



WINDPARK ROTE ERDE

Schattenwurfberechnung

WindStrom Erneuerbare Energien GmbH & Co. KG

Berichtsnummer: 10537702-A-3-A

Datum: 2025-10-01



WICHTIGER HINWEIS UND HAFTUNGSAUSSCHLUSS

1. Dieses Dokument ist ausschließlich zur Verwendung durch den auf der nächsten Seite dieses Dokuments genannten Kunden bestimmt, an den dieses Dokument gerichtet ist und der eine schriftliche Vereinbarung mit dem DNV-Unternehmen geschlossen hat, das dieses Dokument ausstellt („DNV“). Soweit dies rechtlich zulässig ist, übernehmen weder DNV noch ein anderes Unternehmen der Gruppe (die „Gruppe“) irgendeine Verantwortung, sei es aus Vertrag, unerlaubter Handlung, einschließlich, ohne Einschränkung, Fahrlässigkeit, oder anderweitig, gegenüber Dritten (anderen Personen als dem Kunden), oder sonst eine Haftung, und kein Unternehmen der Gruppe außer DNV haftet für einen wie auch immer gearteten Verlust oder Schäden jeglicher Art, die aufgrund von Handlungen, Unterlassung oder Versäumnissen (unabhängig davon, ob diese durch Fahrlässigkeit oder anderweitig entstanden sind) von DNV, der Gruppe oder einem seiner oder ihrer Mitarbeiter, Subunternehmer oder Vertreter entstehen. Dieses Dokument muss in seiner Gesamtheit betrachtet werden und unterliegt allen darin oder in einer anderen damit verbundenen maßgeblichen Mitteilung zum Ausdruck gebrachten Annahmen und Voraussetzungen. Dieses Dokument kann detaillierte technische Daten enthalten, die nur zur Verwendung durch Personen bestimmt sind, die über das erforderliche Fachwissen in diesem Bereich verfügen.
2. Dieses Dokument ist urheberrechtlich geschützt. Sofern nicht anders schriftlich vereinbart, darf dieses Dokument nicht kopiert, vervielfältigt oder in irgendeiner Form oder mit irgendwelchen Mitteln, ob digital oder anderweitig, übertragen werden, und sein Inhalt ist vom Kunden vertraulich zu behandeln. Kein Teil dieses Dokuments darf ohne die ausdrückliche vorherige schriftliche Zustimmung von DNV in einer öffentlichen Emissionserklärung, einem Prospekt oder einer Börsennotierung, einem Rundbrief oder Bekanntmachung erscheinen. Eine Einstufung in der Dokumentenklassifizierung, die es dem Kunden erlaubt, dieses Dokument weiterzugeben, bedeutet dadurch nicht, dass DNV gegenüber einem anderen Empfänger als dem Kunden in irgendeiner Weise haftbar ist.
3. Dieses Dokument wurde auf der Grundlage von Informationen zu Daten und Fristen erstellt, auf die in diesem Dokument verwiesen wird. Dieses Dokument schließt nicht aus, dass sich Informationen ändern können. Sofern und in dem Maße wie die Kontrolle und Überprüfung von Informationen oder Daten nicht ausdrücklich in dem schriftlich festgehaltenen Leistungsumfang vereinbart wurde, ist DNV weder für vom Kunden oder einem Dritten an DNV gegebene fehlerhafte Informationen oder Daten noch für die Folgen solcher fehlerhafter Informationen oder Daten in irgendeiner Weise verantwortlich, gleichgültig, ob diese Informationen oder Daten in diesem Dokument enthalten sind bzw. darauf verwiesen wird oder nicht.
4. Sämtliche Schätzungen und Vorhersagen unterliegen Faktoren, die nicht alle im Rahmen der Wahrscheinlichkeit liegen, und beinhalten Unsicherheiten, die in diesem Dokument genannt sind bzw. auf die in diesem Dokument verwiesen wird, und nichts in diesem Dokument gewährleistet eine bestimmte Leistung oder ein bestimmtes Ergebnis.

Projektname:	Windpark Rote Erde	DNV Energy Systems
Berichtstitel:	Schattenwurfberechnung	Renewables Northern Europe
Kunde:	WindStrom Erneuerbare Energien GmbH & Co. KG	Department Measurements
	Königsworther Straße 1	DNV Energy Systems
	28832 Achim	Germany GmbH
Kontaktperson:	Herr Thies Junge	Sommerdeich 14b
Auftragsdatum:	2024-11-05	25709 Kaiser-Wilhelm-Koog
Projektnummer:	10537702	Germany
Org-Einheit:	E-NV-MA	Tel: +49 4856 901-0
Berichtsnummer:	10537702-A-3-A	
Berichtsdatum:	2025-10-01	

Anwendbarer Vertrag, für die Bereitstellung dieses Berichts: OPP-00387861-P-1-A

Auftrag:

Schattenwurfberechnung für die Umgebung des geplanten Windenergieparks Rote Erde

Berichtsersteller:

Prüfer:

Freigabe erteilt durch:

M. Sc. Lucia Schröder Antúnez
Project Engineer

Dipl.-Ing. (FH) Jörg Dedert
Principal Engineer

Dipl.-Ing. Klaus Buchmann
Head of Section Acoustics & Power Quality

Copyright © DNV 2025. Alle Rechte vorbehalten. Sofern nicht anders schriftlich vereinbart: (i) Diese Publikation oder Teile davon dürfen nicht in irgendeiner Form oder mit irgendwelchen Mitteln, weder digital noch anderweitig, kopiert, reproduziert oder übertragen werden; (ii) Der Inhalt dieser Publikation ist vom Kunden vertraulich zu behandeln; (iii) kein Dritter darf sich auf ihren Inhalt verlassen; und (iv) DNV übernimmt keine Sorgfaltspflicht gegenüber Dritten. Ein Verweis auf einen Teil dieser Publikation, der zu Fehlinterpretationen führen kann, ist untersagt.

DNV Dokumentenklassifizierung: DNV Confidential

Schlüsselworte:

Windpark Rote Erde, Schattenwurfberechnung

Revision	Datum	Grund der Überarbeitung	Berichtsersteller	Prüfer	Freigabe erteilt durch
A	2025-10-01	Erstausgabe	Lucía Schröder Antúnez	Jörg Dedert	Klaus Buchmann



Dieser Bericht darf auszugsweise nur mit schriftlicher Zustimmung der DNV Energy Systems Germany GmbH vervielfältigt werden. Er umfasst insgesamt 155 Seiten inklusive des Anhangs.

Inhaltsverzeichnis

1	EINLEITUNG	4
2	IMMISSIONSRELEVANTE WINDENERGIEANLAGEN	4
3	IMMISSIONSORTE	5
4	BEURTEILUNGSVERFAHREN	5
5	BERECHNUNG DER ERGEBNISSE	6
5.1	Gesamtbelastung	6
5.2	Vorbelastung	8
5.3	Zusatzbelastung	8
6	PROGNOSEGENAUIGKEIT	10
7	ABSCHLIEßENDE BEURTEILUNG	10
8	ZUSAMMENFASSUNG	11
9	LITERATURVERZEICHNIS	12
10	TABELLENVERZEICHNIS	12
11	ANHANG	12
11.1	Hauptergebnis Vorbelastung	13
11.2	Schattenwurfkarte Vorbelastung, Stunden pro Jahr	16
11.3	Schattenwurfkarte Vorbelastung, Tage pro Jahr	17
11.4	Schattenwurfkarte Vorbelastung, Minuten pro Tag	18
11.5	Hauptergebnis Zusatzbelastung	19
11.6	Schattenwurfkarte Zusatzbelastung, Stunden pro Jahr	22
11.7	Schattenwurfkarte Zusatzbelastung, Detail Ortslage Benthullen, Stunden pro Jahr	23
11.8	Schattenwurfkarte Zusatzbelastung, Detail Ortslage Vehnberg, Stunden pro Jahr	24
11.9	Schattenwurfkarte Zusatzbelastung, Tage pro Jahr	25
11.10	Schattenwurfkarte Zusatzbelastung, Minuten pro Tag	26
11.11	Schattenwurfkarte Zusatzbelastung, Detail Ortslage Benthullen, Minuten pro Tag	27
11.12	Schattenwurfkarte Zusatzbelastung, Detail Ortslage Vehnberg, Minuten pro Tag	28
11.13	Hauptergebnis Gesamtbelastung	29
11.14	Schattenwurfkarte Gesamtbelastung, Stunden pro Jahr	32
11.15	Schattenwurfkarte Gesamtbelastung, Detail Ortslage Benthullen, Stunden pro Jahr	33
11.16	Schattenwurfkarte Gesamtbelastung, Detail Ortslage Vehnberg, Stunden pro Jahr	34
11.17	Schattenwurfkarte Gesamtbelastung, Tage pro Jahr	35
11.18	Schattenwurfkarte Gesamtbelastung, Minuten pro Tag	36
11.19	Schattenwurfkarte Gesamtbelastung, Detail Ortslage Benthullen, Minuten pro Tag	37
11.20	Schattenwurfkarte Gesamtbelastung, Detail Ortslage Vehnberg, Minuten pro Tag	38
11.21	Schattenwurfkalender, grafisch	39
11.22	Schattenwurfkalender, tabellarisch	49

1 EINLEITUNG

Von der WindStrom Erneuerbare Energien GmbH & Co. KG wurde der DNV Energy Systems Germany GmbH (DNV) am 2024-11-05 der Auftrag erteilt, für den geplanten Windenergiepark Rote Erde die Schattenwurfbelastung an den umliegenden Immissionsorten (IO) unter Berücksichtigung aller immissionsrelevanten Windenergieanlagen (WEA) zu berechnen.

Die Arbeiten werden auf Grundlage der ISI-RA-MEA-4620 /4/ des Management Systems der DNV Energy Systems Germany GmbH durchgeführt.

2 IMMISSIONSRELEVANTE WINDENERGIEANLAGEN

Auf der geplanten Fläche sind von der WindStrom Erneuerbare Energien GmbH & Co. KG fünf neue Windenergieanlagen (WEA) des Typs Enercon E-175 EP5-E2/7,0 MW mit einer Nabenhöhe von 162 m und einem Rotordurchmesser von 175 m geplant.

Als Vorbelastung werden insgesamt die folgenden 11 WEA berücksichtigt:

- drei bestehende WEA des Windparks Charlottendorf vom Typ Enercon E-101/3,05 MW mit einer Nabenhöhe von 135,4 m und einem Rotordurchmesser von 101 m (WEA CD 01 bis WEA CD 03);
- zwei bestehende WEA des Windparks in Garrel vom Typ Enercon E-101/3,05 MW mit einer Nabenhöhe von 135,4 m und einem Rotordurchmesser von 101 m (WEA G 02 und WEA G 03);
- 1 bestehende WEA des Windparks in Garrel vom Typ Enercon E-115 mit einer Nabenhöhe von 135,4 m und einem Rotordurchmesser von 115,7 m (WEA G 01);
- 5 weitere geplante WEA des Windparks Benthullen vom Typ Vestas V162 EnVentus/7,2 MW mit einer Nabenhöhe von 169 m und einem Rotordurchmesser von 162 m (WEA BH 01 bis WEA BH 05).

Die Reichweite der Schatten der Windenergieanlagen wird gemäß /1/ errechnet. Es wird ein Linke-Trübungsfaktor von 3,5 berücksichtigt. Dies entspricht dem Wert der größten zu erwartenden Schattenwurfreichweite, wie er an klaren Wintertagen vorkommt. Die geplanten sowie die bestehenden WEA und die sich ergebenden Werte sind in Tabelle 2.1 aufgeführt.

Tabelle 2.1 Auflistung der geplanten und vorhandenen WEA

ID	Bezeichnung/Typ	Standortkoordinaten (UTM ETRS 89)		Rotor- durchmesser D (m)	Nabenhöhe NH (m)	Blatttiefe (m)			Schattenwurfreichweite (m)
		X	Y			Min.	Max.	Mittel	
WEA RE 01	Enercon E-175 EP5 E2 / 7,0 MW	439695	5875396	175	162	1,11	4,01	2,56	1737
WEA RE 02	Enercon E -175 EP5 E2 / 7,0 MW	439689	5875005	175	162	1,11	4,01	2,56	1737
WEA RE 03	Enercon E -175 EP5 E2 / 7,0 MW	440086	5875385	175	162	1,11	4,01	2,56	1737
WEA RE 04	Enercon E -175 EP5 E2 / 7,0 MW	440417	5876126	175	162	1,11	4,01	2,56	1737
WEA RE 05	Enercon E -175 EP5 E2 / 7,0 MW	440505	5875678	175	162	1,11	4,01	2,56	1737
WEA CD 01	Enercon E-101 / 3,05 MW	440676	5874374	101	135,4	1,79	4,72	3,26	2214
WEA CD 02	Enercon E-101 / 3,05 MW	440724	5874036	101	135,4	1,79	4,72	3,26	2214

WEA CD 03	Enercon E -101 / 3,05 MW	440545	5873653	101	135,4	1,79	4,72	3,26	2214
WEA G 01	Enercon E -115/3,0 MW	439746	5873458	115,7	135,4	1,55	4,53	3,04	2067
WEA G 02	Enercon E -101/3,05 MW	439992	5873215	101	135,4	1,79	4,72	3,26	2214
WEA G 03	Enercon E -101/3,05 MW	440414	5873153	101	135,4	1,79	4,72	3,26	2214
WEA BH 01	Vestas V162 EnVentus / 7,2 MW	439618	5879109	162	169	1,69	4,32	3,01	2041
WEA BH 02	Vestas V162 EnVentus / 7,2 MW	439787	5878795	162	169	1,69	4,32	3,01	2041
WEA BH 03	Vestas V162 EnVentus / 7,2 MW	440057	5878563	162	169	1,69	4,32	3,01	2041
WEA BH 04	Vestas V162 EnVentus / 7,2 MW	440182	5878184	162	169	1,69	4,32	3,01	2041
WEA BH 05	Vestas V162 EnVentus / 7,2 MW	440461	5877934	162	169	1,69	4,32	3,01	2041

Die Koordinaten der Standorte der WEA wurden vom Auftraggeber angegeben. Die Aufstellungsgeometrie ist mit genauen Koordinaten im Hauptresultat im Anhang dargestellt. Über die im Anhang dargestellten WEA hinaus sind dem Gutachter keine vorhandenen, genehmigten oder geplanten Anlagen in immissionsrelevanter Entfernung bekannt.

3 IMMISSIONSORTE

Als Immissionsorte (IO) wurden die nächstgelegenen Wohnbebauungen ausgewählt, für die von erhöhter potenzieller Schattenwurfimmission ausgegangen werden kann. Die ausgewählten IO sind unterschiedlich bewachsen und werden als den zu beurteilenden WEA zugewandt betrachtet. Es wird davon ausgegangen, dass Bewuchs den Schattenwurf nicht wesentlich abschwächt. Die Wohnung am Ohlhoffsweg 63 wurde nicht als IO berücksichtigt, da das Gebäude gemäß Angaben des Auftraggebers /5/ entwohnt wird.

Die Koordinaten der IO wurden anhand von Karten im Maßstab 1:5.000 ermittelt. Erhebliche Abweichungen, die einen Einfluss auf das Endergebnis haben könnten, sind nicht zu erwarten.

4 BEURTEILUNGSVERFAHREN

Einen Einfluss auf die Schattenwurfbelastung haben die geographische Lage der WEA, der Immissionsorte (IO) und deren Lage zueinander sowie die örtlichen Gegebenheiten. Diese Daten werden als Eingabeparameter für die verwendete Software "WindPRO" der Fa. Energi- og Miljødata, Aalborg, Dänemark, in der Version 4.1.287 /2/ benutzt, mit der über Sonnenstandsdiagramme und die sich dann ergebende Geometrie möglicher Schattenwurf berechnet wird. Die Standortkoordinaten (UTM (north)-ETRS89 Zone 32) und die Höhe über N.N. der zu berücksichtigenden WEA sowie deren Nabenhöhe und der Rotordurchmesser werden ermittelt und stellen den ersten Teil der Eingangsgrößen für die Schattenwurfberechnung dar. Der zweite Teil ist die Festlegung der Immissionsorte. Sie werden durch die vor Ort gewonnenen Kenntnisse über Wohnbebauungen anhand der Standortkoordinaten, der Höhe über N.N., der Größe, der Platzierung und der Ausrichtung beschrieben. Die Größe wird hier gemäß den Empfehlungen des Arbeitskreises Schattenwurf unter Federführung des Staatlichen Umweltamtes Schleswig /3/ als annähernd punktförmig festgelegt und durch ein horizontales Quadrat von 1 x 1 m abgebildet, dass sich auf einer Höhe von 2 m über dem Boden befindet.

Anhand der oben genannten Eingangsdaten erfolgt die Berechnung der maximal möglichen Schattenwurfbelastung an den IO. Die Berechnung der maximalen Schattenwurfbelastung an den IO entspricht dem ungünstigsten Fall („worst case“), wobei folgende Annahmen getroffen werden:

- die Sonne scheint durchgehend während der gesamten Zeit zwischen Sonnenauf- und Sonnenuntergang, es wird also stets von einem wolkenlosen Himmel ausgegangen. Eine Ausnahme hiervon sind die Zeiten, in

denen die Sonne weniger als 3° über dem Horizont steht. Diese werden wegen zu geringer Strahlungsintensität nicht berücksichtigt.

- die Windrichtung wird stets so angenommen, dass die Rotorfläche senkrecht zur Sonneneinstrahlung steht, also den maximal möglichen Schatten verursacht.
- die WEA sind immer in Betrieb, haben also keine technisch bedingten Stillstandszeiten und immer ausreichend starken Wind.
- der Einwirkungsbereich des Schattens einer WEA beträgt bis zu 2500 m. Liegen Daten zur Rotorblattgeometrie der WEA vor, wird der Beschattungsbereich anhand der Geometriedaten ermittelt.
- die angenommenen Schattenwurfrezeptoren bzw. Fenster an den IO sind nicht durch Gebäude, Bewuchs oder ähnliches teilweise oder ganz verdeckt.

5 BERECHNUNG DER ERGEBNISSE

Die detaillierten Gesamtergebnisse sind dem Anhang zu entnehmen.

Nach Eingabe der Eingangsdaten wurde die maximal mögliche Schattenwurfbelastung an den ausgewählten Immissionsorten bestimmt. Dabei werden zum einen die Vorbelastung durch vorhandene und ggf. weitere geplante WEA und zum anderen die resultierenden Gesamtimmisionen bestimmt. Dabei ergibt sich folgendes Ergebnis für den ungünstigsten Fall:

5.1 Gesamtbelastung

Die sich an den Immissionsorten ergebenden Gesamtbelastungen sind in Tabelle 5.1 absteigend sortiert dargestellt. Es sind hierin nur Immissionsorte aufgelistet die von Schattenwurf betroffen sind. Am Immissionsort IO 01 (Ohlhoffsweg 42, Wardenburg) tritt die höchste Belastung durch Schattenwurf auf. Sie beträgt 350 Stunden und 45 Minuten pro Jahr, verteilt auf 305 Tage. Die maximale Tagesbelastung beträgt 2 Stunden und 9 Minuten. Am zweitstärksten belastet ist mit bis zu 227 Stunden und 44 Minuten pro Jahr, verteilt auf 258 Tage, und einer maximalen Tagesbelastung von 1 Stunde und 45 Minuten der IO 07 (Böseler Straße 561A, Wardenburg). Insgesamt werden bei 48 Immissionsorte Überschreitungen der Richtwerte durch die geplanten und/oder die vorhandenen WEA verursacht.

Tabelle 5.1: Gesamtbelastung absteigend sortiert

Immissionspunkt	Stunden/Jahr	Richtwert Stunden/Jahr	Richtwert eingehalten?	Stunden/Tag	Richtwert Stunden/Tag	Richtwert eingehalten?
IO 01 Ohlhoffsweg 42 Wardenburg	350:45:00	30:00:00	nein	2:09:00	00:30:00	nein
IO 07 Böseler Straße 561A Wardenburg	227:44:00	30:00:00	nein	1:45:00	00:30:00	nein
IO 07a Böseler Straße 545 Wardenburg	223:47:00	30:00:00	nein	1:43:00	00:30:00	nein
IO 08 Böseler Straße 579 Wardenburg	198:19:00	30:00:00	nein	1:40:00	00:30:00	nein
IO 04 Pappelweg 21 Wardenburg	166:04:00	30:00:00	nein	1:09:00	00:30:00	nein
IO 03 Pappelweg 15 Wardenburg	165:17:00	30:00:00	nein	1:03:00	00:30:00	nein
IO 05 Rote-Erde-Weg 100 Wardenburg	142:11:00	30:00:00	nein	1:13:00	00:30:00	nein
IO 09 Mastenweg 102A Wardenburg	142:00:00	30:00:00	nein	1:02:00	00:30:00	nein
IO 02 Pappelweg 1 Wardenburg	134:25:00	30:00:00	nein	0:53:00	00:30:00	nein
IO 18 Böseler Straße 531 Wardenburg	131:05:00	30:00:00	nein	1:17:00	00:30:00	nein
IO 06 Rote-Erde-Weg 102 Wardenburg	121:17:00	30:00:00	nein	0:40:00	00:30:00	nein
IO 17 Böseler Straße 544 Wardenburg	116:51:00	30:00:00	nein	1:09:00	00:30:00	nein
IO 26 Böseler Straße 443 Wardenburg	114:16:00	30:00:00	nein	1:05:00	00:30:00	nein

IO 16 Böeseler Straße 580 Wardenburg	110:56:00	30:00:00	nein	1:05:00	00:30:00	nein
IO 25 Böeseler Straße 455 Wardenburg	109:58:00	30:00:00	nein	0:59:00	00:30:00	nein
IO 19 Böeseler Straße 532 Wardenburg	106:13:00	30:00:00	nein	1:11:00	00:30:00	nein
IO 45 Unter den Linden 32 Wardenburg	101:59:00	30:00:00	nein	1:02:00	00:30:00	nein
IO 15 Böeseler Straße 594 Wardenburg	99:43:00	30:00:00	nein	1:01:00	00:30:00	nein
IO 27 Böeseler Straße 435B Wardenburg	99:35:00	30:00:00	nein	1:03:00	00:30:00	nein
IO 24 Böeseler Straße 464 Wardenburg	95:18:00	30:00:00	nein	0:53:00	00:30:00	nein
IO 36 Am Denkmal 2 Wardenburg	92:50:00	30:00:00	nein	1:01:00	00:30:00	nein
IO 44 Unter den Linden 22 Wardenburg	87:17:00	30:00:00	nein	0:59:00	00:30:00	nein
IO 20 Böeseler Straße 522 Wardenburg	86:50:00	30:00:00	nein	0:59:00	00:30:00	nein
IO 21 Böeseler Straße 491 Wardenburg	84:21:00	30:00:00	nein	0:50:00	00:30:00	nein
IO 37 Am Denkmal 8 Wardenburg	78:04:00	30:00:00	nein	0:58:00	00:30:00	nein
IO 47 Vehnberg 39 Wardenburg	77:47:00	30:00:00	nein	0:40:00	00:30:00	nein
IO 13 Hauptstraße 81 Bösel	77:23:00	30:00:00	nein	1:02:00	00:30:00	nein
IO 14 Hauptstraße 83 Bösel	74:08:00	30:00:00	nein	0:54:00	00:30:00	nein
IO 51 Vehnberg 10 Wardenburg	73:28:00	30:00:00	nein	0:32:00	00:30:00	nein
IO 38 Am Denkmal 15 Wardenburg	72:34:00	30:00:00	nein	0:58:00	00:30:00	nein
IO 35 Mastenweg 2 Wardenburg	70:49:00	30:00:00	nein	1:01:00	00:30:00	nein
IO 49 Vehnberg 18 Wardenburg	70:17:00	30:00:00	nein	0:34:00	00:30:00	nein
IO 52 Vehnberg 4 Wardenburg	70:15:00	30:00:00	nein	0:31:00	00:30:00	nein
IO 28 Böeseler Straße 426 Wardenburg	68:13:00	30:00:00	nein	0:56:00	00:30:00	nein
IO 46 Unter den Linden 21 Wardenburg	66:33:00	30:00:00	nein	0:48:00	00:30:00	nein
IO 23 Böeseler Straße 490 Wardenburg	66:17:00	30:00:00	nein	0:42:00	00:30:00	nein
IO 50 Vehnberg 13A Wardenburg	66:13:00	30:00:00	nein	0:32:00	00:30:00	nein
IO 39 Am Denkmal 26 Wardenburg	58:48:00	30:00:00	nein	0:50:00	00:30:00	nein
IO 53 Münsterscher Damm 152 Wardenburg	57:56:00	30:00:00	nein	0:30:00	00:30:00	ja
IO 48 Vehnberg 23 Wardenburg	54:38:00	30:00:00	nein	0:28:00	00:30:00	ja
IO 22 Böeseler Straße 502 Wardenburg	53:28:00	30:00:00	nein	0:38:00	00:30:00	nein
IO 54 Beyerstraße 41 Wardenburg	53:10:00	30:00:00	nein	0:26:00	00:30:00	ja
IO 29 Böeseler Straße 408 Wardenburg	47:23:00	30:00:00	nein	0:52:00	00:30:00	nein
IO 43 Am Spielplatz 5 Wardenburg	43:10:00	30:00:00	nein	0:48:00	00:30:00	nein
IO 12 Hauptstraße 68 Bösel	42:32:00	30:00:00	nein	0:46:00	00:30:00	nein
IO 40 Saarländer Weg 23 Wardenburg	42:13:00	30:00:00	nein	0:44:00	00:30:00	nein
IO 11 Hauptstraße 66 Bösel	33:30:00	30:00:00	nein	0:40:00	00:30:00	nein
IO 30 Böeseler Straße 398 Wardenburg	33:03:00	30:00:00	nein	0:45:00	00:30:00	nein
IO 41 Saarländer Weg 37 Wardenburg	30:39:00	30:00:00	nein	0:38:00	00:30:00	nein
IO 42 Saarländer Weg 30 Wardenburg	25:53:00	30:00:00	ja	0:37:00	00:30:00	nein
IO 31 Böeseler Straße 384 Wardenburg	18:46:00	30:00:00	ja	0:35:00	00:30:00	nein
IO 32 Böeseler Straße 374 Wardenburg	10:10:00	30:00:00	ja	0:25:00	00:30:00	ja
IO 33 Böeseler Straße 333 Wardenburg (Ponyhof)	3:06:00	30:00:00	ja	0:14:00	00:30:00	ja

5.2 Vorbelastung

Die sich an den betreffenden Immissionsorten ergebenden Vorbelastungen sind in Tabelle 5.2 absteigend sortiert dargestellt. Immissionsorte an denen kein Schattenwurf auftritt, werden in der Tabelle nicht aufgeführt. Am Immissionsort IO 05 (Rote-Erde-Weg 100, Wardenburg) beträgt die höchste Vorbelastung 142 Stunden und 11 Minuten pro Jahr, verteilt auf 213 Tage. Die maximale Tagesbelastung beträgt dort 1 Stunde und 13 Minuten. Am zweitstärksten belastet ist mit bis zu 121 Stunden und 17 Minuten pro Jahr, verteilt auf 251 Tage, und einer maximalen Tagesbelastung von 40 Minuten der IO 06 (Rote-Erde-Weg 102, Wardenburg). Insgesamt werden bei 7 Immissionsorte Überschreitungen der Richtwerte durch die vorhandenen WEA verursacht.

Tabelle 5.2: Vorbelastung absteigend sortiert

Immissionspunkt	Stunden/Jahr	Richtwert Stunden/Jahr	Richtwert eingehalten?	Stunden/Tag	Richtwert Stunden/Tag	Richtwert eingehalten?
IO 05 Rote-Erde-Weg 100 Wardenburg	142:11:00	30:00:00	nein	1:13:00	00:30:00	nein
IO 06 Rote-Erde-Weg 102 Wardenburg	121:17:00	30:00:00	nein	0:40:00	00:30:00	nein
IO 04 Pappelweg 21 Wardenburg	54:28:00	30:00:00	nein	0:39:00	00:30:00	nein
IO 03 Pappelweg 15 Wardenburg	53:48:00	30:00:00	nein	0:41:00	00:30:00	nein
IO 02 Pappelweg 1 Wardenburg	51:22:00	30:00:00	nein	0:42:00	00:30:00	nein
IO 54 Beyerstraße 41 Wardenburg	32:49:00	30:00:00	nein	0:25:00	00:30:00	ja
IO 48 Vehnberg 23 Wardenburg	32:32:00	30:00:00	nein	0:25:00	00:30:00	ja
IO 49 Vehnberg 18 Wardenburg	28:05:00	30:00:00	ja	0:23:00	00:30:00	ja
IO 50 Vehnberg 13A Wardenburg	27:35:00	30:00:00	ja	0:21:00	00:30:00	ja
IO 51 Vehnberg 10 Wardenburg	25:12:00	30:00:00	ja	0:20:00	00:30:00	ja
IO 52 Vehnberg 4 Wardenburg	23:45:00	30:00:00	ja	0:19:00	00:30:00	ja
IO 53 Münsterscher Damm 152 Wardenburg	23:40:00	30:00:00	ja	0:19:00	00:30:00	ja
IO 47 Vehnberg 39 Wardenburg	14:45:00	30:00:00	ja	0:22:00	00:30:00	ja
IO 07 Böseler Straße 561A Wardenburg	7:36:00	30:00:00	ja	0:13:00	00:30:00	ja
IO 08 Böseler Straße 579 Wardenburg	3:18:00	30:00:00	ja	0:12:00	00:30:00	ja
IO 07a Böseler Straße 545 Wardenburg	1:57:00	30:00:00	ja	0:08:00	00:30:00	ja

5.3 Zusatzbelastung

Die sich an den Immissionsorten ergebenden Zusatzbelastungen sind in Tabelle 5.3 absteigend sortiert dargestellt. An fünf Immissionsorten, die bereits durch die WEA der Vorbelastung mit Überschreitung der Jahres- und/oder Tagesrichtwerte belastet werden, wird die Belastung durch die geplanten WEA weiter erhöht. Bei diesen Immissionsorten handelt es sich um die IO 02 bis 04, IO 48 und IO 54.

An weiteren 9 Immissionsorten (IO 07, IO 07a, IO 08, IO 47 und IO 49 bis IO 53), die bereits durch die WEA der Vorbelastung mit Schattenwurf belastet werden, dies jedoch ohne Überschreitung der Richtwerte, führen die geplanten WEA zur genannten Überschreitung der Richtwerte.

Weitere 37 Immissionsorte werden durch die geplanten WEA erstmals mit Schattenwurf beaufschlagt. An 2 dieser Immissionsorte (IO 32 und IO 33) kommt es nicht zu Überschreitungen der Richtwerte. Dennoch kommt es an den restlichen 35 Immissionsorten (IO 01, IO 09, IO 11 bis IO 31, IO 35 bis IO 46) zu Überschreitungen.

Tabelle 5.3: Zusatzbelastung absteigend sortiert

Immissionspunkt	Stunden/Jahr	Richtwert Stunden/Jahr	Richtwert eingehalten?	Stunden/Tag	Richtwert Stunden/Tag	Richtwert eingehalten?
IO 01 Ohlhoffsweg 42 Wardenburg	350:45:00	30:00:00	nein	2:09:00	00:30:00	nein

IO 07a Böseler Straße 545 Wardenburg	221:50:00	30:00:00	nein	1:35:00	00:30:00	nein
IO 07 Böseler Straße 561A Wardenburg	220:08:00	30:00:00	nein	1:32:00	00:30:00	nein
IO 08 Böseler Straße 579 Wardenburg	195:01:00	30:00:00	nein	1:28:00	00:30:00	nein
IO 09 Mastenweg 102A Wardenburg	142:00:00	30:00:00	nein	1:02:00	00:30:00	nein
IO 18 Böseler Straße 531 Wardenburg	131:05:00	30:00:00	nein	1:17:00	00:30:00	nein
IO 17 Böseler Straße 544 Wardenburg	116:51:00	30:00:00	nein	1:09:00	00:30:00	nein
IO 26 Böseler Straße 443 Wardenburg	114:16:00	30:00:00	nein	1:05:00	00:30:00	nein
IO 04 Pappelweg 21 Wardenburg	111:36:00	30:00:00	nein	0:30:00	00:30:00	ja
IO 03 Pappelweg 15 Wardenburg	111:29:00	30:00:00	nein	0:22:00	00:30:00	ja
IO 16 Böseler Straße 580 Wardenburg	110:56:00	30:00:00	nein	1:05:00	00:30:00	nein
IO 25 Böseler Straße 455 Wardenburg	109:58:00	30:00:00	nein	0:59:00	00:30:00	nein
IO 19 Böseler Straße 532 Wardenburg	106:13:00	30:00:00	nein	1:11:00	00:30:00	nein
IO 45 Unter den Linden 32 Wardenburg	101:59:00	30:00:00	nein	1:02:00	00:30:00	nein
IO 15 Böseler Straße 594 Wardenburg	99:43:00	30:00:00	nein	1:01:00	00:30:00	nein
IO 27 Böseler Straße 435B Wardenburg	99:35:00	30:00:00	nein	1:03:00	00:30:00	nein
IO 24 Böseler Straße 464 Wardenburg	95:18:00	30:00:00	nein	0:53:00	00:30:00	nein
IO 36 Am Denkmal 2 Wardenburg	92:50:00	30:00:00	nein	1:01:00	00:30:00	nein
IO 44 Unter den Linden 22 Wardenburg	87:17:00	30:00:00	nein	0:59:00	00:30:00	nein
IO 20 Böseler Straße 522 Wardenburg	86:50:00	30:00:00	nein	0:59:00	00:30:00	nein
IO 21 Böseler Straße 491 Wardenburg	84:21:00	30:00:00	nein	0:50:00	00:30:00	nein
IO 02 Pappelweg 1 Wardenburg	83:03:00	30:00:00	nein	0:11:00	00:30:00	ja
IO 37 Am Denkmal 8 Wardenburg	78:04:00	30:00:00	nein	0:58:00	00:30:00	nein
IO 13 Hauptstraße 81 Bösel	77:23:00	30:00:00	nein	1:02:00	00:30:00	nein
IO 14 Hauptstraße 83 Bösel	74:08:00	30:00:00	nein	0:54:00	00:30:00	nein
IO 38 Am Denkmal 15 Wardenburg	72:34:00	30:00:00	nein	0:58:00	00:30:00	nein
IO 35 Mastenweg 2 Wardenburg	70:49:00	30:00:00	nein	1:01:00	00:30:00	nein
IO 28 Böseler Straße 426 Wardenburg	68:13:00	30:00:00	nein	0:56:00	00:30:00	nein
IO 46 Unter den Linden 21 Wardenburg	66:33:00	30:00:00	nein	0:48:00	00:30:00	nein
IO 23 Böseler Straße 490 Wardenburg	66:17:00	30:00:00	nein	0:42:00	00:30:00	nein
IO 47 Vehnberg 39 Wardenburg	63:02:00	30:00:00	nein	0:18:00	00:30:00	ja
IO 39 Am Denkmal 26 Wardenburg	58:48:00	30:00:00	nein	0:50:00	00:30:00	nein
IO 22 Böseler Straße 502 Wardenburg	53:28:00	30:00:00	nein	0:38:00	00:30:00	nein
IO 51 Vehnberg 10 Wardenburg	48:16:00	30:00:00	nein	0:12:00	00:30:00	ja
IO 29 Böseler Straße 408 Wardenburg	47:23:00	30:00:00	nein	0:52:00	00:30:00	nein
IO 52 Vehnberg 4 Wardenburg	46:30:00	30:00:00	nein	0:12:00	00:30:00	ja
IO 50 Vehnberg 13A Wardenburg	43:10:00	30:00:00	nein	0:48:00	00:30:00	nein
IO 39 Am Denkmal 26 Wardenburg	42:32:00	30:00:00	nein	0:46:00	00:30:00	nein
IO 53 Münsterscher Damm 152 Wardenburg	42:13:00	30:00:00	nein	0:44:00	00:30:00	nein
IO 48 Vehnberg 23 Wardenburg	42:12:00	30:00:00	nein	0:11:00	00:30:00	ja
IO 22 Böseler Straße 502 Wardenburg	38:38:00	30:00:00	nein	0:11:00	00:30:00	ja
IO 54 Beyerstraße 41 Wardenburg	34:16:00	30:00:00	nein	0:11:00	00:30:00	ja
IO 29 Böseler Straße 408 Wardenburg	33:30:00	30:00:00	nein	0:40:00	00:30:00	nein

IO 43 Am Spielplatz 5 Wardenburg	43:10:00	30:00:00	nein	0:45:00	00:30:00	nein
IO 12 Hauptstraße 68 Bösel	42:32:00	30:00:00	nein	0:38:00	00:30:00	nein
IO 40 Saarländer Weg 23 Wardenburg	42:13:00	30:00:00	nein	0:37:00	00:30:00	nein
IO 11 Hauptstraße 66 Bösel	33:30:00	30:00:00	nein	0:03:00	00:30:00	ja
IO 30 Böselers Straße 398 Wardenburg	33:03:00	30:00:00	nein	0:01:00	00:30:00	ja
IO 41 Saarländer Weg 37 Wardenburg	30:39:00	30:00:00	nein	0:35:00	00:30:00	nein
IO 42 Saarländer Weg 30 Wardenburg	25:53:00	30:00:00	ja	0:25:00	00:30:00	ja
IO 31 Böselers Straße 384 Wardenburg	18:46:00	30:00:00	ja	0:14:00	00:30:00	ja
IO 32 Böselers Straße 374 Wardenburg	10:10:00	30:00:00	ja	0:00:00	00:30:00	ja
IO 33 Böselers Straße 333 Wardenburg (Ponyhof)	3:06:00	30:00:00	ja	0:00:00	00:30:00	ja

6 PROGNOSEGENAUIGKEIT

Zur Genauigkeit der Ergebnisse der Schattenwurfberechnung kann keine Aussage getroffen werden, da noch keine auf Langzeitstudien basierenden Ergebnisse zu den Unsicherheiten der Berechnung vorliegen. Aufgrund des angewendeten Verfahrens kann die Berechnung jedoch als konservativ im Sinne des Immissionsschutzes betrachtet werden.

7 ABSCHLIEßENDE BEURTEILUNG

Gemäß den Hinweisen zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen des Länderausschusses für Immissionsschutz /3/ soll eine Belastung von 30 h im Jahr oder 30 min pro Tag nicht überschritten werden.

Unter den oben beschriebenen Vorbedingungen ergibt die Berechnung, dass am Wohnhaus am Ohlhoffsweg 42 und an den Wohnhäusern am Pappelweg und im Bereich der Ortschaft Benthullen eine Überschreitung der genannten Richtwerte nicht ausgeschlossen werden kann. Gleiches gilt für die Wohnhäuser am Mastenweg und im Bereich der Ortschaft Vehnberg. Die Belastung der Immissionsorte durch die geplanten Anlagen ist somit als beeinträchtigend zu werten.

Daher sollte durch eine Einrichtung, die den Schattenwurf auf das zulässige Maß begrenzt, der Schutz der Anwohner vor diesen Beeinträchtigungen sichergestellt werden. Gemäß /3/ können hierfür technische Maßnahmen zur zeitlichen Beschränkung angewandt werden. Diese sollte mindestens alle Wohngebäude in folgenden Bereichen berücksichtigen:

- Die Wohngebäude am Ohlhoffsweg 42 (IO 01) und am Pappelweg 1, 15 und 21 (IO 02 bis IO 04)
- Die Wohngebäude an der Hauptstraße 66 bis 83 (repräsentiert durch die IO 11 bis IO 14) und an der Böselers Straße 398 bis 594 (repräsentiert durch die IO 07, IO 07a, IO 08 und IO 15 bis IO 31)
- Die Wohngebäude am Mastenweg 2, 102 und 104 (repräsentiert durch die IO 35 und IO 09), Am Denkmal (repräsentiert durch die IO 36 bis IO 39), Am Spielplatz (repräsentiert durch das IO 43) und am Saarländer Weg 3 bis 39 (repräsentiert durch die IO 40 bis 42)
- Die Wohngebäude an der Straße Unter den Linden 21 bis 32 (repräsentiert durch die IO 44 bis 46)
- Die Wohngebäude an der Vehnberg Straße 3 bis 40 (repräsentiert durch die IO 47 bis 52), und an der Straße Münsterscher Damm 152 (IO 53)

Da der Richtwert von 30 Stunden pro Kalenderjahr auf Grundlage der astronomisch möglichen Beschattung entwickelt wurde, ist für Abschaltautomatiken der Wert für die tatsächliche, meteorologische Schattendauer auf 8 Stunden pro Kalenderjahr zu berücksichtigen.

Es ist zu beachten, dass sich die Zeitpunkte für Schattenwurf durch die Tatsache, dass das Kalenderjahr nicht exakt 365 Tage hat, jedes Jahr leicht verschieben. Daher muss für eine zeitgesteuerte Abschaltung ein Kalender basierend auf dem realen Sonnenstand zugrunde gelegt werden.

8 ZUSAMMENFASSUNG

Zur Ermittlung der Schattenwurfbelastung in der Umgebung des Windenergieparks Rote Erde wurden Berechnungen durchgeführt. Die örtlichen Parameter wurden bei einer Ortsbesichtigung am 09.04.2025 ermittelt bzw. durch Standardvorgaben für die Ermittlung des ungünstigsten Falles festgelegt.

Die Belastung der Immissionsorte durch Schattenwurf beträgt bei einer Berechnung des ungünstigsten Falles unter Berücksichtigung der als Vorbelastung zu wertenden WEA maximal 350 Stunden und 45 Minuten im Jahr bzw. 2 Stunden und 9 Minuten pro Tag am IO 01 (Ohlhoffsweg 42, Wardenburg) und wird ausschließlich durch die neu geplanten WEA verursacht. An 49 weiteren Immissionsorten der Betrachtung werden die Überschreitungen der Richtwerte durch die neu geplanten und/oder der Vorbelastung verursacht.

9 LITERATURVERZEICHNIS

- /1/ Hans D. Freund, Institut für Physik und Allgemeine Elektronik, FH Kiel, "Die Reichweite des Schattenwurfs von Windkraftanlagen", 1999-06.
- /2/ Energi- og Miljødata, Aalborg, Dänemark, " WindPro ", Vers. 4.1.287.
- /3/ Länderausschuss für Immissionsschutz, "Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen Aktualisierung 2019", 2020-01-23.
- /4/ DNV Management System, "ISI-RA-MEA-4620 Shadow Flicker Impact Assessment"
2021-12-22.
** Dieses Dokument ist Teil des DNV Management Systems und kann bei Bedarf im Hause der DNV eingesehen werden.*
- /5/ Auskunft vom Auftraggeber, Email vom 5.03.2025, Betreff: Windparks Rote Erde und Benthullen -
Gebietsnutzungen

10 TABELLENVERZEICHNIS

Tabelle 2.1 Auflistung der geplanten und vorhandenen WEA.....	4
Tabelle 5.1: Gesamtbelastung absteigend sortiert.....	6
Tabelle 5.2: Vorbelastung absteigend sortiert.....	8
Tabelle 5.3: Zusatzbelastung absteigend sortiert.....	8

11 ANHANG

Auf den folgenden Seiten sind die Berechnungsergebnisse dargestellt.

11.1 Hauptergebnis Vorbelastung

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 16:47/4.1.287

SHADOW - Hauptergebnis

Berechnung: Vorbelastung

Annahmen für Schattenschwurfberechnung

Beschattungsbereich der WEA
Schatten nur relevant, wo Rotorblatt mind. 20% der Sonne verdeckt
Siehe WEA-Tabelle

Minimale relevante Sonnehöhe über Horizont 3 °
Tage zwischen Berechnungen 1 Tag(e)
Berechnungszeitsprung 1 Minuten

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
DHM: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	NH	Schattendaten	
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA_BH_01	439.618	5.879.109	12,6	WEA BH 01 V162 EnVentus...	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_02	439.787	5.878.795	12,6	WEA BH 02 V162 EnVentus...	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_03	440.057	5.878.563	12,5	WEA BH 03 V162 EnVentus...	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_04	440.182	5.878.184	12,8	WEA BH 04 V162 EnVentus...	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_05	440.461	5.877.934	12,9	WEA BH 05 V162 EnVentus...	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_CD_01	440.676	5.874.374	12,1	WEA CD 01 Enercon E-101...	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_CD_02	440.724	5.874.036	12,3	WEA CD 02 Enercon E-101...	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_CD_03	440.545	5.873.653	12,6	WEA CD 03 Enercon E-101...	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_G_01	439.746	5.873.458	14,5	WEA G 01 ENERCON E-115	Nein	ENERCON	E-115-3.000	3.000	115,7	135,4	2.067	12,4
WEA_G_02	439.992	5.873.215	14,7	WEA G 02 ENERCON E-101	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_G_03	440.414	5.873.153	13,7	WEA G 03 ENERCON E-101	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5

Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO_01	IO 01 Ohlhoffsweg 42 Wardenburg	439.782	5.876.005	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_02	IO 02 Pappelweg 1 Wardenburg	440.451	5.874.925	13,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_03	IO 03 Pappelweg 15 Wardenburg	440.324	5.874.848	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_04	IO 04 Pappelweg 21 Wardenburg	440.270	5.874.822	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_05	IO 05 Rote-Erde-Weg 100 Wardenburg	440.048	5.873.945	14,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_06	IO 06 Rote-Erde-Weg 102 Wardenburg	440.085	5.874.215	13,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_07	IO 07 Böseler Straße 561A Wardenburg	439.324	5.875.871	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_07a	IO 07a Böseler Straße 545 Wardenburg	439.425	5.875.968	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_08	IO 08 Böseler Straße 579 Wardenburg	439.162	5.875.746	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_09	IO 09 Mastenweg 102A Wardenburg	441.152	5.875.971	12,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_10	IO 10 Lutzweg 4 Bösel	437.897	5.875.511	11,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_11	IO 11 Hauptstraße 66 Bösel	438.419	5.875.701	12,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_12	IO 12 Hauptstraße 68 Bösel	438.555	5.875.768	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_13	IO 13 Hauptstraße 81 Bösel	438.759	5.875.987	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_14	IO 14 Hauptstraße 83 Bösel	438.713	5.876.165	12,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_15	IO 15 Böseler Straße 594 Wardenburg	438.888	5.876.117	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_16	IO 16 Böseler Straße 580 Wardenburg	439.010	5.876.147	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_17	IO 17 Böseler Straße 544 Wardenburg	439.290	5.876.304	13,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_18	IO 18 Böseler Straße 531 Wardenburg	439.384	5.876.266	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_19	IO 19 Böseler Straße 532 Wardenburg	439.378	5.876.360	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 16:47/4.1.287

SHADOW - Hauptergebnis

Berechnung: Vorbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO_20	IO 20 Böseler Straße 522 Wardenburg	439.479	5.876.423	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_21	IO 21 Böseler Straße 491 Wardenburg	439.696	5.876.471	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_22	IO 22 Böseler Straße 502 Wardenburg	439.495	5.876.643	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_23	IO 23 Böseler Straße 490 Wardenburg	439.606	5.876.678	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_24	IO 24 Böseler Straße 464 Wardenburg	439.861	5.876.653	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_25	IO 25 Böseler Straße 455 Wardenburg	439.939	5.876.618	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_26	IO 26 Böseler Straße 443 Wardenburg	440.064	5.876.703	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_27	IO 27 Böseler Straße 435B Wardenburg	440.154	5.876.738	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_28	IO 28 Böseler Straße 426 Wardenburg	440.160	5.876.857	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_29	IO 29 Böseler Straße 408 Wardenburg	440.294	5.876.922	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_30	IO 30 Böseler Straße 398 Wardenburg	440.385	5.876.975	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_31	IO 31 Böseler Straße 384 Wardenburg	440.491	5.877.047	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_32	IO 32 Böseler Straße 374 Wardenburg	440.623	5.877.122	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_33	IO 33 Böseler Straße 333 Wardenburg (Ponyhof)	440.834	5.877.262	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_34	IO 34 Böseler Straße 334 Wardenburg	440.998	5.877.452	11,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_35	IO 35 Mastenweg 2 Wardenburg	440.322	5.876.830	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_36	IO 36 Am Denkmal 2 Wardenburg	440.052	5.876.773	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_37	IO 37 Am Denkmal 8 Wardenburg	440.006	5.876.837	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_38	IO 38 Am Denkmal 15 Wardenburg	439.906	5.876.888	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_39	IO 39 Am Denkmal 26 Wardenburg	440.039	5.876.918	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_40	IO 40 Saarländer Weg 23 Wardenburg	439.992	5.877.022	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_41	IO 41 Saarländer Weg 37 Wardenburg	439.925	5.877.122	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_42	IO 42 Saarländer Weg 30 Wardenburg	439.982	5.877.129	13,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_43	IO 43 Am Spielplatz 5 Wardenburg	440.167	5.876.965	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_44	IO 44 Unter den Linden 22 Wardenburg	440.821	5.876.771	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_45	IO 45 Unter den Linden 32 Wardenburg	440.940	5.876.673	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_46	IO 46 Unter den Linden 21 Wardenburg	440.914	5.876.866	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_47	IO 47 Vehnberg 39 Wardenburg	441.461	5.875.178	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_48	IO 48 Vehnberg 23 Wardenburg	441.487	5.874.947	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_49	IO 49 Vehnberg 18 Wardenburg	441.562	5.875.011	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_50	IO 50 Vehnberg 13A Wardenburg	441.664	5.874.940	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_51	IO 51 Vehnberg 10 Wardenburg	441.686	5.875.024	13,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_52	IO 52 Vehnberg 4 Wardenburg	441.756	5.875.037	13,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_53	IO 53 Münsterscher Damm 152 Wardenburg	441.798	5.874.996	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_54	IO 54 Beyerstraße 41 Wardenburg	441.573	5.874.627	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag
		[h/a]	[d/a]	[h/d]
IO_01	IO 01 Ohlhoffsweg 42 Wardenburg	0:00	0	0:00
IO_02	IO 02 Pappelweg 1 Wardenburg	51:22	84	0:42
IO_03	IO 03 Pappelweg 15 Wardenburg	53:48	113	0:41
IO_04	IO 04 Pappelweg 21 Wardenburg	54:28	120	0:39
IO_05	IO 05 Rote-Erde-Weg 100 Wardenburg	142:11	213	1:13
IO_06	IO 06 Rote-Erde-Weg 102 Wardenburg	121:17	251	0:40
IO_07	IO 07 Böseler Straße 561A Wardenburg	7:36	46	0:13
IO_07a	IO 07a Böseler Straße 545 Wardenburg	1:57	18	0:08
IO_08	IO 08 Böseler Straße 579 Wardenburg	3:18	24	0:12
IO_09	IO 09 Mastenweg 102A Wardenburg	0:00	0	0:00
IO_10	IO 10 Lutzweg 4 Bösel	0:00	0	0:00
IO_11	IO 11 Hauptstraße 66 Bösel	0:00	0	0:00
IO_12	IO 12 Hauptstraße 68 Bösel	0:00	0	0:00
IO_13	IO 13 Hauptstraße 81 Bösel	0:00	0	0:00
IO_14	IO 14 Hauptstraße 83 Bösel	0:00	0	0:00
IO_15	IO 15 Böseler Straße 594 Wardenburg	0:00	0	0:00
IO_16	IO 16 Böseler Straße 580 Wardenburg	0:00	0	0:00
IO_17	IO 17 Böseler Straße 544 Wardenburg	0:00	0	0:00
IO_18	IO 18 Böseler Straße 531 Wardenburg	0:00	0	0:00
IO_19	IO 19 Böseler Straße 532 Wardenburg	0:00	0	0:00
IO_20	IO 20 Böseler Straße 522 Wardenburg	0:00	0	0:00
IO_21	IO 21 Böseler Straße 491 Wardenburg	0:00	0	0:00

(Fortsetzung nächste Seite)...

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 16:47/4.1.287

SHADOW - Hauptergebnis

Berechnung: Vorbelastung

...(Fortsetzung von vorheriger Seite)

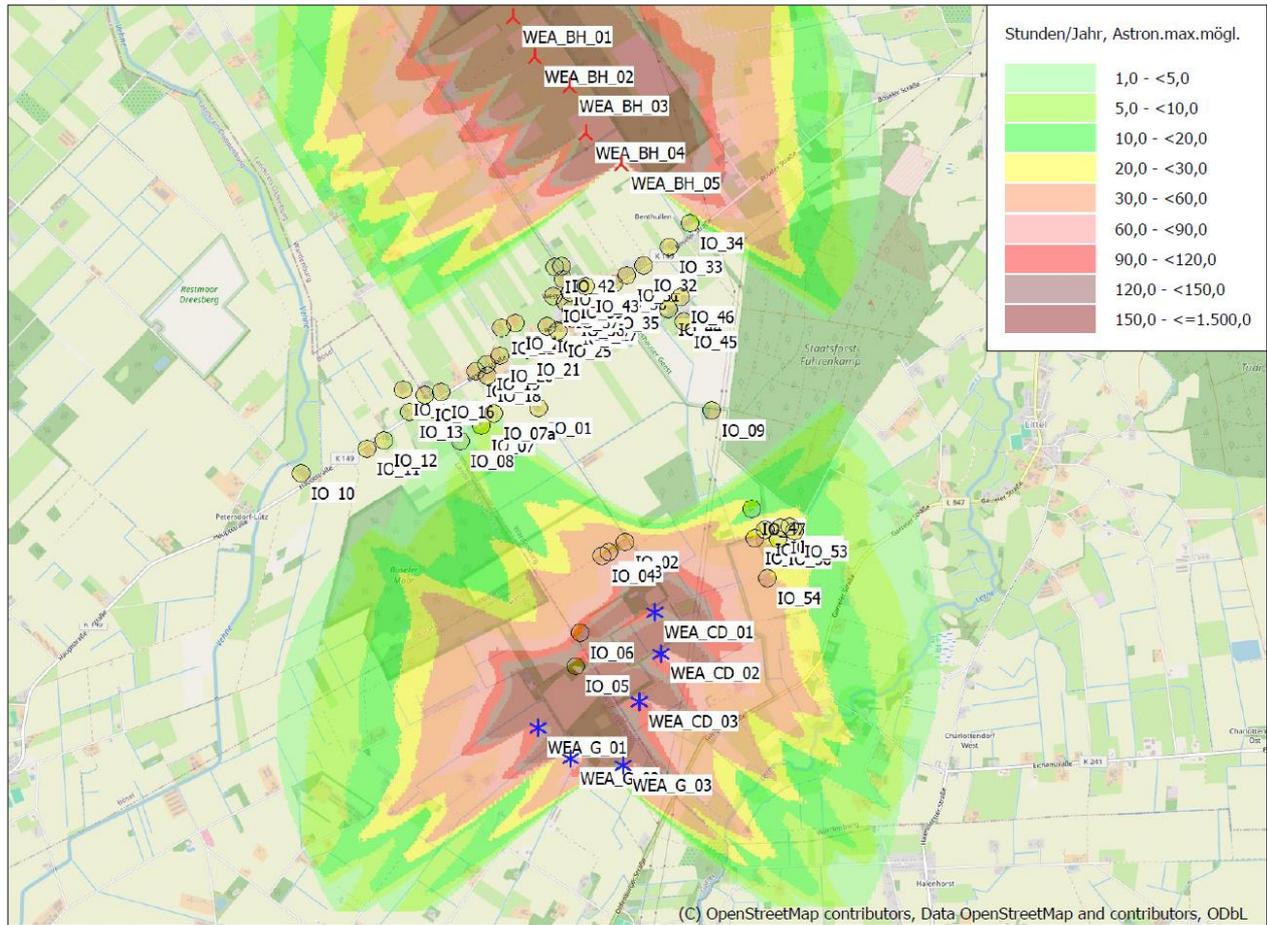
Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO_22	IO 22 Böseler Straße 502 Wardenburg	0:00	0	0:00
IO_23	IO 23 Böseler Straße 490 Wardenburg	0:00	0	0:00
IO_24	IO 24 Böseler Straße 464 Wardenburg	0:00	0	0:00
IO_25	IO 25 Böseler Straße 455 Wardenburg	0:00	0	0:00
IO_26	IO 26 Böseler Straße 443 Wardenburg	0:00	0	0:00
IO_27	IO 27 Böseler Straße 435B Wardenburg	0:00	0	0:00
IO_28	IO 28 Böseler Straße 426 Wardenburg	0:00	0	0:00
IO_29	IO 29 Böseler Straße 408 Wardenburg	0:00	0	0:00
IO_30	IO 30 Böseler Straße 398 Wardenburg	0:00	0	0:00
IO_31	IO 31 Böseler Straße 384 Wardenburg	0:00	0	0:00
IO_32	IO 32 Böseler Straße 374 Wardenburg	0:00	0	0:00
IO_33	IO 33 Böseler Straße 333 Wardenburg (Ponyhof)	0:00	0	0:00
IO_34	IO 34 Böseler Straße 334 Wardenburg	0:00	0	0:00
IO_35	IO 35 Mastenweg 2 Wardenburg	0:00	0	0:00
IO_36	IO 36 Am Denkmal 2 Wardenburg	0:00	0	0:00
IO_37	IO 37 Am Denkmal 8 Wardenburg	0:00	0	0:00
IO_38	IO 38 Am Denkmal 15 Wardenburg	0:00	0	0:00
IO_39	IO 39 Am Denkmal 26 Wardenburg	0:00	0	0:00
IO_40	IO 40 Saarländer Weg 23 Wardenburg	0:00	0	0:00
IO_41	IO 41 Saarländer Weg 37 Wardenburg	0:00	0	0:00
IO_42	IO 42 Saarländer Weg 30 Wardenburg	0:00	0	0:00
IO_43	IO 43 Am Spielplatz 5 Wardenburg	0:00	0	0:00
IO_44	IO 44 Unter den Linden 22 Wardenburg	0:00	0	0:00
IO_45	IO 45 Unter den Linden 32 Wardenburg	0:00	0	0:00
IO_46	IO 46 Unter den Linden 21 Wardenburg	0:00	0	0:00
IO_47	IO 47 Vehnberg 39 Wardenburg	14:45	61	0:22
IO_48	IO 48 Vehnberg 23 Wardenburg	32:32	100	0:25
IO_49	IO 49 Vehnberg 18 Wardenburg	28:05	95	0:23
IO_50	IO 50 Vehnberg 13A Wardenburg	27:35	109	0:21
IO_51	IO 51 Vehnberg 10 Wardenburg	25:12	100	0:20
IO_52	IO 52 Vehnberg 4 Wardenburg	23:45	101	0:19
IO_53	IO 53 Münsterscher Damm 152 Wardenburg	23:40	108	0:19
IO_54	IO 54 Beyerstraße 41 Wardenburg	32:49	118	0:25

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA_BH_01	WEA BH 01 V162 EnVentus - 7,2 MW	0:00
WEA_BH_02	WEA BH 02 V162 EnVentus - 7,2 MW	0:00
WEA_BH_03	WEA BH 03 V162 EnVentus - 7,2 MW	0:00
WEA_BH_04	WEA BH 04 V162 EnVentus - 7,2 MW	0:00
WEA_BH_05	WEA BH 05 V162 EnVentus - 7,2 MW	0:00
WEA_CD_01	WEA CD 01 Enercon E-101 - 3,05 MW	220:59
WEA_CD_02	WEA CD 02 Enercon E-101 - 3,05 MW	131:12
WEA_CD_03	WEA CD 03 Enercon E-101 - 3,05 MW	81:54
WEA_G_01	WEA G 01 ENERCON E-115	87:07
WEA_G_02	WEA G 02 ENERCON E-101	10:19
WEA_G_03	WEA G 03 ENERCON E-101	18:36

Summen in Rezeptortabelle und WEA-Tabelle können sich unterscheiden, da eine WEA gleichzeitig an zwei oder mehr Rezeptoren Beschattung verursachen kann und/oder ein Rezeptor gleichzeitig von zwei oder mehr WEA beschattet werden kann.

11.2 Schattenwurfkarte Vorbelastung, Stunden pro Jahr



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

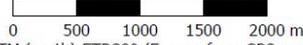
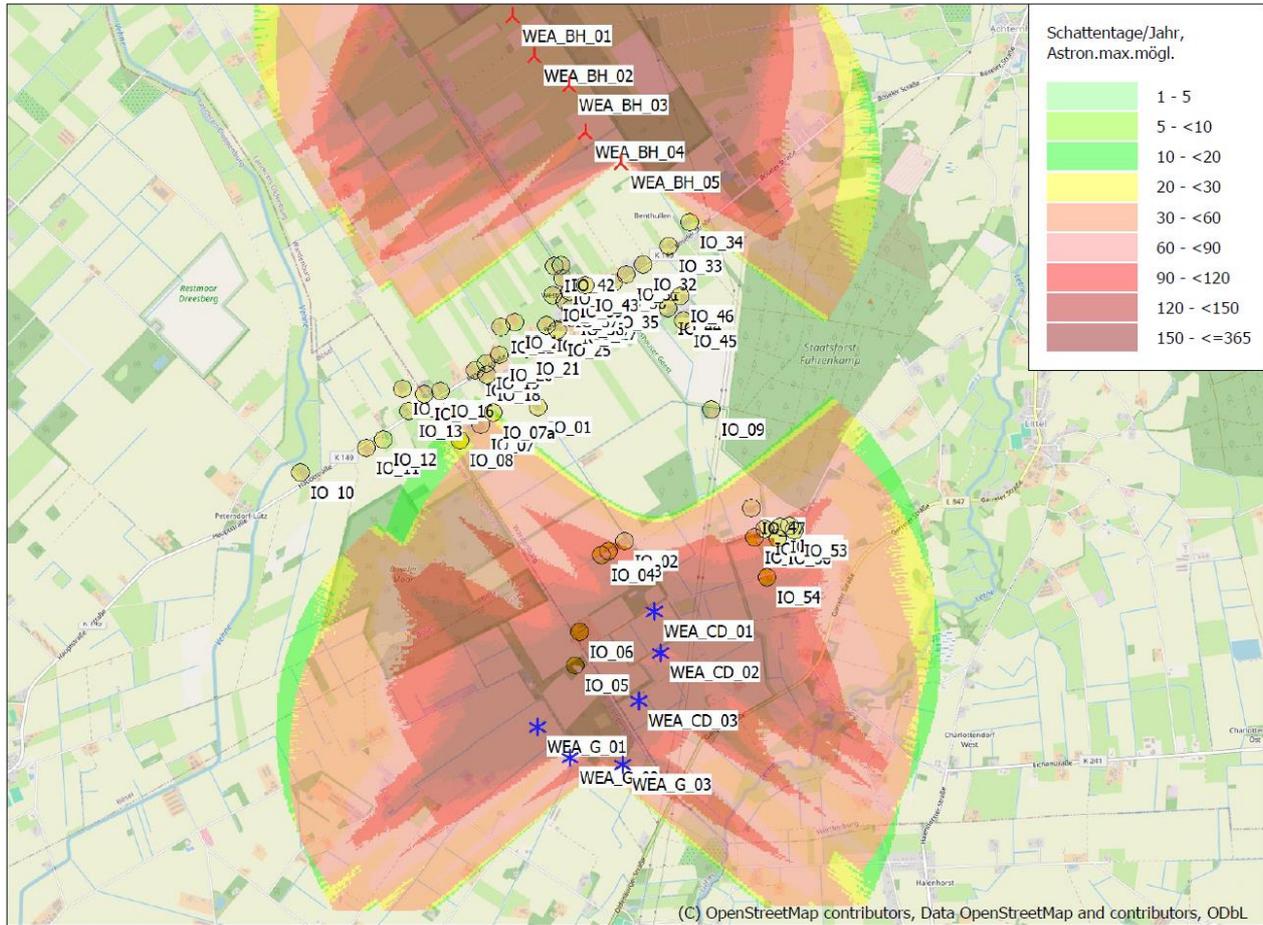
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:48.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.590 Nord: 5.875.600

▲ Neue WEA
 ★ Existierende WEA
 ● Schattenrezeptor

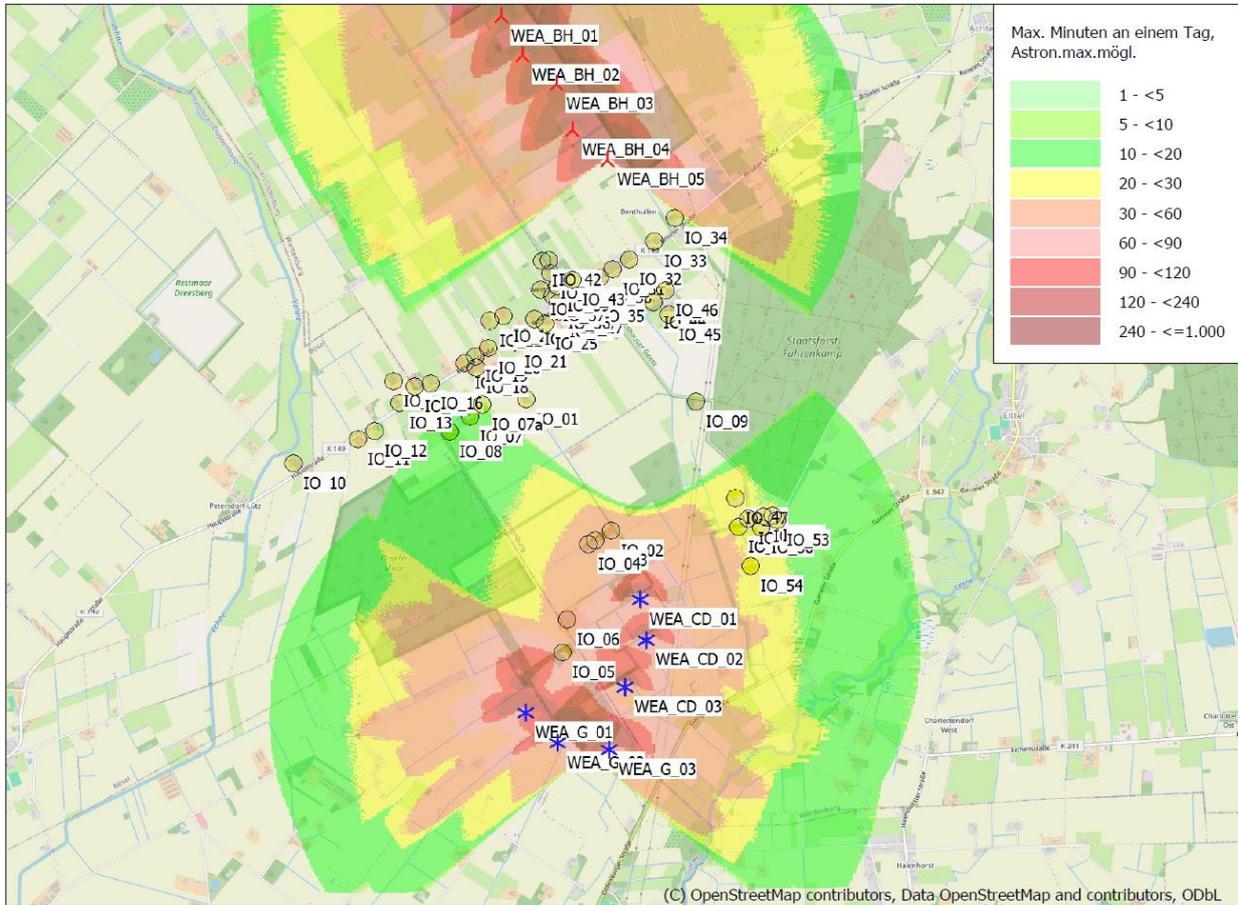
Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.3 Schattenwurfkarte Vorbelastung, Tage pro Jahr



Karte: EMD OpenStreetMap, Maßstab 1:48.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.590 Nord: 5.875.600
 * Neue WEA * Existierende WEA * Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.4 Schattenwurfkarte Vorbelastung, Minuten pro Tag



0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:48.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.590 Nord: 5.875.600
 ▲ Neue WEA * Existierende WEA ● Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.5 Hauptergebnis Zusatzbelastung

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 13:49/4.1.287

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung

Annahmen für Schattenwurfberechnung

Beschattungsbereich der WEA
Schatten nur relevant, wo Rotorblatt mind. 20% der Sonne verdeckt
Siehe WEA-Tabelle

Minimale relevante Sonnenhöhe über Horizont 3 °
Tage zwischen Berechnungen 1 Tag(e)
Berechnungszeitsprung 1 Minuten

Die dargestellten Zeiten sind die astronomisch maximal mögliche
Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:
DHM: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	NH	Schattendaten		
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min	
			[m]					[kW]	[m]	[m]	[m]	[U/min]	
WEA_RE_01	439.695	5.875.396	13,1	WEA RE 01	Enercon E-...	Ja	ENERCON	E-175 EPS E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_02	439.689	5.875.005	13,4	WEA RE 02	Enercon E-...	Ja	ENERCON	E-175 EPS E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_03	440.086	5.875.385	13,1	WEA RE 03	Enercon E-...	Ja	ENERCON	E-175 EPS E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_04	440.417	5.876.126	13,2	WEA RE 04	Enercon E-...	Ja	ENERCON	E-175 EPS E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_05	440.505	5.875.678	13,3	WEA RE 05	Enercon E-...	Ja	ENERCON	E-175 EPS E2-7.000	7.000	175,0	162,0	1.737	-

Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO_01	IO 01 Ohlhoffsweg 42 Wardenburg	439.782	5.876.005	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_02	IO 02 Pappelweg 1 Wardenburg	440.451	5.874.925	13,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_03	IO 03 Pappelweg 15 Wardenburg	440.324	5.874.848	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_04	IO 04 Pappelweg 21 Wardenburg	440.270	5.874.822	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_05	IO 05 Rote-Erde-Weg 100 Wardenburg	440.048	5.873.945	14,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_06	IO 06 Rote-Erde-Weg 102 Wardenburg	440.085	5.874.215	13,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_07	IO 07 Böseler Straße 561A Wardenburg	439.324	5.875.871	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_07a	IO 07a Böseler Straße 545 Wardenburg	439.425	5.875.968	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_08	IO 08 Böseler Straße 579 Wardenburg	439.162	5.875.746	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_09	IO 09 Mastenweg 102A Wardenburg	441.152	5.875.971	12,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_10	IO 10 Lutzweg 4 Bösel	437.897	5.875.511	11,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_11	IO 11 Hauptstraße 66 Bösel	438.419	5.875.701	12,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_12	IO 12 Hauptstraße 68 Bösel	438.555	5.875.768	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_13	IO 13 Hauptstraße 81 Bösel	438.759	5.875.987	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_14	IO 14 Hauptstraße 83 Bösel	438.713	5.876.165	12,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_15	IO 15 Böseler Straße 594 Wardenburg	438.888	5.876.117	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_16	IO 16 Böseler Straße 580 Wardenburg	439.010	5.876.147	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_17	IO 17 Böseler Straße 544 Wardenburg	439.290	5.876.304	13,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_18	IO 18 Böseler Straße 531 Wardenburg	439.384	5.876.266	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_19	IO 19 Böseler Straße 532 Wardenburg	439.378	5.876.360	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_20	IO 20 Böseler Straße 522 Wardenburg	439.479	5.876.423	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_21	IO 21 Böseler Straße 491 Wardenburg	439.696	5.876.471	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_22	IO 22 Böseler Straße 502 Wardenburg	439.495	5.876.643	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_23	IO 23 Böseler Straße 490 Wardenburg	439.606	5.876.678	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_24	IO 24 Böseler Straße 464 Wardenburg	439.861	5.876.653	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_25	IO 25 Böseler Straße 455 Wardenburg	439.939	5.876.618	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 13:49/4.1.287

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
					[m]	[m]	[m]	[°]		[m]
IO_26	IO 26 Böseler Straße 443 Wardenburg	440.064	5.876.703	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_27	IO 27 Böseler Straße 435B Wardenburg	440.154	5.876.738	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_28	IO 28 Böseler Straße 426 Wardenburg	440.160	5.876.857	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_29	IO 29 Böseler Straße 408 Wardenburg	440.294	5.876.922	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_30	IO 30 Böseler Straße 398 Wardenburg	440.385	5.876.975	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_31	IO 31 Böseler Straße 384 Wardenburg	440.491	5.877.047	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_32	IO 32 Böseler Straße 374 Wardenburg	440.623	5.877.122	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_33	IO 33 Böseler Straße 333 Wardenburg (Ponyhof)	440.834	5.877.262	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_34	IO 34 Böseler Straße 334 Wardenburg	440.998	5.877.452	11,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_35	IO 35 Mastenweg 2 Wardenburg	440.322	5.876.830	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_36	IO 36 Am Denkmal 2 Wardenburg	440.052	5.876.773	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_37	IO 37 Am Denkmal 8 Wardenburg	440.006	5.876.837	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_38	IO 38 Am Denkmal 15 Wardenburg	439.906	5.876.888	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_39	IO 39 Am Denkmal 26 Wardenburg	440.039	5.876.918	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_40	IO 40 Saarländer Weg 23 Wardenburg	439.992	5.877.022	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_41	IO 41 Saarländer Weg 37 Wardenburg	439.925	5.877.122	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_42	IO 42 Saarländer Weg 30 Wardenburg	439.982	5.877.129	13,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_43	IO 43 Am Spielplatz 5 Wardenburg	440.167	5.876.965	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_44	IO 44 Unter den Linden 22 Wardenburg	440.821	5.876.771	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_45	IO 45 Unter den Linden 32 Wardenburg	440.940	5.876.673	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_46	IO 46 Unter den Linden 21 Wardenburg	440.914	5.876.866	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_47	IO 47 Vehnberg 39 Wardenburg	441.461	5.875.178	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_48	IO 48 Vehnberg 23 Wardenburg	441.487	5.874.947	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_49	IO 49 Vehnberg 18 Wardenburg	441.562	5.875.011	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_50	IO 50 Vehnberg 13A Wardenburg	441.664	5.874.940	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_51	IO 51 Vehnberg 10 Wardenburg	441.686	5.875.024	13,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_52	IO 52 Vehnberg 4 Wardenburg	441.756	5.875.037	13,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_53	IO 53 Münsterscher Damm 152 Wardenburg	441.798	5.874.996	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_54	IO 54 Beyerstraße 41 Wardenburg	441.573	5.874.627	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO_01	IO 01 Ohlhoffsweg 42 Wardenburg	350:45	305	2:09
IO_02	IO 02 Pappelweg 1 Wardenburg	83:03	132	0:53
IO_03	IO 03 Pappelweg 15 Wardenburg	111:29	126	1:03
IO_04	IO 04 Pappelweg 21 Wardenburg	111:36	111	1:09
IO_05	IO 05 Rote-Erde-Weg 100 Wardenburg	0:00	0	0:00
IO_06	IO 06 Rote-Erde-Weg 102 Wardenburg	0:00	0	0:00
IO_07	IO 07 Böseler Straße 561A Wardenburg	220:08	258	1:45
IO_07a	IO 07a Böseler Straße 545 Wardenburg	221:50	241	1:43
IO_08	IO 08 Böseler Straße 579 Wardenburg	195:01	273	1:40
IO_09	IO 09 Mastenweg 102A Wardenburg	142:00	200	1:02
IO_10	IO 10 Lutzweg 4 Bösel	0:00	0	0:00
IO_11	IO 11 Hauptstraße 66 Bösel	33:30	78	0:40
IO_12	IO 12 Hauptstraße 68 Bösel	42:32	88	0:46
IO_13	IO 13 Hauptstraße 81 Bösel	77:23	168	1:02
IO_14	IO 14 Hauptstraße 83 Bösel	74:08	164	0:54
IO_15	IO 15 Böseler Straße 594 Wardenburg	99:43	200	1:01
IO_16	IO 16 Böseler Straße 580 Wardenburg	110:56	194	1:05
IO_17	IO 17 Böseler Straße 544 Wardenburg	116:51	177	1:09
IO_18	IO 18 Böseler Straße 531 Wardenburg	131:05	181	1:17
IO_19	IO 19 Böseler Straße 532 Wardenburg	106:13	170	1:11
IO_20	IO 20 Böseler Straße 522 Wardenburg	86:50	162	0:59
IO_21	IO 21 Böseler Straße 491 Wardenburg	84:21	165	0:50
IO_22	IO 22 Böseler Straße 502 Wardenburg	53:28	134	0:38
IO_23	IO 23 Böseler Straße 490 Wardenburg	66:17	145	0:42
IO_24	IO 24 Böseler Straße 464 Wardenburg	95:18	140	0:53
IO_25	IO 25 Böseler Straße 455 Wardenburg	109:58	144	0:59
IO_26	IO 26 Böseler Straße 443 Wardenburg	114:16	120	1:05
IO_27	IO 27 Böseler Straße 435B Wardenburg	99:35	107	1:03

(Fortsetzung nächste Seite)...

Projekt:

WP Rote Erde 12.05.2025

Lizenzierter Anwender:

DNV Energy Systems Germany GmbH
 Brooktorkai 18
 DE-20457 Hamburg
 (0 48 56)901-0

Berechnet:

30.09.2025 13:49/4.1.287

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung

...(Fortsetzung von vorheriger Seite)

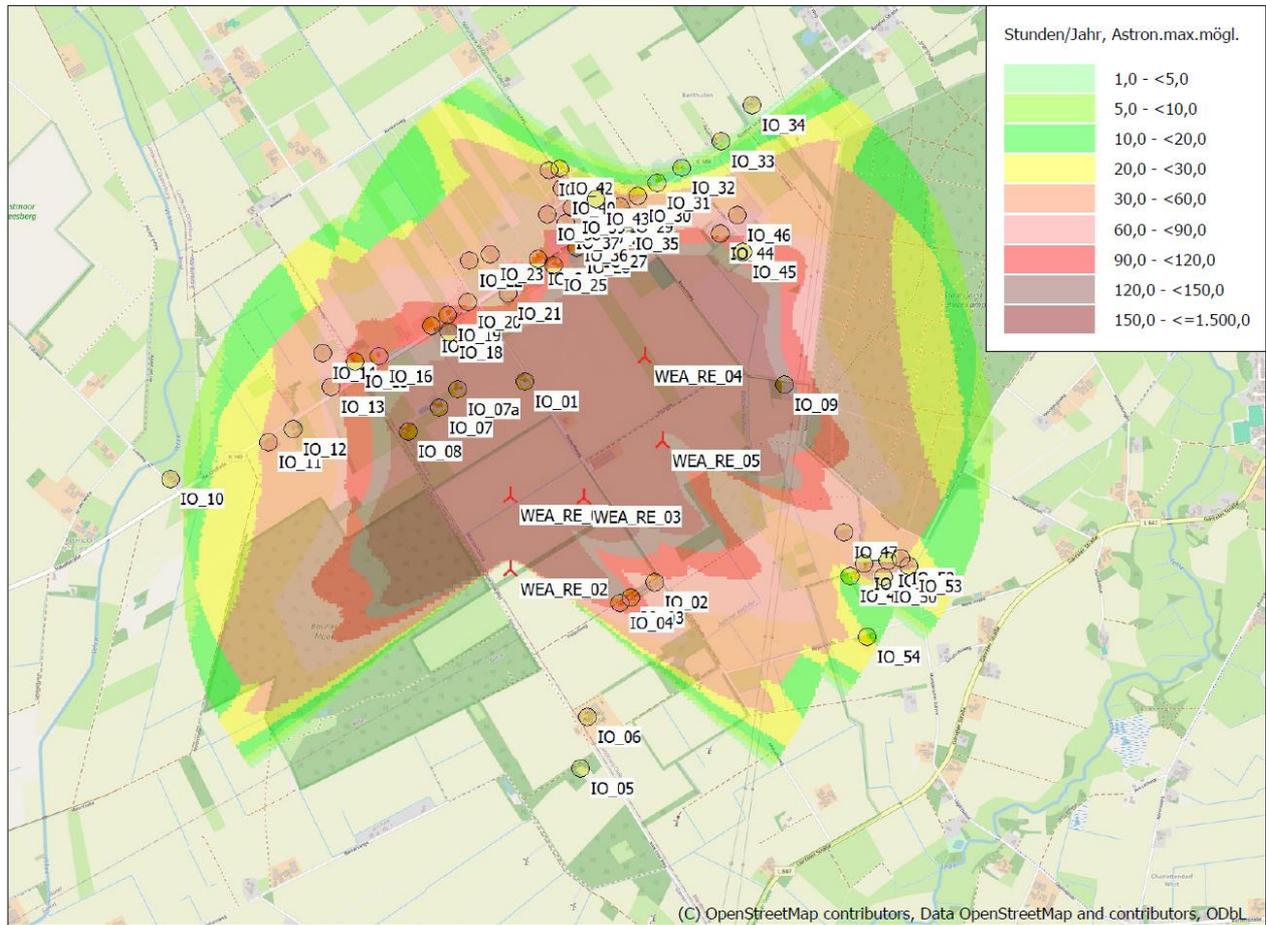
Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO_28	IO 28 Böseler Straße 426 Wardenburg	68:13	84	0:56
IO_29	IO 29 Böseler Straße 408 Wardenburg	47:23	66	0:52
IO_30	IO 30 Böseler Straße 398 Wardenburg	33:03	54	0:45
IO_31	IO 31 Böseler Straße 384 Wardenburg	18:46	40	0:35
IO_32	IO 32 Böseler Straße 374 Wardenburg	10:10	30	0:25
IO_33	IO 33 Böseler Straße 333 Wardenburg (Ponyhof)	3:06	17	0:14
IO_34	IO 34 Böseler Straße 334 Wardenburg	0:00	0	0:00
IO_35	IO 35 Mastenweg 2 Wardenburg	70:49	82	1:01
IO_36	IO 36 Am Denkmal 2 Wardenburg	92:50	106	1:01
IO_37	IO 37 Am Denkmal 8 Wardenburg	78:04	98	0:58
IO_38	IO 38 Am Denkmal 15 Wardenburg	72:34	96	0:58
IO_39	IO 39 Am Denkmal 26 Wardenburg	58:48	82	0:50
IO_40	IO 40 Saarländer Weg 23 Wardenburg	42:13	68	0:44
IO_41	IO 41 Saarländer Weg 37 Wardenburg	30:39	58	0:38
IO_42	IO 42 Saarländer Weg 30 Wardenburg	25:53	52	0:37
IO_43	IO 43 Am Spielplatz 5 Wardenburg	43:10	64	0:48
IO_44	IO 44 Unter den Linden 22 Wardenburg	87:17	106	0:59
IO_45	IO 45 Unter den Linden 32 Wardenburg	101:59	132	1:02
IO_46	IO 46 Unter den Linden 21 Wardenburg	66:33	96	0:48
IO_47	IO 47 Vehnberg 39 Wardenburg	63:02	122	0:40
IO_48	IO 48 Vehnberg 23 Wardenburg	22:06	69	0:28
IO_49	IO 49 Vehnberg 18 Wardenburg	42:12	101	0:34
IO_50	IO 50 Vehnberg 13A Wardenburg	38:38	98	0:32
IO_51	IO 51 Vehnberg 10 Wardenburg	48:16	115	0:32
IO_52	IO 52 Vehnberg 4 Wardenburg	46:30	121	0:31
IO_53	IO 53 Münsterscher Damm 152 Wardenburg	34:16	84	0:30
IO_54	IO 54 Beyerstraße 41 Wardenburg	20:21	66	0:26

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA_RE_01	WEA RE 01 Enercon E-175 EP5 E2 - 7,0 MW	495:40
WEA_RE_02	WEA RE 02 Enercon E-175 EP5 E2 - 7,0 MW	368:16
WEA_RE_03	WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW	393:52
WEA_RE_04	WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW	861:39
WEA_RE_05	WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW	414:30

Summen in Rezeptortabelle und WEA-Tabelle können sich unterscheiden, da eine WEA gleichzeitig an zwei oder mehr Rezeptoren Beschattung verursachen kann und/oder ein Rezeptor gleichzeitig von zwei oder mehr WEA beschattet werden kann.

11.6 Schattenwurfkarte Zusatzbelastung, Stunden pro Jahr



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

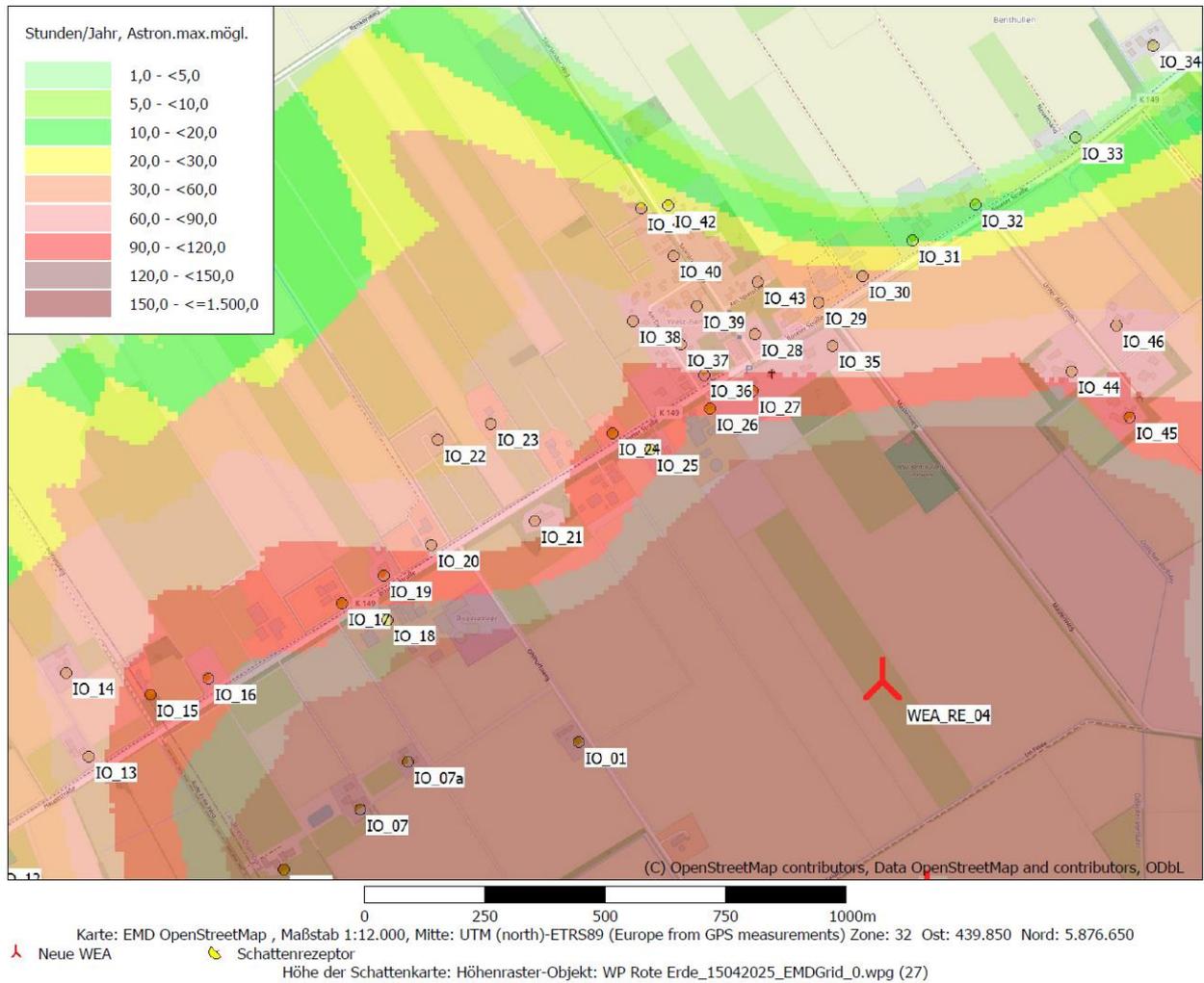
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:32.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.380 Nord: 5.875.590

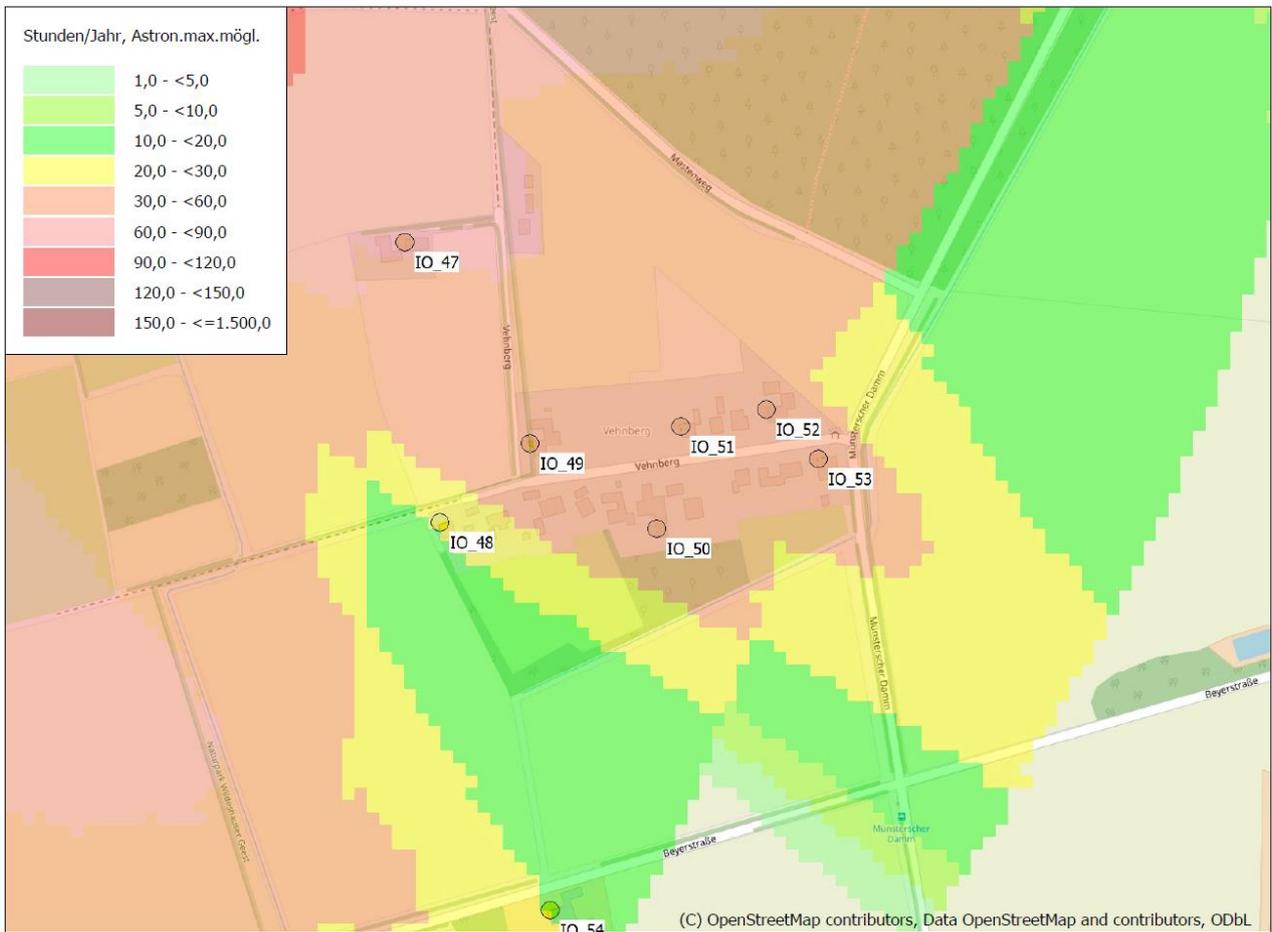
 Neue WEA
  Schattenrezeptor

Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.7 Schattenwurfkarte Zusatzbelastung, Detail Ortslage Benthullen, Stunden pro Jahr



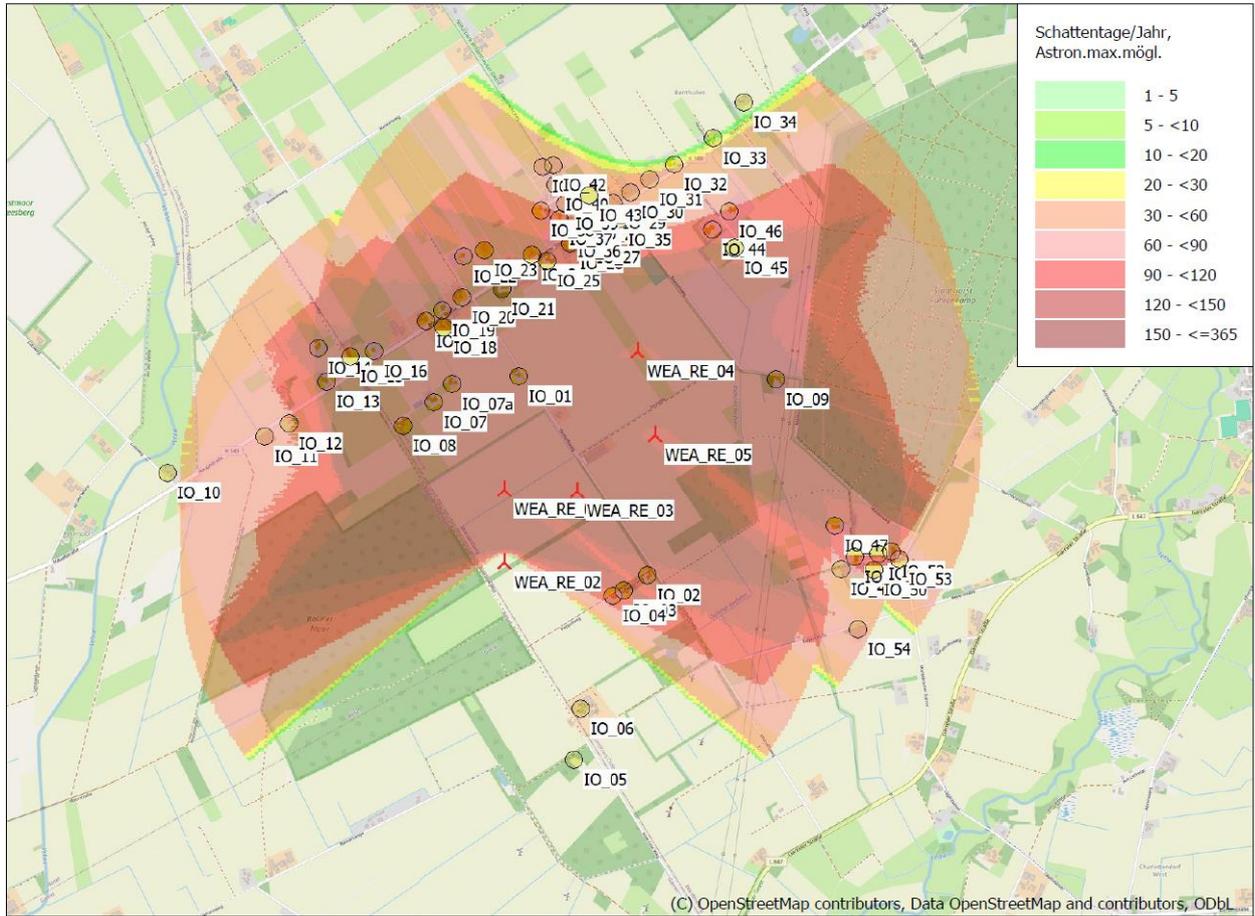
11.8 Schattenwurfkarte Zusatzbelastung, Detail Ortslage Vehnberg, Stunden pro Jahr



0 50 100 150 200 m

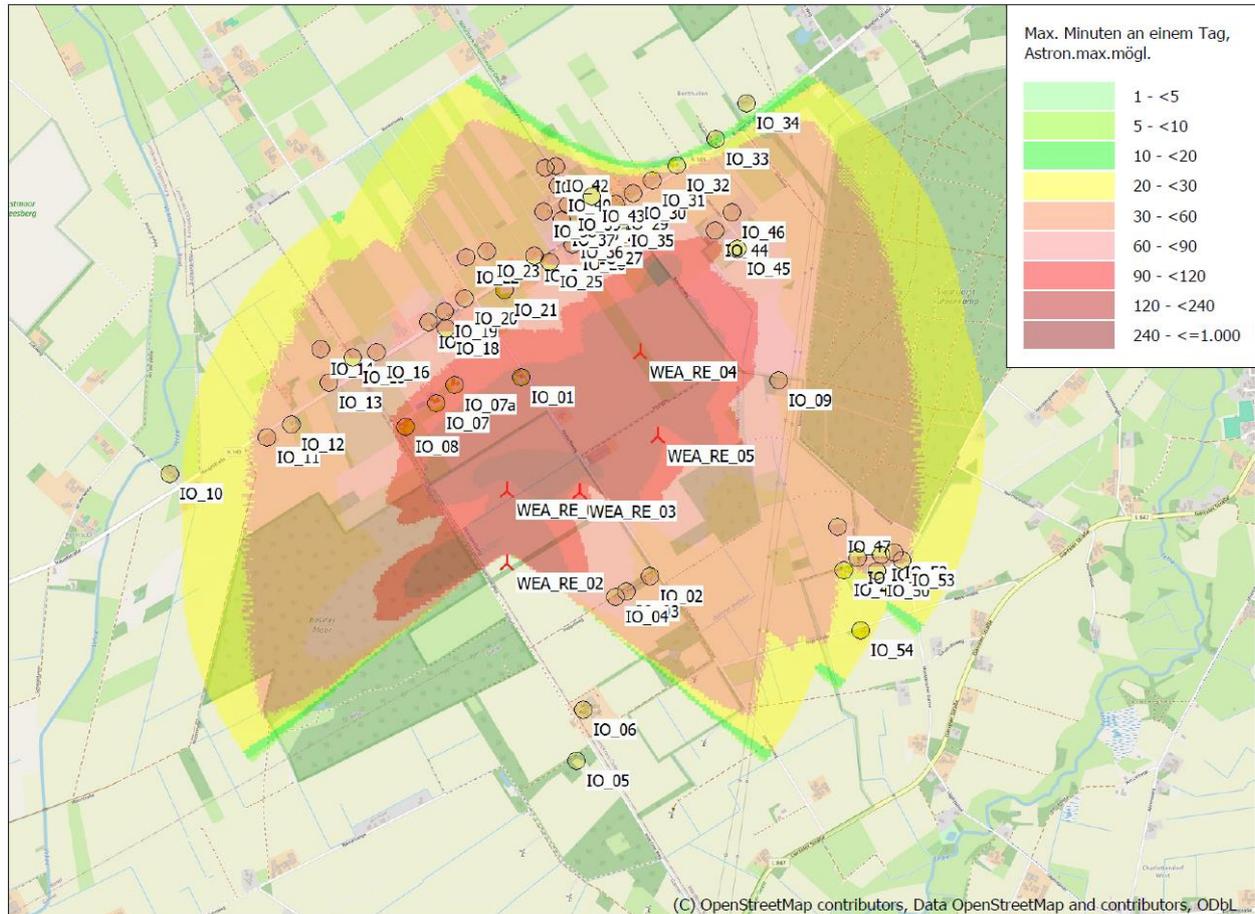
Karte: EMD OpenStreetMap , Maßstab 1:5.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 441.652 Nord: 5.874.995
 Neue WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.9 Schattenwurfkarte Zusatzbelastung, Tage pro Jahr



Karte: EMD OpenStreetMap, Maßstab 1:32.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.380 Nord: 5.875.590
 Neue WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

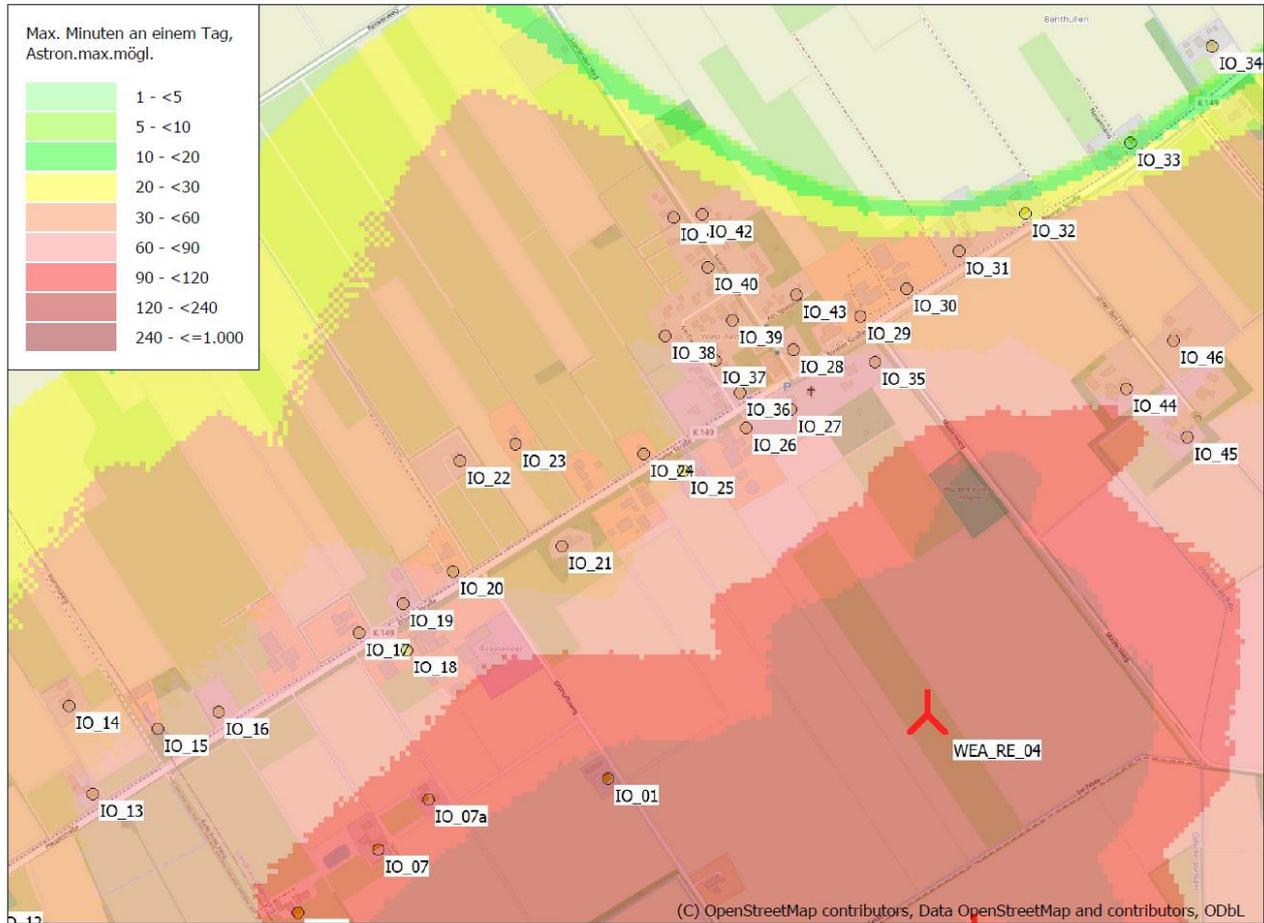
11.10 Schattenwurfkarte Zusatzbelastung, Minuten pro Tag



0 500 1000 1500 2000 m

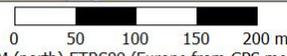
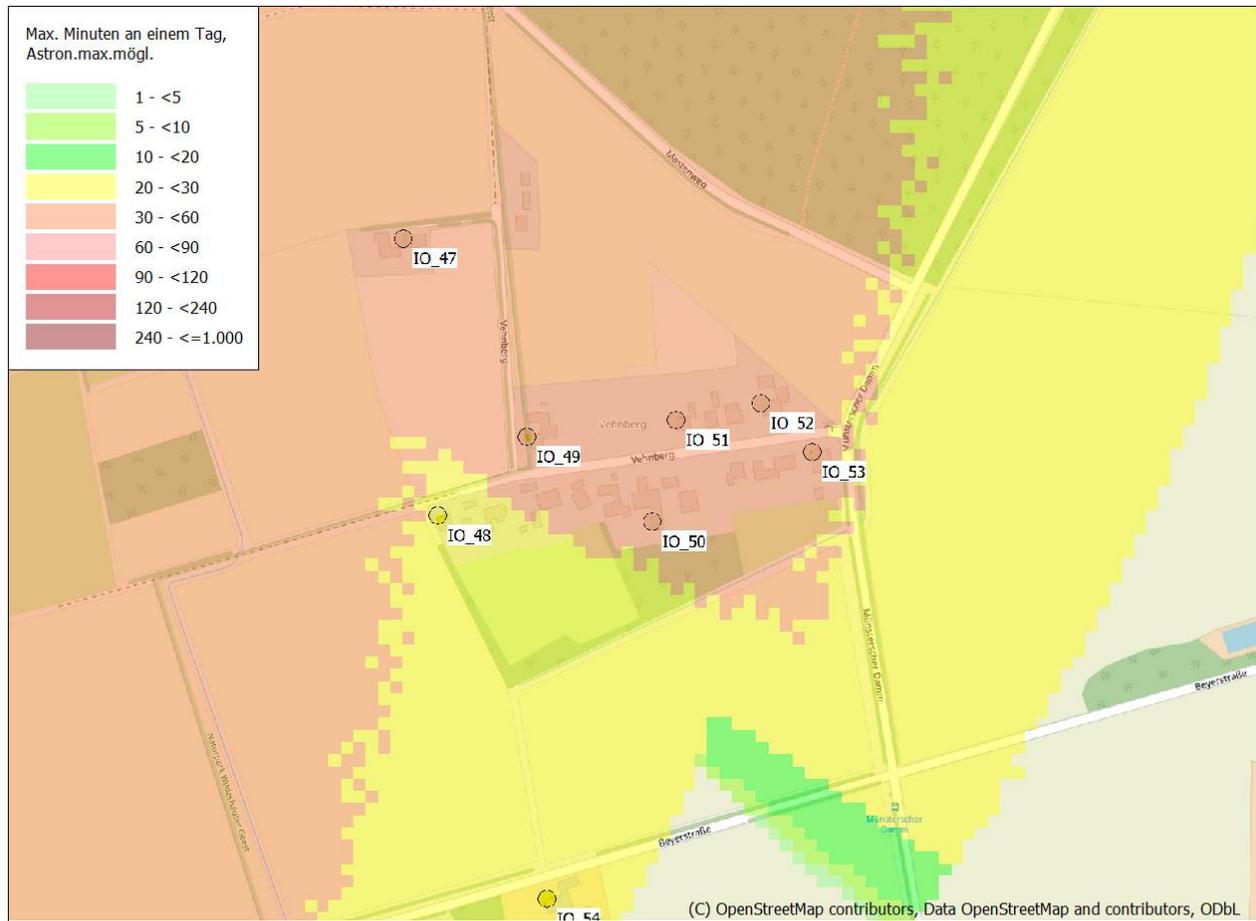
Karte: EMD OpenStreetMap , Maßstab 1:32.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.380 Nord: 5.875.590
 Neue WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.11 Schattenwurfkarte Zusatzbelastung, Detail Ortslage Benthullen, Minuten pro Tag



0 250 500 750 1000m
 Karte: EMD OpenStreetMap , Maßstab 1:12.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 439.850 Nord: 5.876.650
 Neue WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.12 Schattenwurfkarte Zusatzbelastung, Detail Ortslage Vehnberg, Minuten pro Tag



Karte: EMD OpenStreetMap , Maßstab 1:5.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 441.652 Nord: 5.874.995
 Neue WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.13 Hauptergebnis Gesamtbelastung

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung Annahmen für Schattenwurfberechnung

Beschattungsbereich der WEA
Schatten nur relevant, wo Rotorblatt mind. 20% der Sonne verdeckt
Siehe WEA-Tabelle

Minimale relevante Sonnenhöhe über Horizont 3 °
Tage zwischen Berechnungen 1 Tag(e)
Berechnungszeitsprung 1 Minuten

Die dargestellten Zeiten sind die astronomisch maximal mögliche
Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinfallrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:
DHM: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	NH	Schattendaten	
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA_BH_01	439.618	5.879.109	12,6	WEA BH 01 V162 EnVe...Ja	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_02	439.787	5.878.795	12,6	WEA BH 02 V162 EnVe...Ja	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_03	440.057	5.878.563	12,5	WEA BH 03 V162 EnVe...Ja	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_04	440.182	5.878.184	12,8	WEA BH 04 V162 EnVe...Ja	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_BH_05	440.461	5.877.934	12,9	WEA BH 05 V162 EnVe...Ja	Ja	VESTAS	V162-7.2-7.200	7.200	162,0	119,0	2.044	9,5
WEA_CD_01	440.676	5.874.374	12,1	WEA CD 01 Enercon E...Nein	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_CD_02	440.724	5.874.036	12,3	WEA CD 02 Enercon E...Nein	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_CD_03	440.545	5.873.653	12,6	WEA CD 03 Enercon E...Nein	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_G_01	439.746	5.873.458	14,5	WEA G 01 ENERCON E...Nein	Nein	ENERCON	E-115-3.000	3.000	115,7	135,4	2.067	12,4
WEA_G_02	439.992	5.873.215	14,7	WEA G 02 ENERCON E...Nein	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_G_03	440.414	5.873.153	13,7	WEA G 03 ENERCON E...Nein	Nein	ENERCON	E-101-3.050	3.050	101,0	135,4	2.214	14,5
WEA_RE_01	439.695	5.875.396	13,1	WEA RE 01 Enercon E...Ja	Ja	ENERCON	E-175 EP5 E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_02	439.689	5.875.005	13,4	WEA RE 02 Enercon E...Ja	Ja	ENERCON	E-175 EP5 E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_03	440.086	5.875.385	13,1	WEA RE 03 Enercon E...Ja	Ja	ENERCON	E-175 EP5 E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_04	440.417	5.876.126	13,2	WEA RE 04 Enercon E...Ja	Ja	ENERCON	E-175 EP5 E2-7.000	7.000	175,0	162,0	1.737	-
WEA_RE_05	440.505	5.875.678	13,3	WEA RE 05 Enercon E...Ja	Ja	ENERCON	E-175 EP5 E2-7.000	7.000	175,0	162,0	1.737	-

Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO_01	IO 01 Ohlhoffsweg 42 Wardenburg	439.782	5.876.005	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_02	IO 02 Pappelweg 1 Wardenburg	440.451	5.874.925	13,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_03	IO 03 Pappelweg 15 Wardenburg	440.324	5.874.848	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_04	IO 04 Pappelweg 21 Wardenburg	440.270	5.874.822	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_05	IO 05 Rote-Erde-Weg 100 Wardenburg	440.048	5.873.945	14,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_06	IO 06 Rote-Erde-Weg 102 Wardenburg	440.085	5.874.215	13,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_07	IO 07 Böseler Straße 561A Wardenburg	439.324	5.875.871	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_07a	IO 07a Böseler Straße 545 Wardenburg	439.425	5.875.968	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_08	IO 08 Böseler Straße 579 Wardenburg	439.162	5.875.746	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_09	IO 09 Mastenweg 102A Wardenburg	441.152	5.875.971	12,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_10	IO 10 Lutzweg 4 Bösel	437.897	5.875.511	11,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_11	IO 11 Hauptstraße 66 Bösel	438.419	5.875.701	12,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_12	IO 12 Hauptstraße 68 Bösel	438.555	5.875.768	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_13	IO 13 Hauptstraße 81 Bösel	438.759	5.875.987	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_14	IO 14 Hauptstraße 83 Bösel	438.713	5.876.165	12,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite),...

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO_15	IO 15 Böseler Straße 594 Wardenburg	438.888	5.876.117	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_16	IO 16 Böseler Straße 580 Wardenburg	439.010	5.876.147	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_17	IO 17 Böseler Straße 544 Wardenburg	439.290	5.876.304	13,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_18	IO 18 Böseler Straße 531 Wardenburg	439.384	5.876.266	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_19	IO 19 Böseler Straße 532 Wardenburg	439.378	5.876.360	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_20	IO 20 Böseler Straße 522 Wardenburg	439.479	5.876.423	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_21	IO 21 Böseler Straße 491 Wardenburg	439.696	5.876.471	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_22	IO 22 Böseler Straße 502 Wardenburg	439.495	5.876.643	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_23	IO 23 Böseler Straße 490 Wardenburg	439.606	5.876.678	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_24	IO 24 Böseler Straße 464 Wardenburg	439.861	5.876.653	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_25	IO 25 Böseler Straße 455 Wardenburg	439.939	5.876.618	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_26	IO 26 Böseler Straße 443 Wardenburg	440.064	5.876.703	13,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_27	IO 27 Böseler Straße 435B Wardenburg	440.154	5.876.738	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_28	IO 28 Böseler Straße 426 Wardenburg	440.160	5.876.857	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_29	IO 29 Böseler Straße 408 Wardenburg	440.294	5.876.922	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_30	IO 30 Böseler Straße 398 Wardenburg	440.385	5.876.975	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_31	IO 31 Böseler Straße 384 Wardenburg	440.491	5.877.047	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_32	IO 32 Böseler Straße 374 Wardenburg	440.623	5.877.122	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_33	IO 33 Böseler Straße 333 Wardenburg (Ponyhof)	440.834	5.877.262	12,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_34	IO 34 Böseler Straße 334 Wardenburg	440.998	5.877.452	11,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_35	IO 35 Mastenweg 2 Wardenburg	440.322	5.876.830	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_36	IO 36 Am Denkmal 2 Wardenburg	440.052	5.876.773	13,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_37	IO 37 Am Denkmal 8 Wardenburg	440.006	5.876.837	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_38	IO 38 Am Denkmal 15 Wardenburg	439.906	5.876.888	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_39	IO 39 Am Denkmal 26 Wardenburg	440.039	5.876.918	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_40	IO 40 Saarländer Weg 23 Wardenburg	439.992	5.877.022	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_41	IO 41 Saarländer Weg 37 Wardenburg	439.925	5.877.122	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_42	IO 42 Saarländer Weg 30 Wardenburg	439.982	5.877.129	13,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_43	IO 43 Am Spielplatz 5 Wardenburg	440.167	5.876.965	13,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_44	IO 44 Unter den Linden 22 Wardenburg	440.821	5.876.771	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_45	IO 45 Unter den Linden 32 Wardenburg	440.940	5.876.673	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_46	IO 46 Unter den Linden 21 Wardenburg	440.914	5.876.866	12,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_47	IO 47 Vehnberg 39 Wardenburg	441.461	5.875.178	13,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_48	IO 48 Vehnberg 23 Wardenburg	441.487	5.874.947	12,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_49	IO 49 Vehnberg 18 Wardenburg	441.562	5.875.011	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_50	IO 50 Vehnberg 13A Wardenburg	441.664	5.874.940	13,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_51	IO 51 Vehnberg 10 Wardenburg	441.686	5.875.024	13,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_52	IO 52 Vehnberg 4 Wardenburg	441.756	5.875.037	13,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_53	IO 53 Münstercher Damm 152 Wardenburg	441.798	5.874.996	13,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO_54	IO 54 Beyerstraße 41 Wardenburg	441.573	5.874.627	12,8	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag
		[h/a]	[d/a]	[h/d]
IO_01	IO 01 Ohlhoffsweg 42 Wardenburg	350:45	305	2:09
IO_02	IO 02 Pappelweg 1 Wardenburg	134:25	216	0:53
IO_03	IO 03 Pappelweg 15 Wardenburg	165:17	239	1:03
IO_04	IO 04 Pappelweg 21 Wardenburg	166:04	231	1:09
IO_05	IO 05 Rote-Erde-Weg 100 Wardenburg	142:11	213	1:13
IO_06	IO 06 Rote-Erde-Weg 102 Wardenburg	121:17	251	0:40
IO_07	IO 07 Böseler Straße 561A Wardenburg	227:44	258	1:45
IO_07a	IO 07a Böseler Straße 545 Wardenburg	223:47	241	1:43
IO_08	IO 08 Böseler Straße 579 Wardenburg	198:19	273	1:40
IO_09	IO 09 Mastenweg 102A Wardenburg	142:00	200	1:02
IO_10	IO 10 Lutzweg 4 Bösel	0:00	0	0:00
IO_11	IO 11 Hauptstraße 66 Bösel	33:30	78	0:40
IO_12	IO 12 Hauptstraße 68 Bösel	42:32	88	0:46
IO_13	IO 13 Hauptstraße 81 Bösel	77:23	168	1:02
IO_14	IO 14 Hauptstraße 83 Bösel	74:08	164	0:54
IO_15	IO 15 Böseler Straße 594 Wardenburg	99:43	200	1:01
IO_16	IO 16 Böseler Straße 580 Wardenburg	110:56	194	1:05

(Fortsetzung nächste Seite)...

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

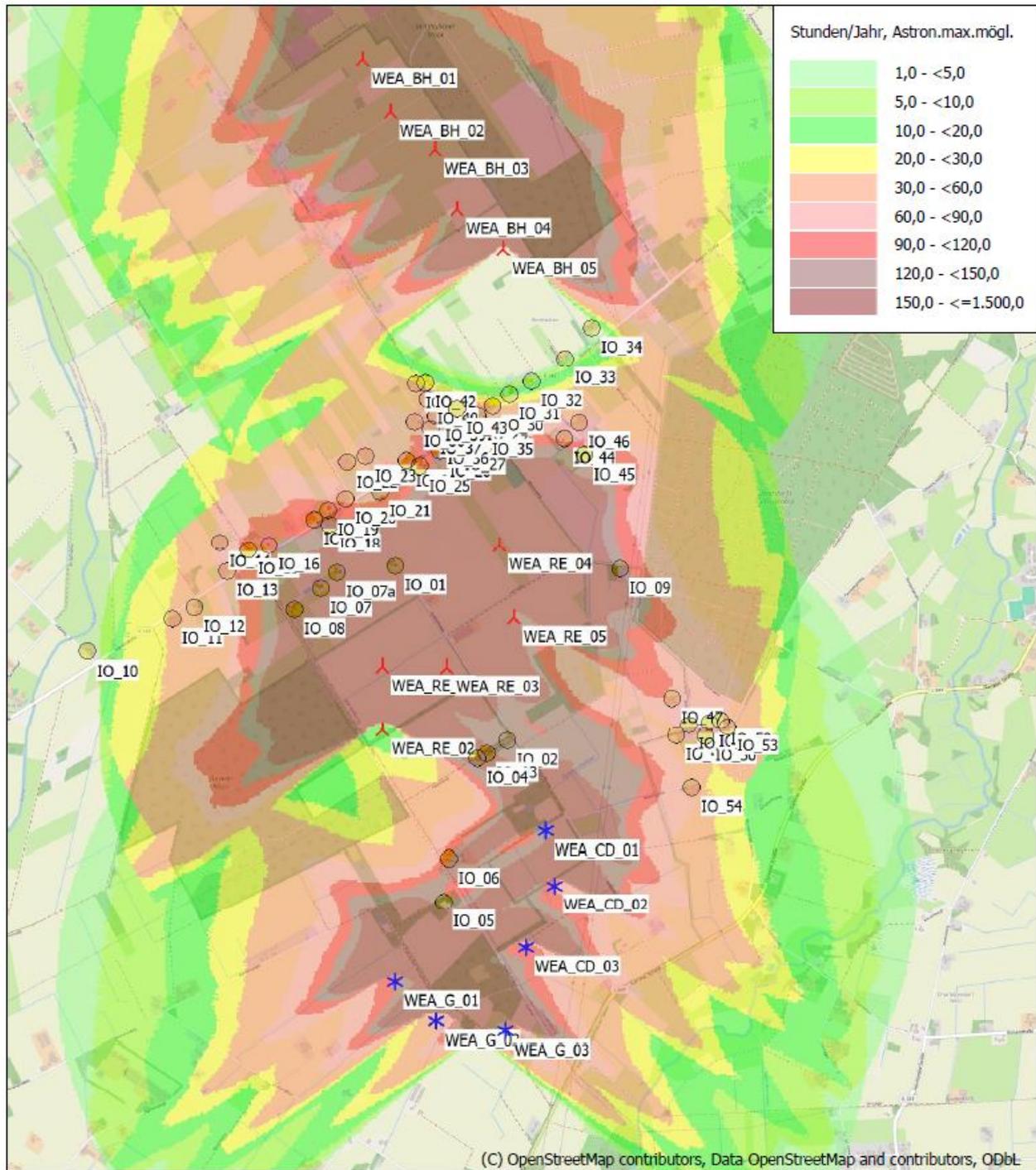
Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO_17	IO 17 Böseler Straße 544 Wardenburg	116:51	177	1:09
IO_18	IO 18 Böseler Straße 531 Wardenburg	131:05	181	1:17
IO_19	IO 19 Böseler Straße 532 Wardenburg	106:13	170	1:11
IO_20	IO 20 Böseler Straße 522 Wardenburg	86:50	162	0:59
IO_21	IO 21 Böseler Straße 491 Wardenburg	84:21	165	0:50
IO_22	IO 22 Böseler Straße 502 Wardenburg	53:28	134	0:38
IO_23	IO 23 Böseler Straße 490 Wardenburg	66:17	145	0:42
IO_24	IO 24 Böseler Straße 464 Wardenburg	95:18	140	0:53
IO_25	IO 25 Böseler Straße 455 Wardenburg	109:58	144	0:59
IO_26	IO 26 Böseler Straße 443 Wardenburg	114:16	120	1:05
IO_27	IO 27 Böseler Straße 435B Wardenburg	99:35	107	1:03
IO_28	IO 28 Böseler Straße 426 Wardenburg	68:13	84	0:56
IO_29	IO 29 Böseler Straße 408 Wardenburg	47:23	66	0:52
IO_30	IO 30 Böseler Straße 398 Wardenburg	33:03	54	0:45
IO_31	IO 31 Böseler Straße 384 Wardenburg	18:46	40	0:35
IO_32	IO 32 Böseler Straße 374 Wardenburg	10:10	30	0:25
IO_33	IO 33 Böseler Straße 333 Wardenburg (Ponyhof)	3:06	17	0:14
IO_34	IO 34 Böseler Straße 334 Wardenburg	0:00	0	0:00
IO_35	IO 35 Mastenweg 2 Wardenburg	70:49	82	1:01
IO_36	IO 36 Am Denkmal 2 Wardenburg	92:50	106	1:01
IO_37	IO 37 Am Denkmal 8 Wardenburg	78:04	98	0:58
IO_38	IO 38 Am Denkmal 15 Wardenburg	72:34	96	0:58
IO_39	IO 39 Am Denkmal 26 Wardenburg	58:48	82	0:50
IO_40	IO 40 Saarländer Weg 23 Wardenburg	42:13	68	0:44
IO_41	IO 41 Saarländer Weg 37 Wardenburg	30:39	58	0:38
IO_42	IO 42 Saarländer Weg 30 Wardenburg	25:53	52	0:37
IO_43	IO 43 Am Spielplatz 5 Wardenburg	43:10	64	0:48
IO_44	IO 44 Unter den Linden 22 Wardenburg	87:17	106	0:59
IO_45	IO 45 Unter den Linden 32 Wardenburg	101:59	132	1:02
IO_46	IO 46 Unter den Linden 21 Wardenburg	66:33	96	0:48
IO_47	IO 47 Vehnberg 39 Wardenburg	77:47	183	0:40
IO_48	IO 48 Vehnberg 23 Wardenburg	54:38	169	0:28
IO_49	IO 49 Vehnberg 18 Wardenburg	70:17	196	0:34
IO_50	IO 50 Vehnberg 13A Wardenburg	66:13	207	0:32
IO_51	IO 51 Vehnberg 10 Wardenburg	73:28	215	0:32
IO_52	IO 52 Vehnberg 4 Wardenburg	70:15	222	0:31
IO_53	IO 53 Münsterscher Damm 152 Wardenburg	57:56	192	0:30
IO_54	IO 54 Beyerstraße 41 Wardenburg	53:10	184	0:26

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA_BH_01	WEA BH 01 V162 EnVentus - 7,2 MW	0:00
WEA_BH_02	WEA BH 02 V162 EnVentus - 7,2 MW	0:00
WEA_BH_03	WEA BH 03 V162 EnVentus - 7,2 MW	0:00
WEA_BH_04	WEA BH 04 V162 EnVentus - 7,2 MW	0:00
WEA_BH_05	WEA BH 05 V162 EnVentus - 7,2 MW	0:00
WEA_CD_01	WEA CD 01 Enercon E-101 - 3,05 MW	220:59
WEA_CD_02	WEA CD 02 Enercon E-101 - 3,05 MW	131:12
WEA_CD_03	WEA CD 03 Enercon E-101 - 3,05 MW	81:54
WEA_G_01	WEA G 01 ENERCON E-115	87:07
WEA_G_02	WEA G 02 ENERCON E-101	10:19
WEA_G_03	WEA G 03 ENERCON E-101	18:36
WEA_RE_01	WEA RE 01 Enercon E-175 EP5 E2 - 7,0 MW	495:40
WEA_RE_02	WEA RE 02 Enercon E-175 EP5 E2 - 7,0 MW	368:16
WEA_RE_03	WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW	393:52
WEA_RE_04	WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW	861:39
WEA_RE_05	WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW	414:30

Summen in Rezeptortabelle und WEA-Tabelle können sich unterscheiden, da eine WEA gleichzeitig an zwei oder mehr Rezeptoren Beschattung verursachen kann und/oder ein Rezeptor gleichzeitig von zwei oder mehr WEA beschattet werden kann.

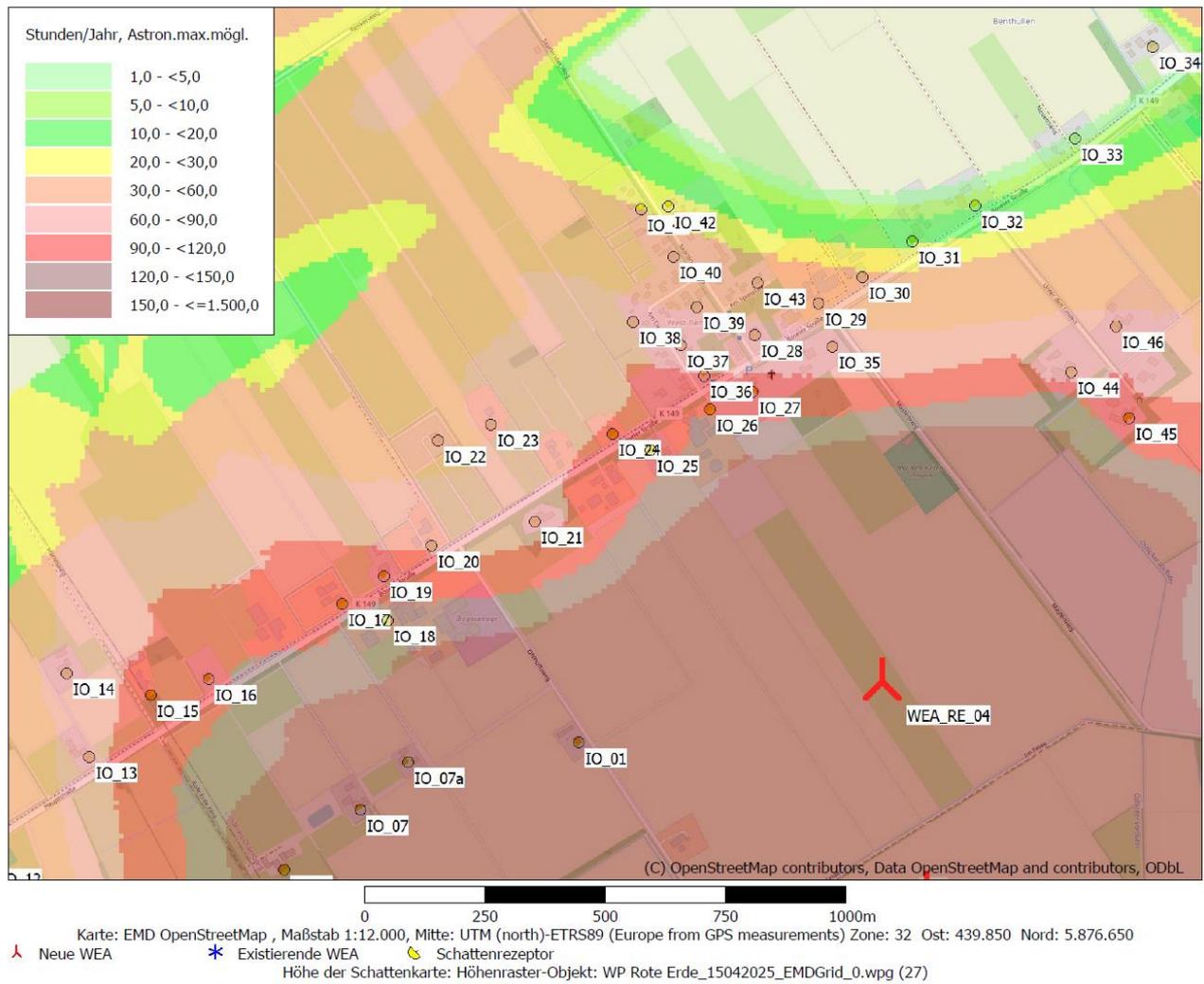
11.14 Schattenwurfkarte Gesamtbelastung, Stunden pro Jahr



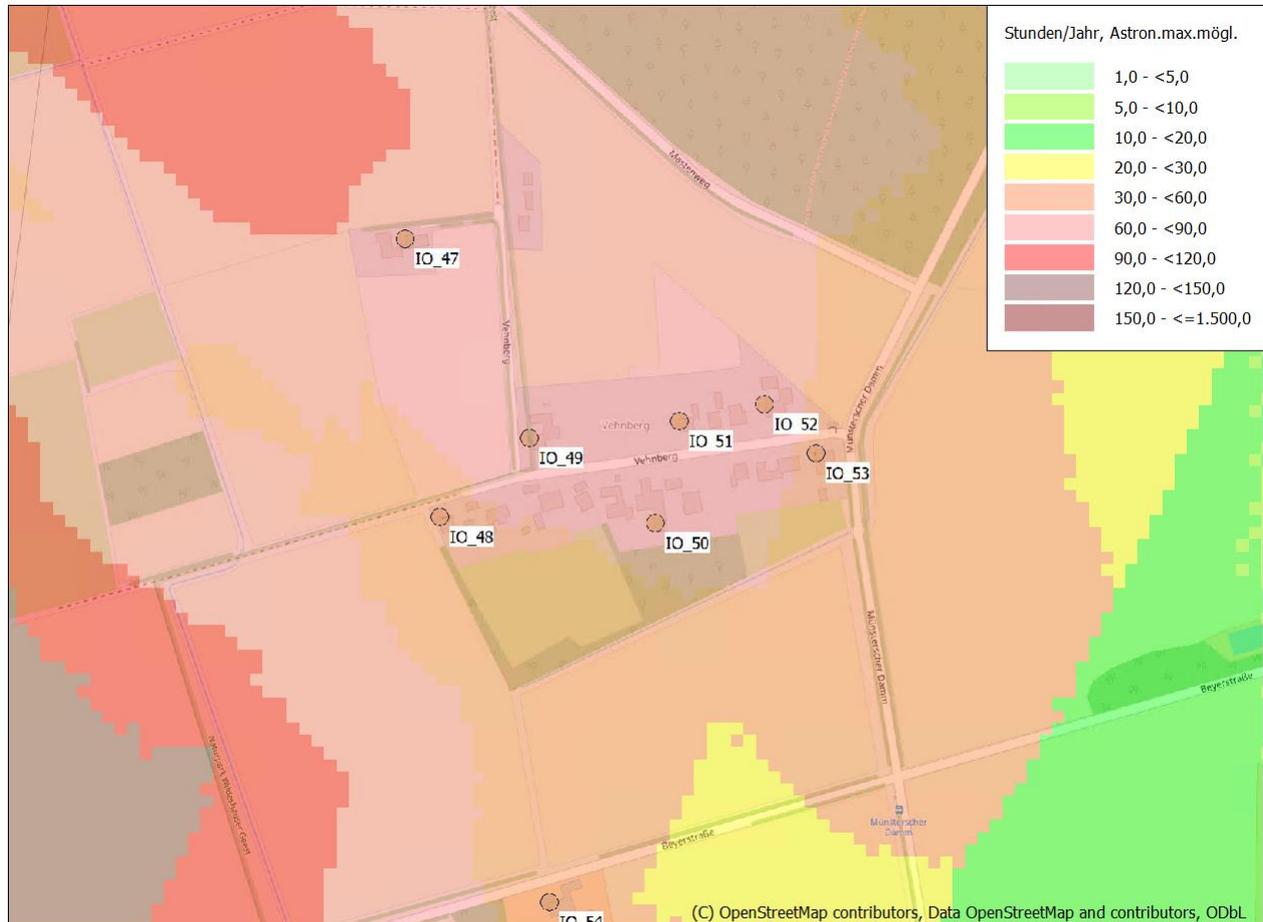
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap, Maßstab 1:35.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.590 Nord: 5.875.900
 ▲ Neue WEA * Existierende WEA ● Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.15 Schattenwurfkarte Gesamtbelastung, Detail Ortslage Benthullen, Stunden pro Jahr



11.16 Schattenwurfkarte Gesamtbelastung, Detail Ortslage Vehnberg, Stunden pro Jahr



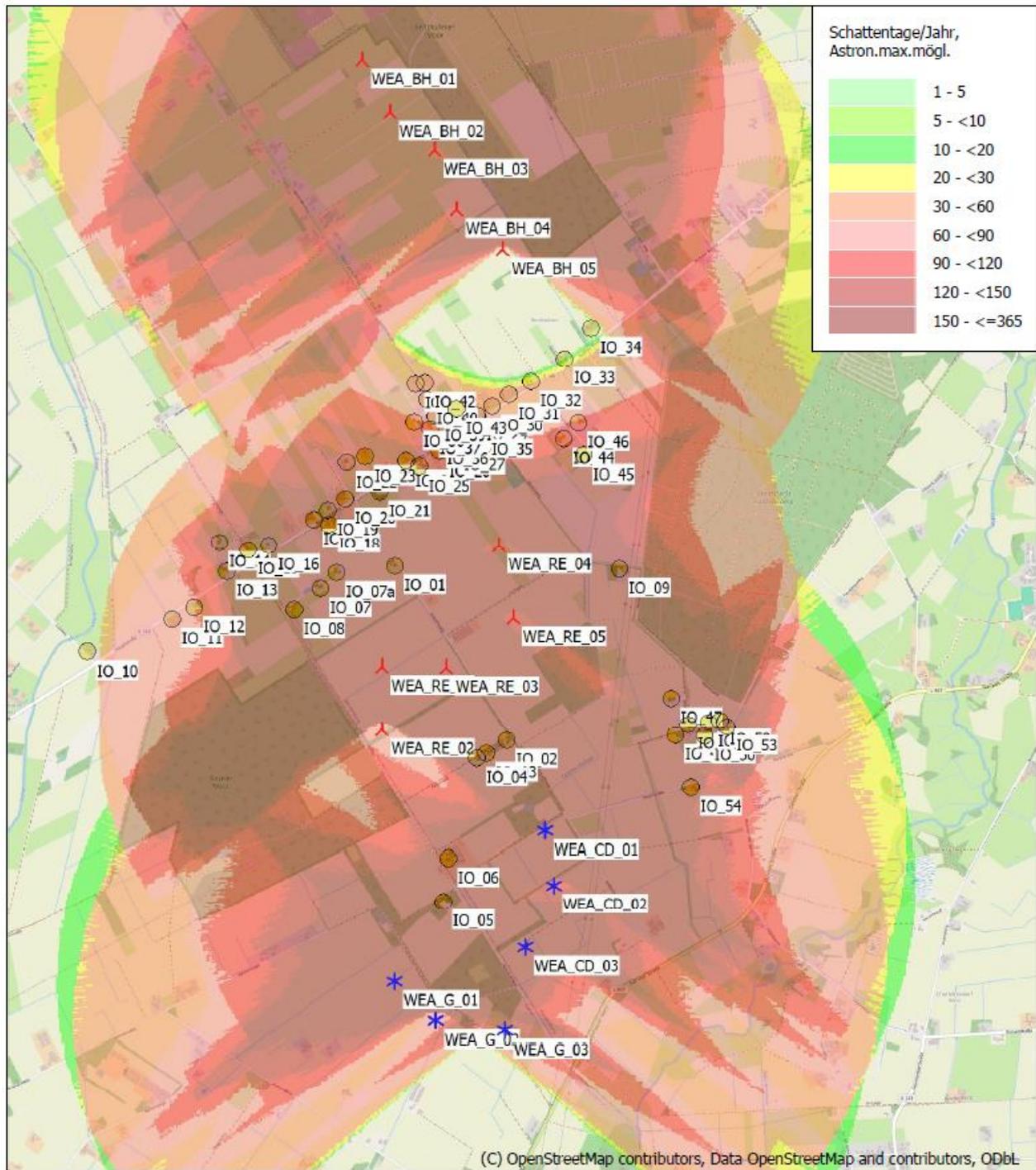
0 50 100 150 200 m

Karte: EMD OpenStreetMap , Maßstab 1:5.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 441.652 Nord: 5.874.995

▲ Neue WEA
 ✳ Existierende WEA
 ● Schattenrezeptor

Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.17 Schattenwurfkarte Gesamtbelastung, Tage pro Jahr



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

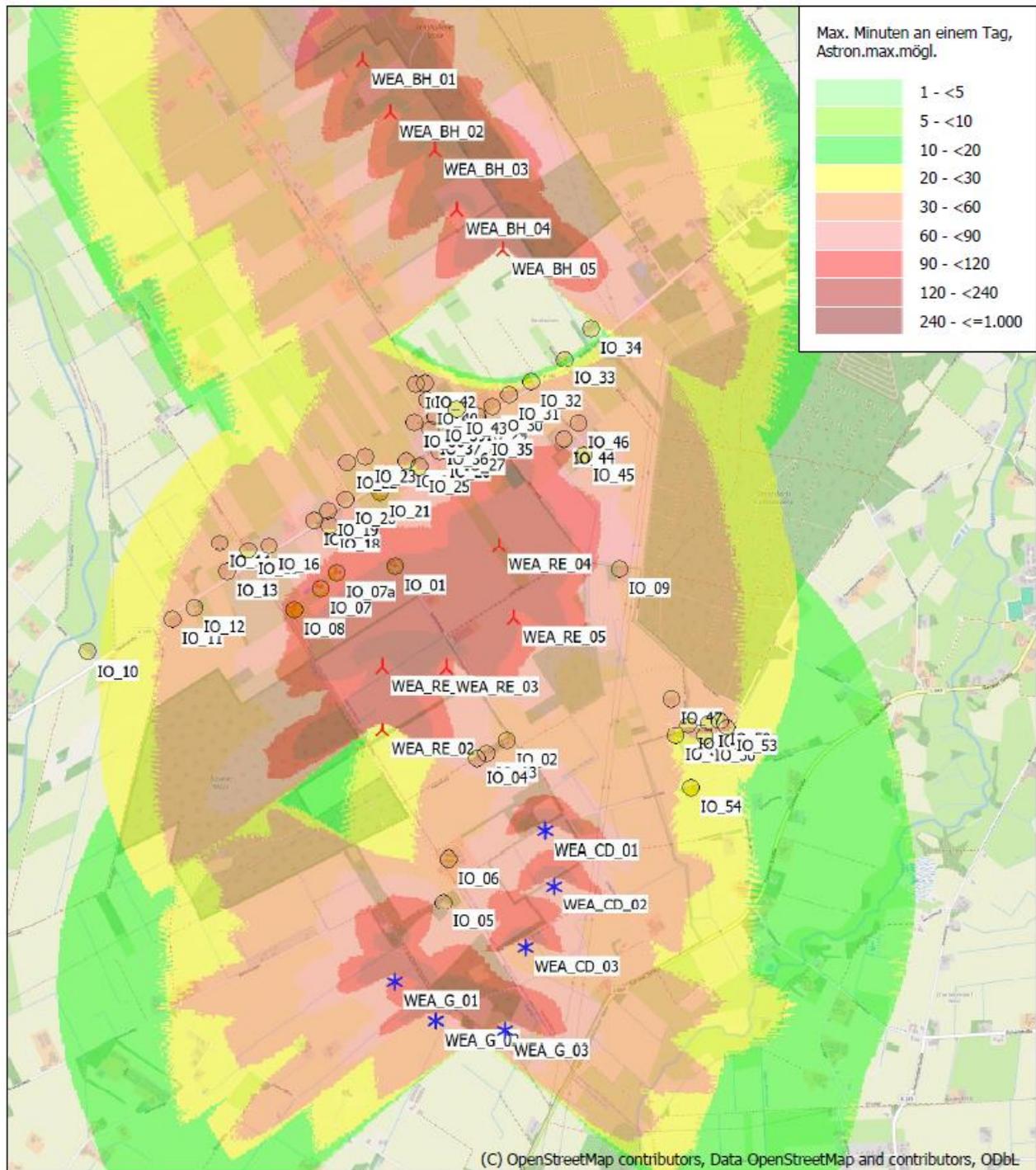
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:35.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.590 Nord: 5.875.900

▲ Neue WEA
 ★ Existierende WEA
 ● Schattenrezeptor

Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

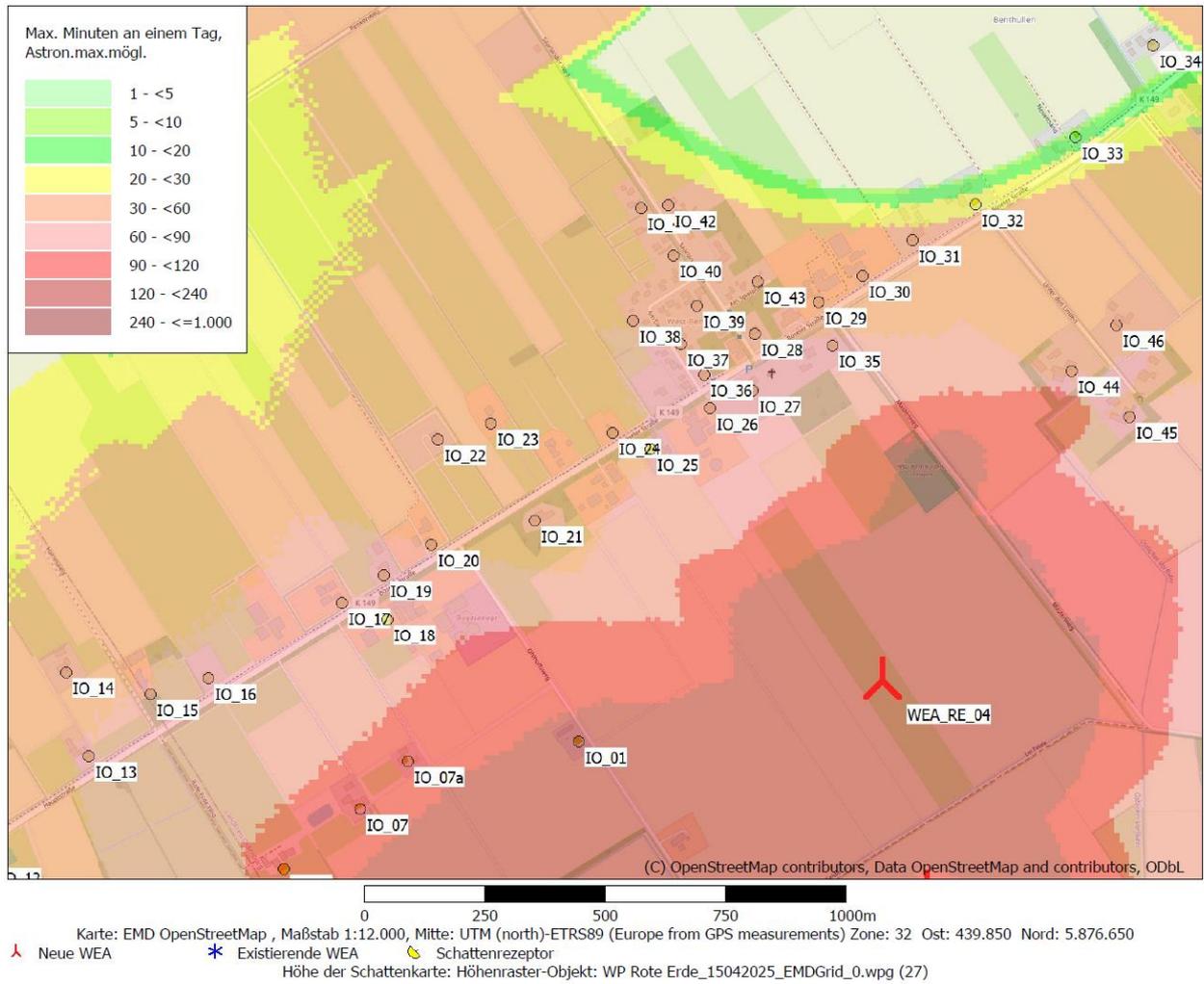
11.18 Schattenwurfkarte Gesamtbelastung, Minuten pro Tag



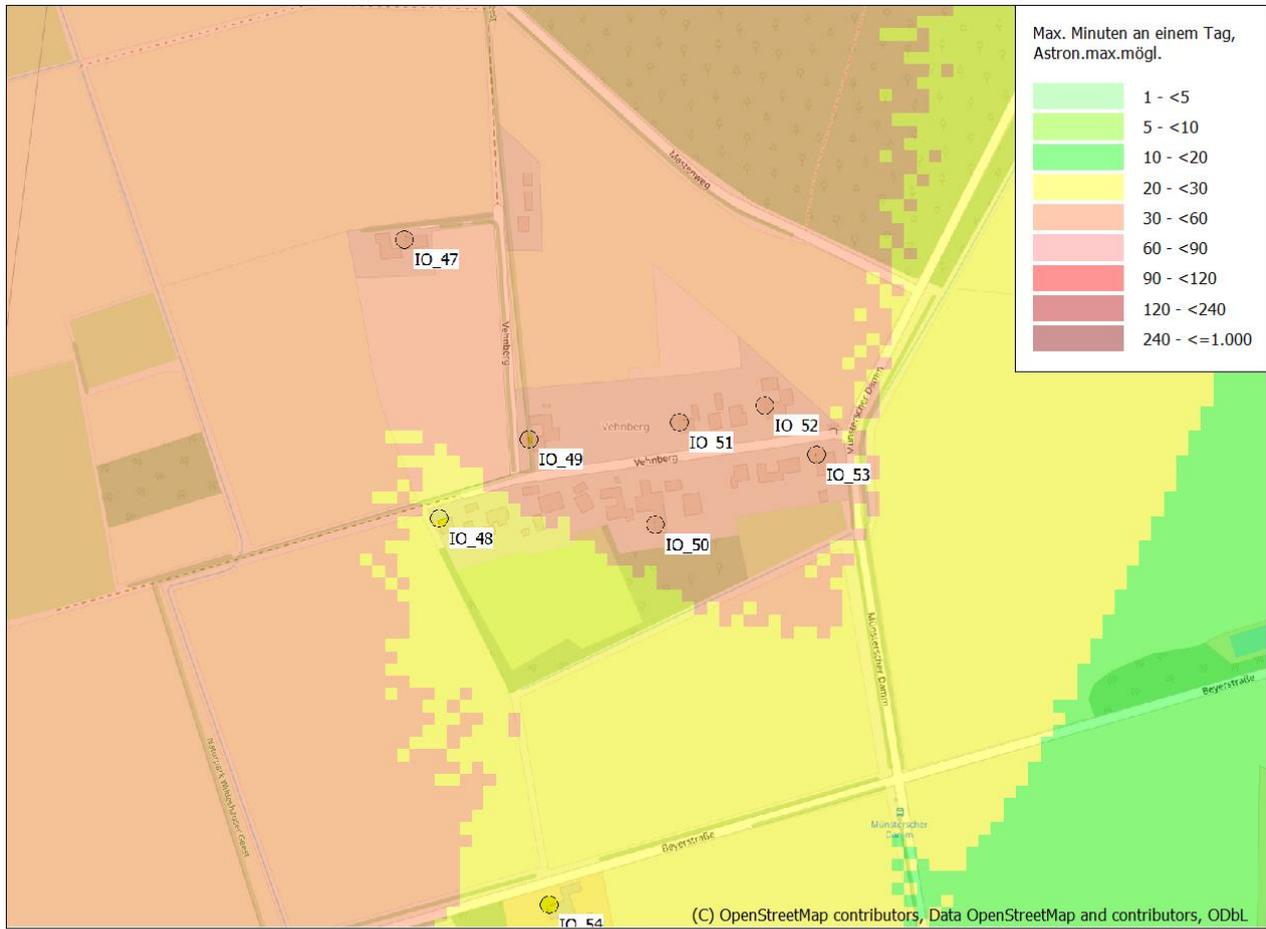
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:35.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 440.590 Nord: 5.875.900
 ▲ Neue WEA * Existierende WEA ● Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.19 Schattenwurfkarte Gesamtbelastung, Detail Ortslage Benthullen, Minuten pro Tag



11.20 Schattenwurfkarte Gesamtbelastung, Detail Ortslage Vehnberg, Minuten pro Tag



Karte: EMD OpenStreetMap, Maßstab 1:5.000, Mitte: UTM (north)-ETRS89 (Europe from GPS measurements) Zone: 32 Ost: 441.652 Nord: 5.874.995
 Neue WEA * Existierende WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: WP Rote Erde_15042025_EMDGrid_0.wpg (27)

11.21 Schattenwurfkalender, grafisch

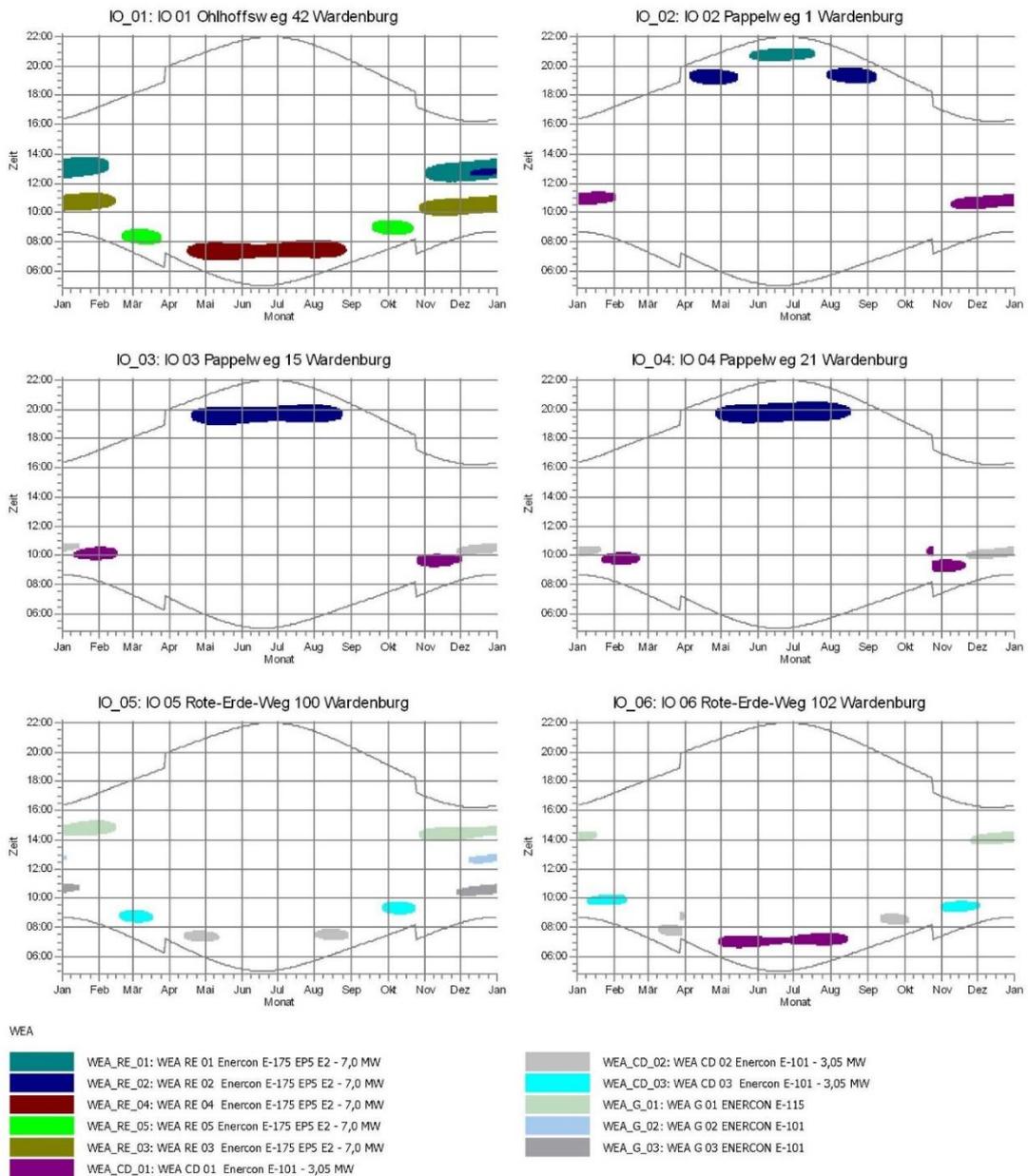
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
 Brooktorkai 18
 DE-20457 Hamburg
 (0 48 56)901-0

Berechnet:
 30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



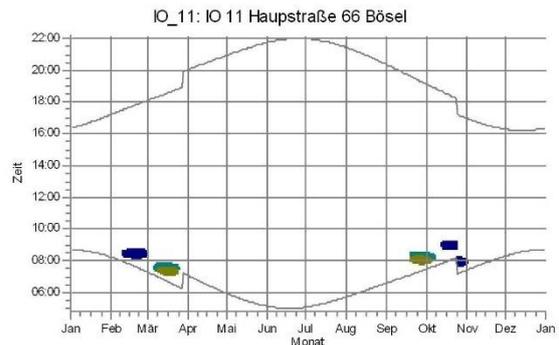
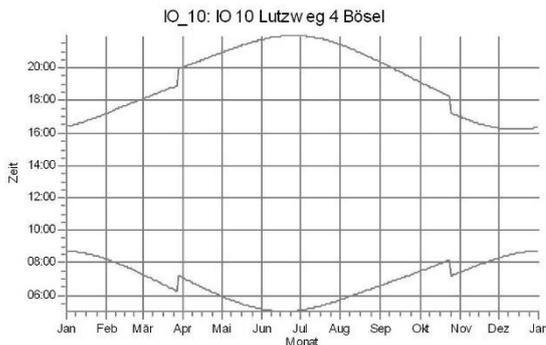
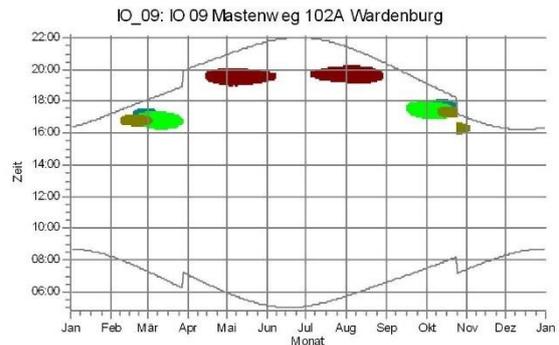
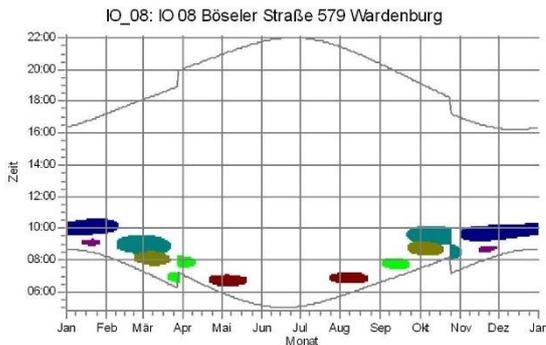
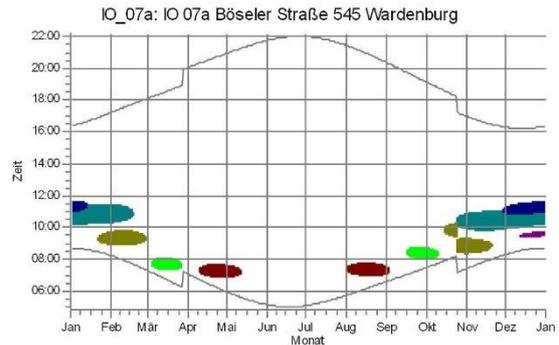
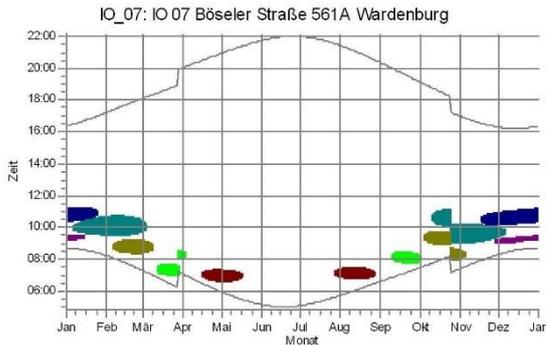
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

WEA_RE_01: WEA RE 01 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_RE_02: WEA RE 02 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW

WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_RE_03: WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_CD_01: WEA CD 01 Enercon E-101 - 3,05 MW

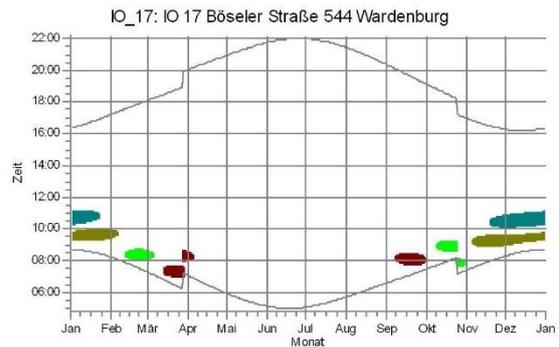
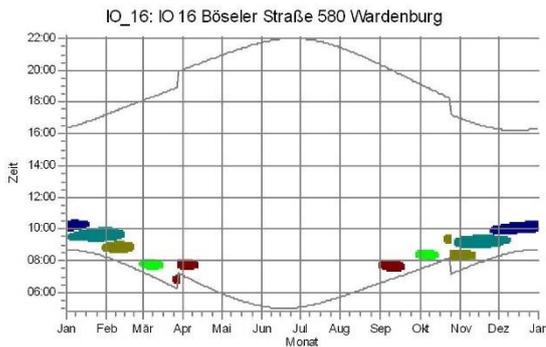
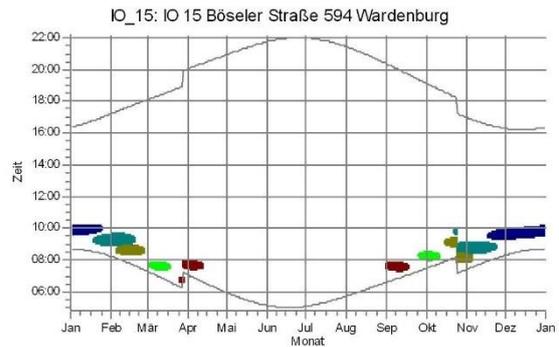
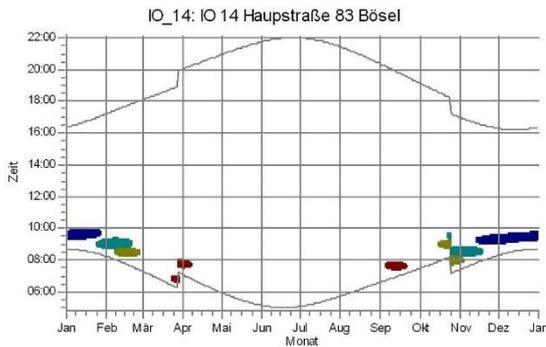
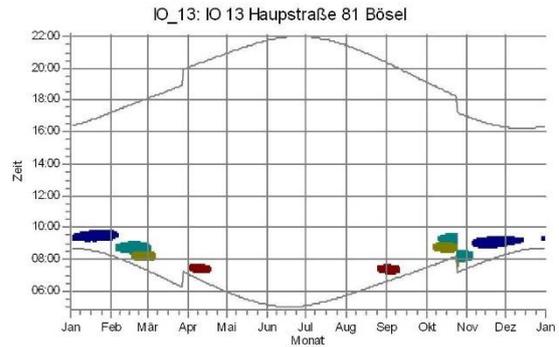
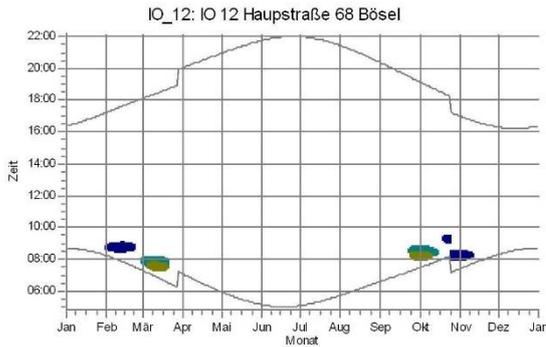
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

- WEA_RE_01: WEA RE 01 Enercon E-175 EP5 E2 - 7,0 MW
- WEA_RE_02: WEA RE 02 Enercon E-175 EP5 E2 - 7,0 MW
- WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW

- WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW
- WEA_RE_03: WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW

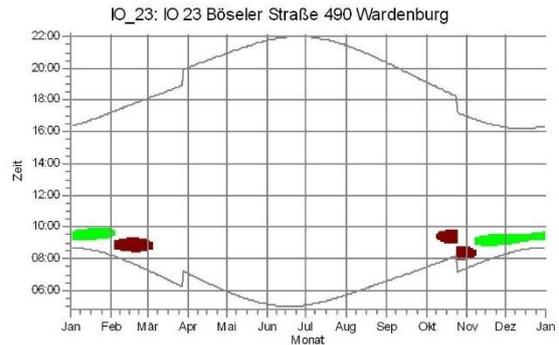
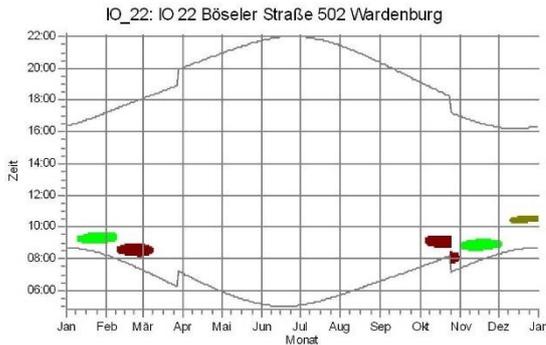
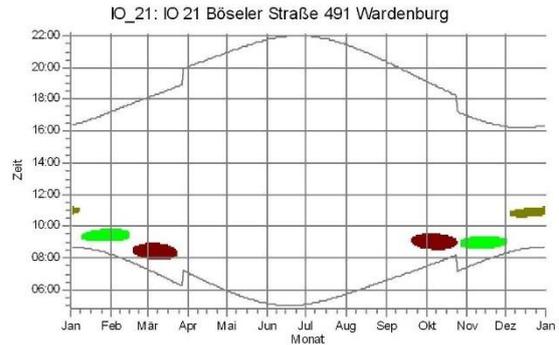
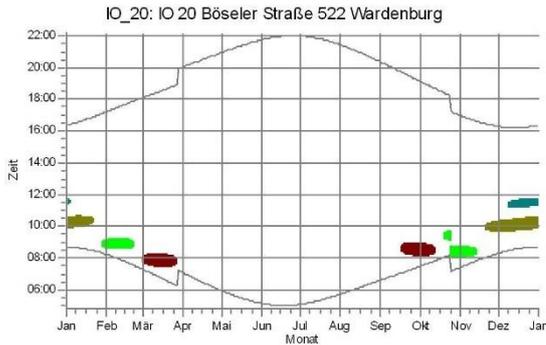
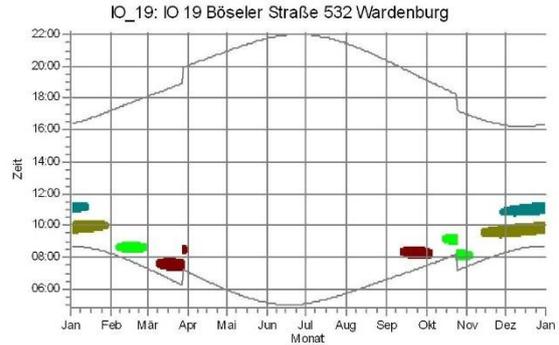
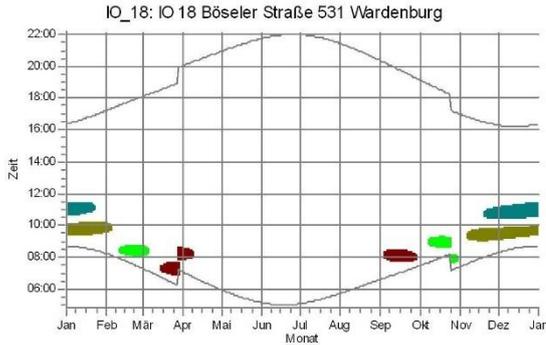
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

WEA_RE_01: WEA RE 01 Enercon E-175 EP5 E2 - 7,0 MW
WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW

WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW
WEA_RE_03: WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW

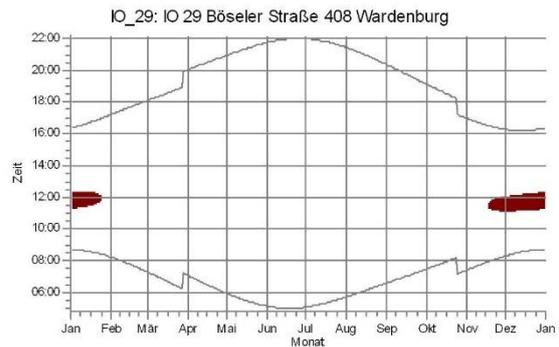
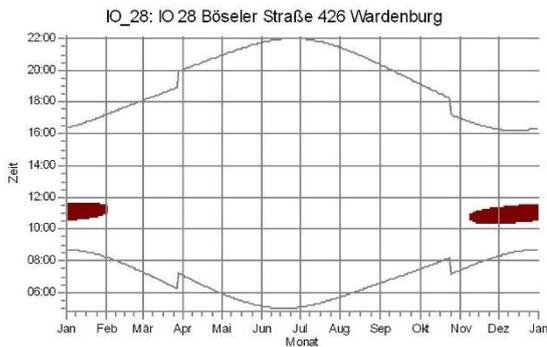
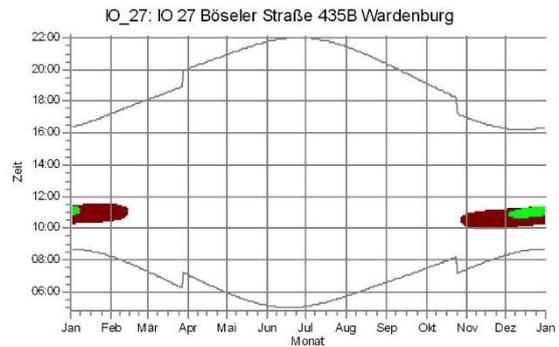
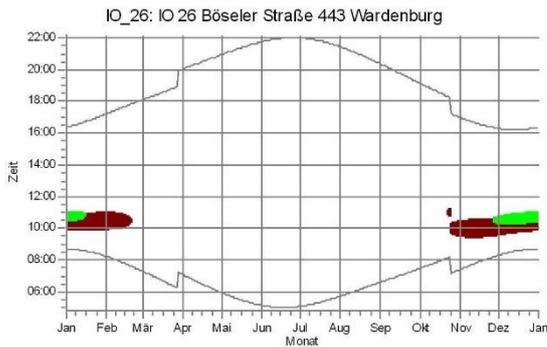
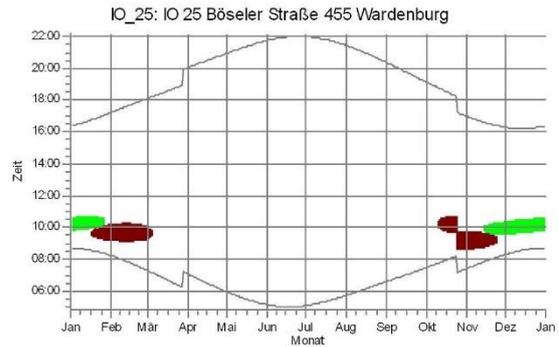
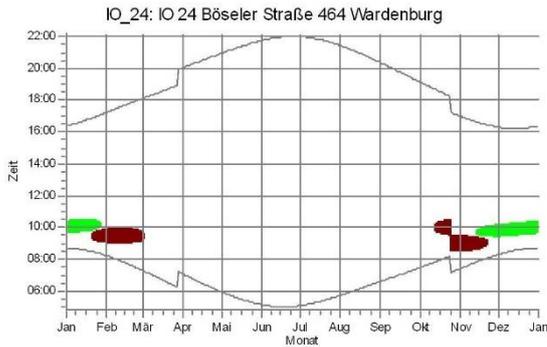
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW

WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW

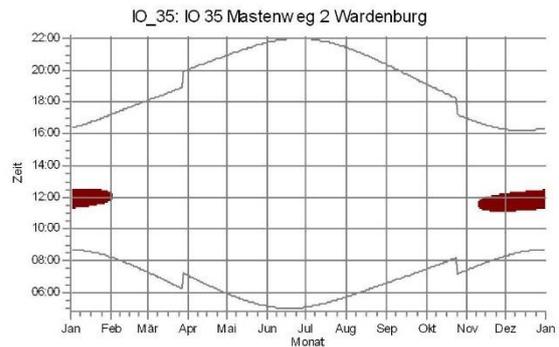
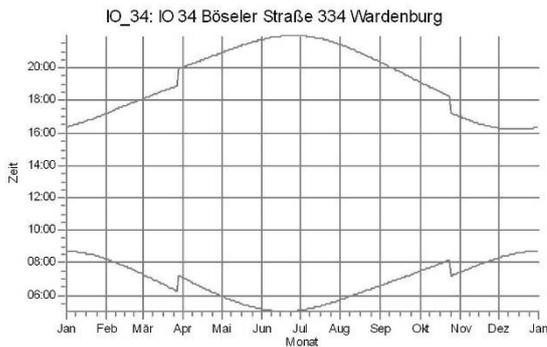
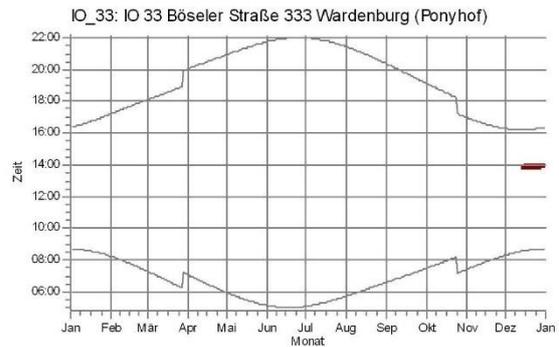
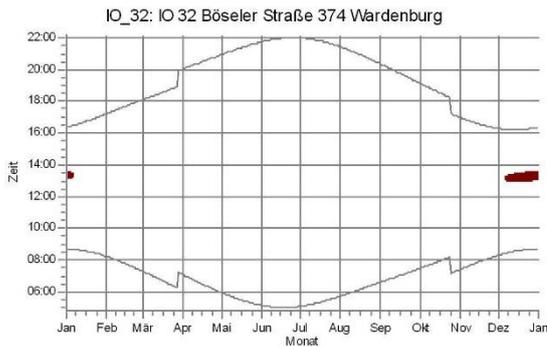
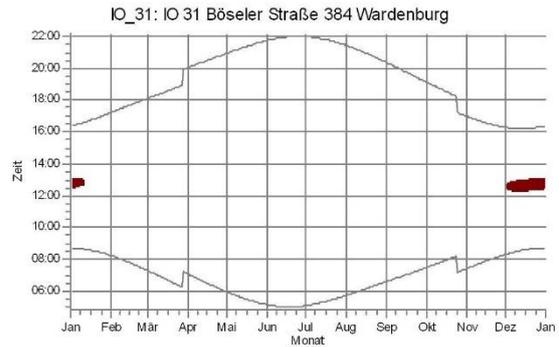
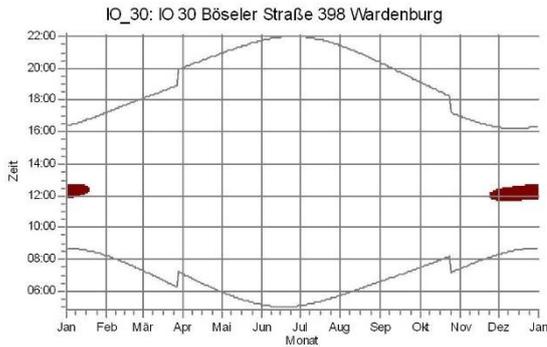
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA
 WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW

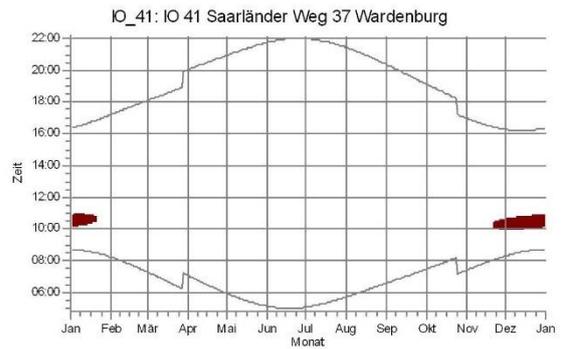
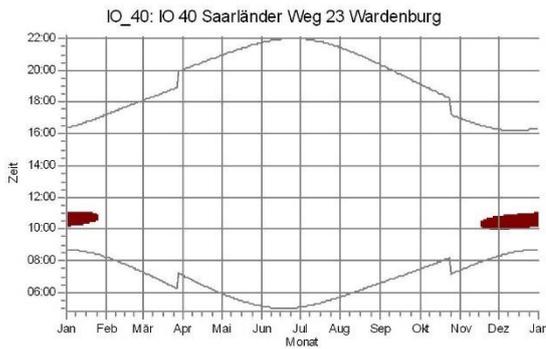
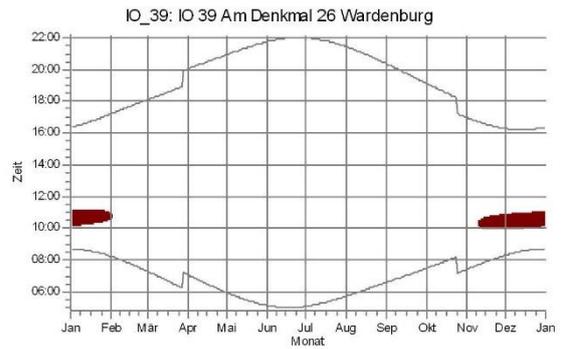
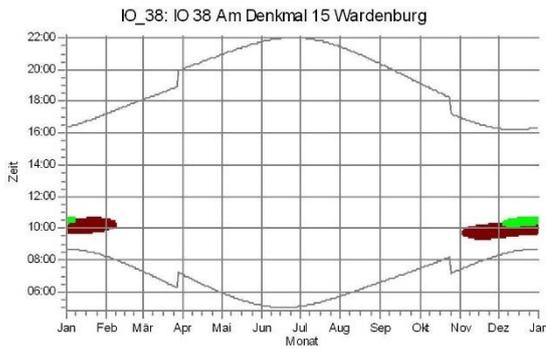
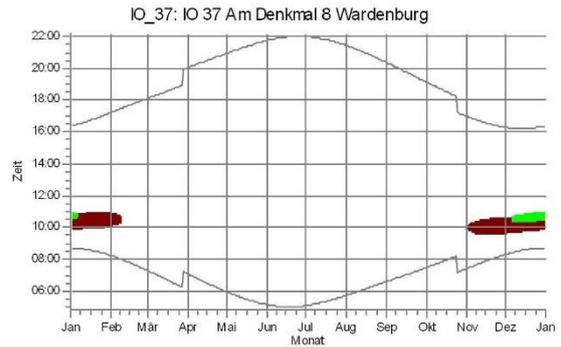
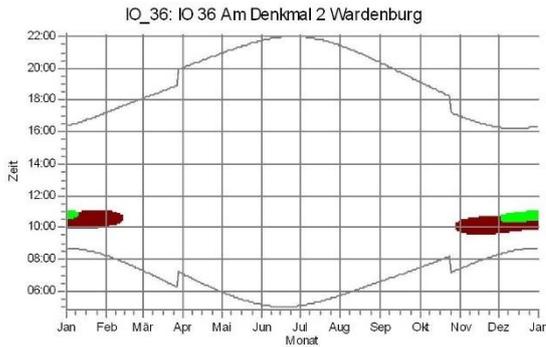
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

 WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW

 WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW

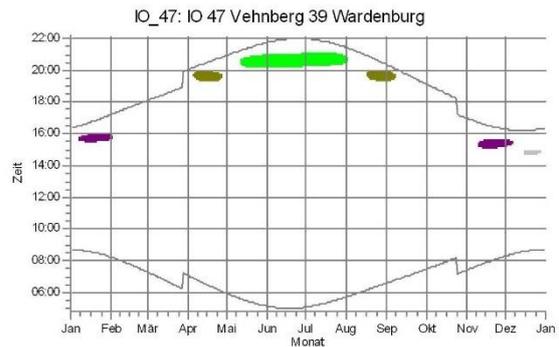
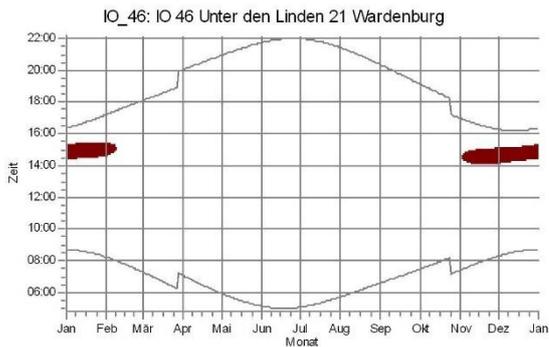
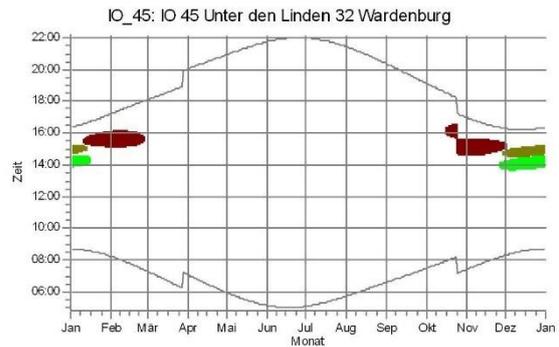
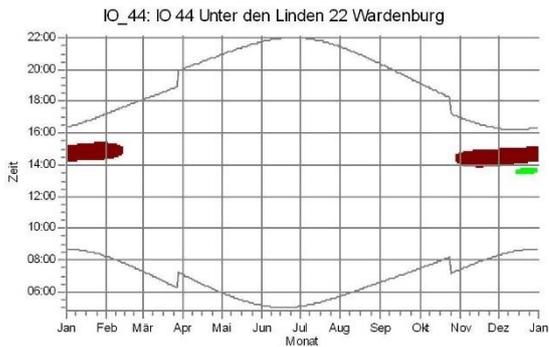
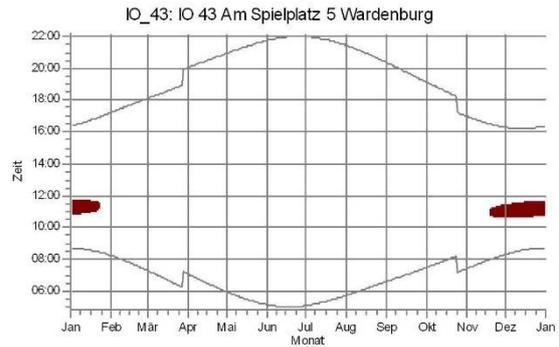
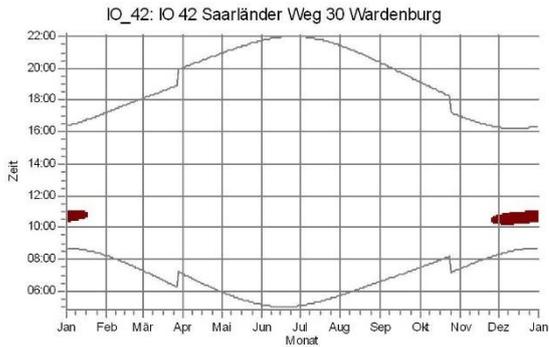
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

WEA_RE_04: WEA RE 04 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_RE_03: WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW

WEA_CD_01: WEA CD 01 Enercon E-101 - 3,05 MW
 WEA_CD_02: WEA CD 02 Enercon E-101 - 3,05 MW

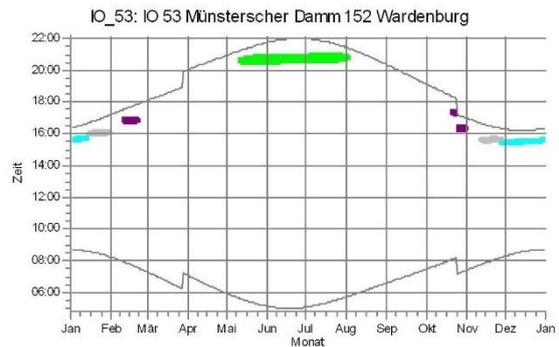
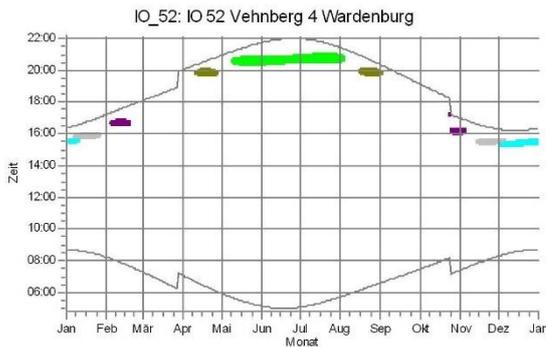
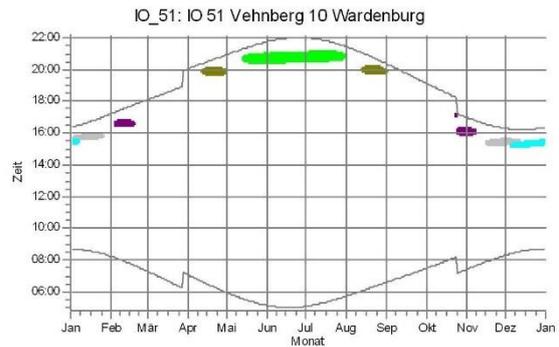
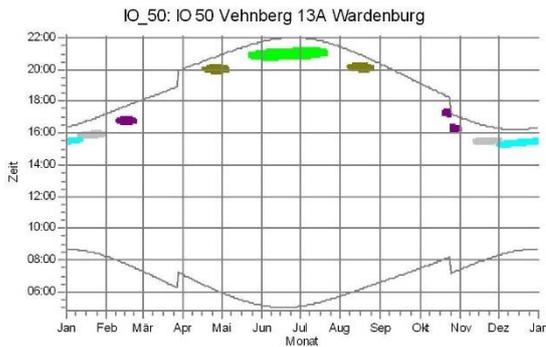
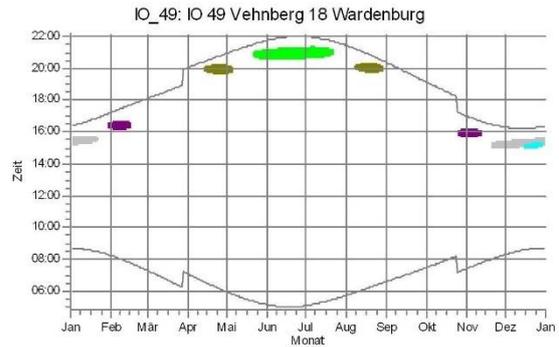
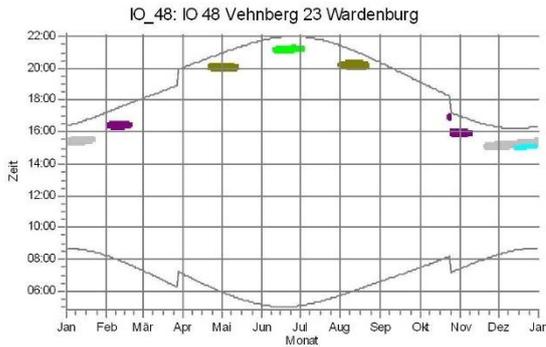
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

- WEA_RE_05: WEA RE 05 Enercon E-175 EP5 E2 - 7,0 MW
- WEA_RE_03: WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW
- WEA_CD_01: WEA CD 01 Enercon E-101 - 3,05 MW

- WEA_CD_02: WEA CD 02 Enercon E-101 - 3,05 MW
- WEA_CD_03: WEA CD 03 Enercon E-101 - 3,05 MW

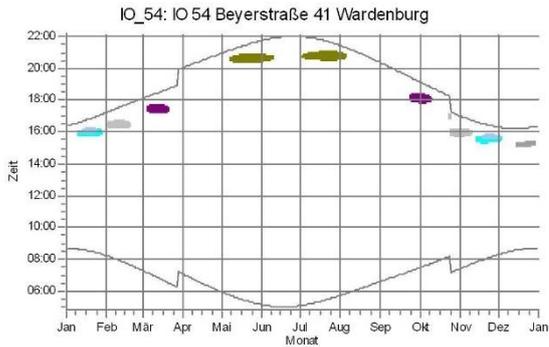
Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
 Brooktorkai 18
 DE-20457 Hamburg
 (0 48 56)901-0

Berechnet:
 30.09.2025 14:27/4.1.287

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung



WEA

WEA_RE_03: WEA RE 03 Enercon E-175 EP5 E2 - 7,0 MW
 WEA_CD_01: WEA CD 01 Enercon E-101 - 3,05 MW
 WEA_CD_02: WEA CD 02 Enercon E-101 - 3,05 MW

WEA_CD_03: WEA CD 03 Enercon E-101 - 3,05 MW
 WEA_G_02: WEA G 02 ENERCON E-101
 WEA_G_03: WEA G 03 ENERCON E-101

11.22 Schattenwurfkalender, tabellarisch

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_01 - IO 01 Ohlhoffsweg 42 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni
1 08:42	10:11 (WEA_RE_03) 08:13	10:21 (WEA_RE_03) 07:17	08:03 (WEA_RE_05) 07:04	05:57	06:53 (WEA_RE_04) 05:09
1 16:21	13:36 (WEA_RE_01) 17:11	13:37 (WEA_RE_01) 18:05	43 08:44 (WEA_RE_05) 20:01	20:55	50 07:51 (WEA_RE_04) 21:43
2 08:42	10:10 (WEA_RE_03) 08:11	10:21 (WEA_RE_03) 07:15	08:00 (WEA_RE_05) 07:02	05:55	06:52 (WEA_RE_04) 05:09
1 16:22	13:35 (WEA_RE_01) 17:13	13:35 (WEA_RE_01) 18:07	45 08:45 (WEA_RE_05) 20:03	20:57	50 07:51 (WEA_RE_04) 21:44
3 08:42	10:11 (WEA_RE_03) 08:10	10:22 (WEA_RE_03) 07:19	08:00 (WEA_RE_05) 07:06	05:53	06:51 (WEA_RE_04) 05:08
1 16:23	13:36 (WEA_RE_01) 17:15	13:35 (WEA_RE_01) 18:09	46 08:46 (WEA_RE_05) 20:05	20:58	60 07:51 (WEA_RE_04) 21:45
4 08:41	10:12 (WEA_RE_03) 08:09	10:24 (WEA_RE_03) 07:11	40 07:58 (WEA_RE_05) 06:57	05:51	06:50 (WEA_RE_04) 05:07
1 16:25	13:37 (WEA_RE_01) 17:17	13:33 (WEA_RE_01) 18:11	40 08:46 (WEA_RE_05) 20:07	21:00	61 07:51 (WEA_RE_04) 21:46
5 08:41	10:12 (WEA_RE_03) 08:06	10:25 (WEA_RE_03) 07:08	40 07:58 (WEA_RE_05) 06:55	05:49	06:51 (WEA_RE_04) 05:06
1 16:26	13:37 (WEA_RE_01) 17:19	13:31 (WEA_RE_01) 18:12	40 08:46 (WEA_RE_05) 20:09	21:02	61 07:52 (WEA_RE_04) 21:47
6 08:41	10:12 (WEA_RE_03) 08:05	10:26 (WEA_RE_03) 07:06	40 07:57 (WEA_RE_05) 06:54	05:48	06:49 (WEA_RE_04) 05:04
1 16:27	13:38 (WEA_RE_01) 17:21	13:29 (WEA_RE_01) 18:14	40 08:47 (WEA_RE_05) 20:10	21:04	62 07:52 (WEA_RE_04) 21:49
7 08:40	10:12 (WEA_RE_03) 08:03	10:27 (WEA_RE_03) 07:04	40 07:57 (WEA_RE_05) 06:50	05:48	06:50 (WEA_RE_04) 05:05
1 16:28	13:38 (WEA_RE_01) 17:23	13:26 (WEA_RE_01) 18:16	40 08:46 (WEA_RE_05) 20:12	21:05	62 07:52 (WEA_RE_04) 21:49
8 08:40	10:12 (WEA_RE_03) 08:04	10:29 (WEA_RE_03) 07:01	40 07:57 (WEA_RE_05) 06:48	05:48	06:49 (WEA_RE_04) 05:04
1 16:30	13:38 (WEA_RE_01) 17:24	13:22 (WEA_RE_01) 18:18	40 08:46 (WEA_RE_05) 20:14	21:07	63 07:52 (WEA_RE_04) 21:50
9 08:39	10:13 (WEA_RE_03) 07:59	10:30 (WEA_RE_03) 06:59	40 07:57 (WEA_RE_05) 06:45	05:42	06:50 (WEA_RE_04) 05:04
1 16:31	13:39 (WEA_RE_01) 17:26	11:07 (WEA_RE_03) 18:20	40 08:46 (WEA_RE_05) 20:16	21:09	62 07:52 (WEA_RE_04) 21:51
10 08:39	10:13 (WEA_RE_03) 07:57	10:32 (WEA_RE_03) 06:57	40 07:56 (WEA_RE_05) 06:43	05:40	06:49 (WEA_RE_04) 05:03
1 16:33	13:39 (WEA_RE_01) 17:28	11:05 (WEA_RE_03) 18:22	40 08:45 (WEA_RE_05) 20:18	21:10	63 07:52 (WEA_RE_04) 21:52
11 08:38	10:13 (WEA_RE_03) 07:58	10:25 (WEA_RE_03) 06:54	40 07:56 (WEA_RE_05) 06:41	05:38	06:49 (WEA_RE_04) 05:03
1 16:34	13:40 (WEA_RE_01) 17:30	11:02 (WEA_RE_03) 18:23	40 08:45 (WEA_RE_05) 20:19	21:12	63 07:52 (WEA_RE_04) 21:53
12 08:37	10:13 (WEA_RE_03) 07:53	10:38 (WEA_RE_03) 06:52	40 07:55 (WEA_RE_05) 06:38	05:36	06:49 (WEA_RE_04) 05:02
1 16:36	13:40 (WEA_RE_01) 17:32	10:59 (WEA_RE_03) 18:25	40 08:44 (WEA_RE_05) 20:21	21:14	63 07:52 (WEA_RE_04) 21:54
13 08:37	10:13 (WEA_RE_03) 07:51	10:44 (WEA_RE_03) 06:50	40 07:55 (WEA_RE_05) 06:36	05:35	06:49 (WEA_RE_04) 05:02
1 16:37	13:40 (WEA_RE_01) 17:34	9 10:53 (WEA_RE_03) 18:27	48 08:44 (WEA_RE_05) 20:23	21:15	62 07:51 (WEA_RE_04) 21:54
14 08:36	10:14 (WEA_RE_03) 07:49	10:47	47 07:57 (WEA_RE_05) 06:34	05:33	06:49 (WEA_RE_04) 05:02
1 16:39	13:40 (WEA_RE_01) 17:36	10:50	46 08:43 (WEA_RE_05) 20:25	21:17	63 07:52 (WEA_RE_04) 21:55
15 08:35	10:14 (WEA_RE_03) 07:47	10:45	46 07:56 (WEA_RE_05) 06:31	05:31	06:49 (WEA_RE_04) 05:02
1 16:40	13:41 (WEA_RE_01) 17:38	10:51	46 08:42 (WEA_RE_05) 20:26	21:19	62 07:51 (WEA_RE_04) 21:56
16 08:34	10:14 (WEA_RE_03) 07:45	10:42	47 07:57 (WEA_RE_05) 06:29	05:30	06:49 (WEA_RE_04) 05:01
1 16:42	13:41 (WEA_RE_01) 17:40	10:53	44 08:41 (WEA_RE_05) 20:28	21:20	62 07:51 (WEA_RE_04) 21:56
17 08:33	10:15 (WEA_RE_03) 07:43	10:40	47 07:57 (WEA_RE_05) 06:27	05:28	06:49 (WEA_RE_04) 05:01
1 16:44	13:41 (WEA_RE_01) 17:42	10:54	42 08:39 (WEA_RE_05) 20:30	6 07:28 (WEA_RE_04) 09:28	62 07:51 (WEA_RE_04) 21:57
18 08:32	10:15 (WEA_RE_03) 07:41	10:38	40 07:58 (WEA_RE_05) 06:25	05:27	06:49 (WEA_RE_04) 05:01
1 16:45	13:42 (WEA_RE_01) 17:44	10:56	40 08:38 (WEA_RE_05) 20:32	20 07:28 (WEA_RE_04) 21:29	62 07:51 (WEA_RE_04) 21:57
19 08:31	10:15 (WEA_RE_03) 07:39	10:25	47 07:57 (WEA_RE_05) 06:22	05:25	06:50 (WEA_RE_04) 05:01
1 16:47	13:41 (WEA_RE_01) 17:46	10:57	38 08:37 (WEA_RE_05) 20:34	27 07:27 (WEA_RE_04) 21:25	61 07:51 (WEA_RE_04) 21:57
20 08:30	10:15 (WEA_RE_03) 07:37	10:20	40 08:00 (WEA_RE_05) 06:20	05:24	06:49 (WEA_RE_04) 05:01
1 16:49	13:41 (WEA_RE_01) 17:48	10:58	34 08:34 (WEA_RE_05) 20:35	33 07:40 (WEA_RE_04) 21:27	61 07:50 (WEA_RE_04) 21:58
21 08:29	10:16 (WEA_RE_03) 07:35	10:11	31 08:33 (WEA_RE_05) 20:37	37 07:42 (WEA_RE_04) 21:28	60 07:50 (WEA_RE_04) 21:58
1 16:50	13:42 (WEA_RE_01) 17:50	10:59	31 08:33 (WEA_RE_05) 20:37	37 07:42 (WEA_RE_04) 21:28	60 07:50 (WEA_RE_04) 21:58
22 08:27	10:16 (WEA_RE_03) 07:33	10:04	30 08:33 (WEA_RE_05) 20:36	41 07:43 (WEA_RE_04) 21:29	60 07:50 (WEA_RE_04) 21:58
1 16:52	13:41 (WEA_RE_01) 17:52	10:59	26 08:29 (WEA_RE_05) 20:39	41 07:44 (WEA_RE_04) 21:30	59 07:50 (WEA_RE_04) 21:58
23 08:26	10:17 (WEA_RE_03) 07:31	09:11	26 08:06 (WEA_RE_05) 06:14	05:22	06:51 (WEA_RE_04) 05:02
1 16:54	13:42 (WEA_RE_01) 17:53	25 09:36 (WEA_RE_05) 18:45	20 08:26 (WEA_RE_05) 20:41	43 07:45 (WEA_RE_04) 21:31	59 07:50 (WEA_RE_04) 21:58
24 08:25	10:16 (WEA_RE_03) 07:29	08:09	12 08:22 (WEA_RE_05) 20:42	46 07:46 (WEA_RE_04) 21:33	58 07:50 (WEA_RE_04) 21:58
1 16:56	13:41 (WEA_RE_01) 17:55	30 08:39 (WEA_RE_05) 18:47	12 08:22 (WEA_RE_05) 20:42	46 07:46 (WEA_RE_04) 21:33	58 07:50 (WEA_RE_04) 21:58
25 08:24	10:17 (WEA_RE_03) 07:28	08:07	06:09	05:21	06:52 (WEA_RE_04) 05:03
1 16:58	13:41 (WEA_RE_01) 17:57	34 08:41 (WEA_RE_05) 18:49	06:07	05:19	06:53 (WEA_RE_04) 05:03
26 08:22	10:17 (WEA_RE_03) 07:24	08:05	06:07	05:16	06:52 (WEA_RE_04) 05:03
1 17:00	13:40 (WEA_RE_01) 17:59	36 08:41 (WEA_RE_05) 18:51	20:46	51 07:48 (WEA_RE_04) 21:35	56 07:48 (WEA_RE_04) 21:58
27 08:21	10:18 (WEA_RE_03) 07:22	08:04	20:50	05:15	06:52 (WEA_RE_04) 05:03
1 17:01	13:41 (WEA_RE_01) 18:01	39 08:43 (WEA_RE_05) 18:52	20:48	53 07:49 (WEA_RE_04) 21:37	56 07:48 (WEA_RE_04) 21:58
28 08:19	10:19 (WEA_RE_03) 07:20	08:03	20:53	05:14	06:52 (WEA_RE_04) 05:04
1 17:03	13:40 (WEA_RE_01) 18:03	41 08:44 (WEA_RE_05) 18:54	20:50	55 07:50 (WEA_RE_04) 21:38	56 07:48 (WEA_RE_04) 21:58
29 08:18	10:19 (WEA_RE_03) 07:19	08:01	20:53	05:13	06:54 (WEA_RE_04) 05:04
1 17:05	13:39 (WEA_RE_01) 18:05	42 08:44 (WEA_RE_05) 18:56	20:51	56 07:50 (WEA_RE_04) 21:39	54 07:48 (WEA_RE_04) 21:58
30 08:16	10:20 (WEA_RE_03) 07:17	08:00	20:55	05:12	06:54 (WEA_RE_04) 05:05
1 17:07	13:39 (WEA_RE_01) 18:07	43 08:44 (WEA_RE_05) 18:58	20:53	57 07:50 (WEA_RE_04) 21:41	54 07:48 (WEA_RE_04) 21:58
31 08:15	10:20 (WEA_RE_03) 07:15	08:00	20:57	05:11	06:54 (WEA_RE_04) 05:05
1 17:09	13:38 (WEA_RE_01) 18:09	44 08:44 (WEA_RE_05) 19:00	20:55	57 07:50 (WEA_RE_04) 21:43	54 07:48 (WEA_RE_04) 21:58
Sommerrechenstunden	294	275	267	246	205
abr.max.mögl.Beschattung	3051	1047	1000	410	1054

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schatteneende
			(WEA mit letztem Schatten)

Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_01 - IO 01 Ohlhoffsweg 42 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember					
1	10:06	07:04 (WEA_RE_04) 05:44	06:59 (WEA_RE_04) 06:26			07:20	08:25 (WEA_RE_05) 07:24	10:01 (WEA_RE_03) 08:17	09:55 (WEA_RE_03)						
2	12:58	07:49 (WEA_RE_04) 21:24	08:02 (WEA_RE_04) 20:19			19:07	09:24 (WEA_RE_05) 16:59	34	10:35 (WEA_RE_03) 16:16	128	13:22 (WEA_RE_01)				
3	12:57	07:49 (WEA_RE_04) 21:22	08:02 (WEA_RE_04) 20:17			19:05	09:23 (WEA_RE_05) 16:57	37	10:37 (WEA_RE_03) 16:15	127	13:22 (WEA_RE_01)				
4	10:08	07:04 (WEA_RE_04) 05:47	06:59 (WEA_RE_04) 06:40			07:31	08:34 (WEA_RE_05) 07:28		09:58 (WEA_RE_03) 08:20		09:50 (WEA_RE_03)				
5	12:57	07:50 (WEA_RE_04) 21:20	08:02 (WEA_RE_04) 20:14			19:02	09:23 (WEA_RE_05) 16:55	61	12:52 (WEA_RE_01) 16:15	127	13:22 (WEA_RE_01)				
6	12:56	07:50 (WEA_RE_04) 21:18	08:02 (WEA_RE_04) 20:12			19:00	09:23 (WEA_RE_05) 16:53	71	12:56 (WEA_RE_01) 16:14	127	13:23 (WEA_RE_01)				
7	10:09	07:04 (WEA_RE_04) 05:51	07:00 (WEA_RE_04) 06:43			07:35	08:34 (WEA_RE_05) 07:32		09:55 (WEA_RE_03) 08:23		09:57 (WEA_RE_03)				
8	12:56	07:51 (WEA_RE_04) 21:17	08:02 (WEA_RE_04) 20:10			18:58	09:23 (WEA_RE_05) 16:51	80	12:59 (WEA_RE_01) 16:13	127	13:23 (WEA_RE_01)				
9	10:10	07:04 (WEA_RE_04) 05:52	07:00 (WEA_RE_04) 06:45			07:37	08:34 (WEA_RE_05) 07:34		09:54 (WEA_RE_03) 08:25		09:59 (WEA_RE_03)				
10	12:55	07:52 (WEA_RE_04) 21:15	08:02 (WEA_RE_04) 20:07			18:55	09:23 (WEA_RE_05) 16:49	87	13:01 (WEA_RE_01) 16:13	127	13:24 (WEA_RE_01)				
11	10:11	07:04 (WEA_RE_04) 05:54	07:00 (WEA_RE_04) 06:47			07:38	08:33 (WEA_RE_05) 07:35		09:54 (WEA_RE_03) 08:26		09:59 (WEA_RE_03)				
12	12:55	07:52 (WEA_RE_04) 21:13	08:01 (WEA_RE_04) 20:05			18:53	09:22 (WEA_RE_05) 16:47	92	13:03 (WEA_RE_01) 16:12	126	13:24 (WEA_RE_01)				
13	10:12	07:03 (WEA_RE_04) 05:56	07:00 (WEA_RE_04) 06:48			07:40	08:33 (WEA_RE_05) 07:37		09:53 (WEA_RE_03) 08:27		09:59 (WEA_RE_03)				
14	12:54	07:52 (WEA_RE_04) 21:11	08:02 (WEA_RE_04) 20:03			18:51	09:21 (WEA_RE_05) 16:46	98	13:05 (WEA_RE_01) 16:12	126	13:24 (WEA_RE_01)				
15	10:13	07:03 (WEA_RE_04) 05:57	07:00 (WEA_RE_04) 06:50			07:42	08:33 (WEA_RE_05) 07:39		09:52 (WEA_RE_03) 08:28		10:00 (WEA_RE_03)				
16	12:54	07:52 (WEA_RE_04) 21:09	08:01 (WEA_RE_04) 20:00			18:48	09:21 (WEA_RE_05) 16:44	101	13:06 (WEA_RE_01) 16:12	124	13:25 (WEA_RE_01)				
17	10:14	07:03 (WEA_RE_04) 05:59	07:01 (WEA_RE_04) 06:52			07:44	08:33 (WEA_RE_05) 07:41		09:52 (WEA_RE_03) 08:29		10:01 (WEA_RE_03)				
18	12:52	07:53 (WEA_RE_04) 21:07	08:01 (WEA_RE_04) 19:59			18:46	09:20 (WEA_RE_05) 16:42	105	13:09 (WEA_RE_01) 16:11	124	13:25 (WEA_RE_01)				
19	10:15	07:02 (WEA_RE_04) 06:01	07:00 (WEA_RE_04) 06:53			07:46	08:34 (WEA_RE_05) 07:43		09:51 (WEA_RE_03) 08:31		10:01 (WEA_RE_03)				
20	12:52	07:54 (WEA_RE_04) 21:05	08:01 (WEA_RE_04) 19:55			18:44	09:20 (WEA_RE_05) 16:41	109	13:09 (WEA_RE_01) 16:11	125	13:26 (WEA_RE_01)				
21	10:16	07:02 (WEA_RE_04) 06:02	07:01 (WEA_RE_04) 06:56			07:47	08:35 (WEA_RE_05) 07:45		09:51 (WEA_RE_03) 08:32		10:01 (WEA_RE_03)				
22	12:51	07:55 (WEA_RE_04) 21:03	08:01 (WEA_RE_04) 19:53			18:41	09:19 (WEA_RE_05) 16:39	111	13:10 (WEA_RE_01) 16:11	125	13:26 (WEA_RE_01)				
23	10:17	07:03 (WEA_RE_04) 06:04	07:02 (WEA_RE_04) 06:57			07:48	08:35 (WEA_RE_05) 07:47		09:51 (WEA_RE_03) 08:33		10:02 (WEA_RE_03)				
24	12:50	07:56 (WEA_RE_04) 21:01	08:01 (WEA_RE_04) 19:51			18:39	09:18 (WEA_RE_05) 16:37	114	13:11 (WEA_RE_01) 16:11	123	13:26 (WEA_RE_01)				
25	10:18	07:02 (WEA_RE_04) 06:06	07:02 (WEA_RE_04) 06:59			07:51	08:35 (WEA_RE_05) 07:48		09:50 (WEA_RE_03) 08:34		10:03 (WEA_RE_03)				
26	12:49	07:56 (WEA_RE_04) 20:59	08:01 (WEA_RE_04) 19:48			18:37	09:18 (WEA_RE_05) 16:36	118	13:12 (WEA_RE_01) 16:11	123	13:27 (WEA_RE_01)				
27	10:19	07:02 (WEA_RE_04) 06:07	07:03 (WEA_RE_04) 07:00			07:53	08:35 (WEA_RE_05) 07:50		09:50 (WEA_RE_03) 08:35		10:03 (WEA_RE_03)				
28	12:48	07:57 (WEA_RE_04) 20:57	08:01 (WEA_RE_04) 19:46			18:35	09:18 (WEA_RE_05) 16:34	119	13:13 (WEA_RE_01) 16:11	123	13:27 (WEA_RE_01)				
29	10:21	07:02 (WEA_RE_04) 06:09	07:02 (WEA_RE_04) 07:02			07:55	08:36 (WEA_RE_05) 07:52		09:50 (WEA_RE_03) 08:36		10:04 (WEA_RE_03)				
30	12:47	07:57 (WEA_RE_04) 20:55	08:01 (WEA_RE_04) 19:43			18:32	09:17 (WEA_RE_05) 16:33	121	13:15 (WEA_RE_01) 16:11	122	13:28 (WEA_RE_01)				
31	10:22	07:01 (WEA_RE_04) 06:11	07:04 (WEA_RE_04) 07:04			07:56	08:39 (WEA_RE_05) 07:54		09:50 (WEA_RE_03) 08:36		10:05 (WEA_RE_03)				
1	12:46	07:58 (WEA_RE_04) 20:53	08:01 (WEA_RE_04) 19:41			18:30	09:11 (WEA_RE_05) 16:31	122	13:14 (WEA_RE_01) 16:11	122	13:28 (WEA_RE_01)				
2	10:23	07:01 (WEA_RE_04) 06:12	07:05 (WEA_RE_04) 07:05			07:58	08:41 (WEA_RE_05) 07:56		09:50 (WEA_RE_03) 08:37		10:04 (WEA_RE_03)				
3	12:44	07:58 (WEA_RE_04) 20:51	08:01 (WEA_RE_04) 19:39			18:28	09:09 (WEA_RE_05) 16:30	123	13:15 (WEA_RE_01) 16:12	122	13:28 (WEA_RE_01)				
4	10:25	07:01 (WEA_RE_04) 06:14	07:06 (WEA_RE_04) 07:07		08:59 (WEA_RE_05) 08:00		08:43 (WEA_RE_05) 07:50		09:51 (WEA_RE_03) 08:38		10:05 (WEA_RE_03)				
5	12:43	07:59 (WEA_RE_04) 20:48	08:01 (WEA_RE_04) 19:36		7	09:06 (WEA_RE_05) 18:26	24	09:07 (WEA_RE_05) 18:29	124	13:16 (WEA_RE_01) 16:12	122	13:29 (WEA_RE_01)			
6	10:26	07:01 (WEA_RE_04) 06:16	07:07 (WEA_RE_04) 07:09		8	08:53 (WEA_RE_05) 18:22		08:46 (WEA_RE_05) 07:59		09:51 (WEA_RE_03) 08:38		10:06 (WEA_RE_03)			
7	12:42	07:59 (WEA_RE_04) 20:46	08:01 (WEA_RE_04) 19:34		19	09:12 (WEA_RE_05) 18:13	17	09:03 (WEA_RE_05) 18:27	125	13:16 (WEA_RE_01) 16:12	122	13:30 (WEA_RE_01)			
8	10:27	07:00 (WEA_RE_04) 06:18	07:08 (WEA_RE_04) 07:11			08:49 (WEA_RE_05) 08:04		08:53 (WEA_RE_05) 08:01		09:51 (WEA_RE_03) 08:39		10:06 (WEA_RE_03)			
9	12:41	07:59 (WEA_RE_04) 20:44	08:01 (WEA_RE_04) 19:31		25	09:14 (WEA_RE_05) 18:21	3	08:56 (WEA_RE_05) 18:26	127	13:17 (WEA_RE_01) 16:13	123	13:30 (WEA_RE_01)			
10	10:28	07:01 (WEA_RE_04) 06:19	07:10 (WEA_RE_04) 07:12			08:47 (WEA_RE_05) 08:06		08:03		09:51 (WEA_RE_03) 08:40		10:07 (WEA_RE_03)			
11	12:39	08:00 (WEA_RE_04) 20:42	08:01 (WEA_RE_04) 19:29		30	09:17 (WEA_RE_05) 18:16		16:25	127	13:17 (WEA_RE_01) 16:13	122	13:30 (WEA_RE_01)			
12	10:30	07:00 (WEA_RE_04) 06:21	07:12 (WEA_RE_04) 07:14			08:45 (WEA_RE_05) 08:07		08:05		09:52 (WEA_RE_03) 08:40		10:07 (WEA_RE_03)			
13	12:38	08:00 (WEA_RE_04) 20:40	08:01 (WEA_RE_04) 19:28		32	09:18 (WEA_RE_05) 18:17		16:24	127	13:18 (WEA_RE_01) 16:14	122	13:31 (WEA_RE_01)			
14	10:32	07:00 (WEA_RE_04) 06:23	07:14 (WEA_RE_04) 07:16		33	09:19 (WEA_RE_05) 18:15		08:06		09:52 (WEA_RE_03) 08:41		10:08 (WEA_RE_03)			
15	12:36	08:00 (WEA_RE_04) 20:37	08:01 (WEA_RE_04) 19:24		37	09:19 (WEA_RE_05) 18:15		16:23	128	13:19 (WEA_RE_01) 16:14	122	13:32 (WEA_RE_01)			
16	10:33	07:00 (WEA_RE_04) 06:24	07:15 (WEA_RE_04) 07:17			08:41 (WEA_RE_05) 07:11		08:08		09:53 (WEA_RE_03) 08:41		10:08 (WEA_RE_03)			
17	12:35	08:01 (WEA_RE_04) 20:35	08:01 (WEA_RE_04) 19:22		39	09:20 (WEA_RE_05) 18:13		16:21	127	13:19 (WEA_RE_01) 16:15	122	13:32 (WEA_RE_01)			
18	10:35	07:00 (WEA_RE_04) 06:26	07:16 (WEA_RE_04) 07:19			08:40 (WEA_RE_05) 07:13		08:10		09:52 (WEA_RE_03) 08:41		10:09 (WEA_RE_03)			
19	12:33	08:01 (WEA_RE_04) 20:33	1	07:27 (WEA_RE_04) 19:19		42	09:22 (WEA_RE_05) 18:11		16:20	129	13:19 (WEA_RE_01) 16:15	122	13:33 (WEA_RE_01)		
20	10:36	07:00 (WEA_RE_04) 06:28				08:39 (WEA_RE_05) 07:15		08:11		09:53 (WEA_RE_03) 08:41		10:09 (WEA_RE_03)			
21	12:32	08:02 (WEA_RE_04) 20:31				19:17	43	09:22 (WEA_RE_05) 18:09		16:19	128	13:20 (WEA_RE_01) 16:16	123	13:33 (WEA_RE_01)	
22	10:38	07:00 (WEA_RE_04) 06:30				07:23		08:37 (WEA_RE_05) 07:17		08:13		09:54 (WEA_RE_03) 08:42		10:09 (WEA_RE_03)	
23	12:30	08:02 (WEA_RE_04) 20:28				19:14	45	09:22 (WEA_RE_05) 18:07		16:18	128	13:20 (WEA_RE_01) 16:17	123	13:33 (WEA_RE_01)	
24	10:39	08:00 (WEA_RE_04) 06:31				07:24		08:37 (WEA_RE_05) 07:19		08:14		09:55 (WEA_RE_03) 08:42		10:09 (WEA_RE_03)	
25	12:29	08:02 (WEA_RE_04) 20:26				19:12	46	09:23 (WEA_RE_05) 18:04	13	10:24 (WEA_RE_03) 16:18	127	13:21 (WEA_RE_01) 16:18	123	13:33 (WEA_RE_01)	
26	10:41	07:00 (WEA_RE_04) 06:33				07:26		08:36 (WEA_RE_05) 07:20		10:07 (WEA_RE_03) 08:16		09:54 (WEA_RE_03) 08:42		10:10 (WEA_RE_03)	
27	12:27	08:02 (WEA_RE_04) 20:24				19:10	47	09:23 (WEA_RE_05) 18:02	22	10:26 (WEA_RE_03) 16:17	129	13:21 (WEA_RE_01) 16:19	124	13:34 (WEA_RE_01)	
28	10:42	08:00 (WEA_RE_04) 06:35						07:22		10:04 (WEA_RE_03)		08:42		10:10 (WEA_RE_03)	
29	12:25	08:02 (WEA_RE_04) 20:21						18:58		16:20	124	13:25 (WEA_RE_01)		10:11 (WEA_RE_03)	
30	10:44							17:01							10:11 (WEA_RE_03)
31	10:44							17:01							10:11 (WEA_RE_03)
Sonnenscheinstunden	508		457		382		330		262		238		204		
avr_max_mögl_Beschattung	1699		1299		413		901		3229						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_02 - IO 02 Pappelweg 1 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

[Januar]		[Februar]		[März]		[April]		[Mai]		[Juni]	
1	08:42		10:34 (WEA_CD_01) 08:13		10:58 (WEA_CD_01) 07:17		07:04		05:57		05:09
	16:21	40	11:14 (WEA_CD_01) 17:11	10	11:08 (WEA_CD_01) 18:05		20:01		20:55	47	21:43
2	08:42		10:34 (WEA_CD_01) 08:11		07:15		07:02		05:55		05:08
	16:22	40	11:14 (WEA_CD_01) 17:13		18:07		20:03		20:57	47	21:44
3	08:41		10:35 (WEA_CD_01) 08:10		07:13		06:59		05:53		05:08
	16:23	40	11:15 (WEA_CD_01) 17:15		18:09		20:05		20:58	46	21:45
4	08:41		10:35 (WEA_CD_01) 08:08		07:11		06:57		05:51		05:07
	16:25	41	11:16 (WEA_CD_01) 17:17		18:10		20:07		21:00	44	21:46
5	08:41		10:35 (WEA_CD_01) 08:06		07:08		06:55		05:49		05:06
	16:26	41	11:16 (WEA_CD_01) 17:19		18:12		20:09		21:02	42	21:47
6	08:41		10:36 (WEA_CD_01) 08:05		07:06		06:52		05:47		05:05
	16:27	41	11:17 (WEA_CD_01) 17:21		18:14		20:10		19:26 (WEA_RE_02) 21:04	41	21:48
7	08:40		10:36 (WEA_CD_01) 08:03		07:04		06:50		05:45		05:05
	16:28	41	11:17 (WEA_CD_01) 17:22		18:16		20:12	23	19:29 (WEA_RE_02) 21:05	38	21:49
8	08:40		10:36 (WEA_CD_01) 08:01		07:01		06:48		05:43		05:04
	16:30	41	11:17 (WEA_CD_01) 17:24		18:18		20:14	28	19:31 (WEA_RE_02) 21:07	36	21:50
9	08:39		10:37 (WEA_CD_01) 07:59		06:59		06:45		05:42		05:04
	16:31	41	11:18 (WEA_CD_01) 17:26		18:20		20:16	32	19:33 (WEA_RE_02) 21:09	33	21:51
10	08:39		10:37 (WEA_CD_01) 07:57		06:57		06:43		05:40		05:03
	16:33	41	11:18 (WEA_CD_01) 17:28		18:22		20:17	36	19:34 (WEA_RE_02) 21:10	31	21:52
11	08:38		10:37 (WEA_CD_01) 07:55		06:54		06:41		05:38		05:03
	16:34	42	11:19 (WEA_CD_01) 17:30		18:23		20:19	39	19:36 (WEA_RE_02) 21:12	28	21:53
12	08:37		10:38 (WEA_CD_01) 07:53		06:52		06:38		05:36		05:02
	16:36	41	11:19 (WEA_CD_01) 17:32		18:25		20:21	42	19:37 (WEA_RE_02) 21:14	25	21:54
13	08:36		10:38 (WEA_CD_01) 07:51		06:50		06:36		05:35		05:02
	16:37	41	11:19 (WEA_CD_01) 17:34		18:27		20:23	44	19:38 (WEA_RE_02) 21:15	20	21:54
14	08:36		10:38 (WEA_CD_01) 07:49		06:47		06:34		05:33		05:02
	16:39	42	11:20 (WEA_CD_01) 17:36		18:29		20:25	46	19:38 (WEA_RE_02) 21:17	14	21:55
15	08:35		10:39 (WEA_CD_01) 07:47		06:45		06:31		05:31		05:02
	16:40	41	11:20 (WEA_CD_01) 17:38		18:31		20:26	48	19:39 (WEA_RE_02) 21:19		21:55
16	08:34		10:39 (WEA_CD_01) 07:45		06:42		06:29		05:30		05:01
	16:42	41	11:20 (WEA_CD_01) 17:40		18:33		20:28	48	19:39 (WEA_RE_02) 21:20		21:56
17	08:33		10:40 (WEA_CD_01) 07:43		06:40		06:27		05:28		05:01
	16:44	41	11:21 (WEA_CD_01) 17:42		18:34		20:30	50	19:40 (WEA_RE_02) 21:22		21:56
18	08:32		10:41 (WEA_CD_01) 07:41		06:38		06:25		05:27		05:01
	16:45	40	11:21 (WEA_CD_01) 17:44		18:36		20:32	50	19:40 (WEA_RE_02) 21:23		21:57
19	08:31		10:41 (WEA_CD_01) 07:39		06:35		06:22		05:25		05:01
	16:47	39	11:20 (WEA_CD_01) 17:46		18:38		20:34	51	19:39 (WEA_RE_02) 21:25		21:57
20	08:30		10:42 (WEA_CD_01) 07:37		06:33		06:20		05:24		05:01
	16:49	39	11:21 (WEA_CD_01) 17:48		18:40		20:35	52	19:40 (WEA_RE_02) 21:27		21:58
21	08:29		10:43 (WEA_CD_01) 07:35		06:31		06:18		05:22		05:01
	16:50	38	11:21 (WEA_CD_01) 17:50		18:42		20:37	52	19:40 (WEA_RE_02) 21:28		21:58
22	08:27		10:43 (WEA_CD_01) 07:33		06:28		06:16		05:21		05:02
	16:52	37	11:20 (WEA_CD_01) 17:52		18:43		20:39	53	19:40 (WEA_RE_02) 21:30		21:58
23	08:26		10:44 (WEA_CD_01) 07:31		06:26		06:14		05:19		05:02
	16:54	36	11:20 (WEA_CD_01) 17:53		18:45		20:41	53	19:40 (WEA_RE_02) 21:31		21:58
24	08:25		10:44 (WEA_CD_01) 07:28		06:23		06:12		05:18		05:02
	16:56	35	11:19 (WEA_CD_01) 17:55		18:47		20:42	53	19:40 (WEA_RE_02) 21:32		21:58
25	08:23		10:46 (WEA_CD_01) 07:26		06:21		06:09		05:17		05:03
	16:58	33	11:19 (WEA_CD_01) 17:57		18:49		20:44	52	19:39 (WEA_RE_02) 21:34		21:58
26	08:22		10:46 (WEA_CD_01) 07:24		06:19		06:07		05:16		05:03
	17:00	32	11:18 (WEA_CD_01) 17:59		18:51		20:46	52	19:39 (WEA_RE_02) 21:35	8	20:38 (WEA_RE_01) 05:03
27	08:21		10:48 (WEA_CD_01) 07:22		06:16		06:05		05:14		05:03
	17:01	30	11:18 (WEA_CD_01) 18:01		18:52		20:48	52	19:39 (WEA_RE_02) 21:37	14	20:49 (WEA_RE_01) 21:58
28	08:19		10:49 (WEA_CD_01) 07:20		06:14		06:03		05:13		05:04
	17:03	28	11:17 (WEA_CD_01) 18:03		18:54		20:50	50	19:38 (WEA_RE_02) 21:38	18	20:51 (WEA_RE_01) 21:59
29	08:18		10:50 (WEA_CD_01) 07:18		06:11		06:01		05:12		05:04
	17:05	25	11:15 (WEA_CD_01) 18:05		19:56		20:51	50	19:38 (WEA_RE_02) 21:39	22	20:54 (WEA_RE_01) 21:58
30	08:16		10:52 (WEA_CD_01) 07:16		06:09		05:59		05:11		05:05
	17:07	21	11:14 (WEA_CD_01) 18:07		19:58		20:53	49	19:37 (WEA_RE_02) 21:41	24	20:55 (WEA_RE_01) 21:58
31	08:15		10:55 (WEA_CD_01) 07:14		06:07		05:57		05:10		05:06
	17:09	17	11:12 (WEA_CD_01) 18:09		20:00				21:42	26	20:56 (WEA_RE_01) 21:59
	Sonnenscheinstunden	254		275		367	418		490		505
	astr. max.mögl. Beschattung	1146		10			1121		604		1129

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_02 - IO 02 Pappelweg 1 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42		10:34 (WEA_CD_01) 08:13		10:58 (WEA_CD_01) 07:17		07:04		05:57		08:49 (WEA_RE_02) 05:09
	16:21	40	11:14 (WEA_CD_01) 17:11	10	11:08 (WEA_CD_01) 18:05		20:01		20:55	47	19:36 (WEA_RE_02) 21:43
2	08:42		10:34 (WEA_CD_01) 08:11		07:15		07:02		05:55		18:49 (WEA_RE_02) 05:08
	16:22	40	11:14 (WEA_CD_01) 17:13		18:07		20:03		20:57	47	19:36 (WEA_RE_02) 21:44
3	08:41		10:35 (WEA_CD_01) 08:10		07:13		06:59		05:53		18:49 (WEA_RE_02) 05:08
	16:23	40	11:15 (WEA_CD_01) 17:15		18:09		20:05		20:59	46	19:36 (WEA_RE_02) 21:45
4	08:41		10:35 (WEA_CD_01) 08:08		07:11		06:57		05:51		18:50 (WEA_RE_02) 05:07
	16:25	41	11:16 (WEA_CD_01) 17:17		18:10		20:07		21:00	44	19:34 (WEA_RE_02) 21:46
5	08:41		10:35 (WEA_CD_01) 08:06		07:08		06:55		05:49		18:52 (WEA_RE_02) 05:06
	16:26	41	11:16 (WEA_CD_01) 17:19		18:12		20:09		21:02	42	19:34 (WEA_RE_02) 21:47
6	08:41		10:36 (WEA_CD_01) 08:05		07:06		06:52		05:47		18:52 (WEA_RE_02) 05:05
	16:27	41	11:17 (WEA_CD_01) 17:21		18:14		20:10	16	19:26 (WEA_RE_02) 21:04	41	19:33 (WEA_RE_02) 21:48
7	08:40		10:36 (WEA_CD_01) 08:03		07:04		06:50		05:45		18:53 (WEA_RE_02) 05:05
	16:28	41	11:17 (WEA_CD_01) 17:22		18:16		20:12	23	19:29 (WEA_RE_02) 21:05	38	19:31 (WEA_RE_02) 21:49
8	08:40		10:36 (WEA_CD_01) 08:01		07:01		06:48		05:43		18:54 (WEA_RE_02) 05:04
	16:30	41	11:17 (WEA_CD_01) 17:24		18:18		20:14	28	19:31 (WEA_RE_02) 21:07	36	19:30 (WEA_RE_02) 21:50
9	08:39		10:37 (WEA_CD_01) 07:59		06:59		06:45		05:42		18:56 (WEA_RE_02) 05:04
	16:31	41	11:18 (WEA_CD_01) 17:26		18:20		20:16	32	19:33 (WEA_RE_02) 21:09	33	19:29 (WEA_RE_02) 21:51
10	08:39		10:37 (WEA_CD_01) 07:57		06:57		06:43		05:40		18:57 (WEA_RE_02) 05:03
	16:33	41	11:18 (WEA_CD_01) 17:28		18:22		20:17	36	19:34 (WEA_RE_02) 21:10	31	19:28 (WEA_RE_02) 21:52
11	08:38		10:37 (WEA_CD_01) 07:55		06:54		06:41		05:38		18:58 (WEA_RE_02) 05:03
	16:34	42	11:19 (WEA_CD_01) 17:30		18:23		20:19	39	19:36 (WEA_RE_02) 21:12	28	19:26 (WEA_RE_02) 21:53
12	08:37		10:38 (WEA_CD_01) 07:53		06:52		06:38		05:36		19:00 (WEA_RE_02) 05:02
	16:36	41	11:19 (WEA_CD_01) 17:32		18:25		20:21	42	19:37 (WEA_RE_02) 21:14	25	19:25 (WEA_RE_02) 21:54
13	08:36		10:38 (WEA_CD_01) 07:51		06:50		06:36		05:35		19:02 (WEA_RE_02) 05:02
	16:37	41	11:19 (WEA_CD_01) 17:34		18:27		20:23	44	19:38 (WEA_RE_02) 21:15	20	19:22 (WEA_RE_02) 21:54
14	08:36		10:38 (WEA_CD_01) 07:49		06:47		06:34		05:33		19:06 (WEA_RE_02) 05:02
	16:39	42	11:20 (WEA_CD_01) 17:36		18:29		20:25	46	19:38 (WEA_RE_02) 21:17	14	19:20 (WEA_RE_02) 21:55
15	08:35		10:39 (WEA_CD_01) 07:47		06:45		06:31		05:31		18:51 (WEA_RE_02) 05:02
	16:40	41	11:20 (WEA_CD_01) 17:38		18:31		20:26	48	19:39 (WEA_RE_02) 21:19		21:55
16	08:34		10:39 (WEA_CD_01) 07:45		06:42		06:29		05:30		18:51 (WEA_RE_02) 05:01
	16:42	41	11:20 (WEA_CD_01) 17:40		18:33		20:28	48	19:39 (WEA_RE_02) 21:20		21:56
17	08:33		10:40 (WEA_CD_01) 07:43		06:40		06:27		05:28		18:50 (WEA_RE_02) 05:01
	16:44	41	11:21 (WEA_CD_01) 17:42		18:34		20:30	50	19:40 (WEA_RE_02) 21:22		21:56
18	08:32		10:41 (WEA_CD_01) 07:41		06:38		06:25		05:27		18:50 (WEA_RE_02) 05:01
	16:45	40	11:21 (WEA_CD_01) 17:44		18:36		20:32	50	19:40 (WEA_RE_02) 21:23		21:57
19	08:31		10:41 (WEA_CD_01) 07:39		06:35		06:22		05:25		18:48 (WEA_RE_02) 05:01
	16:47	39	11:20 (WEA_CD_01) 17:46		18:38		20:34	51	19:39 (WEA_RE_02) 21:25		21:57
20	08:30		10:42 (WEA_CD_01) 07:37		06:33		06:20		05:24		18:48 (WEA_RE_02) 05:01
	16:49	39	11:21 (WEA_CD_01) 17:48		18:40		20:35	52	19:40 (WEA_RE_02) 21:27		21:58
21	08:29		10:43 (WEA_CD_01) 07:35		06:31		06:18		05:22		18:48 (WEA_RE_02) 05:01
	16:50	38	11:21 (WEA_CD_01) 17:50		18:42		20:37	52	19:40 (WEA_RE_02) 21:28		21:58
22	08:27		10:43 (WEA_CD_01) 07:33		06:28		06:16		05:21		18:47 (WEA_RE_02) 05:02
	16:52	37	11:20 (WEA_CD_01) 17:52		18:43		20:39	53	19:40 (WEA_RE_02) 21:30		21:58
23	08:26		10:44 (WEA_CD_01) 07:31		06:26		06:14		05:19		18:47 (WEA_RE_02) 05:02
	16:54	36	11:20 (WEA_CD_01) 17:53		18:45		20:41	53	19:40 (WEA_RE_02) 21:31		21:59
24	08:25		10:44 (WEA_CD_01) 07:28		06:23		06:12		05:18		18:47 (WEA_RE_02) 05:02
	16:56	35	11:19 (WEA_CD_01) 17:55		18:47		20:42	53	19:40 (WEA_RE_02) 21:32		21:58
25	08:23		10:46 (WEA_CD_01) 07:26		06:21		06:09		05:17		18:47 (WEA_RE_02) 05:03
	16:58	33	11:19 (WEA_CD_01) 17:57		18:49		20:44	52	19:39 (WEA_RE_02) 21:34		21:58
26	08:22		10:46 (WEA_CD_01) 07:24		06:19		06:07		05:16		20:38 (WEA_RE_01) 05:03
	17:00	32	11:18 (WEA_CD_01) 17:59		18:51		20:46	52	19:39 (WEA_RE_02) 21:35	8	20:46 (WEA_RE_01) 21:58
27	08:21		10:48 (WEA_CD_01) 07:22		06:16		06:05		05:14		20:35 (WEA_RE_01) 05:03
	17:01	30	11:18 (WEA_CD_01) 18:01		18:52		20:48	52	19:39 (WEA_RE_02) 21:37	14	20:49 (WEA_RE_01) 21:58
28	08:19		10:49 (WEA_CD_01) 07:20		06:14		06:03		05:13		20:33 (WEA_RE_01) 05:04
	17:03	28	11:17 (WEA_CD_01) 18:03		18:54		20:50	50	19:38 (WEA_RE_02) 21:38	18	20:51 (WEA_RE_01) 21:59
29	08:18		10:50 (WEA_CD_01) 07:18		06:11		06:01		05:12		20:32 (WEA_RE_01) 05:04
	17:05	25	11:15 (WEA_CD_01) 18:05		19:56		20:51	50	19:38 (WEA_RE_02) 21:39	22	20:54 (WEA_RE_01) 21:58
30	08:16		10:52 (WEA_CD_01) 07:16		06:09		05:59		05:11		20:31 (WEA_RE_01) 05:05
	17:07	21	11:14 (WEA_CD_01) 18:07		19:58		20:53	49	19:37 (WEA_RE_02) 21:41	24	20:55 (WEA_RE_01) 21:58
31	08:15		10:55 (WEA_CD_01) 07:14		06:07		05:57		05:10		20:30 (WEA_RE_01) 05:06
	17:09	17	11:12 (WEA_CD_01) 18:09		20:00				21:42	26	20:56 (WEA_RE_01) 21:59
	Sonnenscheinstunden	254		275		367	418		490		505
	astr. max.mögl. Beschattung	1146		10			1121		604		1129

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_02 - IO 02 Pappelweg 1 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember	
1	05:06	20:30 (WEA_RE_01)	05:44	19:10 (WEA_RE_02)	06:36	18:56 (WEA_RE_02)	07:28	07:24	08:17	10:20 (WEA_CD_01)	
	21:57	38	21:08 (WEA_RE_01)	21:24	26	19:36 (WEA_RE_02)	19:07	16:59		16:16	41
2	05:06	20:30 (WEA_RE_01)	05:46	19:08 (WEA_RE_02)	06:38	18:57 (WEA_RE_02)	07:30	07:26	08:19	10:20 (WEA_CD_01)	
	21:57	38	21:08 (WEA_RE_01)	21:22	29	19:37 (WEA_RE_02)	19:05	16:57		16:15	41
3	05:07	20:31 (WEA_RE_01)	05:47	19:07 (WEA_RE_02)	06:40	18:58 (WEA_RE_02)	07:31	07:28	08:20	10:20 (WEA_CD_01)	
	21:57	37	21:09 (WEA_RE_01)	21:20	32	19:39 (WEA_RE_02)	19:02	16:55		16:15	41
4	05:08	20:31 (WEA_RE_01)	05:49	19:05 (WEA_RE_02)	06:42	19:00 (WEA_RE_02)	07:33	07:30	08:22	10:21 (WEA_CD_01)	
	21:56	37	21:08 (WEA_RE_01)	21:18	34	19:39 (WEA_RE_02)	19:00	16:53		16:14	41
5	05:09	20:32 (WEA_RE_01)	05:51	19:04 (WEA_RE_02)	06:43	19:02 (WEA_RE_02)	07:35	07:32	08:23	10:21 (WEA_CD_01)	
	21:56	36	21:08 (WEA_RE_01)	21:17	37	19:41 (WEA_RE_02)	18:58	16:51		16:13	41
6	05:10	20:33 (WEA_RE_01)	05:52	19:03 (WEA_RE_02)	06:45	19:05 (WEA_RE_02)	07:37	07:34	08:24	10:21 (WEA_CD_01)	
	21:55	35	21:08 (WEA_RE_01)	21:15	39	19:42 (WEA_RE_02)	18:55	16:49		16:12	41
7	05:11	20:34 (WEA_RE_01)	05:54	19:01 (WEA_RE_02)	06:47	19:07 (WEA_RE_02)	07:38	07:35	08:26	10:22 (WEA_CD_01)	
	21:54	34	21:08 (WEA_RE_01)	21:13	41	19:42 (WEA_RE_02)	18:53	16:47		16:12	41
8	05:12	20:33 (WEA_RE_01)	05:56	19:01 (WEA_RE_02)	06:48	19:01 (WEA_RE_02)	07:40	07:37	08:27	10:23 (WEA_CD_01)	
	21:54	33	21:06 (WEA_RE_01)	21:11	42	19:43 (WEA_RE_02)	18:51	16:46		16:12	40
9	05:13	20:34 (WEA_RE_01)	05:57	18:59 (WEA_RE_02)	06:50	18:59 (WEA_RE_02)	07:42	07:39	08:28	10:23 (WEA_CD_01)	
	21:53	32	21:06 (WEA_RE_01)	21:09	45	19:44 (WEA_RE_02)	18:48	16:44		16:12	40
10	05:14	20:35 (WEA_RE_01)	05:59	18:59 (WEA_RE_02)	06:52	18:59 (WEA_RE_02)	07:44	07:41	08:29	10:24 (WEA_CD_01)	
	21:52	30	21:05 (WEA_RE_01)	21:07	45	19:44 (WEA_RE_02)	18:46	16:42	10	10:29 (WEA_CD_01)	15:11
11	05:15	20:36 (WEA_RE_01)	06:01	18:57 (WEA_RE_02)	06:53	18:57 (WEA_RE_02)	07:45	07:43	08:30	10:24 (WEA_CD_01)	
	21:51	29	21:05 (WEA_RE_01)	21:05	47	19:44 (WEA_RE_02)	18:44	16:41	18	10:43 (WEA_CD_01)	16:11
12	05:16	20:37 (WEA_RE_01)	06:02	18:57 (WEA_RE_02)	06:55	18:57 (WEA_RE_02)	07:47	07:45	08:32	10:25 (WEA_CD_01)	
	21:51	27	21:04 (WEA_RE_01)	21:03	48	19:45 (WEA_RE_02)	18:41	16:39	22	10:45 (WEA_CD_01)	16:11
13	05:17	20:39 (WEA_RE_01)	06:04	18:57 (WEA_RE_02)	06:57	18:57 (WEA_RE_02)	07:49	07:47	08:33	10:25 (WEA_CD_01)	
	21:50	25	21:04 (WEA_RE_01)	21:01	49	19:46 (WEA_RE_02)	18:39	16:37	25	10:47 (WEA_CD_01)	16:11
14	05:18	20:40 (WEA_RE_01)	06:06	18:55 (WEA_RE_02)	06:59	18:55 (WEA_RE_02)	07:51	07:48	08:34	10:26 (WEA_CD_01)	
	21:49	23	21:03 (WEA_RE_01)	20:59	50	19:45 (WEA_RE_02)	18:37	16:36	28	10:49 (WEA_CD_01)	16:11
15	05:19	20:42 (WEA_RE_01)	06:07	18:55 (WEA_RE_02)	07:00	18:55 (WEA_RE_02)	07:53	07:50	08:35	10:27 (WEA_CD_01)	
	21:48	19	21:01 (WEA_RE_01)	20:57	51	19:46 (WEA_RE_02)	18:35	16:34	30	10:50 (WEA_CD_01)	16:11
16	05:21	20:43 (WEA_RE_01)	06:09	18:54 (WEA_RE_02)	07:02	18:54 (WEA_RE_02)	07:54	07:52	08:36	10:27 (WEA_CD_01)	
	21:47	17	21:00 (WEA_RE_01)	20:55	51	19:45 (WEA_RE_02)	18:32	16:33	32	10:51 (WEA_CD_01)	16:11
17	05:22	20:46 (WEA_RE_01)	06:11	18:54 (WEA_RE_02)	07:04	18:54 (WEA_RE_02)	07:56	07:54	08:36	10:28 (WEA_CD_01)	
	21:45	11	20:57 (WEA_RE_01)	20:53	52	19:46 (WEA_RE_02)	18:30	16:31	34	10:52 (WEA_CD_01)	16:11
18	05:23	20:51	06:12	18:54 (WEA_RE_02)	07:05	18:54 (WEA_RE_02)	07:58	07:56	08:37	10:28 (WEA_CD_01)	
	21:44	20:51	06:14	18:53 (WEA_RE_02)	07:07	18:53 (WEA_RE_02)	08:00	07:57	35	10:53 (WEA_CD_01)	16:12
19	05:25	20:48	06:14	18:53 (WEA_RE_02)	07:07	18:53 (WEA_RE_02)	08:00	07:57	36	10:18 (WEA_CD_01)	16:12
	21:43	20:48	06:16	18:53 (WEA_RE_02)	07:09	18:53 (WEA_RE_02)	08:02	07:59	37	10:18 (WEA_CD_01)	16:12
20	05:26	20:46	06:18	18:52 (WEA_RE_02)	07:11	18:52 (WEA_RE_02)	08:04	08:01	38	10:18 (WEA_CD_01)	16:12
	21:42	20:44	06:19	18:52 (WEA_RE_02)	07:12	18:52 (WEA_RE_02)	08:04	08:01	39	10:18 (WEA_CD_01)	16:12
21	05:27	20:42	06:21	18:53 (WEA_RE_02)	07:14	18:53 (WEA_RE_02)	08:07	08:04	40	10:18 (WEA_CD_01)	16:12
	21:41	20:44	06:22	18:52 (WEA_RE_02)	07:16	18:52 (WEA_RE_02)	08:09	08:06	41	10:18 (WEA_CD_01)	16:12
22	05:29	20:37	06:23	18:52 (WEA_RE_02)	07:17	18:52 (WEA_RE_02)	08:11	08:08	42	10:18 (WEA_CD_01)	16:12
	21:39	20:42	06:24	18:52 (WEA_RE_02)	07:19	18:52 (WEA_RE_02)	08:13	08:10	43	10:18 (WEA_CD_01)	16:12
23	05:30	20:35	06:25	18:52 (WEA_RE_02)	07:20	18:52 (WEA_RE_02)	08:15	08:12	44	10:18 (WEA_CD_01)	16:12
	21:38	20:40	06:26	18:52 (WEA_RE_02)	07:21	18:52 (WEA_RE_02)	08:17	08:14	45	10:18 (WEA_CD_01)	16:12
24	05:32	20:37	06:27	18:52 (WEA_RE_02)	07:22	18:52 (WEA_RE_02)	08:19	08:16	46	10:18 (WEA_CD_01)	16:12
	21:36	20:37	06:28	18:52 (WEA_RE_02)	07:23	18:52 (WEA_RE_02)	08:21	08:18	47	10:18 (WEA_CD_01)	16:12
25	05:33	20:35	06:29	18:52 (WEA_RE_02)	07:24	18:52 (WEA_RE_02)	08:23	08:20	48	10:18 (WEA_CD_01)	16:12
	21:35	20:35	06:30	18:52 (WEA_RE_02)	07:25	18:52 (WEA_RE_02)	08:25	08:22	49	10:18 (WEA_CD_01)	16:12
26	05:35	20:33	06:31	18:52 (WEA_RE_02)	07:26	18:52 (WEA_RE_02)	08:27	08:24	50	10:18 (WEA_CD_01)	16:12
	21:33	20:33	06:32	18:52 (WEA_RE_02)	07:27	18:52 (WEA_RE_02)	08:29	08:26	51	10:18 (WEA_CD_01)	16:12
27	05:36	20:31	06:33	18:52 (WEA_RE_02)	07:28	18:52 (WEA_RE_02)	08:31	08:28	52	10:18 (WEA_CD_01)	16:12
	21:32	20:31	06:34	18:52 (WEA_RE_02)	07:29	18:52 (WEA_RE_02)	08:33	08:30	53	10:18 (WEA_CD_01)	16:12
28	05:38	20:29	06:35	18:52 (WEA_RE_02)	07:30	18:52 (WEA_RE_02)	08:35	08:32	54	10:18 (WEA_CD_01)	16:12
	21:30	20:29	06:36	18:52 (WEA_RE_02)	07:31	18:52 (WEA_RE_02)	08:37	08:34	55	10:18 (WEA_CD_01)	16:12
29	05:39	19:18 (WEA_RE_02)	06:37	18:53 (WEA_RE_02)	07:32	18:53 (WEA_RE_02)	08:39	08:36	56	10:18 (WEA_CD_01)	16:12
	21:29	9	19:27 (WEA_RE_02)	20:26	46	19:39 (WEA_RE_02)	17:04	16:18	41	11:00 (WEA_CD_01)	16:18
30	05:41	19:15 (WEA_RE_02)	06:38	18:54 (WEA_RE_02)	07:33	18:54 (WEA_RE_02)	08:41	08:38	57	10:19 (WEA_CD_01)	16:18
	21:27	16	19:31 (WEA_RE_02)	20:24	44	19:38 (WEA_RE_02)	17:02	16:17	41	11:00 (WEA_CD_01)	16:19
31	05:42	19:12 (WEA_RE_02)	06:39	18:55 (WEA_RE_02)	07:34	18:55 (WEA_RE_02)	08:43	08:40	58	10:19 (WEA_CD_01)	16:18
	21:25	21	19:33 (WEA_RE_02)	20:21	42	19:37 (WEA_RE_02)	17:01	16:17	41	11:00 (WEA_CD_01)	16:20
Sonnenscheinstunden		508	457	382	175	330	262	708	238	1218	
astr. max.mögl. Beschattung		547	1407								

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_03 - IO 03 Pappelweg 15 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	10:20 (WEA_CD_02)	08:13	09:47 (WEA_CD_01)	07:17	07:04	05:57	19:05 (WEA_RE_02)	05:09	19:06 (WEA_RE_02)	
	16:21	10:44 (WEA_CD_02)	17:11	10:28 (WEA_CD_01)	18:05	20:01	20:55	54	19:59 (WEA_RE_02)	21:43	56
2	08:42	10:20 (WEA_CD_02)	08:11	09:47 (WEA_CD_01)	07:15	07:02	05:55	19:04 (WEA_RE_02)	05:08	19:06 (WEA_RE_02)	
	16:22	10:44 (WEA_CD_02)	17:13	10:28 (WEA_CD_01)	18:07	20:03	20:57	55	19:59 (WEA_RE_02)	21:44	55
3	08:41	10:21 (WEA_CD_02)	08:10	09:48 (WEA_CD_01)	07:13	06:59	05:53	19:03 (WEA_RE_02)	05:08	19:07 (WEA_RE_02)	
	16:23	10:44 (WEA_CD_02)	17:15	10:28 (WEA_CD_01)	18:09	20:05	20:58	57	20:00 (WEA_RE_02)	21:45	55
4	08:41	10:22 (WEA_CD_02)	08:08	09:49 (WEA_CD_01)	07:11	06:57	05:51	19:02 (WEA_RE_02)	05:07	19:07 (WEA_RE_02)	
	16:25	10:45 (WEA_CD_02)	17:17	10:28 (WEA_CD_01)	18:10	20:07	21:00	58	20:00 (WEA_RE_02)	21:46	54
5	08:41	10:22 (WEA_CD_02)	08:06	09:49 (WEA_CD_01)	07:08	06:55	05:49	19:03 (WEA_RE_02)	05:06	19:07 (WEA_RE_02)	
	16:26	10:44 (WEA_CD_02)	17:19	10:28 (WEA_CD_01)	18:12	20:09	21:02	58	20:01 (WEA_RE_02)	21:47	54
6	08:41	10:24 (WEA_CD_02)	08:05	09:49 (WEA_CD_01)	07:06	06:52	05:47	19:02 (WEA_RE_02)	05:05	19:08 (WEA_RE_02)	
	16:27	10:45 (WEA_CD_02)	17:21	10:27 (WEA_CD_01)	18:14	20:10	21:04	59	20:01 (WEA_RE_02)	21:48	53
7	08:40	10:24 (WEA_CD_02)	08:03	09:50 (WEA_CD_01)	07:04	06:50	05:45	19:01 (WEA_RE_02)	05:05	19:08 (WEA_RE_02)	
	16:28	10:45 (WEA_CD_02)	17:23	10:27 (WEA_CD_01)	18:16	20:12	21:05	61	20:02 (WEA_RE_02)	21:49	53
8	08:40	10:25 (WEA_CD_02)	08:01	09:50 (WEA_CD_01)	07:01	06:48	05:43	19:01 (WEA_RE_02)	05:04	19:09 (WEA_RE_02)	
	16:30	10:44 (WEA_CD_02)	17:24	10:26 (WEA_CD_01)	18:18	20:14	21:07	61	20:02 (WEA_RE_02)	21:50	52
9	08:39	10:27 (WEA_CD_02)	07:59	09:51 (WEA_CD_01)	06:59	06:45	05:42	19:01 (WEA_RE_02)	05:04	19:09 (WEA_RE_02)	
	16:31	10:44 (WEA_CD_02)	17:26	10:26 (WEA_CD_01)	18:20	20:16	21:09	61	20:02 (WEA_RE_02)	21:51	52
10	08:39	10:28 (WEA_CD_02)	07:57	09:52 (WEA_CD_01)	06:57	06:43	05:40	19:00 (WEA_RE_02)	05:03	19:10 (WEA_RE_02)	
	16:33	10:44 (WEA_CD_02)	17:28	10:25 (WEA_CD_01)	18:22	20:17	21:10	62	20:02 (WEA_RE_02)	21:52	51
11	08:38	10:29 (WEA_CD_02)	07:55	09:53 (WEA_CD_01)	06:54	06:41	05:38	19:00 (WEA_RE_02)	05:03	19:11 (WEA_RE_02)	
	16:34	10:43 (WEA_CD_02)	17:30	10:24 (WEA_CD_01)	18:23	20:19	21:12	62	20:02 (WEA_RE_02)	21:53	50
12	08:37	09:57 (WEA_CD_01)	07:53	09:54 (WEA_CD_01)	06:52	06:38	05:36	19:00 (WEA_RE_02)	05:02	19:10 (WEA_RE_02)	
	16:36	10:42 (WEA_CD_02)	17:32	10:22 (WEA_CD_01)	18:25	20:21	21:14	63	20:03 (WEA_RE_02)	21:54	50
13	08:36	09:55 (WEA_CD_01)	07:51	09:56 (WEA_CD_01)	06:50	06:36	05:35	19:00 (WEA_RE_02)	05:02	19:11 (WEA_RE_02)	
	16:37	10:40 (WEA_CD_02)	17:34	10:21 (WEA_CD_01)	18:27	20:23	21:15	62	20:02 (WEA_RE_02)	21:54	50
14	08:36	09:54 (WEA_CD_01)	07:49	09:58 (WEA_CD_01)	06:47	06:34	05:33	19:00 (WEA_RE_02)	05:02	19:12 (WEA_RE_02)	
	16:39	10:12 (WEA_CD_01)	17:36	10:18 (WEA_CD_01)	18:29	20:25	21:17	63	20:03 (WEA_RE_02)	21:55	49
15	08:35	09:53 (WEA_CD_01)	07:47	10:01 (WEA_CD_01)	06:45	06:31	05:31	19:00 (WEA_RE_02)	05:02	19:12 (WEA_RE_02)	
	16:40	10:14 (WEA_CD_01)	17:38	10:15 (WEA_CD_01)	18:31	20:26	21:19	62	20:02 (WEA_RE_02)	21:55	49
16	08:34	09:52 (WEA_CD_01)	07:45	10:02 (WEA_CD_01)	06:42	06:29	05:30	19:00 (WEA_RE_02)	05:01	19:12 (WEA_RE_02)	
	16:42	10:15 (WEA_CD_01)	17:40	18:33	20:28	21:20	63	20:03 (WEA_RE_02)	21:56	49	
17	08:33	09:52 (WEA_CD_01)	07:43	10:03 (WEA_CD_01)	06:40	06:27	05:28	19:00 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:44	10:17 (WEA_CD_01)	17:42	18:34	20:30	21:22	62	20:02 (WEA_RE_02)	21:56	48	
18	08:32	09:51 (WEA_CD_01)	07:41	10:04 (WEA_CD_01)	06:38	06:25	05:27	19:00 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:45	10:18 (WEA_CD_01)	17:44	18:36	20:32	21:23	63	20:03 (WEA_RE_02)	21:57	48	
19	08:31	09:50 (WEA_CD_01)	07:39	10:05 (WEA_CD_01)	06:35	06:22	05:25	19:01 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:47	10:19 (WEA_CD_01)	17:46	18:38	20:34	21:25	62	20:03 (WEA_RE_02)	21:57	49	
20	08:30	09:50 (WEA_CD_01)	07:37	10:06 (WEA_CD_01)	06:33	06:20	05:24	19:01 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:49	10:20 (WEA_CD_01)	17:48	18:40	20:35	21:27	61	20:02 (WEA_RE_02)	21:58	49	
21	08:29	09:49 (WEA_CD_01)	07:35	10:07 (WEA_CD_01)	06:31	06:18	05:23	19:01 (WEA_RE_02)	05:02	19:13 (WEA_RE_02)	
	16:51	10:22 (WEA_CD_01)	17:50	18:42	20:37	21:29	61	20:02 (WEA_RE_02)	21:58	49	
22	08:27	09:48 (WEA_CD_01)	07:33	10:08 (WEA_CD_01)	06:28	06:16	05:21	19:02 (WEA_RE_02)	05:02	19:14 (WEA_RE_02)	
	16:52	10:22 (WEA_CD_01)	17:52	18:43	20:39	21:30	61	20:03 (WEA_RE_02)	21:58	49	
23	08:26	09:49 (WEA_CD_01)	07:31	10:09 (WEA_CD_01)	06:26	06:14	05:19	19:02 (WEA_RE_02)	05:02	19:14 (WEA_RE_02)	
	16:54	10:23 (WEA_CD_01)	17:53	18:45	20:41	21:31	61	20:03 (WEA_RE_02)	21:59	49	
24	08:25	09:48 (WEA_CD_01)	07:28	10:10 (WEA_CD_01)	06:23	06:12	05:18	19:03 (WEA_RE_02)	05:02	19:14 (WEA_RE_02)	
	16:56	10:24 (WEA_CD_01)	17:55	18:47	20:42	21:32	60	20:03 (WEA_RE_02)	21:58	48	
25	08:23	09:48 (WEA_CD_01)	07:26	10:11 (WEA_CD_01)	06:21	06:09	05:17	19:03 (WEA_RE_02)	05:03	19:15 (WEA_RE_02)	
	16:58	10:25 (WEA_CD_01)	17:57	18:49	20:44	21:34	60	20:03 (WEA_RE_02)	21:58	48	
26	08:22	09:47 (WEA_CD_01)	07:24	10:12 (WEA_CD_01)	06:19	06:07	05:16	19:02 (WEA_RE_02)	05:03	19:15 (WEA_RE_02)	
	17:00	10:25 (WEA_CD_01)	17:59	18:51	20:46	21:35	60	20:02 (WEA_RE_02)	21:58	48	
27	08:21	09:48 (WEA_CD_01)	07:22	10:13 (WEA_CD_01)	06:16	06:05	05:14	19:03 (WEA_RE_02)	05:03	19:14 (WEA_RE_02)	
	17:01	10:26 (WEA_CD_01)	18:01	18:52	20:48	21:37	59	20:02 (WEA_RE_02)	21:58	49	
28	08:19	09:47 (WEA_CD_01)	07:20	10:14 (WEA_CD_01)	06:14	06:03	05:13	19:03 (WEA_RE_02)	05:04	19:15 (WEA_RE_02)	
	17:03	10:27 (WEA_CD_01)	18:03	18:54	20:50	21:39	59	20:02 (WEA_RE_02)	21:59	49	
29	08:18	09:47 (WEA_CD_01)	07:18	10:15 (WEA_CD_01)	06:11	06:01	05:12	19:04 (WEA_RE_02)	05:04	19:15 (WEA_RE_02)	
	17:05	10:27 (WEA_CD_01)	18:04	18:56	20:51	21:39	57	20:02 (WEA_RE_02)	21:58	50	
30	08:16	09:46 (WEA_CD_01)	07:16	10:16 (WEA_CD_01)	06:09	05:59	05:11	19:05 (WEA_RE_02)	05:05	20:05 (WEA_RE_02)	
	17:07	10:28 (WEA_CD_01)	18:05	18:58	20:53	21:41	57	20:02 (WEA_RE_02)	21:58	50	
31	08:15	09:47 (WEA_CD_01)	07:14	10:17 (WEA_CD_01)	06:07	05:57	05:10	19:05 (WEA_RE_02)	05:05	20:05 (WEA_RE_02)	
	17:09	10:28 (WEA_CD_01)	18:06	19:00	21:42	21:42	57	20:02 (WEA_RE_02)	21:58	50	
Sonnenscheinstunden		254	275	367	418	490	505			505	1515
astr.max.mögl.Beschattung		851	497		413	1861					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_03 - IO 03 Pappelweg 15 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	10:20 (WEA_CD_02)	08:13	09:47 (WEA_CD_01)	07:17	07:04	05:57	19:05 (WEA_RE_02)	05:09	19:06 (WEA_RE_02)	
	16:21	10:44 (WEA_CD_02)	17:11	10:28 (WEA_CD_01)	18:05	20:01	20:55	54	19:59 (WEA_RE_02)	21:43	56
2	08:42	10:20 (WEA_CD_02)	08:11	09:47 (WEA_CD_01)	07:15	07:02	05:55	19:04 (WEA_RE_02)	05:08	19:06 (WEA_RE_02)	
	16:22	10:44 (WEA_CD_02)	17:13	10:28 (WEA_CD_01)	18:07	20:03	20:57	55	19:59 (WEA_RE_02)	21:44	55
3	08:41	10:21 (WEA_CD_02)	08:10	09:48 (WEA_CD_01)	07:13	06:59	05:53	19:03 (WEA_RE_02)	05:08	19:07 (WEA_RE_02)	
	16:23	10:44 (WEA_CD_02)	17:15	10:28 (WEA_CD_01)	18:09	20:05	20:58	57	20:00 (WEA_RE_02)	21:45	55
4	08:41	10:22 (WEA_CD_02)	08:08	09:49 (WEA_CD_01)	07:11	06:57	05:51	19:02 (WEA_RE_02)	05:07	19:07 (WEA_RE_02)	
	16:25	10:45 (WEA_CD_02)	17:17	10:28 (WEA_CD_01)	18:10	20:07	21:00	58	20:00 (WEA_RE_02)	21:46	54
5	08:41	10:22 (WEA_CD_02)	08:06	09:49 (WEA_CD_01)	07:08	06:55	05:49	19:03 (WEA_RE_02)	05:06	19:07 (WEA_RE_02)	
	16:26	10:44 (WEA_CD_02)	17:19	10:28 (WEA_CD_01)	18:12	20:09	21:02	58	20:01 (WEA_RE_02)	21:47	54
6	08:41	10:24 (WEA_CD_02)	08:05	09:49 (WEA_CD_01)	07:06	06:52	05:47	19:02 (WEA_RE_02)	05:05	19:08 (WEA_RE_02)	
	16:27	10:45 (WEA_CD_02)	17:21	10:27 (WEA_CD_01)	18:14	20:10	21:04	59	20:01 (WEA_RE_02)	21:48	53
7	08:40	10:24 (WEA_CD_02)	08:03	09:50 (WEA_CD_01)	07:04	06:50	05:45	19:01 (WEA_RE_02)	05:05	19:08 (WEA_RE_02)	
	16:28	10:45 (WEA_CD_02)	17:23	10:27 (WEA_CD_01)	18:16	20:12	21:05	61	20:02 (WEA_RE_02)	21:49	53
8	08:40	10:25 (WEA_CD_02)	08:01	09:50 (WEA_CD_01)	07:01	06:48	05:43	19:01 (WEA_RE_02)	05:04	19:09 (WEA_RE_02)	
	16:30	10:44 (WEA_CD_02)	17:24	10:26 (WEA_CD_01)	18:18	20:14	21:07	61	20:02 (WEA_RE_02)	21:50	52
9	08:39	10:27 (WEA_CD_02)	07:59	09:51 (WEA_CD_01)	06:59	06:45	05:42	19:01 (WEA_RE_02)	05:04	19:09 (WEA_RE_02)	
	16:31	10:44 (WEA_CD_02)	17:26	10:26 (WEA_CD_01)	18:20	20:16	21:09	61	20:02 (WEA_RE_02)	21:51	52
10	08:39	10:28 (WEA_CD_02)	07:57	09:52 (WEA_CD_01)	06:57	06:43	05:40	19:00 (WEA_RE_02)	05:03	19:10 (WEA_RE_02)	
	16:33	10:44 (WEA_CD_02)	17:28	10:25 (WEA_CD_01)	18:22	20:17	21:10	62	20:02 (WEA_RE_02)	21:52	51
11	08:38	10:29 (WEA_CD_02)	07:55	09:53 (WEA_CD_01)	06:54	06:41	05:38	19:00 (WEA_RE_02)	05:03	19:11 (WEA_RE_02)	
	16:34	10:43 (WEA_CD_02)	17:30	10:24 (WEA_CD_01)	18:23	20:19	21:12	62	20:02 (WEA_RE_02)	21:53	50
12	08:37	09:57 (WEA_CD_01)	07:53	09:54 (WEA_CD_01)	06:52	06:38	05:36	19:00 (WEA_RE_02)	05:02	19:10 (WEA_RE_02)	
	16:36	10:42 (WEA_CD_02)	17:32	10:22 (WEA_CD_01)	18:25	20:21	21:14	63	20:03 (WEA_RE_02)	21:54	50
13	08:36	09:55 (WEA_CD_01)	07:51	09:56 (WEA_CD_01)	06:50	06:36	05:35	19:00 (WEA_RE_02)	05:02	19:11 (WEA_RE_02)	
	16:37	10:40 (WEA_CD_02)	17:34	10:21 (WEA_CD_01)	18:27	20:23	21:15	62	20:02 (WEA_RE_02)	21:54	50
14	08:36	09:54 (WEA_CD_01)	07:49	09:58 (WEA_CD_01)	06:47	06:34	05:33	19:00 (WEA_RE_02)	05:02	19:12 (WEA_RE_02)	
	16:39	10:12 (WEA_CD_01)	17:36	10:18 (WEA_CD_01)	18:29	20:25	21:17	63	20:03 (WEA_RE_02)	21:55	49
15	08:35	09:53 (WEA_CD_01)	07:47	10:01 (WEA_CD_01)	06:45	06:31	05:31	19:00 (WEA_RE_02)	05:02	19:12 (WEA_RE_02)	
	16:40	10:14 (WEA_CD_01)	17:38	10:15 (WEA_CD_01)	18:31	20:26	21:19	62	20:02 (WEA_RE_02)	21:55	49
16	08:34	09:52 (WEA_CD_01)	07:45		06:42	06:29	05:30	19:00 (WEA_RE_02)	05:01	19:12 (WEA_RE_02)	
	16:42	10:15 (WEA_CD_01)	17:40		18:33	20:28	21:20	63	20:03 (WEA_RE_02)	21:56	49
17	08:33	09:52 (WEA_CD_01)	07:43		18:40	20:30	05:28	19:00 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:44	10:17 (WEA_CD_01)	17:42		18:34	20:30	21:22	62	20:02 (WEA_RE_02)	21:56	48
18	08:32	09:51 (WEA_CD_01)	07:41		18:38	20:32	05:27	19:00 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:45	10:18 (WEA_CD_01)	17:44		18:36	20:32	21:23	63	20:03 (WEA_RE_02)	21:57	48
19	08:31	09:50 (WEA_CD_01)	07:39		18:35	20:32	05:25	19:01 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:47	10:19 (WEA_CD_01)	17:46		18:38	20:34	21:25	62	20:03 (WEA_RE_02)	21:57	49
20	08:30	09:50 (WEA_CD_01)	07:37		18:33	20:30	05:24	19:01 (WEA_RE_02)	05:01	19:13 (WEA_RE_02)	
	16:49	10:20 (WEA_CD_01)	17:48		18:40	20:35	11	19:28 (WEA_RE_02)	21:27	61	49
21	08:29	09:49 (WEA_CD_01)	07:35		18:40	20:35	19:23 (WEA_RE_02)	05:22	19:01 (WEA_RE_02)	05:02	19:13 (WEA_RE_02)
	16:51	10:22 (WEA_CD_01)	17:50		18:42	20:37	21	19:44 (WEA_RE_02)	21:28	61	49
22	08:27	09:48 (WEA_CD_01)	07:33		18:38	20:36	19:19 (WEA_RE_02)	05:21	20:02 (WEA_RE_02)	21:58	49
	16:52	10:22 (WEA_CD_01)	17:52		18:43	20:39	29	19:48 (WEA_RE_02)	21:30	61	49
23	08:26	09:49 (WEA_CD_01)	07:31		18:36	20:34	19:17 (WEA_RE_02)	05:19	19:02 (WEA_RE_02)	05:02	19:14 (WEA_RE_02)
	16:54	10:23 (WEA_CD_01)	17:53		18:45	20:41	33	19:50 (WEA_RE_02)	21:31	61	49
24	08:25	09:48 (WEA_CD_01)	07:28		18:32	20:32	19:15 (WEA_RE_02)	05:18	19:03 (WEA_RE_02)	05:02	19:14 (WEA_RE_02)
	16:56	10:24 (WEA_CD_01)	17:55		18:47	20:42	37	19:52 (WEA_RE_02)	21:32	60	48
25	08:23	09:48 (WEA_CD_01)	07:26		18:31	20:29	19:13 (WEA_RE_02)	05:17	19:03 (WEA_RE_02)	05:03	19:15 (WEA_RE_02)
	16:58	10:25 (WEA_CD_01)	17:57		18:49	20:44	40	19:53 (WEA_RE_02)	21:34	60	48
26	08:22	09:47 (WEA_CD_01)	07:24		18:30	20:30	19:11 (WEA_RE_02)	05:16	19:02 (WEA_RE_02)	05:03	19:15 (WEA_RE_02)
	17:00	10:25 (WEA_CD_01)	17:59		18:51	20:46	44	19:55 (WEA_RE_02)	21:35	60	48
27	08:21	09:48 (WEA_CD_01)	07:22		18:36	20:35	19:10 (WEA_RE_02)	05:14	19:03 (WEA_RE_02)	05:03	19:14 (WEA_RE_02)
	17:01	10:26 (WEA_CD_01)	18:01		18:52	20:48	46	19:56 (WEA_RE_02)	21:37	59	49
28	08:19	09:47 (WEA_CD_01)	07:20		18:34	20:33	19:08 (WEA_RE_02)	05:13	19:03 (WEA_RE_02)	05:04	19:15 (WEA_RE_02)
	17:03	10:27 (WEA_CD_01)	18:03		18:54	20:50	49	19:57 (WEA_RE_02)	21:39	59	49
29	08:18	09:47 (WEA_CD_01)	07:18		18:39	20:38	19:07 (WEA_RE_02)	05:12	19:04 (WEA_RE_02)	05:04	19:15 (WEA_RE_02)
	17:05	10:27 (WEA_CD_01)	18:01		18:56	20:51	51	19:58 (WEA_RE_02)	21:39	57	50
30	08:16	09:46 (WEA_CD_01)	07:16		18:40	20:40	19:06 (WEA_RE_02)	05:11	19:05 (WEA_RE_02)	05:05	20:05 (WEA_RE_02)
	17:07	10:28 (WEA_CD_01)	18:02		18:58	20:53	52	19:58 (WEA_RE_02)	21:41	57	50
31	08:15	09:47 (WEA_CD_01)	07:15		18:42	20:42	19:05 (WEA_RE_02)	05:10	19:05 (WEA_RE_02)	05:06	20:05 (WEA_RE_02)
	17:09	10:28 (WEA_CD_01)	18:03		18:54	20:48	52	19:59 (WEA_RE_02)	21:42	57	50
Sonnenscheinstunden		254	275	367	418	490	505				
astr.max.mögl.Beschattung		851	497	413	413	1861	1515				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_03 - IO 03 Pappelweg 15 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember					
1	05:06	19:15 (WEA_RE_02)	05:44	19:11 (WEA_RE_02)	06:36	19:07	07:28	07:24	09:21 (WEA_CD_01)	08:17	10:11 (WEA_CD_02)				
	21:57	20:05 (WEA_RE_02)	21:24	20:13 (WEA_RE_02)	20:19	19:07	19:07	16:59	33 09:54 (WEA_CD_01)	16:16	14 10:25 (WEA_CD_02)				
2	05:06	19:14 (WEA_RE_02)	05:46	19:10 (WEA_RE_02)	06:38	19:07	07:30	07:26	09:20 (WEA_CD_01)	08:19	10:11 (WEA_CD_02)				
	21:57	20:05 (WEA_RE_02)	21:22	20:12 (WEA_RE_02)	20:17	19:05	19:05	16:57	35 09:55 (WEA_CD_01)	16:15	16 10:27 (WEA_CD_02)				
3	05:07	19:14 (WEA_RE_02)	05:47	19:11 (WEA_RE_02)	06:40	19:07	07:31	07:28	09:20 (WEA_CD_01)	08:20	10:10 (WEA_CD_02)				
	21:57	20:06 (WEA_RE_02)	21:20	20:13 (WEA_RE_02)	20:14	19:02	19:02	16:55	36 09:56 (WEA_CD_01)	16:15	17 10:27 (WEA_CD_02)				
4	05:08	19:15 (WEA_RE_02)	05:49	19:10 (WEA_RE_02)	06:42	19:07	07:33	07:30	09:19 (WEA_CD_01)	08:22	10:10 (WEA_CD_02)				
	21:56	20:06 (WEA_RE_02)	21:18	20:12 (WEA_RE_02)	20:12	19:00	19:00	16:53	38 09:57 (WEA_CD_01)	16:14	19 10:29 (WEA_CD_02)				
5	05:09	19:15 (WEA_RE_02)	05:51	19:11 (WEA_RE_02)	06:43	19:07	07:35	07:32	09:19 (WEA_CD_01)	08:23	10:09 (WEA_CD_02)				
	21:56	20:07 (WEA_RE_02)	21:17	20:12 (WEA_RE_02)	20:10	18:58	18:58	16:51	38 09:57 (WEA_CD_01)	16:13	21 10:30 (WEA_CD_02)				
6	05:10	19:15 (WEA_RE_02)	05:52	19:12 (WEA_RE_02)	06:45	19:07	07:37	07:34	09:18 (WEA_CD_01)	08:24	10:09 (WEA_CD_02)				
	21:55	20:07 (WEA_RE_02)	21:15	20:12 (WEA_RE_02)	20:07	18:55	18:55	16:49	40 09:58 (WEA_CD_01)	16:13	21 10:30 (WEA_CD_02)				
7	05:11	19:15 (WEA_RE_02)	05:54	19:11 (WEA_RE_02)	06:47	19:07	07:38	07:35	09:18 (WEA_CD_01)	08:26	10:09 (WEA_CD_02)				
	21:54	20:08 (WEA_RE_02)	21:13	20:11 (WEA_RE_02)	20:05	18:53	18:53	16:47	40 09:58 (WEA_CD_01)	16:12	23 10:32 (WEA_CD_02)				
8	05:12	19:14 (WEA_RE_02)	05:56	19:12 (WEA_RE_02)	06:48	19:07	07:40	07:37	09:18 (WEA_CD_01)	08:27	10:09 (WEA_CD_02)				
	21:54	20:08 (WEA_RE_02)	21:11	19:20 (WEA_RE_02)	20:03	18:51	18:51	16:46	40 09:58 (WEA_CD_01)	16:12	23 10:32 (WEA_CD_02)				
9	05:13	19:13 (WEA_RE_02)	05:57	19:12 (WEA_RE_02)	06:50	19:07	07:42	07:39	09:18 (WEA_CD_01)	08:28	10:09 (WEA_CD_02)				
	21:53	20:08 (WEA_RE_02)	21:09	20:09 (WEA_RE_02)	20:00	18:48	18:48	16:44	40 09:58 (WEA_CD_01)	16:12	23 10:32 (WEA_CD_02)				
10	05:14	19:13 (WEA_RE_02)	05:59	19:13 (WEA_RE_02)	06:52	19:07	07:44	07:41	09:18 (WEA_CD_01)	08:29	10:10 (WEA_CD_02)				
	21:52	20:08 (WEA_RE_02)	21:07	20:09 (WEA_RE_02)	19:58	18:46	18:46	16:42	41 09:59 (WEA_CD_01)	16:11	24 10:34 (WEA_CD_02)				
11	05:15	19:13 (WEA_RE_02)	06:01	19:13 (WEA_RE_02)	06:53	19:07	07:45	07:43	09:18 (WEA_CD_01)	08:30	10:10 (WEA_CD_02)				
	21:51	20:09 (WEA_RE_02)	21:05	20:08 (WEA_RE_02)	19:55	18:44	18:44	16:41	41 09:59 (WEA_CD_01)	16:11	24 10:34 (WEA_CD_02)				
12	05:16	19:13 (WEA_RE_02)	06:02	19:14 (WEA_RE_02)	06:55	19:07	07:47	07:45	09:19 (WEA_CD_01)	08:32	10:10 (WEA_CD_02)				
	21:51	20:09 (WEA_RE_02)	21:03	20:07 (WEA_RE_02)	19:53	18:41	18:41	16:39	40 09:59 (WEA_CD_01)	16:11	25 10:35 (WEA_CD_02)				
13	05:17	19:14 (WEA_RE_02)	06:04	19:15 (WEA_RE_02)	06:57	19:07	07:49	07:47	09:19 (WEA_CD_01)	08:33	10:10 (WEA_CD_02)				
	21:50	20:10 (WEA_RE_02)	21:01	20:07 (WEA_RE_02)	19:51	18:39	18:39	16:37	40 09:59 (WEA_CD_01)	16:11	26 10:36 (WEA_CD_02)				
14	05:18	19:13 (WEA_RE_02)	06:06	19:15 (WEA_RE_02)	06:59	19:07	07:51	07:48	09:19 (WEA_CD_01)	08:34	10:11 (WEA_CD_02)				
	21:49	20:11 (WEA_RE_02)	20:59	20:05 (WEA_RE_02)	19:48	18:37	18:37	16:36	39 09:58 (WEA_CD_01)	16:11	25 10:36 (WEA_CD_02)				
15	05:19	19:13 (WEA_RE_02)	06:07	19:16 (WEA_RE_02)	07:00	19:07	07:53	07:50	09:20 (WEA_CD_01)	08:35	10:11 (WEA_CD_02)				
	21:48	20:11 (WEA_RE_02)	20:57	20:04 (WEA_RE_02)	19:46	18:35	18:35	16:34	38 09:58 (WEA_CD_01)	16:11	26 10:37 (WEA_CD_02)				
16	05:21	19:13 (WEA_RE_02)	06:09	19:17 (WEA_RE_02)	07:02	19:07	07:54	07:52	09:20 (WEA_CD_01)	08:35	10:12 (WEA_CD_02)				
	21:47	20:11 (WEA_RE_02)	20:55	20:02 (WEA_RE_02)	19:43	18:32	18:32	16:33	38 09:58 (WEA_CD_01)	16:11	25 10:37 (WEA_CD_02)				
17	05:22	19:12 (WEA_RE_02)	06:11	19:18 (WEA_RE_02)	07:04	19:07	07:56	07:54	09:21 (WEA_CD_01)	08:36	10:12 (WEA_CD_02)				
	21:45	20:11 (WEA_RE_02)	20:53	20:01 (WEA_RE_02)	19:41	18:30	18:30	16:31	37 09:58 (WEA_CD_01)	16:11	26 10:38 (WEA_CD_02)				
18	05:23	19:12 (WEA_RE_02)	06:12	19:20 (WEA_RE_02)	07:05	19:07	07:58	07:56	09:22 (WEA_CD_01)	08:37	10:12 (WEA_CD_02)				
	21:44	20:11 (WEA_RE_02)	20:51	20:00 (WEA_RE_02)	19:39	18:28	18:28	16:30	36 09:58 (WEA_CD_01)	16:12	26 10:38 (WEA_CD_02)				
19	05:25	19:12 (WEA_RE_02)	06:14	19:21 (WEA_RE_02)	07:07	19:07	08:00	07:57	09:23 (WEA_CD_01)	08:38	10:13 (WEA_CD_02)				
	21:43	20:12 (WEA_RE_02)	20:48	19:57 (WEA_RE_02)	19:36	18:26	18:26	16:29	34 09:57 (WEA_CD_01)	16:12	26 10:39 (WEA_CD_02)				
20	05:26	19:12 (WEA_RE_02)	06:16	19:23 (WEA_RE_02)	07:09	19:07	08:02	07:59	09:23 (WEA_CD_01)	08:38	10:13 (WEA_CD_02)				
	21:42	20:12 (WEA_RE_02)	20:46	19:55 (WEA_RE_02)	19:34	18:23	18:23	16:27	34 09:57 (WEA_CD_01)	16:12	27 10:40 (WEA_CD_02)				
21	05:27	19:11 (WEA_RE_02)	06:18	19:25 (WEA_RE_02)	07:11	19:07	08:04	08:01	09:24 (WEA_CD_01)	08:39	10:13 (WEA_CD_02)				
	21:41	20:12 (WEA_RE_02)	20:44	19:52 (WEA_RE_02)	19:31	18:21	18:21	16:26	33 09:57 (WEA_CD_01)	16:13	27 10:40 (WEA_CD_02)				
22	05:29	19:12 (WEA_RE_02)	06:19	19:28 (WEA_RE_02)	07:12	19:07	08:05	08:03	09:26 (WEA_CD_01)	08:40	10:14 (WEA_CD_02)				
	21:39	20:13 (WEA_RE_02)	20:42	19:49 (WEA_RE_02)	19:29	18:19	18:19	16:25	30 09:56 (WEA_CD_01)	16:13	27 10:41 (WEA_CD_02)				
23	05:30	19:11 (WEA_RE_02)	06:21	19:34 (WEA_RE_02)	07:14	19:07	08:07	08:04	09:27 (WEA_CD_01)	08:40	10:14 (WEA_CD_02)				
	21:38	20:13 (WEA_RE_02)	20:40	19:43 (WEA_RE_02)	19:26	18:17	18:17	16:24	29 09:56 (WEA_CD_01)	16:14	27 10:41 (WEA_CD_02)				
24	05:32	19:11 (WEA_RE_02)	06:23	19:35 (WEA_RE_02)	07:16	19:07	08:09	08:06	09:28 (WEA_CD_01)	08:40	10:15 (WEA_CD_02)				
	21:36	20:13 (WEA_RE_02)	20:37	19:24 (WEA_RE_02)	18:15	18:15	18:15	16:23	28 09:56 (WEA_CD_01)	16:14	26 10:41 (WEA_CD_02)				
25	05:33	19:11 (WEA_RE_02)	06:24	19:37 (WEA_RE_02)	07:17	19:07	08:11	08:08	09:30 (WEA_CD_01)	08:41	10:16 (WEA_CD_02)				
	21:35	20:13 (WEA_RE_02)	20:35	19:22 (WEA_RE_02)	17:13	17:13	17:13	16:21	25 09:55 (WEA_CD_01)	16:15	26 10:42 (WEA_CD_02)				
26	05:35	19:11 (WEA_RE_02)	06:26	19:39 (WEA_RE_02)	07:19	19:07	08:13	08:09	09:30 (WEA_CD_01)	08:41	10:16 (WEA_CD_02)				
	21:33	20:13 (WEA_RE_02)	20:33	19:19 (WEA_RE_02)	17:11	17:11	17:11	16:20	23 09:53 (WEA_CD_01)	16:15	26 10:42 (WEA_CD_02)				
27	05:36	19:11 (WEA_RE_02)	06:28	19:41 (WEA_RE_02)	07:21	19:07	08:15	08:11	09:30 (WEA_CD_01)	08:41	10:16 (WEA_CD_02)				
	21:32	20:14 (WEA_RE_02)	20:31	19:17 (WEA_RE_02)	17:09	17:09	17:09	16:19	21 09:53 (WEA_CD_01)	16:16	26 10:42 (WEA_CD_02)				
28	05:38	19:11 (WEA_RE_02)	06:30	19:43 (WEA_RE_02)	07:23	19:07	08:17	08:13	09:34 (WEA_CD_01)	08:42	10:17 (WEA_CD_02)				
	21:30	20:13 (WEA_RE_02)	20:28	19:14 (WEA_RE_02)	17:07	17:07	17:07	16:18	19 09:52 (WEA_CD_01)	16:17	26 10:43 (WEA_CD_02)				
29	05:39	19:10 (WEA_RE_02)	06:31	19:45 (WEA_RE_02)	07:24	19:07	08:19	08:14	09:36 (WEA_CD_01)	08:42	10:17 (WEA_CD_02)				
	21:29	20:13 (WEA_RE_02)	20:26	19:12 (WEA_RE_02)	17:04	17:04	17:04	16:18	21 10:21 (WEA_CD_01)	16:18	26 10:43 (WEA_CD_02)				
30	05:41	19:11 (WEA_RE_02)	06:33	19:47 (WEA_RE_02)	07:26	19:07	08:21	08:16	09:38 (WEA_CD_01)	08:42	10:18 (WEA_CD_02)				
	21:27	20:13 (WEA_RE_02)	20:24	19:10 (WEA_RE_02)	17:02	17:02	17:02	16:17	21 10:25 (WEA_CD_01)	16:19	25 10:43 (WEA_CD_02)				
31	05:43	19:10 (WEA_RE_02)	06:35	19:49 (WEA_RE_02)	07:28	19:07	08:23	08:18	09:40 (WEA_CD_01)	08:42	10:19 (WEA_CD_02)				
	21:25	20:13 (WEA_RE_02)	20:21	19:11 (WEA_RE_02)	17:01	17:01	17:01	16:20	25 10:44 (WEA_CD_01)	16:20	25 10:44 (WEA_CD_02)				
Sonnenscheinstunden		508		457		382		390		252		239		744	
astr. max.mögl. Beschattung		1788		1112		382		390		252		239		744	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_04 - IO 04 Pappelweg 21 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	10:03 (WEA_CD_02) 08:13		09:29 (WEA_CD_01) 07:17	07:04			05:57	19:23 (WEA_RE_02) 05:09	19:08 (WEA_RE_02)	
	16:21	10:30 (WEA_CD_02) 17:11	35	10:04 (WEA_CD_01) 18:05	20:01			20:55	36	19:59 (WEA_RE_02) 21:43	68
2	08:42	10:03 (WEA_CD_02) 08:11		09:28 (WEA_CD_01) 07:15	07:02			05:55		19:21 (WEA_RE_02) 05:08	19:08 (WEA_RE_02)
	16:22	10:30 (WEA_CD_02) 17:13	36	10:04 (WEA_CD_01) 18:07	20:03			05:57	40	20:01 (WEA_RE_02) 21:44	68
3	08:41	10:03 (WEA_CD_02) 08:10		09:29 (WEA_CD_01) 07:13	06:59			05:53		19:19 (WEA_RE_02) 05:08	19:09 (WEA_RE_02)
	16:23	10:31 (WEA_CD_02) 17:15	37	10:06 (WEA_CD_01) 18:09	20:05			20:58	43	20:02 (WEA_RE_02) 21:45	68
4	08:41	10:04 (WEA_CD_02) 08:08		09:28 (WEA_CD_01) 07:11	06:57			05:51		19:17 (WEA_RE_02) 05:07	19:09 (WEA_RE_02)
	16:25	10:32 (WEA_CD_02) 17:17	38	10:06 (WEA_CD_01) 18:10	20:07			21:00	46	20:03 (WEA_RE_02) 21:46	68
5	08:41	10:04 (WEA_CD_02) 08:06		09:28 (WEA_CD_01) 07:08	06:55			05:49		19:17 (WEA_RE_02) 05:06	19:09 (WEA_RE_02)
	16:26	10:31 (WEA_CD_02) 17:19	38	10:06 (WEA_CD_01) 18:12	20:09			21:02	48	20:05 (WEA_RE_02) 21:47	67
6	08:41	10:06 (WEA_CD_02) 08:05		09:28 (WEA_CD_01) 07:06	06:52			05:47		19:15 (WEA_RE_02) 05:05	19:09 (WEA_RE_02)
	16:27	10:32 (WEA_CD_02) 17:21	39	10:07 (WEA_CD_01) 18:14	20:10			21:04	51	20:06 (WEA_RE_02) 21:48	68
7	08:40	10:06 (WEA_CD_02) 08:03		09:28 (WEA_CD_01) 07:04	06:50			05:45		19:14 (WEA_RE_02) 05:05	19:09 (WEA_RE_02)
	16:28	10:32 (WEA_CD_02) 17:23	39	10:07 (WEA_CD_01) 18:16	20:12			21:05	53	20:07 (WEA_RE_02) 21:49	68
8	08:40	10:06 (WEA_CD_02) 08:01		09:28 (WEA_CD_01) 07:01	06:48			05:43		19:13 (WEA_RE_02) 05:04	19:10 (WEA_RE_02)
	16:30	10:32 (WEA_CD_02) 17:24	39	10:07 (WEA_CD_01) 18:18	20:14			21:07	54	20:07 (WEA_RE_02) 21:50	67
9	08:39	10:07 (WEA_CD_02) 07:59		09:28 (WEA_CD_01) 06:59	06:45			05:42		19:12 (WEA_RE_02) 05:04	19:10 (WEA_RE_02)
	16:31	10:33 (WEA_CD_02) 17:26	39	10:07 (WEA_CD_01) 18:20	20:16			21:09	57	20:09 (WEA_RE_02) 21:51	67
10	08:39	10:08 (WEA_CD_02) 07:57		09:28 (WEA_CD_01) 06:57	06:43			05:40		19:11 (WEA_RE_02) 05:03	19:10 (WEA_RE_02)
	16:33	10:33 (WEA_CD_02) 17:28	38	10:06 (WEA_CD_01) 18:22	20:17			21:10	58	20:09 (WEA_RE_02) 21:52	67
11	08:38	10:08 (WEA_CD_02) 07:55		09:28 (WEA_CD_01) 06:54	06:41			05:38		19:10 (WEA_RE_02) 05:03	19:11 (WEA_RE_02)
	16:34	10:32 (WEA_CD_02) 17:30	38	10:06 (WEA_CD_01) 18:23	20:19			21:12	60	20:10 (WEA_RE_02) 21:53	67
12	08:37	10:09 (WEA_CD_02) 07:53		09:29 (WEA_CD_01) 06:52	06:38			05:36		19:10 (WEA_RE_02) 05:02	19:10 (WEA_RE_02)
	16:36	10:32 (WEA_CD_02) 17:32	37	10:06 (WEA_CD_01) 18:25	20:21			21:14	61	20:11 (WEA_RE_02) 21:54	67
13	08:36	10:10 (WEA_CD_02) 07:51		09:29 (WEA_CD_01) 06:50	06:36			05:35		19:09 (WEA_RE_02) 05:02	19:11 (WEA_RE_02)
	16:37	10:32 (WEA_CD_02) 17:34	36	10:05 (WEA_CD_01) 18:27	20:23			21:15	62	20:11 (WEA_RE_02) 21:54	67
14	08:36	10:11 (WEA_CD_02) 07:49		09:30 (WEA_CD_01) 06:47	06:34			05:33		19:09 (WEA_RE_02) 05:02	19:11 (WEA_RE_02)
	16:39	10:32 (WEA_CD_02) 17:36	35	10:05 (WEA_CD_01) 18:29	20:25			21:17	63	20:12 (WEA_RE_02) 21:55	67
15	08:35	10:12 (WEA_CD_02) 07:47		09:31 (WEA_CD_01) 06:45	06:31			05:31		19:08 (WEA_RE_02) 05:02	19:12 (WEA_RE_02)
	16:40	10:31 (WEA_CD_02) 17:38	33	10:04 (WEA_CD_01) 18:31	20:26			21:19	64	20:12 (WEA_RE_02) 21:55	66
16	08:34	10:14 (WEA_CD_02) 07:45		09:32 (WEA_CD_01) 06:42	06:29			05:30		19:08 (WEA_RE_02) 05:01	19:12 (WEA_RE_02)
	16:42	10:31 (WEA_CD_02) 17:40	31	10:03 (WEA_CD_01) 18:33	20:28			21:20	65	20:13 (WEA_RE_02) 21:56	67
17	08:33	10:15 (WEA_CD_02) 07:43		09:32 (WEA_CD_01) 06:40	06:27			05:28		19:08 (WEA_RE_02) 05:01	19:12 (WEA_RE_02)
	16:44	10:30 (WEA_CD_02) 17:42	29	10:01 (WEA_CD_01) 18:34	20:30			21:22	64	20:12 (WEA_RE_02) 21:56	67
18	08:32	10:17 (WEA_CD_02) 07:41		09:34 (WEA_CD_01) 06:38	06:25			05:27		19:08 (WEA_RE_02) 05:01	19:12 (WEA_RE_02)
	16:45	10:29 (WEA_CD_02) 17:44	25	09:39 (WEA_CD_01) 18:36	20:32			21:23	65	20:13 (WEA_RE_02) 21:57	67
19	08:31	10:19 (WEA_CD_02) 07:39		09:36 (WEA_CD_01) 06:35	06:22			05:25		19:08 (WEA_RE_02) 05:01	19:13 (WEA_RE_02)
	16:47	10:26 (WEA_CD_02) 17:46	21	09:57 (WEA_CD_01) 18:38	20:34			21:25	66	20:14 (WEA_RE_02) 21:57	66
20	08:30		07:37	09:38 (WEA_CD_01) 06:33	06:20			05:24		19:07 (WEA_RE_02) 05:01	19:13 (WEA_RE_02)
	16:49		17:48	09:35 (WEA_CD_01) 18:40	20:35			21:27	66	20:15 (WEA_RE_02) 21:58	66
21	08:29		07:35	09:43 (WEA_CD_01) 06:31	06:18			05:22		19:07 (WEA_RE_02) 05:02	19:13 (WEA_RE_02)
	16:51		17:50	09:50 (WEA_CD_01) 18:42	20:37			21:28	67	20:14 (WEA_RE_02) 21:58	66
22	08:27	09:41 (WEA_CD_01) 07:33			06:16			05:21		19:07 (WEA_RE_02) 05:02	19:14 (WEA_RE_02)
	16:52	09:47 (WEA_CD_01) 17:52			18:43	20:39		21:30	67	20:14 (WEA_RE_02) 21:58	66
23	08:26	09:38 (WEA_CD_01) 07:31			06:26	06:14		05:19		19:07 (WEA_RE_02) 05:02	19:14 (WEA_RE_02)
	16:54	09:52 (WEA_CD_01) 17:53			18:45	20:41		21:31	68	20:15 (WEA_RE_02) 21:58	66
24	08:25	09:35 (WEA_CD_01) 07:28			06:23	06:12		05:18		19:08 (WEA_RE_02) 05:02	19:14 (WEA_RE_02)
	16:56	09:54 (WEA_CD_01) 17:55			18:47	20:42		21:32	67	20:15 (WEA_RE_02) 21:58	66
25	08:23	09:34 (WEA_CD_01) 07:26			06:21	06:09		05:17		19:08 (WEA_RE_02) 05:03	19:14 (WEA_RE_02)
	16:58	09:56 (WEA_CD_01) 17:57			18:49	20:44		21:34	67	20:15 (WEA_RE_02) 21:58	67
26	08:22	09:33 (WEA_CD_01) 07:24			06:19	06:07		05:16		19:07 (WEA_RE_02) 05:03	19:14 (WEA_RE_02)
	17:00	09:57 (WEA_CD_01) 17:59			18:51	20:46		21:35	68	20:15 (WEA_RE_02) 21:58	67
27	08:21	09:32 (WEA_CD_01) 07:22			06:16	06:05		05:14		19:07 (WEA_RE_02) 05:03	19:14 (WEA_RE_02)
	17:01	09:59 (WEA_CD_01) 18:01			18:52	20:48	4	19:40 (WEA_RE_02) 05:14	68	20:15 (WEA_RE_02) 21:58	66
28	08:19	09:31 (WEA_CD_01) 07:20			06:14	06:03		05:13		19:07 (WEA_RE_02) 05:04	19:14 (WEA_RE_02)
	17:03	10:00 (WEA_CD_01) 18:03			18:54	20:50	19	19:51 (WEA_RE_02) 05:13	68	20:15 (WEA_RE_02) 21:58	67
29	08:18	09:30 (WEA_CD_01) 07:19			07:11	06:01		05:12		19:08 (WEA_RE_02) 05:04	19:14 (WEA_RE_02)
	17:05	10:01 (WEA_CD_01) 18:04			19:56	20:51	27	19:55 (WEA_RE_02) 05:12	68	20:16 (WEA_RE_02) 21:59	67
30	08:16	09:30 (WEA_CD_01) 07:18			07:09	05:59		05:11		19:08 (WEA_RE_02) 05:05	19:15 (WEA_RE_02)
	17:07	10:03 (WEA_CD_01) 18:05			19:58	20:53	32	19:57 (WEA_RE_02) 05:11	68	20:16 (WEA_RE_02) 21:58	67
31	08:15	09:29 (WEA_CD_01) 07:17			07:07	05:57		05:10		19:08 (WEA_RE_02) 05:04	19:15 (WEA_RE_02)
	17:09	10:03 (WEA_CD_01) 18:06			20:00	20:54		21:42	68	20:16 (WEA_RE_02) 21:58	67
Sonnenscheinstunden		254	275	367	418	490	505	505	505	505	505
astr. max.mögl. Beschattung		665	687	82	82	1866	2008				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_04 - IO 04 Pappelweg 21 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

[Juli]		[August]		[September]		[Oktober]		[November]		[Dezember]				
1	05:06	19:15 (WEA_RE_02)	05:44	19:21 (WEA_RE_02)	06:36	19:28	07:28	07:24	08:58 (WEA_CD_01)	08:17	09:51 (WEA_CD_02)			
	21:57	67	20:22 (WEA_RE_02)	21:24	60	20:21 (WEA_RE_02)	20:19	19:07	16:59	38	09:36 (WEA_CD_01)	16:16	24	10:15 (WEA_CD_02)
2	05:06	19:15 (WEA_RE_02)	05:46	19:21 (WEA_RE_02)	06:38	19:28	07:30	07:26	08:57 (WEA_CD_01)	08:19	09:51 (WEA_CD_02)			
	21:57	67	20:22 (WEA_RE_02)	21:22	59	20:20 (WEA_RE_02)	20:17	19:05	16:57	39	09:36 (WEA_CD_01)	16:15	25	10:16 (WEA_CD_02)
3	05:07	19:15 (WEA_RE_02)	05:47	19:22 (WEA_RE_02)	06:40	19:29	07:31	07:28	08:57 (WEA_CD_01)	08:20	09:51 (WEA_CD_02)			
	21:57	67	20:22 (WEA_RE_02)	21:20	57	20:19 (WEA_RE_02)	20:14	19:02	16:55	39	09:36 (WEA_CD_01)	16:15	25	10:16 (WEA_CD_02)
4	05:08	19:15 (WEA_RE_02)	05:49	19:22 (WEA_RE_02)	06:42	19:29	07:33	07:30	08:57 (WEA_CD_01)	08:22	09:51 (WEA_CD_02)			
	21:56	68	20:23 (WEA_RE_02)	21:18	56	20:18 (WEA_RE_02)	20:12	19:00	16:53	39	09:36 (WEA_CD_01)	16:14	26	10:17 (WEA_CD_02)
5	05:09	19:16 (WEA_RE_02)	05:51	19:23 (WEA_RE_02)	06:43	19:30	07:35	07:32	08:57 (WEA_CD_01)	08:23	09:51 (WEA_CD_02)			
	21:56	67	20:23 (WEA_RE_02)	21:17	55	20:18 (WEA_RE_02)	20:10	18:58	16:51	39	09:36 (WEA_CD_01)	16:13	26	10:17 (WEA_CD_02)
6	05:10	19:16 (WEA_RE_02)	05:52	19:25 (WEA_RE_02)	06:45	19:30	07:37	07:34	08:58 (WEA_CD_01)	08:24	09:52 (WEA_CD_02)			
	21:55	67	20:23 (WEA_RE_02)	21:15	52	20:17 (WEA_RE_02)	20:07	18:55	16:49	38	09:36 (WEA_CD_01)	16:13	26	10:18 (WEA_CD_02)
7	05:11	19:16 (WEA_RE_02)	05:54	19:25 (WEA_RE_02)	06:47	19:30	07:38	07:35	08:58 (WEA_CD_01)	08:26	09:52 (WEA_CD_02)			
	21:54	68	20:24 (WEA_RE_02)	21:13	50	20:15 (WEA_RE_02)	20:05	18:53	16:47	38	09:36 (WEA_CD_01)	16:12	26	10:18 (WEA_CD_02)
8	05:12	19:15 (WEA_RE_02)	05:56	19:26 (WEA_RE_02)	06:48	19:30	07:40	07:37	08:58 (WEA_CD_01)	08:27	09:52 (WEA_CD_02)			
	21:54	68	20:23 (WEA_RE_02)	21:11	48	20:14 (WEA_RE_02)	20:03	18:51	16:46	38	09:36 (WEA_CD_01)	16:12	27	10:19 (WEA_CD_02)
9	05:13	19:15 (WEA_RE_02)	05:57	19:27 (WEA_RE_02)	06:50	19:30	07:42	07:39	08:59 (WEA_CD_01)	08:28	09:52 (WEA_CD_02)			
	21:53	68	20:23 (WEA_RE_02)	21:09	45	20:12 (WEA_RE_02)	20:00	18:49	16:44	36	09:35 (WEA_CD_01)	16:12	27	10:19 (WEA_CD_02)
10	05:14	19:15 (WEA_RE_02)	05:59	19:29 (WEA_RE_02)	06:52	19:30	07:44	07:41	09:00 (WEA_CD_01)	08:29	09:53 (WEA_CD_02)			
	21:52	68	20:22 (WEA_RE_02)	21:07	42	20:11 (WEA_RE_02)	19:58	18:46	16:42	36	09:35 (WEA_CD_01)	16:11	27	10:20 (WEA_CD_02)
11	05:15	19:16 (WEA_RE_02)	06:01	19:30 (WEA_RE_02)	06:53	19:30	07:45	07:43	09:00 (WEA_CD_01)	08:30	09:53 (WEA_CD_02)			
	21:51	68	20:24 (WEA_RE_02)	21:05	39	20:09 (WEA_RE_02)	19:55	18:44	16:41	34	09:34 (WEA_CD_01)	16:11	27	10:20 (WEA_CD_02)
12	05:16	19:16 (WEA_RE_02)	06:02	19:32 (WEA_RE_02)	06:55	19:30	07:47	07:45	09:01 (WEA_CD_01)	08:32	09:53 (WEA_CD_02)			
	21:51	68	20:24 (WEA_RE_02)	21:03	35	20:07 (WEA_RE_02)	19:53	18:41	16:39	33	09:34 (WEA_CD_01)	16:11	28	10:21 (WEA_CD_02)
13	05:17	19:17 (WEA_RE_02)	06:04	19:34 (WEA_RE_02)	06:57	19:30	07:49	07:47	09:02 (WEA_CD_01)	08:33	09:54 (WEA_CD_02)			
	21:50	68	20:25 (WEA_RE_02)	21:01	31	20:05 (WEA_RE_02)	19:51	18:39	16:37	31	09:33 (WEA_CD_01)	16:11	27	10:21 (WEA_CD_02)
14	05:18	19:17 (WEA_RE_02)	06:06	19:37 (WEA_RE_02)	06:59	19:30	07:51	07:48	09:03 (WEA_CD_01)	08:34	09:54 (WEA_CD_02)			
	21:49	68	20:25 (WEA_RE_02)	20:59	25	20:02 (WEA_RE_02)	19:48	18:37	16:36	29	09:32 (WEA_CD_01)	16:11	28	10:22 (WEA_CD_02)
15	05:19	19:16 (WEA_RE_02)	06:07	19:41 (WEA_RE_02)	07:00	19:30	07:53	07:50	09:04 (WEA_CD_01)	08:35	09:55 (WEA_CD_02)			
	21:48	69	20:25 (WEA_RE_02)	20:57	17	19:58 (WEA_RE_02)	19:46	18:35	16:34	27	09:31 (WEA_CD_01)	16:11	27	10:22 (WEA_CD_02)
16	05:21	19:16 (WEA_RE_02)	06:09	19:43 (WEA_RE_02)	07:02	19:30	07:54	07:52	09:06 (WEA_CD_01)	08:35	09:55 (WEA_CD_02)			
	21:47	68	20:24 (WEA_RE_02)	20:55		19:43	18:32	16:33	24	09:30 (WEA_CD_01)	16:11	28	10:23 (WEA_CD_02)	
17	05:22	19:16 (WEA_RE_02)	06:11	19:44 (WEA_RE_02)	07:04	19:30	07:56	07:54	09:07 (WEA_CD_01)	08:36	09:56 (WEA_CD_02)			
	21:45	68	20:24 (WEA_RE_02)	20:53		19:41	18:30	16:31	22	09:29 (WEA_CD_01)	16:11	27	10:23 (WEA_CD_02)	
18	05:23	19:16 (WEA_RE_02)	06:12	19:45 (WEA_RE_02)	07:05	19:30	07:58	07:56	09:09 (WEA_CD_01)	08:37	09:56 (WEA_CD_02)			
	21:44	68	20:24 (WEA_RE_02)	20:51		19:39	18:28	16:30	19	09:28 (WEA_CD_01)	16:12	28	10:23 (WEA_CD_02)	
19	05:25	19:17 (WEA_RE_02)	06:14	19:46 (WEA_RE_02)	07:07	19:30	08:00	07:57	09:12 (WEA_CD_01)	08:38	09:56 (WEA_CD_02)			
	21:43	68	20:25 (WEA_RE_02)	20:48		19:36	18:26	16:29	14	09:26 (WEA_CD_01)	16:12	28	10:24 (WEA_CD_02)	
20	05:26	19:17 (WEA_RE_02)	06:16	19:47 (WEA_RE_02)	07:09	19:30	08:02	07:59	09:16 (WEA_CD_01)	08:38	09:57 (WEA_CD_02)			
	21:42	68	20:25 (WEA_RE_02)	20:46		19:34	18:23	16:27	6	09:22 (WEA_CD_01)	16:12	28	10:25 (WEA_CD_02)	
21	05:27	19:17 (WEA_RE_02)	06:18	19:48 (WEA_RE_02)	07:11	19:30	08:04	08:01	09:23 (WEA_CD_01)	08:39	09:57 (WEA_CD_02)			
	21:41	67	20:24 (WEA_RE_02)	20:44		19:31	18:21	16:26	10	10:22 (WEA_CD_01)	16:26	28	10:25 (WEA_CD_02)	
22	05:29	19:18 (WEA_RE_02)	06:19	19:49 (WEA_RE_02)	07:12	19:30	08:05	07:12	09:24 (WEA_CD_01)	08:03	09:58 (WEA_CD_02)			
	21:39	67	20:25 (WEA_RE_02)	20:42		19:29	18:19	16:25	10	10:26 (WEA_CD_01)	16:25	28	10:26 (WEA_CD_02)	
23	05:30	19:18 (WEA_RE_02)	06:21	19:50 (WEA_RE_02)	07:14	19:30	08:07	08:04	09:26 (WEA_CD_01)	08:04	09:58 (WEA_CD_02)			
	21:38	66	20:24 (WEA_RE_02)	20:40		19:26	18:17	22	10:28 (WEA_CD_01)	16:24	28	10:26 (WEA_CD_02)		
24	05:32	19:17 (WEA_RE_02)	06:23	19:51 (WEA_RE_02)	07:16	19:30	08:09	08:06	09:27 (WEA_CD_01)	08:05	09:59 (WEA_CD_02)			
	21:36	67	20:24 (WEA_RE_02)	20:37		19:24	18:15	26	10:30 (WEA_CD_01)	16:23	28	10:26 (WEA_CD_02)		
25	05:33	19:18 (WEA_RE_02)	06:24	19:52 (WEA_RE_02)	07:17	19:30	08:11	08:08	09:28 (WEA_CD_01)	08:06	09:59 (WEA_CD_02)			
	21:35	66	20:24 (WEA_RE_02)	20:35		19:22	17:13	30	09:32 (WEA_CD_01)	16:21	28	10:27 (WEA_CD_02)		
26	05:35	19:18 (WEA_RE_02)	06:26	19:53 (WEA_RE_02)	07:19	19:30	08:13	08:10	09:29 (WEA_CD_01)	08:07	10:00 (WEA_CD_02)			
	21:33	65	20:23 (WEA_RE_02)	20:33		19:19	17:11	32	09:33 (WEA_CD_01)	16:20	27	10:27 (WEA_CD_02)		
27	05:36	19:19 (WEA_RE_02)	06:28	19:54 (WEA_RE_02)	07:21	19:30	08:15	08:12	09:30 (WEA_CD_01)	08:11	10:00 (WEA_CD_02)			
	21:32	65	20:24 (WEA_RE_02)	20:31		19:17	17:09	34	09:34 (WEA_CD_01)	16:19	28	10:28 (WEA_CD_02)		
28	05:38	19:19 (WEA_RE_02)	06:30	19:55 (WEA_RE_02)	07:23	19:30	08:17	08:14	09:31 (WEA_CD_01)	08:12	10:00 (WEA_CD_02)			
	21:30	64	20:23 (WEA_RE_02)	20:28		19:14	17:07	35	09:34 (WEA_CD_01)	16:18	28	10:28 (WEA_CD_02)		
29	05:39	19:19 (WEA_RE_02)	06:31	19:56 (WEA_RE_02)	07:24	19:30	08:19	08:16	09:32 (WEA_CD_01)	08:13	10:01 (WEA_CD_02)			
	21:29	63	20:22 (WEA_RE_02)	20:26		19:12	17:04	36	09:35 (WEA_CD_01)	16:18	28	10:29 (WEA_CD_02)		
30	05:41	19:20 (WEA_RE_02)	06:33	19:57 (WEA_RE_02)	07:26	19:30	08:21	08:18	09:36 (WEA_CD_01)	08:16	10:01 (WEA_CD_02)			
	21:27	62	20:22 (WEA_RE_02)	20:24		19:10	17:02	37	09:35 (WEA_CD_01)	16:17	28	10:29 (WEA_CD_02)		
31	05:43	19:20 (WEA_RE_02)	06:35	19:58 (WEA_RE_02)	07:28	19:30	08:23	08:20	09:37 (WEA_CD_01)	08:17	10:02 (WEA_CD_02)			
	21:25	61	20:21 (WEA_RE_02)	20:21		17:01	17:01	38	09:36 (WEA_CD_01)	16:20	28	10:30 (WEA_CD_02)		
Sonnenscheinstunden		508	457	382	330	262	238	842						
astr. max.mögl. Beschattung		2069	671	318	756									

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM)	Schattenanfang (WEA mit erstem Schatten)	Schattenende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	-------------------	--	---

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_05 - IO 05 Rote-Erde-Weg 100 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	10:26 (WEA_G_03) 08:13		14:26 (WEA_G_01) 07:17		08:27 (WEA_CD_03) 07:04		05:57		07:07 (WEA_CD_02) 05:09	
	16:21	14:54 (WEA_G_01) 17:11	45	15:11 (WEA_G_01) 18:05	38	09:05 (WEA_CD_03) 20:01		20:55	33	07:40 (WEA_CD_02) 21:43	
2	08:42	10:26 (WEA_G_03) 08:11		14:26 (WEA_G_01) 07:15		08:27 (WEA_CD_03) 07:02		05:55		07:08 (WEA_CD_02) 05:08	
	16:22	14:54 (WEA_G_01) 17:13	45	15:11 (WEA_G_01) 18:07	39	09:06 (WEA_CD_03) 20:03		20:57	31	07:39 (WEA_CD_02) 21:44	
3	08:41	10:27 (WEA_G_03) 08:10		14:28 (WEA_G_01) 07:13		08:27 (WEA_CD_03) 06:59		05:53		07:08 (WEA_CD_02) 05:08	
	16:23	14:55 (WEA_G_01) 17:15	43	15:11 (WEA_G_01) 18:09	39	09:06 (WEA_CD_03) 20:05		20:59	30	07:38 (WEA_CD_02) 21:45	
4	08:41	10:28 (WEA_G_03) 08:08		14:28 (WEA_G_01) 07:11		08:26 (WEA_CD_03) 06:57		05:51		07:08 (WEA_CD_02) 05:07	
	16:25	14:57 (WEA_G_01) 17:17	43	15:11 (WEA_G_01) 18:11	39	09:05 (WEA_CD_03) 20:07		21:00	29	07:37 (WEA_CD_02) 21:46	
5	08:41	10:28 (WEA_G_03) 08:06		14:29 (WEA_G_01) 07:08		08:26 (WEA_CD_03) 06:55		05:49		07:10 (WEA_CD_02) 05:06	
	16:26	14:57 (WEA_G_01) 17:19	41	15:10 (WEA_G_01) 18:12	39	09:05 (WEA_CD_03) 20:09		21:02	27	07:37 (WEA_CD_02) 21:47	
6	08:41	10:30 (WEA_G_03) 08:05		14:30 (WEA_G_01) 07:06		08:26 (WEA_CD_03) 06:52		05:47		07:10 (WEA_CD_02) 05:05	
	16:27	14:58 (WEA_G_01) 17:21	39	15:09 (WEA_G_01) 18:14	39	09:05 (WEA_CD_03) 20:10		21:04	26	07:36 (WEA_CD_02) 21:48	
7	08:40	10:30 (WEA_G_03) 08:03		14:31 (WEA_G_01) 07:04		08:26 (WEA_CD_03) 06:50		05:45		07:11 (WEA_CD_02) 05:05	
	16:28	14:59 (WEA_G_01) 17:23	38	15:09 (WEA_G_01) 18:16	38	09:04 (WEA_CD_03) 20:12		21:05	23	07:34 (WEA_CD_02) 21:49	
8	08:40	10:31 (WEA_G_03) 08:01		14:32 (WEA_G_01) 07:01		08:26 (WEA_CD_03) 06:48		05:43		07:12 (WEA_CD_02) 05:04	
	16:30	14:59 (WEA_G_01) 17:24	35	15:07 (WEA_G_01) 18:18	37	09:03 (WEA_CD_03) 20:14		21:07	20	07:32 (WEA_CD_02) 21:50	
9	08:39	10:33 (WEA_G_03) 07:59		14:34 (WEA_G_01) 06:59		08:27 (WEA_CD_03) 06:45		05:42		07:14 (WEA_CD_02) 05:04	
	16:31	15:01 (WEA_G_01) 17:26	32	15:06 (WEA_G_01) 18:20	36	09:03 (WEA_CD_03) 20:16		21:09	17	07:31 (WEA_CD_02) 21:51	
10	08:39	10:34 (WEA_G_03) 07:57		14:36 (WEA_G_01) 06:57		08:27 (WEA_CD_03) 06:43		05:40		07:16 (WEA_CD_02) 05:03	
	16:33	15:02 (WEA_G_01) 17:28	29	15:05 (WEA_G_01) 18:22	34	09:01 (WEA_CD_03) 20:17		21:10	12	07:28 (WEA_CD_02) 21:52	
11	08:38	10:35 (WEA_G_03) 07:55		14:38 (WEA_G_01) 06:54		08:28 (WEA_CD_03) 06:41		05:38		07:21 (WEA_CD_02) 05:03	
	16:34	15:02 (WEA_G_01) 17:30	25	15:03 (WEA_G_01) 18:23	32	09:00 (WEA_CD_03) 20:19		21:12	1	07:22 (WEA_CD_02) 21:53	
12	08:37	10:37 (WEA_G_03) 07:53		14:41 (WEA_G_01) 06:52		08:28 (WEA_CD_03) 06:38		05:36		07:22 (WEA_CD_02) 05:02	
	16:36	15:03 (WEA_G_01) 17:32	19	15:00 (WEA_G_01) 18:25	30	08:58 (WEA_CD_03) 06:34		21:14		21:53	
13	08:36	10:39 (WEA_G_03) 07:51		14:46 (WEA_G_01) 06:50		08:30 (WEA_CD_03) 06:36		05:35		07:23 (WEA_CD_02) 05:02	
	16:37	15:04 (WEA_G_01) 17:34	10	14:56 (WEA_G_01) 06:47		08:30 (WEA_CD_03) 06:32		21:15		21:54	
14	08:36	10:42 (WEA_G_03) 07:49		14:56 (WEA_G_01) 06:47		08:32 (WEA_CD_03) 06:29		05:33		07:23 (WEA_CD_02) 05:02	
	16:39	15:05 (WEA_G_01) 17:36		14:56 (WEA_G_01) 06:47		08:32 (WEA_CD_03) 06:29		21:17		21:55	
15	08:35	10:42 (WEA_G_03) 07:47		14:56 (WEA_G_01) 06:47		08:34 (WEA_CD_03) 06:32		05:31		07:22 (WEA_CD_02) 05:02	
	16:40	15:06 (WEA_G_01) 17:38		14:56 (WEA_G_01) 06:47		08:34 (WEA_CD_03) 06:32		21:19		21:55	
16	08:34	10:42 (WEA_G_03) 07:45		14:56 (WEA_G_01) 06:47		08:36 (WEA_CD_03) 06:29		05:30		07:23 (WEA_CD_02) 05:01	
	16:42	15:06 (WEA_G_01) 17:40		14:56 (WEA_G_01) 06:47		08:36 (WEA_CD_03) 06:29		21:20		21:56	
17	08:33	10:42 (WEA_G_03) 07:43		14:56 (WEA_G_01) 06:47		08:38 (WEA_CD_03) 06:29		05:28		07:23 (WEA_CD_02) 05:01	
	16:44	15:07 (WEA_G_01) 17:42		14:56 (WEA_G_01) 06:47		08:38 (WEA_CD_03) 06:29		21:22		21:56	
18	08:32	10:43 (WEA_G_03) 07:41		14:56 (WEA_G_01) 06:47		08:40 (WEA_CD_03) 06:29		05:27		07:23 (WEA_CD_02) 05:01	
	16:45	15:08 (WEA_G_01) 17:44		14:56 (WEA_G_01) 06:47		08:40 (WEA_CD_03) 06:29		21:23		21:57	
19	08:31	10:43 (WEA_G_03) 07:39		14:56 (WEA_G_01) 06:47		08:42 (WEA_CD_03) 06:29		05:25		07:23 (WEA_CD_02) 05:01	
	16:47	15:08 (WEA_G_01) 17:46	7	08:44 (WEA_CD_03) 06:35		08:42 (WEA_CD_03) 06:29		21:25		21:57	
20	08:30	10:43 (WEA_G_03) 07:37		14:56 (WEA_G_01) 06:47		08:44 (WEA_CD_03) 06:29		05:24		07:23 (WEA_CD_02) 05:01	
	16:49	15:09 (WEA_G_01) 17:48	16	08:56 (WEA_CD_03) 06:30		08:44 (WEA_CD_03) 06:29		21:26		21:58	
21	08:29	10:43 (WEA_G_03) 07:35		14:56 (WEA_G_01) 06:47		08:46 (WEA_CD_03) 06:29		05:22		07:23 (WEA_CD_02) 05:02	
	16:51	15:10 (WEA_G_01) 17:50	22	08:59 (WEA_CD_03) 06:32		08:46 (WEA_CD_03) 06:29		21:28		21:58	
22	08:27	10:42 (WEA_G_03) 07:33		14:56 (WEA_G_01) 06:47		08:48 (WEA_CD_03) 06:29		05:21		07:23 (WEA_CD_02) 05:02	
	16:52	15:10 (WEA_G_01) 17:52	26	09:00 (WEA_CD_03) 06:33		08:48 (WEA_CD_03) 06:29		21:29		21:58	
23	08:26	10:43 (WEA_G_03) 07:31		14:56 (WEA_G_01) 06:47		08:50 (WEA_CD_03) 06:29		05:20		07:23 (WEA_CD_02) 05:02	
	16:54	15:10 (WEA_G_01) 17:54	29	09:02 (WEA_CD_03) 06:35		08:50 (WEA_CD_03) 06:29		21:31		21:58	
24	08:25	10:43 (WEA_G_03) 07:28		14:56 (WEA_G_01) 06:47		08:52 (WEA_CD_03) 06:29		05:18		07:23 (WEA_CD_02) 05:02	
	16:56	15:10 (WEA_G_01) 17:55	31	09:03 (WEA_CD_03) 06:37		08:52 (WEA_CD_03) 06:29		21:32		21:58	
25	08:23	10:43 (WEA_G_03) 07:26		14:56 (WEA_G_01) 06:47		08:54 (WEA_CD_03) 06:29		05:17		07:23 (WEA_CD_02) 05:03	
	16:58	15:11 (WEA_G_01) 17:57	33	09:04 (WEA_CD_03) 06:39		08:54 (WEA_CD_03) 06:29		21:34		21:58	
26	08:22	10:43 (WEA_G_03) 07:24		14:56 (WEA_G_01) 06:47		08:56 (WEA_CD_03) 06:29		05:16		07:23 (WEA_CD_02) 05:03	
	17:00	15:11 (WEA_G_01) 17:59	35	09:04 (WEA_CD_03) 06:39		08:56 (WEA_CD_03) 06:29		21:35		21:58	
27	08:21	10:44 (WEA_G_03) 07:22		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		05:15		07:23 (WEA_CD_02) 05:03	
	17:01	15:12 (WEA_G_01) 18:01	37	09:05 (WEA_CD_03) 06:41		08:58 (WEA_CD_03) 06:29		21:37		21:58	
28	08:19	10:44 (WEA_G_03) 07:20		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		05:13		07:23 (WEA_CD_02) 05:04	
	17:03	15:12 (WEA_G_01) 18:03	38	09:06 (WEA_CD_03) 06:43		08:58 (WEA_CD_03) 06:29		21:38		21:58	
29	08:18	10:44 (WEA_G_03) 07:19		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		05:12		07:23 (WEA_CD_02) 05:05	
	17:05	15:11 (WEA_G_01) 18:01		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		21:39		21:58	
30	08:16	10:45 (WEA_G_03) 07:17		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		05:11		07:23 (WEA_CD_02) 05:05	
	17:07	15:12 (WEA_G_01) 18:03		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		21:40		21:58	
31	08:15	10:45 (WEA_G_03) 07:15		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		05:10		07:23 (WEA_CD_02) 05:04	
	17:09	15:12 (WEA_G_01) 18:05		14:56 (WEA_G_01) 06:47		08:58 (WEA_CD_03) 06:29		21:42		21:58	
Sonnenscheinstunden		254	275	367	418	461	490	505			
astr.max.mögl.Beschattung		1592	718	511	418	461	249				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattendenende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	-----------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_05 - IO 05 Rote-Erde-Weg 100 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember
1	05:06 05:44		05:36	07:28	09:09 (WEA_CD_03) 07:24	14:05 (WEA_G_01) 08:17
	21:57 21:24		20:19	19:07	28 09:37 (WEA_CD_03) 16:59	30 14:35 (WEA_G_01) 16:16
2	05:07 05:46		05:38	07:30	09:06 (WEA_CD_03) 07:26	14:03 (WEA_G_01) 08:19
	21:57 21:22	8	20:17	19:05	31 09:37 (WEA_CD_03) 16:57	33 14:36 (WEA_G_01) 16:15
3	05:07 05:47		05:40	07:31	09:05 (WEA_CD_03) 07:28	14:02 (WEA_G_01) 08:20
	21:57 21:20	14	20:14	19:02	39 09:38 (WEA_CD_03) 16:58	35 14:37 (WEA_G_01) 16:15
4	05:08 05:49		05:42	07:33	09:04 (WEA_CD_03) 07:30	14:01 (WEA_G_01) 08:22
	21:56 21:18	18	20:12	19:00	35 09:39 (WEA_CD_03) 16:53	37 14:38 (WEA_G_01) 16:14
5	05:09 05:51		05:43	07:35	09:03 (WEA_CD_03) 07:32	13:59 (WEA_G_01) 08:23
	21:56 21:17	21	20:10	18:58	37 09:40 (WEA_CD_03) 16:51	40 14:39 (WEA_G_01) 16:13
6	05:10 05:52		05:45	07:37	09:03 (WEA_CD_03) 07:34	13:59 (WEA_G_01) 08:24
	21:55 21:15	24	20:07	18:55	38 09:41 (WEA_CD_03) 16:49	41 14:40 (WEA_G_01) 16:13
7	05:11 05:54		05:47	07:38	09:01 (WEA_CD_03) 07:35	13:58 (WEA_G_01) 08:26
	21:54 21:13	26	20:05	18:53	39 09:40 (WEA_CD_03) 16:47	43 14:41 (WEA_G_01) 16:13
8	05:12 05:56		05:48	07:40	09:01 (WEA_CD_03) 07:37	13:57 (WEA_G_01) 08:27
	21:54 21:11	28	20:03	18:51	39 09:40 (WEA_CD_03) 16:46	44 14:41 (WEA_G_01) 16:12
9	05:13 05:57		05:50	07:42	09:01 (WEA_CD_03) 07:39	13:57 (WEA_G_01) 08:28
	21:53 21:09	30	20:00	18:48	39 09:40 (WEA_CD_03) 16:44	45 14:42 (WEA_G_01) 16:12
10	05:14 05:59		05:52	07:44	09:01 (WEA_CD_03) 07:41	13:56 (WEA_G_01) 08:29
	21:52 21:07	31	19:58	18:46	39 09:40 (WEA_CD_03) 16:42	46 14:42 (WEA_G_01) 16:12
11	05:15 06:01		05:53	07:45	09:01 (WEA_CD_03) 07:43	13:56 (WEA_G_01) 08:30
	21:51 21:05	32	19:55	18:44	39 09:40 (WEA_CD_03) 16:41	47 14:43 (WEA_G_01) 16:11
12	05:16 06:02		05:55	07:47	09:01 (WEA_CD_03) 07:45	13:56 (WEA_G_01) 08:32
	21:51 21:03	33	19:53	18:41	39 09:40 (WEA_CD_03) 16:39	47 14:43 (WEA_G_01) 16:11
13	05:17 06:04		05:57	07:49	09:00 (WEA_CD_03) 07:47	13:56 (WEA_G_01) 08:33
	21:50 21:01	33	19:51	18:39	38 09:38 (WEA_CD_03) 16:37	47 14:43 (WEA_G_01) 16:11
14	05:18 06:06		05:59	07:51	09:00 (WEA_CD_03) 07:48	13:56 (WEA_G_01) 08:34
	21:49 20:59	34	19:48	18:37	38 09:38 (WEA_CD_03) 16:36	47 14:43 (WEA_G_01) 16:11
15	05:20 06:07		06:00	07:53	09:01 (WEA_CD_03) 07:50	13:56 (WEA_G_01) 08:34
	21:48 20:57	34	19:46	18:35	36 09:37 (WEA_CD_03) 16:34	48 14:44 (WEA_G_01) 16:11
16	05:21 06:09		06:02	07:54	09:02 (WEA_CD_03) 07:52	13:56 (WEA_G_01) 08:35
	21:47 20:55	34	19:43	18:32	34 09:36 (WEA_CD_03) 16:33	48 14:44 (WEA_G_01) 16:11
17	05:22 06:11		06:04	07:56	09:02 (WEA_CD_03) 07:54	13:56 (WEA_G_01) 08:36
	21:45 20:53	35	19:41	18:30	33 09:35 (WEA_CD_03) 16:31	48 14:44 (WEA_G_01) 16:11
18	05:23 06:13		06:05	07:58	09:03 (WEA_CD_03) 07:56	13:56 (WEA_G_01) 08:37
	21:44 20:51	34	19:39	18:28	31 09:34 (WEA_CD_03) 16:30	48 14:44 (WEA_G_01) 16:12
19	05:25 06:14		06:07	08:00	09:05 (WEA_CD_03) 07:57	13:57 (WEA_G_01) 08:38
	21:43 20:48	34	19:36	18:26	27 09:32 (WEA_CD_03) 16:29	47 14:44 (WEA_G_01) 16:12
20	05:26 06:16		06:09	08:02	09:06 (WEA_CD_03) 07:59	13:57 (WEA_G_01) 08:38
	21:42 20:46	32	19:34	18:23	25 09:31 (WEA_CD_03) 16:27	48 14:45 (WEA_G_01) 16:12
21	05:27 06:18		06:11	08:04	09:08 (WEA_CD_03) 08:01	13:58 (WEA_G_01) 08:39
	21:40 20:44	32	19:31	18:21	20 09:28 (WEA_CD_03) 16:26	47 14:45 (WEA_G_01) 16:13
22	05:29 06:19		06:12	08:05	09:11 (WEA_CD_03) 08:03	13:58 (WEA_G_01) 08:39
	21:39 20:42	31	19:29	18:19	14 09:25 (WEA_CD_03) 16:25	47 14:45 (WEA_G_01) 16:13
23	05:30 06:21		06:14	08:07		08:04
	21:38 20:40	29	19:26	18:17		16:24
24	05:32 06:23		06:16	08:09		08:06
	21:36 20:37	27	19:24	18:15		16:23
25	05:33 06:24		06:17	08:11		08:08
	21:35 20:35	24	19:22	17:13		16:21
26	05:35 06:26		06:19	08:13		08:09
	21:33 20:33	20	19:19	17:11		16:20
27	05:36 06:28		06:21	08:15		08:11
	21:32 20:31	16	19:17	17:09		16:19
28	05:38 06:30		06:23	08:17		08:13
	21:30 20:28	8	19:14	17:07		16:19
29	05:39 06:31		06:24	08:18		08:14
	21:29 20:26		19:12	17:05	13	14:27 (WEA_G_01) 16:18
30	05:41 06:33		06:26	08:20		14:10 (WEA_G_01) 08:16
	21:27 20:24		19:10	17:03	20	14:30 (WEA_G_01) 16:17
31	05:43 06:35		06:28	08:22		14:07 (WEA_G_01) 08:14
	21:25 20:21		19:08	17:01	26	14:33 (WEA_G_01) 16:20
Sonnenscheinstunden	508	457	382	330	262	238
astr. max.mögl. Beschattung		722	60	791	1332	2095

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_06 - IO 06 Rote-Erde-Weg 102 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	10:42	13:57 (WEA_G_01)	10:13	09:37 (WEA_CD_03)	10:17	10:04	05:57	06:54 (WEA_CD_01)	05:09	06:49 (WEA_CD_01)	
1	16:21	14:26 (WEA_G_01)	13:11	32 30:09 (WEA_CD_03)	18:05	18:01	20:55	19 07:13 (WEA_CD_01)	21:43	30 07:18 (WEA_CD_01)	
2	08:42	13:57 (WEA_G_01)	10:13	09:38 (WEA_CD_03)	10:15	10:01	08:55	06:52 (WEA_CD_01)	05:08	08:48 (WEA_CD_01)	
1	16:22	14:26 (WEA_G_01)	13:13	31 30:09 (WEA_CD_03)	18:07	18:03	20:57	23 07:15 (WEA_CD_01)	21:44	30 07:18 (WEA_CD_01)	
3	08:41	13:58 (WEA_G_01)	10:10	09:39 (WEA_CD_03)	10:13	10:00	08:53	06:50 (WEA_CD_01)	05:08	06:50 (WEA_CD_01)	
1	16:23	14:29 (WEA_G_01)	13:15	30 30:09 (WEA_CD_03)	18:09	18:05	20:58	26 07:16 (WEA_CD_01)	21:45	28 07:18 (WEA_CD_01)	
4	08:41	13:59 (WEA_G_01)	09:58	09:40 (WEA_CD_03)	10:11	10:00	08:51	06:49 (WEA_CD_01)	05:07	06:50 (WEA_CD_01)	
1	16:25	14:29 (WEA_G_01)	13:17	29 30:09 (WEA_CD_03)	18:11	18:07	21:00	29 07:17 (WEA_CD_01)	21:46	27 07:17 (WEA_CD_01)	
5	08:41	13:59 (WEA_G_01)	09:56	09:41 (WEA_CD_03)	10:08	10:00	08:50	06:48 (WEA_CD_01)	05:06	06:50 (WEA_CD_01)	
1	16:28	14:30 (WEA_G_01)	13:19	27 30:08 (WEA_CD_03)	18:12	18:09	21:02	31 07:19 (WEA_CD_01)	21:47	26 07:18 (WEA_CD_01)	
6	08:41	14:01 (WEA_G_01)	09:05	09:42 (WEA_CD_03)	10:06	10:00	08:52	06:47 (WEA_CD_01)	05:05	06:51 (WEA_CD_01)	
1	16:27	14:29 (WEA_G_01)	13:21	25 30:07 (WEA_CD_03)	18:14	18:10	21:04	32 07:19 (WEA_CD_01)	21:48	25 07:18 (WEA_CD_01)	
7	08:40	14:01 (WEA_G_01)	09:03	09:43 (WEA_CD_03)	10:04	10:00	08:50	06:46 (WEA_CD_01)	05:05	06:52 (WEA_CD_01)	
1	16:28	14:29 (WEA_G_01)	13:23	22 30:05 (WEA_CD_03)	18:16	18:12	21:05	34 07:20 (WEA_CD_01)	21:49	24 07:18 (WEA_CD_01)	
8	08:40	14:02 (WEA_G_01)	09:01	09:44 (WEA_CD_03)	10:01	10:00	08:48	06:45 (WEA_CD_01)	05:04	06:53 (WEA_CD_01)	
1	16:30	14:29 (WEA_G_01)	13:24	20 30:04 (WEA_CD_03)	18:18	18:14	21:07	35 07:20 (WEA_CD_01)	21:50	23 07:18 (WEA_CD_01)	
9	08:39	14:03 (WEA_G_01)	09:00	09:47 (WEA_CD_03)	10:00	10:00	08:42	06:45 (WEA_CD_01)	05:04	06:53 (WEA_CD_01)	
1	16:31	14:29 (WEA_G_01)	13:26	14 30:01 (WEA_CD_03)	18:20	18:16	21:09	36 07:21 (WEA_CD_01)	21:51	22 07:18 (WEA_CD_01)	
10	08:39	09:44 (WEA_CD_03)	10:57	09:51 (WEA_CD_03)	10:57	10:43	18:10	06:44 (WEA_CD_01)	05:03	06:54 (WEA_CD_01)	
11	16:33	14:29 (WEA_G_01)	13:28	7 09:58 (WEA_CD_03)	18:22	18:17	21:10	37 07:21 (WEA_CD_01)	21:52	21 07:18 (WEA_CD_01)	
11	08:38	09:43 (WEA_CD_03)	10:55	06:54	07:46 (WEA_CD_03)	10:41	08:38	06:43 (WEA_CD_01)	05:03	06:55 (WEA_CD_01)	
1	16:34	14:28 (WEA_G_01)	13:30	18:23	14 08:00 (WEA_CD_03)	18:19	21:12	38 07:21 (WEA_CD_01)	21:53	20 07:18 (WEA_CD_01)	
12	08:37	09:41 (WEA_CD_03)	10:53	06:52	07:42 (WEA_CD_03)	10:38	08:36	06:43 (WEA_CD_01)	05:02	06:56 (WEA_CD_01)	
1	16:36	14:28 (WEA_G_01)	13:32	18:25	20 08:02 (WEA_CD_03)	18:21	21:14	39 07:22 (WEA_CD_01)	21:54	19 07:18 (WEA_CD_01)	
13	08:36	09:40 (WEA_CD_03)	10:51	06:50	07:40 (WEA_CD_03)	10:36	08:35	06:43 (WEA_CD_01)	05:02	06:56 (WEA_CD_01)	
1	16:37	14:27 (WEA_G_01)	13:34	18:27	24 08:04 (WEA_CD_03)	18:23	21:15	40 07:21 (WEA_CD_01)	21:54	18 07:18 (WEA_CD_01)	
14	08:36	09:39 (WEA_CD_03)	10:49	06:47	07:39 (WEA_CD_03)	10:34	08:33	06:43 (WEA_CD_01)	05:02	06:57 (WEA_CD_01)	
1	16:39	14:26 (WEA_G_01)	13:36	18:29	26 08:05 (WEA_CD_03)	18:25	21:17	39 07:22 (WEA_CD_01)	21:55	16 07:18 (WEA_CD_01)	
15	08:35	09:39 (WEA_CD_03)	10:47	06:45	07:37 (WEA_CD_03)	10:32	08:32	06:43 (WEA_CD_01)	05:02	06:57 (WEA_CD_01)	
1	16:40	14:25 (WEA_G_01)	13:38	18:31	29 08:06 (WEA_CD_03)	18:26	21:19	40 07:22 (WEA_CD_01)	21:55	16 07:18 (WEA_CD_01)	
16	08:34	09:38 (WEA_CD_03)	10:45	06:42	07:36 (WEA_CD_03)	10:29	08:30	06:43 (WEA_CD_01)	05:01	06:58 (WEA_CD_01)	
1	16:42	14:25 (WEA_G_01)	13:40	18:33	31 08:07 (WEA_CD_03)	18:28	21:20	39 07:22 (WEA_CD_01)	21:56	15 07:18 (WEA_CD_01)	
17	08:33	09:38 (WEA_CD_03)	10:43	06:40	07:34 (WEA_CD_03)	10:27	08:29	06:42 (WEA_CD_01)	05:01	06:58 (WEA_CD_01)	
1	16:44	14:25 (WEA_G_01)	13:42	18:34	32 08:06 (WEA_CD_03)	18:30	21:22	39 07:21 (WEA_CD_01)	21:56	14 07:18 (WEA_CD_01)	
18	08:32	09:38 (WEA_CD_03)	10:41	06:38	07:34 (WEA_CD_03)	10:25	08:27	06:43 (WEA_CD_01)	05:01	06:59 (WEA_CD_01)	
1	16:45	14:24 (WEA_G_01)	13:44	18:36	33 08:07 (WEA_CD_03)	18:32	21:23	39 07:22 (WEA_CD_01)	21:57	14 07:18 (WEA_CD_01)	
19	08:31	09:37 (WEA_CD_03)	10:39	06:36	07:34 (WEA_CD_03)	10:22	08:26	06:43 (WEA_CD_01)	05:01	06:59 (WEA_CD_01)	
1	16:47	14:24 (WEA_G_01)	13:46	18:38	33 08:07 (WEA_CD_03)	18:34	21:25	39 07:22 (WEA_CD_01)	21:57	14 07:18 (WEA_CD_01)	
20	08:30	09:37 (WEA_CD_03)	10:37	06:33	07:32 (WEA_CD_03)	10:20	08:24	06:43 (WEA_CD_01)	05:01	07:00 (WEA_CD_01)	
1	16:49	14:23 (WEA_G_01)	13:48	18:40	35 08:07 (WEA_CD_03)	18:35	21:26	38 07:21 (WEA_CD_01)	21:58	13 07:18 (WEA_CD_01)	
21	08:29	09:37 (WEA_CD_03)	10:35	06:31	07:32 (WEA_CD_03)	10:18	08:22	06:43 (WEA_CD_01)	05:02	07:00 (WEA_CD_01)	
1	16:51	14:23 (WEA_G_01)	13:50	18:42	35 08:07 (WEA_CD_03)	18:37	21:28	38 07:21 (WEA_CD_01)	21:58	13 07:18 (WEA_CD_01)	
22	08:27	09:36 (WEA_CD_03)	10:33	06:28	07:32 (WEA_CD_03)	10:16	08:21	06:44 (WEA_CD_01)	05:02	07:01 (WEA_CD_01)	
1	16:52	14:23 (WEA_G_01)	13:52	18:43	34 08:06 (WEA_CD_03)	18:39	21:30	37 07:21 (WEA_CD_01)	21:58	13 07:18 (WEA_CD_01)	
23	08:26	09:36 (WEA_CD_03)	10:31	06:26	07:32 (WEA_CD_03)	10:14	08:19	06:44 (WEA_CD_01)	05:02	07:01 (WEA_CD_01)	
1	16:54	14:23 (WEA_G_01)	13:53	18:45	34 08:06 (WEA_CD_03)	18:41	21:31	37 07:21 (WEA_CD_01)	21:58	13 07:18 (WEA_CD_01)	
24	08:25	09:36 (WEA_CD_03)	10:29	06:23	07:31 (WEA_CD_03)	10:12	08:18	06:45 (WEA_CD_01)	05:02	07:00 (WEA_CD_01)	
1	16:56	14:22 (WEA_G_01)	13:55	18:47	33 08:04 (WEA_CD_03)	18:42	21:32	36 07:21 (WEA_CD_01)	21:58	14 07:18 (WEA_CD_01)	
25	08:23	09:36 (WEA_CD_03)	10:26	06:21	07:32 (WEA_CD_03)	10:09	08:17	06:45 (WEA_CD_01)	05:03	07:01 (WEA_CD_01)	
1	16:58	14:23 (WEA_G_01)	13:57	18:49	32 08:04 (WEA_CD_03)	18:44	21:34	36 07:21 (WEA_CD_01)	21:58	14 07:18 (WEA_CD_01)	
26	08:22	09:36 (WEA_CD_03)	10:24	06:19	07:32 (WEA_CD_03)	10:07	08:16	06:44 (WEA_CD_01)	05:03	07:00 (WEA_CD_01)	
1	17:00	14:23 (WEA_G_01)	13:59	18:51	30 08:03 (WEA_CD_03)	18:46	21:35	36 07:20 (WEA_CD_01)	21:58	15 07:18 (WEA_CD_01)	
27	08:21	09:37 (WEA_CD_03)	10:22	06:16	07:33 (WEA_CD_03)	10:05	08:15	06:45 (WEA_CD_01)	05:03	07:01 (WEA_CD_01)	
1	17:01	14:23 (WEA_G_01)	13:59	18:52	28 08:01 (WEA_CD_03)	18:48	21:37	34 07:19 (WEA_CD_01)	21:58	15 07:18 (WEA_CD_01)	
28	08:19	09:36 (WEA_CD_03)	10:20	06:14	07:34 (WEA_CD_03)	10:03	08:13	06:46 (WEA_CD_01)	05:04	07:00 (WEA_CD_01)	
1	17:03	14:23 (WEA_G_01)	13:59	18:54	25 08:00 (WEA_CD_03)	18:50	21:39	34 07:20 (WEA_CD_01)	21:58	16 07:18 (WEA_CD_01)	
29	08:18	09:36 (WEA_CD_03)	10:19	06:11	08:08 (WEA_CD_03)	10:01	08:12	06:47 (WEA_CD_01)	05:05	07:00 (WEA_CD_01)	
1	17:05	14:23 (WEA_G_01)	13:59	18:56	22 08:08 (WEA_CD_03)	18:51	21:39	33 07:20 (WEA_CD_01)	21:58	16 07:18 (WEA_CD_01)	
30	08:16	09:37 (WEA_CD_03)	10:18	06:09	08:07 (WEA_CD_03)	09:59	08:11	06:47 (WEA_CD_01)	05:05	06:59 (WEA_CD_01)	
1	17:07	14:23 (WEA_G_01)	13:59	18:58	18 08:05 (WEA_CD_03)	18:53	21:41	32 07:19 (WEA_CD_01)	21:58	19 07:18 (WEA_CD_01)	
31	08:15	09:37 (WEA_CD_03)	10:17	06:07	08:04 (WEA_CD_03)	10:00	08:10	06:48 (WEA_CD_01)	05:05	07:00 (WEA_CD_01)	
1	17:09	14:23 (WEA_G_01)	13:59	19:00	12 08:02 (WEA_CD_03)	18:55	21:42	31 07:19 (WEA_CD_01)	21:58	19 07:18 (WEA_CD_01)	
Sonnenscheinstunden	294		275		367		418		490		505
avr.max.mögl.Beschattung	965		237		501		13		1074		565

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_06 - IO 06 Rote-Erde-Weg 102 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember					
1	05:06	06:59 (WEA_CD_01)	05:44	06:54 (WEA_CD_01)	06:36	07:28	08:21 (WEA_CD_02)	07:24	09:19 (WEA_CD_03)	08:17	09:24 (WEA_CD_03)				
2	05:06	07:19 (WEA_CD_01)	21:24	38	07:32 (WEA_CD_01)	20:19	19:07	21	08:42 (WEA_CD_02)	16:59	9	09:28 (WEA_CD_03)	16:16	36	14:11 (WEA_G_01)
3	05:07	06:58 (WEA_CD_01)	05:47	37	07:31 (WEA_CD_01)	06:38	19:05	17	08:22 (WEA_CD_02)	07:26	09:16 (WEA_CD_03)	08:19	09:27 (WEA_CD_03)		
4	05:08	06:58 (WEA_CD_01)	21:20	36	07:30 (WEA_CD_01)	20:14	19:02	9	08:26 (WEA_CD_02)	07:28	09:14 (WEA_CD_03)	08:20	13:47 (WEA_G_01)		
5	05:09	06:58 (WEA_CD_01)	05:49	36	07:30 (WEA_CD_01)	06:42	19:00	16:55	20	08:34 (WEA_CD_02)	16:15	25	14:12 (WEA_G_01)		
6	05:10	06:58 (WEA_CD_01)	05:52	35	07:30 (WEA_CD_01)	06:45	18:58	16:51	26	09:12 (WEA_CD_03)	08:22	13:47 (WEA_G_01)			
7	05:11	06:58 (WEA_CD_01)	21:15	34	07:30 (WEA_CD_01)	20:07	18:55	16:49	28	09:28 (WEA_CD_03)	16:13	29	14:15 (WEA_G_01)		
8	05:12	06:57 (WEA_CD_01)	05:56	31	07:28 (WEA_CD_01)	20:05	18:53	16:47	29	09:39 (WEA_CD_03)	16:13	29	14:16 (WEA_G_01)		
9	05:13	06:57 (WEA_CD_01)	21:11	30	07:28 (WEA_CD_01)	20:03	18:51	16:46	30	09:29 (WEA_CD_03)	16:12	30	14:16 (WEA_G_01)		
10	05:14	06:56 (WEA_CD_01)	05:59	28	07:26 (WEA_CD_01)	20:00	18:48	16:44	31	09:40 (WEA_CD_03)	16:12	31	14:17 (WEA_G_01)		
11	05:15	06:56 (WEA_CD_01)	21:07	25	07:25 (WEA_CD_01)	19:58	18:46	16:42	32	09:40 (WEA_CD_03)	16:12	31	14:18 (WEA_G_01)		
12	05:16	06:56 (WEA_CD_01)	05:59	22	07:23 (WEA_CD_01)	19:55	18:44	16:41	33	09:41 (WEA_CD_03)	16:11	32	14:19 (WEA_G_01)		
13	05:17	06:56 (WEA_CD_01)	21:03	18	07:21 (WEA_CD_01)	19:53	18:42	16:39	33	09:41 (WEA_CD_03)	16:11	32	14:19 (WEA_G_01)		
14	05:18	06:56 (WEA_CD_01)	05:59	16	07:19 (WEA_CD_01)	19:51	18:40	16:37	33	09:41 (WEA_CD_03)	16:11	32	14:20 (WEA_G_01)		
15	05:20	06:55 (WEA_CD_01)	06:06	15	07:18 (WEA_CD_01)	19:49	18:38	16:36	33	09:41 (WEA_CD_03)	16:11	32	14:20 (WEA_G_01)		
16	05:21	06:55 (WEA_CD_01)	20:57	14	07:18 (WEA_CD_01)	19:48	18:37	16:35	34	09:42 (WEA_CD_03)	16:11	33	14:21 (WEA_G_01)		
17	05:22	06:55 (WEA_CD_01)	06:09	13	07:17 (WEA_CD_01)	19:47	18:36	16:34	34	09:42 (WEA_CD_03)	16:11	33	14:21 (WEA_G_01)		
18	05:23	06:54 (WEA_CD_01)	05:59	12	07:16 (WEA_CD_01)	19:46	18:35	16:33	33	09:42 (WEA_CD_03)	16:11	32	14:21 (WEA_G_01)		
19	05:25	06:54 (WEA_CD_01)	20:55	11	07:15 (WEA_CD_01)	19:45	18:34	16:32	33	09:42 (WEA_CD_03)	16:11	32	14:21 (WEA_G_01)		
20	05:26	06:54 (WEA_CD_01)	06:11	10	07:15 (WEA_CD_01)	19:44	18:33	16:31	33	09:42 (WEA_CD_03)	16:11	32	14:21 (WEA_G_01)		
21	05:27	06:54 (WEA_CD_01)	05:59	9	07:14 (WEA_CD_01)	19:43	18:32	16:30	33	09:42 (WEA_CD_03)	16:11	32	14:21 (WEA_G_01)		
22	05:28	06:54 (WEA_CD_01)	20:57	8	07:14 (WEA_CD_01)	19:42	18:31	16:29	33	09:42 (WEA_CD_03)	16:11	32	14:21 (WEA_G_01)		
23	05:30	06:53 (WEA_CD_01)	06:13	7	07:13 (WEA_CD_01)	19:41	18:30	16:28	32	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
24	05:32	06:53 (WEA_CD_01)	05:51	6	07:13 (WEA_CD_01)	19:40	18:29	16:27	32	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
25	05:33	06:53 (WEA_CD_01)	20:51	5	07:12 (WEA_CD_01)	19:39	18:28	16:26	32	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
26	05:35	06:53 (WEA_CD_01)	06:14	4	07:12 (WEA_CD_01)	19:38	18:27	16:25	32	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
27	05:36	06:53 (WEA_CD_01)	05:59	3	07:11 (WEA_CD_01)	19:37	18:26	16:24	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
28	05:38	06:53 (WEA_CD_01)	20:48	2	07:11 (WEA_CD_01)	19:36	18:25	16:23	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
29	05:39	06:53 (WEA_CD_01)	06:19	1	07:11 (WEA_CD_01)	19:35	18:24	16:22	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
30	05:41	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:34	18:23	16:21	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
31	05:43	06:53 (WEA_CD_01)	20:37	0	07:11 (WEA_CD_01)	19:33	18:22	16:20	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
1	05:44	06:53 (WEA_CD_01)	06:26	0	07:11 (WEA_CD_01)	19:32	18:21	16:19	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
2	05:45	06:53 (WEA_CD_01)	05:59	0	07:11 (WEA_CD_01)	19:31	18:20	16:18	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
3	05:46	06:53 (WEA_CD_01)	20:30	0	07:11 (WEA_CD_01)	19:30	18:19	16:17	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
4	05:47	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:29	18:18	16:16	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
5	05:48	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:28	18:17	16:15	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
6	05:49	06:53 (WEA_CD_01)	20:23	0	07:11 (WEA_CD_01)	19:27	18:16	16:14	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
7	05:50	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:26	18:15	16:13	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
8	05:51	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:25	18:14	16:12	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
9	05:52	06:53 (WEA_CD_01)	20:14	0	07:11 (WEA_CD_01)	19:24	18:13	16:11	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
10	05:53	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:23	18:12	16:10	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
11	05:54	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:22	18:11	16:09	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
12	05:55	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:21	18:10	16:08	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
13	05:56	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:20	18:09	16:07	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
14	05:57	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:19	18:08	16:06	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
15	05:58	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:18	18:07	16:05	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
16	05:59	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:17	18:06	16:04	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
17	06:00	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:16	18:05	16:03	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
18	06:01	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:15	18:04	16:02	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
19	06:02	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:14	18:03	16:01	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
20	06:03	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:13	18:02	16:00	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
21	06:04	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:12	18:01	15:59	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
22	06:05	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:11	18:00	15:58	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
23	06:06	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:10	17:59	15:57	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
24	06:07	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:09	17:58	15:56	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
25	06:08	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:08	17:57	15:55	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
26	06:09	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:07	17:56	15:54	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
27	06:10	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:06	17:55	15:53	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
28	06:11	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:05	17:54	15:52	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
29	06:12	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:04	17:53	15:51	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
30	06:13	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:03	17:52	15:50	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
31	06:14	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	19:02	17:51	15:49	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
1	06:15	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	19:01	17:50	15:48	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
2	06:16	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	19:00	17:49	15:47	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
3	06:17	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	18:59	17:48	15:46	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
4	06:18	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	18:58	17:47	15:45	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
5	06:19	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	18:57	17:46	15:44	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
6	06:20	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	18:56	17:45	15:43	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
7	06:21	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	18:55	17:44	15:42	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
8	06:22	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	18:54	17:43	15:41	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
9	06:23	06:53 (WEA_CD_01)	06:31	0	07:11 (WEA_CD_01)	18:53	17:42	15:40	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
10	06:24	06:53 (WEA_CD_01)	05:42	0	07:11 (WEA_CD_01)	18:52	17:41	15:39	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
11	06:25	06:53 (WEA_CD_01)	20:05	0	07:11 (WEA_CD_01)	18:51	17:40	15:38	31	09:42 (WEA_CD_03)	16:12	33	14:22 (WEA_G_01)		
12	06:26	06:53 (WEA_CD_01)													

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_07 - IO 07 Böseler Straße 561A Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	09:15 (WEA_CD_01)	08:13	09:34 (WEA_RE_01)	07:17	08:28 (WEA_RE_03)	07:04	08:08 (WEA_RE_05)	05:57	06:41 (WEA_RE_04)	05:09
2	16:21	11:10 (WEA_RE_02)	17:11	10:37 (WEA_RE_01)	18:05	10:18 (WEA_RE_01)	20:01	08:25 (WEA_RE_05)	20:55	07:17 (WEA_RE_04)	21:43
3	08:42	09:15 (WEA_CD_01)	08:13	09:34 (WEA_RE_01)	07:15	08:28 (WEA_RE_03)	07:02	08:12 (WEA_RE_05)	05:55	06:41 (WEA_RE_04)	05:08
4	16:22	11:11 (WEA_RE_02)	17:13	10:38 (WEA_RE_01)	18:07	10:13 (WEA_RE_01)	20:03	08:21 (WEA_RE_05)	20:57	07:17 (WEA_RE_04)	21:44
5	08:42	09:15 (WEA_CD_01)	08:10	09:34 (WEA_RE_01)	07:13	08:29 (WEA_RE_03)	07:00	08:29 (WEA_RE_05)	05:53	06:41 (WEA_RE_04)	05:08
6	16:23	11:10 (WEA_RE_02)	17:15	10:39 (WEA_RE_01)	18:09	10:04 (WEA_RE_01)	20:05	08:29 (WEA_RE_05)	20:59	07:17 (WEA_RE_04)	21:45
7	08:41	09:16 (WEA_CD_01)	08:08	09:34 (WEA_RE_01)	07:11	08:29 (WEA_RE_03)	06:57	08:21 (WEA_RE_05)	05:51	06:41 (WEA_RE_04)	05:07
8	16:25	11:11 (WEA_RE_02)	17:17	10:39 (WEA_RE_01)	18:11	10:02 (WEA_RE_03)	20:07	08:29 (WEA_RE_05)	20:57	07:17 (WEA_RE_04)	21:46
9	08:41	09:16 (WEA_CD_01)	08:06	09:34 (WEA_RE_01)	07:08	08:31 (WEA_RE_03)	06:55	08:29 (WEA_RE_05)	05:49	06:42 (WEA_RE_04)	05:06
10	16:26	11:11 (WEA_RE_02)	17:19	10:39 (WEA_RE_01)	18:12	09:01 (WEA_RE_03)	20:09	08:29 (WEA_RE_05)	21:02	07:16 (WEA_RE_04)	21:48
11	08:41	09:17 (WEA_CD_01)	08:05	09:33 (WEA_RE_01)	07:06	08:33 (WEA_RE_03)	06:52	08:29 (WEA_RE_05)	05:47	06:42 (WEA_RE_04)	05:05
12	16:27	11:12 (WEA_RE_02)	17:21	10:40 (WEA_RE_01)	18:14	08:59 (WEA_RE_03)	20:10	08:29 (WEA_RE_05)	21:04	07:15 (WEA_RE_04)	21:49
13	08:40	09:17 (WEA_CD_01)	08:03	08:45 (WEA_RE_03)	07:04	08:34 (WEA_RE_03)	06:50	08:29 (WEA_RE_05)	05:45	06:42 (WEA_RE_04)	05:05
14	16:28	11:12 (WEA_RE_02)	17:23	10:40 (WEA_RE_01)	18:16	08:56 (WEA_RE_03)	20:12	08:29 (WEA_RE_05)	21:05	07:15 (WEA_RE_04)	21:49
15	08:40	09:17 (WEA_CD_01)	08:01	08:40 (WEA_RE_03)	07:01	08:40 (WEA_RE_03)	06:48	08:29 (WEA_RE_05)	05:43	06:42 (WEA_RE_04)	05:04
16	16:30	11:11 (WEA_RE_02)	17:24	10:40 (WEA_RE_01)	18:18	08:52 (WEA_RE_03)	20:14	08:29 (WEA_RE_05)	21:07	07:13 (WEA_RE_04)	21:50
17	08:39	09:19 (WEA_CD_01)	07:59	08:37 (WEA_RE_03)	06:59	08:37 (WEA_RE_03)	06:45	08:29 (WEA_RE_05)	05:42	06:44 (WEA_RE_04)	05:04
18	16:31	11:12 (WEA_RE_02)	17:26	10:40 (WEA_RE_01)	18:20	08:52 (WEA_RE_03)	20:16	08:29 (WEA_RE_05)	21:09	07:13 (WEA_RE_04)	21:51
19	08:39	09:19 (WEA_CD_01)	07:57	08:35 (WEA_RE_03)	06:57	08:35 (WEA_RE_03)	06:43	08:29 (WEA_RE_05)	05:40	06:44 (WEA_RE_04)	05:03
20	16:33	11:12 (WEA_RE_02)	17:28	10:40 (WEA_RE_01)	18:22	08:52 (WEA_RE_03)	20:18	08:29 (WEA_RE_05)	21:10	07:12 (WEA_RE_04)	21:52
21	08:38	09:20 (WEA_CD_01)	07:55	08:34 (WEA_RE_03)	06:54	08:34 (WEA_RE_03)	06:41	08:29 (WEA_RE_05)	05:38	06:45 (WEA_RE_04)	05:03
22	16:34	11:12 (WEA_RE_02)	17:30	10:40 (WEA_RE_01)	18:24	08:52 (WEA_RE_03)	20:19	08:29 (WEA_RE_05)	21:12	07:11 (WEA_RE_04)	21:53
23	08:37	09:21 (WEA_CD_01)	07:53	08:32 (WEA_RE_03)	06:52	08:32 (WEA_RE_03)	06:38	08:29 (WEA_RE_05)	05:36	06:46 (WEA_RE_04)	05:02
24	16:36	11:12 (WEA_RE_02)	17:32	10:40 (WEA_RE_01)	18:25	08:52 (WEA_RE_03)	20:21	08:29 (WEA_RE_05)	21:14	07:10 (WEA_RE_04)	21:54
25	08:37	09:22 (WEA_CD_01)	07:51	08:31 (WEA_RE_03)	06:50	07:17 (WEA_RE_05)	06:36	08:29 (WEA_RE_05)	05:35	06:47 (WEA_RE_04)	05:02
26	16:37	11:12 (WEA_RE_02)	17:34	10:40 (WEA_RE_01)	18:27	07:23 (WEA_RE_05)	20:23	08:29 (WEA_RE_05)	21:15	07:08 (WEA_RE_04)	21:54
27	08:36	09:45 (WEA_RE_01)	07:49	08:30 (WEA_RE_03)	06:47	07:14 (WEA_RE_05)	06:34	08:29 (WEA_RE_05)	05:33	06:49 (WEA_RE_04)	05:02
28	16:39	11:12 (WEA_RE_02)	17:36	10:39 (WEA_RE_01)	18:29	07:32 (WEA_RE_05)	20:25	08:29 (WEA_RE_05)	21:17	07:07 (WEA_RE_04)	21:55
29	08:35	09:42 (WEA_RE_01)	07:47	08:29 (WEA_RE_03)	06:45	07:11 (WEA_RE_05)	06:32	08:29 (WEA_RE_05)	05:31	06:51 (WEA_RE_04)	05:02
30	16:40	11:11 (WEA_RE_02)	17:38	10:39 (WEA_RE_01)	18:31	07:33 (WEA_RE_05)	20:26	08:29 (WEA_RE_05)	21:19	07:04 (WEA_RE_04)	21:56
31	08:34	09:42 (WEA_RE_01)	07:45	08:29 (WEA_RE_03)	06:43	07:10 (WEA_RE_05)	06:29	08:29 (WEA_RE_05)	05:30	06:55 (WEA_RE_04)	05:01
1	16:42	11:11 (WEA_RE_02)	17:40	10:39 (WEA_RE_01)	18:33	07:25 (WEA_RE_05)	20:28	08:29 (WEA_RE_05)	21:20	07:01 (WEA_RE_04)	21:56
2	08:33	09:41 (WEA_RE_01)	07:43	08:27 (WEA_RE_03)	06:40	07:08 (WEA_RE_05)	06:27	06:58 (WEA_RE_04)	05:28	06:47 (WEA_RE_04)	05:01
3	16:44	11:11 (WEA_RE_02)	17:42	10:37 (WEA_RE_01)	18:34	07:35 (WEA_RE_05)	20:30	07:07 (WEA_RE_04)	21:22	07:07 (WEA_RE_04)	21:57
4	08:32	09:41 (WEA_RE_01)	07:41	08:27 (WEA_RE_03)	06:38	07:07 (WEA_RE_05)	06:25	06:54 (WEA_RE_04)	05:27	06:47 (WEA_RE_04)	05:01
5	16:45	11:11 (WEA_RE_02)	17:44	10:37 (WEA_RE_01)	18:36	07:36 (WEA_RE_05)	20:32	07:11 (WEA_RE_04)	21:24	07:11 (WEA_RE_04)	21:57
6	08:31	09:39 (WEA_RE_01)	07:39	08:27 (WEA_RE_03)	06:35	07:06 (WEA_RE_05)	06:23	06:51 (WEA_RE_04)	05:25	06:47 (WEA_RE_04)	05:01
7	16:47	11:09 (WEA_RE_02)	17:46	10:36 (WEA_RE_01)	18:38	07:37 (WEA_RE_05)	20:34	06:51 (WEA_RE_04)	05:25	07:12 (WEA_RE_04)	21:57
8	08:30	09:39 (WEA_RE_01)	07:37	08:27 (WEA_RE_03)	06:33	07:05 (WEA_RE_05)	06:20	06:49 (WEA_RE_04)	05:24	06:49 (WEA_RE_04)	05:01
9	16:49	11:09 (WEA_RE_02)	17:48	10:35 (WEA_RE_01)	18:40	07:37 (WEA_RE_05)	20:35	06:49 (WEA_RE_04)	21:27	07:14 (WEA_RE_04)	21:58
10	08:29	09:39 (WEA_RE_01)	07:35	08:26 (WEA_RE_03)	06:31	07:04 (WEA_RE_05)	06:18	06:47 (WEA_RE_04)	05:22	06:47 (WEA_RE_04)	05:02
11	16:51	11:08 (WEA_RE_02)	17:50	10:34 (WEA_RE_01)	18:42	07:37 (WEA_RE_05)	20:37	06:47 (WEA_RE_04)	21:28	07:15 (WEA_RE_04)	21:58
12	08:27	09:38 (WEA_RE_01)	07:33	08:26 (WEA_RE_03)	06:28	07:03 (WEA_RE_05)	06:16	06:46 (WEA_RE_04)	05:21	06:46 (WEA_RE_04)	05:02
13	16:52	11:06 (WEA_RE_02)	17:52	10:32 (WEA_RE_01)	18:44	07:37 (WEA_RE_05)	20:39	06:46 (WEA_RE_04)	21:30	07:16 (WEA_RE_04)	21:58
14	08:26	09:38 (WEA_RE_01)	07:31	08:26 (WEA_RE_03)	06:26	07:03 (WEA_RE_05)	06:14	06:45 (WEA_RE_04)	05:19	06:45 (WEA_RE_04)	05:02
15	16:54	11:04 (WEA_RE_02)	17:54	10:31 (WEA_RE_01)	18:46	07:37 (WEA_RE_05)	20:41	06:42 (WEA_RE_04)	21:31	07:17 (WEA_RE_04)	21:58
16	08:25	09:37 (WEA_RE_01)	07:29	08:26 (WEA_RE_03)	06:23	07:04 (WEA_RE_05)	06:12	06:44 (WEA_RE_04)	05:18	06:44 (WEA_RE_04)	05:02
17	16:56	11:01 (WEA_RE_02)	17:55	10:30 (WEA_RE_01)	18:47	07:37 (WEA_RE_05)	20:43	06:42 (WEA_RE_04)	21:33	07:17 (WEA_RE_04)	21:58
18	08:24	09:37 (WEA_RE_01)	07:26	08:26 (WEA_RE_03)	06:21	07:03 (WEA_RE_05)	06:09	06:43 (WEA_RE_04)	05:17	06:43 (WEA_RE_04)	05:03
19	16:58	11:02 (WEA_RE_02)	17:57	10:29 (WEA_RE_01)	18:49	07:35 (WEA_RE_05)	20:44	06:43 (WEA_RE_04)	21:34	07:18 (WEA_RE_04)	21:58
20	08:22	09:36 (WEA_RE_01)	07:24	08:26 (WEA_RE_03)	06:19	07:03 (WEA_RE_05)	06:07	06:43 (WEA_RE_04)	05:16	06:43 (WEA_RE_04)	05:03
21	17:00	10:33 (WEA_RE_01)	17:59	10:26 (WEA_RE_01)	18:51	07:35 (WEA_RE_05)	20:46	06:43 (WEA_RE_04)	21:35	07:18 (WEA_RE_04)	21:58
22	08:21	09:36 (WEA_RE_01)	07:22	08:26 (WEA_RE_03)	06:16	07:03 (WEA_RE_05)	06:05	06:42 (WEA_RE_04)	05:14	06:42 (WEA_RE_04)	05:03
23	17:01	10:34 (WEA_RE_01)	18:01	10:24 (WEA_RE_01)	18:52	07:33 (WEA_RE_05)	20:48	06:42 (WEA_RE_04)	21:37	07:18 (WEA_RE_04)	21:58
24	08:19	09:35 (WEA_RE_01)	07:20	08:27 (WEA_RE_03)	06:14	07:04 (WEA_RE_05)	06:03	06:42 (WEA_RE_04)	05:13	06:42 (WEA_RE_04)	05:04
25	17:03	10:35 (WEA_RE_01)	18:03	10:21 (WEA_RE_01)	18:54	07:33 (WEA_RE_05)	20:50	06:42 (WEA_RE_04)	21:38	07:18 (WEA_RE_04)	21:58
26	08:18	09:35 (WEA_RE_01)	07:19	08:27 (WEA_RE_03)	06:11	07:03 (WEA_RE_05)	06:01	06:41 (WEA_RE_04)	05:12	06:41 (WEA_RE_04)	05:04
27	17:05	10:35 (WEA_RE_01)	18:01	10:21 (WEA_RE_01)	18:56	07:33 (WEA_RE_05)	20:51	06:41 (WEA_RE_04)	21:39	07:18 (WEA_RE_04)	21:58
28	08:16	09:35 (WEA_RE_01)	07:18	08:27 (WEA_RE_03)	06:10	07:03 (WEA_RE_05)	06:00	06:41 (WEA_RE_04)	05:11	06:41 (WEA_RE_04)	05:05
29	17:07	10:37 (WEA_RE_01)	18:02	10:22 (WEA_RE_01)	18:58	07:33 (WEA_RE_05)	20:53	06:41 (WEA_RE_04)	21:41	07:18 (WEA_RE_04)	21:58
30	08:15	09:34 (WEA_RE_01)	07:17	08:27 (WEA_RE_03)	06:07	07:03 (WEA_RE_05)	06:00	06:41 (WEA_RE_04)	05:10	06:41 (WEA_RE_04)	05:05
31	17:09	10:37 (WEA_RE_01)	18:03	10:20 (WEA_RE_01)	18:59	07:33 (WEA_RE_05)	20:54	06:41 (WEA_RE_04)	21:42	07:18 (WEA_RE_04)	21:58
Sonnenscheinstunden		254	275	367	418	437	490	505			
astr. max.mögl. Beschattung		2085	2477	815	437	490	505				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_07 - IO 07 Böseler Straße 561A Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

1. Juli	August	September	Oktober	November	Dezember	
1 10506	05:44	06:56 (WEA_RE_04) 106:26	107:20	08:01 (WEA_RE_05) 107:24	08:05 (WEA_RE_02) 108:17	09:02 (WEA_CD_01)
2 12158	12:24	07:21 (WEA_RE_04) 20:19	19:07	4 08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
3 10506	05:46	06:53 (WEA_RE_04) 106:28	107:30	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
4 10508	05:49	06:53 (WEA_RE_04) 106:42	107:33	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
5 10509	05:51	06:53 (WEA_RE_04) 106:43	107:35	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
6 10510	05:52	06:52 (WEA_RE_04) 106:45	107:37	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
7 10511	05:54	06:51 (WEA_RE_04) 106:47	107:38	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
8 10512	05:56	06:51 (WEA_RE_04) 106:48	107:40	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
9 10513	05:57	06:50 (WEA_RE_04) 106:50	107:42	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
10 10514	05:59	06:50 (WEA_RE_04) 106:52	107:44	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
11 10515	06:01	06:49 (WEA_RE_04) 106:54	107:46	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
12 10516	06:02	06:49 (WEA_RE_04) 106:55	107:47	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
13 10517	06:04	06:48 (WEA_RE_04) 106:57	107:49	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
14 10518	06:06	06:49 (WEA_RE_04) 106:59	107:51	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
15 10519	06:07	06:49 (WEA_RE_04) 107:00	107:53	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
16 10521	06:09	06:49 (WEA_RE_04) 107:02	107:55	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
17 10522	06:11	06:49 (WEA_RE_04) 107:04	107:56	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
18 10523	06:13	06:50 (WEA_RE_04) 107:05	107:58	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
19 10525	06:14	06:50 (WEA_RE_04) 107:07	107:59	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
20 10526	06:15	06:51 (WEA_RE_04) 107:09	108:00	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
21 10527	06:16	06:51 (WEA_RE_04) 107:11	108:01	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
22 10528	06:18	06:52 (WEA_RE_04) 107:12	108:02	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
23 10530	06:21	06:54 (WEA_RE_04) 107:14	108:03	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
24 10532	06:23	06:55 (WEA_RE_04) 107:16	108:04	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
25 10533	06:24	06:57 (WEA_RE_04) 107:17	108:05	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
26 10535	06:26	07:00 (WEA_RE_04) 107:19	108:06	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
27 10536	06:28	07:03 (WEA_RE_04) 107:21	108:07	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
28 10538	06:30	07:06 (WEA_RE_04) 107:23	108:08	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
29 10539	06:31	07:08 (WEA_RE_04) 107:24	108:09	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
30 10541	06:33	07:11 (WEA_RE_04) 107:26	108:10	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
31 10543	06:35	07:14 (WEA_RE_04) 107:28	108:11	08:05 (WEA_RE_05) 16:59	93 10:10 (WEA_RE_01) 16:16	78 10:54 (WEA_RE_02)
Sonnenscheinstunden	508	457	382	330	262	238
av. max. mögl. Beschattung	66	791	550	2080	2110	1700

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_07a - IO 07a Böseler Straße 545 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	10:15 (WEA_RE_01)	08:13	08:59 (WEA_RE_03)	07:17		07:04		05:57	06:56 (WEA_RE_04)	05:09
	16:21	11:35 (WEA_RE_02)	17:11	11:24 (WEA_RE_01)	18:05		20:01		20:55	07:33 (WEA_RE_04)	21:43
2	08:42	10:15 (WEA_RE_01)	08:11	08:59 (WEA_RE_03)	07:15		07:02		05:55	06:56 (WEA_RE_04)	05:08
	16:22	11:35 (WEA_RE_02)	17:13	11:24 (WEA_RE_01)	18:07		20:03		20:57	07:32 (WEA_RE_04)	21:44
3	08:42	10:15 (WEA_RE_01)	08:10	08:59 (WEA_RE_03)	07:13		06:59		05:53	06:57 (WEA_RE_04)	05:08
	16:23	11:35 (WEA_RE_02)	17:15	11:24 (WEA_RE_01)	18:09		20:05		20:59	07:31 (WEA_RE_04)	21:45
4	08:41	10:15 (WEA_RE_01)	08:08	08:59 (WEA_RE_03)	07:11		06:57		05:51	06:57 (WEA_RE_04)	05:07
	16:25	11:35 (WEA_RE_02)	17:17	11:23 (WEA_RE_01)	18:11		20:07		21:00	07:30 (WEA_RE_04)	21:46
5	08:41	10:15 (WEA_RE_01)	08:06	08:58 (WEA_RE_03)	07:08		06:55		05:49	06:59 (WEA_RE_04)	05:06
	16:26	11:34 (WEA_RE_02)	17:19	11:23 (WEA_RE_01)	18:12	13	07:51 (WEA_RE_05)	20:09	21:02	07:30 (WEA_RE_04)	21:48
6	08:41	10:16 (WEA_RE_01)	08:05	08:57 (WEA_RE_03)	07:06		07:35 (WEA_RE_05)	06:52	05:47	07:00 (WEA_RE_04)	05:05
	16:27	11:34 (WEA_RE_02)	17:21	11:22 (WEA_RE_01)	18:14	19	07:54 (WEA_RE_05)	20:10	21:04	07:29 (WEA_RE_04)	21:49
7	08:40	10:16 (WEA_RE_01)	08:03	08:57 (WEA_RE_03)	07:04		07:32 (WEA_RE_05)	06:50	05:45	07:00 (WEA_RE_04)	05:05
	16:28	11:34 (WEA_RE_02)	17:23	11:21 (WEA_RE_01)	18:16	24	07:56 (WEA_RE_05)	20:12	21:05	07:27 (WEA_RE_04)	21:49
8	08:40	10:15 (WEA_RE_01)	08:01	08:57 (WEA_RE_03)	07:01		07:30 (WEA_RE_05)	06:48	05:43	07:02 (WEA_RE_04)	05:04
	16:30	11:33 (WEA_RE_02)	17:24	11:20 (WEA_RE_01)	18:18	27	07:57 (WEA_RE_05)	20:14	21:07	07:25 (WEA_RE_04)	21:50
9	08:39	10:16 (WEA_RE_01)	07:59	08:57 (WEA_RE_03)	06:59		07:29 (WEA_RE_05)	06:45	05:42	07:04 (WEA_RE_04)	05:04
	16:31	11:33 (WEA_RE_02)	17:26	11:19 (WEA_RE_01)	18:20	30	07:59 (WEA_RE_05)	20:16	21:09	07:23 (WEA_RE_04)	21:51
10	08:39	10:16 (WEA_RE_01)	07:57	08:57 (WEA_RE_03)	06:57		07:28 (WEA_RE_05)	06:43	05:40	07:05 (WEA_RE_04)	05:03
	16:33	11:32 (WEA_RE_02)	17:28	11:18 (WEA_RE_01)	18:22	31	07:59 (WEA_RE_05)	20:18	21:10	07:21 (WEA_RE_04)	21:52
11	08:38	10:16 (WEA_RE_01)	07:55	08:57 (WEA_RE_03)	06:54		07:27 (WEA_RE_05)	06:41	05:38	07:09 (WEA_RE_04)	05:03
	16:34	11:30 (WEA_RE_02)	17:30	11:16 (WEA_RE_01)	18:24	33	08:00 (WEA_RE_05)	20:19	10	07:24 (WEA_RE_04)	21:12
12	08:37	10:16 (WEA_RE_01)	07:53	08:57 (WEA_RE_03)	06:52		07:25 (WEA_RE_05)	06:38	05:36	07:10 (WEA_RE_04)	05:02
	16:36	11:28 (WEA_RE_02)	17:32	11:15 (WEA_RE_01)	18:25	34	07:59 (WEA_RE_05)	20:21	18	07:28 (WEA_RE_04)	21:14
13	08:37	10:17 (WEA_RE_01)	07:51	08:57 (WEA_RE_03)	06:50		07:25 (WEA_RE_05)	06:36	05:35	07:09 (WEA_RE_04)	05:02
	16:37	11:20 (WEA_RE_02)	17:34	11:13 (WEA_RE_01)	18:27	35	08:00 (WEA_RE_05)	20:23	23	07:31 (WEA_RE_04)	21:15
14	08:36	10:17 (WEA_RE_01)	07:49	08:58 (WEA_RE_03)	06:47		07:25 (WEA_RE_05)	06:34	05:33	07:05 (WEA_RE_04)	05:02
	16:39	11:20 (WEA_RE_02)	17:36	11:11 (WEA_RE_01)	18:29	35	08:00 (WEA_RE_05)	20:25	27	07:32 (WEA_RE_04)	21:17
15	08:35	10:17 (WEA_RE_01)	07:47	08:58 (WEA_RE_03)	06:45		07:24 (WEA_RE_05)	06:32	05:32	07:02 (WEA_RE_04)	05:01
	16:40	11:21 (WEA_RE_02)	17:38	11:08 (WEA_RE_01)	18:31	36	08:00 (WEA_RE_05)	20:26	30	07:33 (WEA_RE_04)	21:19
16	08:34	10:17 (WEA_RE_01)	07:45	08:59 (WEA_RE_03)	06:43		07:24 (WEA_RE_05)	06:29	05:30	07:02 (WEA_RE_04)	05:01
	16:42	11:21 (WEA_RE_02)	17:40	11:04 (WEA_RE_01)	18:33	36	08:00 (WEA_RE_05)	20:28	32	07:34 (WEA_RE_04)	21:20
17	08:33	10:18 (WEA_RE_01)	07:43	08:58 (WEA_RE_03)	06:40		07:23 (WEA_RE_05)	06:27	05:28	07:01 (WEA_RE_04)	05:01
	16:44	11:22 (WEA_RE_02)	17:42	11:05 (WEA_RE_01)	18:34	36	07:59 (WEA_RE_05)	20:30	34	07:35 (WEA_RE_04)	21:22
18	08:32	10:18 (WEA_RE_01)	07:41	08:59 (WEA_RE_03)	06:38		07:24 (WEA_RE_05)	06:25	05:27	07:00 (WEA_RE_04)	05:01
	16:45	11:23 (WEA_RE_02)	17:44	11:06 (WEA_RE_01)	18:36	34	07:58 (WEA_RE_05)	20:32	36	07:36 (WEA_RE_04)	21:24
19	08:31	10:17 (WEA_RE_01)	07:39	09:00 (WEA_RE_03)	06:35		07:24 (WEA_RE_05)	06:23	05:25	06:56 (WEA_RE_04)	05:01
	16:47	11:22 (WEA_RE_02)	17:46	10:59 (WEA_RE_01)	18:38	34	07:58 (WEA_RE_05)	20:34	37	07:35 (WEA_RE_04)	21:25
20	08:30	10:18 (WEA_RE_01)	07:37	09:01 (WEA_RE_03)	06:33		07:24 (WEA_RE_05)	06:20	05:24	06:57 (WEA_RE_04)	05:01
	16:49	11:23 (WEA_RE_02)	17:48	10:58 (WEA_RE_01)	18:40	32	07:56 (WEA_RE_05)	20:35	39	07:36 (WEA_RE_04)	21:27
21	08:29	10:18 (WEA_RE_01)	07:35	09:02 (WEA_RE_03)	06:31		07:25 (WEA_RE_05)	06:18	05:22	06:57 (WEA_RE_04)	05:01
	16:51	11:24 (WEA_RE_02)	17:50	10:57 (WEA_RE_01)	18:42	31	07:56 (WEA_RE_05)	20:37	39	07:36 (WEA_RE_04)	21:28
22	08:27	09:15 (WEA_RE_03)	07:33	09:03 (WEA_RE_03)	06:28		07:25 (WEA_RE_05)	06:16	05:21	06:56 (WEA_RE_04)	05:02
	16:52	11:24 (WEA_RE_02)	17:52	10:55 (WEA_RE_01)	18:44	29	07:54 (WEA_RE_05)	20:39	40	07:36 (WEA_RE_04)	21:30
23	08:26	09:11 (WEA_RE_03)	07:31	09:04 (WEA_RE_03)	06:26		07:26 (WEA_RE_05)	06:14	05:19	06:56 (WEA_RE_04)	05:02
	16:54	11:24 (WEA_RE_02)	17:54	10:53 (WEA_RE_01)	18:45	26	07:52 (WEA_RE_05)	20:41	40	07:36 (WEA_RE_04)	21:31
24	08:25	09:08 (WEA_RE_03)	07:29	09:07 (WEA_RE_03)	06:23		07:28 (WEA_RE_05)	06:12	05:18	06:56 (WEA_RE_04)	05:02
	16:56	11:24 (WEA_RE_02)	17:55	10:51 (WEA_RE_01)	18:47	23	07:51 (WEA_RE_05)	20:43	40	07:36 (WEA_RE_04)	21:33
25	08:24	09:06 (WEA_RE_03)	07:26	09:09 (WEA_RE_03)	06:21		07:29 (WEA_RE_05)	06:09	05:17	06:56 (WEA_RE_04)	05:03
	16:58	11:25 (WEA_RE_02)	17:57	10:52 (WEA_RE_01)	18:49	19	07:48 (WEA_RE_05)	20:44	40	07:36 (WEA_RE_04)	21:34
26	08:22	09:04 (WEA_RE_03)	07:24	09:13 (WEA_RE_03)	06:19		07:33 (WEA_RE_05)	06:07	05:16	06:56 (WEA_RE_04)	05:03
	17:00	11:24 (WEA_RE_02)	17:59	10:52 (WEA_RE_01)	18:51	11	07:44 (WEA_RE_05)	20:46	40	07:36 (WEA_RE_04)	21:35
27	08:21	09:04 (WEA_RE_03)	07:22	09:23 (WEA_RE_03)	06:16			06:05	05:14	06:55 (WEA_RE_04)	05:03
	17:01	11:25 (WEA_RE_02)	18:01		18:52			20:48	40	07:35 (WEA_RE_04)	21:37
28	08:19	09:02 (WEA_RE_03)	07:20		06:14			06:03	05:13	06:55 (WEA_RE_04)	05:04
	17:03	11:25 (WEA_RE_02)	18:03		18:54			20:50	40	07:35 (WEA_RE_04)	21:38
29	08:18	09:01 (WEA_RE_03)			07:11			06:01	05:12	06:56 (WEA_RE_04)	05:04
	17:05	11:24 (WEA_RE_02)			18:56			20:51	38	07:34 (WEA_RE_04)	21:39
30	08:16	09:01 (WEA_RE_03)			07:09			05:59	05:11	06:56 (WEA_RE_04)	05:05
	17:07	11:25 (WEA_RE_02)			18:58			20:53	38	07:34 (WEA_RE_04)	21:41
31	08:15	09:00 (WEA_RE_03)			07:07				05:10		21:42
	17:09	11:25 (WEA_RE_02)			20:00						
Sonnenscheinstunden		254	275	367	418	481	505	505	490	291	505
astr. max.mögl. Beschattung		2415	1806	628	681	681	291	505	291	505	505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_07a - IO 07a Böseler Straße 545 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember					
1	05:06 05:44				06:36										
	21:59 21:24				20:19	10	07:13 (WEA_RE_04) 07:28	08:05 (WEA_RE_05) 07:24		08:26 (WEA_RE_03) 08:17	09:58 (WEA_RE_01)				
2	05:06 05:46				06:38		19:07	34	08:39 (WEA_RE_05) 16:59	96	10:48 (WEA_RE_01) 16:16	74	11:12 (WEA_RE_02)		
	21:57 21:22	11	07:18 (WEA_RE_04) 06:38				07:30		08:04 (WEA_RE_05) 07:26		08:27 (WEA_RE_03) 08:19		09:59 (WEA_RE_01)		
3	05:07 05:47				06:40		19:05	34	08:38 (WEA_RE_05) 16:57	98	10:49 (WEA_RE_01) 16:15	76	11:15 (WEA_RE_02)		
	21:57 21:20	17	07:15 (WEA_RE_04) 06:40				07:31		08:05 (WEA_RE_05) 07:28		08:30 (WEA_RE_03) 08:20		09:59 (WEA_RE_01)		
4	05:08 05:49				06:42		19:02	32	08:37 (WEA_RE_05) 16:55	100	10:50 (WEA_RE_01) 16:15	77	11:16 (WEA_RE_02)		
	21:56 21:18	21	07:13 (WEA_RE_04) 06:42				07:33		08:06 (WEA_RE_05) 07:30		08:27 (WEA_RE_03) 08:22		10:01 (WEA_RE_01)		
5	05:09 05:51				06:43		19:00	30	08:36 (WEA_RE_05) 16:53	100	10:51 (WEA_RE_01) 16:14	77	11:18 (WEA_RE_02)		
	21:56 21:17	25	07:11 (WEA_RE_04) 06:43				07:35		08:07 (WEA_RE_05) 07:32		08:27 (WEA_RE_03) 08:23		10:01 (WEA_RE_01)		
6	05:10 05:52				06:45		18:58	28	08:35 (WEA_RE_05) 16:51	102	10:52 (WEA_RE_01) 16:13	78	11:19 (WEA_RE_02)		
	21:55 21:15	27	07:10 (WEA_RE_04) 06:45				07:37		08:08 (WEA_RE_05) 07:34		08:28 (WEA_RE_03) 08:25		10:02 (WEA_RE_01)		
7	05:11 05:54				06:47		18:55	25	08:33 (WEA_RE_05) 16:49	103	10:53 (WEA_RE_01) 16:12	78	11:20 (WEA_RE_02)		
	21:55 21:13	29	07:09 (WEA_RE_04) 06:47				07:38		08:09 (WEA_RE_05) 07:35		08:28 (WEA_RE_03) 08:26		10:02 (WEA_RE_01)		
8	05:12 05:56				06:48		18:53	22	08:31 (WEA_RE_05) 16:47	102	10:53 (WEA_RE_01) 16:12	79	11:21 (WEA_RE_02)		
	21:54 21:11	31	07:08 (WEA_RE_04) 06:48				07:40		08:11 (WEA_RE_05) 07:37		08:29 (WEA_RE_03) 08:27		10:03 (WEA_RE_01)		
9	05:13 05:57				06:50		18:51	17	08:28 (WEA_RE_05) 16:46	103	10:54 (WEA_RE_01) 16:12	79	11:22 (WEA_RE_02)		
	21:53 21:09	34	07:07 (WEA_RE_04) 06:50				07:42		08:15 (WEA_RE_05) 07:39		08:29 (WEA_RE_03) 08:28		10:04 (WEA_RE_01)		
10	05:14 05:59				06:52		18:48	9	08:24 (WEA_RE_05) 16:44	103	10:55 (WEA_RE_01) 16:12	80	11:24 (WEA_RE_02)		
	21:52 21:07	35	07:06 (WEA_RE_04) 06:52				07:44		07:41		08:30 (WEA_RE_03) 08:29		10:04 (WEA_RE_01)		
11	05:15 06:01				06:53		18:46		07:43	102	10:55 (WEA_RE_01) 16:11	80	11:24 (WEA_RE_02)		
	21:52 21:06	36	07:05 (WEA_RE_04) 06:53				07:46		07:43		08:31 (WEA_RE_03) 08:31		10:05 (WEA_RE_01)		
12	05:16 06:02				06:55		18:44		07:45		10:56 (WEA_RE_01) 16:11	80	11:25 (WEA_RE_02)		
	21:51 21:03	38	07:04 (WEA_RE_04) 06:55				07:47		07:45	100	10:56 (WEA_RE_01) 16:11	81	11:26 (WEA_RE_02)		
13	05:17 06:04				06:57		18:42		07:47		08:33 (WEA_RE_03) 08:32		09:26 (WEA_CD_01)		
	21:50 21:01	38	07:04 (WEA_RE_04) 06:57				07:49		07:47	98	10:56 (WEA_RE_01) 16:11	82	11:26 (WEA_RE_02)		
14	05:18 06:06				06:59		18:40		07:48		08:34 (WEA_RE_03) 08:34		09:25 (WEA_CD_01)		
	21:49 20:59	39	07:03 (WEA_RE_04) 06:59				07:51		07:48		10:57 (WEA_RE_01) 16:11	86	11:27 (WEA_RE_02)		
15	05:19 06:07				07:00		18:37		07:50	97	10:57 (WEA_RE_01) 16:11	86	11:27 (WEA_RE_02)		
	21:48 20:57	40	07:03 (WEA_RE_04) 07:00				07:52		07:50		08:36 (WEA_RE_03) 08:35		09:25 (WEA_CD_01)		
16	05:21 06:09				07:02		18:35		07:52	94	10:57 (WEA_RE_01) 16:11	87	11:28 (WEA_RE_02)		
	21:47 20:55	40	07:02 (WEA_RE_04) 07:02				07:55		07:52		08:37 (WEA_RE_03) 08:36		09:25 (WEA_CD_01)		
17	05:22 06:11				07:04		18:32	14	09:57 (WEA_RE_03) 16:33	92	10:57 (WEA_RE_01) 16:11	88	11:29 (WEA_RE_02)		
	21:46 20:53	40	07:02 (WEA_RE_04) 07:04			10	08:22 (WEA_RE_05) 07:56		09:40 (WEA_RE_03) 07:54		08:39 (WEA_RE_03) 08:36		09:26 (WEA_CD_01)		
18	05:23 06:12				07:05		18:30	21	10:01 (WEA_RE_03) 16:31	89	10:58 (WEA_RE_01) 16:11	87	11:29 (WEA_RE_02)		
	21:44 20:51	41	07:02 (WEA_RE_04) 07:05				07:58		09:37 (WEA_RE_03) 07:56		08:42 (WEA_RE_03) 08:37		09:26 (WEA_CD_01)		
19	05:25 06:14				07:09		18:28	26	10:03 (WEA_RE_03) 16:30	85	10:58 (WEA_RE_01) 16:12	89	11:30 (WEA_RE_02)		
	21:43 20:48	41	07:01 (WEA_RE_04) 07:07				08:00		09:35 (WEA_RE_03) 07:58		08:45 (WEA_RE_03) 08:38		09:26 (WEA_CD_01)		
20	05:26 06:16				07:13		18:26	30	10:05 (WEA_RE_03) 16:29	78	10:58 (WEA_RE_01) 16:12	89	11:30 (WEA_RE_02)		
	21:42 20:46	40	07:02 (WEA_RE_04) 07:11				08:02		09:33 (WEA_RE_03) 07:59		08:50 (WEA_RE_03) 08:38		09:27 (WEA_CD_01)		
21	05:27 06:18				07:11		18:25	34	10:07 (WEA_RE_03) 16:27	69	10:59 (WEA_RE_01) 16:12	89	11:31 (WEA_RE_02)		
	21:41 20:44	40	07:01 (WEA_RE_04) 07:11				08:04		09:32 (WEA_RE_03) 08:01		08:51 (WEA_RE_03) 08:39		09:27 (WEA_CD_01)		
22	05:29 06:19				07:12		18:24	36	10:08 (WEA_RE_03) 16:26	66	10:59 (WEA_RE_01) 16:13	88	11:31 (WEA_RE_02)		
	21:39 20:42	39	07:02 (WEA_RE_04) 07:12				08:06		09:31 (WEA_RE_03) 08:03		09:54 (WEA_RE_01) 16:13	88	11:32 (WEA_RE_02)		
23	05:30 06:21				07:14		18:23	38	10:09 (WEA_RE_03) 16:25	65	10:59 (WEA_RE_01) 16:13	88	11:32 (WEA_RE_02)		
	21:38 20:40	38	07:02 (WEA_RE_04) 07:14				08:07		09:30 (WEA_RE_03) 08:05		09:54 (WEA_RE_01) 16:13	88	11:32 (WEA_RE_02)		
24	05:32 06:23				07:16		18:22	40	10:10 (WEA_RE_03) 16:24	65	10:59 (WEA_RE_01) 16:14	89	11:32 (WEA_RE_02)		
	21:36 20:37	37	07:02 (WEA_RE_04) 07:16				08:08		09:29 (WEA_RE_03) 08:06		09:55 (WEA_RE_01) 16:14	89	11:33 (WEA_RE_02)		
25	05:33 06:24				07:17		18:21	42	10:11 (WEA_RE_03) 16:23	65	11:00 (WEA_RE_01) 16:14	89	11:33 (WEA_RE_02)		
	21:35 20:35	35	07:03 (WEA_RE_04) 07:17				08:07		08:28 (WEA_RE_03) 08:08		09:56 (WEA_RE_01) 16:15	89	11:33 (WEA_RE_02)		
26	05:35 06:26				07:19		18:20	56	10:12 (WEA_RE_03) 16:21	64	11:00 (WEA_RE_01) 16:15	89	11:33 (WEA_RE_02)		
	21:34 20:33	34	07:03 (WEA_RE_04) 07:19				08:06		08:28 (WEA_RE_03) 08:10		09:55 (WEA_RE_01) 16:15	89	11:33 (WEA_RE_02)		
27	05:36 06:28				07:21		18:19	68	10:13 (WEA_RE_03) 16:20	64	10:59 (WEA_RE_01) 16:15	88	11:33 (WEA_RE_02)		
	21:32 20:31	32	07:04 (WEA_RE_04) 07:21				08:05		08:27 (WEA_RE_03) 08:11		09:56 (WEA_RE_01) 16:15	89	11:33 (WEA_RE_02)		
28	05:38 06:30				07:23		18:18	75	10:14 (WEA_RE_03) 16:19	64	11:00 (WEA_RE_01) 16:16	87	11:33 (WEA_RE_02)		
	21:30 20:29	30	07:05 (WEA_RE_04) 07:23				08:05		08:27 (WEA_RE_03) 08:13		09:57 (WEA_RE_01) 16:16	87	11:34 (WEA_RE_02)		
29	05:39 06:31				07:24		18:17	82	10:15 (WEA_RE_03) 16:18	63	11:00 (WEA_RE_01) 16:17	87	11:34 (WEA_RE_02)		
	21:29 20:26	26	07:06 (WEA_RE_04) 07:24				08:04		08:27 (WEA_RE_03) 08:14		09:58 (WEA_RE_01) 16:17	87	11:34 (WEA_RE_02)		
30	05:41 06:33				07:26		18:16	86	10:16 (WEA_RE_03) 16:18	63	11:01 (WEA_RE_01) 16:18	86	11:34 (WEA_RE_02)		
	21:27 20:24	22	07:07 (WEA_RE_04) 07:26				08:05		08:27 (WEA_RE_03) 08:16		09:57 (WEA_RE_01) 16:18	87	11:34 (WEA_RE_02)		
31	05:43 06:35				07:28		18:15	90	10:17 (WEA_RE_03) 16:17	71	11:02 (WEA_RE_01) 16:19	83	11:34 (WEA_RE_02)		
	21:25 20:21	18	07:08 (WEA_RE_04) 07:28				08:06		08:26 (WEA_RE_03) 08:15		09:58 (WEA_RE_01) 16:19	83	11:34 (WEA_RE_02)		
							17:01	93	10:46 (WEA_RE_01) 16:17				16:20	80	11:34 (WEA_RE_02)
Sonnenscheinstunden	508	457		392	417		330		262	2563		238		2590	
astr. max.mögl. Beschattung			974				1062								

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_08 - IO 08 Böseler Straße 579 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni						
1	08:42	09:39 (WEA_RE_02)	10:13	09:48 (WEA_RE_02)	10:17	07:52 (WEA_RE_03)	10:04	07:40 (WEA_RE_05)	10:57	06:29 (WEA_RE_04)	10:09					
	16:21	38	10:17 (WEA_RE_02)	17:11	39	10:27 (WEA_RE_02)	18:05	95	09:30 (WEA_RE_01)	20:01	29	08:09 (WEA_RE_05)	20:55	30	06:59 (WEA_RE_04)	21:43
2	08:42	09:39 (WEA_RE_02)	10:12	09:48 (WEA_RE_02)	10:15	07:50 (WEA_RE_03)	10:02	29	07:40 (WEA_RE_05)	10:55	30	06:28 (WEA_RE_04)	10:58			
	16:22	39	10:18 (WEA_RE_02)	17:13	38	10:26 (WEA_RE_02)	18:07	97	09:29 (WEA_RE_01)	20:03	29	08:09 (WEA_RE_05)	20:57	31	06:59 (WEA_RE_04)	21:44
3	08:42	09:39 (WEA_RE_02)	10:10	09:50 (WEA_RE_02)	10:17	07:50 (WEA_RE_03)	10:03	29	07:40 (WEA_RE_05)	10:53	31	06:28 (WEA_RE_04)	10:58			
	16:23	39	10:18 (WEA_RE_02)	17:15	36	10:26 (WEA_RE_02)	18:09	98	09:29 (WEA_RE_01)	20:05	28	08:08 (WEA_RE_05)	20:58	31	06:59 (WEA_RE_04)	21:45
4	08:41	09:39 (WEA_RE_02)	10:08	09:51 (WEA_RE_02)	10:11	07:48 (WEA_RE_03)	10:05	27	07:40 (WEA_RE_05)	10:51	31	06:27 (WEA_RE_04)	10:57			
	16:25	40	10:19 (WEA_RE_02)	17:17	34	10:25 (WEA_RE_02)	18:11	99	09:28 (WEA_RE_01)	20:07	27	08:07 (WEA_RE_05)	21:00	32	06:59 (WEA_RE_04)	21:46
5	08:41	09:39 (WEA_RE_02)	10:06	09:53 (WEA_RE_02)	10:08	07:48 (WEA_RE_03)	10:05	25	07:41 (WEA_RE_05)	10:49	32	06:28 (WEA_RE_04)	10:56			
	16:26	40	10:19 (WEA_RE_02)	17:19	30	10:23 (WEA_RE_02)	18:12	100	09:28 (WEA_RE_01)	20:09	25	08:06 (WEA_RE_05)	21:02	32	07:00 (WEA_RE_04)	21:48
6	08:41	09:40 (WEA_RE_02)	10:05	09:54 (WEA_RE_02)	10:06	07:48 (WEA_RE_03)	10:05	23	07:42 (WEA_RE_05)	10:47	31	06:28 (WEA_RE_04)	10:55			
	16:27	41	10:21 (WEA_RE_02)	17:21	28	10:22 (WEA_RE_02)	18:14	100	09:28 (WEA_RE_01)	20:10	23	08:05 (WEA_RE_05)	21:04	31	06:59 (WEA_RE_04)	21:49
7	08:40	09:39 (WEA_RE_02)	10:03	09:56 (WEA_RE_02)	10:04	07:46 (WEA_RE_03)	10:03	20	07:42 (WEA_RE_05)	10:45	31	06:28 (WEA_RE_04)	10:55			
	16:28	42	10:21 (WEA_RE_02)	17:23	23	10:19 (WEA_RE_02)	18:16	99	09:26 (WEA_RE_01)	20:12	20	08:02 (WEA_RE_05)	21:05	31	06:59 (WEA_RE_04)	21:49
8	08:40	09:39 (WEA_RE_02)	10:01	09:59 (WEA_RE_02)	10:01	07:46 (WEA_RE_03)	10:04	16	07:44 (WEA_RE_05)	10:43	30	06:28 (WEA_RE_04)	10:54			
	16:30	42	10:21 (WEA_RE_02)	17:24	18	10:17 (WEA_RE_02)	18:18	100	09:26 (WEA_RE_01)	20:14	16	08:00 (WEA_RE_05)	21:07	30	06:58 (WEA_RE_04)	21:50
9	08:39	09:40 (WEA_RE_02)	10:01	10:03 (WEA_RE_02)	10:05	07:47 (WEA_RE_03)	10:04	10	07:47 (WEA_RE_05)	10:42	29	06:29 (WEA_RE_04)	10:54			
	16:31	43	10:23 (WEA_RE_02)	17:26	9	10:12 (WEA_RE_02)	18:20	97	09:25 (WEA_RE_01)	20:16	10	07:57 (WEA_RE_05)	21:09	29	06:58 (WEA_RE_04)	21:51
10	08:39	09:40 (WEA_RE_02)	10:01	09:50 (WEA_RE_02)	10:01	07:46 (WEA_RE_03)	10:03	9	07:46 (WEA_RE_05)	10:43	29	06:29 (WEA_RE_04)	10:53			
	16:33	43	10:23 (WEA_RE_02)	17:28	14	09:07 (WEA_RE_01)	18:22	97	09:24 (WEA_RE_01)	20:18	9	08:08 (WEA_RE_05)	21:10	29	06:58 (WEA_RE_04)	21:52
11	08:38	09:40 (WEA_RE_02)	10:01	08:49 (WEA_RE_01)	10:04	07:46 (WEA_RE_03)	10:04	8	07:46 (WEA_RE_05)	10:41	28	06:29 (WEA_RE_04)	10:53			
	16:34	44	10:24 (WEA_RE_02)	17:30	22	09:11 (WEA_RE_01)	18:24	95	09:23 (WEA_RE_01)	20:19	8	08:07 (WEA_RE_05)	21:12	28	06:57 (WEA_RE_04)	21:53
12	08:37	09:40 (WEA_RE_02)	10:01	08:46 (WEA_RE_01)	10:05	07:46 (WEA_RE_03)	10:03	7	07:46 (WEA_RE_05)	10:38	27	06:30 (WEA_RE_04)	10:52			
	16:36	44	10:24 (WEA_RE_02)	17:32	28	09:14 (WEA_RE_01)	18:25	91	09:21 (WEA_RE_01)	20:21	7	06:56 (WEA_RE_04)	10:52			
13	08:37	09:40 (WEA_RE_02)	10:01	08:43 (WEA_RE_01)	10:05	07:46 (WEA_RE_03)	10:03	6	07:46 (WEA_RE_05)	10:36	26	06:30 (WEA_RE_04)	10:52			
	16:37	45	10:25 (WEA_RE_02)	17:34	34	09:17 (WEA_RE_01)	18:27	89	09:20 (WEA_RE_01)	20:23	6	06:55 (WEA_RE_04)	10:52			
14	08:36	09:05 (WEA_CD_01)	10:01	08:41 (WEA_RE_01)	10:04	07:47 (WEA_RE_03)	10:04	5	07:47 (WEA_RE_05)	10:34	25	06:31 (WEA_RE_04)	10:52			
	16:39	47	10:25 (WEA_RE_02)	17:36	38	09:19 (WEA_RE_01)	18:29	85	09:19 (WEA_RE_01)	20:25	5	06:55 (WEA_RE_04)	10:52			
15	08:35	09:05 (WEA_CD_01)	10:01	08:40 (WEA_RE_01)	10:04	07:47 (WEA_RE_03)	10:03	4	07:47 (WEA_RE_05)	10:32	24	06:32 (WEA_RE_04)	10:52			
	16:40	50	10:26 (WEA_RE_02)	17:38	41	09:21 (WEA_RE_01)	18:31	80	09:17 (WEA_RE_01)	20:26	21	06:53 (WEA_RE_04)	10:56			
16	08:34	09:04 (WEA_CD_01)	10:01	08:38 (WEA_RE_01)	10:03	07:48 (WEA_RE_03)	10:03	3	07:48 (WEA_RE_05)	10:29	21	06:34 (WEA_RE_04)	10:51			
	16:42	51	10:26 (WEA_RE_02)	17:40	44	09:22 (WEA_RE_01)	18:33	75	09:15 (WEA_RE_01)	20:28	19	06:53 (WEA_RE_04)	10:56			
17	08:33	09:03 (WEA_CD_01)	10:01	08:36 (WEA_RE_01)	10:03	07:49 (WEA_RE_03)	10:03	2	07:49 (WEA_RE_05)	10:27	20	06:34 (WEA_RE_04)	10:51			
	16:44	54	10:27 (WEA_RE_02)	17:42	47	09:23 (WEA_RE_01)	18:34	68	09:12 (WEA_RE_01)	20:30	17	06:51 (WEA_RE_04)	10:57			
18	08:32	09:02 (WEA_CD_01)	10:01	08:35 (WEA_RE_01)	10:03	07:50 (WEA_RE_03)	10:03	1	07:50 (WEA_RE_05)	10:25	19	06:37 (WEA_RE_04)	10:51			
	16:45	56	10:28 (WEA_RE_02)	17:44	49	09:24 (WEA_RE_01)	18:36	61	09:10 (WEA_RE_01)	20:32	12	06:49 (WEA_RE_04)	10:57			
19	08:31	09:00 (WEA_CD_01)	10:01	08:34 (WEA_RE_01)	10:03	07:53 (WEA_RE_03)	10:03	0	07:53 (WEA_RE_05)	10:23	12	06:40 (WEA_RE_04)	10:51			
	16:47	57	10:27 (WEA_RE_02)	17:46	51	09:25 (WEA_RE_01)	18:38	52	09:08 (WEA_RE_01)	20:34	7	06:47 (WEA_RE_04)	10:57			
20	08:30	09:00 (WEA_CD_01)	10:01	08:33 (WEA_RE_01)	10:03	07:55 (WEA_RE_03)	10:03	0	07:55 (WEA_RE_05)	10:20	11	06:31 (WEA_RE_04)	10:51			
	16:49	58	10:28 (WEA_RE_02)	17:48	53	09:26 (WEA_RE_01)	18:40	39	09:03 (WEA_RE_01)	20:35	6	06:52 (WEA_RE_04)	10:52			
21	08:29	09:01 (WEA_CD_01)	10:01	08:33 (WEA_RE_01)	10:03	08:02 (WEA_RE_03)	10:03	0	08:02 (WEA_RE_05)	10:18	10	06:33 (WEA_RE_04)	10:52			
	16:51	59	10:29 (WEA_RE_02)	17:50	54	09:27 (WEA_RE_01)	18:42	16	08:59 (WEA_RE_01)	20:37	5	06:54 (WEA_RE_04)	10:52			
22	08:27	09:01 (WEA_CD_01)	10:01	08:31 (WEA_RE_01)	10:02	08:31 (WEA_RE_01)	10:02	10	08:31 (WEA_RE_01)	10:16	9	06:35 (WEA_RE_04)	10:52			
	16:52	57	10:28 (WEA_RE_02)	17:52	56	09:27 (WEA_RE_01)	18:44	10	07:03 (WEA_RE_05)	10:39	4	06:50 (WEA_RE_04)	10:56			
23	08:26	09:02 (WEA_CD_01)	10:01	08:31 (WEA_RE_01)	10:02	07:50 (WEA_RE_03)	10:02	11	06:40 (WEA_RE_05)	10:14	8	06:37 (WEA_RE_04)	10:52			
	16:54	56	10:29 (WEA_RE_02)	17:54	57	09:28 (WEA_RE_01)	18:46	16	07:06 (WEA_RE_05)	10:41	11	06:51 (WEA_RE_04)	10:57			
24	08:25	09:03 (WEA_CD_01)	10:01	08:30 (WEA_RE_01)	10:02	08:48 (WEA_RE_03)	10:02	0	08:48 (WEA_RE_05)	10:12	7	06:54 (WEA_RE_04)	10:58			
	16:56	54	10:29 (WEA_RE_02)	17:55	71	09:29 (WEA_RE_01)	18:47	20	07:08 (WEA_RE_05)	10:43	17	06:54 (WEA_RE_04)	10:58			
25	08:24	09:05 (WEA_CD_01)	10:01	07:59 (WEA_RE_03)	10:02	08:45 (WEA_RE_03)	10:02	0	08:45 (WEA_RE_05)	10:09	6	06:35 (WEA_RE_04)	10:57			
	16:58	50	10:29 (WEA_RE_02)	17:57	79	09:29 (WEA_RE_01)	18:49	24	07:09 (WEA_RE_05)	10:44	21	06:56 (WEA_RE_04)	10:57			
26	08:22	09:44 (WEA_RE_02)	10:01	07:56 (WEA_RE_03)	10:01	08:44 (WEA_RE_03)	10:01	0	08:44 (WEA_RE_05)	10:07	5	06:34 (WEA_RE_04)	10:56			
	17:00	45	10:29 (WEA_RE_02)	17:59	84	09:29 (WEA_RE_01)	18:51	26	07:10 (WEA_RE_05)	10:46	23	06:57 (WEA_RE_04)	10:58			
27	08:21	09:45 (WEA_RE_02)	10:01	07:54 (WEA_RE_03)	10:01	08:43 (WEA_RE_03)	10:01	0	08:43 (WEA_RE_05)	10:05	4	06:32 (WEA_RE_04)	10:55			
	17:01	44	10:29 (WEA_RE_02)	18:01	89	09:29 (WEA_RE_01)	18:53	27	07:10 (WEA_RE_05)	10:48	26	06:58 (WEA_RE_04)	10:57			
28	08:19	09:45 (WEA_RE_02)	10:01	07:53 (WEA_RE_03)	10:01	08:42 (WEA_RE_03)	10:01	0	08:42 (WEA_RE_05)	10:03	3	06:31 (WEA_RE_04)	10:57			
	17:03	44	10:29 (WEA_RE_02)	18:03	92	09:29 (WEA_RE_01)	18:54	28	07:10 (WEA_RE_05)	10:50	27	06:58 (WEA_RE_04)	10:58			
29	08:18	09:45 (WEA_RE_02)	10:01	07:51 (WEA_RE_03)	10:01	08:42 (WEA_RE_03)	10:01	0	08:42 (WEA_RE_05)	10:01	2	06:30 (WEA_RE_04)	10:52			
	17:05	43	10:28 (WEA_RE_02)	18:03	91	09:29 (WEA_RE_01)	18:56	29	08:11 (WEA_RE_05)	10:51	29	06:59 (WEA_RE_04)	10:59			
30	08:16	09:47 (WEA_RE_02)	10:01	07:50 (WEA_RE_03)	10:01	08:40 (WEA_RE_03)	10:01	0	08:40 (WEA_RE_05)	10:01	1	06:30 (WEA_RE_04)	10:51			
	17:07	41	10:28 (WEA_RE_02)	18:05	90	09:29 (WEA_RE_01)	18:58	30	08:10 (WEA_RE_05)							

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_08 - IO 08 Böseler Straße 579 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

1 Juli	August	September	Oktober	November	Dezember
1 10506	10544	06:40 (WEA_RE_04) 06:36	07:28	08:26 (WEA_RE_03) 07:24	08:24 (WEA_RE_01) 08:17
2 12158	12124	07:07 (WEA_RE_04) 20:19	19:07	10:01 (WEA_RE_01) 16:59	11 08:35 (WEA_RE_01) 16:10
3 10506	10546	06:39 (WEA_RE_04) 06:38	07:30	08:24 (WEA_RE_03) 07:26	09:32 (WEA_RE_02) 08:19
4 12157	12122	07:07 (WEA_RE_04) 20:17	19:05	10:01 (WEA_RE_01) 16:57	11 09:43 (WEA_RE_02) 16:15
5 10507	10547	06:39 (WEA_RE_04) 06:40	07:45 (WEA_RE_05) 07:31	08:24 (WEA_RE_03) 07:28	09:28 (WEA_RE_02) 08:20
6 12157	12120	07:08 (WEA_RE_04) 20:15	07:50 (WEA_RE_05) 19:33	10:01 (WEA_RE_01) 16:59	19 09:47 (WEA_RE_02) 16:15
7 10508	10549	06:38 (WEA_RE_04) 06:42	07:45 (WEA_RE_05) 07:33	08:24 (WEA_RE_03) 07:30	09:26 (WEA_RE_02) 08:22
8 12156	12118	07:08 (WEA_RE_04) 20:12	16 07:57 (WEA_RE_05) 19:00	09:10 (WEA_RE_01) 16:53	24 09:50 (WEA_RE_02) 16:14
9 10509	10551	06:38 (WEA_RE_04) 06:43	07:39 (WEA_RE_05) 07:35	08:23 (WEA_RE_03) 07:32	09:24 (WEA_RE_02) 08:23
10 12156	12117	07:09 (WEA_RE_04) 20:10	20 07:59 (WEA_RE_05) 18:58	100 10:03 (WEA_RE_01) 16:51	28 09:52 (WEA_RE_02) 16:13
11 10510	10552	06:38 (WEA_RE_04) 06:45	07:37 (WEA_RE_05) 07:37	08:23 (WEA_RE_03) 07:34	09:22 (WEA_RE_02) 08:25
12 12155	12115	07:09 (WEA_RE_04) 20:07	23 08:00 (WEA_RE_05) 18:55	99 10:03 (WEA_RE_01) 16:49	31 09:53 (WEA_RE_02) 16:13
13 10511	10554	06:37 (WEA_RE_04) 06:47	07:36 (WEA_RE_05) 07:38	08:22 (WEA_RE_03) 07:35	09:21 (WEA_RE_02) 08:26
14 12155	12113	06:37 (WEA_RE_04) 20:05	25 08:01 (WEA_RE_05) 18:53	100 10:02 (WEA_RE_01) 16:47	34 09:55 (WEA_RE_02) 16:12
15 10512	10556	06:38 (WEA_RE_04) 06:48	07:35 (WEA_RE_05) 07:40	08:23 (WEA_RE_03) 07:37	09:20 (WEA_RE_02) 08:27
16 12154	12111	07:09 (WEA_RE_04) 20:03	27 08:02 (WEA_RE_05) 18:51	100 10:03 (WEA_RE_01) 16:46	36 09:56 (WEA_RE_02) 16:12
17 10513	10557	06:37 (WEA_RE_04) 06:50	07:34 (WEA_RE_05) 07:42	08:23 (WEA_RE_03) 07:39	09:19 (WEA_RE_02) 08:28
18 12153	12109	07:09 (WEA_RE_04) 20:00	28 08:02 (WEA_RE_05) 18:48	99 10:03 (WEA_RE_01) 16:44	38 09:57 (WEA_RE_02) 16:12
19 10514	10559	06:37 (WEA_RE_04) 06:52	07:33 (WEA_RE_05) 07:44	08:23 (WEA_RE_03) 07:41	09:18 (WEA_RE_02) 08:29
20 12152	12107	07:09 (WEA_RE_04) 19:59	29 08:02 (WEA_RE_05) 18:46	99 10:03 (WEA_RE_01) 16:42	40 09:58 (WEA_RE_02) 16:12
21 10515	10561	06:37 (WEA_RE_04) 06:54	07:33 (WEA_RE_05) 07:46	08:24 (WEA_RE_03) 07:43	09:18 (WEA_RE_02) 08:31
22 12152	12105	07:08 (WEA_RE_04) 19:55	29 08:02 (WEA_RE_05) 18:44	98 10:03 (WEA_RE_01) 16:41	41 09:59 (WEA_RE_02) 16:11
23 10516	10602	06:37 (WEA_RE_04) 06:55	07:32 (WEA_RE_05) 07:47	08:25 (WEA_RE_03) 07:45	09:17 (WEA_RE_02) 08:32
24 12151	12103	07:08 (WEA_RE_04) 19:53	29 08:01 (WEA_RE_05) 18:41	96 10:03 (WEA_RE_01) 16:39	42 09:59 (WEA_RE_02) 16:11
25 10517	10604	06:38 (WEA_RE_04) 06:57	07:32 (WEA_RE_05) 07:49	08:26 (WEA_RE_03) 07:47	09:17 (WEA_RE_02) 08:33
26 12150	12101	07:08 (WEA_RE_04) 19:51	29 08:01 (WEA_RE_05) 18:39	94 10:03 (WEA_RE_01) 16:37	43 10:00 (WEA_RE_02) 16:11
27 10518	10606	06:38 (WEA_RE_04) 06:59	07:32 (WEA_RE_05) 07:51	08:26 (WEA_RE_03) 07:49	09:17 (WEA_RE_02) 08:34
28 12149	12059	07:06 (WEA_RE_04) 19:48	29 08:01 (WEA_RE_05) 18:37	90 10:01 (WEA_RE_01) 16:36	44 10:01 (WEA_RE_02) 16:11
29 10519	10607	06:39 (WEA_RE_04) 07:00	07:31 (WEA_RE_05) 07:53	08:27 (WEA_RE_03) 07:50	09:17 (WEA_RE_02) 08:35
30 12148	12057	07:06 (WEA_RE_04) 19:46	29 08:00 (WEA_RE_05) 18:35	87 10:01 (WEA_RE_01) 16:34	44 10:01 (WEA_RE_02) 16:11
31 10521	10609	06:39 (WEA_RE_04) 07:02	07:32 (WEA_RE_05) 07:55	08:27 (WEA_RE_03) 07:52	09:16 (WEA_RE_02) 08:36
1 12147	12055	07:04 (WEA_RE_04) 19:43	27 07:59 (WEA_RE_05) 18:32	83 10:01 (WEA_RE_01) 16:33	46 10:02 (WEA_RE_02) 16:11
2 10522	10611	06:40 (WEA_RE_04) 07:04	07:32 (WEA_RE_05) 07:56	08:32 (WEA_RE_03) 07:54	08:38 (WEA_RE_02) 08:36
3 12146	12053	07:03 (WEA_RE_04) 19:41	26 07:58 (WEA_RE_05) 18:30	76 10:00 (WEA_RE_01) 16:31	51 10:02 (WEA_RE_02) 16:11
4 10523	10613	06:42 (WEA_RE_04) 07:05	07:32 (WEA_RE_05) 07:58	08:36 (WEA_RE_03) 07:56	08:37 (WEA_RE_02) 08:37
5 12144	12051	07:02 (WEA_RE_04) 19:39	24 07:56 (WEA_RE_05) 18:28	66 10:00 (WEA_RE_01) 16:30	54 10:03 (WEA_RE_02) 16:12
6 10525	10614	06:43 (WEA_RE_04) 07:07	07:34 (WEA_RE_05) 08:00	09:02 (WEA_RE_01) 07:59	08:36 (WEA_RE_02) 08:38
7 12143	12049	06:59 (WEA_RE_04) 19:36	21 07:55 (WEA_RE_05) 18:26	57 09:59 (WEA_RE_01) 16:29	56 10:03 (WEA_RE_02) 16:12
8 10526	10616	06:46 (WEA_RE_04) 07:09	07:36 (WEA_RE_05) 08:02	09:03 (WEA_RE_01) 07:59	08:36 (WEA_RE_02) 08:38
9 12142	12046	10 06:56 (WEA_RE_04) 19:34	17 07:53 (WEA_RE_05) 18:23	55 09:58 (WEA_RE_01) 16:27	57 10:03 (WEA_RE_02) 16:12
10 10527	10618	07:11	07:37 (WEA_RE_05) 08:04	09:03 (WEA_RE_01) 08:01	08:36 (WEA_RE_02) 08:39
11 12141	12044	19:31	12 07:49 (WEA_RE_05) 18:21	54 09:57 (WEA_RE_01) 16:26	59 10:04 (WEA_RE_02) 16:13
12 10528	10619	07:12	09:31 (WEA_RE_01) 08:05	09:04 (WEA_RE_01) 08:03	08:36 (WEA_RE_02) 08:40
13 12139	12042	19:29	10 09:41 (WEA_RE_01) 18:19	52 09:56 (WEA_RE_01) 16:25	58 10:04 (WEA_RE_02) 16:13
14 10530	10621	07:14	08:40 (WEA_RE_05) 08:07	09:05 (WEA_RE_01) 08:05	08:37 (WEA_RE_02) 08:40
15 12138	12040	19:27	09:47 (WEA_RE_01) 18:17	50 09:55 (WEA_RE_01) 16:24	57 10:04 (WEA_RE_02) 16:14
16 10532	10623	07:16	09:37 (WEA_RE_03) 08:09	09:06 (WEA_RE_01) 08:06	08:39 (WEA_RE_02) 08:41
17 12136	12037	19:24	48 09:50 (WEA_RE_01) 18:15	48 09:54 (WEA_RE_01) 16:23	56 10:05 (WEA_RE_02) 16:14
18 10533	10624	07:17	08:34 (WEA_RE_03) 07:11	08:07 (WEA_RE_01) 08:08	08:41 (WEA_RE_02) 08:41
19 12135	12035	19:22	58 09:52 (WEA_RE_01) 18:13	46 08:53 (WEA_RE_01) 16:21	54 10:05 (WEA_RE_02) 16:15
20 10535	10626	07:19	08:32 (WEA_RE_03) 07:13	08:08 (WEA_RE_01) 08:10	08:42 (WEA_RE_02) 08:41
21 12134	12033	19:19	66 09:54 (WEA_RE_01) 18:11	43 08:51 (WEA_RE_01) 16:20	52 10:05 (WEA_RE_02) 16:16
22 10536	10628	07:21	08:31 (WEA_RE_03) 07:15	08:10 (WEA_RE_01) 08:11	08:44 (WEA_RE_02) 08:42
23 12132	12031	19:17	73 09:56 (WEA_RE_01) 18:09	40 08:50 (WEA_RE_01) 16:19	49 10:05 (WEA_RE_02) 16:16
24 10538	10630	07:23	08:28 (WEA_RE_03) 07:17	08:11 (WEA_RE_01) 08:13	08:46 (WEA_RE_02) 08:42
25 12130	12029	19:14	79 09:57 (WEA_RE_01) 18:07	37 08:48 (WEA_RE_01) 16:19	47 10:05 (WEA_RE_02) 16:17
26 10539	10631	07:24	08:27 (WEA_RE_03) 07:19	08:13 (WEA_RE_01) 08:14	09:21 (WEA_RE_02) 08:42
27 12129	12026	19:12	83 09:58 (WEA_RE_01) 18:05	33 08:46 (WEA_RE_01) 16:18	45 10:06 (WEA_RE_02) 16:18
28 10541	10633	07:26	08:26 (WEA_RE_03) 07:20	08:16 (WEA_RE_01) 08:16	09:21 (WEA_RE_02) 08:42
29 12127	12024	19:10	88 10:00 (WEA_RE_01) 18:03	27 08:43 (WEA_RE_01) 16:17	44 10:05 (WEA_RE_02) 16:19
30 10542	10635		07:22	08:19 (WEA_RE_01)	08:42
31 12125	12022		17:01	21 08:40 (WEA_RE_01)	16:20
Sonnenscheinstunden 508	457	382	330	262	238
avr_max_mgl_Beschattung 133	544	991	2226	1271	1181

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_09 - IO 09 Mastenweg 102A Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42 16:21 16:22	08:13 17:11 17:13	07:17 18:05 18:07	07:04 17:26 (WEA_RE_01) 16:24 (WEA_RE_05)	07:04 20:01 07:02	05:57 19:04 (WEA_RE_04) 19:57 (WEA_RE_04)	19:20 (WEA_RE_04) 19:45 (WEA_RE_04) 19:21 (WEA_RE_04)
2	08:41 16:22 16:23	08:10 17:15 17:16	07:12 18:09 18:10	06:59 17:25 (WEA_RE_01) 16:22 (WEA_RE_05)	06:59 20:05 06:57	05:53 19:03 (WEA_RE_04) 19:57 (WEA_RE_04)	19:22 (WEA_RE_04) 19:42 (WEA_RE_04) 19:24 (WEA_RE_04)
3	08:41 16:23 16:24	08:10 17:15 17:17	07:12 18:09 18:10	06:59 17:25 (WEA_RE_01) 16:22 (WEA_RE_05)	06:59 20:05 06:57	05:53 19:03 (WEA_RE_04) 19:57 (WEA_RE_04)	19:22 (WEA_RE_04) 19:42 (WEA_RE_04) 19:24 (WEA_RE_04)
4	08:41 16:24 16:25	08:06 17:19 17:20	07:08 18:12 18:13	06:55 17:22 (WEA_RE_01) 16:22 (WEA_RE_05)	06:55 20:08 06:52	05:49 19:03 (WEA_RE_04) 19:57 (WEA_RE_04)	19:25 (WEA_RE_04) 19:40 (WEA_RE_04) 19:28 (WEA_RE_04)
5	08:41 16:25 16:26	08:05 17:20 17:22	07:06 18:14 18:15	06:52 17:21 (WEA_RE_01) 16:20 (WEA_RE_05)	06:52 20:10 06:50	05:47 19:03 (WEA_RE_04) 19:57 (WEA_RE_04)	19:28 (WEA_RE_04) 19:39 (WEA_RE_04) 19:30 (WEA_RE_04)
6	08:40 16:26 16:27	08:01 17:22 17:24	07:01 18:18 18:19	07:01 17:17 (WEA_RE_01) 16:20 (WEA_RE_05)	20:12 20:12 20:14	05:45 19:02 (WEA_RE_04) 19:57 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
7	08:40 16:27 16:28	08:03 17:22 17:24	07:04 18:16 18:17	07:04 17:17 (WEA_RE_01) 16:20 (WEA_RE_05)	20:13 20:12 20:14	05:45 19:03 (WEA_RE_04) 19:57 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
8	08:40 16:28 16:29	08:01 17:24 17:26	07:01 18:18 18:20	07:01 17:15 (WEA_RE_05) 16:20 (WEA_RE_05)	20:14 20:14 20:16	05:43 19:02 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
9	08:39 16:29 16:30	07:59 17:26 17:28	06:59 18:20 18:22	06:59 17:16 (WEA_RE_05) 16:20 (WEA_RE_05)	06:45 20:16 20:17	05:42 19:03 (WEA_RE_04) 19:57 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
10	08:39 16:30 16:31	07:57 17:28 17:30	06:57 18:22 18:24	06:43 17:15 (WEA_RE_05) 16:20 (WEA_RE_05)	06:43 20:17 06:41	05:40 19:03 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
11	08:38 16:31 16:32	07:55 17:30 17:32	06:54 18:25 18:27	06:41 17:15 (WEA_RE_05) 16:19 (WEA_RE_05)	06:41 20:19 06:38	05:38 19:03 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
12	08:37 16:32 16:33	07:53 17:32 17:34	06:52 18:25 18:27	06:38 17:14 (WEA_RE_05) 16:20 (WEA_RE_05)	06:38 20:21 06:36	05:36 19:04 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
13	08:36 16:33 16:34	07:51 17:34 17:36	06:50 18:27 18:29	06:36 17:14 (WEA_RE_05) 16:20 (WEA_RE_05)	06:36 20:23 06:34	05:34 19:04 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
14	08:36 16:34 16:35	07:49 17:36 17:38	06:47 18:29 18:31	06:34 17:14 (WEA_RE_05) 16:20 (WEA_RE_05)	06:34 20:25 06:31	05:33 19:05 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
15	08:35 16:35 16:36	07:47 17:38 17:40	06:45 18:31 18:33	06:31 17:12 (WEA_RE_05) 16:21 (WEA_RE_05)	06:31 20:26 06:29	05:31 19:05 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
16	08:34 16:36 16:37	07:45 17:40 17:42	06:42 18:33 18:35	06:29 17:12 (WEA_RE_05) 16:21 (WEA_RE_05)	06:29 20:28 06:27	05:30 19:06 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
17	08:33 16:37 16:38	07:43 17:42 17:44	06:40 18:34 18:36	06:27 17:11 (WEA_RE_05) 16:22 (WEA_RE_05)	06:27 20:30 06:25	05:28 19:07 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
18	08:32 16:38 16:39	07:41 17:44 17:46	06:38 18:36 18:38	06:25 17:10 (WEA_RE_05) 16:22 (WEA_RE_05)	06:25 20:32 06:22	05:26 19:08 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
19	08:31 16:39 16:40	07:39 17:46 17:48	06:35 18:38 18:40	06:22 17:08 (WEA_RE_05) 16:23 (WEA_RE_05)	06:22 20:34 06:20	05:25 19:16 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
20	08:30 16:40 16:41	07:37 17:48 17:50	06:33 18:40 18:42	06:20 17:07 (WEA_RE_05) 16:25 (WEA_RE_05)	06:20 20:36 06:18	05:23 19:18 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
21	08:29 16:41 16:42	07:35 17:50 17:52	06:31 18:42 18:44	06:18 17:06 (WEA_RE_05) 16:25 (WEA_RE_05)	06:18 20:37 06:16	05:22 19:19 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
22	08:28 16:42 16:43	07:33 17:52 17:54	06:28 18:44 18:46	06:16 17:04 (WEA_RE_05) 16:27 (WEA_RE_05)	06:16 20:39 06:14	05:21 19:20 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
23	08:26 16:43 16:44	07:31 17:54 17:56	06:26 18:46 18:48	06:14 17:02 (WEA_RE_05) 16:29 (WEA_RE_05)	06:14 20:41 06:11	05:19 19:21 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
24	08:25 16:44 16:45	07:28 17:56 17:58	06:23 18:48 18:50	06:11 17:00 (WEA_RE_05) 16:32 (WEA_RE_05)	06:11 20:42 06:09	05:18 19:22 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
25	08:23 16:45 16:46	07:26 17:57 17:59	06:21 18:49 18:51	06:09 16:57 (WEA_RE_05) 16:35 (WEA_RE_05)	06:09 20:44 06:07	05:17 19:23 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
26	08:22 16:46 16:47	07:24 17:59 18:01	06:18 18:51 18:53	06:07 16:54 (WEA_RE_05) 16:42 (WEA_RE_05)	06:07 20:46 06:05	05:16 19:24 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
27	08:21 16:47 16:48	07:22 18:01 18:03	06:15 18:53 18:55	06:05 16:46 (WEA_RE_05) 06:03	06:05 20:48 06:03	05:14 19:25 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
28	08:19 16:48 16:49	07:20 18:03 18:05	06:14 18:55 18:57	06:03 16:46 (WEA_RE_05) 06:01	06:03 20:50 06:01	05:13 19:26 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
29	08:18 16:49 16:50	07:19 18:05 18:07	06:11 18:57 18:59	06:01 16:46 (WEA_RE_05) 06:01	06:01 20:51 05:59	05:12 19:27 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
30	08:16 16:50 16:51	07:17 18:07 18:09	06:09 19:00 19:02	06:01 16:46 (WEA_RE_05) 06:01	06:01 20:52 05:57	05:11 19:28 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
31	08:15 16:51 16:52	07:15 18:09 18:11	06:07 19:02 19:04	06:01 16:46 (WEA_RE_05) 06:01	06:01 20:53 05:55	05:10 19:29 (WEA_RE_04) 19:56 (WEA_RE_04)	19:24 (WEA_RE_04) 19:49 (WEA_RE_04) 19:36 (WEA_RE_04)
	Sonnenscheinstunden astr. max.mögl. Beschattung	254 275	791 367	1291 367	418 604	490 1432	505 117

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_09 - IO 09 Mastenweg 102A Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember
1	05:06	05:44	19:14 (WEA_RE_04) 06:36	07:28	16:59 (WEA_RE_05) 07:24	16:08 (WEA_RE_03) 08:17
	21:57	21:24	20:07 (WEA_RE_04) 20:19	19:07	17:54 (WEA_RE_05) 16:58	17:25 (WEA_RE_03) 16:16
2	05:06	05:46	19:13 (WEA_RE_04) 06:38	07:30	16:58 (WEA_RE_05) 07:26	16:11 (WEA_RE_03) 08:19
	21:57	21:22	20:06 (WEA_RE_04) 20:17	19:05	17:53 (WEA_RE_05) 16:57	16:22 (WEA_RE_03) 16:15
3	05:07	05:47	19:13 (WEA_RE_04) 06:40	07:31	16:58 (WEA_RE_05) 07:28	16:13
	21:57	21:20	20:07 (WEA_RE_04) 20:14	19:02	17:53 (WEA_RE_05) 16:55	16:14
4	05:08	05:49	19:13 (WEA_RE_04) 06:41	07:33	16:57 (WEA_RE_05) 07:30	16:14
	21:56	21:18	20:06 (WEA_RE_04) 20:12	19:00	17:53 (WEA_RE_05) 16:53	16:14
5	05:09	05:51	19:13 (WEA_RE_04) 06:43	07:35	16:57 (WEA_RE_05) 07:32	16:14
	21:56	21:17	20:07 (WEA_RE_04) 20:10	18:58	17:52 (WEA_RE_05) 16:51	16:13
6	05:10	19:35 (WEA_RE_04) 05:52	19:12 (WEA_RE_04) 06:45	07:37	16:57 (WEA_RE_05) 07:33	16:13
	21:55	19:44 (WEA_RE_04) 21:15	20:06 (WEA_RE_04) 20:07	18:55	17:52 (WEA_RE_05) 16:49	16:13
7	05:11	19:32 (WEA_RE_04) 05:54	19:12 (WEA_RE_04) 06:47	07:38	16:56 (WEA_RE_05) 07:35	16:13
	21:55	19:46 (WEA_RE_04) 21:13	20:07 (WEA_RE_04) 20:05	18:53	17:54 (WEA_RE_05) 16:47	16:12
8	05:12	19:31 (WEA_RE_04) 05:55	19:13 (WEA_RE_04) 06:48	07:40	16:57 (WEA_RE_05) 07:37	16:12
	21:54	19:47 (WEA_RE_04) 21:11	20:07 (WEA_RE_04) 20:03	18:51	17:57 (WEA_RE_05) 16:46	16:12
9	05:13	19:30 (WEA_RE_04) 05:57	19:12 (WEA_RE_04) 06:50	07:42	16:57 (WEA_RE_05) 07:39	16:12
	21:53	19:49 (WEA_RE_04) 21:09	20:06 (WEA_RE_04) 20:00	18:48	17:58 (WEA_RE_05) 16:44	16:12
10	05:14	19:29 (WEA_RE_04) 05:59	19:12 (WEA_RE_04) 06:52	07:44	16:57 (WEA_RE_05) 07:41	16:12
	21:52	19:50 (WEA_RE_04) 21:07	20:06 (WEA_RE_04) 19:58	18:46	17:59 (WEA_RE_05) 16:42	16:11
11	05:15	19:27 (WEA_RE_04) 06:01	19:12 (WEA_RE_04) 06:53	07:45	16:58 (WEA_RE_05) 07:43	16:11
	21:51	19:52 (WEA_RE_04) 21:05	20:05 (WEA_RE_04) 19:55	18:44	18:00 (WEA_RE_05) 16:41	16:11
12	05:16	19:26 (WEA_RE_04) 06:02	19:12 (WEA_RE_04) 06:55	07:47	16:58 (WEA_RE_05) 07:45	16:11
	21:51	19:53 (WEA_RE_04) 21:03	20:05 (WEA_RE_04) 19:53	18:41	18:00 (WEA_RE_05) 16:39	16:11
13	05:17	19:25 (WEA_RE_04) 06:04	19:12 (WEA_RE_04) 06:57	07:49	16:58 (WEA_RE_05) 07:47	16:11
	21:50	19:54 (WEA_RE_04) 21:01	20:04 (WEA_RE_04) 19:51	18:39	17:59 (WEA_RE_05) 16:37	16:11
14	05:18	19:25 (WEA_RE_04) 06:06	19:12 (WEA_RE_04) 06:59	07:51	16:59 (WEA_RE_05) 07:48	16:11
	21:49	19:56 (WEA_RE_04) 20:59	20:04 (WEA_RE_04) 19:48	18:37	18:00 (WEA_RE_05) 16:36	16:11
15	05:19	19:24 (WEA_RE_04) 06:07	19:13 (WEA_RE_04) 07:00	07:53	17:00 (WEA_RE_05) 07:50	16:11
	21:48	19:57 (WEA_RE_04) 20:57	20:04 (WEA_RE_04) 19:46	18:34	17:59 (WEA_RE_05) 16:34	16:11
16	05:21	19:23 (WEA_RE_04) 06:09	19:13 (WEA_RE_04) 07:02	07:54	17:01 (WEA_RE_05) 07:52	16:11
	21:47	19:57 (WEA_RE_04) 20:55	20:02 (WEA_RE_04) 19:43	18:32	17:59 (WEA_RE_05) 16:33	16:11
17	05:22	19:22 (WEA_RE_04) 06:11	19:14 (WEA_RE_04) 07:04	17:25 (WEA_RE_05) 07:56	17:03 (WEA_RE_05) 07:54	16:11
	21:45	19:58 (WEA_RE_04) 20:53	20:02 (WEA_RE_04) 19:41	17:41 (WEA_RE_05) 18:30	17:59 (WEA_RE_05) 16:31	16:11
18	05:23	19:21 (WEA_RE_04) 06:12	19:13 (WEA_RE_04) 07:05	17:20 (WEA_RE_05) 07:58	17:02 (WEA_RE_05) 07:56	16:11
	21:44	19:59 (WEA_RE_04) 20:51	20:00 (WEA_RE_04) 19:38	17:44 (WEA_RE_05) 18:28	17:58 (WEA_RE_05) 16:30	16:11
19	05:25	19:21 (WEA_RE_04) 06:14	19:14 (WEA_RE_04) 07:07	17:17 (WEA_RE_05) 08:00	17:02 (WEA_RE_05) 07:57	16:11
	21:43	19:20 (WEA_RE_04) 20:48	20:00 (WEA_RE_04) 19:36	17:47 (WEA_RE_05) 18:26	17:56 (WEA_RE_05) 16:29	16:11
20	05:26	19:20 (WEA_RE_04) 06:16	19:16 (WEA_RE_04) 07:09	17:15 (WEA_RE_05) 08:02	17:01 (WEA_RE_05) 07:59	16:11
	21:42	20:01 (WEA_RE_04) 20:46	19:59 (WEA_RE_04) 19:34	17:40 (WEA_RE_05) 18:23	17:54 (WEA_RE_05) 16:27	16:11
21	05:27	19:19 (WEA_RE_04) 06:18	19:16 (WEA_RE_04) 07:10	17:12 (WEA_RE_05) 08:04	17:01 (WEA_RE_05) 08:01	16:11
	21:41	20:01 (WEA_RE_04) 20:44	19:57 (WEA_RE_04) 19:31	17:49 (WEA_RE_05) 18:21	17:52 (WEA_RE_05) 16:26	16:11
22	05:29	19:19 (WEA_RE_04) 06:19	19:17 (WEA_RE_04) 07:12	17:10 (WEA_RE_05) 08:05	17:01 (WEA_RE_05) 08:03	16:11
	21:39	20:02 (WEA_RE_04) 20:42	19:56 (WEA_RE_04) 19:29	17:51 (WEA_RE_05) 18:19	17:50 (WEA_RE_05) 16:25	16:11
23	05:30	19:19 (WEA_RE_04) 06:21	19:19 (WEA_RE_04) 07:14	17:08 (WEA_RE_05) 08:07	17:01 (WEA_RE_05) 08:04	16:11
	21:38	20:03 (WEA_RE_04) 20:40	19:54 (WEA_RE_04) 19:26	17:52 (WEA_RE_05) 18:17	17:47 (WEA_RE_05) 16:24	16:11
24	05:32	19:18 (WEA_RE_04) 06:23	19:20 (WEA_RE_04) 07:16	17:06 (WEA_RE_05) 08:09	17:01 (WEA_RE_05) 08:06	16:11
	21:36	20:03 (WEA_RE_04) 20:37	19:52 (WEA_RE_04) 19:24	17:52 (WEA_RE_05) 18:15	17:34 (WEA_RE_05) 16:22	16:11
25	05:33	19:18 (WEA_RE_04) 06:24	19:22 (WEA_RE_04) 07:17	17:05 (WEA_RE_05) 08:11	16:01 (WEA_RE_05) 08:09	16:11
	21:35	20:04 (WEA_RE_04) 20:35	19:50 (WEA_RE_04) 19:22	17:52 (WEA_RE_05) 17:13	16:33 (WEA_RE_05) 16:21	16:11
26	05:35	19:17 (WEA_RE_04) 06:26	19:24 (WEA_RE_04) 07:19	17:04 (WEA_RE_05) 08:13	16:02 (WEA_RE_05) 08:09	16:11
	21:33	20:04 (WEA_RE_04) 20:33	19:46 (WEA_RE_04) 19:19	17:53 (WEA_RE_05) 17:11	16:33 (WEA_RE_05) 16:20	16:11
27	05:36	19:16 (WEA_RE_04) 06:28	19:28 (WEA_RE_04) 07:21	17:03 (WEA_RE_05) 08:15	16:02 (WEA_RE_05) 08:11	16:11
	21:32	20:04 (WEA_RE_04) 20:31	19:42 (WEA_RE_04) 19:17	17:54 (WEA_RE_05) 17:08	16:32 (WEA_RE_05) 16:19	16:11
28	05:38	19:16 (WEA_RE_04) 06:29	19:16 (WEA_RE_04) 07:23	17:01 (WEA_RE_05) 08:17	16:02 (WEA_RE_05) 08:13	16:11
	21:30	20:05 (WEA_RE_04) 20:28	19:14	17:53 (WEA_RE_05) 17:06	16:31 (WEA_RE_05) 16:19	16:11
29	05:39	19:15 (WEA_RE_04) 06:31	19:15	17:00 (WEA_RE_05) 08:18	16:04 (WEA_RE_05) 08:14	16:11
	21:29	20:05 (WEA_RE_04) 20:26	19:12	17:53 (WEA_RE_05) 17:04	16:30 (WEA_RE_05) 16:17	16:11
30	05:41	19:15 (WEA_RE_04) 06:32	19:10	17:00 (WEA_RE_05) 08:20	16:05 (WEA_RE_05) 08:16	16:11
	21:27	20:06 (WEA_RE_04) 20:24	19:10	17:54 (WEA_RE_05) 17:02	16:29 (WEA_RE_05) 16:17	16:11
31	05:42	19:14 (WEA_RE_04) 06:35	19:10	17:00 (WEA_RE_05) 08:22	16:06 (WEA_RE_05) 08:18	16:11
	21:25	20:06 (WEA_RE_04) 20:21	19:10	17:00	16:27 (WEA_RE_05) 16:20	16:11
Sonnenscheinstunden	508	457	382	330	262	238
astr. max.mögl. Beschattung	929	1243	578	1507	28	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_10 - IO 10 Lutzweg 4 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	08:13	07:18	07:04	05:57	05:09	05:06	05:44	06:37	07:28	07:24	08:18
	16:21	17:11	18:05	20:02	20:55	21:43	21:58	21:24	20:19	19:07	16:59	16:16
2	08:42	08:12	07:15	07:02	05:55	05:09	05:07	05:46	06:38	07:30	07:26	08:19
	16:22	17:13	18:07	20:03	20:57	21:44	21:57	21:22	20:17	19:05	16:57	16:15
3	08:42	08:10	07:13	07:00	05:53	05:08	05:07	05:47	06:40	07:31	07:28	08:20
	16:24	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:15	19:03	16:55	16:15
4	08:41	08:08	07:11	06:57	05:51	05:07	05:08	05:49	06:42	07:33	07:30	08:22
	16:25	17:17	18:11	20:07	21:00	21:47	21:56	21:19	20:12	19:00	16:53	16:14
5	08:41	08:06	07:08	06:55	05:49	05:06	05:09	05:51	06:43	07:35	07:32	08:23
	16:26	17:19	18:12	20:09	21:02	21:48	21:56	21:17	20:10	18:58	16:51	16:14
6	08:41	08:05	07:06	06:53	05:47	05:05	05:10	05:52	06:45	07:37	07:34	08:25
	16:27	17:21	18:14	20:10	21:04	21:49	21:55	21:15	20:07	18:55	16:49	16:13
7	08:40	08:03	07:04	06:50	05:45	05:05	05:11	05:54	06:47	07:39	07:36	08:26
	16:29	17:23	18:16	20:12	21:05	21:50	21:55	21:13	20:05	18:53	16:48	16:13
8	08:40	08:01	07:01	06:48	05:44	05:04	05:12	05:56	06:48	07:40	07:37	08:27
	16:30	17:25	18:18	20:14	21:07	21:50	21:54	21:11	20:03	18:51	16:46	16:12
9	08:39	07:59	06:59	06:45	05:42	05:04	05:13	05:57	06:50	07:42	07:39	08:28
	16:31	17:27	18:20	20:16	21:09	21:51	21:53	21:09	20:00	18:48	16:44	16:12
10	08:39	07:57	06:57	06:43	05:40	05:03	05:14	05:59	06:52	07:44	07:41	08:30
	16:33	17:28	18:22	20:18	21:11	21:52	21:52	21:07	19:58	18:46	16:42	16:12
11	08:38	07:55	06:54	06:41	05:38	05:03	05:15	06:01	06:54	07:46	07:43	08:31
	16:34	17:30	18:24	20:19	21:12	21:53	21:52	21:05	19:56	18:44	16:41	16:11
12	08:37	07:54	06:52	06:38	05:36	05:02	05:16	06:02	06:55	07:47	07:45	08:32
	16:36	17:32	18:25	20:21	21:14	21:54	21:51	21:03	19:53	18:42	16:39	16:11
13	08:37	07:52	06:50	06:36	05:35	05:02	05:17	06:04	06:57	07:49	07:47	08:33
	16:37	17:34	18:27	20:23	21:16	21:54	21:50	21:01	19:51	18:39	16:37	16:11
14	08:36	07:50	06:47	06:34	05:33	05:02	05:18	06:06	06:59	07:51	07:49	08:34
	16:39	17:36	18:29	20:25	21:17	21:55	21:49	20:59	19:48	18:37	16:36	16:11
15	08:35	07:48	06:45	06:32	05:31	05:02	05:20	06:07	07:00	07:53	07:50	08:35
	16:40	17:38	18:31	20:27	21:19	21:56	21:48	20:57	19:46	18:35	16:34	16:11
16	08:34	07:46	06:43	06:29	05:30	05:02	05:21	06:09	07:02	07:55	07:52	08:36
	16:42	17:40	18:33	20:28	21:20	21:56	21:47	20:55	19:44	18:32	16:33	16:11
17	08:33	07:43	06:40	06:27	05:28	05:01	05:22	06:11	07:04	07:56	07:54	08:36
	16:44	17:42	18:35	20:30	21:22	21:57	21:46	20:53	19:41	18:30	16:32	16:11
18	08:32	07:41	06:38	06:25	05:27	05:01	05:23	06:13	07:06	07:58	07:56	08:37
	16:45	17:44	18:36	20:32	21:24	21:57	21:44	20:51	19:39	18:28	16:30	16:12
19	08:31	07:39	06:35	06:23	05:25	05:01	05:25	06:14	07:07	08:00	07:58	08:38
	16:47	17:46	18:38	20:34	21:25	21:57	21:43	20:49	19:36	18:26	16:29	16:12
20	08:30	07:37	06:33	06:20	05:24	05:01	05:26	06:16	07:09	08:02	07:59	08:39
	16:49	17:48	18:40	20:35	21:27	21:58	21:42	20:46	19:34	18:24	16:27	16:12
21	08:29	07:35	06:31	06:18	05:22	05:02	05:28	06:18	07:11	08:04	08:01	08:39
	16:51	17:50	18:42	20:37	21:28	21:58	21:41	20:44	19:31	18:21	16:26	16:13
22	08:28	07:33	06:28	06:16	05:21	05:02	05:29	06:19	07:12	08:06	08:03	08:40
	16:52	17:52	18:44	20:39	21:30	21:58	21:39	20:42	19:29	18:19	16:25	16:13
23	08:26	07:31	06:26	06:14	05:20	05:02	05:30	06:21	07:14	08:07	08:05	08:40
	16:54	17:54	18:45	20:41	21:31	21:58	21:38	20:40	19:27	18:17	16:24	16:14
24	08:25	07:29	06:23	06:12	05:18	05:02	05:32	06:23	07:16	08:09	08:06	08:41
	16:56	17:56	18:47	20:43	21:33	21:58	21:37	20:38	19:24	18:15	16:23	16:14
25	08:24	07:26	06:21	06:10	05:17	05:03	05:33	06:25	07:18	08:11	08:08	08:41
	16:58	17:57	18:49	20:44	21:34	21:59	21:35	20:35	19:22	18:13	16:22	16:15
26	08:22	07:24	06:19	06:07	05:16	05:03	05:35	06:26	07:19	08:13	08:10	08:41
	17:00	17:59	18:51	20:46	21:35	21:58	21:34	20:33	19:19	18:11	16:21	16:16
27	08:21	07:22	06:16	06:05	05:15	05:04	05:36	06:28	07:21	08:15	08:11	08:42
	17:02	18:01	18:53	20:48	21:37	21:58	21:32	20:31	19:17	18:09	16:20	16:16
28	08:19	07:20	06:14	06:03	05:13	05:04	05:38	06:30	07:23	08:17	08:13	08:42
	17:03	18:03	18:54	20:50	21:38	21:58	21:30	20:28	19:15	18:07	16:19	16:17
29	08:18		07:12	06:01	05:12	05:05	05:39	06:31	07:24	08:19	08:14	08:42
	17:05		19:56	20:51	21:39	21:58	21:29	20:26	19:12	18:05	16:18	16:18
30	08:16		07:09	05:59	05:11	05:05	05:41	06:33	07:26	08:21	08:16	08:42
	17:07		19:58	20:53	21:41	21:58	21:27	20:24	19:10	18:03	16:17	16:19
31	08:15		07:07		05:10		05:43	06:35		07:22		08:42
	17:09		20:00		21:42		21:26	20:22		17:01		16:20
Sonnenscheinstunden	254	275	367	418	490	505	508	457	382	330	262	238
astr.max.mögl. Beschattung												

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_11 - IO 11 Hauptstraße 66 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42 16:21	08:13 17:11	07:17 18:05		07:04 20:02	05:09 21:43	
2	08:42 16:22	08:12 17:13	07:15 18:07		07:02 20:03	05:08 21:44	
3	08:42 16:23	08:10 17:15	07:13 18:09		07:00 20:05	05:08 21:45	
4	08:41 16:25	08:08 17:17	07:11 18:11		06:57 20:07	05:07 21:47	
5	08:41 16:26	08:06 17:19	07:08 18:12		06:55 20:09	05:06 21:48	
6	08:41 16:27	08:05 17:21	07:06 18:14		06:52 20:10	05:05 21:49	
7	08:40 16:28	08:03 17:23	07:04 18:16	7	07:33 (WEA_RE_01) 07:40 (WEA_RE_01)	06:50 20:12	05:05 21:50
8	08:40 16:30	08:01 17:25	07:01 18:18	15	07:26 (WEA_RE_01) 07:46 (WEA_RE_01)	06:48 20:14	05:04 21:50
9	08:39 16:31	07:59 17:26	06:59 18:20	20	07:23 (WEA_RE_03) 07:48 (WEA_RE_01)	06:45 20:16	05:04 21:51
10	08:39 16:33	07:57 17:28	06:57 18:22	25	07:20 (WEA_RE_03) 07:48 (WEA_RE_01)	06:43 20:18	05:03 21:52
11	08:38 16:34	07:55 17:30	06:54 18:24	28	07:18 (WEA_RE_03) 07:49 (WEA_RE_01)	06:41 20:19	05:03 21:53
12	08:37 16:36	07:53 17:32	06:52 18:25	31	07:16 (WEA_RE_03) 07:50 (WEA_RE_01)	06:38 20:21	05:02 21:54
13	08:37 16:37	07:52 17:34	06:50 18:27	34	07:13 (WEA_RE_03) 07:49 (WEA_RE_01)	06:36 20:23	05:02 21:54
14	08:36 16:39	07:50 17:36	06:47 18:29	36	07:11 (WEA_RE_03) 07:50 (WEA_RE_01)	06:34 20:25	05:02 21:55
15	08:35 16:40	07:48 17:38	06:45 18:31	39	07:10 (WEA_RE_03) 07:49 (WEA_RE_01)	06:32 20:27	05:01 21:56
16	08:34 16:42	07:46 17:40	06:43 18:33	39	07:10 (WEA_RE_03) 07:49 (WEA_RE_01)	06:29 20:28	05:01 21:56
17	08:33 16:44	07:43 17:42	06:40 18:35	39	07:09 (WEA_RE_03) 07:48 (WEA_RE_01)	06:27 20:30	05:01 21:57
18	08:32 16:45	07:41 17:44	06:38 18:36	39	07:09 (WEA_RE_03) 07:48 (WEA_RE_01)	06:25 20:32	05:01 21:57
19	08:31 16:47	07:39 17:46	06:35 18:38	39	07:10 (WEA_RE_03) 07:47 (WEA_RE_01)	06:23 20:34	05:01 21:57
20	08:30 16:49	07:37 17:48	06:33 18:40	37	07:10 (WEA_RE_03) 07:46 (WEA_RE_01)	06:20 20:35	05:01 21:58
21	08:29 16:51	07:35 17:50	06:31 18:42	36	07:11 (WEA_RE_03) 07:45 (WEA_RE_01)	06:18 20:37	05:02 21:58
22	08:28 16:52	07:33 17:52	06:28 18:44	34	07:12 (WEA_RE_03) 07:43 (WEA_RE_01)	06:16 20:39	05:02 21:58
23	08:26 16:54	07:31 17:54	06:26 18:45	31	07:14 (WEA_RE_03) 07:41 (WEA_RE_01)	06:14 20:41	05:02 21:58
24	08:25 16:56	07:29 17:55	06:23 18:47	27	07:25 (WEA_RE_01) 07:38 (WEA_RE_01)	06:12 20:43	05:02 21:58
25	08:24 16:58	07:26 17:57	06:21 18:49	13	07:29 (WEA_RE_01) 07:32 (WEA_RE_01)	06:09 20:44	05:03 21:58
26	08:22 17:00	07:24 17:59	06:19 18:51	3		06:07 20:46	05:03 21:58
27	08:21 17:02	07:22 18:01	06:16 18:53			06:05 20:48	05:03 21:58
28	08:19 17:03	07:20 18:03	06:14 18:54			06:03 20:50	05:04 21:58
29	08:18 17:05		07:11 19:56			06:01 20:51	05:05 21:58
30	08:16 17:07		07:09 19:58			05:59 20:53	05:05 21:58
31	08:15 17:09		07:07 20:00			05:10 21:42	
Sonnenscheinstunden		254	275	367	418	490	505
astr.max.mögl.Beschattung			426	572			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_11 - IO 11 Hauptstraße 66 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September		Oktober		November		Dezember
1	05:06	05:44	06:36		07:28		07:24		08:17
	21:58	21:24	20:19		19:07	35	08:29 (WEA_RE_01)	16:59	16:16
2	05:07	05:46	06:38		07:30		07:56 (WEA_RE_03)	07:26	08:19
	21:57	21:22	20:17		19:05	32	08:28 (WEA_RE_01)	16:57	16:15
3	05:07	05:47	06:40		07:31		07:57 (WEA_RE_03)	07:28	08:20
	21:57	21:20	20:15		19:03	29	08:26 (WEA_RE_01)	16:55	16:15
4	05:08	05:49	06:42		07:33		07:59 (WEA_RE_03)	07:30	08:22
	21:56	21:19	20:12		19:00	26	08:25 (WEA_RE_01)	16:53	16:14
5	05:09	05:51	06:43		07:35		08:02 (WEA_RE_01)	07:32	08:23
	21:56	21:17	20:10		18:58	22	08:24 (WEA_RE_01)	16:51	16:13
6	05:10	05:52	06:45		07:37		08:04 (WEA_RE_01)	07:34	08:25
	21:55	21:15	20:07		18:55	18	08:22 (WEA_RE_01)	16:49	16:13
7	05:11	05:54	06:47		07:38		08:07 (WEA_RE_01)	07:36	08:26
	21:55	21:13	20:05		18:53	12	08:19 (WEA_RE_01)	16:48	16:13
8	05:12	05:56	06:48		07:40			07:37	08:27
	21:54	21:11	20:03		18:51			16:46	16:12
9	05:13	05:57	06:50		07:42			07:39	08:28
	21:53	21:09	20:00		18:48			16:44	16:12
10	05:14	05:59	06:52		07:44			07:41	08:30
	21:52	21:07	19:58		18:46			16:42	16:12
11	05:15	06:01	06:54		07:46			07:43	08:31
	21:52	21:05	19:56		18:44			16:41	16:11
12	05:16	06:02	06:55		07:47			07:45	08:32
	21:51	21:03	19:53		18:41			16:39	16:11
13	05:17	06:04	06:57		07:49		08:56 (WEA_RE_02)	07:47	08:33
	21:50	21:01	19:51		18:39	7	09:03 (WEA_RE_02)	16:37	16:11
14	05:18	06:06	06:59		07:51		08:53 (WEA_RE_02)	07:49	08:34
	21:49	20:59	19:48		18:37	14	09:07 (WEA_RE_02)	16:36	16:11
15	05:20	06:07	07:00		07:53		08:49 (WEA_RE_02)	07:50	08:35
	21:48	20:57	19:46		18:35	19	09:08 (WEA_RE_02)	16:34	16:11
16	05:21	06:09	07:02		07:55		08:48 (WEA_RE_02)	07:52	08:36
	21:47	20:55	19:43		18:32	21	09:09 (WEA_RE_02)	16:33	16:11
17	05:22	06:11	07:04		07:56		08:47 (WEA_RE_02)	07:54	08:36
	21:46	20:53	19:41		18:30	23	09:10 (WEA_RE_02)	16:31	16:11
18	05:23	06:13	07:05		07:58		08:46 (WEA_RE_02)	07:56	08:37
	21:44	20:51	19:39		18:28	25	09:11 (WEA_RE_02)	16:30	16:12
19	05:25	06:14	07:07		08:00		08:45 (WEA_RE_02)	07:58	08:38
	21:43	20:49	19:36	12	08:24 (WEA_RE_01)	18:26	09:11 (WEA_RE_02)	16:29	16:12
20	05:26	06:16	07:09		08:02 (WEA_RE_03)	08:02	08:44 (WEA_RE_02)	07:59	08:39
	21:42	20:46	19:34	25	08:27 (WEA_RE_01)	18:24	09:12 (WEA_RE_02)	16:27	16:12
21	05:27	06:18	07:11		07:58 (WEA_RE_03)	08:04	08:44 (WEA_RE_02)	08:01	08:39
	21:41	20:44	19:31	30	08:28 (WEA_RE_01)	18:21	09:12 (WEA_RE_02)	16:26	16:13
22	05:29	06:19	07:12		07:56 (WEA_RE_03)	08:06	08:44 (WEA_RE_02)	08:03	08:40
	21:39	20:42	19:29	33	08:29 (WEA_RE_01)	18:19	09:12 (WEA_RE_02)	16:25	16:13
23	05:30	06:21	07:14		07:55 (WEA_RE_03)	08:07	08:44 (WEA_RE_02)	08:05	08:40
	21:38	20:40	19:27	35	08:30 (WEA_RE_01)	18:17	09:12 (WEA_RE_02)	16:24	16:14
24	05:32	06:23	07:16		07:54 (WEA_RE_03)	08:09	08:44 (WEA_RE_02)	08:06	08:41
	21:37	20:38	19:24	37	08:31 (WEA_RE_01)	18:15	09:12 (WEA_RE_02)	16:23	16:14
25	05:33	06:25	07:18		07:52 (WEA_RE_03)	07:11	07:44 (WEA_RE_02)	08:08	08:41
	21:35	20:35	19:22	38	08:30 (WEA_RE_01)	17:13	08:11 (WEA_RE_02)	16:22	16:15
26	05:35	06:26	07:19		07:52 (WEA_RE_03)	07:13	07:45 (WEA_RE_02)	08:10	08:41
	21:34	20:33	19:19	39	08:31 (WEA_RE_01)	17:11	08:11 (WEA_RE_02)	16:20	16:16
27	05:36	06:28	07:21		07:51 (WEA_RE_03)	07:15	07:45 (WEA_RE_02)	08:11	08:42
	21:32	20:31	19:17	40	08:31 (WEA_RE_01)	17:09	08:10 (WEA_RE_02)	16:19	16:16
28	05:38	06:30	07:23		07:51 (WEA_RE_03)	07:17	07:46 (WEA_RE_02)	08:13	08:42
	21:30	20:28	19:15	39	08:30 (WEA_RE_01)	17:07	08:09 (WEA_RE_02)	16:19	16:17
29	05:39	06:31	07:24		07:51 (WEA_RE_03)	07:19	07:47 (WEA_RE_02)	08:14	08:42
	21:29	20:26	19:12	39	08:30 (WEA_RE_01)	17:05	08:08 (WEA_RE_02)	16:18	16:18
30	05:41	06:33	07:26		07:52 (WEA_RE_03)	07:20	07:49 (WEA_RE_02)	08:16	08:42
	21:27	20:24	19:10	37	08:29 (WEA_RE_01)	17:03	08:06 (WEA_RE_02)	16:17	16:19
31	05:43	06:35			07:22		07:51 (WEA_RE_02)		08:42
	21:26	20:22			17:01	13	08:04 (WEA_RE_02)		16:20
Sonnenscheinstunden	508	457	382		330	601	262	7	238
astr.max.mögl.Beschattung			404						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_12 - IO 12 Hauptstraße 68 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42 16:21	08:13 17:11	08:42 (WEA_RE_02) 18:05	07:45 (WEA_RE_01) 07:04	05:57 20:55	05:09 21:43
2	08:42 16:22	08:12 17:13	08:40 (WEA_RE_02) 18:07	07:42 (WEA_RE_01) 07:02	05:55 20:57	05:08 21:44
3	08:42 16:23	08:10 17:15	08:38 (WEA_RE_02) 18:09	07:41 (WEA_RE_01) 07:00	05:53 20:58	05:08 21:45
4	08:41 16:25	08:08 17:17	08:36 (WEA_RE_02) 18:11	07:40 (WEA_RE_01) 06:57	05:51 21:00	05:07 21:47
5	08:41 16:26	08:06 17:19	08:35 (WEA_RE_02) 18:12	07:32 (WEA_RE_03) 06:55	05:49 21:02	05:06 21:48
6	08:41 16:27	08:05 17:21	08:34 (WEA_RE_02) 18:14	07:30 (WEA_RE_03) 06:52	05:47 21:04	05:05 21:49
7	08:40 16:28	08:03 17:23	08:33 (WEA_RE_02) 18:16	07:27 (WEA_RE_03) 06:50	05:45 21:05	05:05 21:50
8	08:40 16:30	08:01 17:25	08:32 (WEA_RE_02) 18:18	07:25 (WEA_RE_03) 06:48	05:43 21:07	05:04 21:50
9	08:39 16:31	07:59 17:26	08:32 (WEA_RE_02) 18:20	07:24 (WEA_RE_03) 06:45	05:42 21:09	05:04 21:51
10	08:39 16:33	07:57 17:28	08:32 (WEA_RE_02) 18:22	07:22 (WEA_RE_03) 06:43	05:40 21:11	05:03 21:52
11	08:38 16:34	07:55 17:30	08:31 (WEA_RE_02) 18:24	07:22 (WEA_RE_03) 06:41	05:38 21:12	05:03 21:53
12	08:37 16:36	07:53 17:32	08:31 (WEA_RE_02) 18:25	07:22 (WEA_RE_03) 06:38	05:36 21:14	05:02 21:54
13	08:37 16:37	07:52 17:34	08:31 (WEA_RE_02) 18:27	07:21 (WEA_RE_03) 06:36	05:35 21:16	05:02 21:54
14	08:36 16:39	07:50 17:36	08:32 (WEA_RE_02) 18:29	07:22 (WEA_RE_03) 06:34	05:33 21:17	05:02 21:55
15	08:35 16:40	07:48 17:38	08:32 (WEA_RE_02) 18:31	07:21 (WEA_RE_03) 06:32	05:31 21:19	05:02 21:56
16	08:34 16:42	07:45 17:40	08:33 (WEA_RE_02) 18:33	07:22 (WEA_RE_03) 06:29	05:30 21:20	05:01 21:56
17	08:33 16:44	07:43 17:42	08:33 (WEA_RE_02) 18:35	07:22 (WEA_RE_03) 06:27	05:28 21:22	05:01 21:57
18	08:32 16:45	07:41 17:44	08:33 (WEA_RE_02) 18:36	07:24 (WEA_RE_03) 06:25	05:27 21:24	05:01 21:57
19	08:31 16:47	07:39 17:46	08:34 (WEA_RE_02) 18:38	08:00 (WEA_RE_01) 06:23	05:25 21:25	05:01 21:57
20	08:30 16:49	07:37 17:48	08:36 (WEA_RE_02) 18:40	07:26 (WEA_RE_03) 06:20	05:24 21:27	05:01 21:58
21	08:29 16:51	07:35 17:50	08:38 (WEA_RE_02) 18:42	07:58 (WEA_RE_01) 06:20	05:22 21:28	05:02 21:58
22	08:27 16:52	07:33 17:52	08:40 (WEA_RE_02) 18:44	07:29 (WEA_RE_03) 06:18	05:21 21:30	05:02 21:58
23	08:26 16:54	07:31 17:54	08:42 (WEA_RE_02) 18:45	07:53 (WEA_RE_01) 06:14	05:19 21:31	05:02 21:58
24	08:25 16:56	07:29 17:55	08:44 (WEA_RE_02) 18:47	08:00 (WEA_RE_01) 06:12	05:18 21:33	05:02 21:58
25	08:24 16:58	07:26 17:57	08:46 (WEA_RE_02) 18:49	08:00 (WEA_RE_01) 06:09	05:17 21:34	05:03 21:58
26	08:22 17:00	07:24 17:59	08:48 (WEA_RE_02) 18:51	08:00 (WEA_RE_01) 06:07	05:16 21:35	05:03 21:58
27	08:21 17:02	07:22 18:01	08:50 (WEA_RE_02) 18:53	08:00 (WEA_RE_01) 06:05	05:15 21:37	05:03 21:58
28	08:19 17:03	07:20 18:03	07:48 (WEA_RE_01) 06:14	08:00 (WEA_RE_01) 06:03	05:13 21:38	05:04 21:58
29	08:18 17:05	07:19 18:04	08:01 (WEA_RE_01) 18:54	08:00 (WEA_RE_01) 06:01	05:12 21:39	05:05 21:58
30	08:16 17:07	07:18 18:05	08:02 (WEA_RE_01) 18:55	08:00 (WEA_RE_01) 05:59	05:11 21:41	05:05 21:58
31	08:15 17:09	07:17 18:06	08:03 (WEA_RE_01) 18:56	08:00 (WEA_RE_01) 05:57	05:10 21:42	05:05 21:58
Sonnenscheinstunden		254	275	367	418	505
astr.max.mögl.Beschattung			531	734		

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	--	---------------------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_12 - IO 12 Hauptstraße 68 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September		Oktober		November		Dezember	
1	05:06	05:44	06:36		07:28		07:24		08:17	
	21:58	21:24	20:19		19:07	46	08:47 (WEA_RE_01)	16:59	08:31 (WEA_RE_02)	16:16
2	05:07	05:46	06:38		07:30		08:01 (WEA_RE_03)	07:26	08:02 (WEA_RE_02)	08:19
	21:57	21:22	20:17		19:05	46	08:47 (WEA_RE_01)	16:57	08:30 (WEA_RE_02)	16:15
3	05:07	05:47	06:40		07:31		08:00 (WEA_RE_03)	07:28	08:02 (WEA_RE_02)	08:20
	21:57	21:20	20:15		19:03	46	08:46 (WEA_RE_01)	16:55	08:30 (WEA_RE_02)	16:15
4	05:08	05:49	06:42		07:33		08:00 (WEA_RE_03)	07:30	08:03 (WEA_RE_02)	08:22
	21:56	21:19	20:12		19:00	46	08:46 (WEA_RE_01)	16:53	08:29 (WEA_RE_02)	16:14
5	05:09	05:51	06:43		07:35		08:01 (WEA_RE_03)	07:32	08:04 (WEA_RE_02)	08:23
	21:56	21:17	20:10		18:58	45	08:46 (WEA_RE_01)	16:51	08:28 (WEA_RE_02)	16:13
6	05:10	05:52	06:45		07:37		08:03 (WEA_RE_03)	07:34	08:05 (WEA_RE_02)	08:25
	21:55	21:15	20:07		18:55	43	08:46 (WEA_RE_01)	16:49	08:27 (WEA_RE_02)	16:13
7	05:11	05:54	06:47		07:38		08:05 (WEA_RE_03)	07:36	08:06 (WEA_RE_02)	08:26
	21:55	21:13	20:05		18:53	40	08:45 (WEA_RE_01)	16:47	08:26 (WEA_RE_02)	16:13
8	05:12	05:56	06:48		07:40		08:06 (WEA_RE_03)	07:37	08:08 (WEA_RE_02)	08:27
	21:54	21:11	20:03		18:51	37	08:43 (WEA_RE_01)	16:46	08:24 (WEA_RE_02)	16:12
9	05:13	05:57	06:50		07:42		08:08 (WEA_RE_03)	07:39	08:10 (WEA_RE_02)	08:28
	21:53	21:09	20:00		18:48	34	08:42 (WEA_RE_01)	16:44	08:22 (WEA_RE_02)	16:12
10	05:14	05:59	06:52		07:44		08:15 (WEA_RE_01)	07:41	08:14 (WEA_RE_02)	08:30
	21:52	21:07	19:58		18:46	26	08:41 (WEA_RE_01)	16:42	4 08:18 (WEA_RE_02)	16:12
11	05:15	06:01	06:54		07:46		08:16 (WEA_RE_01)	07:43		08:31
	21:52	21:05	19:56		18:44	24	08:40 (WEA_RE_01)	16:41		16:11
12	05:16	06:02	06:55		07:47		08:17 (WEA_RE_01)	07:45		08:32
	21:51	21:03	19:53		18:41	21	08:38 (WEA_RE_01)	16:39		16:11
13	05:17	06:04	06:57		07:49		08:19 (WEA_RE_01)	07:47		08:33
	21:50	21:01	19:51		18:39	17	08:36 (WEA_RE_01)	16:37		16:11
14	05:18	06:06	06:59		07:51		08:23 (WEA_RE_01)	07:49		08:34
	21:49	20:59	19:48		18:37	9	08:32 (WEA_RE_01)	16:36		16:11
15	05:20	06:07	07:00		07:53			07:50		08:35
	21:48	20:57	19:46		18:35			16:34		16:11
16	05:21	06:09	07:02		07:55			07:52		08:36
	21:47	20:55	19:43		18:32			16:33		16:11
17	05:22	06:11	07:04		07:56			07:54		08:36
	21:46	20:53	19:41		18:30			16:31		16:11
18	05:23	06:13	07:05		07:58			07:56		08:37
	21:44	20:51	19:39		18:28			16:30		16:12
19	05:25	06:14	07:07		08:00		09:14 (WEA_RE_02)	07:58		08:38
	21:43	20:49	19:36		18:26	5	09:19 (WEA_RE_02)	16:29		16:12
20	05:26	06:16	07:09		08:02		09:10 (WEA_RE_02)	07:59		08:39
	21:42	20:46	19:34		18:24	14	09:24 (WEA_RE_02)	16:27		16:12
21	05:27	06:18	07:11		08:04		09:07 (WEA_RE_02)	08:01		08:39
	21:41	20:44	19:31		18:21	19	09:26 (WEA_RE_02)	16:26		16:13
22	05:29	06:19	07:12		08:06		09:06 (WEA_RE_02)	08:03		08:40
	21:39	20:42	19:29		18:19	21	09:27 (WEA_RE_02)	16:25		16:13
23	05:30	06:21	07:14		08:07		09:04 (WEA_RE_02)	08:05		08:40
	21:38	20:40	19:27	5	08:36 (WEA_RE_01)	18:17	09:29 (WEA_RE_02)	16:24		16:14
24	05:32	06:23	07:16		08:10 (WEA_RE_03)	08:09	09:03 (WEA_RE_02)	08:06		08:41
	21:37	20:38	19:24	27	08:41 (WEA_RE_01)	18:15	09:29 (WEA_RE_02)	16:23		16:14
25	05:33	06:25	07:17		08:07 (WEA_RE_03)	07:11	08:03 (WEA_RE_02)	08:08		08:41
	21:35	20:35	19:22	35	08:42 (WEA_RE_01)	17:13	08:30 (WEA_RE_02)	16:21		16:15
26	05:35	06:26	07:19		08:05 (WEA_RE_03)	07:13	08:02 (WEA_RE_02)	08:10		08:41
	21:34	20:33	19:19	39	08:44 (WEA_RE_01)	17:11	08:31 (WEA_RE_02)	16:20		16:16
27	05:36	06:28	07:21		08:04 (WEA_RE_03)	07:15	08:01 (WEA_RE_02)	08:11		08:42
	21:32	20:31	19:17	41	08:45 (WEA_RE_01)	17:09	08:31 (WEA_RE_02)	16:19		16:16
28	05:38	06:30	07:23		08:02 (WEA_RE_03)	07:17	08:01 (WEA_RE_02)	08:13		08:42
	21:30	20:28	19:15	43	08:45 (WEA_RE_01)	17:07	08:31 (WEA_RE_02)	16:19		16:17
29	05:39	06:31	07:24		08:01 (WEA_RE_03)	07:19	08:01 (WEA_RE_02)	08:14		08:42
	21:29	20:26	19:12	45	08:46 (WEA_RE_01)	17:05	08:31 (WEA_RE_02)	16:18		16:18
30	05:41	06:33	07:26		08:01 (WEA_RE_03)	07:20	08:01 (WEA_RE_02)	08:16		08:42
	21:27	20:24	19:10	46	08:47 (WEA_RE_01)	17:03	08:31 (WEA_RE_02)	16:17		16:19
31	05:43	06:35			07:22		08:01 (WEA_RE_02)			08:42
	21:26	20:22			17:01	30	08:31 (WEA_RE_02)			16:20
Sonnenscheinstunden	508	457	382		330		262	210		238
astr.max.mögl.Beschattung			281		796					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	--	---------------------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_13 - IO 13 Hauptstraße 81 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42	09:16 (WEA_RE_02) 08:13	09:19 (WEA_RE_02) 07:17	07:59 (WEA_RE_03) 07:04	05:57	05:09
2	16:21	09:27 (WEA_RE_02) 17:11	09:43 (WEA_RE_02) 18:05	08:52 (WEA_RE_01) 20:01	20:55	21:43
3	08:42	09:16 (WEA_RE_02) 08:12	09:21 (WEA_RE_02) 07:15	07:59 (WEA_RE_03) 07:02	07:25 (WEA_RE_04) 05:55	05:08
4	16:22	09:28 (WEA_RE_02) 17:13	09:42 (WEA_RE_02) 18:07	08:48 (WEA_RE_01) 20:03	07:31 (WEA_RE_04) 20:57	21:44
5	08:42	09:15 (WEA_RE_02) 08:10	09:23 (WEA_RE_02) 07:13	08:00 (WEA_RE_03) 07:00	07:23 (WEA_RE_04) 05:53	05:08
6	16:23	09:29 (WEA_RE_02) 17:15	09:41 (WEA_RE_02) 18:09	08:23 (WEA_RE_03) 20:05	07:34 (WEA_RE_04) 20:58	21:45
7	08:41	09:15 (WEA_RE_02) 08:08	09:25 (WEA_RE_02) 07:11	08:01 (WEA_RE_03) 06:57	07:20 (WEA_RE_04) 05:51	05:07
8	16:25	09:31 (WEA_RE_02) 17:17	09:38 (WEA_RE_02) 18:11	08:21 (WEA_RE_03) 20:07	07:35 (WEA_RE_04) 21:00	21:47
9	08:41	09:14 (WEA_RE_02) 08:06	09:29 (WEA_RE_02) 07:08	08:02 (WEA_RE_03) 06:55	07:18 (WEA_RE_04) 05:49	05:06
10	16:26	09:31 (WEA_RE_02) 17:19	09:34 (WEA_RE_02) 18:12	08:19 (WEA_RE_03) 20:09	07:36 (WEA_RE_04) 21:02	21:48
11	08:41	09:14 (WEA_RE_02) 08:05	08:38 (WEA_RE_01) 07:06	08:05 (WEA_RE_03) 06:52	07:16 (WEA_RE_04) 05:47	05:05
12	16:27	09:33 (WEA_RE_02) 17:21	08:50 (WEA_RE_01) 18:14	08:16 (WEA_RE_03) 20:10	07:37 (WEA_RE_04) 21:04	21:49
13	08:40	09:14 (WEA_RE_02) 08:03	08:35 (WEA_RE_01) 07:04	06:50	07:13 (WEA_RE_04) 05:45	05:05
14	16:28	09:34 (WEA_RE_02) 17:23	08:53 (WEA_RE_01) 18:16	08:12	07:37 (WEA_RE_04) 21:05	21:50
15	08:40	09:13 (WEA_RE_02) 08:01	08:33 (WEA_RE_01) 07:01	06:48	07:13 (WEA_RE_04) 05:43	05:04
16	16:30	09:34 (WEA_RE_02) 17:25	08:55 (WEA_RE_01) 18:18	08:14	07:37 (WEA_RE_04) 21:07	21:50
17	08:39	09:14 (WEA_RE_02) 07:59	08:31 (WEA_RE_01) 06:59	06:45	07:13 (WEA_RE_04) 05:42	05:04
18	16:31	09:36 (WEA_RE_02) 17:26	08:56 (WEA_RE_01) 18:20	08:16	07:37 (WEA_RE_04) 21:09	21:51
19	08:39	09:13 (WEA_RE_02) 07:57	08:30 (WEA_RE_01) 06:57	06:43	07:12 (WEA_RE_04) 05:40	05:03
20	16:33	09:37 (WEA_RE_02) 17:28	08:58 (WEA_RE_01) 18:22	08:18	07:36 (WEA_RE_04) 21:10	21:52
21	08:38	09:13 (WEA_RE_02) 07:55	08:29 (WEA_RE_01) 06:54	06:41	07:12 (WEA_RE_04) 05:38	05:03
22	16:34	09:38 (WEA_RE_02) 17:30	08:59 (WEA_RE_01) 18:24	08:19	07:36 (WEA_RE_04) 21:12	21:53
23	08:37	09:13 (WEA_RE_02) 07:53	08:28 (WEA_RE_01) 06:52	06:38	07:12 (WEA_RE_04) 05:36	05:02
24	16:36	09:38 (WEA_RE_02) 17:32	09:00 (WEA_RE_01) 18:25	08:21	07:35 (WEA_RE_04) 21:14	21:54
25	08:37	09:12 (WEA_RE_02) 07:52	08:28 (WEA_RE_01) 06:50	06:36	07:13 (WEA_RE_04) 05:35	05:02
26	16:37	09:39 (WEA_RE_02) 17:34	09:01 (WEA_RE_01) 18:27	08:23	07:35 (WEA_RE_04) 21:16	21:54
27	08:36	09:12 (WEA_RE_02) 07:50	08:27 (WEA_RE_01) 06:47	06:34	07:13 (WEA_RE_04) 05:33	05:02
28	16:39	09:40 (WEA_RE_02) 17:36	09:01 (WEA_RE_01) 18:29	08:25	07:35 (WEA_RE_04) 21:17	21:55
29	08:35	09:12 (WEA_RE_02) 07:48	08:27 (WEA_RE_01) 06:45	06:32	07:14 (WEA_RE_04) 05:31	05:02
30	16:40	09:41 (WEA_RE_02) 17:38	09:02 (WEA_RE_01) 18:31	08:27	07:32 (WEA_RE_04) 21:19	21:56
31	08:34	09:13 (WEA_RE_02) 07:45	08:26 (WEA_RE_01) 06:43	06:29	07:15 (WEA_RE_04) 05:30	05:01
32	16:42	09:42 (WEA_RE_02) 17:40	09:02 (WEA_RE_01) 18:33	08:28	07:30 (WEA_RE_04) 21:20	21:56
33	08:33	09:13 (WEA_RE_02) 07:43	08:09 (WEA_RE_03) 06:40	06:27	07:18 (WEA_RE_04) 05:28	05:01
34	16:44	09:43 (WEA_RE_02) 17:42	09:03 (WEA_RE_01) 18:35	08:30	07:27 (WEA_RE_04) 21:22	21:57
35	08:32	09:13 (WEA_RE_02) 07:41	08:06 (WEA_RE_03) 06:38	06:25	07:18 (WEA_RE_04) 05:27	05:01
36	16:45	09:43 (WEA_RE_02) 17:44	09:02 (WEA_RE_01) 18:36	08:31	07:27 (WEA_RE_04) 21:24	21:57
37	08:31	09:12 (WEA_RE_02) 07:39	08:04 (WEA_RE_03) 06:35	06:23	07:18 (WEA_RE_04) 05:25	05:01
38	16:47	09:43 (WEA_RE_02) 17:46	09:02 (WEA_RE_01) 18:38	08:33	07:27 (WEA_RE_04) 21:25	21:57
39	08:30	09:13 (WEA_RE_02) 07:37	08:02 (WEA_RE_03) 06:33	06:20	07:18 (WEA_RE_04) 05:24	05:01
40	16:49	09:44 (WEA_RE_02) 17:48	09:02 (WEA_RE_01) 18:40	08:35	07:27 (WEA_RE_04) 21:27	21:58
41	08:29	09:13 (WEA_RE_02) 07:35	08:01 (WEA_RE_03) 06:31	06:18	07:18 (WEA_RE_04) 05:22	05:02
42	16:51	09:45 (WEA_RE_02) 17:50	09:02 (WEA_RE_01) 18:42	08:37	07:27 (WEA_RE_04) 21:28	21:58
43	08:27	09:13 (WEA_RE_02) 07:33	08:00 (WEA_RE_03) 06:28	06:16	07:18 (WEA_RE_04) 05:21	05:02
44	16:52	09:44 (WEA_RE_02) 17:52	09:02 (WEA_RE_01) 18:44	08:39	07:27 (WEA_RE_04) 21:30	21:58
45	08:26	09:14 (WEA_RE_02) 07:31	07:59 (WEA_RE_03) 06:26	06:14	07:19 (WEA_RE_04) 05:19	05:02
46	16:54	09:45 (WEA_RE_02) 17:54	09:00 (WEA_RE_01) 18:45	08:41	07:27 (WEA_RE_04) 21:31	21:58
47	08:25	09:14 (WEA_RE_02) 07:29	07:59 (WEA_RE_03) 06:23	06:12	07:19 (WEA_RE_04) 05:18	05:02
48	16:56	09:45 (WEA_RE_02) 17:55	09:00 (WEA_RE_01) 18:47	08:43	07:27 (WEA_RE_04) 21:33	21:58
49	08:24	09:14 (WEA_RE_02) 07:26	07:59 (WEA_RE_03) 06:21	06:09	07:19 (WEA_RE_04) 05:17	05:03
50	16:58	09:45 (WEA_RE_02) 17:57	08:59 (WEA_RE_01) 18:49	08:44	07:27 (WEA_RE_04) 21:34	21:58
51	08:22	09:14 (WEA_RE_02) 07:24	07:58 (WEA_RE_03) 06:19	06:07	07:19 (WEA_RE_04) 05:16	05:03
52	17:00	09:45 (WEA_RE_02) 17:59	08:57 (WEA_RE_01) 18:51	08:46	07:27 (WEA_RE_04) 21:35	21:58
53	08:21	09:16 (WEA_RE_02) 07:22	07:58 (WEA_RE_03) 06:16	06:05	07:19 (WEA_RE_04) 05:15	05:03
54	17:01	09:45 (WEA_RE_02) 18:01	08:56 (WEA_RE_01) 18:53	08:48	07:27 (WEA_RE_04) 21:37	21:58
55	08:19	09:16 (WEA_RE_02) 07:20	07:58 (WEA_RE_03) 06:14	06:03	07:19 (WEA_RE_04) 05:13	05:04
56	17:03	09:45 (WEA_RE_02) 18:03	08:54 (WEA_RE_01) 18:54	08:50	07:27 (WEA_RE_04) 21:38	21:58
57	08:18	09:17 (WEA_RE_02)	07:11	06:01	07:19 (WEA_RE_04) 05:12	05:05
58	17:05	09:45 (WEA_RE_02)	19:56	20:51	07:27 (WEA_RE_04) 21:39	21:58
59	08:16	09:18 (WEA_RE_02)	07:09	05:59	07:19 (WEA_RE_04) 05:11	05:05
60	17:07	09:45 (WEA_RE_02)	19:58	20:53	07:27 (WEA_RE_04) 21:41	21:58
61	08:15	09:18 (WEA_RE_02)	07:07	05:59	07:19 (WEA_RE_04) 05:10	05:05
62	17:09	09:44 (WEA_RE_02)	20:00	20:57	07:27 (WEA_RE_04) 21:42	21:58
Sonnenscheinstunden	254		367	418	490	505
astr.max.mögl.Beschattung	787	1058	153	298		

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	---------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_13 - IO 13 Hauptstraße 81 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember				
1	05:06 05:44		06:36 07:11 (WEA_RE_04) 07:28		07:24 08:00 (WEA_RE_01) 08:17	08:55 (WEA_RE_02)				
2	21:58 21:24		20:19 07:35 (WEA_RE_04) 19:07		16:59 08:27 (WEA_RE_01) 16:16	09:20 (WEA_RE_02)				
3	05:06 05:46		06:38 07:11 (WEA_RE_04) 07:30		07:26 08:01 (WEA_RE_01) 08:19	08:56 (WEA_RE_02)				
4	21:57 21:22		20:17 07:35 (WEA_RE_04) 19:05		16:57 08:26 (WEA_RE_01) 16:15	09:20 (WEA_RE_02)				
5	05:07 05:47		06:40 07:11 (WEA_RE_04) 07:31		07:28 08:03 (WEA_RE_01) 08:20	08:57 (WEA_RE_02)				
6	21:57 21:20		20:15 07:35 (WEA_RE_04) 19:03		16:55 08:24 (WEA_RE_01) 16:15	09:19 (WEA_RE_02)				
7	05:08 05:49		06:42 07:10 (WEA_RE_04) 07:33		07:30 08:05 (WEA_RE_01) 08:22	08:58 (WEA_RE_02)				
8	21:56 21:19		20:12 07:34 (WEA_RE_04) 19:00		16:53 08:22 (WEA_RE_01) 16:14	09:20 (WEA_RE_02)				
9	05:09 05:51		06:43 07:10 (WEA_RE_04) 07:35		07:32 08:08 (WEA_RE_01) 08:23	08:59 (WEA_RE_02)				
10	21:56 21:17		20:10 07:34 (WEA_RE_04) 18:58		16:51 08:19 (WEA_RE_01) 16:13	09:19 (WEA_RE_02)				
11	05:10 05:52		06:45 07:11 (WEA_RE_04) 07:37		07:34 08:58 (WEA_RE_02) 08:25	09:00 (WEA_RE_02)				
12	21:55 21:15		20:07 07:32 (WEA_RE_04) 18:55		16:49 09:05 (WEA_RE_02) 16:13	09:19 (WEA_RE_02)				
13	05:11 05:54		06:47 07:13 (WEA_RE_04) 07:38		07:36 08:54 (WEA_RE_02) 08:26	09:01 (WEA_RE_02)				
14	21:55 21:13		20:05 07:31 (WEA_RE_04) 18:53	7	08:50 (WEA_RE_03) 16:47	14	09:08 (WEA_RE_02) 16:13	17	09:18 (WEA_RE_02)	
15	05:12 05:56		06:48 07:15 (WEA_RE_04) 07:40		08:38 (WEA_RE_03) 07:37		08:52 (WEA_RE_02) 08:27		09:02 (WEA_RE_02)	
16	21:54 21:11		20:03 07:30 (WEA_RE_04) 18:51	15	08:53 (WEA_RE_03) 16:46	19	09:11 (WEA_RE_02) 16:12	16	09:18 (WEA_RE_02)	
17	05:13 05:57		06:50 07:16 (WEA_RE_04) 07:42		08:36 (WEA_RE_03) 07:39		08:51 (WEA_RE_02) 08:28		09:04 (WEA_RE_02)	
18	21:53 21:09		20:00 07:27 (WEA_RE_04) 18:48	19	08:55 (WEA_RE_03) 16:44	21	09:12 (WEA_RE_02) 16:12	14	09:18 (WEA_RE_02)	
19	05:14 05:59		06:52 07:18 (WEA_RE_04) 07:44		08:35 (WEA_RE_03) 07:41		08:50 (WEA_RE_02) 08:30		09:05 (WEA_RE_02)	
20	21:52 21:07		19:58 07:25 (WEA_RE_04) 18:46	21	08:56 (WEA_RE_03) 16:42	23	09:13 (WEA_RE_02) 16:12	12	09:17 (WEA_RE_02)	
21	05:15 06:01		06:54 07:20 (WEA_RE_04) 07:46		08:34 (WEA_RE_03) 07:43		08:49 (WEA_RE_02) 08:31		09:06 (WEA_RE_02)	
22	21:52 21:05		19:56 07:22 (WEA_RE_04) 18:44	29	09:19 (WEA_RE_01) 16:41	26	09:15 (WEA_RE_02) 16:11	11	09:17 (WEA_RE_02)	
23	05:16 06:02		06:55 07:23 (WEA_RE_04) 07:47		08:33 (WEA_RE_03) 07:45		08:49 (WEA_RE_02) 08:32		09:07 (WEA_RE_02)	
24	21:51 21:03		19:53 07:21 (WEA_RE_04) 18:41	41	09:24 (WEA_RE_01) 16:39	26	09:15 (WEA_RE_02) 16:11	9	09:16 (WEA_RE_02)	
25	05:17 06:04		06:57 07:24 (WEA_RE_04) 07:49		08:32 (WEA_RE_03) 07:47		08:48 (WEA_RE_02) 08:33		09:09 (WEA_RE_02)	
26	21:50 21:01		19:51 07:20 (WEA_RE_04) 18:39	47	09:26 (WEA_RE_01) 16:37	28	09:16 (WEA_RE_02) 16:11	6	09:15 (WEA_RE_02)	
27	05:18 06:06		06:59 07:25 (WEA_RE_04) 07:51		08:30 (WEA_RE_03) 07:49		08:48 (WEA_RE_02) 08:34		09:12 (WEA_RE_02)	
28	21:49 20:59		19:48 07:23 (WEA_RE_04) 18:37	53	09:27 (WEA_RE_01) 16:36	29	09:17 (WEA_RE_02) 16:11	1	09:13 (WEA_RE_02)	
29	05:19 06:07		07:00 07:28 (WEA_RE_04) 07:53		08:30 (WEA_RE_03) 07:50		08:47 (WEA_RE_02) 08:35			
30	21:48 20:57		19:46 07:24 (WEA_RE_04) 18:35	56	09:29 (WEA_RE_01) 16:34	30	09:17 (WEA_RE_02) 16:11			
31	05:21 06:09		07:02 07:29 (WEA_RE_04) 07:55		08:30 (WEA_RE_03) 07:52		08:47 (WEA_RE_02) 08:36			
1	21:47 20:55		19:43 07:25 (WEA_RE_04) 18:32	58	09:30 (WEA_RE_01) 16:33	31	09:18 (WEA_RE_02) 16:11			
2	05:22 06:11		07:04 07:30 (WEA_RE_04) 07:56		08:30 (WEA_RE_03) 07:54		08:47 (WEA_RE_02) 08:36			
3	21:46 20:53		19:41 07:26 (WEA_RE_04) 18:30	60	09:31 (WEA_RE_01) 16:31	31	09:16 (WEA_RE_02) 16:11			
4	05:23 06:13		07:05 07:31 (WEA_RE_04) 07:58		08:30 (WEA_RE_03) 07:56		08:48 (WEA_RE_02) 08:37			
5	21:44 20:51		19:39 07:27 (WEA_RE_04) 18:28	60	09:31 (WEA_RE_01) 16:30	31	09:19 (WEA_RE_02) 16:12			
6	05:25 06:14		07:07 07:32 (WEA_RE_04) 07:58		08:30 (WEA_RE_03) 07:58		08:48 (WEA_RE_02) 08:38			
7	21:43 20:48		19:36 07:28 (WEA_RE_04) 18:25	62	09:32 (WEA_RE_01) 16:29	31	09:19 (WEA_RE_02) 16:12			
8	05:26 06:16		07:09 07:34 (WEA_RE_04) 07:59		08:31 (WEA_RE_03) 07:59		08:48 (WEA_RE_02) 08:39			
9	21:42 20:46		19:34 07:29 (WEA_RE_04) 18:23	60	09:32 (WEA_RE_01) 16:27	31	09:19 (WEA_RE_02) 16:12			
10	05:27 06:18		07:11 07:36 (WEA_RE_04) 07:59		08:32 (WEA_RE_03) 08:01		08:48 (WEA_RE_02) 08:39			
11	21:41 20:44		19:31 07:30 (WEA_RE_04) 18:21	59	09:32 (WEA_RE_01) 16:26	32	09:20 (WEA_RE_02) 16:13			
12	05:29 06:19		07:12 07:37 (WEA_RE_04) 08:00		08:33 (WEA_RE_03) 08:03		08:49 (WEA_RE_02) 08:40			
13	21:39 20:42		19:29 07:31 (WEA_RE_04) 18:19	57	09:32 (WEA_RE_01) 16:25	31	09:20 (WEA_RE_02) 16:13			
14	05:30 06:21		07:14 07:39 (WEA_RE_04) 08:07		08:35 (WEA_RE_03) 08:05		08:49 (WEA_RE_02) 08:40			
15	21:38 20:40		19:27 07:32 (WEA_RE_04) 18:17	53	09:32 (WEA_RE_01) 16:24	31	09:20 (WEA_RE_02) 16:14			
16	05:32 06:23		07:16 07:41 (WEA_RE_04) 08:09		08:37 (WEA_RE_03) 08:06		08:50 (WEA_RE_02) 08:41			
17	21:37 20:38		19:24 07:33 (WEA_RE_04) 18:15	49	09:32 (WEA_RE_01) 16:23	30	09:20 (WEA_RE_02) 16:14			
18	05:33 06:24		07:17 07:42 (WEA_RE_04) 08:11		08:39 (WEA_RE_03) 08:08		08:51 (WEA_RE_02) 08:41			
19	21:35 20:35		19:22 07:35 (WEA_RE_04) 18:13	44	09:32 (WEA_RE_01) 16:21	30	09:21 (WEA_RE_02) 16:15			
20	05:35 06:26		07:19 07:44 (WEA_RE_04) 08:13		08:40 (WEA_RE_03) 08:10		08:52 (WEA_RE_02) 08:41			
21	21:34 20:33	10	07:30 (WEA_RE_04) 19:19		17:11 08:32 (WEA_RE_01) 16:20	29	09:21 (WEA_RE_02) 16:16			
22	05:36 06:28		07:17 (WEA_RE_04) 07:21		07:15 07:56 (WEA_RE_01) 08:11		08:52 (WEA_RE_02) 08:42			
23	21:32 20:31	15	07:32 (WEA_RE_04) 19:17		17:09 08:31 (WEA_RE_01) 16:19	28	09:20 (WEA_RE_02) 16:16			
24	05:38 06:30		07:16 (WEA_RE_04) 07:23		07:17 07:57 (WEA_RE_01) 08:13		08:52 (WEA_RE_02) 08:42			
25	21:30 20:28	18	07:34 (WEA_RE_04) 19:14		17:07 08:31 (WEA_RE_01) 16:19	28	09:20 (WEA_RE_02) 16:17			
26	05:39 06:31		07:14 (WEA_RE_04) 07:24		07:19 07:57 (WEA_RE_01) 08:14		08:54 (WEA_RE_02) 08:42			
27	21:29 20:26	20	07:34 (WEA_RE_04) 19:12		17:05 08:30 (WEA_RE_01) 16:18	26	09:20 (WEA_RE_02) 16:18			
28	05:41 06:33		07:13 (WEA_RE_04) 07:26		07:20 07:58 (WEA_RE_01) 08:16		08:54 (WEA_RE_02) 08:42			
29	21:27 20:24	22	07:35 (WEA_RE_04) 19:10		17:03 08:29 (WEA_RE_01) 16:17	26	09:20 (WEA_RE_02) 16:19	4	09:18 (WEA_RE_02)	
30	05:43 06:35	23	07:35 (WEA_RE_04) 19:10		07:22 07:59 (WEA_RE_01) 16:17		08:42		09:17 (WEA_RE_02)	
31	21:26 20:22	25	07:35 (WEA_RE_04) 19:10		17:01 08:28 (WEA_RE_01) 16:17		16:20	7	09:24 (WEA_RE_02)	
	Sonnenscheinstunden	508	457	392	330	262	238			
	astr. max.mögl. Beschattung		108	192	1048	770	229			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_14 - IO 14 Hauptstraße 83 Bösel
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	09:20 (WEA_RE_02)	08:13	08:47 (WEA_RE_01)	07:17	07:04	07:34 (WEA_RE_04)	05:57	05:09		
	16:21	26 09:46 (WEA_RE_02)	17:11	28 09:15 (WEA_RE_01)	18:05	20:01	23 07:57 (WEA_RE_04)	20:55	21:43		
2	08:42	09:20 (WEA_RE_02)	08:12	08:47 (WEA_RE_01)	07:15	07:02	07:35 (WEA_RE_04)	05:55	05:08		
	16:22	27 09:47 (WEA_RE_02)	17:13	30 09:17 (WEA_RE_01)	18:07	20:03	22 07:57 (WEA_RE_04)	20:57	21:44		
3	08:42	09:20 (WEA_RE_02)	08:10	08:46 (WEA_RE_01)	07:13	07:00	07:35 (WEA_RE_04)	05:53	05:08		
	16:23	27 09:47 (WEA_RE_02)	17:15	31 09:17 (WEA_RE_01)	18:09	20:05	21 07:56 (WEA_RE_04)	20:58	21:45		
4	08:41	09:21 (WEA_RE_02)	08:08	08:46 (WEA_RE_01)	07:11	06:57	07:35 (WEA_RE_04)	05:51	05:07		
	16:25	27 09:48 (WEA_RE_02)	17:17	32 09:18 (WEA_RE_01)	18:11	20:07	19 07:54 (WEA_RE_04)	21:00	21:47		
5	08:41	09:21 (WEA_RE_02)	08:06	08:46 (WEA_RE_01)	07:08	06:55	07:37 (WEA_RE_04)	05:49	05:06		
	16:26	27 09:48 (WEA_RE_02)	17:19	32 09:18 (WEA_RE_01)	18:12	20:09	16 07:53 (WEA_RE_04)	21:02	21:48		
6	08:41	09:21 (WEA_RE_02)	08:05	08:46 (WEA_RE_01)	07:06	06:52	07:39 (WEA_RE_04)	05:47	05:05		
	16:27	28 09:49 (WEA_RE_02)	17:21	32 09:18 (WEA_RE_01)	18:14	20:10	12 07:51 (WEA_RE_04)	21:04	21:49		
7	08:40	09:21 (WEA_RE_02)	08:03	08:45 (WEA_RE_01)	07:04	06:50	07:41 (WEA_RE_04)	05:45	05:05		
	16:28	28 09:49 (WEA_RE_02)	17:23	34 09:19 (WEA_RE_01)	18:16	20:12	5 07:46 (WEA_RE_04)	21:05	21:50		
8	08:40	09:21 (WEA_RE_02)	08:01	08:27 (WEA_RE_03)	07:01	06:48		05:43	05:04		
	16:30	28 09:49 (WEA_RE_02)	17:25	40 09:19 (WEA_RE_01)	18:18	20:14		21:07	21:50		
9	08:39	09:22 (WEA_RE_02)	07:59	08:25 (WEA_RE_03)	06:59	06:45		05:42	05:04		
	16:31	28 09:50 (WEA_RE_02)	17:26	44 09:19 (WEA_RE_01)	18:20	20:16		21:09	21:51		
10	08:39	09:22 (WEA_RE_02)	07:57	08:23 (WEA_RE_03)	06:57	06:43		05:40	05:03		
	16:33	29 09:51 (WEA_RE_02)	17:28	47 09:18 (WEA_RE_01)	18:22	20:18		21:11	21:52		
11	08:38	09:23 (WEA_RE_02)	07:55	08:21 (WEA_RE_03)	06:54	06:41		05:38	05:03		
	16:34	28 09:51 (WEA_RE_02)	17:30	50 09:18 (WEA_RE_01)	18:24	20:19		21:12	21:53		
12	08:37	09:23 (WEA_RE_02)	07:53	08:19 (WEA_RE_03)	06:52	06:38		05:36	05:02		
	16:36	28 09:51 (WEA_RE_02)	17:32	52 09:18 (WEA_RE_01)	18:25	20:21		21:14	21:54		
13	08:37	09:23 (WEA_RE_02)	07:52	08:18 (WEA_RE_03)	06:50	06:36		05:35	05:02		
	16:37	29 09:52 (WEA_RE_02)	17:34	53 09:17 (WEA_RE_01)	18:27	20:23		21:16	21:54		
14	08:36	09:24 (WEA_RE_02)	07:50	08:17 (WEA_RE_03)	06:47	06:34		05:33	05:02		
	16:39	28 09:52 (WEA_RE_02)	17:36	54 09:17 (WEA_RE_01)	18:29	20:25		21:17	21:55		
15	08:35	09:24 (WEA_RE_02)	07:48	08:17 (WEA_RE_03)	06:45	06:32		05:31	05:02		
	16:40	28 09:52 (WEA_RE_02)	17:38	52 09:16 (WEA_RE_01)	18:31	20:27		21:19	21:56		
16	08:34	09:25 (WEA_RE_02)	07:45	08:17 (WEA_RE_03)	06:43	06:29		05:30	05:01		
	16:42	27 09:52 (WEA_RE_02)	17:40	49 09:14 (WEA_RE_01)	18:33	20:28		21:20	21:56		
17	08:33	09:25 (WEA_RE_02)	07:43	08:17 (WEA_RE_03)	06:40	06:27		05:28	05:01		
	16:44	28 09:53 (WEA_RE_02)	17:42	47 09:13 (WEA_RE_01)	18:35	20:30		21:22	21:57		
18	08:32	09:26 (WEA_RE_02)	07:41	08:16 (WEA_RE_03)	06:38	06:25		05:27	05:01		
	16:45	27 09:53 (WEA_RE_02)	17:44	43 09:10 (WEA_RE_01)	18:36	20:32		21:24	21:57		
19	08:31	09:26 (WEA_RE_02)	07:39	08:17 (WEA_RE_03)	06:35	06:23		05:25	05:01		
	16:47	26 09:52 (WEA_RE_02)	17:46	35 09:07 (WEA_RE_01)	18:38	20:34		21:25	21:57		
20	08:30	09:27 (WEA_RE_02)	07:37	08:17 (WEA_RE_03)	06:33	06:20		05:24	05:01		
	16:49	25 09:52 (WEA_RE_02)	17:48	24 08:41 (WEA_RE_03)	18:40	20:35		21:27	21:58		
21	08:29	09:28 (WEA_RE_02)	07:35	08:18 (WEA_RE_03)	06:31	06:18		05:22	05:02		
	16:51	25 09:53 (WEA_RE_02)	17:50	23 08:41 (WEA_RE_03)	18:42	20:37		21:28	21:58		
22	08:28	09:29 (WEA_RE_02)	07:33	08:19 (WEA_RE_03)	06:28	06:16		05:21	05:02		
	16:52	23 09:52 (WEA_RE_02)	17:52	21 08:40 (WEA_RE_03)	18:44	20:39		21:30	21:58		
23	08:26	09:30 (WEA_RE_02)	07:31	08:19 (WEA_RE_03)	06:26	06:14		05:19	05:02		
	16:54	21 09:51 (WEA_RE_02)	17:54	19 08:38 (WEA_RE_03)	18:45	20:41		21:31	21:58		
24	08:25	09:31 (WEA_RE_02)	07:29	08:21 (WEA_RE_03)	06:23	06:12		05:18	05:02		
	16:56	19 09:50 (WEA_RE_02)	17:55	15 08:36 (WEA_RE_03)	18:47	8 06:55 (WEA_RE_04)	20:43	21:33	21:58		
25	08:24	08:57 (WEA_RE_01)	07:26	08:24 (WEA_RE_03)	06:21	06:44 (WEA_RE_04)	06:09	05:17	05:03		
	16:58	23 09:50 (WEA_RE_02)	17:57	10 08:34 (WEA_RE_03)	18:49	12 06:56 (WEA_RE_04)	20:44	21:34	21:59		
26	08:22	08:53 (WEA_RE_01)	07:24		06:19	06:42 (WEA_RE_04)	06:07	05:16	05:03		
	17:00	27 09:48 (WEA_RE_02)	17:59		18:51	16 06:58 (WEA_RE_04)	20:46	21:35	21:58		
27	08:21	08:52 (WEA_RE_01)	07:22		06:16	06:39 (WEA_RE_04)	06:05	05:15	05:03		
	17:01	25 09:46 (WEA_RE_02)	18:01		18:53	19 06:58 (WEA_RE_04)	20:48	21:37	21:58		
28	08:19	08:50 (WEA_RE_01)	07:20		06:14	06:37 (WEA_RE_04)	06:03	05:13	05:04		
	17:03	21 09:11 (WEA_RE_01)	18:03		18:54	22 06:59 (WEA_RE_04)	20:50	21:38	21:58		
29	08:18	08:50 (WEA_RE_01)			07:11	23 07:36 (WEA_RE_04)	06:01	05:12	05:05		
	17:05	23 09:13 (WEA_RE_01)			19:56	23 07:59 (WEA_RE_04)	20:51	21:39	21:58		
30	08:16	08:49 (WEA_RE_01)			07:09	07:35 (WEA_RE_04)	05:59	05:11	05:05		
	17:07	25 09:14 (WEA_RE_01)			19:58	24 07:59 (WEA_RE_04)	20:53	21:41	21:58		
31	08:15	08:48 (WEA_RE_01)			07:07	07:35 (WEA_RE_04)		05:10			
	17:09	27 09:15 (WEA_RE_01)			20:00	24 07:59 (WEA_RE_04)		21:42			
Sonnenscheinstunden	254				367		418				
astr.max.mögl.Beschattung	808	275	897	148		118	490	505			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_14 - IO 14 Hauptstraße 83 Bösel

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember					
1	05:06	05:44	06:36		07:24	08:17					
2	21:58	21:24	20:19		16:59	47 08:48 (WEA_RE_01) 16:16					
3	05:06	05:46	06:38		07:26	07:55 (WEA_RE_03) 08:19					
4	21:57	21:22	20:17		16:57	43 08:48 (WEA_RE_01) 16:15					
5	05:07	05:47	06:40		07:28	07:57 (WEA_RE_03) 08:20					
6	21:57	21:20	20:15		16:55	38 08:48 (WEA_RE_01) 16:15					
7	05:08	05:49	06:42		07:30	08:15 (WEA_RE_01) 08:22					
8	21:56	21:19	20:12		16:53	33 08:48 (WEA_RE_01) 16:14					
9	05:09	05:51	06:43	4 07:39 (WEA_RE_04) 07:35	07:32	08:15 (WEA_RE_01) 08:23					
10	21:56	21:17	20:10	4 07:43 (WEA_RE_04) 18:58	16:51	33 08:48 (WEA_RE_01) 16:13					
11	05:10	05:52	06:45	07:34 (WEA_RE_04) 07:37	07:34	08:16 (WEA_RE_01) 08:25					
12	21:55	21:15	20:07	12 07:46 (WEA_RE_04) 18:55	16:49	32 08:48 (WEA_RE_01) 16:13					
13	05:11	05:54	06:47	07:32 (WEA_RE_04) 07:38	07:36	08:16 (WEA_RE_01) 08:26					
14	21:55	21:13	20:05	16 07:48 (WEA_RE_04) 18:53	16:47	32 08:48 (WEA_RE_01) 16:13					
15	05:12	05:56	06:48	07:31 (WEA_RE_04) 07:40	07:37	08:16 (WEA_RE_01) 08:27					
16	21:54	21:11	20:03	19 07:50 (WEA_RE_04) 18:51	16:46	31 08:47 (WEA_RE_01) 16:12					
17	05:13	05:57	06:50	07:29 (WEA_RE_04) 07:42	07:39	08:17 (WEA_RE_01) 08:28					
18	21:53	21:09	20:00	20 07:49 (WEA_RE_04) 18:48	16:44	30 08:47 (WEA_RE_01) 16:12					
19	05:14	05:59	06:52	07:28 (WEA_RE_04) 07:44	07:41	08:18 (WEA_RE_01) 08:30					
20	21:52	21:07	19:58	22 07:50 (WEA_RE_04) 18:46	16:42	28 08:46 (WEA_RE_01) 16:12					
21	05:15	06:01	06:54	07:28 (WEA_RE_04) 07:46	07:43	08:19 (WEA_RE_01) 08:31					
22	21:52	21:05	19:56	23 07:51 (WEA_RE_04) 18:44	16:41	26 08:45 (WEA_RE_01) 16:11					
23	05:16	06:02	06:55	07:26 (WEA_RE_04) 07:47	07:45	08:20 (WEA_RE_01) 08:32					
24	21:51	21:03	19:53	24 07:50 (WEA_RE_04) 18:41	16:39	25 08:45 (WEA_RE_01) 16:11					
25	05:17	06:04	06:57	07:26 (WEA_RE_04) 07:49	07:47	08:21 (WEA_RE_01) 08:33					
26	21:50	21:01	19:51	24 07:50 (WEA_RE_04) 18:39	16:37	23 08:44 (WEA_RE_01) 16:11					
27	05:18	06:06	06:59	07:26 (WEA_RE_04) 07:51	07:49	08:22 (WEA_RE_01) 08:34					
28	21:49	20:59	19:48	24 07:50 (WEA_RE_04) 18:37	16:36	21 08:43 (WEA_RE_01) 16:11					
29	05:19	06:07	07:00	07:26 (WEA_RE_04) 07:53	07:50	08:25 (WEA_RE_01) 08:35					
30	21:48	20:57	19:46	22 07:48 (WEA_RE_04) 18:35	16:34	25 09:19 (WEA_RE_02) 16:11					
31	05:21	06:09	07:02	07:28 (WEA_RE_04) 07:55	08:59 (WEA_RE_03) 07:52	08:26 (WEA_RE_01) 08:36					
1	21:47	20:55	19:43	20 07:48 (WEA_RE_04) 18:32	3 09:02 (WEA_RE_03) 16:33	27 09:21 (WEA_RE_02) 16:11					
2	05:22	06:11	07:04	07:30 (WEA_RE_04) 07:56	08:54 (WEA_RE_03) 07:54	08:30 (WEA_RE_01) 08:36					
3	21:46	20:53	19:41	17 07:47 (WEA_RE_04) 18:30	12 09:06 (WEA_RE_03) 16:31	23 09:23 (WEA_RE_02) 16:11					
4	05:23	06:13	07:05	07:31 (WEA_RE_04) 07:58	08:52 (WEA_RE_03) 07:56	09:05 (WEA_RE_02) 08:37					
5	21:44	20:51	19:39	13 07:44 (WEA_RE_04) 18:28	16 09:08 (WEA_RE_03) 16:30	19 09:24 (WEA_RE_02) 16:12					
6	05:25	06:14	07:07	07:33 (WEA_RE_04) 08:00	08:50 (WEA_RE_03) 07:58	09:04 (WEA_RE_02) 08:38					
7	21:43	20:49	19:36	9 07:42 (WEA_RE_04) 18:26	20 09:10 (WEA_RE_03) 16:29	21 09:25 (WEA_RE_02) 16:12					
8	05:26	06:16	07:09	07:35 (WEA_RE_04) 08:02	08:49 (WEA_RE_03) 07:59	09:04 (WEA_RE_02) 08:39					
9	21:42	20:46	19:34	4 07:39 (WEA_RE_04) 18:23	22 09:11 (WEA_RE_03) 16:27	23 09:27 (WEA_RE_02) 16:12					
10	05:27	06:18	07:11		08:48 (WEA_RE_03) 08:01	09:03 (WEA_RE_02) 08:39					
11	21:41	20:44	19:31		23 09:11 (WEA_RE_03) 16:26	25 09:28 (WEA_RE_02) 16:13					
12	05:29	06:19	07:12		08:47 (WEA_RE_03) 08:03	09:03 (WEA_RE_02) 08:40					
13	21:39	20:42	19:29		25 09:12 (WEA_RE_03) 16:25	25 09:28 (WEA_RE_02) 16:13					
14	05:30	06:21	07:14		08:47 (WEA_RE_03) 08:05	09:03 (WEA_RE_02) 08:40					
15	21:38	20:40	19:27		37 09:38 (WEA_RE_01) 16:24	26 09:29 (WEA_RE_02) 16:14					
16	05:32	06:23	07:16		08:47 (WEA_RE_03) 08:06	09:03 (WEA_RE_02) 08:41					
17	21:37	20:38	19:24		18:15 43 09:41 (WEA_RE_01) 16:23	27 09:30 (WEA_RE_02) 16:14					
18	05:33	06:24	07:17		07:46 (WEA_RE_03) 08:08	09:04 (WEA_RE_02) 08:41					
19	21:35	20:35	19:22		17:13 48 08:43 (WEA_RE_01) 16:21	27 09:31 (WEA_RE_02) 16:15					
20	05:35	06:26	07:19		07:46 (WEA_RE_03) 08:10	09:04 (WEA_RE_02) 08:41					
21	21:34	20:33	19:19		17:11 50 08:44 (WEA_RE_01) 16:20	28 09:32 (WEA_RE_02) 16:16					
22	05:36	06:28	07:21		07:47 (WEA_RE_03) 08:11	09:03 (WEA_RE_02) 08:42					
23	21:32	20:31	19:17		17:09 52 08:45 (WEA_RE_01) 16:19	28 09:31 (WEA_RE_02) 16:16					
24	05:38	06:30	07:23		07:47 (WEA_RE_03) 08:13	09:04 (WEA_RE_02) 08:42					
25	21:30	20:28	19:14		17:07 52 08:46 (WEA_RE_01) 16:19	28 09:32 (WEA_RE_02) 16:17					
26	05:39	06:31	07:24		07:47 (WEA_RE_03) 08:14	09:04 (WEA_RE_02) 08:42					
27	21:29	20:26	19:12		17:05 54 08:47 (WEA_RE_01) 16:18	29 09:33 (WEA_RE_02) 16:18					
28	05:41	06:33	07:26		07:20 52 07:49 (WEA_RE_03) 08:16	28 09:04 (WEA_RE_02) 08:42					
29	21:27	20:24	19:10		17:03 52 08:47 (WEA_RE_01) 16:17	28 09:32 (WEA_RE_02) 16:19					
30	05:43	06:35			07:22 50 07:51 (WEA_RE_03) 16:20	26 08:42					
31	21:26	20:22			17:01 50 08:48 (WEA_RE_01) 16:20	26 09:19 (WEA_RE_02)					
Sonnenscheinstunden		508	457	382	273	330	559	262	851	238	794
astr. max. mögl. Beschattung											

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_15 - IO 15 Böseler Straße 594 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42	09:35 (WEA_RE_02) 08:13	08:58 (WEA_RE_01) 07:17	07:04	07:30 (WEA_RE_04) 05:57	05:09
	16:21	32 10:07 (WEA_RE_02) 17:11	37 09:35 (WEA_RE_01) 18:05	20:01	25 07:55 (WEA_RE_04) 20:55	21:43
2	08:42	09:36 (WEA_RE_02) 08:12	08:59 (WEA_RE_01) 07:15	07:02	07:29 (WEA_RE_04) 05:55	05:08
	16:22	31 10:07 (WEA_RE_02) 17:13	37 09:36 (WEA_RE_01) 18:07	20:03	26 07:55 (WEA_RE_04) 20:57	21:44
3	08:42	09:36 (WEA_RE_02) 08:10	08:59 (WEA_RE_01) 07:13	07:00	07:29 (WEA_RE_04) 05:53	05:08
	16:23	31 10:07 (WEA_RE_02) 17:15	38 09:37 (WEA_RE_01) 18:09	8 07:45 (WEA_RE_05) 20:05	26 07:55 (WEA_RE_04) 20:58	21:45
4	08:41	09:36 (WEA_RE_02) 08:08	08:58 (WEA_RE_01) 07:11	07:35 (WEA_RE_05) 06:57	07:28 (WEA_RE_04) 05:51	05:07
	16:25	32 10:08 (WEA_RE_02) 17:17	39 09:37 (WEA_RE_01) 18:11	12 07:47 (WEA_RE_05) 20:07	26 07:54 (WEA_RE_04) 21:00	21:47
5	08:41	09:36 (WEA_RE_02) 08:06	08:58 (WEA_RE_01) 07:08	07:32 (WEA_RE_05) 06:55	07:28 (WEA_RE_04) 05:49	05:06
	16:26	32 10:08 (WEA_RE_02) 17:19	39 09:37 (WEA_RE_01) 18:12	16 07:48 (WEA_RE_05) 20:09	26 07:54 (WEA_RE_04) 21:02	21:48
6	08:41	09:37 (WEA_RE_02) 08:05	08:31 (WEA_RE_03) 07:06	07:30 (WEA_RE_05) 06:52	07:29 (WEA_RE_04) 05:47	05:05
	16:27	32 10:09 (WEA_RE_02) 17:21	51 09:37 (WEA_RE_01) 18:14	19 07:49 (WEA_RE_05) 20:10	25 07:54 (WEA_RE_04) 21:04	21:49
7	08:40	09:37 (WEA_RE_02) 08:03	08:29 (WEA_RE_03) 07:04	07:27 (WEA_RE_05) 06:50	07:28 (WEA_RE_04) 05:45	05:05
	16:28	32 10:09 (WEA_RE_02) 17:23	53 09:36 (WEA_RE_01) 18:16	22 07:49 (WEA_RE_05) 20:12	24 07:52 (WEA_RE_04) 21:05	21:50
8	08:40	09:38 (WEA_RE_02) 08:01	08:27 (WEA_RE_03) 07:01	07:26 (WEA_RE_05) 06:48	07:29 (WEA_RE_04) 05:43	05:04
	16:30	31 10:09 (WEA_RE_02) 17:25	57 09:36 (WEA_RE_01) 18:18	24 07:50 (WEA_RE_05) 20:14	22 07:51 (WEA_RE_04) 21:07	21:50
9	08:39	09:39 (WEA_RE_02) 07:59	08:26 (WEA_RE_03) 06:59	07:26 (WEA_RE_05) 06:45	07:30 (WEA_RE_04) 05:42	05:04
	16:31	31 10:10 (WEA_RE_02) 17:26	59 09:36 (WEA_RE_01) 18:20	24 07:50 (WEA_RE_05) 20:16	20 07:50 (WEA_RE_04) 21:09	21:51
10	08:39	09:39 (WEA_RE_02) 07:57	08:25 (WEA_RE_03) 06:57	07:25 (WEA_RE_05) 06:43	07:31 (WEA_RE_04) 05:40	05:03
	16:33	31 10:10 (WEA_RE_02) 17:28	60 09:36 (WEA_RE_01) 18:22	24 07:49 (WEA_RE_05) 20:18	17 07:48 (WEA_RE_04) 21:10	21:52
11	08:38	09:40 (WEA_RE_02) 07:55	08:24 (WEA_RE_03) 06:54	07:26 (WEA_RE_05) 06:41	07:33 (WEA_RE_04) 05:38	05:03
	16:34	30 10:10 (WEA_RE_02) 17:30	61 09:35 (WEA_RE_01) 18:24	23 07:49 (WEA_RE_05) 20:19	12 07:45 (WEA_RE_04) 21:12	21:53
12	08:37	09:40 (WEA_RE_02) 07:53	08:24 (WEA_RE_03) 06:52	07:25 (WEA_RE_05) 06:38	07:34 (WEA_RE_04) 05:36	05:02
	16:36	30 10:10 (WEA_RE_02) 17:32	60 09:34 (WEA_RE_01) 18:25	23 07:48 (WEA_RE_05) 20:21	2 07:40 (WEA_RE_04) 21:14	21:54
13	08:37	09:41 (WEA_RE_02) 07:52	08:23 (WEA_RE_03) 06:50	07:26 (WEA_RE_05) 06:36		05:35 05:02
	16:37	29 10:10 (WEA_RE_02) 17:34	60 09:34 (WEA_RE_01) 18:27	22 07:48 (WEA_RE_05) 20:23		21:16 21:54
14	08:36	09:41 (WEA_RE_02) 07:50	08:23 (WEA_RE_03) 06:47	07:27 (WEA_RE_05) 06:34		05:33 05:02
	16:39	29 10:10 (WEA_RE_02) 17:36	59 09:33 (WEA_RE_01) 18:29	20 07:47 (WEA_RE_05) 20:25		21:17 21:55
15	08:35	09:42 (WEA_RE_02) 07:48	08:23 (WEA_RE_03) 06:45	07:27 (WEA_RE_05) 06:32		05:31 05:02
	16:40	28 10:10 (WEA_RE_02) 17:38	56 09:31 (WEA_RE_01) 18:31	18 07:45 (WEA_RE_05) 20:27		21:19 21:56
16	08:34	09:43 (WEA_RE_02) 07:45	08:23 (WEA_RE_03) 06:43	07:29 (WEA_RE_05) 06:29		05:30 05:01
	16:42	27 10:10 (WEA_RE_02) 17:40	53 09:30 (WEA_RE_01) 18:33	14 07:43 (WEA_RE_05) 20:28		21:20 21:56
17	08:33	09:44 (WEA_RE_02) 07:43	08:23 (WEA_RE_03) 06:40	07:31 (WEA_RE_05) 06:27		05:28 05:01
	16:44	26 10:10 (WEA_RE_02) 17:42	49 09:28 (WEA_RE_01) 18:35	8 07:39 (WEA_RE_05) 20:30		21:22 21:57
18	08:32	09:45 (WEA_RE_02) 07:41	08:23 (WEA_RE_03) 06:38		06:25	05:27 05:01
	16:45	25 10:10 (WEA_RE_02) 17:44	42 09:24 (WEA_RE_01) 18:36		20:32	21:24 21:57
19	08:31	09:09 (WEA_RE_01) 07:39	08:23 (WEA_RE_03) 06:35		06:23	05:25 05:01
	16:47	32 10:09 (WEA_RE_02) 17:46	28 08:51 (WEA_RE_03) 18:38		20:34	21:25 21:57
20	08:30	09:07 (WEA_RE_01) 07:37	08:24 (WEA_RE_03) 06:33		06:20	05:24 05:01
	16:49	35 10:08 (WEA_RE_02) 17:48	26 08:50 (WEA_RE_03) 18:40		20:35	21:27 21:58
21	08:29	09:05 (WEA_RE_01) 07:35	08:25 (WEA_RE_03) 06:31		06:18	05:22 05:02
	16:51	38 10:08 (WEA_RE_02) 17:50	25 08:50 (WEA_RE_03) 18:42		20:37	21:28 21:58
22	08:27	09:04 (WEA_RE_01) 07:33	08:26 (WEA_RE_03) 06:28		06:16	05:21 05:02
	16:52	37 10:06 (WEA_RE_02) 17:52	23 08:49 (WEA_RE_03) 18:44		20:39	21:30 21:58
23	08:26	09:03 (WEA_RE_01) 07:31	08:26 (WEA_RE_03) 06:26		06:14	05:19 05:02
	16:54	36 10:05 (WEA_RE_02) 17:54	21 08:47 (WEA_RE_03) 18:45		20:41	21:31 21:58
24	08:25	09:02 (WEA_RE_01) 07:29	08:28 (WEA_RE_03) 06:23		06:12	05:18 05:02
	16:56	31 10:01 (WEA_RE_02) 17:55	17 08:45 (WEA_RE_03) 18:47		20:43	21:33 21:58
25	08:24	09:01 (WEA_RE_01) 07:26	08:31 (WEA_RE_03) 06:21		06:09	05:17 05:03
	16:58	29 09:30 (WEA_RE_01) 17:57	11 08:42 (WEA_RE_03) 18:49		20:44	21:34 21:58
26	08:22	09:00 (WEA_RE_01) 07:24		06:19		05:16 05:03
	17:00	31 09:31 (WEA_RE_01) 17:59		18:51	3 06:46 (WEA_RE_04) 20:46	21:35 21:58
27	08:21	09:00 (WEA_RE_01) 07:22		06:16		05:14 05:03
	17:01	32 09:32 (WEA_RE_01) 18:01		18:53	11 06:50 (WEA_RE_04) 20:48	21:37 21:58
28	08:19	08:59 (WEA_RE_01) 07:20		06:14		05:13 05:04
	17:03	34 09:33 (WEA_RE_01) 18:03		18:54	16 06:53 (WEA_RE_04) 20:50	21:38 21:58
29	08:18	09:00 (WEA_RE_01)		07:11		05:12 05:04
	17:05	34 09:34 (WEA_RE_01)		19:56	19 07:54 (WEA_RE_04) 20:51	21:39 21:58
30	08:16	08:59 (WEA_RE_01)		07:09		05:11 05:05
	17:07	36 09:35 (WEA_RE_01)		19:58	22 07:54 (WEA_RE_04) 20:53	21:41 21:58
31	08:15	08:59 (WEA_RE_01)		07:07		05:10
	17:09	36 09:35 (WEA_RE_01)		20:00	24 07:55 (WEA_RE_04)	21:42
Sonnenscheinstunden	254					
astr.max.mögl.Beschattung	980	275	1061	372	418	251
						490
						505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_15 - IO 15 Böseler Straße 594 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember	
1	05:06 05:44		06:36 07:32 (WEA_RE_04) 07:24		08:05 (WEA_RE_05) 07:24	07:55 (WEA_RE_03) 08:17	
	21:58 21:24		20:19 12 07:44 (WEA_RE_04) 19:07	23 08:28 (WEA_RE_05) 16:59	60 09:05 (WEA_RE_01) 16:16	30 09:52 (WEA_RE_02)	
2	05:06 05:46		06:38 07:30 (WEA_RE_04) 07:30		08:05 (WEA_RE_05) 07:26		09:22 (WEA_RE_02)
	21:57 21:22		20:17 17 07:47 (WEA_RE_04) 19:05	23 08:28 (WEA_RE_05) 16:57	59 09:06 (WEA_RE_01) 16:15	31 09:53 (WEA_RE_02)	
3	05:07 05:47		06:40 07:28 (WEA_RE_04) 07:31		08:03 (WEA_RE_05) 07:28		09:22 (WEA_RE_02)
	21:57 21:20		20:15 20 07:48 (WEA_RE_04) 19:03	24 08:27 (WEA_RE_05) 16:55	57 09:05 (WEA_RE_01) 16:15	31 09:53 (WEA_RE_02)	
4	05:08 05:49		06:42 07:26 (WEA_RE_04) 07:33		08:03 (WEA_RE_05) 07:30		09:23 (WEA_RE_02)
	21:56 21:19		20:12 22 07:48 (WEA_RE_04) 19:00	24 08:27 (WEA_RE_05) 16:53	54 09:06 (WEA_RE_01) 16:14	31 09:54 (WEA_RE_02)	
5	05:09 05:51		06:43 07:25 (WEA_RE_04) 07:35		08:03 (WEA_RE_05) 07:32		09:22 (WEA_RE_02)
	21:56 21:17		20:10 24 07:49 (WEA_RE_04) 18:58	24 08:27 (WEA_RE_05) 16:51	49 09:06 (WEA_RE_01) 16:13	32 09:54 (WEA_RE_02)	
6	05:10 05:52		06:45 07:24 (WEA_RE_04) 07:37		08:04 (WEA_RE_05) 07:34		09:23 (WEA_RE_02)
	21:55 21:15		20:07 25 07:49 (WEA_RE_04) 18:55	22 08:26 (WEA_RE_05) 16:49	38 09:06 (WEA_RE_01) 16:13	32 09:55 (WEA_RE_02)	
7	05:11 05:54		06:47 07:23 (WEA_RE_04) 07:38		08:05 (WEA_RE_05) 07:36		09:23 (WEA_RE_02)
	21:55 21:13		20:05 26 07:49 (WEA_RE_04) 18:53	21 08:26 (WEA_RE_05) 16:47	38 09:06 (WEA_RE_01) 16:12	32 09:55 (WEA_RE_02)	
8	05:12 05:56		06:48 07:23 (WEA_RE_04) 07:40		08:06 (WEA_RE_05) 07:37		09:23 (WEA_RE_02)
	21:54 21:11		20:03 26 07:49 (WEA_RE_04) 18:51	18 08:24 (WEA_RE_05) 16:46	38 09:06 (WEA_RE_01) 16:12	32 09:55 (WEA_RE_02)	
9	05:13 05:57		06:50 07:22 (WEA_RE_04) 07:42		08:08 (WEA_RE_05) 07:39		09:25 (WEA_RE_02)
	21:53 21:09		20:00 27 07:49 (WEA_RE_04) 18:48	14 08:22 (WEA_RE_05) 16:44	37 09:06 (WEA_RE_01) 16:12	31 09:56 (WEA_RE_02)	
10	05:14 05:59		06:52 07:22 (WEA_RE_04) 07:44		08:10 (WEA_RE_05) 07:41		09:25 (WEA_RE_02)
	21:52 21:07		19:58 26 07:48 (WEA_RE_04) 18:46	10 08:20 (WEA_RE_05) 16:42	37 09:06 (WEA_RE_01) 16:12	32 09:57 (WEA_RE_02)	
11	05:15 06:01		06:54 07:23 (WEA_RE_04) 07:46		08:12 (WEA_RE_05) 07:43		09:25 (WEA_RE_02)
	21:52 21:06		19:56 25 07:48 (WEA_RE_04) 18:44	5 08:17 (WEA_RE_05) 16:41	37 09:06 (WEA_RE_01) 16:11	32 09:57 (WEA_RE_02)	
12	05:16 06:02		06:55 07:22 (WEA_RE_04) 07:47		07:45		09:25 (WEA_RE_02)
	21:51 21:03		19:53 25 07:47 (WEA_RE_04) 18:41		16:39	35 09:05 (WEA_RE_01) 16:11	32 09:57 (WEA_RE_02)
13	05:17 06:04		06:57 07:22 (WEA_RE_04) 07:49		07:47		09:26 (WEA_RE_02)
	21:50 21:01		19:51 23 07:46 (WEA_RE_04) 18:39		16:37	34 09:05 (WEA_RE_01) 16:11	31 09:57 (WEA_RE_02)
14	05:18 06:06		06:59 07:25 (WEA_RE_04) 07:51		07:49		09:26 (WEA_RE_02)
	21:49 20:59		19:48 20 07:45 (WEA_RE_04) 18:37		16:36	34 09:05 (WEA_RE_01) 16:11	32 09:58 (WEA_RE_02)
15	05:19 06:07		07:00 07:26 (WEA_RE_04) 07:53		07:50		09:27 (WEA_RE_02)
	21:48 20:57		19:46 16 07:42 (WEA_RE_04) 18:35		16:34	32 09:04 (WEA_RE_01) 16:11	31 09:58 (WEA_RE_02)
16	05:21 06:09		07:02 07:28 (WEA_RE_04) 07:55		09:06 (WEA_RE_03) 07:52		09:27 (WEA_RE_02)
	21:47 20:55		19:43 12 07:40 (WEA_RE_04) 18:32	4 09:10 (WEA_RE_03) 16:33	30 09:03 (WEA_RE_01) 16:11	32 09:59 (WEA_RE_02)	
17	05:22 06:11		07:04 07:30 (WEA_RE_04) 07:56		09:11 (WEA_RE_03) 07:54		09:28 (WEA_RE_02)
	21:46 20:53		19:41 7 07:37 (WEA_RE_04) 18:30	14 09:15 (WEA_RE_03) 16:31	29 09:03 (WEA_RE_01) 16:11	32 10:00 (WEA_RE_02)	
18	05:23 06:13		07:05 07:28 (WEA_RE_04) 07:57		08:59 (WEA_RE_03) 07:56		09:29 (WEA_RE_02)
	21:44 20:51		19:39 07:28 (WEA_RE_04) 18:26	18 09:17 (WEA_RE_03) 16:30	31 09:25 (WEA_RE_01) 16:12	31 10:00 (WEA_RE_02)	
19	05:25 06:14		07:07 07:29 (WEA_RE_04) 07:58		08:57 (WEA_RE_03) 07:58		09:29 (WEA_RE_02)
	21:43 20:48		19:36 08:02 (WEA_RE_03) 16:29	21 09:18 (WEA_RE_03) 16:29	36 09:37 (WEA_RE_01) 16:12	31 10:00 (WEA_RE_02)	
20	05:26 06:16		07:09 08:02 (WEA_RE_03) 16:27		08:56 (WEA_RE_03) 07:59		09:30 (WEA_RE_02)
	21:42 20:46		19:34 18:23 (WEA_RE_03) 16:27	23 09:19 (WEA_RE_03) 16:27	37 09:41 (WEA_RE_02) 16:12	31 10:01 (WEA_RE_02)	
21	05:27 06:18		07:11 08:04 (WEA_RE_03) 16:25		08:55 (WEA_RE_03) 08:01		09:29 (WEA_RE_02)
	21:41 20:44		19:31 18:21 (WEA_RE_03) 16:25	25 09:20 (WEA_RE_03) 16:26	38 09:43 (WEA_RE_02) 16:13	32 10:01 (WEA_RE_02)	
22	05:29 06:19		07:12 08:06 (WEA_RE_03) 16:24		08:54 (WEA_RE_03) 08:03		09:30 (WEA_RE_02)
	21:39 20:42		19:29 18:19 (WEA_RE_03) 16:25	27 09:21 (WEA_RE_03) 16:25	35 09:44 (WEA_RE_02) 16:13	32 10:02 (WEA_RE_02)	
23	05:30 06:21		07:14 08:07 (WEA_RE_03) 16:23		08:53 (WEA_RE_03) 08:05		09:31 (WEA_RE_02)
	21:38 20:40		19:27 18:17 (WEA_RE_03) 16:24	33 09:30 (WEA_RE_03) 16:24	32 09:46 (WEA_RE_02) 16:14	31 10:02 (WEA_RE_02)	
24	05:32 06:23		07:16 08:09 (WEA_RE_03) 16:22		08:53 (WEA_RE_03) 08:06		09:32 (WEA_RE_02)
	21:37 20:37		19:24 18:15 (WEA_RE_03) 16:23	44 09:35 (WEA_RE_03) 16:23	25 09:47 (WEA_RE_02) 16:14	31 10:03 (WEA_RE_02)	
25	05:33 06:24		07:17 08:11 (WEA_RE_03) 16:21		07:53 (WEA_RE_03) 08:08		09:32 (WEA_RE_02)
	21:35 20:35		19:22 17:13 (WEA_RE_03) 16:21	50 09:38 (WEA_RE_03) 16:21	26 09:48 (WEA_RE_02) 16:15	31 10:03 (WEA_RE_02)	
26	05:35 06:26		07:19 08:17 (WEA_RE_05) 17:13		07:53 (WEA_RE_03) 08:10		09:32 (WEA_RE_02)
	21:34 20:33		19:19 1 08:18 (WEA_RE_05) 17:11	54 09:40 (WEA_RE_03) 16:20	27 09:49 (WEA_RE_02) 16:16	31 10:03 (WEA_RE_02)	
27	05:36 06:28		07:21 08:12 (WEA_RE_05) 17:15		07:53 (WEA_RE_03) 08:11		09:32 (WEA_RE_02)
	21:32 20:31		19:17 12 08:24 (WEA_RE_05) 17:09	56 09:41 (WEA_RE_03) 16:19	28 09:49 (WEA_RE_02) 16:16	32 10:04 (WEA_RE_02)	
28	05:38 06:30		07:23 08:09 (WEA_RE_05) 17:17		07:53 (WEA_RE_03) 08:13		09:33 (WEA_RE_02)
	21:30 20:28		19:14 16 08:25 (WEA_RE_05) 17:07	58 09:42 (WEA_RE_03) 16:19	29 09:50 (WEA_RE_02) 16:17	31 10:04 (WEA_RE_02)	
29	05:39 06:31		07:24 08:07 (WEA_RE_05) 17:19		07:53 (WEA_RE_03) 08:14		09:33 (WEA_RE_02)
	21:29 20:26		19:12 19 08:26 (WEA_RE_05) 17:05	60 09:43 (WEA_RE_03) 16:18	29 09:51 (WEA_RE_02) 16:18	32 10:05 (WEA_RE_02)	
30	05:41 06:33		07:26 08:06 (WEA_RE_05) 17:20		07:53 (WEA_RE_03) 08:16		09:34 (WEA_RE_02)
	21:27 20:24		19:10 21 08:27 (WEA_RE_05) 17:03	61 09:44 (WEA_RE_03) 16:17	30 09:51 (WEA_RE_02) 16:19	31 10:05 (WEA_RE_02)	
31	05:43 06:35	07:37 (WEA_RE_04)	07:27 17:01	61 07:54 (WEA_RE_03)			09:34 (WEA_RE_02)
	21:26 20:22	4 07:41 (WEA_RE_04)	17:01	61 09:05 (WEA_RE_01)			16:20 32 10:06 (WEA_RE_02)
Sonnenscheinstunden	508	457	382	330	262	238	
astr. max.mögl. Beschattung		4	422	817	1101	975	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_16 - IO 16 Böseler Straße 580 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42	09:56 (WEA_RE_02) 08:13	08:41 (WEA_RE_03) 07:17	07:42 (WEA_RE_05) 07:04	07:33 (WEA_RE_04) 05:57	05:09	
2	16:21	10:27 (WEA_RE_02) 17:11	09:59 (WEA_RE_01) 18:05	07:57 (WEA_RE_05) 20:01	08:01 (WEA_RE_04) 20:55	21:43	
3	08:42	09:57 (WEA_RE_02) 08:12	08:41 (WEA_RE_03) 07:15	07:39 (WEA_RE_05) 07:02	07:33 (WEA_RE_04) 05:55	05:08	
4	16:22	10:27 (WEA_RE_02) 17:13	10:00 (WEA_RE_01) 18:07	07:57 (WEA_RE_05) 20:03	08:01 (WEA_RE_04) 20:57	21:44	
5	08:42	09:27 (WEA_RE_01) 08:10	08:40 (WEA_RE_03) 07:13	07:37 (WEA_RE_05) 07:00	07:33 (WEA_RE_04) 05:53	05:08	
6	16:23	10:27 (WEA_RE_02) 17:15	10:00 (WEA_RE_01) 18:09	07:59 (WEA_RE_05) 20:05	08:02 (WEA_RE_04) 20:58	21:45	
7	08:41	09:25 (WEA_RE_01) 08:08	08:39 (WEA_RE_03) 07:11	07:36 (WEA_RE_05) 06:57	07:32 (WEA_RE_04) 05:51	05:07	
8	16:25	10:27 (WEA_RE_02) 17:17	09:59 (WEA_RE_01) 18:11	07:59 (WEA_RE_05) 20:07	08:00 (WEA_RE_04) 21:00	21:46	
9	08:41	09:24 (WEA_RE_01) 08:06	08:38 (WEA_RE_03) 07:08	07:34 (WEA_RE_05) 06:55	07:33 (WEA_RE_04) 05:49	05:06	
10	16:26	10:27 (WEA_RE_02) 17:19	09:58 (WEA_RE_01) 18:12	07:59 (WEA_RE_05) 20:09	08:00 (WEA_RE_04) 21:02	21:48	
11	08:41	09:24 (WEA_RE_01) 08:05	08:37 (WEA_RE_03) 07:06	07:34 (WEA_RE_05) 06:52	07:33 (WEA_RE_04) 05:47	05:05	
12	16:27	10:28 (WEA_RE_02) 17:21	09:58 (WEA_RE_01) 18:14	08:00 (WEA_RE_05) 20:10	08:00 (WEA_RE_04) 21:04	21:49	
13	08:40	09:23 (WEA_RE_01) 08:03	08:37 (WEA_RE_03) 07:04	07:33 (WEA_RE_05) 06:50	07:33 (WEA_RE_04) 05:45	05:05	
14	16:28	10:27 (WEA_RE_02) 17:23	09:57 (WEA_RE_01) 18:16	07:59 (WEA_RE_05) 20:12	07:58 (WEA_RE_04) 21:05	21:50	
15	08:40	09:22 (WEA_RE_01) 08:01	08:36 (WEA_RE_03) 07:01	07:33 (WEA_RE_05) 06:48	07:34 (WEA_RE_04) 05:43	05:04	
16	16:30	10:27 (WEA_RE_02) 17:24	09:56 (WEA_RE_01) 18:18	07:59 (WEA_RE_05) 20:14	07:57 (WEA_RE_04) 21:07	21:50	
17	08:39	09:22 (WEA_RE_01) 07:59	08:36 (WEA_RE_03) 06:59	07:34 (WEA_RE_05) 06:45	07:35 (WEA_RE_04) 05:42	05:04	
18	16:31	10:28 (WEA_RE_02) 17:26	09:55 (WEA_RE_01) 18:20	07:59 (WEA_RE_05) 20:16	07:55 (WEA_RE_04) 21:09	21:51	
19	08:39	09:21 (WEA_RE_01) 07:57	08:36 (WEA_RE_03) 06:57	07:33 (WEA_RE_05) 06:43	07:36 (WEA_RE_04) 05:40	05:03	
20	16:33	10:27 (WEA_RE_02) 17:28	09:53 (WEA_RE_01) 18:22	07:57 (WEA_RE_05) 20:18	07:53 (WEA_RE_04) 21:10	21:52	
21	08:38	09:20 (WEA_RE_01) 07:55	08:36 (WEA_RE_03) 06:54	07:34 (WEA_RE_05) 06:41	07:38 (WEA_RE_04) 05:38	05:03	
22	16:34	10:27 (WEA_RE_02) 17:30	09:51 (WEA_RE_01) 18:24	07:57 (WEA_RE_05) 20:19	07:50 (WEA_RE_04) 21:12	21:53	
23	08:37	09:20 (WEA_RE_01) 07:53	08:36 (WEA_RE_03) 06:52	07:34 (WEA_RE_05) 06:38		05:36	
24	16:36	10:26 (WEA_RE_02) 17:32	09:49 (WEA_RE_01) 18:25	07:55 (WEA_RE_05) 20:21		21:14	
25	08:37	09:19 (WEA_RE_01) 07:51	08:36 (WEA_RE_03) 06:50	07:36 (WEA_RE_05) 06:36		05:35	
26	16:37	10:26 (WEA_RE_02) 17:34	09:45 (WEA_RE_01) 18:27	07:54 (WEA_RE_05) 20:23		21:15	
27	08:36	09:19 (WEA_RE_01) 07:50	08:37 (WEA_RE_03) 06:47	07:38 (WEA_RE_05) 06:34		05:33	
28	16:39	10:25 (WEA_RE_02) 17:36	09:07 (WEA_RE_03) 18:29	07:52 (WEA_RE_05) 20:25		21:17	
29	08:35	09:19 (WEA_RE_01) 07:48	08:37 (WEA_RE_03) 06:45	07:40 (WEA_RE_05) 06:32		05:31	
30	16:40	10:24 (WEA_RE_02) 17:38	09:06 (WEA_RE_03) 18:31	8	07:48 (WEA_RE_05) 20:27	21:19	
31	08:34	09:19 (WEA_RE_01) 07:45	08:38 (WEA_RE_03) 06:43		06:29	05:30	
32	16:42	10:23 (WEA_RE_02) 17:40	09:06 (WEA_RE_03) 18:33		20:28	21:20	
33	08:33	09:19 (WEA_RE_01) 07:43	08:39 (WEA_RE_03) 06:40		06:27	05:28	
34	16:44	10:20 (WEA_RE_02) 17:42	09:05 (WEA_RE_03) 18:35		20:30	21:22	
35	08:32	09:19 (WEA_RE_01) 07:41	08:39 (WEA_RE_03) 06:38		06:25	05:27	
36	16:45	10:24 (WEA_RE_02) 17:44	09:03 (WEA_RE_03) 18:36		20:32	21:24	
37	08:31	09:18 (WEA_RE_01) 07:39	08:41 (WEA_RE_03) 06:35		06:23	05:25	
38	16:47	10:24 (WEA_RE_02) 17:46	09:02 (WEA_RE_03) 18:38		20:34	21:25	
39	08:30	09:18 (WEA_RE_01) 07:37	08:43 (WEA_RE_03) 06:33		06:20	05:24	
40	16:49	10:23 (WEA_RE_02) 17:48	09:00 (WEA_RE_03) 18:40		20:35	21:27	
41	08:29	09:18 (WEA_RE_01) 07:35	08:45 (WEA_RE_03) 06:31		06:18	05:22	
42	16:51	10:23 (WEA_RE_02) 17:50	08:58 (WEA_RE_03) 18:42		20:37	21:28	
43	08:27	09:17 (WEA_RE_01) 07:33			06:16	05:21	
44	16:52	10:23 (WEA_RE_02) 17:52			20:39	21:30	
45	08:26	09:18 (WEA_RE_01) 07:31			06:14	05:19	
46	16:54	10:23 (WEA_RE_02) 17:54			20:41	21:31	
47	08:25	09:17 (WEA_RE_01) 07:29			06:12	05:18	
48	16:56	10:22 (WEA_RE_02) 17:55			20:43	21:33	
49	08:24	09:18 (WEA_RE_01) 07:26			06:21	05:17	
50	16:58	10:21 (WEA_RE_02) 17:57			18:49	20:44	
51	08:22	09:18 (WEA_RE_01) 07:24			06:19	06:42 (WEA_RE_04) 06:07	
52	17:00	10:21 (WEA_RE_02) 17:59			18:51	06:58 (WEA_RE_04) 20:46	
53	08:21	09:18 (WEA_RE_01) 07:22			06:39 (WEA_RE_04) 06:05		
54	17:01	10:21 (WEA_RE_02) 18:01			07:49 (WEA_RE_05) 18:53	06:59 (WEA_RE_04) 20:48	
55	08:19	09:18 (WEA_RE_01) 07:20			07:44 (WEA_RE_05) 06:14	06:38 (WEA_RE_04) 06:03	
56	17:03	10:21 (WEA_RE_02) 18:03			07:54 (WEA_RE_05) 18:54	07:00 (WEA_RE_04) 20:50	
57	08:18	09:18 (WEA_RE_01) 07:19			07:11	07:37 (WEA_RE_04) 06:01	
58	17:05	10:21 (WEA_RE_02) 18:05			19:56	08:01 (WEA_RE_04) 20:51	
59	08:16	09:18 (WEA_RE_01) 07:17			07:09	07:35 (WEA_RE_04) 05:59	
60	17:07	10:21 (WEA_RE_02) 18:07			19:58	08:01 (WEA_RE_04) 20:53	
61	08:15	09:18 (WEA_RE_01) 07:15			07:07	07:34 (WEA_RE_04) 05:57	
62	17:09	10:21 (WEA_RE_02) 18:09			20:00	08:02 (WEA_RE_04) 21:42	
63	Sonnenscheinstunden	254					
64	astr. max. mögl. Beschattung	1315	275	367	418	490	505
65			961	460	264		

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------



Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_16 - IO 16 Böseler Straße 580 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November	Dezember
1	05:06	05:44	06:36	07:37 (WEA_RE_04) 07:28	08:15 (WEA_RE_05) 07:24	08:06 (WEA_RE_03) 08:17
2	05:58	06:46	07:40	08:41 (WEA_RE_04) 07:30	09:19 (WEA_RE_05) 07:30	09:02 (WEA_RE_01) 09:02
3	06:50	07:42	08:38	09:37 (WEA_RE_04) 07:31	10:15 (WEA_RE_05) 07:31	09:54 (WEA_RE_01) 09:54
4	07:42	08:38	09:34	10:31 (WEA_RE_04) 07:32	10:52 (WEA_RE_05) 07:32	10:10 (WEA_RE_02) 10:10
5	08:34	09:34	10:30	11:27 (WEA_RE_04) 07:33	11:28 (WEA_RE_05) 07:33	10:05 (WEA_RE_01) 10:05
6	09:26	10:28	11:24	12:22 (WEA_RE_04) 07:34	12:08 (WEA_RE_05) 07:34	10:11 (WEA_RE_02) 10:11
7	10:18	11:22	12:18	13:17 (WEA_RE_04) 07:35	12:54 (WEA_RE_05) 07:35	10:07 (WEA_RE_01) 10:07
8	11:10	12:16	13:12	14:11 (WEA_RE_04) 07:36	13:41 (WEA_RE_05) 07:36	10:12 (WEA_RE_02) 10:12
9	12:02	13:10	14:06	15:06 (WEA_RE_04) 07:37	14:11 (WEA_RE_05) 07:37	10:07 (WEA_RE_01) 10:07
10	12:54	14:04	15:00	16:01 (WEA_RE_04) 07:38	15:06 (WEA_RE_05) 07:38	10:12 (WEA_RE_02) 10:12
11	13:46	15:00	16:00	17:06 (WEA_RE_04) 07:39	16:11 (WEA_RE_05) 07:39	10:10 (WEA_RE_01) 10:10
12	14:38	16:00	17:00	18:01 (WEA_RE_04) 07:40	17:16 (WEA_RE_05) 07:40	10:14 (WEA_RE_02) 10:14
13	15:30	17:00	18:00	18:56 (WEA_RE_04) 07:41	18:31 (WEA_RE_05) 07:41	10:12 (WEA_RE_01) 10:12
14	16:22	18:00	19:00	19:51 (WEA_RE_04) 07:42	19:26 (WEA_RE_05) 07:42	10:16 (WEA_RE_02) 10:16
15	17:14	19:00	20:00	20:46 (WEA_RE_04) 07:43	20:21 (WEA_RE_05) 07:43	10:16 (WEA_RE_01) 10:16
16	18:06	20:00	21:00	21:41 (WEA_RE_04) 07:44	21:16 (WEA_RE_05) 07:44	10:20 (WEA_RE_02) 10:20
17	18:58	21:00	22:00	22:36 (WEA_RE_04) 07:45	22:11 (WEA_RE_05) 07:45	10:18 (WEA_RE_01) 10:18
18	19:50	22:00	23:00	23:31 (WEA_RE_04) 07:46	22:56 (WEA_RE_05) 07:46	10:18 (WEA_RE_02) 10:18
19	20:42	23:00	24:00	24:26 (WEA_RE_04) 07:47	23:51 (WEA_RE_05) 07:47	10:18 (WEA_RE_01) 10:18
20	21:34	24:00	25:00	25:21 (WEA_RE_04) 07:48	24:46 (WEA_RE_05) 07:48	10:22 (WEA_RE_02) 10:22
21	22:26	25:00	26:00	26:16 (WEA_RE_04) 07:49	25:41 (WEA_RE_05) 07:49	10:20 (WEA_RE_01) 10:20
22	23:18	26:00	27:00	27:11 (WEA_RE_04) 07:50	26:36 (WEA_RE_05) 07:50	10:24 (WEA_RE_02) 10:24
23	24:10	27:00	28:00	28:06 (WEA_RE_04) 07:51	27:31 (WEA_RE_05) 07:51	10:24 (WEA_RE_01) 10:24
24	25:02	28:00	29:00	29:01 (WEA_RE_04) 07:52	28:26 (WEA_RE_05) 07:52	10:28 (WEA_RE_02) 10:28
25	25:54	29:00	30:00	29:56 (WEA_RE_04) 07:53	29:21 (WEA_RE_05) 07:53	10:26 (WEA_RE_01) 10:26
26	26:46	30:00	31:00	30:51 (WEA_RE_04) 07:54	30:16 (WEA_RE_05) 07:54	10:28 (WEA_RE_02) 10:28
27	27:38	31:00	01:00	31:46 (WEA_RE_04) 07:55	31:11 (WEA_RE_05) 07:55	10:26 (WEA_RE_01) 10:26
28	28:30	01:00	02:00	32:41 (WEA_RE_04) 07:56	32:06 (WEA_RE_05) 07:56	10:30 (WEA_RE_02) 10:30
29	29:22	02:00	03:00	33:36 (WEA_RE_04) 07:57	33:01 (WEA_RE_05) 07:57	10:28 (WEA_RE_01) 10:28
30	30:14	03:00	04:00	34:31 (WEA_RE_04) 07:58	33:56 (WEA_RE_05) 07:58	10:32 (WEA_RE_02) 10:32
31	31:06	04:00	05:00	35:26 (WEA_RE_04) 07:59	34:51 (WEA_RE_05) 07:59	10:30 (WEA_RE_01) 10:30
1	05:06	05:44	06:36	07:37 (WEA_RE_04) 07:28	08:15 (WEA_RE_05) 07:24	08:06 (WEA_RE_03) 08:17
2	05:58	06:46	07:40	08:41 (WEA_RE_04) 07:30	09:19 (WEA_RE_05) 07:30	09:02 (WEA_RE_01) 09:02
3	06:50	07:42	08:38	09:37 (WEA_RE_04) 07:31	10:15 (WEA_RE_05) 07:31	09:54 (WEA_RE_01) 09:54
4	07:42	08:38	09:34	10:31 (WEA_RE_04) 07:32	10:52 (WEA_RE_05) 07:32	10:10 (WEA_RE_02) 10:10
5	08:34	09:34	10:30	11:27 (WEA_RE_04) 07:33	11:28 (WEA_RE_05) 07:33	10:05 (WEA_RE_01) 10:05
6	09:26	10:28	11:24	12:22 (WEA_RE_04) 07:34	12:08 (WEA_RE_05) 07:34	10:11 (WEA_RE_02) 10:11
7	10:18	11:22	12:18	13:17 (WEA_RE_04) 07:35	12:54 (WEA_RE_05) 07:35	10:07 (WEA_RE_01) 10:07
8	11:10	12:16	13:12	14:11 (WEA_RE_04) 07:36	13:41 (WEA_RE_05) 07:36	10:12 (WEA_RE_02) 10:12
9	12:02	13:10	14:06	15:06 (WEA_RE_04) 07:37	14:11 (WEA_RE_05) 07:37	10:07 (WEA_RE_01) 10:07
10	12:54	14:04	15:00	16:01 (WEA_RE_04) 07:38	15:06 (WEA_RE_05) 07:38	10:12 (WEA_RE_02) 10:12
11	13:46	15:00	16:00	17:06 (WEA_RE_04) 07:39	16:11 (WEA_RE_05) 07:39	10:10 (WEA_RE_01) 10:10
12	14:38	16:00	17:00	18:01 (WEA_RE_04) 07:40	17:16 (WEA_RE_05) 07:40	10:14 (WEA_RE_02) 10:14
13	15:30	17:00	18:00	18:56 (WEA_RE_04) 07:41	18:31 (WEA_RE_05) 07:41	10:12 (WEA_RE_01) 10:12
14	16:22	18:00	19:00	19:51 (WEA_RE_04) 07:42	19:26 (WEA_RE_05) 07:42	10:16 (WEA_RE_02) 10:16
15	17:14	19:00	20:00	20:46 (WEA_RE_04) 07:43	20:21 (WEA_RE_05) 07:43	10:16 (WEA_RE_01) 10:16
16	18:06	20:00	21:00	21:41 (WEA_RE_04) 07:44	21:16 (WEA_RE_05) 07:44	10:20 (WEA_RE_02) 10:20
17	18:58	21:00	22:00	22:36 (WEA_RE_04) 07:45	22:11 (WEA_RE_05) 07:45	10:18 (WEA_RE_01) 10:18
18	19:50	22:00	23:00	23:31 (WEA_RE_04) 07:46	23:06 (WEA_RE_05) 07:46	10:18 (WEA_RE_02) 10:18
19	20:42	23:00	24:00	24:26 (WEA_RE_04) 07:47	24:01 (WEA_RE_05) 07:47	10:18 (WEA_RE_01) 10:18
20	21:34	24:00	25:00	25:21 (WEA_RE_04) 07:48	24:56 (WEA_RE_05) 07:48	10:22 (WEA_RE_02) 10:22
21	22:26	25:00	26:00	26:16 (WEA_RE_04) 07:49	25:51 (WEA_RE_05) 07:49	10:20 (WEA_RE_01) 10:20
22	23:18	26:00	27:00	27:11 (WEA_RE_04) 07:50	26:46 (WEA_RE_05) 07:50	10:24 (WEA_RE_02) 10:24
23	24:10	27:00	28:00	28:06 (WEA_RE_04) 07:51	27:41 (WEA_RE_05) 07:51	10:24 (WEA_RE_01) 10:24
24	25:02	28:00	29:00	29:01 (WEA_RE_04) 07:52	28:36 (WEA_RE_05) 07:52	10:28 (WEA_RE_02) 10:28
25	25:54	29:00	30:00	29:56 (WEA_RE_04) 07:53	29:31 (WEA_RE_05) 07:53	10:26 (WEA_RE_01) 10:26
26	26:46	30:00	31:00	30:51 (WEA_RE_04) 07:54	30:26 (WEA_RE_05) 07:54	10:30 (WEA_RE_02) 10:30
27	27:38	31:00	01:00	31:46 (WEA_RE_04) 07:55	31:21 (WEA_RE_05) 07:55	10:28 (WEA_RE_01) 10:28
28	28:30	01:00	02:00	32:41 (WEA_RE_04) 07:56	32:16 (WEA_RE_05) 07:56	10:32 (WEA_RE_02) 10:32
29	29:22	02:00	03:00	33:36 (WEA_RE_04) 07:57	33:11 (WEA_RE_05) 07:57	10:30 (WEA_RE_01) 10:30
30	30:14	03:00	04:00	34:31 (WEA_RE_04) 07:58	34:06 (WEA_RE_05) 07:58	10:34 (WEA_RE_02) 10:34
31	31:06	04:00	05:00	35:26 (WEA_RE_04) 07:59	35:01 (WEA_RE_05) 07:59	10:32 (WEA_RE_01) 10:32
1	05:06	05:44	06:36	07:37 (WEA_RE_04) 07:28	08:15 (WEA_RE_05) 07:24	08:06 (WEA_RE_03) 08:17
2	05:58	06:46	07:40	08:41 (WEA_RE_04) 07:30	09:19 (WEA_RE_05) 07:30	09:02 (WEA_RE_01) 09:02
3	06:50	07:42	08:38	09:37 (WEA_RE_04) 07:31	10:15 (WEA_RE_05) 07:31	09:54 (WEA_RE_01) 09:54
4	07:42	08:38	09:34	10:31 (WEA_RE_04) 07:32	10:52 (WEA_RE_05) 07:32	10:10 (WEA_RE_02) 10:10
5	08:34	09:34	10:30	11:27 (WEA_RE_04) 07:33	11:28 (WEA_RE_05) 07:33	10:05 (WEA_RE_01) 10:05
6	09:26	10:28	11:24	12:22 (WEA_RE_04) 07:34	12:08 (WEA_RE_05) 07:34	10:11 (WEA_RE_02) 10:11
7	10:18	11:22	12:18	13:17 (WEA_RE_04) 07:35	12:54 (WEA_RE_05) 07:35	10:07 (WEA_RE_01) 10:07
8	11:10	12:16	13:12	14:11 (WEA_RE_04) 07:36	13:41 (WEA_RE_05) 07:36	10:12 (WEA_RE_02) 10:12
9	12:02	13:10	14:06	15:06 (WEA_RE_04) 07:37	14:11 (WEA_RE_05) 07:37	10:07 (WEA_RE_01) 10:07
10	12:54	14:04	15:00	16:01 (WEA_RE_04) 07:38	15:06 (WEA_RE_05) 07:38	10:12 (WEA_RE_02) 10:12
11	13:46	15:00	16:00	17:06 (WEA_RE_04) 07:39	16:11 (WEA_RE_05) 07:39	10:10 (WEA_RE_01) 10:10
12	14:38	16:00	17:00	18:01 (WEA_RE_04) 07:40	17:16 (WEA_RE_05) 07:40	10:14 (WEA_RE_02) 10:14
13	15:30	17:00	18:00	18:56 (WEA_RE_04) 07:41	18:31 (WEA_RE_05) 07:41	10:12 (WEA_RE_01) 10:12
14	16:22	18:00	19:00	19:51 (WEA_RE_04) 07:42	19:26 (WEA_RE_05) 07:42	10:16 (WEA_RE_02) 10:16
15	17:14	19:00	20:00	20:46 (WEA_RE_04) 07:43	20:21 (WEA_RE_05) 07:43	10:16 (WEA_RE_01) 10:16
16	18:06	20:00	21:00	21:41 (WEA_RE_04) 07:44	21:16 (WEA_RE_05) 07:44	10:20 (WEA_RE_02) 10:20
17	18:58	21:00	22:00	22:36 (WEA_RE_04) 07:45	22:11 (WEA_RE_05) 07:45	10:18 (WEA_RE_01) 10:18
18	19:50	22:00	23:00	23:31 (WEA_RE_04) 07:46	23:06 (WEA_RE_05) 07:46	10:18 (WEA_RE_02) 10:18
19	20:42	23:00	24:00	24:26 (WEA_RE_04) 07:47	24:01 (WEA_RE_05) 07:47	10:18 (WEA_RE_01) 10:18
20	21:34	24:00	25:00	25:21 (WEA_RE_04) 07:48	24:56 (WEA_RE_05) 07:48	10:22 (WEA_RE_02) 10:22
21	22:26	25:00	26:00	26:16 (WEA_RE_04) 07:49	25:51 (WEA_RE_05) 07:49	10:20 (WEA_RE_01) 10:20
22	23:18	26:00	27:00	27:11 (WEA_RE_04) 07:50	26:46 (WEA_RE_05) 07:50	10:24 (WEA_RE_02) 10:24
23	24:10	27:00	28:00	28:06 (WEA_RE_04) 07:51	27:41 (WEA_RE_05) 07:51	10:24 (WEA_RE_01) 10:24
24	25:02	28:00	29:00	29:01 (WEA_RE_04) 07:52	28:36 (WEA_RE_05) 07:52	10:28 (WEA_RE_02) 10:28
25	25:54	29:00	30:00	29:56 (WEA_RE_04) 07:53	29:31 (WEA_RE_05) 07:53	10:26 (WEA_RE_01) 10:26
26	26:46	30:00	31:00	30:51 (WEA_RE_04) 07:54	30:26 (WEA_RE_05) 07:54	10:30 (WEA_RE_02) 10:30
27	27:38	31:00	01:00	31:46 (WEA_RE_04) 07:55	31:21 (WEA_RE_05) 07:55	10:28 (WEA_RE_01) 10:28
28	28:30	01:00	02:00	32:41 (WEA_RE_04) 07:56	32:16 (WEA_RE_05) 07:56	10:32 (WEA_RE_02) 10:32
29	29:22	02:00	03:00	33:36 (WEA_RE_04) 07:57	33:11 (WEA_RE_05) 07:57	10:30 (WEA_RE_01) 10:30
30	30:14	03:00	04:00	34:31 (WEA_RE_04) 07:58	34:06 (WEA_RE_05) 07:58	10:34 (WEA_RE_02) 10:34
31	31:06	04:00	05:00	35:26 (WEA_RE_04) 07:59	35:01 (WEA_RE_05) 07:59	10:32 (WEA_RE_01) 10:32
1	05:06	05:44	06:36	07:37 (WEA_RE_04) 07:28	08:15 (WEA_RE_05) 07:24	08:06 (WEA_RE_03) 08:17
2	05:58	06:46	07:40	08:41 (WEA_RE_04) 07:30	09:19 (WEA_RE_05) 07:30	09:02 (WEA_RE_01) 09:02
3	06:50	07:42	08:38	09:37 (WEA_RE_04) 07:31	10:15 (WEA_RE_05) 07:31	09:54 (WEA_RE_01) 09:54
4	07:42	08:38	09:34	10:31 (WEA_RE_04) 07:32	10:52 (WEA_RE_05) 07:32	10:10 (WEA_RE_02) 10:10
5	08:34	09:34	10:30	11:27 (WEA_RE_04) 07:33	11:28 (WEA_RE_05) 07:33	10:05 (WEA_RE_01) 10:05
6	09:26	10:28	11:24	12:22 (WEA_RE_04) 07:34	12:08 (WEA_RE_05) 07:34	10:11 (WEA_RE_02) 10:11
7	10:18	11:22	12:18	13:17 (WEA_RE_04) 07:35	12:54 (WEA_RE_05) 07:35	10:07 (WEA_RE_01) 10:07
8	11:10	12:16	13:12	14:11 (WEA_RE_04) 07:36	13:41 (WEA_RE_05) 07:36	10:12 (WEA_RE_02) 10:12

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_17 - IO 17 Böseler Straße 544 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42	09:21 (WEA_RE_03) 08:13	09:30 (WEA_RE_03) 07:17	08:11 (WEA_RE_05) 07:04	08:04 (WEA_RE_04) 05:57	05:09
2	16:21	65 11:03 (WEA_RE_01) 17:11	24 09:54 (WEA_RE_03) 18:05	22 08:33 (WEA_RE_05) 20:01	24 08:28 (WEA_RE_04) 20:55	21:43
3	08:42	09:21 (WEA_RE_03) 08:12	09:31 (WEA_RE_03) 07:15	08:12 (WEA_RE_05) 07:02	08:06 (WEA_RE_04) 05:55	05:08
4	16:22	66 11:04 (WEA_RE_01) 17:13	22 09:53 (WEA_RE_03) 18:07	19 08:31 (WEA_RE_05) 20:03	21 08:27 (WEA_RE_04) 20:57	21:44
5	08:42	09:20 (WEA_RE_03) 08:10	09:34 (WEA_RE_03) 07:13	08:15 (WEA_RE_05) 07:00	08:08 (WEA_RE_04) 05:53	05:08
6	16:23	67 11:04 (WEA_RE_01) 17:15	18 09:52 (WEA_RE_03) 18:09	14 08:29 (WEA_RE_05) 20:05	16 08:24 (WEA_RE_04) 20:58	21:45
7	08:41	09:21 (WEA_RE_03) 08:08	09:36 (WEA_RE_03) 07:11	08:18 (WEA_RE_05) 06:57	08:11 (WEA_RE_04) 05:51	05:07
8	16:25	67 11:04 (WEA_RE_01) 17:17	13 09:49 (WEA_RE_03) 18:11	6 08:24 (WEA_RE_05) 20:07	8 08:19 (WEA_RE_04) 21:00	21:46
9	08:41	09:20 (WEA_RE_03) 08:06	09:41 (WEA_RE_03) 07:08	06:55	05:49	05:06
10	16:26	68 11:04 (WEA_RE_01) 17:19	3 09:44 (WEA_RE_03) 18:12	06:55	05:49	05:06
11	08:41	09:21 (WEA_RE_03) 08:05	07:06	06:52	05:47	05:05
12	16:27	68 11:05 (WEA_RE_01) 17:21	18:14	20:09	21:02	21:48
13	08:40	09:20 (WEA_RE_03) 08:03	07:04	06:50	05:45	05:05
14	16:28	69 11:04 (WEA_RE_01) 17:23	18:16	20:12	21:05	21:50
15	08:40	09:20 (WEA_RE_03) 08:01	07:01	06:48	05:43	05:04
16	16:30	68 11:04 (WEA_RE_01) 17:24	18:18	20:14	21:07	21:50
17	08:39	09:21 (WEA_RE_03) 07:59	06:59	06:45	05:42	05:04
18	16:31	69 11:05 (WEA_RE_01) 17:26	18:20	20:16	21:09	21:51
19	08:39	09:21 (WEA_RE_03) 07:57	06:57	06:43	05:40	05:03
20	16:33	68 11:05 (WEA_RE_01) 17:28	18:22	20:18	21:10	21:52
21	08:38	09:21 (WEA_RE_03) 07:55	06:54	06:41	05:38	05:03
22	16:34	69 11:05 (WEA_RE_01) 17:30	18:24	20:19	21:12	21:53
23	08:37	09:21 (WEA_RE_03) 07:53	06:52	06:38	05:36	05:02
24	16:36	68 11:04 (WEA_RE_01) 17:32	18:25	20:21	21:14	21:54
25	08:37	09:21 (WEA_RE_03) 07:51	06:50	06:36	05:35	05:02
26	16:37	67 11:04 (WEA_RE_01) 17:34	11 08:29 (WEA_RE_05) 18:27	20:23	21:15	21:54
27	08:36	09:21 (WEA_RE_03) 07:49	08:15 (WEA_RE_05) 06:47	07:16 (WEA_RE_04) 06:34	05:33	05:02
28	16:39	67 11:04 (WEA_RE_01) 17:36	17 08:32 (WEA_RE_05) 18:29	14 07:30 (WEA_RE_04) 20:25	21:17	21:55
29	08:35	09:21 (WEA_RE_03) 07:47	08:14 (WEA_RE_05) 06:45	07:12 (WEA_RE_04) 06:32	05:31	05:02
30	16:40	67 11:04 (WEA_RE_01) 17:38	20 08:34 (WEA_RE_05) 18:31	20 07:32 (WEA_RE_04) 20:26	21:19	21:56
31	08:34	09:21 (WEA_RE_03) 07:45	08:12 (WEA_RE_05) 06:43	07:10 (WEA_RE_04) 06:29	05:30	05:01
32	16:42	65 11:03 (WEA_RE_01) 17:40	23 08:35 (WEA_RE_05) 18:33	24 07:34 (WEA_RE_04) 20:28	21:20	21:56
33	08:33	09:21 (WEA_RE_03) 07:43	08:10 (WEA_RE_05) 06:40	07:08 (WEA_RE_04) 06:27	05:28	05:01
34	16:44	64 11:03 (WEA_RE_01) 17:42	26 08:36 (WEA_RE_05) 18:34	27 07:35 (WEA_RE_04) 20:30	21:22	21:57
35	08:32	09:22 (WEA_RE_03) 07:41	08:10 (WEA_RE_05) 06:38	07:07 (WEA_RE_04) 06:25	05:27	05:01
36	16:45	62 11:02 (WEA_RE_01) 17:44	26 08:36 (WEA_RE_05) 18:36	29 07:36 (WEA_RE_04) 20:32	21:24	21:57
37	08:31	09:21 (WEA_RE_03) 07:39	08:09 (WEA_RE_05) 06:35	07:06 (WEA_RE_04) 06:23	05:25	05:01
38	16:47	60 11:01 (WEA_RE_01) 17:46	28 08:37 (WEA_RE_05) 18:38	31 07:37 (WEA_RE_04) 20:34	21:25	21:57
39	08:30	09:22 (WEA_RE_03) 07:37	08:09 (WEA_RE_05) 06:33	07:04 (WEA_RE_04) 06:20	05:24	05:01
40	16:49	57 11:00 (WEA_RE_01) 17:48	29 08:38 (WEA_RE_05) 18:40	33 07:37 (WEA_RE_04) 20:35	21:27	21:58
41	08:29	09:23 (WEA_RE_03) 07:35	08:09 (WEA_RE_05) 06:31	07:04 (WEA_RE_04) 06:18	05:22	05:01
42	16:51	52 10:58 (WEA_RE_01) 17:50	29 08:38 (WEA_RE_05) 18:42	33 07:37 (WEA_RE_04) 20:37	21:28	21:58
43	08:27	09:22 (WEA_RE_03) 07:33	08:08 (WEA_RE_05) 06:28	07:03 (WEA_RE_04) 06:16	05:21	05:02
44	16:52	47 10:55 (WEA_RE_01) 17:52	29 08:37 (WEA_RE_05) 18:44	34 07:37 (WEA_RE_04) 20:39	21:30	21:58
45	08:26	09:23 (WEA_RE_03) 07:31	08:08 (WEA_RE_05) 06:26	07:02 (WEA_RE_04) 06:14	05:19	05:02
46	16:54	35 09:58 (WEA_RE_03) 17:54	30 08:38 (WEA_RE_05) 18:45	35 07:37 (WEA_RE_04) 20:41	21:31	21:58
47	08:25	09:23 (WEA_RE_03) 07:29	08:08 (WEA_RE_05) 06:23	07:02 (WEA_RE_04) 06:12	05:18	05:02
48	16:56	34 09:57 (WEA_RE_03) 17:55	30 08:38 (WEA_RE_05) 18:47	35 07:37 (WEA_RE_04) 20:43	21:33	21:58
49	08:24	09:24 (WEA_RE_03) 07:26	30 08:09 (WEA_RE_05) 06:21	37 07:02 (WEA_RE_04) 06:09	05:17	05:03
50	16:58	34 09:58 (WEA_RE_03) 17:57	28 08:37 (WEA_RE_05) 18:49	34 07:36 (WEA_RE_04) 20:44	21:34	21:58
51	08:22	09:24 (WEA_RE_03) 07:24	08:08 (WEA_RE_05) 06:19	07:02 (WEA_RE_04) 06:07	05:16	05:03
52	17:00	33 09:57 (WEA_RE_03) 17:59	28 08:36 (WEA_RE_05) 18:51	34 07:36 (WEA_RE_04) 20:46	21:35	21:58
53	08:21	09:25 (WEA_RE_03) 07:22	08:09 (WEA_RE_05) 06:16	07:01 (WEA_RE_04) 06:05	05:14	05:03
54	17:01	33 09:58 (WEA_RE_03) 18:01	26 08:35 (WEA_RE_05) 18:53	34 07:35 (WEA_RE_04) 20:48	21:37	21:58
55	08:19	09:26 (WEA_RE_03) 07:20	08:10 (WEA_RE_05) 06:14	07:02 (WEA_RE_04) 06:03	05:13	05:04
56	17:03	31 09:57 (WEA_RE_03) 18:03	25 08:35 (WEA_RE_05) 18:54	32 07:34 (WEA_RE_04) 20:50	21:38	21:58
57	08:18	09:26 (WEA_RE_03)	07:11	08:03 (WEA_RE_04) 06:01	05:12	05:04
58	17:05	30 09:56 (WEA_RE_03)	19:56	31 08:34 (WEA_RE_04) 20:51	21:39	21:58
59	08:16	09:28 (WEA_RE_03)	07:09	08:02 (WEA_RE_04) 05:59	05:11	05:05
60	17:07	28 09:56 (WEA_RE_03)	19:58	30 08:32 (WEA_RE_04) 20:53	21:41	21:58
61	08:15	09:29 (WEA_RE_03)	07:07	08:04 (WEA_RE_04)	05:10	
62	17:09	26 09:55 (WEA_RE_03)	20:00	27 08:31 (WEA_RE_04)	21:42	
63	Sonnenscheinstunden	254			418	505
64	astr. max. mögl. Beschattung	1704	485	598	69	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_17 - IO 17 Böseler Straße 544 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November	Dezember	
1	05:06	05:44	06:36		07:24		08:17
	21:58	21:24	20:19		16:59		16:16
2	05:06	05:46	06:38		07:26		08:19
	21:57	21:22	20:17		16:57		16:15
3	05:07	05:47	06:40		07:28		08:20
	21:57	21:20	20:15		16:55		16:15
4	05:08	05:49	06:42		07:30		08:22
	21:56	21:18	20:12		16:53		16:14
5	05:09	05:51	06:43		07:32		08:23
	21:56	21:17	20:10		16:51		16:13
6	05:10	05:52	06:45		07:34	09:09 (WEA_RE_03)	08:25
	21:55	21:15	20:07		16:49	6 09:15 (WEA_RE_03)	16:13
7	05:11	05:54	06:47		07:35	09:05 (WEA_RE_03)	08:26
	21:55	21:13	20:05		16:47	14 09:19 (WEA_RE_03)	16:12
8	05:12	05:56	06:48		07:37	09:03 (WEA_RE_03)	08:27
	21:54	21:11	20:03	7 08:14 (WEA_RE_04)	16:46	19 09:22 (WEA_RE_03)	16:12
9	05:13	05:57	06:50		07:39	09:02 (WEA_RE_03)	08:28
	21:53	21:09	20:00	15 08:17 (WEA_RE_04)	16:44	22 09:24 (WEA_RE_03)	16:12
10	05:14	05:59	06:52		07:41	09:00 (WEA_RE_03)	08:30
	21:52	21:07	19:58	21 08:20 (WEA_RE_04)	16:42	25 09:25 (WEA_RE_03)	16:11
11	05:15	06:01	06:54		07:43	08:59 (WEA_RE_03)	08:31
	21:52	21:05	19:55	25 08:22 (WEA_RE_04)	16:41	27 09:26 (WEA_RE_03)	16:11
12	05:16	06:02	06:55		07:45	08:59 (WEA_RE_03)	08:32
	21:51	21:03	19:53	27 08:22 (WEA_RE_04)	16:39	28 09:27 (WEA_RE_03)	16:11
13	05:17	06:04	06:57		07:47	08:58 (WEA_RE_03)	08:33
	21:50	21:01	19:51	29 08:23 (WEA_RE_04)	16:37	30 09:28 (WEA_RE_03)	16:11
14	05:18	06:06	06:59		07:49	08:58 (WEA_RE_03)	08:34
	21:49	20:59	19:48	31 08:24 (WEA_RE_04)	16:36	31 09:29 (WEA_RE_03)	16:11
15	05:19	06:07	07:00		07:51	08:57 (WEA_RE_03)	08:35
	21:48	20:57	19:46	33 08:24 (WEA_RE_04)	16:34	33 09:30 (WEA_RE_03)	16:11
16	05:21	06:09	07:02		07:53	08:57 (WEA_RE_03)	08:36
	21:47	20:55	19:43	33 08:24 (WEA_RE_04)	16:32	33 09:30 (WEA_RE_03)	16:11
17	05:22	06:11	07:04		07:54	08:57 (WEA_RE_03)	08:36
	21:46	20:53	19:41	35 08:25 (WEA_RE_04)	16:31	34 09:31 (WEA_RE_03)	16:11
18	05:23	06:12	07:05		07:56	08:57 (WEA_RE_03)	08:37
	21:44	20:51	19:39	35 08:24 (WEA_RE_04)	16:30	34 09:31 (WEA_RE_03)	16:12
19	05:25	06:14	07:07		07:58	08:57 (WEA_RE_03)	08:38
	21:43	20:48	19:36	35 08:24 (WEA_RE_04)	16:29	35 09:32 (WEA_RE_03)	16:12
20	05:26	06:16	07:09		07:59	08:57 (WEA_RE_03)	08:39
	21:42	20:46	19:34	35 08:24 (WEA_RE_04)	16:27	47 10:30 (WEA_RE_01)	16:12
21	05:27	06:18	07:11		08:01	08:58 (WEA_RE_03)	08:39
	21:41	20:44	19:31	35 08:23 (WEA_RE_04)	16:26	52 10:33 (WEA_RE_01)	16:13
22	05:29	06:19	07:12		08:03	08:58 (WEA_RE_03)	08:40
	21:39	20:42	19:29	34 08:22 (WEA_RE_04)	16:25	57 10:36 (WEA_RE_01)	16:13
23	05:30	06:21	07:14		08:05	08:58 (WEA_RE_03)	08:40
	21:38	20:40	19:27	33 08:22 (WEA_RE_04)	16:24	60 10:38 (WEA_RE_01)	16:14
24	05:32	06:23	07:16		08:06	08:59 (WEA_RE_03)	08:41
	21:36	20:37	19:24	32 08:21 (WEA_RE_04)	16:23	62 10:39 (WEA_RE_01)	16:14
25	05:33	06:24	07:17		08:08	08:59 (WEA_RE_03)	08:41
	21:35	20:35	19:22	30 08:19 (WEA_RE_04)	16:21	64 10:41 (WEA_RE_01)	16:15
26	05:35	06:26	07:19		08:10	09:00 (WEA_RE_03)	08:41
	21:34	20:33	19:19	28 08:18 (WEA_RE_04)	16:20	65 10:42 (WEA_RE_01)	16:15
27	05:36	06:28	07:21		08:11	09:00 (WEA_RE_03)	08:42
	21:32	20:31	19:17	24 08:16 (WEA_RE_04)	16:19	67 10:43 (WEA_RE_01)	16:16
28	05:38	06:30	07:23		08:13	09:01 (WEA_RE_03)	08:42
	21:30	20:28	19:14	21 08:13 (WEA_RE_04)	16:18	67 10:44 (WEA_RE_01)	16:17
29	05:39	06:31	07:24		08:14	09:02 (WEA_RE_03)	08:42
	21:29	20:26	19:12	16 08:11 (WEA_RE_04)	16:18	67 10:45 (WEA_RE_01)	16:18
30	05:41	06:33	07:26		08:16	09:02 (WEA_RE_03)	08:42
	21:27	20:24	19:10	7 08:06 (WEA_RE_04)	16:17	69 10:46 (WEA_RE_01)	16:19
31	05:43	06:35					08:42
	21:26	20:22					16:20
Sonnenscheinstunden	508	457	382	621	475	262	238
astr.max.mögl.Beschattung						1048	2011

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_18 - IO 18 Böseler Straße 531 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni		
1	08:42	09:27 (WEA_RE_03)	08:13	09:40 (WEA_RE_03)	07:17	08:12 (WEA_RE_05)	07:04	07:56 (WEA_RE_04)	05:57	05:09		
	11:21	11:24 (WEA_RE_01)	17:11	10:04 (WEA_RE_03)	18:05	26	08:38 (WEA_RE_05)	20:01	36	08:32 (WEA_RE_04)	20:55	21:43
2	08:42	09:27 (WEA_RE_03)	08:12	09:41 (WEA_RE_03)	07:15		08:12 (WEA_RE_05)	07:02		07:57 (WEA_RE_04)	05:55	05:08
	11:22	11:24 (WEA_RE_01)	17:13	10:02 (WEA_RE_03)	18:07	24	08:36 (WEA_RE_05)	20:03	34	08:31 (WEA_RE_04)	20:57	21:44
3	08:42	09:27 (WEA_RE_03)	08:10	09:44 (WEA_RE_03)	07:13		08:14 (WEA_RE_05)	06:59		07:58 (WEA_RE_04)	05:53	05:08
	11:23	11:24 (WEA_RE_01)	17:15	10:01 (WEA_RE_03)	18:09	21	08:35 (WEA_RE_05)	20:05	32	08:30 (WEA_RE_04)	20:58	21:45
4	08:41	09:28 (WEA_RE_03)	08:08	09:47 (WEA_RE_03)	07:11		08:15 (WEA_RE_05)	06:57		07:58 (WEA_RE_04)	05:51	05:07
	11:25	11:24 (WEA_RE_01)	17:17	10:00 (WEA_RE_03)	18:11	16	08:31 (WEA_RE_05)	20:07	30	08:28 (WEA_RE_04)	21:00	21:46
5	08:41	09:27 (WEA_RE_03)	08:06	09:47 (WEA_RE_03)	07:08		08:19 (WEA_RE_05)	06:55		07:59 (WEA_RE_04)	05:49	05:06
	11:26	11:24 (WEA_RE_01)	17:19		18:12	9	08:28 (WEA_RE_05)	20:09	28	08:27 (WEA_RE_04)	21:02	21:48
6	08:41	09:28 (WEA_RE_03)	08:05		17:06			06:52		08:01 (WEA_RE_04)	05:47	05:05
	11:27	11:25 (WEA_RE_01)	17:21		18:14			20:10	24	08:25 (WEA_RE_04)	21:04	21:49
7	08:40	09:28 (WEA_RE_03)	08:03		17:04			06:50		08:02 (WEA_RE_04)	05:45	05:05
	11:28	11:25 (WEA_RE_01)	17:23		18:16			20:12	20	08:22 (WEA_RE_04)	21:05	21:50
8	08:40	09:28 (WEA_RE_03)	08:01		17:01			06:48		08:05 (WEA_RE_04)	05:43	05:04
	11:30	11:24 (WEA_RE_01)	17:24		18:18			20:14	14	08:19 (WEA_RE_04)	21:07	21:50
9	08:39	09:28 (WEA_RE_03)	07:59		16:59			06:45			05:42	05:04
	11:31	11:25 (WEA_RE_01)	17:26		18:20			20:16			21:09	21:51
10	08:39	09:28 (WEA_RE_03)	07:57		16:57			06:43			05:40	05:03
	11:33	11:25 (WEA_RE_01)	17:28		18:22			20:18			21:10	21:52
11	08:38	09:28 (WEA_RE_03)	07:55		16:54			06:41			05:38	05:03
	11:34	11:25 (WEA_RE_01)	17:30		18:24			20:19			21:12	21:53
12	08:37	09:28 (WEA_RE_03)	07:53	08:24 (WEA_RE_05)	06:52			06:38			05:36	05:02
	11:36	11:24 (WEA_RE_01)	17:32	5	08:29 (WEA_RE_05)	18:25		20:21			21:14	21:54
13	08:37	09:29 (WEA_RE_03)	07:51		08:19 (WEA_RE_05)	06:50		06:36			05:35	05:02
	11:37	11:24 (WEA_RE_01)	17:34	14	08:33 (WEA_RE_05)	18:27		20:23			21:15	21:54
14	08:36	09:29 (WEA_RE_03)	07:49		08:17 (WEA_RE_05)	06:47		06:34			05:33	05:02
	11:39	11:24 (WEA_RE_01)	17:36	19	08:36 (WEA_RE_05)	18:29		20:25			21:17	21:55
15	08:35	09:29 (WEA_RE_03)	07:47		08:15 (WEA_RE_05)	06:45		06:32			05:31	05:02
	11:40	11:23 (WEA_RE_01)	17:38	22	08:37 (WEA_RE_05)	18:31		20:26			21:19	21:56
16	08:34	09:29 (WEA_RE_03)	07:45		08:14 (WEA_RE_05)	06:43		06:29			05:30	05:01
	11:42	11:23 (WEA_RE_01)	17:40	25	08:39 (WEA_RE_05)	18:33	12	07:26 (WEA_RE_04)	20:28		21:20	21:56
17	08:33	09:30 (WEA_RE_03)	07:43		08:12 (WEA_RE_05)	06:40		06:27			05:28	05:01
	11:44	11:22 (WEA_RE_01)	17:42	27	08:39 (WEA_RE_05)	18:34	18	07:28 (WEA_RE_04)	20:30		21:22	21:57
18	08:32	09:30 (WEA_RE_03)	07:41		08:12 (WEA_RE_05)	06:38		06:25			05:27	05:01
	11:45	11:22 (WEA_RE_01)	17:44	28	08:40 (WEA_RE_05)	18:36	24	07:31 (WEA_RE_04)	20:32		21:24	21:57
19	08:31	09:30 (WEA_RE_03)	07:39		08:11 (WEA_RE_05)	06:35		06:22			05:25	05:01
	11:47	11:20 (WEA_RE_01)	17:46	30	08:41 (WEA_RE_05)	18:38	27	07:33 (WEA_RE_04)	20:34		21:25	21:57
20	08:30	09:31 (WEA_RE_03)	07:37		08:11 (WEA_RE_05)	06:33		06:20			05:24	05:01
	11:49	11:18 (WEA_RE_01)	17:48	30	08:41 (WEA_RE_05)	18:40	30	07:33 (WEA_RE_04)	20:35		21:27	21:58
21	08:29	09:31 (WEA_RE_03)	07:35		08:10 (WEA_RE_05)	06:31		06:18			05:22	05:01
	11:51	11:17 (WEA_RE_01)	17:50	32	08:42 (WEA_RE_05)	18:42	33	07:35 (WEA_RE_04)	20:37		21:28	21:58
22	08:27	09:31 (WEA_RE_03)	07:33		08:09 (WEA_RE_05)	06:28		06:16			05:21	05:02
	11:52	11:13 (WEA_RE_01)	17:52	32	08:41 (WEA_RE_05)	18:44	34	07:35 (WEA_RE_04)	20:39		21:30	21:58
23	08:26	09:32 (WEA_RE_03)	07:31		08:09 (WEA_RE_05)	06:26		06:14			05:19	05:02
	11:54	10:09 (WEA_RE_03)	17:54	32	08:41 (WEA_RE_05)	18:45	35	07:35 (WEA_RE_04)	20:41		21:31	21:58
24	08:25	09:32 (WEA_RE_03)	07:29		08:10 (WEA_RE_05)	06:23		06:12			05:18	05:02
	11:56	10:08 (WEA_RE_03)	17:55	31	08:41 (WEA_RE_05)	18:47	37	07:36 (WEA_RE_04)	20:43		21:33	21:58
25	08:24	09:33 (WEA_RE_03)	07:26		08:10 (WEA_RE_05)	06:21		06:09			05:17	05:03
	11:58	10:09 (WEA_RE_03)	17:57	31	08:41 (WEA_RE_05)	18:49	38	07:36 (WEA_RE_04)	20:44		21:34	21:58
26	08:22	09:33 (WEA_RE_03)	07:24		08:09 (WEA_RE_05)	06:19		06:07			05:16	05:03
	17:00	10:08 (WEA_RE_03)	17:59	31	08:40 (WEA_RE_05)	18:51	38	07:36 (WEA_RE_04)	20:46		21:35	21:58
27	08:21	09:35 (WEA_RE_03)	07:22		08:10 (WEA_RE_05)	06:16		06:05			05:14	05:03
	17:01	10:08 (WEA_RE_03)	18:01	30	08:40 (WEA_RE_05)	18:52	38	07:35 (WEA_RE_04)	20:48		21:37	21:58
28	08:19	09:35 (WEA_RE_03)	07:20		08:11 (WEA_RE_05)	06:14		06:03			05:13	05:04
	17:03	10:08 (WEA_RE_03)	18:03	28	08:39 (WEA_RE_05)	18:54	38	07:35 (WEA_RE_04)	20:50		21:38	21:58
29	08:18	09:36 (WEA_RE_03)			07:11			06:01			05:12	05:04
	17:05	10:07 (WEA_RE_03)			19:56			20:51			21:39	21:58
30	08:16	09:38 (WEA_RE_03)			07:09			05:59			05:11	05:05
	17:07	10:07 (WEA_RE_03)			19:58			20:53			21:41	21:58
31	08:15	09:39 (WEA_RE_03)			07:07			05:57			05:10	
	17:09	10:05 (WEA_RE_03)			20:00			06:33 (WEA_RE_04)			21:42	
Sonnenscheinstunden	254				367			418			490	505
astr.max.mögl.Beschattung	1842	275	520	610	610	218						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_18 - IO 18 Böseler Straße 531 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November	Dezember
1	05:06	05:44	06:36		07:24	08:17
	21:58	21:24	20:19	19:07	16:59	16:16
2	05:06	05:46	06:38		07:26	08:19
	21:57	21:22	20:17	19:05	16:57	16:15
3	05:07	05:47	06:40		07:31	08:20
	21:57	21:20	20:14	19:02	16:55	16:15
4	05:08	05:49	06:42	08:02 (WEA_RE_04)	07:33	08:22
	21:56	21:18	20:12	14 08:16 (WEA_RE_04)	19:00	16:14
5	05:09	05:51	06:43		07:35	08:23
	21:56	21:17	20:10	20 08:19 (WEA_RE_04)	18:58	16:13
6	05:10	05:52	06:45		07:37	08:25
	21:55	21:15	20:07	24 08:20 (WEA_RE_04)	18:55	16:13
7	05:11	05:54	06:47		07:35	09:17 (WEA_RE_03)
	21:55	21:13	20:05	27 08:22 (WEA_RE_04)	18:53	16:12
8	05:12	05:56	06:48		07:37	09:14 (WEA_RE_03)
	21:54	21:11	20:03	30 08:23 (WEA_RE_04)	18:51	16:12
9	05:13	05:57	06:50		07:39	09:12 (WEA_RE_03)
	21:53	21:09	20:00	32 08:23 (WEA_RE_04)	18:48	16:12
10	05:14	05:59	06:52		07:41	09:10 (WEA_RE_03)
	21:52	21:07	19:58	34 08:24 (WEA_RE_04)	18:46	16:11
11	05:15	06:01	06:53		07:43	09:09 (WEA_RE_03)
	21:52	21:05	19:55	35 08:25 (WEA_RE_04)	18:44	16:11
12	05:16	06:02	06:55		07:45	09:08 (WEA_RE_03)
	21:51	21:03	19:53	37 08:25 (WEA_RE_04)	18:41	16:11
13	05:17	06:04	06:57		07:47	09:08 (WEA_RE_03)
	21:50	21:01	19:51	37 08:25 (WEA_RE_04)	18:39	16:11
14	05:18	06:06	06:59		07:49	09:07 (WEA_RE_03)
	21:49	20:59	19:48	38 08:25 (WEA_RE_04)	18:37	16:11
15	05:19	06:07	07:00		07:51	09:07 (WEA_RE_03)
	21:48	20:57	19:46	38 08:24 (WEA_RE_04)	18:35	16:11
16	05:21	06:09	07:02		07:53	09:06 (WEA_RE_03)
	21:47	20:55	19:43	38 08:24 (WEA_RE_04)	18:32	16:11
17	05:22	06:11	07:04		07:54	09:06 (WEA_RE_03)
	21:46	20:53	19:41	38 08:24 (WEA_RE_04)	18:30	16:11
18	05:23	06:12	07:05		07:56	09:06 (WEA_RE_03)
	21:44	20:51	19:39	37 08:23 (WEA_RE_04)	18:28	16:12
19	05:25	06:14	07:07		07:58	09:06 (WEA_RE_03)
	21:43	20:48	19:36	37 08:23 (WEA_RE_04)	18:26	16:12
20	05:26	06:16	07:09		07:59	09:06 (WEA_RE_03)
	21:42	20:46	19:34	36 08:22 (WEA_RE_04)	18:23	16:12
21	05:27	06:18	07:11		08:01	09:06 (WEA_RE_03)
	21:41	20:44	19:31	34 08:20 (WEA_RE_04)	18:21	16:13
22	05:29	06:19	07:12		08:03	09:07 (WEA_RE_03)
	21:39	20:42	19:29	32 08:19 (WEA_RE_04)	18:19	16:13
23	05:30	06:21	07:14		08:05	09:07 (WEA_RE_03)
	21:38	20:40	19:27	30 08:18 (WEA_RE_04)	18:17	16:14
24	05:32	06:23	07:16		08:06	09:07 (WEA_RE_03)
	21:36	20:37	19:24	28 08:17 (WEA_RE_04)	18:15	16:14
25	05:33	06:24	07:17		08:08	09:08 (WEA_RE_03)
	21:35	20:35	19:22	24 08:14 (WEA_RE_04)	17:13	16:15
26	05:35	06:26	07:19		08:10	09:09 (WEA_RE_03)
	21:34	20:33	19:19	20 08:12 (WEA_RE_04)	17:11	16:15
27	05:36	06:28	07:21		08:11	09:08 (WEA_RE_03)
	21:32	20:31	19:17	14 08:09 (WEA_RE_04)	17:09	16:16
28	05:38	06:30	07:23		08:13	09:09 (WEA_RE_03)
	21:30	20:28	19:14		17:07	11:04 (WEA_RE_01)
29	05:39	06:31	07:24		08:14	09:10 (WEA_RE_03)
	21:29	20:26	19:12		17:05	11:05 (WEA_RE_01)
30	05:41	06:33	07:26		08:16	09:10 (WEA_RE_03)
	21:27	20:24	19:10		17:03	11:05 (WEA_RE_01)
31	05:43	06:35			08:17	09:08 (WEA_RE_03)
	21:25	20:22			17:01	11:05 (WEA_RE_01)
Sonnenscheinstunden	508	457	382		262	238
astr.max.mögl.Beschattung				734	544	1082
						2315

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_19 - IO 19 Böseler Straße 532 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	09:34 (WEA_RE_03) 08:13			07:04	05:57	05:09	
	16:21	11:24 (WEA_RE_01) 17:11			20:01	20:55	21:43	
2	08:42	09:35 (WEA_RE_03) 08:12			07:02	05:55	05:08	
	16:22	11:24 (WEA_RE_01) 17:13			20:03	20:57	21:44	
3	08:42	09:35 (WEA_RE_03) 08:10			06:59	05:53	05:08	
	16:23	11:23 (WEA_RE_01) 17:15			20:05	20:58	21:45	
4	08:41	09:35 (WEA_RE_03) 08:08			06:57	05:51	05:07	
	16:25	11:24 (WEA_RE_01) 17:17			20:07	21:00	21:46	
5	08:41	09:35 (WEA_RE_03) 08:06			06:55	05:49	05:06	
	16:26	11:23 (WEA_RE_01) 17:19			20:09	21:02	21:48	
6	08:41	09:36 (WEA_RE_03) 08:05	08:34 (WEA_RE_05) 07:06		06:52	05:47	05:05	
	16:27	11:24 (WEA_RE_01) 17:21	6 08:40 (WEA_RE_05) 18:14		20:10	21:04	21:49	
7	08:40	09:36 (WEA_RE_03) 08:03	08:30 (WEA_RE_05) 07:04		06:50	05:45	05:05	
	16:28	11:23 (WEA_RE_01) 17:23	14 08:44 (WEA_RE_05) 18:16		20:12	21:05	21:50	
8	08:40	09:36 (WEA_RE_03) 08:01	08:28 (WEA_RE_05) 07:01	07:35 (WEA_RE_04) 06:48	05:43	05:04		
	16:30	11:22 (WEA_RE_01) 17:24	18 08:46 (WEA_RE_05) 18:18	5 07:40 (WEA_RE_04) 20:14	21:07	21:50		
9	08:39	09:37 (WEA_RE_03) 07:59	08:27 (WEA_RE_05) 06:59	07:30 (WEA_RE_04) 06:45	05:42	05:04		
	16:31	11:23 (WEA_RE_01) 17:26	21 08:48 (WEA_RE_05) 18:20	15 07:45 (WEA_RE_04) 20:16	21:09	21:51		
10	08:39	09:37 (WEA_RE_03) 07:57	08:25 (WEA_RE_05) 06:57	07:26 (WEA_RE_04) 06:43	05:40	05:03		
	16:33	11:22 (WEA_RE_01) 17:28	24 08:49 (WEA_RE_05) 18:22	21 07:47 (WEA_RE_04) 20:18	21:10	21:52		
11	08:38	09:38 (WEA_RE_03) 07:55	08:24 (WEA_RE_05) 06:54	07:24 (WEA_RE_04) 06:41	05:38	05:03		
	16:34	11:21 (WEA_RE_01) 17:30	26 08:50 (WEA_RE_05) 18:24	25 07:49 (WEA_RE_04) 20:19	21:12	21:53		
12	08:37	09:38 (WEA_RE_03) 07:53	08:24 (WEA_RE_05) 06:52	07:22 (WEA_RE_04) 06:38	05:36	05:02		
	16:36	11:20 (WEA_RE_01) 17:32	27 08:51 (WEA_RE_05) 18:25	28 07:50 (WEA_RE_04) 20:21	21:14	21:54		
13	08:37	09:38 (WEA_RE_03) 07:51	08:23 (WEA_RE_05) 06:50	07:21 (WEA_RE_04) 06:36	05:35	05:02		
	16:37	11:18 (WEA_RE_01) 17:34	29 08:52 (WEA_RE_05) 18:27	30 07:51 (WEA_RE_04) 20:23	21:15	21:54		
14	08:36	09:39 (WEA_RE_03) 07:49	08:23 (WEA_RE_05) 06:47	07:20 (WEA_RE_04) 06:34	05:33	05:02		
	16:39	11:16 (WEA_RE_01) 17:36	30 08:53 (WEA_RE_05) 18:29	32 07:52 (WEA_RE_04) 20:25	21:17	21:55		
15	08:35	09:39 (WEA_RE_03) 07:47	08:22 (WEA_RE_05) 06:45	07:18 (WEA_RE_04) 06:32	05:31	05:02		
	16:40	10:14 (WEA_RE_03) 17:38	31 08:53 (WEA_RE_05) 18:31	34 07:52 (WEA_RE_04) 20:26	21:19	21:56		
16	08:34	09:40 (WEA_RE_03) 07:45	08:22 (WEA_RE_05) 06:43	07:18 (WEA_RE_04) 06:29	05:30	05:01		
	16:42	10:15 (WEA_RE_03) 17:40	31 08:53 (WEA_RE_05) 18:33	35 07:53 (WEA_RE_04) 20:28	21:20	21:56		
17	08:33	09:41 (WEA_RE_03) 07:43	08:21 (WEA_RE_05) 06:40	07:16 (WEA_RE_04) 06:27	05:28	05:01		
	16:44	10:15 (WEA_RE_03) 17:42	31 08:52 (WEA_RE_05) 18:34	37 07:53 (WEA_RE_04) 20:30	21:22	21:57		
18	08:32	09:42 (WEA_RE_03) 07:41	08:22 (WEA_RE_05) 06:38	07:16 (WEA_RE_04) 06:25	05:27	05:01		
	16:45	10:15 (WEA_RE_03) 17:44	30 08:52 (WEA_RE_05) 18:36	37 07:53 (WEA_RE_04) 20:32	21:24	21:57		
19	08:31	09:42 (WEA_RE_03) 07:39	08:22 (WEA_RE_05) 06:35	07:16 (WEA_RE_04) 06:22	05:25	05:01		
	16:47	10:14 (WEA_RE_03) 17:46	30 08:52 (WEA_RE_05) 18:38	37 07:53 (WEA_RE_04) 20:34	21:25	21:57		
20	08:30	09:43 (WEA_RE_03) 07:37	08:22 (WEA_RE_05) 06:33	07:15 (WEA_RE_04) 06:20	05:24	05:01		
	16:49	10:15 (WEA_RE_03) 17:48	30 08:52 (WEA_RE_05) 18:40	37 07:52 (WEA_RE_04) 20:35	21:27	21:58		
21	08:29	09:44 (WEA_RE_03) 07:35	08:23 (WEA_RE_05) 06:31	07:15 (WEA_RE_04) 06:18	05:22	05:01		
	16:51	10:15 (WEA_RE_03) 17:50	29 08:52 (WEA_RE_05) 18:42	37 07:52 (WEA_RE_04) 20:37	21:28	21:58		
22	08:27	09:44 (WEA_RE_03) 07:33	08:23 (WEA_RE_05) 06:28	07:15 (WEA_RE_04) 06:16	05:21	05:02		
	16:52	10:14 (WEA_RE_03) 17:52	27 08:50 (WEA_RE_05) 18:44	36 07:51 (WEA_RE_04) 20:39	21:30	21:58		
23	08:26	09:45 (WEA_RE_03) 07:31	08:24 (WEA_RE_05) 06:26	07:15 (WEA_RE_04) 06:14	05:19	05:02		
	16:54	10:14 (WEA_RE_03) 17:54	25 08:49 (WEA_RE_05) 18:45	36 07:51 (WEA_RE_04) 20:41	21:31	21:58		
24	08:25	09:46 (WEA_RE_03) 07:29	08:25 (WEA_RE_05) 06:23	07:16 (WEA_RE_04) 06:12	05:18	05:02		
	16:56	10:13 (WEA_RE_03) 17:55	23 08:48 (WEA_RE_05) 18:47	34 07:50 (WEA_RE_04) 20:43	21:33	21:58		
25	08:24	09:48 (WEA_RE_03) 07:26	08:27 (WEA_RE_05) 06:21	07:15 (WEA_RE_04) 06:09	05:17	05:03		
	16:58	10:12 (WEA_RE_03) 17:57	20 08:47 (WEA_RE_05) 18:49	34 07:49 (WEA_RE_04) 20:44	21:34	21:58		
26	08:22	09:49 (WEA_RE_03) 07:24	08:28 (WEA_RE_05) 06:19	07:16 (WEA_RE_04) 06:07	05:16	05:03		
	17:00	10:11 (WEA_RE_03) 17:59	16 08:44 (WEA_RE_05) 18:51	32 07:48 (WEA_RE_04) 20:46	21:35	21:58		
27	08:21	09:51 (WEA_RE_03) 07:22	08:31 (WEA_RE_05) 06:16	07:17 (WEA_RE_04) 06:05	05:14	05:03		
	17:01	10:10 (WEA_RE_03) 18:01	10 08:41 (WEA_RE_05) 18:52	29 07:46 (WEA_RE_04) 20:48	21:37	21:58		
28	08:19	09:53 (WEA_RE_03) 07:20		06:14	07:18 (WEA_RE_04) 06:03	05:13	05:04	
	17:03	10:08 (WEA_RE_03) 18:03		18:54	26 07:44 (WEA_RE_04) 20:50	21:38	21:58	
29	08:18	09:56 (WEA_RE_03)		07:11	08:20 (WEA_RE_04) 06:01	05:12	05:04	
	17:05	8 10:04 (WEA_RE_03)		19:56	22 08:42 (WEA_RE_04) 20:51	21:39	21:58	
30	08:16			07:09	08:21 (WEA_RE_04) 05:59	05:11	05:05	
	17:07			19:58	18 08:39 (WEA_RE_04) 20:53	21:41	21:58	
31	08:15			07:07	08:25 (WEA_RE_04)	05:10		
	17:09			20:00	10 08:35 (WEA_RE_04)	21:42		
Sonnenscheinstunden	254	275	367	418	490	505		
astr.max.mögl.Beschattung	1261	528	687					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Zeitpunkt (SS:MM) Schattende	(WEA mit letztem Schatten)
	Minuten mit Schatten		

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_19 - IO 19 Böseler Straße 532 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September		Oktober		November		Dezember					
1	05:06	05:44	06:36		07:28		08:01 (WEA_RE_04)	07:24	07:55 (WEA_RE_05)	08:17	09:20 (WEA_RE_03)			
	21:58	21:24	20:19		19:07	29	08:30 (WEA_RE_04)	16:59	24	08:19 (WEA_RE_05)	16:16	56	11:03 (WEA_RE_01)	
2	05:06	05:46	06:38		07:30		08:01 (WEA_RE_04)	07:26		07:56 (WEA_RE_05)	08:19		09:20 (WEA_RE_03)	
	21:57	21:22	20:17		19:05	27	08:28 (WEA_RE_04)	16:57	21	08:17 (WEA_RE_05)	16:15	59	11:05 (WEA_RE_01)	
3	05:07	05:47	06:40		07:31		08:03 (WEA_RE_04)	07:28		07:58 (WEA_RE_05)	08:20		09:20 (WEA_RE_03)	
	21:57	21:20	20:14		19:02	23	08:26 (WEA_RE_04)	16:55	18	08:16 (WEA_RE_05)	16:15	61	11:06 (WEA_RE_01)	
4	05:08	05:49	06:42		07:33		08:05 (WEA_RE_04)	07:30		08:00 (WEA_RE_05)	08:22		09:21 (WEA_RE_03)	
	21:56	21:18	20:12		19:00	19	08:24 (WEA_RE_04)	16:53	13	08:13 (WEA_RE_05)	16:14	63	11:08 (WEA_RE_01)	
5	05:09	05:51	06:43		07:35		08:08 (WEA_RE_04)	07:32		08:04 (WEA_RE_05)	08:23		09:21 (WEA_RE_03)	
	21:56	21:17	20:10		18:58	12	08:20 (WEA_RE_04)	16:51	5	08:09 (WEA_RE_05)	16:13	64	11:08 (WEA_RE_01)	
6	05:10	05:52	06:45		07:37			07:34			08:25		09:22 (WEA_RE_03)	
	21:55	21:15	20:07		18:55			16:49			16:13	66	11:10 (WEA_RE_01)	
7	05:11	05:54	06:47		07:38			07:35			08:26		09:22 (WEA_RE_03)	
	21:55	21:13	20:05		18:53			16:47			16:12	66	11:10 (WEA_RE_01)	
8	05:12	05:56	06:48		07:40			07:37			08:27		09:22 (WEA_RE_03)	
	21:54	21:11	20:03		18:51			16:46			16:12	68	11:11 (WEA_RE_01)	
9	05:13	05:57	06:50		07:42			07:39			08:28		09:24 (WEA_RE_03)	
	21:53	21:09	20:00		18:48			16:44			16:12	68	11:13 (WEA_RE_01)	
10	05:14	05:59	06:52		07:44			07:41			08:29		09:24 (WEA_RE_03)	
	21:52	21:07	19:58		18:46			16:42			16:11	68	11:13 (WEA_RE_01)	
11	05:15	06:01	06:53		07:46			07:43			08:31		09:24 (WEA_RE_03)	
	21:52	21:05	19:55		18:44			16:41			16:11	69	11:14 (WEA_RE_01)	
12	05:16	06:02	06:55		07:47			07:45			08:32		09:25 (WEA_RE_03)	
	21:51	21:03	19:53	9	08:26 (WEA_RE_04)	18:41		16:39			16:11	68	11:14 (WEA_RE_01)	
13	05:17	06:04	06:57		07:49			07:47		09:28 (WEA_RE_03)	08:33		09:25 (WEA_RE_03)	
	21:50	21:01	19:51	17	08:30 (WEA_RE_04)	18:39		16:37	8	09:36 (WEA_RE_03)	16:11	70	11:15 (WEA_RE_01)	
14	05:18	06:06	06:59		07:51			07:49		09:25 (WEA_RE_03)	08:34		09:26 (WEA_RE_03)	
	21:49	20:59	19:48	22	08:32 (WEA_RE_04)	18:37		16:36	15	09:40 (WEA_RE_03)	16:11	70	11:16 (WEA_RE_01)	
15	05:19	06:07	07:00		07:53			09:02 (WEA_RE_05)	07:50	09:23 (WEA_RE_03)	08:35		09:26 (WEA_RE_03)	
	21:48	20:57	19:46	25	08:33 (WEA_RE_04)	18:35	12	09:14 (WEA_RE_05)	16:34	19	09:42 (WEA_RE_03)	16:11	69	11:16 (WEA_RE_01)
16	05:21	06:09	07:02		07:55			08:59 (WEA_RE_05)	07:52	09:22 (WEA_RE_03)	08:36		09:27 (WEA_RE_03)	
	21:47	20:55	19:43	29	08:35 (WEA_RE_04)	18:32	18	09:17 (WEA_RE_05)	16:33	22	09:44 (WEA_RE_03)	16:11	70	11:17 (WEA_RE_01)
17	05:22	06:11	07:04		07:56			08:57 (WEA_RE_05)	07:54	09:21 (WEA_RE_03)	08:36		09:28 (WEA_RE_03)	
	21:46	20:52	19:41	31	08:36 (WEA_RE_04)	18:30	22	09:19 (WEA_RE_05)	16:31	24	09:45 (WEA_RE_03)	16:11	69	11:18 (WEA_RE_01)
18	05:23	06:13	07:05		07:58			08:56 (WEA_RE_05)	07:56	09:20 (WEA_RE_03)	08:37		09:28 (WEA_RE_03)	
	21:44	20:51	19:39	33	08:36 (WEA_RE_04)	18:28	24	09:20 (WEA_RE_05)	16:30	27	09:47 (WEA_RE_03)	16:12	71	11:19 (WEA_RE_01)
19	05:25	06:14	07:07		08:00			08:55 (WEA_RE_05)	07:58	09:19 (WEA_RE_03)	08:38		09:28 (WEA_RE_03)	
	21:43	20:48	19:36	35	08:37 (WEA_RE_04)	18:26	26	09:21 (WEA_RE_05)	16:29	29	09:48 (WEA_RE_03)	16:12	71	11:19 (WEA_RE_01)
20	05:26	06:16	07:09		08:02			08:54 (WEA_RE_05)	07:59	09:19 (WEA_RE_03)	08:39		09:29 (WEA_RE_03)	
	21:42	20:46	19:34	35	08:37 (WEA_RE_04)	18:23	28	09:22 (WEA_RE_05)	16:27	30	09:49 (WEA_RE_03)	16:12	70	11:19 (WEA_RE_01)
21	05:27	06:18	07:11		08:04			08:53 (WEA_RE_05)	08:01	09:19 (WEA_RE_03)	08:39		09:29 (WEA_RE_03)	
	21:41	20:44	19:31	37	08:37 (WEA_RE_04)	18:21	29	09:22 (WEA_RE_05)	16:26	31	09:50 (WEA_RE_03)	16:13	70	11:19 (WEA_RE_01)
22	05:29	06:19	07:12		08:06			08:53 (WEA_RE_05)	08:03	09:19 (WEA_RE_03)	08:40		09:30 (WEA_RE_03)	
	21:39	20:42	19:29	37	08:37 (WEA_RE_04)	18:19	30	09:23 (WEA_RE_05)	16:25	32	09:51 (WEA_RE_03)	16:13	70	11:20 (WEA_RE_01)
23	05:30	06:21	07:14		08:07			08:52 (WEA_RE_05)	08:05	09:19 (WEA_RE_03)	08:40		09:30 (WEA_RE_03)	
	21:38	20:40	19:27	37	08:37 (WEA_RE_04)	18:17	31	09:23 (WEA_RE_05)	16:24	32	09:51 (WEA_RE_03)	16:14	70	11:20 (WEA_RE_01)
24	05:32	06:23	07:16		08:09			08:52 (WEA_RE_05)	08:06	09:19 (WEA_RE_03)	08:41		09:31 (WEA_RE_03)	
	21:36	20:37	19:24	37	08:37 (WEA_RE_04)	18:15	31	09:23 (WEA_RE_05)	16:23	33	09:52 (WEA_RE_03)	16:14	70	11:21 (WEA_RE_01)
25	05:33	06:24	07:17		07:59			07:52 (WEA_RE_05)	08:08	09:19 (WEA_RE_03)	08:41		09:31 (WEA_RE_03)	
	21:35	20:35	19:22	37	08:36 (WEA_RE_04)	17:13	31	08:23 (WEA_RE_05)	16:21	34	09:53 (WEA_RE_03)	16:15	71	11:22 (WEA_RE_01)
26	05:35	06:26	07:19		07:59			07:52 (WEA_RE_05)	08:10	09:19 (WEA_RE_03)	08:41		09:32 (WEA_RE_03)	
	21:34	20:33	19:19	36	08:35 (WEA_RE_04)	17:11	31	08:23 (WEA_RE_05)	16:20	35	09:54 (WEA_RE_03)	16:15	70	11:22 (WEA_RE_01)
27	05:36	06:28	07:21		07:59			07:52 (WEA_RE_05)	08:11	09:18 (WEA_RE_03)	08:42		09:32 (WEA_RE_03)	
	21:32	20:31	19:17	36	08:35 (WEA_RE_04)	17:09	30	08:22 (WEA_RE_05)	16:19	35	09:53 (WEA_RE_03)	16:16	70	11:22 (WEA_RE_01)
28	05:38	06:30	07:23		07:59			07:52 (WEA_RE_05)	08:13	09:19 (WEA_RE_03)	08:42		09:32 (WEA_RE_03)	
	21:30	20:28	19:14	34	08:33 (WEA_RE_04)	17:07	30	08:22 (WEA_RE_05)	16:18	44	10:56 (WEA_RE_01)	16:17	70	11:22 (WEA_RE_01)
29	05:39	06:31	07:24		07:59			07:53 (WEA_RE_05)	08:14	09:19 (WEA_RE_03)	08:42		09:33 (WEA_RE_03)	
	21:29	20:26	19:12	34	08:33 (WEA_RE_04)	17:05	28	08:21 (WEA_RE_05)	16:18	50	10:59 (WEA_RE_01)	16:18	70	11:23 (WEA_RE_01)
30	05:41	06:33	07:26		08:00			07:53 (WEA_RE_05)	08:16	09:19 (WEA_RE_03)	08:42		09:33 (WEA_RE_03)	
	21:27	20:24	19:10	32	08:32 (WEA_RE_04)	17:03	28	08:21 (WEA_RE_05)	16:17	54	11:01 (WEA_RE_01)	16:19	69	11:23 (WEA_RE_01)
31	05:43	06:35			07:22			07:54 (WEA_RE_05)			08:42		09:34 (WEA_RE_03)	
	21:26	20:22			17:01	26	08:20 (WEA_RE_05)				16:20	68	11:23 (WEA_RE_01)	
Sonnenscheinstunden	508	457	382		330			262			238			
astr.max.mögl.Beschattung				593		565			635				2104	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_20 - IO 20 Böseler Straße 522 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	09:57 (WEA_RE_03) 08:13	08:43 (WEA_RE_05) 07:17		07:04	05:57	05:09	
16:21	48	11:40 (WEA_RE_01) 17:11	09:04 (WEA_RE_05) 18:05		20:01	20:55	21:43	
2	08:42	09:57 (WEA_RE_03) 08:12	08:41 (WEA_RE_05) 07:15	07:48 (WEA_RE_04)	07:02	05:55	05:08	
16:22	46	11:40 (WEA_RE_01) 17:13	09:06 (WEA_RE_05) 18:07	15	08:03 (WEA_RE_04)	20:03	20:57	21:44
3	08:42	09:57 (WEA_RE_03) 08:10	08:41 (WEA_RE_05) 07:13	07:45 (WEA_RE_04)	06:59	05:53	05:08	
16:23	40	11:37 (WEA_RE_01) 17:15	09:07 (WEA_RE_05) 18:09	22	08:07 (WEA_RE_04)	20:05	20:58	21:45
4	08:41	09:58 (WEA_RE_03) 08:08	08:40 (WEA_RE_05) 07:11	07:42 (WEA_RE_04)	06:57	05:51	05:07	
16:25	35	10:33 (WEA_RE_03) 17:17	09:08 (WEA_RE_05) 18:11	26	08:08 (WEA_RE_04)	20:07	21:00	21:46
5	08:41	09:58 (WEA_RE_03) 08:06	08:40 (WEA_RE_05) 07:08	07:41 (WEA_RE_04)	06:55	05:49	05:06	
16:26	35	10:33 (WEA_RE_03) 17:19	09:09 (WEA_RE_05) 18:12	29	08:10 (WEA_RE_04)	20:09	21:02	21:48
6	08:41	10:00 (WEA_RE_03) 08:05	08:39 (WEA_RE_05) 07:06	07:39 (WEA_RE_04)	06:52	05:47	05:05	
16:27	33	10:33 (WEA_RE_03) 17:21	09:10 (WEA_RE_05) 18:14	32	08:11 (WEA_RE_04)	20:10	21:04	21:49
7	08:40	10:00 (WEA_RE_03) 08:03	08:39 (WEA_RE_05) 07:04	07:37 (WEA_RE_04)	06:50	05:45	05:05	
16:28	33	10:33 (WEA_RE_03) 17:23	09:10 (WEA_RE_05) 18:16	34	08:11 (WEA_RE_04)	20:12	21:05	21:50
8	08:40	10:00 (WEA_RE_03) 08:01	08:39 (WEA_RE_05) 07:01	07:37 (WEA_RE_04)	06:48	05:43	05:04	
16:30	33	10:33 (WEA_RE_03) 17:24	09:10 (WEA_RE_05) 18:18	36	08:13 (WEA_RE_04)	20:14	21:07	21:50
9	08:39	10:02 (WEA_RE_03) 07:59	08:38 (WEA_RE_05) 06:59	07:36 (WEA_RE_04)	06:45	05:42	05:04	
16:31	32	10:34 (WEA_RE_03) 17:26	09:11 (WEA_RE_05) 18:20	37	08:13 (WEA_RE_04)	20:16	21:09	21:51
10	08:39	10:02 (WEA_RE_03) 07:57	08:38 (WEA_RE_05) 06:57	07:35 (WEA_RE_04)	06:43	05:40	05:03	
16:33	32	10:34 (WEA_RE_03) 17:28	09:11 (WEA_RE_05) 18:22	38	08:13 (WEA_RE_04)	20:18	21:10	21:52
11	08:38	10:03 (WEA_RE_03) 07:55	08:38 (WEA_RE_05) 06:54	07:34 (WEA_RE_04)	06:41	05:38	05:03	
16:34	31	10:34 (WEA_RE_03) 17:30	09:11 (WEA_RE_05) 18:24	40	08:14 (WEA_RE_04)	20:19	21:12	21:53
12	08:37	10:03 (WEA_RE_03) 07:53	08:39 (WEA_RE_05) 06:52	07:33 (WEA_RE_04)	06:38	05:36	05:02	
16:36	30	10:33 (WEA_RE_03) 17:32	09:11 (WEA_RE_05) 18:25	40	08:13 (WEA_RE_04)	20:21	21:14	21:54
13	08:37	10:04 (WEA_RE_03) 07:51	08:39 (WEA_RE_05) 06:50	07:33 (WEA_RE_04)	06:36	05:35	05:02	
16:37	29	10:33 (WEA_RE_03) 17:34	09:11 (WEA_RE_05) 18:27	40	08:13 (WEA_RE_04)	20:23	21:15	21:54
14	08:36	10:05 (WEA_RE_03) 07:49	08:39 (WEA_RE_05) 06:47	07:33 (WEA_RE_04)	06:34	05:33	05:02	
16:39	28	10:33 (WEA_RE_03) 17:36	09:10 (WEA_RE_05) 18:29	40	08:13 (WEA_RE_04)	20:25	21:17	21:55
15	08:35	10:06 (WEA_RE_03) 07:47	08:40 (WEA_RE_05) 06:45	07:32 (WEA_RE_04)	06:32	05:31	05:02	
16:40	27	10:33 (WEA_RE_03) 17:38	09:10 (WEA_RE_05) 18:31	41	08:13 (WEA_RE_04)	20:26	21:19	21:56
16	08:34	10:08 (WEA_RE_03) 07:45	08:41 (WEA_RE_05) 06:43	07:33 (WEA_RE_04)	06:29	05:30	05:01	
16:42	24	10:32 (WEA_RE_03) 17:40	09:09 (WEA_RE_05) 18:33	39	08:12 (WEA_RE_04)	20:28	21:20	21:56
17	08:33	10:09 (WEA_RE_03) 07:43	08:41 (WEA_RE_05) 06:40	07:32 (WEA_RE_04)	06:27	05:28	05:01	
16:44	23	10:32 (WEA_RE_03) 17:42	09:07 (WEA_RE_05) 18:34	39	08:11 (WEA_RE_04)	20:30	21:22	21:57
18	08:32	10:11 (WEA_RE_03) 07:41	08:42 (WEA_RE_05) 06:38	07:33 (WEA_RE_04)	06:25	05:27	05:01	
16:45	20	10:31 (WEA_RE_03) 17:44	09:06 (WEA_RE_05) 18:36	38	08:11 (WEA_RE_04)	20:32	21:24	21:57
19	08:31	10:12 (WEA_RE_03) 07:39	08:43 (WEA_RE_05) 06:35	07:33 (WEA_RE_04)	06:22	05:25	05:01	
16:47	17	10:29 (WEA_RE_03) 17:46	09:05 (WEA_RE_05) 18:38	37	08:10 (WEA_RE_04)	20:34	21:25	21:57
20	08:30	10:15 (WEA_RE_03) 07:37	08:45 (WEA_RE_05) 06:33	07:33 (WEA_RE_04)	06:20	05:24	05:01	
16:49	12	10:27 (WEA_RE_03) 17:48	09:03 (WEA_RE_05) 18:40	35	08:08 (WEA_RE_04)	20:35	21:27	21:58
21	08:29	10:19 (WEA_RE_03) 07:35	08:48 (WEA_RE_05) 06:31	07:34 (WEA_RE_04)	06:18	05:22	05:01	
16:50	5	10:24 (WEA_RE_03) 17:50	09:01 (WEA_RE_05) 18:42	34	08:08 (WEA_RE_04)	20:37	21:28	21:58
22	08:27			07:34 (WEA_RE_04)	06:16	05:21	05:02	
16:52		07:33	06:28	08:05 (WEA_RE_04)	06:14	05:19	05:02	
23	08:26	07:31	06:26	07:36 (WEA_RE_04)	06:14	05:19	05:02	
16:54		17:53	18:45	08:04 (WEA_RE_04)	06:12	05:18	05:02	
24	08:25	07:29	06:23	07:38 (WEA_RE_04)	06:12	05:18	05:02	
16:56		17:55	18:47	08:02 (WEA_RE_04)	06:09	05:17	05:03	
25	08:24	07:26	06:21	07:39 (WEA_RE_04)	06:09	05:17	05:03	
16:58		17:57	18:49	07:59 (WEA_RE_04)	06:07	05:16	05:03	
26	08:22	07:24	06:19	07:43 (WEA_RE_04)	06:07	05:16	05:03	
17:00		17:59	18:51	07:55 (WEA_RE_04)	06:05	05:15	05:03	
27	08:21	07:22	06:16		06:05	05:14	05:03	
17:01		18:01	18:52		20:48	21:37	21:58	
28	08:19	07:20	06:14		06:03	05:13	05:04	
17:03		18:03	18:54		20:50	21:38	21:58	
29	08:18		07:11		06:01	05:12	05:04	
17:05	9	08:57 (WEA_RE_05)	19:56		20:51	21:39	21:58	
30	08:16	08:46 (WEA_RE_05)	07:09		05:59	05:11	05:05	
17:07	15	09:01 (WEA_RE_05)	19:58		20:53	21:41	21:58	
31	08:15	08:44 (WEA_RE_05)	07:07			05:10		
17:09	19	09:03 (WEA_RE_05)	20:00			21:42		
Sonnenscheinstunden	254		367		418	490	505	
astr.max.mögl.Beschattung	656	275	577	807				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Zeitpunkt (SS:MM) Schattende	(WEA mit letztem Schatten)
	Minuten mit Schatten		

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_20 - IO 20 Böseler Straße 522 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November	Dezember
1	05:06	05:44	06:36	07:28		
	21:58	21:24	20:19	19:07	40	08:13 (WEA_RE_04) 07:24
2	05:06	05:46	06:38	07:30		
	21:57	21:22	20:17	19:05	40	08:52 (WEA_RE_04) 16:59
3	05:07	05:47	06:40	07:31		
	21:57	21:20	20:14	19:02	39	08:12 (WEA_RE_04) 07:26
4	05:08	05:49	06:42	07:33		
	21:56	21:18	20:12	19:00	38	08:51 (WEA_RE_04) 16:55
5	05:09	05:51	06:43	07:35		
	21:56	21:17	20:10	18:58	37	08:13 (WEA_RE_04) 07:30
6	05:10	05:52	06:45	07:37		
	21:55	21:15	20:07	18:55	35	08:51 (WEA_RE_04) 16:53
7	05:11	05:54	06:47	07:38		
	21:55	21:13	20:05	18:53	33	08:14 (WEA_RE_04) 07:34
8	05:12	05:56	06:48	07:40		
	21:54	21:11	20:03	18:51	31	08:49 (WEA_RE_04) 16:49
9	05:13	05:57	06:50	07:42		
	21:53	21:09	20:00	18:48	28	08:14 (WEA_RE_04) 07:35
10	05:14	05:59	06:52	07:44		
	21:52	21:07	19:58	18:46	24	08:47 (WEA_RE_04) 16:47
11	05:15	06:01	06:53	07:46		
	21:52	21:05	19:55	18:44	18	08:15 (WEA_RE_04) 07:37
12	05:16	06:02	06:55	07:47		
	21:51	21:03	19:53	18:41	11	08:46 (WEA_RE_04) 16:46
13	05:17	06:04	06:57	07:49		
	21:50	21:01	19:51	18:39	9	08:16 (WEA_RE_04) 07:39
14	05:18	06:06	06:59	07:51		
	21:49	20:59	19:48	18:37		
15	05:19	06:07	07:00	07:52		
	21:48	20:57	19:46	18:35		
16	05:21	06:09	07:02	07:55		
	21:47	20:55	19:43	18:32		
17	05:22	06:11	07:04	07:56		
	21:46	20:53	19:41	18:30		
18	05:23	06:12	07:05	07:58		
	21:44	20:51	19:39	18:28		
19	05:25	06:14	07:07	08:00		
	21:43	20:48	19:36	18:26		
20	05:26	06:16	07:09	08:02		
	21:42	20:46	19:34	18:23	5	09:22 (WEA_RE_05) 07:59
21	05:27	06:18	07:11	08:04		
	21:41	20:44	19:31	18:21	14	09:27 (WEA_RE_05) 16:27
22	05:29	06:19	07:12	08:06		
	21:39	20:42	19:29	18:19	19	09:18 (WEA_RE_05) 08:01
23	05:30	06:21	07:14	08:07		
	21:38	20:40	19:26	18:17	5	09:54 (WEA_RE_03) 08:39
24	05:32	06:23	07:16	08:09		
	21:36	20:37	19:24	18:15	23	09:59 (WEA_RE_03) 16:13
25	05:33	06:24	07:17	08:11		
	21:35	20:35	19:22	18:13	12	09:15 (WEA_RE_05) 08:03
26	05:35	06:26	07:19	08:13		
	21:34	20:33	19:19	18:11	17	10:03 (WEA_RE_03) 16:13
27	05:36	06:28	07:21	08:14		
	21:32	20:31	19:17	18:09	20	09:49 (WEA_RE_03) 08:40
28	05:38	06:30	07:23	08:15		
	21:30	20:28	19:14	18:07	23	10:08 (WEA_RE_03) 16:14
29	05:39	06:31	07:24	08:16		
	21:29	20:26	19:12	18:05	17	09:47 (WEA_RE_03) 08:41
30	05:41	06:33	07:26	08:17		
	21:27	20:24	19:10	18:03	24	10:11 (WEA_RE_03) 16:15
31	05:42	06:35		07:22		
	21:25	20:22		17:01	29	09:46 (WEA_RE_03) 08:42
Sonnenscheinstunden	508	457	382	330	262	238
astr. max. mögl. Beschattung			451	674	541	1504

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_21 - IO 21 Böseler Straße 491 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42	10:49 (WEA_RE_03) 08:13	09:07 (WEA_RE_05) 07:17	08:03 (WEA_RE_04) 07:04	05:57	05:09
	16:21	11:09 (WEA_RE_03) 08:11	09:44 (WEA_RE_05) 18:05	08:49 (WEA_RE_04) 20:01	20:55	21:43
2	08:42	10:50 (WEA_RE_03) 08:11	09:07 (WEA_RE_05) 07:15	08:03 (WEA_RE_04) 07:02	05:55	05:08
	16:22	11:09 (WEA_RE_03) 08:13	09:44 (WEA_RE_05) 18:07	08:50 (WEA_RE_04) 20:03	20:57	21:44
3	08:42	10:51 (WEA_RE_03) 08:10	09:09 (WEA_RE_05) 07:13	08:03 (WEA_RE_04) 06:59	05:53	05:08
	16:23	11:08 (WEA_RE_03) 08:10	09:44 (WEA_RE_05) 18:09	08:51 (WEA_RE_04) 20:05	20:58	21:45
4	08:41	10:53 (WEA_RE_03) 08:08	09:09 (WEA_RE_05) 07:11	08:01 (WEA_RE_04) 06:57	05:51	05:07
	16:25	11:07 (WEA_RE_03) 08:11	09:44 (WEA_RE_05) 18:11	08:50 (WEA_RE_04) 20:07	21:00	21:46
5	08:41	10:54 (WEA_RE_03) 08:06	09:09 (WEA_RE_05) 07:08	08:01 (WEA_RE_04) 06:55	05:49	05:06
	16:26	11:06 (WEA_RE_03) 08:10	09:44 (WEA_RE_05) 18:12	08:50 (WEA_RE_04) 20:09	21:02	21:48
6	08:41	10:57 (WEA_RE_03) 08:05	09:10 (WEA_RE_05) 07:06	08:01 (WEA_RE_04) 06:52	05:47	05:05
	16:27	11:05 (WEA_RE_03) 08:03	09:43 (WEA_RE_05) 18:14	08:51 (WEA_RE_04) 20:10	21:04	21:49
7	08:40	10:57 (WEA_RE_03) 08:03	09:11 (WEA_RE_05) 07:04	08:00 (WEA_RE_04) 06:50	05:45	05:05
	16:28	11:05 (WEA_RE_03) 08:03	09:42 (WEA_RE_05) 18:16	08:50 (WEA_RE_04) 20:12	21:05	21:50
8	08:40	10:57 (WEA_RE_03) 08:01	09:11 (WEA_RE_05) 07:01	08:01 (WEA_RE_04) 06:48	05:43	05:04
	16:30	11:05 (WEA_RE_03) 08:01	09:42 (WEA_RE_05) 18:18	08:50 (WEA_RE_04) 20:14	21:07	21:50
9	08:39	10:57 (WEA_RE_03) 07:59	09:12 (WEA_RE_05) 06:59	08:01 (WEA_RE_04) 06:45	05:42	05:04
	16:31	11:05 (WEA_RE_03) 07:59	09:41 (WEA_RE_05) 18:20	08:50 (WEA_RE_04) 20:16	21:09	21:51
10	08:39	10:57 (WEA_RE_03) 07:57	09:14 (WEA_RE_05) 06:57	08:00 (WEA_RE_04) 06:43	05:40	05:03
	16:33	11:05 (WEA_RE_03) 07:57	09:39 (WEA_RE_05) 18:22	08:49 (WEA_RE_04) 20:18	21:10	21:52
11	08:38	09:18 (WEA_RE_05) 07:55	09:15 (WEA_RE_05) 06:54	08:01 (WEA_RE_04) 06:41	05:38	05:03
	16:34	09:22 (WEA_RE_05) 17:30	09:38 (WEA_RE_05) 18:23	08:48 (WEA_RE_04) 20:19	21:12	21:53
12	08:37	09:15 (WEA_RE_05) 07:53	09:17 (WEA_RE_05) 06:52	08:00 (WEA_RE_04) 06:38	05:36	05:02
	16:36	09:26 (WEA_RE_05) 17:32	09:36 (WEA_RE_05) 18:25	08:47 (WEA_RE_04) 20:21	21:14	21:54
13	08:37	09:13 (WEA_RE_05) 07:51	09:21 (WEA_RE_05) 06:50	08:01 (WEA_RE_04) 06:36	05:35	05:02
	16:37	09:28 (WEA_RE_05) 17:34	09:33 (WEA_RE_05) 18:27	08:46 (WEA_RE_04) 20:23	21:15	21:54
14	08:36	09:12 (WEA_RE_05) 07:49	09:12 (WEA_RE_05) 06:47	08:02 (WEA_RE_04) 06:34	05:33	05:02
	16:39	09:30 (WEA_RE_05) 17:36	09:29 (WEA_RE_05) 18:29	08:46 (WEA_RE_04) 20:25	21:17	21:55
15	08:35	09:11 (WEA_RE_05) 07:47	09:11 (WEA_RE_05) 06:45	08:02 (WEA_RE_04) 06:31	05:31	05:02
	16:40	09:31 (WEA_RE_05) 17:38	09:11 (WEA_RE_05) 06:45	08:44 (WEA_RE_04) 20:26	21:19	21:56
16	08:34	09:10 (WEA_RE_05) 07:45	09:10 (WEA_RE_05) 06:42	08:03 (WEA_RE_04) 06:29	05:30	05:01
	16:42	09:33 (WEA_RE_05) 17:40	09:10 (WEA_RE_05) 06:42	08:43 (WEA_RE_04) 20:28	21:20	21:56
17	08:33	09:10 (WEA_RE_05) 07:43	09:10 (WEA_RE_05) 06:40	08:03 (WEA_RE_04) 06:27	05:28	05:01
	16:44	09:35 (WEA_RE_05) 17:42	09:10 (WEA_RE_05) 06:38	08:41 (WEA_RE_04) 20:30	21:22	21:57
18	08:32	09:10 (WEA_RE_05) 07:41	09:10 (WEA_RE_05) 06:38	08:05 (WEA_RE_04) 06:25	05:27	05:01
	16:45	09:36 (WEA_RE_05) 17:44	09:10 (WEA_RE_05) 06:36	08:39 (WEA_RE_04) 20:32	21:24	21:57
19	08:31	09:08 (WEA_RE_05) 07:39	08:23 (WEA_RE_04) 06:35	08:06 (WEA_RE_04) 06:22	05:25	05:01
	16:47	09:36 (WEA_RE_05) 17:46	08:33 (WEA_RE_04) 18:38	08:37 (WEA_RE_04) 20:34	21:25	21:57
20	08:30	09:08 (WEA_RE_05) 07:37	08:19 (WEA_RE_04) 06:33	08:08 (WEA_RE_04) 06:20	05:24	05:01
	16:49	09:38 (WEA_RE_05) 17:48	08:38 (WEA_RE_04) 18:40	08:34 (WEA_RE_04) 20:35	21:27	21:58
21	08:29	09:08 (WEA_RE_05) 07:35	08:16 (WEA_RE_04) 06:31	08:11 (WEA_RE_04) 06:18	05:22	05:01
	16:50	09:39 (WEA_RE_05) 17:50	08:41 (WEA_RE_04) 18:42	08:31 (WEA_RE_04) 20:37	21:28	21:58
22	08:27	09:07 (WEA_RE_05) 07:33	08:13 (WEA_RE_04) 06:28	08:14 (WEA_RE_04) 06:16	05:21	05:02
	16:52	09:39 (WEA_RE_05) 17:52	08:42 (WEA_RE_04) 18:43	08:26 (WEA_RE_04) 20:39	21:30	21:58
23	08:26	09:08 (WEA_RE_05) 07:31	08:11 (WEA_RE_04) 06:26	08:11 (WEA_RE_04) 06:14	05:19	05:02
	16:54	09:41 (WEA_RE_05) 17:53	08:44 (WEA_RE_04) 18:45	08:11 (WEA_RE_04) 06:14	20:41	21:31
24	08:25	09:07 (WEA_RE_05) 07:29	08:10 (WEA_RE_04) 06:23	08:10 (WEA_RE_04) 06:12	05:18	05:02
	16:56	09:41 (WEA_RE_05) 17:55	08:46 (WEA_RE_04) 18:47	08:10 (WEA_RE_04) 06:12	20:43	21:33
25	08:24	09:07 (WEA_RE_05) 07:26	08:08 (WEA_RE_04) 06:21	08:09 (WEA_RE_04) 06:09	05:17	05:03
	16:58	09:42 (WEA_RE_05) 17:57	08:47 (WEA_RE_04) 18:49	08:09 (WEA_RE_04) 06:09	20:44	21:34
26	08:22	09:07 (WEA_RE_05) 07:24	08:06 (WEA_RE_04) 06:19	08:07 (WEA_RE_04) 06:07	05:16	05:03
	17:00	09:42 (WEA_RE_05) 17:59	08:48 (WEA_RE_04) 18:51	08:07 (WEA_RE_04) 06:07	20:46	21:35
27	08:21	09:07 (WEA_RE_05) 07:22	08:06 (WEA_RE_04) 06:16	08:06 (WEA_RE_04) 06:05	05:14	05:03
	17:01	09:43 (WEA_RE_05) 18:01	08:49 (WEA_RE_04) 18:52	08:06 (WEA_RE_04) 06:05	20:48	21:37
28	08:19	09:07 (WEA_RE_05) 07:20	08:05 (WEA_RE_04) 06:14	08:05 (WEA_RE_04) 06:03	05:13	05:04
	17:03	09:43 (WEA_RE_05) 18:03	08:50 (WEA_RE_04) 18:54	08:05 (WEA_RE_04) 06:03	20:50	21:38
29	08:18	09:07 (WEA_RE_05) 07:18	08:05 (WEA_RE_04) 06:14	08:05 (WEA_RE_04) 06:03	05:12	05:04
	17:05	09:43 (WEA_RE_05) 18:03	08:50 (WEA_RE_04) 18:54	08:05 (WEA_RE_04) 06:03	20:51	21:39
30	08:16	09:07 (WEA_RE_05) 07:17	08:04 (WEA_RE_04) 06:13	08:04 (WEA_RE_04) 06:02	05:11	05:05
	17:07	09:44 (WEA_RE_05) 18:04	08:51 (WEA_RE_04) 18:55	08:04 (WEA_RE_04) 06:02	20:53	21:41
31	08:15	09:07 (WEA_RE_05) 07:15	08:03 (WEA_RE_04) 06:12	08:03 (WEA_RE_04) 06:01	05:10	05:05
	17:09	09:44 (WEA_RE_05) 18:05	08:52 (WEA_RE_04) 18:56	08:03 (WEA_RE_04) 06:01	20:54	21:42
	Sonnenscheinstunden	254	275	367	418	505
	astr.max.mögl.Beschattung	672	703	912	490	505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Zeitpunkt (SS:MM) Schattende	(WEA mit letztem Schatten)
	Minuten mit Schatten		

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_21 - IO 21 Böseler Straße 491 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember
1	05:06	05:44	06:36	07:28	08:40 (WEA_RE_04) 07:24	08:43 (WEA_RE_05) 08:17
	21:58	21:24	20:19	19:07	09:27 (WEA_RE_04) 16:59	09:09 (WEA_RE_05) 16:16
2	05:06	05:46	06:38	07:30	08:39 (WEA_RE_04) 07:26	08:42 (WEA_RE_05) 08:19
	21:57	21:22	20:17	19:05	09:26 (WEA_RE_04) 16:57	09:10 (WEA_RE_05) 16:15
3	05:07	05:47	06:40	07:31	08:38 (WEA_RE_04) 07:28	08:41 (WEA_RE_05) 08:20
	21:57	21:20	20:14	19:02	09:26 (WEA_RE_04) 16:55	09:11 (WEA_RE_05) 16:15
4	05:08	05:49	06:42	07:33	08:38 (WEA_RE_04) 07:30	08:40 (WEA_RE_05) 08:22
	21:56	21:18	20:12	19:00	09:27 (WEA_RE_04) 16:53	09:12 (WEA_RE_05) 16:14
5	05:09	05:51	06:43	07:35	08:38 (WEA_RE_04) 07:32	08:39 (WEA_RE_05) 08:23
	21:56	21:17	20:10	18:58	09:27 (WEA_RE_04) 16:51	09:13 (WEA_RE_05) 16:13
6	05:10	05:52	06:45	07:37	08:37 (WEA_RE_04) 07:34	08:39 (WEA_RE_05) 08:25
	21:55	21:15	20:07	18:55	09:27 (WEA_RE_04) 16:49	09:13 (WEA_RE_05) 16:13
7	05:11	05:54	06:47	07:38	08:36 (WEA_RE_04) 07:35	08:39 (WEA_RE_05) 08:26
	21:55	21:13	20:05	18:53	09:26 (WEA_RE_04) 16:47	09:14 (WEA_RE_05) 16:12
8	05:12	05:56	06:48	07:40	08:36 (WEA_RE_04) 07:37	08:38 (WEA_RE_05) 08:27
	21:54	21:11	20:03	18:51	09:26 (WEA_RE_04) 16:46	09:14 (WEA_RE_05) 16:12
9	05:13	05:57	06:50	07:42	08:36 (WEA_RE_04) 07:39	08:38 (WEA_RE_05) 08:28
	21:53	21:09	20:00	18:48	09:25 (WEA_RE_04) 16:44	09:15 (WEA_RE_05) 16:12
10	05:14	05:59	06:52	07:44	08:37 (WEA_RE_04) 07:41	08:38 (WEA_RE_05) 08:29
	21:52	21:07	19:58	18:46	09:25 (WEA_RE_04) 16:42	09:15 (WEA_RE_05) 16:11
11	05:15	06:01	06:53	07:46	08:37 (WEA_RE_04) 07:43	08:38 (WEA_RE_05) 08:31
	21:52	21:05	19:55	18:44	09:25 (WEA_RE_04) 16:41	09:15 (WEA_RE_05) 16:11
12	05:16	06:02	06:55	07:47	08:37 (WEA_RE_04) 07:45	08:38 (WEA_RE_05) 08:32
	21:51	21:03	19:53	18:41	09:24 (WEA_RE_04) 16:39	09:15 (WEA_RE_05) 16:11
13	05:17	06:04	06:57	07:49	08:38 (WEA_RE_04) 07:47	08:38 (WEA_RE_05) 08:33
	21:50	21:01	19:51	18:39	09:23 (WEA_RE_04) 16:37	09:15 (WEA_RE_05) 16:11
14	05:18	06:06	06:59	07:51	08:37 (WEA_RE_04) 07:48	08:39 (WEA_RE_05) 08:34
	21:49	20:59	19:48	18:37	09:21 (WEA_RE_04) 16:36	09:15 (WEA_RE_05) 16:11
15	05:19	06:07	07:00	07:52	08:38 (WEA_RE_04) 07:50	08:39 (WEA_RE_05) 08:35
	21:48	20:57	19:46	18:35	09:20 (WEA_RE_04) 16:34	09:15 (WEA_RE_05) 16:11
16	05:21	06:09	07:02	07:55	08:39 (WEA_RE_04) 07:52	08:40 (WEA_RE_05) 08:36
	21:47	20:55	19:43	18:32	09:19 (WEA_RE_04) 16:33	09:15 (WEA_RE_05) 16:11
17	05:22	06:11	07:04	07:56	08:40 (WEA_RE_04) 07:54	08:40 (WEA_RE_05) 08:36
	21:46	20:53	19:41	18:30	09:18 (WEA_RE_04) 16:31	09:15 (WEA_RE_05) 16:11
18	05:23	06:12	07:05	07:58	08:41 (WEA_RE_04) 07:56	08:41 (WEA_RE_05) 08:37
	21:44	20:51	19:39	18:28	09:17 (WEA_RE_04) 16:30	09:15 (WEA_RE_05) 16:12
19	05:25	06:14	07:07	08:00	08:43 (WEA_RE_04) 07:58	08:42 (WEA_RE_05) 08:38
	21:43	20:48	19:36	18:26	09:15 (WEA_RE_04) 16:29	09:15 (WEA_RE_05) 16:12
20	05:26	06:16	07:09	08:02	08:45 (WEA_RE_04) 07:59	08:42 (WEA_RE_05) 08:38
	21:42	20:46	19:34	18:23	09:13 (WEA_RE_04) 16:27	09:14 (WEA_RE_05) 16:12
21	05:27	06:18	07:11	08:04	08:47 (WEA_RE_04) 08:01	08:43 (WEA_RE_05) 08:39
	21:41	20:44	19:31	18:21	09:10 (WEA_RE_04) 16:26	09:14 (WEA_RE_05) 16:13
22	05:29	06:19	07:12	08:06	08:50 (WEA_RE_04) 08:03	08:44 (WEA_RE_05) 08:40
	21:39	20:42	19:29	18:19	09:07 (WEA_RE_04) 16:25	09:14 (WEA_RE_05) 16:13
23	05:30	06:21	07:14	08:07	08:58 (WEA_RE_04) 08:05	08:45 (WEA_RE_05) 08:40
	21:38	20:40	19:26	18:17	08:59 (WEA_RE_04) 16:24	09:13 (WEA_RE_05) 16:14
24	05:32	06:23	07:16	08:09	08:06	08:47 (WEA_RE_05) 08:41
	21:36	20:37	19:24	18:15	16:22	09:13 (WEA_RE_05) 16:14
25	05:33	06:24	07:17	08:08	08:08	08:48 (WEA_RE_05) 08:41
	21:35	20:35	19:22	18:13	16:21	09:13 (WEA_RE_05) 16:15
26	05:35	06:26	07:19	08:06	08:10	08:49 (WEA_RE_05) 08:41
	21:34	20:33	19:19	18:11	16:20	09:12 (WEA_RE_05) 16:15
27	05:36	06:28	07:21	08:05	08:11	08:50 (WEA_RE_05) 08:42
	21:32	20:31	19:17	18:09	16:19	09:11 (WEA_RE_05) 16:16
28	05:38	06:30	07:23	08:03	08:13	08:52 (WEA_RE_05) 08:42
	21:30	20:28	19:14	18:07	16:18	09:10 (WEA_RE_05) 16:17
29	05:39	06:31	07:24	08:02	08:14	08:54 (WEA_RE_05) 08:42
	21:29	20:26	19:12	18:04	16:18	09:09 (WEA_RE_05) 16:18
30	05:41	06:33	07:26	08:01	08:16	08:56 (WEA_RE_05) 08:42
	21:27	20:24	19:10	18:02	16:17	09:07 (WEA_RE_05) 16:19
31	05:42	06:35		07:22	08:45 (WEA_RE_05)	08:42
	21:25	20:21		17:01	09:08 (WEA_RE_05)	16:20
Sonnenscheinstunden	508	457	382	318	262	238
astr. max. mögl. Beschattung				330	984	909
						563

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_22 - IO 22 Böseler Straße 502 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42 16:21	10:32 (WEA_RE_03) 08:13 10:36 (WEA_RE_03) 17:11	09:06 (WEA_RE_05) 07:17 09:34 (WEA_RE_05) 18:05	08:16 (WEA_RE_04) 07:04 08:51 (WEA_RE_04) 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	08:12 17:13	09:07 (WEA_RE_05) 07:15 09:33 (WEA_RE_05) 18:07	08:16 (WEA_RE_04) 07:02 08:49 (WEA_RE_04) 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	08:10 17:15	09:08 (WEA_RE_05) 07:13 09:33 (WEA_RE_05) 18:09	08:17 (WEA_RE_04) 06:59 08:48 (WEA_RE_04) 20:05	05:53 20:58	05:08 21:45
4	08:41 16:25	08:08 17:17	09:09 (WEA_RE_05) 07:11 09:32 (WEA_RE_05) 18:11	08:18 (WEA_RE_04) 06:57 08:46 (WEA_RE_04) 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	08:06 17:19	09:10 (WEA_RE_05) 07:08 09:31 (WEA_RE_05) 18:12	08:19 (WEA_RE_04) 06:55 08:45 (WEA_RE_04) 20:09	05:49 21:02	05:06 21:48
6	08:41 16:27	08:05 17:21	09:12 (WEA_RE_05) 07:06 09:30 (WEA_RE_05) 18:14	08:21 (WEA_RE_04) 06:52 08:43 (WEA_RE_04) 20:10	05:47 21:04	05:05 21:49
7	08:40 16:28	08:03 17:23	09:14 (WEA_RE_05) 07:04 09:28 (WEA_RE_05) 18:16	08:23 (WEA_RE_04) 06:50 08:39 (WEA_RE_04) 20:12	05:45 21:05	05:05 21:50
8	08:40 16:30	08:01 17:24	09:17 (WEA_RE_05) 07:01 09:24 (WEA_RE_05) 18:18	08:29 (WEA_RE_04) 06:48 08:34 (WEA_RE_04) 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	07:59 17:26	06:59 18:20	06:45 20:16	05:42 21:09	05:04 21:51
10	08:39 16:33	09:11 (WEA_RE_05) 07:57 09:17 (WEA_RE_05) 17:28	06:57 18:22	06:43 20:18	05:40 21:10	05:03 21:52
11	08:38 16:34	09:09 (WEA_RE_05) 07:55 09:19 (WEA_RE_05) 17:30	08:29 (WEA_RE_04) 06:54 08:40 (WEA_RE_04) 18:24	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:36	09:08 (WEA_RE_05) 07:53 09:21 (WEA_RE_05) 17:32	08:26 (WEA_RE_04) 06:52 08:43 (WEA_RE_04) 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	09:07 (WEA_RE_05) 07:51 09:23 (WEA_RE_05) 17:34	08:24 (WEA_RE_04) 06:50 08:46 (WEA_RE_04) 18:27	06:36 20:23	05:35 21:15	05:02 21:54
14	08:36 16:39	09:06 (WEA_RE_05) 07:49 09:24 (WEA_RE_05) 17:36	08:22 (WEA_RE_04) 06:47 08:47 (WEA_RE_04) 18:29	06:34 20:25	05:33 21:17	05:02 21:55
15	08:35 16:40	09:05 (WEA_RE_05) 07:47 09:26 (WEA_RE_05) 17:38	08:21 (WEA_RE_04) 06:45 08:49 (WEA_RE_04) 18:31	06:32 20:26	05:31 21:19	05:02 21:56
16	08:34 16:42	09:05 (WEA_RE_05) 07:45 09:27 (WEA_RE_05) 17:40	08:20 (WEA_RE_04) 06:43 08:50 (WEA_RE_04) 18:33	06:29 20:28	05:30 21:20	05:01 21:56
17	08:33 16:44	09:05 (WEA_RE_05) 07:43 09:28 (WEA_RE_05) 17:42	08:18 (WEA_RE_04) 06:40 08:50 (WEA_RE_04) 18:34	06:27 20:30	05:28 21:22	05:01 21:57
18	08:32 16:45	09:05 (WEA_RE_05) 07:41 09:29 (WEA_RE_05) 17:44	08:17 (WEA_RE_04) 06:38 08:51 (WEA_RE_04) 18:36	06:25 20:32	05:27 21:24	05:01 21:57
19	08:31 16:47	09:04 (WEA_RE_05) 07:39 09:30 (WEA_RE_05) 17:46	08:17 (WEA_RE_04) 06:35 08:52 (WEA_RE_04) 18:38	06:22 20:34	05:25 21:25	05:01 21:57
20	08:30 16:49	09:04 (WEA_RE_05) 07:37 09:31 (WEA_RE_05) 17:48	08:16 (WEA_RE_04) 06:33 08:53 (WEA_RE_04) 18:40	06:20 20:35	05:24 21:27	05:01 21:58
21	08:29 16:50	09:04 (WEA_RE_05) 07:35 09:32 (WEA_RE_05) 17:50	08:16 (WEA_RE_04) 06:31 08:53 (WEA_RE_04) 18:42	06:18 20:37	05:22 21:28	05:01 21:58
22	08:27 16:52	09:03 (WEA_RE_05) 07:33 09:32 (WEA_RE_05) 17:52	08:15 (WEA_RE_04) 06:28 08:53 (WEA_RE_04) 18:44	06:16 20:39	05:21 21:30	05:02 21:58
23	08:26 16:54	09:04 (WEA_RE_05) 07:31 09:33 (WEA_RE_05) 17:53	08:15 (WEA_RE_04) 06:26 08:53 (WEA_RE_04) 18:45	06:14 20:41	05:19 21:31	05:02 21:58
24	08:25 16:56	09:03 (WEA_RE_05) 07:29 09:33 (WEA_RE_05) 17:55	08:15 (WEA_RE_04) 06:23 08:53 (WEA_RE_04) 18:47	06:12 20:43	05:18 21:33	05:02 21:58
25	08:24 16:58	09:04 (WEA_RE_05) 07:26 09:34 (WEA_RE_05) 17:57	08:15 (WEA_RE_04) 06:21 08:53 (WEA_RE_04) 18:49	06:09 20:44	05:17 21:34	05:03 21:58
26	08:22 17:00	09:04 (WEA_RE_05) 07:24 09:34 (WEA_RE_05) 17:59	08:14 (WEA_RE_04) 06:19 08:52 (WEA_RE_04) 18:51	06:07 20:46	05:16 21:35	05:03 21:58
27	08:21 17:01	09:04 (WEA_RE_05) 07:22 09:35 (WEA_RE_05) 18:01	08:15 (WEA_RE_04) 06:16 08:52 (WEA_RE_04) 18:52	06:05 20:48	05:14 21:37	05:03 21:58
28	08:19 17:03	09:04 (WEA_RE_05) 07:20 09:34 (WEA_RE_05) 18:03	08:16 (WEA_RE_04) 06:14 08:51 (WEA_RE_04) 18:54	06:03 20:50	05:13 21:38	05:04 21:58
29	08:18 17:05	09:04 (WEA_RE_05) 09:34 (WEA_RE_05)	07:11 19:56	06:01 20:51	05:12 21:39	05:04 21:58
30	08:16 17:07	09:05 (WEA_RE_05) 09:35 (WEA_RE_05)	07:09 19:58	05:59 20:53	05:11 21:41	05:05 21:58
31	08:15 17:09	09:06 (WEA_RE_05) 09:34 (WEA_RE_05)	07:07 20:00	05:59 21:42	05:11 21:42	05:05 21:58
	Sonnenscheinstunden astr.max.mögl.Beschattung	254 535	275 732	367 196	418 490	505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Zeitpunkt (SS:MM) Schattende	(WEA mit letztem Schatten)
	Minuten mit Schatten		

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_22 - IO 22 Böseler Straße 502 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07		07:24 16:59		08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05		07:26 16:57		08:19 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02		07:28 16:55	08:46 (WEA_RE_05)	08:20 16:15
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00		07:30 16:53	8 08:43 (WEA_RE_05)	08:22 16:14
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58		07:32 16:51	15 08:41 (WEA_RE_05)	08:23 16:13
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	12 09:02 (WEA_RE_04)	07:34 16:49	19 09:00 (WEA_RE_05)	08:25 16:13
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	18 09:14 (WEA_RE_04)	07:35 16:47	21 09:01 (WEA_RE_05)	08:26 16:12
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	24 09:16 (WEA_RE_04)	07:37 16:46	23 09:02 (WEA_RE_05)	08:27 16:12
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	27 09:19 (WEA_RE_04)	07:39 16:44	25 09:03 (WEA_RE_05)	08:28 16:12
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	30 09:20 (WEA_RE_04)	07:41 16:42	27 09:04 (WEA_RE_05)	08:30 16:11
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	32 09:22 (WEA_RE_04)	07:43 16:41	28 09:05 (WEA_RE_05)	08:31 16:11
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	34 09:23 (WEA_RE_04)	07:45 16:39	29 09:05 (WEA_RE_05)	4 10:22 (WEA_RE_03)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	35 09:24 (WEA_RE_04)	07:47 16:37	30 09:06 (WEA_RE_05)	7 10:21 (WEA_RE_03)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	37 09:24 (WEA_RE_04)	07:49 16:36	30 09:06 (WEA_RE_05)	10 10:20 (WEA_RE_03)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	37 09:24 (WEA_RE_04)	07:50 16:34	30 09:06 (WEA_RE_05)	11 10:19 (WEA_RE_03)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	37 09:24 (WEA_RE_04)	07:52 16:33	31 09:07 (WEA_RE_05)	13 10:18 (WEA_RE_03)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	37 09:24 (WEA_RE_04)	07:54 16:31	30 09:07 (WEA_RE_05)	13 10:17 (WEA_RE_03)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	38 09:24 (WEA_RE_04)	07:56 16:30	30 09:07 (WEA_RE_05)	14 10:16 (WEA_RE_03)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	38 09:24 (WEA_RE_04)	07:58 16:29	30 09:07 (WEA_RE_05)	15 10:15 (WEA_RE_03)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	38 09:24 (WEA_RE_04)	07:59 16:27	29 09:07 (WEA_RE_05)	15 10:14 (WEA_RE_03)
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	37 09:24 (WEA_RE_04)	08:01 16:26	29 09:07 (WEA_RE_05)	16 10:13 (WEA_RE_03)
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	36 09:23 (WEA_RE_04)	08:03 16:25	28 09:07 (WEA_RE_05)	16 10:12 (WEA_RE_03)
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	36 09:23 (WEA_RE_04)	08:05 16:24	27 09:07 (WEA_RE_05)	16 10:11 (WEA_RE_03)
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	35 09:22 (WEA_RE_04)	08:06 16:22	26 09:07 (WEA_RE_05)	15 10:10 (WEA_RE_03)
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	34 09:22 (WEA_RE_04)	08:08 16:21	25 09:07 (WEA_RE_05)	15 10:09 (WEA_RE_03)
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	32 08:21 (WEA_RE_04)	08:10 16:20	23 09:06 (WEA_RE_05)	15 10:08 (WEA_RE_03)
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	31 08:20 (WEA_RE_04)	08:11 16:19	22 09:06 (WEA_RE_05)	14 10:07 (WEA_RE_03)
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	27 08:18 (WEA_RE_04)	08:13 16:18	20 09:05 (WEA_RE_05)	14 10:06 (WEA_RE_03)
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:05	25 08:17 (WEA_RE_04)	08:14 16:17	19 09:05 (WEA_RE_05)	13 10:05 (WEA_RE_03)
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:03	21 08:15 (WEA_RE_04)	08:16 16:16	16 09:04 (WEA_RE_05)	12 10:04 (WEA_RE_03)
31	05:42 21:26	06:35 20:22	07:28 19:08	08:22 18:01	16 08:12 (WEA_RE_04)	08:17 16:15	14 09:03 (WEA_RE_05)	11 10:03 (WEA_RE_03)
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382 330	330 777		262 684		238 284

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_23 - IO 23 Böseler Straße 490 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42	09:17 (WEA_RE_05) 08:13	09:28 (WEA_RE_05) 07:17	08:38 (WEA_RE_04) 07:04	05:57	05:09
	16:21	09:37 (WEA_RE_05) 17:11	09:45 (WEA_RE_05) 18:05	09:03 (WEA_RE_04) 20:01	20:55	21:43
2	08:42	09:17 (WEA_RE_05) 08:12	09:30 (WEA_RE_05) 07:15	08:40 (WEA_RE_04) 07:02	05:55	05:08
	16:22	09:38 (WEA_RE_05) 17:13	09:43 (WEA_RE_05) 18:07	09:01 (WEA_RE_04) 20:03	20:57	21:44
3	08:42	09:16 (WEA_RE_05) 08:10	09:35 (WEA_RE_05) 07:13	08:43 (WEA_RE_04) 06:59	05:53	05:08
	16:23	09:39 (WEA_RE_05) 17:15	09:40 (WEA_RE_05) 18:09	08:58 (WEA_RE_04) 20:05	20:58	21:45
4	08:41	09:17 (WEA_RE_05) 08:08	08:46 (WEA_RE_04) 07:11		06:57	05:07
	16:25	09:40 (WEA_RE_05) 17:17	08:59 (WEA_RE_04) 18:11		20:07	21:00
5	08:41	09:16 (WEA_RE_05) 08:06	08:43 (WEA_RE_04) 07:08		06:55	05:06
	16:26	09:40 (WEA_RE_05) 17:19	09:02 (WEA_RE_04) 18:12		20:09	21:02
6	08:41	09:17 (WEA_RE_05) 08:05	08:41 (WEA_RE_04) 07:06		06:52	05:05
	16:27	09:42 (WEA_RE_05) 17:21	09:04 (WEA_RE_04) 18:14		20:10	21:04
7	08:40	09:16 (WEA_RE_05) 08:03	08:39 (WEA_RE_04) 07:04		06:50	05:05
	16:28	09:42 (WEA_RE_05) 17:23	09:06 (WEA_RE_04) 18:16		20:12	21:05
8	08:40	09:16 (WEA_RE_05) 08:01	08:38 (WEA_RE_04) 07:01		06:48	05:04
	16:30	09:43 (WEA_RE_05) 17:24	09:07 (WEA_RE_04) 18:18		20:14	21:07
9	08:39	09:17 (WEA_RE_05) 07:59	08:37 (WEA_RE_04) 06:59		06:45	05:04
	16:31	09:44 (WEA_RE_05) 17:26	09:09 (WEA_RE_04) 18:20		20:16	21:09
10	08:39	09:17 (WEA_RE_05) 07:57	08:36 (WEA_RE_04) 06:57		06:43	05:03
	16:33	09:45 (WEA_RE_05) 17:28	09:10 (WEA_RE_04) 18:22		20:18	21:10
11	08:38	09:17 (WEA_RE_05) 07:55	08:35 (WEA_RE_04) 06:54		06:41	05:03
	16:34	09:45 (WEA_RE_05) 17:30	09:11 (WEA_RE_04) 18:24		20:19	21:12
12	08:37	09:17 (WEA_RE_05) 07:53	08:34 (WEA_RE_04) 06:52		06:38	05:02
	16:36	09:46 (WEA_RE_05) 17:32	09:11 (WEA_RE_04) 18:25		20:21	21:14
13	08:37	09:17 (WEA_RE_05) 07:51	08:34 (WEA_RE_04) 06:50		06:36	05:02
	16:37	09:46 (WEA_RE_05) 17:34	09:12 (WEA_RE_04) 18:27		20:23	21:15
14	08:36	09:17 (WEA_RE_05) 07:49	08:33 (WEA_RE_04) 06:47		06:34	05:02
	16:39	09:47 (WEA_RE_05) 17:36	09:13 (WEA_RE_04) 18:29		20:25	21:17
15	08:35	09:17 (WEA_RE_05) 07:47	08:33 (WEA_RE_04) 06:45		06:31	05:01
	16:40	09:48 (WEA_RE_05) 17:38	09:13 (WEA_RE_04) 18:31		20:26	21:19
16	08:34	09:17 (WEA_RE_05) 07:45	08:33 (WEA_RE_04) 06:43		06:29	05:00
	16:42	09:48 (WEA_RE_05) 17:40	09:14 (WEA_RE_04) 18:33		20:28	21:20
17	08:33	09:18 (WEA_RE_05) 07:43	08:32 (WEA_RE_04) 06:40		06:27	05:00
	16:44	09:49 (WEA_RE_05) 17:42	09:13 (WEA_RE_04) 18:34		20:30	21:22
18	08:32	09:18 (WEA_RE_05) 07:41	08:32 (WEA_RE_04) 06:38		06:25	05:01
	16:45	09:50 (WEA_RE_05) 17:44	09:13 (WEA_RE_04) 18:36		20:32	21:24
19	08:31	09:18 (WEA_RE_05) 07:39	08:32 (WEA_RE_04) 06:35		06:22	05:01
	16:47	09:49 (WEA_RE_05) 17:46	09:13 (WEA_RE_04) 18:38		20:34	21:25
20	08:30	09:18 (WEA_RE_05) 07:37	08:32 (WEA_RE_04) 06:33		06:20	05:01
	16:49	09:50 (WEA_RE_05) 17:48	09:13 (WEA_RE_04) 18:40		20:35	21:27
21	08:29	09:19 (WEA_RE_05) 07:35	08:32 (WEA_RE_04) 06:31		06:18	05:01
	16:50	09:50 (WEA_RE_05) 17:50	09:13 (WEA_RE_04) 18:42		20:37	21:28
22	08:27	09:19 (WEA_RE_05) 07:33	08:32 (WEA_RE_04) 06:28		06:16	05:02
	16:52	09:50 (WEA_RE_05) 17:52	09:12 (WEA_RE_04) 18:44		20:39	21:30
23	08:26	09:20 (WEA_RE_05) 07:31	08:33 (WEA_RE_04) 06:26		06:14	05:02
	16:54	09:51 (WEA_RE_05) 17:53	09:11 (WEA_RE_04) 18:45		20:41	21:31
24	08:25	09:19 (WEA_RE_05) 07:29	08:33 (WEA_RE_04) 06:23		06:12	05:02
	16:56	09:50 (WEA_RE_05) 17:55	09:11 (WEA_RE_04) 18:47		20:43	21:33
25	08:24	09:21 (WEA_RE_05) 07:26	08:34 (WEA_RE_04) 06:21		06:09	05:03
	16:58	09:50 (WEA_RE_05) 17:57	09:10 (WEA_RE_04) 18:49		20:44	21:34
26	08:22	09:21 (WEA_RE_05) 07:24	08:34 (WEA_RE_04) 06:19		06:07	05:03
	17:00	09:50 (WEA_RE_05) 17:59	09:08 (WEA_RE_04) 18:51		20:46	21:35
27	08:21	09:22 (WEA_RE_05) 07:22	08:35 (WEA_RE_04) 06:16		06:05	05:04
	17:01	09:50 (WEA_RE_05) 18:01	09:07 (WEA_RE_04) 18:52		20:48	21:37
28	08:19	09:23 (WEA_RE_05) 07:20	08:37 (WEA_RE_04) 06:14		06:03	05:04
	17:03	09:49 (WEA_RE_05) 18:03	09:06 (WEA_RE_04) 18:54		20:50	21:38
29	08:18	09:23 (WEA_RE_05)			06:01	05:12
	17:05	09:48 (WEA_RE_05)			20:51	21:39
30	08:16	09:25 (WEA_RE_05)			05:59	05:11
	17:07	09:48 (WEA_RE_05)			20:53	21:41
31	08:15	09:26 (WEA_RE_05)				05:10
	17:09	09:47 (WEA_RE_05)				21:42
	Sonnenscheinstunden	254			418	490
	astr.max.mögl.Beschattung	853	896	61		505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_23 - IO 23 Böseler Straße 490 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember			
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07		07:24 16:59	34	08:05 (WEA_RE_04) 08:39 (WEA_RE_04)	08:17 16:16	28	08:59 (WEA_RE_05) 09:27 (WEA_RE_05)
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05		07:26 16:57	32	08:06 (WEA_RE_04) 08:38 (WEA_RE_04)	08:19 16:15	28	09:00 (WEA_RE_05) 09:28 (WEA_RE_05)
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02		07:28 16:55	29	08:08 (WEA_RE_04) 08:37 (WEA_RE_04)	08:20 16:15	27	09:00 (WEA_RE_05) 09:27 (WEA_RE_05)
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00		07:30 16:53	27	08:09 (WEA_RE_04) 08:36 (WEA_RE_04)	08:22 16:14	27	09:01 (WEA_RE_05) 09:28 (WEA_RE_05)
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58		07:32 16:51	23	08:11 (WEA_RE_04) 08:34 (WEA_RE_04)	08:23 16:13	25	09:02 (WEA_RE_05) 09:27 (WEA_RE_05)
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55		07:34 16:49	19	08:13 (WEA_RE_04) 08:32 (WEA_RE_04)	08:25 16:13	25	09:03 (WEA_RE_05) 09:28 (WEA_RE_05)
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53		07:35 16:47	13	08:16 (WEA_RE_04) 08:29 (WEA_RE_04)	08:26 16:12	24	09:03 (WEA_RE_05) 09:27 (WEA_RE_05)
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51		07:37 16:46	6	09:04 (WEA_RE_05) 09:10 (WEA_RE_05)	08:27 16:12	23	09:04 (WEA_RE_05) 09:27 (WEA_RE_05)
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48		07:39 16:44	14	09:00 (WEA_RE_05) 09:14 (WEA_RE_05)	08:28 16:12	23	09:05 (WEA_RE_05) 09:28 (WEA_RE_05)
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	9	07:41 16:42	18	09:20 (WEA_RE_04) 09:29 (WEA_RE_04)	07:41 16:42	18	09:06 (WEA_RE_05) 09:27 (WEA_RE_05)
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	18	07:43 16:41	21	09:16 (WEA_RE_04) 09:34 (WEA_RE_04)	07:43 16:41	21	09:07 (WEA_RE_05) 09:27 (WEA_RE_05)
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	23	07:45 16:39	23	09:13 (WEA_RE_04) 09:36 (WEA_RE_04)	07:45 16:39	23	09:08 (WEA_RE_05) 09:27 (WEA_RE_05)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	27	07:47 16:37	25	09:11 (WEA_RE_04) 09:38 (WEA_RE_04)	07:47 16:37	25	09:08 (WEA_RE_05) 09:27 (WEA_RE_05)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	31	07:49 16:36	27	09:08 (WEA_RE_04) 09:39 (WEA_RE_04)	07:49 16:36	27	09:09 (WEA_RE_05) 09:27 (WEA_RE_05)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	33	07:50 16:34	28	09:07 (WEA_RE_04) 09:40 (WEA_RE_04)	07:50 16:34	28	09:10 (WEA_RE_05) 09:27 (WEA_RE_05)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	35	07:52 16:33	29	09:06 (WEA_RE_04) 09:41 (WEA_RE_04)	07:52 16:33	29	09:11 (WEA_RE_05) 09:28 (WEA_RE_05)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	37	07:54 16:31	29	09:05 (WEA_RE_04) 09:42 (WEA_RE_04)	07:54 16:31	29	09:12 (WEA_RE_05) 09:28 (WEA_RE_05)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	38	07:56 16:30	31	09:04 (WEA_RE_04) 09:42 (WEA_RE_04)	07:56 16:30	31	09:13 (WEA_RE_05) 09:28 (WEA_RE_05)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	39	07:58 16:29	31	09:04 (WEA_RE_04) 09:43 (WEA_RE_04)	07:58 16:29	31	09:13 (WEA_RE_05) 09:28 (WEA_RE_05)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	40	07:59 16:27	31	09:03 (WEA_RE_04) 09:43 (WEA_RE_04)	07:59 16:27	31	09:14 (WEA_RE_05) 09:29 (WEA_RE_05)
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	40	08:01 16:26	31	09:03 (WEA_RE_04) 09:43 (WEA_RE_04)	08:01 16:26	31	09:14 (WEA_RE_05) 09:29 (WEA_RE_05)
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	42	08:03 16:25	32	09:02 (WEA_RE_04) 09:44 (WEA_RE_04)	08:03 16:25	32	09:15 (WEA_RE_05) 09:30 (WEA_RE_05)
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	42	08:05 16:24	31	09:02 (WEA_RE_04) 09:44 (WEA_RE_04)	08:05 16:24	31	09:15 (WEA_RE_05) 09:30 (WEA_RE_05)
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	41	08:06 16:22	32	09:02 (WEA_RE_04) 09:43 (WEA_RE_04)	08:06 16:22	32	09:16 (WEA_RE_05) 09:31 (WEA_RE_05)
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	41	08:08 16:21	31	09:02 (WEA_RE_04) 09:43 (WEA_RE_04)	08:08 16:21	31	09:16 (WEA_RE_05) 09:31 (WEA_RE_05)
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	41	08:10 16:20	31	08:02 (WEA_RE_04) 09:43 (WEA_RE_04)	08:10 16:20	31	09:16 (WEA_RE_05) 09:32 (WEA_RE_05)
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	40	08:11 16:19	31	08:03 (WEA_RE_04) 09:43 (WEA_RE_04)	08:11 16:19	31	09:16 (WEA_RE_05) 09:32 (WEA_RE_05)
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	39	08:13 16:18	30	08:03 (WEA_RE_04) 09:42 (WEA_RE_04)	08:13 16:18	30	09:16 (WEA_RE_05) 09:33 (WEA_RE_05)
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	39	08:14 16:18	29	08:03 (WEA_RE_04) 09:42 (WEA_RE_04)	08:14 16:18	29	09:16 (WEA_RE_05) 09:34 (WEA_RE_05)
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	37	08:16 16:17	29	08:04 (WEA_RE_04) 09:41 (WEA_RE_04)	08:16 16:17	29	09:16 (WEA_RE_05) 09:35 (WEA_RE_05)
31	05:42 21:25	06:35 20:21	07:27 19:07	08:22 18:01	35	08:17 16:16	20	08:05 (WEA_RE_04) 09:40 (WEA_RE_04)	08:17 16:16	20	09:16 (WEA_RE_05) 09:36 (WEA_RE_05)
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382 330	330 267	767	262 797	603				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_24 - IO 24 Böseler Straße 464 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42 16:21	09:43 (WEA_RE_05) 08:13 10:20 (WEA_RE_05) 17:11	09:07 (WEA_RE_04) 07:17 09:52 (WEA_RE_04) 18:05	09:22 (WEA_RE_04) 07:04 09:33 (WEA_RE_04) 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	09:44 (WEA_RE_05) 08:11 10:21 (WEA_RE_05) 17:13	09:06 (WEA_RE_04) 07:15 09:52 (WEA_RE_04) 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	09:44 (WEA_RE_05) 08:10 10:21 (WEA_RE_05) 17:15	09:06 (WEA_RE_04) 07:13 09:54 (WEA_RE_04) 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:25	09:45 (WEA_RE_05) 08:08 10:22 (WEA_RE_05) 17:17	09:06 (WEA_RE_04) 07:11 09:55 (WEA_RE_04) 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	09:45 (WEA_RE_05) 08:06 10:22 (WEA_RE_05) 17:19	09:05 (WEA_RE_04) 07:08 09:55 (WEA_RE_04) 18:12	06:55 20:09	05:49 21:02	05:06 21:48
6	08:41 16:27	09:46 (WEA_RE_05) 08:05 10:23 (WEA_RE_05) 17:21	09:05 (WEA_RE_04) 07:06 09:55 (WEA_RE_04) 18:14	06:52 20:10	05:47 21:04	05:05 21:49
7	08:40 16:28	09:46 (WEA_RE_05) 08:03 10:23 (WEA_RE_05) 17:22	09:04 (WEA_RE_04) 07:04 09:56 (WEA_RE_04) 18:16	06:50 20:12	05:45 21:05	05:05 21:50
8	08:40 16:30	09:46 (WEA_RE_05) 08:01 10:23 (WEA_RE_05) 17:24	09:04 (WEA_RE_04) 07:01 09:56 (WEA_RE_04) 18:18	06:48 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	09:47 (WEA_RE_05) 07:59 10:24 (WEA_RE_05) 17:26	09:04 (WEA_RE_04) 06:59 09:56 (WEA_RE_04) 18:20	06:45 20:16	05:42 21:09	05:04 21:51
10	08:39 16:33	09:47 (WEA_RE_05) 07:57 10:24 (WEA_RE_05) 17:28	09:04 (WEA_RE_04) 06:57 09:57 (WEA_RE_04) 18:22	06:43 20:18	05:40 21:10	05:03 21:52
11	08:38 16:34	09:48 (WEA_RE_05) 07:55 10:24 (WEA_RE_05) 17:30	09:04 (WEA_RE_04) 06:54 09:57 (WEA_RE_04) 18:23	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:36	09:48 (WEA_RE_05) 07:53 10:24 (WEA_RE_05) 17:32	09:04 (WEA_RE_04) 06:52 09:57 (WEA_RE_04) 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	09:49 (WEA_RE_05) 07:51 10:24 (WEA_RE_05) 17:34	09:04 (WEA_RE_04) 06:50 09:57 (WEA_RE_04) 18:27	06:36 20:23	05:35 21:15	05:02 21:54
14	08:36 16:39	09:49 (WEA_RE_05) 07:49 10:24 (WEA_RE_05) 17:36	09:04 (WEA_RE_04) 06:47 09:57 (WEA_RE_04) 18:29	06:34 20:25	05:33 21:17	05:02 21:55
15	08:35 16:40	09:50 (WEA_RE_05) 07:47 10:24 (WEA_RE_05) 17:38	09:05 (WEA_RE_04) 06:45 09:57 (WEA_RE_04) 18:31	06:31 20:26	05:31 21:19	05:01 21:56
16	08:34 16:42	09:51 (WEA_RE_05) 07:45 10:25 (WEA_RE_05) 17:40	09:05 (WEA_RE_04) 06:42 09:56 (WEA_RE_04) 18:33	06:29 20:28	05:30 21:20	05:01 21:56
17	08:33 16:44	09:52 (WEA_RE_05) 07:43 10:25 (WEA_RE_05) 17:42	09:04 (WEA_RE_04) 06:40 09:55 (WEA_RE_04) 18:34	06:27 20:30	05:28 21:22	05:01 21:57
18	08:32 16:45	09:53 (WEA_RE_05) 07:41 10:25 (WEA_RE_05) 17:44	09:05 (WEA_RE_04) 06:38 09:55 (WEA_RE_04) 18:36	06:25 20:32	05:27 21:24	05:01 21:57
19	08:31 16:47	09:53 (WEA_RE_05) 07:39 10:24 (WEA_RE_05) 17:46	09:06 (WEA_RE_04) 06:35 09:54 (WEA_RE_04) 18:38	06:22 20:34	05:25 21:25	05:01 21:57
20	08:30 16:49	09:54 (WEA_RE_05) 07:37 10:24 (WEA_RE_05) 17:48	09:06 (WEA_RE_04) 06:33 09:53 (WEA_RE_04) 18:40	06:20 20:35	05:24 21:27	05:01 21:58
21	08:29 16:50	09:21 (WEA_RE_04) 07:35 10:23 (WEA_RE_05) 17:50	09:07 (WEA_RE_04) 06:31 09:53 (WEA_RE_04) 18:42	06:18 20:37	05:22 21:28	05:01 21:58
22	08:27 16:52	09:18 (WEA_RE_04) 07:33 10:22 (WEA_RE_05) 17:52	09:07 (WEA_RE_04) 06:28 09:51 (WEA_RE_04) 18:43	06:16 20:39	05:21 21:30	05:02 21:58
23	08:26 16:54	09:16 (WEA_RE_04) 07:31 10:22 (WEA_RE_05) 17:53	09:08 (WEA_RE_04) 06:26 09:50 (WEA_RE_04) 18:45	06:14 20:41	05:19 21:31	05:02 21:58
24	08:25 16:56	09:14 (WEA_RE_04) 07:29 10:20 (WEA_RE_05) 17:55	09:10 (WEA_RE_04) 06:23 09:48 (WEA_RE_04) 18:47	06:12 20:43	05:18 21:33	05:02 21:58
25	08:24 16:58	09:13 (WEA_RE_04) 07:26 10:19 (WEA_RE_05) 17:57	09:11 (WEA_RE_04) 06:21 09:47 (WEA_RE_04) 18:49	06:09 20:44	05:17 21:34	05:02 21:58
26	08:22 17:00	09:11 (WEA_RE_04) 07:24 10:17 (WEA_RE_05) 17:59	09:12 (WEA_RE_04) 06:19 09:44 (WEA_RE_04) 18:51	06:07 20:46	05:16 21:35	05:03 21:58
27	08:21 17:01	09:11 (WEA_RE_04) 07:22 10:13 (WEA_RE_05) 18:01	09:15 (WEA_RE_04) 06:16 09:42 (WEA_RE_04) 18:52	06:05 20:48	05:14 21:37	05:03 21:58
28	08:19 17:03	09:10 (WEA_RE_04) 07:20 09:47 (WEA_RE_04) 18:03	09:18 (WEA_RE_04) 06:14 09:39 (WEA_RE_04) 18:54	06:03 20:50	05:13 21:38	05:04 21:58
29	08:18 17:05	09:08 (WEA_RE_04) 09:48 (WEA_RE_04)	07:11 19:56	06:01 20:51	05:12 21:39	05:04 21:58
30	08:16 17:07	09:08 (WEA_RE_04) 09:50 (WEA_RE_04)	07:09 19:58	05:59 20:53	05:11 21:41	05:05 21:58
31	08:15 17:09	09:07 (WEA_RE_04) 09:51 (WEA_RE_04)	07:07 20:00	05:58 20:53	05:10 21:42	05:05 21:58
	Sonnenscheinstunden astr.max.mögl.Beschattung	254 1182	275 1294	367 11	418 490	505 505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Zeitpunkt (SS:MM) Schattendenende	(WEA mit letztem Schatten)
	Minuten mit Schatten		

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_24 - IO 24 Böseler Straße 464 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07		07:24 16:59		08:34 (WEA_RE_04) 08:17 09:26 (WEA_RE_04) 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05		07:26 16:57	52	08:34 (WEA_RE_04) 08:19 09:26 (WEA_RE_04) 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02		07:28 16:55	52	08:34 (WEA_RE_04) 08:20 09:26 (WEA_RE_04) 16:15
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00		07:30 16:53	51	08:34 (WEA_RE_04) 08:22 09:25 (WEA_RE_04) 16:14
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58		07:32 16:51	50	08:35 (WEA_RE_04) 08:23 09:25 (WEA_RE_04) 16:13
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55		07:34 16:49	50	08:35 (WEA_RE_04) 08:25 09:25 (WEA_RE_04) 16:13
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53		07:35 16:47	49	08:35 (WEA_RE_04) 08:26 09:24 (WEA_RE_04) 16:12
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51		07:37 16:46	48	08:36 (WEA_RE_04) 08:27 09:24 (WEA_RE_04) 16:12
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48		07:39 16:44	46	08:37 (WEA_RE_04) 08:28 09:23 (WEA_RE_04) 16:12
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46		07:41 16:42	45	08:38 (WEA_RE_04) 08:29 09:23 (WEA_RE_04) 16:11
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44		07:43 16:41	44	08:38 (WEA_RE_04) 08:31 09:22 (WEA_RE_04) 16:11
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41		07:45 16:39	42	08:39 (WEA_RE_04) 08:32 09:21 (WEA_RE_04) 16:11
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	16	07:47 16:37	40	08:40 (WEA_RE_04) 08:33 09:20 (WEA_RE_04) 16:11
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	23	07:48 16:36	37	08:42 (WEA_RE_04) 08:34 09:19 (WEA_RE_04) 16:11
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	29	07:50 16:34	40	08:43 (WEA_RE_04) 08:35 09:45 (WEA_RE_05) 16:11
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	33	07:52 16:33	47	08:44 (WEA_RE_04) 08:36 09:50 (WEA_RE_05) 16:11
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	37	07:54 16:31	48	08:46 (WEA_RE_04) 08:36 09:52 (WEA_RE_05) 16:11
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	39	07:56 16:30	48	08:48 (WEA_RE_04) 08:37 09:54 (WEA_RE_05) 16:11
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	42	07:58 16:29	47	08:50 (WEA_RE_04) 08:38 09:56 (WEA_RE_05) 16:12
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	44	07:59 16:27	44	08:53 (WEA_RE_04) 08:38 09:57 (WEA_RE_05) 16:12
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	46	08:01 16:26	39	08:56 (WEA_RE_04) 08:39 09:58 (WEA_RE_05) 16:13
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	47	08:03 16:25	30	09:30 (WEA_RE_05) 08:40 10:00 (WEA_RE_05) 16:13
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	49	08:05 16:24	31	09:30 (WEA_RE_05) 08:40 10:01 (WEA_RE_05) 16:14
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	50	08:06 16:22	32	09:30 (WEA_RE_05) 08:41 10:02 (WEA_RE_05) 16:14
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	51	08:08 16:21	33	09:30 (WEA_RE_05) 08:41 10:03 (WEA_RE_05) 16:15
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	52	08:10 16:20	34	09:30 (WEA_RE_05) 08:41 10:04 (WEA_RE_05) 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	52	08:11 16:19	35	09:29 (WEA_RE_05) 08:42 10:04 (WEA_RE_05) 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	52	08:13 16:18	35	09:29 (WEA_RE_05) 08:42 10:04 (WEA_RE_05) 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	52	08:14 16:18	35	09:30 (WEA_RE_05) 08:42 10:05 (WEA_RE_05) 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	53	08:16 16:17	36	09:29 (WEA_RE_05) 08:42 10:05 (WEA_RE_05) 16:19
31	05:42 21:25	06:35 20:21	07:27 19:07	08:22 18:01	53	08:17 16:16	37	08:42 16:20
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382 330	820		262 1272		238 1139

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_25 - IO 25 Böseler Straße 455 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:42 16:21	09:53 (WEA_RE_05) 08:13 10:32 (WEA_RE_05) 17:11	09:15 (WEA_RE_04) 07:17 10:06 (WEA_RE_04) 18:05	09:23 (WEA_RE_04) 07:04 09:53 (WEA_RE_04) 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	09:53 (WEA_RE_05) 08:11 10:33 (WEA_RE_05) 17:13	09:14 (WEA_RE_04) 07:15 10:06 (WEA_RE_04) 18:07	09:26 (WEA_RE_04) 07:02 09:50 (WEA_RE_04) 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	09:53 (WEA_RE_05) 08:10 10:33 (WEA_RE_05) 17:15	09:14 (WEA_RE_04) 07:13 10:08 (WEA_RE_04) 18:09	09:31 (WEA_RE_04) 06:59 09:45 (WEA_RE_04) 20:05	05:53 20:58	05:07 21:45
4	08:41 16:25	09:54 (WEA_RE_05) 08:08 10:33 (WEA_RE_05) 17:17	09:14 (WEA_RE_04) 07:11 10:08 (WEA_RE_04) 18:10	09:13 (WEA_RE_04) 07:08 10:09 (WEA_RE_04) 18:12	06:57 20:07	05:51 21:46
5	08:41 16:26	09:54 (WEA_RE_05) 08:06 10:33 (WEA_RE_05) 17:19	09:13 (WEA_RE_04) 07:08 10:09 (WEA_RE_04) 18:12	09:13 (WEA_RE_04) 07:06 10:09 (WEA_RE_04) 18:14	06:55 20:09	05:49 21:48
6	08:41 16:27	09:55 (WEA_RE_05) 08:05 10:34 (WEA_RE_05) 17:21	09:13 (WEA_RE_04) 07:06 10:09 (WEA_RE_04) 18:14	09:13 (WEA_RE_04) 07:04 10:10 (WEA_RE_04) 18:16	06:52 20:10	05:47 21:49
7	08:40 16:28	09:55 (WEA_RE_05) 08:03 10:34 (WEA_RE_05) 17:22	09:13 (WEA_RE_04) 07:04 10:10 (WEA_RE_04) 18:16	09:13 (WEA_RE_04) 07:04 10:10 (WEA_RE_04) 18:16	06:50 20:12	05:45 21:49
8	08:40 16:30	09:55 (WEA_RE_05) 08:01 10:34 (WEA_RE_05) 17:24	09:12 (WEA_RE_04) 07:01 10:10 (WEA_RE_04) 18:18	09:12 (WEA_RE_04) 07:01 10:10 (WEA_RE_04) 18:18	06:48 20:14	05:43 21:50
9	08:39 16:31	09:57 (WEA_RE_05) 07:59 10:35 (WEA_RE_05) 17:26	09:12 (WEA_RE_04) 06:59 10:10 (WEA_RE_04) 18:20	09:12 (WEA_RE_04) 06:59 10:10 (WEA_RE_04) 18:20	06:45 20:16	05:42 21:51
10	08:39 16:33	09:57 (WEA_RE_05) 07:57 10:35 (WEA_RE_05) 17:28	09:12 (WEA_RE_04) 06:57 10:11 (WEA_RE_04) 18:22	09:12 (WEA_RE_04) 06:54 10:11 (WEA_RE_04) 18:23	06:43 20:18	05:40 21:52
11	08:38 16:34	09:57 (WEA_RE_05) 07:55 10:35 (WEA_RE_05) 17:30	09:12 (WEA_RE_04) 06:54 10:11 (WEA_RE_04) 18:23	09:12 (WEA_RE_04) 06:52 10:11 (WEA_RE_04) 18:25	06:41 20:19	05:38 21:53
12	08:37 16:36	09:58 (WEA_RE_05) 07:53 10:35 (WEA_RE_05) 17:32	09:12 (WEA_RE_04) 06:52 10:11 (WEA_RE_04) 18:25	09:12 (WEA_RE_04) 06:50 10:11 (WEA_RE_04) 18:27	06:38 20:23	05:36 21:54
13	08:37 16:37	09:58 (WEA_RE_05) 07:51 10:35 (WEA_RE_05) 17:34	09:12 (WEA_RE_04) 06:50 10:11 (WEA_RE_04) 18:27	09:12 (WEA_RE_04) 06:47 10:11 (WEA_RE_04) 18:29	06:36 20:25	05:35 21:55
14	08:36 16:39	09:59 (WEA_RE_05) 07:49 10:35 (WEA_RE_05) 17:36	09:12 (WEA_RE_04) 06:47 10:11 (WEA_RE_04) 18:29	09:12 (WEA_RE_04) 06:45 10:11 (WEA_RE_04) 18:31	06:34 20:26	05:33 21:56
15	08:35 16:40	10:00 (WEA_RE_05) 07:47 10:35 (WEA_RE_05) 17:38	09:12 (WEA_RE_04) 06:45 10:11 (WEA_RE_04) 18:31	09:13 (WEA_RE_04) 06:42 10:10 (WEA_RE_04) 18:33	06:31 20:28	05:31 21:56
16	08:34 16:42	10:01 (WEA_RE_05) 07:45 10:36 (WEA_RE_05) 17:40	09:13 (WEA_RE_04) 06:42 10:10 (WEA_RE_04) 18:33	09:13 (WEA_RE_04) 06:40 10:09 (WEA_RE_04) 18:34	06:29 20:30	05:30 21:56
17	08:33 16:44	10:02 (WEA_RE_05) 07:43 10:36 (WEA_RE_05) 17:42	09:12 (WEA_RE_04) 06:40 10:09 (WEA_RE_04) 18:34	09:12 (WEA_RE_04) 06:38 10:09 (WEA_RE_04) 18:36	06:27 20:32	05:28 21:57
18	08:32 16:45	09:33 (WEA_RE_04) 07:41 10:35 (WEA_RE_05) 17:44	09:13 (WEA_RE_04) 06:38 10:09 (WEA_RE_04) 18:36	09:13 (WEA_RE_04) 06:35 10:08 (WEA_RE_04) 18:38	06:25 20:34	05:27 21:57
19	08:31 16:47	09:29 (WEA_RE_04) 07:39 10:34 (WEA_RE_05) 17:46	09:13 (WEA_RE_04) 06:35 10:08 (WEA_RE_04) 18:38	09:13 (WEA_RE_04) 06:33 10:08 (WEA_RE_04) 18:40	06:22 20:35	05:25 21:58
20	08:30 16:49	09:27 (WEA_RE_04) 07:37 10:34 (WEA_RE_05) 17:48	09:14 (WEA_RE_04) 06:33 10:08 (WEA_RE_04) 18:40	09:14 (WEA_RE_04) 06:31 10:07 (WEA_RE_04) 18:42	06:20 20:37	05:24 21:58
21	08:29 16:50	09:25 (WEA_RE_04) 07:35 10:34 (WEA_RE_05) 17:50	09:15 (WEA_RE_04) 06:31 10:07 (WEA_RE_04) 18:42	09:15 (WEA_RE_04) 06:28 10:06 (WEA_RE_04) 18:43	06:18 20:39	05:22 21:58
22	08:27 16:52	09:23 (WEA_RE_04) 07:33 10:33 (WEA_RE_05) 17:52	09:14 (WEA_RE_04) 06:28 10:06 (WEA_RE_04) 18:43	09:14 (WEA_RE_04) 06:26 10:05 (WEA_RE_04) 18:45	06:16 20:41	05:21 21:58
23	08:26 16:54	09:22 (WEA_RE_04) 07:31 10:32 (WEA_RE_05) 17:53	09:15 (WEA_RE_04) 06:26 10:05 (WEA_RE_04) 18:45	09:17 (WEA_RE_04) 06:23 10:04 (WEA_RE_04) 18:47	06:14 20:42	05:19 21:58
24	08:25 16:56	09:21 (WEA_RE_04) 07:29 10:30 (WEA_RE_05) 17:55	09:17 (WEA_RE_04) 06:23 10:04 (WEA_RE_04) 18:47	09:18 (WEA_RE_04) 06:21 10:02 (WEA_RE_04) 18:49	06:12 20:44	05:18 21:58
25	08:24 16:58	09:20 (WEA_RE_04) 07:26 10:29 (WEA_RE_05) 17:57	09:18 (WEA_RE_04) 06:21 10:02 (WEA_RE_04) 18:49	09:18 (WEA_RE_04) 06:19 10:00 (WEA_RE_04) 18:51	06:09 20:46	05:17 21:58
26	08:22 17:00	09:19 (WEA_RE_04) 07:24 10:26 (WEA_RE_05) 17:59	09:18 (WEA_RE_04) 06:19 10:00 (WEA_RE_04) 18:51	09:20 (WEA_RE_04) 06:16 09:58 (WEA_RE_04) 18:52	06:07 20:48	05:16 21:58
27	08:21 17:01	09:18 (WEA_RE_04) 07:22 10:01 (WEA_RE_04) 18:01	09:20 (WEA_RE_04) 06:16 09:58 (WEA_RE_04) 18:52	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	06:05 20:50	05:14 21:58
28	08:19 17:03	09:17 (WEA_RE_04) 07:20 10:02 (WEA_RE_04) 18:03	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	06:03 20:51	05:13 21:58
29	08:18 17:05	09:16 (WEA_RE_04) 07:19 10:03 (WEA_RE_04) 18:04	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	06:01 20:52	05:12 21:58
30	08:16 17:07	09:16 (WEA_RE_04) 07:19 10:04 (WEA_RE_04) 18:04	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	06:01 20:53	05:12 21:58
31	08:15 17:09	09:15 (WEA_RE_04) 07:18 10:05 (WEA_RE_04) 18:05	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	09:22 (WEA_RE_04) 06:14 09:56 (WEA_RE_04) 18:54	06:01 20:53	05:12 21:58
	Sonnenscheinstunden astr.max.mögl.Beschattung	254 1342	275 1488	367 68	418 490	505 505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattenden	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	-------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_25 - IO 25 Böseler Straße 455 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember	
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07		07:24 16:59	58	08:42 (WEA_RE_04) 16:16	
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05		07:26 16:57	58	08:42 (WEA_RE_04) 16:15	
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02		07:28 16:55	58	08:42 (WEA_RE_04) 16:15	
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00		07:30 16:53	57	08:42 (WEA_RE_04) 16:14	
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58		07:32 16:51	56	08:43 (WEA_RE_04) 16:13	
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55		07:34 16:49	56	08:43 (WEA_RE_04) 16:13	
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53		07:35 16:47	54	08:44 (WEA_RE_04) 16:12	
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51		07:37 16:46	54	08:44 (WEA_RE_04) 16:12	
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48		07:39 16:44	52	08:45 (WEA_RE_04) 16:12	
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46		07:41 16:42	51	08:46 (WEA_RE_04) 16:11	
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	18	10:03 (WEA_RE_04) 07:43	50	08:46 (WEA_RE_04) 16:11	
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	26	09:59 (WEA_RE_04) 07:45	48	08:47 (WEA_RE_04) 16:11	
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	32	10:25 (WEA_RE_04) 07:47	47	08:48 (WEA_RE_04) 16:11	
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	36	10:28 (WEA_RE_04) 07:48	45	08:49 (WEA_RE_04) 16:11	
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	39	10:29 (WEA_RE_04) 07:50	43	08:50 (WEA_RE_04) 16:11	
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	43	09:52 (WEA_RE_04) 07:52	51	08:52 (WEA_RE_04) 16:11	
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	45	09:50 (WEA_RE_04) 07:54	55	08:53 (WEA_RE_04) 16:11	
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	48	10:34 (WEA_RE_04) 07:56	55	08:55 (WEA_RE_04) 16:11	
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	50	10:35 (WEA_RE_04) 07:58	57	10:04 (WEA_RE_05) 16:12	
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	51	09:46 (WEA_RE_04) 07:59	57	08:56 (WEA_RE_04) 16:12	
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	53	10:37 (WEA_RE_04) 08:01	54	10:06 (WEA_RE_05) 16:13	
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	54	10:38 (WEA_RE_04) 08:03	51	09:00 (WEA_RE_04) 16:13	
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	56	09:44 (WEA_RE_04) 08:05	47	10:10 (WEA_RE_05) 16:14	
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	56	10:39 (WEA_RE_04) 08:06	42	10:11 (WEA_RE_05) 16:14	
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	57	09:43 (WEA_RE_04) 08:08	34	10:13 (WEA_RE_05) 16:15	
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	58	08:43 (WEA_RE_04) 08:10	35	09:40 (WEA_RE_04) 16:15	
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	58	09:40 (WEA_RE_04) 08:11	36	10:14 (WEA_RE_05) 16:16	
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:06	58	09:40 (WEA_RE_04) 08:13	36	10:15 (WEA_RE_05) 16:17	
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	58	08:42 (WEA_RE_04) 08:14	37	09:39 (WEA_RE_05) 16:18	
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	58	09:40 (WEA_RE_04) 08:16	37	10:16 (WEA_RE_05) 16:19	
31	05:42 21:25	06:35 20:21	07:28 19:07	08:22 18:00	58	08:42 (WEA_RE_04) 08:17		08:42 (WEA_RE_05) 16:20	
	Sonnenscheinstunden	508	457	382	330	262	1471	238	1217
	astr.max.mögl.Beschattung				1012				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM)	Schattenanfang (WEA mit erstem Schatten)	Schattenende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	-------------------	--	---

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_26 - IO 26 Böseler Straße 443 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42 16:21	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	08:13 17:11	09:58 (WEA_RE_04) 18:05	07:17 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	09:56 (WEA_RE_04) 11:01 (WEA_RE_05)	08:11 17:13	09:58 (WEA_RE_04) 18:07	07:15 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	08:10 17:15	09:59 (WEA_RE_04) 18:09	07:13 20:05	06:59 20:58	05:07 21:45
4	08:41 16:25	09:56 (WEA_RE_04) 11:01 (WEA_RE_05)	08:08 17:17	09:59 (WEA_RE_04) 18:10	07:11 20:07	06:57 21:00	05:07 21:46
5	08:41 16:26	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	08:06 17:19	10:00 (WEA_RE_04) 18:12	07:08 20:09	06:55 21:02	05:06 21:48
6	08:41 16:27	09:56 (WEA_RE_04) 11:01 (WEA_RE_05)	08:05 17:21	10:00 (WEA_RE_04) 18:14	07:06 20:10	06:52 21:04	05:05 21:49
7	08:40 16:28	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	08:03 17:22	10:01 (WEA_RE_04) 18:16	07:04 20:12	06:50 21:05	05:05 21:49
8	08:40 16:30	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	08:01 17:24	10:01 (WEA_RE_04) 18:18	07:01 20:14	06:48 21:07	05:04 21:50
9	08:39 16:31	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:59 17:26	10:02 (WEA_RE_04) 18:20	06:59 20:16	06:45 21:09	05:04 21:51
10	08:39 16:33	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:57 17:28	10:03 (WEA_RE_04) 18:22	06:57 20:18	06:43 21:10	05:03 21:52
11	08:38 16:34	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	07:55 17:30	10:04 (WEA_RE_04) 18:23	06:54 20:19	06:41 21:12	05:03 21:53
12	08:37 16:36	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	07:53 17:32	10:05 (WEA_RE_04) 18:25	06:52 20:21	06:38 21:14	05:02 21:54
13	08:37 16:37	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	07:51 17:34	10:06 (WEA_RE_04) 18:27	06:50 20:23	06:36 21:15	05:02 21:54
14	08:36 16:39	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	07:49 17:36	10:08 (WEA_RE_04) 18:29	06:47 20:25	06:34 21:17	05:02 21:55
15	08:35 16:40	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	07:47 17:38	10:10 (WEA_RE_04) 18:31	06:45 20:26	06:31 21:19	05:01 21:56
16	08:34 16:42	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:45 17:40	10:12 (WEA_RE_04) 18:33	06:42 20:28	06:29 21:20	05:01 21:56
17	08:33 16:44	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:43 17:42	10:14 (WEA_RE_04) 18:34	06:40 20:30	06:27 21:22	05:01 21:57
18	08:32 16:45	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:41 17:44	10:17 (WEA_RE_04) 18:36	06:38 20:32	06:25 21:24	05:01 21:57
19	08:31 16:47	09:55 (WEA_RE_04) 11:00 (WEA_RE_05)	07:39 17:46	10:20 (WEA_RE_04) 18:38	06:35 20:34	06:22 21:25	05:01 21:57
20	08:30 16:49	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:37 17:48	10:24 (WEA_RE_04) 18:40	06:33 20:35	06:20 21:27	05:01 21:58
21	08:29 16:50	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:35 17:50	10:28 (WEA_RE_04) 18:42	06:31 20:37	06:18 21:28	05:01 21:58
22	08:27 16:52	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:33 17:52	10:32 (WEA_RE_04) 18:43	06:28 20:39	06:16 21:30	05:02 21:58
23	08:26 16:54	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:31 17:53	10:36 (WEA_RE_04) 18:45	06:26 20:41	06:14 21:31	05:02 21:58
24	08:25 16:56	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:28 17:55	10:40 (WEA_RE_04) 18:47	06:23 20:42	06:11 21:33	05:02 21:58
25	08:24 16:58	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:26 17:57	10:44 (WEA_RE_04) 18:49	06:21 20:44	06:09 21:34	05:02 21:58
26	08:22 17:00	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:24 17:59	10:48 (WEA_RE_04) 18:51	06:19 20:46	06:07 21:35	05:03 21:58
27	08:21 17:01	09:57 (WEA_RE_04) 11:00 (WEA_RE_05)	07:22 18:01	10:52 (WEA_RE_04) 18:52	06:16 20:48	06:05 21:37	05:03 21:58
28	08:19 17:03	09:57 (WEA_RE_04) 11:00 (WEA_RE_05)	07:20 18:03	10:56 (WEA_RE_04) 18:54	06:14 20:50	06:03 21:38	05:04 21:58
29	08:18 17:05	09:56 (WEA_RE_04) 11:00 (WEA_RE_05)	07:18 18:05	11:00 (WEA_RE_04) 18:56	06:11 20:51	06:01 21:39	05:04 21:58
30	08:16 17:07	09:57 (WEA_RE_04) 11:00 (WEA_RE_05)	07:16 18:07	11:04 (WEA_RE_04) 18:58	06:09 20:53	05:59 21:41	05:05 21:58
31	08:15 17:09	09:57 (WEA_RE_04) 11:00 (WEA_RE_05)	07:14 18:09	11:08 (WEA_RE_04) 19:00	06:07 20:55	05:57 21:42	05:05 21:58
	Sonnenscheinstunden astr.max.mögl.Beschattung	254 1906	275 867	367 367	418 418	490 490	505 505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_26 - IO 26 Böseler Straße 443 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November	Dezember
1	05:06	05:44	06:36	07:28		07:24	08:17
	21:58	21:24	20:19	19:07		16:59	16:16
2	05:06	05:46	06:38	07:30		07:26	08:19
	21:57	21:22	20:17	19:05		16:57	16:15
3	05:07	05:47	06:40	07:31		07:28	08:20
	21:57	21:20	20:14	19:02		16:55	16:15
4	05:08	05:49	06:42	07:33		07:30	08:22
	21:56	21:18	20:12	19:00		16:53	16:14
5	05:09	05:51	06:43	07:35		07:32	08:23
	21:56	21:17	20:10	18:58		16:51	16:13
6	05:10	05:52	06:45	07:37		07:34	08:25
	21:55	21:15	20:07	18:55		16:49	16:13
7	05:11	05:54	06:47	07:38		07:35	08:26
	21:55	21:13	20:05	18:53		16:47	16:12
8	05:12	05:56	06:48	07:40		07:37	08:27
	21:54	21:11	20:03	18:51		16:46	16:12
9	05:13	05:57	06:50	07:42		07:39	08:28
	21:53	21:09	20:00	18:48		16:44	16:12
10	05:14	05:59	06:52	07:44		07:41	08:29
	21:52	21:07	19:58	18:46		16:42	16:11
11	05:15	06:01	06:53	07:46		07:43	08:31
	21:52	21:05	19:55	18:44		16:41	16:11
12	05:16	06:02	06:55	07:47		07:45	08:32
	21:51	21:03	19:53	18:41		16:39	16:11
13	05:17	06:04	06:57	07:49		07:47	08:33
	21:50	21:01	19:51	18:39		16:37	16:11
14	05:18	06:06	06:59	07:51		07:48	08:34
	21:49	20:59	19:48	18:37		16:36	16:11
15	05:19	06:07	07:00	07:53		07:50	08:35
	21:48	20:57	19:46	18:35		16:34	16:11
16	05:21	06:09	07:02	07:55		07:52	08:36
	21:47	20:55	19:43	18:32		16:33	16:11
17	05:22	06:11	07:04	07:56		07:54	08:36
	21:46	20:53	19:41	18:30		16:31	16:11
18	05:23	06:12	07:05	07:58		07:56	08:37
	21:44	20:51	19:39	18:28		16:30	16:11
19	05:25	06:14	07:07	08:00		07:58	08:38
	21:43	20:48	19:36	18:26		16:29	16:12
20	05:26	06:16	07:09	08:02		07:59	08:38
	21:42	20:46	19:34	18:23		16:27	16:12
21	05:27	06:18	07:11	08:04		08:01	08:39
	21:41	20:44	19:31	18:21		16:26	16:13
22	05:29	06:19	07:12	08:05		08:03	08:40
	21:39	20:42	19:29	18:19		16:25	16:13
23	05:30	06:21	07:14	08:07	10:51 (WEA_RE_04)	08:05	08:40
	21:38	20:40	19:26	18:17	13 11:04 (WEA_RE_04)	16:24	16:13
24	05:32	06:23	07:16	08:09	10:46 (WEA_RE_04)	08:06	08:41
	21:36	20:37	19:24	18:15	23 11:09 (WEA_RE_04)	16:22	16:14
25	05:33	06:24	07:17	08:11	09:43 (WEA_RE_04)	08:08	08:41
	21:35	20:35	19:22	17:13	29 10:12 (WEA_RE_04)	16:21	16:15
26	05:35	06:26	07:19	08:13	09:41 (WEA_RE_04)	08:10	08:41
	21:34	20:33	19:19	17:11	34 10:15 (WEA_RE_04)	16:20	16:15
27	05:36	06:28	07:21	08:15	09:39 (WEA_RE_04)	08:11	08:42
	21:32	20:31	19:17	17:09	38 10:17 (WEA_RE_04)	16:19	16:16
28	05:38	06:30	07:23	08:17	09:37 (WEA_RE_04)	08:13	08:42
	21:30	20:28	19:14	17:06	41 10:18 (WEA_RE_04)	16:18	16:17
29	05:39	06:31	07:24	08:19	09:36 (WEA_RE_04)	08:14	08:42
	21:29	20:26	19:12	17:04	44 10:20 (WEA_RE_04)	16:18	16:18
30	05:41	06:33	07:26	08:20	09:34 (WEA_RE_04)	08:16	08:42
	21:27	20:24	19:10	17:02	47 10:21 (WEA_RE_04)	16:17	16:19
31	05:42	06:35		08:22	09:33 (WEA_RE_04)		08:42
	21:25	20:21		17:00	49 10:22 (WEA_RE_04)		16:20
Sonnenscheinstunden	508	457	382	330		262	238
astr.max.mögl.Beschattung				318		1759	2006

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_27 - IO 27 Böseler Straße 435B Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42 16:21	10:21 (WEA_RE_04) 11:20 (WEA_RE_04)	08:13 17:11	10:32 (WEA_RE_04) 11:28 (WEA_RE_04)	07:17 18:05	07:04 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	10:22 (WEA_RE_04) 11:21 (WEA_RE_04)	08:11 17:13	10:33 (WEA_RE_04) 11:27 (WEA_RE_04)	07:15 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	10:21 (WEA_RE_04) 11:21 (WEA_RE_04)	08:10 17:15	10:35 (WEA_RE_04) 11:27 (WEA_RE_04)	07:13 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:25	10:22 (WEA_RE_04) 11:22 (WEA_RE_04)	08:08 17:17	10:35 (WEA_RE_04) 11:26 (WEA_RE_04)	07:11 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	10:22 (WEA_RE_04) 11:22 (WEA_RE_04)	08:06 17:19	10:36 (WEA_RE_04) 11:25 (WEA_RE_04)	07:08 18:12	06:55 20:09	05:49 21:02	05:06 21:48
6	08:41 16:27	10:23 (WEA_RE_04) 11:23 (WEA_RE_04)	08:05 17:21	10:37 (WEA_RE_04) 11:24 (WEA_RE_04)	07:06 18:14	06:52 20:10	05:47 21:04	05:05 21:49
7	08:40 16:28	10:23 (WEA_RE_04) 11:23 (WEA_RE_04)	08:03 17:22	10:39 (WEA_RE_04) 11:22 (WEA_RE_04)	07:04 18:16	06:50 20:12	05:45 21:05	05:05 21:49
8	08:40 16:30	10:22 (WEA_RE_04) 11:24 (WEA_RE_04)	08:01 17:24	10:40 (WEA_RE_04) 11:21 (WEA_RE_04)	07:01 18:18	06:48 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	10:23 (WEA_RE_04) 11:25 (WEA_RE_04)	07:59 17:26	10:42 (WEA_RE_04) 11:19 (WEA_RE_04)	06:59 18:20	06:45 20:16	05:42 21:09	05:04 21:51
10	08:39 16:33	10:24 (WEA_RE_04) 11:25 (WEA_RE_04)	07:57 17:28	10:44 (WEA_RE_04) 11:16 (WEA_RE_04)	06:57 18:22	06:43 20:18	05:40 21:10	05:03 21:52
11	08:38 16:34	10:24 (WEA_RE_04) 11:25 (WEA_RE_04)	07:55 17:30	10:47 (WEA_RE_04) 11:14 (WEA_RE_04)	06:54 18:23	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:36	10:24 (WEA_RE_04) 11:26 (WEA_RE_04)	07:53 17:32	10:51 (WEA_RE_04) 11:10 (WEA_RE_04)	06:52 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	10:24 (WEA_RE_04) 11:26 (WEA_RE_04)	07:51 17:34	10:50 (WEA_RE_04) 18:27	06:50 20:23	06:36 21:15	05:35 21:15	05:02 21:54
14	08:36 16:39	10:24 (WEA_RE_04) 11:27 (WEA_RE_04)	07:49 17:36	10:49 (WEA_RE_04) 18:29	06:47 20:25	06:34 21:17	05:33 21:17	05:02 21:55
15	08:35 16:40	10:25 (WEA_RE_04) 11:27 (WEA_RE_04)	07:47 17:38	10:45 (WEA_RE_04) 18:31	06:45 20:26	06:31 21:19	05:31 21:19	05:01 21:56
16	08:34 16:42	10:25 (WEA_RE_04) 11:28 (WEA_RE_04)	07:45 17:40	10:42 (WEA_RE_04) 18:33	06:42 20:28	06:29 21:20	05:30 21:20	05:01 21:56
17	08:33 16:44	10:25 (WEA_RE_04) 11:28 (WEA_RE_04)	07:43 17:42	10:40 (WEA_RE_04) 18:34	06:40 20:30	06:27 21:22	05:28 21:22	05:01 21:57
18	08:32 16:45	10:26 (WEA_RE_04) 11:29 (WEA_RE_04)	07:41 17:44	10:38 (WEA_RE_04) 18:36	06:38 20:32	06:25 21:24	05:26 21:24	05:01 21:57
19	08:31 16:47	10:26 (WEA_RE_04) 11:28 (WEA_RE_04)	07:39 17:46	10:35 (WEA_RE_04) 18:38	06:35 20:34	06:22 21:25	05:25 21:25	05:01 21:57
20	08:30 16:49	10:26 (WEA_RE_04) 11:29 (WEA_RE_04)	07:37 17:48	10:33 (WEA_RE_04) 18:40	06:33 20:35	06:20 21:27	05:24 21:27	05:01 21:58
21	08:29 16:50	10:27 (WEA_RE_04) 11:30 (WEA_RE_04)	07:35 17:50	10:31 (WEA_RE_04) 18:42	06:31 20:37	06:18 21:28	05:22 21:28	05:01 21:58
22	08:27 16:52	10:27 (WEA_RE_04) 11:29 (WEA_RE_04)	07:33 17:52	10:28 (WEA_RE_04) 18:43	06:28 20:39	06:16 21:30	05:21 21:30	05:02 21:58
23	08:26 16:54	10:28 (WEA_RE_04) 11:30 (WEA_RE_04)	07:31 17:53	10:26 (WEA_RE_04) 18:45	06:26 20:41	06:14 21:31	05:19 21:31	05:02 21:58
24	08:25 16:56	10:27 (WEA_RE_04) 11:29 (WEA_RE_04)	07:28 17:55	10:23 (WEA_RE_04) 18:47	06:23 20:42	06:11 21:33	05:18 21:33	05:02 21:58
25	08:24 16:58	10:28 (WEA_RE_04) 11:30 (WEA_RE_04)	07:26 17:57	10:21 (WEA_RE_04) 18:49	06:21 20:44	06:09 21:34	05:17 21:34	05:02 21:58
26	08:22 17:00	10:28 (WEA_RE_04) 11:29 (WEA_RE_04)	07:24 17:59	10:19 (WEA_RE_04) 18:51	06:19 20:46	06:07 21:35	05:16 21:35	05:03 21:58
27	08:21 17:01	10:30 (WEA_RE_04) 11:30 (WEA_RE_04)	07:22 18:01	10:16 (WEA_RE_04) 18:52	06:16 20:48	06:05 21:37	05:14 21:37	05:03 21:58
28	08:19 17:03	10:30 (WEA_RE_04) 11:29 (WEA_RE_04)	07:20 18:03	10:14 (WEA_RE_04) 18:54	06:14 20:50	06:03 21:38	05:13 21:38	05:04 21:58
29	08:18 17:05	10:30 (WEA_RE_04) 11:29 (WEA_RE_04)	07:19 18:03	10:11 (WEA_RE_04) 19:56	07:11 20:51	06:01 21:39	05:12 21:39	05:04 21:58
30	08:16 17:07	10:31 (WEA_RE_04) 11:29 (WEA_RE_04)	07:18 18:03	10:09 (WEA_RE_04) 19:58	07:09 20:53	05:59 21:41	05:11 21:41	05:05 21:58
31	08:15 17:09	10:32 (WEA_RE_04) 11:28 (WEA_RE_04)	07:17 18:03	10:07 (WEA_RE_04) 20:00	07:07 20:00	05:10 21:42	05:10 21:42	05:05 21:58
Sonneneinstrahlung		254	275	367	418	490	505	
astr.max.mögl.Beschattung		1891	2088	2308	2508	2708	2891	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)		Zeitpunkt (SS:MM) Schatteneinde	(WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_27 - IO 27 Böseler Straße 435B Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember	
1	05:06	05:44	06:36	07:28		07:24	10:13 (WEA_RE_04)	08:17	10:06 (WEA_RE_04)
	21:58	21:24	20:19	19:07		16:59	10:47 (WEA_RE_04)	16:16	11:08 (WEA_RE_04)
2	05:06	05:46	06:38	07:30		07:26	10:11 (WEA_RE_04)	08:19	10:07 (WEA_RE_04)
	21:57	21:22	20:17	19:05		16:57	10:49 (WEA_RE_04)	16:15	11:08 (WEA_RE_04)
3	05:07	05:47	06:40	07:31		07:28	10:10 (WEA_RE_04)	08:20	10:07 (WEA_RE_04)
	21:57	21:20	20:14	19:02		16:55	10:51 (WEA_RE_04)	16:15	11:08 (WEA_RE_04)
4	05:08	05:49	06:42	07:33		07:30	10:08 (WEA_RE_04)	08:22	10:08 (WEA_RE_04)
	21:56	21:18	20:12	19:00		16:53	10:52 (WEA_RE_04)	16:14	11:09 (WEA_RE_04)
5	05:09	05:51	06:43	07:35		07:32	10:07 (WEA_RE_04)	08:23	10:08 (WEA_RE_04)
	21:56	21:17	20:10	18:58		16:51	10:54 (WEA_RE_04)	16:13	11:08 (WEA_RE_04)
6	05:10	05:52	06:45	07:37		07:34	10:06 (WEA_RE_04)	08:25	10:09 (WEA_RE_04)
	21:55	21:15	20:07	18:55		16:49	10:55 (WEA_RE_04)	16:13	11:09 (WEA_RE_04)
7	05:11	05:54	06:47	07:38		07:35	10:05 (WEA_RE_04)	08:26	10:09 (WEA_RE_04)
	21:55	21:13	20:05	18:53		16:47	10:56 (WEA_RE_04)	16:12	11:09 (WEA_RE_04)
8	05:12	05:56	06:48	07:40		07:37	10:04 (WEA_RE_04)	08:27	10:09 (WEA_RE_04)
	21:54	21:11	20:03	18:51		16:46	10:57 (WEA_RE_04)	16:12	11:09 (WEA_RE_04)
9	05:13	05:57	06:50	07:42		07:39	10:04 (WEA_RE_04)	08:28	10:10 (WEA_RE_04)
	21:53	21:09	20:00	18:48		16:44	10:58 (WEA_RE_04)	16:12	11:10 (WEA_RE_04)
10	05:14	05:59	06:52	07:44		07:41	10:03 (WEA_RE_04)	08:29	10:11 (WEA_RE_04)
	21:52	21:07	19:58	18:46		16:42	10:59 (WEA_RE_04)	16:11	11:10 (WEA_RE_04)
11	05:15	06:01	06:53	07:45		07:43	10:03 (WEA_RE_04)	08:31	10:11 (WEA_RE_04)
	21:52	21:05	19:55	18:44		16:41	10:59 (WEA_RE_04)	16:11	11:10 (WEA_RE_04)
12	05:16	06:02	06:55	07:47		07:45	10:02 (WEA_RE_04)	08:32	10:12 (WEA_RE_04)
	21:51	21:03	19:53	18:41		16:39	11:00 (WEA_RE_04)	16:11	11:10 (WEA_RE_04)
13	05:17	06:04	06:57	07:49		07:47	10:02 (WEA_RE_04)	08:33	10:12 (WEA_RE_04)
	21:50	21:01	19:51	18:39		16:37	11:01 (WEA_RE_04)	16:11	11:11 (WEA_RE_04)
14	05:18	06:06	06:59	07:51		07:48	10:02 (WEA_RE_04)	08:34	10:13 (WEA_RE_04)
	21:49	20:59	19:48	18:37		16:36	11:01 (WEA_RE_04)	16:11	11:11 (WEA_RE_04)
15	05:19	06:07	07:00	07:53		07:50	10:01 (WEA_RE_04)	08:35	10:13 (WEA_RE_04)
	21:48	20:57	19:46	18:35		16:34	11:02 (WEA_RE_04)	16:11	11:11 (WEA_RE_04)
16	05:21	06:09	07:02	07:55		07:52	10:01 (WEA_RE_04)	08:35	10:14 (WEA_RE_04)
	21:47	20:55	19:43	18:32		16:33	11:02 (WEA_RE_04)	16:11	11:12 (WEA_RE_04)
17	05:22	06:11	07:04	07:56		07:54	10:01 (WEA_RE_04)	08:36	10:15 (WEA_RE_04)
	21:46	20:53	19:41	18:30		16:31	11:03 (WEA_RE_04)	16:11	11:12 (WEA_RE_04)
18	05:23	06:12	07:05	07:58		07:56	10:01 (WEA_RE_04)	08:37	10:15 (WEA_RE_04)
	21:44	20:51	19:39	18:28		16:30	11:03 (WEA_RE_04)	16:11	11:13 (WEA_RE_04)
19	05:25	06:14	07:07	08:00		07:58	10:02 (WEA_RE_04)	08:38	10:15 (WEA_RE_04)
	21:43	20:48	19:36	18:26		16:29	11:04 (WEA_RE_04)	16:12	11:13 (WEA_RE_04)
20	05:26	06:16	07:09	08:02		07:59	10:02 (WEA_RE_04)	08:38	10:16 (WEA_RE_04)
	21:42	20:46	19:34	18:23		16:27	11:04 (WEA_RE_04)	16:12	11:14 (WEA_RE_04)
21	05:27	06:18	07:11	08:04		08:01	10:02 (WEA_RE_04)	08:39	10:16 (WEA_RE_04)
	21:41	20:44	19:31	18:21		16:26	11:05 (WEA_RE_04)	16:12	11:14 (WEA_RE_04)
22	05:29	06:19	07:12	08:05		08:03	10:02 (WEA_RE_04)	08:40	10:17 (WEA_RE_04)
	21:39	20:42	19:29	18:19		16:25	11:05 (WEA_RE_04)	16:13	11:15 (WEA_RE_04)
23	05:30	06:21	07:14	08:07		08:05	10:03 (WEA_RE_04)	08:40	10:17 (WEA_RE_04)
	21:38	20:40	19:26	18:17		16:24	11:06 (WEA_RE_04)	16:13	11:15 (WEA_RE_04)
24	05:32	06:23	07:16	08:09		08:06	10:03 (WEA_RE_04)	08:41	10:18 (WEA_RE_04)
	21:36	20:37	19:24	18:15		16:22	11:06 (WEA_RE_04)	16:14	11:16 (WEA_RE_04)
25	05:33	06:24	07:17	08:11		08:08	10:04 (WEA_RE_04)	08:41	10:18 (WEA_RE_04)
	21:35	20:35	19:22	17:13		16:21	11:06 (WEA_RE_04)	16:15	11:16 (WEA_RE_04)
26	05:35	06:26	07:19	08:13		08:10	10:03 (WEA_RE_04)	08:41	10:19 (WEA_RE_04)
	21:33	20:33	19:19	17:11		16:20	11:06 (WEA_RE_04)	16:15	11:16 (WEA_RE_04)
27	05:36	06:28	07:21	08:15		08:11	10:04 (WEA_RE_04)	08:42	10:19 (WEA_RE_04)
	21:32	20:31	19:17	17:09		16:19	11:06 (WEA_RE_04)	16:16	11:17 (WEA_RE_04)
28	05:38	06:30	07:23	08:17		08:13	10:04 (WEA_RE_04)	08:42	10:19 (WEA_RE_04)
	21:30	20:28	19:14	17:06		16:18	11:07 (WEA_RE_04)	16:17	11:17 (WEA_RE_04)
29	05:39	06:31	07:24	08:19		08:14	10:05 (WEA_RE_04)	08:42	10:20 (WEA_RE_04)
	21:29	20:26	19:12	17:04	9	10:34 (WEA_RE_04)	16:18	16:18	11:18 (WEA_RE_04)
30	05:41	06:33	07:26	08:20		08:16	10:19 (WEA_RE_04)	08:42	10:20 (WEA_RE_04)
	21:27	20:24	19:10	17:02	21	10:40 (WEA_RE_04)	16:17	16:19	11:18 (WEA_RE_04)
31	05:42	06:35		08:22		08:17	10:16 (WEA_RE_04)	08:42	10:20 (WEA_RE_04)
	21:25	20:21		17:00	28	10:44 (WEA_RE_04)		16:20	11:19 (WEA_RE_04)
Sonnenscheinstunden	508	457	382	330		262		238	
astr.max.mögl.Beschattung				58		1695		1823	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM)	Schattenanfang (WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_28 - IO 28 Böseler Straße 426 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42 16:21 55	10:37 (WEA_RE_04) 11:32 (WEA_RE_04) 17:11	08:13 11:07 (WEA_RE_04) 17:11	07:17 11:20 (WEA_RE_04) 18:05	07:04 18:05 20:01	05:57 20:01 20:55	05:09 21:43 21:43	
2	08:42 16:22 56	10:37 (WEA_RE_04) 11:33 (WEA_RE_04) 17:13	08:11 17:13	07:15 18:07 20:03	07:02 20:03 20:57	05:55 20:57 21:44	05:08 21:44 21:44	
3	08:42 16:23 56	10:37 (WEA_RE_04) 11:33 (WEA_RE_04) 17:15	08:10 17:15	07:13 18:09 20:05	06:59 20:05 20:58	05:53 20:58 21:45	05:07 21:45 21:45	
4	08:41 16:24 55	10:38 (WEA_RE_04) 11:33 (WEA_RE_04) 17:17	08:08 17:17	07:11 18:10 20:07	06:57 20:07 21:00	05:51 21:00 21:46	05:07 21:46 21:46	
5	08:41 16:26 55	10:38 (WEA_RE_04) 11:33 (WEA_RE_04) 17:19	08:06 17:19	07:08 18:12 20:09	06:55 20:09 21:02	05:49 21:02 21:48	05:06 21:48 21:48	
6	08:41 16:27 55	10:39 (WEA_RE_04) 11:34 (WEA_RE_04) 17:21	08:05 17:21	07:06 18:14 20:10	06:52 20:10 21:04	05:47 21:04 21:49	05:05 21:49 21:49	
7	08:40 16:28 55	10:39 (WEA_RE_04) 11:34 (WEA_RE_04) 17:22	08:03 17:22	07:04 18:16 20:12	06:50 20:12 21:05	05:45 21:05 21:49	05:05 21:49 21:49	
8	08:40 16:30 55	10:39 (WEA_RE_04) 11:34 (WEA_RE_04) 17:24	08:01 17:24	07:01 18:18 20:14	06:48 20:14 21:07	05:43 21:07 21:50	05:04 21:50 21:50	
9	08:39 16:31 54	10:41 (WEA_RE_04) 11:35 (WEA_RE_04) 17:26	07:59 17:26	06:59 18:20 20:16	06:45 20:16 21:09	05:42 21:09 21:51	05:03 21:51 21:51	
10	08:39 16:33 54	10:41 (WEA_RE_04) 11:35 (WEA_RE_04) 17:28	07:57 17:28	06:57 18:22 20:18	06:43 20:18 21:10	05:40 21:10 21:52	05:03 21:52 21:52	
11	08:38 16:34 54	10:41 (WEA_RE_04) 11:35 (WEA_RE_04) 17:30	07:55 17:30	06:54 18:23 20:19	06:41 20:19 21:12	05:38 21:12 21:53	05:03 21:53 21:53	
12	08:37 16:36 53	10:42 (WEA_RE_04) 11:35 (WEA_RE_04) 17:32	07:53 17:32	06:52 18:25 20:21	06:38 20:21 21:14	05:36 21:14 21:54	05:02 21:54 21:54	
13	08:37 16:37 54	10:42 (WEA_RE_04) 11:36 (WEA_RE_04) 17:34	07:51 17:34	06:50 18:27 20:23	06:36 20:23 21:15	05:35 21:15 21:54	05:02 21:54 21:54	
14	08:36 16:39 53	10:43 (WEA_RE_04) 11:36 (WEA_RE_04) 17:36	07:49 17:36	06:47 18:29 20:25	06:34 20:25 21:17	05:33 21:17 21:55	05:02 21:55 21:55	
15	08:35 16:40 53	10:43 (WEA_RE_04) 11:36 (WEA_RE_04) 17:38	07:47 17:38	06:45 18:31 20:26	06:31 20:26 21:19	05:31 21:19 21:56	05:01 21:56 21:56	
16	08:34 16:42 52	10:44 (WEA_RE_04) 11:36 (WEA_RE_04) 17:40	07:45 17:40	06:42 18:33 20:28	06:29 20:28 21:20	05:30 21:20 21:56	05:01 21:56 21:56	
17	08:33 16:44 51	10:45 (WEA_RE_04) 11:36 (WEA_RE_04) 17:42	07:43 17:42	06:40 18:34 20:30	06:27 20:30 21:22	05:28 21:22 21:57	05:01 21:57 21:57	
18	08:32 16:45 50	10:46 (WEA_RE_04) 11:36 (WEA_RE_04) 17:44	07:41 17:44	06:38 18:36 20:32	06:25 20:32 21:24	05:26 21:24 21:57	05:01 21:57 21:57	
19	08:31 16:47 49	10:46 (WEA_RE_04) 11:35 (WEA_RE_04) 17:46	07:39 17:46	06:35 18:38 20:34	06:22 20:34 21:25	05:25 21:25 21:57	05:01 21:57 21:57	
20	08:30 16:49 49	10:47 (WEA_RE_04) 11:36 (WEA_RE_04) 17:48	07:37 17:48	06:33 18:40 20:35	06:20 20:35 21:27	05:24 21:27 21:58	05:01 21:58 21:58	
21	08:29 16:50 48	10:48 (WEA_RE_04) 11:36 (WEA_RE_04) 17:50	07:35 17:50	06:31 18:42 20:37	06:18 20:37 21:28	05:22 21:28 21:58	05:01 21:58 21:58	
22	08:27 16:52 46	10:49 (WEA_RE_04) 11:35 (WEA_RE_04) 17:52	07:33 17:52	06:28 18:43 20:39	06:16 20:39 21:30	05:21 21:30 21:58	05:02 21:58 21:58	
23	08:26 16:54 45	10:50 (WEA_RE_04) 11:35 (WEA_RE_04) 17:53	07:31 17:53	06:26 18:45 20:41	06:14 20:41 21:31	05:19 21:31 21:58	05:02 21:58 21:58	
24	08:25 16:56 43	10:50 (WEA_RE_04) 11:33 (WEA_RE_04) 17:55	07:28 17:55	06:23 18:47 20:42	06:11 20:42 21:33	05:18 21:33 21:58	05:02 21:58 21:58	
25	08:24 16:58 41	10:52 (WEA_RE_04) 11:33 (WEA_RE_04) 17:57	07:26 17:57	06:21 18:49 20:44	06:09 20:44 21:34	05:17 21:34 21:58	05:02 21:58 21:58	
26	08:22 17:00 39	10:53 (WEA_RE_04) 11:32 (WEA_RE_04) 17:59	07:24 17:59	06:19 18:51 20:46	06:07 20:46 21:35	05:16 21:35 21:58	05:03 21:58 21:58	
27	08:21 17:01 36	10:55 (WEA_RE_04) 11:31 (WEA_RE_04) 18:01	07:22 18:01	06:16 18:52 20:48	06:05 20:48 21:37	05:14 21:37 21:58	05:03 21:58 21:58	
28	08:19 17:03 34	10:56 (WEA_RE_04) 11:30 (WEA_RE_04) 18:03	07:20 18:03	06:14 18:54 20:50	06:03 20:50 21:38	05:13 21:38 21:58	05:04 21:58 21:58	
29	08:18 17:05 30	10:58 (WEA_RE_04) 11:28 (WEA_RE_04) 18:01	18:01	06:11 19:56 20:51	06:01 20:51 21:39	05:12 21:39 21:58	05:04 21:58 21:58	
30	08:16 17:07 26	11:01 (WEA_RE_04) 11:27 (WEA_RE_04) 18:00	18:00	06:09 19:58 20:53	05:59 20:53 21:41	05:11 21:41 21:58	05:05 21:58 21:58	
31	08:15 17:09 21	11:03 (WEA_RE_04) 11:24 (WEA_RE_04) 18:00	18:00	07:07 20:00 367	05:10 21:42 418	05:10 21:42 490	21:58 21:58 505	
	Sonneneinstrahlung astr.max.mögl.Beschattung	254 1477	275	13	367	418	490	505

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattenden	Schattenanfang (WEA mit erstem Schatten)	Schattenden (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	-------------------------------	--	--

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_28 - IO 28 Böseler Straße 426 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	08:19 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	08:20 16:15
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	08:22 16:14
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	08:23 16:13
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	08:25 16:13
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	08:26 16:12
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	08:27 16:12
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	08:28 16:12
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	08:29 16:11
11	05:15 21:52	06:01 21:05	06:53 19:55	07:45 18:44	07:43 16:41	08:31 16:11
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	08:32 16:11
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	08:33 16:11
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	08:34 16:11
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	08:35 16:11
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	08:36 16:11
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	08:36 16:11
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	08:37 16:11
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	08:38 16:12
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	08:38 16:12
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	08:39 16:12
22	05:29 21:39	06:19 20:42	07:12 19:29	08:05 18:19	08:03 16:25	08:40 16:13
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	08:40 16:13
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	08:41 16:14
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	08:41 16:15
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	08:41 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	08:42 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	08:13 16:18	08:42 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	08:42 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	08:42 16:19
31	05:42 21:25	06:35 20:21		08:22 17:00		08:42 16:20
	Sonneneinstrahlung	508	457	382	330	262
	astr.max.mögl.Beschattung				889	238
						1714

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_29 - IO 29 Böseler Straße 408 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	11:24 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09	
	16:21	50	12:14 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43
2	08:42	11:24 (WEA_RE_04)	08:11	07:15	07:02	05:55	05:08	
	16:22	50	12:14 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44
3	08:42	11:24 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07	
	16:23	50	12:14 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45
4	08:41	11:25 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07	
	16:24	50	12:15 (WEA_RE_04)	17:17	18:10	20:07	21:00	21:46
5	08:41	11:26 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06	
	16:26	48	12:14 (WEA_RE_04)	17:19	18:12	20:09	21:02	21:48
6	08:41	11:27 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05	
	16:27	48	12:15 (WEA_RE_04)	17:21	18:14	20:10	21:04	21:49
7	08:40	11:27 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05	
	16:28	48	12:15 (WEA_RE_04)	17:22	18:16	20:12	21:05	21:49
8	08:40	11:28 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04	
	16:30	46	12:14 (WEA_RE_04)	17:24	18:18	20:14	21:07	21:50
9	08:39	11:29 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03	
	16:31	46	12:15 (WEA_RE_04)	17:26	18:20	20:16	21:09	21:51
10	08:39	11:30 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03	
	16:33	45	12:15 (WEA_RE_04)	17:28	18:22	20:18	21:10	21:52
11	08:38	11:30 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03	
	16:34	45	12:15 (WEA_RE_04)	17:30	18:23	20:19	21:12	21:53
12	08:37	11:31 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02	
	16:36	43	12:14 (WEA_RE_04)	17:32	18:25	20:21	21:14	21:54
13	08:37	11:32 (WEA_RE_04)	07:51	06:50	06:36	05:35	05:02	
	16:37	42	12:14 (WEA_RE_04)	17:34	18:27	20:23	21:15	21:54
14	08:36	11:33 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02	
	16:39	41	12:14 (WEA_RE_04)	17:36	18:29	20:25	21:17	21:55
15	08:35	11:34 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01	
	16:40	40	12:14 (WEA_RE_04)	17:38	18:31	20:26	21:19	21:56
16	08:34	11:36 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01	
	16:42	37	12:13 (WEA_RE_04)	17:40	18:33	20:28	21:20	21:56
17	08:33	11:37 (WEA_RE_04)	07:43	06:40	06:27	05:28	05:01	
	16:44	36	12:13 (WEA_RE_04)	17:42	18:34	20:30	21:22	21:57
18	08:32	11:39 (WEA_RE_04)	07:41	06:38	06:25	05:26	05:01	
	16:45	33	12:12 (WEA_RE_04)	17:44	18:36	20:32	21:24	21:57
19	08:31	11:40 (WEA_RE_04)	07:39	06:35	06:22	05:25	05:01	
	16:47	30	12:10 (WEA_RE_04)	17:46	18:38	20:34	21:25	21:57
20	08:30	11:42 (WEA_RE_04)	07:37	06:33	06:20	05:24	05:01	
	16:49	27	12:09 (WEA_RE_04)	17:48	18:40	20:35	21:27	21:58
21	08:29	11:44 (WEA_RE_04)	07:35	06:31	06:18	05:22	05:01	
	16:50	24	12:08 (WEA_RE_04)	17:50	18:42	20:37	21:28	21:58
22	08:27	11:46 (WEA_RE_04)	07:33	06:28	06:16	05:21	05:02	
	16:52	19	12:05 (WEA_RE_04)	17:52	18:43	20:39	21:30	21:58
23	08:26	11:51 (WEA_RE_04)	07:31	06:26	06:14	05:19	05:02	
	16:54	11	12:02 (WEA_RE_04)	17:53	18:45	20:41	21:31	21:58
24	08:25		07:28	06:23	06:11	05:18	05:02	
	16:56		17:55	18:47	20:42	21:33	21:58	
25	08:24		07:26	06:21	06:09	05:17	05:02	
	16:58		17:57	18:49	20:44	21:34	21:58	
26	08:22		07:24	06:19	06:07	05:16	05:03	
	17:00		17:59	18:51	20:46	21:35	21:58	
27	08:21		07:22	06:16	06:05	05:14	05:03	
	17:01		18:01	18:52	20:48	21:37	21:58	
28	08:19		07:20	06:14	06:03	05:13	05:04	
	17:03		18:03	18:54	20:50	21:38	21:58	
29	08:18			07:11	06:01	05:12	05:04	
	17:05			19:56	20:51	21:39	21:58	
30	08:16			07:09	05:59	05:11	05:05	
	17:07			19:58	20:53	21:41	21:58	
31	08:15			07:07		05:10		
	17:09			20:00		21:42		
Sonnenscheinstunden	254		275	367	418	490	505	
astr.max.mögl.Beschattung	909							

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	--	---------------------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_29 - IO 29 Böseler Straße 408 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember	
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16	
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	44 08:19 11:13 (WEA_RE_04)	
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	45 16:15 11:58 (WEA_RE_04)	
4	05:08 21:56	05:49 21:18	06:41 20:12	07:33 19:00	07:30 16:53	46 08:20 11:12 (WEA_RE_04)	
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	47 16:14 12:00 (WEA_RE_04)	
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	48 08:23 11:12 (WEA_RE_04)	
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	48 16:13 12:00 (WEA_RE_04)	
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	49 08:27 11:13 (WEA_RE_04)	
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	49 16:12 12:02 (WEA_RE_04)	
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	49 08:28 11:14 (WEA_RE_04)	
11	05:15 21:52	06:01 21:05	06:53 19:55	07:45 18:44	07:43 16:41	50 16:11 12:03 (WEA_RE_04)	
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	50 08:31 11:14 (WEA_RE_04)	
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	51 16:11 12:04 (WEA_RE_04)	
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	51 08:33 11:14 (WEA_RE_04)	
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	51 16:11 12:05 (WEA_RE_04)	
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	52 08:34 11:14 (WEA_RE_04)	
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	52 16:11 12:05 (WEA_RE_04)	
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	51 08:35 11:15 (WEA_RE_04)	
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	51 16:11 12:06 (WEA_RE_04)	
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	52 11:25 (WEA_RE_04) 08:38	
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	52 11:36 (WEA_RE_04) 16:12	
22	05:29 21:39	06:19 20:42	07:12 19:29	08:05 18:19	08:03 16:25	52 11:21 (WEA_RE_04) 08:38	
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	19 11:40 (WEA_RE_04) 16:12	
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	24 11:19 (WEA_RE_04) 08:39	
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	24 11:43 (WEA_RE_04) 16:12	
26	05:35 21:33	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	27 11:18 (WEA_RE_04) 08:40	
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	27 11:45 (WEA_RE_04) 16:13	
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	08:13 16:18	27 11:17 (WEA_RE_04) 08:40	
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	30 11:47 (WEA_RE_04) 16:13	
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	30 11:16 (WEA_RE_04) 08:41	
31	05:42 21:25	06:35 20:21		08:22 17:00		33 11:49 (WEA_RE_04) 16:14	
Sonnenscheinstunden		508	457	382	330	262	
astr.max.mögl.Beschattung					384	238	1550

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_30 - IO 30 Böseler Straße 398 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	11:56 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09	
	16:21	43	12:39 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43
2	08:42	11:57 (WEA_RE_04)	08:11	07:15	07:02	05:55	05:08	
	16:22	42	12:39 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44
3	08:42	11:58 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07	
	16:23	41	12:39 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45
4	08:41	11:59 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07	
	16:24	40	12:39 (WEA_RE_04)	17:17	18:10	20:07	21:00	21:46
5	08:41	11:59 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06	
	16:26	40	12:39 (WEA_RE_04)	17:19	18:12	20:09	21:02	21:48
6	08:41	12:01 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05	
	16:27	38	12:39 (WEA_RE_04)	17:21	18:14	20:10	21:04	21:49
7	08:40	12:01 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05	
	16:28	38	12:39 (WEA_RE_04)	17:22	18:16	20:12	21:05	21:49
8	08:40	12:02 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04	
	16:30	36	12:38 (WEA_RE_04)	17:24	18:18	20:14	21:07	21:50
9	08:39	12:04 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03	
	16:31	35	12:39 (WEA_RE_04)	17:26	18:20	20:16	21:09	21:51
10	08:39	12:04 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03	
	16:33	34	12:38 (WEA_RE_04)	17:28	18:22	20:18	21:10	21:52
11	08:38	12:06 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03	
	16:34	32	12:38 (WEA_RE_04)	17:30	18:23	20:19	21:12	21:53
12	08:37	12:07 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02	
	16:35	30	12:37 (WEA_RE_04)	17:32	18:25	20:21	21:14	21:54
13	08:37	12:08 (WEA_RE_04)	07:51	06:50	06:36	05:35	05:02	
	16:37	28	12:36 (WEA_RE_04)	17:34	18:27	20:23	21:15	21:54
14	08:36	12:10 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02	
	16:39	25	12:35 (WEA_RE_04)	17:36	18:29	20:25	21:17	21:55
15	08:35	12:12 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01	
	16:40	22	12:34 (WEA_RE_04)	17:38	18:31	20:26	21:19	21:56
16	08:34	12:15 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01	
	16:42	17	12:32 (WEA_RE_04)	17:40	18:33	20:28	21:20	21:56
17	08:33	12:19 (WEA_RE_04)	07:43	06:40	06:27	05:28	05:01	
	16:44	10	12:29 (WEA_RE_04)	17:42	18:34	20:30	21:22	21:57
18	08:32		07:41	06:38	06:25	05:26	05:01	
	16:45		17:44	18:36	20:32	21:24	21:57	
19	08:31		07:39	06:35	06:22	05:25	05:01	
	16:47		17:46	18:38	20:34	21:25	21:57	
20	08:30		07:37	06:33	06:20	05:23	05:01	
	16:49		17:48	18:40	20:35	21:27	21:58	
21	08:29		07:35	06:31	06:18	05:22	05:01	
	16:50		17:50	18:42	20:37	21:28	21:58	
22	08:27		07:33	06:28	06:16	05:21	05:02	
	16:52		17:52	18:43	20:39	21:30	21:58	
23	08:26		07:31	06:26	06:14	05:19	05:02	
	16:54		17:53	18:45	20:41	21:31	21:58	
24	08:25		07:28	06:23	06:11	05:18	05:02	
	16:56		17:55	18:47	20:42	21:33	21:58	
25	08:24		07:26	06:21	06:09	05:17	05:02	
	16:58		17:57	18:49	20:44	21:34	21:58	
26	08:22		07:24	06:19	06:07	05:16	05:03	
	16:59		17:59	18:51	20:46	21:35	21:58	
27	08:21		07:22	06:16	06:05	05:14	05:03	
	17:01		18:01	18:52	20:48	21:37	21:58	
28	08:19		07:20	06:14	06:03	05:13	05:04	
	17:03		18:03	18:54	20:50	21:38	21:58	
29	08:18			07:11	06:01	05:12	05:04	
	17:05			19:56	20:51	21:39	21:58	
30	08:16			07:09	05:59	05:11	05:05	
	17:07			19:58	20:53	21:41	21:58	
31	08:15			07:07		05:10		
	17:09			20:00		21:42		
Sonnenscheinstunden	254		275	367	418	490	505	
astr.max.mögl.Beschattung	551							

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_30 - IO 30 Böseler Straße 398 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	32 08:19 33 12:21 (WEA_RE_04)
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	08:20 35 12:22 (WEA_RE_04)
4	05:08 21:56	05:49 21:18	06:41 20:12	07:33 19:00	07:30 16:53	08:22 36 12:23 (WEA_RE_04)
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	08:23 38 12:24 (WEA_RE_04)
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	08:25 38 12:25 (WEA_RE_04)
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	08:26 40 12:26 (WEA_RE_04)
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	08:27 40 12:26 (WEA_RE_04)
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	08:28 41 12:28 (WEA_RE_04)
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	08:29 41 12:28 (WEA_RE_04)
11	05:15 21:52	06:01 21:05	06:53 19:55	07:45 18:44	07:43 16:41	08:31 42 12:29 (WEA_RE_04)
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	08:32 42 12:29 (WEA_RE_04)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	08:33 43 12:30 (WEA_RE_04)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	08:34 44 12:31 (WEA_RE_04)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	08:35 44 12:31 (WEA_RE_04)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:54 18:32	07:52 16:33	08:35 44 12:32 (WEA_RE_04)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	08:36 45 12:33 (WEA_RE_04)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	08:37 45 12:34 (WEA_RE_04)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	08:38 45 12:34 (WEA_RE_04)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	08:38 45 12:34 (WEA_RE_04)
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	08:39 45 12:34 (WEA_RE_04)
22	05:29 21:39	06:19 20:42	07:12 19:29	08:05 18:19	08:03 16:25	08:40 45 12:35 (WEA_RE_04)
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	08:40 45 12:35 (WEA_RE_04)
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	08:41 44 12:36 (WEA_RE_04)
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 17:13	08:08 16:21	11:57 (WEA_RE_04) 08:41 10 12:07 (WEA_RE_04) 16:15
26	05:35 21:33	06:26 20:33	07:19 19:19	08:13 17:11	08:10 16:20	11:53 (WEA_RE_04) 08:41 17 12:10 (WEA_RE_04) 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 17:09	08:11 16:19	11:51 (WEA_RE_04) 08:42 22 12:13 (WEA_RE_04) 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 17:06	08:13 16:18	11:50 (WEA_RE_04) 08:42 25 12:15 (WEA_RE_04) 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 17:04	08:14 16:17	11:50 (WEA_RE_04) 08:42 27 12:17 (WEA_RE_04) 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 17:02	08:16 16:17	11:48 (WEA_RE_04) 08:42 30 12:18 (WEA_RE_04) 16:19
31	05:42 21:25	06:35 20:21		08:22 17:00		08:42 43 12:38 (WEA_RE_04)
Sonneneinstrahlung		508	457	382	330	262
astr.max.mögl.Beschattung					131	238
						1301

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattenden	Schattenanfang (WEA mit erstem Schatten)	Schattenden (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	-------------------------------	--	--

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_31 - IO 31 Böseler Straße 384 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	12:32 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09	05:06	05:44	06:36	07:28	08:17
2	16:21	13:03 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43	21:58	21:24	20:19	19:07	16:59
3	16:22	12:34 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44	21:57	21:22	20:17	19:05	16:57
4	16:23	12:34 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
5	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
6	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
7	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
8	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
9	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
10	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
11	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
12	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
13	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
14	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
15	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
16	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
17	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
18	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
19	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
20	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
21	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
22	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
23	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
24	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
25	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
26	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
27	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
28	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
29	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
30	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
31	16:24	12:35 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55
Sonnenscheinstunden		254	275	367	418	490	505	508	457	382	330	262
astr. max.mögl. Beschattung		229										897

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_32 - IO 32 Böseler Straße 374 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember		
1	08:42	13:10 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09	05:06	05:44	06:36	07:28	08:17		
2	16:21	19	13:29 (WEA_RE_04)	17:11	16:05	20:01	20:55	21:43	21:58	21:24	20:19	19:07	16:58	16:16
3	08:42	13:28 (WEA_RE_04)	08:11	07:15	07:02	05:55	05:08	05:06	05:46	06:38	07:30	08:26	08:19	
4	16:22	17	13:28 (WEA_RE_04)	17:13	16:07	20:03	20:57	21:44	21:57	21:22	20:17	19:05	16:57	16:15
5	08:42	13:12 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07	05:07	05:47	06:40	07:31	08:28	08:20	
6	16:23	15	13:27 (WEA_RE_04)	17:15	16:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55	16:14
7	08:41	13:15 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07	05:08	05:49	06:41	07:33	08:30	08:22	
8	16:24	11	13:26 (WEA_RE_04)	17:17	16:10	20:07	21:00	21:46	21:56	21:18	20:12	19:00	16:53	16:14
9	08:41	13:17 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06	05:09	05:51	06:43	07:35	08:32	08:23	
10	16:25	7	13:24 (WEA_RE_04)	17:19	16:12	20:09	21:02	21:48	21:56	21:17	20:10	18:58	16:51	16:13
11	08:41	13:27 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05	05:10	05:52	06:45	07:37	08:34	08:25	
12	16:27	17:20	18:14	20:10	21:04	21:49	21:55	21:15	20:07	18:55	16:49	16:13		
13	08:40	13:28 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05	05:11	05:54	06:47	07:38	08:35	08:26	
14	16:28	17:22	18:16	20:12	21:05	21:49	21:55	21:13	20:05	18:53	16:47	16:12	7	13:04 (WEA_RE_04)
15	08:40	13:29 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04	05:11	05:55	06:48	07:40	08:37	08:27	13:02 (WEA_RE_04)
16	16:30	17:24	18:18	20:14	21:07	21:50	21:54	21:11	20:03	18:51	16:46	16:12	11	13:13 (WEA_RE_04)
17	08:39	13:30 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03	05:12	05:57	06:50	07:42	08:39	08:28	13:02 (WEA_RE_04)
18	16:31	17:26	18:20	20:16	21:09	21:51	21:53	21:09	20:00	18:48	16:44	16:12	14	13:16 (WEA_RE_04)
19	08:39	13:31 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03	05:14	05:59	06:52	07:44	08:41	08:29	13:01 (WEA_RE_04)
20	16:32	17:28	18:22	20:17	21:10	21:52	21:52	21:07	19:58	18:46	16:42	16:11	16	13:17 (WEA_RE_04)
21	08:38	13:32 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03	05:15	06:01	06:53	07:45	08:42	08:31	13:00 (WEA_RE_04)
22	16:34	17:30	18:23	20:19	21:12	21:53	21:52	21:05	19:55	18:44	16:40	16:11	19	13:19 (WEA_RE_04)
23	08:37	13:33 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02	05:16	06:02	06:55	07:47	08:44	08:32	12:59 (WEA_RE_04)
24	16:35	17:32	18:25	20:21	21:14	21:54	21:51	21:03	19:53	18:41	16:39	16:11	21	13:20 (WEA_RE_04)
25	08:37	13:34 (WEA_RE_04)	07:51	06:50	06:36	05:34	05:02	05:17	06:04	06:57	07:49	08:46	08:33	12:59 (WEA_RE_04)
26	16:37	17:34	18:27	20:23	21:15	21:54	21:50	21:01	19:51	18:39	16:37	16:11	22	13:21 (WEA_RE_04)
27	08:36	13:35 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02	05:18	06:06	06:59	07:51	08:48	08:34	12:59 (WEA_RE_04)
28	16:39	17:36	18:29	20:25	21:17	21:55	21:49	20:59	19:48	18:37	16:35	16:11	23	13:22 (WEA_RE_04)
29	08:35	13:36 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01	05:19	06:07	07:00	07:53	08:50	08:35	12:59 (WEA_RE_04)
30	16:40	17:38	18:31	20:26	21:19	21:56	21:48	20:57	19:46	18:34	16:34	16:11	23	13:22 (WEA_RE_04)
31	08:34	13:37 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01	05:21	06:09	07:02	07:54	08:52	08:35	12:59 (WEA_RE_04)
32	16:42	17:40	18:33	20:28	21:20	21:56	21:47	20:55	19:43	18:32	16:33	16:11	24	13:23 (WEA_RE_04)
33	08:33	13:38 (WEA_RE_04)	07:43	06:40	06:27	05:28	05:01	05:22	06:11	07:04	07:56	07:54	08:36	13:00 (WEA_RE_04)
34	16:44	17:42	18:34	20:30	21:22	21:57	21:46	20:53	19:41	18:30	16:31	16:11	24	13:24 (WEA_RE_04)
35	08:32	13:39 (WEA_RE_04)	07:41	06:38	06:25	05:26	05:01	05:23	06:12	07:05	07:58	07:56	08:37	13:00 (WEA_RE_04)
36	16:45	17:44	18:36	20:32	21:23	21:57	21:44	20:51	19:39	18:28	16:30	16:11	25	13:25 (WEA_RE_04)
37	08:31	13:40 (WEA_RE_04)	07:39	06:35	06:22	05:25	05:01	05:25	06:14	07:07	08:00	07:58	08:38	13:00 (WEA_RE_04)
38	16:47	17:46	18:38	20:34	21:25	21:57	21:43	20:48	19:36	18:26	16:29	16:12	25	13:25 (WEA_RE_04)
39	08:30	13:41 (WEA_RE_04)	07:37	06:33	06:20	05:23	05:01	05:26	06:16	07:09	08:02	07:59	08:38	13:01 (WEA_RE_04)
40	16:49	17:48	18:40	20:35	21:27	21:58	21:42	20:46	19:34	18:23	16:27	16:12	25	13:26 (WEA_RE_04)
41	08:29	13:42 (WEA_RE_04)	07:35	06:31	06:18	05:22	05:01	05:27	06:18	07:10	08:04	08:01	08:39	13:01 (WEA_RE_04)
42	16:50	17:50	18:42	20:37	21:28	21:58	21:41	20:44	19:31	18:21	16:26	16:12	25	13:26 (WEA_RE_04)
43	08:27	13:43 (WEA_RE_04)	07:33	06:28	06:16	05:21	05:02	05:29	06:19	07:12	08:05	08:03	08:40	13:02 (WEA_RE_04)
44	16:52	17:52	18:43	20:39	21:30	21:58	21:39	20:42	19:29	18:19	16:25	16:13	25	13:27 (WEA_RE_04)
45	08:26	13:44 (WEA_RE_04)	07:31	06:26	06:14	05:19	05:02	05:30	06:21	07:14	08:07	08:04	08:40	13:02 (WEA_RE_04)
46	16:54	17:53	18:45	20:41	21:31	21:59	21:38	20:40	19:26	18:17	16:24	16:13	25	13:27 (WEA_RE_04)
47	08:25	13:45 (WEA_RE_04)	07:28	06:23	06:11	05:18	05:02	05:32	06:23	07:16	08:09	08:06	08:41	13:03 (WEA_RE_04)
48	16:56	17:55	18:47	20:42	21:33	21:58	21:36	20:37	19:24	18:15	16:22	16:14	25	13:28 (WEA_RE_04)
49	08:24	13:46 (WEA_RE_04)	07:26	06:21	06:09	05:17	05:02	05:33	06:24	07:17	08:10	08:08	08:41	13:03 (WEA_RE_04)
50	16:58	17:57	18:49	20:44	21:34	21:58	21:35	20:35	19:22	18:13	16:21	16:15	25	13:28 (WEA_RE_04)
51	08:22	13:47 (WEA_RE_04)	07:24	06:19	06:07	05:16	05:03	05:35	06:26	07:19	08:12	08:10	08:41	13:04 (WEA_RE_04)
52	16:59	17:59	18:51	20:46	21:35	21:58	21:33	20:33	19:19	18:11	16:20	16:15	24	13:28 (WEA_RE_04)
53	08:21	13:48 (WEA_RE_04)	07:22	06:16	06:05	05:14	05:03	05:36	06:28	07:21	08:15	08:11	08:41	13:04 (WEA_RE_04)
54	17:01	18:01	18:52	20:48	21:37	21:58	21:32	20:31	19:17	18:08	16:19	16:16	24	13:28 (WEA_RE_04)
55	08:19	13:49 (WEA_RE_04)	07:20	06:14	06:03	05:13	05:04	05:38	06:29	07:23	08:17	08:13	08:42	13:05 (WEA_RE_04)
56	17:03	18:03	18:54	20:50	21:39	21:58	21:30	20:28	19:14	18:05	16:18	16:17	23	13:28 (WEA_RE_04)
57	08:18	13:50 (WEA_RE_04)	07:11	06:01	05:12	05:04	05:39	06:31	07:24	08:19	09:14	09:10	08:42	13:06 (WEA_RE_04)
58	17:05	18:05	18:56	20:51	21:39	21:58	21:29	20:26	19:12	18:04	16:17	16:18	23	13:29 (WEA_RE_04)
59	08:16	13:51 (WEA_RE_04)	07:09	05:59	05:11	05:05	05:41	06:33	07:26	08:20	09:16	09:12	22	13:07 (WEA_RE_04)
60	17:07	18:07	18:58	20:53	21:41	21:58	21:27	20:24	19:10	18:02	16:17	16:19	22	13:29 (WEA_RE_04)
61	08:15	13:52 (WEA_RE_04)	07:07	05:50	05:10	05:04	05:42	06:35	07:28	08:22	09:18	09:14	22	13:08 (WEA_RE_04)
62	17:09	18:09	18:59	20:54	21:42	21:59	21:25	20:21	19:07	18:00	16:20	16:20	21	13:29 (WEA_RE_04)
63	Sonnenscheinstunden	254	275	367	418	490	505	508	457	382	330	262	238	
64	astr. max.mögl. Beschattung	69												541

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_33 - IO 33 Böseler Straße 333 Wardenburg (Ponyhof)

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:42	08:13	07:17	07:04	05:57	05:09	05:06	05:44	06:36	07:28	07:24	08:17	
	16:21	17:11	18:05	20:01	20:55	21:43	21:58	21:24	20:19	19:07	16:58	16:16	
2	08:42	08:11	07:15	07:02	05:55	05:08	05:06	05:46	06:38	07:30	07:26	08:19	
	16:22	17:13	18:07	20:03	20:57	21:44	21:57	21:22	20:17	19:05	16:57	16:15	
3	08:42	08:10	07:13	06:59	05:53	05:07	05:07	05:47	06:40	07:31	07:28	08:20	
	16:23	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55	16:14	
4	08:41	08:08	07:11	06:57	05:51	05:07	05:08	05:49	06:41	07:33	07:30	08:22	
	16:24	17:17	18:10	20:07	21:00	21:46	21:56	21:18	20:12	19:00	16:53	16:14	
5	08:41	08:06	07:08	06:55	05:49	05:06	05:09	05:50	06:43	07:35	07:32	08:23	
	16:26	17:19	18:12	20:09	21:02	21:48	21:56	21:17	20:10	18:58	16:51	16:13	
6	08:41	08:05	07:06	06:52	05:47	05:05	05:10	05:52	06:45	07:37	07:34	08:25	
	16:27	17:20	18:14	20:10	21:04	21:49	21:55	21:15	20:07	18:55	16:49	16:13	
7	08:40	08:03	07:04	06:50	05:45	05:05	05:10	05:54	06:47	07:38	07:35	08:26	
	16:28	17:22	18:16	20:12	21:05	21:49	21:55	21:13	20:05	18:53	16:47	16:12	
8	08:40	08:01	07:01	06:48	05:43	05:04	05:11	05:55	06:48	07:40	07:37	08:27	
	16:30	17:24	18:18	20:14	21:07	21:50	21:54	21:11	20:03	18:51	16:46	16:12	
9	08:39	07:59	06:59	06:45	05:41	05:03	05:12	05:57	06:50	07:42	07:39	08:28	
	16:31	17:26	18:20	20:16	21:09	21:51	21:53	21:09	20:00	18:48	16:44	16:12	
10	08:39	07:57	06:57	06:43	05:40	05:03	05:14	05:59	06:52	07:44	07:41	08:29	
	16:32	17:28	18:22	20:17	21:10	21:52	21:52	21:07	19:58	18:46	16:42	16:11	
11	08:38	07:55	06:54	06:41	05:38	05:03	05:15	06:01	06:53	07:45	07:43	08:31	
	16:34	17:30	18:23	20:19	21:12	21:53	21:52	21:05	19:55	18:44	16:40	16:11	
12	08:37	07:53	06:52	06:38	05:36	05:02	05:16	06:02	06:55	07:47	07:45	08:32	
	16:35	17:32	18:25	20:21	21:14	21:54	21:51	21:03	19:53	18:41	16:39	16:11	
13	08:37	07:51	06:50	06:36	05:34	05:02	05:17	06:04	06:57	07:49	07:47	08:33	
	16:37	17:34	18:27	20:23	21:15	21:54	21:50	21:01	19:51	18:39	16:37	16:11	
14	08:36	07:49	06:47	06:34	05:33	05:02	05:18	06:06	06:59	07:51	07:48	08:34	13:46 (WEA_RE_04)
	16:39	17:36	18:29	20:25	21:17	21:55	21:49	20:59	19:48	18:37	16:36	16:11	6 13:52 (WEA_RE_04)
15	08:35	07:47	06:45	06:31	05:31	05:01	05:19	06:07	07:00	07:53	07:50	08:35	13:45 (WEA_RE_04)
	16:40	17:38	18:31	20:26	21:19	21:56	21:48	20:57	19:46	18:34	16:34	16:11	9 13:54 (WEA_RE_04)
16	08:34	07:45	06:42	06:29	05:30	05:01	05:21	06:09	07:02	07:54	07:52	08:35	13:45 (WEA_RE_04)
	16:42	17:40	18:33	20:28	21:20	21:56	21:47	20:55	19:43	18:32	16:33	16:11	10 13:55 (WEA_RE_04)
17	08:33	07:43	06:40	06:27	05:28	05:01	05:22	06:11	07:04	07:56	07:54	08:36	13:45 (WEA_RE_04)
	16:43	17:42	18:34	20:30	21:22	21:57	21:46	20:53	19:41	18:30	16:31	16:11	11 13:56 (WEA_RE_04)
18	08:32	07:41	06:38	06:25	05:26	05:01	05:23	06:12	07:05	07:58	07:56	08:37	13:45 (WEA_RE_04)
	16:45	17:44	18:36	20:32	21:23	21:57	21:44	20:51	19:39	18:28	16:30	16:11	12 13:57 (WEA_RE_04)
19	08:31	07:39	06:35	06:22	05:25	05:01	05:25	06:14	07:07	08:00	07:58	08:38	13:45 (WEA_RE_04)
	16:47	17:46	18:38	20:34	21:25	21:57	21:43	20:48	19:36	18:26	16:29	16:12	13 13:58 (WEA_RE_04)
20	08:30	07:37	06:33	06:20	05:23	05:01	05:26	06:16	07:09	08:02	07:59	08:38	13:45 (WEA_RE_04)
	16:49	17:48	18:40	20:35	21:27	21:58	21:42	20:46	19:34	18:23	16:27	16:12	14 13:59 (WEA_RE_04)
21	08:29	07:35	06:30	06:18	05:22	05:01	05:27	06:17	07:10	08:04	08:01	08:39	13:45 (WEA_RE_04)
	16:50	17:50	18:42	20:37	21:28	21:58	21:41	20:44	19:31	18:21	16:26	16:12	14 13:59 (WEA_RE_04)
22	08:27	07:33	06:28	06:16	05:21	05:02	05:29	06:19	07:12	08:05	08:03	08:40	13:46 (WEA_RE_04)
	16:52	17:51	18:43	20:39	21:30	21:58	21:39	20:42	19:29	18:19	16:25	16:13	14 14:00 (WEA_RE_04)
23	08:26	07:31	06:26	06:14	05:19	05:02	05:30	06:21	07:14	08:07	08:04	08:40	13:46 (WEA_RE_04)
	16:54	17:53	18:45	20:41	21:31	21:58	21:38	20:40	19:26	18:17	16:24	16:13	14 14:00 (WEA_RE_04)
24	08:25	07:28	06:23	06:11	05:18	05:02	05:32	06:23	07:16	08:09	08:06	08:41	13:47 (WEA_RE_04)
	16:56	17:55	18:47	20:42	21:33	21:58	21:36	20:37	19:24	18:15	16:22	16:14	14 14:01 (WEA_RE_04)
25	08:24	07:26	06:21	06:09	05:17	05:02	05:33	06:24	07:17	07:11	08:08	08:41	13:48 (WEA_RE_04)
	16:58	17:57	18:49	20:44	21:34	21:58	21:35	20:35	19:22	17:13	16:21	16:15	12 14:00 (WEA_RE_04)
26	08:22	07:24	06:19	06:07	05:16	05:03	05:35	06:26	07:19	07:13	08:10	08:41	13:48 (WEA_RE_04)
	16:59	17:59	18:51	20:46	21:35	21:58	21:33	20:33	19:19	17:11	16:20	16:15	12 14:00 (WEA_RE_04)
27	08:21	07:22	06:16	06:05	05:14	05:03	05:36	06:28	07:21	07:15	08:11	08:41	13:49 (WEA_RE_04)
	17:01	18:01	18:52	20:48	21:37	21:58	21:32	20:31	19:17	17:08	16:19	16:16	11 14:00 (WEA_RE_04)
28	08:19	07:20	06:14	06:03	05:13	05:04	05:38	06:29	07:23	07:17	08:13	08:42	13:51 (WEA_RE_04)
	17:03	18:03	18:54	20:50	21:38	21:58	21:30	20:28	19:14	17:06	16:18	16:17	9 14:00 (WEA_RE_04)
29	08:18		07:11	06:01	05:12	05:04	05:39	06:31	07:24	07:19	08:14	08:42	13:52 (WEA_RE_04)
	17:05		19:56	20:51	21:39	21:58	21:29	20:26	19:12	17:04	16:17	16:18	7 13:59 (WEA_RE_04)
30	08:16		07:09	05:59	05:11	05:05	05:41	06:33	07:26	07:20	08:16	08:42	13:54 (WEA_RE_04)
	17:07		19:58	20:53	21:41	21:58	21:27	20:24	19:10	17:02	16:17	16:19	4 13:58 (WEA_RE_04)
31	08:15		07:07		05:10		05:42	06:35		07:22		08:42	
	17:09		20:00		21:42		21:25	20:21		17:00		16:20	
Sonnenscheinstunden	254	275	367	418	490	505	508	457	382	330	262	238	186
astr.max.mögl.Beschattung													

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_34 - IO 34 Böseler Straße 334 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	08:13	07:17	07:04	05:57	05:09	05:06	05:44	06:36	07:28	07:24	08:17
	16:21	17:11	18:05	20:01	20:55	21:43	21:58	21:24	20:19	19:07	16:58	16:16
2	08:42	08:11	07:15	07:02	05:55	05:08	05:06	05:46	06:38	07:30	07:26	08:19
	16:22	17:13	18:07	20:03	20:57	21:44	21:57	21:22	20:17	19:05	16:57	16:15
3	08:42	08:10	07:13	06:59	05:53	05:07	05:07	05:47	06:40	07:31	07:28	08:20
	16:23	17:15	18:09	20:05	20:58	21:45	21:57	21:20	20:14	19:02	16:55	16:14
4	08:41	08:08	07:11	06:57	05:51	05:07	05:08	05:49	06:41	07:33	07:30	08:22
	16:24	17:17	18:10	20:07	21:00	21:46	21:56	21:18	20:12	19:00	16:53	16:14
5	08:41	08:06	07:08	06:55	05:49	05:06	05:09	05:50	06:43	07:35	07:32	08:23
	16:26	17:19	18:12	20:09	21:02	21:48	21:56	21:17	20:10	18:58	16:51	16:13
6	08:41	08:05	07:06	06:52	05:47	05:05	05:10	05:52	06:45	07:37	07:34	08:25
	16:27	17:20	18:14	20:10	21:04	21:49	21:55	21:15	20:07	18:55	16:49	16:13
7	08:40	08:03	07:04	06:50	05:45	05:05	05:10	05:54	06:47	07:38	07:35	08:26
	16:28	17:22	18:16	20:12	21:05	21:49	21:55	21:13	20:05	18:53	16:47	16:12
8	08:40	08:01	07:01	06:48	05:43	05:04	05:11	05:55	06:48	07:40	07:37	08:27
	16:30	17:24	18:18	20:14	21:07	21:50	21:54	21:11	20:03	18:51	16:46	16:12
9	08:39	07:59	06:59	06:45	05:41	05:03	05:12	05:57	06:50	07:42	07:39	08:28
	16:31	17:26	18:20	20:16	21:09	21:51	21:53	21:09	20:00	18:48	16:44	16:12
10	08:39	07:57	06:57	06:43	05:40	05:03	05:14	05:59	06:52	07:44	07:41	08:29
	16:32	17:28	18:22	20:17	21:10	21:52	21:52	21:07	19:58	18:46	16:42	16:11
11	08:38	07:55	06:54	06:41	05:38	05:03	05:15	06:00	06:53	07:45	07:43	08:31
	16:34	17:30	18:23	20:19	21:12	21:53	21:52	21:05	19:55	18:44	16:40	16:11
12	08:37	07:53	06:52	06:38	05:36	05:02	05:16	06:02	06:55	07:47	07:45	08:32
	16:35	17:32	18:25	20:21	21:14	21:54	21:51	21:03	19:53	18:41	16:39	16:11
13	08:37	07:51	06:50	06:36	05:34	05:02	05:17	06:04	06:57	07:49	07:47	08:33
	16:37	17:34	18:27	20:23	21:15	21:54	21:50	21:01	19:51	18:39	16:37	16:11
14	08:36	07:49	06:47	06:34	05:33	05:02	05:18	06:06	06:59	07:51	07:48	08:34
	16:39	17:36	18:29	20:25	21:17	21:55	21:49	20:59	19:48	18:37	16:36	16:11
15	08:35	07:47	06:45	06:31	05:31	05:01	05:19	06:07	07:00	07:53	07:50	08:35
	16:40	17:38	18:31	20:26	21:19	21:56	21:48	20:57	19:46	18:34	16:34	16:11
16	08:34	07:45	06:42	06:29	05:30	05:01	05:21	06:09	07:02	07:54	07:52	08:35
	16:42	17:40	18:33	20:28	21:20	21:56	21:47	20:55	19:43	18:32	16:33	16:11
17	08:33	07:43	06:40	06:27	05:28	05:01	05:22	06:11	07:04	07:56	07:54	08:36
	16:43	17:42	18:34	20:30	21:22	21:57	21:46	20:53	19:41	18:30	16:31	16:11
18	08:32	07:41	06:38	06:25	05:26	05:01	05:23	06:12	07:05	07:58	07:56	08:37
	16:45	17:44	18:36	20:32	21:23	21:57	21:44	20:51	19:39	18:28	16:30	16:11
19	08:31	07:39	06:35	06:22	05:25	05:01	05:24	06:14	07:07	08:00	07:57	08:38
	16:47	17:46	18:38	20:34	21:25	21:57	21:43	20:48	19:36	18:26	16:28	16:12
20	08:30	07:37	06:33	06:20	05:23	05:01	05:26	06:16	07:09	08:02	07:59	08:38
	16:49	17:48	18:40	20:35	21:27	21:58	21:42	20:46	19:34	18:23	16:27	16:12
21	08:29	07:35	06:30	06:18	05:22	05:01	05:27	06:17	07:10	08:04	08:01	08:39
	16:50	17:50	18:42	20:37	21:28	21:58	21:41	20:44	19:31	18:21	16:26	16:12
22	08:27	07:33	06:28	06:16	05:21	05:02	05:29	06:19	07:12	08:05	08:03	08:40
	16:52	17:51	18:43	20:39	21:30	21:58	21:39	20:42	19:29	18:19	16:25	16:13
23	08:26	07:31	06:26	06:14	05:19	05:02	05:30	06:21	07:14	08:07	08:04	08:40
	16:54	17:53	18:45	20:41	21:31	21:58	21:38	20:40	19:26	18:17	16:24	16:13
24	08:25	07:28	06:23	06:11	05:18	05:02	05:32	06:23	07:16	08:09	08:06	08:41
	16:56	17:55	18:47	20:42	21:33	21:58	21:36	20:37	19:24	18:15	16:22	16:14
25	08:24	07:26	06:21	06:09	05:17	05:02	05:33	06:24	07:17	08:11	08:08	08:41
	16:58	17:57	18:49	20:44	21:34	21:58	21:35	20:35	19:22	18:13	16:21	16:15
26	08:22	07:24	06:18	06:07	05:15	05:03	05:35	06:26	07:19	08:13	08:10	08:41
	16:59	17:59	18:51	20:46	21:35	21:58	21:33	20:33	19:19	18:11	16:20	16:15
27	08:21	07:22	06:16	06:05	05:14	05:03	05:36	06:28	07:21	08:15	08:11	08:41
	17:01	18:01	18:52	20:48	21:37	21:58	21:32	20:31	19:17	18:08	16:19	16:16
28	08:19	07:20	06:14	06:03	05:13	05:04	05:38	06:29	07:23	08:17	08:13	08:42
	17:03	18:03	18:54	20:50	21:38	21:58	21:30	20:28	19:14	18:06	16:18	16:17
29	08:18		07:11	06:01	05:12	05:04	05:39	06:31	07:24	08:19	08:14	08:42
	17:05		19:56	20:51	21:39	21:58	21:29	20:26	19:12	18:04	16:17	16:18
30	08:16		07:09	05:59	05:11	05:05	05:41	06:33	07:26	08:20	08:16	08:42
	17:07		19:58	20:53	21:41	21:58	21:27	20:24	19:10	18:02	16:17	16:19
31	08:15		07:07		05:10		05:42	06:35		07:22		08:42
	17:09		20:00		21:42		21:25	20:21		17:00		16:20
Sonnenscheinstunden	254	275	367	418	490	505	508	457	382	330	262	238
astr.max.mögl. Beschattung												

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_35 - IO 35 Mastenweg 2 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42 16:21	11:24 (WEA_RE_04) 12:24 (WEA_RE_04)	08:13 17:11	07:17 18:05	07:04 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	60 12:25 (WEA_RE_04)	08:11 17:13	07:15 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	60 12:25 (WEA_RE_04)	08:10 17:15	07:13 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:24	59 12:25 (WEA_RE_04)	08:08 17:17	07:11 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	59 12:25 (WEA_RE_04)	08:06 17:19	07:08 18:12	06:55 20:09	05:49 21:02	05:06 21:48
6	08:41 16:27	59 12:26 (WEA_RE_04)	08:05 17:21	07:06 18:14	06:52 20:10	05:47 21:04	05:05 21:49
7	08:40 16:28	59 12:26 (WEA_RE_04)	08:03 17:22	07:04 18:16	06:50 20:12	05:45 21:05	05:05 21:49
8	08:40 16:30	59 12:26 (WEA_RE_04)	08:01 17:24	07:01 18:18	06:48 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	58 12:27 (WEA_RE_04)	07:59 17:26	06:59 18:20	06:45 20:16	05:42 21:09	05:03 21:51
10	08:39 16:33	58 12:27 (WEA_RE_04)	07:57 17:28	06:57 18:22	06:43 20:18	05:40 21:10	05:03 21:52
11	08:38 16:34	58 12:27 (WEA_RE_04)	07:55 17:30	06:54 18:23	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:36	57 12:27 (WEA_RE_04)	07:53 17:32	06:52 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	56 12:27 (WEA_RE_04)	07:51 17:34	06:50 18:27	06:36 20:23	05:35 21:15	05:02 21:54
14	08:36 16:39	56 12:27 (WEA_RE_04)	07:49 17:36	06:47 18:29	06:34 20:25	05:33 21:17	05:02 21:55
15	08:35 16:40	55 12:27 (WEA_RE_04)	07:47 17:38	06:45 18:31	06:31 20:26	05:31 21:19	05:01 21:56
16	08:34 16:42	54 12:27 (WEA_RE_04)	07:45 17:40	06:42 18:33	06:29 20:28	05:30 21:20	05:01 21:56
17	08:33 16:44	53 12:27 (WEA_RE_04)	07:43 17:42	06:40 18:34	06:27 20:30	05:28 21:22	05:01 21:57
18	08:32 16:45	52 12:27 (WEA_RE_04)	07:41 17:44	06:38 18:36	06:25 20:32	05:26 21:24	05:01 21:57
19	08:31 16:47	51 12:26 (WEA_RE_04)	07:39 17:46	06:35 18:38	06:22 20:34	05:25 21:25	05:01 21:57
20	08:30 16:49	50 12:26 (WEA_RE_04)	07:37 17:48	06:33 18:40	06:20 20:35	05:24 21:27	05:01 21:58
21	08:29 16:50	48 12:26 (WEA_RE_04)	07:35 17:50	06:31 18:42	06:18 20:37	05:22 21:28	05:01 21:58
22	08:27 16:52	47 12:25 (WEA_RE_04)	07:33 17:52	06:28 18:43	06:16 20:39	05:21 21:30	05:02 21:58
23	08:26 16:54	45 12:25 (WEA_RE_04)	07:31 17:53	06:26 18:45	06:14 20:41	05:19 21:31	05:02 21:58
24	08:25 16:56	43 12:23 (WEA_RE_04)	07:28 17:55	06:23 18:47	06:11 20:42	05:18 21:33	05:02 21:58
25	08:24 16:58	41 12:23 (WEA_RE_04)	07:26 17:57	06:21 18:49	06:09 20:44	05:17 21:34	05:02 21:58
26	08:22 17:00	38 12:21 (WEA_RE_04)	07:24 17:59	06:19 18:51	06:07 20:46	05:16 21:35	05:03 21:58
27	08:21 17:01	35 12:21 (WEA_RE_04)	07:22 18:01	06:16 18:52	06:05 20:48	05:14 21:37	05:03 21:58
28	08:19 17:03	31 12:19 (WEA_RE_04)	07:20 18:03	06:14 18:54	06:03 20:50	05:13 21:38	05:04 21:58
29	08:18 17:05	26 12:16 (WEA_RE_04)	07:11 19:56	07:11 19:56	06:01 20:51	05:12 21:39	05:04 21:58
30	08:16 17:07	20 12:14 (WEA_RE_04)	07:09 19:58	07:09 19:58	05:59 20:53	05:11 21:41	05:05 21:58
31	08:15 17:09	11 12:09 (WEA_RE_04)	07:07 20:00	07:07 20:00	05:10 21:42	05:10 21:42	05:05 21:58
Sonnenscheinstunden		254	275	367	418	490	505
astr.max.mögl.Beschattung		1518					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_35 - IO 35 Mastenweg 2 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember	
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16	
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	08:19 16:15	
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	08:20 16:14	
4	05:08 21:56	05:49 21:18	06:41 20:12	07:33 19:00	07:30 16:53	08:22 16:14	
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	08:23 16:13	
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	08:25 16:13	
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	08:26 16:12	
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	08:27 16:12	
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	08:28 16:12	
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	08:29 16:11	
11	05:15 21:52	06:01 21:05	06:53 19:55	07:45 18:44	07:43 16:41	11:29 (WEA_RE_04) 08:31	
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	11:24 (WEA_RE_04) 08:32	
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	21 11:45 (WEA_RE_04) 16:11	
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	27 11:48 (WEA_RE_04) 16:11	
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	32 11:51 (WEA_RE_04) 16:11	
16	05:21 21:47	06:09 20:55	07:02 19:43	07:54 18:32	07:52 16:33	35 11:53 (WEA_RE_04) 16:11	
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	38 11:54 (WEA_RE_04) 16:11	
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	41 11:56 (WEA_RE_04) 16:11	
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	43 11:57 (WEA_RE_04) 16:11	
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	45 11:59 (WEA_RE_04) 16:12	
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	47 12:00 (WEA_RE_04) 16:12	
22	05:29 21:39	06:19 20:42	07:12 19:29	08:05 18:19	08:03 16:25	48 11:13 (WEA_RE_04) 08:39	
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	50 12:02 (WEA_RE_04) 16:13	
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	51 12:03 (WEA_RE_04) 16:13	
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	52 12:04 (WEA_RE_04) 16:14	
26	05:35 21:33	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	53 12:05 (WEA_RE_04) 16:15	
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	54 12:05 (WEA_RE_04) 16:15	
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	08:13 16:18	55 12:06 (WEA_RE_04) 16:16	
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	56 12:07 (WEA_RE_04) 16:17	
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	57 12:08 (WEA_RE_04) 16:18	
31	05:42 21:25	06:35 20:21		07:22 17:00		08:42 16:20	
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382	330	262	872	238 1859

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_36 - IO 36 Am Denkmal 2 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	09:59 (WEA_RE_04)	08:13	10:09 (WEA_RE_04)	07:17	07:04	05:57	05:09
	16:21	60 10:59 (WEA_RE_05)	17:11	50 10:59 (WEA_RE_04)	18:05	20:01	20:55	21:43
2	08:42	10:00 (WEA_RE_04)	08:11	10:09 (WEA_RE_04)	07:15	07:02	05:55	05:08
	16:22	59 10:59 (WEA_RE_05)	17:13	49 10:58 (WEA_RE_04)	18:07	20:03	20:57	21:44
3	08:42	09:59 (WEA_RE_04)	08:10	10:11 (WEA_RE_04)	07:13	06:59	05:53	05:07
	16:23	59 10:58 (WEA_RE_05)	17:15	47 10:58 (WEA_RE_04)	18:09	20:05	20:58	21:45
4	08:41	10:00 (WEA_RE_04)	08:08	10:12 (WEA_RE_04)	07:11	06:57	05:51	05:07
	16:25	59 10:59 (WEA_RE_05)	17:17	45 10:57 (WEA_RE_04)	18:10	20:07	21:00	21:46
5	08:41	10:00 (WEA_RE_04)	08:06	10:13 (WEA_RE_04)	07:08	06:55	05:49	05:06
	16:26	58 10:58 (WEA_RE_05)	17:19	43 10:56 (WEA_RE_04)	18:12	20:09	21:02	21:48
6	08:41	10:00 (WEA_RE_04)	08:05	10:14 (WEA_RE_04)	07:06	06:52	05:47	05:05
	16:27	58 10:58 (WEA_RE_05)	17:21	41 10:55 (WEA_RE_04)	18:14	20:10	21:04	21:49
7	08:40	10:00 (WEA_RE_04)	08:03	10:15 (WEA_RE_04)	07:04	06:50	05:45	05:05
	16:28	57 10:57 (WEA_RE_05)	17:22	39 10:54 (WEA_RE_04)	18:16	20:12	21:05	21:49
8	08:40	10:00 (WEA_RE_04)	08:01	10:16 (WEA_RE_04)	07:01	06:48	05:43	05:04
	16:30	55 10:55 (WEA_RE_05)	17:24	36 10:52 (WEA_RE_04)	18:18	20:14	21:07	21:50
9	08:39	10:01 (WEA_RE_04)	07:59	10:18 (WEA_RE_04)	06:59	06:45	05:42	05:04
	16:31	54 10:55 (WEA_RE_05)	17:26	32 10:50 (WEA_RE_04)	18:20	20:16	21:09	21:51
10	08:39	10:01 (WEA_RE_04)	07:57	10:20 (WEA_RE_04)	06:57	06:43	05:40	05:03
	16:33	54 10:55 (WEA_RE_05)	17:28	28 10:48 (WEA_RE_04)	18:22	20:18	21:10	21:52
11	08:38	10:01 (WEA_RE_04)	07:55	10:23 (WEA_RE_04)	06:54	06:41	05:38	05:03
	16:34	54 10:55 (WEA_RE_05)	17:30	22 10:45 (WEA_RE_04)	18:23	20:19	21:12	21:53
12	08:37	10:01 (WEA_RE_04)	07:53	10:28 (WEA_RE_04)	06:52	06:38	05:36	05:02
	16:36	55 10:56 (WEA_RE_05)	17:32	12 10:40 (WEA_RE_04)	18:25	20:21	21:14	21:54
13	08:37	10:01 (WEA_RE_04)	07:51		06:50	06:36	05:35	05:02
	16:37	55 10:56 (WEA_RE_05)	17:34		18:27	20:23	21:15	21:54
14	08:36	10:02 (WEA_RE_04)	07:49		06:47	06:34	05:33	05:02
	16:39	55 10:57 (WEA_RE_05)	17:36		18:29	20:25	21:17	21:55
15	08:35	10:02 (WEA_RE_04)	07:47		06:45	06:31	05:31	05:01
	16:40	56 10:58 (WEA_RE_05)	17:38		18:31	20:26	21:19	21:56
16	08:34	10:02 (WEA_RE_04)	07:45		06:42	06:29	05:30	05:01
	16:42	56 10:58 (WEA_RE_05)	17:40		18:33	20:28	21:20	21:56
17	08:33	10:03 (WEA_RE_04)	07:43		06:40	06:27	05:28	05:01
	16:44	56 10:59 (WEA_RE_05)	17:42		18:34	20:30	21:22	21:57
18	08:32	10:03 (WEA_RE_04)	07:41		06:38	06:25	05:26	05:01
	16:45	56 10:59 (WEA_RE_05)	17:44		18:36	20:32	21:24	21:57
19	08:31	10:03 (WEA_RE_04)	07:39		06:35	06:22	05:25	05:01
	16:47	56 10:59 (WEA_RE_05)	17:46		18:38	20:34	21:25	21:57
20	08:30	10:03 (WEA_RE_04)	07:37		06:33	06:20	05:24	05:01
	16:49	57 11:00 (WEA_RE_04)	17:48		18:40	20:35	21:27	21:58
21	08:29	10:04 (WEA_RE_04)	07:35		06:31	06:18	05:22	05:01
	16:50	56 11:00 (WEA_RE_05)	17:50		18:42	20:37	21:28	21:58
22	08:27	10:03 (WEA_RE_04)	07:33		06:28	06:16	05:21	05:02
	16:52	57 11:00 (WEA_RE_05)	17:52		18:43	20:39	21:30	21:58
23	08:26	10:04 (WEA_RE_04)	07:31		06:26	06:14	05:19	05:02
	16:54	57 11:01 (WEA_RE_05)	17:53		18:45	20:41	21:31	21:58
24	08:25	10:04 (WEA_RE_04)	07:29		06:23	06:11	05:18	05:02
	16:56	56 11:00 (WEA_RE_05)	17:55		18:47	20:42	21:33	21:58
25	08:24	10:05 (WEA_RE_04)	07:26		06:21	06:09	05:17	05:02
	16:58	56 11:01 (WEA_RE_05)	17:57		18:49	20:44	21:34	21:58
26	08:22	10:05 (WEA_RE_04)	07:24		06:19	06:07	05:16	05:03
	17:00	55 11:00 (WEA_RE_05)	17:59		18:51	20:46	21:35	21:58
27	08:21	10:06 (WEA_RE_04)	07:22		06:16	06:05	05:14	05:03
	17:01	55 11:01 (WEA_RE_05)	18:01		18:52	20:48	21:37	21:58
28	08:19	10:06 (WEA_RE_04)	07:20		06:14	06:03	05:13	05:04
	17:03	54 11:00 (WEA_RE_05)	18:03		18:54	20:50	21:38	21:58
29	08:18	10:06 (WEA_RE_04)			07:11	06:01	05:12	05:04
	17:05	54 11:00 (WEA_RE_05)			19:56	20:51	21:39	21:58
30	08:16	10:08 (WEA_RE_04)			07:09	05:59	05:11	05:05
	17:07	52 11:00 (WEA_RE_05)			19:58	20:53	21:41	21:58
31	08:15	10:08 (WEA_RE_04)			07:07		05:10	
	17:09	52 11:00 (WEA_RE_05)			20:00		21:42	
	Sonneneinstrahlung	254	275	367	418	490	505	
	astr.max.mögl.Beschattung	1733	444					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_36 - IO 36 Am Denkmal 2 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember	
1	05:06	05:44	06:36	07:28		07:24	09:50 (WEA_RE_04)	08:17	09:43 (WEA_RE_04)
	21:58	21:24	20:19	19:07		16:59	10:18 (WEA_RE_04)	16:16	10:38 (WEA_RE_04)
2	05:06	05:46	06:38	07:30		07:26	09:48 (WEA_RE_04)	08:19	09:44 (WEA_RE_04)
	21:57	21:22	20:17	19:05		16:57	10:20 (WEA_RE_04)	16:15	10:38 (WEA_RE_04)
3	05:07	05:47	06:40	07:31		07:28	09:46 (WEA_RE_04)	08:20	09:44 (WEA_RE_04)
	21:57	21:20	20:14	19:02		16:55	10:22 (WEA_RE_04)	16:15	10:38 (WEA_RE_04)
4	05:08	05:49	06:42	07:33		07:30	09:44 (WEA_RE_04)	08:22	09:45 (WEA_RE_04)
	21:56	21:18	20:12	19:00		16:53	10:24 (WEA_RE_04)	16:14	10:40 (WEA_RE_05)
5	05:09	05:51	06:43	07:35		07:32	09:43 (WEA_RE_04)	08:23	09:45 (WEA_RE_04)
	21:56	21:17	20:10	18:58		16:51	10:25 (WEA_RE_04)	16:13	10:42 (WEA_RE_05)
6	05:10	05:52	06:45	07:37		07:34	09:42 (WEA_RE_04)	08:25	09:47 (WEA_RE_04)
	21:55	21:15	20:07	18:55		16:49	10:26 (WEA_RE_04)	16:13	10:44 (WEA_RE_05)
7	05:11	05:54	06:47	07:38		07:35	09:41 (WEA_RE_04)	08:26	09:47 (WEA_RE_04)
	21:55	21:13	20:05	18:53		16:47	10:27 (WEA_RE_04)	16:12	10:45 (WEA_RE_05)
8	05:12	05:56	06:48	07:40		07:37	09:40 (WEA_RE_04)	08:27	09:47 (WEA_RE_04)
	21:54	21:11	20:03	18:51		16:46	10:28 (WEA_RE_04)	16:12	10:46 (WEA_RE_05)
9	05:13	05:57	06:50	07:42		07:39	09:40 (WEA_RE_04)	08:28	09:48 (WEA_RE_04)
	21:53	21:09	20:00	18:48		16:44	10:29 (WEA_RE_04)	16:12	10:47 (WEA_RE_05)
10	05:14	05:59	06:52	07:44		07:41	09:39 (WEA_RE_04)	08:29	09:49 (WEA_RE_04)
	21:52	21:07	19:58	18:46		16:42	10:30 (WEA_RE_04)	16:11	10:48 (WEA_RE_05)
11	05:15	06:01	06:53	07:46		07:43	09:39 (WEA_RE_04)	08:31	09:49 (WEA_RE_04)
	21:52	21:05	19:55	18:44		16:41	10:31 (WEA_RE_04)	16:11	10:49 (WEA_RE_05)
12	05:16	06:02	06:55	07:47		07:45	09:39 (WEA_RE_04)	08:32	09:50 (WEA_RE_04)
	21:51	21:03	19:53	18:41		16:39	10:31 (WEA_RE_04)	16:11	10:50 (WEA_RE_05)
13	05:17	06:04	06:57	07:49		07:47	09:38 (WEA_RE_04)	08:33	09:50 (WEA_RE_04)
	21:50	21:01	19:51	18:39		16:37	10:32 (WEA_RE_04)	16:11	10:50 (WEA_RE_05)
14	05:18	06:06	06:59	07:51		07:48	09:38 (WEA_RE_04)	08:34	09:51 (WEA_RE_04)
	21:49	20:59	19:48	18:37		16:36	10:32 (WEA_RE_04)	16:11	10:51 (WEA_RE_05)
15	05:19	06:07	07:00	07:53		07:50	09:38 (WEA_RE_04)	08:35	09:52 (WEA_RE_04)
	21:48	20:57	19:46	18:35		16:34	10:33 (WEA_RE_04)	16:11	10:52 (WEA_RE_05)
16	05:21	06:09	07:02	07:55		07:52	09:38 (WEA_RE_04)	08:36	09:52 (WEA_RE_04)
	21:47	20:55	19:43	18:32		16:33	10:33 (WEA_RE_04)	16:11	10:53 (WEA_RE_05)
17	05:22	06:11	07:04	07:56		07:54	09:38 (WEA_RE_04)	08:36	09:53 (WEA_RE_04)
	21:46	20:53	19:41	18:30		16:31	10:34 (WEA_RE_04)	16:11	10:54 (WEA_RE_05)
18	05:23	06:12	07:05	07:58		07:56	09:38 (WEA_RE_04)	08:37	09:54 (WEA_RE_04)
	21:44	20:51	19:39	18:28		16:30	10:34 (WEA_RE_04)	16:11	10:54 (WEA_RE_05)
19	05:25	06:14	07:07	08:00		07:58	09:38 (WEA_RE_04)	08:38	09:54 (WEA_RE_04)
	21:43	20:48	19:36	18:26		16:29	10:35 (WEA_RE_04)	16:12	10:54 (WEA_RE_05)
20	05:26	06:16	07:09	08:02		07:59	09:38 (WEA_RE_04)	08:38	09:55 (WEA_RE_04)
	21:42	20:46	19:34	18:23		16:27	10:35 (WEA_RE_04)	16:12	10:55 (WEA_RE_05)
21	05:27	06:18	07:11	08:04		08:01	09:39 (WEA_RE_04)	08:39	09:55 (WEA_RE_04)
	21:41	20:44	19:31	18:21		16:26	10:35 (WEA_RE_04)	16:13	10:55 (WEA_RE_05)
22	05:29	06:19	07:12	08:06		08:03	09:39 (WEA_RE_04)	08:40	09:56 (WEA_RE_04)
	21:39	20:42	19:29	18:19		16:25	10:36 (WEA_RE_04)	16:13	10:56 (WEA_RE_05)
23	05:30	06:21	07:14	08:07		08:05	09:40 (WEA_RE_04)	08:40	09:56 (WEA_RE_04)
	21:38	20:40	19:26	18:17		16:24	10:36 (WEA_RE_04)	16:13	10:56 (WEA_RE_05)
24	05:32	06:23	07:16	08:09		08:06	09:40 (WEA_RE_04)	08:41	09:57 (WEA_RE_04)
	21:36	20:37	19:24	18:15		16:22	10:36 (WEA_RE_04)	16:14	10:57 (WEA_RE_05)
25	05:33	06:24	07:17	08:11		08:08	09:41 (WEA_RE_04)	08:41	09:57 (WEA_RE_04)
	21:35	20:35	19:22	17:13		16:21	10:37 (WEA_RE_04)	16:15	10:57 (WEA_RE_05)
26	05:35	06:26	07:19	08:13		08:10	09:41 (WEA_RE_04)	08:41	09:57 (WEA_RE_04)
	21:34	20:33	19:19	17:11		16:20	10:37 (WEA_RE_04)	16:15	10:58 (WEA_RE_05)
27	05:36	06:28	07:21	08:15		08:11	09:41 (WEA_RE_04)	08:42	09:57 (WEA_RE_04)
	21:32	20:31	19:17	17:09		16:19	10:37 (WEA_RE_04)	16:16	10:58 (WEA_RE_05)
28	05:38	06:30	07:23	08:17		08:13	09:42 (WEA_RE_04)	08:42	09:57 (WEA_RE_04)
	21:30	20:28	19:14	17:06		16:18	10:37 (WEA_RE_04)	16:17	10:58 (WEA_RE_05)
29	05:39	06:31	07:24	08:19		08:14	09:42 (WEA_RE_04)	08:42	09:58 (WEA_RE_04)
	21:29	20:26	19:12	17:04		16:18	10:38 (WEA_RE_04)	16:18	10:58 (WEA_RE_05)
30	05:41	06:33	07:26	08:20		08:16	09:42 (WEA_RE_04)	08:42	09:58 (WEA_RE_04)
	21:27	20:24	19:10	17:02	15	10:11 (WEA_RE_04)	16:17	16:19	10:58 (WEA_RE_05)
31	05:42	06:35		07:22		09:52 (WEA_RE_04)		08:42	09:59 (WEA_RE_04)
	21:25	20:21		17:00	23	10:15 (WEA_RE_04)		16:20	10:59 (WEA_RE_05)
Sonnenscheinstunden	508	457	382	330		262		238	
astr.max.mögl.Beschattung				38		1523		1832	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	---------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_37 - IO 37 Am Denkmal 8 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	09:56 (WEA_RE_04)	08:13	10:10 (WEA_RE_04)	07:17	07:04	05:57	05:09
	16:21	55 10:51 (WEA_RE_05)	17:11	39 10:49 (WEA_RE_04)	18:05	20:01	20:55	21:43
2	08:42	09:57 (WEA_RE_04)	08:11	10:11 (WEA_RE_04)	07:15	07:02	05:55	05:08
	16:22	54 10:51 (WEA_RE_05)	17:13	37 10:48 (WEA_RE_04)	18:07	20:03	20:57	21:44
3	08:42	09:56 (WEA_RE_04)	08:10	10:13 (WEA_RE_04)	07:13	06:59	05:53	05:07
	16:23	54 10:50 (WEA_RE_05)	17:15	35 10:48 (WEA_RE_04)	18:09	20:05	20:58	21:45
4	08:41	09:57 (WEA_RE_04)	08:08	10:14 (WEA_RE_04)	07:11	06:57	05:51	05:07
	16:25	53 10:50 (WEA_RE_05)	17:17	32 10:46 (WEA_RE_04)	18:10	20:07	21:00	21:46
5	08:41	09:57 (WEA_RE_04)	08:06	10:16 (WEA_RE_04)	07:08	06:55	05:49	05:06
	16:26	51 10:48 (WEA_RE_05)	17:19	28 10:44 (WEA_RE_04)	18:12	20:09	21:02	21:48
6	08:41	09:58 (WEA_RE_04)	08:05	10:18 (WEA_RE_04)	07:06	06:52	05:47	05:05
	16:27	49 10:47 (WEA_RE_04)	17:21	24 10:42 (WEA_RE_04)	18:14	20:10	21:04	21:49
7	08:40	09:58 (WEA_RE_04)	08:03	10:21 (WEA_RE_04)	07:04	06:50	05:45	05:05
	16:28	50 10:48 (WEA_RE_04)	17:22	18 10:39 (WEA_RE_04)	18:16	20:12	21:05	21:50
8	08:40	09:57 (WEA_RE_04)	08:01	10:27 (WEA_RE_04)	07:01	06:48	05:43	05:04
	16:30	51 10:48 (WEA_RE_04)	17:24	6 10:33 (WEA_RE_04)	18:18	20:14	21:07	21:50
9	08:39	09:58 (WEA_RE_04)	07:59		06:59	06:45	05:42	05:04
	16:31	51 10:49 (WEA_RE_04)	17:26		18:20	20:16	21:09	21:51
10	08:39	09:59 (WEA_RE_04)	07:57		06:57	06:43	05:40	05:03
	16:33	50 10:49 (WEA_RE_04)	17:28		18:22	20:18	21:10	21:52
11	08:38	09:59 (WEA_RE_04)	07:55		06:54	06:41	05:38	05:03
	16:34	51 10:50 (WEA_RE_04)	17:30		18:23	20:19	21:12	21:53
12	08:37	09:59 (WEA_RE_04)	07:53		06:52	06:38	05:36	05:02
	16:36	51 10:50 (WEA_RE_04)	17:32		18:25	20:21	21:14	21:54
13	08:37	09:59 (WEA_RE_04)	07:51		06:50	06:36	05:35	05:02
	16:37	51 10:50 (WEA_RE_04)	17:34		18:27	20:23	21:15	21:54
14	08:36	09:59 (WEA_RE_04)	07:49		06:47	06:34	05:33	05:02
	16:39	52 10:51 (WEA_RE_04)	17:36		18:29	20:25	21:17	21:55
15	08:35	10:00 (WEA_RE_04)	07:47		06:45	06:31	05:31	05:01
	16:40	51 10:51 (WEA_RE_04)	17:38		18:31	20:26	21:19	21:56
16	08:34	10:00 (WEA_RE_04)	07:45		06:42	06:29	05:30	05:01
	16:42	52 10:52 (WEA_RE_04)	17:40		18:33	20:28	21:20	21:56
17	08:33	10:01 (WEA_RE_04)	07:43		06:40	06:27	05:28	05:01
	16:44	51 10:52 (WEA_RE_04)	17:42		18:34	20:30	21:22	21:57
18	08:32	10:01 (WEA_RE_04)	07:41		06:38	06:25	05:26	05:01
	16:45	52 10:53 (WEA_RE_04)	17:44		18:36	20:32	21:24	21:57
19	08:31	10:01 (WEA_RE_04)	07:39		06:35	06:22	05:25	05:01
	16:47	51 10:52 (WEA_RE_04)	17:46		18:38	20:34	21:25	21:57
20	08:30	10:02 (WEA_RE_04)	07:37		06:33	06:20	05:24	05:01
	16:49	51 10:53 (WEA_RE_04)	17:48		18:40	20:35	21:27	21:58
21	08:29	10:02 (WEA_RE_04)	07:35		06:31	06:18	05:22	05:01
	16:50	51 10:53 (WEA_RE_04)	17:50		18:42	20:37	21:28	21:58
22	08:27	10:02 (WEA_RE_04)	07:33		06:28	06:16	05:21	05:02
	16:52	51 10:53 (WEA_RE_04)	17:52		18:43	20:39	21:30	21:58
23	08:26	10:03 (WEA_RE_04)	07:31		06:26	06:14	05:19	05:02
	16:54	50 10:53 (WEA_RE_04)	17:53		18:45	20:41	21:31	21:58
24	08:25	10:03 (WEA_RE_04)	07:29		06:23	06:11	05:18	05:02
	16:56	50 10:53 (WEA_RE_04)	17:55		18:47	20:43	21:33	21:58
25	08:24	10:04 (WEA_RE_04)	07:26		06:21	06:09	05:17	05:02
	16:58	49 10:53 (WEA_RE_04)	17:57		18:49	20:44	21:34	21:58
26	08:22	10:04 (WEA_RE_04)	07:24		06:19	06:07	05:16	05:03
	17:00	48 10:52 (WEA_RE_04)	17:59		18:51	20:46	21:35	21:58
27	08:21	10:06 (WEA_RE_04)	07:22		06:16	06:05	05:14	05:03
	17:01	47 10:53 (WEA_RE_04)	18:01		18:52	20:48	21:37	21:58
28	08:19	10:06 (WEA_RE_04)	07:20		06:14	06:03	05:13	05:04
	17:03	46 10:52 (WEA_RE_04)	18:03		18:54	20:50	21:38	21:58
29	08:18	10:07 (WEA_RE_04)			07:11	06:01	05:12	05:04
	17:05	44 10:51 (WEA_RE_04)			19:56	20:51	21:39	21:58
30	08:16	10:08 (WEA_RE_04)			07:09	05:59	05:11	05:05
	17:07	43 10:51 (WEA_RE_04)			19:58	20:53	21:41	21:58
31	08:15	10:09 (WEA_RE_04)			07:07		05:10	
	17:09	41 10:50 (WEA_RE_04)			20:00		21:42	
Sonnenscheinstunden	254	275	367	418	490	505		
astr.max.mögl.Beschattung	1551	219						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattendenende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	-----------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_37 - IO 37 Am Denkmal 8 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November		Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59		08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57		08:19 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	9	09:55 (WEA_RE_04) 10:04 (WEA_RE_04)
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	19	09:50 (WEA_RE_04) 10:09 (WEA_RE_04)
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	24	09:48 (WEA_RE_04) 10:12 (WEA_RE_04)
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	28	09:46 (WEA_RE_04) 10:14 (WEA_RE_04)
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	32	09:44 (WEA_RE_04) 10:16 (WEA_RE_04)
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	35	09:43 (WEA_RE_04) 10:18 (WEA_RE_04)
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	38	09:41 (WEA_RE_04) 10:19 (WEA_RE_04)
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	40	09:40 (WEA_RE_04) 10:20 (WEA_RE_04)
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	07:43 16:41	41	09:40 (WEA_RE_04) 10:21 (WEA_RE_04)
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	43	09:39 (WEA_RE_04) 10:22 (WEA_RE_04)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	45	09:38 (WEA_RE_04) 10:23 (WEA_RE_04)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	46	09:38 (WEA_RE_04) 10:24 (WEA_RE_04)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	47	09:38 (WEA_RE_04) 10:25 (WEA_RE_04)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	48	09:37 (WEA_RE_04) 10:25 (WEA_RE_04)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	49	09:37 (WEA_RE_04) 10:26 (WEA_RE_04)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	50	09:37 (WEA_RE_04) 10:27 (WEA_RE_04)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	50	09:37 (WEA_RE_04) 10:27 (WEA_RE_04)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	51	09:37 (WEA_RE_04) 10:28 (WEA_RE_04)
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	51	09:37 (WEA_RE_04) 10:28 (WEA_RE_04)
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	08:03 16:25	51	09:38 (WEA_RE_04) 10:29 (WEA_RE_04)
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	51	09:38 (WEA_RE_04) 10:29 (WEA_RE_04)
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	52	09:38 (WEA_RE_04) 10:30 (WEA_RE_04)
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	51	09:39 (WEA_RE_04) 10:30 (WEA_RE_04)
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	52	09:39 (WEA_RE_04) 10:31 (WEA_RE_04)
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	51	09:39 (WEA_RE_04) 10:30 (WEA_RE_04)
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:06	08:13 16:18	52	09:39 (WEA_RE_04) 10:31 (WEA_RE_04)
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	52	09:40 (WEA_RE_04) 10:32 (WEA_RE_04)
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	51	09:40 (WEA_RE_04) 10:31 (WEA_RE_04)
31	05:42 21:25	06:35 20:21		08:22 17:00			08:42 16:20
	Sonneneinstrahlung	508	457	382	330	262	238
	astr.max.mögl.Beschattung					1209	1705

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_38 - IO 38 Am Denkmal 15 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42 16:21	09:43 (WEA_RE_04) 10:39 (WEA_RE_05)	08:13 17:11	09:56 (WEA_RE_04) 10:30 (WEA_RE_04)	07:17 18:05	07:04 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	09:43 (WEA_RE_04) 10:39 (WEA_RE_05)	08:11 17:13	09:57 (WEA_RE_04) 10:29 (WEA_RE_04)	07:15 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	09:43 (WEA_RE_04) 10:38 (WEA_RE_05)	08:10 17:15	09:59 (WEA_RE_04) 10:29 (WEA_RE_04)	07:13 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:25	09:44 (WEA_RE_04) 10:38 (WEA_RE_05)	08:08 17:17	10:01 (WEA_RE_04) 10:27 (WEA_RE_04)	07:11 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	09:43 (WEA_RE_04) 10:37 (WEA_RE_05)	08:06 17:19	10:03 (WEA_RE_04) 10:25 (WEA_RE_04)	07:08 18:12	06:55 20:09	05:49 21:02	05:06 21:48
6	08:41 16:27	09:44 (WEA_RE_04) 10:37 (WEA_RE_05)	08:05 17:21	10:05 (WEA_RE_04) 10:22 (WEA_RE_04)	07:06 18:14	06:52 20:10	05:47 21:04	05:05 21:49
7	08:40 16:28	09:44 (WEA_RE_04) 10:34 (WEA_RE_05)	08:03 17:22	10:10 (WEA_RE_04) 10:16 (WEA_RE_04)	07:04 18:16	06:50 20:12	05:45 21:05	05:05 21:50
8	08:40 16:30	09:44 (WEA_RE_04) 10:28 (WEA_RE_04)	08:01 17:24	09:44 (WEA_RE_04) 10:28 (WEA_RE_04)	07:01 18:18	06:48 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	09:45 (WEA_RE_04) 10:29 (WEA_RE_04)	07:59 17:26	09:45 (WEA_RE_04) 10:29 (WEA_RE_04)	06:59 18:20	06:45 20:16	05:42 21:09	05:04 21:51
10	08:39 16:33	09:45 (WEA_RE_04) 10:30 (WEA_RE_04)	07:57 17:28	09:45 (WEA_RE_04) 10:30 (WEA_RE_04)	06:57 18:22	06:43 20:18	05:40 21:10	05:03 21:52
11	08:38 16:34	09:45 (WEA_RE_04) 10:30 (WEA_RE_04)	07:55 17:30	09:45 (WEA_RE_04) 10:30 (WEA_RE_04)	06:54 18:23	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:36	09:45 (WEA_RE_04) 10:30 (WEA_RE_04)	07:53 17:32	09:45 (WEA_RE_04) 10:30 (WEA_RE_04)	06:52 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	09:45 (WEA_RE_04) 10:31 (WEA_RE_04)	07:51 17:34	09:45 (WEA_RE_04) 10:31 (WEA_RE_04)	06:50 18:27	06:36 20:23	05:35 21:15	05:02 21:54
14	08:36 16:39	09:46 (WEA_RE_04) 10:31 (WEA_RE_04)	07:49 17:36	09:46 (WEA_RE_04) 10:31 (WEA_RE_04)	06:47 18:29	06:34 20:25	05:33 21:17	05:02 21:55
15	08:35 16:40	09:46 (WEA_RE_04) 10:32 (WEA_RE_04)	07:47 17:38	09:46 (WEA_RE_04) 10:32 (WEA_RE_04)	06:45 18:31	06:31 20:26	05:31 21:19	05:01 21:56
16	08:34 16:42	09:46 (WEA_RE_04) 10:32 (WEA_RE_04)	07:45 17:40	09:46 (WEA_RE_04) 10:32 (WEA_RE_04)	06:42 18:33	06:29 20:28	05:30 21:20	05:01 21:56
17	08:33 16:44	09:47 (WEA_RE_04) 10:33 (WEA_RE_04)	07:43 17:42	09:47 (WEA_RE_04) 10:33 (WEA_RE_04)	06:40 18:34	06:27 20:30	05:28 21:22	05:01 21:57
18	08:32 16:45	09:47 (WEA_RE_04) 10:34 (WEA_RE_04)	07:41 17:44	09:47 (WEA_RE_04) 10:34 (WEA_RE_04)	06:38 18:36	06:25 20:32	05:26 21:24	05:01 21:57
19	08:31 16:47	09:47 (WEA_RE_04) 10:33 (WEA_RE_04)	07:39 17:46	09:47 (WEA_RE_04) 10:33 (WEA_RE_04)	06:35 18:38	06:22 20:34	05:25 21:25	05:01 21:57
20	08:30 16:49	09:48 (WEA_RE_04) 10:34 (WEA_RE_04)	07:37 17:48	09:48 (WEA_RE_04) 10:34 (WEA_RE_04)	06:33 18:40	06:20 20:35	05:24 21:27	05:01 21:58
21	08:29 16:50	09:48 (WEA_RE_04) 10:34 (WEA_RE_04)	07:35 17:50	09:48 (WEA_RE_04) 10:34 (WEA_RE_04)	06:31 18:42	06:18 20:37	05:22 21:28	05:01 21:58
22	08:27 16:52	09:48 (WEA_RE_04) 10:34 (WEA_RE_04)	07:33 17:52	09:48 (WEA_RE_04) 10:34 (WEA_RE_04)	06:28 18:43	06:16 20:39	05:21 21:30	05:02 21:58
23	08:26 16:54	09:49 (WEA_RE_04) 10:34 (WEA_RE_04)	07:31 17:53	09:49 (WEA_RE_04) 10:34 (WEA_RE_04)	06:26 18:45	06:14 20:41	05:19 21:31	05:02 21:58
24	08:25 16:56	09:49 (WEA_RE_04) 10:34 (WEA_RE_04)	07:29 17:55	09:49 (WEA_RE_04) 10:34 (WEA_RE_04)	06:23 18:47	06:11 20:43	05:18 21:33	05:02 21:58
25	08:24 16:58	09:50 (WEA_RE_04) 10:34 (WEA_RE_04)	07:26 17:57	09:50 (WEA_RE_04) 10:34 (WEA_RE_04)	06:21 18:49	06:09 20:44	05:17 21:34	05:02 21:58
26	08:22 17:00	09:50 (WEA_RE_04) 10:33 (WEA_RE_04)	07:24 17:59	09:50 (WEA_RE_04) 10:33 (WEA_RE_04)	06:19 18:51	06:07 20:46	05:16 21:35	05:03 21:58
27	08:21 17:01	09:52 (WEA_RE_04) 10:34 (WEA_RE_04)	07:22 18:01	09:52 (WEA_RE_04) 10:34 (WEA_RE_04)	06:16 18:52	06:05 20:48	05:14 21:37	05:03 21:58
28	08:19 17:03	09:52 (WEA_RE_04) 10:33 (WEA_RE_04)	07:20 18:03	09:52 (WEA_RE_04) 10:33 (WEA_RE_04)	06:14 18:54	06:03 20:50	05:13 21:38	05:04 21:58
29	08:18 17:05	09:52 (WEA_RE_04) 10:32 (WEA_RE_04)	07:19 18:03	09:52 (WEA_RE_04) 10:32 (WEA_RE_04)	06:11 18:54	06:01 20:51	05:12 21:39	05:04 21:58
30	08:16 17:07	09:54 (WEA_RE_04) 10:32 (WEA_RE_04)	07:17 18:03	09:54 (WEA_RE_04) 10:32 (WEA_RE_04)	06:09 18:56	05:59 20:51	05:11 21:41	05:05 21:58
31	08:15 17:09	09:55 (WEA_RE_04) 10:31 (WEA_RE_04)	07:15 18:03	09:55 (WEA_RE_04) 10:31 (WEA_RE_04)	06:07 19:58	05:57 20:53	05:10 21:41	05:05 21:58
	Sonneneinstrahlung astr.max.mögl.Beschattung	254 1434	275 167	367 418	418 490	490 505		

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schatteneinde	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	---------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_38 - IO 38 Am Denkmal 15 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	08:19 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	08:20 16:15
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	08:22 16:14
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	08:23 16:13
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	08:25 16:13
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	08:26 16:12
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	08:27 16:12
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	08:28 16:12
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	08:29 16:11
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	07:43 16:41	08:31 16:11
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	08:32 16:11
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	08:33 16:11
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	08:34 16:11
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	08:35 16:11
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	08:36 16:11
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	08:36 16:11
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	08:37 16:11
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	08:38 16:12
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	08:39 16:12
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	08:39 16:13
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	08:03 16:25	08:40 16:13
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	08:40 16:13
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	08:41 16:14
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	08:41 16:15
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	08:41 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	08:42 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:07	08:13 16:18	08:42 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:06	08:14 16:18	08:42 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:21 18:04	08:16 16:17	08:42 16:19
31	05:42 21:25	06:35 20:21		08:22 18:02	08:17 17:00	08:42 16:20
	Sonneneinstrahlung	508	457	382	330	262
	astr.max.mögl.Beschattung				1057	238
						1696

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_39 - IO 39 Am Denkmal 26 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42 16:21	49 11:02 (WEA_RE_04)	08:13 17:11	07:17 18:05	07:04 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	49 11:03 (WEA_RE_04)	08:11 17:13	07:15 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	49 11:03 (WEA_RE_04)	08:10 17:15	07:13 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:24	50 11:04 (WEA_RE_04)	08:08 17:17	07:11 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	49 11:03 (WEA_RE_04)	08:06 17:19	07:08 18:12	06:55 20:09	05:49 21:02	05:06 21:48
6	08:41 16:27	49 11:04 (WEA_RE_04)	08:05 17:21	07:06 18:14	06:52 20:10	05:47 21:04	05:05 21:49
7	08:40 16:28	49 11:04 (WEA_RE_04)	08:03 17:22	07:04 18:16	06:50 20:12	05:45 21:05	05:05 21:50
8	08:40 16:30	48 11:04 (WEA_RE_04)	08:01 17:24	07:01 18:18	06:48 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	48 11:05 (WEA_RE_04)	07:59 17:26	06:59 18:20	06:45 20:16	05:42 21:09	05:04 21:51
10	08:39 16:33	48 11:05 (WEA_RE_04)	07:57 17:28	06:57 18:22	06:43 20:18	05:40 21:10	05:03 21:52
11	08:38 16:34	49 11:06 (WEA_RE_04)	07:55 17:30	06:54 18:23	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:36	48 11:06 (WEA_RE_04)	07:53 17:32	06:52 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	48 11:06 (WEA_RE_04)	07:51 17:34	06:50 18:27	06:36 20:23	05:35 21:15	05:02 21:54
14	08:36 16:39	47 11:06 (WEA_RE_04)	07:49 17:36	06:47 18:29	06:34 20:25	05:33 21:17	05:02 21:55
15	08:35 16:40	46 11:06 (WEA_RE_04)	07:47 17:38	06:45 18:31	06:31 20:26	05:31 21:19	05:01 21:56
16	08:34 16:42	46 11:06 (WEA_RE_04)	07:45 17:40	06:42 18:33	06:29 20:28	05:30 21:20	05:01 21:56
17	08:33 16:44	45 11:06 (WEA_RE_04)	07:43 17:42	06:40 18:34	06:27 20:30	05:28 21:22	05:01 21:57
18	08:32 16:45	45 11:07 (WEA_RE_04)	07:41 17:44	06:38 18:36	06:25 20:32	05:26 21:24	05:01 21:57
19	08:31 16:47	44 11:06 (WEA_RE_04)	07:39 17:46	06:35 18:38	06:22 20:34	05:25 21:25	05:01 21:57
20	08:30 16:49	43 11:06 (WEA_RE_04)	07:37 17:48	06:33 18:40	06:20 20:35	05:24 21:27	05:01 21:58
21	08:29 16:50	42 11:06 (WEA_RE_04)	07:35 17:50	06:31 18:42	06:18 20:37	05:22 21:28	05:01 21:58
22	08:27 16:52	40 11:05 (WEA_RE_04)	07:33 17:52	06:28 18:43	06:16 20:39	05:21 21:30	05:02 21:58
23	08:26 16:54	39 11:05 (WEA_RE_04)	07:31 17:53	06:26 18:45	06:14 20:41	05:19 21:31	05:02 21:58
24	08:25 16:56	37 11:04 (WEA_RE_04)	07:29 17:55	06:23 18:47	06:11 20:43	05:18 21:33	05:02 21:58
25	08:24 16:58	34 11:03 (WEA_RE_04)	07:26 17:57	06:21 18:49	06:09 20:44	05:17 21:34	05:02 21:58
26	08:22 17:00	33 11:02 (WEA_RE_04)	07:24 17:59	06:19 18:51	06:07 20:46	05:16 21:35	05:03 21:58
27	08:21 17:01	29 11:01 (WEA_RE_04)	07:22 18:01	06:16 18:52	06:05 20:48	05:14 21:37	05:03 21:58
28	08:19 17:03	26 10:59 (WEA_RE_04)	07:20 18:03	06:14 18:54	06:03 20:50	05:13 21:38	05:04 21:58
29	08:18 17:05	22 10:57 (WEA_RE_04)	07:19 18:04	06:13 18:55	06:02 20:51	05:12 21:39	05:04 21:58
30	08:16 17:07	16 10:55 (WEA_RE_04)	07:18 18:05	06:12 18:56	06:01 20:52	05:11 21:40	05:05 21:58
31	08:15 17:09	7 10:50 (WEA_RE_04)	07:17 18:06	06:11 18:57	06:00 20:53	05:10 21:41	05:05 21:58
Sonnenscheinstunden		254	275	367	418	490	505
astr.max.mögl.Beschattung		1274					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	--	---------------------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_39 - IO 39 Am Denkmal 26 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	48 08:19 49 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	49 08:20 49 16:15
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	48 08:22 48 16:14
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	48 08:23 48 16:13
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	48 08:25 48 16:13
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	49 08:26 50 16:12
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	49 08:27 49 16:12
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	49 08:28 49 16:12
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	49 08:29 49 16:11
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	07:43 16:41	8 08:31 49 16:11
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	17 08:32 50 16:11
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	22 08:33 49 16:11
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	26 08:34 49 16:11
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	29 08:35 49 16:11
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	33 08:36 49 16:11
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	34 08:36 49 16:11
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	37 08:37 49 16:11
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	39 08:38 49 16:12
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	40 08:38 48 16:12
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	41 08:39 49 16:12
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	08:03 16:25	43 08:40 49 16:13
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	44 08:40 49 16:13
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	45 08:41 49 16:14
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	46 08:41 49 16:15
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	46 08:41 49 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	46 08:42 49 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:06	08:13 16:18	47 08:42 49 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	47 08:42 49 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	48 08:42 49 16:19
31	05:42 21:25	06:35 20:21		08:22 17:00		48 08:42 49 16:20
	Sonneneinstrahlung	508	457	382	330	262
	astr.max.mögl.Beschattung				738	238
						1516

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_40 - IO 40 Saarländer Weg 23 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42	10:15 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09
	16:21	43 10:58 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43
2	08:42	10:16 (WEA_RE_04)	08:11	07:15	07:02	05:55	05:08
	16:22	43 10:59 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44
3	08:42	10:16 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07
	16:23	42 10:58 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45
4	08:41	10:17 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07
	16:24	42 10:59 (WEA_RE_04)	17:17	18:10	20:07	21:00	21:46
5	08:41	10:17 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06
	16:26	42 10:59 (WEA_RE_04)	17:19	18:12	20:09	21:02	21:48
6	08:41	10:18 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05
	16:27	42 11:00 (WEA_RE_04)	17:21	18:14	20:10	21:04	21:49
7	08:40	10:18 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05
	16:28	41 10:59 (WEA_RE_04)	17:22	18:16	20:12	21:05	21:50
8	08:40	10:18 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04
	16:30	41 10:59 (WEA_RE_04)	17:24	18:18	20:14	21:07	21:50
9	08:39	10:20 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03
	16:31	40 11:00 (WEA_RE_04)	17:26	18:20	20:16	21:09	21:51
10	08:39	10:20 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03
	16:33	40 11:00 (WEA_RE_04)	17:28	18:22	20:18	21:10	21:52
11	08:38	10:21 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03
	16:34	39 11:00 (WEA_RE_04)	17:30	18:23	20:19	21:12	21:53
12	08:37	10:21 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02
	16:36	39 11:00 (WEA_RE_04)	17:32	18:25	20:21	21:14	21:54
13	08:37	10:22 (WEA_RE_04)	07:51	06:50	06:36	05:35	05:02
	16:37	38 11:00 (WEA_RE_04)	17:34	18:27	20:23	21:15	21:54
14	08:36	10:23 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02
	16:39	37 11:00 (WEA_RE_04)	17:36	18:29	20:25	21:17	21:55
15	08:35	10:24 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01
	16:40	36 11:00 (WEA_RE_04)	17:38	18:31	20:26	21:19	21:56
16	08:34	10:25 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01
	16:42	34 10:59 (WEA_RE_04)	17:40	18:33	20:28	21:20	21:56
17	08:33	10:26 (WEA_RE_04)	07:43	06:40	06:27	05:28	05:01
	16:44	33 10:59 (WEA_RE_04)	17:42	18:34	20:30	21:22	21:57
18	08:32	10:28 (WEA_RE_04)	07:41	06:38	06:25	05:26	05:01
	16:45	31 10:59 (WEA_RE_04)	17:44	18:36	20:32	21:24	21:57
19	08:31	10:28 (WEA_RE_04)	07:39	06:35	06:22	05:25	05:01
	16:47	29 10:57 (WEA_RE_04)	17:46	18:38	20:34	21:25	21:57
20	08:30	10:30 (WEA_RE_04)	07:37	06:33	06:20	05:24	05:01
	16:49	27 10:57 (WEA_RE_04)	17:48	18:40	20:35	21:27	21:58
21	08:29	10:32 (WEA_RE_04)	07:35	06:31	06:18	05:22	05:01
	16:50	24 10:56 (WEA_RE_04)	17:50	18:42	20:37	21:28	21:58
22	08:27	10:33 (WEA_RE_04)	07:33	06:28	06:16	05:21	05:02
	16:52	21 10:54 (WEA_RE_04)	17:52	18:43	20:39	21:30	21:58
23	08:26	10:36 (WEA_RE_04)	07:31	06:26	06:14	05:19	05:02
	16:54	17 10:53 (WEA_RE_04)	17:53	18:45	20:41	21:31	21:58
24	08:25	10:39 (WEA_RE_04)	07:29	06:23	06:11	05:18	05:02
	16:56	10 10:49 (WEA_RE_04)	17:55	18:47	20:43	21:33	21:58
25	08:24		07:26	06:21	06:09	05:17	05:02
	16:58		17:57	18:49	20:44	21:34	21:58
26	08:22		07:24	06:19	06:07	05:16	05:03
	17:00		17:59	18:51	20:46	21:35	21:58
27	08:21		07:22	06:16	06:05	05:14	05:03
	17:01		18:01	18:52	20:48	21:37	21:58
28	08:19		07:20	06:14	06:03	05:13	05:04
	17:03		18:03	18:54	20:50	21:38	21:58
29	08:18			07:11	06:01	05:12	05:04
	17:05			19:56	20:51	21:39	21:58
30	08:16			07:09	05:59	05:11	05:05
	17:07			19:58	20:53	21:41	21:58
31	08:15			07:07		05:10	
	17:09			20:00		21:42	
Sonnenscheinstunden	254		275	367	418	490	505
astr.max.mögl.Beschattung	831						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	--	---------------------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_40 - IO 40 Saarländer Weg 23 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	39 08:19 40 16:15
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	40 08:20 40 16:15
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	41 08:22 41 16:14
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	42 08:23 42 16:13
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	42 08:25 42 16:13
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	42 08:26 42 16:12
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	42 08:27 42 16:12
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	42 08:28 42 16:12
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	43 08:29 43 16:11
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	07:43 16:41	43 08:31 43 16:11
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	43 08:32 43 16:11
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	43 08:33 43 16:11
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	43 08:34 43 16:11
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	43 08:35 43 16:11
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	44 08:36 44 16:11
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	44 08:36 43 16:11
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	44 08:37 44 16:11
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	44 08:38 44 16:12
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	44 08:39 44 16:12
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	44 08:39 44 16:12
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	08:03 16:25	44 08:40 44 16:13
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	44 08:40 44 16:13
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	44 08:41 44 16:14
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	44 08:41 44 16:15
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	44 08:41 43 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	43 08:42 43 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:06	08:13 16:18	43 08:42 43 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	43 08:42 43 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	43 08:42 43 16:19
31	05:42 21:25	06:35 20:21		08:22 17:00		43 08:42 43 16:20
Sonneneinstrahlung		508	457	382	330	262
astr.max.mögl.Beschattung					375	238
						1327

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_41 - IO 41 Saarländer Weg 37 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	10:13 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09	
	16:21	37	10:50 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43
2	08:42	10:14 (WEA_RE_04)	08:12	07:15	07:02	05:55	05:08	
	16:22	36	10:50 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44
3	08:42	10:14 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07	
	16:23	36	10:50 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45
4	08:41	10:15 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07	
	16:24	36	10:51 (WEA_RE_04)	17:17	18:10	20:07	21:00	21:46
5	08:41	10:15 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06	
	16:26	35	10:50 (WEA_RE_04)	17:19	18:12	20:09	21:02	21:48
6	08:41	10:17 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05	
	16:27	34	10:51 (WEA_RE_04)	17:21	18:14	20:10	21:04	21:49
7	08:40	10:17 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05	
	16:28	34	10:51 (WEA_RE_04)	17:22	18:16	20:12	21:05	21:50
8	08:40	10:17 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04	
	16:30	33	10:50 (WEA_RE_04)	17:24	18:18	20:14	21:07	21:50
9	08:39	10:19 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03	
	16:31	32	10:51 (WEA_RE_04)	17:26	18:20	20:16	21:09	21:51
10	08:39	10:20 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03	
	16:33	31	10:51 (WEA_RE_04)	17:28	18:22	20:18	21:10	21:52
11	08:38	10:20 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03	
	16:34	30	10:50 (WEA_RE_04)	17:30	18:23	20:19	21:12	21:53
12	08:37	10:21 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02	
	16:36	29	10:50 (WEA_RE_04)	17:32	18:25	20:21	21:14	21:54
13	08:37	10:22 (WEA_RE_04)	07:51	06:50	06:36	05:35	05:02	
	16:37	28	10:50 (WEA_RE_04)	17:34	18:27	20:23	21:15	21:54
14	08:36	10:23 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02	
	16:39	26	10:49 (WEA_RE_04)	17:36	18:29	20:25	21:17	21:55
15	08:35	10:25 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01	
	16:40	24	10:49 (WEA_RE_04)	17:38	18:31	20:26	21:19	21:56
16	08:34	10:26 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01	
	16:42	22	10:48 (WEA_RE_04)	17:40	18:33	20:28	21:20	21:56
17	08:33	10:28 (WEA_RE_04)	07:43	06:40	06:27	05:28	05:01	
	16:44	19	10:47 (WEA_RE_04)	17:42	18:34	20:30	21:22	21:57
18	08:32	10:31 (WEA_RE_04)	07:41	06:38	06:25	05:26	05:01	
	16:45	14	10:45 (WEA_RE_04)	17:44	18:36	20:32	21:24	21:57
19	08:31	10:33 (WEA_RE_04)	07:39	06:35	06:22	05:25	05:01	
	16:47	9	10:42 (WEA_RE_04)	17:46	18:38	20:34	21:25	21:57
20	08:30	07:37	06:33	06:20	05:24	05:01		
	16:49	17:48	18:40	20:35	21:27	21:58		
21	08:29	07:35	06:31	06:18	05:22	05:01		
	16:50	17:50	18:42	20:37	21:28	21:58		
22	08:27	07:33	06:28	06:16	05:21	05:02		
	16:52	17:52	18:43	20:39	21:30	21:58		
23	08:26	07:31	06:26	06:14	05:19	05:02		
	16:54	17:53	18:45	20:41	21:31	21:58		
24	08:25	07:29	06:23	06:11	05:18	05:02		
	16:56	17:55	18:47	20:43	21:33	21:58		
25	08:24	07:26	06:21	06:09	05:17	05:02		
	16:58	17:57	18:49	20:44	21:34	21:58		
26	08:22	07:24	06:19	06:07	05:16	05:03		
	17:00	17:59	18:51	20:46	21:35	21:58		
27	08:21	07:22	06:16	06:05	05:14	05:03		
	17:01	18:01	18:52	20:48	21:37	21:58		
28	08:19	07:20	06:14	06:03	05:13	05:04		
	17:03	18:03	18:54	20:50	21:38	21:58		
29	08:18		07:11	06:01	05:12	05:04		
	17:05		19:56	20:51	21:39	21:58		
30	08:16		07:09	05:59	05:11	05:05		
	17:07		19:58	20:53	21:41	21:58		
31	08:15		07:07		05:10			
	17:09		20:00		21:42			
Sonnenscheinstunden	254	275	367	418	490	505		
astr.max.mögl.Beschattung	545							

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
	Sonnenuntergang (SS:MM)					

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_41 - IO 41 Saarländer Weg 37 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	30 08:19 10:03 (WEA_RE_04)
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	31 08:20 10:02 (WEA_RE_04)
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	32 08:22 10:02 (WEA_RE_04)
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	33 08:23 10:02 (WEA_RE_04)
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	34 08:25 10:03 (WEA_RE_04)
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	34 08:26 10:02 (WEA_RE_04)
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	35 08:27 10:02 (WEA_RE_04)
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	36 08:28 10:03 (WEA_RE_04)
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	36 08:30 10:03 (WEA_RE_04)
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	07:43 16:41	37 08:31 10:03 (WEA_RE_04)
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	37 08:32 10:03 (WEA_RE_04)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	37 08:33 10:04 (WEA_RE_04)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	37 08:34 10:04 (WEA_RE_04)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	37 08:35 10:05 (WEA_RE_04)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	37 08:36 10:05 (WEA_RE_04)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	38 08:36 10:06 (WEA_RE_04)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	37 08:37 10:06 (WEA_RE_04)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	38 08:38 10:06 (WEA_RE_04)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	38 08:39 10:07 (WEA_RE_04)
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	38 08:39 10:07 (WEA_RE_04)
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	08:03 16:25	38 08:40 10:08 (WEA_RE_04)
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	38 08:40 10:08 (WEA_RE_04)
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	9 10:10 (WEA_RE_04) 10:19 (WEA_RE_04)	38 08:41 16:13 10:08 (WEA_RE_04)
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	14 10:22 (WEA_RE_04) 10:06 (WEA_RE_04)	38 08:41 16:14 10:07 (WEA_RE_04)
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	19 10:25 (WEA_RE_04) 10:06 (WEA_RE_04)	38 08:41 16:15 10:10 (WEA_RE_04)
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	21 10:27 (WEA_RE_04) 10:04 (WEA_RE_04)	37 08:42 16:15 10:10 (WEA_RE_04)
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:06	24 10:28 (WEA_RE_04) 10:04 (WEA_RE_04)	38 08:42 16:16 10:10 (WEA_RE_04)
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	25 10:29 (WEA_RE_04) 10:03 (WEA_RE_04)	38 08:42 16:17 10:11 (WEA_RE_04)
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	28 10:31 (WEA_RE_04) 10:02 (WEA_RE_04)	37 08:42 16:18 10:12 (WEA_RE_04)
31	05:42 21:25	06:35 20:21		08:22 17:00	29 10:31 (WEA_RE_04)	37 08:42 16:19 10:12 (WEA_RE_04)
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382	330	262	238
				169		1125

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM) Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten) Schattende (WEA mit letztem Schatten)
--------------	--	----------------------	--	---

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_42 - IO 42 Saarländer Weg 30 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42	10:26 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09
	16:21	35 11:01 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43
2	08:42	10:27 (WEA_RE_04)	08:11	07:15	07:02	05:55	05:08
	16:22	34 11:01 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44
3	08:42	10:27 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07
	16:23	34 11:01 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45
4	08:41	10:28 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07
	16:24	33 11:01 (WEA_RE_04)	17:17	18:10	20:07	21:00	21:46
5	08:41	10:29 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06
	16:26	32 11:01 (WEA_RE_04)	17:19	18:12	20:09	21:02	21:48
6	08:41	10:30 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05
	16:27	31 11:01 (WEA_RE_04)	17:21	18:14	20:10	21:04	21:49
7	08:40	10:31 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05
	16:28	30 11:01 (WEA_RE_04)	17:22	18:16	20:12	21:05	21:50
8	08:40	10:31 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04
	16:30	29 11:00 (WEA_RE_04)	17:24	18:18	20:14	21:07	21:50
9	08:39	10:33 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03
	16:31	28 11:01 (WEA_RE_04)	17:26	18:20	20:16	21:09	21:51
10	08:39	10:34 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03
	16:33	26 11:00 (WEA_RE_04)	17:28	18:22	20:18	21:10	21:52
11	08:38	10:35 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03
	16:34	25 11:00 (WEA_RE_04)	17:30	18:23	20:19	21:12	21:53
12	08:37	10:36 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02
	16:36	23 10:59 (WEA_RE_04)	17:32	18:25	20:21	21:14	21:54
13	08:37	10:38 (WEA_RE_04)	07:51	06:50	06:36	05:35	05:02
	16:37	20 10:58 (WEA_RE_04)	17:34	18:27	20:23	21:15	21:54
14	08:36	10:39 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02
	16:39	18 10:57 (WEA_RE_04)	17:36	18:29	20:25	21:17	21:55
15	08:35	10:42 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01
	16:40	14 10:56 (WEA_RE_04)	17:38	18:31	20:26	21:19	21:56
16	08:34	10:45 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01
	16:42	8 10:53 (WEA_RE_04)	17:40	18:33	20:28	21:20	21:56
17	08:33		07:43	06:40	06:27	05:28	05:01
	16:44		17:42	18:34	20:30	21:22	21:57
18	08:32		07:41	06:38	06:25	05:26	05:01
	16:45		17:44	18:36	20:32	21:24	21:57
19	08:31		07:39	06:35	06:22	05:25	05:01
	16:47		17:46	18:38	20:34	21:25	21:57
20	08:30		07:37	06:33	06:20	05:24	05:01
	16:49		17:48	18:40	20:35	21:27	21:58
21	08:29		07:35	06:31	06:18	05:22	05:01
	16:50		17:50	18:42	20:37	21:28	21:58
22	08:27		07:33	06:28	06:16	05:21	05:02
	16:52		17:52	18:43	20:39	21:30	21:58
23	08:26		07:31	06:26	06:14	05:19	05:02
	16:54		17:53	18:45	20:41	21:31	21:58
24	08:25		07:29	06:23	06:11	05:18	05:02
	16:56		17:55	18:47	20:43	21:33	21:58
25	08:24		07:26	06:21	06:09	05:17	05:02
	16:58		17:57	18:49	20:44	21:34	21:58
26	08:22		07:24	06:19	06:07	05:16	05:03
	17:00		17:59	18:51	20:46	21:35	21:58
27	08:21		07:22	06:16	06:05	05:14	05:03
	17:01		18:01	18:52	20:48	21:37	21:58
28	08:19		07:20	06:14	06:03	05:13	05:04
	17:03		18:03	18:54	20:50	21:38	21:58
29	08:18			07:11	06:01	05:12	05:04
	17:05			19:56	20:51	21:39	21:58
30	08:16			07:09	05:59	05:11	05:05
	17:07			19:58	20:53	21:41	21:58
31	08:15			07:07		05:10	
	17:09			20:00		21:42	
Sonnenscheinstunden	254		275	367	418	490	505
astr.max.mögl.Beschattung	420						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_42 - IO 42 Saarländer Weg 30 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember	
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16	
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	25 08:19 16:15	
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	26 08:20 16:15	
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	28 08:22 16:14	
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	29 08:23 16:13	
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	30 08:25 16:13	
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	31 08:26 16:12	
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	32 08:27 16:12	
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	32 08:28 16:12	
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	34 08:29 16:11	
11	05:15 21:52	06:01 21:05	06:53 19:55	07:46 18:44	07:43 16:41	34 08:31 16:11	
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	35 08:32 16:11	
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	34 08:33 16:11	
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	35 08:34 16:11	
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	35 08:35 16:11	
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	36 08:36 16:11	
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	36 08:36 16:11	
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	37 08:37 16:11	
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	36 08:38 16:12	
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	36 08:39 16:12	
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	36 08:39 16:12	
22	05:29 21:39	06:19 20:42	07:12 19:29	08:06 18:19	08:03 16:25	36 08:40 16:13	
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	36 08:40 16:13	
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	36 08:41 16:14	
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 17:13	08:08 16:21	36 08:41 16:15	
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 17:11	08:10 16:20	36 08:41 16:15	
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 17:09	08:11 16:19	36 08:42 16:16	
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 17:06	08:13 16:18	36 08:42 16:17	
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 17:04	08:14 16:18	35 08:42 16:18	
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 17:02	08:16 16:17	35 08:42 16:19	
31	05:42 21:25	06:35 20:21		08:22 17:00		35 08:42 16:20	
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382	330	262	82	238 1051

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattenende	Schattenanfang (WEA mit erstem Schatten)	Schattenende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	--------------------------------	--	---

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_43 - IO 43 Am Spielplatz 5 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlungsrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:42	10:51 (WEA_RE_04)	08:13	07:17	07:04	05:57	05:09
	16:21	47 11:38 (WEA_RE_04)	17:11	18:05	20:01	20:55	21:43
2	08:42	10:52 (WEA_RE_04)	08:11	07:15	07:02	05:55	05:08
	16:22	47 11:39 (WEA_RE_04)	17:13	18:07	20:03	20:57	21:44
3	08:42	10:52 (WEA_RE_04)	08:10	07:13	06:59	05:53	05:07
	16:23	46 11:38 (WEA_RE_04)	17:15	18:09	20:05	20:58	21:45
4	08:41	10:53 (WEA_RE_04)	08:08	07:11	06:57	05:51	05:07
	16:24	46 11:39 (WEA_RE_04)	17:17	18:10	20:07	21:00	21:46
5	08:41	10:53 (WEA_RE_04)	08:06	07:08	06:55	05:49	05:06
	16:26	46 11:39 (WEA_RE_04)	17:19	18:12	20:09	21:02	21:48
6	08:41	10:55 (WEA_RE_04)	08:05	07:06	06:52	05:47	05:05
	16:27	44 11:39 (WEA_RE_04)	17:21	18:14	20:10	21:04	21:49
7	08:40	10:55 (WEA_RE_04)	08:03	07:04	06:50	05:45	05:05
	16:28	44 11:39 (WEA_RE_04)	17:22	18:16	20:12	21:05	21:50
8	08:40	10:55 (WEA_RE_04)	08:01	07:01	06:48	05:43	05:04
	16:30	44 11:39 (WEA_RE_04)	17:24	18:18	20:14	21:07	21:50
9	08:39	10:57 (WEA_RE_04)	07:59	06:59	06:45	05:42	05:03
	16:31	42 11:39 (WEA_RE_04)	17:26	18:20	20:16	21:09	21:51
10	08:39	10:57 (WEA_RE_04)	07:57	06:57	06:43	05:40	05:03
	16:33	42 11:39 (WEA_RE_04)	17:28	18:22	20:18	21:10	21:52
11	08:38	10:58 (WEA_RE_04)	07:55	06:54	06:41	05:38	05:03
	16:34	41 11:39 (WEA_RE_04)	17:30	18:23	20:19	21:12	21:53
12	08:37	10:59 (WEA_RE_04)	07:53	06:52	06:38	05:36	05:02
	16:36	40 11:39 (WEA_RE_04)	17:32	18:25	20:21	21:14	21:54
13	08:37	11:00 (WEA_RE_04)	07:51	06:50	06:36	05:35	05:02
	16:37	38 11:38 (WEA_RE_04)	17:34	18:27	20:23	21:15	21:54
14	08:36	11:01 (WEA_RE_04)	07:49	06:47	06:34	05:33	05:02
	16:39	37 11:38 (WEA_RE_04)	17:36	18:29	20:25	21:17	21:55
15	08:35	11:02 (WEA_RE_04)	07:47	06:45	06:31	05:31	05:01
	16:40	36 11:38 (WEA_RE_04)	17:38	18:31	20:26	21:19	21:56
16	08:34	11:03 (WEA_RE_04)	07:45	06:42	06:29	05:30	05:01
	16:42	34 11:37 (WEA_RE_04)	17:40	18:33	20:28	21:20	21:56
17	08:33	11:05 (WEA_RE_04)	07:43	06:40	06:27	05:28	05:01
	16:44	32 11:37 (WEA_RE_04)	17:42	18:34	20:30	21:22	21:57
18	08:32	11:06 (WEA_RE_04)	07:41	06:38	06:25	05:26	05:01
	16:45	30 11:36 (WEA_RE_04)	17:44	18:36	20:32	21:24	21:57
19	08:31	11:07 (WEA_RE_04)	07:39	06:35	06:22	05:25	05:01
	16:47	27 11:34 (WEA_RE_04)	17:46	18:38	20:34	21:25	21:57
20	08:30	11:10 (WEA_RE_04)	07:37	06:33	06:20	05:24	05:01
	16:49	23 11:33 (WEA_RE_04)	17:48	18:40	20:35	21:27	21:58
21	08:29	11:12 (WEA_RE_04)	07:35	06:31	06:18	05:22	05:01
	16:50	20 11:32 (WEA_RE_04)	17:50	18:42	20:37	21:28	21:58
22	08:27	11:15 (WEA_RE_04)	07:33	06:28	06:16	05:21	05:02
	16:52	14 11:29 (WEA_RE_04)	17:52	18:43	20:39	21:30	21:58
23	08:26		07:31	06:26	06:14	05:19	05:02
	16:54		17:53	18:45	20:41	21:31	21:58
24	08:25		07:28	06:23	06:11	05:18	05:02
	16:56		17:55	18:47	20:42	21:33	21:58
25	08:24		07:26	06:21	06:09	05:17	05:02
	16:58		17:57	18:49	20:44	21:34	21:58
26	08:22		07:24	06:19	06:07	05:16	05:03
	17:00		17:59	18:51	20:46	21:35	21:58
27	08:21		07:22	06:16	06:05	05:14	05:03
	17:01		18:01	18:52	20:48	21:37	21:58
28	08:19		07:20	06:14	06:03	05:13	05:04
	17:03		18:03	18:54	20:50	21:38	21:58
29	08:18			07:11	06:01	05:12	05:04
	17:05			19:56	20:51	21:39	21:58
30	08:16			07:09	05:59	05:11	05:05
	17:07			19:58	20:53	21:41	21:58
31	08:15			07:07		05:10	
	17:09			20:00		21:42	
Sonnenscheinstunden	254		275	367	418	490	505
astr.max.mögl.Beschattung	820						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
	Sonnenuntergang (SS:MM)					

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_43 - IO 43 Am Spielplatz 5 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:58	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:59	08:17 16:16
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	41 08:19 41 11:22 (WEA_RE_04)
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	08:20 43 11:23 (WEA_RE_04)
4	05:08 21:56	05:49 21:18	06:42 20:12	07:33 19:00	07:30 16:53	08:22 44 11:24 (WEA_RE_04)
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	08:23 44 11:24 (WEA_RE_04)
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	08:25 44 11:25 (WEA_RE_04)
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	08:26 45 11:26 (WEA_RE_04)
8	05:12 21:54	05:56 21:11	06:48 20:03	07:40 18:51	07:37 16:46	08:27 46 11:26 (WEA_RE_04)
9	05:13 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	08:28 46 11:27 (WEA_RE_04)
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	08:29 47 11:28 (WEA_RE_04)
11	05:15 21:52	06:01 21:05	06:53 19:55	07:45 18:44	07:43 16:41	08:31 47 11:28 (WEA_RE_04)
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	08:32 47 11:29 (WEA_RE_04)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	08:33 47 11:29 (WEA_RE_04)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	08:34 48 11:30 (WEA_RE_04)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:35	07:50 16:34	08:35 47 11:30 (WEA_RE_04)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:55 18:32	07:52 16:33	08:36 48 11:31 (WEA_RE_04)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	08:36 48 11:32 (WEA_RE_04)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	08:37 47 11:32 (WEA_RE_04)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:58 16:29	08:38 48 11:32 (WEA_RE_04)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	10:50 (WEA_RE_04) 08:38 14 11:04 (WEA_RE_04) 16:12
21	05:27 21:41	06:18 20:44	07:11 19:31	08:04 18:21	08:01 16:26	08:39 20 11:07 (WEA_RE_04) 16:12
22	05:29 21:39	06:19 20:42	07:12 19:29	08:05 18:19	08:03 16:25	10:46 (WEA_RE_04) 08:40 23 11:09 (WEA_RE_04) 16:13
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:05 16:24	10:44 (WEA_RE_04) 08:40 27 11:11 (WEA_RE_04) 16:13
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	10:44 (WEA_RE_04) 08:41 29 11:13 (WEA_RE_04) 16:14
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 18:13	08:08 16:21	10:43 (WEA_RE_04) 08:41 32 11:15 (WEA_RE_04) 16:15
26	05:35 21:34	06:26 20:33	07:19 19:19	08:13 18:11	08:10 16:20	10:42 (WEA_RE_04) 08:41 34 11:16 (WEA_RE_04) 16:15
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 18:09	08:11 16:19	10:41 (WEA_RE_04) 08:42 36 11:17 (WEA_RE_04) 16:16
28	05:38 21:30	06:30 20:28	07:23 19:14	08:17 18:06	08:13 16:18	10:41 (WEA_RE_04) 08:42 37 11:18 (WEA_RE_04) 16:17
29	05:39 21:29	06:31 20:26	07:24 19:12	08:19 18:04	08:14 16:18	10:41 (WEA_RE_04) 08:42 39 11:20 (WEA_RE_04) 16:18
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 18:02	08:16 16:17	10:40 (WEA_RE_04) 08:42 40 11:20 (WEA_RE_04) 16:19
31	05:42 21:25	06:35 20:21		08:22 17:00		08:42 47 11:37 (WEA_RE_04)
Sonneneinstrahlung		508	457	382	330	262
astr.max.mögl.Beschattung					331	238
						1439

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_44 - IO 44 Unter den Linden 22 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42 16:21	14:17 (WEA_RE_04) 15:05 (WEA_RE_04)	08:13 17:11	14:26 (WEA_RE_04) 15:16 (WEA_RE_04)	07:17 18:05	07:04 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	14:17 (WEA_RE_04) 15:05 (WEA_RE_04)	08:11 17:13	14:27 (WEA_RE_04) 15:15 (WEA_RE_04)	07:15 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	14:17 (WEA_RE_04) 15:06 (WEA_RE_04)	08:10 17:15	14:29 (WEA_RE_04) 15:16 (WEA_RE_04)	07:13 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:24	14:18 (WEA_RE_04) 15:07 (WEA_RE_04)	08:08 17:17	14:29 (WEA_RE_04) 15:15 (WEA_RE_04)	07:11 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	14:17 (WEA_RE_04) 15:07 (WEA_RE_04)	08:06 17:19	14:30 (WEA_RE_04) 15:14 (WEA_RE_04)	07:08 18:12	06:55 20:09	05:49 21:02	05:06 21:47
6	08:41 16:27	14:18 (WEA_RE_04) 15:08 (WEA_RE_04)	08:05 17:20	14:32 (WEA_RE_04) 15:13 (WEA_RE_04)	07:06 18:14	06:52 20:10	05:47 21:04	05:05 21:48
7	08:40 16:28	14:18 (WEA_RE_04) 15:08 (WEA_RE_04)	08:03 17:22	14:33 (WEA_RE_04) 15:12 (WEA_RE_04)	07:04 18:16	06:50 20:12	05:45 21:05	05:05 21:49
8	08:40 16:30	14:18 (WEA_RE_04) 15:09 (WEA_RE_04)	08:01 17:24	14:35 (WEA_RE_04) 15:11 (WEA_RE_04)	07:01 18:18	06:48 20:14	05:43 21:07	05:04 21:50
9	08:39 16:31	14:19 (WEA_RE_04) 15:10 (WEA_RE_04)	07:59 17:26	14:36 (WEA_RE_04) 15:09 (WEA_RE_04)	06:59 18:20	06:45 20:16	05:42 21:09	05:03 21:51
10	08:39 16:32	14:19 (WEA_RE_04) 15:11 (WEA_RE_04)	07:57 17:28	14:39 (WEA_RE_04) 15:07 (WEA_RE_04)	06:57 18:22	06:43 20:17	05:40 21:10	05:03 21:52
11	08:38 16:34	14:19 (WEA_RE_04) 15:11 (WEA_RE_04)	07:55 17:30	14:42 (WEA_RE_04) 15:05 (WEA_RE_04)	06:54 18:23	06:41 20:19	05:38 21:12	05:03 21:53
12	08:37 16:35	14:19 (WEA_RE_04) 15:12 (WEA_RE_04)	07:53 17:32	14:46 (WEA_RE_04) 15:01 (WEA_RE_04)	06:52 18:25	06:38 20:21	05:36 21:14	05:02 21:54
13	08:37 16:37	14:19 (WEA_RE_04) 15:12 (WEA_RE_04)	07:51 17:34	14:49 (WEA_RE_04) 18:27	06:50 20:23	06:36 21:15	05:34 21:54	05:02 21:54
14	08:36 16:39	14:19 (WEA_RE_04) 15:13 (WEA_RE_04)	07:49 17:36	14:51 (WEA_RE_04) 18:29	06:47 20:25	06:34 21:17	05:33 21:55	05:02 21:55
15	08:35 16:40	14:19 (WEA_RE_04) 15:13 (WEA_RE_04)	07:47 17:38	14:54 (WEA_RE_04) 18:31	06:45 20:26	06:31 21:19	05:31 21:56	05:01 21:56
16	08:34 16:42	14:20 (WEA_RE_04) 15:14 (WEA_RE_04)	07:45 17:40	14:57 (WEA_RE_04) 18:33	06:42 20:28	06:29 21:20	05:30 21:56	05:01 21:56
17	08:33 16:44	14:20 (WEA_RE_04) 15:15 (WEA_RE_04)	07:43 17:42	14:59 (WEA_RE_04) 18:34	06:40 20:30	06:27 21:22	05:28 21:57	05:01 21:57
18	08:32 16:45	14:20 (WEA_RE_04) 15:15 (WEA_RE_04)	07:41 17:44	15:01 (WEA_RE_04) 18:36	06:38 20:32	06:25 21:23	05:26 21:57	05:01 21:57
19	08:31 16:47	14:20 (WEA_RE_04) 15:15 (WEA_RE_04)	07:39 17:46	15:04 (WEA_RE_04) 18:38	06:35 20:34	06:22 21:25	05:25 21:57	05:01 21:57
20	08:30 16:49	14:21 (WEA_RE_04) 15:16 (WEA_RE_04)	07:37 17:48	15:06 (WEA_RE_04) 18:40	06:33 20:35	06:20 21:27	05:23 21:58	05:01 21:58
21	08:29 16:50	14:21 (WEA_RE_04) 15:16 (WEA_RE_04)	07:35 17:50	15:09 (WEA_RE_04) 18:42	06:30 20:37	06:18 21:28	05:22 21:58	05:01 21:58
22	08:27 16:52	14:21 (WEA_RE_04) 15:16 (WEA_RE_04)	07:33 17:51	15:11 (WEA_RE_04) 18:43	06:28 20:39	06:16 21:30	05:21 21:58	05:02 21:58
23	08:26 16:54	14:22 (WEA_RE_04) 15:17 (WEA_RE_04)	07:31 17:53	15:13 (WEA_RE_04) 18:45	06:26 20:41	06:14 21:31	05:19 21:58	05:02 21:58
24	08:25 16:56	14:22 (WEA_RE_04) 15:16 (WEA_RE_04)	07:28 17:55	15:16 (WEA_RE_04) 18:47	06:23 20:42	06:11 21:32	05:18 21:58	05:02 21:58
25	08:24 16:58	14:22 (WEA_RE_04) 15:17 (WEA_RE_04)	07:26 17:57	15:18 (WEA_RE_04) 18:49	06:21 20:44	06:09 21:34	05:17 21:58	05:02 21:58
26	08:22 16:59	14:22 (WEA_RE_04) 15:17 (WEA_RE_04)	07:24 17:59	15:20 (WEA_RE_04) 18:51	06:19 20:46	06:07 21:35	05:16 21:58	05:03 21:58
27	08:21 17:01	14:23 (WEA_RE_04) 15:17 (WEA_RE_04)	07:22 18:01	15:22 (WEA_RE_04) 18:52	06:16 20:48	06:05 21:37	05:14 21:58	05:03 21:58
28	08:19 17:03	14:24 (WEA_RE_04) 15:17 (WEA_RE_04)	07:20 18:03	15:24 (WEA_RE_04) 18:54	06:14 20:50	06:03 21:38	05:13 21:58	05:04 21:58
29	08:18 17:05	14:24 (WEA_RE_04) 15:17 (WEA_RE_04)	07:19 18:04	15:26 (WEA_RE_04) 18:56	06:11 20:51	06:01 21:39	05:12 21:58	05:04 21:58
30	08:16 17:07	14:25 (WEA_RE_04) 15:17 (WEA_RE_04)	07:18 18:05	15:28 (WEA_RE_04) 19:00	06:09 20:53	05:59 21:41	05:11 21:58	05:05 21:58
31	08:15 17:09	14:26 (WEA_RE_04) 15:17 (WEA_RE_04)	07:17 18:06	15:30 (WEA_RE_04) 19:02	06:07 20:55	05:57 21:42	05:10 21:58	05:05 21:58
Sonneneinstrahlung		254	275	367	418	490	505	
astr.max.mögl.Beschattung		1630	450	367	418	490	505	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)		Zeitpunkt (SS:MM) Schattende	(WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_44 - IO 44 Unter den Linden 22 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober		November		Dezember	
1	05:06	05:44	06:36	07:28		07:24	14:06 (WEA_RE_04)	08:17	14:01 (WEA_RE_04)
	21:57	21:24	20:19	19:07		16:58	14:37 (WEA_RE_04)	16:16	14:53 (WEA_RE_04)
2	05:06	05:46	06:38	07:30		07:26	14:06 (WEA_RE_04)	08:19	14:02 (WEA_RE_04)
	21:57	21:22	20:17	19:05		16:57	14:39 (WEA_RE_04)	16:15	14:54 (WEA_RE_04)
3	05:07	05:47	06:40	07:31		07:28	14:04 (WEA_RE_04)	08:20	14:02 (WEA_RE_04)
	21:57	21:20	20:14	19:02		16:55	14:40 (WEA_RE_04)	16:14	14:53 (WEA_RE_04)
4	05:08	05:49	06:41	07:33		07:30	14:02 (WEA_RE_04)	08:22	14:03 (WEA_RE_04)
	21:56	21:18	20:12	19:00		16:53	14:42 (WEA_RE_04)	16:14	14:54 (WEA_RE_04)
5	05:09	05:51	06:43	07:35		07:32	14:01 (WEA_RE_04)	08:23	14:03 (WEA_RE_04)
	21:56	21:17	20:10	18:58		16:51	14:43 (WEA_RE_04)	16:13	14:54 (WEA_RE_04)
6	05:10	05:52	06:45	07:37		07:34	14:00 (WEA_RE_04)	08:24	14:04 (WEA_RE_04)
	21:55	21:15	20:07	18:55		16:49	14:44 (WEA_RE_04)	16:13	14:54 (WEA_RE_04)
7	05:11	05:54	06:47	07:38		07:35	13:59 (WEA_RE_04)	08:26	14:05 (WEA_RE_04)
	21:55	21:13	20:05	18:53		16:47	14:45 (WEA_RE_04)	16:12	14:54 (WEA_RE_04)
8	05:11	05:55	06:48	07:40		07:37	13:58 (WEA_RE_04)	08:27	14:05 (WEA_RE_04)
	21:54	21:11	20:03	18:51		16:46	14:46 (WEA_RE_04)	16:12	14:54 (WEA_RE_04)
9	05:13	05:57	06:50	07:42		07:39	13:58 (WEA_RE_04)	08:28	14:06 (WEA_RE_04)
	21:53	21:09	20:00	18:48		16:44	14:46 (WEA_RE_04)	16:12	14:55 (WEA_RE_04)
10	05:14	05:59	06:52	07:44		07:41	13:57 (WEA_RE_04)	08:29	14:07 (WEA_RE_04)
	21:52	21:07	19:58	18:46		16:42	14:47 (WEA_RE_04)	16:11	14:55 (WEA_RE_04)
11	05:15	06:01	06:53	07:45		07:43	13:56 (WEA_RE_04)	08:31	14:07 (WEA_RE_04)
	21:52	21:05	19:55	18:44		16:40	14:47 (WEA_RE_04)	16:11	14:55 (WEA_RE_04)
12	05:16	06:02	06:55	07:47		07:45	13:56 (WEA_RE_04)	08:32	14:08 (WEA_RE_04)
	21:51	21:03	19:53	18:41		16:39	14:48 (WEA_RE_04)	16:11	14:55 (WEA_RE_04)
13	05:17	06:04	06:57	07:49		07:47	13:56 (WEA_RE_04)	08:33	14:08 (WEA_RE_04)
	21:50	21:01	19:51	18:39		16:37	14:48 (WEA_RE_04)	16:11	14:55 (WEA_RE_04)
14	05:18	06:06	06:59	07:51		07:48	13:56 (WEA_RE_04)	08:34	14:09 (WEA_RE_04)
	21:49	20:59	19:48	18:37		16:36	14:49 (WEA_RE_04)	16:11	14:55 (WEA_RE_04)
15	05:19	06:07	07:00	07:53		07:50	13:55 (WEA_RE_04)	08:35	13:28 (WEA_RE_05)
	21:48	20:57	19:46	18:34		16:34	14:49 (WEA_RE_04)	16:11	14:56 (WEA_RE_04)
16	05:21	06:09	07:02	07:54		07:52	13:55 (WEA_RE_04)	08:35	13:28 (WEA_RE_05)
	21:47	20:55	19:43	18:32		16:33	14:50 (WEA_RE_04)	16:11	14:56 (WEA_RE_04)
17	05:22	06:11	07:04	07:56		07:54	13:55 (WEA_RE_04)	08:36	13:27 (WEA_RE_05)
	21:46	20:53	19:41	18:30		16:31	14:50 (WEA_RE_04)	16:11	14:57 (WEA_RE_04)
18	05:23	06:12	07:05	07:58		07:56	13:55 (WEA_RE_04)	08:37	13:27 (WEA_RE_05)
	21:44	20:51	19:39	18:28		16:30	14:50 (WEA_RE_04)	16:11	14:56 (WEA_RE_04)
19	05:25	06:14	07:07	08:00		07:57	13:56 (WEA_RE_04)	08:38	13:27 (WEA_RE_05)
	21:43	20:48	19:36	18:26		16:29	14:51 (WEA_RE_04)	16:12	14:57 (WEA_RE_04)
20	05:26	06:16	07:09	08:02		07:59	13:56 (WEA_RE_04)	08:38	13:28 (WEA_RE_05)
	21:42	20:46	19:34	18:23		16:27	14:51 (WEA_RE_04)	16:12	14:58 (WEA_RE_04)
21	05:27	06:18	07:10	08:04		08:01	13:56 (WEA_RE_04)	08:39	13:27 (WEA_RE_05)
	21:41	20:44	19:31	18:21		16:26	14:51 (WEA_RE_04)	16:12	14:58 (WEA_RE_04)
22	05:29	06:19	07:12	08:05		08:03	13:57 (WEA_RE_04)	08:40	13:28 (WEA_RE_05)
	21:39	20:42	19:29	18:19		16:25	14:52 (WEA_RE_04)	16:13	14:59 (WEA_RE_04)
23	05:30	06:21	07:14	08:07		08:04	13:57 (WEA_RE_04)	08:40	13:29 (WEA_RE_05)
	21:38	20:40	19:26	18:17		16:24	14:52 (WEA_RE_04)	16:13	14:59 (WEA_RE_04)
24	05:32	06:23	07:16	08:09		08:06	13:58 (WEA_RE_04)	08:41	13:30 (WEA_RE_05)
	21:36	20:37	19:24	18:15		16:22	14:52 (WEA_RE_04)	16:14	15:00 (WEA_RE_04)
25	05:33	06:24	07:17	08:11		08:08	13:58 (WEA_RE_04)	08:41	13:30 (WEA_RE_05)
	21:35	20:35	19:22	17:13		16:21	14:53 (WEA_RE_04)	16:15	15:00 (WEA_RE_04)
26	05:35	06:26	07:19	08:13		08:10	13:58 (WEA_RE_04)	08:41	13:31 (WEA_RE_05)
	21:33	20:33	19:19	17:11		16:20	14:52 (WEA_RE_04)	16:15	15:01 (WEA_RE_04)
27	05:36	06:28	07:21	08:15		08:11	13:58 (WEA_RE_04)	08:41	13:32 (WEA_RE_05)
	21:32	20:31	19:17	17:08		16:19	14:52 (WEA_RE_04)	16:16	15:01 (WEA_RE_04)
28	05:38	06:29	07:23	08:17		08:13	13:59 (WEA_RE_04)	08:42	13:34 (WEA_RE_05)
	21:30	20:28	19:14	17:06		16:18	14:53 (WEA_RE_04)	16:17	15:02 (WEA_RE_04)
29	05:39	06:31	07:24	08:18		08:14	14:00 (WEA_RE_04)	08:42	13:36 (WEA_RE_05)
	21:29	20:26	19:12	17:04		16:17	14:53 (WEA_RE_04)	16:18	15:02 (WEA_RE_04)
30	05:41	06:33	07:26	08:20		08:16	14:00 (WEA_RE_04)	08:42	14:16 (WEA_RE_04)
	21:27	20:24	19:10	17:02	17	14:31 (WEA_RE_04)	16:17	16:19	15:03 (WEA_RE_04)
31	05:42	06:35		07:22		14:11 (WEA_RE_04)		08:42	14:16 (WEA_RE_04)
	21:25	20:21		17:00	24	14:35 (WEA_RE_04)		16:20	15:04 (WEA_RE_04)
Sonnenscheinstunden	508	457	382	330		262		238	1621
astr.max.mögl.Beschattung				41		1495			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	Schattenanfang (WEA mit erstem Schatten)	Schattende (WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	--	---------------------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_45 - IO 45 Unter den Linden 32 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42	13:55 (WEA_RE_05)	08:13	15:09 (WEA_RE_04)	07:17	07:04	05:57	05:09
	16:21	57 15:08 (WEA_RE_03)	17:11	52 16:01 (WEA_RE_04)	18:05	20:01	20:55	21:43
2	08:42	13:55 (WEA_RE_05)	08:11	15:09 (WEA_RE_04)	07:15	07:02	05:55	05:08
	16:22	56 15:07 (WEA_RE_03)	17:13	52 16:01 (WEA_RE_04)	18:07	20:03	20:57	21:44
3	08:42	13:56 (WEA_RE_05)	08:10	15:09 (WEA_RE_04)	07:13	06:59	05:53	05:07
	16:23	54 15:08 (WEA_RE_03)	17:15	54 16:03 (WEA_RE_04)	18:09	20:05	20:58	21:45
4	08:41	13:57 (WEA_RE_05)	08:08	15:09 (WEA_RE_04)	07:11	06:57	05:51	05:07
	16:24	53 15:08 (WEA_RE_03)	17:17	54 16:03 (WEA_RE_04)	18:10	20:07	21:00	21:46
5	08:41	13:57 (WEA_RE_05)	08:06	15:09 (WEA_RE_04)	07:08	06:55	05:49	05:06
	16:26	52 15:08 (WEA_RE_03)	17:19	54 16:03 (WEA_RE_04)	18:12	20:09	21:02	21:47
6	08:41	13:59 (WEA_RE_05)	08:05	15:09 (WEA_RE_04)	07:06	06:52	05:47	05:05
	16:27	49 15:08 (WEA_RE_03)	17:20	54 16:03 (WEA_RE_04)	18:14	20:10	21:04	21:48
7	08:40	13:59 (WEA_RE_05)	08:03	15:09 (WEA_RE_04)	07:04	06:50	05:45	05:05
	16:28	48 15:08 (WEA_RE_03)	17:22	54 16:03 (WEA_RE_04)	18:16	20:12	21:05	21:49
8	08:40	14:00 (WEA_RE_05)	08:01	15:09 (WEA_RE_04)	07:01	06:48	05:43	05:04
	16:30	45 15:07 (WEA_RE_03)	17:24	54 16:03 (WEA_RE_04)	18:18	20:14	21:07	21:50
9	08:39	14:02 (WEA_RE_05)	07:59	15:09 (WEA_RE_04)	06:59	06:45	05:41	05:03
	16:31	42 15:08 (WEA_RE_03)	17:26	54 16:03 (WEA_RE_04)	18:20	20:16	21:09	21:51
10	08:39	14:03 (WEA_RE_05)	07:57	15:10 (WEA_RE_04)	06:57	06:43	05:40	05:03
	16:32	38 15:07 (WEA_RE_03)	17:28	53 16:03 (WEA_RE_04)	18:22	20:17	21:10	21:52
11	08:38	14:04 (WEA_RE_05)	07:55	15:10 (WEA_RE_04)	06:54	06:41	05:38	05:03
	16:34	33 15:05 (WEA_RE_03)	17:30	53 16:03 (WEA_RE_04)	18:23	20:19	21:12	21:53
12	08:37	14:05 (WEA_RE_05)	07:53	15:11 (WEA_RE_04)	06:52	06:38	05:36	05:02
	16:35	35 15:34 (WEA_RE_04)	17:32	52 16:03 (WEA_RE_04)	18:25	20:21	21:14	21:54
13	08:36	14:07 (WEA_RE_05)	07:51	15:11 (WEA_RE_04)	06:50	06:36	05:34	05:02
	16:37	34 15:38 (WEA_RE_04)	17:34	51 16:02 (WEA_RE_04)	18:27	20:23	21:15	21:54
14	08:36	14:09 (WEA_RE_05)	07:49	15:12 (WEA_RE_04)	06:47	06:34	05:33	05:02
	16:39	35 15:40 (WEA_RE_04)	17:36	50 16:02 (WEA_RE_04)	18:29	20:25	21:17	21:55
15	08:35	14:13 (WEA_RE_05)	07:47	15:13 (WEA_RE_04)	06:45	06:31	05:31	05:01
	16:40	32 15:42 (WEA_RE_04)	17:38	49 16:02 (WEA_RE_04)	18:31	20:26	21:19	21:55
16	08:34	15:18 (WEA_RE_04)	07:45	15:14 (WEA_RE_04)	06:42	06:29	05:30	05:01
	16:42	26 15:44 (WEA_RE_04)	17:40	47 16:01 (WEA_RE_04)	18:33	20:28	21:20	21:56
17	08:33	15:17 (WEA_RE_04)	07:43	15:14 (WEA_RE_04)	06:40	06:27	05:28	05:01
	16:44	29 15:46 (WEA_RE_04)	17:42	45 15:59 (WEA_RE_04)	18:34	20:30	21:22	21:57
18	08:32	15:16 (WEA_RE_04)	07:41	15:15 (WEA_RE_04)	06:38	06:25	05:26	05:01
	16:45	32 15:48 (WEA_RE_04)	17:44	43 15:58 (WEA_RE_04)	18:36	20:32	21:23	21:57
19	08:31	15:15 (WEA_RE_04)	07:39	15:16 (WEA_RE_04)	06:35	06:22	05:25	05:01
	16:47	34 15:49 (WEA_RE_04)	17:46	42 15:58 (WEA_RE_04)	18:38	20:34	21:25	21:57
20	08:30	15:14 (WEA_RE_04)	07:37	15:18 (WEA_RE_04)	06:33	06:20	05:23	05:01
	16:49	36 15:50 (WEA_RE_04)	17:48	38 15:56 (WEA_RE_04)	18:40	20:35	21:27	21:58
21	08:29	15:14 (WEA_RE_04)	07:35	15:20 (WEA_RE_04)	06:30	06:18	05:22	05:01
	16:50	38 15:52 (WEA_RE_04)	17:50	35 15:55 (WEA_RE_04)	18:42	20:37	21:28	21:58
22	08:27	15:13 (WEA_RE_04)	07:33	15:21 (WEA_RE_04)	06:28	06:16	05:21	05:02
	16:52	40 15:53 (WEA_RE_04)	17:51	31 15:52 (WEA_RE_04)	18:43	20:39	21:30	21:58
23	08:26	15:13 (WEA_RE_04)	07:31	15:24 (WEA_RE_04)	06:26	06:14	05:19	05:02
	16:54	41 15:54 (WEA_RE_04)	17:53	26 15:50 (WEA_RE_04)	18:45	20:41	21:31	21:58
24	08:25	15:11 (WEA_RE_04)	07:28	15:27 (WEA_RE_04)	06:23	06:11	05:18	05:02
	16:56	44 15:55 (WEA_RE_04)	17:55	20 15:47 (WEA_RE_04)	18:47	20:42	21:32	21:58
25	08:24	15:12 (WEA_RE_04)	07:26	15:33 (WEA_RE_04)	06:21	06:09	05:17	05:02
	16:58	44 15:56 (WEA_RE_04)	17:57	9 15:42 (WEA_RE_04)	18:49	20:44	21:34	21:58
26	08:22	15:11 (WEA_RE_04)	07:24		06:19	06:07	05:16	05:03
	16:59	46 15:57 (WEA_RE_04)	17:59		18:51	20:46	21:35	21:58
27	08:21	15:11 (WEA_RE_04)	07:22		06:16	06:05	05:14	05:03
	17:01	47 15:58 (WEA_RE_04)	18:01		18:52	20:48	21:37	21:58
28	08:19	15:10 (WEA_RE_04)	07:20		06:14	06:03	05:13	05:04
	17:03	49 15:59 (WEA_RE_04)	18:03		18:54	20:50	21:38	21:58
29	08:18	15:09 (WEA_RE_04)			07:11	06:01	05:12	05:04
	17:05	50 15:59 (WEA_RE_04)			19:56	20:51	21:39	21:58
30	08:16	15:10 (WEA_RE_04)			07:09	05:59	05:11	05:05
	17:07	50 16:00 (WEA_RE_04)			19:58	20:53	21:41	21:58
31	08:15	15:09 (WEA_RE_04)			07:07		05:10	
	17:09	52 16:01 (WEA_RE_04)			20:00		21:42	
	Sonnenscheinstunden	254	275	367	418	490	505	
	astr.max.mögl.Beschattung	1321	1126					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM)	Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM)	Schattenende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_45 - IO 45 Unter den Linden 32 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November	Dezember
1	05:06	05:44	06:36	07:28	07:24	08:17
	21:57	21:24	20:19	19:07	16:58	16:16
2	05:06	05:46	06:38	07:30	07:26	08:19
	21:57	21:22	20:17	19:05	16:57	16:15
3	05:07	05:47	06:40	07:31	07:28	08:20
	21:57	21:20	20:14	19:02	16:55	16:14
4	05:08	05:49	06:41	07:33	07:30	08:22
	21:56	21:18	20:12	19:00	16:53	16:14
5	05:09	05:51	06:43	07:35	07:32	08:23
	21:56	21:17	20:10	18:58	16:51	16:13
6	05:10	05:52	06:45	07:37	07:34	08:24
	21:55	21:15	20:07	18:55	16:49	16:13
7	05:11	05:54	06:47	07:38	07:35	08:26
	21:55	21:13	20:05	18:53	16:47	16:12
8	05:11	05:55	06:48	07:40	07:37	08:27
	21:54	21:11	20:03	18:51	16:46	16:12
9	05:12	05:57	06:50	07:42	07:39	08:28
	21:53	21:09	20:00	18:48	16:44	16:12
10	05:14	05:59	06:52	07:44	07:41	08:29
	21:52	21:07	19:58	18:46	16:42	16:11
11	05:15	06:01	06:53	07:45	07:43	08:31
	21:52	21:05	19:55	18:44	16:40	16:11
12	05:16	06:02	06:55	07:47	07:45	08:32
	21:51	21:03	19:53	18:41	16:39	16:11
13	05:17	06:04	06:57	07:49	07:47	08:33
	21:50	21:01	19:51	18:39	16:37	16:11
14	05:18	06:06	06:59	07:51	07:48	08:34
	21:49	20:59	19:48	18:37	16:36	16:11
15	05:19	06:07	07:00	07:53	07:50	08:35
	21:48	20:57	19:46	18:34	16:34	16:11
16	05:21	06:09	07:02	07:54	07:52	08:35
	21:47	20:55	19:43	18:32	16:33	16:11
17	05:22	06:11	07:04	07:56	07:54	08:36
	21:45	20:53	19:41	18:30	16:31	16:11
18	05:23	06:12	07:05	07:58	07:56	08:37
	21:44	20:51	19:39	18:28	16:30	16:11
19	05:25	06:14	07:07	08:00	07:57	08:38
	21:43	20:48	19:36	18:26	16:29	16:12
20	05:26	06:16	07:09	08:02	07:59	08:38
	21:42	20:46	19:34	18:23	16:27	16:12
21	05:27	06:18	07:10	08:04	08:01	08:39
	21:41	20:44	19:31	18:21	16:26	16:12
22	05:29	06:19	07:12	08:05	08:03	08:40
	21:39	20:42	19:29	18:19	16:25	16:13
23	05:30	06:21	07:14	08:07	08:04	08:40
	21:38	20:40	19:26	18:17	16:24	16:13
24	05:32	06:23	07:16	08:09	08:06	08:41
	21:36	20:37	19:24	18:15	16:22	16:14
25	05:33	06:24	07:17	08:11	08:08	08:41
	21:35	20:35	19:22	18:13	16:21	16:15
26	05:35	06:26	07:19	08:13	08:09	08:41
	21:33	20:33	19:19	18:11	16:20	16:15
27	05:36	06:28	07:21	08:15	08:11	08:41
	21:32	20:31	19:17	18:08	16:19	16:16
28	05:38	06:29	07:23	08:17	08:13	08:42
	21:30	20:28	19:14	18:06	16:18	16:17
29	05:39	06:31	07:24	08:18	08:14	08:42
	21:29	20:26	19:12	18:04	16:17	16:18
30	05:41	06:33	07:26	08:20	08:16	08:42
	21:27	20:24	19:10	18:02	16:17	16:19
31	05:42	06:35		08:22	08:16	08:42
	21:25	20:21		18:00	16:16	16:20
				15:33 (WEA_RE_04)		15:07 (WEA_RE_03)
Sonnenscheinstunden	508	457	382	330	262	238
astr.max.mögl.Beschattung				609	1330	1733

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM)	Schattenanfang (WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Schattenende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_46 - IO 46 Unter den Linden 21 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1	08:42 16:21	14:29 (WEA_RE_04) 15:12 (WEA_RE_04)	08:13 17:11	14:43 (WEA_RE_04) 15:19 (WEA_RE_04)	07:17 18:05	07:04 20:01	05:57 20:55	05:09 21:43
2	08:42 16:22	14:29 (WEA_RE_04) 15:12 (WEA_RE_04)	08:11 17:13	14:45 (WEA_RE_04) 15:18 (WEA_RE_04)	07:15 18:07	07:02 20:03	05:55 20:57	05:08 21:44
3	08:42 16:23	14:29 (WEA_RE_04) 15:13 (WEA_RE_04)	08:10 17:15	14:47 (WEA_RE_04) 15:17 (WEA_RE_04)	07:13 18:09	06:59 20:05	05:53 20:58	05:07 21:45
4	08:41 16:24	14:30 (WEA_RE_04) 15:14 (WEA_RE_04)	08:08 17:17	14:49 (WEA_RE_04) 15:15 (WEA_RE_04)	07:11 18:10	06:57 20:07	05:51 21:00	05:07 21:46
5	08:41 16:26	14:30 (WEA_RE_04) 15:14 (WEA_RE_04)	08:06 17:19	14:51 (WEA_RE_04) 15:13 (WEA_RE_04)	07:08 18:12	06:55 20:09	05:49 21:02	05:06 21:47
6	08:41 16:27	14:30 (WEA_RE_04) 15:16 (WEA_RE_04)	08:05 17:20	14:54 (WEA_RE_04) 15:11 (WEA_RE_04)	07:06 18:14	06:52 20:10	05:47 21:04	05:05 21:48
7	08:40 16:28	14:30 (WEA_RE_04) 15:16 (WEA_RE_04)	08:03 17:22	15:00 (WEA_RE_04) 15:05 (WEA_RE_04)	07:04 18:16	06:50 20:12	05:45 21:05	05:05 21:49
8	08:40 16:30	14:30 (WEA_RE_04) 15:16 (WEA_RE_04)	08:01 17:24	15:05 (WEA_RE_04) 18:18	18:16 20:14	20:12 21:07	21:05 21:50	21:49 21:50
9	08:39 16:31	14:31 (WEA_RE_04) 15:17 (WEA_RE_04)	07:59 17:26	18:18 18:20	20:14 20:16	21:07 21:09	21:50 21:51	21:50 21:51
10	08:39 16:32	14:31 (WEA_RE_04) 15:18 (WEA_RE_04)	07:57 17:28	18:20 18:22	20:16 20:17	21:09 21:10	21:51 21:52	21:51 21:52
11	08:38 16:34	14:31 (WEA_RE_04) 15:18 (WEA_RE_04)	07:55 17:30	18:22 18:23	20:17 20:19	21:10 21:12	21:52 21:53	21:52 21:53
12	08:37 16:35	14:31 (WEA_RE_04) 15:18 (WEA_RE_04)	07:53 17:32	18:23 18:25	20:19 20:21	21:12 21:14	21:53 21:54	21:53 21:54
13	08:37 16:37	14:32 (WEA_RE_04) 15:19 (WEA_RE_04)	07:51 17:34	18:25 18:27	20:21 20:23	21:14 21:15	21:54 21:54	21:54 21:54
14	08:36 16:39	14:32 (WEA_RE_04) 15:19 (WEA_RE_04)	07:49 17:36	18:27 18:29	20:23 20:25	21:15 21:17	21:54 21:55	21:54 21:55
15	08:35 16:40	14:32 (WEA_RE_04) 15:20 (WEA_RE_04)	07:47 17:38	18:29 18:31	20:25 20:26	21:17 21:19	21:55 21:56	21:55 21:56
16	08:34 16:42	14:33 (WEA_RE_04) 15:20 (WEA_RE_04)	07:45 17:40	18:31 18:33	20:26 20:28	21:19 21:20	21:56 21:56	21:56 21:56
17	08:33 16:43	14:33 (WEA_RE_04) 15:21 (WEA_RE_04)	07:43 17:42	18:33 18:34	20:28 20:30	21:20 21:22	21:56 21:57	21:56 21:57
18	08:32 16:45	14:34 (WEA_RE_04) 15:21 (WEA_RE_04)	07:41 17:44	18:34 18:36	20:30 20:32	21:22 21:23	21:57 21:57	21:57 21:57
19	08:31 16:47	14:34 (WEA_RE_04) 15:21 (WEA_RE_04)	07:39 17:46	18:36 18:38	20:32 20:34	21:23 21:25	21:57 21:57	21:57 21:57
20	08:30 16:49	14:34 (WEA_RE_04) 15:22 (WEA_RE_04)	07:37 17:48	18:38 18:40	20:34 20:35	21:25 21:27	21:57 21:58	21:57 21:58
21	08:29 16:50	14:35 (WEA_RE_04) 15:22 (WEA_RE_04)	07:35 17:50	18:40 18:42	20:35 20:37	21:27 21:28	21:58 21:58	21:58 21:58
22	08:27 16:52	14:35 (WEA_RE_04) 15:22 (WEA_RE_04)	07:33 17:51	18:42 18:43	20:37 20:39	21:28 21:30	21:58 21:58	21:58 21:58
23	08:26 16:54	14:36 (WEA_RE_04) 15:22 (WEA_RE_04)	07:31 17:53	18:44 18:45	20:39 20:41	21:30 21:31	21:58 21:58	21:58 21:58
24	08:25 16:56	14:36 (WEA_RE_04) 15:22 (WEA_RE_04)	07:28 17:55	18:46 18:47	20:41 20:42	21:31 21:32	21:58 21:58	21:58 21:58
25	08:24 16:58	14:37 (WEA_RE_04) 15:22 (WEA_RE_04)	07:26 17:57	18:48 18:49	20:42 20:44	21:32 21:34	21:58 21:58	21:58 21:58
26	08:22 16:59	14:37 (WEA_RE_04) 15:21 (WEA_RE_04)	07:24 17:59	18:50 18:51	20:44 20:46	21:33 21:35	21:58 21:58	21:58 21:58
27	08:21 17:01	14:39 (WEA_RE_04) 15:22 (WEA_RE_04)	07:22 18:01	18:52 18:52	20:46 20:48	21:35 21:37	21:58 21:58	21:58 21:58
28	08:19 17:03	14:39 (WEA_RE_04) 15:21 (WEA_RE_04)	07:20 18:03	18:54 18:54	20:48 20:50	21:37 21:38	21:58 21:58	21:58 21:58
29	08:18 17:05	14:40 (WEA_RE_04) 15:20 (WEA_RE_04)	18:03	18:56 19:56	20:51 20:51	21:39 21:39	21:58 21:58	21:58 21:58
30	08:16 17:07	14:41 (WEA_RE_04) 15:21 (WEA_RE_04)		19:58 19:58	20:52 20:53	21:40 21:41	21:58 21:58	21:58 21:58
31	08:15 17:09	14:42 (WEA_RE_04) 15:20 (WEA_RE_04)		20:00 20:00		21:42	21:58	21:58
	Sonnenscheinstunden 254		275		367	418	490	505
	astr.max.mögl.Beschattung 1400		169					

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Schattenanfang (WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)		Zeitpunkt (SS:MM) Schatteneende	Schatteneende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_46 - IO 46 Unter den Linden 21 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	05:06 21:57	05:44 21:24	06:36 20:19	07:28 19:07	07:24 16:58	08:17 14:13 (WEA_RE_04) 16:16 15:00 (WEA_RE_04)
2	05:06 21:57	05:46 21:22	06:38 20:17	07:30 19:05	07:26 16:57	47 08:19 14:14 (WEA_RE_04) 16:15 15:01 (WEA_RE_04)
3	05:07 21:57	05:47 21:20	06:40 20:14	07:31 19:02	07:28 16:55	47 08:20 14:14 (WEA_RE_04) 16:14 15:00 (WEA_RE_04)
4	05:08 21:56	05:49 21:18	06:41 20:12	07:33 19:00	07:30 16:53	46 08:22 14:15 (WEA_RE_04) 16:14 15:01 (WEA_RE_04)
5	05:09 21:56	05:51 21:17	06:43 20:10	07:35 18:58	07:32 16:51	46 08:23 14:15 (WEA_RE_04) 16:13 15:01 (WEA_RE_04)
6	05:10 21:55	05:52 21:15	06:45 20:07	07:37 18:55	07:34 16:49	46 08:24 14:16 (WEA_RE_04) 16:13 15:02 (WEA_RE_04)
7	05:11 21:55	05:54 21:13	06:47 20:05	07:38 18:53	07:35 16:47	45 08:26 14:17 (WEA_RE_04) 16:12 15:02 (WEA_RE_04)
8	05:11 21:54	05:55 21:11	06:48 20:03	07:40 18:51	07:37 16:46	44 08:27 14:17 (WEA_RE_04) 16:12 15:01 (WEA_RE_04)
9	05:12 21:53	05:57 21:09	06:50 20:00	07:42 18:48	07:39 16:44	44 08:28 14:18 (WEA_RE_04) 16:12 15:02 (WEA_RE_04)
10	05:14 21:52	05:59 21:07	06:52 19:58	07:44 18:46	07:41 16:42	43 08:29 14:19 (WEA_RE_04) 16:11 15:02 (WEA_RE_04)
11	05:15 21:52	06:01 21:05	06:53 19:55	07:45 18:44	07:43 16:40	43 08:31 14:20 (WEA_RE_04) 16:11 15:03 (WEA_RE_04)
12	05:16 21:51	06:02 21:03	06:55 19:53	07:47 18:41	07:45 16:39	43 08:32 14:20 (WEA_RE_04) 16:11 15:03 (WEA_RE_04)
13	05:17 21:50	06:04 21:01	06:57 19:51	07:49 18:39	07:47 16:37	43 08:33 14:20 (WEA_RE_04) 16:11 15:03 (WEA_RE_04)
14	05:18 21:49	06:06 20:59	06:59 19:48	07:51 18:37	07:48 16:36	42 08:34 14:21 (WEA_RE_04) 16:11 15:03 (WEA_RE_04)
15	05:19 21:48	06:07 20:57	07:00 19:46	07:53 18:34	07:50 16:34	42 08:35 14:21 (WEA_RE_04) 16:11 15:04 (WEA_RE_04)
16	05:21 21:47	06:09 20:55	07:02 19:43	07:54 18:32	07:52 16:33	42 08:35 14:22 (WEA_RE_04) 16:11 15:04 (WEA_RE_04)
17	05:22 21:46	06:11 20:53	07:04 19:41	07:56 18:30	07:54 16:31	42 08:36 14:23 (WEA_RE_04) 16:11 15:05 (WEA_RE_04)
18	05:23 21:44	06:12 20:51	07:05 19:39	07:58 18:28	07:56 16:30	42 08:37 14:22 (WEA_RE_04) 16:11 15:04 (WEA_RE_04)
19	05:25 21:43	06:14 20:48	07:07 19:36	08:00 18:26	07:57 16:29	42 08:38 14:23 (WEA_RE_04) 16:12 15:05 (WEA_RE_04)
20	05:26 21:42	06:16 20:46	07:09 19:34	08:02 18:23	07:59 16:27	42 08:38 14:24 (WEA_RE_04) 16:12 15:06 (WEA_RE_04)
21	05:27 21:41	06:18 20:44	07:10 19:31	08:04 18:21	08:01 16:26	42 08:39 14:24 (WEA_RE_04) 16:12 15:06 (WEA_RE_04)
22	05:29 21:39	06:19 20:42	07:12 19:29	08:05 18:19	08:03 16:25	42 08:40 14:25 (WEA_RE_04) 16:13 15:07 (WEA_RE_04)
23	05:30 21:38	06:21 20:40	07:14 19:26	08:07 18:17	08:04 16:24	42 08:40 14:25 (WEA_RE_04) 16:13 15:07 (WEA_RE_04)
24	05:32 21:36	06:23 20:37	07:16 19:24	08:09 18:15	08:06 16:22	42 08:41 14:26 (WEA_RE_04) 16:14 15:08 (WEA_RE_04)
25	05:33 21:35	06:24 20:35	07:17 19:22	08:11 17:13	08:08 16:21	42 08:41 14:26 (WEA_RE_04) 16:15 15:08 (WEA_RE_04)
26	05:35 21:33	06:26 20:33	07:19 19:19	08:13 17:11	08:10 16:20	42 08:41 14:27 (WEA_RE_04) 16:15 15:09 (WEA_RE_04)
27	05:36 21:32	06:28 20:31	07:21 19:17	08:15 17:08	08:11 16:19	42 08:41 14:27 (WEA_RE_04) 16:16 15:09 (WEA_RE_04)
28	05:38 21:30	06:29 20:28	07:23 19:14	08:17 17:06	08:13 16:18	42 08:42 14:27 (WEA_RE_04) 16:17 15:09 (WEA_RE_04)
29	05:39 21:29	06:31 20:26	07:24 19:12	08:18 17:04	08:14 16:17	43 08:42 14:27 (WEA_RE_04) 16:18 15:10 (WEA_RE_04)
30	05:41 21:27	06:33 20:24	07:26 19:10	08:20 17:02	08:16 16:17	43 08:42 14:28 (WEA_RE_04) 16:19 15:11 (WEA_RE_04)
31	05:42 21:25	06:35 20:21		07:22 17:00		43 08:42 14:28 (WEA_RE_04) 16:20 15:11 (WEA_RE_04)
	Sonnenscheinstunden astr.max.mögl.Beschattung	508 457	382	330	262 1080	238 1344

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_47 - IO 47 Vehnberg 39 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April		Mai		Juni			
1	08:42	08:13	07:17	07:04		05:57		05:09	20:13 (WEA_RE_05)		
	16:21	17:11	18:05	20:01		20:55		21:43	39 20:52 (WEA_RE_05)		
2	08:42	08:11	07:15	07:02		05:55		05:08	20:12 (WEA_RE_05)		
	16:22	17:13	18:07	20:03		20:57		21:44	40 20:52 (WEA_RE_05)		
3	08:41	08:10	07:13	06:59		05:53		05:07	20:12 (WEA_RE_05)		
	16:23	17:15	18:09	20:05		20:58		21:45	40 20:52 (WEA_RE_05)		
4	08:41	08:08	07:10	06:57		05:51		05:07	20:13 (WEA_RE_05)		
	16:24	17:17	18:10	20:07		21:00		21:46	40 20:53 (WEA_RE_05)		
5	08:41	08:06	07:08	06:55		05:49		05:06	20:13 (WEA_RE_05)		
	16:26	17:19	18:12	20:08		21:02		21:47	40 20:53 (WEA_RE_05)		
6	08:41	08:04	07:06	06:52		19:37 (WEA_RE_03)	05:47	05:05	20:13 (WEA_RE_05)		
	16:27	17:20	18:14	20:10	5	19:42 (WEA_RE_03)	21:03	21:48	40 20:53 (WEA_RE_05)		
7	08:40	08:03	07:04	06:50		19:32 (WEA_RE_03)	05:45	05:05	20:13 (WEA_RE_05)		
	16:28	17:22	18:16	20:12	13	19:45 (WEA_RE_03)	21:05	21:49	40 20:53 (WEA_RE_05)		
8	08:40	15:36 (WEA_CD_01)	08:01	07:01	06:48	19:29 (WEA_RE_03)	05:43	05:04	20:14 (WEA_RE_05)		
	16:30	15:43 (WEA_CD_01)	17:24	18:18	20:14	18	19:47 (WEA_RE_03)	21:07	21:50	40 20:54 (WEA_RE_05)	
9	08:39	15:36 (WEA_CD_01)	07:59	06:59	06:45	19:28 (WEA_RE_03)	05:42	05:04	20:13 (WEA_RE_05)		
	16:31	9 15:45 (WEA_CD_01)	17:26	18:20	20:16	21	19:49 (WEA_RE_03)	21:09	21:51	40 20:53 (WEA_RE_05)	
10	08:39	15:35 (WEA_CD_01)	07:57	06:57	06:43	19:26 (WEA_RE_03)	05:40	05:03	20:14 (WEA_RE_05)		
	16:33	12 15:47 (WEA_CD_01)	17:28	18:22	20:17	24	19:50 (WEA_RE_03)	21:10	21:52	40 20:54 (WEA_RE_05)	
11	08:38	15:34 (WEA_CD_01)	07:55	06:54	06:41	19:25 (WEA_RE_03)	05:38	05:03	20:15 (WEA_RE_05)		
	16:34	14 15:48 (WEA_CD_01)	17:30	18:23	20:19	25	19:50 (WEA_RE_03)	21:12	21:53	39 20:54 (WEA_RE_05)	
12	08:37	15:34 (WEA_CD_01)	07:53	06:52	06:38	19:24 (WEA_RE_03)	05:36	05:02	20:14 (WEA_RE_05)		
	16:36	15 15:49 (WEA_CD_01)	17:32	18:25	20:21	27	19:51 (WEA_RE_03)	21:14	21:53	40 20:54 (WEA_RE_05)	
13	08:37	15:33 (WEA_CD_01)	07:51	06:50	06:36	19:23 (WEA_RE_03)	05:35	20:24 (WEA_RE_05)	05:02	20:14 (WEA_RE_05)	
	16:37	17 15:50 (WEA_CD_01)	17:34	18:27	20:23	29	19:52 (WEA_RE_03)	21:15	13 20:37 (WEA_RE_05)	21:54	40 20:54 (WEA_RE_05)
14	08:36	15:33 (WEA_CD_01)	07:49	06:47	06:34	19:22 (WEA_RE_03)	05:33	20:22 (WEA_RE_05)	05:02	20:15 (WEA_RE_05)	
	16:39	18 15:51 (WEA_CD_01)	17:36	18:29	20:25	29	19:51 (WEA_RE_03)	21:17	18 20:40 (WEA_RE_05)	21:55	40 20:55 (WEA_RE_05)
15	08:35	15:33 (WEA_CD_01)	07:47	06:45	06:31	19:22 (WEA_RE_03)	05:31	20:20 (WEA_RE_05)	05:01	20:15 (WEA_RE_05)	
	16:40	19 15:52 (WEA_CD_01)	17:38	18:31	20:26	29	19:51 (WEA_RE_03)	21:19	21 20:41 (WEA_RE_05)	21:55	40 20:55 (WEA_RE_05)
16	08:34	15:33 (WEA_CD_01)	07:45	06:42	06:29	19:22 (WEA_RE_03)	05:30	20:19 (WEA_RE_05)	05:01	20:16 (WEA_RE_05)	
	16:42	20 15:53 (WEA_CD_01)	17:40	18:33	20:28	29	19:51 (WEA_RE_03)	21:20	24 20:43 (WEA_RE_05)	21:56	39 20:55 (WEA_RE_05)
17	08:33	15:33 (WEA_CD_01)	07:43	06:40	06:27	19:22 (WEA_RE_03)	05:28	20:17 (WEA_RE_05)	05:01	20:16 (WEA_RE_05)	
	16:44	21 15:54 (WEA_CD_01)	17:42	18:34	20:30	29	19:51 (WEA_RE_03)	21:22	27 20:44 (WEA_RE_05)	21:56	39 20:55 (WEA_RE_05)
18	08:32	15:33 (WEA_CD_01)	07:41	06:38	06:25	19:21 (WEA_RE_03)	05:26	20:17 (WEA_RE_05)	05:01	20:16 (WEA_RE_05)	
	16:45	21 15:54 (WEA_CD_01)	17:44	18:36	20:32	29	19:50 (WEA_RE_03)	21:23	28 20:45 (WEA_RE_05)	21:57	40 20:56 (WEA_RE_05)
19	08:31	15:33 (WEA_CD_01)	07:39	06:35	06:22	19:22 (WEA_RE_03)	05:25	20:16 (WEA_RE_05)	05:01	20:16 (WEA_RE_05)	
	16:47	21 15:54 (WEA_CD_01)	17:46	18:38	20:33	27	19:49 (WEA_RE_03)	21:25	30 20:46 (WEA_RE_05)	21:57	40 20:56 (WEA_RE_05)
20	08:30	15:33 (WEA_CD_01)	07:37	06:33	06:20	19:22 (WEA_RE_03)	05:24	20:15 (WEA_RE_05)	05:01	20:16 (WEA_RE_05)	
	16:49	22 15:55 (WEA_CD_01)	17:48	18:40	20:35	26	19:48 (WEA_RE_03)	21:26	32 20:47 (WEA_RE_05)	21:58	40 20:56 (WEA_RE_05)
21	08:29	15:34 (WEA_CD_01)	07:35	06:30	06:18	19:23 (WEA_RE_03)	05:22	20:15 (WEA_RE_05)	05:01	20:16 (WEA_RE_05)	
	16:50	22 15:56 (WEA_CD_01)	17:50	18:42	20:37	25	19:48 (WEA_RE_03)	21:28	32 20:47 (WEA_RE_05)	21:58	40 20:56 (WEA_RE_05)
22	08:27	15:34 (WEA_CD_01)	07:33	06:28	06:16	19:24 (WEA_RE_03)	05:21	20:14 (WEA_RE_05)	05:02	20:17 (WEA_RE_05)	
	16:52	22 15:56 (WEA_CD_01)	17:51	18:43	20:39	23	19:47 (WEA_RE_03)	21:29	34 20:48 (WEA_RE_05)	21:58	40 20:57 (WEA_RE_05)
23	08:26	15:35 (WEA_CD_01)	07:31	06:26	06:14	19:25 (WEA_RE_03)	05:19	20:14 (WEA_RE_05)	05:02	20:17 (WEA_RE_05)	
	16:54	21 15:56 (WEA_CD_01)	17:53	18:45	20:41	20	19:45 (WEA_RE_03)	21:31	35 20:49 (WEA_RE_05)	21:58	40 20:57 (WEA_RE_05)
24	08:25	15:34 (WEA_CD_01)	07:28	06:23	06:11	19:26 (WEA_RE_03)	05:18	20:14 (WEA_RE_05)	05:02	20:17 (WEA_RE_05)	
	16:56	22 15:56 (WEA_CD_01)	17:55	18:47	20:42	18	19:44 (WEA_RE_03)	21:32	36 20:50 (WEA_RE_05)	21:58	40 20:57 (WEA_RE_05)
25	08:23	15:36 (WEA_CD_01)	07:26	06:21	06:09	19:28 (WEA_RE_03)	05:17	20:13 (WEA_RE_05)	05:02	20:17 (WEA_RE_05)	
	16:58	20 15:56 (WEA_CD_01)	17:57	18:49	20:44	13	19:41 (WEA_RE_03)	21:34	36 20:49 (WEA_RE_05)	21:58	39 20:56 (WEA_RE_05)
26	08:22	15:36 (WEA_CD_01)	07:24	06:18	06:07	19:32 (WEA_RE_03)	05:16	20:13 (WEA_RE_05)	05:03	20:18 (WEA_RE_05)	
	16:59	20 15:56 (WEA_CD_01)	17:59	18:51	20:46	5	19:37 (WEA_RE_03)	21:35	37 20:50 (WEA_RE_05)	21:58	39 20:57 (WEA_RE_05)
27	08:21	15:37 (WEA_CD_01)	07:22	06:16	06:05		05:14	20:12 (WEA_RE_05)	05:03	20:17 (WEA_RE_05)	
	17:01	19 15:56 (WEA_CD_01)	18:01	18:52	20:48		21:37	38 20:50 (WEA_RE_05)	21:58	40 20:57 (WEA_RE_05)	
28	08:19	15:38 (WEA_CD_01)	07:20	06:14	06:03		05:13	38 20:12 (WEA_RE_05)	05:04	20:18 (WEA_RE_05)	
	17:03	17 15:55 (WEA_CD_01)	18:03	18:54	20:49		21:38	38 20:50 (WEA_RE_05)	21:58	40 20:58 (WEA_RE_05)	
29	08:18	15:39 (WEA_CD_01)		07:11	06:01		05:12	39 20:12 (WEA_RE_05)	05:04	20:18 (WEA_RE_05)	
	17:05	15 15:54 (WEA_CD_01)		19:56	20:51		21:39	39 20:51 (WEA_RE_05)	21:58	39 20:57 (WEA_RE_05)	
30	08:16	15:41 (WEA_CD_01)		07:09	05:59		05:11	39 20:13 (WEA_RE_05)	05:05	20:18 (WEA_RE_05)	
	17:07	12 15:53 (WEA_CD_01)		19:58	20:53		21:40	39 20:52 (WEA_RE_05)	21:58	40 20:58 (WEA_RE_05)	
31	08:15	15:44 (WEA_CD_01)		07:07			05:10	39 20:13 (WEA_RE_05)			
	17:09	7 15:51 (WEA_CD_01)		20:00			21:42	39 20:52 (WEA_RE_05)			
Sonnenscheinstunden	254						490				
astr.max.mögl.Beschattung	413	275	367	418	464		596		505	1193	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_47 - IO 47 Vehnberg 39 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember			
1	05:06	20:19 (WEA_RE_05)	05:44	06:36	19:24 (WEA_RE_03)	07:28	07:24			08:17	15:16 (WEA_CD_01)		
	21:57	40	20:59 (WEA_RE_05)	21:24	20:19	25	19:49 (WEA_RE_03)	19:07	16:58		16:16	14	15:30 (WEA_CD_01)
2	05:06	20:18 (WEA_RE_05)	05:46	06:38	19:25 (WEA_RE_03)	07:29	07:26			08:19	15:17 (WEA_CD_01)		
	21:57	40	20:58 (WEA_RE_05)	21:22	20:17	24	19:49 (WEA_RE_03)	19:05	16:57		16:15	12	15:29 (WEA_CD_01)
3	05:07	20:19 (WEA_RE_05)	05:47	06:40	19:25 (WEA_RE_03)	07:31	07:28			08:20	15:19 (WEA_CD_01)		
	21:57	40	20:59 (WEA_RE_05)	21:20	20:14	21	19:46 (WEA_RE_03)	19:02	16:55		16:14	10	15:29 (WEA_CD_01)
4	05:08	20:19 (WEA_RE_05)	05:49	06:41	19:26 (WEA_RE_03)	07:33	07:30			08:22	15:21 (WEA_CD_01)		
	21:56	40	20:59 (WEA_RE_05)	21:18	20:12	18	19:44 (WEA_RE_03)	19:00	16:53		16:14	7	15:28 (WEA_CD_01)
5	05:09	20:19 (WEA_RE_05)	05:51	06:43	19:29 (WEA_RE_03)	07:35	07:32			08:23	15:24 (WEA_CD_01)		
	21:56	40	20:59 (WEA_RE_05)	21:16	20:10	13	19:42 (WEA_RE_03)	18:58	16:51		16:13	1	15:25 (WEA_CD_01)
6	05:10	20:20 (WEA_RE_05)	05:52	06:45	19:32 (WEA_RE_03)	07:37	07:33			08:24			
	21:55	40	21:00 (WEA_RE_05)	21:15	20:07	6	19:38 (WEA_RE_03)	18:55	16:49		16:12		
7	05:11	20:19 (WEA_RE_05)	05:54	06:47	19:38 (WEA_RE_03)	07:38	07:35			08:26			
	21:54	40	20:59 (WEA_RE_05)	21:13	20:05		18:53	16:47		16:12			
8	05:12	20:19 (WEA_RE_05)	05:56	06:48	19:40 (WEA_RE_03)	07:40	07:37			08:27			
	21:54	40	20:59 (WEA_RE_05)	21:11	20:03		18:51	16:46		16:12			
9	05:13	20:20 (WEA_RE_05)	05:57	06:50	19:42 (WEA_RE_03)	07:42	07:39			08:28			
	21:53	39	20:59 (WEA_RE_05)	21:09	20:00		18:48	16:44		16:12			
10	05:14	20:20 (WEA_RE_05)	05:59	06:52	19:44 (WEA_RE_03)	07:44	07:41			08:29			
	21:52	40	21:00 (WEA_RE_05)	21:07	19:38		18:46	16:42		16:11			
11	05:15	20:20 (WEA_RE_05)	06:01	06:53	19:45 (WEA_RE_03)	07:45	07:43			08:30			
	21:51	40	21:00 (WEA_RE_05)	21:05	19:44	8	16:41	15:14 (WEA_CD_01)		08:30			
12	05:16	20:20 (WEA_RE_05)	06:02	06:55	19:47 (WEA_RE_03)	07:47	07:45			08:32			
	21:51	40	21:00 (WEA_RE_05)	21:03	19:41	12	16:39	15:12 (WEA_CD_01)		08:32			
13	05:17	20:20 (WEA_RE_05)	06:04	06:57	19:49 (WEA_RE_03)	07:49	07:47			08:33			
	21:50	39	20:59 (WEA_RE_05)	21:01	19:51		16:37	15:11 (WEA_CD_01)		08:33			
14	05:18	20:22 (WEA_RE_05)	06:06	06:58	19:51 (WEA_RE_03)	07:51	07:48			08:34			
	21:49	38	21:00 (WEA_RE_05)	20:59	19:48		16:36	15:09 (WEA_CD_01)		08:34			
15	05:19	20:22 (WEA_RE_05)	06:07	07:00	19:52 (WEA_RE_03)	07:53	07:50			08:34			
	21:48	38	21:00 (WEA_RE_05)	20:57	19:46		16:34	15:08 (WEA_CD_01)		08:34			
16	05:21	20:22 (WEA_RE_05)	06:09	07:02	19:49 (WEA_RE_03)	07:54	07:52			08:35			
	21:47	38	21:00 (WEA_RE_05)	20:55	19:43		16:33	15:09 (WEA_CD_01)		08:35			
17	05:22	20:22 (WEA_RE_05)	06:11	07:04	19:45 (WEA_RE_03)	07:56	07:54			08:36			
	21:45	37	20:59 (WEA_RE_05)	20:53	19:40		16:31	15:09 (WEA_CD_01)		08:36			
18	05:23	20:22 (WEA_RE_05)	06:12	07:05	19:47 (WEA_RE_03)	07:58	07:56			08:37			
	21:44	37	20:59 (WEA_RE_05)	20:50	19:38		16:30	15:08 (WEA_CD_01)		08:37			
19	05:25	20:23 (WEA_RE_05)	06:14	07:07	19:50 (WEA_RE_03)	08:00	07:57			08:38			
	21:43	37	21:00 (WEA_RE_05)	20:48	19:36		16:29	15:09 (WEA_CD_01)		08:38			
20	05:26	20:23 (WEA_RE_05)	06:16	07:09	19:50 (WEA_RE_03)	08:02	07:59			08:39			
	21:42	36	20:59 (WEA_RE_05)	20:46	19:51		16:27	15:09 (WEA_CD_01)		08:39			
21	05:27	20:24 (WEA_RE_05)	06:18	07:10	19:52 (WEA_RE_03)	08:04	08:01			08:40			
	21:40	34	20:58 (WEA_RE_05)	20:44	19:51		16:26	15:09 (WEA_CD_01)		08:40			
22	05:29	20:25 (WEA_RE_05)	06:19	07:12	19:52 (WEA_RE_03)	08:05	08:03			08:41			
	21:39	33	20:58 (WEA_RE_05)	20:42	19:49		16:25	15:09 (WEA_CD_01)		08:41			
23	05:30	20:25 (WEA_RE_05)	06:21	07:14	19:52 (WEA_RE_03)	08:07	08:04			08:41			
	21:38	33	20:58 (WEA_RE_05)	20:40	19:53		16:24	15:10 (WEA_CD_01)		08:41			
24	05:32	20:26 (WEA_RE_05)	06:23	07:16	19:53 (WEA_RE_03)	08:09	08:06			08:42			
	21:36	31	20:57 (WEA_RE_05)	20:37	19:53		16:22	15:11 (WEA_CD_01)		08:42			
25	05:33	20:27 (WEA_RE_05)	06:24	07:17	19:54 (WEA_RE_03)	08:11	08:08			08:42			
	21:35	29	20:56 (WEA_RE_05)	20:35	19:53		16:21	15:11 (WEA_CD_01)		08:42			
26	05:35	20:28 (WEA_RE_05)	06:26	07:19	19:54 (WEA_RE_03)	08:13	08:10			08:43			
	21:33	27	20:55 (WEA_RE_05)	20:33	19:53		16:20	15:11 (WEA_CD_01)		08:43			
27	05:36	20:28 (WEA_RE_05)	06:28	07:21	19:54 (WEA_RE_03)	08:15	08:11			08:43			
	21:32	26	20:54 (WEA_RE_05)	20:31	19:53		16:19	15:12 (WEA_CD_01)		08:43			
28	05:38	20:30 (WEA_RE_05)	06:29	07:23	19:54 (WEA_RE_03)	08:17	08:13			08:44			
	21:30	23	20:53 (WEA_RE_05)	20:28	19:53		16:18	15:13 (WEA_CD_01)		08:44			
29	05:39	20:31 (WEA_RE_05)	06:31	07:24	19:54 (WEA_RE_03)	08:19	08:14			08:44			
	21:29	20	20:51 (WEA_RE_05)	20:26	19:52		16:18	15:14 (WEA_CD_01)		08:44			
30	05:41	20:34 (WEA_RE_05)	06:33	07:26	19:54 (WEA_RE_03)	08:21	08:16			08:45			
	21:27	15	20:49 (WEA_RE_05)	20:24	19:52		16:17	15:15 (WEA_CD_01)		08:45			
31	05:42	20:36 (WEA_RE_05)	06:35	07:27	19:54 (WEA_RE_03)	08:22				08:45			
	21:25	10	20:46 (WEA_RE_05)	20:21	19:51		17:00			16:20			
Sonnenscheinstunden		508	457	382	307	262	238			238			
astr. max.mögl. Beschattung		1060	362	107						100			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_48 - IO 48 Vehnberg 23 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	15:11 (WEA_CD_02)	08:13		07:17	07:04		05:57	19:49 (WEA_RE_03)	05:09	
	16:21	20 15:31 (WEA_CD_02)	17:11		18:05	20:01		20:55	20:17 (WEA_RE_03)	21:43	
2	08:42	15:11 (WEA_CD_02)	08:11	9	16:19 (WEA_CD_01)	07:15	07:02	05:55	19:49 (WEA_RE_03)	05:08	
	16:22	19 15:30 (WEA_CD_02)	17:13		16:28 (WEA_CD_01)	18:07	20:03	20:57	20:17 (WEA_RE_03)	21:44	
3	08:41	15:12 (WEA_CD_02)	08:10		16:17 (WEA_CD_01)	07:13	06:59	05:53	19:49 (WEA_RE_03)	05:07	
	16:23	19 15:31 (WEA_CD_02)	17:15	13	16:30 (WEA_CD_01)	18:09	20:05	20:58	20:16 (WEA_RE_03)	21:45	
4	08:41	15:12 (WEA_CD_02)	08:08		16:16 (WEA_CD_01)	07:10	06:57	05:51	19:49 (WEA_RE_03)	05:07	
	16:25	20 15:32 (WEA_CD_02)	17:17	17	16:33 (WEA_CD_01)	18:10	20:07	21:00	20:16 (WEA_RE_03)	21:46	
5	08:41	15:12 (WEA_CD_02)	08:06		16:15 (WEA_CD_01)	07:08	06:55	05:49	19:50 (WEA_RE_03)	05:06	
	16:26	20 15:32 (WEA_CD_02)	17:19	19	16:34 (WEA_CD_01)	18:12	20:08	21:02	20:16 (WEA_RE_03)	21:47	
6	08:41	15:13 (WEA_CD_02)	08:04		16:14 (WEA_CD_01)	07:06	06:52	05:47	19:50 (WEA_RE_03)	05:05	
	16:27	21 15:34 (WEA_CD_02)	17:20	21	16:35 (WEA_CD_01)	18:14	20:10	21:03	20:15 (WEA_RE_03)	21:48	
7	08:40	15:13 (WEA_CD_02)	08:03		16:14 (WEA_CD_01)	07:04	06:50	05:45	19:50 (WEA_RE_03)	05:05	
	16:28	21 15:34 (WEA_CD_02)	17:22	21	16:35 (WEA_CD_01)	18:16	20:12	21:05	20:14 (WEA_RE_03)	21:49	
8	08:40	15:13 (WEA_CD_02)	08:01		16:13 (WEA_CD_01)	07:01	06:48	05:43	19:51 (WEA_RE_03)	05:04	
	16:30	21 15:34 (WEA_CD_02)	17:24	23	16:36 (WEA_CD_01)	18:18	20:14	21:07	20:13 (WEA_RE_03)	21:50	
9	08:39	15:14 (WEA_CD_02)	07:59		16:13 (WEA_CD_01)	06:59	06:45	05:42	19:52 (WEA_RE_03)	05:04	
	16:31	21 15:35 (WEA_CD_02)	17:26	23	16:36 (WEA_CD_01)	18:20	20:16	21:09	20:13 (WEA_RE_03)	21:51	
10	08:38	15:14 (WEA_CD_02)	07:57		16:13 (WEA_CD_01)	06:57	06:43	05:40	19:53 (WEA_RE_03)	05:03	
	16:33	21 15:35 (WEA_CD_02)	17:28	24	16:37 (WEA_CD_01)	18:22	20:17	21:10	20:11 (WEA_RE_03)	21:52	6
11	08:38	15:14 (WEA_CD_02)	07:55		16:13 (WEA_CD_01)	06:54	06:41	05:38	19:54 (WEA_RE_03)	05:03	
	16:34	22 15:36 (WEA_CD_02)	17:30	24	16:37 (WEA_CD_01)	18:23	20:19	21:12	20:09 (WEA_RE_03)	21:53	9
12	08:37	15:15 (WEA_CD_02)	07:53		16:13 (WEA_CD_01)	06:52	06:38	05:36	19:57 (WEA_RE_03)	05:02	
	16:36	21 15:36 (WEA_CD_02)	17:32	24	16:37 (WEA_CD_01)	18:25	20:21	21:14	20:08 (WEA_RE_03)	21:53	11
13	08:36	15:15 (WEA_CD_02)	07:51		16:13 (WEA_CD_01)	06:50	06:36	05:35		05:02	
	16:37	21 15:36 (WEA_CD_02)	17:34	24	16:37 (WEA_CD_01)	18:27	20:23	21:15		05:02	13
14	08:36	15:16 (WEA_CD_02)	07:49		16:14 (WEA_CD_01)	06:47	06:34	05:33		05:02	
	16:39	20 15:36 (WEA_CD_02)	17:36	22	16:36 (WEA_CD_01)	18:29	20:25	21:17		21:55	14
15	08:35	15:17 (WEA_CD_02)	07:47		16:15 (WEA_CD_01)	06:45	06:31	05:31		05:01	
	16:40	19 15:36 (WEA_CD_02)	17:38	21	16:36 (WEA_CD_01)	18:31	20:26	21:19		21:55	14
16	08:34	15:17 (WEA_CD_02)	07:45		16:15 (WEA_CD_01)	06:42	06:29	05:30		05:01	
	16:42	19 15:36 (WEA_CD_02)	17:40	19	16:34 (WEA_CD_01)	18:33	20:28	21:20		21:56	15
17	08:33	15:18 (WEA_CD_02)	07:43		16:16 (WEA_CD_01)	06:40	06:27	05:28		05:01	
	16:44	19 15:37 (WEA_CD_02)	17:42	17	16:33 (WEA_CD_01)	18:34	20:30	21:22		21:56	17
18	08:32	15:19 (WEA_CD_02)	07:41		16:19 (WEA_CD_01)	06:38	06:25	05:26		05:01	
	16:45	17 15:36 (WEA_CD_02)	17:44	12	16:31 (WEA_CD_01)	18:36	20:32	21:23		21:57	17
19	08:31	15:20 (WEA_CD_02)	07:39		16:22 (WEA_CD_01)	06:35	06:22	05:25		05:01	
	16:47	15 15:35 (WEA_CD_02)	17:46	5	16:27 (WEA_CD_01)	18:38	20:33	21:25		21:57	17
20	08:30	15:21 (WEA_CD_02)	07:37			06:33	06:20	05:24		05:01	
	16:49	14 15:35 (WEA_CD_02)	17:48			18:40	20:35	21:26		21:58	17
21	08:28	15:22 (WEA_CD_02)	07:35			06:30	06:18	05:22	19:59 (WEA_RE_03)	05:22	
	16:50	11 15:34 (WEA_CD_02)	17:50			18:42	20:37	21:28	20:09 (WEA_RE_03)	05:22	10
22	08:27	15:25 (WEA_CD_02)	07:33			06:28	06:16	05:21	19:56 (WEA_RE_03)	05:21	
	16:52	7 15:32 (WEA_CD_02)	17:51			18:43	20:39	21:29	20:11 (WEA_RE_03)	05:21	15
23	08:26		07:31			06:26	06:14	05:19	19:55 (WEA_RE_03)	05:19	
	16:54		17:53			18:45	20:41	21:31	20:13 (WEA_RE_03)	05:19	18
24	08:25		07:28			06:23	06:11	05:18	19:53 (WEA_RE_03)	05:18	
	16:56		17:55			18:47	20:42	21:32	20:14 (WEA_RE_03)	05:18	21
25	08:23		07:26			06:21	06:09	05:17	19:52 (WEA_RE_03)	05:17	
	16:58		17:57			18:49	20:44	21:34	20:16 (WEA_RE_03)	05:17	24
26	08:22		07:24			06:18	06:07	05:16	19:51 (WEA_RE_03)	05:16	
	16:59		17:59			18:51	20:46	21:35	20:16 (WEA_RE_03)	05:16	25
27	08:21		07:22			06:16	06:05	05:14	19:50 (WEA_RE_03)	05:14	
	17:01		18:01			18:52	20:48	21:37	20:17 (WEA_RE_03)	05:13	27
28	08:19		07:20			06:14	06:03	05:13	19:50 (WEA_RE_03)	05:13	
	17:03		18:03			18:54	20:49	21:38	20:17 (WEA_RE_03)	05:13	27
29	08:18					07:11	06:01	05:12	19:49 (WEA_RE_03)	05:12	
	17:05					19:56	20:51	21:39	20:17 (WEA_RE_03)	05:12	28
30	08:16					07:09	05:59	05:11	19:49 (WEA_RE_03)	05:11	
	17:07					19:58	20:53	21:40	20:17 (WEA_RE_03)	05:11	28
31	08:15					07:07	07:00	05:10		05:10	
	17:09					20:00		21:42			
Sonnenscheinstunden		254			367	418		490		505	
astr. max.mögl. Beschattung		408	275	338		223		272		305	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_48 - IO 48 Vehnberg 23 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember							
1	05:06			20:07 (WEA_RE_03)	06:56		07:28				14:57 (WEA_CD_02)						
	21:57	10	21:09 (WEA_RE_05)	21:24	12	20:19 (WEA_RE_03)	20:19	19:07		15:58	24	16:06 (WEA_CD_01)	16:16	21	15:18 (WEA_CD_02)		
2	05:06		21:09 (WEA_RE_05)	05:46		20:04 (WEA_RE_03)	06:38	07:29		07:26		15:42 (WEA_CD_01)	16:19		14:56 (WEA_CD_02)		
	21:57	8	21:17 (WEA_RE_05)	21:22	16	20:20 (WEA_RE_03)	20:17	19:05		16:57	24	16:06 (WEA_CD_01)	16:15	21	15:17 (WEA_CD_02)		
3	05:07		21:12 (WEA_RE_05)	05:47		20:03 (WEA_RE_03)	06:40	07:31		07:28		15:43 (WEA_CD_01)	16:20		14:57 (WEA_CD_02)		
	21:57	3	21:15 (WEA_RE_05)	21:20	19	20:22 (WEA_RE_03)	20:14	19:02		16:55	23	16:06 (WEA_CD_01)	16:15	21	15:18 (WEA_CD_02)		
4	05:08		05:49			20:01 (WEA_RE_03)	06:41	07:33		07:30		15:43 (WEA_CD_01)	16:22		14:58 (WEA_CD_02)		
	21:58		21:18	21	20:22 (WEA_RE_03)	20:12	19:00			16:53	22	16:05 (WEA_CD_01)	16:14	21	15:19 (WEA_CD_02)		
5	05:09		05:51			20:01 (WEA_RE_03)	06:43	07:35		07:32		15:44 (WEA_CD_01)	16:23		14:58 (WEA_CD_02)		
	21:56		21:16	23	20:24 (WEA_RE_03)	20:10	18:58			16:51	20	16:04 (WEA_CD_01)	16:13	21	15:19 (WEA_CD_02)		
6	05:10		05:52			19:59 (WEA_RE_03)	06:45	07:37		07:33		15:45 (WEA_CD_01)	16:24		14:58 (WEA_CD_02)		
	21:55		21:15	25	20:24 (WEA_RE_03)	20:07	18:55			16:49	18	16:03 (WEA_CD_01)	16:13	21	15:19 (WEA_CD_02)		
7	05:11		05:54			19:59 (WEA_RE_03)	06:47	07:38		07:35		15:46 (WEA_CD_01)	16:26		14:59 (WEA_CD_02)		
	21:54		21:13	26	20:25 (WEA_RE_03)	20:05	18:53			16:47	16	16:02 (WEA_CD_01)	16:12	21	15:20 (WEA_CD_02)		
8	05:12		05:56			19:59 (WEA_RE_03)	06:48	07:40		07:37		15:48 (WEA_CD_01)	16:27		14:59 (WEA_CD_02)		
	21:54		21:11	26	20:25 (WEA_RE_03)	20:03	18:51			16:46	12	16:00 (WEA_CD_01)	16:12	21	15:20 (WEA_CD_02)		
9	05:13		05:57			19:58 (WEA_RE_03)	06:50	07:42		07:39		15:50 (WEA_CD_01)	16:28		15:00 (WEA_CD_02)		
	21:53		21:09	27	20:25 (WEA_RE_03)	20:00	18:48			16:44	8	15:58 (WEA_CD_01)	16:12	20	15:20 (WEA_CD_02)		
10	05:14		05:59			19:58 (WEA_RE_03)	06:52	07:44		07:41			16:29		15:01 (WEA_CD_02)		
	21:52		21:07	28	20:26 (WEA_RE_03)	19:58	18:46			16:42			16:11	20	15:21 (WEA_CD_02)		
11	05:15		06:01			19:57 (WEA_RE_03)	06:53	07:45		07:43			16:30		15:02 (WEA_CD_02)		
	21:51		21:05	28	20:26 (WEA_RE_03)	19:55	18:44			16:41			16:11	19	15:21 (WEA_CD_02)		
12	05:16		06:02			19:57 (WEA_RE_03)	06:55	07:47		07:45			16:32		15:02 (WEA_CD_02)		
	21:51		21:03	28	20:26 (WEA_RE_03)	19:53	18:41			16:39			16:11	19	15:21 (WEA_CD_02)		
13	05:17		06:04			19:57 (WEA_RE_03)	06:57	07:49		07:46			16:33		15:03 (WEA_CD_02)		
	21:50		21:01	28	20:26 (WEA_RE_03)	19:51	18:39			16:37			16:11	18	15:21 (WEA_CD_02)		
14	05:18		06:06			19:57 (WEA_RE_03)	06:58	07:51		07:48			16:34		14:59 (WEA_CD_03)		
	21:49		20:59	28	20:26 (WEA_RE_03)	19:48	18:37			16:36			16:11	20	15:21 (WEA_CD_02)		
15	05:19		06:07			19:57 (WEA_RE_03)	07:00	07:53		07:50			16:34		14:58 (WEA_CD_03)		
	21:48		20:57	28	20:26 (WEA_RE_03)	19:46	18:34			16:34			16:11	23	15:22 (WEA_CD_02)		
16	05:21		06:09			19:57 (WEA_RE_03)	07:02	07:54		07:52			16:35		14:58 (WEA_CD_03)		
	21:47		20:55	26	20:23 (WEA_RE_03)	19:43	18:32			16:33			16:11	23	15:22 (WEA_CD_02)		
17	05:22		06:11			19:56 (WEA_RE_03)	07:04	07:56		07:54			16:36		14:58 (WEA_CD_03)		
	21:45		20:53	25	20:23 (WEA_RE_03)	19:41	18:30			16:31			16:11	25	15:23 (WEA_CD_02)		
18	05:23		06:12			19:58 (WEA_RE_03)	07:05	07:58		07:56			16:37		14:58 (WEA_CD_03)		
	21:44		20:50	23	20:21 (WEA_RE_03)	19:38	18:28			16:30			16:11	24	15:22 (WEA_CD_02)		
19	05:25		06:14			19:59 (WEA_RE_03)	07:07	08:00		07:57			16:38		14:58 (WEA_CD_03)		
	21:43		20:48	21	20:20 (WEA_RE_03)	19:36	18:26			16:29			16:12	25	15:23 (WEA_CD_02)		
20	05:26		06:16			20:00 (WEA_RE_03)	07:09	08:02		07:59			16:38		14:59 (WEA_CD_03)		
	21:42		20:46	18	20:18 (WEA_RE_03)	19:34	18:23			16:27	7	15:07 (WEA_CD_02)	16:12	25	15:24 (WEA_CD_02)		
21	05:27		06:18			20:01 (WEA_RE_03)	07:10	08:04		08:01			14:58 (WEA_CD_02)	08:39	25	14:59 (WEA_CD_03)	
	21:40		20:44	14	20:15 (WEA_RE_03)	19:31	18:21			16:26	11	15:09 (WEA_CD_02)	16:13	25	15:24 (WEA_CD_02)		
22	05:29		06:19			20:04 (WEA_RE_03)	07:12	08:05		08:03			14:57 (WEA_CD_02)	08:39	25	15:00 (WEA_CD_03)	
	21:39		20:42	9	20:13 (WEA_RE_03)	19:29	18:19			16:25	14	15:11 (WEA_CD_02)	16:13	25	15:25 (WEA_CD_02)		
23	05:30		06:21			07:14	08:07			16:51 (WEA_CD_01)	08:04		14:57 (WEA_CD_02)	08:40	25	15:00 (WEA_CD_03)	
	21:38		20:40			19:26	18:17		8	16:59 (WEA_CD_01)	16:24	15	15:12 (WEA_CD_02)	16:13	25	15:25 (WEA_CD_02)	
24	05:32		06:22			07:16	08:09			16:48 (WEA_CD_01)	08:06		14:57 (WEA_CD_02)	08:40	25	15:00 (WEA_CD_03)	
	21:36		20:37			19:24	18:15	14	17:02 (WEA_CD_01)	16:22	17	15:14 (WEA_CD_02)	16:14	25	15:25 (WEA_CD_02)		
25	05:33		06:24			07:17	07:11			15:46 (WEA_CD_01)	08:08		14:56 (WEA_CD_02)	08:41	25	15:01 (WEA_CD_03)	
	21:35		20:35			19:22	17:13	17	16:03 (WEA_CD_01)	16:21	19	15:15 (WEA_CD_02)	16:15	25	15:26 (WEA_CD_02)		
26	05:35		06:26			07:19	07:13			15:45 (WEA_CD_01)	08:09		14:56 (WEA_CD_02)	08:41	25	15:02 (WEA_CD_03)	
	21:33		20:33			19:19	17:11	20	16:05 (WEA_CD_01)	16:20	19	15:15 (WEA_CD_02)	16:15	24	15:26 (WEA_CD_02)		
27	05:36		06:28			07:21	07:15			15:44 (WEA_CD_01)	08:11		14:56 (WEA_CD_02)	08:41	25	15:03 (WEA_CD_03)	
	21:32		20:31			19:17	17:08	21	16:05 (WEA_CD_01)	16:19	19	15:15 (WEA_CD_02)	16:16	24	15:27 (WEA_CD_02)		
28	05:38		06:29			07:23	07:17			15:43 (WEA_CD_01)	08:13		14:56 (WEA_CD_02)	08:42	25	15:04 (WEA_CD_03)	
	21:30		20:28			19:14	17:06	23	16:06 (WEA_CD_01)	16:18	20	15:16 (WEA_CD_02)	16:17	22	15:27 (WEA_CD_02)		
29	05:41		06:31			07:24	07:18			15:43 (WEA_CD_01)	08:14		14:56 (WEA_CD_02)	08:42	25	15:05 (WEA_CD_03)	
	21:29		20:26			19:12	17:04	23	16:06 (WEA_CD_01)	16:18	21	15:17 (WEA_CD_02)	16:18	21	15:28 (WEA_CD_02)		
30	05:41		06:32			07:26	07:20			15:43 (WEA_CD_01)	08:16		14:56 (WEA_CD_02)	08:42	25	15:10 (WEA_CD_02)	
	21:27		20:24			19:10	17:02	23	16:06 (WEA_CD_01)	16:17	21	15:17 (WEA_CD_02)	16:19	19	15:29 (WEA_CD_02)		
31	05:42		20:09 (WEA_RE_03)	06:35		07:22	07:22			15:42 (WEA_CD_01)			16:17		15:11 (WEA_CD_02)		
	21:25	6	20:15 (WEA_RE_03)	20:21		17:00	17:00	24	16:06 (WEA_CD_01)				16:20	19	15:30 (WEA_CD_02)		
Sonnenscheinstunden		508				382		330				262		238			
astr. max.mögl. Beschattung		27		499				173		350				683			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_49 - IO 49 Vehnberg 18 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni			
1	08:42	15:16 (WEA_CD_02)	08:13	16:17 (WEA_CD_01)	07:17	07:04		05:57	19:43 (WEA_RE_03)	05:09	20:38 (WEA_RE_05)		
	16:21	18	15:34 (WEA_CD_02)	17:11	13	16:30 (WEA_CD_01)	18:05	20:01	20	20:03 (WEA_RE_03)	21:43	28	21:06 (WEA_RE_05)
2	08:42	15:15 (WEA_CD_02)	08:11	16:15 (WEA_CD_01)	07:15	07:02		05:55	19:44 (WEA_RE_03)	05:08	20:37 (WEA_RE_05)		
	16:22	19	15:34 (WEA_CD_02)	17:13	16	16:31 (WEA_CD_01)	18:07	20:03	18	20:02 (WEA_RE_03)	21:44	29	21:06 (WEA_RE_05)
3	08:41	15:16 (WEA_CD_02)	08:10	16:14 (WEA_CD_01)	07:13	06:59		05:53	19:46 (WEA_RE_03)	05:07	20:37 (WEA_RE_05)		
	16:23	19	15:35 (WEA_CD_02)	17:15	18	16:32 (WEA_CD_01)	18:09	20:05	14	20:00 (WEA_RE_03)	21:45	29	21:06 (WEA_RE_05)
4	08:41	15:17 (WEA_CD_02)	08:08	16:14 (WEA_CD_01)	07:10	06:57		05:51	19:48 (WEA_RE_03)	05:07	20:37 (WEA_RE_05)		
	16:24	19	15:36 (WEA_CD_02)	17:17	20	16:34 (WEA_CD_01)	18:10	20:07	9	19:57 (WEA_RE_03)	21:46	30	21:07 (WEA_RE_05)
5	08:41	15:16 (WEA_CD_02)	08:06	16:14 (WEA_CD_01)	07:08	06:55		05:49		05:06	20:37 (WEA_RE_05)		
	16:26	20	15:36 (WEA_CD_02)	17:19	20	16:34 (WEA_CD_01)	18:12	20:08		21:02	21:47	30	21:07 (WEA_RE_05)
6	08:41	15:17 (WEA_CD_02)	08:04	16:13 (WEA_CD_01)	07:06	06:52		05:47		05:05	20:37 (WEA_RE_05)		
	16:27	20	15:37 (WEA_CD_02)	17:20	22	16:35 (WEA_CD_01)	18:14	20:10		21:03	21:48	31	21:08 (WEA_RE_05)
7	08:40	15:17 (WEA_CD_02)	08:03	16:13 (WEA_CD_01)	07:04	06:50		05:45		05:05	20:37 (WEA_RE_05)		
	16:28	20	15:37 (WEA_CD_02)	17:22	22	16:35 (WEA_CD_01)	18:16	20:12		21:05	21:49	31	21:08 (WEA_RE_05)
8	08:40	15:17 (WEA_CD_02)	08:01	16:13 (WEA_CD_01)	07:01	06:48		05:43		05:04	20:37 (WEA_RE_05)		
	16:30	20	15:37 (WEA_CD_02)	17:24	22	16:35 (WEA_CD_01)	18:18	20:14		21:07	21:50	32	21:09 (WEA_RE_05)
9	08:39	15:19 (WEA_CD_02)	07:59	16:13 (WEA_CD_01)	06:59	06:45		05:42		05:04	20:37 (WEA_RE_05)		
	16:31	19	15:38 (WEA_CD_02)	17:26	22	16:35 (WEA_CD_01)	18:20	20:16		21:09	21:51	32	21:09 (WEA_RE_05)
10	08:38	15:19 (WEA_CD_02)	07:57	16:14 (WEA_CD_01)	06:57	06:43		05:40		05:03	20:37 (WEA_RE_05)		
	16:33	19	15:38 (WEA_CD_02)	17:28	21	16:35 (WEA_CD_01)	18:22	20:17		21:10	21:52	33	21:10 (WEA_RE_05)
11	08:38	15:19 (WEA_CD_02)	07:55	16:14 (WEA_CD_01)	06:54	06:41		05:38		05:03	20:37 (WEA_RE_05)		
	16:34	19	15:38 (WEA_CD_02)	17:30	21	16:35 (WEA_CD_01)	18:23	20:19		21:12	21:53	33	21:10 (WEA_RE_05)
12	08:37	15:19 (WEA_CD_02)	07:53	16:15 (WEA_CD_01)	06:52	06:38		05:36		05:02	20:37 (WEA_RE_05)		
	16:36	19	15:38 (WEA_CD_02)	17:32	19	16:34 (WEA_CD_01)	18:25	20:21		21:14	21:53	33	21:10 (WEA_RE_05)
13	08:36	15:20 (WEA_CD_02)	07:51	16:16 (WEA_CD_01)	06:49	06:36		05:35		05:02	20:37 (WEA_RE_05)		
	16:37	19	15:39 (WEA_CD_02)	17:34	17	16:33 (WEA_CD_01)	18:27	20:23		21:15	21:54	33	21:10 (WEA_RE_05)
14	08:36	15:21 (WEA_CD_02)	07:49	16:18 (WEA_CD_01)	06:47	06:34		05:33		05:02	20:37 (WEA_RE_05)		
	16:39	18	15:39 (WEA_CD_02)	17:36	14	16:32 (WEA_CD_01)	18:29	20:25		21:17	21:55	34	21:11 (WEA_RE_05)
15	08:35	15:21 (WEA_CD_02)	07:47	16:20 (WEA_CD_01)	06:45	06:31		05:31	19:52 (WEA_RE_03)	05:21	20:38 (WEA_RE_05)		
	16:40	18	15:39 (WEA_CD_02)	17:38	10	16:30 (WEA_CD_01)	18:31	20:26	7	19:59 (WEA_RE_03)	21:19	33	21:11 (WEA_RE_05)
16	08:34	15:22 (WEA_CD_02)	07:45	06:42	06:29		05:29	19:49 (WEA_RE_03)	05:30	05:01	20:38 (WEA_RE_05)		
	16:42	17	15:39 (WEA_CD_02)	17:40		18:33	20:28	12	20:01 (WEA_RE_03)	21:20	21:56	33	21:11 (WEA_RE_05)
17	08:33	15:24 (WEA_CD_02)	07:43	16:40	06:27		05:27	19:47 (WEA_RE_03)	05:28	05:01	20:38 (WEA_RE_05)		
	16:44	15	15:39 (WEA_CD_02)	17:42	18:34	20:30	16	20:03 (WEA_RE_03)	21:22	21:56	34	21:12 (WEA_RE_05)	
18	08:32	15:24 (WEA_CD_02)	07:41	06:38	06:25		05:25	19:45 (WEA_RE_03)	05:26	05:01	20:38 (WEA_RE_05)		
	16:45	14	15:38 (WEA_CD_02)	17:44	18:36	20:32	19	20:04 (WEA_RE_03)	21:23	21:57	34	21:12 (WEA_RE_05)	
19	08:31	15:26 (WEA_CD_02)	07:39	06:35	06:22		05:22	19:44 (WEA_RE_03)	05:25	05:01	20:38 (WEA_RE_05)		
	16:47	11	15:37 (WEA_CD_02)	17:46	18:38	20:33	21	20:05 (WEA_RE_03)	21:25	21:57	34	21:12 (WEA_RE_05)	
20	08:30	15:28 (WEA_CD_02)	07:37	06:33	06:20		05:20	19:43 (WEA_RE_03)	05:24	05:01	20:38 (WEA_RE_05)		
	16:49	8	15:36 (WEA_CD_02)	17:48	18:40	20:35	24	20:07 (WEA_RE_03)	21:26	21:58	34	21:12 (WEA_RE_05)	
21	08:28	15:32 (WEA_CD_02)	07:35	06:30	06:18		05:18	19:42 (WEA_RE_03)	05:22	05:01	20:38 (WEA_RE_05)		
	16:50	1	15:33 (WEA_CD_02)	17:50	18:42	20:37	26	20:08 (WEA_RE_03)	21:28	21:58	34	21:12 (WEA_RE_05)	
22	08:27	07:33	06:28	06:16	06:03		05:03	19:42 (WEA_RE_03)	05:21	05:02	20:39 (WEA_RE_05)		
	16:52	1	15:33 (WEA_CD_02)	17:51	18:43	20:39	26	20:08 (WEA_RE_03)	21:29	21:58	34	21:13 (WEA_RE_05)	
23	08:26	07:31	06:26	06:14	06:01		05:01	19:41 (WEA_RE_03)	05:19	05:02	20:39 (WEA_RE_05)		
	16:54	17:53	18:45	20:41	27	20:08 (WEA_RE_03)	21:31	8	20:55 (WEA_RE_03)	21:58	34	21:13 (WEA_RE_05)	
24	08:25	07:28	06:23	06:11	05:59		05:00	19:41 (WEA_RE_03)	05:18	05:02	20:39 (WEA_RE_05)		
	16:56	17:55	18:47	20:42	27	20:08 (WEA_RE_03)	21:32	14	20:58 (WEA_RE_03)	21:58	34	21:13 (WEA_RE_05)	
25	08:23	07:26	06:21	06:09	05:57		05:00	19:41 (WEA_RE_03)	05:17	05:02	20:39 (WEA_RE_05)		
	16:58	17:57	18:49	20:44	27	20:08 (WEA_RE_03)	21:34	17	20:59 (WEA_RE_03)	21:58	34	21:13 (WEA_RE_05)	
26	08:22	07:24	06:18	06:07	05:56		05:00	19:41 (WEA_RE_03)	05:16	05:03	20:40 (WEA_RE_05)		
	16:59	17:59	18:51	20:46	26	20:07 (WEA_RE_03)	21:35	19	21:00 (WEA_RE_03)	21:58	34	21:14 (WEA_RE_05)	
27	08:21	07:22	06:16	06:05	05:55		05:00	19:41 (WEA_RE_03)	05:14	05:03	20:40 (WEA_RE_05)		
	17:01	18:01	18:52	20:48	26	20:07 (WEA_RE_03)	21:37	21	21:01 (WEA_RE_03)	21:58	33	21:13 (WEA_RE_05)	
28	08:19	07:20	06:14	06:03	05:54		05:00	19:41 (WEA_RE_03)	05:13	05:04	20:40 (WEA_RE_05)		
	17:03	18:03	18:54	20:49	25	20:06 (WEA_RE_03)	21:39	23	21:02 (WEA_RE_03)	21:58	34	21:14 (WEA_RE_05)	
29	08:18	07:19	06:11	06:01	05:53		05:00	19:42 (WEA_RE_03)	05:12	05:04	20:40 (WEA_RE_05)		
	17:05	18:05	18:56	20:51	24	20:06 (WEA_RE_03)	21:39	24	21:03 (WEA_RE_03)	21:58	34	21:14 (WEA_RE_05)	
30	08:16	07:17	06:09	05:59	05:52		05:00	19:42 (WEA_RE_03)	05:11	05:05	20:41 (WEA_RE_05)		
	17:07	18:07	18:58	20:53	23	20:05 (WEA_RE_03)	21:40	26	21:05 (WEA_RE_03)	21:58	33	21:14 (WEA_RE_05)	
31	08:15	16:19 (WEA_CD_01)	07:07	07:00				05:10		20:58 (WEA_RE_03)			
	17:09	9	16:28 (WEA_CD_01)	20:00				21:42	27	21:05 (WEA_RE_03)			
Sonnenscheinstunden		254	275	367	418	490	505	505	505	505	505	505	505
astr. max.mögl. Beschattung		361	277	356	356	240	240	240	240	240	240	240	240

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_49 - IO 49 Vehnberg 18 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September/Oktober		November		Dezember					
1	05:06	20:42 (WEA_RE_05)	05:44		06:36	07:28		07:24	15:43 (WEA_CD_01)	08:17	15:01 (WEA_CD_02)		
	21:57	32	21:14 (WEA_RE_06)	21:24		20:19	19:07	16:58	22	16:05 (WEA_CD_01)	16:16	19	15:30 (WEA_CD_02)
2	05:06		20:41 (WEA_RE_05)	05:46		06:38	07:29	07:26		15:43 (WEA_CD_01)	08:19	19	15:01 (WEA_CD_02)
	21:57	33	21:14 (WEA_RE_06)	21:22		20:17	19:05	16:57	22	16:05 (WEA_CD_01)	16:15	19	15:20 (WEA_CD_02)
3	05:07		20:42 (WEA_RE_05)	05:47		06:40	07:31	07:28		15:43 (WEA_CD_01)	08:20	19	15:02 (WEA_CD_02)
	21:57	32	21:14 (WEA_RE_06)	21:20		20:14	19:02	16:55	22	16:05 (WEA_CD_01)	16:15	19	15:21 (WEA_CD_02)
4	05:08		20:42 (WEA_RE_05)	05:49		06:41	07:33	07:30		15:43 (WEA_CD_01)	08:22	19	15:02 (WEA_CD_02)
	21:56	32	21:14 (WEA_RE_06)	21:18		20:12	19:00	16:53	22	16:05 (WEA_CD_01)	16:14	20	15:22 (WEA_CD_02)
5	05:09		20:43 (WEA_RE_05)	05:51		06:43	07:35	07:32		15:43 (WEA_CD_01)	08:23	19	15:02 (WEA_CD_02)
	21:56	32	21:15 (WEA_RE_06)	21:16		20:10	18:58	16:51	22	16:05 (WEA_CD_01)	16:13	20	15:22 (WEA_CD_02)
6	05:10		20:43 (WEA_RE_05)	05:52		06:45	07:37	07:33		15:44 (WEA_CD_01)	08:24	19	15:02 (WEA_CD_02)
	21:55	32	21:15 (WEA_RE_06)	21:15		20:07	18:55	16:49	20	16:04 (WEA_CD_01)	16:13	20	15:22 (WEA_CD_02)
7	05:11		20:43 (WEA_RE_05)	05:54		06:47	07:38	07:35		15:44 (WEA_CD_01)	08:26	19	15:04 (WEA_CD_02)
	21:54	31	21:14 (WEA_RE_06)	21:13		20:05	18:53	16:47	20	16:04 (WEA_CD_01)	16:12	19	15:23 (WEA_CD_02)
8	05:12		20:43 (WEA_RE_05)	05:55		20:01 (WEA_RE_03)	06:48	07:40		15:45 (WEA_CD_01)	08:27	19	15:04 (WEA_CD_02)
	21:54	31	21:14 (WEA_RE_06)	21:11	3	20:04 (WEA_RE_03)	20:03	18:51	18	16:03 (WEA_CD_01)	16:12	19	15:23 (WEA_CD_02)
9	05:13		20:44 (WEA_RE_05)	05:57		19:56 (WEA_RE_03)	06:50	07:42		15:46 (WEA_CD_01)	08:28	19	15:04 (WEA_CD_02)
	21:53	30	21:14 (WEA_RE_06)	21:09	12	20:08 (WEA_RE_03)	20:00	18:48	16	16:02 (WEA_CD_01)	16:12	19	15:23 (WEA_CD_02)
10	05:14		20:44 (WEA_RE_05)	05:59		19:55 (WEA_RE_03)	06:52	07:44		15:48 (WEA_CD_01)	08:29	19	15:05 (WEA_CD_02)
	21:52	30	21:14 (WEA_RE_06)	21:07	15	20:10 (WEA_RE_03)	19:58	18:46	12	16:03 (WEA_CD_01)	16:11	19	15:24 (WEA_CD_02)
11	05:15		20:45 (WEA_RE_05)	06:01		19:52 (WEA_RE_03)	06:53	07:45		15:50 (WEA_CD_01)	08:30	19	15:06 (WEA_CD_02)
	21:51	28	21:13 (WEA_RE_06)	21:05	19	20:11 (WEA_RE_03)	19:55	18:44	8	15:59 (WEA_CD_01)	16:11	18	15:24 (WEA_CD_02)
12	05:16		20:46 (WEA_RE_05)	06:02		19:51 (WEA_RE_03)	06:55	07:47			08:32	18	15:06 (WEA_CD_02)
	21:51	27	21:13 (WEA_RE_06)	21:03	21	20:12 (WEA_RE_03)	19:53	18:41		16:11	16:11	18	15:24 (WEA_CD_02)
13	05:17		20:46 (WEA_RE_05)	06:04		19:50 (WEA_RE_03)	06:57	07:49		16:11	16:11	17	15:07 (WEA_CD_02)
	21:50	26	21:12 (WEA_RE_06)	21:01	22	20:13 (WEA_RE_03)	19:51	18:39		16:11	16:11	17	15:24 (WEA_CD_02)
14	05:18		20:48 (WEA_RE_05)	06:06		19:49 (WEA_RE_03)	06:59	07:51		16:11	16:11	17	15:07 (WEA_CD_02)
	21:49	25	21:13 (WEA_RE_06)	20:59	24	20:13 (WEA_RE_03)	19:48	18:37		16:11	16:11	18	15:25 (WEA_CD_02)
15	05:19		20:48 (WEA_RE_05)	06:07		19:49 (WEA_RE_03)	07:00	07:52		16:11	16:11	18	15:08 (WEA_CD_02)
	21:48	24	21:12 (WEA_RE_06)	20:57	25	20:14 (WEA_RE_03)	19:46	18:34		16:11	16:11	17	15:25 (WEA_CD_02)
16	05:21		20:49 (WEA_RE_05)	06:09		19:48 (WEA_RE_03)	07:02	07:54		16:11	16:11	17	15:08 (WEA_CD_02)
	21:47	22	21:11 (WEA_RE_06)	20:55	26	20:14 (WEA_RE_03)	19:43	18:32		16:11	16:11	19	15:25 (WEA_CD_02)
17	05:22		20:50 (WEA_RE_05)	06:11		19:47 (WEA_RE_03)	07:04	07:56		16:11	16:11	17	15:09 (WEA_CD_02)
	21:45	20	21:10 (WEA_RE_06)	20:53	27	20:14 (WEA_RE_03)	19:41	18:30		16:11	16:11	21	15:26 (WEA_CD_02)
18	05:23		20:51 (WEA_RE_05)	06:12		19:46 (WEA_RE_03)	07:05	07:58		16:11	16:11	17	15:02 (WEA_CD_02)
	21:44	18	21:09 (WEA_RE_06)	20:50	27	20:13 (WEA_RE_03)	19:38	18:28		16:11	16:11	23	15:26 (WEA_CD_02)
19	05:25		20:53 (WEA_RE_05)	06:14		19:47 (WEA_RE_03)	07:07	08:00		16:11	16:11	17	15:03 (WEA_CD_02)
	21:43	15	21:08 (WEA_RE_06)	20:48	27	20:14 (WEA_RE_03)	19:36	18:26		16:11	16:11	22	15:26 (WEA_CD_02)
20	05:26		20:55 (WEA_RE_05)	06:16		19:47 (WEA_RE_03)	07:09	08:02		16:11	16:11	23	15:03 (WEA_CD_02)
	21:42	11	21:06 (WEA_RE_06)	20:46	27	20:14 (WEA_RE_03)	19:34	18:25		16:11	16:11	23	15:27 (WEA_CD_02)
21	05:27		20:58 (WEA_RE_05)	06:18		19:46 (WEA_RE_03)	07:10	08:04		16:11	16:11	23	15:03 (WEA_CD_02)
	21:40	5	21:03 (WEA_RE_06)	20:44	26	20:12 (WEA_RE_03)	19:31	18:21		16:11	16:11	23	15:27 (WEA_CD_02)
22	05:29		20:59 (WEA_RE_05)	06:19		19:47 (WEA_RE_03)	07:12	08:05		16:11	16:11	23	15:04 (WEA_CD_02)
	21:39		20:42	25	20:12 (WEA_RE_03)	19:29	18:19		8	15:12 (WEA_CD_02)	16:13	23	15:28 (WEA_CD_02)
23	05:30		06:21		19:48 (WEA_RE_03)	07:14	08:07			15:03 (WEA_CD_02)	16:40	23	15:04 (WEA_CD_03)
	21:38		20:40	24	20:12 (WEA_RE_03)	19:26	18:17		11	15:14 (WEA_CD_02)	16:13	23	15:28 (WEA_CD_02)
24	05:32		06:23		19:47 (WEA_RE_03)	07:16	08:09			15:02 (WEA_CD_02)	16:40	23	15:04 (WEA_CD_03)
	21:36		20:37	22	20:09 (WEA_RE_03)	19:24	18:15		14	15:16 (WEA_CD_02)	16:14	23	15:28 (WEA_CD_02)
25	05:33		06:24		19:49 (WEA_RE_03)	07:17	07:11			15:02 (WEA_CD_02)	16:41	23	15:06 (WEA_CD_03)
	21:35		20:35	18	20:07 (WEA_RE_03)	19:22	17:13		15	15:17 (WEA_CD_02)	16:15	22	15:29 (WEA_CD_02)
26	05:35		06:26		19:49 (WEA_RE_03)	07:19	07:13			15:01 (WEA_CD_02)	16:41	23	15:06 (WEA_CD_03)
	21:33		20:33	15	20:04 (WEA_RE_03)	19:19	17:11	5	15:52 (WEA_CD_01)	08:09		22	15:30 (WEA_CD_02)
27	05:36		06:28		19:51 (WEA_RE_03)	07:21	07:15		15:49 (WEA_CD_01)	08:11		15:07 (WEA_CD_03)	
	21:32		20:31	11	20:02 (WEA_RE_03)	19:17	17:08	11	16:00 (WEA_CD_01)	16:19	17	15:30 (WEA_CD_02)	
28	05:38		06:29		19:55 (WEA_RE_03)	07:23	07:17			15:01 (WEA_CD_02)	16:42	20	15:09 (WEA_CD_03)
	21:30		20:28	6	20:01 (WEA_RE_03)	19:14	17:06	15	16:02 (WEA_CD_01)	16:19	18	15:31 (WEA_CD_02)	
29	05:39		06:31			07:24	07:18			15:45 (WEA_CD_01)	16:14	19	15:14 (WEA_CD_02)
	21:29		20:26			19:12	17:04	18	16:03 (WEA_CD_01)	16:18	19	15:31 (WEA_CD_02)	
30	05:41		06:32			07:26	07:20			15:44 (WEA_CD_01)	16:16	19	15:15 (WEA_CD_02)
	21:27		20:24			19:10	17:02	20	16:04 (WEA_CD_01)	16:17	19	15:32 (WEA_CD_02)	
31	05:42		06:35			07:22				15:44 (WEA_CD_01)		17	15:15 (WEA_CD_02)
	21:25		20:21			17:00	20	16:04 (WEA_CD_01)				18	15:33 (WEA_CD_02)
Sonnenscheinstunden		508		457		382	330		262		238		616
astr. max.mögl. Beschattung		536		422			89		342				

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_50 - IO 50 Vehnberg 13A Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	15:22 (WEA_CD_03)	08:13		07:17	07:04		05:57	19:49 (WEA_RE_03)	05:09	20:41 (WEA_RE_05)
	16:21	14 15:36 (WEA_CD_03)	17:11		18:05	20:01		20:55	21 20:10 (WEA_RE_03)	21:43	26 21:07 (WEA_RE_05)
2	08:42	15:21 (WEA_CD_03)	08:11		07:15	07:02		05:55	19:49 (WEA_RE_03)	05:08	20:40 (WEA_RE_05)
	16:22	15 15:36 (WEA_CD_03)	17:13		18:07	20:03		20:56	20 20:09 (WEA_RE_03)	21:44	28 21:08 (WEA_RE_05)
3	08:41	15:22 (WEA_CD_03)	08:10		07:13	06:59		05:53	19:50 (WEA_RE_03)	05:07	20:40 (WEA_RE_05)
	16:23	15 15:37 (WEA_CD_03)	17:15		18:09	20:05		20:58	18 20:08 (WEA_RE_03)	21:45	28 21:08 (WEA_RE_05)
4	08:41	15:23 (WEA_CD_03)	08:08		07:10	06:57		05:51	19:51 (WEA_RE_03)	05:07	20:41 (WEA_RE_05)
	16:24	14 15:37 (WEA_CD_03)	17:17		18:10	20:07		21:00	15 20:06 (WEA_RE_03)	21:46	28 21:09 (WEA_RE_05)
5	08:41	15:23 (WEA_CD_03)	08:06		07:08	06:55		05:49	19:54 (WEA_RE_03)	05:06	20:40 (WEA_RE_05)
	16:26	14 15:37 (WEA_CD_03)	17:19		18:12	20:08		21:02	11 20:05 (WEA_RE_03)	21:47	29 21:09 (WEA_RE_05)
6	08:41	15:25 (WEA_CD_03)	08:04		07:06	06:52		05:47		05:05	20:41 (WEA_RE_05)
	16:27	13 15:38 (WEA_CD_03)	17:20		18:14	20:10		21:03		21:48	29 21:10 (WEA_RE_05)
7	08:40	15:25 (WEA_CD_03)	08:03		07:04	06:50		05:45		05:05	20:40 (WEA_RE_05)
	16:28	12 15:37 (WEA_CD_03)	17:22		18:16	20:12		21:05		21:49	30 21:10 (WEA_RE_05)
8	08:40	15:25 (WEA_CD_03)	08:01		07:01	06:48		05:43		05:04	20:41 (WEA_RE_05)
	16:30	12 15:37 (WEA_CD_03)	17:24		18:18	20:14		21:07		21:50	30 21:11 (WEA_RE_05)
9	08:39	15:27 (WEA_CD_03)	07:59		06:59	06:45		05:42		05:04	20:40 (WEA_RE_05)
	16:31	11 15:38 (WEA_CD_03)	17:26		18:20	20:16		21:09		21:51	30 21:10 (WEA_RE_05)
10	08:38	15:28 (WEA_CD_03)	07:57		06:57	06:43		05:40		05:03	20:41 (WEA_RE_05)
	16:33	14 15:52 (WEA_CD_02)	17:28		18:22	20:17		21:10		21:52	30 21:11 (WEA_RE_05)
11	08:38	15:29 (WEA_CD_03)	07:55		06:59	06:54		05:38		05:03	20:41 (WEA_RE_05)
	16:34	15 15:54 (WEA_CD_02)	17:30		18:23	20:19		21:12		21:53	31 21:12 (WEA_RE_05)
12	08:37	15:31 (WEA_CD_03)	07:53		06:58	06:38		05:36		05:02	20:40 (WEA_RE_05)
	16:36	15 15:56 (WEA_CD_02)	17:32		18:25	20:21		21:14		21:53	31 21:11 (WEA_RE_05)
13	08:36	15:44 (WEA_CD_02)	07:51		06:57	06:36		05:35		05:02	20:41 (WEA_RE_05)
	16:37	13 15:57 (WEA_CD_02)	17:34		18:27	20:23		21:15		21:54	31 21:12 (WEA_RE_05)
14	08:36	15:44 (WEA_CD_02)	07:49		06:56	06:47		05:33		05:02	20:41 (WEA_RE_05)
	16:39	14 15:58 (WEA_CD_02)	17:36		18:29	20:25		21:17		21:55	31 21:12 (WEA_RE_05)
15	08:35	15:44 (WEA_CD_02)	07:47		06:56	06:31		05:31		05:01	20:41 (WEA_RE_05)
	16:40	15 15:59 (WEA_CD_02)	17:38		18:31	20:26		21:19		21:55	31 21:12 (WEA_RE_05)
16	08:34	15:44 (WEA_CD_02)	07:45		06:52	06:29		05:30		05:01	20:42 (WEA_RE_05)
	16:42	16 16:00 (WEA_CD_02)	17:40		18:33	20:28		21:20		21:56	31 21:13 (WEA_RE_05)
17	08:33	15:44 (WEA_CD_02)	07:43		06:50	06:27		05:28		05:01	20:42 (WEA_RE_05)
	16:44	17 16:01 (WEA_CD_02)	17:42		18:34	20:30		21:22	3 20:03 (WEA_RE_03)	21:22	31 21:13 (WEA_RE_05)
18	08:32	15:43 (WEA_CD_02)	07:41		06:50	06:25		05:26		05:01	20:42 (WEA_RE_05)
	16:45	18 16:01 (WEA_CD_02)	17:44		18:36	20:32		21:23	9 20:04 (WEA_RE_03)	21:23	31 21:13 (WEA_RE_05)
19	08:31	15:43 (WEA_CD_02)	07:39		06:50	06:22		05:25		05:01	20:42 (WEA_RE_05)
	16:47	19 16:02 (WEA_CD_02)	17:46		18:38	20:33		21:25	12 20:05 (WEA_RE_03)	21:25	31 21:13 (WEA_RE_05)
20	08:30	15:44 (WEA_CD_02)	07:37		06:50	06:20		05:24		05:01	20:42 (WEA_RE_05)
	16:49	18 16:02 (WEA_CD_02)	17:48		18:40	20:35		21:26	16 20:07 (WEA_RE_03)	21:26	31 21:13 (WEA_RE_05)
21	08:28	15:44 (WEA_CD_02)	07:35		06:50	06:18		05:22		05:01	20:42 (WEA_RE_05)
	16:50	19 16:03 (WEA_CD_02)	17:50		18:42	20:37		21:28	19 20:09 (WEA_RE_03)	21:28	31 21:13 (WEA_RE_05)
22	08:27	15:44 (WEA_CD_02)	07:33		06:50	06:16		05:21		05:02	20:43 (WEA_RE_05)
	16:52	19 16:03 (WEA_CD_02)	17:51		18:43	20:39		21:29	22 20:11 (WEA_RE_03)	21:29	31 21:14 (WEA_RE_05)
23	08:26	15:45 (WEA_CD_02)	07:31		06:50	06:14		05:19		05:02	20:43 (WEA_RE_05)
	16:54	18 16:03 (WEA_CD_02)	17:53		18:45	20:41		21:31	9 20:58 (WEA_RE_03)	21:58	31 21:14 (WEA_RE_05)
24	08:25	15:45 (WEA_CD_02)	07:28		06:50	06:11		05:18		05:02	20:43 (WEA_RE_05)
	16:56	18 16:03 (WEA_CD_02)	17:55		18:47	20:42		21:32	13 21:00 (WEA_RE_03)	21:58	31 21:14 (WEA_RE_05)
25	08:23	15:46 (WEA_CD_02)	07:26		06:50	06:09		05:17		05:02	20:43 (WEA_RE_05)
	16:58	17 16:03 (WEA_CD_02)	17:57		18:49	20:44		21:34	17 21:01 (WEA_RE_03)	21:58	31 21:14 (WEA_RE_05)
26	08:22	15:46 (WEA_CD_02)	07:24		06:50	06:07		05:16		05:03	20:44 (WEA_RE_05)
	16:59	17 16:03 (WEA_CD_02)	17:59		18:51	20:46		21:35	18 21:02 (WEA_RE_03)	21:58	31 21:15 (WEA_RE_05)
27	08:21	15:48 (WEA_CD_02)	07:22		06:50	06:05		05:14		05:03	20:43 (WEA_RE_05)
	17:01	15 16:03 (WEA_CD_02)	18:01		18:52	20:48		21:37	20 21:03 (WEA_RE_03)	21:58	32 21:15 (WEA_RE_05)
28	08:19	15:49 (WEA_CD_02)	07:20		06:50	06:03		05:13		05:04	20:44 (WEA_RE_05)
	17:03	13 16:02 (WEA_CD_02)	18:03		18:54	20:49		21:39	22 21:04 (WEA_RE_03)	21:58	31 21:15 (WEA_RE_05)
29	08:18	15:50 (WEA_CD_02)			07:11	06:01		05:12		05:04	20:44 (WEA_RE_05)
	17:05	10 16:00 (WEA_CD_02)			19:56	20:51		21:39	24 21:05 (WEA_RE_03)	21:58	31 21:15 (WEA_RE_05)
30	08:16	15:54 (WEA_CD_02)			07:09	05:59		05:11		05:05	20:44 (WEA_RE_05)
	17:07	4 15:58 (WEA_CD_02)			19:58	20:53		21:40	25 21:07 (WEA_RE_03)	21:58	31 21:15 (WEA_RE_05)
31	08:15				07:07	05:50		05:10		05:06	20:41 (WEA_RE_05)
	17:09				20:00			21:42	26 21:07 (WEA_RE_03)		909
Sonnenscheinstunden		254			367	418		490		505	
astr. max.mögl. Beschattung		444	238			276		259			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_50 - IO 50 Vehnberg 13A Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember					
1	05:06	20:45 (WEA_RE_05)	05:44		06:36	07:28		07:24	16:11 (WEA_CD_01)	08:17	15:11 (WEA_CD_03)				
	21:57	31	21:16 (WEA_RE_06)	21:24	20:19	19:07		16:58	9	16:20 (WEA_CD_01)	16:16	15:36 (WEA_CD_02)			
2	05:06		20:45 (WEA_RE_05)	05:46	06:38	07:29		07:26		08:19	15:10 (WEA_CD_03)				
	21:57	30	21:15 (WEA_RE_05)	21:22	20:17	19:05		16:57		16:15	14	15:34 (WEA_CD_02)			
3	05:07		20:45 (WEA_RE_05)	05:47	06:40	07:31		07:28		08:20	15:10 (WEA_CD_03)				
	21:57	31	21:16 (WEA_RE_05)	21:20	20:14	19:02		16:55		16:14	11	15:21 (WEA_CD_03)			
4	05:08		20:46 (WEA_RE_05)	05:49	06:41	07:33		07:30		08:22	15:11 (WEA_CD_03)				
	21:56	30	21:16 (WEA_RE_05)	21:18	20:12	19:00		16:53		16:14	11	15:22 (WEA_CD_03)			
5	05:09		20:46 (WEA_RE_05)	05:51	06:43	07:35		07:32		08:23	15:10 (WEA_CD_03)				
	21:56	30	21:16 (WEA_RE_05)	21:16	20:10	18:58		16:51		16:13	12	15:22 (WEA_CD_03)			
6	05:10		20:47 (WEA_RE_05)	05:52	06:45	07:37		07:33		08:24	15:10 (WEA_CD_03)				
	21:55	29	21:16 (WEA_RE_05)	21:15	20:07	18:55		16:49		16:12	13	15:23 (WEA_CD_03)			
7	05:11		20:46 (WEA_RE_05)	05:54	20:06 (WEA_RE_03)	06:47	07:38		07:35		08:26	15:10 (WEA_CD_03)			
	21:54	29	21:15 (WEA_RE_05)	21:13	5	20:11 (WEA_RE_03)	20:05	18:53		16:47	14	15:24 (WEA_CD_03)			
8	05:12		20:47 (WEA_RE_05)	05:55	20:03 (WEA_RE_03)	06:48	07:40		07:37		08:27	15:10 (WEA_CD_03)			
	21:54	28	21:15 (WEA_RE_05)	21:11	12	20:15 (WEA_RE_03)	20:03	18:51		16:46	14	15:24 (WEA_CD_03)			
9	05:13		20:47 (WEA_RE_05)	05:57	20:00 (WEA_RE_03)	06:50	07:42		07:39		08:28	15:10 (WEA_CD_03)			
	21:53	28	21:15 (WEA_RE_05)	21:09	16	20:16 (WEA_RE_03)	20:00	18:48		16:44	15	15:25 (WEA_CD_03)			
10	05:14		20:48 (WEA_RE_05)	05:59	19:59 (WEA_RE_03)	06:52	07:44		07:41		08:29	15:11 (WEA_CD_03)			
	21:52	27	21:15 (WEA_RE_05)	21:07	18	20:17 (WEA_RE_03)	19:58	18:46		16:42	15	15:26 (WEA_CD_03)			
11	05:15		20:48 (WEA_RE_05)	06:01	19:57 (WEA_RE_03)	06:53	07:45		07:43		08:30	15:12 (WEA_CD_03)			
	21:51	27	21:15 (WEA_RE_05)	21:05	21	20:18 (WEA_RE_03)	19:55	18:44		16:41	14	15:26 (WEA_CD_03)			
12	05:16		20:49 (WEA_RE_05)	06:02	19:57 (WEA_RE_03)	06:55	07:47		07:45		08:31	15:12 (WEA_CD_03)			
	21:51	26	21:15 (WEA_RE_05)	21:03	22	20:19 (WEA_RE_03)	19:53	18:41		16:39	15	15:27 (WEA_CD_03)			
13	05:17		20:49 (WEA_RE_05)	06:04	19:55 (WEA_RE_03)	06:57	07:49		07:46		08:32	15:12 (WEA_CD_03)			
	21:50	25	21:14 (WEA_RE_05)	21:01	24	20:19 (WEA_RE_03)	19:51	18:39		16:37	15	15:27 (WEA_CD_03)			
14	05:18		20:51 (WEA_RE_05)	06:06	19:55 (WEA_RE_03)	06:59	07:51		07:48	10	15:21 (WEA_CD_03)	08:34	15:13 (WEA_CD_03)		
	21:49	24	21:15 (WEA_RE_05)	20:59	24	20:19 (WEA_RE_03)	19:48	18:37		16:36	13	15:34 (WEA_CD_02)	16:11	14	15:27 (WEA_CD_03)
15	05:19		20:51 (WEA_RE_05)	06:07	19:55 (WEA_RE_03)	07:00	07:52		07:50	15	15:20 (WEA_CD_02)	08:34	15:13 (WEA_CD_03)		
	21:48	23	21:14 (WEA_RE_05)	20:57	25	20:20 (WEA_RE_03)	19:46	18:34		16:34	15	15:35 (WEA_CD_02)	16:11	15	15:28 (WEA_CD_03)
16	05:21		20:52 (WEA_RE_05)	06:09	19:54 (WEA_RE_03)	07:02	07:54		07:52	15	15:19 (WEA_CD_02)	08:35	15:14 (WEA_CD_03)		
	21:46	21	21:13 (WEA_RE_05)	20:55	25	20:19 (WEA_RE_03)	19:43	18:32		16:33	17	15:36 (WEA_CD_02)	16:11	15	15:29 (WEA_CD_03)
17	05:22		20:53 (WEA_RE_05)	06:11	19:54 (WEA_RE_03)	07:04	07:56		07:54	17	15:19 (WEA_CD_02)	08:36	15:14 (WEA_CD_03)		
	21:45	19	21:12 (WEA_RE_05)	20:53	25	20:19 (WEA_RE_03)	19:41	18:30		16:31	17	15:36 (WEA_CD_02)	16:11	15	15:29 (WEA_CD_03)
18	05:23		20:53 (WEA_RE_05)	06:12	19:54 (WEA_RE_03)	07:05	07:58		07:56	18	15:19 (WEA_CD_02)	08:37	15:14 (WEA_CD_03)		
	21:44	18	21:11 (WEA_RE_05)	20:50	24	20:19 (WEA_RE_03)	19:38	18:28		16:30	18	15:37 (WEA_CD_02)	16:11	15	15:29 (WEA_CD_03)
19	05:25		20:56 (WEA_RE_05)	06:14	19:54 (WEA_RE_03)	07:07	08:00		07:57	18	15:19 (WEA_CD_02)	08:38	15:15 (WEA_CD_03)		
	21:43	15	21:11 (WEA_RE_05)	20:48	24	20:18 (WEA_RE_03)	19:36	18:26	10	17:12 (WEA_CD_01)	07:57	15:15 (WEA_CD_03)			
20	05:26		20:57 (WEA_RE_05)	06:16	19:54 (WEA_RE_03)	07:09	08:02		07:59	18	15:37 (WEA_CD_02)	16:12	15:15 (WEA_CD_03)		
	21:42	12	21:09 (WEA_RE_05)	20:46	24	20:18 (WEA_RE_03)	19:34	18:25	14	17:24 (WEA_CD_01)	16:27	15:16 (WEA_CD_03)			
21	05:27		20:59 (WEA_RE_05)	06:18	19:54 (WEA_RE_03)	07:10	08:04		07:51	19	15:19 (WEA_CD_02)	08:39	15:16 (WEA_CD_03)		
	21:40	7	21:06 (WEA_RE_05)	20:44	21	20:15 (WEA_RE_03)	19:31	18:21	17	17:25 (WEA_CD_01)	16:26	15:17 (WEA_CD_03)			
22	05:29		20:59 (WEA_RE_05)	06:19	19:55 (WEA_RE_03)	07:12	08:05		07:52	19	15:20 (WEA_CD_02)	08:39	15:17 (WEA_CD_03)		
	21:39		20:42	18	20:13 (WEA_RE_03)	19:29	18:19	19	17:26 (WEA_CD_01)	16:25	18	15:38 (WEA_CD_02)	16:13	14	15:31 (WEA_CD_03)
23	05:30		20:50	06:21	19:56 (WEA_RE_03)	07:14	08:07		07:54	19	15:20 (WEA_CD_02)	08:40	15:17 (WEA_CD_03)		
	21:38		20:40	16	20:12 (WEA_RE_03)	19:26	18:17	20	17:26 (WEA_CD_01)	16:24	19	15:39 (WEA_CD_02)	16:13	15	15:32 (WEA_CD_03)
24	05:32		20:52	06:23	19:57 (WEA_RE_03)	07:16	08:09		07:56	19	15:21 (WEA_CD_02)	08:40	15:17 (WEA_CD_03)		
	21:36		20:37	12	20:09 (WEA_RE_03)	19:24	18:15	20	17:26 (WEA_CD_01)	16:22	18	15:39 (WEA_CD_02)	16:14	15	15:32 (WEA_CD_03)
25	05:33		20:54	06:24	19:59 (WEA_RE_03)	07:17	08:11		07:57	19	15:22 (WEA_CD_02)	08:41	15:18 (WEA_CD_03)		
	21:35		20:35	8	20:07 (WEA_RE_03)	19:22	17:13	20	16:26 (WEA_CD_01)	16:21	17	15:39 (WEA_CD_02)	16:15	15	15:33 (WEA_CD_03)
26	05:35		20:56	06:26		07:19	08:13		07:59	19	15:22 (WEA_CD_02)	08:41	15:18 (WEA_CD_03)		
	21:33		20:33		19:19	17:11	20	16:26 (WEA_CD_01)	16:20	16	15:38 (WEA_CD_02)	16:15	15	15:33 (WEA_CD_03)	
27	05:36		20:58	06:28		07:21	08:15		07:58	16:06 (WEA_CD_01)	08:11	15:23 (WEA_CD_02)	16:14	15	15:19 (WEA_CD_03)
	21:32		20:31		19:17	17:08	20	16:26 (WEA_CD_01)	16:19	15	15:38 (WEA_CD_02)	16:16	14	15:33 (WEA_CD_03)	
28	05:38		20:58	06:29		07:23	08:17		07:56	16:06 (WEA_CD_01)	08:13	15:24 (WEA_CD_02)	16:14	15	15:19 (WEA_CD_03)
	21:30		20:28		19:14	17:06	19	16:25 (WEA_CD_01)	16:18	14	15:38 (WEA_CD_02)	16:17	15	15:34 (WEA_CD_03)	
29	05:39		20:59	06:31		07:24	08:18		07:57	16:07 (WEA_CD_01)	08:14	15:25 (WEA_CD_02)	16:14	15	15:19 (WEA_CD_03)
	21:29		20:26		19:12	17:04	18	16:25 (WEA_CD_01)	16:18	13	15:38 (WEA_CD_02)	16:18	15	15:34 (WEA_CD_03)	
30	05:41		20:59	06:32		07:26	08:20		07:58	16:07 (WEA_CD_01)	08:16	15:13 (WEA_CD_03)	08:42	15	15:20 (WEA_CD_03)
	21:27		20:24		19:10	17:02	17	16:24 (WEA_CD_01)	16:17	14	15:37 (WEA_CD_02)	16:19	15	15:35 (WEA_CD_03)	
31	05:42		20:59	06:35		07:27	08:22		07:59	16:09 (WEA_CD_01)		08:42	15	15:21 (WEA_CD_03)	
	21:25		20:21		17:00	13	16:22 (WEA_CD_01)					16:20	14	15:35 (WEA_CD_03)	
Sonnenscheinstunden		508		457		382	330		262		238		449		
astr. max.mögl. Beschattung		510		364			227		303						

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_51 - IO 51 Vehnberg 10 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	15:19 (WEA_CD_03)	08:13		07:17	07:04		05:57		05:09	
	16:21	15:41 (WEA_CD_02)	17:11		18:05	20:01		20:55		21:43	32
2	08:42	15:19 (WEA_CD_03)	08:11		07:15	07:02		05:55		05:08	
	16:22	15:42 (WEA_CD_02)	17:13		18:07	20:03		20:56		21:44	32
3	08:41	15:20 (WEA_CD_03)	08:10		07:13	06:59		05:53		05:07	
	16:23	15:44 (WEA_CD_02)	17:15		18:09	20:05		20:58		21:45	32
4	08:41	15:21 (WEA_CD_03)	08:08	16:32 (WEA_CD_01)	07:10	06:57		05:51		05:07	
	16:24	15:46 (WEA_CD_02)	17:17	8	16:40 (WEA_CD_01)	18:10	20:07		21:00	21:46	32
5	08:41	15:22 (WEA_CD_03)	08:06		16:30 (WEA_CD_01)	07:08	06:55		05:49	05:06	
	16:26	15:46 (WEA_CD_02)	17:19	12	16:42 (WEA_CD_01)	18:12	20:08		21:02	21:47	32
6	08:41	15:24 (WEA_CD_03)	08:04		16:29 (WEA_CD_01)	07:06	06:52		05:47	05:05	
	16:27	15:48 (WEA_CD_02)	17:20	14	16:43 (WEA_CD_01)	18:14	20:10		21:03	21:48	31
7	08:40	15:26 (WEA_CD_03)	08:03		16:28 (WEA_CD_01)	07:04	06:50		05:45	05:05	
	16:28	15:48 (WEA_CD_02)	17:22	16	16:44 (WEA_CD_01)	18:16	20:12		21:05	21:49	31
8	08:40	15:24 (WEA_CD_03)	08:01		16:27 (WEA_CD_01)	07:01	06:48		05:43	05:04	
	16:30	15:49 (WEA_CD_02)	17:24	18	16:45 (WEA_CD_01)	18:18	20:14		21:07	21:50	32
9	08:39	15:25 (WEA_CD_03)	07:59		16:27 (WEA_CD_01)	06:59	06:45		05:42	05:04	
	16:31	15:50 (WEA_CD_02)	17:26	19	16:46 (WEA_CD_01)	18:20	20:16		21:09	21:51	31
10	08:38	15:25 (WEA_CD_03)	07:57		16:26 (WEA_CD_01)	06:57	06:43		05:40	05:03	
	16:33	15:51 (WEA_CD_02)	17:28	20	16:46 (WEA_CD_01)	18:22	20:17		21:10	21:52	31
11	08:38	15:25 (WEA_CD_03)	07:55		16:26 (WEA_CD_01)	06:54	06:41		05:38	05:03	
	16:34	15:52 (WEA_CD_02)	17:30	20	16:46 (WEA_CD_01)	18:23	20:19		21:12	21:53	31
12	08:37	15:25 (WEA_CD_03)	07:53		16:27 (WEA_CD_01)	06:52	06:38		05:36	05:02	
	16:35	15:52 (WEA_CD_02)	17:32	19	16:46 (WEA_CD_01)	18:25	20:21	3	19:51 (WEA_RE_03)	20:28 (WEA_RE_05)	31
13	08:36	15:25 (WEA_CD_03)	07:51		16:27 (WEA_CD_01)	06:49	06:36		19:46 (WEA_RE_03)	20:24 (WEA_RE_05)	31
	16:37	15:53 (WEA_CD_02)	17:34	19	16:46 (WEA_CD_01)	18:27	20:23	9	19:55 (WEA_RE_03)	21:15 (WEA_RE_05)	31
14	08:36	15:25 (WEA_CD_03)	07:49		16:28 (WEA_CD_01)	06:47	06:34		19:44 (WEA_RE_03)	20:29 (WEA_RE_05)	31
	16:39	15:53 (WEA_CD_02)	17:36	18	16:46 (WEA_CD_01)	18:29	20:25	13	19:57 (WEA_RE_03)	21:17 (WEA_RE_05)	30
15	08:35	15:26 (WEA_CD_03)	07:47		16:29 (WEA_CD_01)	06:45	06:31		19:43 (WEA_RE_03)	20:33 (WEA_RE_05)	31
	16:40	15:54 (WEA_CD_02)	17:38	16	16:45 (WEA_CD_01)	18:31	20:26	16	19:59 (WEA_RE_03)	21:19 (WEA_RE_05)	30
16	08:34	15:26 (WEA_CD_03)	07:45		16:29 (WEA_CD_01)	06:42	06:29		19:42 (WEA_RE_03)	20:31 (WEA_RE_05)	31
	16:42	15:54 (WEA_CD_02)	17:40	14	16:43 (WEA_CD_01)	18:33	20:28	19	20:01 (WEA_RE_03)	21:20 (WEA_RE_05)	31
17	08:33	15:27 (WEA_CD_03)	07:43		16:31 (WEA_CD_01)	06:40	06:27		19:41 (WEA_RE_03)	20:30 (WEA_RE_05)	31
	16:44	15:55 (WEA_CD_02)	17:42	10	16:41 (WEA_CD_01)	18:34	20:30	22	20:03 (WEA_RE_03)	21:22 (WEA_RE_05)	30
18	08:32	15:26 (WEA_CD_03)	07:41		16:35 (WEA_CD_01)	06:38	06:25		19:39 (WEA_RE_03)	20:29 (WEA_RE_05)	31
	16:45	15:54 (WEA_CD_02)	17:44	2	16:37 (WEA_CD_01)	18:36	20:32	24	20:03 (WEA_RE_03)	21:23 (WEA_RE_05)	30
19	08:31	15:27 (WEA_CD_03)	07:39		16:35 (WEA_CD_01)	06:35	06:22		19:39 (WEA_RE_03)	20:28 (WEA_RE_05)	31
	16:47	15:54 (WEA_CD_02)	17:46		18:38	20:33	25	20:04 (WEA_RE_03)	21:25 (WEA_RE_05)	21:57	30
20	08:30	15:28 (WEA_CD_03)	07:37		16:33	06:30	06:17		19:39 (WEA_RE_03)	20:27 (WEA_RE_05)	31
	16:49	15:55 (WEA_CD_02)	17:48		18:40	20:35	26	20:04 (WEA_RE_03)	21:26 (WEA_RE_05)	21:57	30
21	08:28	15:29 (WEA_CD_03)	07:35		16:30	06:18	06:05		19:39 (WEA_RE_03)	20:27 (WEA_RE_05)	31
	16:50	15:55 (WEA_CD_02)	17:50		18:42	20:37	27	20:04 (WEA_RE_03)	21:28 (WEA_RE_05)	21:58	30
22	08:27	15:40 (WEA_CD_03)	07:33		16:28	06:16	06:02		19:39 (WEA_RE_03)	20:27 (WEA_RE_05)	31
	16:52	15:54 (WEA_CD_02)	17:51		18:43	20:39	28	20:03 (WEA_RE_03)	21:29 (WEA_RE_05)	21:58	30
23	08:26	15:41 (WEA_CD_03)	07:31		16:26	06:14	05:59		19:39 (WEA_RE_03)	20:26 (WEA_RE_05)	31
	16:54	15:54 (WEA_CD_02)	17:53		18:45	20:41	29	20:03 (WEA_RE_03)	21:31 (WEA_RE_05)	21:58	30
24	08:25	15:43 (WEA_CD_03)	07:28		16:25	06:11	05:56		19:39 (WEA_RE_03)	20:26 (WEA_RE_05)	31
	16:56	15:52 (WEA_CD_02)	17:55		18:47	20:42	30	20:02 (WEA_RE_03)	21:32 (WEA_RE_05)	21:58	30
25	08:23	15:46 (WEA_CD_03)	07:26		16:21	06:09	05:53		19:40 (WEA_RE_03)	20:25 (WEA_RE_05)	31
	16:58	15:51 (WEA_CD_02)	17:57		18:49	20:44	31	20:01 (WEA_RE_03)	21:34 (WEA_RE_05)	21:58	30
26	08:22	15:48 (WEA_CD_03)	07:24		16:18	06:07	05:50		19:41 (WEA_RE_03)	20:25 (WEA_RE_05)	31
	16:59	15:51 (WEA_CD_02)	17:59		18:51	20:46	32	20:00 (WEA_RE_03)	21:35 (WEA_RE_05)	21:58	31
27	08:21	15:49 (WEA_CD_03)	07:22		16:16	06:05	05:47		19:42 (WEA_RE_03)	20:25 (WEA_RE_05)	31
	17:01	18:01			18:52	20:48	33	19:59 (WEA_RE_03)	21:37 (WEA_RE_05)	21:58	31
28	08:19	15:50 (WEA_CD_03)	07:20		16:14	06:03	05:44		19:43 (WEA_RE_03)	20:25 (WEA_RE_05)	31
	17:03	18:03			18:54	20:49	34	19:57 (WEA_RE_03)	21:39 (WEA_RE_05)	21:58	30
29	08:18				16:11	06:01	05:41		19:45 (WEA_RE_03)	20:25 (WEA_RE_05)	31
	17:05				19:56	20:51	35	19:55 (WEA_RE_03)	21:39 (WEA_RE_05)	21:58	31
30	08:16				16:09	05:59	05:38		19:46 (WEA_RE_03)	20:26 (WEA_RE_05)	31
	17:07				19:58	20:53	36	19:56 (WEA_RE_03)	21:40 (WEA_RE_05)	21:58	31
31	08:15				16:07	05:57	05:36		19:47 (WEA_RE_03)	20:26 (WEA_RE_05)	31
	17:09				20:00		37	19:48 (WEA_RE_03)	21:42 (WEA_RE_05)	21:58	31
	Sonnenscheinstunden	254			367	418		490		505	924
	astr. max.mögl. Beschattung	397	275	225			333	464			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_51 - IO 51 Vehnberg 10 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember					
1	05:06	20:32 (WEA_RE_05)	05:44		06:36	07:28		07:24	15:56 (WEA_CD_01)	08:17	15:17 (WEA_CD_02)				
	21:57	31	21:03 (WEA_RE_06)	21:24		20:19	19:07		16:58	20	16:16 (WEA_CD_01)	16:16	17	15:34 (WEA_CD_02)	
2	05:06	20:32 (WEA_RE_05)	05:46		06:38	07:29		07:26	15:56 (WEA_CD_01)	08:19	15:17 (WEA_CD_02)				
	21:57	31	21:03 (WEA_RE_06)	21:22		20:17	19:05		16:57	19	16:15 (WEA_CD_01)	16:15	16	15:33 (WEA_CD_02)	
3	05:07	20:32 (WEA_RE_05)	05:47		06:40	07:31		07:28	15:57 (WEA_CD_01)	08:20	15:18 (WEA_CD_02)				
	21:57	31	21:03 (WEA_RE_06)	21:20		20:14	19:02		16:55	18	16:15 (WEA_CD_01)	16:14	16	15:34 (WEA_CD_02)	
4	05:08	20:33 (WEA_RE_05)	05:49		06:41	07:33		07:30	15:57 (WEA_CD_01)	08:22	15:20 (WEA_CD_02)				
	21:56	31	21:04 (WEA_RE_06)	21:18		20:12	19:00		16:53	17	16:14 (WEA_CD_01)	16:14	14	15:34 (WEA_CD_02)	
5	05:09	20:33 (WEA_RE_05)	05:51		06:43	07:35		07:32	15:58 (WEA_CD_01)	08:23	15:20 (WEA_CD_02)				
	21:56	31	21:04 (WEA_RE_06)	21:16		20:10	18:58		16:51	15	16:13 (WEA_CD_01)	16:13	13	15:33 (WEA_CD_02)	
6	05:10	20:33 (WEA_RE_05)	05:52		06:45	07:37		07:33	16:00 (WEA_CD_01)	08:24	15:09 (WEA_CD_03)				
	21:55	32	21:05 (WEA_RE_06)	21:15		20:07	18:55		16:49	12	16:12 (WEA_CD_01)	16:12	18	15:29 (WEA_CD_02)	
7	05:11	20:32 (WEA_RE_05)	05:54		06:47	07:38		07:35	16:02 (WEA_CD_01)	08:26	15:09 (WEA_CD_03)				
	21:54	32	21:04 (WEA_RE_06)	21:13		20:05	18:53		16:47	7	16:09 (WEA_CD_01)	16:12	18	15:33 (WEA_CD_02)	
8	05:12	20:33 (WEA_RE_05)	05:55		06:48	07:40		07:37	16:03 (WEA_CD_01)	08:27	15:08 (WEA_CD_03)				
	21:54	31	21:04 (WEA_RE_06)	21:11		20:03	18:51		16:46		16:12	19	15:33 (WEA_CD_02)		
9	05:13	20:33 (WEA_RE_05)	05:57		06:50	07:42		07:39	16:04 (WEA_CD_01)	08:28	15:08 (WEA_CD_03)				
	21:53	32	21:05 (WEA_RE_06)	21:09		20:00	18:48		16:44		16:12	18	15:32 (WEA_CD_02)		
10	05:14	20:33 (WEA_RE_05)	05:59		06:52	07:44		07:41	16:05 (WEA_CD_01)	08:29	15:09 (WEA_CD_03)				
	21:52	32	21:05 (WEA_RE_06)	21:07		19:58	18:46		16:42		16:11	17	15:33 (WEA_CD_02)		
11	05:15	20:33 (WEA_RE_05)	06:01		06:53	07:45		07:43	16:06 (WEA_CD_01)	08:30	15:09 (WEA_CD_03)				
	21:51	32	21:05 (WEA_RE_06)	21:05		19:55	18:44		16:40		16:11	16	15:32 (WEA_CD_02)		
12	05:16	20:33 (WEA_RE_05)	06:02		06:55	07:47		07:45	16:07 (WEA_CD_01)	08:32	15:09 (WEA_CD_03)				
	21:51	32	21:05 (WEA_RE_06)	21:03		19:53	18:41		16:39		16:11	12	15:21 (WEA_CD_03)		
13	05:17	20:33 (WEA_RE_05)	06:04		06:57	07:49		07:46	16:08 (WEA_CD_01)	08:33	15:09 (WEA_CD_03)				
	21:50	32	21:05 (WEA_RE_06)	21:01	8	19:50 (WEA_RE_03)	19:51	18:39		16:37		16:11	12	15:21 (WEA_CD_03)	
14	05:18	20:34 (WEA_RE_05)	06:06		06:59	07:51		07:48	16:09 (WEA_CD_01)	08:34	15:09 (WEA_CD_03)				
	21:49	32	21:06 (WEA_RE_06)	20:59	11	20:03 (WEA_RE_03)	19:48	18:37		16:36		16:11	13	15:22 (WEA_CD_03)	
15	05:19	20:34 (WEA_RE_05)	06:07		07:00	07:52		07:50	16:10 (WEA_CD_01)	08:35	15:10 (WEA_CD_03)				
	21:48	32	21:06 (WEA_RE_06)	20:57	15	20:05 (WEA_RE_03)	19:46	18:34		16:34		16:11	12	15:22 (WEA_CD_03)	
16	05:21	20:34 (WEA_RE_05)	06:09		07:02	07:54		07:52	16:11 (WEA_CD_01)	08:36	15:10 (WEA_CD_03)				
	21:46	32	21:06 (WEA_RE_06)	20:55	18	20:08 (WEA_RE_03)	19:43	18:32		16:33		16:11	13	15:23 (WEA_CD_03)	
17	05:22	20:34 (WEA_RE_05)	06:11		07:04	07:56		07:54	16:12 (WEA_CD_01)	08:37	15:11 (WEA_CD_03)				
	21:45	31	21:05 (WEA_RE_06)	20:53	20	20:07 (WEA_RE_03)	19:41	18:30	5	15:19 (WEA_CD_02)	08:36		13	15:24 (WEA_CD_03)	
18	05:23	20:35 (WEA_RE_05)	06:12		07:05	07:58		07:56	16:13 (WEA_CD_01)	08:38	15:10 (WEA_CD_03)				
	21:44	30	21:05 (WEA_RE_06)	20:50	22	20:07 (WEA_RE_03)	19:38	18:28	10	15:26 (WEA_CD_02)	08:37		14	15:10 (WEA_CD_03)	
19	05:25	20:36 (WEA_RE_05)	06:14		07:07	08:00		07:57	16:14 (WEA_CD_01)	08:39	15:11 (WEA_CD_03)				
	21:43	30	21:06 (WEA_RE_06)	20:48	23	20:08 (WEA_RE_03)	19:36	18:26	13	15:28 (WEA_CD_02)	08:38		13	15:24 (WEA_CD_03)	
20	05:26	20:36 (WEA_RE_05)	06:16		07:09	08:02		07:59	16:15 (WEA_CD_01)	08:40	15:12 (WEA_CD_03)				
	21:42	29	21:05 (WEA_RE_06)	20:46	25	20:09 (WEA_RE_03)	19:34	18:25	14	15:29 (WEA_CD_02)	08:39		13	15:25 (WEA_CD_03)	
21	05:27	20:36 (WEA_RE_05)	06:18		07:10	08:04		08:01	16:16 (WEA_CD_01)	08:41	15:12 (WEA_CD_03)				
	21:40	28	21:04 (WEA_RE_06)	20:44	26	20:09 (WEA_RE_03)	19:31	18:21	16	15:30 (WEA_CD_02)	08:40		13	15:25 (WEA_CD_03)	
22	05:29	20:37 (WEA_RE_05)	06:19		07:12	08:05		08:03	16:17 (WEA_CD_01)	08:42	15:13 (WEA_CD_03)				
	21:39	28	21:05 (WEA_RE_06)	20:42	25	20:08 (WEA_RE_03)	19:29	18:19	17	15:31 (WEA_CD_02)	08:41		13	15:26 (WEA_CD_03)	
23	05:30	20:37 (WEA_RE_05)	06:21		07:14	08:07		08:04	16:18 (WEA_CD_01)	08:43	15:13 (WEA_CD_03)				
	21:38	27	21:04 (WEA_RE_06)	20:40	25	20:08 (WEA_RE_03)	19:26	18:17	17	15:32 (WEA_CD_02)	08:42		13	15:26 (WEA_CD_03)	
24	05:32	20:38 (WEA_RE_05)	06:23		07:16	08:09		08:06	16:19 (WEA_CD_01)	08:44	15:13 (WEA_CD_03)				
	21:36	25	21:03 (WEA_RE_06)	20:37	24	20:07 (WEA_RE_03)	19:24	18:15	6	17:04 (WEA_CD_01)	08:43		13	15:26 (WEA_CD_03)	
25	05:33	20:39 (WEA_RE_05)	06:24		07:17	08:11		08:08	16:20 (WEA_CD_01)	08:45	15:14 (WEA_CD_03)				
	21:35	24	21:03 (WEA_RE_06)	20:35	24	20:07 (WEA_RE_03)	19:22	18:13	11	16:12 (WEA_CD_01)	08:44		13	15:27 (WEA_CD_03)	
26	05:35	20:40 (WEA_RE_05)	06:26		07:19	08:13		08:10	16:21 (WEA_CD_01)	08:46	15:15 (WEA_CD_03)				
	21:33	21	21:01 (WEA_RE_06)	20:33	21	20:04 (WEA_RE_03)	19:19	18:11	15	16:14 (WEA_CD_01)	08:45		13	15:27 (WEA_CD_03)	
27	05:36	20:40 (WEA_RE_05)	06:28		07:21	08:15		08:12	16:22 (WEA_CD_01)	08:47	15:15 (WEA_CD_03)				
	21:32	20	21:00 (WEA_RE_06)	20:31	18	20:02 (WEA_RE_03)	19:17	18:08	17	16:15 (WEA_CD_01)	08:46		13	15:28 (WEA_CD_03)	
28	05:38	20:42 (WEA_RE_05)	06:29		07:23	08:17		08:14	16:23 (WEA_CD_01)	08:48	15:16 (WEA_CD_03)				
	21:30	17	20:59 (WEA_RE_06)	20:28	16	20:01 (WEA_RE_03)	19:14	18:05	18	16:15 (WEA_CD_01)	08:47		13	15:29 (WEA_CD_03)	
29	05:41	20:44 (WEA_RE_05)	06:31		07:24	08:19		08:16	16:24 (WEA_CD_01)	08:49	15:16 (WEA_CD_03)				
	21:29	13	20:57 (WEA_RE_06)	20:26	13	19:58 (WEA_RE_03)	19:12	18:04	18	16:16 (WEA_CD_01)	08:48		13	15:29 (WEA_CD_03)	
30	05:41	20:48 (WEA_RE_05)	06:32		07:26	08:20		08:17	16:25 (WEA_CD_01)	08:50	15:17 (WEA_CD_03)				
	21:27	6	20:54 (WEA_RE_06)	20:24	9	19:56 (WEA_RE_03)	19:10	18:02	20	16:16 (WEA_CD_01)	08:49		12	15:29 (WEA_CD_03)	
31	05:42	20:51 (WEA_RE_05)	06:35		07:28	08:22		08:19	16:26 (WEA_CD_01)	08:51	15:17 (WEA_CD_03)				
	21:25	20:21	3	19:54 (WEA_RE_03)	17:00	20	16:16 (WEA_CD_01)	16:20		262		325		438	
Sonnenscheinstunden		508		457		382		330		262		238		438	
astr. max.mögl. Beschattung		835		340		127									

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_52 - IO 52 Vehnberg 4 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	15:24 (WEA_CD_03)	08:13		07:17	07:04		05:57		05:09	20:21 (WEA_RE_05)
	16:21	13	15:37 (WEA_CD_03)	17:11	18:05	20:01		20:55		21:43	29
2	08:42	15:23 (WEA_CD_03)	08:11		07:15	07:02		05:55		05:08	20:22 (WEA_RE_05)
	16:22	13	15:36 (WEA_CD_03)	17:13	18:07	20:03		20:56		21:44	28
3	08:41	15:24 (WEA_CD_03)	08:10		07:13	06:59		05:53		05:07	20:22 (WEA_RE_05)
	16:23	13	15:37 (WEA_CD_03)	17:15	18:09	20:05		20:58		21:45	28
4	08:41	15:26 (WEA_CD_03)	08:08		07:10	06:57		05:51		05:07	20:23 (WEA_RE_05)
	16:24	11	15:37 (WEA_CD_03)	17:17	18:10	20:07		21:00		21:46	27
5	08:41	15:26 (WEA_CD_03)	08:06	16:40 (WEA_CD_01)	07:08	06:55		05:49		05:06	20:23 (WEA_RE_05)
	16:26	11	15:37 (WEA_CD_03)	17:19	16:42 (WEA_CD_01)	18:12	20:08	21:02		21:47	27
6	08:40	15:27 (WEA_CD_03)	08:04	16:36 (WEA_CD_01)	07:06	06:52		05:47		05:05	20:24 (WEA_RE_05)
	16:27	11	15:38 (WEA_CD_03)	17:20	16:46 (WEA_CD_01)	18:14	20:10	21:03		21:48	26
7	08:40	15:28 (WEA_CD_03)	08:03	16:34 (WEA_CD_01)	07:04	06:50		05:45		05:05	20:24 (WEA_RE_05)
	16:28	14	15:51 (WEA_CD_02)	17:22	16:48 (WEA_CD_01)	18:16	20:12	21:05		21:49	26
8	08:40	15:28 (WEA_CD_03)	08:01	16:33 (WEA_CD_01)	07:01	06:48		05:43		05:04	20:25 (WEA_RE_05)
	16:30	17	15:52 (WEA_CD_02)	17:24	16:49 (WEA_CD_01)	18:18	20:14	21:07		21:50	25
9	08:39	15:31 (WEA_CD_03)	07:59	16:33 (WEA_CD_01)	06:59	06:45		05:42	20:33 (WEA_RE_05)	05:03	20:25 (WEA_RE_05)
	16:31	15	15:54 (WEA_CD_02)	17:26	16:50 (WEA_CD_01)	18:20	20:16	21:09	4	20:37 (WEA_RE_05)	21:51
10	08:38	15:33 (WEA_CD_03)	07:57	16:32 (WEA_CD_01)	06:57	06:43		05:40		05:03	20:26 (WEA_RE_05)
	16:33	13	15:55 (WEA_CD_02)	17:28	16:50 (WEA_CD_01)	18:22	20:17	21:10	12	20:40 (WEA_RE_05)	21:52
11	08:38	15:44 (WEA_CD_02)	07:55	16:32 (WEA_CD_01)	06:54	06:41		05:38	19:46 (WEA_RE_03)	05:38	20:26 (WEA_RE_05)
	16:34	12	15:56 (WEA_CD_02)	17:30	16:51 (WEA_CD_01)	18:23	20:19	6	19:52 (WEA_RE_03)	21:12	15
12	08:37	15:43 (WEA_CD_02)	07:53	16:32 (WEA_CD_01)	06:52	06:38		05:36	19:43 (WEA_RE_03)	05:36	20:26 (WEA_RE_05)
	16:35	14	15:57 (WEA_CD_02)	17:32	16:51 (WEA_CD_01)	18:25	20:21	11	19:54 (WEA_RE_03)	21:14	18
13	08:36	15:43 (WEA_CD_02)	07:51	16:32 (WEA_CD_01)	06:49	06:36		05:34	19:41 (WEA_RE_03)	05:34	20:26 (WEA_RE_05)
	16:37	15	15:58 (WEA_CD_02)	17:34	16:51 (WEA_CD_01)	18:27	20:23	14	19:55 (WEA_RE_03)	21:15	21
14	08:36	15:43 (WEA_CD_02)	07:49	16:33 (WEA_CD_01)	06:47	06:34		05:33	19:40 (WEA_RE_03)	05:33	20:27 (WEA_RE_05)
	16:39	16	15:59 (WEA_CD_02)	17:36	16:51 (WEA_CD_01)	18:29	20:25	17	19:57 (WEA_RE_03)	21:17	23
15	08:35	15:43 (WEA_CD_02)	07:47	16:33 (WEA_CD_01)	06:45	06:31		05:31	19:39 (WEA_RE_03)	05:31	20:27 (WEA_RE_05)
	16:40	16	15:59 (WEA_CD_02)	17:38	16:50 (WEA_CD_01)	18:31	20:26	20	19:59 (WEA_RE_03)	21:19	24
16	08:34	15:43 (WEA_CD_02)	07:45	16:33 (WEA_CD_01)	06:42	06:29		05:30	19:38 (WEA_RE_03)	05:30	20:28 (WEA_RE_05)
	16:42	17	16:00 (WEA_CD_02)	17:40	16:48 (WEA_CD_01)	18:33	20:28	23	20:01 (WEA_RE_03)	21:20	27
17	08:33	15:44 (WEA_CD_02)	07:43	16:35 (WEA_CD_01)	06:40	06:27		05:28	19:38 (WEA_RE_03)	05:28	20:28 (WEA_RE_05)
	16:44	17	16:01 (WEA_CD_02)	17:42	16:47 (WEA_CD_01)	18:34	20:30	24	20:02 (WEA_RE_03)	21:22	28
18	08:32	15:43 (WEA_CD_02)	07:41	16:37 (WEA_CD_01)	06:38	06:25		05:26	19:37 (WEA_RE_03)	05:26	20:29 (WEA_RE_05)
	16:45	17	16:00 (WEA_CD_02)	17:44	16:45 (WEA_CD_01)	18:36	20:32	24	20:01 (WEA_RE_03)	21:23	28
19	08:31	15:44 (WEA_CD_02)	07:39	16:35 (WEA_CD_01)	06:35	06:22		05:25	19:37 (WEA_RE_03)	05:25	20:29 (WEA_RE_05)
	16:47	17	16:01 (WEA_CD_02)	17:46	16:38	20:33	24	20:01 (WEA_RE_03)	21:25	29	20:29 (WEA_RE_05)
20	08:30	15:45 (WEA_CD_02)	07:37	16:33 (WEA_CD_01)	06:33	06:20		05:23	19:37 (WEA_RE_03)	05:23	20:29 (WEA_RE_05)
	16:49	17	16:02 (WEA_CD_02)	17:48	16:40	20:35	23	20:00 (WEA_RE_03)	21:26	30	20:29 (WEA_RE_05)
21	08:28	15:45 (WEA_CD_02)	07:35	16:30 (WEA_CD_01)	06:30	06:18		05:22	19:37 (WEA_RE_03)	05:22	20:29 (WEA_RE_05)
	16:50	17	16:02 (WEA_CD_02)	17:50	16:42	20:37	23	20:00 (WEA_RE_03)	21:28	30	20:29 (WEA_RE_05)
22	08:27	15:45 (WEA_CD_02)	07:33	16:28 (WEA_CD_01)	06:28	06:16		05:21	19:38 (WEA_RE_03)	05:21	20:29 (WEA_RE_05)
	16:52	16	16:01 (WEA_CD_02)	17:51	16:43	20:39	21	19:59 (WEA_RE_03)	21:29	30	20:29 (WEA_RE_05)
23	08:26	15:47 (WEA_CD_02)	07:31	16:26 (WEA_CD_01)	06:26	06:14		05:19	19:38 (WEA_RE_03)	05:19	20:30 (WEA_RE_05)
	16:54	15	16:02 (WEA_CD_02)	17:53	16:45	20:41	20	19:58 (WEA_RE_03)	21:31	30	20:51 (WEA_RE_05)
24	08:25	15:47 (WEA_CD_02)	07:28	16:25 (WEA_CD_01)	06:23	06:11		05:18	19:39 (WEA_RE_03)	05:18	20:30 (WEA_RE_05)
	16:56	14	16:01 (WEA_CD_02)	17:55	16:47	20:42	18	19:57 (WEA_RE_03)	21:32	30	20:50 (WEA_RE_05)
25	08:23	15:49 (WEA_CD_02)	07:26	16:21 (WEA_CD_01)	06:19	06:09		05:17	19:40 (WEA_RE_03)	05:17	20:29 (WEA_RE_05)
	16:58	12	16:01 (WEA_CD_02)	17:57	16:49	20:44	16	19:56 (WEA_RE_03)	21:34	31	20:50 (WEA_RE_05)
26	08:22	15:50 (WEA_CD_02)	07:24	16:18 (WEA_CD_01)	06:17	06:07		05:16	19:42 (WEA_RE_03)	05:16	20:30 (WEA_RE_05)
	16:59	9	15:59 (WEA_CD_02)	17:59	16:51	20:46	12	19:54 (WEA_RE_03)	21:35	31	20:50 (WEA_RE_05)
27	08:21	15:54 (WEA_CD_02)	07:22	16:16 (WEA_CD_01)	06:16	06:05		05:14	19:46 (WEA_RE_03)	05:14	20:30 (WEA_RE_05)
	17:01	3	15:57 (WEA_CD_02)	18:01	16:52	20:48	4	19:50 (WEA_RE_03)	21:37	30	20:50 (WEA_RE_05)
28	08:19		07:20	16:14 (WEA_CD_01)	06:14	06:03		05:13	20:20 (WEA_RE_05)	05:13	20:30 (WEA_RE_05)
	17:03		18:03	16:54	20:49			21:39	30	20:50 (WEA_RE_05)	21:58
29	08:18			16:51	20:47			21:38	30	20:50 (WEA_RE_05)	21:58
	17:05			16:50	20:46			21:37	30	20:50 (WEA_RE_05)	21:58
30	08:16			16:49	20:45			21:36	30	20:50 (WEA_RE_05)	21:58
	17:07			16:48	20:44			21:35	30	20:51 (WEA_RE_05)	21:58
31	08:15			16:47	20:43			21:34	30	20:51 (WEA_RE_05)	21:58
	17:09			16:46	20:42			21:33	29	20:50 (WEA_RE_05)	
	Sonnenscheinstunden	254		275		367	418	490		505	706
	astr. max.mögl. Beschattung	375		204			300	590			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------



Projekt:
WP Rote Erde 12.05.2025

Lizenzierter Anwender:
DNV Energy Systems Germany GmbH
Brooktorkai 18
DE-20457 Hamburg
(0 48 56)901-0

Berechnet:
30.09.2025 14:27/4.1.287

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_52 - IO 52 Vehnberg 4 Wardenburg

Annahmen für Schattenwurfberechnung

- Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Jul	August	September	Oktober	November	Dezember
1	05:06	20:30 (WEA_RE_05) 05:44	20:36 (WEA_RE_05) 06:36	19:45 (WEA_RE_03) 07:28	07:24	16:02 (WEA_CD_01) 08:17
2	05:06	20:54 (WEA_RE_05) 21:24	20:53 (WEA_RE_05) 06:39	19:51 (WEA_RE_03) 07:29	16:50	16:20 (WEA_CD_01) 08:16
3	05:07	20:54 (WEA_RE_05) 21:22	20:51 (WEA_RE_05) 06:39	19:05	16:53	16:02 (WEA_CD_01) 08:19
4	05:08	20:30 (WEA_RE_05) 05:49	20:32	19:02 (WEA_RE_05) 21:20	07:28	16:03 (WEA_CD_01) 08:20
5	05:09	20:55 (WEA_RE_05) 21:10	20:32	20:30 (WEA_RE_05) 05:51	16:55	16:18 (WEA_CD_01) 08:21
6	05:10	20:30 (WEA_RE_05) 05:52	20:30	20:56 (WEA_RE_05) 21:16	16:59	16:04 (WEA_CD_01) 08:22
7	05:11	20:56 (WEA_RE_05) 21:15	20:07	20:29 (WEA_RE_05) 06:01	16:59	16:17 (WEA_CD_01) 08:24
8	05:12	20:29 (WEA_RE_05) 05:55	20:05	20:29 (WEA_RE_05) 21:13	16:51	16:15 (WEA_CD_01) 08:23
9	05:13	20:56 (WEA_RE_05) 21:11	20:07	20:56 (WEA_RE_05) 21:11	16:51	16:15 (WEA_CD_01) 08:23
10	05:14	20:29 (WEA_RE_05) 05:59	20:05	20:57 (WEA_RE_05) 21:09	16:44	16:12 (WEA_CD_01) 08:24
11	05:15	20:57 (WEA_RE_05) 21:07	20:00	20:29 (WEA_RE_05) 06:01	16:44	16:12 (WEA_CD_01) 08:24
12	05:16	20:29 (WEA_RE_05) 06:02	19:55	20:57 (WEA_RE_05) 21:05	16:44	16:11 (WEA_CD_01) 08:25
13	05:17	20:58 (WEA_RE_05) 21:03	19:53	20:29 (WEA_RE_05) 06:02	16:39	16:11 (WEA_CD_01) 08:25
14	05:18	20:29 (WEA_RE_05) 06:06	19:51	20:58 (WEA_RE_05) 21:01	16:39	16:11 (WEA_CD_01) 08:25
15	05:19	20:59 (WEA_RE_05) 20:59	19:48	20:29 (WEA_RE_05) 06:06	16:37	16:11 (WEA_CD_01) 08:26
16	05:21	20:29 (WEA_RE_05) 06:09	19:46	20:59 (WEA_RE_05) 20:57	16:36	16:11 (WEA_CD_01) 08:26
17	05:22	20:59 (WEA_RE_05) 20:55	19:43	20:29 (WEA_RE_05) 06:11	16:34	15:26 (WEA_CD_02) 08:34
18	05:23	20:29 (WEA_RE_05) 06:12	19:41	20:59 (WEA_RE_05) 20:57	16:33	15:29 (WEA_CD_02) 08:34
19	05:25	20:30 (WEA_RE_05) 06:14	19:40	20:29 (WEA_RE_05) 06:12	16:33	15:23 (WEA_CD_02) 08:35
20	05:26	20:59 (WEA_RE_05) 20:48	19:36	20:59 (WEA_RE_05) 20:57	16:33	15:22 (WEA_CD_02) 08:36
21	05:27	20:29 (WEA_RE_05) 06:17	19:35	20:29 (WEA_RE_05) 06:12	16:31	15:34 (WEA_CD_02) 08:37
22	05:29	20:30 (WEA_RE_05) 06:19	19:32	20:59 (WEA_RE_05) 20:59	16:31	15:21 (WEA_CD_02) 08:37
23	05:30	20:30 (WEA_RE_05) 06:21	19:30	20:29 (WEA_RE_05) 06:16	16:30	15:35 (WEA_CD_02) 08:37
24	05:32	20:30 (WEA_RE_05) 06:23	19:28	20:59 (WEA_RE_05) 20:59	16:29	15:21 (WEA_CD_02) 08:38
25	05:33	20:31 (WEA_RE_05) 06:24	19:26	20:29 (WEA_RE_05) 06:16	16:27	15:36 (WEA_CD_02) 08:38
26	05:35	20:31 (WEA_RE_05) 06:26	19:24	20:59 (WEA_RE_05) 20:59	16:27	15:20 (WEA_CD_02) 08:39
27	05:36	20:31 (WEA_RE_05) 06:28	19:22	20:29 (WEA_RE_05) 06:17	16:26	15:27 (WEA_CD_02) 08:39
28	05:38	20:32 (WEA_RE_05) 06:29	19:20	20:59 (WEA_RE_05) 20:59	16:26	15:37 (WEA_CD_02) 08:40
29	05:39	20:32 (WEA_RE_05) 06:31	19:19	20:29 (WEA_RE_05) 06:17	16:25	15:21 (WEA_CD_02) 08:40
30	05:41	20:34 (WEA_RE_05) 06:33	19:17	20:59 (WEA_RE_05) 20:59	16:24	15:21 (WEA_CD_02) 08:41
31	05:42	20:34 (WEA_RE_05) 06:35	19:15	20:29 (WEA_RE_05) 06:17	16:24	15:39 (WEA_CD_02) 08:41
	20:25 (WEA_RE_05) 20:21	19:14 (WEA_RE_03) 07:15	19:14 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	15:39 (WEA_CD_02) 08:42
	20:54 (WEA_RE_05) 20:21	19:12 (WEA_RE_03) 07:15	19:12 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	15:24 (WEA_CD_02) 08:42
		19:10 (WEA_RE_03) 07:15	19:10 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	15:38 (WEA_CD_02) 08:42
		19:08 (WEA_RE_03) 07:15	19:08 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	15:23 (WEA_CD_02) 08:42
		19:06 (WEA_RE_03) 07:15	19:06 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		19:04 (WEA_RE_03) 07:15	19:04 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		19:02 (WEA_RE_03) 07:15	19:02 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		19:00 (WEA_RE_03) 07:15	19:00 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:58 (WEA_RE_03) 07:15	18:58 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:56 (WEA_RE_03) 07:15	18:56 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:54 (WEA_RE_03) 07:15	18:54 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:52 (WEA_RE_03) 07:15	18:52 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:50 (WEA_RE_03) 07:15	18:50 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:48 (WEA_RE_03) 07:15	18:48 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:46 (WEA_RE_03) 07:15	18:46 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:44 (WEA_RE_03) 07:15	18:44 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:42 (WEA_RE_03) 07:15	18:42 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:40 (WEA_RE_03) 07:15	18:40 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:38 (WEA_RE_03) 07:15	18:38 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:36 (WEA_RE_03) 07:15	18:36 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:34 (WEA_RE_03) 07:15	18:34 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:32 (WEA_RE_03) 07:15	18:32 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:30 (WEA_RE_03) 07:15	18:30 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:28 (WEA_RE_03) 07:15	18:28 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:26 (WEA_RE_03) 07:15	18:26 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:24 (WEA_RE_03) 07:15	18:24 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:22 (WEA_RE_03) 07:15	18:22 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:20 (WEA_RE_03) 07:15	18:20 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:18 (WEA_RE_03) 07:15	18:18 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:16 (WEA_RE_03) 07:15	18:16 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:14 (WEA_RE_03) 07:15	18:14 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:12 (WEA_RE_03) 07:15	18:12 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:10 (WEA_RE_03) 07:15	18:10 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:08 (WEA_RE_03) 07:15	18:08 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:06 (WEA_RE_03) 07:15	18:06 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:04 (WEA_RE_03) 07:15	18:04 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:02 (WEA_RE_03) 07:15	18:02 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		18:00 (WEA_RE_03) 07:15	18:00 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:58 (WEA_RE_03) 07:15	17:58 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:56 (WEA_RE_03) 07:15	17:56 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:54 (WEA_RE_03) 07:15	17:54 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:52 (WEA_RE_03) 07:15	17:52 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:50 (WEA_RE_03) 07:15	17:50 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:48 (WEA_RE_03) 07:15	17:48 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:46 (WEA_RE_03) 07:15	17:46 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:44 (WEA_RE_03) 07:15	17:44 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:42 (WEA_RE_03) 07:15	17:42 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:40 (WEA_RE_03) 07:15	17:40 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:38 (WEA_RE_03) 07:15	17:38 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:36 (WEA_RE_03) 07:15	17:36 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:34 (WEA_RE_03) 07:15	17:34 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:32 (WEA_RE_03) 07:15	17:32 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:30 (WEA_RE_03) 07:15	17:30 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:28 (WEA_RE_03) 07:15	17:28 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:26 (WEA_RE_03) 07:15	17:26 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:24 (WEA_RE_03) 07:15	17:24 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:22 (WEA_RE_03) 07:15	17:22 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:20 (WEA_RE_03) 07:15	17:20 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	16:20 (WEA_CD_01) 08:42
		17:18 (WEA_RE_03) 07:15	17:18 (WEA_RE_03) 07:15	19:41 (WEA_RE_03) 07:15	16:23	

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_53 - IO 53 Münsterscher Damm 152 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42	15:30 (WEA_CD_03)	08:13		07:17	07:04	05:57			05:09	20:25 (WEA_RE_05)
	16:21	14 15:44 (WEA_CD_03)	17:11		18:05	20:01	20:55				21:43 28 20:53 (WEA_RE_05)
2	08:42	15:30 (WEA_CD_03)	08:11		07:15	07:02	05:55				05:08 20:25 (WEA_RE_05)
	16:22	14 15:44 (WEA_CD_03)	17:13		18:07	20:03	20:56				21:44 27 20:52 (WEA_RE_05)
3	08:41	15:31 (WEA_CD_03)	08:10		07:13	06:59	05:53				05:07 20:25 (WEA_RE_05)
	16:23	14 15:45 (WEA_CD_03)	17:15		18:09	20:05	20:58				21:45 27 20:52 (WEA_RE_05)
4	08:41	15:32 (WEA_CD_03)	08:08		07:10	06:57	05:51				05:07 20:26 (WEA_RE_05)
	16:24	13 15:45 (WEA_CD_03)	17:17		18:10	20:07	21:00				21:46 27 20:53 (WEA_RE_05)
5	08:41	15:32 (WEA_CD_03)	08:06		07:08	06:55	05:49				05:06 20:26 (WEA_RE_05)
	16:26	13 15:45 (WEA_CD_03)	17:19		18:12	20:08	21:02				21:47 26 20:52 (WEA_RE_05)
6	08:40	15:33 (WEA_CD_03)	08:04		07:06	06:52	05:47				05:05 20:27 (WEA_RE_05)
	16:27	13 15:46 (WEA_CD_03)	17:20		18:14	20:10	21:03				21:48 26 20:53 (WEA_RE_05)
7	08:40	15:33 (WEA_CD_03)	08:03		07:04	06:50	05:45				05:05 20:27 (WEA_RE_05)
	16:28	13 15:46 (WEA_CD_03)	17:22		18:16	20:12	21:05				21:49 25 20:52 (WEA_RE_05)
8	08:40	15:33 (WEA_CD_03)	08:01		07:01	06:48	05:43				05:04 20:28 (WEA_RE_05)
	16:30	13 15:46 (WEA_CD_03)	17:24		18:18	20:14	21:07				21:50 25 20:53 (WEA_RE_05)
9	08:39	15:34 (WEA_CD_03)	07:59		06:59	06:45	05:42				05:03 20:27 (WEA_RE_05)
	16:31	13 15:47 (WEA_CD_03)	17:26		18:20	20:16	21:09				21:51 25 20:52 (WEA_RE_05)
10	08:38	15:35 (WEA_CD_03)	07:57		06:57	06:43	05:40				05:03 20:28 (WEA_RE_05)
	16:33	12 15:47 (WEA_CD_03)	17:28	9 16:46 (WEA_CD_01)	06:57	06:43	05:40				21:52 24 20:52 (WEA_RE_05)
11	08:38	15:36 (WEA_CD_03)	07:55		16:55 (WEA_CD_01)	18:22	20:17	21:10			05:03 20:29 (WEA_RE_05)
	16:34	11 15:47 (WEA_CD_03)	17:30	12 16:56 (WEA_CD_01)	18:23	20:19	21:12		9 20:32 (WEA_RE_05)	05:03	21:53 24 20:53 (WEA_RE_05)
12	08:37	15:36 (WEA_CD_03)	07:53		16:44 (WEA_CD_01)	18:23	20:19	21:12			05:02 20:29 (WEA_RE_05)
	16:35	11 15:47 (WEA_CD_03)	17:32	15 16:58 (WEA_CD_01)	18:25	20:21	21:14		13 20:30 (WEA_RE_05)	05:02	21:53 23 20:52 (WEA_RE_05)
13	08:36	15:38 (WEA_CD_03)	07:51		16:43 (WEA_CD_01)	18:25	20:21	21:14			05:02 20:29 (WEA_RE_05)
	16:37	8 15:46 (WEA_CD_03)	17:34	17 16:59 (WEA_CD_01)	18:27	20:23	21:15		16 20:28 (WEA_RE_05)	05:02	21:54 23 20:52 (WEA_RE_05)
14	08:36	15:39 (WEA_CD_03)	07:49		16:42 (WEA_CD_01)	18:27	20:23	21:15			05:02 20:30 (WEA_RE_05)
	16:39	10 16:02 (WEA_CD_02)	17:36	17 16:59 (WEA_CD_01)	18:29	20:25	21:17		19 20:27 (WEA_RE_05)	05:02	21:55 22 20:52 (WEA_RE_05)
15	08:35	15:56 (WEA_CD_02)	07:47		16:41 (WEA_CD_01)	18:29	20:25	21:17			05:01 20:30 (WEA_RE_05)
	16:40	8 16:04 (WEA_CD_02)	17:38	19 17:00 (WEA_CD_01)	18:31	20:26	21:19		21 20:26 (WEA_RE_05)	05:01	21:55 22 20:52 (WEA_RE_05)
16	08:34	15:55 (WEA_CD_02)	07:45		16:40 (WEA_CD_01)	18:31	20:26	21:19			05:01 20:31 (WEA_RE_05)
	16:42	11 16:06 (WEA_CD_02)	17:40	19 16:59 (WEA_CD_01)	18:33	20:28	21:20		24 20:25 (WEA_RE_05)	05:01	21:56 22 20:53 (WEA_RE_05)
17	08:33	15:55 (WEA_CD_02)	07:43		16:41 (WEA_CD_01)	18:33	20:28	21:20			05:01 20:31 (WEA_RE_05)
	16:44	12 16:07 (WEA_CD_02)	17:42	18 16:59 (WEA_CD_01)	18:34	20:30	21:22		25 20:24 (WEA_RE_05)	05:01	21:56 22 20:53 (WEA_RE_05)
18	08:32	15:54 (WEA_CD_02)	07:41		16:41 (WEA_CD_01)	18:34	20:30	21:22			05:01 20:31 (WEA_RE_05)
	16:45	14 16:08 (WEA_CD_02)	17:44	18 16:59 (WEA_CD_01)	18:36	20:32	21:23		26 20:24 (WEA_RE_05)	05:01	21:57 22 20:53 (WEA_RE_05)
19	08:31	15:54 (WEA_CD_02)	07:39		16:42 (WEA_CD_01)	18:36	20:32	21:23			05:01 20:32 (WEA_RE_05)
	16:47	15 16:09 (WEA_CD_02)	17:46	16 16:58 (WEA_CD_01)	18:38	20:33	21:25		27 20:24 (WEA_RE_05)	05:01	21:58 21 20:53 (WEA_RE_05)
20	08:30	15:54 (WEA_CD_02)	07:37		16:43 (WEA_CD_01)	18:38	20:33	21:25			05:01 20:32 (WEA_RE_05)
	16:49	16 16:10 (WEA_CD_02)	17:48	14 16:57 (WEA_CD_01)	18:40	20:35	21:26		28 20:23 (WEA_RE_05)	05:01	21:57 21 20:53 (WEA_RE_05)
21	08:28	15:54 (WEA_CD_02)	07:35		16:45 (WEA_CD_01)	18:40	20:35	21:26			05:01 20:32 (WEA_RE_05)
	16:50	17 16:11 (WEA_CD_02)	17:50	11 16:56 (WEA_CD_01)	18:42	20:37	21:28		28 20:23 (WEA_RE_05)	05:02	21:58 21 20:53 (WEA_RE_05)
22	08:27	15:54 (WEA_CD_02)	07:33		16:47 (WEA_CD_01)	18:42	20:37	21:28			05:02 20:32 (WEA_RE_05)
	16:52	17 16:11 (WEA_CD_02)	17:51	5 16:52 (WEA_CD_01)	18:43	20:39	21:29		29 20:23 (WEA_RE_05)	05:02	21:58 21 20:53 (WEA_RE_05)
23	08:26	15:54 (WEA_CD_02)	07:31		16:48 (WEA_CD_01)	18:43	20:39	21:29			05:02 20:33 (WEA_RE_05)
	16:54	17 16:11 (WEA_CD_02)	17:53		18:45	20:41	21:31		29 20:23 (WEA_RE_05)	05:02	21:58 21 20:54 (WEA_RE_05)
24	08:25	15:54 (WEA_CD_02)	07:28		18:45	20:42	21:32		30 20:23 (WEA_RE_05)	05:02	21:58 21 20:53 (WEA_RE_05)
	16:56	17 16:11 (WEA_CD_02)	17:55		18:47	20:42	21:32		30 20:23 (WEA_RE_05)	05:02	21:58 21 20:54 (WEA_RE_05)
25	08:23	15:55 (WEA_CD_02)	07:26		18:49	20:44	21:34		30 20:23 (WEA_RE_05)	05:02	21:58 22 20:54 (WEA_RE_05)
	16:58	17 16:12 (WEA_CD_02)	17:57		18:49	20:44	21:34		30 20:23 (WEA_RE_05)	05:02	21:58 22 20:54 (WEA_RE_05)
26	08:22	15:55 (WEA_CD_02)	07:24		18:51	20:46	21:35		29 20:23 (WEA_RE_05)	05:03	21:58 22 20:55 (WEA_RE_05)
	16:59	16 16:11 (WEA_CD_02)	17:59		18:51	20:46	21:35		29 20:23 (WEA_RE_05)	05:03	21:58 22 20:55 (WEA_RE_05)
27	08:21	15:56 (WEA_CD_02)	07:22		18:52	20:48	21:37		29 20:23 (WEA_RE_05)	05:03	21:58 22 20:55 (WEA_RE_05)
	17:01	16 16:12 (WEA_CD_02)	18:01		18:52	20:48	21:37		29 20:23 (WEA_RE_05)	05:03	21:58 22 20:55 (WEA_RE_05)
28	08:19	15:57 (WEA_CD_02)	07:20		18:54	20:49	21:38		29 20:23 (WEA_RE_05)	05:04	21:58 22 20:53 (WEA_RE_05)
	17:03	14 16:11 (WEA_CD_02)	18:03		18:54	20:49	21:38		29 20:23 (WEA_RE_05)	05:04	21:58 22 20:53 (WEA_RE_05)
29	08:18	15:58 (WEA_CD_02)			19:56	20:51	21:39		29 20:23 (WEA_RE_05)	05:04	21:58 22 20:55 (WEA_RE_05)
	17:05	12 16:10 (WEA_CD_02)			19:56	20:51	21:39		29 20:23 (WEA_RE_05)	05:04	21:58 22 20:55 (WEA_RE_05)
30	08:16	16:00 (WEA_CD_02)			19:58	20:53	21:40		29 20:24 (WEA_RE_05)	05:05	21:58 23 20:53 (WEA_RE_05)
	17:07	9 16:09 (WEA_CD_02)			19:58	20:53	21:40		29 20:24 (WEA_RE_05)	05:05	21:58 23 20:56 (WEA_RE_05)
31	08:15	16:03 (WEA_CD_02)			20:00		05:10		28 20:25 (WEA_RE_05)		
	17:09	3 16:06 (WEA_CD_02)			20:00		05:10		28 20:25 (WEA_RE_05)		
	Sonnenscheinstunden	254			367	418	490		505	699	
	astr. max. mögl. Beschattung	403	275	190				526			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_53 - IO 53 Münsterscher Damm 152 Wardenburg
Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember									
1	05:06	20:33 (WEA_RE_05)	05:44	20:41 (WEA_RE_05)	06:36	10:28	07:24	16:16 (WEA_CD_01)	08:17	15:18 (WEA_CD_03)									
	21:57	24	20:57 (WEA_RE_06)	21:24	12	20:53 (WEA_RE_05)	20:19	19:07	16:58	8	16:24 (WEA_CD_01)	16:16	11	15:29 (WEA_CD_03)					
2	05:06	20:33 (WEA_RE_05)	05:46	20:43 (WEA_RE_05)	06:38	07:29	07:26	16:55	07:26	16:15	11	15:29 (WEA_CD_03)							
	21:57	23	20:56 (WEA_RE_05)	21:22	8	20:51 (WEA_RE_05)	20:17	19:05	16:57			16:15	12	15:29 (WEA_CD_03)					
3	05:07	20:33 (WEA_RE_05)	05:47				06:40	07:31	07:28			16:15	12	15:29 (WEA_CD_03)					
	21:57	24	20:57 (WEA_RE_05)	21:20			20:14	19:02	16:55			16:14	12	15:30 (WEA_CD_03)					
4	05:08	20:33 (WEA_RE_05)	05:49				06:41	07:33	07:30			16:14	12	15:30 (WEA_CD_03)					
	21:56	25	20:58 (WEA_RE_05)	21:18			20:12	19:00	16:53			16:14	13	15:31 (WEA_CD_03)					
5	05:09	20:33 (WEA_RE_05)	05:51				06:43	07:35	07:32			16:14	13	15:31 (WEA_CD_03)					
	21:56	25	20:58 (WEA_RE_05)	21:16			20:10	18:58	16:51			16:13	13	15:31 (WEA_CD_03)					
6	05:10	20:33 (WEA_RE_05)	05:52				06:45	07:36	07:33			16:12	14	15:33 (WEA_CD_03)					
	21:55	26	20:59 (WEA_RE_05)	21:15			20:07	18:55	16:49			16:13	13	15:31 (WEA_CD_03)					
7	05:11	20:32 (WEA_RE_05)	05:54				06:47	07:38	07:35			16:12	14	15:34 (WEA_CD_03)					
	21:54	27	20:59 (WEA_RE_05)	21:13			20:05	18:53	16:47			16:12	13	15:32 (WEA_CD_03)					
8	05:12	20:32 (WEA_RE_05)	05:55				06:48	07:40	07:37			16:12	14	15:33 (WEA_CD_03)					
	21:54	27	20:59 (WEA_RE_05)	21:11			20:02	18:51	16:46			16:12	14	15:33 (WEA_CD_03)					
9	05:13	20:32 (WEA_RE_05)	05:57				06:50	07:42	07:39			16:12	14	15:33 (WEA_CD_03)					
	21:53	27	20:59 (WEA_RE_05)	21:09			20:00	18:48	16:44			16:12	14	15:33 (WEA_CD_03)					
10	05:14	20:32 (WEA_RE_05)	05:59				06:52	07:44	07:41			16:12	14	15:33 (WEA_CD_03)					
	21:52	28	21:00 (WEA_RE_05)	21:07			19:58	18:46	16:42			16:11	14	15:34 (WEA_CD_03)					
11	05:15	20:32 (WEA_RE_05)	06:01				06:53	07:45	07:43			15:34 (WEA_CD_02)	08:30	15:21 (WEA_CD_03)					
	21:51	28	21:00 (WEA_RE_05)	21:05			19:55	18:44	16:40	3	15:37 (WEA_CD_02)	16:11	13	15:34 (WEA_CD_03)					
12	05:16	20:32 (WEA_RE_05)	06:02				06:55	07:47	07:45			15:31 (WEA_CD_02)	08:31	15:21 (WEA_CD_03)					
	21:51	28	21:00 (WEA_RE_05)	21:03			19:53	18:41	16:39	9	15:40 (WEA_CD_02)	16:11	13	15:34 (WEA_CD_03)					
13	05:17	20:32 (WEA_RE_05)	06:04				06:57	07:49	07:46			15:30 (WEA_CD_02)	08:33	15:21 (WEA_CD_03)					
	21:50	29	21:01 (WEA_RE_05)	21:01			19:51	18:39	16:37	12	15:42 (WEA_CD_02)	16:11	14	15:35 (WEA_CD_03)					
14	05:18	20:33 (WEA_RE_05)	06:06				06:58	07:51	07:48			15:29 (WEA_CD_02)	08:34	15:22 (WEA_CD_03)					
	21:49	29	21:02 (WEA_RE_05)	20:59			19:48	18:37	16:36	14	15:43 (WEA_CD_02)	16:11	13	15:35 (WEA_CD_03)					
15	05:19	20:33 (WEA_RE_05)	06:07				07:00	07:53	07:50			15:28 (WEA_CD_02)	08:34	15:22 (WEA_CD_03)					
	21:48	29	21:02 (WEA_RE_05)	20:57			19:46	18:34	16:34	16	15:44 (WEA_CD_02)	16:11	12	15:35 (WEA_CD_03)					
16	05:21	20:33 (WEA_RE_05)	06:09				07:02	07:54	07:52			15:28 (WEA_CD_02)	08:35	15:23 (WEA_CD_03)					
	21:46	29	21:02 (WEA_RE_05)	20:55			19:43	18:32	16:33	16	15:44 (WEA_CD_02)	16:11	12	15:35 (WEA_CD_03)					
17	05:22	20:32 (WEA_RE_05)	06:11				07:04	07:56	07:54			15:28 (WEA_CD_02)	08:36	15:24 (WEA_CD_03)					
	21:45	30	21:02 (WEA_RE_05)	20:53			19:41	18:30	16:31	17	15:45 (WEA_CD_02)	16:11	11	15:35 (WEA_CD_03)					
18	05:23	20:32 (WEA_RE_05)	06:12				07:05	07:58	07:56			15:28 (WEA_CD_02)	08:37	15:24 (WEA_CD_03)					
	21:44	30	21:02 (WEA_RE_05)	20:50			19:38	18:28	16:30	17	15:45 (WEA_CD_02)	16:11	10	15:34 (WEA_CD_03)					
19	05:25	20:33 (WEA_RE_05)	06:14				07:07	08:00	07:57			15:28 (WEA_CD_02)	08:38	15:24 (WEA_CD_03)					
	21:43	29	21:02 (WEA_RE_05)	20:48			19:36	18:26	16:29	17	15:45 (WEA_CD_02)	16:12	11	15:35 (WEA_CD_03)					
20	05:26	20:33 (WEA_RE_05)	06:16				07:09	08:02	07:59			15:29 (WEA_CD_02)	08:38	15:25 (WEA_CD_03)					
	21:42	29	21:02 (WEA_RE_05)	20:46			19:34	18:23	16:27	8	17:25 (WEA_CD_01)	16:27	17	15:46 (WEA_CD_02)	16:12	11	15:36 (WEA_CD_03)		
21	05:27	20:33 (WEA_RE_05)	06:17				07:10	08:04	07:58			15:29 (WEA_CD_02)	08:39	15:25 (WEA_CD_03)					
	21:40	29	21:02 (WEA_RE_05)	20:44			19:31	18:21	16:26	12	17:27 (WEA_CD_01)	16:26	17	15:46 (WEA_CD_02)	16:12	11	15:36 (WEA_CD_03)		
22	05:29	20:34 (WEA_RE_05)	06:19				07:12	08:05	07:53			15:30 (WEA_CD_02)	08:39	15:26 (WEA_CD_03)					
	21:39	28	21:02 (WEA_RE_05)	20:42			19:29	18:19	16:25	15	17:28 (WEA_CD_01)	16:25	16	15:46 (WEA_CD_02)	16:13	11	15:37 (WEA_CD_03)		
23	05:30	20:34 (WEA_RE_05)	06:21				07:14	08:07	07:51			15:31 (WEA_CD_02)	08:40	15:26 (WEA_CD_03)					
	21:38	28	21:02 (WEA_RE_05)	20:40			19:26	18:17	16:24	17	17:29 (WEA_CD_01)	16:24	15	15:46 (WEA_CD_02)	16:13	11	15:37 (WEA_CD_03)		
24	05:32	20:34 (WEA_RE_05)	06:23				07:16	08:09	07:54			15:32 (WEA_CD_02)	08:40	15:26 (WEA_CD_03)					
	21:36	27	21:01 (WEA_RE_05)	20:37			19:24	18:15	16:22	14	17:29 (WEA_CD_01)	16:22	14	15:46 (WEA_CD_02)	16:14	11	15:37 (WEA_CD_03)		
25	05:33	20:35 (WEA_RE_05)	06:24				07:17	07:11	07:55			15:32 (WEA_CD_02)	08:41	15:26 (WEA_CD_03)					
	21:35	26	21:01 (WEA_RE_05)	20:35			19:22	17:13	16:21	12	15:44 (WEA_CD_02)	16:15	10	15:38 (WEA_CD_03)					
26	05:35	20:35 (WEA_RE_05)	06:26				07:19	07:13	07:57			15:33 (WEA_CD_02)	08:41	15:26 (WEA_CD_03)					
	21:33	26	21:01 (WEA_RE_05)	20:33			19:19	17:11	16:20	11	15:44 (WEA_CD_02)	16:15	11	15:39 (WEA_CD_03)					
27	05:36	20:35 (WEA_RE_05)	06:28				07:21	07:15	07:59			15:35 (WEA_CD_02)	08:41	15:26 (WEA_CD_03)					
	21:32	25	21:00 (WEA_RE_05)	20:31			19:17	17:08	16:19	8	15:43 (WEA_CD_02)	16:16	11	15:39 (WEA_CD_03)					
28	05:38	20:36 (WEA_RE_05)	06:29				07:22	07:17	08:01			15:19 (WEA_CD_01)	08:42	15:26 (WEA_CD_03)					
	21:30	23	20:59 (WEA_RE_05)	20:28			19:14	17:06	16:29	18	16:29 (WEA_CD_01)	16:18	11	15:42 (WEA_CD_02)	16:17	12	15:40 (WEA_CD_03)		
29	05:39	20:37 (WEA_RE_05)	06:31				07:24	07:18	08:02			15:19 (WEA_CD_01)	08:42	15:26 (WEA_CD_03)					
	21:29	20	20:57 (WEA_RE_05)	20:26			19:12	17:04	16:16	16	16:28 (WEA_CD_01)	16:17	8	15:27 (WEA_CD_03)	16:18	12	15:41 (WEA_CD_03)		
30	05:41	20:38 (WEA_RE_05)	06:32				07:26	07:20	08:04			15:18 (WEA_CD_01)	08:42	15:26 (WEA_CD_03)					
	21:27	18	20:56 (WEA_RE_05)	20:24			19:10	17:02	16:27	15	16:27 (WEA_CD_01)	16:17	10	15:28 (WEA_CD_03)	16:19	13	15:42 (WEA_CD_03)		
31	05:42	20:39 (WEA_RE_05)	06:35				07:27	07:22	08:06			15:14 (WEA_CD_01)	08:42	15:26 (WEA_CD_03)					
	21:25	15	20:54 (WEA_RE_05)	20:21			17:00	12	16:26 (WEA_CD_01)			16:20	13	15:43 (WEA_CD_03)					
Sonnenscheinstunden		508		457		382		330		262		268		238		375			
astr. max.mögl. Beschattung		811		20		184		184		268		268		375		375			

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_54 - IO 54 Beyerstraße 41 Wardenburg

Annahmen für Schattenwurfberechnung

- Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
- Die Sonne scheint täglich von Sonnenauf- bis -untergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:42		08:13		07:17		07:04		05:57		05:09
	16:21		17:11		18:05		20:01		20:55		21:43
2	08:42		08:11		07:15		07:02		05:55	18	20:47 (WEA_RE_03)
	16:22		17:13	7	16:29 (WEA_CD_02)		18:07		20:03		20:58
3	08:41		08:10		07:13		06:59		05:53	17	20:46 (WEA_RE_03)
	16:23		17:15	13	16:32 (WEA_CD_02)		18:09		20:05		20:57
4	08:41		08:08		07:10		06:57		05:51	16	20:47 (WEA_RE_03)
	16:25		17:17	15	16:34 (WEA_CD_02)		18:10		20:07		20:51 (WEA_RE_03)
5	08:41		08:06		07:08		17:23 (WEA_CD_01)		06:55		05:06
	16:26		17:19	18	16:35 (WEA_CD_02)		18:12	9	17:32 (WEA_CD_01)		21:02
6	08:40		08:04		07:06		17:20 (WEA_CD_01)		06:52		21:02
	16:27		17:20	19	16:36 (WEA_CD_02)		18:14	15	17:35 (WEA_CD_01)		21:03
7	08:40		08:03		07:04		17:17 (WEA_CD_01)		06:50		21:03
	16:28		17:22	21	16:37 (WEA_CD_02)		18:16	19	17:36 (WEA_CD_01)		21:05
8	08:40		08:01		07:01		17:16 (WEA_CD_01)		06:48		21:05
	16:30		17:24	23	16:38 (WEA_CD_02)		18:18	21	17:37 (WEA_CD_01)		21:07
9	08:39		07:59		06:59		16:15 (WEA_CD_02)		06:45	3	20:36 (WEA_RE_03)
	16:31		17:26	23	16:38 (WEA_CD_02)		18:20	23	17:37 (WEA_CD_01)		21:09
10	08:38		07:57		06:57		17:14 (WEA_CD_01)		06:43	8	20:39 (WEA_RE_03)
	16:33	6	15:49 (WEA_CD_03)		17:28	23	16:38 (WEA_CD_02)		18:22		21:09
11	08:38		07:55		06:54		17:14 (WEA_CD_01)		06:41	11	20:40 (WEA_RE_03)
	16:34	9	15:59 (WEA_G_02)		17:30	23	16:38 (WEA_CD_02)		18:23		21:10
12	08:37		07:53		06:52		17:13 (WEA_CD_01)		06:38		21:11
	16:36	14	16:01 (WEA_G_02)		17:32	22	16:38 (WEA_CD_02)		18:25	25	17:38 (WEA_CD_01)
13	08:36		07:51		06:49		17:13 (WEA_CD_01)		06:36	16	20:43 (WEA_RE_03)
	16:37	15	16:02 (WEA_G_02)		17:34	22	16:38 (WEA_CD_02)		18:27		21:14
14	08:36		07:49		06:47		17:13 (WEA_CD_01)		06:34	19	20:44 (WEA_RE_03)
	16:39	18	16:04 (WEA_G_02)		17:36	21	16:38 (WEA_CD_02)		18:29		21:15
15	08:35		07:47		06:45		17:13 (WEA_CD_01)		06:31	21	20:46 (WEA_RE_03)
	16:40	20	16:06 (WEA_G_02)		17:38	19	16:37 (WEA_CD_02)		18:31		21:17
16	08:34		07:45		06:42		17:14 (WEA_CD_01)		06:29	23	20:47 (WEA_RE_03)
	16:42	22	16:08 (WEA_G_02)		17:40	17	16:35 (WEA_CD_02)		18:33		21:19
17	08:33		07:43		06:40		17:14 (WEA_CD_01)		06:27	25	20:49 (WEA_RE_03)
	16:44	24	16:10 (WEA_G_02)		17:42	14	16:34 (WEA_CD_02)		18:34		21:20
18	08:32		07:41		06:38		17:16 (WEA_CD_01)		06:25	25	20:48 (WEA_RE_03)
	16:45	24	16:10 (WEA_G_02)		17:44	9	16:31 (WEA_CD_02)		18:36		21:21
19	08:31		07:39		06:35		17:17 (WEA_CD_01)		06:22	25	20:49 (WEA_RE_03)
	16:47	24	16:10 (WEA_G_02)		17:46	13	17:30 (WEA_CD_01)		20:33		21:22
20	08:30		07:37		06:33		17:22 (WEA_CD_01)		06:20	25	20:49 (WEA_RE_03)
	16:49	23	16:10 (WEA_G_02)		17:48	3	17:25 (WEA_CD_01)		20:35		21:23
21	08:28		07:35		06:30		06:18		05:22	26	20:49 (WEA_RE_03)
	16:50	23	16:10 (WEA_G_02)		17:50		20:37		21:28		21:24
22	08:27		07:33		06:28		06:16		05:21	25	20:49 (WEA_RE_03)
	16:52	22	16:09 (WEA_G_02)		17:51		20:39		21:29		21:25
23	08:26		07:31		06:26		06:14		05:19	25	20:49 (WEA_RE_03)
	16:54	20	16:08 (WEA_G_02)		17:53		20:41		21:31		21:26
24	08:25		07:28		06:23		06:11		05:18	25	20:49 (WEA_RE_03)
	16:56	16	16:04 (WEA_CD_03)		17:55		20:42		21:32		21:27
25	08:23		07:26		06:21		06:09		05:17	25	20:49 (WEA_RE_03)
	16:58	15	16:05 (WEA_CD_03)		17:57		20:44		21:34		21:28
26	08:22		07:24		06:18		06:07		05:16	24	20:48 (WEA_RE_03)
	17:00	14	16:04 (WEA_CD_03)		17:59		20:46		21:35		21:29
27	08:21		07:22		06:16		06:05		05:14	23	20:48 (WEA_RE_03)
	17:01	11	16:03 (WEA_CD_03)		18:01		20:48		21:37		21:30
28	08:19		07:20		06:14		06:03		05:13	23	20:48 (WEA_RE_03)
	17:03	8	16:02 (WEA_CD_03)		18:03		20:49		21:38		21:31
29	08:18				06:11		06:01		05:12	22	20:48 (WEA_RE_03)
	17:05				19:56		20:51		21:39		21:32
30	08:16				07:09		06:59		05:11	22	20:48 (WEA_RE_03)
	17:07				19:58		20:53		21:40		21:33
31	08:15				07:07		06:57		05:10	20	20:48 (WEA_RE_03)
	17:09				20:00		21:42		20:48 (WEA_RE_03)		21:34
Sonnenscheinstunden		254			367		418		490		505
astr. max.mögl. Beschattung		328		309		308		495		511	

Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
--------------	-----------------------	-------------------------	----------------------	----------------------------------	------------------------------	---------------------------	----------------------------

SHADOW - Kalender

Berechnung: Gesamtbelastung **Schattenrezeptor:** IO_54 - IO 54 Beyerstraße 41 Wardenburg

Annahmen für Schattenwurfberechnung

Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
Die Sonne scheint täglich von Sonnenauf- bis -untergang
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember	
1	05:06		05:44	20:37 (WEA_RE_03)	06:36	07:28	17:53 (WEA_CD_01)	07:24	15:46 (WEA_CD_02)	08:17	15:30 (WEA_CD_03)
2	05:06		05:46	20:53 (WEA_RE_03)	06:38	19:07	18:17 (WEA_CD_01)	16:58	16:08 (WEA_CD_02)	16:16	15:41 (WEA_G_02)
3	05:07		05:47	20:51 (WEA_RE_03)	06:39	19:05	17:52 (WEA_CD_01)	16:58	15:46 (WEA_CD_02)	08:19	15:31 (WEA_CD_03)
4	05:08		05:49	20:40 (WEA_RE_03)	06:40	19:02	17:52 (WEA_CD_01)	16:58	15:46 (WEA_CD_02)	08:20	15:37 (WEA_CD_03)
5	05:09		05:51	20:30 (WEA_RE_03)	06:41	19:00	18:35 (WEA_CD_01)	16:55	16:07 (WEA_CD_02)	16:15	
6	05:10		05:52	20:40 (WEA_RE_03)	06:42	18:58	17:52 (WEA_CD_01)	16:58	15:46 (WEA_CD_02)	08:22	
7	05:11		05:54	20:37 (WEA_RE_03)	06:43	18:55	18:13 (WEA_CD_01)	16:49	16:05 (WEA_CD_02)	16:13	
8	05:12		05:56	20:49 (WEA_RE_03)	06:44	18:52	17:54 (WEA_CD_01)	16:51	16:06 (WEA_CD_02)	16:13	
9	05:13		05:57	20:51 (WEA_RE_03)	06:45	18:50	18:11 (WEA_CD_01)	16:47	16:04 (WEA_CD_02)	16:12	
10	05:14		05:59	20:38 (WEA_RE_03)	06:46	18:48	17:56 (WEA_CD_01)	16:47	16:04 (WEA_CD_02)	16:12	
11	05:15		06:01	20:37 (WEA_RE_03)	06:47	18:46	18:00 (WEA_CD_01)	16:46	16:03 (WEA_CD_02)	16:12	
12	05:16		06:02	20:54 (WEA_RE_03)	06:48	18:44	18:04 (WEA_CD_01)	16:44	15:59 (WEA_CD_02)	16:12	
13	05:17		06:04	20:36 (WEA_RE_03)	06:49	18:42	17:58 (WEA_CD_01)	16:44	15:59 (WEA_CD_02)	16:12	
14	05:18		06:06	20:53 (WEA_RE_03)	06:50	18:40	18:04 (WEA_CD_01)	16:44	15:59 (WEA_CD_02)	16:12	
15	05:19		06:07	20:35 (WEA_RE_03)	06:51	18:38	17:53 (WEA_CD_01)	16:42	15:58 (WEA_CD_02)	16:11	
16	05:21		06:09	20:57 (WEA_RE_03)	06:52	18:36	18:16 (WEA_CD_01)	16:40	15:56 (WEA_CD_02)	16:11	
17	05:22		06:11	20:34 (WEA_RE_03)	06:53	18:34	17:54 (WEA_CD_01)	16:39	15:55 (WEA_CD_02)	16:11	
18	05:23		06:12	20:58 (WEA_RE_03)	06:54	18:32	18:13 (WEA_CD_01)	16:37	15:53 (WEA_CD_02)	16:11	
19	05:25		06:14	20:35 (WEA_RE_03)	06:55	18:30	17:56 (WEA_CD_01)	16:36	15:52 (WEA_CD_02)	16:11	
20	05:26		06:16	20:59 (WEA_RE_03)	06:56	18:28	18:14 (WEA_CD_01)	16:34	15:50 (WEA_CD_02)	16:11	
21	05:27		06:18	20:34 (WEA_RE_03)	06:57	18:26	17:58 (WEA_CD_01)	16:33	15:49 (WEA_CD_02)	16:11	
22	05:29		06:19	20:54 (WEA_RE_03)	06:58	18:24	18:16 (WEA_CD_01)	16:31	15:47 (WEA_CD_02)	16:11	
23	05:30		06:21	20:34 (WEA_RE_03)	06:59	18:22	17:59 (WEA_CD_01)	16:30	15:46 (WEA_CD_02)	16:11	
24	05:32		06:23	20:59 (WEA_RE_03)	07:00	18:20	18:17 (WEA_CD_01)	16:28	15:44 (WEA_CD_02)	16:11	
25	05:33		06:24	20:34 (WEA_RE_03)	07:01	18:18	17:59 (WEA_CD_01)	16:27	15:43 (WEA_CD_02)	16:11	
26	05:35		06:26	20:59 (WEA_RE_03)	07:02	18:16	18:17 (WEA_CD_01)	16:25	15:41 (WEA_CD_02)	16:11	
27	05:36		06:28	20:34 (WEA_RE_03)	07:03	18:14	17:56 (WEA_CD_01)	16:24	15:40 (WEA_CD_02)	16:11	
28	05:38		06:29	20:59 (WEA_RE_03)	07:04	18:12	18:17 (WEA_CD_01)	16:22	15:38 (WEA_CD_02)	16:11	
29	05:39		06:31	20:34 (WEA_RE_03)	07:05	18:10	17:58 (WEA_CD_01)	16:21	15:37 (WEA_CD_02)	16:11	
30	05:41		06:33	20:59 (WEA_RE_03)	07:06	18:08	18:17 (WEA_CD_01)	16:19	15:35 (WEA_CD_02)	16:11	
31	05:42		06:35	20:34 (WEA_RE_03)	07:07	18:06	17:59 (WEA_CD_01)	16:18	15:34 (WEA_CD_02)	16:11	
1	05:44		06:36	20:59 (WEA_RE_03)	07:08	18:04	18:17 (WEA_CD_01)	16:17	15:32 (WEA_CD_02)	16:11	
2	05:46		06:38	20:34 (WEA_RE_03)	07:09	18:02	17:59 (WEA_CD_01)	16:16	15:31 (WEA_CD_02)	16:11	
3	05:47		06:40	20:59 (WEA_RE_03)	07:10	18:00	18:17 (WEA_CD_01)	16:15	15:30 (WEA_CD_02)	16:11	
4	05:49		06:42	20:34 (WEA_RE_03)	07:11	17:58	17:59 (WEA_CD_01)	16:14	15:29 (WEA_CD_02)	16:11	
5	05:51		06:44	20:59 (WEA_RE_03)	07:12	17:56	18:17 (WEA_CD_01)	16:13	15:28 (WEA_CD_02)	16:11	
6	05:52		06:46	20:34 (WEA_RE_03)	07:13	17:54	17:59 (WEA_CD_01)	16:12	15:27 (WEA_CD_02)	16:11	
7	05:54		06:48	20:59 (WEA_RE_03)	07:14	17:52	18:17 (WEA_CD_01)	16:11	15:26 (WEA_CD_02)	16:11	
8	05:56		06:50	20:34 (WEA_RE_03)	07:15	17:50	17:59 (WEA_CD_01)	16:10	15:25 (WEA_CD_02)	16:11	
9	05:57		06:52	20:59 (WEA_RE_03)	07:16	17:48	18:17 (WEA_CD_01)	16:09	15:24 (WEA_CD_02)	16:11	
10	05:59		06:54	20:34 (WEA_RE_03)	07:17	17:46	17:59 (WEA_CD_01)	16:08	15:23 (WEA_CD_02)	16:11	
11	06:01		06:56	20:59 (WEA_RE_03)	07:18	17:44	18:17 (WEA_CD_01)	16:07	15:22 (WEA_CD_02)	16:11	
12	06:02		06:58	20:34 (WEA_RE_03)	07:19	17:42	17:59 (WEA_CD_01)	16:06	15:21 (WEA_CD_02)	16:11	
13	06:04		06:59	20:59 (WEA_RE_03)	07:20	17:40	18:17 (WEA_CD_01)	16:05	15:20 (WEA_CD_02)	16:11	
14	06:06		07:01	20:34 (WEA_RE_03)	07:21	17:38	17:59 (WEA_CD_01)	16:04	15:19 (WEA_CD_02)	16:11	
15	06:07		07:03	20:59 (WEA_RE_03)	07:22	17:36	18:17 (WEA_CD_01)	16:03	15:18 (WEA_CD_02)	16:11	
16	06:09		07:05	20:34 (WEA_RE_03)	07:23	17:34	17:59 (WEA_CD_01)	16:02	15:17 (WEA_CD_02)	16:11	
17	06:11		07:07	20:59 (WEA_RE_03)	07:24	17:32	18:17 (WEA_CD_01)	16:01	15:16 (WEA_CD_02)	16:11	
18	06:12		07:09	20:34 (WEA_RE_03)	07:25	17:30	17:59 (WEA_CD_01)	16:00	15:15 (WEA_CD_02)	16:11	
19	06:14		07:11	20:59 (WEA_RE_03)	07:26	17:28	18:17 (WEA_CD_01)	15:59	15:14 (WEA_CD_02)	16:11	
20	06:16		07:13	20:34 (WEA_RE_03)	07:27	17:26	17:59 (WEA_CD_01)	15:58	15:13 (WEA_CD_02)	16:11	
21	06:18		07:15	20:59 (WEA_RE_03)	07:28	17:24	18:17 (WEA_CD_01)	15:57	15:12 (WEA_CD_02)	16:11	
22	06:19		07:17	20:34 (WEA_RE_03)	07:29	17:22	17:59 (WEA_CD_01)	15:56	15:11 (WEA_CD_02)	16:11	
23	06:21		07:19	20:59 (WEA_RE_03)	07:30	17:20	18:17 (WEA_CD_01)	15:55	15:10 (WEA_CD_02)	16:11	
24	06:23		07:21	20:34 (WEA_RE_03)	07:31	17:18	17:59 (WEA_CD_01)	15:54	15:09 (WEA_CD_02)	16:11	
25	06:25		07:23	20:59 (WEA_RE_03)	07:32	17:16	18:17 (WEA_CD_01)	15:53	15:08 (WEA_CD_02)	16:11	
26	06:26		07:25	20:34 (WEA_RE_03)	07:33	17:14	17:59 (WEA_CD_01)	15:52	15:07 (WEA_CD_02)	16:11	
27	06:28		07:27	20:59 (WEA_RE_03)	07:34	17:12	18:17 (WEA_CD_01)	15:51	15:06 (WEA_CD_02)	16:11	
28	06:30		07:29	20:34 (WEA_RE_03)	07:35	17:10	17:59 (WEA_CD_01)	15:50	15:05 (WEA_CD_02)	16:11	
29	06:32		07:31	20:59 (WEA_RE_03)	07:36	17:08	18:17 (WEA_CD_01)	15:49	15:04 (WEA_CD_02)	16:11	
30	06:34		07:33	20:34 (WEA_RE_03)	07:37	17:06	17:59 (WEA_CD_01)	15:48	15:03 (WEA_CD_02)	16:11	
31	06:36		07:35	20:59 (WEA_RE_03)	07:38	17:04	18:17 (WEA_CD_01)	15:47	15:02 (WEA_CD_02)	16:11	
1	06:38		07:37	20:34 (WEA_RE_03)	07:39	17:02	17:59 (WEA_CD_01)	15:46	15:01 (WEA_CD_02)	16:11	
2	06:40		07:39	20:59 (WEA_RE_03)	07:40	17:00	18:17 (WEA_CD_01)	15:45	15:00 (WEA_CD_02)	16:11	
3	06:42		07:41	20:34 (WEA_RE_03)	07:41	16:58	17:59 (WEA_CD_01)	15:44	14:59 (WEA_CD_02)	16:11	
4	06:44		07:43	20:59 (WEA_RE_03)	07:42	16:56	18:17 (WEA_CD_01)	15:43	14:58 (WEA_CD_02)	16:11	
5	06:46		07:45	20:34 (WEA_RE_03)	07:43	16:54	17:59 (WEA_CD_01)	15:42	14:57 (WEA_CD_02)	16:11	
6	06:48		07:47	20:59 (WEA_RE_03)	07:44	16:52	18:17 (WEA_CD_01)	15:41	14:56 (WEA_CD_02)	16:11	
7	06:50		07:49	20:34 (WEA_RE_03)	07:45	16:50	17:59 (WEA_CD_01)	15:40	14:55 (WEA_CD_02)	16:11	
8	06:52		07:51	20:59 (WEA_RE_03)	07:46	16:48	18:17 (WEA_CD_01)	15:39	14:54 (WEA_CD_02)	16:11	
9	06:54		07:53	20:34 (WEA_RE_03)	07:47	16:46	17:59 (WEA_CD_01)	15:38	14:53 (WEA_CD_02)	16:11	
10	06:56		07:55	20:59 (WEA_RE_03)	07:48	16:44	18:17 (WEA_CD_01)	15:37	14:52 (WEA_CD_02)	16:11	
11	06:58		07:57	20:34 (WEA_RE_03)	07:49	16:42	17:59 (WEA_CD_01)	15:36	14:51 (WEA_CD_02)	16:11	
12	06:59		07:59	20:59 (WEA_RE_03)	07:50	16:40	18:17 (WEA_CD_01)	15:35	14:50 (WEA_CD_02)	16:11	
13	07:01		08:01	20:34 (WEA_RE_03)	07:51	16:38	17:59 (WEA_CD_01)	15:34	14:49 (WEA_CD_02)	16:11	
14	07:03		08:03	20:59 (WEA_RE_03)	07:52	16:36	18:17 (WEA_CD_01)	15:33	14:48 (WEA_CD_02)	16:11	
15	07:05		08:05	20:34 (WEA_RE_03)	07:53	16:34	17:59 (WEA_CD_01)	15:32	14:47 (WEA_CD_02)	16:11	
16	07:07		08:07	20:59 (WEA_RE_03)	07:54	16:32	18:17 (WEA_CD_01)	15:31	14:46 (WEA_CD_02)	16:11	
17	07:09		08:09	20:34 (WEA_RE_03)	07:55	16:30	17:59 (WEA_CD_01)	15:30	14:45 (WEA_CD_02)	16:11	
18	07:11		08:11	20:59 (WEA_RE_03)	07:56	16:28	18:17 (WEA_CD_01)	15:29	14:44 (WEA_CD_02)	16:11	
19	07:13		08:13	20:34 (WEA_RE_03)	07:57	16:26	17:59 (WEA_CD_01)	15:28	14:43 (WEA_CD_02)	16:11	
20	07:15		08:15	20:59 (WEA_RE_03)	07:58	16:24	18:17 (WEA_CD_01)	15:27	14:42 (WEA_CD_02)	16:11	
21	07:17		08:17	20:34 (WEA_RE_03)	07:59	16:22	17:59 (WEA_CD_01)	15:26	14:41 (WEA_CD_02)	16:11	
22	07:19		08:19	20:59 (WEA_RE_03)	08:00	16:20	18:17 (WEA_CD_01)	15:25	14:40 (WEA_CD_02)	16:11	
23	07:21		08:21	20:34 (WEA_RE_03)	08:01	16:18	17:59 (WEA_CD_01)	15:24	14:39 (WEA_CD_02)	16:11	
24	07:23		08:23	20:59 (WEA_RE_03)	08:02	16:16	18:17 (WEA_CD_01)	15:23	14:38 (WEA_CD_02)	16:11	
25	07:25		08:25	20:34 (WEA_RE_03)	08:03	16:14	17:59 (WEA_CD_01)	15:22	14:37 (WEA_CD_02)	16:11	
26	07:27		08:27	20:59 (WEA_RE_03)	08:04	16:12	18:17 (WEA_CD_01)	15:21	14:36 (WEA_CD_02)	16:11	
27	07:29		08:29	20:34 (WEA_RE_03)	08:05	16:10	17:59 (WEA_CD_01)	15:20	14:35 (WEA_CD_02)	16:11	
28	07:31										



ÜBER DNV

DNV agiert als unabhängiges Unternehmen im Bereich Assurance und Risikomanagement in mehr als 100 Ländern. Aufbauend auf seiner langjährigen Erfahrung und Expertise hat DNV das Ziel, Sicherheit und nachhaltige Leistungen zu fördern.

Von der Bewertung eines neuen Schiffsdesigns, der Leistungsoptimierung eines Windparks, der Analyse von Sensordaten einer Gaspipeline bis hin zur Zertifizierung der Lieferkette eines Lebensmittelunternehmens - DNV hilft Kunden und Partnern mit Sicherheit, die richtigen Entscheidungen zu treffen.

Der Schutz von Leben, Gütern und Umwelt ist für uns Aufgabe und Ansporn zugleich. DNV hilft seinen Kunden, sich ihren Herausforderungen und den globalen Transformationen der heutigen Zeit zu stellen. DNV versteht sich als vertrauensvolle Stimme für viele der weltweit erfolgreichsten und zukunftsorientierten Unternehmen.