/57	08:17 08:51-09:44/53
	21:54 20:52-21:13/21	21:22	20:21	19:12	17:08	16:29 09:51-10:19/28
3	05:22 06:14-06:29/15	06:00 06:30-06:57/27	06:48 07:17-08:02/45	07:36 08:09-08:36/27	07:29 07:59-08:56/57	08:18 08:53-09:43/50
	21:54 20:51-21:13/22	21:20	20:18	19:10	17:06	16:29 09:50-10:19/29
4	05:23 06:13-06:29/16	06:01 06:31-06:56/25	06:50 07:21-08:02/41	07:38 08:09-08:36/27	07:31 08:01-08:59/58	08:20 08:56-09:44/48
	21:53 20:51-21:14/23	21:19	20:16	19:08	17:04	16:28 09:50-10:21/31
5	05:24 06:13-06:30/17	06:03 06:33-07:01/28	06:51 07:22-08:03/41	07:39 08:09-08:35/26	07:33 08:03-09:00/57	08:21 08:56-09:44/48
	21:53 20:51-21:14/23	21:17	20:14	19:06	17:02	16:28 09:50-10:21/31
6	05:25 06:13-06:31/18	06:04 06:34-07:03/29	06:53 07:23-08:03/40	07:41 08:09-08:34/25	07:34 08:04-09:05/61	08:22 08:57-09:44/47
	21:52 20:51-21:15/24	21:15	20:12	19:03	17:01	16:27 09:50-10:22/32
7	05:26 06:13-06:31/18	06:06 06:35-07:04/29	06:55 07:25-08:04/39	07:43 08:10-08:34/24	07:36 08:15-09:08/53	08:23 08:59-09:45/46
	21:52 20:51-21:15/24	21:14	20:10	19:01	16:59 08:06-08:12/6	16:27 09:51-10:23/32
8	05:26 06:13-06:32/19	06:07 06:37-07:05/28	06:56 07:27-08:05/38	07:44 08:11-08:32/21	07:38 08:15-09:10/55	08:25 09:00-09:45/45
	21:51 20:50-21:15/25	21:12	20:07	18:59	16:57	16:26 09:50-10:24/34
9	05:27 06:12-06:32/20	06:09 06:38-07:06/28	06:58 07:31-08:06/35	07:46 08:13-08:30/17	07:40 08:16-09:12/56	08:26 09:01-09:45/44 10:28-10:35/7
	21:51 20:50-21:15/25	21:10	20:05	18:57	16:56	16:26 09:50-10:24/34
10	05:28 06:12-06:32/20	06:10 06:40-07:07/27	06:59 07:31-08:07/36	07:48 08:15-08:29/14	07:41 08:16-09:14/58	08:27 09:02-09:45/43 10:27-10:37/10
	21:50 20:50-21:16/26	21:08	20:03	18:54	16:54	16:26 09:51-10:25/34
11	05:29 06:12-06:33/21	06:12 06:41-07:07/26	07:01 07:31-08:07/36	07:49 08:17-08:26/9	07:43 08:17-09:24/67	08:28 09:03-09:45/42 10:26-10:38/12
	21:49 20:50-21:16/26	21:06	20:00	18:52	16:53	16:26 09:51-10:25/34
12	05:30 06:12-06:33/21	06:13 06:43-07:07/24	07:03 07:32-08:09/37	07:51	07:45 08:18-09:27/69	08:29 09:04-09:45/41 14:45-14:47/2
	21:48 20:50-21:16/26	21:04	19:58	18:50	16:51	16:26 09:51-10:40/49
13	05:31 06:12-06:34/22	06:15 06:45-07:07/22	07:04 07:32-08:09/37	07:53 08:51-09:01/10	07:47 08:19-09:29/70	08:30 09:05-09:46/41 14:39-14:41/2
	21:48 20:50-21:16/26	21:02	19:56	18:48	16:50	16:26 09:51-10:41/50 14:43-14:49/6
14	05:33 06:11-06:34/23	06:17 06:46-07:07/21	07:06 07:34-08:10/36	07:54 08:48-09:04/16	07:48 08:20-09:31/71	08:31 09:06-09:46/40 14:37-14:51/14
	21:47 20:50-21:16/26	21:01 07:24-07:26/2	19:54	18:46	16:48	16:26 09:52-10:42/50
15	05:34 06:11-06:37/26	06:18 06:47-07:06/19	07:07 07:35-08:11/36	07:56 08:47-09:06/19	07:50 08:22-09:33/71	08:32 09:08-09:47/39 14:37-14:52/15
	21:46 20:50-21:16/26	20:59 07:19-07:30/11	19:51	18:44	16:47	16:26 09:52-10:44/52
16	05:35 06:12-06:40/28	06:20 06:49-07:06/17	07:09 07:36-08:14/38	07:58 08:44-09:06/22	07:52 08:23-09:33/70	08:33 09:09-09:47/38 14:37-14:53/16
	21:45 20:50-21:15/25	20:57 07:17-07:33/16	19:49	18:41	16:45	16:26 09:53-10:45/52
17	05:36 06:12-06:42/30	06:21 06:50-07:05/15	07:10 07:37-08:14/37	07:59 08:44-09:07/23	07:53 08:25-09:35/70	08:34 09:10-09:48/38 14:36-14:55/19
	21:44 20:51-21:15/24	20:55 07:15-07:45/30	19:47	18:39	16:44	16:26 09:53-10:46/53
18	05:37 06:12-06:43/31	06:23 06:52-07:05/13	07:12 07:39-08:16/37	08:01 08:43-09:08/25	07:55 08:27-09:36/69	08:34 09:11-09:48/37 14:36-14:56/20
	21:43 20:51-21:13/22	20:53 07:14-07:48/34	19:44	18:37	16:43	16:26 09:54-10:47/53
19	05:39 06:12-06:44/32	06:24 06:53-07:03/10	07:14 07:40-08:16/36	08:03 08:42-09:12/30	07:57 08:29-09:37/68	08:35 09:11-09:48/37 14:36-14:56/20
	21:42 20:51-21:12/21	20:51 07:12-07:49/37	19:42	18:35	16:41	16:26 09:54-10:47/53
20	05:40 06:12-06:44/32	06:26 06:55-07:02/7	07:15 07:42-08:16/34	08:05 08:42-09:15/33	07:58 08:32-09:38/66	08:36 09:12-09:49/37 14:36-14:57/21
	21:40 20:51-21:11/20	20:49 07:12-07:51/39	19:40	18:33	16:40	16:27 09:54-10:48/54
21	05:41 06:12-06:45/33	06:28 06:56-06:59/3	07:17 07:44-08:17/33	08:06 08:41-09:16/35	08:00 08:33-09:39/66	08:36 09:13-09:50/37 14:36-14:57/21
	21:39 20:51-21:10/19	20:47 07:10-07:52/42	19:37	18:31	16:39	16:27 09:55-10:49/54
22	05:42 06:14-06:49/35	06:29 07:10-07:53/43	07:18 07:45-08:16/31	08:08 08:41-09:18/37	08:02 08:34-09:39/65	08:37 09:13-09:50/37 14:37-14:58/21
	21:38 20:52-21:10/18	20:44	19:35	18:29	16:38	16:28 09:55-10:49/54
23	05:44 06:15-06:50/35	06:31 07:09-07:53/44	07:20 07:47-08:16/29	08:10 08:41-09:19/38	08:03 08:36-09:40/64	08:37 09:13-09:50/37 14:37-14:58/21
	21:37 20:52-21:08/16	20:42	19:33	18:27	16:37	16:28 09:55-10:49/54
24	05:45 06:16-06:51/35	06:32 07:09-07:54/45	07:22 07:48-08:15/27	08:12 08:42-09:20/38	08:05 08:38-09:40/62	08:38 09:14-09:51/37 14:38-14:59/21
	21:35 20:53-21:07/14	20:40	19:31	18:25	16:36	16:29 09:56-10:50/54
25	05:46 06:17-06:52/35	06:34 07:08-07:54/46	07:23 07:50-08:14/24	08:13 08:42-09:21/39	08:07 08:40-09:41/61	08:38 09:14-09:51/37 14:39-14:59/20
	21:34 20:53-21:05/12	20:38	19:28 08:20-08:30/10	18:23	16:35 09:56-10:07/11	16:29 09:57-10:50/53
26	05:48 06:19-06:54/35	06:36 07:09-07:55/46	07:25 07:52-08:14/22	08:15 08:44-09:21/37	08:08 08:41-09:41/60	08:39 09:14-09:51/37 14:40-14:59/19
	21:33 20:54-21:05/11	20:36	19:26 08:18-08:33/15	18:21	16:34 09:54-10:09/15	16:30 09:57-10:50/53
27	05:49 06:20-06:54/34	06:37 07:08-07:54/46	07:26 07:53-08:12/19	08:17 09:24-09:36/12	08:10 08:43-09:42/59	08:39 09:15-09:53/38 14:42-15:00/18
	21:31 20:55-21:03/8	20:34	19:24 08:15-08:34/19	18:19 08:46-09:22/36	16:33 09:53-10:12/19	16:31 09:58-10:51/53
28	05:51 06:21-06:55/34	06:39 07:09-07:55/46	07:28 07:55-08:10/15	08:18 08:47-09:37/50	08:11 08:45-09:43/58	08:39 09:15-09:53/38 14:43-14:59/16
	21:30 20:56-21:01/5	20:32	19:21 08:14-08:35/21	18:17	16:32 09:52-10:14/22	16:31 09:59-10:51/52
29	05:52 06:23-06:56/33	06:40 07:09-07:56/47	07:30 07:56-08:08/12	07:20 07:49-08:40/51	08:13 08:46-09:42/56	08:39 09:15-09:54/39 14:44-14:59/15
	21:28 20:58-21:01/3	20:30	19:19 08:12-08:35/23	17:15	16:31 09:51-10:15/24	16:32 09:59-10:51/52
30	05:54 06:24-06:56/32	06:42 07:10-07:58/48	07:31 07:58-08:05/7	07:22 07:51-08:41/50	08:14 08:48-09:43/55	08:39 09:14-09:54/40 14:45-14:59/14
	21:27	20:27	19:17 08:11-08:36/25	17:13	16:31 09:51-10:17/26	16:33 10:00-10:50/50
31	05:55 06:26-06:57/31	06:43 07:11-07:59/48		07:24 07:55-08:42/47		08:40 09:14-09:55/41 14:48-14:50/2
	21:25	20:25		17:11		16:34 10:00-10:50/50 14:52-14:58/6
Potential sun hours	500	453	381	333	269	246
Sum of minutes with flicker	1392	1126	1106	891	1982	3035

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT02 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (489)

Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January	February	March	April	May	June
1	08:40 09:13-09:35/22 15:27-16:03/36	08:14 08:47-09:18/31	07:22 07:53-08:12/19	07:12 07:50-08:07/17	06:09 20:06-20:29/23	05:24 20:24-20:58/34
	16:35 09:37-10:01/24	17:22	18:13	20:06	20:55	21:40
2	08:39 09:12-09:35/23 15:27-16:04/37	08:12 08:47-09:16/29	08:12 07:53-08:11/18	07:10 07:51-08:04/13	06:07 20:06-20:31/25	05:23 20:24-20:58/34
	16:36 09:38-10:01/23	17:24	18:14	20:07	20:57	21:41
3	08:39 09:12-09:36/24 15:28-16:05/37	08:11 08:49-09:11/22	07:17 07:54-08:10/16	07:08 07:54-08:01/7	06:05 20:05-20:32/27	05:23 20:25-20:58/33
	16:37 09:39-10:02/23	17:26	18:16	20:09	20:59	21:42
4	08:39 09:12-09:37/25 15:29-16:07/38	08:09 08:49-09:08/19	07:15 07:55-08:07/12	07:06	06:03 20:05-20:34/29	05:22 20:25-20:58/33
	16:39 09:40-10:02/22	17:28	18:18	20:11	21:00	21:43
5	08:39 09:11-09:37/26 15:30-16:07/37	08:08 08:50-09:07/17	07:13 07:38-07:41/3	07:03	06:01 20:06-20:35/29	05:21 20:26-20:58/32
	16:40 09:40-10:02/22	17:29	18:20 07:58-08:04/6	20:12	21:02	21:44
6	08:39 09:11-09:38/27 15:31-16:08/37	08:06 08:51-09:05/14	07:11 07:36-07:43/7	07:01	05:59 20:06-20:37/31	05:21 20:26-20:58/32
	16:41 09:41-10:02/21	17:31	18:21	20:14	21:03	21:45
7	08:38 09:10-09:38/28 15:31-16:08/37	08:04 08:54-09:04/10	07:09 07:34-07:45/11	06:59 19:48-19:52/4	05:58 20:05-20:38/33	05:20 20:27-20:58/31
	16:42 09:42-10:01/19	17:33	18:23	20:16	21:05	21:46
8	08:38 09:10-09:39/29 15:33-16:09/36	08:03 08:57-09:01/4	07:07 07:31-07:45/14	06:57 19:46-19:53/7	05:56 20:07-20:40/33	05:19 20:27-20:58/31
	16:43 09:43-10:02/19	17:35	18:25	20:17	21:07	21:47
9	08:37 09:09-09:39/30 15:34-16:09/35	08:01	07:04 07:29-07:45/16	06:54 19:45-19:55/10	05:54 20:07-20:41/34	05:19 20:28-20:58/30
	16:45 09:44-10:01/17	17:37	18:27	20:19	21:08	21:48
10	08:37 09:09-09:40/31 15:35-16:09/34	07:59	07:02 07:27-07:46/19	06:52 19:43-19:57/14	05:52 20:07-20:42/35	05:18 20:29-20:59/30
	16:46 09:46-10:01/15	17:38	18:28	20:21	21:10	21:49
11	08:36 09:08-09:40/32 15:38-16:10/32	07:57	07:00 07:25-07:46/21	06:50 19:42-19:58/16	05:51 20:09-20:44/35	05:18 20:29-20:58/29
	16:48 09:47-10:00/13	17:40	18:30	20:22	21:11	21:50
12	08:36 09:07-09:40/33 15:40-15:45/5	07:56	06:58 07:22-07:45/23	06:48 19:41-19:59/18	05:49 20:09-20:45/36	05:18 20:30-20:58/28
	16:49 09:48-09:59/11 15:47-16:10/23	17:42	18:32	20:24	21:13	21:50
13	08:35 09:06-09:41/35 15:48-16:10/22	07:54	06:55 07:20-07:44/24	06:46 19:41-20:01/20	05:48 20:10-20:47/37	05:17 20:30-20:58/28
	16:50 09:50-09:57/7	17:44	18:34	20:26	21:14	21:51
14	08:34 09:05-09:41/36	07:52	06:53 07:18-07:43/25	06:43 19:41-20:03/22	05:46 20:12-20:49/37	05:17 20:31-20:59/28
	16:52 15:49-16:10/21	17:46	18:35	20:27	21:16	21:51
15	08:34 09:04-09:41/37	07:50	06:51 07:15-07:41/26	06:41 19:41-20:04/23	05:45 20:12-20:49/37	05:17 20:32-20:59/27
	16:53 15:49-16:10/21	17:48	18:37	20:29	21:18	21:52
16	08:33 09:03-09:41/38	07:48	06:49 07:13-07:40/27	06:39 19:41-20:04/23	05:43 20:13-20:51/38	05:17 20:32-20:59/27
	16:55 15:50-16:10/20	17:49	18:39	20:31	21:19	21:53
17	08:32 09:02-09:41/39	07:46	06:46 07:11-07:39/28	06:37 19:42-20:04/22	05:42 20:14-20:52/38	05:17 20:32-20:59/27
	16:56 15:51-16:10/19	17:51	18:40	20:32	21:21	21:53
18	08:31 09:01-09:41/40	07:44	06:44 07:09-07:38/29	06:35 19:43-20:03/20	05:40 20:16-20:54/38	05:17 20:33-20:59/26
	16:58 15:52-16:10/18	17:53	18:42	20:34	21:22	21:53
19	08:30 09:00-09:41/41	07:42	06:42 07:06-07:36/30	06:33 19:44-20:02/18	05:39 20:18-20:55/37	05:17 20:33-20:59/26
	17:00 15:54-16:09/15	17:55	18:44	20:36	21:23	21:54
20	08:29 08:59-09:41/42	07:40	06:40 07:06-07:35/29	06:31 19:45-20:01/16	05:37 20:21-20:55/34	05:17 20:33-20:59/26
	17:01 15:56-16:09/13	17:57	18:45	20:37	21:25	21:54
21	08:28 08:58-09:40/42	07:38 08:04-08:09/5	06:37 07:02-07:34/32	06:29 19:46-19:58/12	05:36 20:21-20:56/35	05:17 20:33-20:59/26
	17:03 15:58-16:08/10	17:58	18:47	20:39	21:26	21:54
22	08:27 08:57-09:40/43	07:36 08:02-08:11/9	06:35 06:59-07:31/32	06:26 19:48-19:55/7	05:35 20:21-20:56/35	05:17 20:33-20:59/26
	17:05 16:00-16:05/5	18:00	18:49	20:41	21:28	21:55
23	08:26 08:55-09:38/43	07:34 08:00-08:12/12	06:33 06:57-07:30/33	06:24	05:33 20:21-20:56/35	05:17 20:33-20:59/26
	17:06	18:02	18:50	20:42	21:29	21:55
24	08:25 08:54-09:37/43	07:32 07:58-08:13/15	06:30 06:55-07:29/34	06:22	05:32 20:21-20:57/36	05:18 20:34-21:00/26
	17:08	18:04	18:52	20:44	21:30	21:55
25	08:23 08:53-09:36/43	07:30 07:56-08:13/17	06:28 06:53-07:28/35	06:20 20:14-20:20/6	05:31 20:22-20:57/35	05:18 20:34-21:00/26
	17:10	18:06	18:54	20:45	21:32	21:55
26	08:22 08:51-09:29/38	07:28 07:54-08:14/20	06:26 07:50-08:26/36	06:18 20:11-20:22/11	05:30 20:22-20:57/35	05:18 20:34-21:01/27
	17:11	18:07	19:56	20:47	21:33	21:55
27	08:21 08:50-09:29/39	07:26 07:52-08:13/21	06:24 07:49-08:25/36	06:16 20:10-20:23/13	05:29 20:22-20:57/35	05:19 20:34-21:01/27
	17:13	18:09	19:57	20:49	21:34	21:55
28	08:20 08:48-09:27/39	07:24 07:52-08:12/20	06:21 07:49-08:23/34	06:14 20:08-20:25/17	05:28 20:22-20:57/35	05:19 20:33-21:01/28
	17:15	18:11	19:59	20:50	21:36	21:55
29	08:18 08:47-09:26/39		07:19 07:48-08:10/22	06:12 20:07-20:26/19	05:27 20:22-20:57/35	05:20 20:34-21:02/28
	17:17		20:01 08:11-08:18/7	20:52	21:37	21:55
30	08:17 08:47-09:23/36		07:17 07:49-08:09/20	06:10 20:06-20:27/21	05:26 20:23-20:58/35	05:20 20:34-21:02/28
	17:19		20:02	20:54	21:38	21:55
31	08:15 08:47-09:20/33		07:15 07:49-08:08/19		05:25 20:24-20:58/34	
	17:20		20:04		21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	1900	265	743	376	1051	860

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT02 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (489)

Assumptions for shadow calculations

Reference year for calendar

2017

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December
1	05:21 20:33-21:02/29 21:54	05:57 20:20-20:56/36 21:24	06:45 19:41-19:58/17 20:23	07:33 08:00-08:24/24 19:15	07:25 17:09	08:16 08:49-09:22/33 15:20-15:28/8 16:30 09:29-09:41/12 15:29-15:52/23
2	05:22 20:34-21:03/29 21:54	05:58 20:19-20:54/35 21:22	06:47 19:41-19:56/15 20:21	07:35 08:01-08:23/22 19:12	07:27 17:08	08:17 08:51-09:23/32 15:19-15:53/34 16:29 09:29-09:43/14
3	05:22 20:33-21:03/30 21:54	06:00 20:18-20:53/35 21:20	06:48 19:42-19:54/12 20:18	07:36 08:03-08:24/21 19:10	07:29 17:06	08:18 08:52-09:23/31 15:18-15:53/35 16:29 09:28-09:44/16
4	05:23 20:33-21:03/30 21:53	06:01 20:17-20:51/34 21:19	06:50 19:42-19:51/9 20:16	07:38 08:05-08:24/19 19:08	07:31 08:24-08:33/9 17:04	08:20 08:54-09:24/30 15:18-15:54/36 16:28 09:28-09:46/18
5	05:24 20:33-21:04/31 21:53	06:03 20:16-20:49/33 21:17	06:51 19:44-19:49/5 20:14	07:39 08:06-08:22/16 19:06	07:33 08:22-08:35/13 17:02	08:21 08:55-09:25/28 15:17-15:54/37 16:28 09:27-09:47/20
6	05:25 20:33-21:04/31 21:52	06:04 20:16-20:48/32 21:15	06:53 19:46-19:47/1 20:12	07:41 08:08-08:21/13 19:03	07:34 08:20-08:36/16 17:01	08:22 08:56-09:25/23 15:17-15:54/37 16:27 09:27-09:47/20
7	05:26 20:33-21:05/32 21:52	06:06 20:15-20:46/31 21:14	06:55 20:09	07:43 08:10-08:20/10 19:01	07:36 08:19-08:38/19 16:59	08:23 08:59-09:24/26 15:17-15:55/38 16:27 09:28-09:49/21
8	05:26 20:32-21:04/32 21:51	06:07 20:15-20:44/29 21:12	06:56 20:07	07:44 08:11-08:18/7 18:59	07:38 08:19-08:40/21 16:57	08:25 08:59-09:25/25 15:17-15:55/38 16:26 09:27-09:49/22
9	05:27 20:32-21:05/33 21:51	06:09 20:14-20:43/29 21:10	06:58 20:05	07:46 08:13-08:16/3 18:57 08:33-08:39/6	07:40 08:18-08:46/28 16:56	08:26 09:00-09:24/24 15:17-15:54/37 16:26 09:27-09:50/23
10	05:28 20:32-21:05/33 21:50	06:10 20:15-20:42/27 21:08	06:59 07:46-07:57/11 20:03	07:48 08:30-08:42/12 18:54	07:41 08:18-08:48/30 16:54	08:27 09:01-09:25/24 15:17-15:54/37 16:26 09:27-09:51/24
11	05:29 20:32-21:05/33 21:49	06:12 20:14-20:40/26 21:06	07:01 07:43-07:58/15 20:00	07:49 08:29-08:44/15 18:52	07:43 08:18-08:50/32 16:53	08:28 09:02-09:25/23 15:17-15:53/36 16:26 09:27-09:51/24
12	05:30 20:32-21:06/34 21:48	06:13 20:15-20:38/23 21:04	07:02 07:42-07:59/17 19:58	07:51 08:26-08:44/18 18:50	07:45 08:18-08:52/34 16:51	08:29 09:03-09:25/22 15:17-15:53/36 16:26 09:28-09:52/24
13	05:31 20:32-21:06/34 21:47	06:15 20:15-20:36/21 21:02	07:04 07:40-08:00/20 19:56	07:53 08:26-08:45/19 18:48	07:46 08:19-08:57/38 16:50	08:30 09:04-09:25/21 15:18-15:53/35 16:26 09:28-09:52/24
14	05:33 20:31-21:06/35 21:47	06:16 20:15-20:35/20 21:01	07:06 07:40-08:00/20 19:54	07:54 08:25-08:46/21 18:46	07:48 08:20-08:59/39 16:48	08:31 09:05-09:25/20 15:18-15:53/35 16:26 09:28-09:53/25
15	05:34 20:31-21:06/35 21:46	06:18 20:16-20:32/16 20:59	07:07 07:38-08:10/32 19:51	07:56 08:25-08:46/21 18:44	07:50 08:22-09:01/39 16:47	08:32 09:06-09:26/20 09:56-10:00/4 16:26 09:29-09:54/25 15:18-15:53/35
16	05:35 20:31-21:06/35 21:45	06:20 20:17-20:31/14 20:57	07:09 07:38-08:13/35 19:49	07:58 08:25-08:45/20 18:41	07:52 08:23-09:02/39 16:45	08:33 09:07-09:26/19 09:56-10:02/6 16:26 09:29-09:54/25 15:19-15:53/34
17	05:36 20:32-21:07/35 21:44	06:21 20:17-20:29/12 20:55	07:10 07:37-08:14/37 19:47	07:59 08:27-08:45/18 18:39	07:53 08:25-09:07/42 16:44	08:34 09:08-09:27/19 09:56-10:03/7 16:26 09:30-09:55/25 15:19-15:54/35
18	05:37 20:32-21:07/35 21:43	06:23 20:20-20:27/7 20:53	07:12 07:39-08:15/36 19:44	08:01 08:29-08:44/15 18:37	07:55 08:27-09:10/43 16:43	08:34 09:09-09:28/19 15:20-15:54/34 16:26 09:30-10:04/34
19	05:39 20:32-21:07/35 21:42	06:24 20:22-20:25/3 20:51	07:14 07:40-08:15/35 19:42	08:03 08:31-08:43/12 18:35	07:57 08:29-09:12/43 16:41	08:35 09:09-09:27/18 15:20-15:54/34 16:26 09:30-10:04/34
20	05:40 20:31-21:06/35 21:40	06:26 20:49	07:15 07:42-08:16/34 19:40	08:05 08:33-08:42/9 18:33	07:58 08:31-09:14/43 16:40	08:36 09:10-09:28/18 15:21-15:54/33 16:27 09:31-10:05/34
21	05:41 20:31-21:06/35 21:39	06:28 19:55-19:59/4 20:46	07:17 07:44-08:16/32 19:37	08:06 08:34-08:40/6 18:31	08:00 08:33-09:16/43 16:39 15:33-15:42/9	08:36 09:11-09:29/18 15:21-15:54/33 16:27 09:32-10:06/34
22	05:42 20:32-21:07/35 21:38	06:29 19:52-20:03/11 20:44	07:18 07:45-08:17/32 19:35	08:08 08:36-08:37/1 18:29	08:02 08:34-09:16/42 16:38 15:32-15:44/12	08:37 09:11-09:29/18 15:21-15:55/34 16:28 09:32-10:07/35
23	05:44 20:31-21:06/35 21:37	06:31 19:49-20:04/15 20:42	07:20 07:47-08:19/32 19:33	08:10 18:27	08:03 08:36-09:17/41 16:37 15:31-15:46/15	08:37 09:11-09:29/18 15:22-15:55/33 16:28 09:32-10:06/34
24	05:45 20:31-21:05/34 21:35	06:32 19:48-20:05/17 20:40	07:22 07:50-08:19/29 19:31	08:11 18:25	08:05 08:38-09:18/40 16:36 15:30-15:47/17	08:38 09:12-09:30/18 15:23-15:56/33 16:29 09:33-10:07/34
25	05:46 20:28-21:05/37 21:34	06:34 19:46-20:05/19 20:38	07:23 07:50-08:20/30 19:28	08:13 18:23	08:06 08:40-09:19/39 16:35 15:29-15:47/18	08:38 09:12-09:30/18 15:23-15:57/34 16:29 09:33-10:07/34
26	05:48 20:27-21:05/38 21:33	06:36 19:45-20:06/21 20:36	07:25 07:52-08:21/29 19:26	08:15 18:21	08:08 08:41-09:19/38 16:34 15:29-15:49/20	08:39 09:12-09:31/19 15:23-15:57/34 16:30 09:34-10:07/33
27	05:49 20:25-21:03/38 21:31	06:37 19:43-20:06/23 20:34	07:26 07:53-08:21/28 19:24	08:17 18:19	08:10 08:43-09:20/37 16:33 15:29-15:50/21	08:39 09:13-09:32/19 10:01-10:08/7 16:31 09:35-10:00/25 15:23-15:58/35
28	05:51 20:23-21:01/38 21:30	06:39 19:43-20:06/23 20:32	07:28 07:55-08:22/27 19:21	08:18 18:17	08:11 08:45-09:21/36 16:32 15:28-15:50/22	08:39 09:13-09:32/19 10:02-10:08/6 16:31 09:35-10:00/25 15:25-15:59/34
29	05:52 20:23-21:01/38 21:28	06:40 19:42-20:04/22 20:29	07:30 07:56-08:22/26 19:19	08:20 17:15	08:13 08:46-09:21/35 15:29-15:51/22 16:31 09:33-09:35/2	08:39 09:13-09:33/20 10:03-10:07/4 16:32 09:36-10:01/25 15:26-16:01/35
30	05:54 20:22-20:59/37 21:27	06:42 19:42-20:03/21 20:27	07:31 07:58-08:23/25 19:17	08:22 17:13	08:14 08:48-09:22/34 15:29-15:52/23 16:31 09:31-09:39/8	08:39 09:13-09:34/21 15:26-16:01/35 16:33 09:36-10:01/25
31	05:55 20:21-20:57/36 21:25	06:43 19:41-20:00/19 20:25	07:32 20:16	08:24 17:11	08:39 09:13-09:34/21 15:27-16:02/35 16:34 09:37-10:01/24	
Potential sun hours	500	453	381	333	269	246
Sum of minutes with flicker	1057	658	641	328	1102	2596

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT03 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (484)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January	February	March	April	May	June
1	08:39 16:35	08:14 16:33-16:55/22 17:22	07:22 17:19-17:33/14 18:13	07:12 19:04-19:42/38 20:06	06:09 19:29-20:19/50 20:55	05:24 19:41-20:32/51 21:40
2	08:39 16:36	08:12 16:32-16:56/24 17:24	07:20 17:21-17:31/10 18:14	07:10 19:05-19:43/38 20:07	06:07 19:30-20:20/50 20:57	05:23 19:42-20:32/50 21:41
3	08:39 16:37	08:11 16:32-16:58/26 17:26	07:17 17:46-17:52/6 18:16	07:08 19:06-19:45/39 20:09	06:05 19:31-20:21/50 20:59	05:23 19:43-20:32/49 21:42
4	08:39 16:39	08:09 16:33-17:01/28 17:28	07:15 17:43-17:54/11 18:18	07:06 19:07-19:46/39 20:11	06:03 19:31-20:22/51 21:00	05:22 19:43-20:32/49 21:43
5	08:39 16:40	08:08 16:33-17:02/29 17:29	07:13 17:42-17:56/14 18:20	07:03 19:08-19:46/38 20:12	06:01 19:33-20:24/51 21:02	05:21 19:45-20:32/47 21:44
6	08:39 16:41	08:06 16:34-17:04/30 17:31	07:11 17:40-17:58/18 18:21	07:01 19:08-19:45/37 20:14	05:59 19:34-20:25/51 21:03	05:20 19:45-20:32/47 21:45
7	08:38 16:42	08:04 16:34-17:06/32 17:33	07:09 17:38-17:59/21 18:23	06:59 19:09-19:45/36 20:16	05:58 19:35-20:26/51 21:05	05:20 19:46-20:32/46 21:46
8	08:38 16:43	08:03 16:36-17:09/33 17:35	07:06 17:38-18:01/23 18:25	06:57 19:12-19:45/33 20:17	05:56 19:36-20:27/51 21:07	05:19 19:46-20:32/46 21:47
9	08:37 16:45	08:01 16:38-17:10/32 17:37	07:04 17:37-18:02/25 18:27	06:54 19:15-19:44/29 20:19	05:54 19:36-20:28/52 21:08	05:19 19:47-20:32/45 21:48
10	08:37 16:46	07:59 16:40-17:12/32 17:38	07:02 17:37-18:05/28 18:28	06:52 19:22-19:53/31 20:21	05:52 19:35-20:28/53 21:10	05:18 19:48-20:32/44 21:49
11	08:36 16:48	07:57 16:43-17:14/31 17:40	07:00 17:36-18:06/30 18:30	06:50 19:22-19:55/33 20:22	05:51 19:35-20:29/54 21:11	05:18 19:48-20:32/44 21:49
12	08:36 16:49	07:56 16:47-17:16/29 17:42	06:58 17:36-18:08/32 18:32	06:48 19:24-19:57/33 20:24	05:49 19:34-20:29/55 21:13	05:18 19:49-20:32/43 21:50
13	08:35 16:50	07:54 16:48-17:16/28 17:44	06:55 17:37-18:10/33 18:34	06:46 19:26-19:58/32 20:26	05:48 19:35-20:30/55 21:14	05:17 19:50-20:32/42 21:51
14	08:34 16:52	07:52 16:50-17:16/26 17:46	06:53 17:38-18:12/34 18:35	06:43 19:30-19:59/29 20:27	05:46 19:35-20:31/56 21:16	05:17 19:50-20:32/42 21:51
15	08:34 16:53	07:50 16:51-17:15/24 17:48	06:51 17:38-18:13/35 18:37	06:41 19:30-20:00/30 20:29	05:44 19:35-20:31/56 21:17	05:17 19:51-20:32/41 21:52
16	08:33 16:55	07:48 16:53-17:15/22 17:49	06:49 17:39-18:15/36 18:39	06:39 19:29-20:02/33 20:31	05:43 19:35-20:31/56 21:19	05:17 19:51-20:33/42 21:53
17	08:32 16:56	07:46 16:55-17:14/19 17:51	06:46 17:41-18:16/35 18:40	06:37 19:29-20:03/34 20:32	05:42 19:34-20:31/57 21:20	05:17 19:52-20:33/41 21:53
18	08:31 16:58	07:44 16:58-17:12/14 17:53	06:44 17:43-18:15/32 18:42	06:35 19:28-20:04/36 20:34	05:40 19:35-20:31/56 21:22	05:17 19:52-20:33/41 21:53
19	08:30 17:00	07:42 17:00-17:11/11 17:55	06:42 17:51-18:20/29 18:44	06:33 19:27-20:05/38 20:35	05:39 19:35-20:32/57 21:23	05:17 19:52-20:33/41 21:54
20	08:29 17:01	07:40 17:05-17:06/1 17:57	06:40 17:52-18:22/30 18:45	06:31 19:27-20:06/39 20:37	05:37 19:36-20:32/56 21:25	05:17 19:52-20:33/41 21:54
21	08:28 17:03	07:38 17:12-17:34/22 17:58	06:37 17:52-18:24/32 18:47	06:28 19:27-20:06/39 20:39	05:36 19:36-20:33/57 21:26	05:17 19:53-20:33/40 21:54
22	08:27 17:05	07:36 17:12-17:36/24 18:00	06:35 17:53-18:25/32 18:49	06:26 19:27-20:06/39 20:40	05:35 19:36-20:32/56 21:28	05:17 19:53-20:33/40 21:55
23	08:26 17:06	07:34 17:12-17:38/26 18:02	06:33 17:54-18:27/33 18:50	06:24 19:26-20:07/41 20:42	05:33 19:36-20:32/56 21:29	05:17 19:52-20:33/41 21:55
24	08:25 17:08	07:32 17:13-17:38/25 18:04	06:30 17:56-18:29/33 18:52	06:22 19:27-20:11/44 20:44	05:32 19:37-20:32/55 21:30	05:18 19:53-20:34/41 21:55
25	08:23 17:10	07:30 17:12-17:37/25 18:06	06:28 18:03-18:30/27 18:54	06:20 19:27-20:13/46 20:45	05:31 19:37-20:32/55 21:32	05:18 19:53-20:34/41 21:55
26	08:22 17:11	07:28 17:14-17:36/22 18:07	07:26 19:03-19:32/29 19:55	06:18 19:27-20:15/48 20:47	05:30 19:38-20:32/54 21:33	05:18 19:54-20:35/41 21:55
27	08:21 17:13	07:26 17:15-17:36/21 18:09	07:24 19:03-19:34/31 19:57	06:16 19:27-20:16/49 20:49	05:29 19:38-20:32/54 21:34	05:19 19:53-20:35/42 21:55
28	08:20 17:15	07:24 17:17-17:35/18 18:11	07:21 19:04-19:35/31 19:59	06:14 19:28-20:17/49 20:50	05:28 19:39-20:32/53 21:36	05:19 19:53-20:34/41 21:55
29	08:18 17:17	16:33-16:48/15 17:17	07:19 19:03-19:37/34 20:01	06:12 19:28-20:18/50 20:52	05:27 19:39-20:32/53 21:37	05:20 19:53-20:35/42 21:55
30	08:17 17:19	16:33-16:50/17 17:19	07:17 19:04-19:39/35 20:02	06:10 19:29-20:19/50 20:54	05:26 19:41-20:33/52 21:38	05:20 19:53-20:36/43 21:55
31	08:15 17:20	16:32-16:52/20 17:20	07:15 19:05-19:41/36 20:04		05:25 19:41-20:32/51 21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	87	750	849	1150	1664	1304

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT03 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (484)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December
1	05:21 19:53-20:36/43 21:54	05:57 19:45-20:40/55 21:24	06:45 19:23-19:55/32 20:23	07:33 18:16-18:50/34 19:15	07:25 16:10-16:42/32 17:09	08:15 16:30
2	05:22 19:53-20:37/44 21:54	05:58 19:45-20:39/54 21:22	06:47 19:20-19:52/32 20:21	07:35 18:15-18:47/32 19:12	07:27 16:08-16:41/33 17:08	08:17 16:29
3	05:22 19:52-20:36/44 21:54	05:59 19:46-20:39/53 21:20	06:48 19:20-19:48/28 20:18	07:36 18:15-18:45/30 19:10	07:29 16:06-16:39/33 17:06	08:18 16:29
4	05:23 19:52-20:37/45 21:53	06:01 19:46-20:38/52 21:19	06:50 19:10-19:41/31 20:16	07:38 18:14-18:42/28 19:08	07:31 16:04-16:36/32 17:04	08:20 16:28
5	05:24 19:52-20:38/46 21:53	06:03 19:45-20:37/52 21:17	06:51 19:07-19:42/35 20:14	07:39 18:14-18:39/25 19:05	07:32 16:04-16:34/30 17:02	08:21 16:28
6	05:25 19:52-20:38/46 21:52	06:04 19:45-20:36/51 21:15	06:53 19:05-19:41/36 20:12	07:41 18:15-18:38/23 19:03	07:34 16:03-16:33/30 17:01	08:22 16:27
7	05:26 19:52-20:39/47 21:52	06:06 19:43-20:35/52 21:13	06:55 19:03-19:41/38 20:09	07:43 18:15-18:36/21 19:01	07:36 16:03-16:31/28 16:59	08:23 16:27
8	05:26 19:51-20:38/47 21:51	06:07 19:42-20:34/52 21:12	06:56 19:01-19:40/39 20:07	07:44 18:15-18:33/18 18:59	07:38 16:03-16:29/26 16:57	08:25 16:26
9	05:27 19:50-20:39/49 21:51	06:09 19:41-20:32/51 21:10	06:58 19:00-19:40/40 20:05	07:46 18:17-18:31/14 18:57	07:39 16:03-16:28/25 16:56	08:26 16:26
10	05:28 19:50-20:39/49 21:50	06:10 19:40-20:30/50 21:08	06:59 18:58-19:38/40 20:03	07:48 18:18-18:29/11 18:54	07:41 16:03-16:26/23 16:54	08:27 16:26
11	05:29 19:50-20:40/50 21:49	06:12 19:39-20:29/50 21:06	07:01 18:58-19:36/38 20:00	07:49 18:20-18:26/6 18:52	07:43 16:04-16:24/20 16:53	08:28 16:26
12	05:30 19:49-20:40/51 21:48	06:13 19:38-20:29/51 21:04	07:02 18:56-19:33/37 19:58	07:51 17:54-18:04/10 18:50	07:45 16:04-16:23/19 16:51	08:29 16:26
13	05:31 19:49-20:40/51 21:47	06:15 19:37-20:27/50 21:02	07:04 18:56-19:31/35 19:56	07:53 17:52-18:06/14 18:48	07:46 16:05-16:21/16 16:50	08:30 16:26
14	05:33 19:49-20:41/52 21:47	06:16 19:37-20:27/50 21:00	07:06 18:54-19:28/34 19:54	07:54 17:50-18:08/18 18:46	07:48 16:05-16:19/14 16:48	08:31 16:26
15	05:34 19:48-20:41/53 21:46	06:18 19:35-20:25/50 20:59	07:07 18:53-19:24/31 19:51	07:56 17:47-18:08/21 18:43	07:50 16:06-16:18/12 16:47	08:32 16:26
16	05:35 19:48-20:41/53 21:45	06:20 19:35-20:24/49 20:57	07:09 18:53-19:24/31 19:49	07:58 17:46-18:08/22 18:41	07:52 16:07-16:16/9 16:45	08:33 16:26
17	05:36 19:48-20:42/54 21:44	06:21 19:33-20:21/48 20:55	07:10 18:52-19:22/30 19:47	07:59 17:45-18:09/24 18:39	07:53 16:09-16:15/6 16:44	08:34 16:26
18	05:37 19:48-20:42/54 21:43	06:23 19:33-20:20/47 20:53	07:12 18:52-19:20/28 19:44	08:01 17:44-18:09/25 18:37	07:55 16:11-16:14/3 16:43	08:34 16:26
19	05:39 19:47-20:42/55 21:41	06:24 19:32-20:17/45 20:51	07:14 18:46-19:17/31 19:42	08:03 17:44-18:09/25 18:35	07:57 16:11-16:14/3 16:41	08:35 16:26
20	05:40 19:47-20:42/55 21:40	06:26 19:32-20:14/42 20:49	07:15 18:42-19:15/33 19:40	08:05 17:42-18:06/24 18:33	07:58 16:10-16:13/4 16:40	08:36 16:27
21	05:41 19:46-20:42/56 21:39	06:28 19:31-20:11/40 20:46	07:17 18:39-19:12/33 19:37	08:06 17:42-18:04/22 18:31	08:00 16:09-16:12/5 16:39	08:36 16:27
22	05:42 19:47-20:43/56 21:38	06:29 19:31-20:11/40 20:44	07:18 18:38-19:10/32 19:35	08:08 17:43-18:02/19 18:29	08:02 16:08-16:11/6 16:38	08:37 16:28
23	05:44 19:46-20:43/57 21:37	06:31 19:30-20:09/39 20:42	07:20 18:37-19:08/31 19:33	08:10 17:31-17:41/10 18:27	08:03 16:07-16:10/7 16:37	08:37 16:28
24	05:45 19:46-20:42/56 21:35	06:32 19:31-20:09/38 20:40	07:22 18:35-19:05/30 19:31	08:11 17:29-17:43/14 18:25	08:05 16:06-16:09/8 16:36	08:38 16:29
25	05:46 19:45-20:42/57 21:34	06:34 19:30-20:07/37 20:38	07:23 18:35-19:03/28 19:28	08:13 17:26-17:44/18 18:23	08:06 16:05-16:08/9 16:35	08:38 16:29
26	05:48 19:46-20:42/56 21:33	06:36 19:31-20:06/35 20:36	07:25 18:25-18:57/32 19:26	08:15 17:22-17:44/22 18:21	08:08 16:04-16:07/10 16:34	08:39 16:30
27	05:49 19:45-20:42/57 21:31	06:37 19:31-20:04/33 20:34	07:26 18:22-18:58/36 19:24	08:17 17:21-17:45/24 18:19	08:10 16:03-16:06/11 16:33	08:39 16:31
28	05:51 19:45-20:41/56 21:30	06:39 19:32-20:03/31 20:32	07:28 18:20-18:57/37 19:21	08:18 17:19-17:45/26 18:17	08:11 16:02-16:05/12 16:32	08:39 16:31
29	05:52 19:46-20:42/56 21:28	06:40 19:32-20:01/29 20:29	07:30 18:18-18:54/36 19:19	07:20 16:18-16:45/27 17:15	08:13 16:01-16:04/13 16:31	08:39 16:32
30	05:54 19:45-20:41/56 21:27	06:42 19:28-19:59/31 20:27	07:31 18:17-18:52/35 19:17	07:22 16:17-16:45/28 17:13	08:14 16:00-16:03/14 16:31	08:39 16:33
31	05:55 19:45-20:40/55 21:25	06:43 19:24-19:57/33 20:25		07:24 16:16-16:44/28 17:11		08:39 16:34
Potential sun hours	500	453	381	333	269	247
Sum of minutes with flicker	1606	1390	1009	720	391	0

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT04 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (492)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 15:18-16:03/45 16:35	08:14 16:14-16:54/40 17:22	07:22 17:01-17:40/39 18:13	07:12 17:21-19:09/108 20:06	06:09 17:23-19:05/102 20:55	05:24 17:58-18:51/53 21:40
2	08:39 15:19-16:04/45 16:36	08:12 16:15-16:55/40 17:24	07:20 17:03-17:41/38 18:14	07:10 17:19-19:10/111 20:07	06:07 17:25-19:06/101 20:57	05:23 17:59-18:50/51 21:41
3	08:39 15:21-16:06/45 16:37	08:11 16:16-16:57/41 17:26	07:17 17:02-17:40/38 18:16	07:08 17:18-19:11/113 20:09	06:05 17:25-19:05/100 20:59	05:23 18:00-18:51/51 21:42
4	08:39 15:22-16:07/45 16:39	08:09 16:18-16:59/41 17:28	07:15 17:02-17:40/38 18:18	07:05 17:18-19:12/114 20:11	06:03 17:26-19:05/99 21:00	05:22 18:01-18:50/49 21:43
5	08:39 15:23-16:08/45 16:40	08:08 16:20-16:59/39 17:29	07:13 17:02-17:40/38 18:20	07:03 17:17-19:13/116 20:12	06:01 17:28-19:05/97 21:02	05:21 18:03-18:50/47 21:44
6	08:39 15:24-16:09/45 16:41	08:06 16:23-16:30/7 17:31	07:11 17:44-17:54/10 18:21	07:01 17:16-19:12/116 20:14	05:59 17:29-19:04/95 21:03	05:20 18:03-18:49/46 21:45
7	08:38 15:26-16:10/44 16:42	08:04 16:31-17:00/29 17:33	07:09 17:40-17:56/16 18:23	06:59 17:16-19:13/117 20:16	05:58 17:30-19:04/94 21:05	05:20 18:04-18:49/45 21:46
8	08:38 15:28-16:12/44 16:43	08:03 16:32-17:02/30 17:35	07:06 17:01-17:58/57 18:25	06:57 17:16-19:13/117 20:17	05:56 17:32-19:04/92 21:07	05:19 18:05-18:48/43 21:47
9	08:37 15:35-16:13/38 16:45	08:01 16:31-17:02/31 17:37	07:04 17:02-18:00/58 18:27	06:54 17:15-19:13/118 20:19	05:54 17:33-19:03/90 21:08	05:19 18:06-18:48/42 21:48
10	08:37 15:35-16:14/39 16:46	07:59 16:31-17:02/31 17:38	07:02 17:03-18:02/59 18:28	06:52 17:15-19:13/118 20:20	05:52 17:34-19:02/88 21:10	05:18 18:07-18:48/41 21:49
11	08:36 15:37-16:17/40 16:48	07:57 16:31-17:02/31 17:40	07:00 17:03-18:02/59 18:30	06:50 17:14-19:13/119 20:22	05:51 17:36-19:02/86 21:11	05:18 18:07-18:47/40 21:49
12	08:36 15:37-16:18/41 16:49	07:56 17:04-17:16/12 17:42	06:58 17:04-18:03/59 18:32	06:48 17:14-19:13/119 20:24	05:49 17:37-19:01/84 21:13	05:18 18:08-18:47/39 21:50
13	08:35 15:38-16:19/41 16:50	07:54 16:31-17:18/47 17:44	06:55 17:05-18:03/58 18:33	06:46 17:14-19:13/119 20:25	05:48 17:39-19:01/82 21:14	05:17 18:09-18:47/38 21:51
14	08:34 15:39-16:21/42 16:52	07:52 16:32-17:20/48 17:46	06:53 17:06-18:04/58 18:35	06:43 17:14-19:13/119 20:27	05:46 17:41-19:01/80 21:16	05:17 18:10-18:47/37 21:51
15	08:34 15:40-16:23/43 16:53	07:50 16:32-17:22/50 17:48	06:51 16:56-18:03/67 18:37	06:41 17:14-19:13/119 20:29	05:44 17:42-19:00/78 21:17	05:17 18:11-18:47/36 21:52
16	08:33 15:42-16:24/42 16:55	07:48 16:33-17:24/51 17:49	06:49 16:51-18:03/72 18:39	06:39 17:15-19:12/117 20:30	05:43 17:43-19:00/77 21:19	05:17 18:11-18:47/36 21:52
17	08:32 15:43-16:26/43 16:56	07:46 16:34-17:26/52 17:51	06:46 16:47-18:03/76 18:40	06:37 17:15-19:12/117 20:32	05:42 17:43-18:59/76 21:20	05:17 18:12-18:47/35 21:53
18	08:31 15:45-16:28/43 16:58	07:44 16:35-17:28/53 17:53	06:44 16:43-18:02/79 18:42	06:35 17:15-19:12/117 20:34	05:40 17:45-18:59/74 21:22	05:17 18:12-18:47/35 21:53
19	08:30 15:47-16:30/43 17:00	07:42 16:36-17:30/54 17:55	06:42 16:41-18:02/81 18:44	06:33 17:16-19:11/115 20:35	05:39 17:46-18:58/72 21:23	05:17 18:13-18:47/34 21:54
20	08:29 15:51-16:32/41 17:01	07:40 16:39-17:32/53 17:57	06:40 16:39-18:01/82 18:45	06:31 17:16-19:11/115 20:37	05:37 17:47-18:58/71 21:25	05:17 18:13-18:47/34 21:54
21	08:28 15:53-16:34/41 17:03	07:38 16:55-17:32/37 17:58	06:37 16:37-18:00/83 18:47	06:28 17:16-19:10/114 20:39	05:36 17:48-18:58/70 21:26	05:17 18:13-18:47/34 21:54
22	08:27 15:54-16:35/41 17:05	07:36 16:55-17:34/39 18:00	06:35 16:34-17:59/85 18:49	06:26 17:17-19:10/113 20:40	05:35 17:48-18:56/68 21:28	05:17 18:13-18:47/34 21:55
23	08:26 15:56-16:36/40 17:06	07:34 16:56-17:36/40 18:02	06:33 16:32-18:00/88 18:50	06:24 17:17-19:09/112 20:42	05:33 17:49-18:56/67 21:29	05:17 18:13-18:47/34 21:55
24	08:25 16:00-16:37/37 17:08	07:32 16:56-17:37/41 18:04	06:30 16:31-18:00/89 18:52	06:22 17:18-19:08/110 20:44	05:32 17:50-18:55/65 21:30	05:18 18:14-18:48/34 21:55
25	08:23 16:03-16:36/33 17:10	07:30 16:55-17:37/42 18:06	06:28 16:29-18:00/91 18:54	06:20 17:18-19:07/109 20:45	05:31 17:51-18:55/64 21:32	05:18 18:13-18:48/35 21:55
26	08:22 16:06-16:37/31 17:11	07:28 16:56-17:38/42 18:07	07:26 17:27-19:01/94 19:55	06:18 17:19-19:07/108 20:47	05:30 17:52-18:54/62 21:33	05:18 18:14-18:49/35 21:55
27	08:21 16:08-16:37/29 17:13	07:26 16:57-17:39/42 18:09	07:24 17:26-19:03/97 19:57	06:16 17:20-19:07/107 20:49	05:29 17:53-18:53/60 21:34	05:19 18:13-18:49/36 21:55
28	08:20 16:10-16:37/27 17:15	07:24 16:59-17:40/41 18:11	07:21 17:25-19:05/100 19:59	06:14 17:20-19:06/106 20:50	05:28 17:54-18:53/59 21:35	05:19 18:13-18:49/36 21:55
29	08:18 16:10-16:37/27 17:17		07:19 17:23-19:06/103 20:00	06:12 17:21-19:06/105 20:52	05:27 17:55-18:52/57 21:37	05:20 18:13-18:50/37 21:55
30	08:17 16:11-16:38/27 17:19		07:17 17:22-19:08/106 20:02	06:10 17:22-19:06/104 20:54	05:26 17:57-18:53/56 21:38	05:20 18:13-18:51/38 21:55
31	08:15 16:12-16:37/25 17:20		07:15 17:21-19:09/108 20:04		05:25 17:58-18:52/54 21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	1232	1174	2201	3412	2420	1185

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 WTG: WT04 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (492)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December
1	05:21 18:12-18:51/39 21:54	05:56 17:48-19:12/84 21:24	06:45 17:14-19:13/119 20:23	07:33 17:45-18:43/58 19:15	07:25 16:01-16:32/31 17:09	08:15 15:19-15:59/40 16:30
2	05:22 18:12-18:52/40 21:54	05:58 17:46-19:12/86 21:22	06:47 17:13-19:11/118 20:21	07:34 17:42-18:41/59 19:12	07:27 16:01-16:32/31 17:08	08:17 15:19-15:59/40 16:29
3	05:22 18:11-18:52/41 21:54	05:59 17:45-19:13/88 21:20	06:48 17:13-19:11/118 20:18	07:36 17:41-18:40/59 19:10	07:29 16:01-16:31/30 17:06	08:18 15:18-15:58/40 16:29
4	05:23 18:11-18:53/42 21:53	06:01 17:43-19:13/90 21:19	06:50 17:12-19:10/118 20:16	07:38 17:39-18:38/59 19:08	07:31 16:01-16:30/29 17:04	08:20 15:18-15:56/38 16:28
5	05:24 18:11-18:54/43 21:53	06:03 17:42-19:13/91 21:17	06:51 17:13-19:10/117 20:14	07:39 17:39-18:37/58 19:05	07:32 15:54-15:58/4 17:02	08:21 15:12-15:56/44 16:28
6	05:25 18:10-18:55/45 21:52	06:04 17:41-19:14/93 21:15	06:53 17:12-19:08/116 20:12	07:41 17:38-18:35/57 19:03	07:34 15:50-16:29/39 17:01	08:22 15:11-15:56/45 16:27
7	05:26 18:10-18:56/46 21:52	06:06 17:39-19:13/94 21:13	06:55 17:12-19:08/116 20:09	07:43 18:17-18:33/16 19:01	07:36 15:48-16:29/41 16:59	08:23 15:10-15:55/45 16:27
8	05:26 18:08-18:56/48 21:51	06:07 17:38-19:14/96 21:12	06:56 17:12-19:06/114 20:07	07:44 18:20-18:28/8 18:59	07:38 15:47-16:28/41 17:37-18:14/37	08:25 15:10-15:55/45 16:26
9	05:27 18:08-18:57/49 21:50	06:09 17:36-19:14/98 21:10	06:58 17:12-19:06/114 20:05	07:46 17:37-18:14/37 18:57	07:39 15:46-16:27/41 16:56	08:26 15:09-15:54/45 16:26
10	05:28 18:07-18:57/50 21:50	06:10 17:35-19:14/99 21:08	06:59 17:12-19:04/112 20:03	07:48 17:37-18:15/38 18:54	07:41 15:45-16:25/40 16:54	08:27 15:09-15:54/45 16:26
11	05:29 18:07-18:58/51 21:49	06:12 17:33-19:14/101 21:06	07:01 17:12-19:03/111 20:00	07:49 17:36-18:14/38 18:52	07:43 15:44-16:08/24 16:53	08:28 15:09-15:54/45 16:26
12	05:30 18:06-18:59/53 21:48	06:13 17:32-19:15/103 21:04	07:02 17:12-19:01/109 19:58	07:51 17:36-18:14/38 18:50	07:45 15:43-16:09/26 16:51	08:29 15:09-15:53/44 16:26
13	05:31 18:05-19:00/55 21:47	06:15 17:30-19:14/104 21:02	07:04 17:13-19:00/107 19:56	07:53 17:34-18:13/39 18:48	07:46 15:43-16:10/27 16:50	08:30 15:09-15:53/44 16:26
14	05:33 18:05-19:01/56 21:47	06:16 17:30-19:14/104 21:00	07:06 17:14-18:58/104 19:54	07:54 17:32-18:13/41 18:46	07:48 15:41-16:09/28 16:48	08:31 15:09-15:53/44 16:26
15	05:34 18:04-19:01/57 21:46	06:18 17:28-19:14/106 20:59	07:07 17:14-18:56/102 19:51	07:56 17:30-18:11/41 18:43	07:50 15:41-16:10/29 16:47	08:32 15:10-15:53/43 16:26
16	05:35 18:03-19:02/59 21:45	06:20 17:27-19:14/107 20:57	07:09 17:15-18:54/99 19:49	07:58 17:29-18:11/42 18:41	07:52 15:40-16:10/30 16:45	08:33 15:10-15:53/43 16:26
17	05:36 18:03-19:03/60 21:44	06:21 17:26-19:13/107 20:55	07:10 17:15-18:51/96 19:47	07:59 17:28-18:10/42 18:39	07:53 15:38-16:10/32 16:44	08:34 15:11-15:54/43 16:26
18	05:37 18:02-19:04/62 21:43	06:23 17:25-19:14/109 20:53	07:12 17:16-18:49/93 19:44	08:01 17:27-18:09/42 18:37	07:55 15:36-16:10/34 16:43	08:34 15:11-15:54/43 16:26
19	05:38 18:01-19:05/64 21:41	06:24 17:24-19:14/110 20:51	07:14 17:16-18:47/91 19:42	08:03 17:27-18:07/40 18:35	07:57 15:32-16:11/39 16:41	08:35 15:11-15:54/43 16:26
20	05:40 18:00-19:05/65 21:40	06:26 17:23-19:14/111 20:48	07:15 17:18-18:46/88 19:40	08:05 17:26-18:04/38 18:33	07:58 15:30-16:11/41 16:40	08:36 15:12-15:55/43 16:27
21	05:41 17:59-19:06/67 21:39	06:28 17:22-19:14/112 20:46	07:17 17:18-18:45/87 19:37	08:06 17:26-18:02/36 18:31	08:00 15:28-16:09/41 17:12-17:22/10	08:36 15:12-15:54/42 16:27
22	05:42 17:59-19:07/68 21:38	06:29 17:21-19:15/114 20:44	07:18 17:20-18:45/85 19:35	08:08 17:26-18:02/36 18:29	08:02 15:28-16:08/40 17:09-17:25/16	08:37 15:13-15:55/42 16:28
23	05:44 17:58-19:08/70 21:37	06:31 17:20-19:14/114 20:42	07:20 17:22-18:45/83 19:33	08:10 17:07-18:00/53 18:27	08:03 15:25-16:07/42 16:37	08:37 15:13-15:55/42 16:28
24	05:45 17:57-19:08/71 21:35	06:32 17:19-19:15/116 20:40	07:22 17:23-18:45/82 19:31	08:11 17:06-17:58/52 18:25	08:05 15:23-16:06/43 16:36	08:38 15:14-15:57/43 16:29
25	05:46 17:56-19:08/72 21:34	06:34 17:18-19:14/116 20:38	07:23 17:25-18:45/80 19:28	08:13 17:04-17:57/53 18:23	08:06 15:21-16:04/43 16:35	08:38 15:14-15:57/43 16:29
26	05:48 17:56-19:10/74 21:33	06:35 17:18-19:15/117 20:36	07:25 17:26-18:45/79 19:26	08:15 17:02-17:54/52 18:21	08:08 15:21-16:04/43 16:34	08:39 15:14-15:57/43 16:30
27	05:49 17:54-19:10/76 21:31	06:37 17:16-19:14/118 20:34	07:26 17:29-18:45/76 19:24	08:17 17:02-17:52/50 18:19	08:10 15:20-16:03/43 16:33	08:39 15:15-15:58/43 16:31
28	05:51 17:53-19:10/77 21:30	06:39 17:16-19:14/118 20:32	07:28 17:33-18:45/72 19:21	08:18 17:01-17:50/49 18:17	08:11 15:19-16:01/42 16:32	08:39 15:16-16:00/44 16:31
29	05:52 17:53-19:11/78 21:28	06:40 17:15-19:13/118 20:29	07:30 17:37-18:44/67 19:19	07:20 16:01-16:48/47 17:15	08:13 15:19-16:01/42 16:31	08:39 15:17-16:00/43 16:32
30	05:54 17:51-19:11/80 21:27	06:42 17:15-19:14/119 20:27	07:31 17:46-18:43/57 19:17	07:22 16:33-16:46/13 17:13	08:14 15:19-15:59/40 16:31	08:39 15:17-16:01/44 16:33
31	05:55 17:49-19:11/82 21:25	06:43 17:14-19:13/119 20:25	07:34 17:47-18:43/57 19:15	07:24 16:37-16:42/5 17:11	08:15 15:19-15:59/40 16:31	08:39 15:17-16:01/44 16:34
Potential sun hours	500	453	381	333	269	247
Sum of minutes with flicker	1840	3262	2930	1457	1109	1339

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT05 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (488)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January	February	March	April	May	June
1	08:39 13:51-14:16/25 16:35 09:53-12:07/134	08:14 10:13-10:43/30 17:22	07:22 18:13	07:12 19:18-19:42/24 20:05	06:09 20:55	05:24 21:40
2	08:39 13:53-14:16/23 16:36 09:53-12:07/134	08:12 10:14-10:40/26 17:24	07:19 18:14	07:10 19:18-19:43/25 20:07	06:07 20:57	05:23 21:41
3	08:39 13:54-14:16/22 16:37 09:54-12:07/133	08:11 10:16-10:37/21 17:26	07:17 18:16	07:08 19:19-19:45/26 20:09	06:05 20:59	05:23 21:42
4	08:39 13:55-14:15/20 16:39 09:54-12:07/133	08:09 10:20-10:34/14 17:27	07:15 18:18	07:05 19:19-19:47/28 20:10	06:03 21:00	05:22 21:43
5	08:39 13:57-14:15/18 16:40 09:55-12:07/132	08:08 17:29	07:13 18:20	07:03 19:19-19:47/28 20:12	06:01 21:02	05:21 21:44
6	08:39 14:00-14:14/14 16:41 09:55-12:07/132	08:06 17:31	07:11 18:21	07:01 19:19-19:47/28 20:14	05:59 21:03	05:20 21:45
7	08:38 14:02-14:12/10 16:42 09:55-12:06/131	08:04 17:33	07:09 18:23	06:59 19:19-19:47/28 20:15	05:58 21:05	05:20 21:46
8	08:38 14:07-14:09/2 16:43 09:56-12:05/129	08:03 17:35	07:06 18:25	06:57 19:18-19:47/29 20:17	05:56 21:07	05:19 21:47
9	08:37 09:56-12:04/128 16:45	08:01 17:37	07:04 18:27	06:54 19:18-19:47/29 20:19	05:54 21:08	05:19 21:48
10	08:37 09:56-12:02/126 16:46	07:59 17:38	07:02 18:28	06:52 19:17-19:46/29 20:20	05:52 21:10	05:18 21:49
11	08:36 09:57-12:00/123 16:47	07:57 17:40	07:00 18:30	06:50 19:18-19:46/28 20:22	05:51 21:11	05:18 21:49
12	08:36 09:57-11:48/111 16:49	07:55 17:42	06:58 18:32	06:48 19:18-19:45/27 20:24	05:49 21:13	05:18 21:50
13	08:35 09:58-11:47/109 16:50	07:54 17:44	06:55 18:33	06:45 19:19-19:44/25 20:25	05:48 21:14	05:17 21:51
14	08:34 09:58-11:45/107 16:52	07:52 17:46	06:53 18:35	06:43 19:20-19:43/23 20:27	05:46 21:16	05:17 21:51
15	08:34 11:26-11:43/17 16:53 09:58-11:25/87	07:50 17:48	06:51 18:37	06:41 19:21-19:42/21 20:29	05:44 21:17	05:17 21:52
16	08:33 11:29-11:39/10 16:55 09:59-11:25/86	07:48 17:49	06:49 18:39	06:39 19:22-19:40/18 20:30	05:43 21:19	05:17 21:52
17	08:32 09:59-11:25/86 16:56	07:46 17:51	06:46 18:40	06:37 19:24-19:38/14 20:32	05:41 21:20	05:17 21:53
18	08:31 10:00-11:25/85 16:58	07:44 17:53	06:44 18:42	06:35 19:28-19:34/6 20:34	05:40 21:22	05:17 21:53
19	08:30 10:01-11:25/84 17:00	07:42 17:55	06:42 18:44	06:33 20:35	05:39 21:23	05:17 21:54
20	08:29 10:01-11:24/83 17:01	07:40 17:57	06:39 18:45	06:31 20:37	05:37 21:25	05:17 05:49-05:50/1 21:54
21	08:28 10:02-11:24/82 17:03	07:38 17:58	06:37 18:47	06:28 20:39	05:36 21:26	05:17 05:49-05:50/1 21:54
22	08:27 10:02-11:23/81 17:05	07:36 18:00	06:35 18:49	06:26 20:40	05:35 21:28	05:17 05:49-05:50/1 21:54
23	08:26 10:03-11:22/79 17:06	07:34 18:02	06:33 18:50	06:24 20:42	05:33 21:29	05:17 21:55
24	08:25 10:04-11:21/77 17:08	07:32 18:04	06:30 18:52	06:22 20:44	05:32 21:30	05:18 21:55
25	08:23 10:04-11:19/75 17:10	07:30 18:06	06:28 18:29-18:30/1 18:54	06:20 20:45	05:31 21:32	05:18 21:55
26	08:22 10:49-11:18/29 17:11 10:05-10:48/43	07:28 18:07	07:26 19:25-19:32/7 19:55	06:18 20:47	05:30 21:33	05:18 21:55
27	08:21 10:51-11:15/24 17:13 10:06-10:47/41	07:26 18:09	07:24 19:23-19:34/11 19:57	06:16 20:49	05:29 21:34	05:19 21:55
28	08:19 10:54-11:13/19 17:15 10:07-10:47/40	07:24 18:11	07:21 19:21-19:35/14 19:59	06:14 20:50	05:28 21:35	05:19 21:55
29	08:18 10:57-11:08/11 17:17 10:08-10:46/38		07:19 19:20-19:37/17 20:00	06:12 20:52	05:27 21:37	05:20 21:55
30	08:17 10:10-10:45/35 17:18		07:17 19:20-19:39/19 20:02	06:10 20:54	05:26 21:38	05:20 21:54
31	08:15 10:11-10:43/32 17:20		07:14 19:19-19:41/22 20:04		05:25 21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	3140	91	91	436	0	3

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT05 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (488)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21 21:54	05:56 21:24	06:45 19:18-19:45/27 20:23	07:33 19:14	07:25 17:09	08:15 11:31-11:38/7 16:30 09:39-11:30/111
2	05:22 21:54	05:58 21:22	06:47 19:16-19:45/29 20:21	07:34 19:12	07:27 17:08	08:17 09:40-11:44/124 16:29
3	05:22 21:54	05:59 21:20	06:48 19:16-19:45/29 20:18	07:36 19:10	07:29 17:06	08:18 09:40-11:46/126 16:29
4	05:23 21:53	06:01 21:19	06:50 19:15-19:44/29 20:16	07:38 19:08	07:31 17:04	08:19 09:40-11:48/128 16:28
5	05:24 21:53	06:02 21:17	06:51 19:16-19:44/28 20:14	07:39 19:05	07:32 17:02	08:21 13:49-13:56/7 16:28 09:41-11:50/129
6	05:25 21:52	06:04 21:15	06:53 19:15-19:43/28 20:12	07:41 19:03	07:34 17:01	08:22 13:47-13:59/12 16:27 09:41-11:52/131
7	05:26 21:52	06:06 21:13	06:54 19:15-19:43/28 20:09	07:43 19:01	07:36 09:51-10:02/11 16:59	08:23 13:45-14:00/15 16:27 09:41-11:53/132
8	05:26 21:51	06:07 21:12	06:56 19:14-19:41/27 20:07	07:44 20:07	07:38 09:48-10:07/19 16:57	08:25 13:44-14:03/19 16:26 09:42-11:55/133
9	05:27 21:50	06:09 21:10	06:58 19:13-19:40/27 20:05	07:46 18:57	07:39 09:46-10:10/24 16:56	08:26 13:43-14:04/21 16:26 09:43-11:56/133
10	05:28 21:50	06:10 21:08	06:59 19:12-19:38/26 20:03	07:48 18:54	07:41 09:44-10:12/28 16:54	08:27 13:43-14:05/22 16:26 09:43-11:56/133
11	05:29 21:49	06:12 21:06	07:01 19:11-19:36/25 20:00	07:49 18:52	07:43 09:43-10:15/32 16:53	08:28 13:42-14:06/24 16:26 09:43-11:57/134
12	05:30 21:48	06:13 21:04	07:02 19:10-19:33/23 19:58	07:51 18:50	07:45 09:42-10:16/34 16:51	08:29 13:42-14:07/25 16:26 09:44-11:58/134
13	05:31 21:47	06:15 21:02	07:04 19:11-19:31/20 19:56	07:53 18:48	07:46 10:33-10:38/5 16:50 09:41-10:18/37	08:30 13:42-14:08/26 16:26 09:44-11:59/135
14	05:33 21:46	06:16 21:00	07:06 19:10-19:28/18 19:53	07:54 18:46	07:48 10:27-10:43/16 16:48 09:39-10:18/39	08:31 13:42-14:09/27 16:26 09:45-12:00/135
15	05:34 21:46	06:18 20:58	07:07 19:11-19:26/15 19:51	07:56 18:43	07:50 10:24-10:47/23 16:47 09:39-10:20/41	08:32 13:42-14:10/28 16:26 09:45-12:01/136
16	05:35 21:45	06:20 20:56	07:09 19:12-19:25/13 19:49	07:58 18:41	07:52 10:22-10:50/28 16:45 09:38-10:21/43	08:33 13:42-14:10/28 16:26 09:46-12:01/135
17	05:36 21:44	06:21 20:55	07:10 19:12-19:22/10 19:47	07:59 18:39	07:53 09:38-10:52/74 16:44	08:33 13:43-14:11/28 16:26 09:47-12:02/135
18	05:37 21:42	06:23 20:52	07:12 19:14-19:20/6 19:44	08:01 18:37	07:55 09:38-10:54/76 16:43	08:34 13:42-14:11/29 16:26 09:48-12:02/134
19	05:38 21:41	06:24 20:50	07:14 19:42	08:03 18:35	07:57 09:38-10:56/78 16:41	08:35 13:43-14:12/29 16:26 09:47-12:03/136
20	05:40 21:40	06:26 20:48	07:15 19:40	08:04 18:33	07:58 09:38-10:58/80 16:40	08:36 13:43-14:13/30 16:27 09:48-12:04/136
21	05:41 21:39	06:28 20:46	07:17 19:37	08:06 18:31	08:00 09:37-10:58/81 16:39	08:36 13:43-14:13/30 16:27 09:48-12:04/136
22	05:42 21:38	06:29 20:44	07:18 19:35	08:08 18:29	08:02 09:37-11:00/83 16:38	08:37 13:44-14:14/30 16:28 09:49-12:05/136
23	05:44 21:37	06:31 20:42	07:20 19:33	08:10 18:27	08:03 09:37-11:01/84 16:37	08:37 13:44-14:14/30 16:28 09:49-12:05/136
24	05:45 21:35	06:32 20:40	07:22 19:30	08:11 18:25	08:05 09:38-11:02/84 16:36	08:38 13:45-14:15/30 16:29 09:50-12:06/136
25	05:46 21:34	06:34 20:38	07:23 19:28	08:13 18:23	08:06 09:37-11:02/85 16:35	08:38 13:46-14:15/29 16:29 09:50-12:06/136
26	05:48 21:33	06:35 19:28-19:40/12 20:36	07:25 19:26	08:15 18:21	08:08 11:12-11:14/2 16:34 09:38-11:04/86	08:38 13:46-14:15/29 16:30 09:51-12:06/135
27	05:49 21:31	06:37 19:25-19:41/16 20:34	07:26 19:24	08:17 18:19	08:09 11:07-11:21/14 16:33 09:38-11:05/87	08:39 13:47-14:15/28 16:31 09:51-12:06/135
28	05:51 21:30	06:39 19:23-19:43/20 20:32	07:28 19:21	08:18 18:17	08:11 09:38-11:24/106 16:32	08:39 13:47-14:15/28 16:31 09:51-12:06/135
29	05:52 21:28	06:40 19:21-19:43/22 20:29	07:30 19:19	08:20 17:15	08:12 09:38-11:27/109 16:31	08:39 13:49-14:17/28 16:32 09:52-12:08/136
30	05:54 21:27	06:42 19:20-19:45/25 20:27	07:31 19:17	08:22 17:13	08:14 09:38-11:28/110 16:31	08:39 13:50-14:17/27 16:33 09:53-12:08/135
31	05:55 21:25	06:43 19:18-19:44/26 20:25		07:24 17:11		08:39 13:50-14:16/26 16:34 09:52-12:07/135
Potential sun hours	500	453	381	333	269	247
Sum of minutes with flicker	0	121	408	0	1619	4813

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT06 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (487)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 09:28-10:37/69 16:35	08:14 17:22	07:22 18:13	07:12 18:42-18:45/3 20:05	06:09 20:55	05:24 21:40
2	08:39 09:29-10:37/68 16:36	08:12 17:24	07:19 18:14	07:10 20:07	06:07 20:57	05:23 21:41
3	08:39 09:29-10:36/67 16:37	08:11 17:26	07:17 18:16	07:08 20:09	06:05 20:58	05:23 21:42
4	08:39 10:26-10:35/9 16:39 09:29-10:24/55	08:09 17:27	07:15 18:18	07:05 20:10	06:03 21:00	05:22 21:43
5	08:39 10:29-10:33/4 16:40 09:30-10:25/55	08:08 17:29	07:13 18:20	07:03 20:12	06:01 21:02	05:21 21:44
6	08:38 09:31-10:25/54 16:41	08:06 17:31	07:11 18:21	07:01 20:14	05:59 21:03	05:20 21:45
7	08:38 09:31-10:25/54 16:42	08:04 17:33	07:09 18:23	06:59 20:15	05:58 21:05	05:20 21:46
8	08:38 09:32-10:26/54 16:43	08:03 17:35	07:06 17:46-17:53/7 18:25 17:56-18:00/4	06:56 20:17	05:56 21:07	05:19 21:47
9	08:37 09:32-10:25/53 16:45	08:01 17:37	07:04 17:41-18:03/22 18:27	06:54 20:19	05:54 21:08	05:19 21:48
10	08:37 09:32-10:25/53 16:46	07:59 17:38	07:02 17:39-18:05/26 18:28	06:52 20:20	05:52 21:10	05:18 21:49
11	08:36 09:33-10:26/53 16:47	07:57 17:40	07:00 17:36-18:06/30 18:30	06:50 20:22	05:51 21:11	05:18 21:49
12	08:36 09:33-10:25/52 16:49	07:55 17:42	06:58 17:34-18:08/34 18:32	06:48 20:24	05:49 21:13	05:18 21:50
13	08:35 09:34-10:25/51 16:50	07:54 17:44	06:55 17:33-18:10/37 18:33	06:45 20:25	05:48 21:14	05:17 21:51
14	08:34 09:34-10:24/50 16:52	07:52 17:46	06:53 17:32-18:10/38 18:35	06:43 20:27	05:46 21:16	05:17 21:51
15	08:33 09:35-10:23/48 16:53	07:50 17:47	06:51 17:30-18:10/40 18:37	06:41 20:29	05:44 21:17	05:17 21:52
16	08:33 09:35-10:23/48 16:55	07:48 17:49	06:49 17:30-18:10/40 18:39	06:39 20:30	05:43 21:19	05:17 21:52
17	08:32 09:36-10:21/45 16:56	07:46 17:51	06:46 17:29-18:10/41 18:40	06:37 20:32	05:41 21:20	05:17 21:53
18	08:31 09:37-10:20/43 16:58	07:44 17:53	06:44 17:28-18:09/41 18:42	06:35 20:34	05:40 21:22	05:17 21:53
19	08:30 10:08-10:18/10 17:00 09:38-10:06/28	07:42 17:55	06:42 17:28-18:09/41 18:44	06:33 20:35	05:39 21:23	05:17 21:54
20	08:29 09:39-10:06/27 17:01	07:40 17:57	06:39 17:28-18:08/40 18:45	06:31 20:37	05:37 21:25	05:17 21:54
21	08:28 09:40-10:05/25 17:03	07:38 17:58	06:37 17:27-18:06/39 18:47	06:28 20:39	05:36 21:26	05:17 21:54
22	08:27 09:41-10:04/23 17:05	07:36 18:00	06:35 17:27-18:05/38 18:49	06:26 20:40	05:35 21:28	05:17 21:54
23	08:26 09:42-10:03/21 17:06	07:34 18:02	06:33 17:28-18:04/36 18:50	06:24 20:42	05:33 21:29	05:17 21:55
24	08:25 09:44-10:02/18 17:08	07:32 18:04	06:30 17:28-18:04/36 18:52	06:22 20:44	05:32 21:30	05:18 21:55
25	08:23 09:46-10:00/14 17:10	07:30 18:06	06:28 17:28-18:02/34 18:54	06:20 20:45	05:31 21:32	05:18 21:55
26	08:22 09:49-09:57/8 17:11	07:28 18:07	06:26 18:29-19:01/32 19:55	06:18 20:47	05:30 21:33	05:18 21:55
27	08:21 17:13	07:26 18:09	07:24 18:30-19:00/30 19:57	06:16 20:49	05:29 21:34	05:19 21:55
28	08:19 17:15	07:24 18:11	07:21 18:30-18:58/28 19:59	06:14 20:50	05:28 21:35	05:19 21:55
29	08:18 17:17		07:19 18:32-18:56/24 20:00	06:12 20:52	05:27 21:37	05:20 21:55
30	08:17 17:18		07:17 18:34-18:55/21 20:02	06:10 20:54	05:26 21:38	05:20 21:54
31	08:15 17:20		07:14 18:37-18:52/15 20:04		05:25 21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	1159	0	774	3	0	0

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 WTG: WT06 - Siemens SWT-3.15-142 3150 142.0 !OI hub: 140,0 m (TOT: 211,0 m) (487)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21 21:54	05:56 21:23	06:45 20:23	07:33 19:14	18:12-18:49/37 17:09	08:15 16:30
2	05:22 21:54	05:58 21:22	06:47 20:21	07:34 19:12	18:13-18:47/34 17:08	08:17 16:29
3	05:22 21:54	05:59 21:20	06:48 20:18	07:36 19:10	18:15-18:45/30 17:06	08:18 16:29
4	05:23 21:53	06:01 21:19	06:50 20:16	07:38 19:08	18:16-18:42/26 17:04	08:19 16:28
5	05:24 21:53	06:02 21:17	06:51 20:14	07:39 19:05	18:18-18:40/22 17:02	08:21 16:28
6	05:25 21:52	06:04 21:15	06:53 20:12	07:41 19:03	18:23-18:30/7 18:34-18:36/2 17:01	08:22 16:27
7	05:26 21:52	06:06 21:13	06:54 20:09	07:43 19:01	07:36 16:59	08:23 16:27
8	05:26 21:51	06:07 21:12	06:56 20:07	07:44 18:59	07:38 16:57	08:24 16:26
9	05:27 21:50	06:09 21:10	06:58 20:05	07:46 18:56	07:39 16:56	08:26 16:26
10	05:28 21:50	06:10 21:08	06:59 20:03	07:48 18:54	07:41 16:54	08:27 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	07:49 18:52	07:43 16:53	08:28 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	18:31-18:40/9 18:50	07:51 16:51	08:29 16:26
13	05:31 21:47	06:15 21:02	07:04 19:56	18:27-18:44/17 18:48	07:53 16:50	08:30 16:26
14	05:33 21:46	06:16 21:00	07:06 19:53	18:24-18:46/22 18:46	07:54 16:48	08:31 16:26
15	05:34 21:45	06:18 20:58	07:07 19:51	18:22-18:47/25 18:43	07:56 16:47	08:32 16:26
16	05:35 21:45	06:20 20:56	07:09 19:49	18:20-18:49/29 18:41	07:58 16:45	08:33 16:26
17	05:36 21:44	06:21 20:54	07:10 19:47	18:18-18:49/31 18:39	07:53 16:44	08:33 16:26
18	05:37 21:42	06:23 20:52	07:12 19:44	18:17-18:50/33 18:37	07:55 16:43	08:34 16:26
19	05:38 21:41	06:24 20:50	07:14 19:42	18:15-18:50/35 18:35	07:57 16:41	08:35 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	18:14-18:51/37 18:33	07:58 16:40	08:36 16:27
21	05:41 21:39	06:27 20:46	07:17 19:37	18:13-18:50/37 18:31	08:00 16:39	08:36 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	18:13-18:51/38 18:29	08:02 16:38	08:37 16:28
23	05:44 21:37	06:31 20:42	07:20 19:33	18:12-18:52/40 18:27	08:03 16:37	08:37 16:28
24	05:45 21:35	06:32 20:40	07:22 19:30	18:11-18:52/41 18:25	08:05 16:36	08:38 16:29
25	05:46 21:34	06:34 20:38	07:23 19:28	18:11-18:52/41 18:23	08:06 16:35	08:38 16:29
26	05:48 21:32	06:35 20:36	07:25 19:26	18:11-18:52/41 18:21	08:08 16:34	08:38 16:30
27	05:49 21:31	06:37 20:34	07:26 19:24	18:11-18:52/41 18:19	08:09 16:33	08:39 16:31
28	05:51 21:30	06:39 20:32	07:28 19:21	18:11-18:52/41 18:17	08:11 16:32	08:39 16:31
29	05:52 21:28	06:40 20:29	07:30 19:19	18:11-18:51/40 17:15	08:12 16:31	08:39 16:32
30	05:54 21:27	06:42 20:27	07:31 19:17	18:12-18:50/38 17:13	08:14 16:31	08:39 16:33
31	05:55 21:25	06:43 20:25		07:24 17:11		08:39 16:34
Potential sun hours	500	453	381	333	269	247
Sum of minutes with flicker	0	0	636	158	484	2060

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT07 - SENVION 3.2M122 NES 3200 122.0 !OI hub: 140,0 m (TOT: 201,0 m) (486)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 14:19-15:06/47 16:35	08:14 15:53-16:25/32 17:22	07:22 18:13	07:12 20:05	06:08 06:35-07:00/25 20:55	05:24 21:40
2	08:39 14:20-15:07/47 16:36	08:12 15:53-16:24/31 17:24	07:19 18:14	07:10 20:07	06:07 06:33-07:00/27 20:57	05:23 21:41
3	08:39 14:21-15:07/46 16:37	08:11 15:53-16:23/30 17:26	07:17 18:16	07:08 20:09	06:05 06:32-07:00/28 20:58	05:22 21:42
4	08:39 14:20-15:07/47 16:39	08:09 15:55-16:24/29 17:27	07:15 18:18	07:05 20:10	06:03 06:31-06:59/28 21:00	05:22 21:43
5	08:39 14:21-15:08/47 16:40	08:07 15:56-16:23/27 17:29	07:13 18:20	07:03 20:12	06:01 06:31-07:00/29 21:02	05:21 21:44
6	08:38 14:22-15:09/47 16:41	08:06 15:56-16:22/26 17:31	07:11 18:21	07:01 20:14	05:59 06:30-06:59/29 21:03	05:20 21:45
7	08:38 14:22-15:09/47 16:42	08:04 15:58-16:21/23 17:33	07:09 18:23	06:59 20:15	05:58 06:29-06:58/29 21:05	05:20 21:46
8	08:38 14:22-15:09/47 16:43	08:02 15:59-16:19/20 17:35	07:06 18:25	06:56 20:17	05:56 06:29-06:58/29 21:06	05:19 21:47
9	08:37 14:23-15:10/47 16:45	08:01 16:02-16:19/17 17:37	07:04 18:27	06:54 20:19	05:54 06:29-06:57/28 21:08	05:19 21:48
10	08:37 14:23-15:10/47 16:46	07:59 16:05-16:16/11 17:38	07:02 18:28	06:52 20:20	05:52 06:30-06:57/27 21:10	05:18 21:49
11	08:36 14:24-15:10/46 16:47	07:57 17:40	07:00 18:30	06:50 20:22	05:51 06:29-06:55/26 21:11	05:18 21:49
12	08:36 14:25-15:11/46 16:49	07:55 17:42	06:57 18:32	06:48 20:24	05:49 06:29-06:54/25 21:13	05:18 21:50
13	08:35 14:25-15:11/46 16:50	07:54 17:44	06:55 18:33	06:45 20:25	05:48 06:30-06:52/22 21:14	05:17 21:51
14	08:34 14:26-15:11/45 16:52	07:52 17:46	06:53 18:35	06:43 20:27	05:46 06:31-06:52/21 21:16	05:17 21:51
15	08:33 14:26-15:11/45 16:53	07:50 17:47	06:51 18:37	06:41 20:29	05:44 06:31-06:51/20 21:17	05:17 21:52
16	08:33 14:27-15:11/44 16:55	07:48 17:49	06:48 18:39	06:39 20:30	05:43 06:32-06:50/18 21:19	05:17 21:52
17	08:32 14:28-15:11/43 16:56	07:46 17:51	06:46 18:40	06:37 20:32	05:41 06:33-06:49/16 21:20	05:17 21:53
18	08:31 14:28-15:11/43 16:58	07:44 17:53	06:44 18:42	06:35 20:34	05:40 06:34-06:47/13 21:22	05:17 21:53
19	08:30 14:29-15:11/42 17:00	07:42 17:55	06:42 18:44	06:33 20:35	05:39 06:35-06:46/11 21:23	05:17 21:54
20	08:29 14:30-15:11/41 17:01	07:40 17:57	06:39 18:45	06:30 20:37	05:37 06:38-06:44/6 21:25	05:17 21:54
21	08:28 14:30-15:10/40 17:03	07:38 17:58	06:37 18:47	06:28 20:39	05:36 21:26	05:17 21:54
22	08:27 14:32-15:10/38 17:05	07:36 18:00	06:35 18:49	06:26 20:40	05:35 21:27	05:17 21:54
23	08:26 14:33-15:10/37 17:06	07:34 18:02	06:33 18:50	06:24 20:42	05:33 21:29	05:17 21:55
24	08:24 14:35-15:10/35 17:08	07:32 18:04	06:30 18:52	06:22 20:44	05:32 21:30	05:18 21:55
25	08:23 14:35-15:09/34 17:10	07:30 18:05	06:28 18:54	06:20 06:47-06:52/5 20:45	05:31 21:32	05:18 21:55
26	08:22 14:37-15:08/31 17:11	07:28 18:07	07:26 19:55	06:18 06:44-06:55/11 20:47	05:30 21:33	05:18 21:55
27	08:21 14:39-15:07/28 17:13	07:26 18:09	07:24 19:57	06:16 06:42-06:57/15 20:49	05:29 21:34	05:19 21:55
28	08:19 14:41-15:06/25 17:15	07:24 18:11	07:21 19:59	06:14 06:40-06:58/18 20:50	05:28 21:35	05:19 21:55
29	08:18 14:44-15:04/20 17:17		07:19 20:00	06:12 06:39-06:58/19 20:52	05:27 21:37	05:20 21:55
30	08:17 14:48-15:02/14 17:18		07:17 20:02	06:10 06:36-06:59/23 20:54	05:26 21:38	05:20 21:54
31	08:15 15:52-16:24/32 17:20		07:14 20:04		05:25 21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	1725	246	0	91	457	0

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT07 - SENVION 3.2M122 NES 3200 122.0 !OI hub: 140,0 m (TOT: 201,0 m) (486)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
 Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:21 21:54	05:56 06:40-07:04/24 21:23	06:45 20:23	07:33 19:14	07:25 15:36-15:44/8 17:09	08:15 14:06-14:52/46 16:30 15:41-15:47/6
2	05:22 21:54	05:58 06:39-07:05/26 21:22	06:47 20:21	07:34 19:12	07:27 15:33-15:47/14 17:08	08:17 14:06-14:52/46 16:29
3	05:22 21:53	05:59 06:40-07:07/27 21:20	06:48 20:18	07:36 19:10	07:29 15:29-15:48/19 17:06	08:18 14:07-14:53/46 16:29
4	05:23 21:53	06:01 06:39-07:07/28 21:19	06:50 20:16	07:38 19:08	07:31 15:28-15:50/22 17:04	08:19 14:07-14:53/46 16:28
5	05:24 21:53	06:02 06:39-07:07/28 21:17	06:51 20:14	07:39 19:05	07:32 15:26-15:51/25 17:02	08:21 14:08-14:54/46 16:27
6	05:25 21:52	06:04 06:39-07:08/29 21:15	06:53 20:12	07:41 19:03	07:34 15:25-15:52/27 17:01	08:22 14:08-14:54/46 16:27
7	05:26 21:52	06:06 06:39-07:08/29 21:13	06:54 20:09	07:43 19:01	07:36 15:25-15:53/28 16:59	08:23 14:08-14:55/47 16:27
8	05:26 21:51	06:07 06:40-07:09/29 21:12	06:56 20:07	07:44 18:59	07:38 15:24-15:54/30 16:57	08:24 14:09-14:56/47 16:26
9	05:27 21:50	06:09 06:40-07:08/28 21:10	06:58 20:05	07:46 18:56	07:39 15:24-15:55/31 16:56	08:26 14:09-14:56/47 16:26
10	05:28 21:50	06:10 06:41-07:09/28 21:08	06:59 20:03	07:48 18:54	07:41 15:24-15:55/31 16:54	08:27 14:09-14:56/47 16:26
11	05:29 21:49	06:12 06:41-07:08/27 21:06	07:01 20:00	07:49 18:52	07:43 15:24-15:56/32 16:53	08:28 14:10-14:56/46 16:26
12	05:30 21:48	06:13 06:43-07:08/25 21:04	07:02 19:58	07:51 18:50	07:45 14:21-14:32/11 16:51	08:29 14:10-14:57/47 16:26
13	05:31 21:47	06:15 06:44-07:07/23 21:02	07:04 19:56	07:53 18:48	07:46 14:17-14:34/17 16:50	08:30 14:11-14:57/46 16:25
14	05:33 21:46	06:16 06:47-07:07/20 21:00	07:06 19:53	07:54 18:46	07:48 14:14-14:37/23 16:48	08:31 14:11-14:58/47 16:25
15	05:34 21:45	06:18 06:47-07:05/18 20:58	07:07 19:51	07:56 18:43	07:50 14:12-14:39/27 16:47	08:32 14:12-14:58/46 16:26
16	05:35 21:44	06:20 06:49-07:04/15 20:56	07:09 19:49	07:58 18:41	07:51 14:11-14:40/29 16:45	08:33 14:12-14:59/47 16:26
17	05:36 21:43	06:21 06:50-07:02/12 20:54	07:10 19:47	07:59 18:39	07:53 14:10-14:42/32 16:44	08:33 14:13-14:59/46 16:26
18	05:37 21:42	06:23 06:53-07:00/7 20:52	07:12 19:44	08:01 18:37	07:55 14:09-14:43/34 16:43	08:34 14:13-14:59/46 16:26
19	05:38 21:41	06:24 20:50	07:13 19:42	08:03 18:35	07:57 14:08-14:44/36 16:41	08:35 14:14-15:00/46 16:26
20	05:40 21:40	06:26 20:48	07:15 19:40	08:04 18:33	07:58 14:07-14:45/38 16:40	08:36 14:14-15:01/47 16:27
21	05:41 21:39	06:27 20:46	07:17 19:37	08:06 18:31	08:00 14:06-14:46/40 16:39	08:36 14:14-15:01/47 16:27
22	05:42 21:38	06:29 20:44	07:18 19:35	08:08 18:29	08:01 14:06-14:47/41 16:38	08:37 14:15-15:02/47 16:28
23	05:44 21:36	06:31 20:42	07:20 19:33	08:10 18:27	08:03 14:06-14:48/42 16:37	08:37 14:15-15:02/47 16:28
24	05:45 06:48-06:54/6 21:35	06:32 20:40	07:21 19:30	08:11 18:25	08:05 14:06-14:49/43 16:36	08:38 14:16-15:03/47 16:29
25	05:46 06:45-06:56/11 21:34	06:34 20:38	07:23 19:28	08:13 18:23	08:06 14:05-14:48/43 16:35	08:38 14:17-15:03/46 16:29
26	05:48 06:45-06:58/13 21:32	06:35 20:36	07:25 19:26	08:15 18:21	08:08 14:06-14:49/43 16:34	08:38 14:17-15:03/46 16:30
27	05:49 06:43-06:59/16 21:31	06:37 20:34	07:26 19:24	08:17 18:19	08:09 14:06-14:50/44 16:33	08:39 14:17-15:03/46 16:31
28	05:51 06:42-07:00/18 21:30	06:39 20:31	07:28 19:21	08:18 18:17	08:11 14:05-14:50/45 16:32	08:39 14:17-15:04/47 16:31
29	05:52 06:42-07:02/20 21:28	06:40 20:29	07:30 19:19	08:20 17:15	08:12 14:06-14:51/45 16:31	08:39 14:18-15:04/46 16:32
30	05:54 06:41-07:02/21 21:27	06:42 20:27	07:31 19:17	08:22 17:13	08:14 14:06-14:51/45 16:31	08:39 14:18-15:05/47 16:33
31	05:55 06:40-07:02/22 21:25	06:43 20:25	 17:11	 07:24	 16:31	08:39 14:19-15:05/46 16:34
Potential sun hours	500	453	381	333	269	247
Sum of minutes with flicker	127	423	0	0	1436	1446

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT08 - SENVION 3.2M122 NES 3200 122.0 !OI hub: 140,0 m (TOT: 201,0 m) (491)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:39 14:34-15:01/27 16:35	08:14 07:22 17:22 18:13	07:12 06:08 20:05 20:55	05:24 05:21 21:40 21:54	05:26 05:23 21:23 21:23	06:45 07:33 19:14 17:09	07:25 08:15 16:30 16:30	14:31-14:38/7				
2	08:39 14:35-15:01/26 16:36	08:12 07:19 17:24 18:14	07:10 06:05 20:07 20:57	05:23 05:21 21:41 21:54	05:22 05:22 21:22 21:22	06:47 07:36 19:12 17:08	07:27 08:17 16:29 16:29	14:29-14:40/11				
3	08:39 14:36-15:01/25 16:37	08:11 07:17 17:26 18:16	07:08 06:05 20:09 20:58	05:22 05:22 21:42 21:53	05:22 05:20 21:20 21:20	06:48 07:36 19:10 17:06	07:29 08:18 16:29 16:29	14:28-14:43/15				
4	08:39 14:37-15:01/24 16:39	08:09 07:15 17:27 18:18	07:05 06:03 20:10 21:00	05:22 05:23 21:43 21:53	06:01 06:50 21:18 20:16	07:38 07:31 19:08 17:04	07:31 08:19 16:28 16:28	14:27-14:44/17				
5	08:39 14:38-15:01/23 16:40	08:07 07:13 17:29 18:20	07:03 06:01 20:12 21:02	05:21 05:24 21:44 21:53	06:02 06:51 21:17 20:14	07:39 07:32 19:05 17:02	07:32 08:21 16:27 16:27	14:26-14:46/20				
6	08:38 14:40-15:01/21 16:41	08:06 07:11 17:31 18:21	07:01 06:59 20:14 21:03	05:20 05:25 21:45 21:52	06:04 06:54 21:15 20:12	07:41 07:34 19:03 17:01	07:34 08:22 16:27 16:27	14:26-14:46/20				
7	08:38 14:40-15:01/21 16:42	08:04 07:09 17:33 18:23	07:09 06:59 20:15 21:05	05:20 05:26 21:46 21:52	06:06 06:56 21:13 20:09	07:43 07:36 19:01 16:59	07:36 08:23 16:27 16:27	14:25-14:47/22				
8	08:38 14:41-15:00/19 16:43	08:02 07:06 17:35 18:25	07:06 06:56 20:17 21:06	05:26 05:56 21:47 21:51	06:07 06:56 21:12 20:07	07:44 07:38 18:59 16:57	07:38 08:24 16:26 16:26	14:26-14:49/23				
9	08:37 14:44-15:00/16 16:45	08:01 07:04 17:37 18:27	07:04 06:54 20:19 21:08	05:19 05:48 21:48 21:50	06:09 06:58 21:10 20:05	07:46 07:39 18:56 16:56	07:39 08:26 16:26 16:26	14:25-14:50/25				
10	08:37 14:45-14:59/14 16:46	07:59 07:02 17:38 18:28	06:52 06:43 20:20 21:10	05:18 05:28 21:49 21:50	06:10 06:59 21:08 20:03	07:48 07:41 18:54 16:54	07:41 08:27 16:26 16:26	14:25-14:50/25				
11	08:36 14:47-14:57/10 16:47	07:57 07:00 17:40 18:30	06:50 06:41 20:22 21:11	05:18 05:29 21:49 21:49	06:12 07:01 21:06 20:00	07:49 07:43 18:52 16:53	07:43 08:28 16:26 16:26	14:25-14:51/26				
12	08:36 14:52-14:55/3 16:49	07:55 06:57 17:42 18:32	06:48 06:39 20:24 21:13	05:18 05:30 21:50 21:48	06:13 07:02 21:04 19:58	07:51 07:45 18:50 16:51	07:45 08:29 16:26 16:26	14:25-14:51/26				
13	08:35 16:50 08:34	07:54 17:44 07:52 17:46	06:55 18:33 06:53 18:35	06:45 20:25 06:43 20:27	05:48 21:14 05:46 21:16	05:17 21:51 05:33 21:46	06:15 21:47 06:16 21:00	07:04 19:56 07:06 19:53	07:53 18:48 07:54 18:46	07:46 16:50 07:48 16:48	08:31 14:25-14:53/28 16:25	
14	08:34 16:52 08:33	07:52 17:46 07:50 17:47	06:53 18:35 06:51 18:37	06:43 20:27 06:41 20:29	05:44 21:16 05:44 21:17	05:17 21:51 05:34 21:45	06:18 21:00 06:18 20:58	07:07 19:53 07:07 19:51	07:56 18:46 07:56 18:43	07:50 16:48 07:50 16:47	08:32 14:26-14:54/28 16:26	
15	08:33 16:55 08:32	07:48 17:49 07:46 17:51	06:48 18:39 06:46 18:40	06:39 20:30 06:37 20:32	05:43 21:19 05:41 21:20	05:17 21:52 05:36 21:43	06:20 21:44 06:21 21:54	07:09 19:49 07:10 19:59	07:58 18:41 07:59 18:53	07:58 16:45 07:53 16:44	08:33 14:27-14:55/28 16:26	
16	08:32 16:56 08:31	07:46 17:51 07:44 17:53	06:46 18:40 06:44 18:42	06:37 20:32 06:35 20:34	05:41 21:20 05:40 21:22	05:17 21:53 05:37 21:42	06:21 21:43 06:23 20:52	07:10 19:47 07:12 19:44	07:59 18:39 08:01 18:37	07:53 16:44 07:55 16:43	08:34 14:26-14:55/29 16:26	
17	08:31 16:58 08:30	07:44 17:53 07:42 17:55	06:44 18:42 06:42 18:44	06:35 20:34 06:33 20:35	05:40 21:22 05:39 21:23	05:17 21:53 05:38 21:41	06:24 21:48 06:24 20:50	07:13 19:42 07:15 19:42	08:03 18:35 08:04 18:35	07:57 16:41 07:58 16:41	08:35 14:27-14:56/29 16:26	
18	08:29 17:01 08:28	07:40 17:57 07:38 18:45	06:39 18:45 06:37 18:47	06:30 20:37 06:28 20:39	05:37 21:25 05:36 21:26	05:17 21:54 05:41 21:39	06:26 21:40 06:26 20:46	07:15 19:40 07:17 19:37	08:04 18:33 08:06 18:31	07:58 16:40 08:00 16:39	08:36 14:28-14:57/29 16:27	
19	08:27 17:05 08:26	07:36 18:00 07:34 18:03	06:35 18:49 06:33 18:51	06:26 20:40 06:24 20:42	05:35 21:27 05:33 21:29	05:17 21:54 05:44 21:36	06:29 21:38 06:31 21:42	07:18 19:35 07:20 19:33	08:08 18:29 08:10 18:27	08:08 16:38 08:03 16:37	08:37 14:29-14:58/29 16:28	
20	08:26 17:06 08:24	07:34 18:02 07:32 18:04	06:33 18:50 06:30 18:52	06:24 20:42 06:22 20:44	05:33 21:29 05:32 21:30	05:17 21:55 05:45 21:35	06:31 21:46 06:32 21:40	07:20 19:30 07:21 19:30	08:10 18:11 08:11 18:25	08:03 16:36 08:05 16:36	08:37 14:29-14:58/29 16:29	
21	08:24 17:08 08:23	07:32 18:04 07:30 18:05	06:30 18:52 06:28 18:54	06:22 20:44 06:20 20:45	05:32 21:30 05:31 21:31	05:18 21:55 05:46 21:34	06:34 20:38 06:34 20:38	07:23 19:28 07:23 19:28	08:13 18:23 08:13 18:23	08:06 16:35 08:06 16:35	08:38 14:30-14:59/29 16:29	
22	08:22 17:11 08:21	07:28 18:07 07:26 18:09	06:18 19:55 06:16 19:57	05:30 20:47 05:29 20:49	05:18 21:33 05:19 21:34	05:48 21:55 05:49 21:31	06:35 20:36 06:37 20:34	07:25 19:26 07:26 19:24	08:15 18:21 08:17 18:19	08:08 16:34 08:09 16:33	08:38 14:30-14:59/29 16:30	
23	08:21 17:13 08:19	07:26 18:09 07:24 18:11	06:16 19:57 06:14 19:59	05:29 20:49 05:28 20:50	05:19 21:34 05:28 21:35	05:49 21:55 05:51 21:30	06:37 20:34 06:39 20:31	07:26 19:24 07:28 19:21	08:17 18:19 08:18 18:17	08:09 16:33 08:11 16:31	08:39 14:31-14:59/28 16:31	
24	08:19 17:15 08:18	07:24 18:11 07:19 18:11	06:14 19:59 06:12 19:59	06:14 20:50 06:12 20:52	05:28 21:35 05:27 21:37	05:19 21:55 05:52 21:28	06:39 20:31 06:40 20:29	07:28 19:19 07:30 19:19	08:18 17:15 08:20 17:15	08:11 16:31 08:12 16:31	08:39 14:32-15:00/28 16:32	
25	08:17 17:18 08:15	07:17 20:02 07:14 20:04	06:10 20:54 06:08 20:56	05:26 21:38 05:25 21:39	05:20 21:54 05:25 21:25	05:53 21:38 05:55 21:25	06:42 20:27 06:43 20:25	07:31 19:17 07:24 17:11	07:22 17:13 07:24 17:11	08:14 16:30 08:14 16:30	08:39 14:32-15:00/28 16:33	
26	08:15 17:20 Potential sun hours	07:14 20:04 261	06:08 20:54 367	05:25 21:39 415	05:25 21:39 483	05:55 21:25 496	06:43 20:25 499	07:24 17:11 453	07:24 17:11 381	08:14 16:30 333	08:39 14:33-15:00/27 269	16:34
27	Sum of minutes with flicker	229	0	0	0	0	0	0	0	0	0	776

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017 WTG: WT09 - SENVION 3.2M122 NES 3200 122.0 !OI hub: 140,0 m (TOT: 201,0 m) (485)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:39 16:35	08:14 16:16-16:32/16 17:22	07:22 18:13	07:12 20:05	06:08 20:55	05:24 21:40
2	08:39 16:36	08:12 16:18-16:31/13 17:24	07:19 18:14	07:10 20:07	06:07 20:57	05:23 21:41
3	08:39 16:37	08:11 16:20-16:29/9 17:26	07:17 18:16	07:08 20:09	06:05 20:58	05:22 21:00-21:07/7 21:42
4	08:39 16:39	08:09 17:27	07:15 18:18	07:05 20:10	06:03 21:00	05:22 20:59-21:08/9 21:43
5	08:39 16:40	08:07 17:29	07:13 18:20	07:03 20:12	06:01 21:02	05:21 20:58-21:10/12 21:44
6	08:38 16:41	08:06 17:31	07:11 18:21	07:01 20:14	05:59 21:03	05:20 20:57-21:11/14 21:45
7	08:38 16:42	08:04 17:33	07:09 18:23	06:59 20:15	05:58 21:05	05:20 20:57-21:12/15 21:46
8	08:38 16:43	08:02 17:35	07:06 18:25	06:56 20:17	05:56 21:06	05:19 20:56-21:12/16 21:47
9	08:37 16:45	08:01 17:37	07:04 18:27	06:54 20:19	05:54 21:08	05:19 20:56-21:13/17 21:48
10	08:37 16:46	07:59 17:38	07:02 18:28	06:52 20:20	05:52 21:10	05:18 20:57-21:14/17 21:48
11	08:36 16:47	07:57 17:40	07:00 18:30	06:50 20:22	05:51 21:11	05:18 20:56-21:14/18 21:49
12	08:36 16:49	07:55 17:42	06:57 18:32	06:48 20:24	05:49 21:13	05:18 20:56-21:15/19 21:50
13	08:35 16:50	07:54 17:44	06:55 18:33	06:45 20:25	05:48 21:14	05:17 20:56-21:16/20 21:51
14	08:34 16:16-16:21/5 16:52	07:52 17:46	06:53 18:35	06:43 20:27	05:46 21:16	05:17 20:56-21:16/20 21:51
15	08:33 16:14-16:23/9 16:53	07:50 17:47	06:51 18:37	06:41 20:29	05:44 21:17	05:17 20:56-21:17/21 21:52
16	08:33 16:13-16:24/11 16:55	07:48 17:49	06:48 18:06-18:14/8 18:38	06:39 20:30	05:43 21:19	05:17 20:56-21:17/21 21:52
17	08:32 16:12-16:26/14 16:56	07:46 17:51	06:46 18:03-18:17/14 18:40	06:37 20:32	05:41 21:20	05:17 20:57-21:18/21 21:53
18	08:31 16:12-16:28/16 16:58	07:44 17:53	06:44 18:01-18:17/16 18:42	06:35 20:34	05:40 21:22	05:17 20:57-21:18/21 21:53
19	08:30 16:12-16:29/17 17:00	07:42 17:55	06:42 17:59-18:19/20 18:44	06:33 20:35	05:39 21:23	05:17 20:57-21:18/21 21:54
20	08:29 16:12-16:30/18 17:01	07:40 17:56	06:39 17:59-18:19/20 18:45	06:30 20:37	05:37 21:25	05:17 20:57-21:18/21 21:54
21	08:28 16:11-16:30/19 17:03	07:38 17:58	06:37 17:57-18:19/22 18:47	06:28 20:39	05:36 21:26	05:17 20:57-21:18/21 21:54
22	08:27 16:11-16:31/20 17:05	07:36 18:00	06:35 17:57-18:19/22 18:49	06:26 20:40	05:35 21:27	05:17 20:57-21:18/21 21:54
23	08:26 16:11-16:32/21 17:06	07:34 18:02	06:33 17:57-18:19/22 18:50	06:24 20:42	05:33 21:29	05:17 20:57-21:18/21 21:55
24	08:24 16:11-16:32/21 17:08	07:32 18:04	06:30 17:57-18:19/22 18:52	06:22 20:44	05:32 21:30	05:18 20:58-21:19/21 21:55
25	08:23 16:11-16:33/22 17:10	07:30 18:05	06:28 17:57-18:17/20 18:54	06:20 20:45	05:31 21:31	05:18 20:58-21:19/21 21:55
26	08:22 16:12-16:33/21 17:11	07:28 18:07	06:26 18:58-19:16/18 19:55	06:18 20:47	05:30 21:33	05:18 20:58-21:18/20 21:55
27	08:21 16:12-16:33/21 17:13	07:26 18:09	06:23 18:59-19:15/16 19:57	06:16 20:49	05:29 21:34	05:19 20:58-21:19/21 21:55
28	08:19 16:12-16:33/21 17:15	07:24 18:11	06:21 19:00-19:13/13 19:59	06:14 20:50	05:28 21:35	05:19 20:58-21:19/21 21:55
29	08:18 16:13-16:33/20 17:17		06:19 19:03-19:10/7 20:00	06:12 20:52	05:27 21:37	05:20 20:59-21:19/20 21:54
30	08:17 16:14-16:33/19 17:18		07:17 20:02	06:10 20:54	05:26 21:38	05:20 20:59-21:19/20 21:54
31	08:15 16:14-16:32/18 17:20		07:14 20:04		05:25 21:39	
Potential sun hours	261	278	367	415	483	496
Sum of minutes with flicker	313	38	240	0	0	517

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

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

SHADOW - Calendar per WTG

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017WTG: WT09 - SENVION 3.2M122 NES 3200 122.0 !OI hub: 140,0 m (TOT: 201,0 m) (485)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Reference year for calendar

2017

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,68 2,78 3,46 5,13 6,34 5,79 6,11 6,05 4,40 3,49 2,14 1,33

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
365 482 613 427 449 518 650 1.322 1.626 887 623 424 8.387

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

	July	August	September	October	November	December
1	05:21 21:00-21:19/19 21:54	05:56 21:23	06:45 20:23	07:33 19:14	07:25 17:09	08:15 16:30
2	05:22 21:01-21:19/18 21:54	05:58 21:22	06:47 20:20	07:34 19:12	07:27 17:08	08:17 16:29
3	05:22 21:01-21:18/17 21:53	05:59 21:20	06:48 20:18	07:36 19:10	07:29 17:06	08:18 16:29
4	05:23 21:01-21:18/17 21:53	06:01 21:18	06:50 20:16	07:38 19:08	07:31 17:04	08:19 16:28
5	05:24 21:02-21:18/16 21:53	06:02 21:17	06:51 20:14	07:39 19:05	07:32 17:02	08:21 16:27
6	05:25 21:03-21:18/15 21:52	06:04 21:15	06:53 20:12	07:41 19:03	07:34 17:01	08:22 16:27
7	05:26 21:04-21:18/14 21:52	06:05 21:13	06:54 20:09	07:43 19:01	07:36 16:59	08:23 16:27
8	05:26 21:04-21:16/12 21:51	06:07 21:12	06:56 20:07	07:44 18:59	07:38 15:51-15:58/7 16:57	08:24 16:26
9	05:27 21:06-21:15/9 21:50	06:09 21:10	06:58 20:05	07:46 18:56	07:39 15:49-16:01/12 16:56	08:26 16:26
10	05:28 21:08-21:14/6 21:50	06:10 21:08	06:59 20:03	07:47 18:54	07:41 15:48-16:02/14 16:54	08:27 16:26
11	05:29 21:49	06:12 21:06	07:01 20:00	07:49 18:52	07:43 15:47-16:03/16 16:53	08:28 16:26
12	05:30 21:48	06:13 21:04	07:02 19:58	07:51 18:50	07:45 15:46-16:04/18 16:51	08:29 16:26
13	05:31 21:47	06:15 21:02	07:04 19:56	07:53 18:48	07:46 15:45-16:04/19 16:50	08:30 16:25
14	05:33 21:46	06:16 21:00	07:06 19:53	07:54 18:46	07:48 15:44-16:05/21 16:48	08:31 16:25
15	05:34 21:45	06:18 20:58	07:07 18:52-19:01/9 19:51	07:56 18:43	07:50 15:44-16:06/22 16:47	08:32 16:26
16	05:35 21:44	06:20 20:56	07:09 18:49-19:02/13 19:49	07:58 18:41	07:51 15:44-16:06/22 16:45	08:33 16:26
17	05:36 21:43	06:21 20:54	07:10 18:47-19:04/17 19:46	07:59 18:39	07:53 15:45-16:06/21 16:44	08:33 16:26
18	05:37 21:42	06:23 20:52	07:12 18:46-19:05/19 19:44	08:01 18:37	07:55 15:45-16:07/22 16:43	08:34 16:26
19	05:38 21:41	06:24 20:50	07:13 18:44-19:05/21 19:42	08:03 18:35	07:56 15:46-16:07/21 16:41	08:35 16:26
20	05:40 21:40	06:26 20:48	07:15 18:44-19:05/21 19:40	08:04 18:33	07:58 15:45-16:06/21 16:40	08:35 16:27
21	05:41 21:39	06:27 20:46	07:17 18:42-19:05/23 19:37	08:06 18:31	08:00 15:46-16:06/20 16:39	08:36 16:27
22	05:42 21:38	06:29 20:44	07:18 18:43-19:05/22 19:35	08:08 18:29	08:01 15:47-16:06/19 16:38	08:37 16:28
23	05:44 21:36	06:31 20:42	07:20 18:42-19:03/21 19:33	08:10 18:27	08:03 15:48-16:06/18 16:37	08:37 16:28
24	05:45 21:35	06:32 20:40	07:21 18:42-19:03/21 19:30	08:11 18:25	08:05 15:48-16:05/17 16:36	08:38 16:29
25	05:46 21:34	06:34 20:38	07:23 18:43-19:02/19 19:28	08:13 18:23	08:06 15:50-16:05/15 16:35	08:38 16:29
26	05:48 21:32	06:35 20:36	07:25 18:43-19:00/17 19:26	08:15 18:21	08:08 15:51-16:04/13 16:34	08:38 16:30
27	05:49 21:31	06:37 20:34	07:26 18:45-18:58/13 19:24	08:17 18:19	08:09 15:52-16:02/10 16:33	08:39 16:31
28	05:51 21:30	06:39 20:31	07:28 18:47-18:54/7 19:21	08:18 18:17	08:11 15:54-16:01/7 16:32	08:39 16:31
29	05:52 21:28	06:40 20:29	07:29 19:19	08:20 17:15	08:12 16:31	08:39 16:32
30	05:53 21:27	06:42 20:27	07:31 19:17	08:22 17:13	08:14 16:30	08:39 16:33
31	05:55 21:25	06:43 20:25		07:24 17:11		08:39 16:34
Potential sun hours	499	453	381	333	269	247
Sum of minutes with flicker	143	0	243	0	355	0

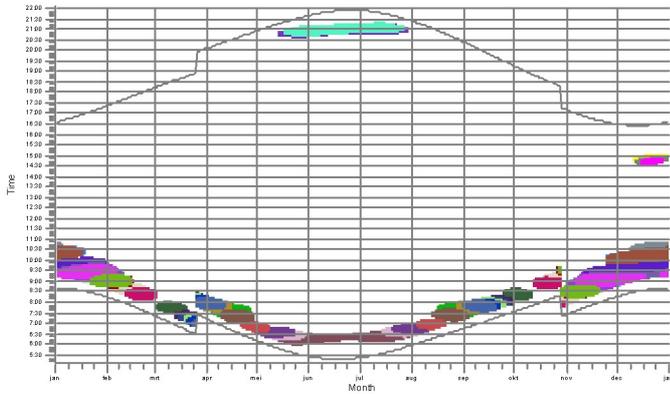
Table layout: For each day in each month the following matrix apply

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

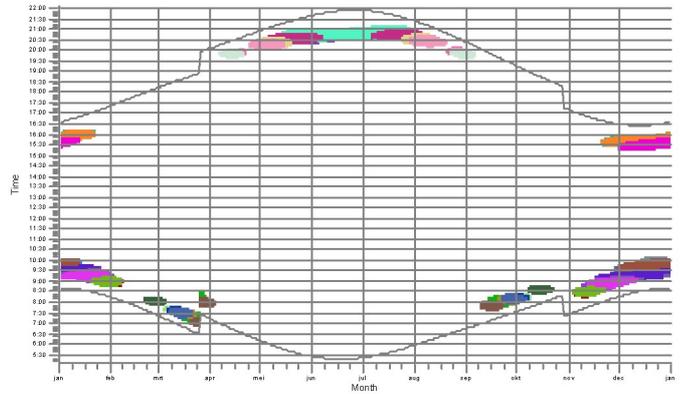
SHADOW - Calendar per WTG, graphical

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

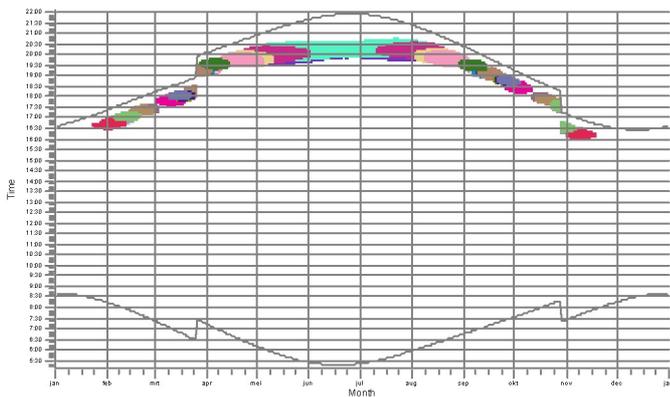
WT01: Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m



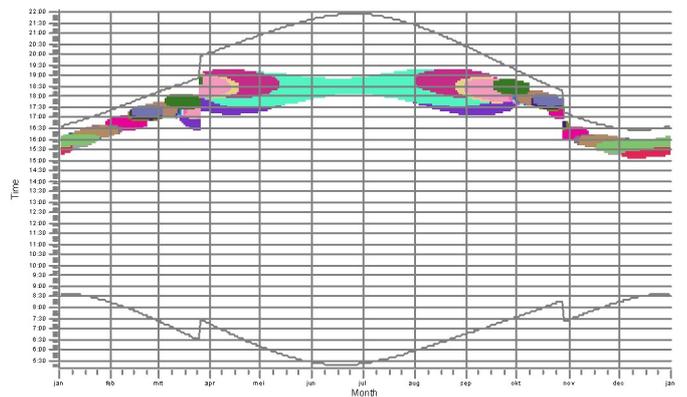
WT02: Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m



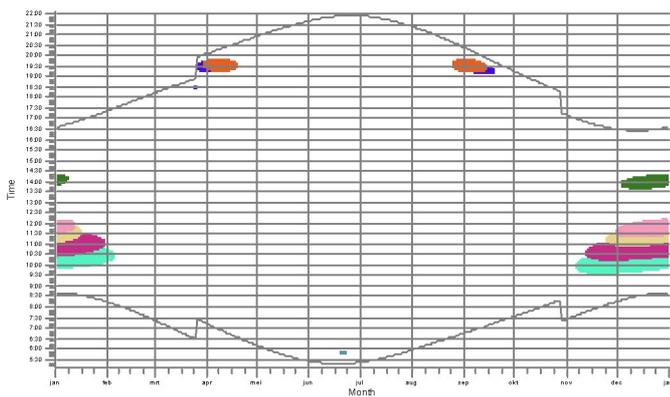
WT03: Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m



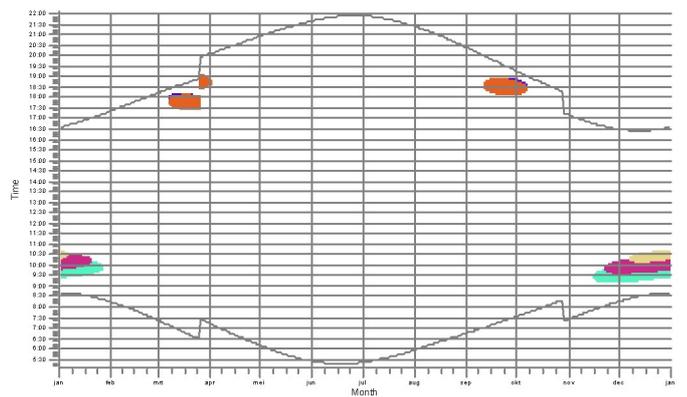
WT04: Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m



WT05: Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m



WT06: Siemens SWT-3.15-142 3150 142.0 !O! hub: 140,0 m



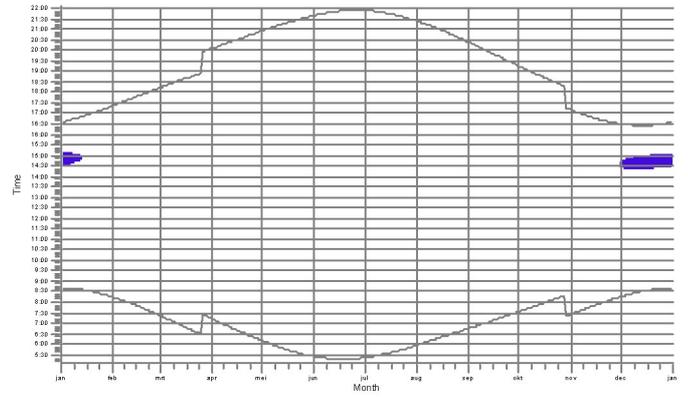
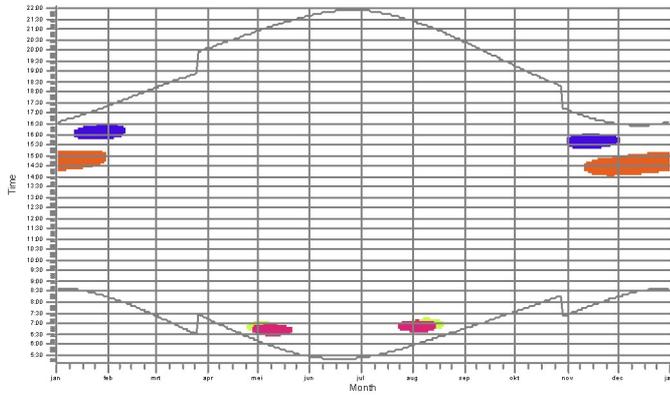
Shadow receptors

1000: Severnsumweg 4	101-3: Severnsumweg 15	115: Grubbenvorstweg 50	151: Heikerkerweg 14	162: Heikerbovenweg 8B	341: Dorpsdijk 16
1001: Severnsumweg 27 (kant Grubbenvorstweg)	1010: Berkler Hsl 2	115a: Grubbenvorstweg 50 (kant Grubbenvorstweg)	152: Heikerkerweg 12	163: Heikerbovenweg 8A	500: Vorstbosweg 38
1001a: Severnsumweg 27	101a: Severnsumweg 15 (kant Grubbenvorstweg)	116: Grubbenvorstweg 53	153: Heikerkerweg 10	164: Heikerbovenweg 8	501: Zeeweg 14
1001b: Severnsumweg 27	102: Severnsumweg 2	117: Heerstraat 1	154: Heikerkerweg 15	165: Heikerbovenweg 4	502: Zeeweg 10
1005: Grubbenvorstweg 49	111: Grubbenvorstweg 57	117a: Heerstraat 1 (kant Grubbenvorstweg)	155: Heikerkerweg 13/13	166: Heikerbovenweg 2a	503: Zeeweg 4
1006: Grubbenvorstweg 47	112: Grubbenvorstweg 62	118: Heerstraat 3	156: Heikerkerweg 9	167: Berkterhsl 1B	504: Dorpsdijk 14
1007: Berkler Hsl 1a	112a: Grubbenvorstweg 62 (kant Grubbenvorstweg)	119: Grubbenvorstweg 48	157: Heikerkerweg 7A	336: Heerstraat 11	505: Vorstbosweg 43
1008: Berkler Hsl 1c	113: Grubbenvorstweg 58	119a: Grubbenvorstweg 48 (kant Grubbenvorstweg)	158: Heikerkerweg 8B	337: Dorpsdijk 9	520: Zonneweid 1-7
1009: Berkler Hsl 1	113a: Grubbenvorstweg 58 (kant Grubbenvorstweg)	120: Berkler Hsl 2	159: Heikerkerweg 5A	338: Dorpsdijk 6	545: De Zaar 2
101-1: Severnsumweg 15	114: Grubbenvorstweg 54	121: Dorpsdijk 20	160: Heikerkerweg 7	239: Dorpsdijk 10	546: De Zaar 2/4
101-2: Severnsumweg 15	114a: Grubbenvorstweg 54 (kant Grubbenvorstweg)	150: Heikerkerweg 16	161: Heikerbovenweg 8	340: Dorpsdijk 12	

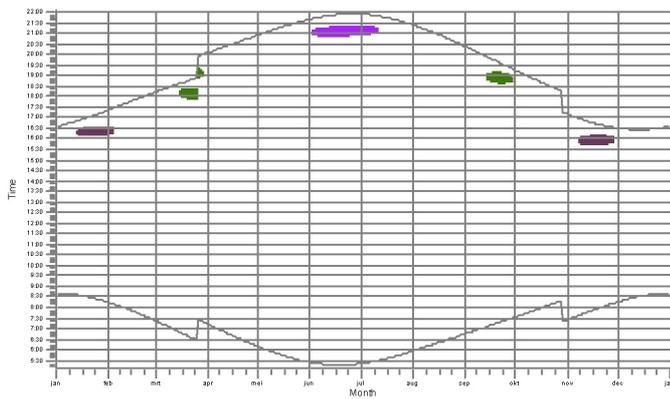
SHADOW - Calendar per WTG, graphical

Calculation: Voorkeursalternatief Windpark Greenport Venlo - juni 2017

WT07: SENVION 3.2M122 NES 3200 122.0 !O! hub: 140,0 m WT08: SENVION 3.2M122 NES 3200 122.0 !O! hub: 140,0 m



WT09: SENVION 3.2M122 NES 3200 122.0 !O! hub: 140,0 m



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