



Schattenwurfprognose

Für eine Windenergieanlage WEA 2 am Standort Boizenburg

06.08.2019
Revision 0

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Die vorliegende Schattenwurfprognose für den Standort Boizenburg wurde von der ENERKRAFT GmbH in Auftrag gegeben und gemäß dem Stand von Wissenschaft und Technik nach bestem Wissen und Gewissen unparteiisch erstellt.

Für die physikalische Einhaltung der prognostizierten Ergebnisse der Schattenwurfprognose werden seitens des Gutachters keine Garantien übernommen. Sie basieren auf Berechnungen nach den Empfehlungen der Bund/Länder-Arbeitsgemeinschaft für Immissionsschutz (LAI) sowie den vom Auftraggeber und dem WEA-Hersteller gestellten Standort- und Anlagendaten.

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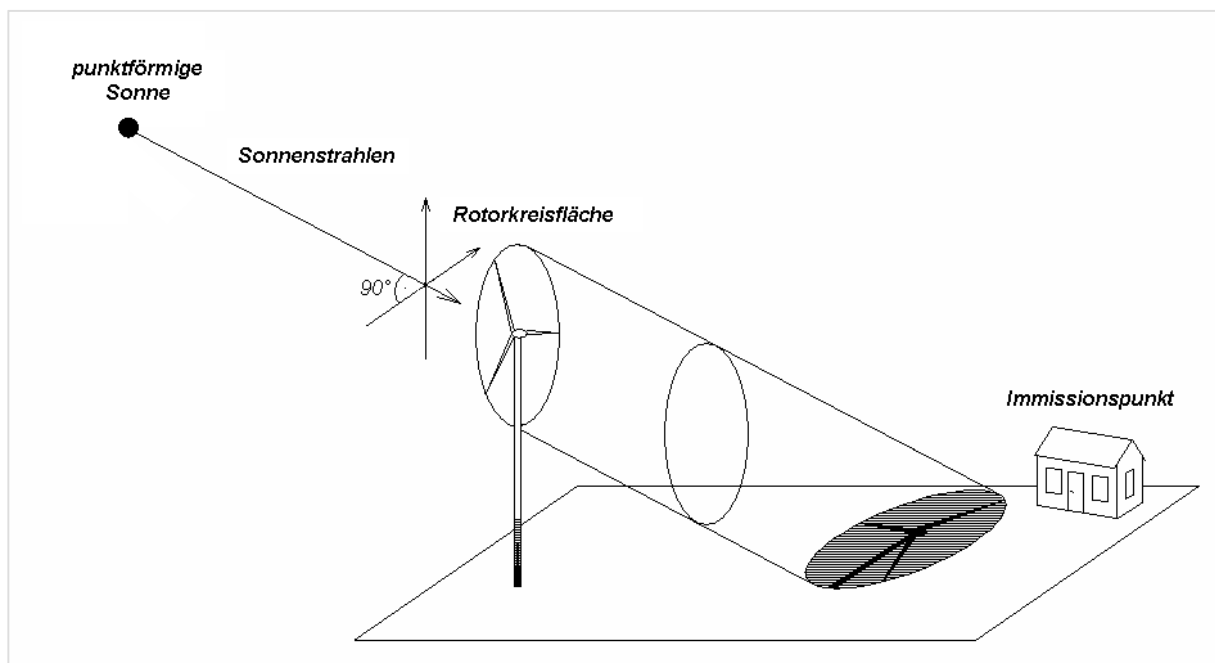
1 Grundlagen

Windenergieanlagen stellen in der heutigen Zeit eine umweltfreundliche Art der Stromerzeugung dar und haben weniger negative Auswirkungen auf den Menschen und seine Umwelt als konventionelle Stromerzeugungsanlagen. Zu den Auswirkungen durch Windenergieanlagen (WEA) gehört der periodische Schattenwurf an Wohn- und Arbeitsstätten. Die Ermittlung dieser Auswirkung erfolgt in einer Schattenwurfprognose.

Der periodische Schattenwurf ist definiert als die wiederkehrende Verschattung des direkten Sonnenlichts durch die Rotorblätter einer Windenergieanlage. Je nach Drehzahl des Rotors verursacht der periodische Schattenwurf hinter der Windenergieanlage starke Lichtwechsel, was auf den Menschen störend wirkt und auf längere Dauer nicht zumutbar ist. Aus diesem Grund muss bei jeder WEA Planung eine Untersuchung des periodischen Schattenwurfs durchgeführt werden.

Durch eine Schattenwurfprognose ist es möglich, die Dauer des periodischen Schattenwurfs durch Windenergieanlagen auf benachbarte Wohngebäude und Arbeitsstätten zu ermitteln. Ist eine Beeinträchtigung durch den periodischen Schattenwurf zu erwarten, wird in der Prognose der Schattenwurf zeitlich vorhergesagt.

Zur Ermittlung der Schattenwurfimmissionen wird vom Berechnungsprogramm ein rein geometrisches Modell verwendet. Dabei wird die Sonne als punktförmig und die von den Rotorblättern überstrichene Fläche als Kreisfläche definiert. Der Sonnenverlauf wird mit einem mathematischen Modell unter Berücksichtigung von Erdachsenneigung, Erdrotation und elliptischer Erdbahn um die Sonne berechnet.



Maßgebliche Parameter für die Berechnung der Schattenwurfimmissionen sind die Nabenhöhe und der Rotordurchmesser der Windenergieanlage sowie die Koordinaten inkl. der geografischen Höhe der Immissionspunkte und der Anlage. Das Gebiet um eine WEA, in dem eine relevante Beschattung auftreten kann, wird als Beschattungsbereich der Windenergieanlage bezeichnet. Zur Ermittlung dieses Gebietes wird das sog. 20%-Verdeckungskriterium herangezogen. Dabei ergibt sich der zu prüfende Bereich aus dem Abstand zur Windenergieanlage, in welchem die Sonnenfläche gerade zu 20% durch ein Rotorblatt verdeckt wird. Da die Blattiefe nicht über den gesamten Flügel konstant ist,

sondern zur Rotorblattspitze hin abnimmt, ist ersatzweise ein rechteckiges Rotorblatt mit folgender mittleren Blatattiefe zu ermitteln:

$$\text{Mittlere Blatattiefe} = \frac{1}{2} * (\text{max. Blatattiefe} + \text{min. Blatattiefe bei } 0,9 * \text{Rotorradius})$$

Innerhalb der Berechnungen wird der astronomisch maximal mögliche Schattenwurf ermittelt. Voraussetzungen hierfür sind ständiger Sonnenschein bei allzeit wolkenfreiem Himmel sowie ein permanenter Betrieb der WEA (100% Verfügbarkeit). Die Rotorfläche steht zudem immer senkrecht zur Sonneneinfallrichtung, die tatsächlich auftretende Windrichtung bleibt somit unberücksichtigt.

2 Schattenwurfprognose

2.1 Aufgabenstellung

Diese Prognose dient der Bestimmung des zu erwartenden periodischen Schattenwurfs, verursacht durch eine in Planung befindliche Windenergieanlage am Standort Boizenburg. Durch das Drehen des Rotors können störende optische Effekte im Umfeld der Windenergieanlagen entstehen.

Daher verlangt der Bau eines Windparks im Antragsverfahren nach BImSchG [1] eine immissionsrechtliche Prognose über den Schattenwurf. Es soll ermittelt werden, ob durch die geplante Windenergieanlage in Abbildung 1 schädliche Umwelteinwirkungen durch Schattenwurf entstehen werden. Maßgeblich für die Prognose sind die vom Länderausschuss für Immissionsschutz (LAI) verfassten Schattenwurf-Hinweise [2].

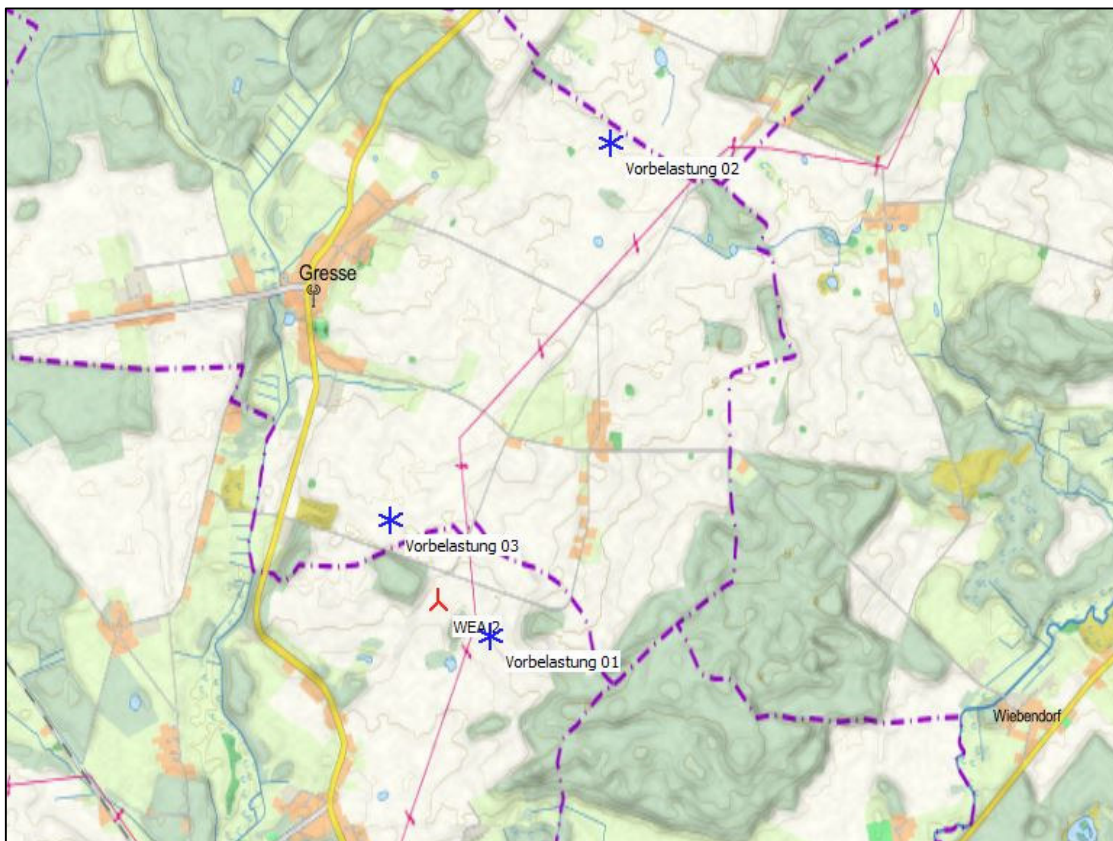


Abbildung 1: Übersichtskarte

2.2 Örtliche Beschreibung

Der Standort der Windenergieanlage Boizenburg befindet sich im Landkreis Ludwigslust-Parchim in Mecklenburg-Vorpommern in der Gemeinde Gresse ca. 3.600 m nördlich von Boizenburg.

Die Umgebung setzt sich überwiegend aus ebenen landwirtschaftlich genutzten Flächen und kleineren Waldgebieten zusammen. Der Standort der geplanten Windkraftanlage liegt auf ca. 29 m üNN.

Umgeben ist der Standort der WKA von der Ortschaft Gresse im Norden, den Ortsteilen Badekow im Osten und dem Ortsteil Schwartow im Südwesten.

2.2 Vor- und Zusatzbelastung

Am Standort Boizenburg sind drei weitere Windenergieanlagen als Vorbelastung in der Berechnung der Schattenwurfbelastung zu berücksichtigen. In nachfolgender Tabelle werden die Anlagentypen und Koordinaten der Vor- und Zusatzbelastung dargestellt. Die Anlagendaten sowie die Koordinaten der Vorbelastung wurden vom Auftraggeber zur Verfügung gestellt.

| | ETRS89/UTM Zone 33N | | Höhe üNN |
|------------------------------|---------------------|---------|-----------|
| | X | Y | Meter (m) |
| Nordex N163/5.7 MW (NEU) | 218213 | 5926327 | 28,9 |
| Nordex N163/5.7 MW (BESTAND) | 217915 | 5926908 | 27,0 |
| Vestas V162/5.6 MW (BESTAND) | 218564 | 5926071 | 29,8 |
| Vestas V162/5.6 MW (BESTAND) | 219596 | 5929422 | 34,0 |

Tab. 1: Vor- und Zusatzbelastung

2.3 Immissionsorte

Die laut der Schattenwurf-Hinweise maßgeblichen Immissionsorte sind schutzwürdige Räume wie:

- Wohnräume, einschließlich Wohndielen
- Schlafräume, einschließlich Übernachtungsräume in Beherbergungsstätten und Bettenräume in Krankenhäusern und Sanatorien
- Unterrichtsräume in Schulen, Hochschulen und ähnlichen Einrichtungen
- Büroräume, Praxisräume, Arbeitsräume, Schulungsräume und ähnliche Arbeitsräume

Direkt an Gebäuden beginnende Außenflächen (z. B. Terrassen und Balkone) sind schutzwürdigen Räumen tagsüber zwischen 6:00 und 22:00 Uhr gleichgestellt.

Im Zuge einer Ortsbesichtigung am 15. Juli 2019 wurden 13 Immissionsorte ausgewählt, deren potentielle Immissionsbelastung durch die geplante Windenergieanlage geprüft werden sollen. Bei den Immissionspunkten handelt es sich um die am nächsten gelegenen schutzwürdigen Gebäude. Die entsprechenden Gebietskategorien für die Bebauung wurden anhand der aktuellen Bebauungs- und

Flächennutzungspläne festgelegt. Auf dem Kartenmaterial sichtbare, näher gelegene Gebäude sind Scheunen und andere unbewohnte Bauwerke.

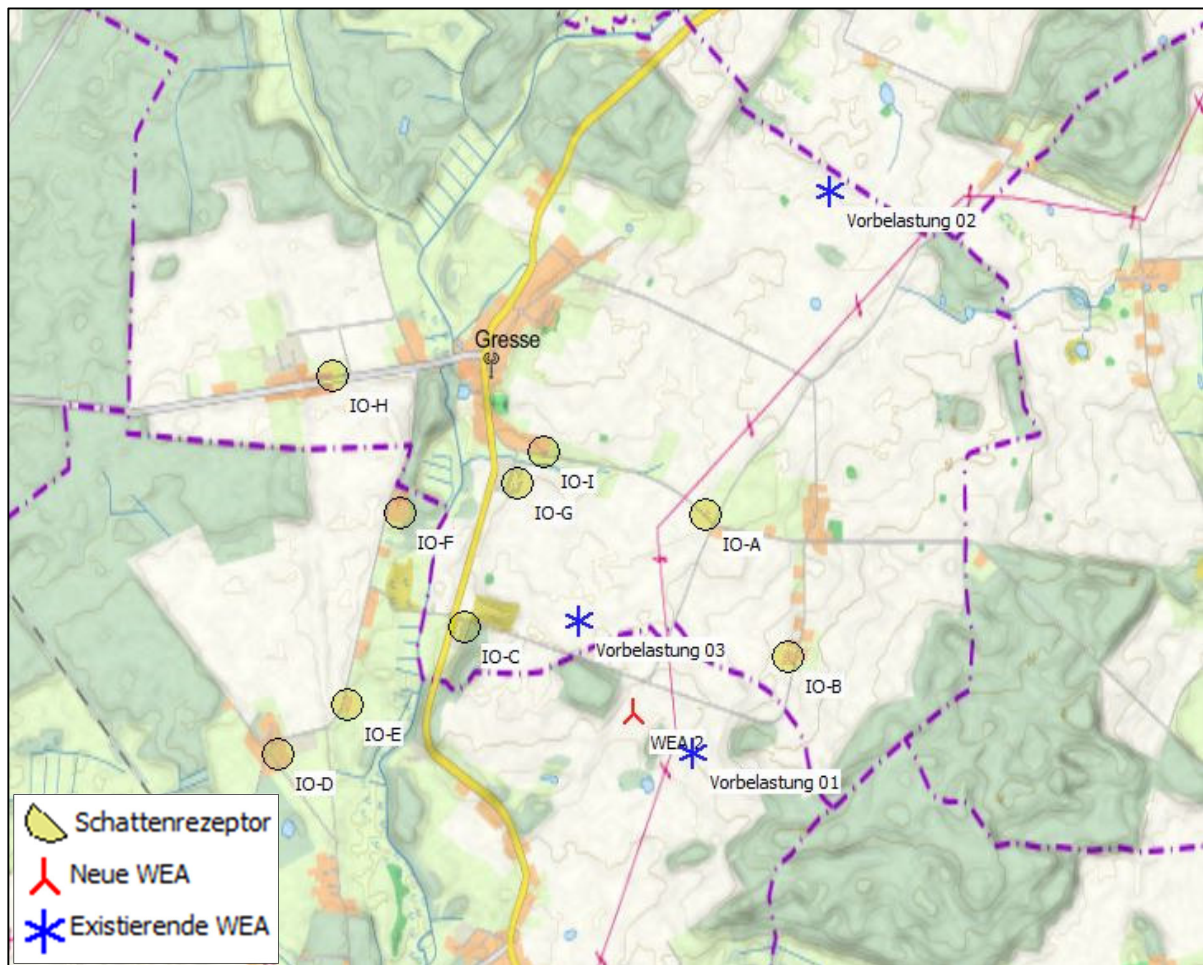


Abbildung 2: Übersichtskarte mit Immissionsorten

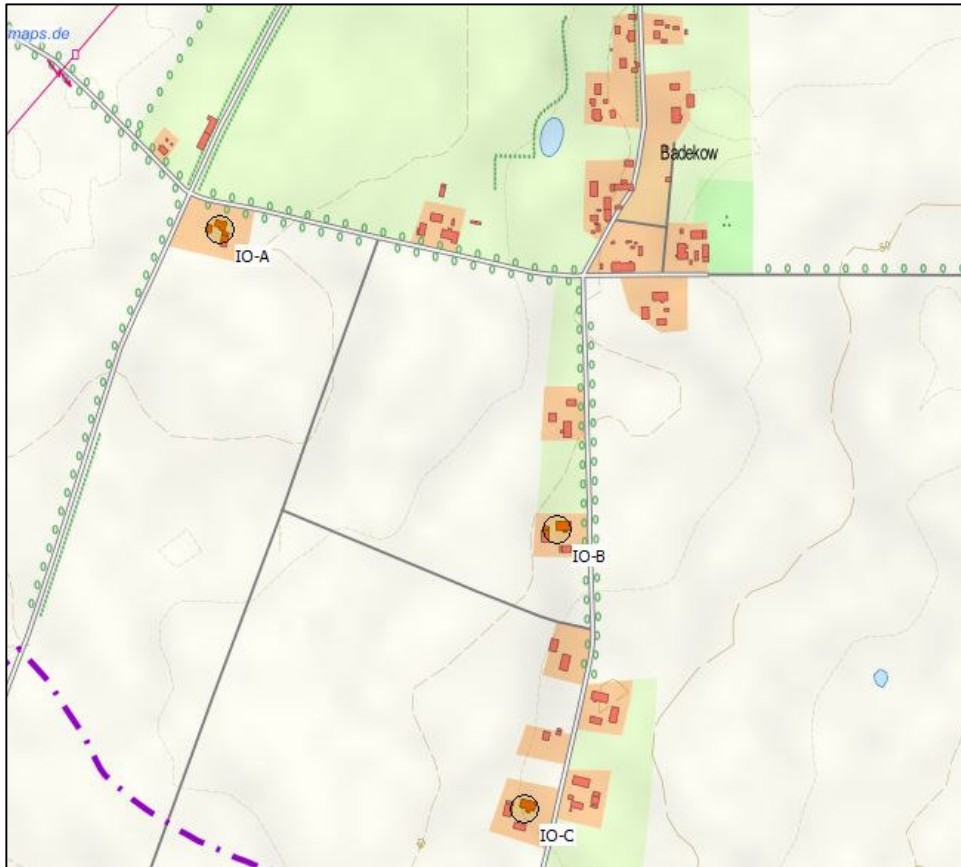


Abbildung 3: Lage Immissionsort A bis C

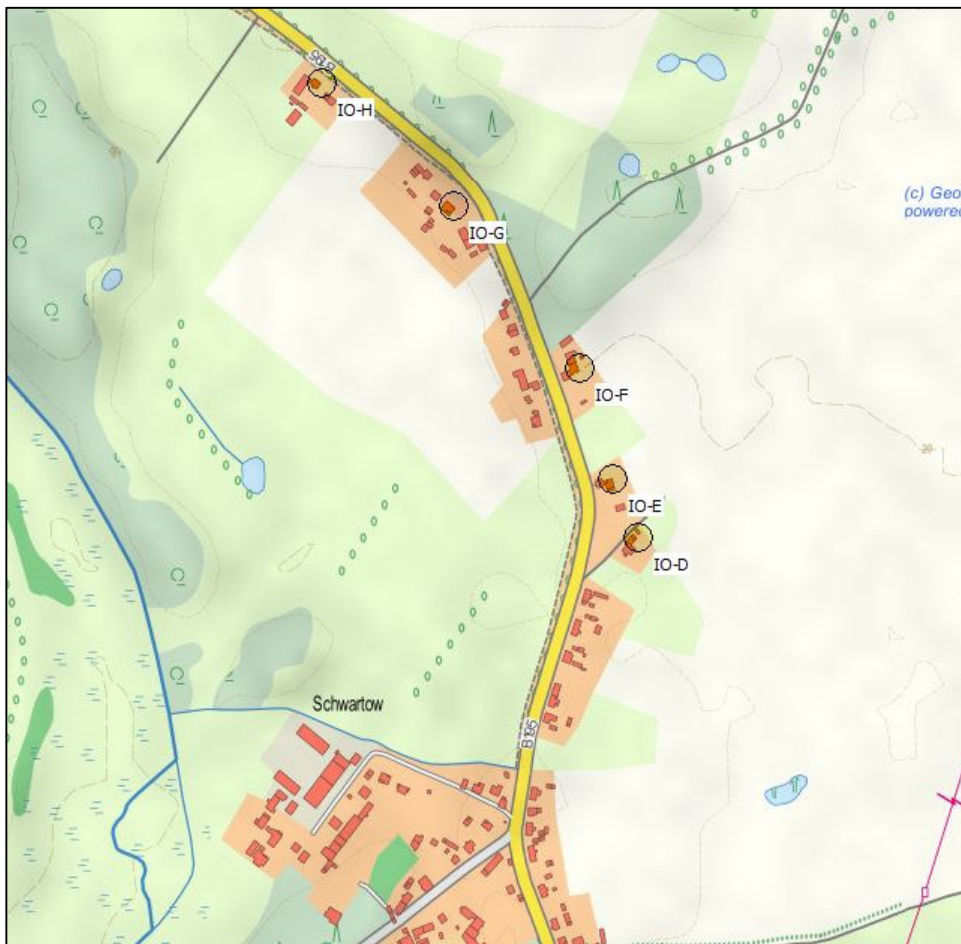


Abbildung 4: Lage Immissionsort D bis H

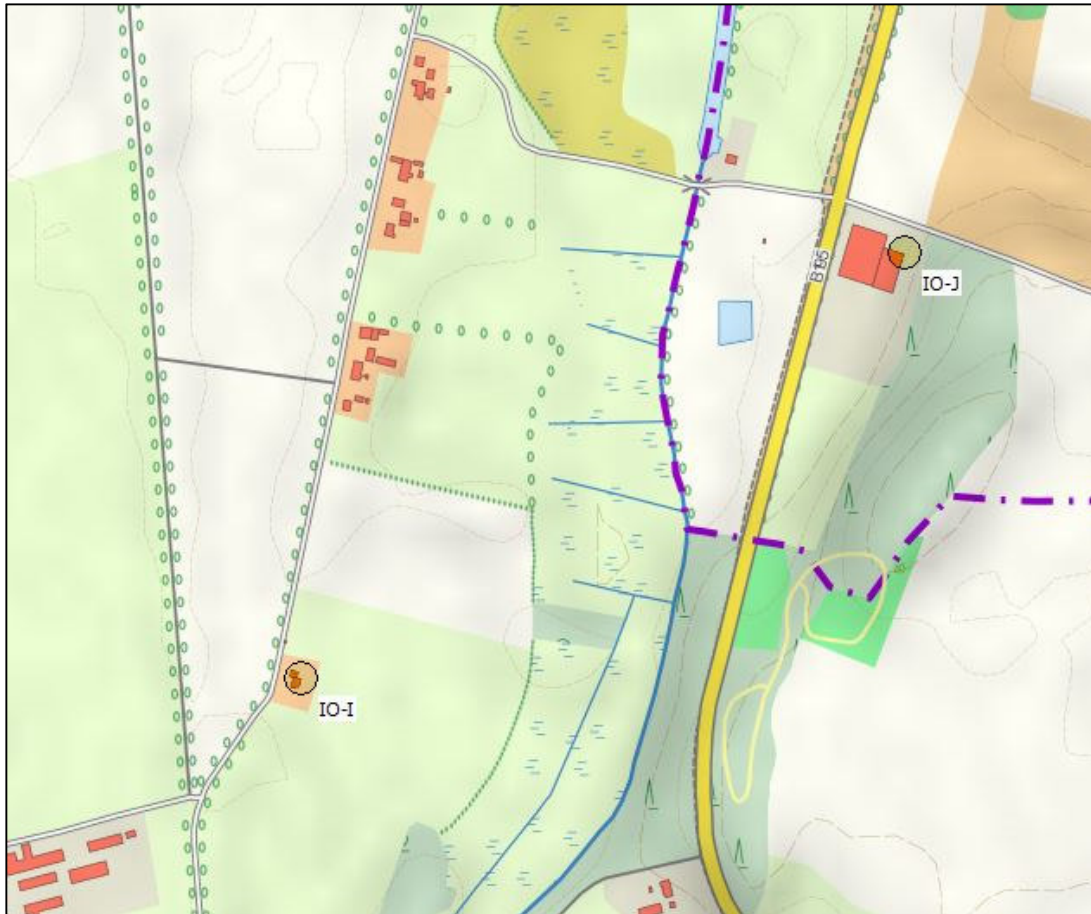


Abbildung 5: Lage Immissionsort I und J

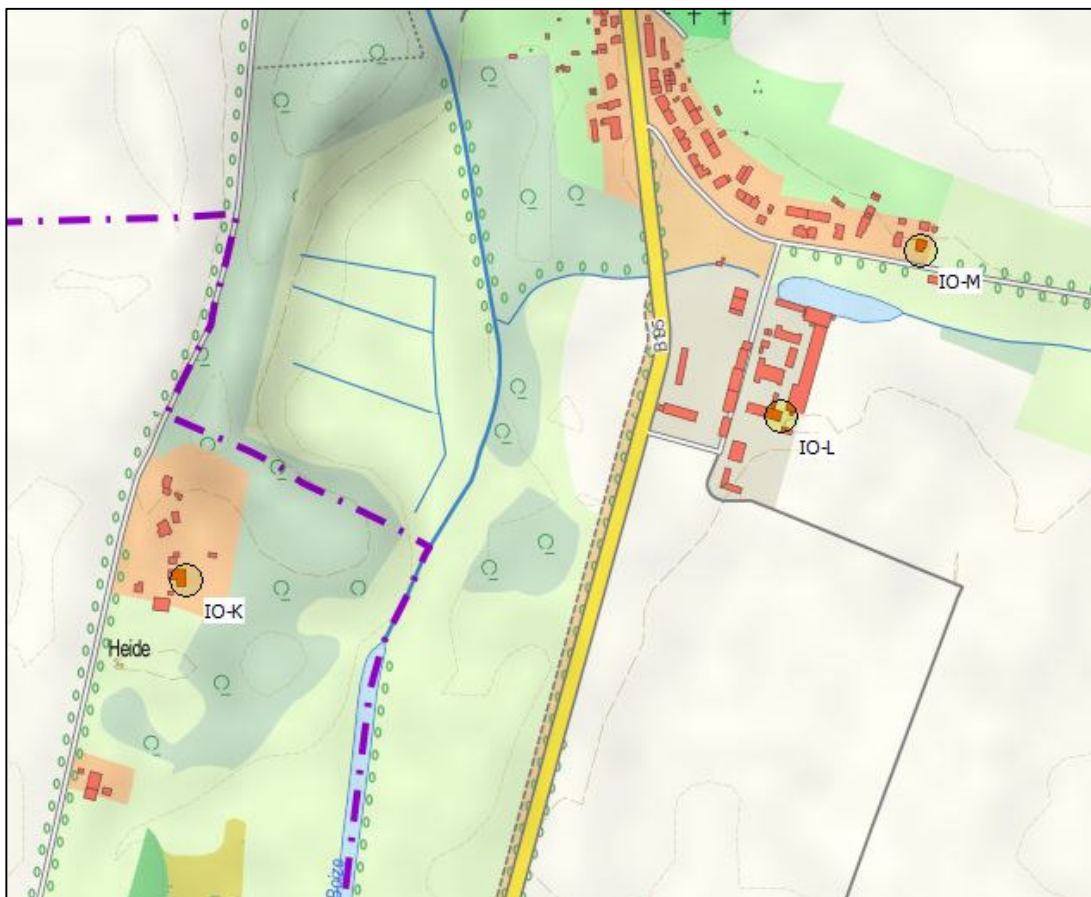


Abbildung 6: Lage Immissionsort K bis M

Grundlegende Daten für die Ermittlung der Schattenwurfbelastung sind die Nabenhöhe und der Rotordurchmesser der Windenergieanlage sowie die Positionen mitsamt der Höhe über Grund der Immissionsorte und der Anlagen. Tabelle 2 gibt Auskunft über die Kenndaten des geplanten WEA-Typs:

| | |
|---------------------------|----------|
| Hersteller | Nordex |
| Typenbezeichnung | N163/5.7 |
| Nennleistung | 5.700 kW |
| Rotordurchmesser | 163 m |
| Nabenhöhe | 164 m |
| Maximale Blatttiefe | 4,15 m |
| Blatttiefe bei 90% Radius | 1,11 m |
| Mittlere Blatttiefe | 2,63 m |

Tab. 2: Kenndaten der geplanten WEA

Untersucht wird die jährliche und tägliche astronomisch maximal mögliche Schattenwurfbelastung an den Immissionsorten. Für die Berechnung der Belastung wird die Verwendung eines punktförmigen Rezeptors in zwei Metern Höhe über Grund empfohlen. Die Immissionsgrenzwerte betragen:

- maximal 30 Stunden Beschattung pro Jahr
- maximal 30 Minuten Beschattung pro Tag

3 Ergebnisse der Vor-, Zusatz- und Gesamtbelastung

Mittels der Software WindPRO [3] und dem zugehörigen Modul SHADOW wird die Immissionsbelastung durch die geplante Windenergieanlage an den definierten Immissionsorten ermittelt. Das Berechnungsmodell simuliert den Verlauf der Sonne über ein Jahr in 1-Minuten-Schritten und damit auch den Gang des Schattens jedes Windenergieanlagenrotors.

Gemäß den Anforderungen der Hinweise des LAI ergibt sich der zu prüfende Beschattungsbereich aus dem Abstand zur WEA, in welchem die Sonnenfläche gerade zu 20 % durch ein Rotorblatt verdeckt wird. Da die Blatttiefe nicht über den gesamten Flügel konstant ist, sondern zur Rotorblattspitze hin abnimmt, ist ersatzweise ein rechteckiges Rotorblatt mit einer mittleren Blatttiefe zu ermitteln und zugrunde zu legen: Mittlere Blatttiefe = $\frac{1}{2} * (\text{max. Blatttiefe} + \text{min. Blatttiefe bei } 0,9 * \text{Rotorradius})$

Höhendifferenzen im Gelände zwischen Standort der Windenergieanlage und dem Immissionsort werden durch Verwendung eines digitalen Geländemodells einbezogen.

Das Berechnungsergebnis stellt die astronomisch maximal mögliche Beschattungsdauer der einzelnen Immissionsorte, das so genannte worst-case-Szenario, dar. Berechnet wird die maximal mögliche Immissionsbelastung unter folgenden Annahmen:

- Die Sonne scheint täglich von Sonnenaufgang bis Sonnenuntergang
- Die Rotorfläche steht immer senkrecht zur Sonneneinfallrichtung
- Die Windenergieanlagen sind immer in Betrieb

- Die Windrichtung entspricht dem Azimutwinkel der Sonne
- Bei Sonnenständen unter 3° wird der Schattenwurf wegen Bewuchs, Bebauung und der Trübung der Atmosphäre nicht berücksichtigt

Die folgenden Tabellen zeigen eine Übersicht der berechneten Immissionsbelastungen an den einzelnen Immissionsorten. Die Detailergebnisse der Berechnungen werden im Anhang dargestellt.

| Immissionsort | | Stunden/Jahr | max. Schatten Minuten/Tag |
|---------------|-----------------------------------|--------------|------------------------------|
| IO | Name | (Std/Jahr) | (min/Tag) |
| A | Gresser Strasse 4, Badekow | 24:58 | 00:38 |
| B | Dorfstrasse 5, Badekow | 37:56 | 00:34 |
| C | Dorfstrasse 1, Badekow | 70:44 | 00:48 |
| D | Zarrentiner Strasse 44, Schwartow | 00:00 | 00:00 |
| E | Zarrentiner Strasse 50, Schwartow | 14:18 | 00:26 |
| F | Zarrentiner Strasse 62, Schwartow | 40:43 | 00:35 |
| G | Zarrentiner Strasse 71, Schwartow | 18:33 | 00:31 |
| H | Zarrentiner Strasse 77, Schwartow | 11:50 | 00:27 |
| I | An der Torfkoppel 9, Heide | 16:25 | 00:27 |
| J | Behr Gemüsehandel GmbH, Gresse | 67:09 | 00:54 |
| K | Heide 6, Heide | 16:26 | 00:30 |
| L | Gewerbegebiet Gresse, Gresse | 49:53 | 00:44 |
| M | Badekower Strasse 14, Gresse | 13:05 | 00:28 |

Tab. 3: Vorbelastung astron. max. mögl. Beschattungsdauer

Am Immissionsort A bis C, F, G, J und L wird die maximale Anzahl von 30 Stunden/Jahr bzw. die maximale Anzahl von 30 Minuten/Tag überschritten.

| Immissionsort | | Stunden/Jahr | max. Schatten Minuten/Tag |
|---------------|-----------------------------------|--------------|------------------------------|
| IO | Name | (Std/Jahr) | (min/Tag) |
| A | Gresser Strasse 4, Badekow | 17:35 | 00:29 |
| B | Dorfstrasse 5, Badekow | 19:45 | 00:32 |
| C | Dorfstrasse 1, Badekow | 22:58 | 00:37 |
| D | Zarrentiner Strasse 44, Schwartow | 00:00 | 00:00 |
| E | Zarrentiner Strasse 50, Schwartow | 00:00 | 00:00 |
| F | Zarrentiner Strasse 62, Schwartow | 00:00 | 00:00 |
| G | Zarrentiner Strasse 71, Schwartow | 00:00 | 00:00 |

| Immissionsort | | Stunden/Jahr | Max. Schatten Minuten/Tag |
|---------------|-----------------------------------|--------------|------------------------------|
| IO | Name | (Std/Jahr) | (min/Tag) |
| H | Zarrentiner Strasse 77, Schwartow | 47:16 | 00:36 |
| I | An der Torfkoppel 9, Heide | 07:50 | 00:22 |
| J | Behr Gemüsehandel GmbH, Gresse | 18:33 | 00:33 |
| K | Heide 6, Heide | 00:00 | 00:00 |
| L | Gewerbegebiet Gresse, Gresse | 02:00 | 00:10 |
| M | Badekower Strasse 14, Gresse | 00:00 | 00:00 |

Tab. 4: Zusatzbelastung astron. max. mögl. Beschattungsdauer

An den Immissionsorten B, C, H und J wird die maximale Anzahl von 30 Stunden/Jahr bzw. die maximale Anzahl von 30 Minuten/Tag überschritten.

| Immissionsort | | Stunden/Jahr | Max. Schatten Minuten/Tag |
|---------------|-----------------------------------|--------------|------------------------------|
| IO | Name | (Std/Jahr) | (min/Tag) |
| A | Gresser Strasse 4, Badekow | 42:33 | 00:38 |
| B | Dorfstrasse 5, Badekow | 57:41 | 00:34 |
| C | Dorfstrasse 1, Badekow | 93:42 | 00:48 |
| D | Zarrentiner Strasse 44, Schwartow | 00:00 | 00:00 |
| E | Zarrentiner Strasse 50, Schwartow | 14:18 | 00:26 |
| F | Zarrentiner Strasse 62, Schwartow | 40:43 | 00:35 |
| G | Zarrentiner Strasse 71, Schwartow | 18:33 | 00:31 |
| H | Zarrentiner Strasse 77, Schwartow | 59:06 | 00:36 |
| I | An der Torfkoppel 9, Heide | 24:15 | 00:27 |
| J | Behr Gemüsehandel GmbH, Gresse | 81:37 | 00:54 |
| K | Heide 6, Heide | 16:26 | 00:30 |
| L | Gewerbegebiet Gresse, Gresse | 49:53 | 00:44 |
| M | Badekower Strasse 14, Gresse | 13:05 | 00:28 |

Tab. 5: Gesamtbelastung astron. max. mögl. Beschattungsdauer

An den Immissionsorten A bis C, F bis H, J und L wird die maximale Anzahl von 30 Stunden/Jahr bzw. die maximale Anzahl von 30 Minuten/Tag überschritten.

Physikalische Parameter wie Lufttrübung, Sonnenausdehnung und die Flügelform haben bedeutende Auswirkungen auf den periodischen Schattenwurf [4], jedoch werden sie in der Berechnungssoftware

WindPRO nicht bzw. modellhaft berücksichtigt. Durch Verwendung dieses rein geometrischen Berechnungsmodells werden somit generell konservativere Ergebnisse erzielt.

Gemäß den Anforderungen der Hinweise des LAI ist die Prognose für die astronomisch maximal möglichen Werte durchzuführen. Werden örtliche Windrichtungsverhältnisse und die Sonnenhäufigkeit am Standort mit einbezogen, kann der meteorologisch wahrscheinliche Schattenwurf dargestellt werden. Dieser liegt erfahrungsgemäß weit unter dem astronomisch maximal möglichen Schattenwurf.

Tabelle 4 zeigt die meteorologisch wahrscheinlichen Werte der Gesamtbelastung für die Immissionsorte am Standort Boizenburg:

Gesamtbelastung: meteorologisch wahrsch. Beschattungsdauer

| Immissionsort | | Stunden/Jahr |
|---------------|-----------------------------------|--------------|
| IO | Name | (Std/Jahr) |
| A | Gresser Strasse 4, Badekow | 04:23 |
| B | Dorfstrasse 5, Badekow | 08:08 |
| C | Dorfstrasse 1, Badekow | 15:13 |
| D | Zarrentiner Strasse 44, Schwartow | 00:00 |
| E | Zarrentiner Strasse 50, Schwartow | 03:40 |
| F | Zarrentiner Strasse 62, Schwartow | 10:55 |
| G | Zarrentiner Strasse 71, Schwartow | 05:13 |
| H | Zarrentiner Strasse 77, Schwartow | 16:03 |
| I | An der Torfkoppel 9, Heide | 06:27 |
| J | Behr Gemüsehandel GmbH, Gresse | 19:52 |
| K | Heide 6, Heide | 02:39 |
| L | Gewerbegebiet Gresse, Gresse | 04:13 |
| M | Badekower Strasse 14, Gresse | 00:56 |

Tab. 6: Gesamtbelastung meteorologisch wahrscheinlichen Beschattungsdauer

Der Grenzwert der meteorologisch wahrscheinlichen Beschattungsdauer von acht Stunden im Jahr wird am Immissionsort B, C, F, H und J überschritten.

4 Zusammenfassung und Empfehlung

Mit dieser Prognose wurde erwarteter periodischer Schattenwurf bestimmt, verursacht durch eine in Planung befindlichen Windenergieanlage am Standort Boizenburg.

Im Zuge einer Ortsbesichtigung am 15. Juli 2019 wurden 13 Immissionsorte ausgewählt, deren potentielle Immissionsbelastung durch den geplanten Windpark geprüft werden sollen. Bei den Immissionspunkten handelt es sich um die am nächsten gelegenen schutzwürdigen Gebäude.

Maßgeblich für die Genehmigung ist die jährliche und tägliche astronomisch maximal mögliche Schattenwurfbelastung an den Immissionsorten. Die Immissionsgrenzwerte betragen hier:

- maximal 30 Stunden Beschattung pro Jahr
- maximal 30 Minuten Beschattung pro Tag

IO-D, E, I, K und M: An diesen Immissionsorten werden alle Richtwerte eingehalten.

IO-A: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 12:33 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 8 min. überschritten.

IO-B: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 27:41 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 4 min. überschritten.

IO-C: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 63:42 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 18 min. überschritten.

IO-F: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 10:43 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 5 min. überschritten.

IO-G: An diesem Immissionsort werden die Immissionsrichtwerte des Tagesrichtwertes um bis zu 1 min. überschritten.

IO-H: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 29:06 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 6 Min. überschritten.

IO-J: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 51:37 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 24 Min. überschritten.

IO-L: An diesem Immissionsort werden die Immissionsrichtwerte der astronomisch maximal möglichen Beschattungsdauer um bis zu 19:53 Std./Jahr überschritten. Die Überschreitung des Tagesrichtwertes wird um bis zu 14 Min. überschritten.

In Bezug auf die Überschreitung der Immissionsrichtwerte die durch den periodischen Schattenwurf an den Immissionspunkten A bis C, F bis H, J und L hervorgerufen werden, empfehlen wir die Integration einer Abschaltautomatik für die geplante Windenergieanlage.



Heilbronn, 06.08.2019

Bearbeiter: Michael Kompa

5 Literatur

- [1] BImSchG - „Bundes-Immissionsschutzgesetz Gesetz zum Schutz vor schädlichen Umwelteinrichtungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge“ in der Fassung der Bekanntmachung vom 17. Mai 2013 (BGBl. I S. 1274), das zuletzt durch Artikel 1 des Gesetzes vom 20. November 2014 (BGBl. I S. 1740) geändert worden ist.

- [2] „Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen“, Beschlüsse der 103. LAI-Sitzung (Länderausschuss für Immissionsschutz); Mai 2002

- [3] WindPRO 3.3.247, EMD International A/S

- [4] „Einflüsse der Lufttrübung, der Sonnenausdehnung und der Flügelform auf den Schattenwurf von Windenergieanlagen“, Forschungsbericht zur Umwelttechnik der Fachhochschule Kiel, Hans-Dieter Freund; 2002

6 Anhang

- Berechnung der astronomisch maximal möglichen sowie meteorologisch wahrscheinlichen Beschattungsdauer inkl. Schattenkarte

SHADOW - Hauptergebnis

Berechnung: Vorbelastung WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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 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:

Verwendete Höhenlinien: Höhenraster-Objekt: 20140305 WP Boizenburg_EMI

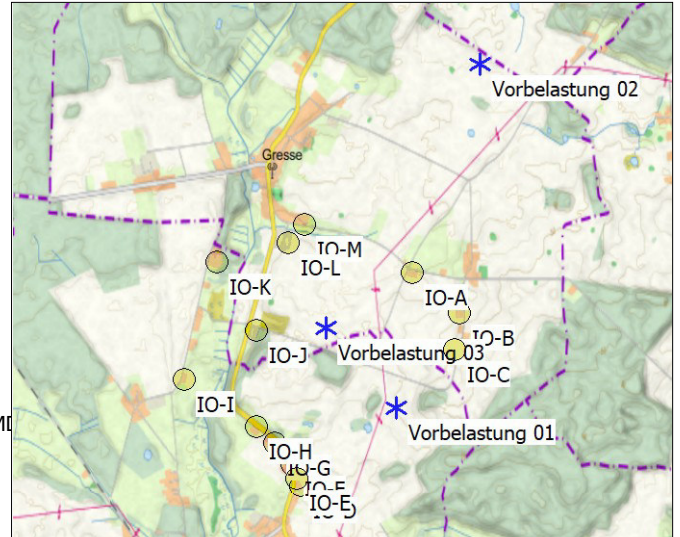
Hindernisse in Berechnung nicht verwendet

Berechnungshöhe ü.Gr. für Karte: 1,5 m

Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:

ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33



Maßstab 1:75.000

* Existierende WEA ● Schattenrezeptor

WEA

| | Ost | Nord | Z | Beschreibung | WEA-Typ | | | Nennleistung | Rotor-durchmesser | Nabenhöhe | Schattendaten | |
|-----------------|---------|-----------|------|-----------------|---------|------------|------------|--------------|-------------------|-----------|-------------------|---------|
| | | | | | Aktuell | Hersteller | Typ | | | | Beschatt.-Bereich | U/min |
| | | | [m] | | | | | [kW] | [m] | [m] | [m] | [U/min] |
| Vorbelastung 01 | 218.564 | 5.926.071 | 29,8 | Vorbelastung 01 | Ja | VESTAS | V162-5.600 | 5.600 | 162,0 | 119,0 | 1.996 | 12,1 |
| Vorbelastung 02 | 219.596 | 5.929.422 | 34,0 | Vorbelastung 02 | Ja | VESTAS | V162-5.600 | 5.600 | 162,0 | 166,0 | 1.993 | 12,1 |
| Vorbelastung 03 | 217.915 | 5.926.908 | 27,0 | Vorbelastung 03 | Ja | NORDEX | N163-5.700 | 5.700 | 163,0 | 164,0 | 1.784 | 10,4 |

Schattenrezeptor-Eingabe

| Nr. | Name | Ost | Nord | Z | Breite | Höhe | Höhe ü.Gr. | Neigung des Fensters | Ausrichtungsmodus | Augenhöhe (ZVI) ü.Gr. |
|------|-----------------------------------|---------|-----------|------|--------|------|------------|----------------------|---------------------|-----------------------|
| | | | | | | | | | | |
| IO-A | Gresser Strasse 4, Badekow | 218.806 | 5.927.398 | 28,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-B | Dorfstrasse 5, Badekow | 219.249 | 5.926.974 | 42,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-C | Dorfstrasse 1, Badekow | 219.183 | 5.926.608 | 45,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 217.571 | 5.925.349 | 16,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 217.541 | 5.925.427 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 217.504 | 5.925.574 | 20,0 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 217.345 | 5.925.795 | 17,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 217.173 | 5.925.965 | 18,5 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-I | An der Torfkoppel 9, Heide | 216.484 | 5.926.478 | 13,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 217.226 | 5.926.915 | 17,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-K | Heide 6, Heide | 216.876 | 5.927.620 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-L | Gewerbegebiet Gresse, Gresse | 217.593 | 5.927.763 | 19,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-M | Badekower Strasse 14, Gresse | 217.771 | 5.927.940 | 19,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |

Berechnungsergebnisse

Schattenrezeptor

astron. max. mögl. Beschattungsdauer

| Nr. | Name | Stunden/Jahr | Schattentage/Jahr | Max.Schattendauer/Tag |
|------|-----------------------------------|--------------|-------------------|-----------------------|
| | | [h/a] | [d/a] | [h/d] |
| IO-A | Gresser Strasse 4, Badekow | 24:58 | 52 | 0:38 |
| IO-B | Dorfstrasse 5, Badekow | 37:56 | 89 | 0:34 |
| IO-C | Dorfstrasse 1, Badekow | 70:44 | 153 | 0:48 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 0:00 | 0 | 0:00 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 14:18 | 46 | 0:26 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 40:43 | 84 | 0:35 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 18:33 | 49 | 0:31 |

(Fortsetzung nächste Seite)...

SHADOW - Hauptergebnis**Berechnung: Vorbelastung WEA 2**

...(Fortsetzung von letzter Seite)

| Nr. | Name | astron. max. mögl. Beschattungsdauer | | |
|------|-----------------------------------|--------------------------------------|----------------------------|--------------------------------|
| | | Stunden/Jahr [h/a] | Schattentage/Jahr [d/a] | Max.Schattendauer/Tag [h/d] |
| IO-H | Zarrentiner Strasse 77, Schwartow | 11:50 | 37 | 0:27 |
| IO-I | An der Torfkoppel 9, Heide | 16:25 | 48 | 0:27 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 67:09 | 118 | 0:54 |
| IO-K | Heide 6, Heide | 16:26 | 41 | 0:30 |
| IO-L | Gewerbegebiet Gresse, Gresse | 49:53 | 78 | 0:44 |
| IO-M | Badekower Strasse 14, Gresse | 13:05 | 36 | 0:28 |

Gesamtmenge der max. mögl. Beschattung an Rezeptoren pro WEA

| Nr. | Name | Maximal [h/a] |
|-----------------|-----------------|------------------|
| Vorbelastung 01 | Vorbelastung 01 | 172:45 |
| Vorbelastung 02 | Vorbelastung 02 | 0:00 |
| Vorbelastung 03 | Vorbelastung 03 | 207:19 |

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.

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 **Schattenrezeptor:** IO-A - Gresser Strasse 4, Badekow

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | Juni | |
|----|--------------------------------------------------|----------------|----------------|----------------------------------------------------|----------------|----------------|----------------|
| 1 | 08:33 16:08 | 08:04 16:59 | 07:07 17:54 | 16:11 (Vorbelastung 03) 16:36 (Vorbelastung 03) | 06:53 19:51 | 05:45 20:46 | 04:56 21:35 |
| 2 | 08:33 16:09 | 08:02 17:01 | 07:05 17:56 | 16:12 (Vorbelastung 03) 16:34 (Vorbelastung 03) | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:57 | 16:15 (Vorbelastung 03) 16:31 (Vorbelastung 03) | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 16:18 (Vorbelastung 03) 16:26 (Vorbelastung 03) | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | | 06:41 20:00 | 05:35 20:54 | 04:52 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 16:20 (Vorbelastung 03) 16:28 (Vorbelastung 03) | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 16:16 (Vorbelastung 03) 16:32 (Vorbelastung 03) | 06:36 20:04 | 05:31 20:58 | 04:51 21:42 |
| 9 | 08:31 16:18 | 07:50 17:15 | 06:49 18:09 | 16:14 (Vorbelastung 03) 16:34 (Vorbelastung 03) | 06:34 20:06 | 05:29 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 16:12 (Vorbelastung 03) 16:36 (Vorbelastung 03) | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:21 | 07:46 17:19 | 06:44 18:13 | 16:11 (Vorbelastung 03) 16:38 (Vorbelastung 03) | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 07:44 17:20 | 06:42 18:14 | 16:10 (Vorbelastung 03) 16:39 (Vorbelastung 03) | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:22 | 06:39 18:16 | 16:09 (Vorbelastung 03) 16:40 (Vorbelastung 03) | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:24 | 06:37 18:18 | 16:07 (Vorbelastung 03) 16:40 (Vorbelastung 03) | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:26 | 06:34 18:20 | 16:07 (Vorbelastung 03) 16:41 (Vorbelastung 03) | 06:20 20:17 | 05:19 21:10 | 04:48 21:47 |
| 16 | 08:25 16:29 | 07:36 17:28 | 06:32 18:22 | 16:06 (Vorbelastung 03) 16:41 (Vorbelastung 03) | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 16:06 (Vorbelastung 03) 16:42 (Vorbelastung 03) | 06:15 20:20 | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 16:06 (Vorbelastung 03) 16:42 (Vorbelastung 03) | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 16:06 (Vorbelastung 03) 16:43 (Vorbelastung 03) | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 16:05 (Vorbelastung 03) 16:42 (Vorbelastung 03) | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 16:05 (Vorbelastung 03) 16:42 (Vorbelastung 03) | 06:06 20:27 | 05:10 21:19 | 04:48 21:50 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:17 18:33 | 16:05 (Vorbelastung 03) 16:42 (Vorbelastung 03) | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 16:06 (Vorbelastung 03) 16:42 (Vorbelastung 03) | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 16:06 (Vorbelastung 03) 16:41 (Vorbelastung 03) | 06:00 20:33 | 05:05 21:24 | 04:49 21:50 |
| 25 | 08:15 16:45 | 07:16 17:46 | 06:10 18:38 | 16:06 (Vorbelastung 03) 16:41 (Vorbelastung 03) | 05:58 20:35 | 05:04 21:25 | 04:49 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 16:07 (Vorbelastung 03) 16:40 (Vorbelastung 03) | 05:55 20:37 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 16:08 (Vorbelastung 03) 16:38 (Vorbelastung 03) | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 16:09 (Vorbelastung 03) 16:37 (Vorbelastung 03) | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 |
| 29 | 08:09 16:53 | | 07:00 19:46 | | 05:49 20:42 | 04:59 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | | 06:58 19:47 | | 05:47 20:44 | 04:58 21:32 | 04:52 21:50 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | | 04:57 21:33 | |
| | Sonnenscheinstunden astr.max.mögl.Beschattung | 252 274 | 674 | 367 71 | 419 | 492 | 508 |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-A - Gresser Strasse 4, Badekow

Voraussetzungen für Berechnung des Schattenwurfs

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

| | July | August | September | Oktober | | November | | Dezember |
|---------------------------|-------|--------|-----------|---------|-----|-------------------------|----------------------------|----------|
| 1 | 04:53 | 05:32 | 06:25 | 07:17 | | 07:15 | 15:42 (Vorbelastung 03) | 08:09 |
| | 21:49 | 21:15 | 20:09 | 18:56 | | 16:47 | 23 16:05 (Vorbelastung 03) | 16:03 |
| 2 | 04:53 | 05:33 | 06:27 | 07:19 | | 07:17 | 15:44 (Vorbelastung 03) | 08:10 |
| | 21:49 | 21:13 | 20:07 | 18:54 | | 16:45 | 19 16:03 (Vorbelastung 03) | 16:03 |
| 3 | 04:54 | 05:35 | 06:28 | 07:21 | | 07:18 | 15:46 (Vorbelastung 03) | 08:12 |
| | 21:48 | 21:11 | 20:04 | 18:52 | | 16:43 | 15 16:01 (Vorbelastung 03) | 16:02 |
| 4 | 04:55 | 05:37 | 06:30 | 07:23 | | 07:20 | 15:51 (Vorbelastung 03) | 08:13 |
| | 21:48 | 21:09 | 20:02 | 18:49 | | 16:41 | 5 15:56 (Vorbelastung 03) | 16:01 |
| 5 | 04:56 | 05:38 | 06:32 | 07:24 | | 07:22 | | 08:15 |
| | 21:47 | 21:08 | 20:00 | 18:47 | | 16:39 | | 16:01 |
| 6 | 04:57 | 05:40 | 06:34 | 07:26 | | 07:24 | | 08:16 |
| | 21:47 | 21:06 | 19:57 | 18:44 | | 16:37 | | 16:00 |
| 7 | 04:58 | 05:42 | 06:35 | 07:28 | | 07:26 | | 08:17 |
| | 21:46 | 21:04 | 19:55 | 18:42 | | 16:35 | | 16:00 |
| 8 | 04:59 | 05:43 | 06:37 | 07:30 | | 07:28 | | 08:18 |
| | 21:46 | 21:02 | 19:52 | 18:40 | | 16:34 | | 15:59 |
| 9 | 05:00 | 05:45 | 06:39 | 07:32 | | 07:30 | | 08:20 |
| | 21:45 | 21:00 | 19:50 | 18:37 | | 16:32 | | 15:59 |
| 10 | 05:01 | 05:47 | 06:41 | 07:33 | | 16:51 (Vorbelastung 03) | 07:32 | 08:21 |
| | 21:44 | 20:58 | 19:48 | 18:35 | 13 | 17:04 (Vorbelastung 03) | 16:30 | 15:59 |
| 11 | 05:02 | 05:49 | 06:42 | 07:35 | | 16:47 (Vorbelastung 03) | 07:34 | 08:22 |
| | 21:43 | 20:56 | 19:45 | 18:33 | 19 | 17:06 (Vorbelastung 03) | 16:29 | 15:58 |
| 12 | 05:03 | 05:50 | 06:44 | 07:37 | | 16:45 (Vorbelastung 03) | 07:36 | 08:23 |
| | 21:42 | 20:54 | 19:43 | 18:30 | 23 | 17:08 (Vorbelastung 03) | 16:27 | 15:58 |
| 13 | 05:04 | 05:52 | 06:46 | 07:39 | | 16:43 (Vorbelastung 03) | 07:37 | 08:24 |
| | 21:41 | 20:52 | 19:40 | 18:28 | 27 | 17:10 (Vorbelastung 03) | 16:25 | 15:58 |
| 14 | 05:05 | 05:54 | 06:48 | 07:41 | | 16:42 (Vorbelastung 03) | 07:39 | 08:25 |
| | 21:40 | 20:50 | 19:38 | 18:26 | 29 | 17:11 (Vorbelastung 03) | 16:24 | 15:58 |
| 15 | 05:07 | 05:55 | 06:49 | 07:43 | | 16:40 (Vorbelastung 03) | 07:41 | 08:26 |
| | 21:39 | 20:48 | 19:35 | 18:23 | 32 | 17:12 (Vorbelastung 03) | 16:22 | 15:58 |
| 16 | 05:08 | 05:57 | 06:51 | 07:44 | | 16:38 (Vorbelastung 03) | 07:43 | 08:27 |
| | 21:38 | 20:45 | 19:33 | 18:21 | 33 | 17:11 (Vorbelastung 03) | 16:21 | 15:58 |
| 17 | 05:09 | 05:59 | 06:53 | 07:46 | | 16:37 (Vorbelastung 03) | 07:45 | 08:28 |
| | 21:37 | 20:43 | 19:31 | 18:19 | 35 | 17:12 (Vorbelastung 03) | 16:19 | 15:58 |
| 18 | 05:11 | 06:01 | 06:55 | 07:48 | | 16:37 (Vorbelastung 03) | 07:47 | 08:29 |
| | 21:36 | 20:41 | 19:28 | 18:17 | 35 | 17:12 (Vorbelastung 03) | 16:18 | 15:59 |
| 19 | 05:12 | 06:02 | 06:56 | 07:50 | | 16:36 (Vorbelastung 03) | 07:48 | 08:29 |
| | 21:35 | 20:39 | 19:26 | 18:14 | 36 | 17:12 (Vorbelastung 03) | 16:16 | 15:59 |
| 20 | 05:13 | 06:04 | 06:58 | 07:52 | | 16:36 (Vorbelastung 03) | 07:50 | 08:30 |
| | 21:33 | 20:37 | 19:23 | 18:12 | 37 | 17:13 (Vorbelastung 03) | 16:15 | 15:59 |
| 21 | 05:15 | 06:06 | 07:00 | 07:54 | | 16:35 (Vorbelastung 03) | 07:52 | 08:31 |
| | 21:32 | 20:34 | 19:21 | 18:10 | 38 | 17:13 (Vorbelastung 03) | 16:14 | 16:00 |
| 22 | 05:16 | 06:08 | 07:01 | 07:56 | | 16:35 (Vorbelastung 03) | 07:54 | 08:31 |
| | 21:31 | 20:32 | 19:18 | 18:08 | 37 | 17:12 (Vorbelastung 03) | 16:12 | 16:00 |
| 23 | 05:18 | 06:09 | 07:03 | 07:58 | | 16:35 (Vorbelastung 03) | 07:56 | 08:32 |
| | 21:29 | 20:30 | 19:16 | 18:05 | 37 | 17:12 (Vorbelastung 03) | 16:11 | 16:01 |
| 24 | 05:19 | 06:11 | 07:05 | 07:59 | | 16:35 (Vorbelastung 03) | 07:57 | 08:32 |
| | 21:28 | 20:28 | 19:13 | 18:03 | 37 | 17:12 (Vorbelastung 03) | 16:10 | 16:01 |
| 25 | 05:21 | 06:13 | 07:07 | 07:01 | | 15:35 (Vorbelastung 03) | 07:59 | 08:32 |
| | 21:26 | 20:25 | 19:11 | 17:01 | 36 | 16:11 (Vorbelastung 03) | 16:09 | 16:02 |
| 26 | 05:22 | 06:15 | 07:08 | 07:03 | | 15:36 (Vorbelastung 03) | 08:01 | 08:33 |
| | 21:25 | 20:23 | 19:09 | 16:59 | 35 | 16:11 (Vorbelastung 03) | 16:08 | 16:03 |
| 27 | 05:24 | 06:16 | 07:10 | 07:05 | | 15:36 (Vorbelastung 03) | 08:02 | 08:33 |
| | 21:23 | 20:21 | 19:06 | 16:57 | 34 | 16:10 (Vorbelastung 03) | 16:07 | 16:03 |
| 28 | 05:25 | 06:18 | 07:12 | 07:07 | | 15:37 (Vorbelastung 03) | 08:04 | 08:33 |
| | 21:22 | 20:19 | 19:04 | 16:55 | 32 | 16:09 (Vorbelastung 03) | 16:06 | 16:04 |
| 29 | 05:27 | 06:20 | 07:14 | 07:09 | | 15:38 (Vorbelastung 03) | 08:06 | 08:33 |
| | 21:20 | 20:16 | 19:01 | 16:53 | 31 | 16:09 (Vorbelastung 03) | 16:05 | 16:05 |
| 30 | 05:28 | 06:22 | 07:16 | 07:11 | | 15:39 (Vorbelastung 03) | 08:07 | 08:33 |
| | 21:18 | 20:14 | 18:59 | 16:51 | 29 | 16:08 (Vorbelastung 03) | 16:04 | 16:06 |
| 31 | 05:30 | 06:23 | | 07:13 | | 15:41 (Vorbelastung 03) | | 08:33 |
| | 21:17 | 20:12 | | 16:49 | 26 | 16:07 (Vorbelastung 03) | | 16:07 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | | 261 | 62 | 236 |
| astr.max.mögl.Beschattung | | | | | 691 | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-B - Dorfstrasse 5, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

- 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

| | Januar | Februar | März | | April | | Mai | Juni |
|---------------------------|--------|----------------------------|-------|----|-------|----------------------------|-------|-------|
| 1 | 08:33 | 14:34 (Vorbelastung 01) | 08:04 | | 06:53 | 18:41 (Vorbelastung 03) | 05:45 | 04:56 |
| | 16:08 | 32 15:06 (Vorbelastung 01) | 16:59 | | 19:51 | 11 18:52 (Vorbelastung 03) | 20:45 | 21:35 |
| 2 | 08:33 | 14:34 (Vorbelastung 01) | 08:02 | | 06:51 | | 05:43 | 04:56 |
| | 16:09 | 32 15:06 (Vorbelastung 01) | 17:01 | | 19:53 | | 20:47 | 21:36 |
| 3 | 08:33 | 14:35 (Vorbelastung 01) | 08:00 | | 06:48 | | 05:41 | 04:55 |
| | 16:11 | 31 15:06 (Vorbelastung 01) | 17:03 | | 19:55 | | 20:49 | 21:37 |
| 4 | 08:33 | 14:36 (Vorbelastung 01) | 07:59 | | 06:46 | | 05:39 | 04:54 |
| | 16:12 | 31 15:07 (Vorbelastung 01) | 17:05 | | 19:57 | | 20:51 | 21:38 |
| 5 | 08:32 | 14:36 (Vorbelastung 01) | 07:57 | | 06:44 | | 05:37 | 04:53 |
| | 16:13 | 31 15:07 (Vorbelastung 01) | 17:07 | | 19:58 | | 20:53 | 21:39 |
| 6 | 08:32 | 14:37 (Vorbelastung 01) | 07:55 | | 06:41 | | 05:35 | 04:52 |
| | 16:14 | 30 15:07 (Vorbelastung 01) | 17:09 | | 20:00 | | 20:54 | 21:40 |
| 7 | 08:32 | 14:38 (Vorbelastung 01) | 07:53 | | 06:39 | | 05:33 | 04:52 |
| | 16:16 | 29 15:07 (Vorbelastung 01) | 17:11 | | 20:02 | | 20:56 | 21:41 |
| 8 | 08:31 | 14:38 (Vorbelastung 01) | 07:51 | | 06:36 | | 05:31 | 04:51 |
| | 16:17 | 29 15:07 (Vorbelastung 01) | 17:13 | | 20:04 | | 20:58 | 21:42 |
| 9 | 08:31 | 14:40 (Vorbelastung 01) | 07:50 | | 06:34 | | 05:29 | 04:51 |
| | 16:18 | 27 15:07 (Vorbelastung 01) | 17:15 | | 20:06 | | 21:00 | 21:43 |
| 10 | 08:30 | 14:41 (Vorbelastung 01) | 07:48 | | 06:32 | | 05:28 | 04:50 |
| | 16:20 | 26 15:07 (Vorbelastung 01) | 17:17 | | 20:07 | | 21:01 | 21:44 |
| 11 | 08:29 | 14:42 (Vorbelastung 01) | 07:46 | | 06:29 | | 05:26 | 04:50 |
| | 16:21 | 24 15:06 (Vorbelastung 01) | 17:19 | | 20:09 | | 21:03 | 21:45 |
| 12 | 08:29 | 14:43 (Vorbelastung 01) | 07:44 | | 06:27 | | 05:24 | 04:49 |
| | 16:23 | 23 15:06 (Vorbelastung 01) | 17:20 | | 20:11 | | 21:05 | 21:45 |
| 13 | 08:28 | 14:44 (Vorbelastung 01) | 07:42 | | 06:25 | | 05:22 | 04:49 |
| | 16:25 | 21 15:05 (Vorbelastung 01) | 17:22 | | 20:13 | | 21:06 | 21:46 |
| 14 | 08:27 | 14:46 (Vorbelastung 01) | 07:40 | | 06:22 | | 05:21 | 04:49 |
| | 16:26 | 19 15:05 (Vorbelastung 01) | 17:24 | | 20:15 | | 21:08 | 21:47 |
| 15 | 08:26 | 14:48 (Vorbelastung 01) | 07:38 | | 06:20 | | 05:19 | 04:48 |
| | 16:28 | 16 15:04 (Vorbelastung 01) | 17:26 | | 20:17 | | 21:10 | 21:47 |
| 16 | 08:25 | 14:50 (Vorbelastung 01) | 07:36 | | 06:18 | 17:44 (Vorbelastung 03) | 05:17 | 04:48 |
| | 16:29 | 12 15:02 (Vorbelastung 01) | 17:28 | 11 | 20:18 | 17:55 (Vorbelastung 03) | 21:11 | 21:48 |
| 17 | 08:24 | 14:53 (Vorbelastung 01) | 07:34 | | 06:15 | 17:42 (Vorbelastung 03) | 05:16 | 04:48 |
| | 16:31 | 6 14:59 (Vorbelastung 01) | 17:30 | 15 | 20:20 | 17:57 (Vorbelastung 03) | 21:13 | 21:48 |
| 18 | 08:23 | | 06:27 | | 06:13 | 17:40 (Vorbelastung 03) | 05:14 | 04:48 |
| | 16:33 | | 17:32 | 20 | 20:22 | 18:00 (Vorbelastung 03) | 21:15 | 21:49 |
| 19 | 08:22 | | 06:25 | | 06:11 | 17:38 (Vorbelastung 03) | 05:13 | 04:48 |
| | 16:35 | | 17:34 | 23 | 20:24 | 18:01 (Vorbelastung 03) | 21:16 | 21:49 |
| 20 | 08:21 | | 06:22 | | 06:09 | 17:37 (Vorbelastung 03) | 05:11 | 04:48 |
| | 16:36 | | 17:36 | 26 | 20:26 | 18:03 (Vorbelastung 03) | 21:18 | 21:49 |
| 21 | 08:20 | | 06:20 | | 06:06 | 17:36 (Vorbelastung 03) | 05:10 | 04:48 |
| | 16:38 | | 17:38 | 26 | 20:27 | 18:02 (Vorbelastung 03) | 21:19 | 21:50 |
| 22 | 08:18 | | 06:17 | | 06:04 | 17:36 (Vorbelastung 03) | 05:08 | 04:49 |
| | 16:40 | | 17:40 | 27 | 20:29 | 18:03 (Vorbelastung 03) | 21:21 | 21:50 |
| 23 | 08:17 | | 06:15 | | 06:02 | 17:34 (Vorbelastung 03) | 05:07 | 04:49 |
| | 16:42 | | 17:42 | 28 | 20:31 | 18:02 (Vorbelastung 03) | 21:22 | 21:50 |
| 24 | 08:16 | | 06:13 | | 06:00 | 17:35 (Vorbelastung 03) | 05:05 | 04:49 |
| | 16:44 | | 17:44 | 28 | 20:33 | 18:03 (Vorbelastung 03) | 21:24 | 21:50 |
| 25 | 08:14 | | 06:10 | | 05:58 | 17:34 (Vorbelastung 03) | 05:04 | 04:49 |
| | 16:45 | | 17:46 | 28 | 20:35 | 18:02 (Vorbelastung 03) | 21:25 | 21:50 |
| 26 | 08:13 | | 06:08 | | 05:55 | 17:34 (Vorbelastung 03) | 05:03 | 04:50 |
| | 16:47 | | 17:48 | 27 | 20:36 | 18:01 (Vorbelastung 03) | 21:27 | 21:50 |
| 27 | 08:12 | | 06:05 | | 05:53 | 17:35 (Vorbelastung 03) | 05:02 | 04:50 |
| | 16:49 | | 17:50 | 26 | 20:38 | 18:01 (Vorbelastung 03) | 21:28 | 21:50 |
| 28 | 08:10 | | 06:03 | | 05:51 | 17:35 (Vorbelastung 03) | 05:01 | 04:51 |
| | 16:51 | | 17:52 | 24 | 20:40 | 17:59 (Vorbelastung 03) | 21:29 | 21:50 |
| 29 | 08:09 | | 07:00 | | 05:49 | 18:36 (Vorbelastung 03) | 04:59 | 04:51 |
| | 16:53 | | 19:46 | 23 | 20:42 | 18:59 (Vorbelastung 03) | 21:31 | 21:50 |
| 30 | 08:07 | | 06:58 | | 05:47 | 18:36 (Vorbelastung 03) | 04:58 | 04:52 |
| | 16:55 | | 19:47 | 20 | 20:44 | 18:56 (Vorbelastung 03) | 21:32 | 21:49 |
| 31 | 08:05 | | 06:56 | | | 18:38 (Vorbelastung 03) | 04:57 | |
| | 16:57 | | 19:49 | 17 | | 18:55 (Vorbelastung 03) | 21:33 | |
| Sonnenscheinstunden | 252 | 274 | 367 | | 419 | | 492 | 508 |
| astr.max.mögl.Beschattung | 419 | | 369 | | 11 | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-B - Dorfstrasse 5, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | July | August | September | Oktober | November | Dezember |
|----|---------------------------|----------------|----------------|----------------------------------------------------|----------------|-------------------------------------------------------------------|
| 1 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:03 |
| 2 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | 07:16 16:45 | 25 14:23 (Vorbelastung 01) 16:03 26 14:49 (Vorbelastung 01) |
| 3 | 04:54 21:48 | 05:35 21:11 | 06:28 20:04 | 07:21 18:52 | 07:18 16:43 | 08:10 14:23 (Vorbelastung 01) 08:12 27 14:23 (Vorbelastung 01) |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 14:24 (Vorbelastung 01) 16:01 28 14:52 (Vorbelastung 01) |
| 5 | 04:56 21:47 | 05:38 21:07 | 06:32 20:00 | 07:24 18:47 | 07:22 16:39 | 08:14 14:23 (Vorbelastung 01) 16:01 29 14:52 (Vorbelastung 01) |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 14:24 (Vorbelastung 01) 16:00 29 14:53 (Vorbelastung 01) |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:35 19:55 | 07:28 18:42 | 07:26 16:35 | 08:17 14:23 (Vorbelastung 01) 16:00 31 14:54 (Vorbelastung 01) |
| 8 | 04:59 21:45 | 05:43 21:02 | 06:37 19:52 | 07:30 18:40 | 07:28 16:34 | 08:18 14:23 (Vorbelastung 01) 15:59 31 14:54 (Vorbelastung 01) |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 14:24 (Vorbelastung 01) 15:59 31 14:55 (Vorbelastung 01) |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:33 18:35 | 07:32 16:30 | 08:21 14:24 (Vorbelastung 01) 15:59 32 14:56 (Vorbelastung 01) |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 18:33 (Vorbelastung 03) 18:44 (Vorbelastung 03) | 07:35 18:33 | 07:34 16:28 |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 18:30 (Vorbelastung 03) 18:46 (Vorbelastung 03) | 07:37 18:30 | 07:36 16:27 |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 18:28 (Vorbelastung 03) 18:48 (Vorbelastung 03) | 07:39 18:28 | 07:37 16:25 |
| 14 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 18:26 (Vorbelastung 03) 18:49 (Vorbelastung 03) | 07:41 18:26 | 07:39 16:24 |
| 15 | 05:07 21:39 | 05:55 20:47 | 06:49 19:35 | 18:25 (Vorbelastung 03) 18:50 (Vorbelastung 03) | 07:43 18:23 | 07:41 16:22 |
| 16 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 18:23 (Vorbelastung 03) 18:49 (Vorbelastung 03) | 07:44 18:21 | 07:43 16:21 |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 18:23 (Vorbelastung 03) 18:50 (Vorbelastung 03) | 07:46 18:19 | 07:45 16:19 |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:54 19:28 | 18:22 (Vorbelastung 03) 18:50 (Vorbelastung 03) | 07:48 18:16 | 07:47 16:18 |
| 19 | 05:12 21:34 | 06:02 20:39 | 06:56 19:26 | 18:21 (Vorbelastung 03) 18:49 (Vorbelastung 03) | 07:50 18:14 | 07:48 16:16 |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 18:21 (Vorbelastung 03) 18:49 (Vorbelastung 03) | 07:52 18:12 | 07:50 16:15 |
| 21 | 05:15 21:32 | 06:06 20:34 | 07:00 19:21 | 18:21 (Vorbelastung 03) 18:49 (Vorbelastung 03) | 07:54 18:10 | 07:52 16:14 |
| 22 | 05:16 21:31 | 06:08 20:32 | 07:01 19:18 | 18:21 (Vorbelastung 03) 18:48 (Vorbelastung 03) | 07:56 18:08 | 07:54 16:12 |
| 23 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 18:21 (Vorbelastung 03) 18:46 (Vorbelastung 03) | 07:57 18:05 | 07:56 16:11 |
| 24 | 05:19 21:28 | 06:11 20:28 | 07:05 19:13 | 18:22 (Vorbelastung 03) 18:45 (Vorbelastung 03) | 07:59 18:03 | 07:57 16:10 |
| 25 | 05:21 21:26 | 06:13 20:25 | 07:07 19:11 | 18:23 (Vorbelastung 03) 18:43 (Vorbelastung 03) | 07:01 17:01 | 07:59 16:09 |
| 26 | 05:22 21:25 | 06:15 20:23 | 07:08 19:09 | 18:24 (Vorbelastung 03) 18:41 (Vorbelastung 03) | 07:03 16:59 | 08:01 16:08 |
| 27 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 18:25 (Vorbelastung 03) 18:38 (Vorbelastung 03) | 07:05 16:57 | 08:02 16:07 |
| 28 | 05:25 21:21 | 06:18 20:19 | 07:12 19:04 | 18:28 (Vorbelastung 03) 18:35 (Vorbelastung 03) | 07:07 16:55 | 08:04 16:06 |
| 29 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 18:35 (Vorbelastung 03) | 07:09 16:53 | 08:06 16:05 |
| 30 | 05:28 21:18 | 06:22 20:14 | 07:16 18:59 | | 07:11 16:51 | 08:07 16:04 |
| 31 | 05:30 21:16 | 06:23 20:12 | | | 07:13 16:49 | 08:33 16:07 |
| | Sonnenscheinstunden 510 | 458 | 382 | 392 | 261 | 236 |
| | astr.max.mögl.Beschattung | | | | 93 | 992 |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-C - Dorfstrasse 1, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 15:19 (Vorbelastung 01) | 08:04 | 15:20 (Vorbelastung 01) | 07:07 | 06:53 |
| | 16:08 | 13 15:32 (Vorbelastung 01) | 16:59 | 46 16:06 (Vorbelastung 01) | 17:54 | 19:51 |
| 2 | 08:33 | 15:19 (Vorbelastung 01) | 08:02 | 15:20 (Vorbelastung 01) | 07:05 | 06:51 |
| | 16:09 | 13 15:32 (Vorbelastung 01) | 17:01 | 46 16:06 (Vorbelastung 01) | 17:56 | 19:53 |
| 3 | 08:33 | 15:19 (Vorbelastung 01) | 08:00 | 15:21 (Vorbelastung 01) | 07:03 | 06:48 |
| | 16:11 | 15 15:34 (Vorbelastung 01) | 17:03 | 45 16:06 (Vorbelastung 01) | 17:57 | 19:55 |
| 4 | 08:33 | 15:19 (Vorbelastung 01) | 07:59 | 15:22 (Vorbelastung 01) | 07:00 | 06:46 |
| | 16:12 | 16 15:35 (Vorbelastung 01) | 17:05 | 44 16:06 (Vorbelastung 01) | 17:59 | 19:57 |
| 5 | 08:32 | 15:19 (Vorbelastung 01) | 07:57 | 15:23 (Vorbelastung 01) | 06:58 | 06:44 |
| | 16:13 | 17 15:36 (Vorbelastung 01) | 17:07 | 42 16:05 (Vorbelastung 01) | 18:01 | 19:58 |
| 6 | 08:32 | 15:19 (Vorbelastung 01) | 07:55 | 15:23 (Vorbelastung 01) | 06:56 | 06:41 |
| | 16:14 | 19 15:38 (Vorbelastung 01) | 17:09 | 42 16:05 (Vorbelastung 01) | 18:03 | 20:00 |
| 7 | 08:32 | 15:19 (Vorbelastung 01) | 07:53 | 15:24 (Vorbelastung 01) | 06:53 | 06:39 |
| | 16:16 | 20 15:39 (Vorbelastung 01) | 17:11 | 40 16:04 (Vorbelastung 01) | 18:05 | 20:02 |
| 8 | 08:31 | 15:18 (Vorbelastung 01) | 07:51 | 15:25 (Vorbelastung 01) | 06:51 | 06:36 |
| | 16:17 | 23 15:41 (Vorbelastung 01) | 17:13 | 38 16:03 (Vorbelastung 01) | 18:07 | 20:04 |
| 9 | 08:31 | 15:18 (Vorbelastung 01) | 07:50 | 15:27 (Vorbelastung 01) | 06:49 | 06:34 |
| | 16:18 | 24 15:42 (Vorbelastung 01) | 17:15 | 35 16:02 (Vorbelastung 01) | 18:09 | 20:06 |
| 10 | 08:30 | 15:18 (Vorbelastung 01) | 07:48 | 15:28 (Vorbelastung 01) | 06:46 | 06:32 |
| | 16:20 | 26 15:44 (Vorbelastung 01) | 17:17 | 33 16:01 (Vorbelastung 01) | 18:11 | 20:07 |
| 11 | 08:29 | 15:18 (Vorbelastung 01) | 07:46 | 15:30 (Vorbelastung 01) | 06:44 | 06:29 |
| | 16:21 | 28 15:46 (Vorbelastung 01) | 17:19 | 30 16:00 (Vorbelastung 01) | 18:13 | 20:09 |
| 12 | 08:29 | 15:18 (Vorbelastung 01) | 07:44 | 15:32 (Vorbelastung 01) | 06:42 | 06:27 |
| | 16:23 | 30 15:48 (Vorbelastung 01) | 17:20 | 26 15:58 (Vorbelastung 01) | 18:14 | 20:11 |
| 13 | 08:28 | 15:18 (Vorbelastung 01) | 07:42 | 15:34 (Vorbelastung 01) | 06:39 | 06:25 |
| | 16:25 | 31 15:49 (Vorbelastung 01) | 17:22 | 22 15:56 (Vorbelastung 01) | 18:16 | 20:13 |
| 14 | 08:27 | 15:18 (Vorbelastung 01) | 07:40 | 15:37 (Vorbelastung 01) | 06:37 | 06:22 |
| | 16:26 | 33 15:51 (Vorbelastung 01) | 17:24 | 15 15:52 (Vorbelastung 01) | 18:18 | 20:15 |
| 15 | 08:26 | 15:18 (Vorbelastung 01) | 07:38 | | 06:34 | 06:20 |
| | 16:28 | 35 15:53 (Vorbelastung 01) | 17:26 | | 18:20 | 20:17 |
| 16 | 08:25 | 15:18 (Vorbelastung 01) | 07:36 | | 06:32 | 06:18 |
| | 16:29 | 37 15:55 (Vorbelastung 01) | 17:28 | | 18:22 | 20:18 |
| 17 | 08:24 | 15:17 (Vorbelastung 01) | 07:34 | | 06:30 | 06:15 |
| | 16:31 | 39 15:56 (Vorbelastung 01) | 17:30 | | 18:24 | 20:20 |
| 18 | 08:23 | 15:17 (Vorbelastung 01) | 07:32 | | 06:27 | 06:13 |
| | 16:33 | 41 15:58 (Vorbelastung 01) | 17:32 | | 18:26 | 20:22 |
| 19 | 08:22 | 15:18 (Vorbelastung 01) | 07:29 | | 06:25 | 06:11 |
| | 16:35 | 43 16:01 (Vorbelastung 01) | 17:34 | | 18:27 | 20:24 |
| 20 | 08:21 | 15:18 (Vorbelastung 01) | 07:27 | | 06:22 | 06:09 |
| | 16:36 | 45 16:03 (Vorbelastung 01) | 17:36 | | 18:29 | 20:26 |
| 21 | 08:20 | 15:17 (Vorbelastung 01) | 07:25 | | 06:20 | 06:06 |
| | 16:38 | 46 16:03 (Vorbelastung 01) | 17:38 | | 18:31 | 20:27 |
| 22 | 08:18 | 15:18 (Vorbelastung 01) | 07:23 | | 06:17 | 06:04 |
| | 16:40 | 46 16:04 (Vorbelastung 01) | 17:40 | | 18:33 | 20:29 |
| 23 | 08:17 | 15:17 (Vorbelastung 01) | 07:21 | | 06:15 | 06:02 |
| | 16:42 | 47 16:04 (Vorbelastung 01) | 17:42 | | 18:35 | 20:31 |
| 24 | 08:16 | 15:18 (Vorbelastung 01) | 07:19 | | 06:13 | 06:00 |
| | 16:44 | 47 16:05 (Vorbelastung 01) | 17:44 | | 18:37 | 20:33 |
| 25 | 08:14 | 15:18 (Vorbelastung 01) | 07:16 | | 06:10 | 05:58 |
| | 16:45 | 47 16:05 (Vorbelastung 01) | 17:46 | | 18:38 | 20:35 |
| 26 | 08:13 | 15:18 (Vorbelastung 01) | 07:14 | | 06:08 | 05:55 |
| | 16:47 | 48 16:06 (Vorbelastung 01) | 17:48 | | 18:40 | 20:36 |
| 27 | 08:12 | 15:18 (Vorbelastung 01) | 07:12 | | 06:05 | 05:53 |
| | 16:49 | 48 16:06 (Vorbelastung 01) | 17:50 | | 18:42 | 20:38 |
| 28 | 08:10 | 15:18 (Vorbelastung 01) | 07:10 | | 06:03 | 05:51 |
| | 16:51 | 48 16:06 (Vorbelastung 01) | 17:52 | | 18:44 | 20:40 |
| 29 | 08:09 | 15:19 (Vorbelastung 01) | | | 07:00 | 05:49 |
| | 16:53 | 48 16:07 (Vorbelastung 01) | | | 19:46 | 20:42 |
| 30 | 08:07 | 15:19 (Vorbelastung 01) | | | 06:58 | 05:47 |
| | 16:55 | 48 16:07 (Vorbelastung 01) | | | 19:47 | 20:44 |
| 31 | 08:05 | 15:19 (Vorbelastung 01) | | | 06:56 | |
| | 16:57 | 47 16:06 (Vorbelastung 01) | | | 19:49 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | 1068 | 504 | 467 | | | |

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) |

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 Schattenrezeptor: IO-C - Dorfstrasse 1, Badekow Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 05:32 | | 06:25 | 19:24 (Vorbelastung 03) 07:17 | 07:15 | 14:57 (Vorbelastung 01) 08:09 | |
| | 21:49 21:15 | | 20:09 | 17 19:41 (Vorbelastung 03) 18:56 | 16:47 | 34 15:31 (Vorbelastung 01) 16:03 | |
| 2 | 04:53 05:33 | | 06:27 | 19:26 (Vorbelastung 03) 07:19 | 07:16 | 14:56 (Vorbelastung 01) 08:10 | |
| | 21:49 21:13 | | 20:07 | 13 19:39 (Vorbelastung 03) 18:54 | 16:45 | 36 15:32 (Vorbelastung 01) 16:03 | |
| 3 | 04:54 05:35 | | 06:28 | 19:28 (Vorbelastung 03) 07:21 | 07:18 | 14:55 (Vorbelastung 01) 08:12 | |
| | 21:48 21:11 | | 20:04 | 8 19:36 (Vorbelastung 03) 18:52 | 16:43 | 38 15:33 (Vorbelastung 01) 16:02 | |
| 4 | 04:55 05:37 | | 06:30 | 07:23 | 07:20 | 14:54 (Vorbelastung 01) 08:13 | |
| | 21:48 21:09 | | 20:02 | 18:49 | 16:41 | 40 15:34 (Vorbelastung 01) 16:01 | |
| 5 | 04:56 05:38 | | 06:32 | 07:24 | 07:22 | 14:53 (Vorbelastung 01) 08:14 | |
| | 21:47 21:07 | | 20:00 | 18:47 | 16:39 | 42 15:35 (Vorbelastung 01) 16:01 | |
| 6 | 04:57 05:40 | | 06:34 | 07:26 | 07:24 | 14:52 (Vorbelastung 01) 08:16 | |
| | 21:47 21:06 | | 19:57 | 18:44 | 16:37 | 43 15:35 (Vorbelastung 01) 16:00 | |
| 7 | 04:58 05:42 | | 06:35 | 07:28 | 07:26 | 14:52 (Vorbelastung 01) 08:17 | |
| | 21:46 21:04 | | 19:55 | 18:42 | 16:35 | 44 15:36 (Vorbelastung 01) 16:00 | |
| 8 | 04:59 05:43 | | 06:37 | 07:30 | 07:28 | 14:51 (Vorbelastung 01) 08:18 | |
| | 21:45 21:02 | | 19:52 | 18:40 | 16:34 | 45 15:36 (Vorbelastung 01) 15:59 | |
| 9 | 05:00 05:45 | | 06:39 | 07:32 | 07:30 | 14:51 (Vorbelastung 01) 08:20 | |
| | 21:45 21:00 | | 19:50 | 18:37 | 16:32 | 46 15:37 (Vorbelastung 01) 15:59 | |
| 10 | 05:01 05:47 | | 06:41 | 07:33 | 07:32 | 14:50 (Vorbelastung 01) 08:21 | |
| | 21:44 20:58 | | 19:48 | 18:35 | 16:30 | 47 15:37 (Vorbelastung 01) 15:59 | |
| 11 | 05:02 05:49 | | 06:42 | 07:35 | 07:34 | 14:50 (Vorbelastung 01) 08:22 | |
| | 21:43 20:56 | | 19:45 | 18:33 | 16:29 | 47 15:37 (Vorbelastung 01) 15:58 | |
| 12 | 05:03 05:50 | | 06:44 | 07:37 | 07:35 | 14:51 (Vorbelastung 01) 08:23 | |
| | 21:42 20:54 | | 19:43 | 18:30 | 16:27 | 47 15:38 (Vorbelastung 01) 15:58 | |
| 13 | 05:04 05:52 | | 06:46 | 07:39 | 07:37 | 14:51 (Vorbelastung 01) 08:24 | |
| | 21:41 20:52 | | 19:40 | 18:28 | 16:25 | 48 15:39 (Vorbelastung 01) 15:58 | |
| 14 | 05:05 05:54 | 8 19:34 (Vorbelastung 03) | 06:48 | 07:41 | 07:39 | 14:51 (Vorbelastung 01) 08:25 | |
| | 21:40 20:50 | 19:42 (Vorbelastung 03) | 19:38 | 18:26 | 16:24 | 48 15:39 (Vorbelastung 01) 15:58 | |
| 15 | 05:07 05:55 | 19:31 (Vorbelastung 03) | 06:49 | 07:43 | 07:41 | 14:51 (Vorbelastung 01) 08:26 | |
| | 21:39 20:47 | 14 19:45 (Vorbelastung 03) | 19:35 | 18:23 | 16:22 | 48 15:39 (Vorbelastung 01) 15:58 | |
| 16 | 05:08 05:57 | 19:29 (Vorbelastung 03) | 06:51 | 07:44 | 07:43 | 14:51 (Vorbelastung 01) 08:27 | |
| | 21:38 20:45 | 18 19:47 (Vorbelastung 03) | 19:33 | 18:21 | 16:21 | 48 15:39 (Vorbelastung 01) 15:58 | |
| 17 | 05:09 05:59 | 19:27 (Vorbelastung 03) | 06:53 | 07:46 | 07:45 | 14:52 (Vorbelastung 01) 08:28 | |
| | 21:37 20:43 | 21 19:48 (Vorbelastung 03) | 19:31 | 18:19 | 16:19 | 47 15:39 (Vorbelastung 01) 15:58 | |
| 18 | 05:11 06:01 | 19:26 (Vorbelastung 03) | 06:54 | 07:48 | 07:47 | 14:52 (Vorbelastung 01) 08:29 | |
| | 21:36 20:41 | 23 19:49 (Vorbelastung 03) | 19:28 | 18:16 | 16:18 | 47 15:39 (Vorbelastung 01) 15:59 | |
| 19 | 05:12 06:02 | 19:25 (Vorbelastung 03) | 06:56 | 07:50 | 07:48 | 14:52 (Vorbelastung 01) 08:29 | |
| | 21:34 20:39 | 25 19:50 (Vorbelastung 03) | 19:26 | 18:14 | 16:16 | 47 15:39 (Vorbelastung 01) 15:59 | |
| 20 | 05:13 06:04 | 19:24 (Vorbelastung 03) | 06:58 | 07:52 | 07:50 | 14:53 (Vorbelastung 01) 08:30 | |
| | 21:33 20:37 | 26 19:50 (Vorbelastung 03) | 19:23 | 18:12 | 16:15 | 46 15:39 (Vorbelastung 01) 15:59 | |
| 21 | 05:15 06:06 | 19:23 (Vorbelastung 03) | 07:00 | 07:54 | 07:52 | 14:53 (Vorbelastung 01) 08:31 | |
| | 21:32 20:34 | 28 19:51 (Vorbelastung 03) | 19:21 | 18:10 | 16:14 | 46 15:39 (Vorbelastung 01) 16:00 | |
| 22 | 05:16 06:08 | 19:23 (Vorbelastung 03) | 07:01 | 07:56 | 07:54 | 14:54 (Vorbelastung 01) 08:31 | |
| | 21:30 20:52 | 28 19:51 (Vorbelastung 03) | 19:18 | 18:08 | 16:12 | 45 15:39 (Vorbelastung 01) 16:00 | |
| 23 | 05:18 06:09 | 19:22 (Vorbelastung 03) | 07:03 | 07:57 | 07:56 | 14:54 (Vorbelastung 01) 08:32 | |
| | 21:29 20:30 | 29 19:51 (Vorbelastung 03) | 19:16 | 18:05 | 16:11 | 43 15:37 (Vorbelastung 01) 16:01 | |
| 24 | 05:19 06:11 | 19:22 (Vorbelastung 03) | 07:05 | 07:59 | 07:57 | 14:54 (Vorbelastung 01) 08:32 | |
| | 21:28 20:28 | 29 19:51 (Vorbelastung 03) | 19:13 | 18:03 | 16:10 | 41 15:35 (Vorbelastung 01) 16:01 | |
| 25 | 05:21 06:13 | 19:22 (Vorbelastung 03) | 07:07 | 07:01 | 07:59 | 14:55 (Vorbelastung 01) 08:32 | |
| | 21:26 20:25 | 29 19:51 (Vorbelastung 03) | 19:11 | 17:01 | 16:09 | 39 15:34 (Vorbelastung 01) 16:02 | |
| 26 | 05:22 06:15 | 19:21 (Vorbelastung 03) | 07:08 | 07:03 | 08:01 | 14:56 (Vorbelastung 01) 08:33 | |
| | 21:25 20:23 | 29 19:50 (Vorbelastung 03) | 19:09 | 16:59 | 16:08 | 37 15:33 (Vorbelastung 01) 16:03 | |
| 27 | 05:24 06:16 | 19:21 (Vorbelastung 03) | 07:10 | 07:05 | 08:02 | 14:57 (Vorbelastung 01) 08:33 | |
| | 21:23 20:21 | 29 19:50 (Vorbelastung 03) | 19:06 | 16:57 | 16:07 | 35 15:32 (Vorbelastung 01) 16:03 | |
| 28 | 05:25 06:18 | 19:21 (Vorbelastung 03) | 07:12 | 07:07 | 08:04 | 14:58 (Vorbelastung 01) 08:33 | |
| | 21:21 20:19 | 27 19:48 (Vorbelastung 03) | 19:04 | 16:55 | 16 | 15:22 (Vorbelastung 01) 16:06 | |
| 29 | 05:27 06:20 | 19:21 (Vorbelastung 03) | 07:14 | 07:09 | 08:06 | 14:58 (Vorbelastung 01) 08:33 | |
| | 21:20 20:16 | 27 19:48 (Vorbelastung 03) | 19:01 | 16:53 | 23 | 15:25 (Vorbelastung 01) 16:05 | |
| 30 | 05:28 06:22 | 19:22 (Vorbelastung 03) | 07:16 | 07:11 | 08:07 | 14:59 (Vorbelastung 01) 08:33 | |
| | 21:18 20:14 | 24 19:46 (Vorbelastung 03) | 18:59 | 16:51 | 27 | 15:28 (Vorbelastung 01) 16:04 | |
| 31 | 05:30 06:23 | 19:22 (Vorbelastung 03) | 07:18 | 07:13 | 08:07 | 14:59 (Vorbelastung 01) 08:33 | |
| | 21:16 20:12 | 21 19:43 (Vorbelastung 03) | 18:57 | 16:49 | 31 | 15:30 (Vorbelastung 01) 16:07 | |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | 261 | 236 | |
| astr.max.mögl.Beschattung | | 435 | | 38 | 102 | 1268 | 362 |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-D - Zarrentiner Strasse 44, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:04 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:54 21:49 | 05:34 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:48 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:47 | 05:39 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:14 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:53 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:45 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:06 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:44 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:34 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:49 21:50 | 05:15 21:32 | 06:06 20:34 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:25 | 07:07 19:11 | 07:57 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 07:03 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 07:05 16:07 | 08:33 16:04 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 | 05:25 21:21 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 07:07 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:52 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:49 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | | 05:30 21:16 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 **Schattenrezeptor:** IO-E - Zarrentiner Strasse 50, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | | 04:57 21:35 | 9 05:27 (Vorbelastung 01) 05:36 (Vorbelastung 01) |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | | 04:56 21:36 | 11 05:26 (Vorbelastung 01) 05:37 (Vorbelastung 01) |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | | 04:55 21:37 | 13 05:25 (Vorbelastung 01) 05:38 (Vorbelastung 01) |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | | 04:54 21:38 | 14 05:25 (Vorbelastung 01) 05:39 (Vorbelastung 01) |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | | 04:53 21:39 | 16 05:24 (Vorbelastung 01) 05:40 (Vorbelastung 01) |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | | 04:53 21:40 | 17 05:23 (Vorbelastung 01) 05:40 (Vorbelastung 01) |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | | 04:52 21:41 | 18 05:23 (Vorbelastung 01) 05:41 (Vorbelastung 01) |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | | 04:51 21:42 | 19 05:22 (Vorbelastung 01) 05:41 (Vorbelastung 01) |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | | 04:51 21:43 | 20 05:22 (Vorbelastung 01) 05:42 (Vorbelastung 01) |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | | 04:50 21:44 | 21 05:22 (Vorbelastung 01) 05:43 (Vorbelastung 01) |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | | 04:50 21:45 | 22 05:21 (Vorbelastung 01) 05:43 (Vorbelastung 01) |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | | 04:49 21:45 | 23 05:21 (Vorbelastung 01) 05:44 (Vorbelastung 01) |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | | 04:49 21:46 | 23 05:21 (Vorbelastung 01) 05:44 (Vorbelastung 01) |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | | 04:49 21:47 | 24 05:21 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | | 04:49 21:47 | 24 05:21 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | | 04:48 21:48 | 25 05:20 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | | 04:48 21:48 | 25 05:20 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | | 04:48 21:49 | 25 05:21 (Vorbelastung 01) 05:46 (Vorbelastung 01) |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | | 04:48 21:49 | 25 05:21 (Vorbelastung 01) 05:46 (Vorbelastung 01) |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | | 04:48 21:49 | 26 05:21 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | | 04:49 21:50 | 26 05:21 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | | 04:49 21:50 | 26 05:21 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | | 04:49 21:50 | 25 05:21 (Vorbelastung 01) 05:46 (Vorbelastung 01) |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | | 04:49 21:50 | 25 05:22 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | | 04:50 21:50 | 25 05:22 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | | 04:50 21:50 | 25 05:23 (Vorbelastung 01) 05:48 (Vorbelastung 01) |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | | 04:50 21:50 | 24 05:23 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | | 04:51 21:50 | 24 05:24 (Vorbelastung 01) 05:48 (Vorbelastung 01) |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | | 04:52 21:50 | 23 05:24 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 4 05:28 (Vorbelastung 01) | 04:52 21:49 | 23 05:25 (Vorbelastung 01) 05:48 (Vorbelastung 01) |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | 7 05:28 (Vorbelastung 01) | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | | 507 | |
| astr.max.mögl.Beschattung | | | | | | 11 | | 646 |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-E - Zarrentiner Strasse 50, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | Juli | | August | September | Oktober | November | Dezember | |
|---------------------------|-------|----|-------------------------|-----------|---------|----------|----------|-------|
| 1 | 04:53 | | 05:25 (Vorbelastung 01) | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| | 21:49 | 22 | 05:47 (Vorbelastung 01) | 21:15 | 20:09 | 18:56 | 16:47 | 16:04 |
| 2 | 04:54 | | 05:26 (Vorbelastung 01) | 05:34 | 06:27 | 07:19 | 07:17 | 08:10 |
| | 21:49 | 21 | 05:47 (Vorbelastung 01) | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 |
| 3 | 04:54 | | 05:27 (Vorbelastung 01) | 05:35 | 06:29 | 07:21 | 07:18 | 08:12 |
| | 21:48 | 21 | 05:48 (Vorbelastung 01) | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 |
| 4 | 04:55 | | 05:28 (Vorbelastung 01) | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| | 21:48 | 20 | 05:48 (Vorbelastung 01) | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 5 | 04:56 | | 05:28 (Vorbelastung 01) | 05:39 | 06:32 | 07:25 | 07:22 | 08:14 |
| | 21:47 | 19 | 05:47 (Vorbelastung 01) | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 6 | 04:57 | | 05:29 (Vorbelastung 01) | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| | 21:47 | 18 | 05:47 (Vorbelastung 01) | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 7 | 04:58 | | 05:30 (Vorbelastung 01) | 05:42 | 06:36 | 07:28 | 07:26 | 08:17 |
| | 21:46 | 16 | 05:46 (Vorbelastung 01) | 21:04 | 19:55 | 18:42 | 16:36 | 16:00 |
| 8 | 04:59 | | 05:31 (Vorbelastung 01) | 05:44 | 06:37 | 07:30 | 07:28 | 08:18 |
| | 21:45 | 15 | 05:46 (Vorbelastung 01) | 21:02 | 19:53 | 18:40 | 16:34 | 15:59 |
| 9 | 05:00 | | 05:32 (Vorbelastung 01) | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| | 21:45 | 13 | 05:45 (Vorbelastung 01) | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 10 | 05:01 | | 05:33 (Vorbelastung 01) | 05:47 | 06:41 | 07:34 | 07:32 | 08:21 |
| | 21:44 | 12 | 05:45 (Vorbelastung 01) | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 11 | 05:02 | | 05:34 (Vorbelastung 01) | 05:49 | 06:42 | 07:35 | 07:34 | 08:22 |
| | 21:43 | 10 | 05:44 (Vorbelastung 01) | 20:56 | 19:45 | 18:33 | 16:29 | 15:59 |
| 12 | 05:03 | | 05:35 (Vorbelastung 01) | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| | 21:42 | 8 | 05:43 (Vorbelastung 01) | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 13 | 05:04 | | 05:36 (Vorbelastung 01) | 05:52 | 06:46 | 07:39 | 07:37 | 08:24 |
| | 21:41 | 5 | 05:41 (Vorbelastung 01) | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 14 | 05:06 | | 05:37 (Vorbelastung 01) | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| | 21:40 | 1 | 05:38 (Vorbelastung 01) | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 15 | 05:07 | | 05:56 | 05:56 | 06:49 | 07:43 | 07:41 | 08:26 |
| | 21:39 | | 20:48 | 19:36 | 18:23 | 16:22 | 15:58 | |
| 16 | 05:08 | | 05:57 | 06:51 | 07:44 | 07:43 | 08:27 | |
| | 21:38 | | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 | |
| 17 | 05:09 | | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 | |
| | 21:37 | | 20:43 | 19:31 | 18:19 | 16:19 | 15:59 | |
| 18 | 05:11 | | 06:01 | 06:55 | 07:48 | 07:47 | 08:29 | |
| | 21:36 | | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 | |
| 19 | 05:12 | | 06:02 | 06:56 | 07:50 | 07:48 | 08:29 | |
| | 21:35 | | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 | |
| 20 | 05:13 | | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 | |
| | 21:33 | | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 | |
| 21 | 05:15 | | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 | |
| | 21:32 | | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 | |
| 22 | 05:16 | | 06:08 | 07:02 | 07:56 | 07:54 | 08:31 | |
| | 21:31 | | 20:32 | 19:18 | 18:08 | 16:13 | 16:00 | |
| 23 | 05:18 | | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 | |
| | 21:29 | | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 | |
| 24 | 05:19 | | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 | |
| | 21:28 | | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 | |
| 25 | 05:21 | | 06:13 | 07:07 | 07:01 | 07:59 | 08:32 | |
| | 21:26 | | 20:25 | 19:11 | 17:01 | 16:09 | 16:02 | |
| 26 | 05:22 | | 06:15 | 07:09 | 07:03 | 08:01 | 08:33 | |
| | 21:25 | | 20:23 | 19:09 | 16:59 | 16:08 | 16:03 | |
| 27 | 05:24 | | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 | |
| | 21:23 | | 20:21 | 19:06 | 16:57 | 16:07 | 16:04 | |
| 28 | 05:25 | | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 | |
| | 21:21 | | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 | |
| 29 | 05:27 | | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | |
| | 21:20 | | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 | |
| 30 | 05:29 | | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | |
| | 21:18 | | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 | |
| 31 | 05:30 | | 06:23 | | 07:13 | | 08:33 | |
| | 21:16 | | 20:12 | | 16:49 | | 16:07 | |
| Sonnenscheinstunden | 510 | | 458 | 382 | 329 | 261 | 236 | |
| astr.max.mögl.Beschattung | 201 | | | | | | | |

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) Schattende | (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 **Schattenrezeptor:** IO-F - Zarreniner Strasse 62, Schwartow

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | | Juni | |
|---------------------------|----------------|----------------|----------------|----------------|----------------|-------------------------------------------------------|----------------|-------------------------------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | | 04:57 21:35 | 34 05:37 (Vorbelastung 01) 06:11 (Vorbelastung 01) |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | | 04:56 21:36 | 34 05:37 (Vorbelastung 01) 06:11 (Vorbelastung 01) |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | | 04:55 21:37 | 34 05:37 (Vorbelastung 01) 06:11 (Vorbelastung 01) |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | | 04:54 21:38 | 34 05:38 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | | 04:53 21:39 | 34 05:38 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | | 04:53 21:40 | 33 05:38 (Vorbelastung 01) 06:11 (Vorbelastung 01) |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | | 04:52 21:41 | 33 05:39 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | | 04:51 21:42 | 33 05:38 (Vorbelastung 01) 06:11 (Vorbelastung 01) |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | | 04:51 21:43 | 33 05:39 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | | 04:50 21:44 | 32 05:40 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 5 05:53 (Vorbelastung 01) 05:58 (Vorbelastung 01) | 04:50 21:45 | 33 05:39 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 9 05:51 (Vorbelastung 01) 06:00 (Vorbelastung 01) | 04:49 21:45 | 32 05:40 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 13 05:49 (Vorbelastung 01) 06:02 (Vorbelastung 01) | 04:49 21:46 | 31 05:41 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 16 05:48 (Vorbelastung 01) 06:04 (Vorbelastung 01) | 04:49 21:47 | 32 05:41 (Vorbelastung 01) 06:13 (Vorbelastung 01) |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 18 05:46 (Vorbelastung 01) 06:04 (Vorbelastung 01) | 04:49 21:47 | 32 05:41 (Vorbelastung 01) 06:13 (Vorbelastung 01) |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 21 05:45 (Vorbelastung 01) 06:06 (Vorbelastung 01) | 04:48 21:48 | 31 05:41 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 23 05:43 (Vorbelastung 01) 06:06 (Vorbelastung 01) | 04:48 21:48 | 31 05:41 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 25 05:42 (Vorbelastung 01) 06:07 (Vorbelastung 01) | 04:48 21:49 | 31 05:41 (Vorbelastung 01) 06:12 (Vorbelastung 01) |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 27 05:41 (Vorbelastung 01) 05:39 (Vorbelastung 01) | 04:48 21:49 | 31 05:42 (Vorbelastung 01) 05:43 (Vorbelastung 01) |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 29 05:38 (Vorbelastung 01) 06:08 (Vorbelastung 01) | 04:48 21:49 | 30 05:43 (Vorbelastung 01) 06:13 (Vorbelastung 01) |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 31 05:38 (Vorbelastung 01) 06:09 (Vorbelastung 01) | 04:49 21:50 | 30 05:43 (Vorbelastung 01) 06:13 (Vorbelastung 01) |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 32 05:37 (Vorbelastung 01) 06:09 (Vorbelastung 01) | 04:49 21:50 | 30 05:43 (Vorbelastung 01) 06:13 (Vorbelastung 01) |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 33 05:37 (Vorbelastung 01) 06:10 (Vorbelastung 01) | 04:49 21:50 | 30 05:43 (Vorbelastung 01) 06:13 (Vorbelastung 01) |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 33 05:36 (Vorbelastung 01) 06:09 (Vorbelastung 01) | 04:49 21:50 | 31 05:43 (Vorbelastung 01) 06:14 (Vorbelastung 01) |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 34 05:36 (Vorbelastung 01) 06:10 (Vorbelastung 01) | 04:50 21:50 | 31 05:43 (Vorbelastung 01) 06:14 (Vorbelastung 01) |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 34 05:36 (Vorbelastung 01) 06:10 (Vorbelastung 01) | 04:50 21:50 | 31 05:44 (Vorbelastung 01) 06:15 (Vorbelastung 01) |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 34 05:36 (Vorbelastung 01) 06:10 (Vorbelastung 01) | 04:50 21:50 | 31 05:44 (Vorbelastung 01) 06:15 (Vorbelastung 01) |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 34 05:36 (Vorbelastung 01) 06:10 (Vorbelastung 01) | 04:51 21:50 | 32 05:44 (Vorbelastung 01) 06:16 (Vorbelastung 01) |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 34 05:36 (Vorbelastung 01) 06:10 (Vorbelastung 01) | 04:52 21:50 | 31 05:44 (Vorbelastung 01) 06:15 (Vorbelastung 01) |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 35 05:36 (Vorbelastung 01) 06:11 (Vorbelastung 01) | 04:52 21:50 | 32 05:44 (Vorbelastung 01) 06:16 (Vorbelastung 01) |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | 35 05:37 (Vorbelastung 01) 06:12 (Vorbelastung 01) | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | | 507 | |
| astr.max.mögl.Beschattung | | | | | 555 | | | 957 |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-F - Zarreniner Strasse 62, Schwartow

Voraussetzungen für Berechnung des Schattenwurfs

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

| Juli | | August | | September | | Oktober | | November | | Dezember | |
|---------------------------|-------|-------------------------|-------|-----------|-------------------------|---------|-------|----------|-------|----------|--|
| 1 | 04:53 | 05:44 (Vorbelastung 01) | 05:32 | 8 | 06:02 (Vorbelastung 01) | 06:25 | 07:17 | 07:15 | 08:09 | | |
| | 21:49 | 06:16 (Vorbelastung 01) | 21:15 | | 06:10 (Vorbelastung 01) | 20:09 | 18:56 | 16:47 | 16:04 | | |
| 2 | 04:54 | 05:44 (Vorbelastung 01) | 05:34 | | 06:04 (Vorbelastung 01) | 06:27 | 07:19 | 07:17 | 08:10 | | |
| | 21:49 | 06:16 (Vorbelastung 01) | 21:13 | 2 | 06:06 (Vorbelastung 01) | 20:07 | 18:54 | 16:45 | 16:03 | | |
| 3 | 04:54 | 05:44 (Vorbelastung 01) | 05:35 | | | 06:29 | 07:21 | 07:18 | 08:12 | | |
| | 21:48 | 06:17 (Vorbelastung 01) | 21:11 | | | 20:05 | 18:52 | 16:43 | 16:02 | | |
| 4 | 04:55 | 05:45 (Vorbelastung 01) | 05:37 | | | 06:30 | 07:23 | 07:20 | 08:13 | | |
| | 21:48 | 06:17 (Vorbelastung 01) | 21:09 | | | 20:02 | 18:49 | 16:41 | 16:01 | | |
| 5 | 04:56 | 05:44 (Vorbelastung 01) | 05:39 | | | 06:32 | 07:25 | 07:22 | 08:15 | | |
| | 21:47 | 06:17 (Vorbelastung 01) | 21:08 | | | 20:00 | 18:47 | 16:39 | 16:01 | | |
| 6 | 04:57 | 05:44 (Vorbelastung 01) | 05:40 | | | 06:34 | 07:26 | 07:24 | 08:16 | | |
| | 21:47 | 06:17 (Vorbelastung 01) | 21:06 | | | 19:57 | 18:44 | 16:37 | 16:00 | | |
| 7 | 04:58 | 05:44 (Vorbelastung 01) | 05:42 | | | 06:36 | 07:28 | 07:26 | 08:17 | | |
| | 21:46 | 06:18 (Vorbelastung 01) | 21:04 | | | 19:55 | 18:42 | 16:36 | 16:00 | | |
| 8 | 04:59 | 05:45 (Vorbelastung 01) | 05:44 | | | 06:37 | 07:30 | 07:28 | 08:18 | | |
| | 21:46 | 06:18 (Vorbelastung 01) | 21:02 | | | 19:53 | 18:40 | 16:34 | 15:59 | | |
| 9 | 05:00 | 05:45 (Vorbelastung 01) | 05:45 | | | 06:39 | 07:32 | 07:30 | 08:20 | | |
| | 21:45 | 06:18 (Vorbelastung 01) | 21:00 | | | 19:50 | 18:37 | 16:32 | 15:59 | | |
| 10 | 05:01 | 05:45 (Vorbelastung 01) | 05:47 | | | 06:41 | 07:34 | 07:32 | 08:21 | | |
| | 21:44 | 06:19 (Vorbelastung 01) | 20:58 | | | 19:48 | 18:35 | 16:30 | 15:59 | | |
| 11 | 05:02 | 05:45 (Vorbelastung 01) | 05:49 | | | 06:42 | 07:35 | 07:34 | 08:22 | | |
| | 21:43 | 06:19 (Vorbelastung 01) | 20:56 | | | 19:45 | 18:33 | 16:29 | 15:59 | | |
| 12 | 05:03 | 05:45 (Vorbelastung 01) | 05:50 | | | 06:44 | 07:37 | 07:36 | 08:23 | | |
| | 21:42 | 06:19 (Vorbelastung 01) | 20:54 | | | 19:43 | 18:30 | 16:27 | 15:58 | | |
| 13 | 05:04 | 05:45 (Vorbelastung 01) | 05:52 | | | 06:46 | 07:39 | 07:37 | 08:24 | | |
| | 21:41 | 06:19 (Vorbelastung 01) | 20:52 | | | 19:40 | 18:28 | 16:25 | 15:58 | | |
| 14 | 05:06 | 05:45 (Vorbelastung 01) | 05:54 | | | 06:48 | 07:41 | 07:39 | 08:25 | | |
| | 21:40 | 06:19 (Vorbelastung 01) | 20:50 | | | 19:38 | 18:26 | 16:24 | 15:58 | | |
| 15 | 05:07 | 05:46 (Vorbelastung 01) | 05:56 | | | 06:49 | 07:43 | 07:41 | 08:26 | | |
| | 21:39 | 06:20 (Vorbelastung 01) | 20:48 | | | 19:36 | 18:23 | 16:22 | 15:58 | | |
| 16 | 05:08 | 05:46 (Vorbelastung 01) | 05:57 | | | 06:51 | 07:45 | 07:43 | 08:27 | | |
| | 21:38 | 06:20 (Vorbelastung 01) | 20:45 | | | 19:33 | 18:21 | 16:21 | 15:58 | | |
| 17 | 05:09 | 05:46 (Vorbelastung 01) | 05:59 | | | 06:53 | 07:46 | 07:45 | 08:28 | | |
| | 21:37 | 06:20 (Vorbelastung 01) | 20:43 | | | 19:31 | 18:19 | 16:19 | 15:59 | | |
| 18 | 05:11 | 05:46 (Vorbelastung 01) | 06:01 | | | 06:55 | 07:48 | 07:47 | 08:29 | | |
| | 21:36 | 06:19 (Vorbelastung 01) | 20:41 | | | 19:28 | 18:17 | 16:18 | 15:59 | | |
| 19 | 05:12 | 05:47 (Vorbelastung 01) | 06:02 | | | 06:56 | 07:50 | 07:48 | 08:29 | | |
| | 21:35 | 06:20 (Vorbelastung 01) | 20:39 | | | 19:26 | 18:14 | 16:16 | 15:59 | | |
| 20 | 05:13 | 05:47 (Vorbelastung 01) | 06:04 | | | 06:58 | 07:52 | 07:50 | 08:30 | | |
| | 21:33 | 06:20 (Vorbelastung 01) | 20:37 | | | 19:23 | 18:12 | 16:15 | 15:59 | | |
| 21 | 05:15 | 05:47 (Vorbelastung 01) | 06:06 | | | 07:00 | 07:54 | 07:52 | 08:31 | | |
| | 21:32 | 06:19 (Vorbelastung 01) | 20:35 | | | 19:21 | 18:10 | 16:14 | 16:00 | | |
| 22 | 05:16 | 05:48 (Vorbelastung 01) | 06:08 | | | 07:02 | 07:56 | 07:54 | 08:31 | | |
| | 21:31 | 06:19 (Vorbelastung 01) | 20:32 | | | 19:18 | 18:08 | 16:13 | 16:00 | | |
| 23 | 05:18 | 05:49 (Vorbelastung 01) | 06:09 | | | 07:03 | 07:58 | 07:56 | 08:32 | | |
| | 21:29 | 06:19 (Vorbelastung 01) | 20:30 | | | 19:16 | 18:06 | 16:11 | 16:01 | | |
| 24 | 05:19 | 05:50 (Vorbelastung 01) | 06:11 | | | 07:05 | 07:59 | 07:57 | 08:32 | | |
| | 21:28 | 06:18 (Vorbelastung 01) | 20:28 | | | 19:14 | 18:03 | 16:10 | 16:01 | | |
| 25 | 05:21 | 05:52 (Vorbelastung 01) | 06:13 | | | 07:07 | 07:01 | 07:59 | 08:32 | | |
| | 21:26 | 06:18 (Vorbelastung 01) | 20:26 | | | 19:11 | 17:01 | 16:09 | 16:02 | | |
| 26 | 05:22 | 05:53 (Vorbelastung 01) | 06:15 | | | 07:09 | 07:03 | 08:01 | 08:33 | | |
| | 21:25 | 06:17 (Vorbelastung 01) | 20:23 | | | 19:09 | 16:59 | 16:08 | 16:03 | | |
| 27 | 05:24 | 05:55 (Vorbelastung 01) | 06:16 | | | 07:10 | 07:05 | 08:02 | 08:33 | | |
| | 21:23 | 06:17 (Vorbelastung 01) | 20:21 | | | 19:06 | 16:57 | 16:07 | 16:04 | | |
| 28 | 05:25 | 05:56 (Vorbelastung 01) | 06:18 | | | 07:12 | 07:07 | 08:04 | 08:33 | | |
| | 21:22 | 06:16 (Vorbelastung 01) | 20:19 | | | 19:04 | 16:55 | 16:06 | 16:04 | | |
| 29 | 05:27 | 05:58 (Vorbelastung 01) | 06:20 | | | 07:14 | 07:09 | 08:06 | 08:33 | | |
| | 21:20 | 06:15 (Vorbelastung 01) | 20:16 | | | 19:01 | 16:53 | 16:05 | 16:05 | | |
| 30 | 05:29 | 05:59 (Vorbelastung 01) | 06:22 | | | 07:16 | 07:11 | 08:07 | 08:33 | | |
| | 21:18 | 06:13 (Vorbelastung 01) | 20:14 | | | 18:59 | 16:51 | 16:04 | 16:06 | | |
| 31 | 05:30 | 06:01 (Vorbelastung 01) | 06:23 | | | | 07:13 | | 08:33 | | |
| | 21:17 | 06:12 (Vorbelastung 01) | 20:12 | | | | 16:49 | | 16:07 | | |
| Sonnenscheinstunden | | 510 | 458 | | | 382 | 329 | 261 | 236 | | |
| astr.max.mögl.Beschattung | | 921 | 10 | | | | | | | | |

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) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |
|--------------|-----------------------|------------------------------------------------------------|----------------------|---------------------------------------------------------|

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 **Schattenrezeptor:** IO-G - Zarrentiner Strasse 71, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | | Mai | | Juni |
|---------------------------|----------------|----------------|----------------|----------------|----|--------------------------------------------------------------------|----|--------------------------------------------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | | 05:45 20:46 | 30 | 06:20 (Vorbelastung 01) 04:57 06:50 (Vorbelastung 01) 21:35 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | | 05:43 20:47 | 29 | 06:21 (Vorbelastung 01) 04:56 06:50 (Vorbelastung 01) 21:36 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | | 05:41 20:49 | 29 | 06:21 (Vorbelastung 01) 04:55 06:50 (Vorbelastung 01) 21:37 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | | 05:39 20:51 | 28 | 06:21 (Vorbelastung 01) 04:54 06:49 (Vorbelastung 01) 21:38 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | | 05:37 20:53 | 26 | 06:22 (Vorbelastung 01) 04:53 06:48 (Vorbelastung 01) 21:39 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | | 05:35 20:54 | 25 | 06:22 (Vorbelastung 01) 04:53 06:47 (Vorbelastung 01) 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | | 05:33 20:56 | 23 | 06:23 (Vorbelastung 01) 04:52 06:46 (Vorbelastung 01) 21:41 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | | 05:31 20:58 | 21 | 06:24 (Vorbelastung 01) 04:51 06:45 (Vorbelastung 01) 21:42 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | | 05:30 21:00 | 18 | 06:25 (Vorbelastung 01) 04:51 06:43 (Vorbelastung 01) 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | | 05:28 21:01 | 14 | 06:27 (Vorbelastung 01) 04:50 06:41 (Vorbelastung 01) 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | | 05:26 21:03 | 10 | 06:30 (Vorbelastung 01) 04:50 06:40 (Vorbelastung 01) 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | | 05:24 21:05 | | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | | 05:22 21:06 | | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | | 05:21 21:08 | | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | | 05:19 21:10 | | 04:49 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | | 05:17 21:11 | | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | | 05:16 21:13 | | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 5 | 06:37 (Vorbelastung 01) 05:14 06:42 (Vorbelastung 01) 21:15 | | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 10 | 06:35 (Vorbelastung 01) 05:13 06:45 (Vorbelastung 01) 21:16 | | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 14 | 06:33 (Vorbelastung 01) 05:11 06:47 (Vorbelastung 01) 21:18 | | 04:48 21:49 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 18 | 06:31 (Vorbelastung 01) 05:10 06:49 (Vorbelastung 01) 21:19 | | 04:49 21:50 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 21 | 06:29 (Vorbelastung 01) 05:08 06:50 (Vorbelastung 01) 21:21 | | 04:49 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 23 | 06:27 (Vorbelastung 01) 05:07 06:50 (Vorbelastung 01) 21:22 | | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 26 | 06:24 (Vorbelastung 01) 05:06 06:50 (Vorbelastung 01) 21:24 | | 04:49 21:50 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 28 | 06:22 (Vorbelastung 01) 05:04 06:50 (Vorbelastung 01) 21:25 | | 04:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 30 | 06:21 (Vorbelastung 01) 05:03 06:51 (Vorbelastung 01) 21:27 | | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 31 | 06:20 (Vorbelastung 01) 05:02 06:51 (Vorbelastung 01) 21:28 | | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 31 | 06:20 (Vorbelastung 01) 05:01 06:51 (Vorbelastung 01) 21:29 | | 04:51 21:50 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 31 | 06:20 (Vorbelastung 01) 05:00 06:51 (Vorbelastung 01) 21:31 | | 04:52 21:50 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 30 | 06:20 (Vorbelastung 01) 04:59 06:50 (Vorbelastung 01) 21:32 | | 04:52 21:50 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | | 04:58 21:33 | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | | 492 | | 507 |
| astr.max.mögl.Beschattung | | | | 298 | | 253 | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-G - Zarrentiner Strasse 71, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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 | October | November | December | |
|----|---------------------------|----------------|-------------------------------|----------------|----------------|----------------|----------------|
| 1 | 04:53 21:49 | 05:32 21:15 | 5 06:42 (Vorbelastung 01) | 06:25 20:09 | 07:17 18:57 | 07:15 16:47 | 08:09 16:04 |
| 2 | 04:54 21:49 | 05:34 21:13 | 12 06:51 (Vorbelastung 01) | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 04:54 21:48 | 05:35 21:11 | 16 06:52 (Vorbelastung 01) | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 04:55 21:48 | 05:37 21:09 | 19 06:53 (Vorbelastung 01) | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 04:56 21:47 | 05:39 21:08 | 22 06:55 (Vorbelastung 01) | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:15 16:01 |
| 6 | 04:57 21:47 | 05:40 21:06 | 23 06:56 (Vorbelastung 01) | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 04:58 21:46 | 05:42 21:04 | 26 06:57 (Vorbelastung 01) | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 04:59 21:46 | 05:44 21:02 | 27 06:58 (Vorbelastung 01) | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 05:00 21:45 | 05:45 21:00 | 29 06:59 (Vorbelastung 01) | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 05:01 21:44 | 05:47 20:58 | 29 06:29 (Vorbelastung 01) | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 05:02 21:43 | 05:49 20:56 | 30 06:29 (Vorbelastung 01) | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 05:03 21:42 | 05:50 20:54 | 30 06:58 (Vorbelastung 01) | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 05:04 21:41 | 05:52 20:52 | 31 06:28 (Vorbelastung 01) | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 05:06 21:40 | 05:54 20:50 | 31 06:59 (Vorbelastung 01) | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 05:07 21:39 | 05:56 20:48 | 30 06:28 (Vorbelastung 01) | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 05:08 21:38 | 05:57 20:45 | 30 06:28 (Vorbelastung 01) | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 05:09 21:37 | 05:59 20:43 | 30 06:27 (Vorbelastung 01) | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 05:11 21:36 | 06:01 20:41 | 28 06:29 (Vorbelastung 01) | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 05:12 21:35 | 06:02 20:39 | 26 06:31 (Vorbelastung 01) | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 05:13 21:33 | 06:04 20:37 | 23 06:32 (Vorbelastung 01) | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 05:15 21:32 | 06:06 20:35 | 20 06:55 (Vorbelastung 01) | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 05:16 21:31 | 06:08 20:32 | 17 06:36 (Vorbelastung 01) | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 05:18 21:29 | 06:09 20:30 | 14 06:37 (Vorbelastung 01) | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 05:19 21:28 | 06:11 20:28 | 10 06:51 (Vorbelastung 01) | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 05:21 21:26 | 06:13 20:26 | 4 06:49 (Vorbelastung 01) | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 05:22 21:25 | 06:15 20:23 | | 07:09 19:09 | 07:03 16:59 | 08:01 16:08 | 08:33 16:03 |
| 27 | 05:24 21:23 | 06:16 20:21 | | 07:10 19:06 | 07:05 16:57 | 08:02 16:07 | 08:33 16:04 |
| 28 | 05:25 21:22 | 06:18 20:19 | | 07:12 19:04 | 07:07 16:55 | 08:04 16:06 | 08:33 16:04 |
| 29 | 05:27 21:20 | 06:20 20:16 | | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 05:29 21:18 | 06:22 20:14 | | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 05:30 21:17 | 06:23 20:12 | | | 07:13 16:49 | | 08:33 16:07 |
| | Sonnenscheinstunden | 510 | | 382 | 329 | 261 | 236 |
| | astr.max.mögl.Beschattung | | 562 | | | | |

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) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 **Schattenrezeptor:** IO-H - Zarrentiner Strasse 77, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | | Mai | Juni | |
|---------------------------|----------------|----------------|----------------|----------------|----|----------------------------------------------------|----------------|----------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | | 05:45 20:46 | 04:57 21:35 | |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | | 05:43 20:47 | 04:56 21:36 | |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | | 05:41 20:49 | 04:55 21:37 | |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 2 | 07:09 (Vorbelastung 01) 07:11 (Vorbelastung 01) | 05:39 20:51 | 04:54 21:38 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 8 | 07:07 (Vorbelastung 01) 07:15 (Vorbelastung 01) | 05:37 20:53 | 04:53 21:39 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 12 | 07:05 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:35 20:54 | 04:53 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 15 | 07:02 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:33 20:56 | 04:52 21:41 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 18 | 07:00 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 05:31 20:58 | 04:51 21:42 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 21 | 06:58 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:30 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 23 | 06:55 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 26 | 06:53 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 27 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 27 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:22 21:07 | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 27 | 06:51 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 26 | 06:51 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:19 21:10 | 04:49 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 25 | 06:52 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:17 21:11 | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 24 | 06:52 (Vorbelastung 01) 07:16 (Vorbelastung 01) | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 22 | 06:52 (Vorbelastung 01) 07:14 (Vorbelastung 01) | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:27 | 06:11 20:24 | 20 | 06:53 (Vorbelastung 01) 07:13 (Vorbelastung 01) | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 16 | 06:55 (Vorbelastung 01) 07:11 (Vorbelastung 01) | 05:11 21:18 | 04:48 21:49 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 12 | 06:57 (Vorbelastung 01) 07:09 (Vorbelastung 01) | 05:10 21:19 | 04:49 21:50 |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | | 05:08 21:21 | 04:49 21:50 | |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | | 05:07 21:22 | 04:49 21:50 | |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | | 05:06 21:24 | 04:49 21:50 | |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | | 05:04 21:25 | 04:50 21:50 | |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | | 05:03 21:27 | 04:50 21:50 | |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | | 05:02 21:28 | 04:50 21:50 | |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | | 05:01 21:29 | 04:51 21:50 | |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | | 05:00 21:31 | 04:52 21:50 | |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | | 04:59 21:32 | 04:52 21:50 | |
| 31 | 08:06 16:57 | | 06:56 19:49 | | | 04:58 21:33 | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | | 492 | 507 | |
| astr.max.mögl.Beschattung | | | | 351 | | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-H - Zarrentiner Strasse 77, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | Juli | August | | September | | Oktober | November | Dezember | |
|---------------------------|----------------|----------------|----|----------------------------------------------------|----|----------------------------------------------------|----------------|----------------|----------------|
| 1 | 04:53 21:49 | 05:32 21:15 | | 06:25 20:09 | 26 | 06:52 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 07:17 18:57 | 07:15 16:47 | 08:09 16:04 |
| 2 | 04:54 21:49 | 05:34 21:13 | | 06:27 20:07 | 23 | 06:54 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 04:54 21:48 | 05:35 21:11 | | 06:29 20:05 | 21 | 06:56 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 04:55 21:48 | 05:37 21:09 | | 06:30 20:02 | 18 | 06:57 (Vorbelastung 01) 07:15 (Vorbelastung 01) | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 04:56 21:47 | 05:39 21:08 | | 06:32 20:00 | 15 | 06:59 (Vorbelastung 01) 07:14 (Vorbelastung 01) | 07:25 18:47 | 07:22 16:39 | 08:15 16:01 |
| 6 | 04:57 21:47 | 05:40 21:06 | | 06:34 19:57 | 12 | 07:01 (Vorbelastung 01) 07:13 (Vorbelastung 01) | 07:26 18:45 | 07:24 16:37 | 08:16 16:00 |
| 7 | 04:58 21:46 | 05:42 21:04 | | 06:36 19:55 | 8 | 07:02 (Vorbelastung 01) 07:10 (Vorbelastung 01) | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 04:59 21:46 | 05:44 21:02 | | 06:37 19:53 | 3 | 07:04 (Vorbelastung 01) 07:07 (Vorbelastung 01) | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 05:00 21:45 | 05:45 21:00 | | 06:39 19:50 | | | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 05:01 21:44 | 05:47 20:58 | | 06:41 19:48 | | | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 05:02 21:43 | 05:49 20:56 | | 06:42 19:45 | | | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 05:03 21:42 | 05:50 20:54 | | 06:44 19:43 | | | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 05:04 21:41 | 05:52 20:52 | | 06:46 19:40 | | | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 05:06 21:40 | 05:54 20:50 | | 06:48 19:38 | | | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 05:07 21:39 | 05:56 20:48 | | 06:49 19:36 | | | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 05:08 21:38 | 05:57 20:45 | | 06:51 19:33 | | | 07:45 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 05:09 21:37 | 05:59 20:43 | | 06:53 19:31 | | | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 05:11 21:36 | 06:01 20:41 | | 06:55 19:28 | | | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 05:12 21:35 | 06:03 20:39 | | 06:56 19:26 | | | 07:50 18:14 | 07:49 16:16 | 08:29 15:59 |
| 20 | 05:13 21:33 | 06:04 20:37 | | 06:58 19:23 | | | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 05:15 21:32 | 06:06 20:35 | | 07:00 19:21 | | | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 05:16 21:31 | 06:08 20:32 | 5 | 07:10 (Vorbelastung 01) 07:01 (Vorbelastung 01) | 13 | 07:14 (Vorbelastung 01) | 18:08 07:56 | 16:13 16:13 | 08:31 16:00 |
| 23 | 05:18 21:29 | 06:09 20:30 | 13 | 06:58 (Vorbelastung 01) 07:15 (Vorbelastung 01) | 17 | 07:14 (Vorbelastung 01) 07:15 (Vorbelastung 01) | 18:06 07:59 | 16:11 16:11 | 08:32 16:01 |
| 24 | 05:19 21:28 | 06:11 20:28 | 17 | 06:57 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 20 | 06:57 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 05:21 21:26 | 06:13 20:26 | 20 | 06:56 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 22 | 07:07 07:18 (Vorbelastung 01) | 07:01 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 05:22 21:25 | 06:15 20:23 | 22 | 06:54 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 24 | 07:09 07:18 (Vorbelastung 01) | 07:03 16:59 | 08:01 16:08 | 08:33 16:03 |
| 27 | 05:24 21:23 | 06:16 20:21 | 24 | 06:54 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 25 | 07:10 07:19 (Vorbelastung 01) | 07:05 16:57 | 08:02 16:07 | 08:33 16:04 |
| 28 | 05:25 21:22 | 06:18 20:19 | 25 | 06:53 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 26 | 07:12 07:19 (Vorbelastung 01) | 07:07 16:55 | 08:04 16:06 | 08:33 16:04 |
| 29 | 05:27 21:20 | 06:20 20:16 | 26 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 27 | 07:14 07:19 (Vorbelastung 01) | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 05:29 21:18 | 06:22 20:14 | 27 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 27 | 07:16 07:19 (Vorbelastung 01) | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 05:30 21:17 | 06:23 20:12 | 27 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 510 | 458 | | 382 | | | 329 | 261 | 236 |
| astr.max.mögl.Beschattung | | 233 | | 126 | | | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-I - An der Torfkoppel 9, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | | Mai | | Juni |
|---------------------------|----------------|----------------|----------------|----------------|----|--------------------------------------------------------------------|----|--------------------------------------------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | | 05:45 20:46 | 18 | 06:14 (Vorbelastung 03) 04:57 06:32 (Vorbelastung 03) 21:35 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | | 05:43 20:47 | 20 | 06:14 (Vorbelastung 03) 04:56 06:34 (Vorbelastung 03) 21:36 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | | 05:41 20:49 | 22 | 06:13 (Vorbelastung 03) 04:55 06:35 (Vorbelastung 03) 21:37 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:01 18:00 | 06:46 19:57 | | 05:39 20:51 | 23 | 06:12 (Vorbelastung 03) 04:54 06:35 (Vorbelastung 03) 21:38 |
| 5 | 08:33 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:59 | | 05:37 20:53 | 25 | 06:11 (Vorbelastung 03) 04:53 06:36 (Vorbelastung 03) 21:39 |
| 6 | 08:32 16:15 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | | 05:35 20:55 | 25 | 06:11 (Vorbelastung 03) 04:53 06:36 (Vorbelastung 03) 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:54 18:05 | 06:39 20:02 | | 05:33 20:56 | 26 | 06:10 (Vorbelastung 03) 04:52 06:36 (Vorbelastung 03) 21:41 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | | 05:31 20:58 | 27 | 06:10 (Vorbelastung 03) 04:51 06:37 (Vorbelastung 03) 21:42 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | | 05:30 21:00 | 26 | 06:10 (Vorbelastung 03) 04:51 06:36 (Vorbelastung 03) 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | | 05:28 21:01 | 26 | 06:10 (Vorbelastung 03) 04:50 06:36 (Vorbelastung 03) 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:30 20:09 | | 05:26 21:03 | 26 | 06:10 (Vorbelastung 03) 04:50 06:36 (Vorbelastung 03) 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | | 05:24 21:05 | 26 | 06:10 (Vorbelastung 03) 04:49 06:36 (Vorbelastung 03) 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | | 05:22 21:07 | 25 | 06:10 (Vorbelastung 03) 04:49 06:35 (Vorbelastung 03) 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:23 20:15 | | 05:21 21:08 | 24 | 06:11 (Vorbelastung 03) 04:49 06:35 (Vorbelastung 03) 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | | 05:19 21:10 | 23 | 06:11 (Vorbelastung 03) 04:49 06:34 (Vorbelastung 03) 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:19 | | 05:17 21:12 | 22 | 06:12 (Vorbelastung 03) 04:48 06:34 (Vorbelastung 03) 21:48 |
| 17 | 08:24 16:31 | 07:34 17:31 | 06:30 18:24 | 06:16 20:20 | | 05:16 21:13 | 20 | 06:13 (Vorbelastung 03) 04:48 06:33 (Vorbelastung 03) 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | | 05:14 21:15 | 18 | 06:14 (Vorbelastung 03) 04:48 06:32 (Vorbelastung 03) 21:49 |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:28 | 06:11 20:24 | | 05:13 21:16 | 16 | 06:15 (Vorbelastung 03) 04:48 06:31 (Vorbelastung 03) 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | | 05:11 21:18 | 13 | 06:16 (Vorbelastung 03) 04:48 06:29 (Vorbelastung 03) 21:50 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | | 05:10 21:19 | 10 | 06:18 (Vorbelastung 03) 04:49 06:28 (Vorbelastung 03) 21:50 |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | | 05:08 21:21 | 4 | 06:21 (Vorbelastung 03) 04:49 06:25 (Vorbelastung 03) 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | | 05:07 21:22 | | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | | 05:06 21:24 | | 04:49 21:50 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:39 | 05:58 20:35 | | 05:04 21:25 | | 04:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | | 05:03 21:27 | | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | | 05:02 21:28 | | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | | 05:01 21:30 | | 04:51 21:50 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 10 | 05:00 21:31 | | 04:52 21:50 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 15 | 06:16 (Vorbelastung 03) 04:59 06:31 (Vorbelastung 03) 21:32 | | 04:52 21:50 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | | 04:58 21:33 | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | | 492 | | 508 |
| astr.max.mögl.Beschattung | | | | 25 | | 465 | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-I - An der Torfkoppel 9, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 | | 05:32 | | 06:21 (Vorbelastung 03) | 06:25 | 07:17 | 07:15 | 08:09 | | | |
| | 21:49 | | 21:15 | 25 | 06:46 (Vorbelastung 03) | 20:09 | 18:57 | 16:47 | 16:04 | | | |
| 2 | 04:54 | | 05:34 | | 06:21 (Vorbelastung 03) | 06:27 | 07:19 | 07:17 | 08:10 | | | |
| | 21:49 | | 21:13 | 26 | 06:47 (Vorbelastung 03) | 20:07 | 18:54 | 16:45 | 16:03 | | | |
| 3 | 04:54 | | 05:35 | | 06:20 (Vorbelastung 03) | 06:29 | 07:21 | 07:19 | 08:12 | | | |
| | 21:49 | | 21:11 | 26 | 06:46 (Vorbelastung 03) | 20:05 | 18:52 | 16:43 | 16:02 | | | |
| 4 | 04:55 | | 05:37 | | 06:20 (Vorbelastung 03) | 06:30 | 07:23 | 07:20 | 08:13 | | | |
| | 21:48 | | 21:09 | 27 | 06:47 (Vorbelastung 03) | 20:02 | 18:49 | 16:41 | 16:01 | | | |
| 5 | 04:56 | | 05:39 | | 06:20 (Vorbelastung 03) | 06:32 | 07:25 | 07:22 | 08:15 | | | |
| | 21:48 | | 21:08 | 26 | 06:46 (Vorbelastung 03) | 20:00 | 18:47 | 16:39 | 16:01 | | | |
| 6 | 04:57 | | 05:40 | | 06:20 (Vorbelastung 03) | 06:34 | 07:26 | 07:24 | 08:16 | | | |
| | 21:47 | | 21:06 | 26 | 06:46 (Vorbelastung 03) | 19:57 | 18:45 | 16:37 | 16:00 | | | |
| 7 | 04:58 | | 05:42 | | 06:20 (Vorbelastung 03) | 06:36 | 07:28 | 07:26 | 08:17 | | | |
| | 21:46 | | 21:04 | 25 | 06:45 (Vorbelastung 03) | 19:55 | 18:42 | 16:36 | 16:00 | | | |
| 8 | 04:59 | | 05:44 | | 06:21 (Vorbelastung 03) | 06:37 | 07:30 | 07:28 | 08:19 | | | |
| | 21:46 | | 21:02 | 24 | 06:45 (Vorbelastung 03) | 19:53 | 18:40 | 16:34 | 16:00 | | | |
| 9 | 05:00 | | 05:45 | | 06:22 (Vorbelastung 03) | 06:39 | 07:32 | 07:30 | 08:20 | | | |
| | 21:45 | | 21:00 | 23 | 06:45 (Vorbelastung 03) | 19:50 | 18:37 | 16:32 | 15:59 | | | |
| 10 | 05:01 | | 05:47 | | 06:22 (Vorbelastung 03) | 06:41 | 07:34 | 07:32 | 08:21 | | | |
| | 21:44 | | 20:58 | 21 | 06:43 (Vorbelastung 03) | 19:48 | 18:35 | 16:30 | 15:59 | | | |
| 11 | 05:02 | | 05:49 | | 06:23 (Vorbelastung 03) | 06:43 | 07:35 | 07:34 | 08:22 | | | |
| | 21:43 | | 20:56 | 20 | 06:43 (Vorbelastung 03) | 19:45 | 18:33 | 16:29 | 15:59 | | | |
| 12 | 05:03 | | 05:50 | | 06:23 (Vorbelastung 03) | 06:44 | 07:37 | 07:36 | 08:23 | | | |
| | 21:42 | | 20:54 | 18 | 06:41 (Vorbelastung 03) | 19:43 | 18:30 | 16:27 | 15:59 | | | |
| 13 | 05:04 | | 05:52 | | 06:25 (Vorbelastung 03) | 06:46 | 07:39 | 07:38 | 08:24 | | | |
| | 21:41 | | 20:52 | 14 | 06:39 (Vorbelastung 03) | 19:40 | 18:28 | 16:25 | 15:58 | | | |
| 14 | 05:06 | | 05:54 | | 06:28 (Vorbelastung 03) | 06:48 | 07:41 | 07:39 | 08:25 | | | |
| | 21:40 | | 20:50 | 9 | 06:37 (Vorbelastung 03) | 19:38 | 18:26 | 16:24 | 15:58 | | | |
| 15 | 05:07 | | 05:56 | | | 06:49 | 07:43 | 07:41 | 08:26 | | | |
| | 21:39 | | 20:48 | | | 19:36 | 18:23 | 16:22 | 15:58 | | | |
| 16 | 05:08 | | 05:57 | | | 06:51 | 07:45 | 07:43 | 08:27 | | | |
| | 21:38 | | 20:45 | | | 19:33 | 18:21 | 16:21 | 15:58 | | | |
| 17 | 05:09 | | 05:59 | | | 06:53 | 07:46 | 07:45 | 08:28 | | | |
| | 21:37 | | 20:43 | | | 19:31 | 18:19 | 16:19 | 15:59 | | | |
| 18 | 05:11 | | 06:01 | | | 06:55 | 07:48 | 07:47 | 08:29 | | | |
| | 21:36 | | 20:41 | | | 19:28 | 18:17 | 16:18 | 15:59 | | | |
| 19 | 05:12 | | 06:03 | | | 06:56 | 07:50 | 07:49 | 08:29 | | | |
| | 21:35 | | 20:39 | | | 19:26 | 18:14 | 16:16 | 15:59 | | | |
| 20 | 05:13 | | 06:04 | | | 06:58 | 07:52 | 07:50 | 08:30 | | | |
| | 21:33 | | 20:37 | | | 19:23 | 18:12 | 16:15 | 15:59 | | | |
| 21 | 05:15 | | 06:06 | | | 07:00 | 07:54 | 07:52 | 08:31 | | | |
| | 21:32 | | 20:35 | | | 19:21 | 18:10 | 16:14 | 16:00 | | | |
| 22 | 05:16 | 06:30 (Vorbelastung 03) | 06:08 | | | 07:02 | 07:56 | 07:54 | 08:31 | | | |
| | 21:31 | 7 | 06:37 (Vorbelastung 03) | 20:32 | | 19:18 | 18:08 | 16:13 | 16:00 | | | |
| 23 | 05:18 | 06:27 (Vorbelastung 03) | 06:09 | | | 07:03 | 07:58 | 07:56 | 08:32 | | | |
| | 21:29 | 12 | 06:39 (Vorbelastung 03) | 20:30 | | 19:16 | 18:06 | 16:11 | 16:01 | | | |
| 24 | 05:19 | 06:26 (Vorbelastung 03) | 06:11 | | | 07:05 | 08:00 | 07:57 | 08:32 | | | |
| | 21:28 | 14 | 06:40 (Vorbelastung 03) | 20:28 | | 19:14 | 18:03 | 16:10 | 16:01 | | | |
| 25 | 05:21 | 06:25 (Vorbelastung 03) | 06:13 | | | 07:07 | 07:01 | 07:59 | 08:33 | | | |
| | 21:26 | 17 | 06:42 (Vorbelastung 03) | 20:26 | | 19:11 | 17:01 | 16:09 | 16:02 | | | |
| 26 | 05:22 | 06:24 (Vorbelastung 03) | 06:15 | | | 07:09 | 07:03 | 08:01 | 08:33 | | | |
| | 21:25 | 19 | 06:43 (Vorbelastung 03) | 20:23 | | 19:09 | 16:59 | 16:08 | 16:03 | | | |
| 27 | 05:24 | 06:23 (Vorbelastung 03) | 06:16 | | | 07:10 | 07:05 | 08:02 | 08:33 | | | |
| | 21:23 | 21 | 06:44 (Vorbelastung 03) | 20:21 | | 19:06 | 16:57 | 16:07 | 16:04 | | | |
| 28 | 05:25 | 06:22 (Vorbelastung 03) | 06:18 | | | 07:12 | 07:07 | 08:04 | 08:33 | | | |
| | 21:22 | 22 | 06:44 (Vorbelastung 03) | 20:19 | | 19:04 | 16:55 | 16:06 | 16:04 | | | |
| 29 | 05:27 | 06:22 (Vorbelastung 03) | 06:20 | | | 07:14 | 07:09 | 08:06 | 08:33 | | | |
| | 21:20 | 24 | 06:46 (Vorbelastung 03) | 20:16 | | 19:01 | 16:53 | 16:05 | 16:05 | | | |
| 30 | 05:29 | 06:21 (Vorbelastung 03) | 06:22 | | | 07:16 | 07:11 | 08:07 | 08:33 | | | |
| | 21:18 | 24 | 06:45 (Vorbelastung 03) | 20:14 | | 18:59 | 16:51 | 16:04 | 16:06 | | | |
| 31 | 05:30 | 06:21 (Vorbelastung 03) | 06:23 | | | | 07:13 | | 08:33 | | | |
| | 21:17 | 25 | 06:46 (Vorbelastung 03) | 20:12 | | | 16:49 | | 16:07 | | | |
| Sonnenscheinstunden | 510 | | 458 | | | 382 | 329 | 261 | 236 | | | |
| astr.max.mögl.Beschattung | 185 | | 310 | | | | | | | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-J - Behr Gemüsehandel GmbH, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 08:33 | 08:04 | 07:07 | 06:53 | 05:45 | 07:12 (Vorbelastung 03) 04:57 |
| | 16:08 | 16:59 | 17:54 | 19:51 | 20:46 | 51 08:03 (Vorbelastung 03) 21:35 |
| 2 | 08:33 | 08:02 | 07:05 | 06:51 | 05:43 | 07:13 (Vorbelastung 03) 04:56 |
| | 16:10 | 17:01 | 17:56 | 19:53 | 20:47 | 50 08:03 (Vorbelastung 03) 21:36 |
| 3 | 08:33 | 08:01 | 07:03 | 06:48 | 05:41 | 07:14 (Vorbelastung 03) 04:55 |
| | 16:11 | 17:03 | 17:58 | 19:55 | 20:49 | 48 08:02 (Vorbelastung 03) 21:37 |
| 4 | 08:33 | 07:59 | 07:00 | 06:46 | 05:39 | 07:14 (Vorbelastung 03) 04:54 |
| | 16:12 | 17:05 | 17:59 | 19:57 | 20:51 | 47 08:01 (Vorbelastung 03) 21:38 |
| 5 | 08:33 | 07:57 | 06:58 | 06:44 | 05:37 | 07:14 (Vorbelastung 03) 04:53 |
| | 16:13 | 17:07 | 18:01 | 19:59 | 20:53 | 46 08:00 (Vorbelastung 03) 21:39 |
| 6 | 08:32 | 07:55 | 06:56 | 06:41 | 05:35 | 07:15 (Vorbelastung 03) 04:52 |
| | 16:14 | 17:09 | 18:03 | 20:00 | 11 07:50 (Vorbelastung 03) 20:54 | 44 07:59 (Vorbelastung 03) 21:40 |
| 7 | 08:32 | 07:53 | 08:20 (Vorbelastung 01) 06:53 | 06:39 | 07:33 (Vorbelastung 03) 05:33 | 07:15 (Vorbelastung 03) 04:52 |
| | 16:16 | 17:11 | 2 08:22 (Vorbelastung 01) 18:05 | 20:02 | 21 07:54 (Vorbelastung 03) 20:56 | 43 07:58 (Vorbelastung 03) 21:41 |
| 8 | 08:31 | 07:52 | 08:18 (Vorbelastung 01) 06:51 | 06:37 | 07:30 (Vorbelastung 03) 05:31 | 07:17 (Vorbelastung 03) 04:51 |
| | 16:17 | 17:13 | 6 08:24 (Vorbelastung 01) 18:07 | 20:04 | 27 07:57 (Vorbelastung 03) 20:58 | 40 07:57 (Vorbelastung 03) 21:42 |
| 9 | 08:31 | 07:50 | 08:16 (Vorbelastung 01) 06:49 | 06:34 | 07:28 (Vorbelastung 03) 05:30 | 07:17 (Vorbelastung 03) 04:51 |
| | 16:19 | 17:15 | 10 08:26 (Vorbelastung 01) 18:09 | 20:06 | 32 08:00 (Vorbelastung 03) 21:00 | 39 07:56 (Vorbelastung 03) 21:43 |
| 10 | 08:30 | 07:48 | 08:14 (Vorbelastung 01) 06:46 | 06:32 | 07:25 (Vorbelastung 03) 05:28 | 07:18 (Vorbelastung 03) 04:50 |
| | 16:20 | 17:17 | 13 08:27 (Vorbelastung 01) 18:11 | 20:08 | 36 08:01 (Vorbelastung 03) 21:01 | 36 07:54 (Vorbelastung 03) 21:44 |
| 11 | 08:29 | 07:46 | 08:12 (Vorbelastung 01) 06:44 | 06:29 | 07:23 (Vorbelastung 03) 05:26 | 07:20 (Vorbelastung 03) 04:50 |
| | 16:22 | 17:19 | 16 08:28 (Vorbelastung 01) 18:13 | 20:09 | 39 08:02 (Vorbelastung 03) 21:03 | 33 07:53 (Vorbelastung 03) 21:45 |
| 12 | 08:29 | 07:44 | 08:10 (Vorbelastung 01) 06:42 | 06:27 | 07:22 (Vorbelastung 03) 05:24 | 07:21 (Vorbelastung 03) 04:49 |
| | 16:23 | 17:21 | 18 08:28 (Vorbelastung 01) 18:15 | 20:11 | 42 08:04 (Vorbelastung 03) 21:05 | 31 07:52 (Vorbelastung 03) 21:45 |
| 13 | 08:28 | 07:42 | 08:08 (Vorbelastung 01) 06:39 | 06:25 | 07:21 (Vorbelastung 03) 05:22 | 07:22 (Vorbelastung 03) 04:49 |
| | 16:25 | 17:23 | 21 08:29 (Vorbelastung 01) 18:16 | 20:13 | 44 08:05 (Vorbelastung 03) 21:07 | 27 07:49 (Vorbelastung 03) 21:46 |
| 14 | 08:27 | 07:40 | 08:06 (Vorbelastung 01) 06:37 | 06:22 | 07:19 (Vorbelastung 03) 05:21 | 07:24 (Vorbelastung 03) 04:49 |
| | 16:26 | 17:25 | 23 08:29 (Vorbelastung 01) 18:18 | 20:15 | 46 08:05 (Vorbelastung 03) 21:08 | 24 07:48 (Vorbelastung 03) 21:47 |
| 15 | 08:26 | 07:38 | 08:04 (Vorbelastung 01) 06:34 | 06:20 | 07:18 (Vorbelastung 03) 05:19 | 07:26 (Vorbelastung 03) 04:49 |
| | 16:28 | 17:27 | 24 08:28 (Vorbelastung 01) 18:20 | 20:17 | 48 08:06 (Vorbelastung 03) 21:10 | 19 07:45 (Vorbelastung 03) 21:47 |
| 16 | 08:25 | 07:36 | 08:04 (Vorbelastung 01) 06:32 | 06:18 | 07:17 (Vorbelastung 03) 05:17 | 07:29 (Vorbelastung 03) 04:48 |
| | 16:30 | 17:28 | 24 08:28 (Vorbelastung 01) 18:22 | 20:18 | 49 08:06 (Vorbelastung 03) 21:12 | 14 07:43 (Vorbelastung 03) 21:48 |
| 17 | 08:24 | 07:34 | 08:05 (Vorbelastung 01) 06:30 | 06:16 | 07:17 (Vorbelastung 03) 05:16 | 07:34 (Vorbelastung 03) 04:48 |
| | 16:31 | 17:30 | 23 08:28 (Vorbelastung 01) 18:24 | 20:20 | 50 08:07 (Vorbelastung 03) 21:13 | 2 07:36 (Vorbelastung 03) 21:48 |
| 18 | 08:23 | 07:32 | 08:05 (Vorbelastung 01) 06:27 | 06:13 | 07:15 (Vorbelastung 03) 05:14 | 07:15 (Vorbelastung 03) 04:48 |
| | 16:33 | 17:32 | 23 08:28 (Vorbelastung 01) 18:26 | 20:22 | 51 08:06 (Vorbelastung 03) 21:15 | 07:14 (Vorbelastung 03) 04:48 |
| 19 | 08:22 | 07:30 | 08:06 (Vorbelastung 01) 06:25 | 06:11 | 07:14 (Vorbelastung 03) 05:13 | 07:14 (Vorbelastung 03) 04:48 |
| | 16:35 | 17:34 | 21 08:27 (Vorbelastung 01) 18:27 | 20:24 | 53 08:07 (Vorbelastung 03) 21:16 | 07:14 (Vorbelastung 03) 04:48 |
| 20 | 08:21 | 07:27 | 08:07 (Vorbelastung 01) 06:22 | 06:09 | 07:14 (Vorbelastung 03) 05:11 | 07:14 (Vorbelastung 03) 04:48 |
| | 16:36 | 17:36 | 18 08:25 (Vorbelastung 01) 18:29 | 20:26 | 53 08:07 (Vorbelastung 03) 21:18 | 07:14 (Vorbelastung 03) 04:48 |
| 21 | 08:20 | 07:25 | 08:08 (Vorbelastung 01) 06:20 | 06:07 | 07:14 (Vorbelastung 03) 05:10 | 07:14 (Vorbelastung 03) 04:48 |
| | 16:38 | 17:38 | 16 08:24 (Vorbelastung 01) 18:31 | 20:28 | 53 08:07 (Vorbelastung 03) 21:19 | 07:13 (Vorbelastung 03) 04:49 |
| 22 | 08:19 | 07:23 | 08:10 (Vorbelastung 01) 06:18 | 06:04 | 07:13 (Vorbelastung 03) 05:08 | 08:07 (Vorbelastung 03) 21:21 |
| | 16:40 | 17:40 | 12 08:22 (Vorbelastung 01) 18:33 | 20:29 | 54 08:07 (Vorbelastung 03) 21:21 | 07:13 (Vorbelastung 03) 05:07 |
| 23 | 08:17 | 07:21 | 08:15 (Vorbelastung 01) 06:15 | 06:02 | 07:13 (Vorbelastung 03) 05:07 | 08:07 (Vorbelastung 03) 21:22 |
| | 16:42 | 17:42 | 3 08:18 (Vorbelastung 01) 18:35 | 20:31 | 54 08:07 (Vorbelastung 03) 21:22 | 07:12 (Vorbelastung 03) 05:06 |
| 24 | 08:16 | 07:19 | 06:13 | 06:00 | 07:12 (Vorbelastung 03) 05:06 | 08:06 (Vorbelastung 03) 21:24 |
| | 16:44 | 17:44 | 18:37 | 20:33 | 54 08:06 (Vorbelastung 03) 21:24 | 07:12 (Vorbelastung 03) 05:04 |
| 25 | 08:15 | 07:16 | 06:10 | 05:58 | 07:12 (Vorbelastung 03) 05:04 | 08:06 (Vorbelastung 03) 21:25 |
| | 16:46 | 17:46 | 18:38 | 20:35 | 54 08:06 (Vorbelastung 03) 21:25 | 07:12 (Vorbelastung 03) 05:03 |
| 26 | 08:13 | 07:14 | 06:08 | 05:56 | 07:12 (Vorbelastung 03) 05:03 | 08:05 (Vorbelastung 03) 21:27 |
| | 16:47 | 17:48 | 18:40 | 20:37 | 53 08:05 (Vorbelastung 03) 21:27 | 07:12 (Vorbelastung 03) 05:02 |
| 27 | 08:12 | 07:12 | 06:05 | 05:53 | 07:12 (Vorbelastung 03) 05:02 | 08:05 (Vorbelastung 03) 21:28 |
| | 16:49 | 17:50 | 18:42 | 20:38 | 53 08:05 (Vorbelastung 03) 21:28 | 07:12 (Vorbelastung 03) 05:01 |
| 28 | 08:10 | 07:10 | 06:03 | 05:51 | 07:12 (Vorbelastung 03) 05:01 | 08:05 (Vorbelastung 03) 21:30 |
| | 16:51 | 17:52 | 18:44 | 20:40 | 53 08:05 (Vorbelastung 03) 21:30 | 07:12 (Vorbelastung 03) 05:00 |
| 29 | 08:09 | | 07:01 | 05:49 | 08:04 (Vorbelastung 03) 21:31 | 08:04 (Vorbelastung 03) 21:31 |
| | 16:53 | | 19:46 | 20:42 | 52 08:04 (Vorbelastung 03) 21:31 | 07:12 (Vorbelastung 03) 04:59 |
| 30 | 08:07 | | 06:58 | 05:47 | 08:03 (Vorbelastung 03) 21:32 | 08:03 (Vorbelastung 03) 21:32 |
| | 16:55 | | 19:48 | 20:44 | 51 08:03 (Vorbelastung 03) 21:32 | 04:58 |
| 31 | 08:06 | | 06:56 | | | 21:33 |
| | 16:57 | | 19:49 | | | 492 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | | 273 | | 1133 | 594 | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-J - Behr Gemüsehandel GmbH, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

- 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

| Juli | | August | | September | | Oktober | | November | | Dezember | | |
|---------------------------|-------|--------|-------------------------|-----------|---------------------------------|---------|---------------------------------|-------------------------|-------------------------|----------|---------------------------------|-------|
| 1 | 04:53 | | 05:32 | 31 | 07:31 (Vorbelastung 03) 06:25 | 39 | 07:22 (Vorbelastung 03) 07:17 | | 07:15 | 12 | 07:44 (Vorbelastung 01) 08:09 | |
| | 21:49 | | 21:15 | | 08:02 (Vorbelastung 03) 20:09 | | 08:01 (Vorbelastung 03) 18:57 | | 16:47 | | 07:56 (Vorbelastung 01) 16:03 | |
| 2 | 04:53 | | 05:33 | | 07:30 (Vorbelastung 03) 06:27 | | 07:24 (Vorbelastung 03) 07:19 | | 07:17 | | 07:46 (Vorbelastung 01) 08:10 | |
| | 21:49 | | 21:13 | 34 | 08:04 (Vorbelastung 03) 20:07 | 36 | 08:00 (Vorbelastung 03) 18:54 | | 16:45 | 9 | 07:55 (Vorbelastung 01) 16:03 | |
| 3 | 04:54 | | 05:35 | | 07:28 (Vorbelastung 03) 06:29 | | 07:26 (Vorbelastung 03) 07:21 | | 07:19 | | 07:48 (Vorbelastung 01) 08:12 | |
| | 21:49 | | 21:11 | 37 | 08:05 (Vorbelastung 03) 20:05 | 32 | 07:58 (Vorbelastung 03) 18:52 | | 16:43 | 6 | 07:54 (Vorbelastung 01) 16:02 | |
| 4 | 04:55 | | 05:37 | | 07:27 (Vorbelastung 03) 06:30 | | 07:27 (Vorbelastung 03) 07:23 | | 07:20 | | 07:50 (Vorbelastung 01) 08:13 | |
| | 21:48 | | 21:09 | 40 | 08:07 (Vorbelastung 03) 20:02 | 27 | 07:54 (Vorbelastung 03) 18:49 | | 16:41 | 2 | 07:52 (Vorbelastung 01) 16:01 | |
| 5 | 04:56 | | 05:38 | | 07:26 (Vorbelastung 03) 06:32 | | 07:30 (Vorbelastung 03) 07:25 | | 07:22 | | 08:15 | |
| | 21:48 | | 21:08 | 41 | 08:07 (Vorbelastung 03) 20:00 | 21 | 07:51 (Vorbelastung 03) 18:47 | | 16:39 | | 16:01 | |
| 6 | 04:57 | | 05:40 | | 07:25 (Vorbelastung 03) 06:34 | | 07:35 (Vorbelastung 03) 07:26 | | 07:24 | | 08:16 | |
| | 21:47 | | 21:06 | 43 | 08:08 (Vorbelastung 03) 19:57 | 12 | 07:47 (Vorbelastung 03) 18:44 | | 16:37 | | 16:00 | |
| 7 | 04:58 | | 05:42 | | 07:24 (Vorbelastung 03) 06:36 | | 07:28 | | 07:26 | | 08:17 | |
| | 21:46 | | 21:04 | 45 | 08:09 (Vorbelastung 03) 19:55 | | 18:42 | | 16:36 | | 16:00 | |
| 8 | 04:59 | | 05:44 | | 07:24 (Vorbelastung 03) 06:37 | | 07:30 | | 07:28 | | 08:19 | |
| | 21:46 | | 21:02 | 46 | 08:10 (Vorbelastung 03) 19:53 | | 18:40 | | 16:34 | | 15:59 | |
| 9 | 05:00 | | 05:45 | | 07:23 (Vorbelastung 03) 06:39 | | 07:32 | | 07:30 | | 08:20 | |
| | 21:45 | | 21:00 | 48 | 08:11 (Vorbelastung 03) 19:50 | | 18:37 | | 16:32 | | 15:59 | |
| 10 | 05:01 | | 05:47 | | 07:22 (Vorbelastung 03) 06:41 | | 07:34 | | 07:32 | | 08:21 | |
| | 21:44 | | 20:58 | 49 | 08:11 (Vorbelastung 03) 19:48 | | 18:35 | | 16:30 | | 15:59 | |
| 11 | 05:02 | | 05:49 | | 07:22 (Vorbelastung 03) 06:42 | | 07:35 | | 07:34 | | 08:22 | |
| | 21:43 | | 20:56 | 50 | 08:12 (Vorbelastung 03) 19:45 | | 18:33 | | 16:29 | | 15:59 | |
| 12 | 05:03 | | 05:50 | | 07:21 (Vorbelastung 03) 06:44 | | 07:37 | | 07:36 | | 08:23 | |
| | 21:42 | | 20:54 | 50 | 08:11 (Vorbelastung 03) 19:43 | | 18:30 | | 16:27 | | 15:58 | |
| 13 | 05:04 | | 05:52 | | 07:20 (Vorbelastung 03) 06:46 | | 07:39 | | 07:37 | | 08:24 | |
| | 21:41 | | 20:52 | 52 | 08:12 (Vorbelastung 03) 19:40 | | 18:28 | | 16:25 | | 15:58 | |
| 14 | 05:05 | | 05:54 | | 07:20 (Vorbelastung 03) 06:48 | | 07:41 | | 07:39 | | 08:25 | |
| | 21:40 | | 20:50 | 53 | 08:13 (Vorbelastung 03) 19:38 | | 18:26 | | 16:24 | | 15:58 | |
| 15 | 05:07 | | 05:56 | | 07:19 (Vorbelastung 03) 06:49 | | 07:43 | | 07:41 | | 08:26 | |
| | 21:39 | | 20:48 | 53 | 08:12 (Vorbelastung 03) 19:36 | | 18:23 | | 16:22 | | 15:58 | |
| 16 | 05:08 | | 05:57 | | 07:19 (Vorbelastung 03) 06:51 | | 07:45 | | 07:43 | | 08:27 | |
| | 21:38 | | 20:45 | 54 | 08:13 (Vorbelastung 03) 19:33 | | 18:21 | | 16:21 | | 15:58 | |
| 17 | 05:09 | | 05:59 | | 07:18 (Vorbelastung 03) 06:53 | | 07:46 | | 07:45 | | 08:28 | |
| | 21:37 | | 20:43 | 54 | 08:12 (Vorbelastung 03) 19:31 | | 18:19 | | 16:19 | | 15:59 | |
| 18 | 05:11 | | 06:01 | | 07:18 (Vorbelastung 03) 06:55 | | 07:48 | | 07:47 | | 08:29 | |
| | 21:36 | | 20:41 | 54 | 08:12 (Vorbelastung 03) 19:28 | | 18:17 | | 16:18 | | 15:59 | |
| 19 | 05:12 | | 06:02 | | 07:19 (Vorbelastung 03) 06:56 | | 07:50 | 08:43 (Vorbelastung 01) | 07:49 | | 08:29 | |
| | 21:35 | | 20:39 | 54 | 08:13 (Vorbelastung 03) 19:26 | | 18:14 | 7 | 08:50 (Vorbelastung 01) | 16:16 | | 15:59 |
| 20 | 05:13 | | 06:04 | | 07:18 (Vorbelastung 03) 06:58 | | 07:52 | 08:40 (Vorbelastung 01) | 07:50 | | 08:30 | |
| | 21:33 | | 20:37 | 54 | 08:12 (Vorbelastung 03) 19:23 | | 18:12 | 13 | 08:53 (Vorbelastung 01) | 16:15 | | 15:59 |
| 21 | 05:15 | | 06:06 | | 07:18 (Vorbelastung 03) 07:00 | | 07:54 | 08:38 (Vorbelastung 01) | 07:52 | | 08:31 | |
| | 21:32 | | 20:35 | 54 | 08:12 (Vorbelastung 03) 19:21 | | 18:10 | 17 | 08:55 (Vorbelastung 01) | 16:14 | | 16:00 |
| 22 | 05:16 | | 06:08 | | 07:18 (Vorbelastung 03) 07:02 | | 07:56 | 08:37 (Vorbelastung 01) | 07:54 | | 08:31 | |
| | 21:31 | | 20:32 | 54 | 08:12 (Vorbelastung 03) 19:18 | | 18:08 | 19 | 08:56 (Vorbelastung 01) | 16:13 | | 16:00 |
| 23 | 05:18 | | 06:09 | | 07:18 (Vorbelastung 03) 07:03 | | 07:58 | 08:36 (Vorbelastung 01) | 07:56 | | 08:32 | |
| | 21:29 | | 20:30 | 53 | 08:11 (Vorbelastung 03) 19:16 | | 18:06 | 21 | 08:57 (Vorbelastung 01) | 16:11 | | 16:01 |
| 24 | 05:19 | | 06:11 | | 07:18 (Vorbelastung 03) 07:05 | | 07:59 | 08:35 (Vorbelastung 01) | 07:57 | | 08:32 | |
| | 21:28 | | 20:28 | 52 | 08:10 (Vorbelastung 03) 19:14 | | 18:03 | 22 | 08:57 (Vorbelastung 01) | 16:10 | | 16:01 |
| 25 | 05:21 | | 06:13 | | 07:19 (Vorbelastung 03) 07:07 | | 07:01 | 07:34 (Vorbelastung 01) | 07:59 | | 08:33 | |
| | 21:26 | | 20:26 | 51 | 08:10 (Vorbelastung 03) 19:11 | | 17:01 | 24 | 07:58 (Vorbelastung 01) | 16:09 | | 16:02 |
| 26 | 05:22 | | 06:15 | | 07:18 (Vorbelastung 03) 07:09 | | 07:03 | 07:34 (Vorbelastung 01) | 08:01 | | 08:33 | |
| | 21:25 | | 20:23 | 51 | 08:09 (Vorbelastung 03) 19:09 | | 16:59 | 24 | 07:58 (Vorbelastung 01) | 16:08 | | 16:03 |
| 27 | 05:24 | 9 | 07:42 (Vorbelastung 03) | 06:16 | 07:19 (Vorbelastung 03) 07:10 | | 07:05 | 07:34 (Vorbelastung 01) | 08:02 | | 08:33 | |
| | 21:23 | | 07:51 (Vorbelastung 03) | 20:21 | 08:08 (Vorbelastung 03) 19:06 | | 16:57 | 24 | 07:58 (Vorbelastung 01) | 16:07 | | 16:03 |
| 28 | 05:25 | | 07:38 (Vorbelastung 03) | 06:18 | 07:20 (Vorbelastung 03) 07:12 | | 07:07 | 07:36 (Vorbelastung 01) | 08:04 | | 08:33 | |
| | 21:22 | 17 | 07:55 (Vorbelastung 03) | 20:19 | 08:07 (Vorbelastung 03) 19:04 | | 16:55 | 23 | 07:59 (Vorbelastung 01) | 16:06 | | 16:04 |
| 29 | 05:27 | | 07:36 (Vorbelastung 03) | 06:20 | 07:20 (Vorbelastung 03) 07:14 | | 07:09 | 07:38 (Vorbelastung 01) | 08:06 | | 08:33 | |
| | 21:20 | 22 | 07:58 (Vorbelastung 03) | 20:16 | 08:06 (Vorbelastung 03) 19:01 | | 16:53 | 20 | 07:58 (Vorbelastung 01) | 16:05 | | 16:05 |
| 30 | 05:29 | | 07:34 (Vorbelastung 03) | 06:22 | 07:21 (Vorbelastung 03) 07:16 | | 07:11 | 07:40 (Vorbelastung 01) | 08:07 | | 08:33 | |
| | 21:18 | 25 | 07:59 (Vorbelastung 03) | 20:14 | 08:05 (Vorbelastung 03) 18:59 | | 16:51 | 18 | 07:58 (Vorbelastung 01) | 16:04 | | 16:06 |
| 31 | 05:30 | | 07:32 (Vorbelastung 03) | 06:23 | 07:22 (Vorbelastung 03) | | 07:13 | 07:42 (Vorbelastung 01) | | | | 08:33 |
| | 21:17 | 29 | 08:01 (Vorbelastung 03) | 20:12 | 08:03 (Vorbelastung 03) | | 16:49 | 15 | 07:57 (Vorbelastung 01) | | | 16:07 |
| Sonnenscheinstunden | | 510 | | 458 | | 382 | | 329 | | 261 | | 236 |
| astr.max.mögl.Beschattung | | 102 | | 1484 | | 167 | | 247 | | 29 | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-K - Heide 6, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | Juni | |
|---------------------------|----------------|----------------|----------------------------------------------------|----------------|----------------|----------------|----------------|
| 1 | 08:33 16:08 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | 05:41 20:49 | 04:55 21:37 | |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:01 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | |
| 5 | 08:33 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:59 | 05:37 20:53 | 04:53 21:39 | |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:55 | 04:52 21:40 | |
| 7 | 08:32 16:16 | 07:54 17:11 | 06:54 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | |
| 9 | 08:31 16:19 | 07:50 17:15 | 08:25 (Vorbelastung 03) 08:37 (Vorbelastung 03) | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 08:22 (Vorbelastung 03) 08:39 (Vorbelastung 03) | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 08:21 (Vorbelastung 03) 08:41 (Vorbelastung 03) | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 08:19 (Vorbelastung 03) 08:42 (Vorbelastung 03) | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 08:19 (Vorbelastung 03) 08:44 (Vorbelastung 03) | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 08:18 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 08:16 (Vorbelastung 03) 08:44 (Vorbelastung 03) | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 08:16 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:32 18:22 | 06:18 20:19 | 05:17 21:12 | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 08:16 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 08:16 (Vorbelastung 03) 08:46 (Vorbelastung 03) | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:30 17:34 | 08:16 (Vorbelastung 03) 08:46 (Vorbelastung 03) | 06:25 18:28 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 08:15 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:50 |
| 21 | 08:20 16:38 | 07:25 17:38 | 08:15 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:48 21:50 |
| 22 | 08:19 16:40 | 07:23 17:40 | 08:16 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 08:17 (Vorbelastung 03) 08:44 (Vorbelastung 03) | 06:15 18:35 | 06:02 20:31 | 05:07 21:23 | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 08:17 (Vorbelastung 03) 08:43 (Vorbelastung 03) | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 |
| 25 | 08:15 16:46 | 07:16 17:46 | 08:18 (Vorbelastung 03) 08:42 (Vorbelastung 03) | 06:10 18:39 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 08:19 (Vorbelastung 03) 08:41 (Vorbelastung 03) | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 08:20 (Vorbelastung 03) 08:38 (Vorbelastung 03) | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 08:23 (Vorbelastung 03) 08:36 (Vorbelastung 03) | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 | 04:51 21:50 |
| 29 | 08:09 16:53 | | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:50 |
| 31 | 08:06 16:57 | | | 06:56 19:49 | | 04:57 21:33 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | |
| astr.max.mögl.Beschattung | | 489 | | | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-K - Heide 6, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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

| | July | August | September | Oktober | | November | | Dezember |
|---------------------------|----------------|----------------|----------------|----------------|----|----------------------------------------------------|----|----------------------------------|
| 1 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:57 | | 07:15 16:47 | 16 | 07:52 (Vorbelastung 03) 16:03 |
| 2 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | | 07:17 16:45 | 11 | 07:55 (Vorbelastung 03) 16:03 |
| 3 | 04:54 21:49 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | | 07:19 16:43 | | 08:12 16:02 |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | | 07:20 16:41 | | 08:13 16:01 |
| 5 | 04:56 21:48 | 05:38 21:08 | 06:32 20:00 | 07:25 18:47 | | 07:22 16:39 | | 08:15 16:01 |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:45 | | 07:24 16:37 | | 08:16 16:00 |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | | 07:26 16:36 | | 08:17 16:00 |
| 8 | 04:59 21:46 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | | 07:28 16:34 | | 08:19 15:59 |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | | 07:30 16:32 | | 08:20 15:59 |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | | 07:32 16:30 | | 08:21 15:59 |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | | 07:34 16:29 | | 08:22 15:59 |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | | 07:36 16:27 | | 08:23 15:58 |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 9 | 08:58 (Vorbelastung 03) 09:07 (Vorbelastung 03) | | 07:38 16:25 |
| 14 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 15 | 08:55 (Vorbelastung 03) 09:10 (Vorbelastung 03) | | 07:39 16:24 |
| 15 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 19 | 08:53 (Vorbelastung 03) 09:12 (Vorbelastung 03) | | 07:41 16:22 |
| 16 | 05:08 21:38 | 05:57 20:46 | 06:51 19:33 | 07:45 18:21 | 22 | 08:51 (Vorbelastung 03) 09:13 (Vorbelastung 03) | | 07:43 16:21 |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 24 | 08:50 (Vorbelastung 03) 09:14 (Vorbelastung 03) | | 07:45 16:19 |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 26 | 08:48 (Vorbelastung 03) 09:14 (Vorbelastung 03) | | 07:47 16:18 |
| 19 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 28 | 08:47 (Vorbelastung 03) 09:15 (Vorbelastung 03) | | 07:49 16:16 |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 29 | 08:46 (Vorbelastung 03) 09:15 (Vorbelastung 03) | | 07:50 16:15 |
| 21 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 29 | 08:46 (Vorbelastung 03) 09:15 (Vorbelastung 03) | | 07:52 16:14 |
| 22 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 30 | 08:45 (Vorbelastung 03) 09:15 (Vorbelastung 03) | | 07:54 16:13 |
| 23 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 30 | 08:45 (Vorbelastung 03) 09:15 (Vorbelastung 03) | | 07:56 16:11 |
| 24 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 08:00 18:03 | 30 | 08:45 (Vorbelastung 03) 09:15 (Vorbelastung 03) | | 07:57 16:10 |
| 25 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 07:01 17:01 | 30 | 07:45 (Vorbelastung 03) 08:15 (Vorbelastung 03) | | 07:59 16:09 |
| 26 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 28 | 07:46 (Vorbelastung 03) 08:14 (Vorbelastung 03) | | 08:01 16:08 |
| 27 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 28 | 07:47 (Vorbelastung 03) 08:15 (Vorbelastung 03) | | 08:02 16:07 |
| 28 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 26 | 07:48 (Vorbelastung 03) 08:14 (Vorbelastung 03) | | 08:04 16:06 |
| 29 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 25 | 07:48 (Vorbelastung 03) 08:13 (Vorbelastung 03) | | 08:06 16:05 |
| 30 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 23 | 07:49 (Vorbelastung 03) 08:12 (Vorbelastung 03) | | 08:07 16:04 |
| 31 | 05:30 21:17 | 06:23 20:12 | | 07:13 16:49 | 19 | 07:51 (Vorbelastung 03) 08:10 (Vorbelastung 03) | | 08:34 16:07 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | | 261 | 27 | 236 |
| astr.max.mögl.Beschattung | | | | 470 | | | | |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-L - Gewerbegebiet Gresse, Gresse

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:08 | 10:14 (Vorbelastung 03) | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:56 21:35 |
| 2 | 08:33 16:09 | 10:15 (Vorbelastung 03) | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 |
| 3 | 08:33 16:11 | 10:15 (Vorbelastung 03) | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 |
| 4 | 08:33 16:12 | 10:16 (Vorbelastung 03) | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 |
| 5 | 08:33 16:13 | 10:16 (Vorbelastung 03) | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 |
| 6 | 08:32 16:14 | 10:17 (Vorbelastung 03) | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:52 21:40 |
| 7 | 08:32 16:16 | 10:17 (Vorbelastung 03) | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 |
| 8 | 08:31 16:17 | 10:17 (Vorbelastung 03) | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 |
| 9 | 08:31 16:19 | 10:18 (Vorbelastung 03) | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:29 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 10:19 (Vorbelastung 03) | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:21 | 10:19 (Vorbelastung 03) | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 10:20 (Vorbelastung 03) | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 10:20 (Vorbelastung 03) | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 04:49 21:46 |
| 14 | 08:27 16:26 | 10:21 (Vorbelastung 03) | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 10:22 (Vorbelastung 03) | 07:38 17:26 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 |
| 16 | 08:25 16:29 | 10:22 (Vorbelastung 03) | 07:36 17:28 | 06:32 18:22 | 06:18 20:18 | 05:17 21:12 | 04:48 21:48 |
| 17 | 08:24 16:31 | 10:23 (Vorbelastung 03) | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 10:23 (Vorbelastung 03) | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 10:24 (Vorbelastung 03) | 07:30 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 10:26 (Vorbelastung 03) | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:50 |
| 21 | 08:20 16:38 | 10:26 (Vorbelastung 03) | 07:25 17:38 | 06:20 18:31 | 06:06 20:28 | 05:10 21:19 | 04:48 21:50 |
| 22 | 08:19 16:40 | 10:27 (Vorbelastung 03) | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 |
| 23 | 08:17 16:42 | 10:28 (Vorbelastung 03) | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 |
| 24 | 08:16 16:44 | 10:30 (Vorbelastung 03) | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 |
| 25 | 08:15 16:45 | 10:31 (Vorbelastung 03) | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:49 21:50 |
| 26 | 08:13 16:47 | 10:33 (Vorbelastung 03) | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 16:49 | 10:35 (Vorbelastung 03) | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 16:51 | 10:38 (Vorbelastung 03) | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 | 04:51 21:50 |
| 29 | 08:09 16:53 | 10:45 (Vorbelastung 03) | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | 10:46 (Vorbelastung 03) | | 06:58 19:48 | 05:47 20:44 | 04:58 21:32 | 04:52 21:50 |
| 31 | 08:06 16:57 | | | 06:56 19:49 | | 04:57 21:33 | |
| Sonnenscheinstunden | 252 | | 274 | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | 1058 | | | | | | |

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) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Vorbelastung WEA 2 **Schattenrezeptor:** IO-L - Gewerbegebiet Gresse, Gresse

Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | | 08:09 16:03 43 10:01 (Vorbelastung 03) |
| 2 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | | 08:10 16:03 43 10:02 (Vorbelastung 03) |
| 3 | 04:54 21:49 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:19 16:43 | | 08:12 16:02 44 10:01 (Vorbelastung 03) |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | | 08:13 16:01 44 10:02 (Vorbelastung 03) |
| 5 | 04:56 21:48 | 05:38 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | | 08:15 16:01 44 10:02 (Vorbelastung 03) |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | | 08:16 16:00 44 10:03 (Vorbelastung 03) |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | | 08:17 16:00 44 10:03 (Vorbelastung 03) |
| 8 | 04:59 21:46 | 05:43 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | | 08:19 15:59 44 10:03 (Vorbelastung 03) |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | | 08:20 15:59 44 10:04 (Vorbelastung 03) |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | | 08:21 15:59 44 10:04 (Vorbelastung 03) |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | | 08:22 15:59 44 10:04 (Vorbelastung 03) |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | | 08:23 15:58 44 10:05 (Vorbelastung 03) |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:38 16:25 | 3 | 10:16 (Vorbelastung 03) 08:24 10:19 (Vorbelastung 03) 15:58 44 10:05 (Vorbelastung 03) |
| 14 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 15 | 10:10 (Vorbelastung 03) 08:25 10:25 (Vorbelastung 03) 15:58 44 10:06 (Vorbelastung 03) |
| 15 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 20 | 10:08 (Vorbelastung 03) 08:26 10:28 (Vorbelastung 03) 15:58 44 10:06 (Vorbelastung 03) |
| 16 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 24 | 10:06 (Vorbelastung 03) 08:27 10:30 (Vorbelastung 03) 15:58 44 10:07 (Vorbelastung 03) |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 27 | 10:05 (Vorbelastung 03) 08:28 10:32 (Vorbelastung 03) 15:59 44 10:07 (Vorbelastung 03) |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 29 | 10:04 (Vorbelastung 03) 08:29 10:33 (Vorbelastung 03) 15:59 44 10:08 (Vorbelastung 03) |
| 19 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:49 16:16 | 32 | 10:03 (Vorbelastung 03) 08:29 10:35 (Vorbelastung 03) 15:59 44 10:08 (Vorbelastung 03) |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 34 | 10:02 (Vorbelastung 03) 08:30 10:36 (Vorbelastung 03) 15:59 43 10:09 (Vorbelastung 03) |
| 21 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 35 | 10:02 (Vorbelastung 03) 08:31 10:37 (Vorbelastung 03) 16:00 43 10:10 (Vorbelastung 03) |
| 22 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:12 | 36 | 10:02 (Vorbelastung 03) 08:31 10:38 (Vorbelastung 03) 16:00 43 10:10 (Vorbelastung 03) |
| 23 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 38 | 10:01 (Vorbelastung 03) 08:32 10:39 (Vorbelastung 03) 16:01 43 10:11 (Vorbelastung 03) |
| 24 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 39 | 10:01 (Vorbelastung 03) 08:32 10:40 (Vorbelastung 03) 16:01 44 10:11 (Vorbelastung 03) |
| 25 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 08:01 17:01 | 07:59 16:09 | 40 | 10:00 (Vorbelastung 03) 08:33 10:40 (Vorbelastung 03) 16:02 44 10:11 (Vorbelastung 03) |
| 26 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 08:01 16:59 | 08:01 16:08 | 41 | 10:00 (Vorbelastung 03) 08:33 10:41 (Vorbelastung 03) 16:03 44 10:11 (Vorbelastung 03) |
| 27 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 08:02 16:57 | 08:02 16:07 | 41 | 10:01 (Vorbelastung 03) 08:33 10:42 (Vorbelastung 03) 16:03 43 10:12 (Vorbelastung 03) |
| 28 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 08:04 16:55 | 08:04 16:06 | 41 | 10:01 (Vorbelastung 03) 08:33 10:42 (Vorbelastung 03) 16:04 44 10:12 (Vorbelastung 03) |
| 29 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 08:06 16:53 | 08:06 16:05 | 42 | 10:01 (Vorbelastung 03) 08:33 10:43 (Vorbelastung 03) 16:05 44 10:12 (Vorbelastung 03) |
| 30 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 08:07 16:51 | 08:07 16:04 | 42 | 10:01 (Vorbelastung 03) 08:33 10:43 (Vorbelastung 03) 16:06 44 10:13 (Vorbelastung 03) |
| 31 | 05:30 21:17 | 06:23 20:12 | | 08:07 16:49 | | | 08:33 16:07 43 10:14 (Vorbelastung 03) |
| | Sonnenscheinstunden 510 | 458 | 382 | 329 | 261 | | 236 |
| | astr.max.mögl.Beschattung | | | | 579 | | 1356 |

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: Vorbelastung WEA 2 **Schattenrezeptor:** IO-M - Badekower Strasse 14, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 08:33 | 11:18 (Vorbelastung 03) | 08:04 | 07:07 | 06:53 | 05:45 | 04:56 | 04:53 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| 2 | 16:08 | 23 11:41 (Vorbelastung 03) | 16:59 | 17:54 | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:56 | 16:47 | 16:03 |
| 3 | 08:33 | 11:19 (Vorbelastung 03) | 08:02 | 07:05 | 06:51 | 05:43 | 04:56 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 |
| 4 | 16:09 | 22 11:41 (Vorbelastung 03) | 17:01 | 17:56 | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 |
| 5 | 08:33 | 11:19 (Vorbelastung 03) | 08:01 | 07:03 | 06:48 | 05:41 | 04:55 | 04:54 | 05:35 | 06:29 | 07:21 | 07:19 | 08:12 |
| 6 | 16:11 | 21 11:40 (Vorbelastung 03) | 17:03 | 17:58 | 19:55 | 20:49 | 21:37 | 21:49 | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 |
| 7 | 08:33 | 11:21 (Vorbelastung 03) | 07:59 | 07:00 | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| 8 | 16:12 | 19 11:40 (Vorbelastung 03) | 17:05 | 17:59 | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 9 | 08:33 | 11:22 (Vorbelastung 03) | 07:57 | 06:58 | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:25 | 07:22 | 08:15 |
| 10 | 16:13 | 17 11:39 (Vorbelastung 03) | 17:07 | 18:01 | 19:58 | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 11 | 08:32 | 11:24 (Vorbelastung 03) | 07:55 | 06:56 | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| 12 | 16:14 | 15 11:39 (Vorbelastung 03) | 17:09 | 18:03 | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 13 | 08:32 | 11:26 (Vorbelastung 03) | 07:53 | 06:53 | 06:39 | 05:33 | 04:52 | 04:58 | 05:42 | 06:35 | 07:28 | 07:26 | 08:17 |
| 14 | 16:16 | 11 11:37 (Vorbelastung 03) | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 16:36 | 16:00 |
| 15 | 08:31 | 11:29 (Vorbelastung 03) | 07:52 | 06:51 | 06:37 | 05:31 | 04:51 | 04:59 | 05:43 | 06:37 | 07:30 | 07:28 | 08:19 |
| 16 | 16:17 | 5 11:34 (Vorbelastung 03) | 17:13 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:53 | 18:40 | 16:34 | 15:59 |
| 17 | 08:31 | | 07:50 | 06:49 | 06:34 | 05:29 | 04:51 | 05:00 | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| 18 | 16:19 | | 17:15 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 19 | 08:30 | | 07:48 | 06:46 | 06:32 | 05:28 | 04:50 | 05:01 | 05:47 | 06:41 | 07:34 | 07:32 | 08:21 |
| 20 | 16:20 | | 17:17 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 21 | 08:29 | | 07:46 | 06:44 | 06:29 | 05:26 | 04:50 | 05:02 | 05:49 | 06:42 | 07:35 | 07:34 | 08:22 |
| 22 | 16:21 | | 17:19 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 16:29 | 15:59 |
| 23 | 08:29 | | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| 24 | 16:23 | | 17:21 | 18:15 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 25 | 08:28 | | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:39 | 07:38 | 08:24 |
| 26 | 16:25 | | 17:23 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 27 | 08:27 | | 07:40 | 06:37 | 06:22 | 05:21 | 04:49 | 05:05 | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| 28 | 16:26 | | 17:25 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 29 | 08:26 | | 07:38 | 06:34 | 06:20 | 05:19 | 04:48 | 05:07 | 05:55 | 06:49 | 07:43 | 07:41 | 08:26 |
| 30 | 16:28 | | 17:26 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 20:48 | 19:36 | 18:23 | 16:22 | 15:58 |
| 31 | 08:25 | | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:45 | 07:43 | 08:27 |
| 32 | 16:29 | | 17:28 | 18:22 | 20:18 | 21:12 | 21:48 | 21:38 | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 |
| 33 | 08:24 | | 07:34 | 06:30 | 06:16 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 |
| 34 | 16:31 | | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18:19 | 16:19 | 15:58 |
| 35 | 08:23 | | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:11 | 06:01 | 06:55 | 07:48 | 07:47 | 08:29 |
| 36 | 16:33 | | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 |
| 37 | 08:22 | | 07:30 | 06:25 | 06:11 | 05:13 | 04:48 | 05:12 | 06:02 | 06:56 | 07:50 | 07:49 | 08:29 |
| 38 | 16:35 | | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 |
| 39 | 08:21 | | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 |
| 40 | 16:36 | | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 |
| 41 | 08:20 | | 07:25 | 06:20 | 06:06 | 05:10 | 04:48 | 05:15 | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 |
| 42 | 16:38 | | 17:38 | 18:31 | 20:28 | 21:19 | 21:50 | 21:32 | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 |
| 43 | 08:19 | | 07:23 | 06:18 | 06:04 | 05:08 | 04:49 | 05:16 | 06:08 | 07:02 | 07:56 | 07:54 | 08:31 |
| 44 | 16:40 | | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 16:12 | 16:00 |
| 45 | 08:17 | | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 |
| 46 | 16:42 | | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 |
| 47 | 08:16 | | 07:19 | 06:13 | 06:00 | 05:06 | 04:49 | 05:19 | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 |
| 48 | 16:44 | | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 |
| 49 | 08:15 | | 07:16 | 06:10 | 05:58 | 05:04 | 04:49 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:33 |
| 50 | 16:45 | | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 20:26 | 19:11 | 18:01 | 16:09 | 16:02 |
| 51 | 08:13 | | 07:14 | 06:08 | 05:56 | 05:03 | 04:50 | 05:22 | 06:15 | 07:09 | 07:03 | 08:01 | 08:33 |
| 52 | 16:47 | | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 18:59 | 16:08 | 16:03 |
| 53 | 08:12 | | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 |
| 54 | 16:49 | | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 18:57 | 16:07 | 16:03 |
| 55 | 08:10 | | 07:10 | 06:03 | 05:51 | 05:01 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 |
| 56 | 16:51 | | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 18:55 | 16:06 | 16:04 |
| 57 | 08:09 | | 07:01 | 05:49 | 05:00 | 04:51 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | 11:14 |
| 58 | 16:53 | | 19:46 | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 18:53 | 16:05 | 16:05 | 26 11:40 |
| 59 | 08:07 | | 06:58 | 05:47 | 04:58 | 04:52 | 05:29 | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | 11:15 |
| 60 | 16:55 | | 19:48 | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 | 25 11:40 |
| 61 | 08:06 | | 06:56 | | 04:57 | | 05:30 | 06:23 | | 07:13 | | 08:33 | 11:16 |
| 62 | 16:57 | | 19:49 | | 21:33 | | 21:17 | 20:12 | | 16:49 | | 16:07 | 24 11:40 |
| 63 | Sonnenscheinstunden | 252 | | | | | | | | | | | |
| 64 | astr.max.mögl.Beschattung | 133 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 652 |

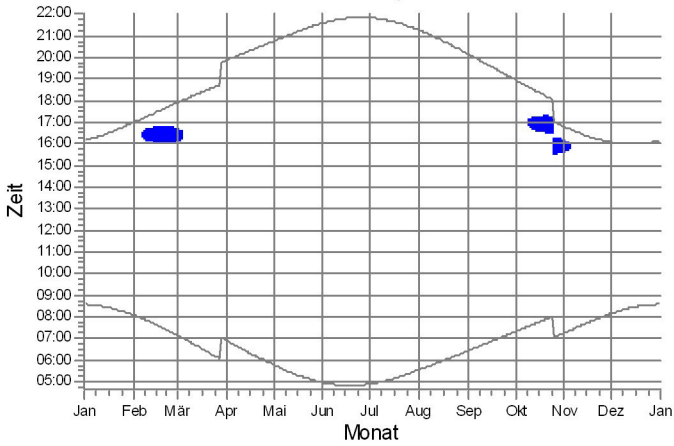
Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

| | | | |
|--------------|-------------------------|----------------------|-----------------------------------------------------------|
| 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) |

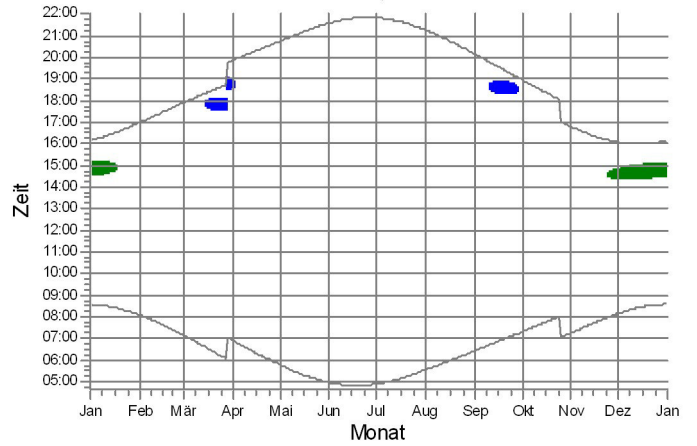
SHADOW - Grafischer Kalender

Berechnung: Vorbelastung WEA 2

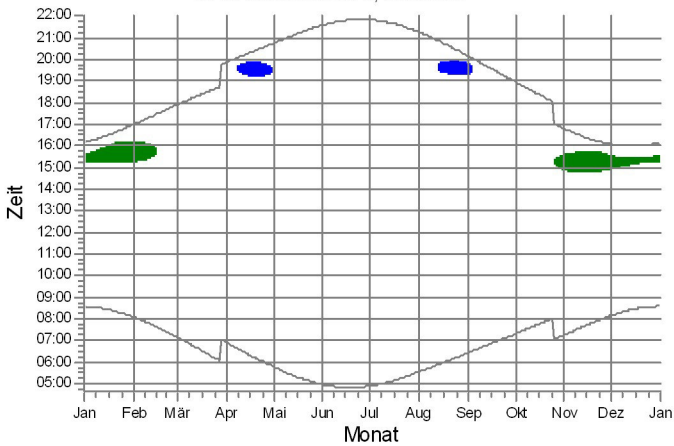
IO-A: Gresser Strasse 4, Badekow



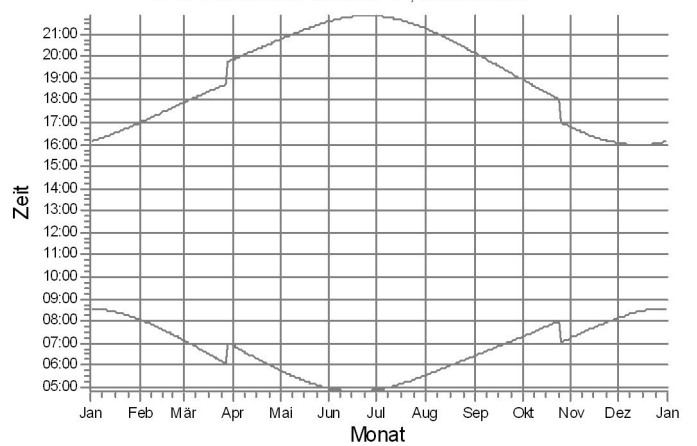
IO-B: Dorfstrasse 5, Badekow



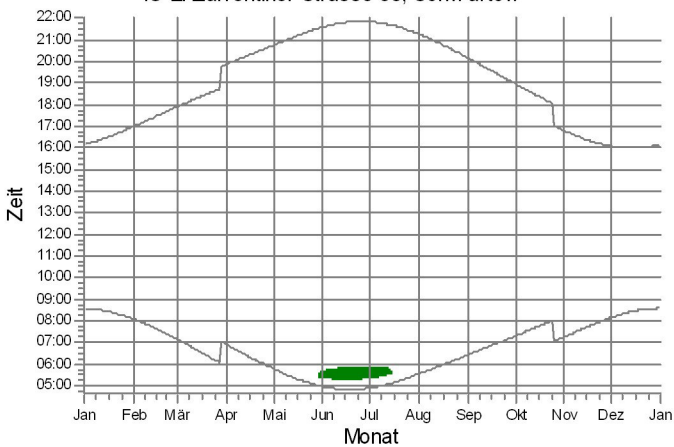
IO-C: Dorfstrasse 1, Badekow



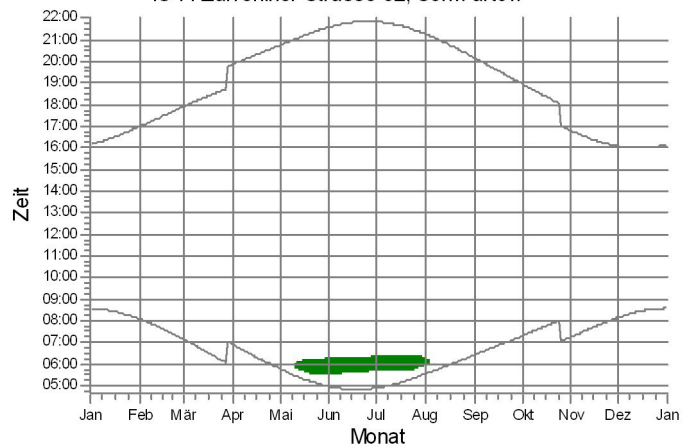
IO-D: Zarrentiner Strasse 44, Schwartow



IO-E: Zarrentiner Strasse 50, Schwartow



IO-F: Zarrentiner Strasse 62, Schwartow



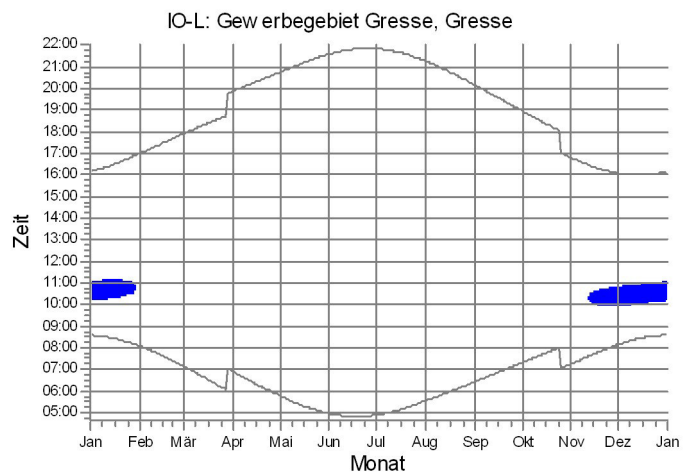
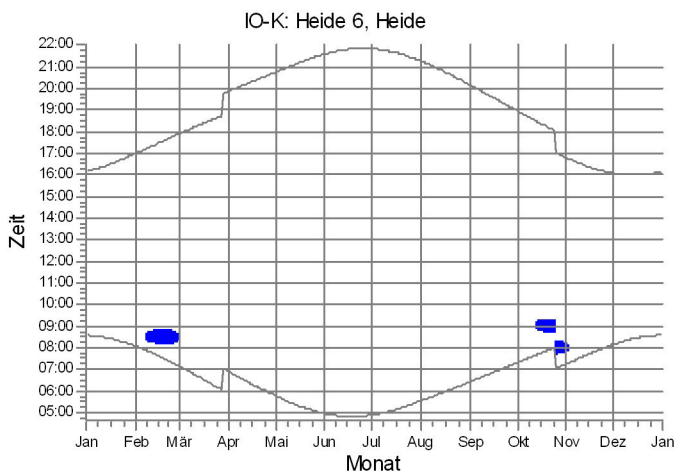
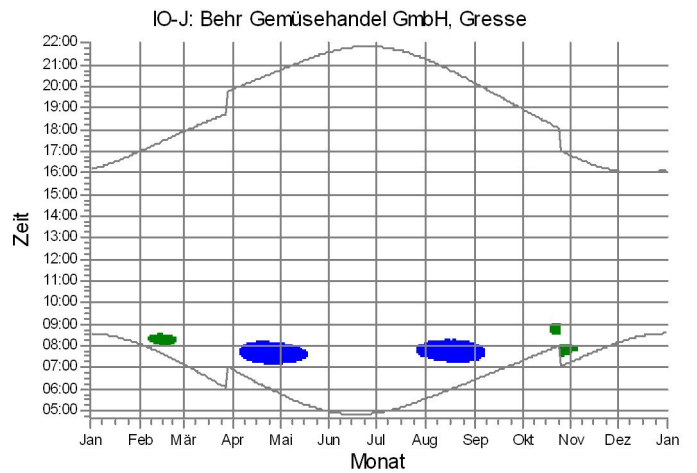
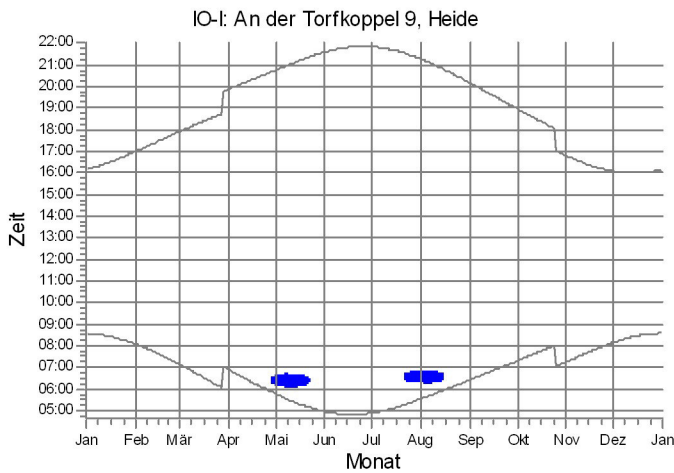
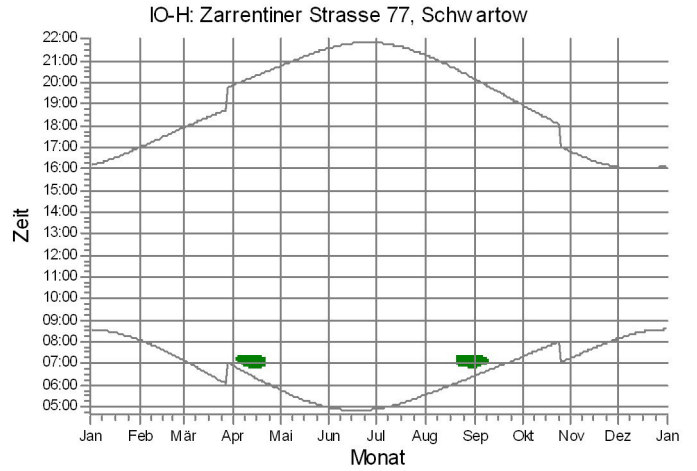
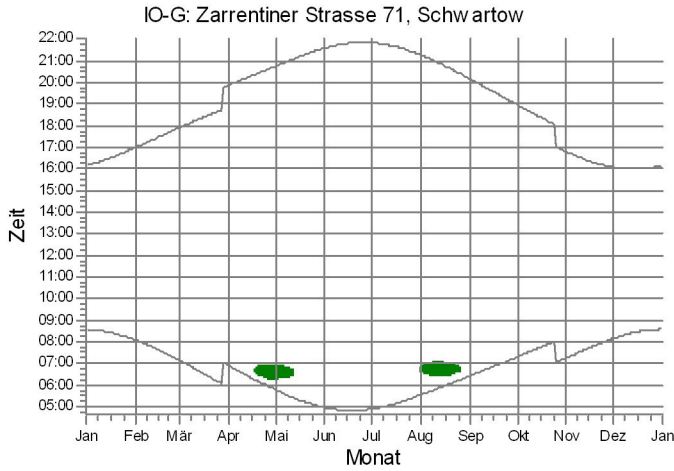
WEA

Vorbelastung 01: Vorbelastung 01

Vorbelastung 03: Vorbelastung 03

SHADOW - Grafischer Kalender

Berechnung: Vorbelastung WEA 2



WEA

Vorbelastung 01: Vorbelastung 01

Vorbelastung 03: Vorbelastung 03

Projekt:

Windpark Boizenburg WEA 2

Lizenzierter Anwender:

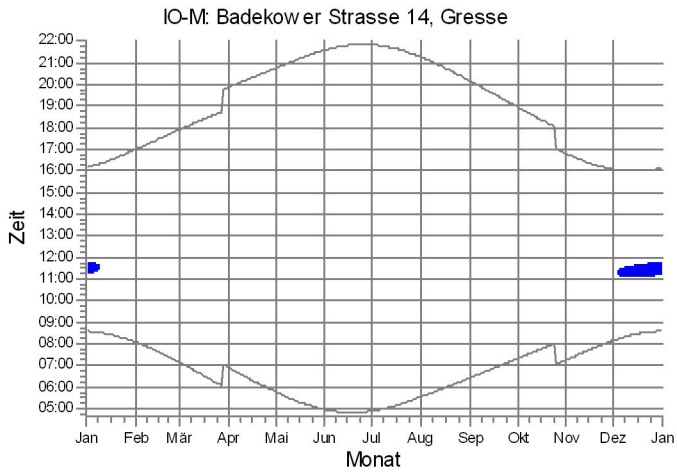
Die Naturschutzplaner GmbH
Nürnberger Strasse 28
DE-74074 Heilbronn

Berechnet:

06.08.2019 13:01/3.3.261

SHADOW - Grafischer Kalender

Berechnung: Vorbelastung WEA 2



WEA



Vorbelastung 03: Vorbelastung 03

SHADOW - Kalender pro WEA

Berechnung: Vorbelastung WEA 2 **WEA:** Vorbelastung 01 - Vorbelastung 01

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 15:19-15:32/13 16:08 14:34-15:06/32 | 08:04 15:20-16:06/46 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 06:20-06:50/30 20:45 | 04:57 05:37-06:11/34 21:35 05:27-05:36/9 |
| 2 | 08:33 15:19-15:32/13 16:10 14:34-15:06/32 | 08:02 15:20-16:06/46 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 06:21-06:50/29 20:47 | 04:56 05:26-06:11/45 21:36 |
| 3 | 08:33 15:19-15:34/15 16:11 14:35-15:06/31 | 08:00 15:21-16:06/45 17:03 | 07:03 17:57 | 06:48 19:55 | 05:41 06:21-06:50/29 20:49 | 04:55 05:25-06:11/46 21:37 |
| 4 | 08:33 15:19-15:35/16 16:12 14:36-15:07/31 | 07:59 15:22-16:06/44 17:05 | 07:00 17:59 | 06:46 07:09-07:11/2 19:57 | 05:39 06:21-06:49/28 20:51 | 04:54 05:25-06:12/47 21:38 |
| 5 | 08:32 15:19-15:36/17 16:13 14:36-15:07/31 | 07:57 15:23-16:05/42 17:07 | 06:58 18:01 | 06:44 07:07-07:15/8 19:58 | 05:37 06:22-06:48/26 20:53 | 04:53 05:24-06:12/48 21:39 |
| 6 | 08:32 15:19-15:38/19 16:14 14:37-15:07/30 | 07:55 15:23-16:05/42 17:09 | 06:56 18:03 | 06:41 07:05-07:17/12 20:00 | 05:35 06:22-06:47/25 20:54 | 04:52 05:23-06:11/48 21:40 |
| 7 | 08:32 15:19-15:39/20 16:16 14:38-15:07/29 | 07:53 08:20-08:22/2 17:11 15:24-16:04/40 | 06:53 18:05 | 06:39 07:02-07:17/15 20:02 | 05:33 06:23-06:46/23 20:56 | 04:52 05:23-06:12/49 21:41 |
| 8 | 08:31 15:18-15:41/23 16:17 14:38-15:07/29 | 07:52 08:18-08:24/6 17:13 15:25-16:03/38 | 06:51 18:07 | 06:36 07:00-07:18/18 20:04 | 05:31 06:24-06:45/21 20:58 | 04:51 05:22-06:11/49 21:42 |
| 9 | 08:31 15:18-15:42/24 16:19 14:40-15:07/27 | 07:50 08:16-08:26/10 17:15 15:27-16:02/35 | 06:49 18:09 | 06:34 06:58-07:19/21 20:06 | 05:29 06:25-06:43/18 21:00 | 04:51 05:22-06:12/50 21:43 |
| 10 | 08:30 15:18-15:44/26 16:20 14:41-15:07/26 | 07:48 08:14-08:27/13 17:17 15:28-16:01/33 | 06:46 18:11 | 06:32 06:55-07:18/23 20:08 | 05:28 06:27-06:41/14 21:01 | 04:50 05:22-06:12/50 21:44 |
| 11 | 08:29 15:18-15:46/28 16:21 14:42-15:06/24 | 07:46 08:12-08:28/16 17:19 15:30-16:00/30 | 06:44 18:13 | 06:29 06:53-07:19/26 20:09 | 05:26 06:30-06:40/10 21:03 05:53-05:58/5 | 04:50 05:21-06:12/51 21:45 |
| 12 | 08:29 15:18-15:48/30 16:23 14:43-15:06/23 | 07:44 08:10-08:28/18 17:21 15:32-15:58/26 | 06:42 18:14 | 06:27 06:52-07:19/27 20:11 | 05:24 05:51-06:00/9 21:05 | 04:49 05:21-06:12/51 21:45 |
| 13 | 08:28 15:18-15:49/31 16:25 14:44-15:05/21 | 07:42 08:08-08:29/21 17:23 15:34-15:56/22 | 06:39 18:16 | 06:25 06:52-07:19/27 20:13 | 05:22 05:49-06:02/13 21:06 | 04:49 05:21-06:12/51 21:46 |
| 14 | 08:27 15:18-15:51/33 16:26 14:46-15:05/19 | 07:40 08:06-08:29/23 17:24 15:37-15:52/15 | 06:37 18:18 | 06:22 06:51-07:18/27 20:15 | 05:21 05:48-06:04/16 21:08 | 04:49 05:21-06:13/52 21:47 |
| 15 | 08:26 15:18-15:53/35 16:28 14:48-15:04/16 | 07:38 08:04-08:28/24 17:26 | 06:34 18:20 | 06:20 06:51-07:17/26 20:17 | 05:19 05:46-06:04/18 21:10 | 04:49 05:21-06:13/52 21:47 |
| 16 | 08:25 15:18-15:55/37 16:29 14:50-15:02/12 | 07:36 08:04-08:28/24 17:28 | 06:32 18:22 | 06:18 06:52-07:17/25 20:18 | 05:17 05:45-06:06/21 21:11 | 04:48 05:20-06:12/52 21:48 |
| 17 | 08:24 15:17-15:56/39 16:31 14:53-14:59/6 | 07:34 08:05-08:28/23 17:30 | 06:30 18:24 | 06:15 06:52-07:16/24 20:20 | 05:16 05:43-06:06/23 21:13 | 04:48 05:20-06:12/52 21:48 |
| 18 | 08:23 15:17-15:58/41 16:33 | 07:32 08:05-08:28/23 17:32 | 06:27 18:26 | 06:13 06:52-07:14/22 20:22 06:37-06:42/5 | 05:14 05:42-06:07/25 21:15 | 04:48 05:21-06:12/51 21:49 |
| 19 | 08:22 15:18-16:01/43 16:35 | 07:29 08:06-08:27/21 17:34 | 06:25 18:27 | 06:11 06:53-07:13/20 20:24 06:35-06:45/10 | 05:13 05:41-06:08/27 21:16 | 04:48 05:21-06:13/52 21:49 |
| 20 | 08:21 15:18-16:03/45 16:36 | 07:27 08:07-08:25/18 17:36 | 06:22 18:29 | 06:09 06:55-07:11/16 20:26 06:33-06:47/14 | 05:11 05:39-06:08/29 21:18 | 04:48 05:21-06:13/52 21:49 |
| 21 | 08:20 15:17-16:03/46 16:38 | 07:25 08:08-08:24/16 17:38 | 06:20 18:31 | 06:06 06:57-07:09/12 20:27 06:31-06:49/18 | 05:10 05:38-06:09/31 21:19 | 04:48 05:21-06:13/52 21:50 |
| 22 | 08:18 15:18-16:04/46 16:40 | 07:23 08:10-08:22/12 17:40 | 06:17 18:33 | 06:04 06:29-06:50/21 20:29 | 05:08 05:37-06:09/32 21:21 | 04:49 05:21-06:13/52 21:50 |
| 23 | 08:17 15:17-16:04/47 16:42 | 07:21 08:15-08:18/3 17:42 | 06:15 18:35 | 06:02 06:27-06:50/23 20:31 | 05:07 05:37-06:10/33 21:22 | 04:49 05:21-06:13/52 21:50 |
| 24 | 08:16 15:18-16:05/47 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 06:24-06:50/26 20:33 | 05:06 05:36-06:09/33 21:24 | 04:49 05:22-06:14/52 21:50 |
| 25 | 08:14 15:18-16:05/47 16:45 | 07:16 17:46 | 06:10 18:38 | 05:58 06:22-06:50/28 20:35 | 05:04 05:36-06:10/34 21:25 | 04:50 05:22-06:14/52 21:50 |
| 26 | 08:13 15:18-16:06/48 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 06:21-06:51/30 20:37 | 05:03 05:36-06:10/34 21:27 | 04:50 05:23-06:15/52 21:50 |
| 27 | 08:12 15:18-16:06/48 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 06:20-06:51/31 20:38 | 05:02 05:36-06:10/34 21:28 | 04:50 05:23-06:15/52 21:50 |
| 28 | 08:10 15:18-16:06/48 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 06:20-06:51/31 20:40 | 05:01 05:36-06:10/34 21:29 | 04:51 05:24-06:16/52 21:50 |
| 29 | 08:09 15:19-16:07/48 16:53 | | 07:00 19:46 | 05:49 06:20-06:51/31 20:42 | 05:00 05:36-06:10/34 21:31 | 04:51 05:24-06:15/51 21:50 |
| 30 | 08:07 15:19-16:07/48 16:55 | | 06:58 19:47 | 05:47 06:20-06:50/30 20:44 | 04:58 05:36-06:11/35 21:32 05:28-05:32/4 | 04:52 05:25-06:16/51 21:49 |
| 31 | 08:05 15:19-16:06/47 16:57 | | 06:56 19:49 | | 04:57 05:37-06:12/35 21:33 05:28-05:35/7 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 |
| Anzahl Minuten mit Schatten | 1487 | 777 | 0 | 649 | 819 | 1509 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Vorbelastung WEA 2 **WEA:** Vorbelastung 01 - Vorbelastung 01

Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 05:25-06:16/51 21:49 | 05:32 06:42-06:47/5 21:15 06:02-06:10/8 | 06:25 06:52-07:18/26 20:09 | 07:17 18:56 | 07:15 07:44-07:56/12 16:47 14:57-15:31/34 | 08:09 15:00-15:28/28 16:03 14:24-14:49/25 |
| 2 | 04:53 05:26-06:16/50 21:49 | 05:33 06:39-06:51/12 21:13 06:04-06:06/2 | 06:27 06:54-07:17/23 20:07 | 07:19 18:54 | 07:16 07:46-07:55/9 16:45 14:56-15:32/36 | 08:10 15:01-15:27/26 16:03 14:23-14:49/26 |
| 3 | 04:54 05:27-06:17/50 21:48 | 05:35 06:36-06:52/16 21:11 | 06:29 06:56-07:17/21 20:04 | 07:21 18:52 | 07:18 07:48-07:54/6 16:43 14:55-15:33/38 | 08:12 15:02-15:26/24 16:02 14:23-14:50/27 |
| 4 | 04:55 05:28-06:17/49 21:48 | 05:37 06:35-06:54/19 21:09 | 06:30 06:57-07:15/18 20:02 | 07:23 18:49 | 07:20 07:50-07:52/2 16:41 14:54-15:34/40 | 08:13 15:03-15:26/23 16:01 14:24-14:52/28 |
| 5 | 04:56 05:28-06:17/49 21:47 | 05:38 06:33-06:55/22 21:07 | 06:32 06:59-07:14/15 20:00 | 07:24 18:47 | 07:22 14:53-15:35/42 16:39 | 08:14 15:04-15:25/21 16:01 14:23-14:52/29 |
| 6 | 04:57 05:29-06:17/48 21:47 | 05:40 06:33-06:56/23 21:06 | 06:34 07:01-07:13/12 19:57 | 07:26 18:44 | 07:24 14:52-15:35/43 16:37 | 08:16 15:04-15:24/20 16:00 14:24-14:53/29 |
| 7 | 04:58 05:30-06:18/48 21:46 | 05:42 06:31-06:57/26 21:04 | 06:35 07:02-07:10/8 19:55 | 07:28 18:42 | 07:26 14:52-15:36/44 16:36 | 08:17 15:06-15:24/18 16:00 14:23-14:54/31 |
| 8 | 04:59 05:31-06:18/47 21:45 | 05:43 06:31-06:58/27 21:02 | 06:37 07:04-07:07/3 19:52 | 07:30 18:40 | 07:28 14:51-15:36/45 16:34 | 08:18 15:06-15:23/17 15:59 14:23-14:54/31 |
| 9 | 05:00 05:32-06:18/46 21:45 | 05:45 06:30-06:59/29 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 14:51-15:37/46 16:32 | 08:20 15:08-15:23/15 15:59 14:24-14:55/31 |
| 10 | 05:01 05:33-06:19/46 21:44 | 05:47 06:29-06:58/29 20:58 | 06:41 19:48 | 07:33 18:35 | 07:32 14:50-15:37/47 16:30 | 08:21 15:09-15:22/13 15:59 14:24-14:56/32 |
| 11 | 05:02 05:45-06:19/34 21:43 | 05:49 06:29-06:59/30 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 14:50-15:37/47 16:29 | 08:22 15:09-15:22/13 15:59 14:24-14:56/32 |
| 12 | 05:03 05:45-06:19/34 21:42 | 05:50 06:28-06:58/30 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 14:51-15:38/47 16:27 | 08:23 15:10-15:21/11 15:58 14:24-14:57/33 |
| 13 | 05:04 05:45-06:19/34 21:41 | 05:52 06:28-06:59/31 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 14:51-15:39/48 16:25 | 08:24 15:11-15:21/10 15:58 14:24-14:57/33 |
| 14 | 05:05 05:45-06:19/34 21:40 | 05:54 06:28-06:59/31 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 14:51-15:39/48 16:24 | 08:25 15:12-15:21/9 15:58 14:25-14:58/33 |
| 15 | 05:07 05:46-06:20/34 21:39 | 05:55 06:28-06:58/30 20:47 | 06:49 19:35 | 07:43 18:23 | 07:41 14:51-15:39/48 16:22 | 08:26 15:13-15:21/8 15:58 14:25-14:58/33 |
| 16 | 05:08 05:46-06:20/34 21:38 | 05:57 06:28-06:58/30 20:45 | 06:51 19:33 | 07:44 18:21 | 07:43 14:51-15:39/48 16:21 | 08:27 15:14-15:21/7 15:58 14:25-14:59/34 |
| 17 | 05:09 05:46-06:20/34 21:37 | 05:59 06:27-06:57/30 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 14:52-15:39/47 16:19 | 08:28 15:15-15:21/6 15:59 14:26-15:00/34 |
| 18 | 05:11 05:46-06:19/33 21:36 | 06:01 06:29-06:57/28 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 14:52-15:39/47 16:18 | 08:29 15:16-15:22/6 15:59 14:27-15:00/33 |
| 19 | 05:12 05:47-06:20/33 21:34 | 06:02 06:31-06:57/26 20:39 | 06:56 19:26 | 07:50 08:43-08:50/7 18:14 | 07:48 14:52-15:39/47 16:16 | 08:29 15:16-15:21/5 15:59 14:26-15:00/34 |
| 20 | 05:13 05:47-06:20/33 21:33 | 06:04 06:32-06:55/23 20:37 | 06:58 19:23 | 07:52 08:40-08:53/13 18:12 | 07:50 14:53-15:39/46 16:15 | 08:30 15:17-15:22/5 15:59 14:27-15:01/34 |
| 21 | 05:15 05:47-06:19/32 21:32 | 06:06 07:05-07:10/5 20:34 | 07:00 19:21 | 07:54 08:38-08:55/17 18:10 | 07:52 14:53-15:39/46 16:14 | 08:31 15:17-15:22/5 16:00 14:27-15:01/34 |
| 22 | 05:16 05:48-06:19/31 21:31 | 06:08 07:01-07:14/13 20:32 | 07:01 19:18 | 07:56 08:37-08:56/19 18:08 | 07:54 14:54-15:39/45 16:12 | 08:31 15:18-15:23/5 16:00 14:28-15:02/34 |
| 23 | 05:18 05:49-06:19/30 21:29 | 06:09 06:58-07:15/17 20:30 | 07:03 19:16 | 07:57 08:36-08:57/21 18:05 | 07:56 14:54-15:37/43 16:11 | 08:32 15:18-15:23/5 16:01 14:28-15:02/34 |
| 24 | 05:19 05:50-06:18/28 21:28 | 06:11 06:57-07:17/20 20:28 | 07:05 19:13 | 07:59 08:35-08:57/22 18:03 | 07:57 14:54-15:35/41 16:10 | 08:32 15:19-15:24/5 16:01 14:29-15:03/34 |
| 25 | 05:21 05:52-06:18/26 21:26 | 06:13 06:56-07:18/22 20:25 | 07:07 19:11 | 07:01 07:34-07:58/24 17:01 | 07:59 14:55-15:34/39 16:09 | 08:32 15:19-15:25/6 16:02 14:29-15:03/34 |
| 26 | 05:22 05:53-06:17/24 21:25 | 06:15 06:54-07:18/24 20:23 | 07:09 19:09 | 07:03 07:34-07:58/24 16:59 | 08:01 14:56-15:33/37 16:08 | 08:33 15:19-15:25/6 16:03 14:30-15:04/34 |
| 27 | 05:24 05:55-06:17/22 21:23 | 06:16 06:54-07:19/25 20:21 | 07:10 19:06 | 07:05 07:34-07:58/24 16:57 | 08:02 14:57-15:32/35 16:07 | 08:33 15:19-15:26/7 16:03 14:30-15:04/34 |
| 28 | 05:25 05:56-06:16/20 21:21 | 06:18 06:53-07:19/26 20:19 | 07:12 19:04 | 07:07 07:36-07:59/23 16:55 | 08:04 14:58-15:31/33 16:06 | 08:33 15:19-15:27/8 16:04 14:31-15:04/33 |
| 29 | 05:27 05:58-06:15/17 21:20 | 06:20 06:52-07:19/27 20:16 | 07:14 19:01 | 07:09 07:38-07:58/20 16:53 | 08:06 14:58-15:29/31 16:05 | 08:33 15:19-15:28/9 16:05 14:31-15:05/34 |
| 30 | 05:29 05:59-06:13/14 21:18 | 06:22 06:52-07:19/27 20:14 | 07:16 18:59 | 07:11 07:40-07:58/18 16:51 | 08:07 14:59-15:29/30 16:04 | 08:33 15:19-15:29/10 16:06 14:32-15:05/33 |
| 31 | 05:30 06:01-06:12/11 21:16 | 06:23 06:52-07:19/27 20:12 | | 07:13 07:42-07:57/15 16:49 | | 08:33 15:19-15:30/11 16:07 14:33-15:05/32 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | 261 | 236 |
| Anzahl Minuten mit Schatten | 1100 | 805 | 126 | 349 | 1390 | 1354 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Vorbelastung WEA 2WEA: Vorbelastung 02 - Vorbelastung 02

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 08:04 | 07:07 | 06:53 | 05:45 | 04:56 | 04:52 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| | 16:08 | 16:59 | 17:54 | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:56 | 16:47 | 16:03 |
| 2 | 08:33 | 08:02 | 07:05 | 06:51 | 05:43 | 04:55 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 |
| | 16:09 | 17:01 | 17:55 | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:02 |
| 3 | 08:33 | 08:01 | 07:03 | 06:48 | 05:41 | 04:54 | 04:54 | 05:35 | 06:28 | 07:21 | 07:18 | 08:12 |
| | 16:10 | 17:03 | 17:57 | 19:55 | 20:49 | 21:37 | 21:49 | 21:11 | 20:04 | 18:52 | 16:43 | 16:02 |
| 4 | 08:33 | 07:59 | 07:00 | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| | 16:12 | 17:05 | 17:59 | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 5 | 08:33 | 07:57 | 06:58 | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:24 | 07:22 | 08:15 |
| | 16:13 | 17:07 | 18:01 | 19:58 | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 6 | 08:32 | 07:55 | 06:56 | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| | 16:14 | 17:09 | 18:03 | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 7 | 08:32 | 07:53 | 06:53 | 06:39 | 05:33 | 04:52 | 04:57 | 05:42 | 06:35 | 07:28 | 07:26 | 08:17 |
| | 16:16 | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 16:35 | 16:00 |
| 8 | 08:31 | 07:52 | 06:51 | 06:36 | 05:31 | 04:51 | 04:58 | 05:43 | 06:37 | 07:30 | 07:28 | 08:19 |
| | 16:17 | 17:12 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:52 | 18:40 | 16:34 | 15:59 |
| 9 | 08:31 | 07:50 | 06:49 | 06:34 | 05:29 | 04:50 | 05:00 | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| | 16:18 | 17:14 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 10 | 08:30 | 07:48 | 06:46 | 06:32 | 05:27 | 04:50 | 05:01 | 05:47 | 06:41 | 07:33 | 07:32 | 08:21 |
| | 16:20 | 17:16 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 11 | 08:29 | 07:46 | 06:44 | 06:29 | 05:26 | 04:49 | 05:02 | 05:48 | 06:42 | 07:35 | 07:34 | 08:22 |
| | 16:21 | 17:18 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 16:28 | 15:58 |
| 12 | 08:29 | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| | 16:23 | 17:20 | 18:14 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 13 | 08:28 | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:39 | 07:37 | 08:24 |
| | 16:24 | 17:22 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 14 | 08:27 | 07:40 | 06:37 | 06:22 | 05:20 | 04:49 | 05:05 | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| | 16:26 | 17:24 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 15 | 08:26 | 07:38 | 06:34 | 06:20 | 05:19 | 04:48 | 05:06 | 05:55 | 06:49 | 07:43 | 07:41 | 08:26 |
| | 16:28 | 17:26 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 20:48 | 19:35 | 18:23 | 16:22 | 15:58 |
| 16 | 08:25 | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:44 | 07:43 | 08:27 |
| | 16:29 | 17:28 | 18:22 | 20:18 | 21:11 | 21:48 | 21:38 | 20:45 | 19:33 | 18:21 | 16:20 | 15:58 |
| 17 | 08:24 | 07:34 | 06:30 | 06:15 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 |
| | 16:31 | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18:19 | 16:19 | 15:58 |
| 18 | 08:23 | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:10 | 06:01 | 06:54 | 07:48 | 07:47 | 08:29 |
| | 16:33 | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 18:16 | 16:18 | 15:59 |
| 19 | 08:22 | 07:29 | 06:25 | 06:11 | 05:12 | 04:48 | 05:12 | 06:02 | 06:56 | 07:50 | 07:49 | 08:29 |
| | 16:34 | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 |
| 20 | 08:21 | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 |
| | 16:36 | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 |
| 21 | 08:20 | 07:25 | 06:20 | 06:06 | 05:09 | 04:48 | 05:15 | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 |
| | 16:38 | 17:38 | 18:31 | 20:27 | 21:19 | 21:50 | 21:32 | 20:34 | 19:21 | 18:10 | 16:14 | 16:00 |
| 22 | 08:19 | 07:23 | 06:17 | 06:04 | 05:08 | 04:48 | 05:16 | 06:07 | 07:01 | 07:56 | 07:54 | 08:31 |
| | 16:40 | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 16:12 | 16:00 |
| 23 | 08:17 | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 |
| | 16:42 | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:05 | 16:11 | 16:01 |
| 24 | 08:16 | 07:19 | 06:13 | 06:00 | 05:05 | 04:49 | 05:19 | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 |
| | 16:43 | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:13 | 18:03 | 16:10 | 16:01 |
| 25 | 08:15 | 07:16 | 06:10 | 05:58 | 05:04 | 04:49 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:33 |
| | 16:45 | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 20:25 | 19:11 | 17:01 | 16:09 | 16:02 |
| 26 | 08:13 | 07:14 | 06:08 | 05:55 | 05:03 | 04:50 | 05:22 | 06:14 | 07:08 | 07:03 | 08:01 | 08:33 |
| | 16:47 | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 16:59 | 16:08 | 16:02 |
| 27 | 08:12 | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 |
| | 16:49 | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 16:57 | 16:07 | 16:03 |
| 28 | 08:10 | 07:10 | 06:03 | 05:51 | 05:00 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 |
| | 16:51 | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 |
| 29 | 08:09 | | 07:00 | 05:49 | 04:59 | 04:51 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 |
| | 16:53 | | 19:46 | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 |
| 30 | 08:07 | | 06:58 | 05:47 | 04:58 | 04:52 | 05:28 | 06:21 | 07:16 | 07:11 | 08:07 | 08:33 |
| | 16:55 | | 19:47 | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 |
| 31 | 08:06 | | 06:56 | | 04:57 | | 05:30 | 06:23 | | 07:13 | | 08:33 |
| | 16:57 | | 19:49 | | 21:33 | | 21:17 | 20:12 | | 16:49 | | 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 459 | 382 | 329 | 261 | 235 |
| Anzahl Minuten mit Schatten | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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

| Tag im Monat | Sonnenaufgang (SS:MM) | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|

SHADOW - Kalender pro WEA

Berechnung: Vorbelastung WEA 2WEA: Vorbelastung 03 - Vorbelastung 03

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | Juni |
|----|----------------------------------------------|----------------------------------------------|-------------------------------|------------------------------------------------------------|----------------------------------------------|----------------|
| 1 | 08:33 11:18-11:41/23 16:08 10:14-10:58/44 | 08:04 16:59 | 07:07 16:11-16:36/25 17:54 | 06:53 18:41-18:52/11 19:51 | 05:45 07:12-08:03/51 20:46 06:14-06:32/18 | 04:57 21:35 |
| 2 | 08:33 11:19-11:41/22 16:10 10:15-10:59/44 | 08:02 17:01 | 07:05 16:12-16:34/22 17:56 | 06:51 19:53 | 05:43 07:13-08:03/50 20:47 06:14-06:34/20 | 04:56 21:36 |
| 3 | 08:33 11:19-11:40/21 16:11 10:15-10:59/44 | 08:01 17:03 | 07:03 16:15-16:31/16 17:58 | 06:48 19:55 | 05:41 07:14-08:02/48 20:49 06:13-06:35/22 | 04:55 21:37 |
| 4 | 08:33 11:21-11:40/19 16:12 10:16-11:00/44 | 07:59 17:05 | 07:00 16:18-16:26/8 17:59 | 06:46 19:57 | 05:39 07:14-08:01/47 20:51 06:12-06:35/23 | 04:54 21:38 |
| 5 | 08:32 11:22-11:39/17 16:13 10:16-11:00/44 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 07:14-08:00/46 20:53 06:11-06:36/25 | 04:53 21:39 |
| 6 | 08:32 11:24-11:39/15 16:14 10:17-11:01/44 | 07:55 17:09 | 06:56 18:03 | 06:41 07:39-07:50/11 20:00 | 05:35 07:15-07:59/44 20:54 06:11-06:36/25 | 04:52 21:40 |
| 7 | 08:32 11:26-11:37/11 16:16 10:17-11:01/44 | 07:53 16:20-16:28/8 17:11 | 06:53 18:05 | 06:39 07:33-07:54/21 20:02 | 05:33 07:15-07:58/43 20:56 06:10-06:36/26 | 04:52 21:41 |
| 8 | 08:31 11:29-11:34/5 16:17 10:17-11:01/44 | 07:52 16:16-16:32/16 17:13 | 06:51 18:07 | 06:37 07:30-07:57/27 20:04 | 05:31 07:17-07:57/40 20:58 06:10-06:37/27 | 04:51 21:42 |
| 9 | 08:31 10:18-11:02/44 16:19 | 07:50 08:25-08:37/12 17:15 16:14-16:34/20 | 06:49 18:09 | 06:34 07:28-08:00/32 20:06 19:31-19:39/8 | 05:29 07:17-07:56/39 21:00 06:10-06:36/26 | 04:51 21:43 |
| 10 | 08:30 10:19-11:02/43 16:20 | 07:48 08:22-08:39/17 17:17 16:12-16:36/24 | 06:46 18:11 | 06:32 07:25-08:01/36 20:08 19:27-19:40/13 | 05:28 07:18-07:54/36 21:01 06:10-06:36/26 | 04:50 21:44 |
| 11 | 08:29 10:19-11:02/43 16:21 | 07:46 08:21-08:41/20 17:19 16:11-16:38/27 | 06:44 18:13 | 06:29 07:23-08:02/39 20:09 19:25-19:42/17 | 05:26 07:20-07:53/33 21:03 06:10-06:36/26 | 04:50 21:45 |
| 12 | 08:29 10:20-11:02/42 16:23 | 07:44 08:19-08:42/23 17:21 16:10-16:39/29 | 06:42 18:15 | 06:27 07:22-08:04/42 20:11 19:23-19:44/21 | 05:24 07:21-07:52/31 21:05 06:10-06:36/26 | 04:49 21:45 |
| 13 | 08:28 10:20-11:02/42 16:25 | 07:42 08:19-08:44/25 17:23 16:09-16:40/31 | 06:39 18:16 | 06:25 07:21-08:05/44 20:13 19:21-19:45/24 | 05:22 07:22-07:49/27 21:06 06:10-06:35/25 | 04:49 21:46 |
| 14 | 08:27 10:21-11:02/41 16:26 | 07:40 08:18-08:45/27 17:25 16:07-16:40/33 | 06:37 18:18 | 06:22 07:19-08:05/46 20:15 19:20-19:47/27 | 05:21 07:24-07:48/24 21:08 06:11-06:35/24 | 04:49 21:47 |
| 15 | 08:26 10:22-11:03/41 16:28 | 07:38 08:16-08:44/28 17:26 16:07-16:41/34 | 06:34 18:20 | 06:20 07:18-08:06/48 20:17 19:20-19:47/27 | 05:19 07:26-07:45/19 21:10 06:11-06:34/23 | 04:49 21:47 |
| 16 | 08:25 10:22-11:03/41 16:29 | 07:36 08:16-08:45/29 17:28 16:06-16:41/35 | 06:32 17:44-17:55/11 18:22 | 06:18 07:17-08:06/49 20:18 19:19-19:48/29 | 05:17 07:29-07:43/14 21:11 06:12-06:34/22 | 04:48 21:48 |
| 17 | 08:24 10:23-11:03/40 16:31 | 07:34 08:16-08:45/29 17:30 16:06-16:42/36 | 06:30 17:42-17:57/15 18:24 | 06:16 07:17-08:07/50 20:20 19:18-19:47/29 | 05:16 07:34-07:36/2 21:13 06:13-06:33/20 | 04:48 21:48 |
| 18 | 08:23 10:23-11:02/39 16:33 | 07:32 08:16-08:46/30 17:32 16:06-16:42/36 | 06:27 17:40-18:00/20 18:26 | 06:13 07:15-08:06/51 20:22 19:18-19:47/29 | 05:14 06:14-06:32/18 21:15 | 04:48 21:49 |
| 19 | 08:22 10:24-11:02/38 16:35 | 07:29 08:16-08:46/30 17:34 16:06-16:43/37 | 06:25 17:38-18:01/23 18:27 | 06:11 07:14-08:07/53 20:24 19:18-19:47/29 | 05:13 06:15-06:31/16 21:16 | 04:48 21:49 |
| 20 | 08:21 10:26-11:02/36 16:36 | 07:27 08:15-08:45/30 17:36 16:05-16:42/37 | 06:22 17:37-18:03/26 18:29 | 06:09 07:14-08:07/53 20:26 19:18-19:47/29 | 05:11 06:16-06:29/13 21:18 | 04:48 21:49 |
| 21 | 08:20 10:26-11:01/35 16:38 | 07:25 08:15-08:45/30 17:38 16:05-16:42/37 | 06:20 17:36-18:02/26 18:31 | 06:06 07:14-08:07/53 20:28 19:18-19:46/28 | 05:10 06:18-06:28/10 21:19 | 04:48 21:50 |
| 22 | 08:19 10:27-11:01/34 16:40 | 07:23 08:16-08:45/29 17:40 16:05-16:42/37 | 06:17 17:36-18:03/27 18:33 | 06:04 07:13-08:07/54 20:29 19:19-19:46/27 | 05:08 06:21-06:25/4 21:21 | 04:49 21:50 |
| 23 | 08:17 10:28-11:00/32 16:42 | 07:21 08:17-08:44/27 17:42 16:06-16:42/36 | 06:15 17:34-18:02/28 18:35 | 06:02 07:13-08:07/54 20:31 19:18-19:44/26 | 05:07 21:22 | 04:49 21:50 |
| 24 | 08:16 10:30-10:59/29 16:44 | 07:19 08:17-08:43/26 17:44 16:06-16:41/35 | 06:13 17:35-18:03/28 18:37 | 06:00 07:12-08:06/54 20:33 19:19-19:43/24 | 05:06 21:24 | 04:49 21:50 |
| 25 | 08:15 10:31-10:58/27 16:45 | 07:16 08:18-08:42/24 17:46 16:06-16:41/35 | 06:10 17:34-18:02/28 18:38 | 05:58 07:12-08:06/54 20:35 19:20-19:42/22 | 05:04 21:25 | 04:50 21:50 |
| 26 | 08:13 10:33-10:57/24 16:47 | 07:14 08:19-08:41/22 17:48 16:07-16:40/33 | 06:08 17:34-18:01/27 18:40 | 05:56 07:12-08:05/53 20:37 19:21-19:41/20 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 10:35-10:55/20 16:49 | 07:12 08:20-08:38/18 17:50 16:08-16:38/30 | 06:05 17:35-18:01/26 18:42 | 05:53 07:12-08:05/53 20:38 19:22-19:40/18 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 10:38-10:52/14 16:51 | 07:10 08:23-08:36/13 17:52 16:09-16:37/28 | 06:03 17:35-17:59/24 18:44 | 05:51 07:12-08:05/53 20:40 19:24-19:37/13 | 05:01 21:30 | 04:51 21:50 |
| 29 | 08:09 10:45-10:46/1 16:53 | | 07:01 18:36-18:59/23 19:46 | 05:49 07:12-08:04/52 19:27-19:34/7 20:42 06:19-06:29/10 | 05:00 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | | 06:58 18:36-18:56/20 19:48 | 05:47 07:12-08:03/51 20:44 06:16-06:31/15 | 04:58 21:32 | 04:52 21:50 |
| 31 | 08:06 16:57 | | 06:56 18:38-18:55/17 19:49 | | 04:57 21:33 | 04:57 21:50 |
| | Sonnenscheinstunden 252 | 274 | 367 | 419 | 492 | 508 |
| | Anzahl Minuten mit Schatten 1191 | 1163 | 440 | 1636 | 1059 | 0 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Vorbelastung WEA 2 **WEA:** Vorbelastung 03 - Vorbelastung 03

Voraussetzungen für Berechnung des Schattenwurfs

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

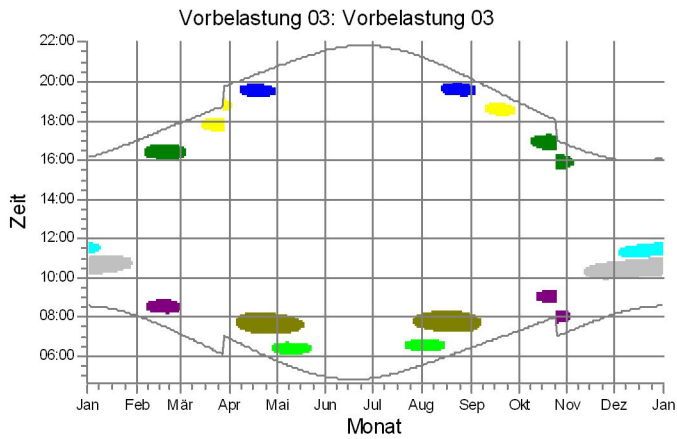
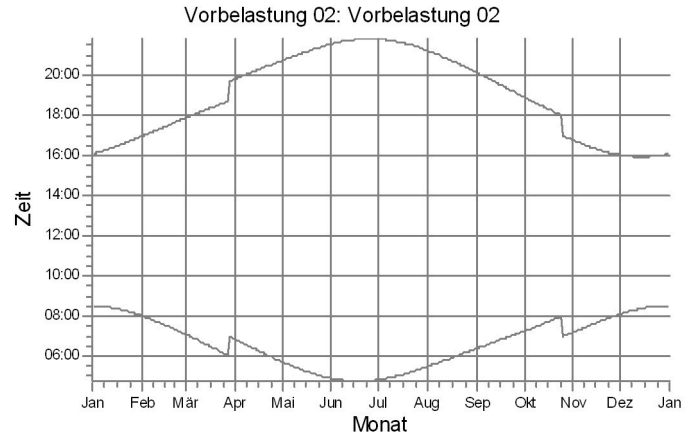
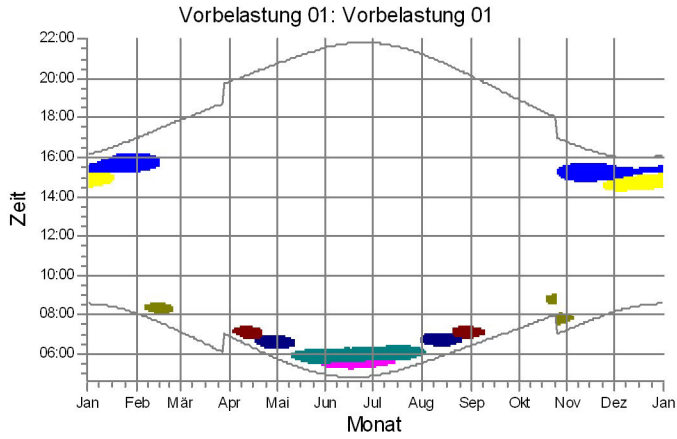
| | July | August | September | Oktober | November | Dezember |
|-----------------------------|----------------------|------------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 | 04:53 | 05:32 07:31-08:02/31 | 06:25 07:22-08:01/39 | 07:17 | 07:15 07:52-08:08/16 | 08:09 10:01-10:44/43 |
| | 21:49 | 21:15 06:21-06:46/25 | 20:09 19:24-19:41/17 | 18:56 | 16:47 15:42-16:05/23 | 16:03 |
| 2 | 04:53 | 05:33 07:30-08:04/34 | 06:27 07:24-08:00/36 | 07:19 | 07:17 07:55-08:06/11 | 08:10 10:02-10:45/43 |
| | 21:49 | 21:13 06:21-06:47/26 | 20:07 19:26-19:39/13 | 18:54 | 16:45 15:44-16:03/19 | 16:03 |
| 3 | 04:54 | 05:35 07:28-08:05/37 | 06:29 07:26-07:58/32 | 07:21 | 07:18 15:46-16:01/15 | 08:12 10:01-10:45/44 |
| | 21:48 | 21:11 06:20-06:46/26 | 20:05 19:28-19:36/8 | 18:52 | 16:43 | 16:02 |
| 4 | 04:55 | 05:37 07:27-08:07/40 | 06:30 07:27-07:54/27 | 07:23 | 07:20 15:51-15:56/5 | 08:13 11:15-11:18/3 |
| | 21:48 | 21:09 06:20-06:47/27 | 20:02 | 18:49 | 16:41 | 16:01 10:02-10:46/44 |
| 5 | 04:56 | 05:38 07:26-08:07/41 | 06:32 07:30-07:51/21 | 07:25 | 07:22 | 08:15 11:11-11:22/11 |
| | 21:47 | 21:08 06:20-06:46/26 | 20:00 | 18:47 | 16:39 | 16:01 10:02-10:46/44 |
| 6 | 04:57 | 05:40 07:25-08:08/43 | 06:34 07:35-07:47/12 | 07:26 | 07:24 | 08:16 11:11-11:24/13 |
| | 21:47 | 21:06 06:20-06:46/26 | 19:57 | 18:44 | 16:37 | 16:00 10:03-10:47/44 |
| 7 | 04:58 | 05:42 07:24-08:09/45 | 06:35 | 07:28 | 07:26 | 08:17 11:09-11:26/17 |
| | 21:46 | 21:04 06:20-06:45/25 | 19:55 | 18:42 | 16:36 | 16:00 10:03-10:47/44 |
| 8 | 04:59 | 05:43 07:24-08:10/46 | 06:37 | 07:30 | 07:28 | 08:19 11:08-11:27/19 |
| | 21:46 | 21:02 06:21-06:45/24 | 19:53 | 18:40 | 16:34 | 15:59 10:03-10:47/44 |
| 9 | 05:00 | 05:45 07:23-08:11/48 | 06:39 | 07:32 | 07:30 | 08:20 11:09-11:29/20 |
| | 21:45 | 21:00 06:22-06:45/23 | 19:50 | 18:37 | 16:32 | 15:59 10:04-10:48/44 |
| 10 | 05:01 | 05:47 07:22-08:11/49 | 06:41 | 07:34 16:51-17:04/13 | 07:32 | 08:21 11:08-11:30/22 |
| | 21:44 | 20:58 06:22-06:43/21 | 19:48 | 18:35 | 16:30 | 15:59 10:04-10:48/44 |
| 11 | 05:02 | 05:49 07:22-08:12/50 | 06:42 18:33-18:44/11 | 07:35 16:47-17:06/19 | 07:34 | 08:22 11:08-11:31/23 |
| | 21:43 | 20:56 06:23-06:43/20 | 19:45 | 18:33 | 16:29 | 15:59 10:04-10:48/44 |
| 12 | 05:03 | 05:50 07:21-08:11/50 | 06:44 18:30-18:46/16 | 07:37 16:45-17:08/23 | 07:36 | 08:23 11:08-11:31/23 |
| | 21:42 | 20:54 06:23-06:41/18 | 19:43 | 18:30 | 16:27 | 15:58 10:05-10:49/44 |
| 13 | 05:04 | 05:52 07:20-08:12/52 | 06:46 18:28-18:48/20 | 07:39 08:58-09:07/9 | 07:37 10:16-10:19/3 | 08:24 11:08-11:32/24 |
| | 21:41 | 20:52 06:25-06:39/14 | 19:40 | 18:28 16:43-17:10/27 | 16:25 | 15:58 10:05-10:49/44 |
| 14 | 05:05 | 05:54 07:20-08:13/53 19:34-19:42/8 | 06:48 18:26-18:49/23 | 07:41 08:55-09:10/15 | 07:39 10:10-10:25/15 | 08:25 11:08-11:33/25 |
| | 21:40 | 20:50 06:28-06:37/9 | 19:38 | 18:26 16:42-17:11/29 | 16:24 | 15:58 10:06-10:50/44 |
| 15 | 05:07 | 05:56 07:19-08:12/53 | 06:49 18:25-18:50/25 | 07:43 08:53-09:12/19 | 07:41 10:08-10:28/20 | 08:26 11:08-11:34/26 |
| | 21:39 | 20:48 19:31-19:45/14 | 19:36 | 18:23 16:40-17:12/32 | 16:22 | 15:58 10:06-10:50/44 |
| 16 | 05:08 | 05:57 07:19-08:13/54 | 06:51 18:23-18:49/26 | 07:45 08:51-09:13/22 | 07:43 10:06-10:30/24 | 08:27 11:08-11:35/27 |
| | 21:38 | 20:45 19:29-19:47/18 | 19:33 | 18:21 16:38-17:11/33 | 16:21 | 15:58 10:07-10:51/44 |
| 17 | 05:09 | 05:59 07:18-08:12/54 | 06:53 18:23-18:50/27 | 07:46 08:50-09:14/24 | 07:45 10:05-10:32/27 | 08:28 11:09-11:35/26 |
| | 21:37 | 20:43 19:27-19:48/21 | 19:31 | 18:19 16:37-17:12/35 | 16:19 | 15:59 10:07-10:51/44 |
| 18 | 05:11 | 06:01 07:18-08:12/54 | 06:55 18:22-18:50/28 | 07:48 08:48-09:14/26 | 07:47 10:04-10:33/29 | 08:29 11:09-11:36/27 |
| | 21:36 | 20:41 19:26-19:49/23 | 19:28 | 18:17 16:37-17:12/35 | 16:18 | 15:59 10:08-10:52/44 |
| 19 | 05:12 | 06:02 07:19-08:13/54 | 06:56 18:21-18:49/28 | 07:50 08:47-09:15/28 | 07:49 10:03-10:35/32 | 08:29 11:09-11:36/27 |
| | 21:35 | 20:39 19:25-19:50/25 | 19:26 | 18:14 16:36-17:12/36 | 16:16 | 15:59 10:08-10:52/44 |
| 20 | 05:13 | 06:04 07:18-08:12/54 | 06:58 18:21-18:49/28 | 07:52 08:46-09:15/29 | 07:50 10:02-10:36/34 | 08:30 11:10-11:37/27 |
| | 21:33 | 20:37 19:24-19:50/26 | 19:23 | 18:12 16:36-17:13/37 | 16:15 | 15:59 10:09-10:52/43 |
| 21 | 05:15 | 06:06 07:18-08:12/54 | 07:00 18:21-18:49/28 | 07:54 08:46-09:15/29 | 07:52 10:02-10:37/35 | 08:31 11:10-11:38/28 |
| | 21:32 | 20:35 19:23-19:51/28 | 19:21 | 18:10 16:35-17:13/38 | 16:14 | 16:00 10:10-10:53/43 |
| 22 | 05:16 06:30-06:37/7 | 06:08 07:18-08:12/54 | 07:02 18:21-18:48/27 | 07:56 08:45-09:15/30 | 07:54 10:02-10:38/36 | 08:31 11:10-11:38/28 |
| | 21:31 | 20:32 19:23-19:51/28 | 19:18 | 18:08 16:35-17:12/37 | 16:13 | 16:00 10:10-10:53/43 |
| 23 | 05:18 06:27-06:39/12 | 06:09 07:18-08:11/53 | 07:03 18:21-18:46/25 | 07:58 08:45-09:15/30 | 07:56 10:01-10:39/38 | 08:32 11:11-11:38/27 |
| | 21:29 | 20:30 19:22-19:51/29 | 19:16 | 18:06 16:35-17:12/37 | 16:11 | 16:01 10:10-10:53/43 |
| 24 | 05:19 06:26-06:40/14 | 06:11 07:18-08:10/52 | 07:05 18:22-18:45/23 | 07:59 08:45-09:15/30 | 07:57 10:01-10:40/39 | 08:32 11:12-11:39/27 |
| | 21:28 | 20:28 19:22-19:51/29 | 19:13 | 18:03 16:35-17:12/37 | 16:10 | 16:01 10:11-10:55/44 |
| 25 | 05:21 06:25-06:42/17 | 06:13 07:19-08:10/51 | 07:07 18:23-18:43/20 | 07:01 07:45-08:15/30 | 07:59 10:00-10:40/40 | 08:32 11:12-11:39/27 |
| | 21:26 | 20:26 19:22-19:51/29 | 19:11 | 17:01 15:35-16:11/36 | 16:09 | 16:02 10:11-10:55/44 |
| 26 | 05:22 06:24-06:43/19 | 06:15 07:18-08:09/51 | 07:09 18:24-18:41/17 | 07:03 07:46-08:14/28 | 08:01 10:00-10:41/41 | 08:33 11:12-11:39/27 |
| | 21:25 | 20:23 19:21-19:50/29 | 19:09 | 16:59 15:36-16:11/35 | 16:08 | 16:03 10:11-10:55/44 |
| 27 | 05:24 07:42-07:51/9 | 06:16 07:19-08:08/49 | 07:10 18:25-18:38/13 | 07:05 07:47-08:15/28 | 08:02 10:01-10:42/41 | 08:33 11:13-11:40/27 |
| | 21:23 06:23-06:44/21 | 20:21 19:21-19:50/29 | 19:06 | 16:57 15:36-16:10/34 | 16:07 | 16:03 10:12-10:55/43 |
| 28 | 05:25 07:38-07:55/17 | 06:18 07:20-08:07/47 | 07:12 18:28-18:35/7 | 07:07 07:48-08:14/26 | 08:04 10:01-10:42/41 | 08:33 11:14-11:40/26 |
| | 21:22 06:22-06:44/22 | 20:19 19:21-19:48/27 | 19:04 | 16:55 15:37-16:09/32 | 16:06 | 16:04 10:12-10:56/44 |
| 29 | 05:27 07:36-07:58/22 | 06:20 07:20-08:06/46 | 07:14 | 07:09 07:48-08:13/25 | 08:06 10:01-10:43/42 | 08:33 11:14-11:40/26 |
| | 21:20 06:22-06:46/24 | 20:16 19:21-19:48/27 | 19:01 | 16:53 15:38-16:09/31 | 16:05 | 16:05 10:12-10:56/44 |
| 30 | 05:29 07:34-07:59/25 | 06:22 07:21-08:05/44 | 07:16 | 07:11 07:49-08:12/23 | 08:07 10:01-10:43/42 | 08:33 11:15-11:40/25 |
| | 21:18 06:21-06:45/24 | 20:14 19:22-19:46/24 | 18:59 | 16:51 15:39-16:08/29 | 16:04 | 16:06 10:13-10:57/44 |
| 31 | 05:30 07:32-08:01/29 | 06:23 07:22-08:03/41 | | 07:13 07:51-08:10/19 | | 08:33 11:16-11:40/24 |
| | 21:17 06:21-06:46/25 | 20:12 19:22-19:43/21 | | 16:49 15:41-16:07/26 | | 16:07 10:14-10:57/43 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | 261 | 236 |
| Anzahl Minuten mit Schatten | 287 | 2229 | 597 | 1161 | 668 | 2008 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Grafischer Kalender pro WEA

Berechnung: Vorbelastung WEA 2

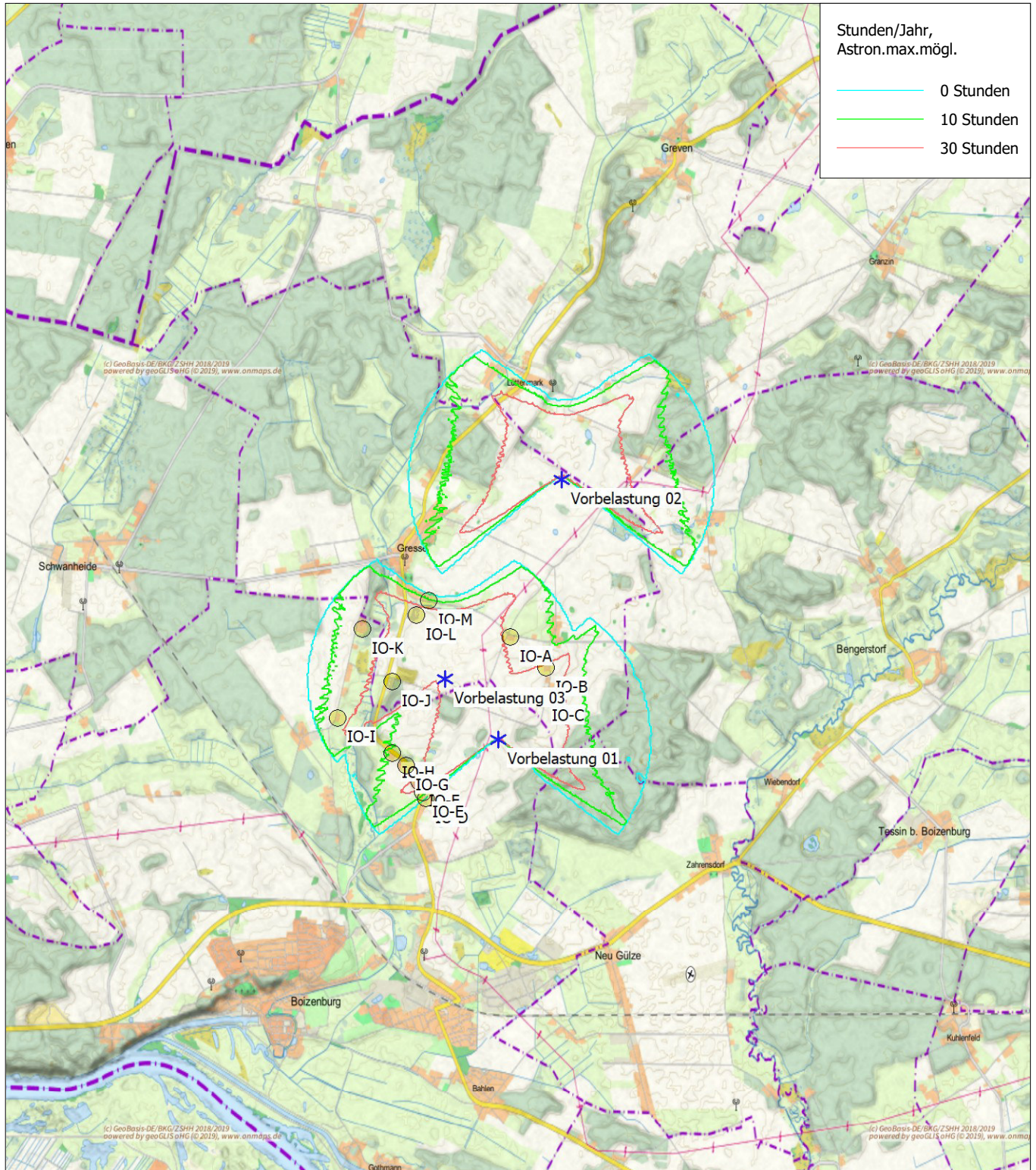


Schattenrezeptoren

| | | | | | |
|-------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------|
|  | IO-A: Gresser Strasse 4, Badekow |  | IO-F: Zarentiner Strasse 62, Schwarzenberg |  | IO-J: Behr Gemüsehandel GmbH, Gresse |
|  | IO-B: Dorfstrasse 5, Badekow |  | IO-G: Zarentiner Strasse 71, Schwarzenberg |  | IO-K: Heide 6, Heide |
|  | IO-C: Dorfstrasse 1, Badekow |  | IO-H: Zarentiner Strasse 77, Schwarzenberg |  | IO-L: Gewerbegebiet Gresse, Gresse |
|  | IO-E: Zarentiner Strasse 50, Schwarzenberg |  | IO-I: An der Torfkoppel 9, Heide |  | IO-M: Badekower Strasse 14, Gresse |

SHADOW - Karte

Berechnung: Vorbelastung WEA 2



Karte: OnMaps , Maßstab 1:75.000, Mitte: ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33 Ost: 218.740 Nord: 5.927.880
 * Existierende WEA ● Schattenrezeptor
 Höhe der Schattenkarte: Höhenraster-Objekt: 20140305 WP Boizenburg_EMDGrid_0.wpg (5)

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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:

Verwendete Höhenlinien: Höhenraster-Objekt: 20140305 WP Boizenburg_EMD

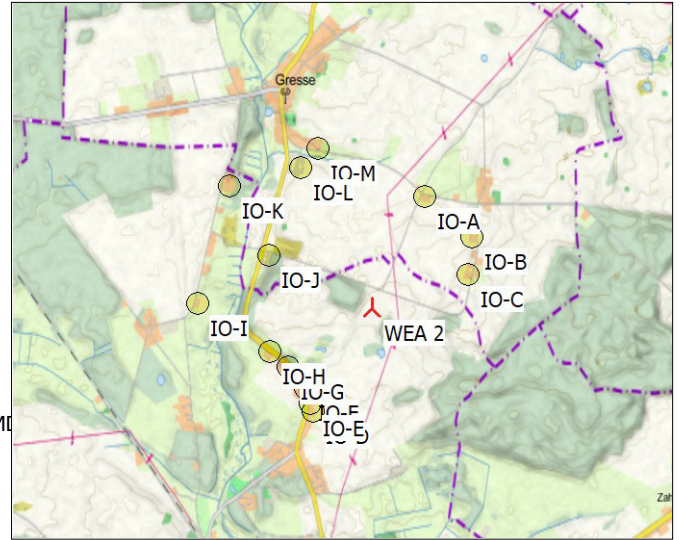
Hindernisse in Berechnung nicht verwendet

Berechnungshöhe ü.Gr. für Karte: 1,5 m

Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:

ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33



Maßstab 1:75.000

Neue WEA

Schattenrezeptor

WEA

| | Ost | Nord | Z | Beschreibung | WEA-Typ | | | Nennleistung [kW] | Rotordurchmesser [m] | Nabenhöhe [m] | Schattendaten | |
|-------|---------|-----------|------|--------------|---------|------------|------------|-------------------|----------------------|---------------|-----------------------|---------------|
| | | | | | Aktuell | Hersteller | Typ | | | | Beschatt.-Bereich [m] | U/min [U/min] |
| WEA 2 | 218.213 | 5.926.327 | 28,9 | WEA 2 | Ja | NORDEX | N163-5.700 | 5.700 | 163,0 | 164,0 | 1.784 | 10,4 |

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] | [m] | [°] | | [m] |
| IO-A | Gresser Strasse 4, Badekow | 218.806 | 5.927.398 | 28,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-B | Dorfstrasse 5, Badekow | 219.249 | 5.926.974 | 42,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-C | Dorfstrasse 1, Badekow | 219.183 | 5.926.608 | 45,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 217.571 | 5.925.349 | 16,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 217.541 | 5.925.427 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 217.504 | 5.925.574 | 20,0 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 217.345 | 5.925.795 | 17,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 217.173 | 5.925.965 | 18,5 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-I | An der Torfkoppel 9, Heide | 216.484 | 5.926.478 | 13,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 217.226 | 5.926.915 | 17,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-K | Heide 6, Heide | 216.876 | 5.927.620 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-L | Gewerbegebiet Gresse, Gresse | 217.593 | 5.927.763 | 19,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-M | Badekower Strasse 14, Gresse | 217.771 | 5.927.940 | 19,4 | 1,0 | 1,0 | 1,0 | 90,0 | "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-A | Gresser Strasse 4, Badekow | 17:35 | 44 | 0:29 |
| IO-B | Dorfstrasse 5, Badekow | 19:45 | 48 | 0:32 |
| IO-C | Dorfstrasse 1, Badekow | 22:58 | 47 | 0:37 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 0:00 | 0 | 0:00 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 0:00 | 0 | 0:00 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 0:00 | 0 | 0:00 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 0:00 | 0 | 0:00 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 47:16 | 94 | 0:36 |
| IO-I | An der Torfkoppel 9, Heide | 7:50 | 28 | 0:22 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 18:33 | 44 | 0:33 |

(Fortsetzung nächste Seite)...

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung WEA 2

...(Fortsetzung von letzter Seite)

| Nr. | Name | astron. max. mögl. Beschattungsdauer | | |
|-----|-----------------------------------|--------------------------------------|----------------------------|--------------------------------|
| | | Stunden/Jahr [h/a] | Schattentage/Jahr [d/a] | Max.Schattendauer/Tag [h/d] |
| | IO-K Heide 6, Heide | 0:00 | 0 | 0:00 |
| | IO-L Gewerbegebiet Gresse, Gresse | 2:00 | 15 | 0:10 |
| | IO-M Badekower Strasse 14, Gresse | 0:00 | 0 | 0:00 |

Gesamtmenge der max. mögl. Beschattung an Rezeptoren pro WEA

| Nr. | Name | Maximal [h/a] |
|-------|-------|------------------|
| WEA 2 | WEA 2 | 135:57 |

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.

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-A - Gresser Strasse 4, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

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 08:33 | 13:59 (WEA 2) | 08:04 | 07:07 | 06:53 | 05:45 | 04:56 | 04:53 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 | 13:53 (WEA 2) |
| 2 16:08 | 27 14:26 (WEA 2) | 16:59 | 17:54 | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:56 | 16:47 | 16:03 | 12 14:05 (WEA 2) |
| 3 08:33 | 14:00 (WEA 2) | 08:02 | 07:05 | 06:51 | 05:43 | 04:56 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 | 13:51 (WEA 2) |
| 4 16:09 | 26 14:26 (WEA 2) | 17:01 | 17:56 | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 | 15 14:06 (WEA 2) |
| 5 08:33 | 14:00 (WEA 2) | 08:01 | 07:03 | 06:48 | 05:41 | 04:55 | 04:54 | 05:35 | 06:28 | 07:21 | 07:18 | 08:12 | 13:51 (WEA 2) |
| 6 16:11 | 26 14:26 (WEA 2) | 17:03 | 17:57 | 19:55 | 20:49 | 21:37 | 21:48 | 21:11 | 20:04 | 18:52 | 16:43 | 16:02 | 17 14:08 (WEA 2) |
| 7 08:33 | 14:02 (WEA 2) | 07:59 | 07:00 | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 | 13:50 (WEA 2) |
| 8 16:12 | 24 14:26 (WEA 2) | 17:05 | 17:59 | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 | 20 14:10 (WEA 2) |
| 9 08:32 | 14:02 (WEA 2) | 07:57 | 06:58 | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:24 | 07:22 | 08:15 | 13:50 (WEA 2) |
| 10 16:13 | 24 14:26 (WEA 2) | 17:07 | 18:01 | 19:58 | 20:53 | 21:39 | 21:47 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 | 21 14:11 (WEA 2) |
| 11 08:32 | 14:04 (WEA 2) | 07:55 | 06:56 | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 | 13:50 (WEA 2) |
| 12 16:14 | 22 14:26 (WEA 2) | 17:09 | 18:03 | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 | 22 14:12 (WEA 2) |
| 13 08:32 | 14:04 (WEA 2) | 07:53 | 06:53 | 06:39 | 05:33 | 04:52 | 04:58 | 05:42 | 06:35 | 07:28 | 07:26 | 08:17 | 13:49 (WEA 2) |
| 14 16:16 | 22 14:26 (WEA 2) | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 16:35 | 16:00 | 24 14:13 (WEA 2) |
| 15 08:31 | 14:05 (WEA 2) | 07:52 | 06:51 | 06:36 | 05:31 | 04:51 | 04:59 | 05:43 | 06:37 | 07:30 | 07:28 | 08:18 | 13:49 (WEA 2) |
| 16 16:17 | 20 14:25 (WEA 2) | 17:13 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:52 | 18:40 | 16:34 | 15:59 | 24 14:13 (WEA 2) |
| 17 08:31 | 14:07 (WEA 2) | 07:50 | 06:49 | 06:34 | 05:29 | 04:51 | 05:00 | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 | 13:50 (WEA 2) |
| 18 16:18 | 18 14:25 (WEA 2) | 17:15 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 | 25 14:15 (WEA 2) |
| 19 08:30 | 14:09 (WEA 2) | 07:48 | 06:46 | 06:32 | 05:28 | 04:50 | 05:01 | 05:47 | 06:41 | 07:33 | 07:32 | 08:21 | 13:49 (WEA 2) |
| 20 16:20 | 15 14:24 (WEA 2) | 17:17 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 | 26 14:15 (WEA 2) |
| 21 08:29 | 14:11 (WEA 2) | 07:46 | 06:44 | 06:29 | 05:26 | 04:50 | 05:02 | 05:49 | 06:42 | 07:35 | 07:34 | 08:22 | 13:49 (WEA 2) |
| 22 16:21 | 12 14:23 (WEA 2) | 17:19 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 16:29 | 15:58 | 27 14:16 (WEA 2) |
| 23 08:29 | 14:13 (WEA 2) | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 | 13:49 (WEA 2) |
| 24 16:23 | 8 14:21 (WEA 2) | 17:20 | 18:14 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 | 27 14:16 (WEA 2) |
| 25 08:28 | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:04 | 05:52 | 06:46 | 07:39 | 07:37 | 08:24 | 13:49 (WEA 2) |
| 26 16:25 | 17:22 | 18:16 | 20:13 | 21:06 | 21:46 | 21:41 | 21:41 | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 | 28 14:17 (WEA 2) |
| 27 08:27 | 07:40 | 06:37 | 06:22 | 05:21 | 04:49 | 05:05 | 05:05 | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 | 13:50 (WEA 2) |
| 28 16:26 | 17:24 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 21:40 | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 | 28 14:18 (WEA 2) |
| 29 08:26 | 07:38 | 06:34 | 06:20 | 05:19 | 04:48 | 05:07 | 05:07 | 05:55 | 06:49 | 07:43 | 07:41 | 08:26 | 13:50 (WEA 2) |
| 30 16:28 | 17:26 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 21:39 | 20:48 | 19:35 | 18:23 | 16:22 | 15:58 | 28 14:18 (WEA 2) |
| 31 08:25 | 06:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:08 | 05:57 | 06:51 | 07:44 | 07:43 | 08:27 | 13:51 (WEA 2) |
| 32 16:29 | 17:28 | 18:22 | 20:18 | 21:11 | 21:48 | 21:38 | 21:38 | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 | 28 14:19 (WEA 2) |
| 33 08:24 | 07:34 | 06:30 | 06:15 | 05:16 | 04:48 | 05:09 | 05:09 | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 | 13:51 (WEA 2) |
| 34 16:31 | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 21:37 | 20:43 | 19:31 | 18:19 | 16:19 | 15:58 | 29 14:20 (WEA 2) |
| 35 08:23 | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:11 | 05:11 | 06:01 | 06:55 | 07:48 | 07:47 | 08:29 | 13:52 (WEA 2) |
| 36 16:33 | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 21:36 | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 | 29 14:21 (WEA 2) |
| 37 08:22 | 07:29 | 06:25 | 06:11 | 05:13 | 04:48 | 05:12 | 05:12 | 06:02 | 06:56 | 07:50 | 07:48 | 08:29 | 13:51 (WEA 2) |
| 38 16:35 | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 21:35 | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 | 29 14:20 (WEA 2) |
| 39 08:21 | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 05:13 | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 | 13:52 (WEA 2) |
| 40 16:36 | 17:36 | 18:29 | 20:26 | 21:18 | 21:49 | 21:33 | 21:33 | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 | 29 14:21 (WEA 2) |
| 41 08:20 | 07:25 | 06:20 | 06:06 | 05:10 | 04:48 | 05:15 | 05:15 | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 | 13:53 (WEA 2) |
| 42 16:38 | 17:38 | 18:31 | 20:27 | 21:19 | 21:50 | 21:32 | 21:32 | 20:34 | 19:21 | 18:10 | 16:14 | 16:00 | 29 14:22 (WEA 2) |
| 43 08:18 | 07:23 | 06:17 | 06:04 | 05:08 | 04:49 | 05:16 | 05:16 | 06:08 | 07:01 | 07:56 | 07:54 | 08:31 | 13:53 (WEA 2) |
| 44 16:40 | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 21:31 | 20:32 | 19:18 | 18:08 | 16:12 | 16:00 | 29 14:22 (WEA 2) |
| 45 08:16 | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 | 13:53 (WEA 2) |
| 46 16:42 | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 21:29 | 20:30 | 19:16 | 18:05 | 16:11 | 16:01 | 29 14:22 (WEA 2) |
| 47 08:16 | 07:19 | 06:13 | 06:00 | 05:05 | 04:49 | 05:19 | 05:19 | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 | 13:54 (WEA 2) |
| 48 16:44 | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 21:28 | 20:28 | 19:13 | 18:03 | 16:10 | 16:01 | 29 14:23 (WEA 2) |
| 49 08:15 | 07:16 | 06:10 | 05:58 | 05:04 | 04:49 | 05:21 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:32 | 13:55 (WEA 2) |
| 50 16:45 | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 21:26 | 20:25 | 19:11 | 18:01 | 16:09 | 16:02 | 29 14:24 (WEA 2) |
| 51 08:13 | 07:14 | 06:08 | 05:55 | 05:03 | 04:50 | 05:22 | 05:22 | 06:15 | 07:08 | 07:03 | 08:01 | 08:33 | 13:55 (WEA 2) |
| 52 16:47 | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 21:25 | 20:23 | 19:09 | 18:00 | 16:08 | 16:03 | 29 14:24 (WEA 2) |
| 53 08:12 | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 | 13:55 (WEA 2) |
| 54 16:49 | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 21:23 | 20:21 | 19:06 | 18:00 | 16:07 | 16:03 | 29 14:24 (WEA 2) |
| 55 08:10 | 07:10 | 06:03 | 05:51 | 05:01 | 04:51 | 05:25 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 | 13:56 (WEA 2) |
| 56 16:51 | 17:52 | 18:44 | 20:40 | 21:29 | 21:50 | 21:22 | 21:22 | 20:19 | 19:04 | 18:00 | 16:06 | 16:04 | 28 14:24 (WEA 2) |
| 57 08:09 | 07:00 | 05:49 | 04:59 | 04:51 | 04:51 | 05:27 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | 13:56 (WEA 2) |
| 58 16:53 | 17:54 | 18:46 | 20:42 | 21:31 | 21:50 | 21:20 | 21:20 | 20:16 | 19:01 | 18:00 | 16:05 | 16:05 | 29 14:25 (WEA 2) |
| 59 08:07 | 06:58 | 05:47 | 04:58 | 04:52 | 04:52 | 05:28 | 05:28 | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | 13:57 (WEA 2) |
| 60 16:55 | 17:57 | 18:49 | 20:44 | 21:32 | 21:50 | 21:18 | 21:18 | 20:14 | 18:59 | 18:00 | 16:04 | 16:06 | 28 14:25 (WEA 2) |
| 61 08:06 | 06:56 | 05:45 | 04:57 | 04:51 | 04:51 | 05:30 | 05:30 | 06:23 | 07:13 | 07:08 | 08:04 | 08:33 | 13:58 (WEA 2) |
| 62 16:57 | 17:59 | 18:51 | 20:47 | 21:33 | 21:50 | 21:17 | 21:17 | 20:12 | 18:59 | 18:00 | 16:04 | 16:07 | 27 14:25 (WEA 2) |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 236 | 803 |
| astr.max.mögl.Beschattung | 244 | | | | | | | | | | 8 | | |

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) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schatteneende (WEA mit letztem Schatten) |
| | Sonnenuntergang (SS:MM) | | | |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-B - Dorfstrasse 5, Badekew

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | | Februar | | März | | April | | Mai | | Juni |
|----|--------------------------------|----|----------------------------------|-----|------------------------------------------------|--|------------------|--|------------------|--|------------------|
| 1 | 08:33 16:08 | | 08:04 16:59 | 21 | 16:05 (WEA 2) 07:07 16:26 (WEA 2) 17:54 | | 06:53 19:51 | | 05:45 20:45 | | 04:56 21:35 |
| 2 | 08:33 16:09 | | 08:02 17:01 | 23 | 16:04 (WEA 2) 07:05 16:27 (WEA 2) 17:56 | | 06:51 19:53 | | 05:43 20:47 | | 04:56 21:36 |
| 3 | 08:33 16:11 | | 08:00 17:03 | 25 | 16:04 (WEA 2) 07:03 16:29 (WEA 2) 17:57 | | 06:48 19:55 | | 05:41 20:49 | | 04:55 21:37 |
| 4 | 08:33 16:12 | | 07:59 17:05 | 27 | 16:03 (WEA 2) 07:00 16:30 (WEA 2) 17:59 | | 06:46 19:57 | | 05:39 20:51 | | 04:54 21:38 |
| 5 | 08:32 16:13 | | 07:57 17:07 | 28 | 16:03 (WEA 2) 06:58 16:31 (WEA 2) 18:01 | | 06:44 19:58 | | 05:37 20:53 | | 04:53 21:39 |
| 6 | 08:32 16:14 | | 07:55 17:09 | 30 | 16:02 (WEA 2) 06:56 16:32 (WEA 2) 18:03 | | 06:41 20:00 | | 05:35 20:54 | | 04:52 21:40 |
| 7 | 08:32 16:16 | | 07:53 17:11 | 30 | 16:02 (WEA 2) 06:53 16:32 (WEA 2) 18:05 | | 06:39 20:02 | | 05:33 20:56 | | 04:52 21:41 |
| 8 | 08:31 16:17 | | 07:51 17:13 | 30 | 16:02 (WEA 2) 06:51 16:32 (WEA 2) 18:07 | | 06:36 20:04 | | 05:31 20:58 | | 04:51 21:42 |
| 9 | 08:31 16:18 | | 07:50 17:15 | 32 | 16:01 (WEA 2) 06:49 16:33 (WEA 2) 18:09 | | 06:34 20:06 | | 05:29 21:00 | | 04:51 21:43 |
| 10 | 08:30 16:20 | | 07:48 17:17 | 32 | 16:01 (WEA 2) 06:46 16:33 (WEA 2) 18:11 | | 06:32 20:07 | | 05:28 21:01 | | 04:50 21:44 |
| 11 | 08:29 16:21 | | 07:46 17:19 | 31 | 16:02 (WEA 2) 06:44 16:33 (WEA 2) 18:13 | | 06:29 20:09 | | 05:26 21:03 | | 04:50 21:45 |
| 12 | 08:29 16:23 | | 07:44 17:20 | 31 | 16:02 (WEA 2) 06:42 16:33 (WEA 2) 18:14 | | 06:27 20:11 | | 05:24 21:05 | | 04:49 21:45 |
| 13 | 08:28 16:25 | | 07:42 17:22 | 31 | 16:02 (WEA 2) 06:39 16:33 (WEA 2) 18:16 | | 06:25 20:13 | | 05:22 21:06 | | 04:49 21:46 |
| 14 | 08:27 16:26 | | 07:40 17:24 | 30 | 16:02 (WEA 2) 06:37 16:32 (WEA 2) 18:18 | | 06:22 20:15 | | 05:21 21:08 | | 04:49 21:47 |
| 15 | 08:26 16:28 | | 07:38 17:26 | 29 | 16:02 (WEA 2) 06:34 16:31 (WEA 2) 18:20 | | 06:20 20:17 | | 05:19 21:10 | | 04:48 21:47 |
| 16 | 08:25 16:29 | | 07:36 17:28 | 28 | 16:03 (WEA 2) 06:32 16:31 (WEA 2) 18:22 | | 06:18 20:18 | | 05:17 21:11 | | 04:48 21:48 |
| 17 | 08:24 16:31 | | 07:34 17:30 | 26 | 16:04 (WEA 2) 06:30 16:30 (WEA 2) 18:24 | | 06:15 20:20 | | 05:16 21:13 | | 04:48 21:48 |
| 18 | 08:23 16:33 | | 07:32 17:32 | 23 | 16:06 (WEA 2) 06:27 16:29 (WEA 2) 18:26 | | 06:13 20:22 | | 05:14 21:15 | | 04:48 21:49 |
| 19 | 08:22 16:35 | | 07:29 17:34 | 20 | 16:08 (WEA 2) 06:25 16:28 (WEA 2) 18:27 | | 06:11 20:24 | | 05:13 21:16 | | 04:48 21:49 |
| 20 | 08:21 16:36 | | 07:27 17:36 | 16 | 16:09 (WEA 2) 06:22 16:25 (WEA 2) 18:29 | | 06:09 20:26 | | 05:11 21:18 | | 04:48 21:49 |
| 21 | 08:20 16:38 | | 07:25 17:38 | 10 | 16:12 (WEA 2) 06:20 16:22 (WEA 2) 18:31 | | 06:06 20:27 | | 05:10 21:19 | | 04:48 21:50 |
| 22 | 08:18 16:40 | | 07:23 17:40 | | 06:17 18:33 | | 06:04 20:29 | | 05:08 21:21 | | 04:49 21:50 |
| 23 | 08:17 16:42 | | 07:21 17:42 | | 06:15 18:35 | | 06:02 20:31 | | 05:07 21:22 | | 04:49 21:50 |
| 24 | 08:16 16:44 | | 07:19 17:44 | | 06:13 18:37 | | 06:00 20:33 | | 05:05 21:24 | | 04:49 21:50 |
| 25 | 08:14 16:45 | | 07:16 17:46 | | 06:10 18:38 | | 05:58 20:35 | | 05:04 21:25 | | 04:49 21:50 |
| 26 | 08:13 16:47 | | 07:14 17:48 | | 06:08 18:40 | | 05:55 20:36 | | 05:03 21:27 | | 04:50 21:50 |
| 27 | 08:12 16:49 | | 07:12 17:50 | | 06:05 18:42 | | 05:53 20:38 | | 05:02 21:28 | | 04:50 21:50 |
| 28 | 08:10 16:51 | | 07:10 17:52 | | 06:03 18:44 | | 05:51 20:40 | | 05:01 21:29 | | 04:51 21:50 |
| 29 | 08:09 16:53 | 6 | 16:13 (WEA 2) 16:19 (WEA 2) | | 07:00 19:46 | | 05:49 20:42 | | 04:59 21:31 | | 04:51 21:50 |
| 30 | 08:07 16:55 | 13 | 16:09 (WEA 2) 16:22 (WEA 2) | | 06:58 19:47 | | 05:47 20:44 | | 04:58 21:32 | | 04:52 21:49 |
| 31 | 08:05 16:57 | 17 | 16:07 (WEA 2) 16:24 (WEA 2) | | 06:56 19:49 | | | | 04:57 21:33 | | |
| | Sonnenscheinstunden 252 | | | 274 | | | 367 | | 419 | | 508 |
| | astr.max.mögl.Beschattung 36 | | | 553 | | | | | | | |

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) Schattende | (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-B - Dorfstrasse 5, Badekew

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Juli | August | September | Oktober | | November | | Dezember |
|---------------------------|-------|--------|-----------|---------|------------------|----------|------------------|----------|
| 1 | 04:53 | 05:32 | 06:25 | 07:17 | | 07:15 | 15:31 (WEA 2) | 08:09 |
| | 21:49 | 21:15 | 20:09 | 18:56 | | 16:47 | 32 16:03 (WEA 2) | 16:03 |
| 2 | 04:53 | 05:33 | 06:27 | 07:19 | | 07:16 | 15:31 (WEA 2) | 08:10 |
| | 21:49 | 21:13 | 20:07 | 18:54 | | 16:45 | 31 16:02 (WEA 2) | 16:03 |
| 3 | 04:54 | 05:35 | 06:28 | 07:21 | | 07:18 | 15:31 (WEA 2) | 08:12 |
| | 21:48 | 21:11 | 20:04 | 18:52 | | 16:43 | 31 16:02 (WEA 2) | 16:02 |
| 4 | 04:55 | 05:37 | 06:30 | 07:23 | | 07:20 | 15:32 (WEA 2) | 08:13 |
| | 21:48 | 21:09 | 20:02 | 18:49 | | 16:41 | 30 16:02 (WEA 2) | 16:01 |
| 5 | 04:56 | 05:38 | 06:32 | 07:24 | | 07:22 | 15:32 (WEA 2) | 08:14 |
| | 21:47 | 21:07 | 20:00 | 18:47 | | 16:39 | 29 16:01 (WEA 2) | 16:01 |
| 6 | 04:57 | 05:40 | 06:34 | 07:26 | | 07:24 | 15:32 (WEA 2) | 08:16 |
| | 21:47 | 21:06 | 19:57 | 18:44 | | 16:37 | 29 16:01 (WEA 2) | 16:00 |
| 7 | 04:58 | 05:42 | 06:35 | 07:28 | | 07:26 | 15:33 (WEA 2) | 08:17 |
| | 21:46 | 21:04 | 19:55 | 18:42 | | 16:35 | 27 16:00 (WEA 2) | 16:00 |
| 8 | 04:59 | 05:43 | 06:37 | 07:30 | | 07:28 | 15:34 (WEA 2) | 08:18 |
| | 21:45 | 21:02 | 19:52 | 18:40 | | 16:34 | 25 15:59 (WEA 2) | 15:59 |
| 9 | 05:00 | 05:45 | 06:39 | 07:32 | | 07:30 | 15:35 (WEA 2) | 08:20 |
| | 21:45 | 21:00 | 19:50 | 18:37 | | 16:32 | 23 15:58 (WEA 2) | 15:59 |
| 10 | 05:01 | 05:47 | 06:41 | 07:33 | | 07:32 | 15:36 (WEA 2) | 08:21 |
| | 21:44 | 20:58 | 19:48 | 18:35 | | 16:30 | 21 15:57 (WEA 2) | 15:59 |
| 11 | 05:02 | 05:49 | 06:42 | 07:35 | | 07:34 | 15:38 (WEA 2) | 08:22 |
| | 21:43 | 20:56 | 19:45 | 18:33 | | 16:28 | 17 15:55 (WEA 2) | 15:58 |
| 12 | 05:03 | 05:50 | 06:44 | 07:37 | | 07:36 | 15:41 (WEA 2) | 08:23 |
| | 21:42 | 20:54 | 19:43 | 18:30 | | 16:27 | 13 15:54 (WEA 2) | 15:58 |
| 13 | 05:04 | 05:52 | 06:46 | 07:39 | | 07:37 | 15:45 (WEA 2) | 08:24 |
| | 21:41 | 20:52 | 19:40 | 18:28 | | 16:25 | 6 15:51 (WEA 2) | 15:58 |
| 14 | 05:05 | 05:54 | 06:48 | 07:41 | | 07:39 | | 08:25 |
| | 21:40 | 20:50 | 19:38 | 18:26 | | 16:24 | | 15:58 |
| 15 | 05:07 | 05:55 | 06:49 | 07:43 | | 07:41 | | 08:26 |
| | 21:39 | 20:47 | 19:35 | 18:23 | | 16:22 | | 15:58 |
| 16 | 05:08 | 05:57 | 06:51 | 07:44 | | 07:43 | | 08:27 |
| | 21:38 | 20:45 | 19:33 | 18:21 | | 16:21 | | 15:58 |
| 17 | 05:09 | 05:59 | 06:53 | 07:46 | | 07:45 | | 08:28 |
| | 21:37 | 20:43 | 19:31 | 18:19 | | 16:19 | | 15:58 |
| 18 | 05:11 | 06:01 | 06:54 | 07:48 | | 07:47 | | 08:29 |
| | 21:36 | 20:41 | 19:28 | 18:16 | | 16:18 | | 15:59 |
| 19 | 05:12 | 06:02 | 06:56 | 07:50 | | 07:48 | | 08:29 |
| | 21:34 | 20:39 | 19:26 | 18:14 | | 16:16 | | 15:59 |
| 20 | 05:13 | 06:04 | 06:58 | 07:52 | | 07:50 | | 08:30 |
| | 21:33 | 20:37 | 19:23 | 18:12 | | 16:15 | | 15:59 |
| 21 | 05:15 | 06:06 | 07:00 | 07:54 | 16:41 (WEA 2) | 07:52 | | 08:31 |
| | 21:32 | 20:34 | 19:21 | 18:10 | 12 16:53 (WEA 2) | 16:14 | | 16:00 |
| 22 | 05:16 | 06:08 | 07:01 | 07:56 | 16:39 (WEA 2) | 07:54 | | 08:31 |
| | 21:31 | 20:32 | 19:18 | 18:08 | 17 16:56 (WEA 2) | 16:12 | | 16:00 |
| 23 | 05:18 | 06:09 | 07:03 | 07:57 | 16:36 (WEA 2) | 07:56 | | 08:32 |
| | 21:29 | 20:30 | 19:16 | 18:05 | 22 16:58 (WEA 2) | 16:11 | | 16:01 |
| 24 | 05:19 | 06:11 | 07:05 | 07:59 | 16:35 (WEA 2) | 07:57 | | 08:32 |
| | 21:28 | 20:28 | 19:13 | 18:03 | 24 16:59 (WEA 2) | 16:10 | | 16:01 |
| 25 | 05:21 | 06:13 | 07:07 | 07:01 | 15:34 (WEA 2) | 07:59 | | 08:32 |
| | 21:26 | 20:25 | 19:11 | 17:01 | 26 16:00 (WEA 2) | 16:09 | | 16:02 |
| 26 | 05:22 | 06:15 | 07:08 | 07:03 | 15:33 (WEA 2) | 08:01 | | 08:33 |
| | 21:25 | 20:23 | 19:09 | 16:59 | 27 16:00 (WEA 2) | 16:08 | | 16:03 |
| 27 | 05:24 | 06:16 | 07:10 | 07:05 | 15:32 (WEA 2) | 08:02 | | 08:33 |
| | 21:23 | 20:21 | 19:06 | 16:57 | 29 16:01 (WEA 2) | 16:07 | | 16:03 |
| 28 | 05:25 | 06:18 | 07:12 | 07:07 | 15:31 (WEA 2) | 08:04 | | 08:33 |
| | 21:21 | 20:19 | 19:04 | 16:55 | 30 16:01 (WEA 2) | 16:06 | | 16:04 |
| 29 | 05:27 | 06:20 | 07:14 | 07:09 | 15:31 (WEA 2) | 08:06 | | 08:33 |
| | 21:20 | 20:16 | 19:01 | 16:53 | 31 16:02 (WEA 2) | 16:05 | | 16:05 |
| 30 | 05:28 | 06:22 | 07:16 | 07:11 | 15:31 (WEA 2) | 08:07 | | 08:33 |
| | 21:18 | 20:14 | 18:59 | 16:51 | 32 16:03 (WEA 2) | 16:04 | | 16:06 |
| 31 | 05:30 | 06:23 | | 07:13 | 15:31 (WEA 2) | | | 08:33 |
| | 21:16 | 20:12 | | 16:49 | 32 16:03 (WEA 2) | | | 16:07 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | | 261 | | 236 |
| astr.max.mögl.Beschattung | | | | 282 | | 314 | | |

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: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-C - Dorfstrasse 1, Badekew

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:08 | 08:04 16:59 | 07:07 17:54 | 16:53 (WEA 2) 17:22 (WEA 2) | 06:53 19:51 | 05:45 20:45 | 04:56 21:35 |
| 2 | 08:33 16:09 | 08:02 17:01 | 07:05 17:56 | 16:51 (WEA 2) 17:22 (WEA 2) | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 |
| 3 | 08:33 16:11 | 08:00 17:03 | 07:03 17:57 | 16:50 (WEA 2) 17:23 (WEA 2) | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 16:49 (WEA 2) 17:23 (WEA 2) | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 16:48 (WEA 2) 17:24 (WEA 2) | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 16:48 (WEA 2) 17:24 (WEA 2) | 06:41 20:00 | 05:35 20:54 | 04:52 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 16:47 (WEA 2) 17:24 (WEA 2) | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 |
| 8 | 08:31 16:17 | 07:51 17:13 | 06:51 18:07 | 16:47 (WEA 2) 17:24 (WEA 2) | 06:36 20:04 | 05:31 20:58 | 04:51 21:42 |
| 9 | 08:31 16:18 | 07:50 17:15 | 06:49 18:09 | 16:46 (WEA 2) 17:23 (WEA 2) | 06:34 20:06 | 05:29 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 16:47 (WEA 2) 17:23 (WEA 2) | 06:32 20:07 | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:21 | 07:46 17:19 | 06:44 18:13 | 16:47 (WEA 2) 17:23 (WEA 2) | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 07:44 17:20 | 06:42 18:14 | 16:47 (WEA 2) 17:22 (WEA 2) | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:22 | 06:39 18:16 | 16:48 (WEA 2) 17:21 (WEA 2) | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:24 | 06:37 18:18 | 16:48 (WEA 2) 17:20 (WEA 2) | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:26 | 06:34 18:20 | 16:49 (WEA 2) 17:19 (WEA 2) | 06:20 20:17 | 05:19 21:10 | 04:48 21:47 |
| 16 | 08:25 16:29 | 07:36 17:28 | 06:32 18:22 | 16:49 (WEA 2) 17:17 (WEA 2) | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 16:51 (WEA 2) 17:16 (WEA 2) | 06:15 20:20 | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 16:53 (WEA 2) 17:14 (WEA 2) | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 16:55 (WEA 2) 17:10 (WEA 2) | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 17:10 (WEA 2) 18:29 | 20:24 20:26 | 21:16 21:18 | 21:49 21:49 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 18:29 18:31 | 20:26 20:27 | 21:18 21:19 | 21:49 21:50 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:17 18:33 | 06:17 18:33 | 20:27 20:29 | 21:19 21:21 | 21:50 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:15 18:35 | 20:30 20:31 | 21:21 21:22 | 21:50 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:13 18:37 | 20:31 20:33 | 21:22 21:24 | 21:50 21:50 |
| 25 | 08:14 16:45 | 07:16 17:46 | 17:01 (WEA 2) 17:13 (WEA 2) | 06:10 18:38 | 05:58 20:35 | 21:24 21:25 | 21:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 16:58 (WEA 2) 17:17 (WEA 2) | 06:08 18:40 | 05:55 20:36 | 21:25 21:27 | 21:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 16:55 (WEA 2) 17:18 (WEA 2) | 06:05 18:42 | 05:53 20:38 | 21:27 21:28 | 21:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 16:54 (WEA 2) 17:20 (WEA 2) | 06:03 18:44 | 05:51 20:40 | 21:29 21:29 | 21:50 21:50 |
| 29 | 08:09 16:53 | | 07:00 19:46 | 07:00 19:46 | 20:42 20:42 | 21:31 21:31 | 21:50 21:50 |
| 30 | 08:07 16:55 | | 06:58 19:47 | 06:58 19:47 | 20:44 20:44 | 21:32 21:32 | 21:49 21:49 |
| 31 | 08:05 16:57 | | 06:56 19:49 | 06:56 19:49 | | 21:33 21:33 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | |
| astr.max.mögl.Beschattung | | 80 | 601 | | | | |

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: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-C - Dorfstrasse 1, Badekew
Voraussetzungen für Berechnung des Schattenwurfs

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

| | July | August | September | | Oktober | | November | Dezember |
|---------------------------|-------|--------|-----------|------------------|---------|------------------|----------|----------|
| 1 | 04:53 | 05:32 | 06:25 | | 07:17 | 17:26 (WEA 2) | 07:15 | 08:09 |
| | 21:49 | 21:15 | 20:09 | | 18:56 | 34 18:00 (WEA 2) | 16:47 | 16:03 |
| 2 | 04:53 | 05:33 | 06:27 | | 07:19 | 17:25 (WEA 2) | 07:16 | 08:10 |
| | 21:49 | 21:13 | 20:07 | | 18:54 | 36 18:01 (WEA 2) | 16:45 | 16:03 |
| 3 | 04:54 | 05:35 | 06:28 | | 07:21 | 17:25 (WEA 2) | 07:18 | 08:12 |
| | 21:48 | 21:11 | 20:04 | | 18:52 | 36 18:01 (WEA 2) | 16:43 | 16:02 |
| 4 | 04:55 | 05:37 | 06:30 | | 07:23 | 17:24 (WEA 2) | 07:20 | 08:13 |
| | 21:48 | 21:09 | 20:02 | | 18:49 | 37 18:01 (WEA 2) | 16:41 | 16:01 |
| 5 | 04:56 | 05:38 | 06:32 | | 07:24 | 17:24 (WEA 2) | 07:22 | 08:14 |
| | 21:47 | 21:07 | 20:00 | | 18:47 | 37 18:01 (WEA 2) | 16:39 | 16:01 |
| 6 | 04:57 | 05:40 | 06:34 | | 07:26 | 17:24 (WEA 2) | 07:24 | 08:16 |
| | 21:47 | 21:06 | 19:57 | | 18:44 | 37 18:01 (WEA 2) | 16:37 | 16:00 |
| 7 | 04:58 | 05:42 | 06:35 | | 07:28 | 17:23 (WEA 2) | 07:26 | 08:17 |
| | 21:46 | 21:04 | 19:55 | | 18:42 | 36 17:59 (WEA 2) | 16:35 | 16:00 |
| 8 | 04:59 | 05:43 | 06:37 | | 07:30 | 17:23 (WEA 2) | 07:28 | 08:18 |
| | 21:45 | 21:02 | 19:52 | | 18:40 | 36 17:59 (WEA 2) | 16:34 | 15:59 |
| 9 | 05:00 | 05:45 | 06:39 | | 07:32 | 17:23 (WEA 2) | 07:30 | 08:20 |
| | 21:45 | 21:00 | 19:50 | | 18:37 | 35 17:58 (WEA 2) | 16:32 | 15:59 |
| 10 | 05:01 | 05:47 | 06:41 | | 07:33 | 17:24 (WEA 2) | 07:32 | 08:21 |
| | 21:44 | 20:58 | 19:48 | | 18:35 | 34 17:58 (WEA 2) | 16:30 | 15:59 |
| 11 | 05:02 | 05:49 | 06:42 | | 07:35 | 17:24 (WEA 2) | 07:34 | 08:22 |
| | 21:43 | 20:56 | 19:45 | | 18:33 | 33 17:57 (WEA 2) | 16:29 | 15:58 |
| 12 | 05:03 | 05:50 | 06:44 | | 07:37 | 17:25 (WEA 2) | 07:35 | 08:23 |
| | 21:42 | 20:54 | 19:43 | | 18:30 | 31 17:56 (WEA 2) | 16:27 | 15:58 |
| 13 | 05:04 | 05:52 | 06:46 | | 07:39 | 17:26 (WEA 2) | 07:37 | 08:24 |
| | 21:41 | 20:52 | 19:40 | | 18:28 | 28 17:54 (WEA 2) | 16:25 | 15:58 |
| 14 | 05:05 | 05:54 | 06:48 | | 07:41 | 17:28 (WEA 2) | 07:39 | 08:25 |
| | 21:40 | 20:50 | 19:38 | | 18:26 | 25 17:53 (WEA 2) | 16:24 | 15:58 |
| 15 | 05:07 | 05:55 | 06:49 | | 07:43 | 17:28 (WEA 2) | 07:41 | 08:26 |
| | 21:39 | 20:47 | 19:35 | | 18:23 | 22 17:50 (WEA 2) | 16:22 | 15:58 |
| 16 | 05:08 | 05:57 | 06:51 | | 07:44 | 17:31 (WEA 2) | 07:43 | 08:27 |
| | 21:38 | 20:45 | 19:33 | | 18:21 | 16 17:47 (WEA 2) | 16:21 | 15:58 |
| 17 | 05:09 | 05:59 | 06:53 | | 07:46 | 17:35 (WEA 2) | 07:45 | 08:28 |
| | 21:37 | 20:43 | 19:31 | | 18:19 | 8 17:43 (WEA 2) | 16:19 | 15:58 |
| 18 | 05:11 | 06:01 | 06:54 | | 07:48 | | 07:47 | 08:29 |
| | 21:36 | 20:41 | 19:28 | | 18:16 | | 16:18 | 15:59 |
| 19 | 05:12 | 06:02 | 06:56 | | 07:50 | | 07:48 | 08:29 |
| | 21:34 | 20:39 | 19:26 | | 18:14 | | 16:16 | 15:59 |
| 20 | 05:13 | 06:04 | 06:58 | | 07:52 | | 07:50 | 08:30 |
| | 21:33 | 20:37 | 19:23 | | 18:12 | | 16:15 | 15:59 |
| 21 | 05:15 | 06:06 | 07:00 | | 07:54 | | 07:52 | 08:31 |
| | 21:32 | 20:34 | 19:21 | | 18:10 | | 16:14 | 16:00 |
| 22 | 05:16 | 06:08 | 07:01 | | 07:56 | | 07:54 | 08:31 |
| | 21:30 | 20:32 | 19:18 | | 18:08 | | 16:12 | 16:00 |
| 23 | 05:18 | 06:09 | 07:03 | | 07:57 | | 07:56 | 08:32 |
| | 21:29 | 20:30 | 19:16 | | 18:05 | | 16:11 | 16:01 |
| 24 | 05:19 | 06:11 | 07:05 | 17:40 (WEA 2) | 07:59 | | 07:57 | 08:32 |
| | 21:28 | 20:28 | 19:13 | 13 17:53 (WEA 2) | 18:03 | | 16:10 | 16:01 |
| 25 | 05:21 | 06:13 | 07:07 | 17:37 (WEA 2) | 07:01 | | 07:59 | 08:32 |
| | 21:26 | 20:25 | 19:11 | 19 17:56 (WEA 2) | 17:01 | | 16:09 | 16:02 |
| 26 | 05:22 | 06:15 | 07:08 | 17:34 (WEA 2) | 07:03 | | 08:01 | 08:33 |
| | 21:25 | 20:23 | 19:09 | 24 17:58 (WEA 2) | 16:59 | | 16:08 | 16:03 |
| 27 | 05:24 | 06:16 | 07:10 | 17:31 (WEA 2) | 07:05 | | 08:02 | 08:33 |
| | 21:23 | 20:21 | 19:06 | 27 17:58 (WEA 2) | 16:57 | | 16:07 | 16:03 |
| 28 | 05:25 | 06:18 | 07:12 | 17:30 (WEA 2) | 07:07 | | 08:04 | 08:33 |
| | 21:21 | 20:19 | 19:04 | 29 17:59 (WEA 2) | 16:55 | | 16:06 | 16:04 |
| 29 | 05:27 | 06:20 | 07:14 | 17:29 (WEA 2) | 07:09 | | 08:06 | 08:33 |
| | 21:20 | 20:16 | 19:01 | 31 18:00 (WEA 2) | 16:53 | | 16:05 | 16:05 |
| 30 | 05:28 | 06:22 | 07:16 | 17:28 (WEA 2) | 07:11 | | 08:07 | 08:33 |
| | 21:18 | 20:14 | 18:59 | 33 18:01 (WEA 2) | 16:51 | | 16:04 | 16:06 |
| 31 | 05:30 | 06:23 | | | 07:13 | | | 08:33 |
| | 21:16 | 20:12 | | | 16:49 | | | 16:07 |
| Sonnenscheinstunden | 510 | 458 | 382 | | 329 | | 261 | 236 |
| astr.max.mögl.Beschattung | | | 176 | | 521 | | | |

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: Zusatzbelastung WEA 2 Schattenrezeptor: IO-D - Zarrentiner Strasse 44, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:04 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:54 21:49 | 05:34 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:48 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:47 | 05:39 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:14 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:53 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:45 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:06 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:44 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:34 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:49 21:50 | 05:15 21:32 | 06:06 20:34 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:25 | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 08:01 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 08:02 16:07 | 08:33 16:04 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 | 05:25 21:21 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 08:04 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:52 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:49 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | | 05:30 21:16 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-E - Zarrentiner Strasse 50, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:04 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:54 21:49 | 05:34 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:48 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:47 | 05:39 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:14 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:53 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:45 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:06 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:44 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:49 21:50 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:25 | 07:07 19:11 | 07:57 18:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 07:03 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 07:05 16:07 | 08:33 16:04 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 | 05:25 21:21 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 07:07 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:52 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:49 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | | 05:30 21:16 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-F - Zarreniner Strasse 62, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:04 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:54 21:49 | 05:34 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:48 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:47 | 05:39 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:15 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:53 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:46 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:06 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:49 21:50 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 08:01 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 08:02 16:07 | 08:33 16:04 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 08:04 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:52 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:50 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | | 05:30 21:17 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-G - Zarrentiner Strasse 71, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:57 | 07:15 16:47 | 08:09 16:04 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:54 21:49 | 05:34 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:48 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:47 | 05:39 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:15 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:53 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:46 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:06 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:49 21:50 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 08:01 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 08:02 16:07 | 08:33 16:04 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 08:04 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:52 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:50 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | | 05:30 21:17 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-H - Zarrentiner Strasse 77, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | | Juni | |
|---------------------------|----------------|----------------|----------------|----------------|----------------|-----|------------------------|--------------------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | | 04:57 21:35 | 33 06:05 (WEA 2) 06:38 (WEA 2) |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | | 04:56 21:36 | 33 06:05 (WEA 2) 06:38 (WEA 2) |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | 05:41 20:49 | | 04:55 21:37 | 33 06:05 (WEA 2) 06:38 (WEA 2) |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | | 04:54 21:38 | 32 06:06 (WEA 2) 06:38 (WEA 2) |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | | 04:53 21:39 | 32 06:06 (WEA 2) 06:38 (WEA 2) |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 11 | 06:15 (WEA 2) 21:40 | 04:53 31 06:37 (WEA 2) |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 16 | 06:12 (WEA 2) 21:41 | 04:52 31 06:07 (WEA 2) 06:38 (WEA 2) |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 20 | 06:11 (WEA 2) 21:42 | 04:51 30 06:37 (WEA 2) |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 23 | 06:09 (WEA 2) 21:43 | 04:51 29 06:37 (WEA 2) |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 26 | 06:07 (WEA 2) 21:44 | 04:50 29 06:09 (WEA 2) 06:38 (WEA 2) |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 27 | 06:07 (WEA 2) 21:45 | 04:50 29 06:37 (WEA 2) |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 29 | 06:06 (WEA 2) 21:45 | 04:49 28 06:37 (WEA 2) |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 31 | 06:04 (WEA 2) 21:46 | 04:49 27 06:37 (WEA 2) |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 32 | 06:04 (WEA 2) 21:47 | 04:49 28 06:38 (WEA 2) |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 33 | 06:03 (WEA 2) 21:47 | 04:49 27 06:38 (WEA 2) |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 34 | 06:03 (WEA 2) 21:48 | 04:48 27 06:37 (WEA 2) |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 34 | 06:03 (WEA 2) 21:48 | 04:48 26 06:37 (WEA 2) |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 35 | 06:03 (WEA 2) 21:49 | 04:48 26 06:38 (WEA 2) |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 35 | 06:03 (WEA 2) 21:49 | 04:48 26 06:38 (WEA 2) |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 36 | 06:02 (WEA 2) 21:49 | 04:48 26 06:38 (WEA 2) |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 36 | 06:02 (WEA 2) 21:50 | 04:49 26 06:38 (WEA 2) |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 36 | 06:03 (WEA 2) 21:50 | 04:49 26 06:38 (WEA 2) |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 36 | 06:03 (WEA 2) 21:50 | 04:49 26 06:38 (WEA 2) |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 36 | 06:02 (WEA 2) 21:50 | 04:49 26 06:39 (WEA 2) |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 36 | 06:02 (WEA 2) 21:50 | 04:50 26 06:39 (WEA 2) |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 35 | 06:03 (WEA 2) 21:50 | 04:50 27 06:40 (WEA 2) |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 35 | 06:03 (WEA 2) 21:50 | 04:50 27 06:40 (WEA 2) |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 35 | 06:03 (WEA 2) 21:50 | 04:51 27 06:41 (WEA 2) |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 35 | 06:03 (WEA 2) 21:50 | 04:52 28 06:41 (WEA 2) |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 34 | 06:04 (WEA 2) 21:50 | 04:52 28 06:13 (WEA 2) 06:41 (WEA 2) |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | 34 | 06:05 (WEA 2) 21:50 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | | 507 | 850 |
| astr.max.mögl.Beschattung | | | | | | 810 | | |

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: Zusatzbelastung WEA 2 Schattenrezeptor: IO-H - Zarrentiner Strasse 77, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 | 06:13 (WEA 2) | 05:32 | 06:16 (WEA 2) | 06:25 | 07:17 | 07:15 | 08:09 | | | |
| | 21:49 | 28 | 06:41 (WEA 2) | 21:15 | 29 | 06:45 (WEA 2) | 20:09 | 18:57 | 16:47 | 16:04 | |
| 2 | 04:54 | 06:13 (WEA 2) | 05:34 | 06:18 (WEA 2) | 06:27 | 07:19 | 07:17 | 08:10 | | | |
| | 21:49 | 29 | 06:42 (WEA 2) | 21:13 | 27 | 06:45 (WEA 2) | 20:07 | 18:54 | 16:45 | 16:03 | |
| 3 | 04:54 | 06:13 (WEA 2) | 05:35 | 06:18 (WEA 2) | 06:29 | 07:21 | 07:18 | 08:12 | | | |
| | 21:48 | 30 | 06:43 (WEA 2) | 21:11 | 25 | 06:43 (WEA 2) | 20:05 | 18:52 | 16:43 | 16:02 | |
| 4 | 04:55 | 06:13 (WEA 2) | 05:37 | 06:20 (WEA 2) | 06:30 | 07:23 | 07:20 | 08:13 | | | |
| | 21:48 | 30 | 06:43 (WEA 2) | 21:09 | 22 | 06:42 (WEA 2) | 20:02 | 18:49 | 16:41 | 16:01 | |
| 5 | 04:56 | 06:13 (WEA 2) | 05:39 | 06:21 (WEA 2) | 06:32 | 07:25 | 07:22 | 08:15 | | | |
| | 21:47 | 30 | 06:43 (WEA 2) | 21:08 | 19 | 06:40 (WEA 2) | 20:00 | 18:47 | 16:39 | 16:01 | |
| 6 | 04:57 | 06:13 (WEA 2) | 05:40 | 06:23 (WEA 2) | 06:34 | 07:26 | 07:24 | 08:16 | | | |
| | 21:47 | 30 | 06:43 (WEA 2) | 21:06 | 15 | 06:38 (WEA 2) | 19:57 | 18:45 | 16:37 | 16:00 | |
| 7 | 04:58 | 06:13 (WEA 2) | 05:42 | 06:26 (WEA 2) | 06:36 | 07:28 | 07:26 | 08:17 | | | |
| | 21:46 | 31 | 06:44 (WEA 2) | 21:04 | 8 | 06:34 (WEA 2) | 19:55 | 18:42 | 16:36 | 16:00 | |
| 8 | 04:59 | 06:13 (WEA 2) | 05:44 | | 06:37 | 07:30 | 07:28 | 08:18 | | | |
| | 21:46 | 32 | 06:45 (WEA 2) | 21:02 | 19:53 | 18:40 | 16:34 | 15:59 | | | |
| 9 | 05:00 | 06:13 (WEA 2) | 05:45 | | 06:39 | 07:32 | 07:30 | 08:20 | | | |
| | 21:45 | 32 | 06:45 (WEA 2) | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 | | | |
| 10 | 05:01 | 06:12 (WEA 2) | 05:47 | | 06:41 | 07:34 | 07:32 | 08:21 | | | |
| | 21:44 | 33 | 06:45 (WEA 2) | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 | | | |
| 11 | 05:02 | 06:12 (WEA 2) | 05:49 | | 06:42 | 07:35 | 07:34 | 08:22 | | | |
| | 21:43 | 34 | 06:46 (WEA 2) | 20:56 | 19:45 | 18:33 | 16:29 | 15:59 | | | |
| 12 | 05:03 | 06:12 (WEA 2) | 05:50 | | 06:44 | 07:37 | 07:36 | 08:23 | | | |
| | 21:42 | 34 | 06:46 (WEA 2) | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 | | | |
| 13 | 05:04 | 06:12 (WEA 2) | 05:52 | | 06:46 | 07:39 | 07:37 | 08:24 | | | |
| | 21:41 | 34 | 06:46 (WEA 2) | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 | | | |
| 14 | 05:06 | 06:12 (WEA 2) | 05:54 | | 06:48 | 07:41 | 07:39 | 08:25 | | | |
| | 21:40 | 35 | 06:47 (WEA 2) | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 | | | |
| 15 | 05:07 | 06:13 (WEA 2) | 05:56 | | 06:49 | 07:43 | 07:41 | 08:26 | | | |
| | 21:39 | 35 | 06:48 (WEA 2) | 20:48 | 19:36 | 18:23 | 16:22 | 15:58 | | | |
| 16 | 05:08 | 06:12 (WEA 2) | 05:57 | | 06:51 | 07:45 | 07:43 | 08:27 | | | |
| | 21:38 | 36 | 06:48 (WEA 2) | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 | | | |
| 17 | 05:09 | 06:12 (WEA 2) | 05:59 | | 06:53 | 07:46 | 07:45 | 08:28 | | | |
| | 21:37 | 36 | 06:48 (WEA 2) | 20:43 | 19:31 | 18:19 | 16:19 | 15:59 | | | |
| 18 | 05:11 | 06:12 (WEA 2) | 06:01 | | 06:55 | 07:48 | 07:47 | 08:29 | | | |
| | 21:36 | 36 | 06:48 (WEA 2) | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 | | | |
| 19 | 05:12 | 06:13 (WEA 2) | 06:03 | | 06:56 | 07:50 | 07:49 | 08:29 | | | |
| | 21:35 | 36 | 06:49 (WEA 2) | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 | | | |
| 20 | 05:13 | 06:12 (WEA 2) | 06:04 | | 06:58 | 07:52 | 07:50 | 08:30 | | | |
| | 21:33 | 36 | 06:48 (WEA 2) | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 | | | |
| 21 | 05:15 | 06:12 (WEA 2) | 06:06 | | 07:00 | 07:54 | 07:52 | 08:31 | | | |
| | 21:32 | 36 | 06:48 (WEA 2) | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 | | | |
| 22 | 05:16 | 06:13 (WEA 2) | 06:08 | | 07:02 | 07:56 | 07:54 | 08:31 | | | |
| | 21:31 | 36 | 06:49 (WEA 2) | 20:32 | 19:18 | 18:08 | 16:13 | 16:00 | | | |
| 23 | 05:18 | 06:13 (WEA 2) | 06:09 | | 07:03 | 07:58 | 07:56 | 08:32 | | | |
| | 21:29 | 36 | 06:49 (WEA 2) | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 | | | |
| 24 | 05:19 | 06:13 (WEA 2) | 06:11 | | 07:05 | 07:59 | 07:57 | 08:32 | | | |
| | 21:28 | 35 | 06:48 (WEA 2) | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 | | | |
| 25 | 05:21 | 06:13 (WEA 2) | 06:13 | | 07:07 | 07:01 | 07:59 | 08:32 | | | |
| | 21:26 | 36 | 06:49 (WEA 2) | 20:26 | 19:11 | 17:01 | 16:09 | 16:02 | | | |
| 26 | 05:22 | 06:13 (WEA 2) | 06:15 | | 07:09 | 07:03 | 08:01 | 08:33 | | | |
| | 21:25 | 35 | 06:48 (WEA 2) | 20:23 | 19:09 | 16:59 | 16:08 | 16:03 | | | |
| 27 | 05:24 | 06:14 (WEA 2) | 06:16 | | 07:10 | 07:05 | 08:02 | 08:33 | | | |
| | 21:23 | 34 | 06:48 (WEA 2) | 20:21 | 19:06 | 16:57 | 16:07 | 16:04 | | | |
| 28 | 05:25 | 06:14 (WEA 2) | 06:18 | | 07:12 | 07:07 | 08:04 | 08:33 | | | |
| | 21:22 | 33 | 06:47 (WEA 2) | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 | | | |
| 29 | 05:27 | 06:15 (WEA 2) | 06:20 | | 07:14 | 07:09 | 08:06 | 08:33 | | | |
| | 21:20 | 32 | 06:47 (WEA 2) | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 | | | |
| 30 | 05:29 | 06:15 (WEA 2) | 06:22 | | 07:16 | 07:11 | 08:07 | 08:33 | | | |
| | 21:18 | 31 | 06:46 (WEA 2) | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 | | | |
| 31 | 05:30 | 06:16 (WEA 2) | 06:23 | | | 07:13 | | 08:33 | | | |
| | 21:17 | 30 | 06:46 (WEA 2) | 20:12 | | 16:49 | | 16:07 | | | |
| Sonnenscheinstunden | | 510 | | 458 | | 382 | 329 | 261 | 236 | | |
| astr.max.mögl.Beschattung | | 1031 | | 145 | | | | | | | |

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) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-I - An der Torfkoppel 9, Heide
Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 08:04 | 07:07 | 06:53 | 07:30 (WEA 2) | 05:45 | 04:57 | 04:53 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 | |
| 2 | 16:09 | 16:59 | 17:54 | 19:51 | 21 07:51 (WEA 2) | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:57 | 16:47 | 16:04 | |
| 3 | 08:33 | 08:02 | 07:05 | 06:51 | 07:30 (WEA 2) | 05:43 | 04:56 | 04:54 | 05:34 | 06:27 | 07:19 | 07:17 | 08:10 | |
| 4 | 16:10 | 17:01 | 17:56 | 19:53 | 19 07:49 (WEA 2) | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 | |
| 5 | 08:33 | 08:01 | 07:03 | 06:49 | 07:30 (WEA 2) | 05:41 | 04:55 | 04:54 | 05:35 | 06:29 | 07:21 | 07:19 | 08:12 | |
| 6 | 16:11 | 17:03 | 17:58 | 19:55 | 18 07:48 (WEA 2) | 20:49 | 21:37 | 21:49 | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 | |
| 7 | 08:33 | 07:59 | 07:01 | 06:46 | 07:32 (WEA 2) | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 | |
| 8 | 16:12 | 17:05 | 18:00 | 19:57 | 15 07:47 (WEA 2) | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 | |
| 9 | 08:33 | 07:57 | 06:58 | 06:44 | 07:33 (WEA 2) | 05:37 | 04:53 | 04:56 | 05:39 | 06:32 | 07:25 | 07:22 | 08:15 | |
| 10 | 16:13 | 17:07 | 18:01 | 19:59 | 11 07:44 (WEA 2) | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 | |
| 11 | 08:32 | 07:55 | 06:56 | 06:41 | 07:38 (WEA 2) | 05:35 | 04:53 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 | |
| 12 | 16:15 | 17:09 | 18:03 | 20:00 | 1 07:39 (WEA 2) | 20:55 | 21:40 | 21:47 | 21:06 | 19:57 | 18:45 | 16:37 | 16:00 | |
| 13 | 08:32 | 07:53 | 06:54 | 06:39 | 05:33 | 04:52 | 04:58 | 05:42 | 06:36 | 07:28 (WEA 2) | 07:28 | 07:26 | 08:17 | |
| 14 | 16:16 | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 11 07:39 (WEA 2) | 18:42 | 16:36 | 16:00 | |
| 15 | 08:31 | 07:52 | 06:51 | 06:37 | 05:31 | 04:51 | 04:59 | 05:44 | 06:37 | 07:26 (WEA 2) | 07:30 | 07:28 | 08:19 | |
| 16 | 16:17 | 17:13 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:53 | 15 07:41 (WEA 2) | 18:40 | 16:34 | 16:00 | |
| 17 | 08:31 | 07:50 | 06:49 | 06:34 | 05:30 | 04:51 | 05:00 | 05:45 | 06:39 | 07:25 (WEA 2) | 07:32 | 07:30 | 08:20 | |
| 18 | 16:19 | 17:15 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 17 07:42 (WEA 2) | 18:37 | 16:32 | 15:59 | |
| 19 | 08:30 | 07:48 | 06:46 | 06:32 | 05:28 | 04:50 | 05:01 | 05:47 | 06:41 | 07:23 (WEA 2) | 07:34 | 07:32 | 08:21 | |
| 20 | 16:20 | 17:17 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 19 07:42 (WEA 2) | 18:35 | 16:30 | 15:59 | |
| 21 | 08:29 | 07:46 | 06:44 | 06:30 | 05:26 | 04:50 | 05:02 | 05:49 | 06:43 | 07:22 (WEA 2) | 07:35 | 07:34 | 08:22 | |
| 22 | 16:22 | 17:19 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 21 07:43 (WEA 2) | 18:33 | 16:29 | 15:59 | |
| 23 | 08:29 | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:22 (WEA 2) | 07:37 | 07:36 | 08:23 | |
| 24 | 16:23 | 17:21 | 18:15 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 21 07:43 (WEA 2) | 18:30 | 16:27 | 15:59 | |
| 25 | 08:28 | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:21 (WEA 2) | 07:39 | 07:38 | 08:24 | |
| 26 | 16:25 | 17:23 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 21 07:42 (WEA 2) | 18:28 | 16:25 | 15:58 | |
| 27 | 08:27 | 07:40 | 06:37 | 06:23 | 05:21 | 04:49 | 05:06 | 05:54 | 06:48 | 07:21 (WEA 2) | 07:41 | 07:39 | 08:25 | |
| 28 | 16:26 | 17:25 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 21 07:42 (WEA 2) | 18:26 | 16:24 | 15:58 | |
| 29 | 08:26 | 07:38 | 06:34 | 06:20 | 05:19 | 04:49 | 05:07 | 05:56 | 06:49 | 07:21 (WEA 2) | 07:43 | 07:41 | 08:26 | |
| 30 | 16:28 | 17:27 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 20:48 | 19:36 | 21 07:42 (WEA 2) | 18:23 | 16:22 | 15:58 | |
| 31 | 08:25 | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:20 (WEA 2) | 07:45 | 07:43 | 08:27 | |
| 32 | 16:30 | 17:29 | 18:22 | 20:19 | 21:12 | 21:48 | 21:38 | 20:45 | 19:33 | 20 07:40 (WEA 2) | 18:21 | 16:21 | 15:58 | |
| 33 | 08:24 | 07:34 | 06:30 | 06:16 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:21 (WEA 2) | 07:46 | 07:45 | 08:28 | |
| 34 | 16:31 | 17:31 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18 07:39 (WEA 2) | 18:19 | 16:19 | 15:59 | |
| 35 | 08:23 | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:11 | 06:01 | 06:55 | 07:22 (WEA 2) | 07:48 | 07:47 | 08:29 | |
| 36 | 16:33 | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 16 07:38 (WEA 2) | 18:17 | 16:18 | 15:59 | |
| 37 | 08:22 | 07:30 | 06:25 | 06:11 | 05:13 | 04:48 | 05:12 | 06:03 | 06:56 | 07:24 (WEA 2) | 07:50 | 07:49 | 08:29 | |
| 38 | 16:35 | 17:34 | 18:28 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 12 07:36 (WEA 2) | 18:14 | 16:16 | 15:59 | |
| 39 | 08:21 | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:27 (WEA 2) | 07:52 | 07:50 | 08:30 | |
| 40 | 16:36 | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 4 07:31 (WEA 2) | 18:12 | 16:15 | 15:59 | |
| 41 | 08:20 | 07:25 | 06:20 | 06:07 | 05:10 | 04:49 | 05:15 | 06:06 | 07:00 | 07:21 (WEA 2) | 07:54 | 07:52 | 08:31 | |
| 42 | 16:38 | 17:38 | 18:31 | 20:28 | 21:19 | 21:50 | 21:32 | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 | 16:00 | |
| 43 | 08:19 | 07:23 | 06:18 | 06:04 | 05:08 | 04:49 | 05:16 | 06:08 | 07:02 | 07:56 | 07:54 | 08:31 | 16:00 | |
| 44 | 16:40 | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 16:13 | 16:00 | 16:00 | |
| 45 | 08:17 | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 | 16:00 | |
| 46 | 16:42 | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 | 16:01 | |
| 47 | 08:16 | 07:19 | 06:13 | 06:00 | 05:06 | 04:49 | 05:19 | 06:11 | 07:05 | 08:00 | 07:57 | 08:32 | 16:01 | |
| 48 | 16:44 | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 | 16:01 | |
| 49 | 08:15 | 07:16 | 06:10 | 05:58 | 05:04 | 04:50 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:33 | 16:01 | |
| 50 | 16:46 | 17:46 | 18:39 | 20:35 | 21:25 | 21:50 | 21:26 | 20:26 | 19:11 | 17:01 | 16:09 | 16:02 | 16:02 | |
| 51 | 08:13 | 07:14 | 06:08 | 05:56 | 05:03 | 04:50 | 05:22 | 06:15 | 07:09 | 07:03 | 08:01 | 08:33 | 16:02 | |
| 52 | 16:47 | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 16:59 | 16:08 | 16:03 | 16:03 | |
| 53 | 08:12 | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 | 16:03 | |
| 54 | 16:49 | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 16:57 | 16:07 | 16:04 | 16:04 | |
| 55 | 08:10 | 07:10 | 06:03 | 05:51 | 05:01 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 | 16:04 | |
| 56 | 16:51 | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 | 16:04 | |
| 57 | 08:09 | 07:01 | 06:50 | 05:49 | 05:00 | 04:52 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | 16:05 | |
| 58 | 16:53 | 19:46 | 22 07:52 (WEA 2) | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 | 16:05 | |
| 59 | 08:07 | 06:58 | 07:30 (WEA 2) | 05:47 | 04:59 | 04:52 | 05:29 | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | 16:06 | |
| 60 | 16:55 | 19:48 | 22 07:52 (WEA 2) | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 | 16:06 | |
| 61 | 08:06 | 06:56 | 07:29 (WEA 2) | 05:40 | 04:58 | 05:30 | 06:23 | 07:13 | 08:06 | 07:13 | 08:07 | 08:33 | 16:07 | |
| 62 | 16:57 | 19:49 | 22 07:51 (WEA 2) | 20:40 | 21:33 | 21:50 | 21:17 | 20:12 | 18:54 | 16:49 | 16:04 | 16:07 | 16:07 | |
| 63 | Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 237 | 329 | 261 | 236 |
| 64 | astr.max.mögl.Beschattung | | | 148 | 85 | | | | | | | | | |

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) Schattendecke (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-J - Behr Gemüsehandel GmbH, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 08:04 | 07:07 | 08:03 (WEA 2) | 06:53 | 05:45 | 04:57 | 04:53 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| 2 | 16:08 | 16:59 | 17:54 | 32 08:35 (WEA 2) | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:57 | 16:47 | 16:03 |
| 3 | 08:33 | 08:02 | 07:05 | 08:03 (WEA 2) | 06:51 | 05:43 | 04:56 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 |
| 4 | 16:10 | 17:01 | 17:56 | 30 08:33 (WEA 2) | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 |
| 5 | 08:33 | 08:01 | 07:03 | 08:04 (WEA 2) | 06:48 | 05:41 | 04:55 | 04:54 | 05:35 | 06:29 | 07:21 | 07:19 | 08:12 |
| 6 | 16:11 | 17:03 | 17:58 | 29 08:33 (WEA 2) | 19:55 | 20:49 | 21:37 | 21:49 | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 |
| 7 | 08:33 | 07:59 | 07:00 | 08:05 (WEA 2) | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| 8 | 16:12 | 17:05 | 17:59 | 27 08:32 (WEA 2) | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 9 | 08:33 | 07:57 | 06:58 | 08:05 (WEA 2) | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:25 | 07:22 | 08:15 |
| 10 | 16:13 | 17:07 | 18:01 | 25 08:30 (WEA 2) | 19:59 | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 4 08:52 (WEA 2) | 07:22 |
| 11 | 08:32 | 07:55 | 06:56 | 08:07 (WEA 2) | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 08:47 (WEA 2) | 07:24 |
| 12 | 16:14 | 17:09 | 18:03 | 21 08:28 (WEA 2) | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 14 09:01 (WEA 2) | 07:24 |
| 13 | 08:32 | 07:53 | 06:53 | 08:08 (WEA 2) | 06:39 | 05:33 | 04:52 | 04:58 | 05:42 | 06:36 | 07:28 | 08:43 (WEA 2) | 07:26 |
| 14 | 16:16 | 17:11 | 18:05 | 17 08:25 (WEA 2) | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 20 09:03 (WEA 2) | 07:26 |
| 15 | 08:31 | 07:52 | 06:51 | 08:12 (WEA 2) | 06:37 | 05:31 | 04:51 | 04:59 | 05:44 | 06:37 | 07:30 | 08:41 (WEA 2) | 07:28 |
| 16 | 16:17 | 17:13 | 18:07 | 10 08:22 (WEA 2) | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:53 | 18:40 | 23 09:04 (WEA 2) | 07:28 |
| 17 | 08:31 | 07:50 | 06:49 | 06:34 | 05:30 | 04:51 | 05:00 | 05:45 | 06:39 | 07:32 | 08:40 (WEA 2) | 07:30 | 08:20 |
| 18 | 16:19 | 17:15 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 26 09:06 (WEA 2) | 07:32 | 08:21 |
| 19 | 08:30 | 07:48 | 06:46 | 06:32 | 05:28 | 04:50 | 05:01 | 05:47 | 06:41 | 07:34 | 08:39 (WEA 2) | 07:32 | 08:21 |
| 20 | 16:20 | 17:17 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 27 09:06 (WEA 2) | 07:32 | 08:21 |
| 21 | 08:29 | 07:46 | 06:44 | 06:29 | 05:26 | 04:50 | 05:02 | 05:49 | 06:42 | 07:35 | 08:38 (WEA 2) | 07:34 | 08:22 |
| 22 | 16:22 | 17:19 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 29 09:07 (WEA 2) | 07:34 | 08:22 |
| 23 | 08:29 | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 08:37 (WEA 2) | 07:36 | 08:23 |
| 24 | 16:23 | 17:21 | 18:15 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 31 09:08 (WEA 2) | 07:36 | 08:23 |
| 25 | 08:28 | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:39 | 08:36 (WEA 2) | 07:37 | 08:24 |
| 26 | 16:25 | 17:23 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 18:28 | 32 09:08 (WEA 2) | 07:37 | 08:24 |
| 27 | 08:27 | 07:40 | 06:37 | 06:22 | 05:21 | 04:49 | 05:05 | 05:54 | 06:48 | 07:41 | 08:36 (WEA 2) | 07:39 | 08:25 |
| 28 | 16:26 | 17:25 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 18:26 | 32 09:08 (WEA 2) | 07:39 | 08:25 |
| 29 | 08:26 | 07:38 | 06:34 | 06:20 | 05:19 | 04:49 | 05:07 | 05:56 | 06:49 | 07:43 | 08:36 (WEA 2) | 07:41 | 08:26 |
| 30 | 16:28 | 17:27 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 20:48 | 19:36 | 18:23 | 32 09:08 (WEA 2) | 07:41 | 08:26 |
| 31 | 08:25 | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:45 | 08:35 (WEA 2) | 07:43 | 08:27 |
| 32 | 16:30 | 17:28 | 18:22 | 20:18 | 21:12 | 21:48 | 21:38 | 20:45 | 19:33 | 18:21 | 33 09:08 (WEA 2) | 07:43 | 08:27 |
| 33 | 08:24 | 07:34 | 06:30 | 06:16 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:46 | 08:35 (WEA 2) | 07:45 | 08:28 |
| 34 | 16:31 | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18:19 | 33 09:08 (WEA 2) | 07:45 | 08:28 |
| 35 | 08:23 | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:11 | 06:01 | 06:55 | 07:48 | 08:34 (WEA 2) | 07:47 | 08:29 |
| 36 | 16:33 | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 18:17 | 32 09:06 (WEA 2) | 07:47 | 08:29 |
| 37 | 08:22 | 07:30 | 06:25 | 06:11 | 05:13 | 04:48 | 05:12 | 06:02 | 06:56 | 07:50 | 08:35 (WEA 2) | 07:49 | 08:29 |
| 38 | 16:35 | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 18:14 | 31 09:06 (WEA 2) | 07:49 | 08:29 |
| 39 | 08:21 | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:52 | 08:35 (WEA 2) | 07:50 | 08:30 |
| 40 | 16:36 | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 18:12 | 30 09:05 (WEA 2) | 07:50 | 08:30 |
| 41 | 08:20 | 07:25 | 06:20 | 06:07 | 05:10 | 04:48 | 05:15 | 06:06 | 07:00 | 07:54 | 08:36 (WEA 2) | 07:52 | 08:31 |
| 42 | 16:38 | 17:38 | 18:31 | 20:28 | 21:19 | 21:50 | 21:32 | 20:35 | 19:21 | 18:10 | 28 09:04 (WEA 2) | 07:52 | 08:31 |
| 43 | 08:19 | 07:23 | 06:18 | 06:04 | 05:08 | 04:49 | 05:16 | 06:08 | 07:02 | 07:56 | 08:37 (WEA 2) | 07:54 | 08:31 |
| 44 | 16:40 | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 26 09:03 (WEA 2) | 07:54 | 08:31 |
| 45 | 08:17 | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 08:38 (WEA 2) | 07:56 | 08:32 |
| 46 | 16:42 | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:06 | 24 09:02 (WEA 2) | 07:56 | 08:32 |
| 47 | 08:16 | 07:19 | 06:13 | 06:00 | 05:06 | 04:49 | 05:19 | 06:11 | 07:05 | 07:59 | 08:39 (WEA 2) | 07:57 | 08:32 |
| 48 | 16:44 | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:14 | 18:03 | 21 09:00 (WEA 2) | 07:57 | 08:32 |
| 49 | 08:15 | 07:16 | 06:10 | 05:58 | 05:04 | 04:50 | 05:21 | 06:13 | 07:07 | 07:01 | 17 07:41 (WEA 2) | 07:59 | 08:33 |
| 50 | 16:46 | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 20:26 | 19:11 | 17:01 | 17 07:58 (WEA 2) | 07:59 | 08:33 |
| 51 | 08:13 | 07:14 | 06:08 | 05:56 | 05:03 | 04:50 | 05:22 | 06:15 | 07:09 | 07:03 | 13 07:43 (WEA 2) | 08:01 | 08:33 |
| 52 | 16:47 | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 16:59 | 13 07:56 (WEA 2) | 08:01 | 08:33 |
| 53 | 08:12 | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 | 08:33 |
| 54 | 16:49 | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 16:57 | 08:03 | 08:33 | 08:33 |
| 55 | 08:10 | 07:10 | 06:03 | 05:51 | 05:01 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 | 08:33 |
| 56 | 16:51 | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 16:55 | 08:05 | 08:33 | 08:33 |
| 57 | 08:09 | | 07:01 | 05:49 | 05:00 | 04:51 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | 08:33 |
| 58 | 16:53 | | 19:46 | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 16:53 | 08:07 | 08:33 | 08:33 |
| 59 | 08:07 | | 06:58 | 05:47 | 04:59 | 04:52 | 05:29 | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | 08:33 |
| 60 | 16:55 | | 19:48 | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 16:51 | 08:08 | 08:33 | 08:33 |
| 61 | 08:06 | | 06:56 | | 04:58 | | 05:30 | 06:23 | | 07:13 | 08:09 | 08:33 | 08:33 |
| 62 | 16:57 | | 19:49 | | 21:33 | | 21:17 | 20:12 | | 16:49 | 08:10 | 08:33 | 08:33 |
| 63 | Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 236 |
| 64 | astr.max.mögl.Beschattung | | 364 | 191 | | | | | | 558 | | | |

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) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten) |
| | Sonnenuntergang (SS:MM) | | | |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-K - Heide 6, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:08 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:57 | 07:15 16:47 | 08:09 16:03 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:49 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:19 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:01 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:33 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:59 | 05:37 20:53 | 04:53 21:39 | 04:56 21:48 | 05:38 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:15 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:55 | 04:52 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:45 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:54 17:11 | 06:54 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:46 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:19 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:38 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:19 | 05:17 21:12 | 04:48 21:48 | 05:08 21:38 | 05:57 20:46 | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:28 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:49 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:50 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:48 21:50 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:23 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 08:00 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:39 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 | 08:33 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 07:03 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 08:02 16:07 | 08:33 16:03 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 | 04:51 21:50 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 07:07 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:51 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:50 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:34 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:57 21:33 | | 05:30 21:17 | 06:23 20:12 | | 07:13 16:49 | | 08:34 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 **Schattenrezeptor:** IO-L - Gewerbegebiet Gresse, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 08:04 | 07:07 | 06:53 | 05:45 | 04:56 | 04:53 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| | 16:08 | 16:59 | 17:54 | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:56 | 16:47 | 16:03 |
| 2 | 08:33 | 08:02 | 07:05 | 06:51 | 05:43 | 04:56 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 |
| | 16:09 | 17:01 | 17:56 | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 |
| 3 | 08:33 | 08:01 | 07:03 | 06:48 | 05:41 | 04:55 | 04:54 | 05:35 | 06:29 | 07:21 | 07:19 | 08:12 |
| | 16:11 | 17:03 | 17:58 | 19:55 | 20:49 | 21:37 | 21:49 | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 |
| 4 | 08:33 | 07:59 | 07:00 | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| | 16:12 | 17:05 | 17:59 | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 5 | 08:33 | 07:57 | 06:58 | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:25 | 07:22 | 08:15 |
| | 16:13 | 17:07 | 18:01 | 19:58 | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 6 | 08:32 | 07:55 | 06:56 | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| | 16:14 | 17:09 | 18:03 | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 7 | 08:32 | 07:53 | 06:53 | 06:39 | 05:33 | 04:52 | 04:58 | 05:42 | 06:36 | 07:28 | 07:26 | 08:17 |
| | 16:16 | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 16:36 | 16:00 |
| 8 | 08:31 | 07:52 | 06:51 | 06:37 | 05:31 | 04:51 | 04:59 | 05:43 | 06:37 | 07:30 | 07:28 | 08:19 |
| | 16:17 | 17:13 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:53 | 18:40 | 16:34 | 15:59 |
| 9 | 08:31 | 07:50 | 06:49 | 06:34 | 05:29 | 04:51 | 05:00 | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| | 16:19 | 17:15 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 10 | 08:30 | 07:48 | 06:46 | 06:32 | 05:28 | 04:50 | 05:01 | 05:47 | 06:41 | 07:34 | 07:32 | 08:21 |
| | 16:20 | 17:17 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 11 | 08:29 | 07:46 | 06:44 | 06:29 | 05:26 | 04:50 | 05:02 | 05:49 | 06:42 | 07:35 | 07:34 | 08:22 |
| | 16:21 | 17:19 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 16:29 | 15:59 |
| 12 | 08:29 | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| | 16:23 | 17:21 | 18:15 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 13 | 08:28 | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:39 | 07:38 | 08:24 |
| | 16:25 | 17:23 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 14 | 08:27 | 07:40 | 06:37 | 06:22 | 05:21 | 04:49 | 05:05 | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| | 16:26 | 17:25 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 15 | 08:26 | 07:38 | 06:34 | 06:20 | 05:19 | 04:49 | 05:07 | 05:56 | 06:49 | 07:43 | 07:41 | 08:26 |
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| 16 | 08:25 | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:45 | 07:43 | 08:27 |
| | 16:29 | 17:28 | 18:22 | 20:18 | 21:12 | 21:48 | 21:38 | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 |
| 17 | 08:24 | 07:34 | 06:30 | 06:16 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 |
| | 16:31 | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18:19 | 16:19 | 15:59 |
| 18 | 08:23 | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:11 | 06:01 | 06:55 | 07:48 | 07:47 | 08:29 |
| | 16:33 | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 |
| 19 | 08:22 | 07:30 | 06:25 | 06:11 | 05:13 | 04:48 | 05:12 | 06:02 | 06:56 | 07:50 | 07:49 | 08:29 |
| | 16:35 | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 |
| 20 | 08:21 | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 |
| | 16:36 | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 |
| 21 | 08:20 | 07:25 | 06:20 | 06:06 | 05:10 | 04:48 | 05:15 | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 |
| | 16:38 | 17:38 | 18:31 | 20:28 | 21:19 | 21:50 | 21:32 | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 |
| 22 | 08:19 | 07:23 | 06:18 | 06:04 | 05:08 | 04:49 | 05:16 | 06:08 | 07:02 | 07:56 | 07:54 | 08:31 |
| | 16:40 | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 16:12 | 16:00 |
| 23 | 08:17 | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 |
| | 16:42 | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 |
| 24 | 08:16 | 07:19 | 06:13 | 06:00 | 05:06 | 04:49 | 05:19 | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 |
| | 16:44 | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 |
| 25 | 08:15 | 07:16 | 06:10 | 05:58 | 05:04 | 04:49 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:33 |
| | 16:45 | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 20:26 | 19:11 | 17:01 | 16:09 | 16:02 |
| 26 | 08:13 | 07:14 | 06:08 | 05:56 | 05:03 | 04:50 | 05:22 | 06:15 | 07:09 | 07:03 | 08:01 | 08:33 |
| | 16:47 | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 16:59 | 16:08 | 16:03 |
| 27 | 08:12 | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 |
| | 16:49 | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 16:57 | 16:07 | 16:03 |
| 28 | 08:10 | 07:10 | 06:03 | 05:51 | 05:01 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 |
| | 16:51 | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 |
| 29 | 08:09 | | 07:01 | 05:49 | 05:00 | 04:51 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 |
| | 16:53 | | 19:46 | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 |
| 30 | 08:07 | | 06:58 | 05:47 | 04:58 | 04:52 | 05:29 | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 |
| | 16:55 | | 19:48 | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 |
| 31 | 08:06 | | 06:56 | | 04:57 | | 05:30 | 06:23 | | 07:13 | | 08:33 |
| | 16:57 | | 19:49 | | 21:33 | | 21:17 | 20:12 | | 16:49 | | 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 236 |
| astr.max.mögl.Beschattung | | | | | | | | | | | | |

120

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) Schattende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Zusatzbelastung WEA 2 Schattenrezeptor: IO-M - Badekower Strasse 14, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

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

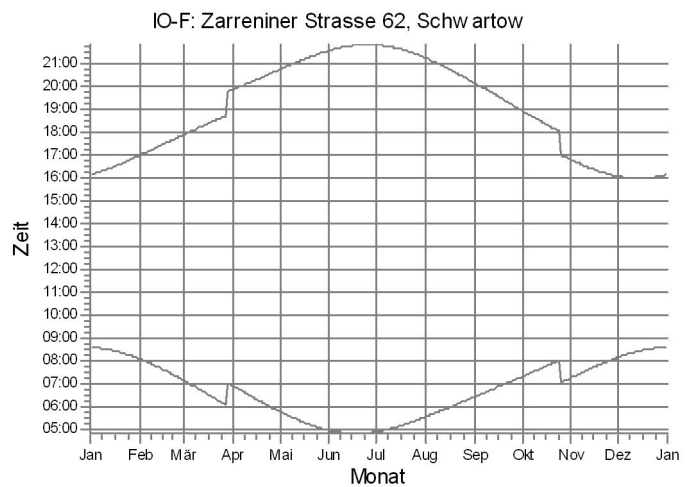
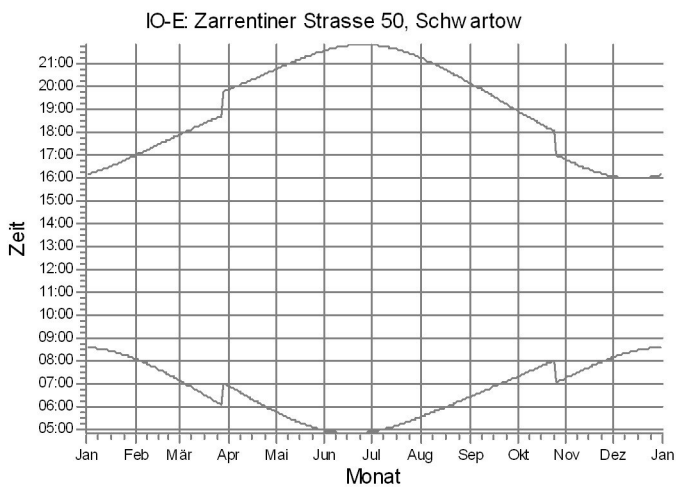
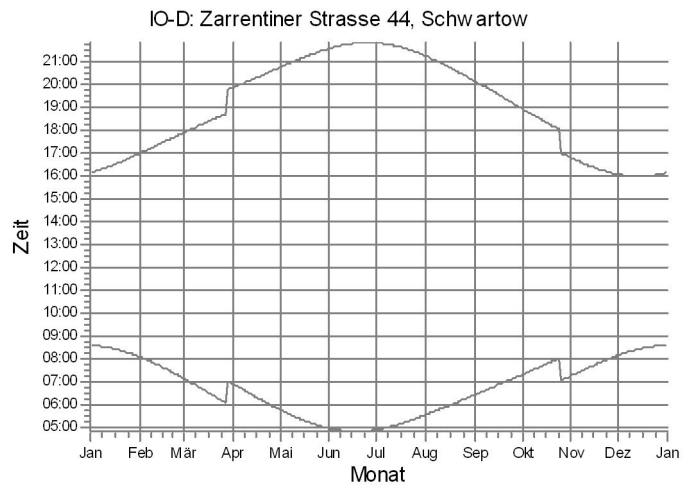
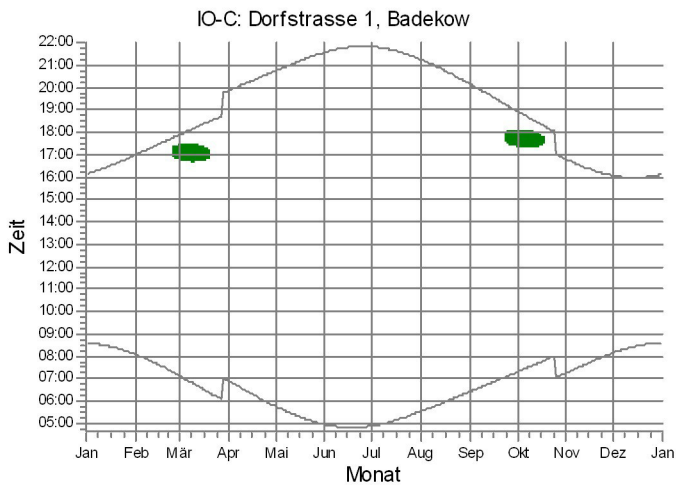
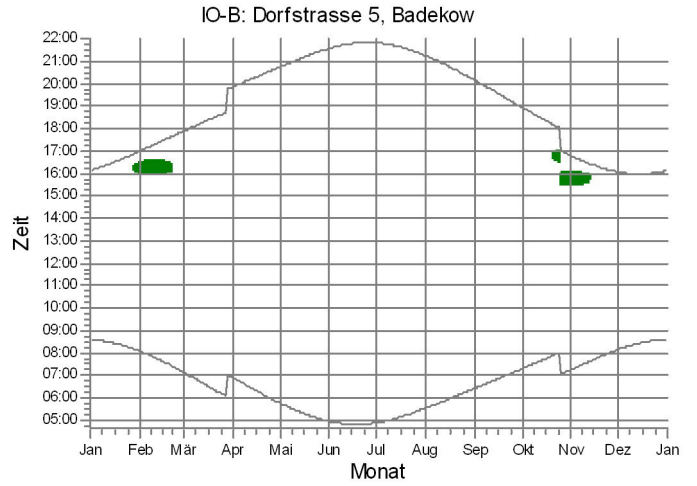
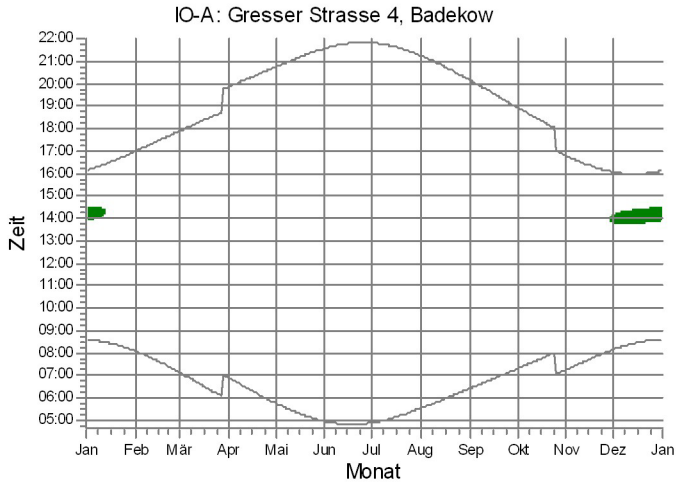
| | Januar | Februar | März | April | Mai | Juni | Juli | August | September | Oktober | November | Dezember |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1 | 08:33 16:08 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:56 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:03 |
| 2 | 08:33 16:09 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:49 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:19 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:33 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:48 | 05:38 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:15 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:52 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:35 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:46 | 05:43 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:19 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:29 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:21 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:38 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:26 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:48 21:47 | 05:07 21:39 | 05:55 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:29 | 07:36 17:28 | 06:32 18:22 | 06:18 20:18 | 05:17 21:12 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:58 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:49 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:50 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:06 20:28 | 05:10 21:19 | 04:48 21:50 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:12 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:45 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:49 21:50 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 | 08:33 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 08:01 16:08 | 08:33 16:03 |
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| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 | 04:51 21:50 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 08:04 16:06 | 08:33 16:04 |
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| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:58 21:32 | 04:52 21:50 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:57 21:33 | | 05:30 21:17 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenende (WEA mit letztem Schatten) |
| | Minuten mit Schatten | | |

SHADOW - Grafischer Kalender

Berechnung: Zusatzbelastung WEA 2



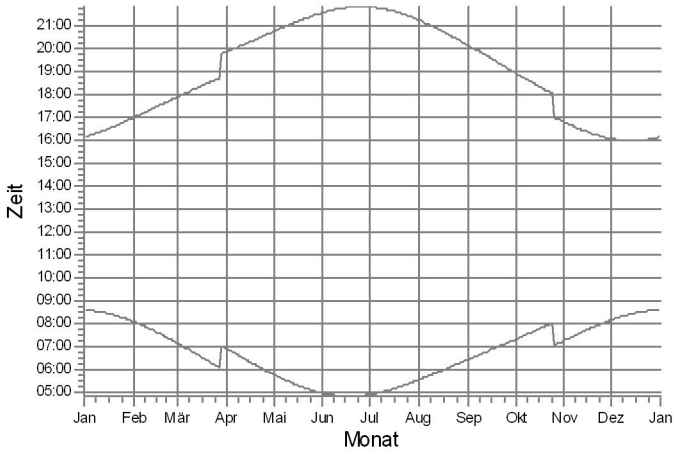
WEA

 WEA 2: WEA 2

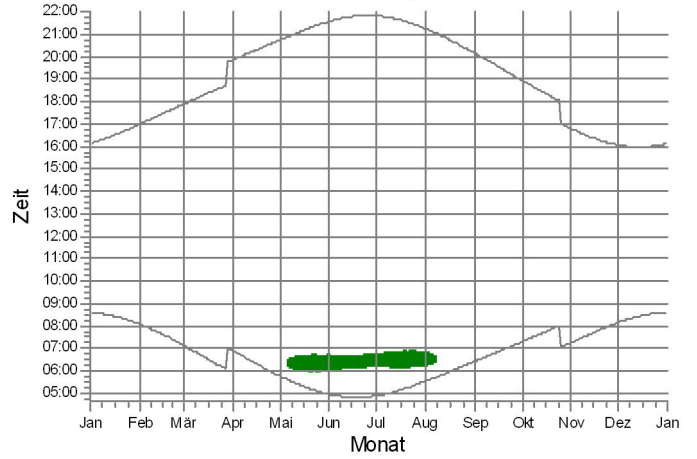
SHADOW - Grafischer Kalender

Berechnung: Zusatzbelastung WEA 2

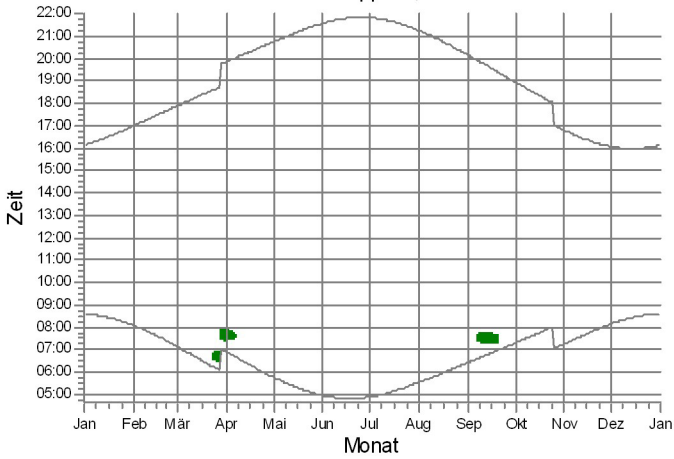
IO-G: Zarrentiner Strasse 71, Schwartow



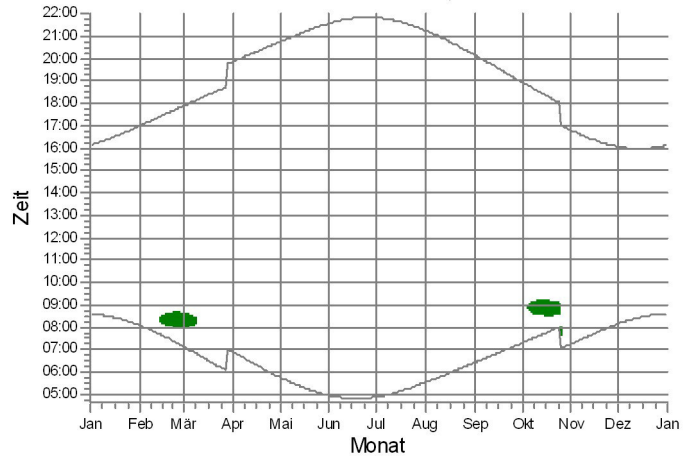
IO-H: Zarrentiner Strasse 77, Schwartow



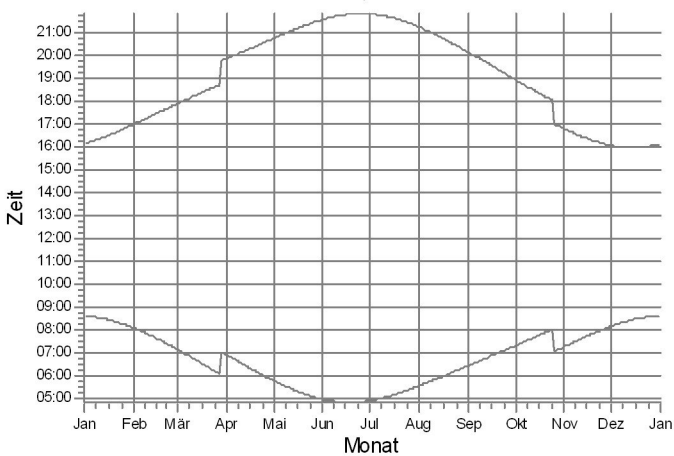
IO-I: An der Torfkoppel 9, Heide



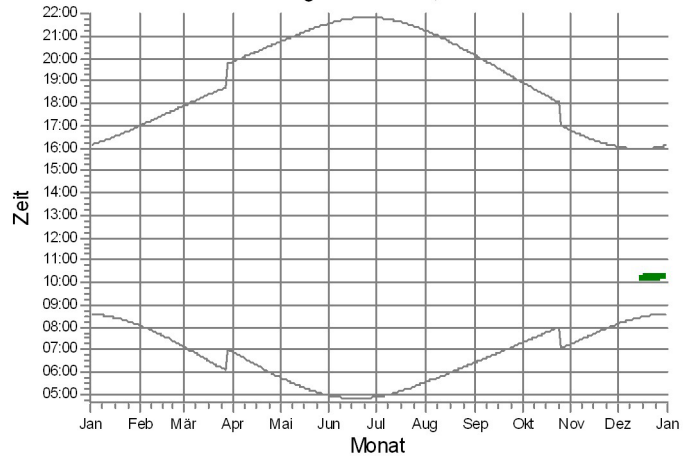
IO-J: Behr Gemüsehandel GmbH, Gresse



IO-K: Heide 6, Heide



IO-L: Gewerbegebiet Gresse, Gresse

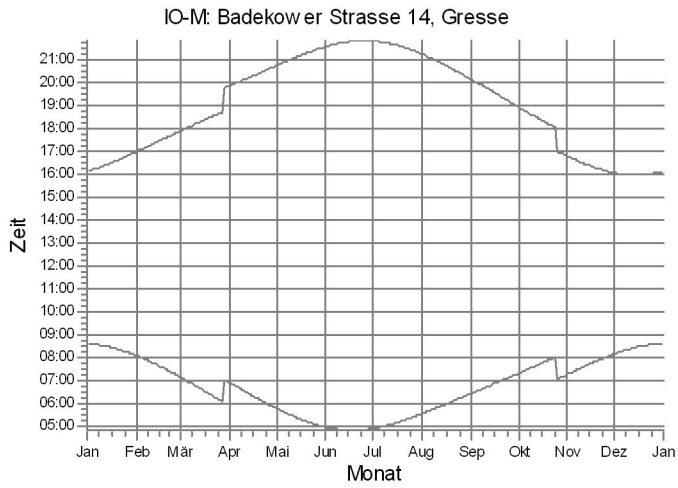


WEA

 WEA 2: WEA 2

SHADOW - Grafischer Kalender

Berechnung: Zusatzbelastung WEA 2



WEA

SHADOW - Kalender pro WEA

Berechnung: Zusatzbelastung WEA 2WEA: WEA 2 - WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 13:59-14:26/27 16:08 | 08:04 16:05-16:26/21 16:59 | 07:07 08:03-08:35/32 17:54 16:53-17:22/29 | 06:53 07:30-07:51/21 19:51 | 05:45 20:46 | 04:57 06:05-06:38/33 21:35 |
| 2 | 08:33 14:00-14:26/26 16:10 | 08:02 16:04-16:27/23 17:01 | 07:05 08:03-08:33/30 17:56 16:51-17:22/31 | 06:51 07:30-07:49/19 19:53 | 05:43 20:47 | 04:56 06:05-06:38/33 21:36 |
| 3 | 08:33 14:00-14:26/26 16:11 | 08:01 16:04-16:29/25 17:03 | 07:03 08:04-08:33/29 17:58 16:50-17:23/33 | 06:48 07:30-07:48/18 19:55 | 05:41 20:49 | 04:55 06:05-06:38/33 21:37 |
| 4 | 08:33 14:02-14:26/24 16:12 | 07:59 16:03-16:30/27 17:05 | 07:00 08:05-08:32/27 17:59 16:49-17:23/34 | 06:46 07:32-07:47/15 19:57 | 05:39 20:51 | 04:54 06:06-06:38/32 21:38 |
| 5 | 08:32 14:02-14:26/24 16:13 | 07:57 16:03-16:31/28 17:07 | 06:58 08:05-08:30/25 18:01 16:48-17:24/36 | 06:44 07:33-07:44/11 19:58 | 05:37 20:53 | 04:53 06:06-06:38/32 21:39 |
| 6 | 08:32 14:04-14:26/22 16:14 | 07:55 16:02-16:32/30 17:09 | 06:56 08:07-08:28/21 18:03 16:48-17:24/36 | 06:41 07:38-07:39/1 20:00 | 05:35 06:15-06:26/11 20:54 | 04:52 06:06-06:37/31 21:40 |
| 7 | 08:32 14:04-14:26/22 16:16 | 07:53 16:02-16:32/30 17:11 | 06:53 08:08-08:25/17 18:05 16:47-17:24/37 | 06:39 20:02 | 05:33 06:12-06:28/16 20:56 | 04:52 06:07-06:38/31 21:41 |
| 8 | 08:31 14:05-14:25/20 16:17 | 07:52 16:02-16:32/30 17:13 | 06:51 08:12-08:22/10 18:07 16:47-17:24/37 | 06:37 20:04 | 05:31 06:11-06:31/20 20:58 | 04:51 06:07-06:37/30 21:42 |
| 9 | 08:31 14:07-14:25/18 16:19 | 07:50 16:01-16:33/32 17:15 | 06:49 16:46-17:23/37 18:09 | 06:34 20:06 | 05:29 06:09-06:32/23 21:00 | 04:51 06:08-06:37/29 21:43 |
| 10 | 08:30 14:09-14:24/15 16:20 | 07:48 16:01-16:33/32 17:17 | 06:46 16:47-17:23/36 18:11 | 06:32 20:08 | 05:28 06:07-06:33/26 21:01 | 04:50 06:09-06:38/29 21:44 |
| 11 | 08:29 14:11-14:23/12 16:21 | 07:46 16:02-16:33/31 17:19 | 06:44 16:47-17:23/36 18:13 | 06:29 20:09 | 05:26 06:07-06:34/27 21:03 | 04:50 06:08-06:37/29 21:45 |
| 12 | 08:29 14:13-14:21/8 16:23 | 07:44 16:02-16:33/31 17:21 | 06:42 16:47-17:22/35 18:14 | 06:27 20:11 | 05:24 06:06-06:35/29 21:05 | 04:49 06:09-06:37/28 21:45 |
| 13 | 08:28 16:25 | 07:42 16:02-16:33/31 17:23 | 06:39 16:48-17:21/33 18:16 | 06:25 20:13 | 05:22 06:04-06:35/31 21:06 | 04:49 06:10-06:37/27 21:46 |
| 14 | 08:27 16:26 | 07:40 16:02-16:32/30 17:25 | 06:37 16:48-17:20/32 18:18 | 06:22 20:15 | 05:21 06:04-06:36/32 21:08 | 04:49 06:10-06:38/28 21:47 |
| 15 | 08:26 16:28 | 07:38 08:18-08:22/4 17:26 16:02-16:31/29 | 06:34 16:49-17:19/30 18:20 | 06:20 20:17 | 05:19 06:03-06:36/33 21:10 | 04:49 06:11-06:38/27 21:47 |
| 16 | 08:25 16:29 | 07:36 08:13-08:27/14 17:28 16:03-16:31/28 | 06:32 16:49-17:17/28 18:22 | 06:18 20:18 | 05:17 06:03-06:37/34 21:11 | 04:48 06:10-06:37/27 21:48 |
| 17 | 08:24 16:31 | 07:34 08:11-08:29/18 17:30 16:04-16:30/26 | 06:30 16:51-17:16/25 18:24 | 06:16 20:20 | 05:16 06:03-06:37/34 21:13 | 04:48 06:11-06:37/26 21:48 |
| 18 | 08:23 16:33 | 07:32 08:09-08:31/22 17:32 16:06-16:29/23 | 06:27 16:53-17:14/21 18:26 | 06:13 20:22 | 05:14 06:03-06:38/35 21:15 | 04:48 06:12-06:38/26 21:49 |
| 19 | 08:22 16:35 | 07:29 08:08-08:33/25 17:34 16:08-16:28/20 | 06:25 16:55-17:10/15 18:27 | 06:11 20:24 | 05:13 06:03-06:38/35 21:16 | 04:48 06:12-06:38/26 21:49 |
| 20 | 08:21 16:36 | 07:27 08:06-08:33/27 17:36 16:09-16:25/16 | 06:22 18:29 | 06:09 20:26 | 05:11 06:02-06:38/36 21:18 | 04:48 06:12-06:38/26 21:49 |
| 21 | 08:20 16:38 | 07:25 08:05-08:34/29 17:38 16:12-16:22/10 | 06:20 18:31 | 06:06 20:27 | 05:10 06:02-06:38/36 21:19 | 04:48 06:12-06:38/26 21:50 |
| 22 | 08:18 16:40 | 07:23 08:05-08:35/30 17:40 | 06:17 18:33 | 06:04 20:29 | 05:08 06:03-06:39/36 21:21 | 04:49 06:12-06:38/26 21:50 |
| 23 | 08:17 16:42 | 07:21 08:04-08:36/32 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 06:03-06:39/36 21:22 | 04:49 06:12-06:38/26 21:50 |
| 24 | 08:16 16:44 | 07:19 08:03-08:35/32 17:44 | 06:13 06:37-06:48/11 18:37 | 06:00 20:33 | 05:06 06:02-06:38/36 21:24 | 04:49 06:13-06:39/26 21:50 |
| 25 | 08:15 16:46 | 07:16 08:03-08:36/33 17:46 17:01-17:13/12 | 06:10 06:35-06:50/15 18:38 | 05:58 20:35 | 05:04 06:02-06:38/36 21:25 | 04:50 06:13-06:39/26 21:50 |
| 26 | 08:13 16:47 | 07:14 08:03-08:36/33 17:48 16:58-17:17/19 | 06:08 06:33-06:50/17 18:40 | 05:56 20:37 | 05:03 06:03-06:38/35 21:27 | 04:50 06:13-06:40/27 21:50 |
| 27 | 08:12 16:49 | 07:12 08:02-08:35/33 17:50 16:55-17:18/23 | 06:05 06:32-06:51/19 18:42 | 05:53 20:38 | 05:02 06:03-06:38/35 21:28 | 04:50 06:13-06:40/27 21:50 |
| 28 | 08:10 16:51 | 07:10 08:03-08:35/32 17:52 16:54-17:20/26 | 06:03 06:31-06:51/20 18:44 | 05:51 20:40 | 05:01 06:03-06:38/35 21:29 | 04:51 06:14-06:41/27 21:50 |
| 29 | 08:09 16:13-16:19/6 16:53 | | 07:01 07:30-07:52/22 19:46 | 05:49 20:42 | 05:00 06:03-06:38/35 21:31 | 04:51 06:13-06:41/28 21:50 |
| 30 | 08:07 16:09-16:22/13 16:55 | | 06:58 07:30-07:52/22 19:48 | 05:47 20:44 | 04:58 06:04-06:38/34 21:32 | 04:52 06:13-06:41/28 21:50 |
| 31 | 08:06 16:07-16:24/17 16:57 | | 06:56 07:29-07:51/22 19:49 | | 04:57 06:05-06:39/34 21:33 | |
| | Sonnenscheinstunden 252 | 274 | 367 | 419 | 492 | 508 |
| | Anzahl Minuten mit Schatten 280 | 997 | 940 | 85 | 810 | 850 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Zusatzbelastung WEA 2WEA: WEA 2 - WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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

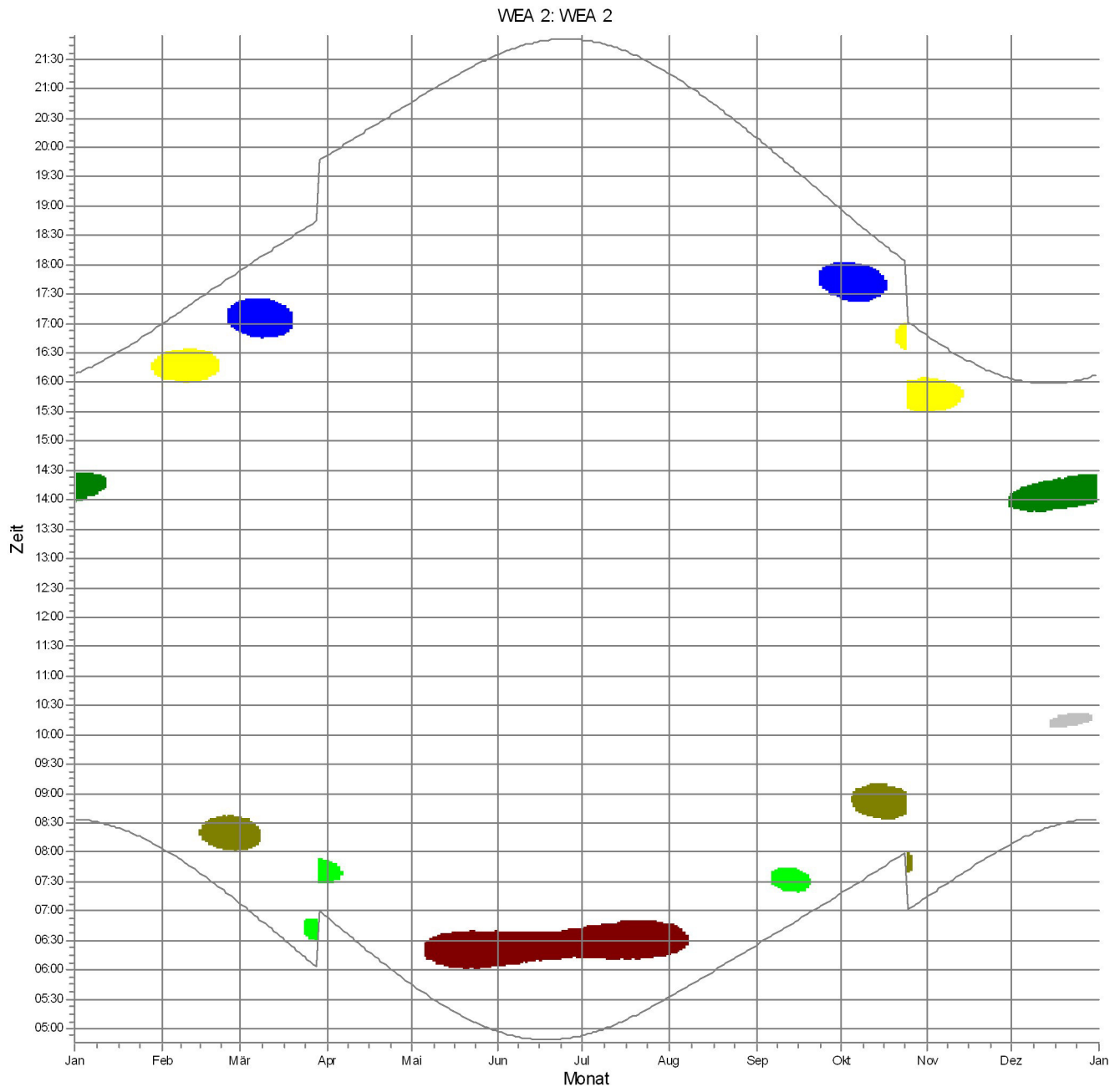
| | July | August | September | Oktober | November | Dezember |
|----|----------------------------------|-------------------------------|-------------------------------|----------------------------------------------|-------------------------------|----------------------------------------------|
| 1 | 04:53 06:13-06:41/28 21:49 | 05:32 06:16-06:45/29 21:15 | 06:25 20:09 | 07:17 17:26-18:00/34 18:56 | 07:15 15:31-16:03/32 16:47 | 08:09 13:53-14:05/12 16:03 |
| 2 | 04:53 06:13-06:42/29 21:49 | 05:33 06:18-06:45/27 21:13 | 06:27 20:07 | 07:19 17:25-18:01/36 18:54 | 07:17 15:31-16:02/31 16:45 | 08:10 13:51-14:06/15 16:03 |
| 3 | 04:54 06:13-06:43/30 21:48 | 05:35 06:18-06:43/25 21:11 | 06:29 20:04 | 07:21 17:25-18:01/36 18:52 | 07:18 15:31-16:02/31 16:43 | 08:12 13:51-14:08/17 16:02 |
| 4 | 04:55 06:13-06:43/30 21:48 | 05:37 06:20-06:42/22 21:09 | 06:30 20:02 | 07:23 17:24-18:01/37 18:49 | 07:20 15:32-16:02/30 16:41 | 08:13 13:50-14:10/20 16:01 |
| 5 | 04:56 06:13-06:43/30 21:47 | 05:38 06:21-06:40/19 21:08 | 06:32 20:00 | 07:24 08:52-08:56/4 18:47 17:24-18:01/37 | 07:22 15:32-16:01/29 16:39 | 08:15 13:50-14:11/21 16:01 |
| 6 | 04:57 06:13-06:43/30 21:47 | 05:40 06:23-06:38/15 21:06 | 06:34 19:57 | 07:26 08:47-09:01/14 18:44 17:24-18:01/37 | 07:24 15:32-16:01/29 16:37 | 08:16 13:50-14:12/22 16:00 |
| 7 | 04:58 06:13-06:44/31 21:46 | 05:42 06:26-06:34/8 21:04 | 06:35 07:28-07:39/11 19:55 | 07:28 08:43-09:03/20 18:42 17:23-17:59/36 | 07:26 15:33-16:00/27 16:36 | 08:17 13:49-14:13/24 16:00 |
| 8 | 04:59 06:13-06:45/32 21:46 | 05:43 21:02 | 06:37 07:26-07:41/15 19:53 | 07:30 08:41-09:04/23 18:40 17:23-17:59/36 | 07:28 15:34-15:59/25 16:34 | 08:18 13:49-14:13/24 15:59 |
| 9 | 05:00 06:13-06:45/32 21:45 | 05:45 21:00 | 06:39 07:25-07:42/17 19:50 | 07:32 08:40-09:06/26 18:37 17:23-17:58/35 | 07:30 15:35-15:58/23 16:32 | 08:20 13:50-14:15/25 15:59 |
| 10 | 05:01 06:12-06:45/33 21:44 | 05:47 20:58 | 06:41 07:23-07:42/19 19:48 | 07:34 08:39-09:06/27 18:35 17:24-17:58/34 | 07:32 15:36-15:57/21 16:30 | 08:21 13:49-14:15/26 15:59 |
| 11 | 05:02 06:12-06:46/34 21:43 | 05:49 20:56 | 06:42 07:22-07:43/21 19:45 | 07:35 08:38-09:07/29 18:33 17:24-17:57/33 | 07:34 15:38-15:55/17 16:29 | 08:22 13:49-14:16/27 15:59 |
| 12 | 05:03 06:12-06:46/34 21:42 | 05:50 20:54 | 06:44 07:22-07:43/21 19:43 | 07:37 08:37-09:08/31 18:30 17:25-17:56/31 | 07:36 15:41-15:54/13 16:27 | 08:23 13:49-14:16/27 15:58 |
| 13 | 05:04 06:12-06:46/34 21:41 | 05:52 20:52 | 06:46 07:21-07:42/21 19:40 | 07:39 08:36-09:08/32 18:28 17:26-17:54/28 | 07:37 15:45-15:51/6 16:25 | 08:24 13:49-14:17/28 15:58 |
| 14 | 05:05 06:12-06:47/35 21:40 | 05:54 20:50 | 06:48 07:21-07:42/21 19:38 | 07:41 08:36-09:08/32 18:26 17:28-17:53/25 | 07:39 16:24 | 08:25 13:50-14:18/28 15:58 |
| 15 | 05:07 06:13-06:48/35 21:39 | 05:56 20:48 | 06:49 07:21-07:42/21 19:35 | 07:43 08:36-09:08/32 18:23 17:28-17:50/22 | 07:41 16:22 | 08:26 10:09-10:14/5 15:58 13:50-14:18/28 |
| 16 | 05:08 06:12-06:48/36 21:38 | 05:57 20:45 | 06:51 07:20-07:40/20 19:33 | 07:44 08:35-09:08/33 18:21 17:31-17:47/16 | 07:43 16:21 | 08:27 10:09-10:15/6 15:58 13:51-14:19/28 |
| 17 | 05:09 06:12-06:48/36 21:37 | 05:59 20:43 | 06:53 07:21-07:39/18 19:31 | 07:46 08:35-09:08/33 18:19 17:35-17:43/8 | 07:45 16:19 | 08:28 10:09-10:16/7 15:59 13:51-14:20/29 |
| 18 | 05:11 06:12-06:48/36 21:36 | 06:01 20:41 | 06:55 07:22-07:38/16 19:28 | 07:48 08:34-09:06/32 18:17 | 07:47 16:18 | 08:29 10:09-10:18/9 15:59 13:52-14:21/29 |
| 19 | 05:12 06:13-06:49/36 21:35 | 06:02 20:39 | 06:56 07:24-07:36/12 19:26 | 07:50 08:35-09:06/31 18:14 | 07:48 16:16 | 08:29 10:08-10:18/10 15:59 13:51-14:20/29 |
| 20 | 05:13 06:12-06:48/36 21:33 | 06:04 20:37 | 06:58 07:27-07:31/4 19:23 | 07:52 08:35-09:05/30 18:12 | 07:50 16:15 | 08:30 10:09-10:19/10 15:59 13:52-14:21/29 |
| 21 | 05:15 06:12-06:48/36 21:32 | 06:06 20:34 | 07:00 19:21 | 07:54 08:36-09:04/28 18:10 16:41-16:53/12 | 07:52 16:14 | 08:31 10:10-10:20/10 16:00 13:53-14:22/29 |
| 22 | 05:16 06:13-06:49/36 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 08:37-09:03/26 18:08 16:39-16:56/17 | 07:54 16:13 | 08:31 10:10-10:20/10 16:00 13:53-14:22/29 |
| 23 | 05:18 06:13-06:49/36 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 08:38-09:02/24 18:06 16:36-16:58/22 | 07:56 16:11 | 08:32 10:10-10:20/10 16:01 13:53-14:22/29 |
| 24 | 05:19 06:13-06:48/35 21:28 | 06:11 20:28 | 07:05 17:40-17:53/13 19:13 | 07:59 08:39-09:00/21 18:03 16:35-16:59/24 | 07:57 16:10 | 08:32 10:11-10:21/10 16:01 13:54-14:23/29 |
| 25 | 05:21 06:13-06:49/36 21:26 | 06:13 20:25 | 07:07 17:37-17:56/19 19:11 | 07:01 07:41-07:58/17 17:01 15:34-16:00/26 | 07:59 16:09 | 08:32 10:12-10:21/9 16:02 13:55-14:24/29 |
| 26 | 05:22 06:13-06:48/35 21:25 | 06:15 20:23 | 07:09 17:34-17:58/24 19:09 | 07:03 07:43-07:56/13 16:59 15:33-16:00/27 | 08:01 16:08 | 08:33 10:12-10:20/8 16:03 13:55-14:24/29 |
| 27 | 05:24 06:14-06:48/34 21:23 | 06:16 20:21 | 07:10 17:31-17:58/27 19:06 | 07:05 15:32-16:01/29 16:57 | 08:02 16:07 | 08:33 10:13-10:20/7 16:03 13:55-14:24/29 |
| 28 | 05:25 06:14-06:47/33 21:21 | 06:18 20:19 | 07:12 17:30-17:59/29 19:04 | 07:07 15:31-16:01/30 16:55 | 08:04 16:06 | 08:33 10:14-10:20/6 16:04 13:56-14:24/28 |
| 29 | 05:27 06:15-06:47/32 21:20 | 06:20 20:16 | 07:14 17:29-18:00/31 19:01 | 07:09 15:31-16:02/31 16:53 | 08:06 16:05 | 08:33 10:16-10:19/3 16:05 13:56-14:25/29 |
| 30 | 05:29 06:15-06:46/31 21:18 | 06:22 20:14 | 07:16 17:28-18:01/33 18:59 | 07:11 15:31-16:03/32 16:51 | 08:07 16:04 | 08:33 13:57-14:25/28 16:06 |
| 31 | 05:30 06:16-06:46/30 21:16 | 06:23 20:12 | | 07:13 15:31-16:03/32 16:49 | | 08:33 13:58-14:25/27 16:07 |
| | Sonnenscheinstunden 510 | 458 | 382 | 329 | 261 | 236 |
| | Anzahl Minuten mit Schatten 1031 | 145 | 413 | 1361 | 322 | 923 |

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

| Tag im Monat | Sonnenaufgang (SS:MM) | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|

SHADOW - Grafischer Kalender pro WEA

Berechnung: Zusatzbelastung WEA 2 **WEA:** WEA 2 - WEA 2

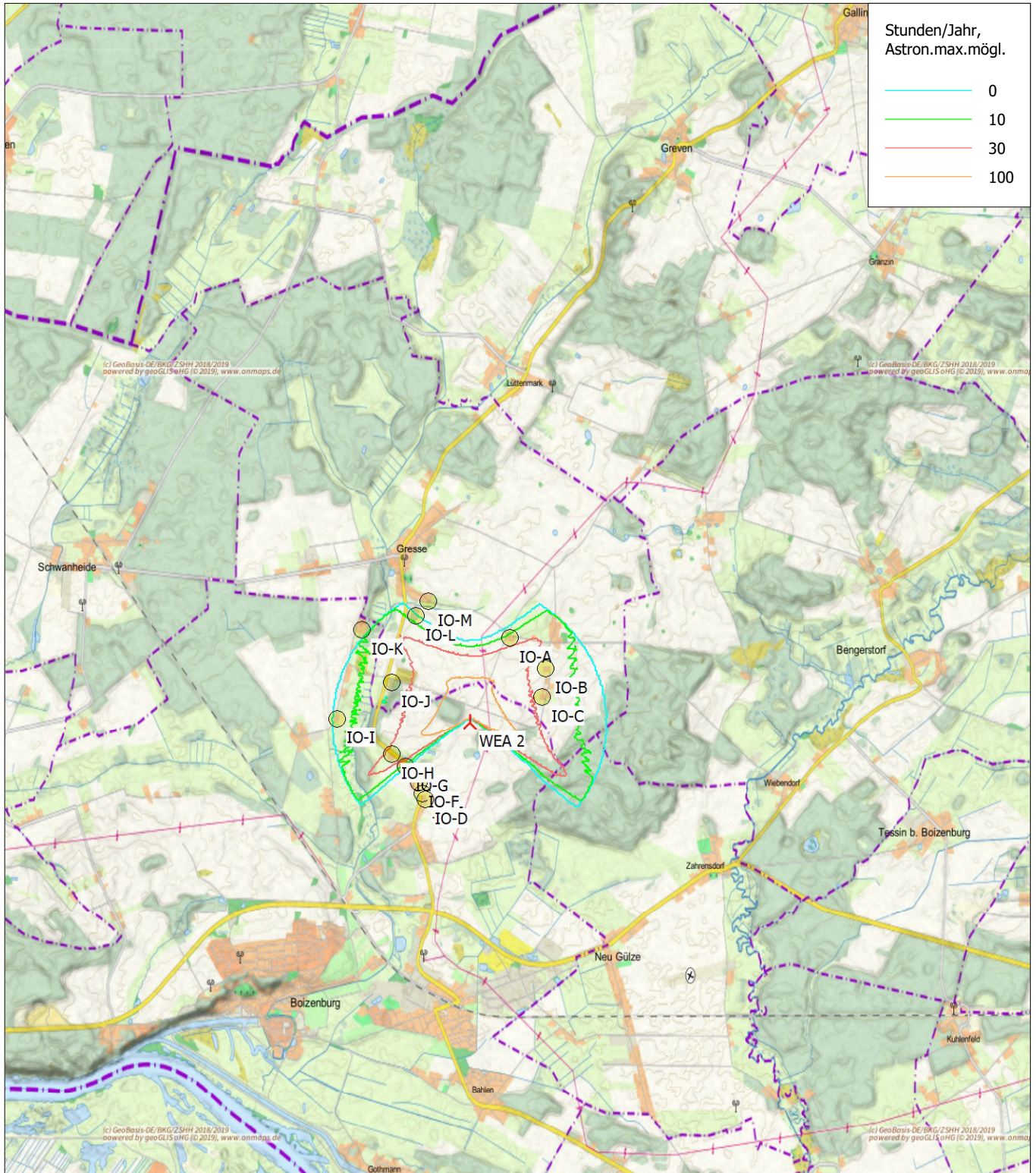


Schattenrezeptoren

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> IO-A: Gresser Strasse 4, Badekow IO-B: Dorfstrasse 5, Badekow IO-C: Dorfstrasse 1, Badekow | <ul style="list-style-type: none"> IO-H: Zarentiner Strasse 77, Schw... IO-I: An der Torfkoppel 9, Heide IO-J: Behr Gemüsehandel GmbH, Gresse | <ul style="list-style-type: none"> IO-L: Gewerbegebiet Gresse, Gresse |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

SHADOW - Karte

Berechnung: Zusatzbelastung WEA 2



Karte: OnMaps , Maßstab 1:75.000, Mitte: ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33 Ost: 218.740 Nord: 5.927.880
▲ Neue WEA ● Schattenrezeptor
Höhe der Schattenkarte: Höhenraster-Objekt: 20140305 WP Boizenburg_EMDGrid_0.wpg (5)

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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 Sonneneinstrahlrichtung
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:

Verwendete Höhenlinien: Höhenraster-Objekt: 20140305 WP Boizenburg_EM

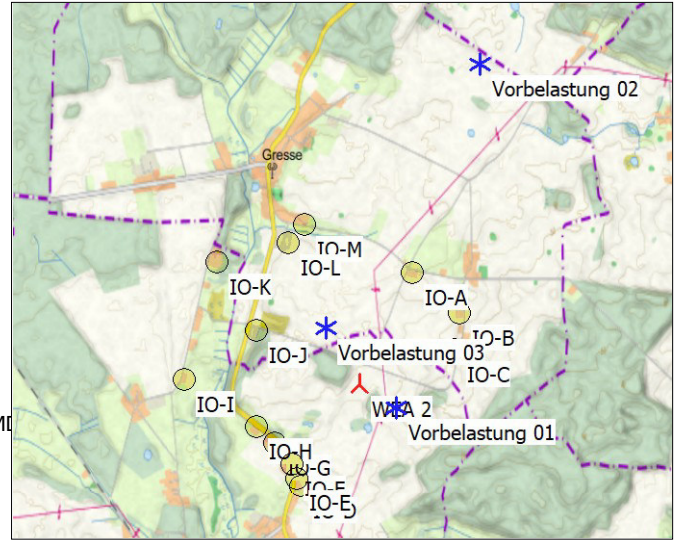
Hindernisse in Berechnung nicht verwendet

Berechnungshöhe ü.Gr. für Karte: 1,5 m

Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:

ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33



Maßstab 1:75.000
▲ Neue WEA
★ Existierende WEA
● Schattenrezeptor

WEA

| | Ost | Nord | Z | Beschreibung | WEA-Typ | | | Nennleistung | Rotor-durchmesser | Nabenhöhe | Schattendaten | |
|-----------------|---------|-----------|------|-----------------|---------|------------|------------|--------------|-------------------|-----------|-------------------|-------|
| | | | | | Aktuell | Hersteller | Typ | | | | Beschatt.-Bereich | U/min |
| | | | [m] | | | | [kW] | [m] | [m] | [m] | [U/min] | |
| Vorbelastung 01 | 218.564 | 5.926.071 | 29,8 | Vorbelastung 01 | Ja | VESTAS | V162-5.600 | 5.600 | 162,0 | 119,0 | 1.996 | 12,1 |
| Vorbelastung 02 | 219.596 | 5.929.422 | 34,0 | Vorbelastung 02 | Ja | VESTAS | V162-5.600 | 5.600 | 162,0 | 166,0 | 1.993 | 12,1 |
| Vorbelastung 03 | 217.915 | 5.926.908 | 27,0 | Vorbelastung 03 | Ja | NORDEX | N163-5.700 | 5.700 | 163,0 | 164,0 | 1.784 | 10,4 |
| WEA 2 | 218.213 | 5.926.327 | 28,9 | WEA 2 | Ja | NORDEX | N163-5.700 | 5.700 | 163,0 | 164,0 | 1.784 | 10,4 |

Schattenrezeptor-Eingabe

| Nr. | Name | Ost | Nord | Z | Breite | Höhe | Höhe ü.Gr. | Neigung des Fensters | Ausrichtungsmodus | Augenhöhe (ZVI) ü.Gr. |
|------|-----------------------------------|---------|-----------|------|--------|------|------------|----------------------|---------------------|-----------------------|
| IO-A | Gresser Strasse 4, Badekow | 218.806 | 5.927.398 | 28,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-B | Dorfstrasse 5, Badekow | 219.249 | 5.926.974 | 42,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-C | Dorfstrasse 1, Badekow | 219.183 | 5.926.608 | 45,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 217.571 | 5.925.349 | 16,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 217.541 | 5.925.427 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 217.504 | 5.925.574 | 20,0 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 217.345 | 5.925.795 | 17,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 217.173 | 5.925.965 | 18,5 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-I | An der Torfkoppel 9, Heide | 216.484 | 5.926.478 | 13,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 217.226 | 5.926.915 | 17,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-K | Heide 6, Heide | 216.876 | 5.927.620 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-L | Gewerbegebiet Gresse, Gresse | 217.593 | 5.927.763 | 19,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |
| IO-M | Badekower Strasse 14, Gresse | 217.771 | 5.927.940 | 19,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | 2,0 |

Berechnungsergebnisse

Schattenrezeptor

astron. max. mögl. Beschattungsdauer

| Nr. | Name | Stunden/Jahr | Schattentage/Jahr | Max.Schattendauer/Tag |
|------|-----------------------------------|--------------|-------------------|-----------------------|
| | | [h/a] | [d/a] | [h/d] |
| IO-A | Gresser Strasse 4, Badekow | 42:33 | 96 | 0:38 |
| IO-B | Dorfstrasse 5, Badekow | 57:41 | 137 | 0:34 |
| IO-C | Dorfstrasse 1, Badekow | 93:42 | 200 | 0:48 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 0:00 | 0 | 0:00 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 14:18 | 46 | 0:26 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 40:43 | 84 | 0:35 |

(Fortsetzung nächste Seite)...

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung WEA 2

...(Fortsetzung von letzter Seite)

| Nr. | Name | astron. max. mögl. Beschattungsdauer | | |
|------|-----------------------------------|--------------------------------------|----------------------------|--------------------------------|
| | | Stunden/Jahr [h/a] | Schattentage/Jahr [d/a] | Max.Schattendauer/Tag [h/d] |
| IO-G | Zarrentiner Strasse 71, Schwartow | 18:33 | 49 | 0:31 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 59:06 | 131 | 0:36 |
| IO-I | An der Torfkoppel 9, Heide | 24:15 | 76 | 0:27 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 81:37 | 145 | 0:54 |
| IO-K | Heide 6, Heide | 16:26 | 41 | 0:30 |
| IO-L | Gewerbegebiet Gresse, Gresse | 49:53 | 78 | 0:44 |
| IO-M | Badekower Strasse 14, Gresse | 13:05 | 36 | 0:28 |

Gesamtmenge der max. mögl. Beschattung an Rezeptoren pro WEA

| Nr. | Name | Maximal [h/a] |
|-----------------|-----------------|------------------|
| Vorbelastung 01 | Vorbelastung 01 | 172:45 |
| Vorbelastung 02 | Vorbelastung 02 | 0:00 |
| Vorbelastung 03 | Vorbelastung 03 | 207:19 |
| | WEA 2 WEA 2 | 135:57 |

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.

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 **Schattenrezeptor:** IO-A - Gresser Strasse 4, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

- 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

| | Januar | Februar | März | April | Mai | Juni |
|----|---------------------------|--------------------------------|-------------------------------------------------------|----------------------------------------------------|----------------------------------|----------------|
| 1 | 08:33 16:08 | 13:59 (WEA 2) 14:26 (WEA 2) | 08:04 16:59 | 07:07 17:54 | 16:11 (Vorbelastung 03) 19:51 | 05:45 21:35 |
| 2 | 08:33 16:09 | 14:00 (WEA 2) 14:26 (WEA 2) | 08:02 17:01 | 07:05 17:56 | 16:12 (Vorbelastung 03) 19:53 | 05:43 21:36 |
| 3 | 08:33 16:11 | 14:00 (WEA 2) 14:26 (WEA 2) | 08:01 17:03 | 07:03 17:57 | 16:15 (Vorbelastung 03) 19:55 | 05:41 21:37 |
| 4 | 08:33 16:12 | 14:02 (WEA 2) 14:26 (WEA 2) | 07:59 17:05 | 07:00 17:59 | 16:18 (Vorbelastung 03) 19:57 | 05:39 21:38 |
| 5 | 08:32 16:13 | 14:02 (WEA 2) 14:26 (WEA 2) | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 21:39 |
| 6 | 08:32 16:14 | 14:04 (WEA 2) 14:26 (WEA 2) | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 21:40 |
| 7 | 08:32 16:16 | 14:04 (WEA 2) 14:26 (WEA 2) | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 21:41 |
| 8 | 08:31 16:17 | 14:05 (WEA 2) 14:25 (WEA 2) | 07:52 17:13 | 16:28 (Vorbelastung 03) 16:16 (Vorbelastung 03) | 18:05 18:07 | 05:31 21:42 |
| 9 | 08:31 16:18 | 14:07 (WEA 2) 14:25 (WEA 2) | 07:50 17:15 | 16:32 (Vorbelastung 03) 16:14 (Vorbelastung 03) | 18:07 18:09 | 05:29 21:43 |
| 10 | 08:30 16:20 | 14:09 (WEA 2) 14:24 (WEA 2) | 07:48 17:17 | 16:34 (Vorbelastung 03) 16:12 (Vorbelastung 03) | 18:09 18:11 | 05:28 21:44 |
| 11 | 08:29 16:21 | 14:11 (WEA 2) 14:23 (WEA 2) | 07:46 17:19 | 16:36 (Vorbelastung 03) 16:11 (Vorbelastung 03) | 18:11 18:13 | 05:27 21:45 |
| 12 | 08:29 16:23 | 14:13 (WEA 2) 14:21 (WEA 2) | 07:44 17:20 | 16:38 (Vorbelastung 03) 16:10 (Vorbelastung 03) | 18:13 18:14 | 05:26 21:45 |
| 13 | 08:28 16:25 | 14:13 (WEA 2) 17:22 | 07:42 17:22 | 16:39 (Vorbelastung 03) 16:09 (Vorbelastung 03) | 18:14 18:16 | 05:25 21:46 |
| 14 | 08:27 16:26 | 17:22 17:40 | 31 16:40 (Vorbelastung 03) 16:07 (Vorbelastung 03) | 18:16 18:18 | 20:13 20:15 | 21:06 21:08 |
| 15 | 08:26 16:28 | 17:24 17:38 | 33 16:40 (Vorbelastung 03) 16:07 (Vorbelastung 03) | 18:18 18:20 | 20:15 20:17 | 21:08 21:09 |
| 16 | 08:25 16:29 | 17:26 17:36 | 34 16:41 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:20 18:22 | 20:17 20:18 | 21:10 21:11 |
| 17 | 08:24 16:31 | 17:28 17:30 | 35 16:41 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:22 18:24 | 20:18 20:20 | 21:11 21:13 |
| 18 | 08:23 16:33 | 17:28 17:32 | 36 16:42 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:22 18:26 | 20:18 20:22 | 21:11 21:15 |
| 19 | 08:22 16:35 | 17:29 17:34 | 36 16:42 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:25 18:27 | 20:19 20:24 | 21:12 21:16 |
| 20 | 08:21 16:36 | 17:27 17:36 | 37 16:43 (Vorbelastung 03) 16:05 (Vorbelastung 03) | 18:27 18:29 | 20:20 20:26 | 21:13 21:18 |
| 21 | 08:20 16:38 | 17:25 17:38 | 37 16:42 (Vorbelastung 03) 16:05 (Vorbelastung 03) | 18:29 18:31 | 20:26 20:27 | 21:18 21:19 |
| 22 | 08:18 16:40 | 17:23 17:40 | 37 16:42 (Vorbelastung 03) 16:05 (Vorbelastung 03) | 18:31 18:33 | 20:27 20:29 | 21:19 21:21 |
| 23 | 08:17 16:42 | 17:21 17:42 | 36 16:42 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:33 18:35 | 20:30 20:31 | 21:21 21:22 |
| 24 | 08:16 16:44 | 17:19 17:44 | 36 16:42 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:35 18:37 | 20:31 20:33 | 21:22 21:24 |
| 25 | 08:15 16:45 | 17:16 17:46 | 35 16:41 (Vorbelastung 03) 16:06 (Vorbelastung 03) | 18:37 18:38 | 20:33 20:35 | 21:24 21:25 |
| 26 | 08:13 16:47 | 17:14 17:48 | 35 16:41 (Vorbelastung 03) 16:07 (Vorbelastung 03) | 18:38 18:40 | 20:35 20:37 | 21:25 21:27 |
| 27 | 08:12 16:49 | 17:12 17:50 | 33 16:40 (Vorbelastung 03) 16:08 (Vorbelastung 03) | 18:40 18:42 | 20:37 20:38 | 21:27 21:28 |
| 28 | 08:10 16:51 | 17:10 17:52 | 30 16:38 (Vorbelastung 03) 16:09 (Vorbelastung 03) | 18:42 18:44 | 20:38 20:40 | 21:28 21:29 |
| 29 | 08:09 16:53 | 17:52 | 28 16:37 (Vorbelastung 03) | 06:03 07:00 | 05:51 20:40 | 05:01 21:29 |
| 30 | 08:07 16:55 | | | 19:46 06:58 | 20:42 20:44 | 21:31 21:32 |
| 31 | 08:06 16:57 | | | 19:47 06:56 | 20:44 20:44 | 21:32 21:33 |
| | Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 |
| | astr.max.mögl.Beschattung | 244 | 674 | 71 | | 508 |

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) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattennende (WEA mit letztem Schatten) |
|--------------|-----------------------|------------------------------------------------------------|----------------------|------------------------------------------------------------|

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 **Schattenrezeptor:** IO-A - Gresser Strasse 4, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | July | August | September | Oktober | | November | | Dezember | |
|---------------------------|-------|--------|-----------|---------|----|-------------------------|----------------------------|----------|------------------|
| 1 | 04:53 | 05:32 | 06:25 | 07:17 | | 07:15 | 15:42 (Vorbelastung 03) | 08:09 | 13:53 (WEA 2) |
| | 21:49 | 21:15 | 20:09 | 18:56 | | 16:47 | 23 16:05 (Vorbelastung 03) | 16:03 | 12 14:05 (WEA 2) |
| 2 | 04:53 | 05:33 | 06:27 | 07:19 | | 07:17 | 15:44 (Vorbelastung 03) | 08:10 | 13:51 (WEA 2) |
| | 21:49 | 21:13 | 20:07 | 18:54 | | 16:45 | 19 16:03 (Vorbelastung 03) | 16:03 | 15 14:06 (WEA 2) |
| 3 | 04:54 | 05:35 | 06:28 | 07:21 | | 07:18 | 15:46 (Vorbelastung 03) | 08:12 | 13:51 (WEA 2) |
| | 21:48 | 21:11 | 20:04 | 18:52 | | 16:43 | 15 16:01 (Vorbelastung 03) | 16:02 | 17 14:08 (WEA 2) |
| 4 | 04:55 | 05:37 | 06:30 | 07:23 | | 07:20 | 15:51 (Vorbelastung 03) | 08:13 | 13:50 (WEA 2) |
| | 21:48 | 21:09 | 20:02 | 18:49 | | 16:41 | 5 15:56 (Vorbelastung 03) | 16:01 | 20 14:10 (WEA 2) |
| 5 | 04:56 | 05:38 | 06:32 | 07:24 | | 07:22 | | 08:15 | 13:50 (WEA 2) |
| | 21:47 | 21:08 | 20:00 | 18:47 | | 16:39 | | 16:01 | 21 14:11 (WEA 2) |
| 6 | 04:57 | 05:40 | 06:34 | 07:26 | | 07:24 | | 08:16 | 13:50 (WEA 2) |
| | 21:47 | 21:06 | 19:57 | 18:44 | | 16:37 | | 16:00 | 22 14:12 (WEA 2) |
| 7 | 04:58 | 05:42 | 06:35 | 07:28 | | 07:26 | | 08:17 | 13:49 (WEA 2) |
| | 21:46 | 21:04 | 19:55 | 18:42 | | 16:35 | | 16:00 | 24 14:13 (WEA 2) |
| 8 | 04:59 | 05:43 | 06:37 | 07:30 | | 07:28 | | 08:18 | 13:49 (WEA 2) |
| | 21:46 | 21:02 | 19:52 | 18:40 | | 16:34 | | 15:59 | 24 14:13 (WEA 2) |
| 9 | 05:00 | 05:45 | 06:39 | 07:32 | | 07:30 | | 08:20 | 13:50 (WEA 2) |
| | 21:45 | 21:00 | 19:50 | 18:37 | | 16:32 | | 15:59 | 25 14:15 (WEA 2) |
| 10 | 05:01 | 05:47 | 06:41 | 07:33 | | 16:51 (Vorbelastung 03) | 07:32 | 08:21 | 13:49 (WEA 2) |
| | 21:44 | 20:58 | 19:48 | 18:35 | 13 | 17:04 (Vorbelastung 03) | 16:30 | 15:59 | 26 14:15 (WEA 2) |
| 11 | 05:02 | 05:49 | 06:42 | 07:35 | | 16:47 (Vorbelastung 03) | 07:34 | 08:22 | 13:49 (WEA 2) |
| | 21:43 | 20:56 | 19:45 | 18:33 | 19 | 17:06 (Vorbelastung 03) | 16:29 | 15:58 | 27 14:16 (WEA 2) |
| 12 | 05:03 | 05:50 | 06:44 | 07:37 | | 16:45 (Vorbelastung 03) | 07:36 | 08:23 | 13:49 (WEA 2) |
| | 21:42 | 20:54 | 19:43 | 18:30 | 23 | 17:08 (Vorbelastung 03) | 16:27 | 15:58 | 27 14:16 (WEA 2) |
| 13 | 05:04 | 05:52 | 06:46 | 07:39 | | 16:43 (Vorbelastung 03) | 07:37 | 08:24 | 13:49 (WEA 2) |
| | 21:41 | 20:52 | 19:40 | 18:28 | 27 | 17:10 (Vorbelastung 03) | 16:25 | 15:58 | 28 14:17 (WEA 2) |
| 14 | 05:05 | 05:54 | 06:48 | 07:41 | | 16:42 (Vorbelastung 03) | 07:39 | 08:25 | 13:50 (WEA 2) |
| | 21:40 | 20:50 | 19:38 | 18:26 | 29 | 17:11 (Vorbelastung 03) | 16:24 | 15:58 | 28 14:18 (WEA 2) |
| 15 | 05:07 | 05:55 | 06:49 | 07:43 | | 16:40 (Vorbelastung 03) | 07:41 | 08:26 | 13:50 (WEA 2) |
| | 21:39 | 20:48 | 19:35 | 18:23 | 32 | 17:12 (Vorbelastung 03) | 16:22 | 15:58 | 28 14:18 (WEA 2) |
| 16 | 05:08 | 05:57 | 06:51 | 07:44 | | 16:38 (Vorbelastung 03) | 07:43 | 08:27 | 13:51 (WEA 2) |
| | 21:38 | 20:45 | 19:33 | 18:21 | 33 | 17:11 (Vorbelastung 03) | 16:21 | 15:58 | 28 14:19 (WEA 2) |
| 17 | 05:09 | 05:59 | 06:53 | 07:46 | | 16:37 (Vorbelastung 03) | 07:45 | 08:28 | 13:51 (WEA 2) |
| | 21:37 | 20:43 | 19:31 | 18:19 | 35 | 17:12 (Vorbelastung 03) | 16:19 | 15:58 | 29 14:20 (WEA 2) |
| 18 | 05:11 | 06:01 | 06:55 | 07:48 | | 16:37 (Vorbelastung 03) | 07:47 | 08:29 | 13:52 (WEA 2) |
| | 21:36 | 20:41 | 19:28 | 18:17 | 35 | 17:12 (Vorbelastung 03) | 16:18 | 15:59 | 29 14:21 (WEA 2) |
| 19 | 05:12 | 06:02 | 06:56 | 07:50 | | 16:36 (Vorbelastung 03) | 07:48 | 08:29 | 13:51 (WEA 2) |
| | 21:35 | 20:39 | 19:26 | 18:14 | 36 | 17:12 (Vorbelastung 03) | 16:16 | 15:59 | 29 14:20 (WEA 2) |
| 20 | 05:13 | 06:04 | 06:58 | 07:52 | | 16:36 (Vorbelastung 03) | 07:50 | 08:30 | 13:52 (WEA 2) |
| | 21:33 | 20:37 | 19:23 | 18:12 | 37 | 17:13 (Vorbelastung 03) | 16:15 | 15:59 | 29 14:21 (WEA 2) |
| 21 | 05:15 | 06:06 | 07:00 | 07:54 | | 16:35 (Vorbelastung 03) | 07:52 | 08:31 | 13:53 (WEA 2) |
| | 21:32 | 20:34 | 19:21 | 18:10 | 38 | 17:13 (Vorbelastung 03) | 16:14 | 16:00 | 29 14:22 (WEA 2) |
| 22 | 05:16 | 06:08 | 07:01 | 07:56 | | 16:35 (Vorbelastung 03) | 07:54 | 08:31 | 13:53 (WEA 2) |
| | 21:31 | 20:32 | 19:18 | 18:08 | 37 | 17:12 (Vorbelastung 03) | 16:12 | 16:00 | 29 14:22 (WEA 2) |
| 23 | 05:18 | 06:09 | 07:03 | 07:58 | | 16:35 (Vorbelastung 03) | 07:56 | 08:32 | 13:53 (WEA 2) |
| | 21:29 | 20:30 | 19:16 | 18:05 | 37 | 17:12 (Vorbelastung 03) | 16:11 | 16:01 | 29 14:22 (WEA 2) |
| 24 | 05:19 | 06:11 | 07:05 | 07:59 | | 16:35 (Vorbelastung 03) | 07:57 | 08:32 | 13:54 (WEA 2) |
| | 21:28 | 20:28 | 19:13 | 18:03 | 37 | 17:12 (Vorbelastung 03) | 16:10 | 16:01 | 29 14:23 (WEA 2) |
| 25 | 05:21 | 06:13 | 07:07 | 07:01 | | 15:35 (Vorbelastung 03) | 07:59 | 08:32 | 13:55 (WEA 2) |
| | 21:26 | 20:25 | 19:11 | 17:01 | 36 | 16:11 (Vorbelastung 03) | 16:09 | 16:02 | 29 14:24 (WEA 2) |
| 26 | 05:22 | 06:15 | 07:08 | 07:03 | | 15:36 (Vorbelastung 03) | 08:01 | 08:33 | 13:55 (WEA 2) |
| | 21:25 | 20:23 | 19:09 | 16:59 | 35 | 16:11 (Vorbelastung 03) | 16:08 | 16:03 | 29 14:24 (WEA 2) |
| 27 | 05:24 | 06:16 | 07:10 | 07:05 | | 15:36 (Vorbelastung 03) | 08:02 | 08:33 | 13:55 (WEA 2) |
| | 21:23 | 20:21 | 19:06 | 16:57 | 34 | 16:10 (Vorbelastung 03) | 16:07 | 16:03 | 29 14:24 (WEA 2) |
| 28 | 05:25 | 06:18 | 07:12 | 07:07 | | 15:37 (Vorbelastung 03) | 08:04 | 08:33 | 13:56 (WEA 2) |
| | 21:22 | 20:19 | 19:04 | 16:55 | 32 | 16:09 (Vorbelastung 03) | 16:06 | 16:04 | 28 14:24 (WEA 2) |
| 29 | 05:27 | 06:20 | 07:14 | 07:09 | | 15:38 (Vorbelastung 03) | 08:06 | 08:33 | 13:56 (WEA 2) |
| | 21:20 | 20:16 | 19:01 | 16:53 | 31 | 16:09 (Vorbelastung 03) | 16:05 | 16:05 | 29 14:25 (WEA 2) |
| 30 | 05:28 | 06:22 | 07:16 | 07:11 | | 15:39 (Vorbelastung 03) | 08:07 | 08:33 | 13:57 (WEA 2) |
| | 21:18 | 20:14 | 18:59 | 16:51 | 29 | 16:08 (Vorbelastung 03) | 16:04 | 16:06 | 28 14:25 (WEA 2) |
| 31 | 05:30 | 06:23 | | 07:13 | | 15:41 (Vorbelastung 03) | | 08:33 | 13:58 (WEA 2) |
| | 21:17 | 20:12 | | 16:49 | 26 | 16:07 (Vorbelastung 03) | | 16:07 | 27 14:25 (WEA 2) |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | | 261 | | 236 | |
| astr.max.mögl.Beschattung | | | | 691 | | 70 | | 803 | |

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 WEA 2 **Schattenrezeptor:** IO-B - Dorfstrasse 5, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

- 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

| | Januar | Februar | März | April | Mai | Juni |
|---------------------------|----------------|--------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------|----------------|
| 1 | 08:33 16:08 | 14:34 (Vorbelastung 01) 08:04 15:06 (Vorbelastung 01) 16:59 | 16:05 (WEA 2) 07:07 16:26 (WEA 2) 17:54 | 06:53 19:51 | 18:41 (Vorbelastung 03) 05:45 18:52 (Vorbelastung 03) 20:45 | 04:56 21:35 |
| 2 | 08:33 16:09 | 14:34 (Vorbelastung 01) 08:02 15:06 (Vorbelastung 01) 17:01 | 16:04 (WEA 2) 07:05 16:27 (WEA 2) 17:56 | 06:51 19:53 | 05:43 20:47 | 21:36 04:56 |
| 3 | 08:33 16:11 | 14:35 (Vorbelastung 01) 08:00 15:06 (Vorbelastung 01) 17:03 | 16:04 (WEA 2) 07:03 16:29 (WEA 2) 17:57 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 |
| 4 | 08:33 16:12 | 14:36 (Vorbelastung 01) 07:59 15:07 (Vorbelastung 01) 17:05 | 16:03 (WEA 2) 07:00 16:30 (WEA 2) 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 |
| 5 | 08:32 16:13 | 14:36 (Vorbelastung 01) 07:57 15:07 (Vorbelastung 01) 17:07 | 16:03 (WEA 2) 06:58 16:31 (WEA 2) 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 |
| 6 | 08:32 16:14 | 14:37 (Vorbelastung 01) 07:55 15:07 (Vorbelastung 01) 17:09 | 16:02 (WEA 2) 06:56 16:32 (WEA 2) 18:03 | 06:41 20:00 | 05:35 20:54 | 04:52 21:40 |
| 7 | 08:32 16:16 | 14:38 (Vorbelastung 01) 07:53 15:07 (Vorbelastung 01) 17:11 | 16:02 (WEA 2) 06:53 16:32 (WEA 2) 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 |
| 8 | 08:31 16:17 | 14:38 (Vorbelastung 01) 07:51 15:07 (Vorbelastung 01) 17:13 | 16:02 (WEA 2) 06:51 16:32 (WEA 2) 18:07 | 06:36 20:04 | 05:31 20:58 | 04:51 21:42 |
| 9 | 08:31 16:18 | 14:40 (Vorbelastung 01) 07:50 15:07 (Vorbelastung 01) 17:15 | 16:01 (WEA 2) 06:49 16:33 (WEA 2) 18:09 | 06:34 20:06 | 05:29 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 14:41 (Vorbelastung 01) 07:48 15:07 (Vorbelastung 01) 17:17 | 16:01 (WEA 2) 06:46 16:33 (WEA 2) 18:11 | 06:32 20:07 | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:21 | 14:42 (Vorbelastung 01) 07:46 15:06 (Vorbelastung 01) 17:19 | 16:02 (WEA 2) 06:44 16:33 (WEA 2) 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 14:43 (Vorbelastung 01) 07:44 15:06 (Vorbelastung 01) 17:20 | 16:02 (WEA 2) 06:42 16:33 (WEA 2) 18:14 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 14:44 (Vorbelastung 01) 07:42 15:05 (Vorbelastung 01) 17:22 | 16:02 (WEA 2) 06:39 16:33 (WEA 2) 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 |
| 14 | 08:27 16:26 | 14:46 (Vorbelastung 01) 07:40 15:05 (Vorbelastung 01) 17:24 | 16:02 (WEA 2) 06:37 16:32 (WEA 2) 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 14:48 (Vorbelastung 01) 07:38 15:04 (Vorbelastung 01) 17:26 | 16:02 (WEA 2) 06:34 16:31 (WEA 2) 18:20 | 06:20 20:17 | 05:19 21:10 | 04:48 21:47 |
| 16 | 08:25 16:29 | 14:50 (Vorbelastung 01) 07:36 15:02 (Vorbelastung 01) 17:28 | 16:03 (WEA 2) 06:32 16:31 (WEA 2) 18:22 | 17:44 (Vorbelastung 03) 06:18 17:55 (Vorbelastung 03) 20:18 | 05:17 21:11 | 04:48 21:48 |
| 17 | 08:24 16:31 | 14:53 (Vorbelastung 01) 07:34 14:59 (Vorbelastung 01) 17:30 | 16:04 (WEA 2) 06:30 16:30 (WEA 2) 18:24 | 17:42 (Vorbelastung 03) 06:15 17:57 (Vorbelastung 03) 20:20 | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 14:59 (Vorbelastung 01) 07:32 17:32 | 16:06 (WEA 2) 06:27 16:29 (WEA 2) 18:26 | 17:40 (Vorbelastung 03) 06:13 18:00 (Vorbelastung 03) 20:22 | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 17:29 17:34 | 16:08 (WEA 2) 06:25 16:28 (WEA 2) 18:27 | 17:38 (Vorbelastung 03) 06:11 18:01 (Vorbelastung 03) 20:24 | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 17:27 17:36 | 16:09 (WEA 2) 06:22 16:25 (WEA 2) 18:29 | 17:37 (Vorbelastung 03) 06:09 18:03 (Vorbelastung 03) 20:26 | 05:11 21:18 | 04:48 21:49 |
| 21 | 08:20 16:38 | 17:25 17:38 | 16:12 (WEA 2) 06:20 16:22 (WEA 2) 18:31 | 17:36 (Vorbelastung 03) 06:06 18:02 (Vorbelastung 03) 20:27 | 05:10 21:19 | 04:48 21:50 |
| 22 | 08:18 16:40 | 17:23 17:40 | 16:17 18:33 | 17:36 (Vorbelastung 03) 06:04 18:03 (Vorbelastung 03) 20:29 | 05:08 21:21 | 04:49 21:50 |
| 23 | 08:17 16:42 | 17:21 17:42 | 16:15 18:35 | 17:34 (Vorbelastung 03) 06:02 18:02 (Vorbelastung 03) 20:31 | 05:07 21:22 | 04:49 21:50 |
| 24 | 08:16 16:44 | 17:19 17:44 | 16:13 18:37 | 17:35 (Vorbelastung 03) 06:00 18:03 (Vorbelastung 03) 20:33 | 05:05 21:24 | 04:49 21:50 |
| 25 | 08:14 16:45 | 17:16 17:46 | 16:10 18:38 | 17:34 (Vorbelastung 03) 05:58 18:02 (Vorbelastung 03) 20:35 | 05:04 21:25 | 04:49 21:50 |
| 26 | 08:13 16:47 | 17:14 17:48 | 16:08 18:40 | 17:34 (Vorbelastung 03) 05:55 18:01 (Vorbelastung 03) 20:36 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 16:49 | 17:12 17:50 | 16:05 18:42 | 17:35 (Vorbelastung 03) 05:53 18:01 (Vorbelastung 03) 20:38 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 16:51 | 17:10 17:52 | 16:03 18:44 | 17:35 (Vorbelastung 03) 05:51 17:59 (Vorbelastung 03) 20:40 | 05:01 21:29 | 04:51 21:50 |
| 29 | 08:09 16:53 | 16:13 (WEA 2) 16:19 (WEA 2) | 17:00 19:46 | 18:36 (Vorbelastung 03) 05:49 18:59 (Vorbelastung 03) 20:42 | 04:59 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | 16:09 (WEA 2) 16:22 (WEA 2) | 06:58 19:47 | 18:36 (Vorbelastung 03) 05:47 18:56 (Vorbelastung 03) 20:44 | 04:58 21:32 | 04:52 21:49 |
| 31 | 08:05 16:57 | 16:07 (WEA 2) 16:24 (WEA 2) | 06:56 19:49 | 18:38 (Vorbelastung 03) 18:55 (Vorbelastung 03) | 04:57 21:33 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | 455 | 553 | 369 | 11 | | |

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 WEA 2 Schattenrezeptor: IO-B - Dorfstrasse 5, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 15:31 (WEA 2) 08:09 16:03 (WEA 2) 16:03 |
| 2 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | 07:16 16:45 | 32 16:03 (WEA 2) 16:03 15:31 (WEA 2) 08:10 |
| 3 | 04:54 21:48 | 05:35 21:11 | 06:28 20:04 | 07:21 18:52 | 07:18 16:43 | 31 16:02 (WEA 2) 16:03 15:31 (WEA 2) 08:12 |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 31 15:32 (WEA 2) 08:13 16:02 (WEA 2) 16:01 |
| 5 | 04:56 21:47 | 05:38 21:07 | 06:32 20:00 | 07:24 18:47 | 07:22 16:39 | 30 15:32 (WEA 2) 08:14 16:02 (WEA 2) 16:01 |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 29 15:32 (WEA 2) 08:16 16:01 (WEA 2) 16:00 |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:35 19:55 | 07:28 18:42 | 07:26 16:35 | 29 15:33 (WEA 2) 08:17 16:00 (WEA 2) 16:00 |
| 8 | 04:59 21:45 | 05:43 21:02 | 06:37 19:52 | 07:30 18:40 | 07:28 16:34 | 27 15:34 (WEA 2) 08:18 15:59 (WEA 2) 15:59 |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 25 15:35 (WEA 2) 08:20 15:58 (WEA 2) 15:59 |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:33 18:35 | 07:32 16:30 | 23 15:36 (WEA 2) 08:21 15:57 (WEA 2) 15:59 |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:28 | 21 15:38 (WEA 2) 08:22 15:55 (WEA 2) 15:58 |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 17 15:41 (WEA 2) 08:23 15:54 (WEA 2) 15:58 |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 13 15:45 (WEA 2) 08:24 15:51 (WEA 2) 15:58 |
| 14 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 6 15:51 (WEA 2) 08:25 15:58 (WEA 2) 15:58 |
| 15 | 05:07 21:39 | 05:55 20:47 | 06:49 19:35 | 07:43 18:23 | 07:41 16:22 | 23 15:58 (WEA 2) 08:26 15:58 (WEA 2) 15:58 |
| 16 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:44 18:21 | 07:43 16:21 | 25 15:58 (WEA 2) 08:27 15:58 (WEA 2) 15:58 |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 26 15:59 (WEA 2) 08:28 15:58 (WEA 2) 15:58 |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:54 19:28 | 07:48 18:16 | 07:47 16:18 | 34 15:59 (WEA 2) 08:29 15:59 (WEA 2) 15:59 |
| 19 | 05:12 21:34 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 33 15:59 (WEA 2) 08:29 15:59 (WEA 2) 15:59 |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 34 15:59 (WEA 2) 08:30 15:59 (WEA 2) 15:59 |
| 21 | 05:15 21:32 | 06:06 20:34 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 34 15:59 (WEA 2) 08:31 16:00 (WEA 2) 16:00 |
| 22 | 05:16 21:31 | 06:08 20:32 | 07:01 19:18 | 07:56 18:08 | 12 16:14 (WEA 2) 16:14 16:39 (WEA 2) 07:54 | 34 16:00 (WEA 2) 08:31 16:00 (WEA 2) 16:00 |
| 23 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:57 18:05 | 17 16:12 (WEA 2) 16:12 16:36 (WEA 2) 07:56 | 34 16:00 (WEA 2) 08:32 16:00 (WEA 2) 16:00 |
| 24 | 05:19 21:28 | 06:11 20:28 | 07:05 19:13 | 07:59 18:03 | 22 16:11 (WEA 2) 16:11 16:35 (WEA 2) 07:57 | 34 16:01 (WEA 2) 08:32 16:01 (WEA 2) 16:01 |
| 25 | 05:21 21:26 | 06:13 20:25 | 07:07 19:11 | 08:01 18:01 | 24 16:10 (WEA 2) 16:10 15:34 (WEA 2) 07:59 | 34 16:01 (WEA 2) 08:32 14:32 (Vorbelastung 01) 08:32 |
| 26 | 05:22 21:25 | 06:15 20:23 | 07:08 19:09 | 08:03 17:59 | 26 16:09 (WEA 2) 16:09 15:33 (WEA 2) 08:01 | 34 16:02 (WEA 2) 08:33 14:29 (Vorbelastung 01) 08:33 |
| 27 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 08:05 17:57 | 11 16:08 (WEA 2) 16:08 15:32 (WEA 2) 08:02 | 34 16:03 (WEA 2) 08:33 14:27 (Vorbelastung 01) 08:33 |
| 28 | 05:25 21:21 | 06:18 20:19 | 07:12 19:04 | 08:07 17:55 | 16 16:07 (WEA 2) 16:07 15:31 (WEA 2) 08:04 | 34 16:03 (WEA 2) 08:33 14:45 (Vorbelastung 01) 16:04 |
| 29 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 08:09 17:53 | 19 16:06 (WEA 2) 16:06 15:31 (WEA 2) 08:06 | 33 16:04 (WEA 2) 08:33 14:25 (Vorbelastung 01) 08:33 |
| 30 | 05:28 21:18 | 06:22 20:14 | 07:16 18:59 | 08:11 17:51 | 20 16:05 (WEA 2) 16:05 15:31 (WEA 2) 08:07 | 34 16:05 (WEA 2) 08:33 14:45 (Vorbelastung 01) 16:05 |
| 31 | 05:30 21:16 | 06:23 20:12 | | 08:13 17:49 | 23 16:04 (WEA 2) 16:04 15:31 (WEA 2) 08:07 | 33 16:06 (WEA 2) 08:33 14:24 (Vorbelastung 01) 16:06 |
| | Sonnenscheinstunden astr.max.mögl.Beschattung | 510 458 | 382 392 | 329 282 | 261 407 | 236 992 |

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 WEA 2 **Schattenrezeptor:** IO-C - Dorfstrasse 1, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

- 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

| | Januar | Februar | März | April | Mai | Juni |
|---------------------------|----------------|--------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------|----------------------------|--------------------------------|
| 1 | 08:33 16:08 | 15:19 (Vorbelastung 01) 08:04 15:32 (Vorbelastung 01) 16:59 | 15:20 (Vorbelastung 01) 07:07 16:06 (Vorbelastung 01) 17:54 | 16:53 (WEA 2) 06:53 17:22 (WEA 2) 19:51 | | 05:45 04:56 20:45 21:35 |
| 2 | 08:33 16:09 | 15:19 (Vorbelastung 01) 08:02 15:32 (Vorbelastung 01) 17:01 | 15:20 (Vorbelastung 01) 07:05 16:06 (Vorbelastung 01) 17:56 | 16:51 (WEA 2) 06:51 17:22 (WEA 2) 19:53 | | 05:43 04:56 20:47 21:36 |
| 3 | 08:33 16:11 | 15:19 (Vorbelastung 01) 08:00 15:34 (Vorbelastung 01) 17:03 | 15:21 (Vorbelastung 01) 07:03 16:06 (Vorbelastung 01) 17:57 | 16:50 (WEA 2) 06:48 17:23 (WEA 2) 19:55 | | 05:41 04:55 20:49 21:37 |
| 4 | 08:33 16:12 | 15:19 (Vorbelastung 01) 07:59 15:35 (Vorbelastung 01) 17:05 | 15:22 (Vorbelastung 01) 07:00 16:06 (Vorbelastung 01) 17:59 | 16:49 (WEA 2) 06:46 17:23 (WEA 2) 19:57 | | 05:39 04:54 20:51 21:38 |
| 5 | 08:32 16:13 | 15:19 (Vorbelastung 01) 07:57 15:36 (Vorbelastung 01) 17:07 | 15:23 (Vorbelastung 01) 06:58 16:05 (Vorbelastung 01) 18:01 | 16:48 (WEA 2) 06:44 17:24 (WEA 2) 19:58 | | 05:37 04:53 20:53 21:39 |
| 6 | 08:32 16:14 | 15:19 (Vorbelastung 01) 07:55 15:38 (Vorbelastung 01) 17:09 | 15:23 (Vorbelastung 01) 06:56 16:05 (Vorbelastung 01) 18:03 | 16:48 (WEA 2) 06:41 17:24 (WEA 2) 20:00 | | 05:35 04:52 20:54 21:40 |
| 7 | 08:32 16:16 | 15:19 (Vorbelastung 01) 07:53 15:42 (Vorbelastung 01) 17:15 | 15:24 (Vorbelastung 01) 06:53 16:04 (Vorbelastung 01) 18:05 | 16:47 (WEA 2) 06:39 17:24 (WEA 2) 20:02 | | 05:33 04:52 20:56 21:41 |
| 8 | 08:31 16:17 | 15:18 (Vorbelastung 01) 07:51 15:41 (Vorbelastung 01) 17:13 | 15:25 (Vorbelastung 01) 06:51 16:03 (Vorbelastung 01) 18:07 | 16:47 (WEA 2) 06:36 17:24 (WEA 2) 20:04 | | 05:31 04:51 20:58 21:42 |
| 9 | 08:31 16:18 | 15:18 (Vorbelastung 01) 07:50 15:42 (Vorbelastung 01) 17:15 | 15:27 (Vorbelastung 01) 06:49 16:02 (Vorbelastung 01) 18:09 | 16:46 (WEA 2) 06:34 17:23 (WEA 2) 20:06 | 8 19:31 (Vorbelastung 03) | 05:29 04:51 21:00 21:43 |
| 10 | 08:30 16:20 | 15:18 (Vorbelastung 01) 07:48 15:44 (Vorbelastung 01) 17:17 | 15:28 (Vorbelastung 01) 06:46 16:01 (Vorbelastung 01) 18:11 | 16:47 (WEA 2) 06:32 17:23 (WEA 2) 20:07 | 13 19:40 (Vorbelastung 03) | 05:28 04:50 21:01 21:44 |
| 11 | 08:29 16:21 | 15:18 (Vorbelastung 01) 07:46 15:46 (Vorbelastung 01) 17:19 | 15:30 (Vorbelastung 01) 06:44 16:00 (Vorbelastung 01) 18:13 | 16:47 (WEA 2) 06:29 17:23 (WEA 2) 20:09 | 17 19:42 (Vorbelastung 03) | 05:26 04:50 21:03 21:45 |
| 12 | 08:29 16:23 | 15:18 (Vorbelastung 01) 07:44 15:48 (Vorbelastung 01) 17:20 | 15:32 (Vorbelastung 01) 06:42 15:58 (Vorbelastung 01) 18:14 | 16:47 (WEA 2) 06:27 17:22 (WEA 2) 20:11 | 21 19:23 (Vorbelastung 03) | 05:24 04:49 21:05 21:45 |
| 13 | 08:28 16:25 | 15:18 (Vorbelastung 01) 07:42 15:49 (Vorbelastung 01) 17:22 | 15:34 (Vorbelastung 01) 06:39 15:56 (Vorbelastung 01) 18:16 | 16:48 (WEA 2) 06:25 17:21 (WEA 2) 20:13 | 24 19:21 (Vorbelastung 03) | 05:22 04:49 21:06 21:46 |
| 14 | 08:27 16:26 | 15:18 (Vorbelastung 01) 07:40 15:51 (Vorbelastung 01) 17:24 | 15:37 (Vorbelastung 01) 06:37 15:52 (Vorbelastung 01) 18:18 | 16:48 (WEA 2) 06:22 17:20 (WEA 2) 20:15 | 27 19:20 (Vorbelastung 03) | 05:21 04:49 21:08 21:47 |
| 15 | 08:26 16:28 | 15:18 (Vorbelastung 01) 07:38 15:53 (Vorbelastung 01) 17:26 | 15:37 (Vorbelastung 01) 06:37 16:04 (Vorbelastung 01) 18:20 | 16:49 (WEA 2) 06:20 17:19 (WEA 2) 20:17 | 27 19:47 (Vorbelastung 03) | 05:19 04:48 21:10 21:47 |
| 16 | 08:25 16:29 | 15:18 (Vorbelastung 01) 07:36 15:55 (Vorbelastung 01) 17:28 | 16:02 (Vorbelastung 01) 06:32 16:30 (Vorbelastung 01) 18:22 | 16:49 (WEA 2) 06:18 17:17 (WEA 2) 20:18 | 29 19:19 (Vorbelastung 03) | 05:17 04:48 21:11 21:48 |
| 17 | 08:24 16:31 | 15:17 (Vorbelastung 01) 07:34 15:56 (Vorbelastung 01) 17:30 | 16:01 (Vorbelastung 01) 06:30 16:29 (Vorbelastung 01) 18:24 | 16:51 (WEA 2) 06:15 17:16 (WEA 2) 20:20 | 29 19:48 (Vorbelastung 03) | 05:16 04:48 21:13 21:48 |
| 18 | 08:23 16:33 | 15:17 (Vorbelastung 01) 07:32 15:58 (Vorbelastung 01) 17:32 | 16:02 (Vorbelastung 01) 06:27 16:26 (Vorbelastung 01) 18:26 | 16:53 (WEA 2) 06:13 17:14 (WEA 2) 20:22 | 29 19:47 (Vorbelastung 03) | 05:14 04:48 21:15 21:49 |
| 19 | 08:22 16:35 | 15:18 (Vorbelastung 01) 07:29 16:01 (Vorbelastung 01) 17:34 | 16:02 (Vorbelastung 01) 06:25 16:27 (Vorbelastung 01) 18:26 | 16:55 (WEA 2) 06:11 17:10 (WEA 2) 20:24 | 29 19:47 (Vorbelastung 03) | 05:13 04:48 21:16 21:49 |
| 20 | 08:21 16:36 | 15:18 (Vorbelastung 01) 07:27 16:03 (Vorbelastung 01) 17:36 | 16:02 (Vorbelastung 01) 06:22 16:29 (Vorbelastung 01) 18:29 | 16:55 (WEA 2) 06:09 17:18 (WEA 2) 20:26 | 29 19:47 (Vorbelastung 03) | 05:11 04:48 21:18 21:49 |
| 21 | 08:20 16:38 | 15:17 (Vorbelastung 01) 07:25 16:03 (Vorbelastung 01) 17:38 | 16:02 (Vorbelastung 01) 06:20 16:31 (Vorbelastung 01) 18:31 | 16:56 (WEA 2) 06:06 17:22 (WEA 2) 20:27 | 29 19:18 (Vorbelastung 03) | 05:10 04:48 21:19 21:50 |
| 22 | 08:18 16:40 | 15:18 (Vorbelastung 01) 07:23 16:04 (Vorbelastung 01) 17:40 | 16:03 (Vorbelastung 01) 06:17 16:33 (Vorbelastung 01) 18:33 | 16:57 (WEA 2) 06:04 17:24 (WEA 2) 20:28 | 28 19:46 (Vorbelastung 03) | 05:08 04:49 21:21 21:50 |
| 23 | 08:17 16:42 | 15:17 (Vorbelastung 01) 07:21 16:04 (Vorbelastung 01) 17:42 | 16:03 (Vorbelastung 01) 06:15 16:35 (Vorbelastung 01) 18:35 | 16:58 (WEA 2) 06:02 17:25 (WEA 2) 20:29 | 27 19:46 (Vorbelastung 03) | 05:07 04:49 21:22 21:50 |
| 24 | 08:16 16:44 | 15:18 (Vorbelastung 01) 07:19 16:05 (Vorbelastung 01) 17:44 | 16:03 (Vorbelastung 01) 06:13 16:37 (Vorbelastung 01) 18:37 | 16:59 (WEA 2) 06:00 17:26 (WEA 2) 20:33 | 26 19:44 (Vorbelastung 03) | 05:05 04:49 21:24 21:50 |
| 25 | 08:14 16:45 | 15:18 (Vorbelastung 01) 07:16 16:05 (Vorbelastung 01) 17:46 | 17:01 (WEA 2) 06:10 17:13 (WEA 2) 18:38 | 17:00 (WEA 2) 05:58 17:30 (WEA 2) 20:36 | 24 19:43 (Vorbelastung 03) | 05:04 04:49 21:25 21:50 |
| 26 | 08:13 16:47 | 15:18 (Vorbelastung 01) 07:14 16:06 (Vorbelastung 01) 17:48 | 16:58 (WEA 2) 06:08 17:17 (WEA 2) 18:40 | 17:01 (WEA 2) 05:55 17:31 (WEA 2) 20:36 | 22 19:42 (Vorbelastung 03) | 05:03 04:50 21:27 21:50 |
| 27 | 08:12 16:49 | 15:18 (Vorbelastung 01) 07:12 16:06 (Vorbelastung 01) 17:50 | 16:55 (WEA 2) 06:05 17:18 (WEA 2) 18:42 | 17:02 (WEA 2) 05:53 17:32 (WEA 2) 20:38 | 20 19:41 (Vorbelastung 03) | 05:02 04:50 21:28 21:50 |
| 28 | 08:10 16:51 | 15:18 (Vorbelastung 01) 07:10 16:06 (Vorbelastung 01) 17:52 | 16:54 (WEA 2) 06:03 17:20 (WEA 2) 18:44 | 17:03 (WEA 2) 05:51 17:33 (WEA 2) 20:40 | 18 19:24 (Vorbelastung 03) | 05:01 04:51 21:29 21:50 |
| 29 | 08:09 16:53 | 15:19 (Vorbelastung 01) 07:09 16:07 (Vorbelastung 01) 17:54 | 17:20 (WEA 2) 06:00 19:46 (Vorbelastung 03) | 17:04 (WEA 2) 05:49 19:47 (Vorbelastung 03) | 13 19:37 (Vorbelastung 03) | 04:59 04:51 21:31 21:50 |
| 30 | 08:07 16:55 | 15:19 (Vorbelastung 01) 07:07 16:07 (Vorbelastung 01) 17:56 | 19:47 (Vorbelastung 03) | 19:48 (Vorbelastung 03) | 7 19:34 (Vorbelastung 03) | 04:58 04:52 21:32 21:49 |
| 31 | 08:05 16:57 | 15:19 (Vorbelastung 01) 07:05 16:06 (Vorbelastung 01) 17:58 | 19:49 (Vorbelastung 03) | 19:49 (Vorbelastung 03) | | 04:57 04:51 21:33 21:49 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | 1068 | 584 | 601 | 467 | | |

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 WEA 2 Schattenrezeptor: IO-C - Dorfstrasse 1, Badekow
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 04:53 05:32 | | 06:25 | 07:17 | 07:15 | 08:09 |
| | 21:49 21:15 | | 20:09 | 18:56 | 18:00 (WEA 2) 16:47 | 15:00 (Vorbelastung 01) 15:00 (Vorbelastung 01) |
| 2 | 04:53 05:33 | | 06:27 | 07:19 | 07:16 | 08:10 |
| | 21:49 21:13 | | 20:07 | 18:54 | 18:01 (WEA 2) 16:45 | 15:03 (Vorbelastung 01) 15:03 (Vorbelastung 01) |
| 3 | 04:54 05:35 | | 06:28 | 07:21 | 07:18 | 08:12 |
| | 21:48 21:11 | | 20:04 | 18:52 | 18:01 (WEA 2) 16:43 | 15:02 (Vorbelastung 01) 15:02 (Vorbelastung 01) |
| 4 | 04:55 05:37 | | 06:30 | 07:23 | 07:20 | 08:13 |
| | 21:48 21:09 | | 20:02 | 18:49 | 18:01 (WEA 2) 16:41 | 15:03 (Vorbelastung 01) 15:03 (Vorbelastung 01) |
| 5 | 04:56 05:38 | | 06:32 | 07:24 | 07:22 | 08:14 |
| | 21:47 21:07 | | 20:00 | 18:47 | 18:01 (WEA 2) 16:39 | 15:04 (Vorbelastung 01) 15:04 (Vorbelastung 01) |
| 6 | 04:57 05:40 | | 06:34 | 07:26 | 07:24 | 08:16 |
| | 21:47 21:06 | | 19:57 | 18:44 | 18:01 (WEA 2) 16:37 | 15:04 (Vorbelastung 01) 15:04 (Vorbelastung 01) |
| 7 | 04:58 05:42 | | 06:35 | 07:28 | 07:26 | 08:17 |
| | 21:46 21:04 | | 19:55 | 18:42 | 17:59 (WEA 2) 16:35 | 15:06 (Vorbelastung 01) 15:06 (Vorbelastung 01) |
| 8 | 04:59 05:43 | | 06:37 | 07:30 | 07:28 | 08:18 |
| | 21:45 21:02 | | 19:52 | 18:40 | 17:59 (WEA 2) 16:34 | 15:06 (Vorbelastung 01) 15:06 (Vorbelastung 01) |
| 9 | 05:00 05:45 | | 06:39 | 07:32 | 07:30 | 08:20 |
| | 21:45 21:00 | | 19:50 | 18:37 | 17:58 (WEA 2) 16:32 | 15:07 (Vorbelastung 01) 15:07 (Vorbelastung 01) |
| 10 | 05:01 05:47 | | 06:41 | 07:33 | 07:32 | 08:21 |
| | 21:44 20:58 | | 19:48 | 18:35 | 17:58 (WEA 2) 16:30 | 15:09 (Vorbelastung 01) 15:09 (Vorbelastung 01) |
| 11 | 05:02 05:49 | | 06:42 | 07:35 | 07:34 | 08:22 |
| | 21:43 20:56 | | 19:45 | 18:33 | 17:57 (WEA 2) 16:29 | 15:11 (Vorbelastung 01) 15:11 (Vorbelastung 01) |
| 12 | 05:03 05:50 | | 06:44 | 07:37 | 07:35 | 08:23 |
| | 21:42 20:54 | | 19:43 | 18:30 | 17:56 (WEA 2) 16:27 | 15:12 (Vorbelastung 01) 15:12 (Vorbelastung 01) |
| 13 | 05:04 05:52 | | 06:46 | 07:39 | 07:37 | 08:24 |
| | 21:41 20:52 | | 19:40 | 18:28 | 17:54 (WEA 2) 16:25 | 15:13 (Vorbelastung 01) 15:13 (Vorbelastung 01) |
| 14 | 05:05 05:54 | 8 | 19:34 (Vorbelastung 03) 06:48 | 07:41 | 07:39 | 08:25 |
| | 21:40 20:50 | | 19:38 | 18:26 | 17:53 (WEA 2) 16:24 | 15:14 (Vorbelastung 01) 15:14 (Vorbelastung 01) |
| 15 | 05:07 05:55 | | 06:49 | 07:43 | 07:41 | 08:26 |
| | 21:39 20:47 | 14 | 19:45 (Vorbelastung 03) 06:51 | 18:23 | 17:50 (WEA 2) 16:22 | 15:15 (Vorbelastung 01) 15:15 (Vorbelastung 01) |
| 16 | 05:08 05:57 | | 06:51 | 07:44 | 07:43 | 08:27 |
| | 21:38 20:45 | 18 | 19:47 (Vorbelastung 03) 06:53 | 18:21 | 17:47 (WEA 2) 16:21 | 15:16 (Vorbelastung 01) 15:16 (Vorbelastung 01) |
| 17 | 05:09 05:59 | | 06:53 | 07:46 | 07:45 | 08:28 |
| | 21:37 20:43 | 21 | 19:48 (Vorbelastung 03) 06:54 | 18:19 | 17:43 (WEA 2) 16:19 | 15:17 (Vorbelastung 01) 15:17 (Vorbelastung 01) |
| 18 | 05:11 06:01 | | 06:54 | 07:48 | 07:47 | 08:29 |
| | 21:36 20:41 | 23 | 19:49 (Vorbelastung 03) 06:56 | 18:16 | 17:38 (WEA 2) 16:18 | 15:18 (Vorbelastung 01) 15:18 (Vorbelastung 01) |
| 19 | 05:12 06:02 | | 06:56 | 07:50 | 07:48 | 08:29 |
| | 21:34 20:39 | 25 | 19:50 (Vorbelastung 03) 06:58 | 18:14 | 17:35 (WEA 2) 16:17 | 15:19 (Vorbelastung 01) 15:19 (Vorbelastung 01) |
| 20 | 05:13 06:04 | | 06:58 | 07:52 | 07:50 | 08:30 |
| | 21:33 20:37 | 26 | 19:50 (Vorbelastung 03) 06:59 | 18:12 | 17:31 (WEA 2) 16:15 | 15:20 (Vorbelastung 01) 15:20 (Vorbelastung 01) |
| 21 | 05:15 06:06 | | 07:00 | 07:54 | 07:52 | 08:31 |
| | 21:32 20:34 | 28 | 19:51 (Vorbelastung 03) 07:01 | 18:10 | 17:28 (WEA 2) 16:14 | 15:21 (Vorbelastung 01) 15:21 (Vorbelastung 01) |
| 22 | 05:16 06:08 | | 07:01 | 07:56 | 07:54 | 08:31 |
| | 21:30 20:32 | 28 | 19:51 (Vorbelastung 03) 07:02 | 18:08 | 17:25 (WEA 2) 16:12 | 15:22 (Vorbelastung 01) 15:22 (Vorbelastung 01) |
| 23 | 05:18 06:09 | | 07:03 | 07:57 | 07:56 | 08:32 |
| | 21:29 20:30 | 29 | 19:51 (Vorbelastung 03) 07:04 | 18:05 | 17:22 (WEA 2) 16:11 | 15:23 (Vorbelastung 01) 15:23 (Vorbelastung 01) |
| 24 | 05:19 06:11 | | 07:05 | 07:59 | 07:57 | 08:32 |
| | 21:28 20:28 | 29 | 19:51 (Vorbelastung 03) 07:06 | 18:03 | 17:19 (WEA 2) 16:10 | 15:24 (Vorbelastung 01) 15:24 (Vorbelastung 01) |
| 25 | 05:21 06:13 | | 07:07 | 08:01 | 07:59 | 08:32 |
| | 21:26 20:25 | 29 | 19:51 (Vorbelastung 03) 07:08 | 18:01 | 17:16 (WEA 2) 16:09 | 15:25 (Vorbelastung 01) 15:25 (Vorbelastung 01) |
| 26 | 05:22 06:15 | | 07:08 | 08:03 | 08:01 | 08:33 |
| | 21:25 20:23 | 29 | 19:50 (Vorbelastung 03) 07:09 | 17:58 | 17:13 (WEA 2) 16:08 | 15:26 (Vorbelastung 01) 15:26 (Vorbelastung 01) |
| 27 | 05:24 06:16 | | 07:10 | 08:05 | 08:02 | 08:33 |
| | 21:23 20:21 | 29 | 19:50 (Vorbelastung 03) 07:11 | 17:56 | 17:10 (WEA 2) 16:07 | 15:27 (Vorbelastung 01) 15:27 (Vorbelastung 01) |
| 28 | 05:25 06:18 | | 07:12 | 08:07 | 08:04 | 08:33 |
| | 21:21 20:19 | 27 | 19:48 (Vorbelastung 03) 07:13 | 17:54 | 17:07 (WEA 2) 16:06 | 15:28 (Vorbelastung 01) 15:28 (Vorbelastung 01) |
| 29 | 05:27 06:20 | | 07:14 | 08:09 | 08:06 | 08:33 |
| | 21:20 20:16 | 27 | 19:48 (Vorbelastung 03) 07:15 | 17:52 | 17:05 (WEA 2) 16:05 | 15:29 (Vorbelastung 01) 15:29 (Vorbelastung 01) |
| 30 | 05:28 06:22 | | 07:16 | 08:11 | 08:07 | 08:33 |
| | 21:18 20:14 | 24 | 19:46 (Vorbelastung 03) 07:17 | 17:50 | 17:03 (WEA 2) 16:04 | 15:30 (Vorbelastung 01) 15:30 (Vorbelastung 01) |
| 31 | 05:30 06:23 | | 07:18 | 08:13 | 08:09 | 08:33 |
| | 21:16 20:12 | 21 | 19:43 (Vorbelastung 03) 07:19 | 17:48 | 17:01 (WEA 2) 16:03 | 15:31 (Vorbelastung 01) 15:31 (Vorbelastung 01) |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | 261 | 236 |
| astr.max.mögl.Beschattung | | 435 | 214 | 623 | 1268 | 362 |

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 WEA 2 **Schattenrezeptor:** IO-D - Zarentiner Strasse 44, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | 08:09 16:04 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | 04:54 21:49 | 05:34 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | 08:10 16:03 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | 04:55 21:37 | 04:54 21:48 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 | 08:12 16:02 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | 08:13 16:01 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | 04:53 21:39 | 04:56 21:47 | 05:39 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | 08:14 16:01 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | 04:53 21:40 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | 08:16 16:00 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | 08:17 16:00 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | 04:59 21:45 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | 08:18 15:59 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | 08:20 15:59 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | 08:21 15:59 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | 08:22 15:59 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | 08:23 15:58 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 04:49 21:46 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 | 08:24 15:58 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 | 05:06 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 08:25 15:58 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 08:26 15:58 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 04:48 21:48 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:44 18:21 | 07:43 16:21 | 08:27 15:58 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 08:28 15:59 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 08:29 15:59 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 | 05:12 21:34 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 | 08:29 15:59 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:49 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 08:30 15:59 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:49 21:50 | 05:15 21:32 | 06:06 20:34 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 08:31 16:00 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 | 08:31 16:00 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 04:49 21:50 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 08:32 16:01 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 08:32 16:01 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 | 05:21 21:26 | 06:13 20:25 | 07:07 19:11 | 07:57 17:01 | 07:59 16:09 | 08:32 16:02 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 07:03 16:08 | 08:33 16:03 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 07:05 16:07 | 08:33 16:04 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 04:51 21:50 | 05:25 21:21 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 07:07 16:06 | 08:33 16:04 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:52 21:50 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 | 08:33 16:05 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:49 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 | 08:33 16:06 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | | 05:30 21:16 | 06:23 20:12 | | 07:13 16:49 | | 08:33 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 | 510 | 458 | 382 | 329 | 261 | 236 |
| 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) | Zeitpunkt (SS:MM) | Schattenanfang (WEA mit erstem Schatten) |
| | Sonnenuntergang (SS:MM) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 **Schattenrezeptor:** IO-E - Zarrentiner Strasse 50, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

- 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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | | 04:57 21:35 | 9 05:27 (Vorbelastung 01) 05:36 (Vorbelastung 01) |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | | 04:56 21:36 | 11 05:26 (Vorbelastung 01) 05:37 (Vorbelastung 01) |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | | 04:55 21:37 | 13 05:25 (Vorbelastung 01) 05:38 (Vorbelastung 01) |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | | 04:54 21:38 | 14 05:25 (Vorbelastung 01) 05:39 (Vorbelastung 01) |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | | 04:53 21:39 | 16 05:24 (Vorbelastung 01) 05:40 (Vorbelastung 01) |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | | 04:53 21:40 | 17 05:23 (Vorbelastung 01) 05:40 (Vorbelastung 01) |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | | 04:52 21:41 | 18 05:23 (Vorbelastung 01) 05:41 (Vorbelastung 01) |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | | 04:51 21:42 | 19 05:22 (Vorbelastung 01) 05:41 (Vorbelastung 01) |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | | 04:51 21:43 | 20 05:22 (Vorbelastung 01) 05:42 (Vorbelastung 01) |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | | 04:50 21:44 | 21 05:22 (Vorbelastung 01) 05:43 (Vorbelastung 01) |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | | 04:50 21:45 | 22 05:21 (Vorbelastung 01) 05:43 (Vorbelastung 01) |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | | 04:49 21:45 | 23 05:21 (Vorbelastung 01) 05:44 (Vorbelastung 01) |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | | 04:49 21:46 | 23 05:21 (Vorbelastung 01) 05:44 (Vorbelastung 01) |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | | 04:49 21:47 | 24 05:21 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | | 04:49 21:47 | 24 05:21 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | | 04:48 21:48 | 25 05:20 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | | 04:48 21:48 | 25 05:20 (Vorbelastung 01) 05:45 (Vorbelastung 01) |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | | 04:48 21:49 | 25 05:21 (Vorbelastung 01) 05:46 (Vorbelastung 01) |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | | 04:48 21:49 | 25 05:21 (Vorbelastung 01) 05:46 (Vorbelastung 01) |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | | 04:48 21:49 | 26 05:21 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | | 04:49 21:50 | 26 05:21 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | | 04:49 21:50 | 26 05:21 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | | 04:49 21:50 | 25 05:21 (Vorbelastung 01) 05:46 (Vorbelastung 01) |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | | 04:49 21:50 | 25 05:22 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | | 04:50 21:50 | 25 05:22 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | | 04:50 21:50 | 25 05:23 (Vorbelastung 01) 05:48 (Vorbelastung 01) |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | | 04:50 21:50 | 24 05:23 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | | 04:51 21:50 | 24 05:24 (Vorbelastung 01) 05:48 (Vorbelastung 01) |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | | 04:52 21:50 | 23 05:24 (Vorbelastung 01) 05:47 (Vorbelastung 01) |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 4 05:28 (Vorbelastung 01) | 04:52 21:49 | 23 05:25 (Vorbelastung 01) 05:48 (Vorbelastung 01) |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | 7 05:28 (Vorbelastung 01) | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | | 507 | |
| astr.max.mögl.Beschattung | | | | | | 11 | | 646 |

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 WEA 2 **Schattenrezeptor:** IO-E - Zarrentiner Strasse 50, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | Juli | | August | September | Oktober | November | Dezember | |
|---------------------------|-------|----|-------------------------|-----------|---------|----------|----------|-------|
| 1 | 04:53 | | 05:25 (Vorbelastung 01) | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| | 21:49 | 22 | 05:47 (Vorbelastung 01) | 21:15 | 20:09 | 18:56 | 16:47 | 16:04 |
| 2 | 04:54 | | 05:26 (Vorbelastung 01) | 05:34 | 06:27 | 07:19 | 07:17 | 08:10 |
| | 21:49 | 21 | 05:47 (Vorbelastung 01) | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 |
| 3 | 04:54 | | 05:27 (Vorbelastung 01) | 05:35 | 06:29 | 07:21 | 07:18 | 08:12 |
| | 21:48 | 21 | 05:48 (Vorbelastung 01) | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 |
| 4 | 04:55 | | 05:28 (Vorbelastung 01) | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| | 21:48 | 20 | 05:48 (Vorbelastung 01) | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 5 | 04:56 | | 05:28 (Vorbelastung 01) | 05:39 | 06:32 | 07:25 | 07:22 | 08:14 |
| | 21:47 | 19 | 05:47 (Vorbelastung 01) | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 6 | 04:57 | | 05:29 (Vorbelastung 01) | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| | 21:47 | 18 | 05:47 (Vorbelastung 01) | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 7 | 04:58 | | 05:30 (Vorbelastung 01) | 05:42 | 06:36 | 07:28 | 07:26 | 08:17 |
| | 21:46 | 16 | 05:46 (Vorbelastung 01) | 21:04 | 19:55 | 18:42 | 16:36 | 16:00 |
| 8 | 04:59 | | 05:31 (Vorbelastung 01) | 05:44 | 06:37 | 07:30 | 07:28 | 08:18 |
| | 21:45 | 15 | 05:46 (Vorbelastung 01) | 21:02 | 19:53 | 18:40 | 16:34 | 15:59 |
| 9 | 05:00 | | 05:32 (Vorbelastung 01) | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| | 21:45 | 13 | 05:45 (Vorbelastung 01) | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 10 | 05:01 | | 05:33 (Vorbelastung 01) | 05:47 | 06:41 | 07:34 | 07:32 | 08:21 |
| | 21:44 | 12 | 05:45 (Vorbelastung 01) | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 11 | 05:02 | | 05:34 (Vorbelastung 01) | 05:49 | 06:42 | 07:35 | 07:34 | 08:22 |
| | 21:43 | 10 | 05:44 (Vorbelastung 01) | 20:56 | 19:45 | 18:33 | 16:29 | 15:59 |
| 12 | 05:03 | | 05:35 (Vorbelastung 01) | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| | 21:42 | 8 | 05:43 (Vorbelastung 01) | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 13 | 05:04 | | 05:36 (Vorbelastung 01) | 05:52 | 06:46 | 07:39 | 07:37 | 08:24 |
| | 21:41 | 5 | 05:41 (Vorbelastung 01) | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 14 | 05:06 | | 05:37 (Vorbelastung 01) | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| | 21:40 | 1 | 05:38 (Vorbelastung 01) | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 15 | 05:07 | | 05:56 | 05:56 | 06:49 | 07:43 | 07:41 | 08:26 |
| | 21:39 | | 20:48 | 19:36 | 18:23 | 16:22 | 15:58 | |
| 16 | 05:08 | | 05:57 | 06:51 | 07:44 | 07:43 | 08:27 | |
| | 21:38 | | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 | |
| 17 | 05:09 | | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 | |
| | 21:37 | | 20:43 | 19:31 | 18:19 | 16:19 | 15:59 | |
| 18 | 05:11 | | 06:01 | 06:55 | 07:48 | 07:47 | 08:29 | |
| | 21:36 | | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 | |
| 19 | 05:12 | | 06:02 | 06:56 | 07:50 | 07:48 | 08:29 | |
| | 21:35 | | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 | |
| 20 | 05:13 | | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 | |
| | 21:33 | | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 | |
| 21 | 05:15 | | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 | |
| | 21:32 | | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 | |
| 22 | 05:16 | | 06:08 | 07:02 | 07:56 | 07:54 | 08:31 | |
| | 21:31 | | 20:32 | 19:18 | 18:08 | 16:13 | 16:00 | |
| 23 | 05:18 | | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 | |
| | 21:29 | | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 | |
| 24 | 05:19 | | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 | |
| | 21:28 | | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 | |
| 25 | 05:21 | | 06:13 | 07:07 | 07:01 | 07:59 | 08:32 | |
| | 21:26 | | 20:25 | 19:11 | 17:01 | 16:09 | 16:02 | |
| 26 | 05:22 | | 06:15 | 07:09 | 07:03 | 08:01 | 08:33 | |
| | 21:25 | | 20:23 | 19:09 | 16:59 | 16:08 | 16:03 | |
| 27 | 05:24 | | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 | |
| | 21:23 | | 20:21 | 19:06 | 16:57 | 16:07 | 16:04 | |
| 28 | 05:25 | | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 | |
| | 21:21 | | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 | |
| 29 | 05:27 | | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | |
| | 21:20 | | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 | |
| 30 | 05:29 | | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | |
| | 21:18 | | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 | |
| 31 | 05:30 | | 06:23 | | 07:13 | | 08:33 | |
| | 21:16 | | 20:12 | | 16:49 | | 16:07 | |
| Sonnenscheinstunden | 510 | | 458 | 382 | 329 | 261 | 236 | |
| astr.max.mögl.Beschattung | 201 | | | | | | | |

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) Schattende | (WEA mit letztem Schatten) |

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 Schattenrezeptor: IO-F - Zarreniner Strasse 62, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | | Juni | |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------------------|----------------|-------------------------------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | | 04:57 21:35 | 05:37 (Vorbelastung 01) 34 06:11 (Vorbelastung 01) |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | | 04:56 21:36 | 05:37 (Vorbelastung 01) 34 06:11 (Vorbelastung 01) |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 | | 04:55 21:37 | 05:37 (Vorbelastung 01) 34 06:11 (Vorbelastung 01) |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 | | 04:54 21:38 | 05:38 (Vorbelastung 01) 34 06:12 (Vorbelastung 01) |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 | | 04:53 21:39 | 05:38 (Vorbelastung 01) 34 06:12 (Vorbelastung 01) |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 | | 04:53 21:40 | 05:38 (Vorbelastung 01) 33 06:11 (Vorbelastung 01) |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 | | 04:52 21:41 | 05:39 (Vorbelastung 01) 33 06:12 (Vorbelastung 01) |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | | 04:51 21:42 | 05:38 (Vorbelastung 01) 33 06:11 (Vorbelastung 01) |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | | 04:51 21:43 | 05:39 (Vorbelastung 01) 33 06:12 (Vorbelastung 01) |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | | 04:50 21:44 | 05:40 (Vorbelastung 01) 32 06:12 (Vorbelastung 01) |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 5 05:53 (Vorbelastung 01) | 04:50 21:45 | 05:39 (Vorbelastung 01) 33 06:12 (Vorbelastung 01) |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 9 06:00 (Vorbelastung 01) | 04:49 21:45 | 05:40 (Vorbelastung 01) 32 06:12 (Vorbelastung 01) |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:06 | 13 05:49 (Vorbelastung 01) | 04:49 21:46 | 05:41 (Vorbelastung 01) 31 06:12 (Vorbelastung 01) |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 16 06:04 (Vorbelastung 01) | 04:49 21:47 | 05:41 (Vorbelastung 01) 32 06:13 (Vorbelastung 01) |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 18 06:04 (Vorbelastung 01) | 04:49 21:47 | 05:41 (Vorbelastung 01) 32 06:13 (Vorbelastung 01) |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 05:17 21:11 | 21 06:06 (Vorbelastung 01) | 04:48 21:48 | 05:41 (Vorbelastung 01) 31 06:12 (Vorbelastung 01) |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 23 06:06 (Vorbelastung 01) | 04:48 21:48 | 05:41 (Vorbelastung 01) 31 06:12 (Vorbelastung 01) |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 25 06:07 (Vorbelastung 01) | 04:48 21:49 | 05:41 (Vorbelastung 01) 31 06:12 (Vorbelastung 01) |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 | 27 06:08 (Vorbelastung 01) | 04:48 21:49 | 05:42 (Vorbelastung 01) 31 06:13 (Vorbelastung 01) |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 29 06:08 (Vorbelastung 01) | 04:48 21:49 | 05:43 (Vorbelastung 01) 30 06:13 (Vorbelastung 01) |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 31 06:09 (Vorbelastung 01) | 04:49 21:50 | 05:43 (Vorbelastung 01) 30 06:13 (Vorbelastung 01) |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 32 06:09 (Vorbelastung 01) | 04:49 21:50 | 05:43 (Vorbelastung 01) 30 06:13 (Vorbelastung 01) |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 33 06:10 (Vorbelastung 01) | 04:49 21:50 | 05:43 (Vorbelastung 01) 30 06:13 (Vorbelastung 01) |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 33 06:09 (Vorbelastung 01) | 04:49 21:50 | 05:43 (Vorbelastung 01) 31 06:14 (Vorbelastung 01) |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 | 34 06:10 (Vorbelastung 01) | 04:50 21:50 | 05:43 (Vorbelastung 01) 31 06:14 (Vorbelastung 01) |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 34 06:10 (Vorbelastung 01) | 04:50 21:50 | 05:44 (Vorbelastung 01) 31 06:15 (Vorbelastung 01) |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 34 06:10 (Vorbelastung 01) | 04:50 21:50 | 05:44 (Vorbelastung 01) 31 06:15 (Vorbelastung 01) |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:29 | 34 06:10 (Vorbelastung 01) | 04:51 21:50 | 05:44 (Vorbelastung 01) 32 06:16 (Vorbelastung 01) |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 34 06:10 (Vorbelastung 01) | 04:52 21:50 | 05:44 (Vorbelastung 01) 31 06:15 (Vorbelastung 01) |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 35 06:11 (Vorbelastung 01) | 04:52 21:50 | 05:44 (Vorbelastung 01) 32 06:16 (Vorbelastung 01) |
| 31 | 08:06 16:57 | | 06:56 19:49 | | 04:58 21:33 | 35 06:12 (Vorbelastung 01) | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | | 507 | |
| astr.max.mögl.Beschattung | | | | | 555 | | 957 | |

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 WEA 2 **Schattenrezeptor:** IO-F - Zarreniner Strasse 62, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| Juli | | August | | September | | Oktober | | November | | Dezember | | |
|---------------------------|-------|-------------------------|-------------------------|-----------|-------------------------|-------------------------|-------|----------|-------|----------|--|--|
| 1 | 04:53 | 05:44 (Vorbelastung 01) | 05:32 | 8 | 06:02 (Vorbelastung 01) | 06:25 | 07:17 | 07:15 | 08:09 | | | |
| | 21:49 | 32 | 06:16 (Vorbelastung 01) | 21:15 | | 20:09 | 18:56 | 16:47 | 16:04 | | | |
| 2 | 04:54 | 05:44 (Vorbelastung 01) | 05:34 | | 06:04 (Vorbelastung 01) | 06:27 | 07:19 | 07:17 | 08:10 | | | |
| | 21:49 | 32 | 06:16 (Vorbelastung 01) | 21:13 | 2 | 06:06 (Vorbelastung 01) | 20:07 | 18:54 | 16:45 | 16:03 | | |
| 3 | 04:54 | 05:44 (Vorbelastung 01) | 05:35 | | | 06:29 | 07:21 | 07:18 | 08:12 | | | |
| | 21:48 | 33 | 06:17 (Vorbelastung 01) | 21:11 | | 20:05 | 18:52 | 16:43 | 16:02 | | | |
| 4 | 04:55 | 05:45 (Vorbelastung 01) | 05:37 | | | 06:30 | 07:23 | 07:20 | 08:13 | | | |
| | 21:48 | 32 | 06:17 (Vorbelastung 01) | 21:09 | | 20:02 | 18:49 | 16:41 | 16:01 | | | |
| 5 | 04:56 | 05:44 (Vorbelastung 01) | 05:39 | | | 06:32 | 07:25 | 07:22 | 08:15 | | | |
| | 21:47 | 33 | 06:17 (Vorbelastung 01) | 21:08 | | 20:00 | 18:47 | 16:39 | 16:01 | | | |
| 6 | 04:57 | 05:44 (Vorbelastung 01) | 05:40 | | | 06:34 | 07:26 | 07:24 | 08:16 | | | |
| | 21:47 | 33 | 06:17 (Vorbelastung 01) | 21:06 | | 19:57 | 18:44 | 16:37 | 16:00 | | | |
| 7 | 04:58 | 05:44 (Vorbelastung 01) | 05:42 | | | 06:36 | 07:28 | 07:26 | 08:17 | | | |
| | 21:46 | 34 | 06:18 (Vorbelastung 01) | 21:04 | | 19:55 | 18:42 | 16:36 | 16:00 | | | |
| 8 | 04:59 | 05:45 (Vorbelastung 01) | 05:44 | | | 06:37 | 07:30 | 07:28 | 08:18 | | | |
| | 21:46 | 33 | 06:18 (Vorbelastung 01) | 21:02 | | 19:53 | 18:40 | 16:34 | 15:59 | | | |
| 9 | 05:00 | 05:45 (Vorbelastung 01) | 05:45 | | | 06:39 | 07:32 | 07:30 | 08:20 | | | |
| | 21:45 | 33 | 06:18 (Vorbelastung 01) | 21:00 | | 19:50 | 18:37 | 16:32 | 15:59 | | | |
| 10 | 05:01 | 05:45 (Vorbelastung 01) | 05:47 | | | 06:41 | 07:34 | 07:32 | 08:21 | | | |
| | 21:44 | 34 | 06:19 (Vorbelastung 01) | 20:58 | | 19:48 | 18:35 | 16:30 | 15:59 | | | |
| 11 | 05:02 | 05:45 (Vorbelastung 01) | 05:49 | | | 06:42 | 07:35 | 07:34 | 08:22 | | | |
| | 21:43 | 34 | 06:19 (Vorbelastung 01) | 20:56 | | 19:45 | 18:33 | 16:29 | 15:59 | | | |
| 12 | 05:03 | 05:45 (Vorbelastung 01) | 05:50 | | | 06:44 | 07:37 | 07:36 | 08:23 | | | |
| | 21:42 | 34 | 06:19 (Vorbelastung 01) | 20:54 | | 19:43 | 18:30 | 16:27 | 15:58 | | | |
| 13 | 05:04 | 05:45 (Vorbelastung 01) | 05:52 | | | 06:46 | 07:39 | 07:37 | 08:24 | | | |
| | 21:41 | 34 | 06:19 (Vorbelastung 01) | 20:52 | | 19:40 | 18:28 | 16:25 | 15:58 | | | |
| 14 | 05:06 | 05:45 (Vorbelastung 01) | 05:54 | | | 06:48 | 07:41 | 07:39 | 08:25 | | | |
| | 21:40 | 34 | 06:19 (Vorbelastung 01) | 20:50 | | 19:38 | 18:26 | 16:24 | 15:58 | | | |
| 15 | 05:07 | 05:46 (Vorbelastung 01) | 05:56 | | | 06:49 | 07:43 | 07:41 | 08:26 | | | |
| | 21:39 | 34 | 06:20 (Vorbelastung 01) | 20:48 | | 19:36 | 18:23 | 16:22 | 15:58 | | | |
| 16 | 05:08 | 05:46 (Vorbelastung 01) | 05:57 | | | 06:51 | 07:45 | 07:43 | 08:27 | | | |
| | 21:38 | 34 | 06:20 (Vorbelastung 01) | 20:45 | | 19:33 | 18:21 | 16:21 | 15:58 | | | |
| 17 | 05:09 | 05:46 (Vorbelastung 01) | 05:59 | | | 06:53 | 07:46 | 07:45 | 08:28 | | | |
| | 21:37 | 34 | 06:20 (Vorbelastung 01) | 20:43 | | 19:31 | 18:19 | 16:19 | 15:59 | | | |
| 18 | 05:11 | 05:46 (Vorbelastung 01) | 06:01 | | | 06:55 | 07:48 | 07:47 | 08:29 | | | |
| | 21:36 | 33 | 06:19 (Vorbelastung 01) | 20:41 | | 19:28 | 18:17 | 16:18 | 15:59 | | | |
| 19 | 05:12 | 05:47 (Vorbelastung 01) | 06:02 | | | 06:56 | 07:50 | 07:48 | 08:29 | | | |
| | 21:35 | 33 | 06:20 (Vorbelastung 01) | 20:39 | | 19:26 | 18:14 | 16:16 | 15:59 | | | |
| 20 | 05:13 | 05:47 (Vorbelastung 01) | 06:04 | | | 06:58 | 07:52 | 07:50 | 08:30 | | | |
| | 21:33 | 33 | 06:20 (Vorbelastung 01) | 20:37 | | 19:23 | 18:12 | 16:15 | 15:59 | | | |
| 21 | 05:15 | 05:47 (Vorbelastung 01) | 06:06 | | | 07:00 | 07:54 | 07:52 | 08:31 | | | |
| | 21:32 | 32 | 06:19 (Vorbelastung 01) | 20:35 | | 19:21 | 18:10 | 16:14 | 16:00 | | | |
| 22 | 05:16 | 05:48 (Vorbelastung 01) | 06:08 | | | 07:02 | 07:56 | 07:54 | 08:31 | | | |
| | 21:31 | 31 | 06:19 (Vorbelastung 01) | 20:32 | | 19:18 | 18:08 | 16:13 | 16:00 | | | |
| 23 | 05:18 | 05:49 (Vorbelastung 01) | 06:09 | | | 07:03 | 07:58 | 07:56 | 08:32 | | | |
| | 21:29 | 30 | 06:19 (Vorbelastung 01) | 20:30 | | 19:16 | 18:06 | 16:11 | 16:01 | | | |
| 24 | 05:19 | 05:50 (Vorbelastung 01) | 06:11 | | | 07:05 | 07:59 | 07:57 | 08:32 | | | |
| | 21:28 | 28 | 06:18 (Vorbelastung 01) | 20:28 | | 19:14 | 18:03 | 16:10 | 16:01 | | | |
| 25 | 05:21 | 05:52 (Vorbelastung 01) | 06:13 | | | 07:07 | 07:01 | 07:59 | 08:32 | | | |
| | 21:26 | 26 | 06:18 (Vorbelastung 01) | 20:26 | | 19:11 | 17:01 | 16:09 | 16:02 | | | |
| 26 | 05:22 | 05:53 (Vorbelastung 01) | 06:15 | | | 07:09 | 07:03 | 08:01 | 08:33 | | | |
| | 21:25 | 24 | 06:17 (Vorbelastung 01) | 20:23 | | 19:09 | 16:59 | 16:08 | 16:03 | | | |
| 27 | 05:24 | 05:55 (Vorbelastung 01) | 06:16 | | | 07:10 | 07:05 | 08:02 | 08:33 | | | |
| | 21:23 | 22 | 06:17 (Vorbelastung 01) | 20:21 | | 19:06 | 16:57 | 16:07 | 16:04 | | | |
| 28 | 05:25 | 05:56 (Vorbelastung 01) | 06:18 | | | 07:12 | 07:07 | 08:04 | 08:33 | | | |
| | 21:22 | 20 | 06:16 (Vorbelastung 01) | 20:19 | | 19:04 | 16:55 | 16:06 | 16:04 | | | |
| 29 | 05:27 | 05:58 (Vorbelastung 01) | 06:20 | | | 07:14 | 07:09 | 08:06 | 08:33 | | | |
| | 21:20 | 17 | 06:15 (Vorbelastung 01) | 20:16 | | 19:01 | 16:53 | 16:05 | 16:05 | | | |
| 30 | 05:29 | 05:59 (Vorbelastung 01) | 06:22 | | | 07:16 | 07:11 | 08:07 | 08:33 | | | |
| | 21:18 | 14 | 06:13 (Vorbelastung 01) | 20:14 | | 18:59 | 16:51 | 16:04 | 16:06 | | | |
| 31 | 05:30 | 06:01 (Vorbelastung 01) | 06:23 | | | | 07:13 | | 08:33 | | | |
| | 21:17 | 11 | 06:12 (Vorbelastung 01) | 20:12 | | | 16:49 | | 16:07 | | | |
| Sonnenscheinstunden | | 510 | | 458 | | 382 | 329 | 261 | 236 | | | |
| astr.max.mögl.Beschattung | | 921 | | 10 | | | | | | | | |

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 WEA 2 **Schattenrezeptor:** IO-G - Zarrentiner Strasse 71, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | | Mai | | Juni |
|---------------------------|----------------|----------------|----------------|----------------|----|--------------------------------------------------------------------|----|--------------------------------------------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | | 05:45 20:46 | 30 | 06:20 (Vorbelastung 01) 04:57 06:50 (Vorbelastung 01) 21:35 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | | 05:43 20:47 | 29 | 06:21 (Vorbelastung 01) 04:56 06:50 (Vorbelastung 01) 21:36 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | | 05:41 20:49 | 29 | 06:21 (Vorbelastung 01) 04:55 06:50 (Vorbelastung 01) 21:37 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | | 05:39 20:51 | 28 | 06:21 (Vorbelastung 01) 04:54 06:49 (Vorbelastung 01) 21:38 |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | | 05:37 20:53 | 26 | 06:22 (Vorbelastung 01) 04:53 06:48 (Vorbelastung 01) 21:39 |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | | 05:35 20:54 | 25 | 06:22 (Vorbelastung 01) 04:53 06:47 (Vorbelastung 01) 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | | 05:33 20:56 | 23 | 06:23 (Vorbelastung 01) 04:52 06:46 (Vorbelastung 01) 21:41 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | | 05:31 20:58 | 21 | 06:24 (Vorbelastung 01) 04:51 06:45 (Vorbelastung 01) 21:42 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | | 05:30 21:00 | 18 | 06:25 (Vorbelastung 01) 04:51 06:43 (Vorbelastung 01) 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | | 05:28 21:01 | 14 | 06:27 (Vorbelastung 01) 04:50 06:41 (Vorbelastung 01) 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | | 05:26 21:03 | 10 | 06:30 (Vorbelastung 01) 04:50 06:40 (Vorbelastung 01) 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | | 05:24 21:05 | | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | | 05:22 21:06 | | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | | 05:21 21:08 | | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | | 05:19 21:10 | | 04:49 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | | 05:17 21:11 | | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | | 05:16 21:13 | | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 5 | 06:37 (Vorbelastung 01) 05:14 06:42 (Vorbelastung 01) 21:15 | | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:29 17:34 | 06:25 18:27 | 06:11 20:24 | 10 | 06:35 (Vorbelastung 01) 05:13 06:45 (Vorbelastung 01) 21:16 | | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 14 | 06:33 (Vorbelastung 01) 05:11 06:47 (Vorbelastung 01) 21:18 | | 04:48 21:49 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 18 | 06:31 (Vorbelastung 01) 05:10 06:49 (Vorbelastung 01) 21:19 | | 04:49 21:50 |
| 22 | 08:18 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 21 | 06:29 (Vorbelastung 01) 05:08 06:50 (Vorbelastung 01) 21:21 | | 04:49 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 23 | 06:27 (Vorbelastung 01) 05:07 06:50 (Vorbelastung 01) 21:22 | | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 26 | 06:24 (Vorbelastung 01) 05:06 06:50 (Vorbelastung 01) 21:24 | | 04:49 21:50 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 28 | 06:22 (Vorbelastung 01) 05:04 06:50 (Vorbelastung 01) 21:25 | | 04:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 30 | 06:21 (Vorbelastung 01) 05:03 06:51 (Vorbelastung 01) 21:27 | | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 31 | 06:20 (Vorbelastung 01) 05:02 06:51 (Vorbelastung 01) 21:28 | | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 31 | 06:20 (Vorbelastung 01) 05:01 06:51 (Vorbelastung 01) 21:29 | | 04:51 21:50 |
| 29 | 08:09 16:53 | | 07:01 19:46 | 05:49 20:42 | 31 | 06:20 (Vorbelastung 01) 05:00 06:51 (Vorbelastung 01) 21:31 | | 04:52 21:50 |
| 30 | 08:07 16:55 | | 06:58 19:48 | 05:47 20:44 | 30 | 06:20 (Vorbelastung 01) 04:59 06:50 (Vorbelastung 01) 21:32 | | 04:52 21:50 |
| 31 | 08:06 16:57 | | 06:56 19:49 | | | 04:58 21:33 | | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | | 492 | | 507 |
| astr.max.mögl.Beschattung | | | | 298 | | 253 | | |

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 WEA 2 **Schattenrezeptor:** IO-G - Zarrentiner Strasse 71, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

- 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

| | Juli | August | | September | Oktober | November | Dezember |
|----|---------------------------|----------------|-----|----------------------------------------------------|----------------|----------------|----------------|
| 1 | 04:53 21:49 | 05:32 21:15 | 5 | 06:42 (Vorbelastung 01) 06:47 (Vorbelastung 01) | 06:25 20:09 | 07:17 18:57 | 07:15 16:47 |
| 2 | 04:54 21:49 | 05:34 21:13 | 12 | 06:39 (Vorbelastung 01) 06:51 (Vorbelastung 01) | 06:27 20:07 | 07:19 18:54 | 07:17 16:03 |
| 3 | 04:54 21:48 | 05:35 21:11 | 16 | 06:36 (Vorbelastung 01) 06:52 (Vorbelastung 01) | 06:29 20:05 | 07:21 18:52 | 07:18 16:43 |
| 4 | 04:55 21:48 | 05:37 21:09 | 19 | 06:35 (Vorbelastung 01) 06:54 (Vorbelastung 01) | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 |
| 5 | 04:56 21:47 | 05:39 21:08 | 22 | 06:33 (Vorbelastung 01) 06:55 (Vorbelastung 01) | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 |
| 6 | 04:57 21:47 | 05:40 21:06 | 23 | 06:33 (Vorbelastung 01) 06:56 (Vorbelastung 01) | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 |
| 7 | 04:58 21:46 | 05:42 21:04 | 26 | 06:31 (Vorbelastung 01) 06:57 (Vorbelastung 01) | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 |
| 8 | 04:59 21:46 | 05:44 21:02 | 27 | 06:31 (Vorbelastung 01) 06:58 (Vorbelastung 01) | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 |
| 9 | 05:00 21:45 | 05:45 21:00 | 29 | 06:30 (Vorbelastung 01) 06:59 (Vorbelastung 01) | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 |
| 10 | 05:01 21:44 | 05:47 20:58 | 29 | 06:29 (Vorbelastung 01) 06:58 (Vorbelastung 01) | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 |
| 11 | 05:02 21:43 | 05:49 20:56 | 30 | 06:29 (Vorbelastung 01) 06:59 (Vorbelastung 01) | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 |
| 12 | 05:03 21:42 | 05:50 20:54 | 30 | 06:28 (Vorbelastung 01) 06:58 (Vorbelastung 01) | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 |
| 13 | 05:04 21:41 | 05:52 20:52 | 31 | 06:28 (Vorbelastung 01) 06:59 (Vorbelastung 01) | 06:46 19:40 | 07:39 18:28 | 07:37 16:25 |
| 14 | 05:06 21:40 | 05:54 20:50 | 31 | 06:28 (Vorbelastung 01) 06:59 (Vorbelastung 01) | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 |
| 15 | 05:07 21:39 | 05:56 20:48 | 30 | 06:28 (Vorbelastung 01) 06:58 (Vorbelastung 01) | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 |
| 16 | 05:08 21:38 | 05:57 20:45 | 30 | 06:28 (Vorbelastung 01) 06:58 (Vorbelastung 01) | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 |
| 17 | 05:09 21:37 | 05:59 20:43 | 30 | 06:27 (Vorbelastung 01) 06:57 (Vorbelastung 01) | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 |
| 18 | 05:11 21:36 | 06:01 20:41 | 28 | 06:29 (Vorbelastung 01) 06:57 (Vorbelastung 01) | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 |
| 19 | 05:12 21:35 | 06:02 20:39 | 26 | 06:31 (Vorbelastung 01) 06:57 (Vorbelastung 01) | 06:56 19:26 | 07:50 18:14 | 07:48 16:16 |
| 20 | 05:13 21:33 | 06:04 20:37 | 23 | 06:32 (Vorbelastung 01) 06:55 (Vorbelastung 01) | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 |
| 21 | 05:15 21:32 | 06:06 20:35 | 20 | 06:34 (Vorbelastung 01) 06:54 (Vorbelastung 01) | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 |
| 22 | 05:16 21:31 | 06:08 20:32 | 17 | 06:36 (Vorbelastung 01) 06:53 (Vorbelastung 01) | 07:02 19:18 | 07:56 18:08 | 07:54 16:13 |
| 23 | 05:18 21:29 | 06:09 20:30 | 14 | 06:37 (Vorbelastung 01) 06:51 (Vorbelastung 01) | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 |
| 24 | 05:19 21:28 | 06:11 20:28 | 10 | 06:39 (Vorbelastung 01) 06:49 (Vorbelastung 01) | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 |
| 25 | 05:21 21:26 | 06:13 20:26 | 4 | 06:41 (Vorbelastung 01) 06:45 (Vorbelastung 01) | 07:07 19:11 | 07:01 17:01 | 07:59 16:09 |
| 26 | 05:22 21:25 | 06:15 20:23 | | | 07:09 19:09 | 07:03 16:59 | 08:01 16:08 |
| 27 | 05:24 21:23 | 06:16 20:21 | | | 07:10 19:06 | 07:05 16:57 | 08:02 16:07 |
| 28 | 05:25 21:22 | 06:18 20:19 | | | 07:12 19:04 | 07:07 16:55 | 08:04 16:06 |
| 29 | 05:27 21:20 | 06:20 20:16 | | | 07:14 19:01 | 07:09 16:53 | 08:06 16:05 |
| 30 | 05:29 21:18 | 06:22 20:14 | | | 07:16 18:59 | 07:11 16:51 | 08:07 16:04 |
| 31 | 05:30 21:17 | 06:23 20:12 | | | | 07:13 16:49 | 08:33 16:07 |
| | Sonnenscheinstunden 510 | 458 | | | 382 | 329 | 261 |
| | astr.max.mögl.Beschattung | | 562 | | | | 236 |

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 WEA 2 **Schattenrezeptor:** IO-H - Zarentiner Strasse 77, Schwartow
Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | | 05:45 20:46 | | 04:57 21:35 | 06:05 (WEA 2) 33 06:38 (WEA 2) |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | | 05:43 20:47 | | 04:56 21:36 | 06:05 (WEA 2) 33 06:38 (WEA 2) |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | | 05:41 20:49 | | 04:55 21:37 | 06:05 (WEA 2) 33 06:38 (WEA 2) |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | | 05:39 20:51 | | 04:54 21:38 | 06:06 (WEA 2) 32 06:38 (WEA 2) |
| 5 | 08:32 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 2 | 07:09 (Vorbelastung 01) 07:11 (Vorbelastung 01) | 05:37 20:53 | 04:53 21:39 | 06:06 (WEA 2) 32 06:38 (WEA 2) |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 8 | 07:05 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:35 20:54 | 06:15 (WEA 2) 06:12 (WEA 2) | 04:53 21:40 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 12 | 07:02 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:33 20:56 | 06:11 (WEA 2) 06:07 (WEA 2) | 04:52 21:41 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 15 | 07:00 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 05:31 20:58 | 06:11 (WEA 2) 06:31 (WEA 2) | 04:51 21:42 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 18 | 06:58 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:30 21:00 | 06:09 (WEA 2) 06:32 (WEA 2) | 04:51 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 21 | 06:55 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 05:28 21:01 | 06:07 (WEA 2) 06:33 (WEA 2) | 04:50 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 23 | 06:53 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:26 21:03 | 06:07 (WEA 2) 06:34 (WEA 2) | 04:50 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 26 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:24 21:05 | 06:06 (WEA 2) 06:35 (WEA 2) | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 27 | 06:52 (Vorbelastung 01) 07:19 (Vorbelastung 01) | 05:22 21:07 | 06:04 (WEA 2) 06:35 (WEA 2) | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 27 | 06:51 (Vorbelastung 01) 07:18 (Vorbelastung 01) | 05:21 21:08 | 06:04 (WEA 2) 06:36 (WEA 2) | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 27 | 06:51 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:19 21:10 | 06:03 (WEA 2) 06:36 (WEA 2) | 04:49 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:18 | 26 | 06:52 (Vorbelastung 01) 07:17 (Vorbelastung 01) | 05:17 21:11 | 06:03 (WEA 2) 06:37 (WEA 2) | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 25 | 06:52 (Vorbelastung 01) 07:16 (Vorbelastung 01) | 05:16 21:13 | 06:03 (WEA 2) 06:37 (WEA 2) | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 24 | 06:52 (Vorbelastung 01) 07:14 (Vorbelastung 01) | 05:14 21:15 | 06:03 (WEA 2) 06:38 (WEA 2) | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:27 | 06:11 20:24 | 22 | 06:53 (Vorbelastung 01) 07:13 (Vorbelastung 01) | 05:13 21:16 | 06:03 (WEA 2) 06:38 (WEA 2) | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 20 | 06:55 (Vorbelastung 01) 07:11 (Vorbelastung 01) | 05:11 21:18 | 06:02 (WEA 2) 06:38 (WEA 2) | 04:48 21:49 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 16 | 06:57 (Vorbelastung 01) 07:09 (Vorbelastung 01) | 05:10 21:19 | 06:02 (WEA 2) 06:38 (WEA 2) | 04:49 21:50 |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 12 | 05:08 21:21 | 05:08 21:21 | 06:03 (WEA 2) 06:39 (WEA 2) | 04:49 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 35 | 05:07 21:22 | 05:07 21:22 | 06:03 (WEA 2) 06:39 (WEA 2) | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 36 | 05:06 21:24 | 05:06 21:24 | 06:02 (WEA 2) 06:38 (WEA 2) | 04:49 21:50 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 36 | 05:04 21:25 | 05:04 21:25 | 06:02 (WEA 2) 06:38 (WEA 2) | 04:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 36 | 05:03 21:27 | 05:03 21:27 | 06:03 (WEA 2) 06:38 (WEA 2) | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 35 | 05:02 21:28 | 05:02 21:28 | 06:03 (WEA 2) 06:38 (WEA 2) | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 35 | 05:01 21:29 | 05:01 21:29 | 06:03 (WEA 2) 06:38 (WEA 2) | 04:51 21:50 |
| 29 | 08:09 16:53 | 07:01 19:46 | 05:49 20:42 | | 35 | 05:00 21:31 | 05:00 21:31 | 06:03 (WEA 2) 06:38 (WEA 2) | 04:52 21:50 |
| 30 | 08:07 16:55 | 06:58 19:48 | 05:47 20:44 | | 34 | 04:59 21:32 | 04:59 21:32 | 06:04 (WEA 2) 06:38 (WEA 2) | 04:52 21:50 |
| 31 | 08:06 16:57 | 06:56 19:49 | | | 34 | 04:58 21:33 | 04:58 21:33 | 06:05 (WEA 2) 06:39 (WEA 2) | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | | 492 | | 507 | |
| astr.max.mögl.Beschattung | | | | 351 | | 810 | | 850 | |

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 WEA 2 Schattenrezeptor: IO-H - Zarrentiner Strasse 77, Schwartow Voraussetzungen für Berechnung des Schattenwurfs

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

| Juli | | August | | September | | Oktober | | November | | Dezember | |
|---------------------------|-------|---------------|---------------|-----------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------|-------|
| 1 | 04:53 | 06:13 (WEA 2) | 05:32 | | 06:16 (WEA 2) | 06:25 | 06:52 (Vorbelastung 01) | 07:17 | 07:15 | 08:09 | |
| | 21:49 | 28 | 06:41 (WEA 2) | 21:15 | 29 | 06:45 (WEA 2) | 20:09 | 26 | 07:18 (Vorbelastung 01) | 18:57 | 16:47 |
| 2 | 04:54 | 06:13 (WEA 2) | 05:34 | | 06:18 (WEA 2) | 06:27 | 06:54 (Vorbelastung 01) | 07:19 | 07:17 | 08:10 | |
| | 21:49 | 29 | 06:42 (WEA 2) | 21:13 | 27 | 06:45 (WEA 2) | 20:07 | 23 | 07:17 (Vorbelastung 01) | 18:54 | 16:45 |
| 3 | 04:54 | 06:13 (WEA 2) | 05:35 | | 06:18 (WEA 2) | 06:29 | 06:56 (Vorbelastung 01) | 07:21 | 07:18 | 08:12 | |
| | 21:48 | 30 | 06:43 (WEA 2) | 21:11 | 25 | 06:43 (WEA 2) | 20:05 | 21 | 07:17 (Vorbelastung 01) | 18:52 | 16:43 |
| 4 | 04:55 | 06:13 (WEA 2) | 05:37 | | 06:20 (WEA 2) | 06:30 | 06:57 (Vorbelastung 01) | 07:23 | 07:20 | 08:13 | |
| | 21:48 | 30 | 06:43 (WEA 2) | 21:09 | 22 | 06:42 (WEA 2) | 20:02 | 18 | 07:15 (Vorbelastung 01) | 18:49 | 16:41 |
| 5 | 04:56 | 06:13 (WEA 2) | 05:39 | | 06:21 (WEA 2) | 06:32 | 06:59 (Vorbelastung 01) | 07:25 | 07:22 | 08:15 | |
| | 21:47 | 30 | 06:43 (WEA 2) | 21:08 | 19 | 06:40 (WEA 2) | 20:00 | 15 | 07:14 (Vorbelastung 01) | 18:47 | 16:39 |
| 6 | 04:57 | 06:13 (WEA 2) | 05:40 | | 06:23 (WEA 2) | 06:34 | 07:01 (Vorbelastung 01) | 07:26 | 07:24 | 08:16 | |
| | 21:47 | 30 | 06:43 (WEA 2) | 21:06 | 15 | 06:38 (WEA 2) | 19:57 | 12 | 07:13 (Vorbelastung 01) | 18:45 | 16:37 |
| 7 | 04:58 | 06:13 (WEA 2) | 05:42 | | 06:26 (WEA 2) | 06:36 | 07:02 (Vorbelastung 01) | 07:28 | 07:26 | 08:17 | |
| | 21:46 | 31 | 06:44 (WEA 2) | 21:04 | 8 | 06:34 (WEA 2) | 19:55 | 8 | 07:10 (Vorbelastung 01) | 18:42 | 16:36 |
| 8 | 04:59 | 06:13 (WEA 2) | 05:44 | | | 06:37 | 07:04 (Vorbelastung 01) | 07:30 | 07:28 | 08:18 | |
| | 21:46 | 32 | 06:45 (WEA 2) | 21:02 | | 19:53 | 3 | 07:07 (Vorbelastung 01) | 18:40 | 16:34 | 15:59 |
| 9 | 05:00 | 06:13 (WEA 2) | 05:45 | | | 06:39 | | 07:32 | 07:30 | 08:20 | |
| | 21:45 | 32 | 06:45 (WEA 2) | 21:00 | | 19:50 | | 18:37 | 16:32 | 15:59 | |
| 10 | 05:01 | 06:12 (WEA 2) | 05:47 | | | 06:41 | | 07:34 | 07:32 | 08:21 | |
| | 21:44 | 33 | 06:45 (WEA 2) | 20:58 | | 19:48 | | 18:35 | 16:30 | 15:59 | |
| 11 | 05:02 | 06:12 (WEA 2) | 05:49 | | | 06:42 | | 07:35 | 07:34 | 08:22 | |
| | 21:43 | 34 | 06:46 (WEA 2) | 20:56 | | 19:45 | | 18:33 | 16:29 | 15:59 | |
| 12 | 05:03 | 06:12 (WEA 2) | 05:50 | | | 06:44 | | 07:37 | 07:36 | 08:23 | |
| | 21:42 | 34 | 06:46 (WEA 2) | 20:54 | | 19:43 | | 18:30 | 16:27 | 15:58 | |
| 13 | 05:04 | 06:12 (WEA 2) | 05:52 | | | 06:46 | | 07:39 | 07:37 | 08:24 | |
| | 21:41 | 34 | 06:46 (WEA 2) | 20:52 | | 19:40 | | 18:28 | 16:25 | 15:58 | |
| 14 | 05:06 | 06:12 (WEA 2) | 05:54 | | | 06:48 | | 07:41 | 07:39 | 08:25 | |
| | 21:40 | 35 | 06:47 (WEA 2) | 20:50 | | 19:38 | | 18:26 | 16:24 | 15:58 | |
| 15 | 05:07 | 06:13 (WEA 2) | 05:56 | | | 06:49 | | 07:43 | 07:41 | 08:26 | |
| | 21:39 | 35 | 06:48 (WEA 2) | 20:48 | | 19:36 | | 18:23 | 16:22 | 15:58 | |
| 16 | 05:08 | 06:12 (WEA 2) | 05:57 | | | 06:51 | | 07:45 | 07:43 | 08:27 | |
| | 21:38 | 36 | 06:48 (WEA 2) | 20:45 | | 19:33 | | 18:21 | 16:21 | 15:58 | |
| 17 | 05:09 | 06:12 (WEA 2) | 05:59 | | | 06:53 | | 07:46 | 07:45 | 08:28 | |
| | 21:37 | 36 | 06:48 (WEA 2) | 20:43 | | 19:31 | | 18:19 | 16:19 | 15:59 | |
| 18 | 05:11 | 06:12 (WEA 2) | 06:01 | | | 06:55 | | 07:48 | 07:47 | 08:29 | |
| | 21:36 | 36 | 06:48 (WEA 2) | 20:41 | | 19:28 | | 18:17 | 16:18 | 15:59 | |
| 19 | 05:12 | 06:13 (WEA 2) | 06:03 | | | 06:56 | | 07:50 | 07:49 | 08:29 | |
| | 21:35 | 36 | 06:49 (WEA 2) | 20:39 | | 19:26 | | 18:14 | 16:16 | 15:59 | |
| 20 | 05:13 | 06:12 (WEA 2) | 06:04 | | | 06:58 | | 07:52 | 07:50 | 08:30 | |
| | 21:33 | 36 | 06:48 (WEA 2) | 20:37 | | 19:23 | | 18:12 | 16:15 | 15:59 | |
| 21 | 05:15 | 06:12 (WEA 2) | 06:06 | | 07:05 (Vorbelastung 01) | 07:00 | | 07:54 | 07:52 | 08:31 | |
| | 21:32 | 36 | 06:48 (WEA 2) | 20:35 | 5 | 07:10 (Vorbelastung 01) | 19:21 | 18:10 | 16:14 | 16:00 | |
| 22 | 05:16 | 06:13 (WEA 2) | 06:08 | | | 07:01 (Vorbelastung 01) | 07:02 | 07:56 | 07:54 | 08:31 | |
| | 21:31 | 36 | 06:49 (WEA 2) | 20:32 | 13 | 07:14 (Vorbelastung 01) | 19:18 | 18:08 | 16:13 | 16:00 | |
| 23 | 05:18 | 06:13 (WEA 2) | 06:09 | | | 06:58 (Vorbelastung 01) | 07:03 | 07:58 | 07:56 | 08:32 | |
| | 21:29 | 36 | 06:49 (WEA 2) | 20:30 | 17 | 07:15 (Vorbelastung 01) | 19:16 | 18:06 | 16:11 | 16:01 | |
| 24 | 05:19 | 06:13 (WEA 2) | 06:11 | | | 06:57 (Vorbelastung 01) | 07:05 | 07:59 | 07:57 | 08:32 | |
| | 21:28 | 35 | 06:48 (WEA 2) | 20:28 | 20 | 07:17 (Vorbelastung 01) | 19:14 | 18:03 | 16:10 | 16:01 | |
| 25 | 05:21 | 06:13 (WEA 2) | 06:13 | | | 06:56 (Vorbelastung 01) | 07:07 | 07:01 | 07:59 | 08:32 | |
| | 21:26 | 36 | 06:49 (WEA 2) | 20:26 | 22 | 07:18 (Vorbelastung 01) | 19:11 | 17:01 | 16:09 | 16:02 | |
| 26 | 05:22 | 06:13 (WEA 2) | 06:15 | | | 06:54 (Vorbelastung 01) | 07:09 | 07:03 | 08:01 | 08:33 | |
| | 21:25 | 35 | 06:48 (WEA 2) | 20:23 | 24 | 07:18 (Vorbelastung 01) | 19:09 | 16:59 | 16:08 | 16:03 | |
| 27 | 05:24 | 06:14 (WEA 2) | 06:16 | | | 06:54 (Vorbelastung 01) | 07:10 | 07:05 | 08:02 | 08:33 | |
| | 21:23 | 34 | 06:48 (WEA 2) | 20:21 | 25 | 07:19 (Vorbelastung 01) | 19:06 | 16:57 | 16:07 | 16:04 | |
| 28 | 05:25 | 06:14 (WEA 2) | 06:18 | | | 06:53 (Vorbelastung 01) | 07:12 | 07:07 | 08:04 | 08:33 | |
| | 21:22 | 33 | 06:47 (WEA 2) | 20:19 | 26 | 07:19 (Vorbelastung 01) | 19:04 | 16:55 | 16:06 | 16:04 | |
| 29 | 05:27 | 06:15 (WEA 2) | 06:20 | | | 06:52 (Vorbelastung 01) | 07:14 | 07:09 | 08:06 | 08:33 | |
| | 21:20 | 32 | 06:47 (WEA 2) | 20:16 | 27 | 07:19 (Vorbelastung 01) | 19:01 | 16:53 | 16:05 | 16:05 | |
| 30 | 05:29 | 06:15 (WEA 2) | 06:22 | | | 06:52 (Vorbelastung 01) | 07:16 | 07:11 | 08:07 | 08:33 | |
| | 21:18 | 31 | 06:46 (WEA 2) | 20:14 | 27 | 07:19 (Vorbelastung 01) | 18:59 | 16:51 | 16:04 | 16:06 | |
| 31 | 05:30 | 06:16 (WEA 2) | 06:23 | | | 06:52 (Vorbelastung 01) | | 07:13 | | 08:33 | |
| | 21:17 | 30 | 06:46 (WEA 2) | 20:12 | 27 | 07:19 (Vorbelastung 01) | | 16:49 | | 16:07 | |
| Sonnenscheinstunden | 510 | | 458 | | | 382 | | 329 | 261 | 236 | |
| astr.max.mögl.Beschattung | 1031 | | 378 | | | 126 | | | | | |

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) | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |
|--------------|-----------------------|-------------------------|----------------------|------------------------------------------------------------|---------------------------------------------------------|
|--------------|-----------------------|-------------------------|----------------------|------------------------------------------------------------|---------------------------------------------------------|

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 **Schattenrezeptor:** IO-I - An der Torfkoppel 9, Heide
Voraussetzungen für Berechnung des Schattenwurfs

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 Windergieanlage/n ist/sind immer in Betrieb

| | Januar | Februar | März | April | Mai | Juni | |
|---------------------------|----------------|----------------|----------------|----------------|----------------------------------------------------|----------------|----------------------------------|
| 1 | 08:33 16:09 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 07:30 (WEA 2) 07:51 (WEA 2) | 05:45 20:46 | 06:14 (Vorbelastung 03) 04:57 |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 07:30 (WEA 2) 07:49 (WEA 2) | 05:43 20:47 | 06:14 (Vorbelastung 03) 04:56 |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | 07:30 (WEA 2) 07:48 (WEA 2) | 05:41 20:49 | 06:13 (Vorbelastung 03) 04:55 |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:01 18:00 | 06:46 19:57 | 07:32 (WEA 2) 07:47 (WEA 2) | 05:39 20:51 | 06:12 (Vorbelastung 03) 04:54 |
| 5 | 08:33 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:59 | 07:33 (WEA 2) 07:44 (WEA 2) | 05:37 20:53 | 06:11 (Vorbelastung 03) 04:53 |
| 6 | 08:32 16:15 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 07:38 (WEA 2) 07:39 (WEA 2) | 05:35 20:55 | 06:11 (Vorbelastung 03) 04:53 |
| 7 | 08:32 16:16 | 07:53 17:11 | 06:54 18:05 | 06:39 20:02 | 05:33 20:56 | 05:33 20:56 | 06:10 (Vorbelastung 03) 04:52 |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 05:31 20:58 | 06:10 (Vorbelastung 03) 04:51 |
| 9 | 08:31 16:19 | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 05:30 21:00 | 06:10 (Vorbelastung 03) 04:51 |
| 10 | 08:30 16:20 | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 05:28 21:01 | 06:10 (Vorbelastung 03) 04:50 |
| 11 | 08:29 16:22 | 07:46 17:19 | 06:44 18:13 | 06:30 20:09 | 05:26 21:03 | 05:26 21:03 | 06:10 (Vorbelastung 03) 04:50 |
| 12 | 08:29 16:23 | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 05:24 21:05 | 06:10 (Vorbelastung 03) 04:49 |
| 13 | 08:28 16:25 | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 05:22 21:07 | 06:10 (Vorbelastung 03) 04:49 |
| 14 | 08:27 16:26 | 07:40 17:25 | 06:37 18:18 | 06:23 20:15 | 05:21 21:08 | 05:21 21:08 | 06:11 (Vorbelastung 03) 04:49 |
| 15 | 08:26 16:28 | 07:38 17:27 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 05:19 21:10 | 06:11 (Vorbelastung 03) 04:49 |
| 16 | 08:25 16:30 | 07:36 17:29 | 06:32 18:22 | 06:18 20:19 | 05:17 21:12 | 05:17 21:12 | 06:12 (Vorbelastung 03) 04:48 |
| 17 | 08:24 16:31 | 07:34 17:31 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 05:16 21:13 | 06:13 (Vorbelastung 03) 04:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 05:14 21:15 | 06:14 (Vorbelastung 03) 04:48 |
| 19 | 08:22 16:35 | 07:30 17:34 | 06:25 18:28 | 06:11 20:24 | 05:13 21:16 | 05:13 21:16 | 06:15 (Vorbelastung 03) 04:48 |
| 20 | 08:21 16:36 | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 05:11 21:18 | 06:16 (Vorbelastung 03) 04:48 |
| 21 | 08:20 16:38 | 07:25 17:38 | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 05:10 21:19 | 06:18 (Vorbelastung 03) 04:49 |
| 22 | 08:19 16:40 | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 05:08 21:21 | 06:21 (Vorbelastung 03) 04:49 |
| 23 | 08:17 16:42 | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 | 05:07 21:22 | 06:22 (Vorbelastung 03) 04:49 |
| 24 | 08:16 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 05:06 21:24 | 06:23 (Vorbelastung 03) 04:49 |
| 25 | 08:15 16:46 | 07:16 17:46 | 06:10 18:39 | 05:58 20:35 | 05:04 21:25 | 05:04 21:25 | 06:24 (Vorbelastung 03) 04:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 05:03 21:27 | 06:25 (Vorbelastung 03) 04:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 05:02 21:28 | 06:26 (Vorbelastung 03) 04:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 | 05:01 21:30 | 06:27 (Vorbelastung 03) 04:51 |
| 29 | 08:09 16:53 | 07:01 19:46 | 06:01 19:46 | 05:49 20:42 | 06:19 (Vorbelastung 03) 06:29 (Vorbelastung 03) | 05:00 21:31 | 06:28 (Vorbelastung 03) 04:52 |
| 30 | 08:07 16:55 | 06:58 19:48 | 05:58 19:48 | 05:47 20:44 | 06:16 (Vorbelastung 03) 06:31 (Vorbelastung 03) | 04:59 21:32 | 06:29 (Vorbelastung 03) 04:52 |
| 31 | 08:06 16:57 | 06:56 19:49 | 05:56 19:49 | 05:45 20:44 | 04:58 21:33 | 04:58 21:33 | 06:30 (Vorbelastung 03) 04:52 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 492 | 508 |
| astr.max.mögl.Beschattung | | | 148 | 110 | 465 | | |

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) | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |
|--------------|-----------------------|-------------------------|----------------------|------------------------------------------------------------|---------------------------------------------------------|
|--------------|-----------------------|-------------------------|----------------------|------------------------------------------------------------|---------------------------------------------------------|

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 **Schattenrezeptor:** IO-I - An der Torfkoppel 9, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 21:49 | 05:32 21:15 | 06:21 (Vorbelastung 03) 06:25 | | 07:17 07:15 | 08:09 16:04 | |
| 2 | 04:54 21:49 | 05:34 21:13 | 06:21 (Vorbelastung 03) 06:27 | | 07:19 18:54 | 07:17 16:45 | |
| 3 | 04:54 21:49 | 05:35 21:11 | 06:20 (Vorbelastung 03) 06:29 | | 07:21 18:52 | 07:19 16:43 | |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:20 (Vorbelastung 03) 06:30 | | 07:23 18:49 | 07:20 16:41 | |
| 5 | 04:56 21:48 | 05:39 21:08 | 06:20 (Vorbelastung 03) 06:32 | | 07:25 18:47 | 07:22 16:39 | |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:20 (Vorbelastung 03) 06:34 | | 07:26 18:45 | 07:24 16:37 | |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:20 (Vorbelastung 03) 06:36 | 07:28 (WEA 2) | 07:28 | 07:26 16:36 | |
| 8 | 04:59 21:46 | 05:44 21:02 | 06:21 (Vorbelastung 03) 06:37 | 11 07:39 (WEA 2) | 18:42 | 16:36 08:19 | |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:22 (Vorbelastung 03) 06:39 | 15 07:41 (WEA 2) | 18:40 | 16:34 08:20 | |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:22 (Vorbelastung 03) 06:41 | 17 07:42 (WEA 2) | 18:37 | 16:32 08:21 | |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:23 (Vorbelastung 03) 06:41 | 19 07:43 (WEA 2) | 18:35 | 16:30 08:22 | |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:23 (Vorbelastung 03) 06:44 | 21 07:43 (WEA 2) | 18:33 | 16:29 15:59 | |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:23 (Vorbelastung 03) 06:46 | 21 07:43 (WEA 2) | 18:30 | 16:27 08:24 | |
| 14 | 05:06 21:40 | 05:54 20:50 | 06:23 (Vorbelastung 03) 06:48 | 21 07:42 (WEA 2) | 18:28 | 16:25 08:25 | |
| 15 | 05:07 21:39 | 05:56 20:48 | 06:28 (Vorbelastung 03) 06:48 | 9 19:38 | 18:26 | 16:24 08:26 | |
| 16 | 05:08 21:38 | 05:57 20:45 | 06:49 | 21 07:42 (WEA 2) | 18:23 | 16:22 15:58 | |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:51 | 20 07:40 (WEA 2) | 18:21 | 16:21 15:58 | |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:53 | 18 07:41 (WEA 2) | 18:19 | 16:19 15:59 | |
| 19 | 05:12 21:35 | 06:03 20:39 | 06:55 | 16 07:38 (WEA 2) | 18:17 | 16:18 08:29 | |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:56 | 12 07:36 (WEA 2) | 18:14 | 16:16 15:59 | |
| 21 | 05:15 21:32 | 06:06 20:35 | 06:58 | 4 07:31 (WEA 2) | 18:12 | 16:15 08:30 | |
| 22 | 05:16 21:31 | 06:30 (Vorbelastung 03) 06:08 | 07:00 | | 07:54 | 07:52 08:31 | |
| 23 | 05:18 21:29 | 06:37 (Vorbelastung 03) 06:09 | 07:02 | | 18:10 | 16:14 08:31 | |
| 24 | 05:19 21:28 | 06:27 (Vorbelastung 03) 06:39 (Vorbelastung 03) | 07:03 | | 07:56 | 16:13 16:00 | |
| 25 | 05:21 21:26 | 06:26 (Vorbelastung 03) 06:11 | 07:03 | | 07:58 | 16:11 08:32 | |
| 26 | 05:22 21:25 | 06:40 (Vorbelastung 03) 06:13 | 07:05 | | 18:06 | 16:11 16:01 | |
| 27 | 05:24 21:23 | 06:25 (Vorbelastung 03) 06:15 | 07:07 | | 08:00 | 16:10 08:32 | |
| 28 | 05:25 21:22 | 06:42 (Vorbelastung 03) 06:16 | 07:09 | | 18:03 | 16:10 16:01 | |
| 29 | 05:27 21:20 | 06:24 (Vorbelastung 03) 06:15 | 07:09 | | 07:01 | 16:09 16:02 | |
| 30 | 05:29 21:18 | 06:43 (Vorbelastung 03) 06:15 | 07:10 | | 17:01 | 16:09 16:02 | |
| 31 | 05:30 21:17 | 06:23 (Vorbelastung 03) 06:16 | 07:12 | | 07:03 | 16:08 08:33 | |
| | | 06:44 (Vorbelastung 03) 06:20 | 07:14 | | 16:59 | 16:08 16:03 | |
| | | 06:22 (Vorbelastung 03) 06:20 | 07:16 | | 07:05 | 16:08 08:33 | |
| | | 06:46 (Vorbelastung 03) 06:22 | 07:18 | | 16:57 | 16:07 16:04 | |
| | | 06:21 (Vorbelastung 03) 06:22 | 07:20 | | 07:07 | 16:07 08:33 | |
| | | 06:45 (Vorbelastung 03) 06:23 | 07:22 | | 16:55 | 16:06 16:04 | |
| | | 06:21 (Vorbelastung 03) 06:23 | 07:24 | | 07:09 | 16:06 08:33 | |
| | | 06:46 (Vorbelastung 03) 06:23 | 07:26 | | 16:53 | 16:05 16:05 | |
| | | | 07:28 | | 07:11 | 16:04 08:33 | |
| | | | 18:59 | | 16:51 | 16:04 16:06 | |
| | | | | | 07:13 | 16:07 08:33 | |
| | | | | | 16:49 | 16:07 16:07 | |
| Sonnenscheinstunden | 510 | 458 | 382 | | 329 | 261 | 236 |
| astr.max.mögl.Beschattung | 185 | 310 | 237 | | | | |

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 WEA 2 Schattenrezeptor: IO-J - Behr Gemüsehandel GmbH, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 08:04 | 07:07 | 08:03 (WEA 2) 06:53 | 05:45 | 07:12 (Vorbelastung 03) 04:57 |
| | 16:08 | 16:59 | 17:54 | 32 08:35 (WEA 2) 19:51 | 20:46 | 51 08:03 (Vorbelastung 03) 21:35 |
| 2 | 08:33 | 08:02 | 07:05 | 08:03 (WEA 2) 06:51 | 05:43 | 07:13 (Vorbelastung 03) 04:56 |
| | 16:10 | 17:01 | 17:56 | 30 08:33 (WEA 2) 19:53 | 20:47 | 50 08:03 (Vorbelastung 03) 21:36 |
| 3 | 08:33 | 08:01 | 07:03 | 08:04 (WEA 2) 06:48 | 05:41 | 07:14 (Vorbelastung 03) 04:55 |
| | 16:11 | 17:03 | 17:58 | 29 08:33 (WEA 2) 19:55 | 20:49 | 48 08:02 (Vorbelastung 03) 21:37 |
| 4 | 08:33 | 07:59 | 07:00 | 08:05 (WEA 2) 06:46 | 05:39 | 07:14 (Vorbelastung 03) 04:54 |
| | 16:12 | 17:05 | 17:59 | 27 08:32 (WEA 2) 19:57 | 20:51 | 47 08:01 (Vorbelastung 03) 21:38 |
| 5 | 08:33 | 07:57 | 06:58 | 08:05 (WEA 2) 06:44 | 05:37 | 07:14 (Vorbelastung 03) 04:53 |
| | 16:13 | 17:07 | 18:01 | 25 08:30 (WEA 2) 19:59 | 20:53 | 46 08:00 (Vorbelastung 03) 21:39 |
| 6 | 08:32 | 07:55 | 06:56 | 08:07 (WEA 2) 06:41 | 07:39 (Vorbelastung 03) 05:35 | 07:15 (Vorbelastung 03) 04:52 |
| | 16:14 | 17:09 | 18:03 | 21 08:28 (WEA 2) 20:00 | 11 07:50 (Vorbelastung 03) 20:54 | 44 07:59 (Vorbelastung 03) 21:40 |
| 7 | 08:32 | 07:53 | 08:20 (Vorbelastung 01) 06:53 | 08:08 (WEA 2) 06:39 | 07:33 (Vorbelastung 03) 05:33 | 07:15 (Vorbelastung 03) 04:52 |
| | 16:16 | 17:11 | 18:05 | 17 08:25 (WEA 2) 20:02 | 21 07:54 (Vorbelastung 03) 20:56 | 43 07:58 (Vorbelastung 03) 21:41 |
| 8 | 08:31 | 07:52 | 08:18 (Vorbelastung 01) 06:51 | 08:12 (WEA 2) 06:37 | 07:30 (Vorbelastung 03) 05:31 | 07:17 (Vorbelastung 03) 04:51 |
| | 16:17 | 17:13 | 18:07 | 10 08:22 (WEA 2) 20:04 | 27 07:57 (Vorbelastung 03) 20:58 | 40 07:57 (Vorbelastung 03) 21:42 |
| 9 | 08:31 | 07:50 | 08:16 (Vorbelastung 01) 06:49 | 06:34 | 07:28 (Vorbelastung 03) 05:30 | 07:17 (Vorbelastung 03) 04:51 |
| | 16:19 | 17:15 | 18:09 | 32 08:00 (Vorbelastung 03) 21:00 | 39 07:56 (Vorbelastung 03) 21:43 | 07:18 (Vorbelastung 03) 04:50 |
| 10 | 08:30 | 07:48 | 08:14 (Vorbelastung 01) 06:46 | 06:32 | 07:25 (Vorbelastung 03) 05:28 | 07:18 (Vorbelastung 03) 04:50 |
| | 16:20 | 17:17 | 18:11 | 20:08 | 36 08:01 (Vorbelastung 03) 21:01 | 36 07:54 (Vorbelastung 03) 21:44 |
| 11 | 08:29 | 07:46 | 08:12 (Vorbelastung 01) 06:44 | 06:29 | 07:23 (Vorbelastung 03) 05:26 | 07:20 (Vorbelastung 03) 04:50 |
| | 16:22 | 17:19 | 18:13 | 20:09 | 39 08:02 (Vorbelastung 03) 21:03 | 33 07:53 (Vorbelastung 03) 21:45 |
| 12 | 08:29 | 07:44 | 08:10 (Vorbelastung 01) 06:42 | 06:27 | 07:22 (Vorbelastung 03) 05:24 | 07:21 (Vorbelastung 03) 04:49 |
| | 16:23 | 17:21 | 18:15 | 20:11 | 42 08:04 (Vorbelastung 03) 21:05 | 31 07:52 (Vorbelastung 03) 21:45 |
| 13 | 08:28 | 07:42 | 08:08 (Vorbelastung 01) 06:39 | 06:25 | 07:21 (Vorbelastung 03) 05:22 | 07:22 (Vorbelastung 03) 04:49 |
| | 16:25 | 17:23 | 18:16 | 20:13 | 44 08:05 (Vorbelastung 03) 21:07 | 27 07:49 (Vorbelastung 03) 21:46 |
| 14 | 08:27 | 07:40 | 08:06 (Vorbelastung 01) 06:37 | 06:22 | 07:19 (Vorbelastung 03) 05:21 | 07:24 (Vorbelastung 03) 04:49 |
| | 16:26 | 17:25 | 18:18 | 20:15 | 46 08:05 (Vorbelastung 03) 21:08 | 24 07:48 (Vorbelastung 03) 21:47 |
| 15 | 08:26 | 07:38 | 08:04 (Vorbelastung 01) 06:34 | 06:20 | 07:18 (Vorbelastung 03) 05:19 | 07:26 (Vorbelastung 03) 04:49 |
| | 16:28 | 17:27 | 18:20 | 20:17 | 48 08:06 (Vorbelastung 03) 21:10 | 19 07:45 (Vorbelastung 03) 21:47 |
| 16 | 08:25 | 07:36 | 08:04 (Vorbelastung 01) 06:32 | 06:18 | 07:17 (Vorbelastung 03) 05:17 | 07:29 (Vorbelastung 03) 04:48 |
| | 16:30 | 17:28 | 18:22 | 20:18 | 49 08:06 (Vorbelastung 03) 21:12 | 14 07:43 (Vorbelastung 03) 21:48 |
| 17 | 08:24 | 07:34 | 08:05 (Vorbelastung 01) 06:30 | 06:16 | 07:17 (Vorbelastung 03) 05:16 | 07:34 (Vorbelastung 03) 04:48 |
| | 16:31 | 17:30 | 18:24 | 20:20 | 50 08:07 (Vorbelastung 03) 21:13 | 2 07:36 (Vorbelastung 03) 21:48 |
| 18 | 08:23 | 07:32 | 08:05 (Vorbelastung 01) 06:27 | 06:13 | 07:15 (Vorbelastung 03) 05:14 | 04:48 |
| | 16:33 | 17:32 | 18:26 | 20:22 | 51 08:06 (Vorbelastung 03) 21:15 | 21:49 |
| 19 | 08:22 | 07:30 | 08:06 (Vorbelastung 01) 06:25 | 06:11 | 07:14 (Vorbelastung 03) 05:13 | 04:48 |
| | 16:35 | 17:34 | 18:27 | 20:24 | 53 08:07 (Vorbelastung 03) 21:16 | 21:49 |
| 20 | 08:21 | 07:27 | 08:06 (WEA 2) 06:22 | 06:09 | 07:14 (Vorbelastung 03) 05:11 | 04:48 |
| | 16:36 | 17:36 | 18:29 | 20:26 | 53 08:07 (Vorbelastung 03) 21:18 | 21:50 |
| 21 | 08:20 | 07:25 | 08:05 (WEA 2) 06:20 | 06:07 | 07:14 (Vorbelastung 03) 05:10 | 04:48 |
| | 16:38 | 17:38 | 18:31 | 20:28 | 53 08:07 (Vorbelastung 03) 21:19 | 21:50 |
| 22 | 08:19 | 07:23 | 08:05 (WEA 2) 06:18 | 06:04 | 07:13 (Vorbelastung 03) 05:08 | 04:49 |
| | 16:40 | 17:40 | 18:33 | 20:29 | 54 08:07 (Vorbelastung 03) 21:21 | 21:50 |
| 23 | 08:17 | 07:21 | 08:04 (WEA 2) 06:15 | 06:02 | 07:13 (Vorbelastung 03) 05:07 | 04:49 |
| | 16:42 | 17:42 | 18:35 | 20:31 | 54 08:07 (Vorbelastung 03) 21:22 | 21:50 |
| 24 | 08:16 | 07:19 | 08:03 (WEA 2) 06:13 | 06:00 | 07:12 (Vorbelastung 03) 05:06 | 04:49 |
| | 16:44 | 17:44 | 18:37 | 20:33 | 54 08:06 (Vorbelastung 03) 21:24 | 21:50 |
| 25 | 08:15 | 07:16 | 08:03 (WEA 2) 06:10 | 05:58 | 07:12 (Vorbelastung 03) 05:04 | 04:50 |
| | 16:46 | 17:46 | 18:38 | 20:35 | 54 08:06 (Vorbelastung 03) 21:25 | 21:50 |
| 26 | 08:13 | 07:14 | 08:03 (WEA 2) 06:08 | 05:56 | 07:12 (Vorbelastung 03) 05:03 | 04:50 |
| | 16:47 | 17:48 | 18:40 | 20:37 | 53 08:05 (Vorbelastung 03) 21:27 | 21:50 |
| 27 | 08:12 | 07:12 | 08:02 (WEA 2) 06:05 | 05:53 | 07:12 (Vorbelastung 03) 05:02 | 04:50 |
| | 16:49 | 17:50 | 18:42 | 20:38 | 53 08:05 (Vorbelastung 03) 21:28 | 21:50 |
| 28 | 08:10 | 07:10 | 08:03 (WEA 2) 06:03 | 05:51 | 07:12 (Vorbelastung 03) 05:01 | 04:51 |
| | 16:51 | 17:52 | 18:44 | 20:40 | 53 08:05 (Vorbelastung 03) 21:30 | 21:50 |
| 29 | 08:09 | | 07:01 | 05:49 | 07:12 (Vorbelastung 03) 05:00 | 04:51 |
| | 16:53 | | 19:46 | 20:42 | 52 08:04 (Vorbelastung 03) 21:31 | 21:50 |
| 30 | 08:07 | | 06:58 | 05:47 | 07:12 (Vorbelastung 03) 04:59 | 04:52 |
| | 16:55 | | 19:48 | 20:44 | 51 08:03 (Vorbelastung 03) 21:32 | 21:50 |
| 31 | 08:06 | | 06:56 | | 04:58 | |
| | 16:57 | | 19:49 | | 21:33 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | | 515 | 191 | 1133 | 594 | |

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) | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |
|--------------|-----------------------|-------------------------|----------------------|------------------------------------------------------------|---------------------------------------------------------|

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 **Schattenrezeptor:** IO-J - Behr Gemüsehandel GmbH, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 | 05:32 | 07:31 (Vorbelastung 03) | 06:25 | 07:22 (Vorbelastung 03) | 07:17 | | 07:15 | 07:44 (Vorbelastung 01) | 08:09 | 08:09 |
| | 21:49 | 21:15 | 08:02 (Vorbelastung 03) | 20:09 | 39 | 08:01 (Vorbelastung 03) | 18:57 | | 16:47 | 12 | 16:03 |
| 2 | 04:53 | 05:33 | 07:30 (Vorbelastung 03) | 06:27 | | 07:24 (Vorbelastung 03) | 07:19 | | 07:17 | | 08:10 |
| | 21:49 | 21:13 | 08:04 (Vorbelastung 03) | 20:07 | 36 | 08:00 (Vorbelastung 03) | 18:54 | | 16:45 | 9 | 16:03 |
| 3 | 04:54 | 05:35 | 07:28 (Vorbelastung 03) | 06:29 | | 07:26 (Vorbelastung 03) | 07:21 | | 07:19 | | 08:12 |
| | 21:49 | 21:11 | 08:05 (Vorbelastung 03) | 20:05 | 32 | 07:58 (Vorbelastung 03) | 18:52 | | 16:43 | 6 | 16:02 |
| 4 | 04:55 | 05:37 | 07:27 (Vorbelastung 03) | 06:30 | | 07:27 (Vorbelastung 03) | 07:23 | | 07:20 | | 08:13 |
| | 21:48 | 21:09 | 08:07 (Vorbelastung 03) | 20:02 | 27 | 07:54 (Vorbelastung 03) | 18:49 | | 16:41 | 2 | 16:01 |
| 5 | 04:56 | 05:38 | 07:26 (Vorbelastung 03) | 06:32 | | 07:30 (Vorbelastung 03) | 07:25 | 08:52 (WEA 2) | 07:22 | | 08:15 |
| | 21:48 | 21:08 | 08:07 (Vorbelastung 03) | 20:00 | 21 | 07:51 (Vorbelastung 03) | 18:47 | 08:56 (WEA 2) | 16:39 | | 16:01 |
| 6 | 04:57 | 05:40 | 07:25 (Vorbelastung 03) | 06:34 | | 07:35 (Vorbelastung 03) | 07:26 | 08:39 (WEA 2) | 07:32 | | 08:16 |
| | 21:47 | 21:06 | 08:08 (Vorbelastung 03) | 19:57 | 12 | 07:47 (Vorbelastung 03) | 18:44 | 09:01 (WEA 2) | 16:37 | | 16:00 |
| 7 | 04:58 | 05:42 | 07:24 (Vorbelastung 03) | 06:36 | | | | 08:43 (WEA 2) | 07:26 | | 08:17 |
| | 21:46 | 21:04 | 08:09 (Vorbelastung 03) | 19:55 | | | 18:42 | 09:03 (WEA 2) | 16:36 | | 16:00 |
| 8 | 04:59 | 05:44 | 07:24 (Vorbelastung 03) | 06:37 | | | 07:30 | 08:41 (WEA 2) | 07:28 | | 08:19 |
| | 21:46 | 21:02 | 08:10 (Vorbelastung 03) | 19:53 | | | 18:40 | 09:04 (WEA 2) | 16:34 | | 15:59 |
| 9 | 05:00 | 05:45 | 07:23 (Vorbelastung 03) | 06:39 | | | 07:32 | 08:40 (WEA 2) | 07:30 | | 08:20 |
| | 21:45 | 21:00 | 08:11 (Vorbelastung 03) | 19:50 | | | 18:37 | 09:06 (WEA 2) | 16:32 | | 15:59 |
| 10 | 05:01 | 05:47 | 07:22 (Vorbelastung 03) | 06:41 | | | 07:34 | 08:39 (WEA 2) | 07:32 | | 08:21 |
| | 21:44 | 20:58 | 08:11 (Vorbelastung 03) | 19:48 | | | 18:35 | 09:06 (WEA 2) | 16:30 | | 15:59 |
| 11 | 05:02 | 05:49 | 07:22 (Vorbelastung 03) | 06:42 | | | 07:35 | 08:38 (WEA 2) | 07:34 | | 08:22 |
| | 21:43 | 20:56 | 08:12 (Vorbelastung 03) | 19:45 | | | 18:33 | 09:07 (WEA 2) | 16:29 | | 15:59 |
| 12 | 05:03 | 05:50 | 07:21 (Vorbelastung 03) | 06:44 | | | 07:37 | 08:37 (WEA 2) | 07:36 | | 08:23 |
| | 21:42 | 20:54 | 08:11 (Vorbelastung 03) | 19:43 | | | 18:30 | 09:08 (WEA 2) | 16:27 | | 15:58 |
| 13 | 05:04 | 05:52 | 07:20 (Vorbelastung 03) | 06:46 | | | 07:39 | 08:36 (WEA 2) | 07:37 | | 08:24 |
| | 21:41 | 20:52 | 08:12 (Vorbelastung 03) | 19:40 | | | 18:28 | 09:08 (WEA 2) | 16:25 | | 15:58 |
| 14 | 05:05 | 05:54 | 07:20 (Vorbelastung 03) | 06:48 | | | 07:41 | 08:36 (WEA 2) | 07:39 | | 08:25 |
| | 21:40 | 20:50 | 08:13 (Vorbelastung 03) | 19:38 | | | 18:26 | 09:08 (WEA 2) | 16:24 | | 15:58 |
| 15 | 05:07 | 05:56 | 07:19 (Vorbelastung 03) | 06:49 | | | 07:43 | 08:36 (WEA 2) | 07:41 | | 08:26 |
| | 21:39 | 20:48 | 08:12 (Vorbelastung 03) | 19:36 | | | 18:23 | 09:08 (WEA 2) | 16:22 | | 15:58 |
| 16 | 05:08 | 05:57 | 07:19 (Vorbelastung 03) | 06:51 | | | 07:45 | 08:35 (WEA 2) | 07:43 | | 08:27 |
| | 21:38 | 20:45 | 08:13 (Vorbelastung 03) | 19:33 | | | 18:21 | 09:08 (WEA 2) | 16:21 | | 15:58 |
| 17 | 05:09 | 05:59 | 07:18 (Vorbelastung 03) | 06:53 | | | 07:46 | 08:35 (WEA 2) | 07:45 | | 08:28 |
| | 21:37 | 20:43 | 08:12 (Vorbelastung 03) | 19:31 | | | 18:19 | 09:08 (WEA 2) | 16:19 | | 15:59 |
| 18 | 05:11 | 06:01 | 07:18 (Vorbelastung 03) | 06:55 | | | 07:48 | 08:34 (WEA 2) | 07:47 | | 08:29 |
| | 21:36 | 20:41 | 08:12 (Vorbelastung 03) | 19:28 | | | 18:17 | 09:06 (WEA 2) | 16:18 | | 15:59 |
| 19 | 05:12 | 06:02 | 07:19 (Vorbelastung 03) | 06:56 | | | 07:50 | 08:35 (WEA 2) | 07:49 | | 08:29 |
| | 21:35 | 20:39 | 08:13 (Vorbelastung 03) | 19:26 | | | 18:14 | 09:06 (WEA 2) | 16:16 | | 15:59 |
| 20 | 05:13 | 06:04 | 07:18 (Vorbelastung 03) | 06:58 | | | 07:52 | 08:35 (WEA 2) | 07:50 | | 08:30 |
| | 21:33 | 20:37 | 08:12 (Vorbelastung 03) | 19:23 | | | 18:12 | 09:05 (WEA 2) | 16:15 | | 15:59 |
| 21 | 05:15 | 06:06 | 07:18 (Vorbelastung 03) | 07:00 | | | 07:54 | 08:36 (WEA 2) | 07:52 | | 08:31 |
| | 21:32 | 20:35 | 08:12 (Vorbelastung 03) | 19:21 | | | 18:10 | 09:04 (WEA 2) | 16:14 | | 16:00 |
| 22 | 05:16 | 06:08 | 07:18 (Vorbelastung 03) | 07:02 | | | 07:56 | 08:37 (Vorbelastung 01) | 07:54 | | 08:31 |
| | 21:31 | 20:32 | 08:12 (Vorbelastung 03) | 19:18 | | | 18:08 | 09:03 (WEA 2) | 16:13 | | 16:00 |
| 23 | 05:18 | 06:09 | 07:18 (Vorbelastung 03) | 07:03 | | | 07:58 | 08:36 (Vorbelastung 01) | 07:56 | | 08:32 |
| | 21:29 | 20:30 | 08:11 (Vorbelastung 03) | 19:16 | | | 18:06 | 09:02 (WEA 2) | 16:11 | | 16:01 |
| 24 | 05:19 | 06:11 | 07:18 (Vorbelastung 03) | 07:05 | | | 07:59 | 08:35 (Vorbelastung 01) | 07:57 | | 08:32 |
| | 21:28 | 20:28 | 08:10 (Vorbelastung 03) | 19:14 | | | 18:03 | 09:00 (WEA 2) | 16:10 | | 16:01 |
| 25 | 05:21 | 06:13 | 07:19 (Vorbelastung 03) | 07:07 | | | 07:01 | 07:34 (Vorbelastung 01) | 07:59 | | 08:33 |
| | 21:26 | 20:26 | 08:10 (Vorbelastung 03) | 19:11 | | | 17:01 | 07:58 (Vorbelastung 01) | 16:09 | | 16:02 |
| 26 | 05:22 | 06:15 | 07:18 (Vorbelastung 03) | 07:09 | | | 07:03 | 07:34 (Vorbelastung 01) | 08:01 | | 08:33 |
| | 21:25 | 20:23 | 08:09 (Vorbelastung 03) | 19:09 | | | 16:59 | 07:58 (Vorbelastung 01) | 16:08 | | 16:03 |
| 27 | 05:24 | 06:16 | 07:19 (Vorbelastung 03) | 07:10 | | | 07:05 | 07:34 (Vorbelastung 01) | 08:02 | | 08:33 |
| | 21:23 | 20:21 | 08:08 (Vorbelastung 03) | 19:06 | | | 16:57 | 07:58 (Vorbelastung 01) | 16:07 | | 16:03 |
| 28 | 05:25 | 06:18 | 07:20 (Vorbelastung 03) | 07:12 | | | 07:07 | 07:36 (Vorbelastung 01) | 08:04 | | 08:33 |
| | 21:22 | 20:19 | 08:07 (Vorbelastung 03) | 19:04 | | | 16:55 | 07:59 (Vorbelastung 01) | 16:06 | | 16:04 |
| 29 | 05:27 | 06:20 | 07:20 (Vorbelastung 03) | 07:14 | | | 07:09 | 07:38 (Vorbelastung 01) | 08:06 | | 08:33 |
| | 21:20 | 20:16 | 08:06 (Vorbelastung 03) | 19:01 | | | 16:53 | 07:58 (Vorbelastung 01) | 16:05 | | 16:05 |
| 30 | 05:29 | 06:22 | 07:21 (Vorbelastung 03) | 07:16 | | | 07:11 | 07:40 (Vorbelastung 01) | 08:07 | | 08:33 |
| | 21:18 | 20:14 | 08:05 (Vorbelastung 03) | 18:59 | | | 16:51 | 07:58 (Vorbelastung 01) | 16:04 | | 16:06 |
| 31 | 05:30 | 06:23 | 07:22 (Vorbelastung 03) | | | | 07:13 | 07:42 (Vorbelastung 01) | | | 08:33 |
| | 21:17 | 20:12 | 08:03 (Vorbelastung 03) | | | | 16:49 | 07:57 (Vorbelastung 01) | | | 16:07 |
| | Sonnenscheinstunden | 458 | | 382 | | | 329 | | 261 | | 236 |
| | astr.max.mögl.Beschattung | 102 | 1484 | 167 | 682 | 29 | | | | | |

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) | Minuten mit Schatten | Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten) |
| | Sonnenuntergang (SS:MM) | | | |

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 Schattenrezeptor: IO-K - Heide 6, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | Juni | |
|---------------------------|----------------|----------------|----------------------------------------------------|----------------|----------------|----------------|----------------|
| 1 | 08:33 16:08 | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 | 04:57 21:35 | |
| 2 | 08:33 16:10 | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 | 04:56 21:36 | |
| 3 | 08:33 16:11 | 08:01 17:03 | 07:03 17:58 | 06:49 19:55 | 05:41 20:49 | 04:55 21:37 | |
| 4 | 08:33 16:12 | 07:59 17:05 | 07:01 17:59 | 06:46 19:57 | 05:39 20:51 | 04:54 21:38 | |
| 5 | 08:33 16:13 | 07:57 17:07 | 06:58 18:01 | 06:44 19:59 | 05:37 20:53 | 04:53 21:39 | |
| 6 | 08:32 16:14 | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:55 | 04:52 21:40 | |
| 7 | 08:32 16:16 | 07:54 17:11 | 06:54 18:05 | 06:39 20:02 | 05:33 20:56 | 04:52 21:41 | |
| 8 | 08:31 16:17 | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 | 04:51 21:42 | |
| 9 | 08:31 16:19 | 07:50 17:15 | 08:25 (Vorbelastung 03) 08:37 (Vorbelastung 03) | 06:49 18:09 | 06:34 20:06 | 05:30 21:00 | 04:51 21:43 |
| 10 | 08:30 16:20 | 07:48 17:17 | 08:22 (Vorbelastung 03) 08:39 (Vorbelastung 03) | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 | 04:50 21:44 |
| 11 | 08:29 16:22 | 07:46 17:19 | 08:21 (Vorbelastung 03) 08:41 (Vorbelastung 03) | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 | 04:50 21:45 |
| 12 | 08:29 16:23 | 07:44 17:21 | 08:19 (Vorbelastung 03) 08:42 (Vorbelastung 03) | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 | 04:49 21:45 |
| 13 | 08:28 16:25 | 07:42 17:23 | 08:19 (Vorbelastung 03) 08:44 (Vorbelastung 03) | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 | 04:49 21:46 |
| 14 | 08:27 16:26 | 07:40 17:25 | 08:18 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 | 04:49 21:47 |
| 15 | 08:26 16:28 | 07:38 17:27 | 08:16 (Vorbelastung 03) 08:44 (Vorbelastung 03) | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 | 04:49 21:47 |
| 16 | 08:25 16:30 | 07:36 17:29 | 08:16 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:32 18:22 | 06:18 20:19 | 05:17 21:12 | 04:48 21:48 |
| 17 | 08:24 16:31 | 07:34 17:30 | 08:16 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 | 04:48 21:48 |
| 18 | 08:23 16:33 | 07:32 17:32 | 08:16 (Vorbelastung 03) 08:46 (Vorbelastung 03) | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 | 04:48 21:49 |
| 19 | 08:22 16:35 | 07:30 17:34 | 08:16 (Vorbelastung 03) 08:46 (Vorbelastung 03) | 06:25 18:28 | 06:11 20:24 | 05:13 21:16 | 04:48 21:49 |
| 20 | 08:21 16:36 | 07:27 17:36 | 08:15 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 | 04:48 21:50 |
| 21 | 08:20 16:38 | 07:25 17:38 | 08:15 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:20 18:31 | 06:07 20:28 | 05:10 21:19 | 04:48 21:50 |
| 22 | 08:19 16:40 | 07:23 17:40 | 08:16 (Vorbelastung 03) 08:45 (Vorbelastung 03) | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 | 04:49 21:50 |
| 23 | 08:17 16:42 | 07:21 17:42 | 08:17 (Vorbelastung 03) 08:44 (Vorbelastung 03) | 06:15 18:35 | 06:02 20:31 | 05:07 21:23 | 04:49 21:50 |
| 24 | 08:16 16:44 | 07:19 17:44 | 08:17 (Vorbelastung 03) 08:43 (Vorbelastung 03) | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 | 04:49 21:50 |
| 25 | 08:15 16:46 | 07:16 17:46 | 08:18 (Vorbelastung 03) 08:42 (Vorbelastung 03) | 06:10 18:39 | 05:58 20:35 | 05:04 21:25 | 04:50 21:50 |
| 26 | 08:13 16:47 | 07:14 17:48 | 08:19 (Vorbelastung 03) 08:41 (Vorbelastung 03) | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 16:49 | 07:12 17:50 | 08:20 (Vorbelastung 03) 08:38 (Vorbelastung 03) | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 16:51 | 07:10 17:52 | 08:23 (Vorbelastung 03) 08:36 (Vorbelastung 03) | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 | 04:51 21:50 |
| 29 | 08:09 16:53 | | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | | | 06:58 19:48 | 05:47 20:44 | 04:59 21:32 | 04:52 21:50 |
| 31 | 08:06 16:57 | | | 06:56 19:49 | | 04:57 21:33 | |
| Sonnenscheinstunden | 252 | 274 | | 367 | 419 | 492 | 508 |
| astr.max.mögl.Beschattung | | 489 | | | | | |

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 WEA 2 Schattenrezeptor: IO-K - Heide 6, Heide

Voraussetzungen für Berechnung des Schattenwurfs

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

| | July | August | September | Oktober | | November | | Dezember |
|----|---------------------------|----------------|----------------|----------------|----|--------------------------------------------------------------------|----|--------------------------------------------------------------------|
| 1 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:57 | | 07:15 16:47 | 16 | 07:52 (Vorbelastung 03) 08:09 08:08 (Vorbelastung 03) 16:03 |
| 2 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | | 07:17 16:45 | 11 | 07:55 (Vorbelastung 03) 08:10 08:06 (Vorbelastung 03) 16:03 |
| 3 | 04:54 21:49 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | | 07:19 16:43 | | 07:19 08:12 16:02 16:02 |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | | 07:20 16:41 | | 07:20 08:13 16:39 16:01 |
| 5 | 04:56 21:48 | 05:38 21:08 | 06:32 20:00 | 07:25 18:47 | | 07:22 16:39 | | 07:22 08:15 16:39 16:01 |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:45 | | 07:24 16:37 | | 07:24 08:16 16:37 16:00 |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | | 07:26 16:36 | | 07:26 08:17 16:36 16:00 |
| 8 | 04:59 21:46 | 05:44 21:02 | 06:37 19:53 | 07:30 18:40 | | 07:28 16:34 | | 07:28 08:19 16:34 15:59 |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | | 07:30 16:32 | | 07:30 08:20 16:32 15:59 |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | | 07:32 16:30 | | 07:32 08:21 16:30 15:59 |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | | 07:34 16:29 | | 07:34 08:22 16:29 15:59 |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | | 07:36 16:27 | | 07:36 08:23 16:27 15:58 |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 9 | 08:58 (Vorbelastung 03) 07:38 09:07 (Vorbelastung 03) 16:25 | | 07:38 08:24 16:25 15:58 |
| 14 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 15 | 08:55 (Vorbelastung 03) 07:39 09:10 (Vorbelastung 03) 16:24 | | 07:39 08:25 16:24 15:58 |
| 15 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 19 | 08:53 (Vorbelastung 03) 07:41 09:12 (Vorbelastung 03) 16:22 | | 07:41 08:26 16:22 15:58 |
| 16 | 05:08 21:38 | 05:57 20:46 | 06:51 19:33 | 07:45 18:21 | 22 | 08:51 (Vorbelastung 03) 07:43 09:13 (Vorbelastung 03) 16:21 | | 07:43 08:27 16:21 15:58 |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 24 | 08:50 (Vorbelastung 03) 07:45 09:14 (Vorbelastung 03) 16:19 | | 07:45 08:28 16:19 15:59 |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 26 | 08:48 (Vorbelastung 03) 07:47 09:14 (Vorbelastung 03) 16:18 | | 07:47 08:29 16:18 15:59 |
| 19 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 28 | 08:47 (Vorbelastung 03) 07:49 09:15 (Vorbelastung 03) 16:16 | | 07:49 08:29 16:16 15:59 |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 29 | 08:46 (Vorbelastung 03) 07:50 09:15 (Vorbelastung 03) 16:15 | | 07:50 08:30 16:15 15:59 |
| 21 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 29 | 08:46 (Vorbelastung 03) 07:52 09:15 (Vorbelastung 03) 16:14 | | 07:52 08:31 16:14 16:00 |
| 22 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 30 | 08:45 (Vorbelastung 03) 07:54 09:15 (Vorbelastung 03) 16:13 | | 07:54 08:31 16:13 16:00 |
| 23 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 30 | 08:45 (Vorbelastung 03) 07:56 09:15 (Vorbelastung 03) 16:11 | | 07:56 08:32 16:11 16:01 |
| 24 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 08:00 18:03 | 30 | 08:45 (Vorbelastung 03) 07:57 09:15 (Vorbelastung 03) 16:10 | | 07:57 08:32 16:10 16:01 |
| 25 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 07:01 17:01 | 30 | 07:45 (Vorbelastung 03) 07:59 08:15 (Vorbelastung 03) 16:09 | | 07:59 08:33 16:09 16:02 |
| 26 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 07:03 16:59 | 28 | 07:46 (Vorbelastung 03) 08:01 08:14 (Vorbelastung 03) 16:08 | | 08:01 08:33 16:08 16:03 |
| 27 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 07:05 16:57 | 28 | 07:47 (Vorbelastung 03) 08:02 08:15 (Vorbelastung 03) 16:07 | | 08:02 08:33 16:07 16:03 |
| 28 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 07:07 16:55 | 26 | 07:48 (Vorbelastung 03) 08:04 08:14 (Vorbelastung 03) 16:06 | | 08:04 08:33 16:06 16:04 |
| 29 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 07:09 16:53 | 25 | 07:48 (Vorbelastung 03) 08:06 08:13 (Vorbelastung 03) 16:05 | | 08:06 08:33 16:05 16:05 |
| 30 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 07:11 16:51 | 23 | 07:49 (Vorbelastung 03) 08:07 08:12 (Vorbelastung 03) 16:04 | | 08:07 08:34 16:04 16:06 |
| 31 | 05:30 21:17 | 06:23 20:12 | | 07:13 16:49 | 19 | 07:51 (Vorbelastung 03) 08:10 (Vorbelastung 03) | | 07:13 08:34 16:04 16:07 |
| | Sonnenscheinstunden 510 | 458 | 382 | 329 | | 261 | 27 | 236 |
| | astr.max.mögl.Beschattung | | | 470 | | 27 | | |

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 WEA 2 Schattenrezeptor: IO-L - Gewerbegebiet Gresse, Gresse Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | Juni |
|---------------------------|----------------|-------------------------|----------------|----------------|----------------|----------------|
| 1 | 08:33 16:08 | 10:14 (Vorbelastung 03) | 08:04 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 20:46 |
| 2 | 08:33 16:09 | 10:15 (Vorbelastung 03) | 08:02 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 20:47 |
| 3 | 08:33 16:11 | 10:15 (Vorbelastung 03) | 08:01 17:03 | 07:03 17:58 | 06:48 19:55 | 05:41 20:49 |
| 4 | 08:33 16:12 | 10:16 (Vorbelastung 03) | 07:59 17:05 | 07:00 17:59 | 06:46 19:57 | 05:39 20:51 |
| 5 | 08:33 16:13 | 10:16 (Vorbelastung 03) | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 20:53 |
| 6 | 08:32 16:14 | 10:17 (Vorbelastung 03) | 07:55 17:09 | 06:56 18:03 | 06:41 20:00 | 05:35 20:54 |
| 7 | 08:32 16:16 | 10:17 (Vorbelastung 03) | 07:53 17:11 | 06:53 18:05 | 06:39 20:02 | 05:33 20:56 |
| 8 | 08:31 16:17 | 10:17 (Vorbelastung 03) | 07:52 17:13 | 06:51 18:07 | 06:37 20:04 | 05:31 20:58 |
| 9 | 08:31 16:19 | 10:18 (Vorbelastung 03) | 07:50 17:15 | 06:49 18:09 | 06:34 20:06 | 05:29 21:00 |
| 10 | 08:30 16:20 | 10:19 (Vorbelastung 03) | 07:48 17:17 | 06:46 18:11 | 06:32 20:08 | 05:28 21:01 |
| 11 | 08:29 16:21 | 10:19 (Vorbelastung 03) | 07:46 17:19 | 06:44 18:13 | 06:29 20:09 | 05:26 21:03 |
| 12 | 08:29 16:23 | 10:20 (Vorbelastung 03) | 07:44 17:21 | 06:42 18:15 | 06:27 20:11 | 05:24 21:05 |
| 13 | 08:28 16:25 | 10:20 (Vorbelastung 03) | 07:42 17:23 | 06:39 18:16 | 06:25 20:13 | 05:22 21:07 |
| 14 | 08:27 16:26 | 10:21 (Vorbelastung 03) | 07:40 17:25 | 06:37 18:18 | 06:22 20:15 | 05:21 21:08 |
| 15 | 08:26 16:28 | 10:22 (Vorbelastung 03) | 07:38 17:26 | 06:34 18:20 | 06:20 20:17 | 05:19 21:10 |
| 16 | 08:25 16:29 | 10:22 (Vorbelastung 03) | 07:36 17:28 | 06:32 18:22 | 06:18 20:18 | 05:17 21:12 |
| 17 | 08:24 16:31 | 10:23 (Vorbelastung 03) | 07:34 17:30 | 06:30 18:24 | 06:16 20:20 | 05:16 21:13 |
| 18 | 08:23 16:33 | 10:23 (Vorbelastung 03) | 07:32 17:32 | 06:27 18:26 | 06:13 20:22 | 05:14 21:15 |
| 19 | 08:22 16:35 | 10:24 (Vorbelastung 03) | 07:30 17:34 | 06:25 18:27 | 06:11 20:24 | 05:13 21:16 |
| 20 | 08:21 16:36 | 10:26 (Vorbelastung 03) | 07:27 17:36 | 06:22 18:29 | 06:09 20:26 | 05:11 21:18 |
| 21 | 08:20 16:38 | 10:26 (Vorbelastung 03) | 07:25 17:38 | 06:20 18:31 | 06:06 20:28 | 05:10 21:19 |
| 22 | 08:19 16:40 | 10:27 (Vorbelastung 03) | 07:23 17:40 | 06:18 18:33 | 06:04 20:29 | 05:08 21:21 |
| 23 | 08:17 16:42 | 10:28 (Vorbelastung 03) | 07:21 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 21:22 |
| 24 | 08:16 16:44 | 10:30 (Vorbelastung 03) | 07:19 17:44 | 06:13 18:37 | 06:00 20:33 | 05:06 21:24 |
| 25 | 08:15 16:45 | 10:31 (Vorbelastung 03) | 07:16 17:46 | 06:10 18:38 | 05:58 20:35 | 05:04 21:25 |
| 26 | 08:13 16:47 | 10:33 (Vorbelastung 03) | 07:14 17:48 | 06:08 18:40 | 05:56 20:37 | 05:03 21:27 |
| 27 | 08:12 16:49 | 10:35 (Vorbelastung 03) | 07:12 17:50 | 06:05 18:42 | 05:53 20:38 | 05:02 21:28 |
| 28 | 08:10 16:51 | 10:38 (Vorbelastung 03) | 07:10 17:52 | 06:03 18:44 | 05:51 20:40 | 05:01 21:30 |
| 29 | 08:09 16:53 | 10:45 (Vorbelastung 03) | | 07:01 19:46 | 05:49 20:42 | 05:00 21:31 |
| 30 | 08:07 16:55 | 10:46 (Vorbelastung 03) | | 06:58 19:48 | 05:47 20:44 | 04:58 21:32 |
| 31 | 08:06 16:57 | | | 06:56 19:49 | | 04:57 21:33 |
| Sonnenscheinstunden | 252 | | 274 | 367 | 419 | 492 |
| astr.max.mögl.Beschattung | 1058 | | | | | 508 |

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 WEA 2 Schattenrezeptor: IO-L - Gewerbegebiet Gresse, Gresse Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 21:49 | 05:32 21:15 | 06:25 20:09 | 07:17 18:56 | 07:15 16:47 | | 08:09 16:03 43 10:01 (Vorbelastung 03) |
| 2 | 04:53 21:49 | 05:33 21:13 | 06:27 20:07 | 07:19 18:54 | 07:17 16:45 | | 08:10 16:03 43 10:02 (Vorbelastung 03) |
| 3 | 04:54 21:49 | 05:35 21:11 | 06:29 20:05 | 07:21 18:52 | 07:19 16:43 | | 08:12 16:02 44 10:01 (Vorbelastung 03) |
| 4 | 04:55 21:48 | 05:37 21:09 | 06:30 20:02 | 07:23 18:49 | 07:20 16:41 | | 08:13 16:01 44 10:02 (Vorbelastung 03) |
| 5 | 04:56 21:48 | 05:38 21:08 | 06:32 20:00 | 07:25 18:47 | 07:22 16:39 | | 08:15 16:01 44 10:02 (Vorbelastung 03) |
| 6 | 04:57 21:47 | 05:40 21:06 | 06:34 19:57 | 07:26 18:44 | 07:24 16:37 | | 08:16 16:00 44 10:03 (Vorbelastung 03) |
| 7 | 04:58 21:46 | 05:42 21:04 | 06:36 19:55 | 07:28 18:42 | 07:26 16:36 | | 08:17 16:00 44 10:03 (Vorbelastung 03) |
| 8 | 04:59 21:46 | 05:43 21:02 | 06:37 19:53 | 07:30 18:40 | 07:28 16:34 | | 08:19 15:59 44 10:03 (Vorbelastung 03) |
| 9 | 05:00 21:45 | 05:45 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 16:32 | | 08:20 15:59 44 10:04 (Vorbelastung 03) |
| 10 | 05:01 21:44 | 05:47 20:58 | 06:41 19:48 | 07:34 18:35 | 07:32 16:30 | | 08:21 15:59 44 10:04 (Vorbelastung 03) |
| 11 | 05:02 21:43 | 05:49 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 16:29 | | 08:22 15:59 44 10:04 (Vorbelastung 03) |
| 12 | 05:03 21:42 | 05:50 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 16:27 | | 08:23 15:58 44 10:05 (Vorbelastung 03) |
| 13 | 05:04 21:41 | 05:52 20:52 | 06:46 19:40 | 07:39 18:28 | 07:38 16:25 | 3 | 10:16 (Vorbelastung 03) 08:24 10:19 (Vorbelastung 03) 15:58 44 10:05 (Vorbelastung 03) |
| 14 | 05:05 21:40 | 05:54 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 16:24 | 15 | 10:10 (Vorbelastung 03) 08:25 10:25 (Vorbelastung 03) 15:58 44 10:06 (Vorbelastung 03) |
| 15 | 05:07 21:39 | 05:56 20:48 | 06:49 19:36 | 07:43 18:23 | 07:41 16:22 | 20 | 10:08 (Vorbelastung 03) 08:26 10:28 (Vorbelastung 03) 15:58 44 10:06 (Vorbelastung 03) |
| 16 | 05:08 21:38 | 05:57 20:45 | 06:51 19:33 | 07:45 18:21 | 07:43 16:21 | 24 | 10:06 (Vorbelastung 03) 08:27 10:30 (Vorbelastung 03) 15:58 44 10:07 (Vorbelastung 03) |
| 17 | 05:09 21:37 | 05:59 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 16:19 | 27 | 10:05 (Vorbelastung 03) 08:28 10:32 (Vorbelastung 03) 15:59 44 10:07 (Vorbelastung 03) |
| 18 | 05:11 21:36 | 06:01 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 16:18 | 29 | 10:04 (Vorbelastung 03) 08:29 10:33 (Vorbelastung 03) 15:59 44 10:08 (Vorbelastung 03) |
| 19 | 05:12 21:35 | 06:02 20:39 | 06:56 19:26 | 07:50 18:14 | 07:49 16:16 | 32 | 10:03 (Vorbelastung 03) 08:29 10:35 (Vorbelastung 03) 15:59 44 10:08 (WEA 2) |
| 20 | 05:13 21:33 | 06:04 20:37 | 06:58 19:23 | 07:52 18:12 | 07:50 16:15 | 34 | 10:02 (Vorbelastung 03) 08:30 10:36 (Vorbelastung 03) 15:59 43 10:09 (WEA 2) |
| 21 | 05:15 21:32 | 06:06 20:35 | 07:00 19:21 | 07:54 18:10 | 07:52 16:14 | 35 | 10:02 (Vorbelastung 03) 08:31 10:37 (Vorbelastung 03) 16:00 43 10:10 (WEA 2) |
| 22 | 05:16 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 18:08 | 07:54 16:12 | 36 | 10:02 (Vorbelastung 03) 08:31 10:38 (Vorbelastung 03) 16:00 43 10:10 (WEA 2) |
| 23 | 05:18 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 18:06 | 07:56 16:11 | 38 | 10:01 (Vorbelastung 03) 08:32 10:39 (Vorbelastung 03) 16:01 43 10:11 (WEA 2) |
| 24 | 05:19 21:28 | 06:11 20:28 | 07:05 19:14 | 07:59 18:03 | 07:57 16:10 | 39 | 10:01 (Vorbelastung 03) 08:32 10:40 (Vorbelastung 03) 16:01 44 10:11 (WEA 2) |
| 25 | 05:21 21:26 | 06:13 20:26 | 07:07 19:11 | 08:01 17:01 | 07:59 16:09 | 40 | 10:00 (Vorbelastung 03) 08:33 10:40 (Vorbelastung 03) 16:02 44 10:11 (WEA 2) |
| 26 | 05:22 21:25 | 06:15 20:23 | 07:09 19:09 | 08:01 16:59 | 08:01 16:08 | 41 | 10:00 (Vorbelastung 03) 08:33 10:41 (Vorbelastung 03) 16:03 44 10:11 (WEA 2) |
| 27 | 05:24 21:23 | 06:16 20:21 | 07:10 19:06 | 08:02 16:57 | 08:02 16:07 | 41 | 10:01 (Vorbelastung 03) 08:33 10:42 (Vorbelastung 03) 16:03 43 10:12 (Vorbelastung 03) |
| 28 | 05:25 21:22 | 06:18 20:19 | 07:12 19:04 | 08:04 16:55 | 08:04 16:06 | 41 | 10:01 (Vorbelastung 03) 08:33 10:42 (Vorbelastung 03) 16:04 44 10:12 (Vorbelastung 03) |
| 29 | 05:27 21:20 | 06:20 20:16 | 07:14 19:01 | 08:06 16:53 | 08:06 16:05 | 42 | 10:01 (Vorbelastung 03) 08:33 10:43 (Vorbelastung 03) 16:05 44 10:12 (Vorbelastung 03) |
| 30 | 05:29 21:18 | 06:22 20:14 | 07:16 18:59 | 08:07 16:51 | 08:07 16:04 | 42 | 10:01 (Vorbelastung 03) 08:33 10:43 (Vorbelastung 03) 16:06 44 10:13 (Vorbelastung 03) |
| 31 | 05:30 21:17 | 06:23 20:12 | | 08:07 16:49 | | | 08:33 16:07 43 10:14 (Vorbelastung 03) |
| Sonnenscheinstunden | | 510 | 458 | 382 | 329 | 261 | 236 |
| astr.max.mögl.Beschattung | | | | | 579 | | 1356 |

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) | Zeitpunkt (SS:MM) Schattende | (WEA mit letztem Schatten) |
|--------------|-----------------------|-------------------------|----------------------|----------------------------------|---------------------------|------------------------------|----------------------------|

SHADOW - Kalender

Berechnung: Gesamtbelastung WEA 2 Schattenrezeptor: IO-M - Badekower Strasse 14, Gresse
Voraussetzungen für Berechnung des Schattenwurfs

- 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

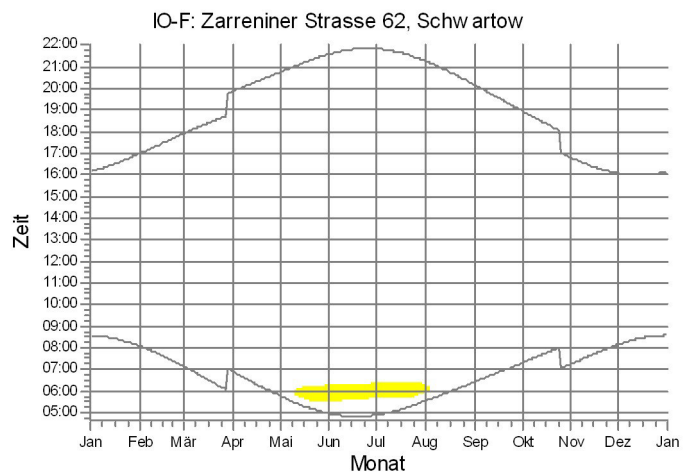
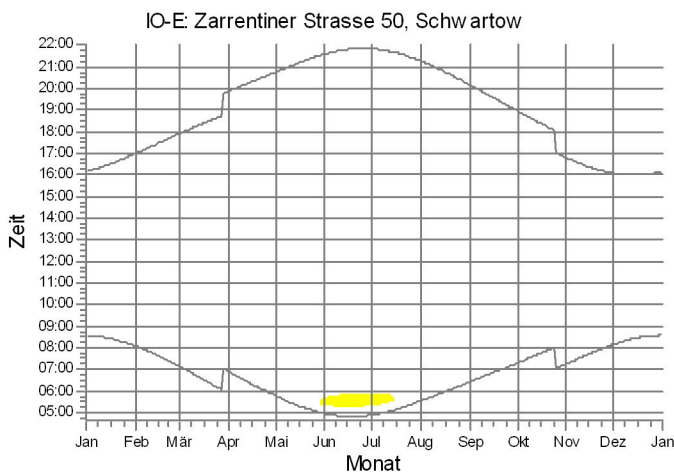
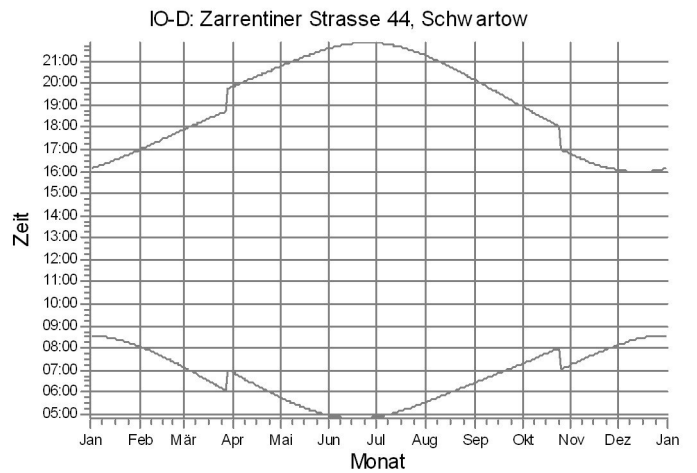
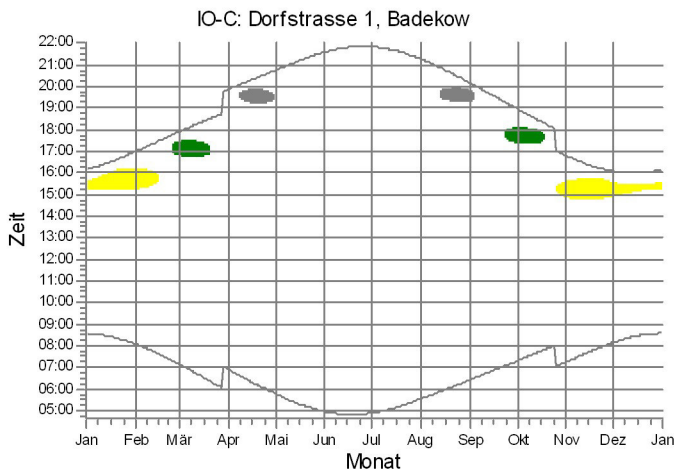
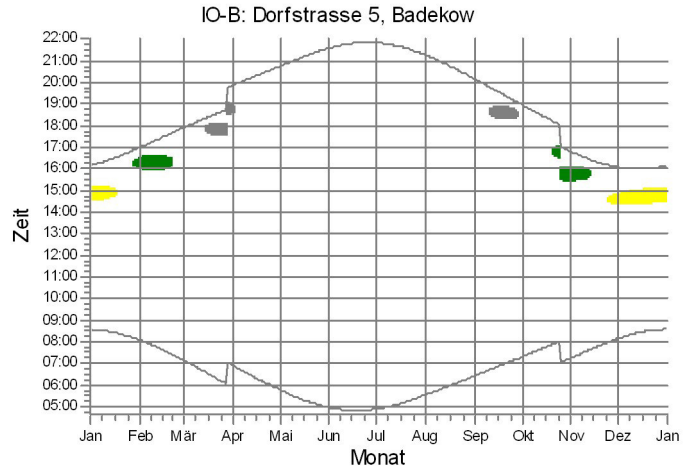
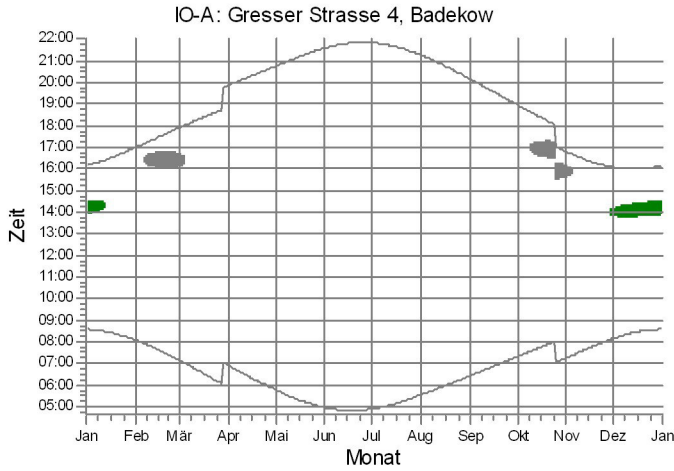
| | Januar | Februar | März | April | Mai | Juni | Juli | August | September | Oktober | November | Dezember | |
|----|---------------------------|----------------------------|-------|-------|-------|-------|-------|--------|-----------|---------|----------|----------|----------|
| 1 | 08:33 | 11:18 (Vorbelastung 03) | 08:04 | 07:07 | 06:53 | 05:45 | 04:56 | 04:53 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| 2 | 16:08 | 23 11:41 (Vorbelastung 03) | 16:59 | 17:54 | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:56 | 16:47 | 16:03 |
| 3 | 08:33 | 11:19 (Vorbelastung 03) | 08:02 | 07:05 | 06:51 | 05:43 | 04:56 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 |
| 4 | 16:09 | 22 11:41 (Vorbelastung 03) | 17:01 | 17:56 | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:03 |
| 5 | 08:33 | 11:19 (Vorbelastung 03) | 08:01 | 07:03 | 06:48 | 05:41 | 04:55 | 04:54 | 05:35 | 06:29 | 07:21 | 07:19 | 08:12 |
| 6 | 16:11 | 21 11:40 (Vorbelastung 03) | 17:03 | 17:58 | 19:55 | 20:49 | 21:37 | 21:49 | 21:11 | 20:05 | 18:52 | 16:43 | 16:02 |
| 7 | 08:33 | 11:21 (Vorbelastung 03) | 07:59 | 07:00 | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| 8 | 16:12 | 19 11:40 (Vorbelastung 03) | 17:05 | 17:59 | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 9 | 08:33 | 11:22 (Vorbelastung 03) | 07:57 | 06:58 | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:25 | 07:22 | 08:15 |
| 10 | 16:13 | 17 11:39 (Vorbelastung 03) | 17:07 | 18:01 | 19:58 | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 11 | 08:32 | 11:24 (Vorbelastung 03) | 07:55 | 06:56 | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| 12 | 16:14 | 15 11:39 (Vorbelastung 03) | 17:09 | 18:03 | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 13 | 08:32 | 11:26 (Vorbelastung 03) | 07:53 | 06:53 | 06:39 | 05:33 | 04:52 | 04:58 | 05:42 | 06:35 | 07:28 | 07:26 | 08:17 |
| 14 | 16:16 | 11 11:37 (Vorbelastung 03) | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 16:36 | 16:00 |
| 15 | 08:31 | 11:29 (Vorbelastung 03) | 07:52 | 06:51 | 06:37 | 05:31 | 04:51 | 04:59 | 05:43 | 06:37 | 07:30 | 07:28 | 08:19 |
| 16 | 16:17 | 5 11:34 (Vorbelastung 03) | 17:13 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:53 | 18:40 | 16:34 | 15:59 |
| 17 | 08:31 | | 07:50 | 06:49 | 06:34 | 05:29 | 04:51 | 05:00 | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| 18 | 16:19 | | 17:15 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 19 | 08:30 | | 07:48 | 06:46 | 06:32 | 05:28 | 04:50 | 05:01 | 05:47 | 06:41 | 07:34 | 07:32 | 08:21 |
| 20 | 16:20 | | 17:17 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 21 | 08:29 | | 07:46 | 06:44 | 06:29 | 05:26 | 04:50 | 05:02 | 05:49 | 06:42 | 07:35 | 07:34 | 08:22 |
| 22 | 16:21 | | 17:19 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 16:29 | 15:59 |
| 23 | 08:29 | | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| 24 | 16:23 | | 17:21 | 18:15 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 25 | 08:28 | | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:39 | 07:38 | 08:24 |
| 26 | 16:25 | | 17:23 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 27 | 08:27 | | 07:40 | 06:37 | 06:22 | 05:21 | 04:49 | 05:05 | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| 28 | 16:26 | | 17:25 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 29 | 08:26 | | 07:38 | 06:34 | 06:20 | 05:19 | 04:48 | 05:07 | 05:55 | 06:49 | 07:43 | 07:41 | 08:26 |
| 30 | 16:28 | | 17:26 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 20:48 | 19:36 | 18:23 | 16:22 | 15:58 |
| 31 | 08:25 | | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:45 | 07:43 | 08:27 |
| 32 | 16:29 | | 17:28 | 18:22 | 20:18 | 21:12 | 21:48 | 21:38 | 20:45 | 19:33 | 18:21 | 16:21 | 15:58 |
| 33 | 08:24 | | 07:34 | 06:30 | 06:16 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 |
| 34 | 16:31 | | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18:19 | 16:19 | 15:58 |
| 35 | 08:23 | | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:11 | 06:01 | 06:55 | 07:48 | 07:47 | 08:29 |
| 36 | 16:33 | | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 18:17 | 16:18 | 15:59 |
| 37 | 08:22 | | 07:30 | 06:25 | 06:11 | 05:13 | 04:48 | 05:12 | 06:02 | 06:56 | 07:50 | 07:49 | 08:29 |
| 38 | 16:35 | | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 |
| 39 | 08:21 | | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 |
| 40 | 16:36 | | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 |
| 41 | 08:20 | | 07:25 | 06:20 | 06:06 | 05:10 | 04:48 | 05:15 | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 |
| 42 | 16:38 | | 17:38 | 18:31 | 20:28 | 21:19 | 21:50 | 21:32 | 20:35 | 19:21 | 18:10 | 16:14 | 16:00 |
| 43 | 08:19 | | 07:23 | 06:18 | 06:04 | 05:08 | 04:49 | 05:16 | 06:08 | 07:02 | 07:56 | 07:54 | 08:31 |
| 44 | 16:40 | | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 16:12 | 16:00 |
| 45 | 08:17 | | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 |
| 46 | 16:42 | | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:06 | 16:11 | 16:01 |
| 47 | 08:16 | | 07:19 | 06:13 | 06:00 | 05:06 | 04:49 | 05:19 | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 |
| 48 | 16:44 | | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:14 | 18:03 | 16:10 | 16:01 |
| 49 | 08:15 | | 07:16 | 06:10 | 05:58 | 05:04 | 04:49 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:33 |
| 50 | 16:45 | | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 20:26 | 19:11 | 17:01 | 16:09 | 16:02 |
| 51 | 08:13 | | 07:14 | 06:08 | 05:56 | 05:03 | 04:50 | 05:22 | 06:15 | 07:09 | 07:03 | 08:01 | 08:33 |
| 52 | 16:47 | | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 18:59 | 16:08 | 16:03 |
| 53 | 08:12 | | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 |
| 54 | 16:49 | | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 18:57 | 16:07 | 16:03 |
| 55 | 08:10 | | 07:10 | 06:03 | 05:51 | 05:01 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 |
| 56 | 16:51 | | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 18:55 | 16:06 | 16:04 |
| 57 | 08:09 | | 07:01 | 05:49 | 05:00 | 04:51 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 | 11:14 |
| 58 | 16:53 | | 19:46 | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 18:53 | 16:05 | 16:05 | 26 11:40 |
| 59 | 08:07 | | 06:58 | 05:47 | 04:58 | 04:52 | 05:29 | 06:22 | 07:16 | 07:11 | 08:07 | 08:33 | 11:15 |
| 60 | 16:55 | | 19:48 | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 18:51 | 16:04 | 16:06 | 25 11:40 |
| 61 | 08:06 | | 06:56 | | 04:57 | | 05:30 | 06:23 | | 07:13 | | 08:33 | 11:16 |
| 62 | 16:57 | | 19:49 | | 21:33 | | 21:17 | 20:12 | | 16:49 | | 16:07 | 24 11:40 |
| 63 | Sonnenscheinstunden | 252 | | | | | | | | | | | |
| 64 | astr.max.mögl.Beschattung | 133 | 274 | 367 | 419 | 492 | 508 | 510 | 458 | 382 | 329 | 261 | 652 |

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 - Grafischer Kalender

Berechnung: Gesamtbelastung WEA 2



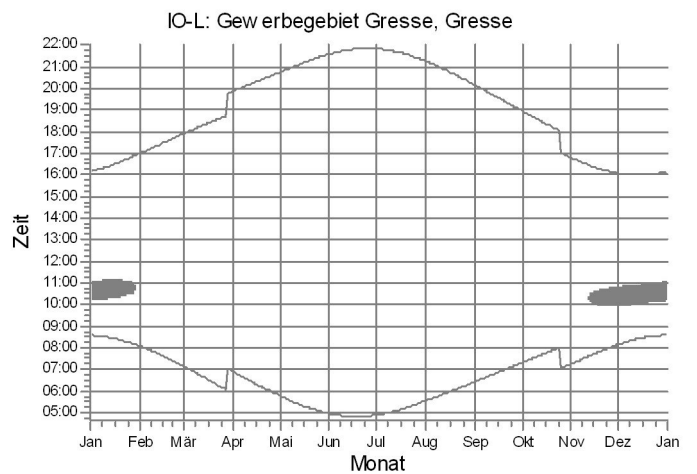
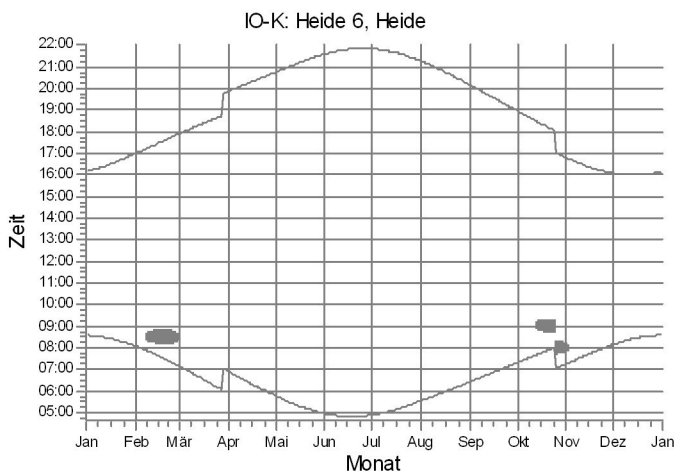
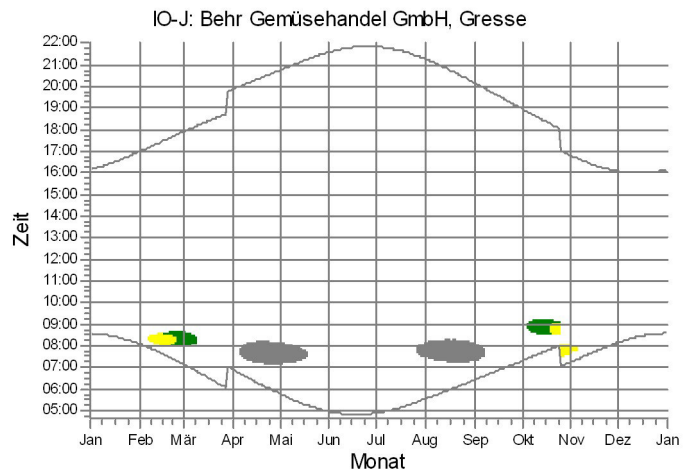
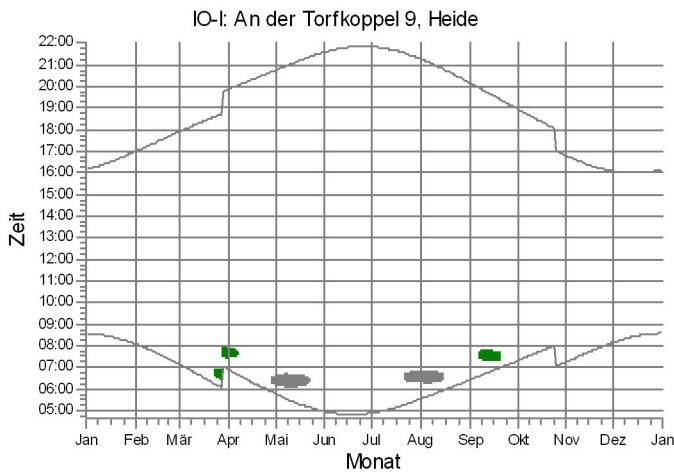
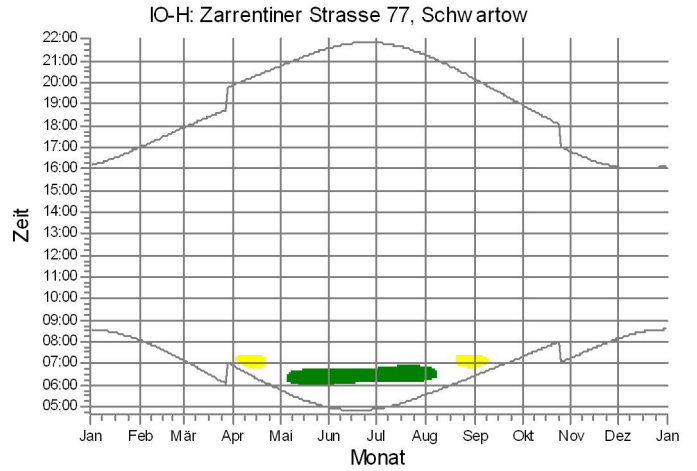
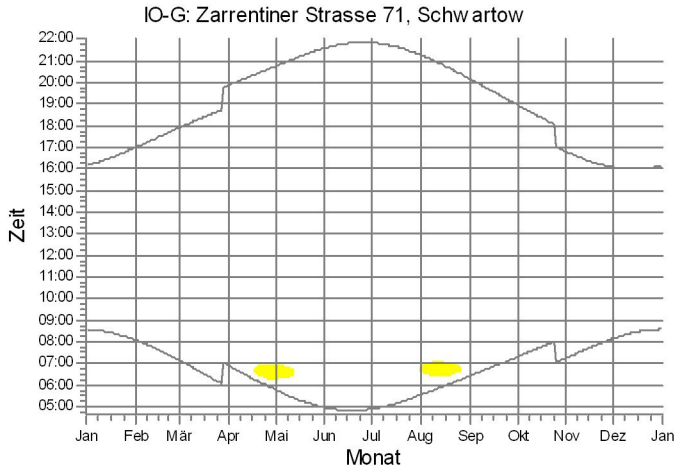
WEA

- WEA 2: WEA 2
- Vorbelastung 01: Vorbelastung 01

- Vorbelastung 03: Vorbelastung 03

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung WEA 2



WEA

- WEA 2: WEA 2
- Vorbelastung 01: Vorbelastung 01

- Vorbelastung 03: Vorbelastung 03

Projekt:

Windpark Boizenburg WEA 2

Lizenzierter Anwender:

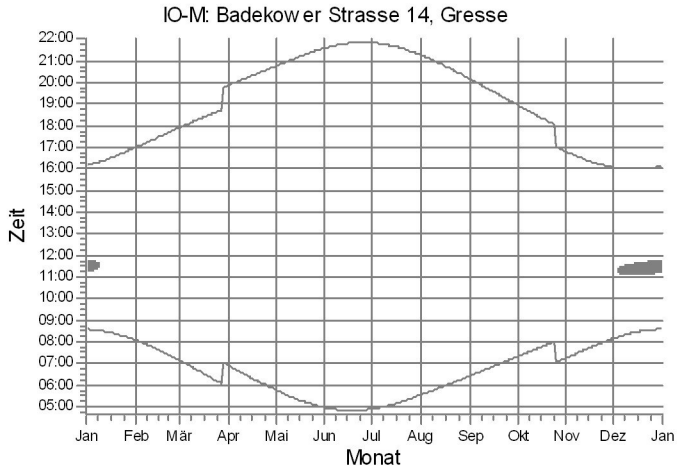
Die Naturschutzplaner GmbH
Nürnberger Strasse 28
DE-74074 Heilbronn

Berechnet:

06.08.2019 13:43/3.3.261

SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung WEA 2



WEA

Vorbelastung 03: Vorbelastung 03

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2WEA: WEA 2 - WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 13:59-14:26/27 16:08 | 08:04 16:05-16:26/21 16:59 | 07:07 08:03-08:35/32 17:54 16:53-17:22/29 | 06:53 07:30-07:51/21 19:51 | 05:45 20:46 | 04:57 06:05-06:38/33 21:35 |
| 2 | 08:33 14:00-14:26/26 16:10 | 08:02 16:04-16:27/23 17:01 | 07:05 08:03-08:33/30 17:56 16:51-17:22/31 | 06:51 07:30-07:49/19 19:53 | 05:43 20:47 | 04:56 06:05-06:38/33 21:36 |
| 3 | 08:33 14:00-14:26/26 16:11 | 08:01 16:04-16:29/25 17:03 | 07:03 08:04-08:33/29 17:58 16:50-17:23/33 | 06:48 07:30-07:48/18 19:55 | 05:41 20:49 | 04:55 06:05-06:38/33 21:37 |
| 4 | 08:33 14:02-14:26/24 16:12 | 07:59 16:03-16:30/27 17:05 | 07:00 08:05-08:32/27 17:59 16:49-17:23/34 | 06:46 07:32-07:47/15 19:57 | 05:39 20:51 | 04:54 06:06-06:38/32 21:38 |
| 5 | 08:32 14:02-14:26/24 16:13 | 07:57 16:03-16:31/28 17:07 | 06:58 08:05-08:30/25 18:01 16:48-17:24/36 | 06:44 07:33-07:44/11 19:58 | 05:37 20:53 | 04:53 06:06-06:38/32 21:39 |
| 6 | 08:32 14:04-14:26/22 16:14 | 07:55 16:02-16:32/30 17:09 | 06:56 08:07-08:28/21 18:03 16:48-17:24/36 | 06:41 07:38-07:39/1 20:00 | 05:35 06:15-06:26/11 20:54 | 04:52 06:06-06:37/31 21:40 |
| 7 | 08:32 14:04-14:26/22 16:16 | 07:53 16:02-16:32/30 17:11 | 06:53 08:08-08:25/17 18:05 16:47-17:24/37 | 06:39 20:02 | 05:33 06:12-06:28/16 20:56 | 04:52 06:07-06:38/31 21:41 |
| 8 | 08:31 14:05-14:25/20 16:17 | 07:52 16:02-16:32/30 17:13 | 06:51 08:12-08:22/10 18:07 16:47-17:24/37 | 06:37 20:04 | 05:31 06:11-06:31/20 20:58 | 04:51 06:07-06:37/30 21:42 |
| 9 | 08:31 14:07-14:25/18 16:19 | 07:50 16:01-16:33/32 17:15 | 06:49 16:46-17:23/37 18:09 | 06:34 20:06 | 05:29 06:09-06:32/23 21:00 | 04:51 06:08-06:37/29 21:43 |
| 10 | 08:30 14:09-14:24/15 16:20 | 07:48 16:01-16:33/32 17:17 | 06:46 16:47-17:23/36 18:11 | 06:32 20:08 | 05:28 06:07-06:33/26 21:01 | 04:50 06:09-06:38/29 21:44 |
| 11 | 08:29 14:11-14:23/12 16:21 | 07:46 16:02-16:33/31 17:19 | 06:44 16:47-17:23/36 18:13 | 06:29 20:09 | 05:26 06:07-06:34/27 21:03 | 04:50 06:08-06:37/29 21:45 |
| 12 | 08:29 14:13-14:21/8 16:23 | 07:44 16:02-16:33/31 17:21 | 06:42 16:47-17:22/35 18:14 | 06:27 20:11 | 05:24 06:06-06:35/29 21:05 | 04:49 06:09-06:37/28 21:45 |
| 13 | 08:28 16:25 | 07:42 16:02-16:33/31 17:23 | 06:39 16:48-17:21/33 18:16 | 06:25 20:13 | 05:22 06:04-06:35/31 21:06 | 04:49 06:10-06:37/27 21:46 |
| 14 | 08:27 16:26 | 07:40 16:02-16:32/30 17:25 | 06:37 16:48-17:20/32 18:18 | 06:22 20:15 | 05:21 06:04-06:36/32 21:08 | 04:49 06:10-06:38/28 21:47 |
| 15 | 08:26 16:28 | 07:38 08:18-08:22/4 17:26 16:02-16:31/29 | 06:34 16:49-17:19/30 18:20 | 06:20 20:17 | 05:19 06:03-06:36/33 21:10 | 04:49 06:11-06:38/27 21:47 |
| 16 | 08:25 16:29 | 07:36 08:13-08:27/14 17:28 16:03-16:31/28 | 06:32 16:49-17:17/28 18:22 | 06:18 20:18 | 05:17 06:03-06:37/34 21:11 | 04:48 06:10-06:37/27 21:48 |
| 17 | 08:24 16:31 | 07:34 08:11-08:29/18 17:30 16:04-16:30/26 | 06:30 16:51-17:16/25 18:24 | 06:16 20:20 | 05:16 06:03-06:37/34 21:13 | 04:48 06:11-06:37/26 21:48 |
| 18 | 08:23 16:33 | 07:32 08:09-08:31/22 17:32 16:06-16:29/23 | 06:27 16:53-17:14/21 18:26 | 06:13 20:22 | 05:14 06:03-06:38/35 21:15 | 04:48 06:12-06:38/26 21:49 |
| 19 | 08:22 16:35 | 07:29 08:08-08:33/25 17:34 16:08-16:28/20 | 06:25 16:55-17:10/15 18:27 | 06:11 20:24 | 05:13 06:03-06:38/35 21:16 | 04:48 06:12-06:38/26 21:49 |
| 20 | 08:21 16:36 | 07:27 08:06-08:33/27 17:36 16:09-16:25/16 | 06:22 18:29 | 06:09 20:26 | 05:11 06:02-06:38/36 21:18 | 04:48 06:12-06:38/26 21:49 |
| 21 | 08:20 16:38 | 07:25 08:05-08:34/29 17:38 16:12-16:22/10 | 06:20 18:31 | 06:06 20:27 | 05:10 06:02-06:38/36 21:19 | 04:48 06:12-06:38/26 21:50 |
| 22 | 08:18 16:40 | 07:23 08:05-08:35/30 17:40 | 06:17 18:33 | 06:04 20:29 | 05:08 06:03-06:39/36 21:21 | 04:49 06:12-06:38/26 21:50 |
| 23 | 08:17 16:42 | 07:21 08:04-08:36/32 17:42 | 06:15 18:35 | 06:02 20:31 | 05:07 06:03-06:39/36 21:22 | 04:49 06:12-06:38/26 21:50 |
| 24 | 08:16 16:44 | 07:19 08:03-08:35/32 17:44 | 06:13 06:37-06:48/11 18:37 | 06:00 20:33 | 05:06 06:02-06:38/36 21:24 | 04:49 06:13-06:39/26 21:50 |
| 25 | 08:15 16:46 | 07:16 08:03-08:36/33 17:46 17:01-17:13/12 | 06:10 06:35-06:50/15 18:38 | 05:58 20:35 | 05:04 06:02-06:38/36 21:25 | 04:50 06:13-06:39/26 21:50 |
| 26 | 08:13 16:47 | 07:14 08:03-08:36/33 17:48 16:58-17:17/19 | 06:08 06:33-06:50/17 18:40 | 05:56 20:37 | 05:03 06:03-06:38/35 21:27 | 04:50 06:13-06:40/27 21:50 |
| 27 | 08:12 16:49 | 07:12 08:02-08:35/33 17:50 16:55-17:18/23 | 06:05 06:32-06:51/19 18:42 | 05:53 20:38 | 05:02 06:03-06:38/35 21:28 | 04:50 06:13-06:40/27 21:50 |
| 28 | 08:10 16:51 | 07:10 08:03-08:35/32 17:52 16:54-17:20/26 | 06:03 06:31-06:51/20 18:44 | 05:51 20:40 | 05:01 06:03-06:38/35 21:29 | 04:51 06:14-06:41/27 21:50 |
| 29 | 08:09 16:13-16:19/6 16:53 | | 07:01 07:30-07:52/22 19:46 | 05:49 20:42 | 05:00 06:03-06:38/35 21:31 | 04:51 06:13-06:41/28 21:50 |
| 30 | 08:07 16:09-16:22/13 16:55 | | 06:58 07:30-07:52/22 19:48 | 05:47 20:44 | 04:58 06:04-06:38/34 21:32 | 06:13-06:41/28 21:50 |
| 31 | 08:06 16:07-16:24/17 16:57 | | 06:56 07:29-07:51/22 19:49 | | 04:57 06:05-06:39/34 21:33 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 |
| Anzahl Minuten mit Schatten | 280 | 997 | 940 | 85 | 810 | 850 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2 WEA: WEA 2 - WEA 2

Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 06:13-06:41/28 21:49 | 05:32 06:16-06:45/29 21:15 | 06:25 20:09 | 07:17 17:26-18:00/34 18:56 | 07:15 15:31-16:03/32 16:47 | 08:09 13:53-14:05/12 16:03 |
| 2 | 04:53 06:13-06:42/29 21:49 | 05:33 06:18-06:45/27 21:13 | 06:27 20:07 | 07:19 17:25-18:01/36 18:54 | 07:17 15:31-16:02/31 16:45 | 08:10 13:51-14:06/15 16:03 |
| 3 | 04:54 06:13-06:43/30 21:48 | 05:35 06:18-06:43/25 21:11 | 06:29 20:04 | 07:21 17:25-18:01/36 18:52 | 07:18 15:31-16:02/31 16:43 | 08:12 13:51-14:08/17 16:02 |
| 4 | 04:55 06:13-06:43/30 21:48 | 05:37 06:20-06:42/22 21:09 | 06:30 20:02 | 07:23 17:24-18:01/37 18:49 | 07:20 15:32-16:02/30 16:41 | 08:13 13:50-14:10/20 16:01 |
| 5 | 04:56 06:13-06:43/30 21:47 | 05:38 06:21-06:40/19 21:08 | 06:32 20:00 | 07:24 08:52-08:56/4 18:47 17:24-18:01/37 | 07:22 15:32-16:01/29 16:39 | 08:15 13:50-14:11/21 16:01 |
| 6 | 04:57 06:13-06:43/30 21:47 | 05:40 06:23-06:38/15 21:06 | 06:34 19:57 | 07:26 08:47-09:01/14 18:44 17:24-18:01/37 | 07:24 15:32-16:01/29 16:37 | 08:16 13:50-14:12/22 16:00 |
| 7 | 04:58 06:13-06:44/31 21:46 | 05:42 06:26-06:34/8 21:04 | 06:35 07:28-07:39/11 19:55 | 07:28 08:43-09:03/20 18:42 17:23-17:59/36 | 07:26 15:33-16:00/27 16:36 | 08:17 13:49-14:13/24 16:00 |
| 8 | 04:59 06:13-06:45/32 21:46 | 05:43 21:02 | 06:37 07:26-07:41/15 19:53 | 07:30 08:41-09:04/23 18:40 17:23-17:59/36 | 07:28 15:34-15:59/25 16:34 | 08:18 13:49-14:13/24 15:59 |
| 9 | 05:00 06:13-06:45/32 21:45 | 05:45 21:00 | 06:39 07:25-07:42/17 19:50 | 07:32 08:40-09:06/26 18:37 17:23-17:58/35 | 07:30 15:35-15:58/23 16:32 | 08:20 13:50-14:15/25 15:59 |
| 10 | 05:01 06:12-06:45/33 21:44 | 05:47 20:58 | 06:41 07:23-07:42/19 19:48 | 07:34 08:39-09:06/27 18:35 17:24-17:58/34 | 07:32 15:36-15:57/21 16:30 | 08:21 13:49-14:15/26 15:59 |
| 11 | 05:02 06:12-06:46/34 21:43 | 05:49 20:56 | 06:42 07:22-07:43/21 19:45 | 07:35 08:38-09:07/29 18:33 17:24-17:57/33 | 07:34 15:38-15:55/17 16:29 | 08:22 13:49-14:16/27 15:59 |
| 12 | 05:03 06:12-06:46/34 21:42 | 05:50 20:54 | 06:44 07:22-07:43/21 19:43 | 07:37 08:37-09:08/31 18:30 17:25-17:56/31 | 07:36 15:41-15:54/13 16:27 | 08:23 13:49-14:16/27 15:58 |
| 13 | 05:04 06:12-06:46/34 21:41 | 05:52 20:52 | 06:46 07:21-07:42/21 19:40 | 07:39 08:36-09:08/32 18:28 17:26-17:54/28 | 07:37 15:45-15:51/6 16:25 | 08:24 13:49-14:17/28 15:58 |
| 14 | 05:05 06:12-06:47/35 21:40 | 05:54 20:50 | 06:48 07:21-07:42/21 19:38 | 07:41 08:36-09:08/32 18:26 17:28-17:53/25 | 07:39 16:24 | 08:25 13:50-14:18/28 15:58 |
| 15 | 05:07 06:13-06:48/35 21:39 | 05:56 20:48 | 06:49 07:21-07:42/21 19:35 | 07:43 08:36-09:08/32 18:23 17:28-17:50/22 | 07:41 16:22 | 08:26 10:09-10:14/5 15:58 13:50-14:18/28 |
| 16 | 05:08 06:12-06:48/36 21:38 | 05:57 20:45 | 06:51 07:20-07:40/20 19:33 | 07:44 08:35-09:08/33 18:21 17:31-17:47/16 | 07:43 16:21 | 08:27 10:09-10:15/6 15:58 13:51-14:19/28 |
| 17 | 05:09 06:12-06:48/36 21:37 | 05:59 20:43 | 06:53 07:21-07:39/18 19:31 | 07:46 08:35-09:08/33 18:19 17:35-17:43/8 | 07:45 16:19 | 08:28 10:09-10:16/7 15:59 13:51-14:20/29 |
| 18 | 05:11 06:12-06:48/36 21:36 | 06:01 20:41 | 06:55 07:22-07:38/16 19:28 | 07:48 08:34-09:06/32 18:17 | 07:47 16:18 | 08:29 10:09-10:18/9 15:59 13:52-14:21/29 |
| 19 | 05:12 06:13-06:49/36 21:35 | 06:02 20:39 | 06:56 07:24-07:36/12 19:26 | 07:50 08:35-09:06/31 18:14 | 07:48 16:16 | 08:29 10:08-10:18/10 15:59 13:51-14:20/29 |
| 20 | 05:13 06:12-06:48/36 21:33 | 06:04 20:37 | 06:58 07:27-07:31/4 19:23 | 07:52 08:35-09:05/30 18:12 | 07:50 16:15 | 08:30 10:09-10:19/10 15:59 13:52-14:21/29 |
| 21 | 05:15 06:12-06:48/36 21:32 | 06:06 20:34 | 07:00 19:21 | 07:54 08:36-09:04/28 18:10 16:41-16:53/12 | 07:52 16:14 | 08:31 10:10-10:20/10 16:00 13:53-14:22/29 |
| 22 | 05:16 06:13-06:49/36 21:31 | 06:08 20:32 | 07:02 19:18 | 07:56 08:37-09:03/26 18:08 16:39-16:56/17 | 07:54 16:13 | 08:31 10:10-10:20/10 16:00 13:53-14:22/29 |
| 23 | 05:18 06:13-06:49/36 21:29 | 06:09 20:30 | 07:03 19:16 | 07:58 08:38-09:02/24 18:06 16:36-16:58/22 | 07:56 16:11 | 08:32 10:10-10:20/10 16:01 13:53-14:22/29 |
| 24 | 05:19 06:13-06:48/35 21:28 | 06:11 20:28 | 07:05 17:40-17:53/13 19:13 | 07:59 08:39-09:00/21 18:03 16:35-16:59/24 | 07:57 16:10 | 08:32 10:11-10:21/10 16:01 13:54-14:23/29 |
| 25 | 05:21 06:13-06:49/36 21:26 | 06:13 20:25 | 07:07 17:37-17:56/19 19:11 | 07:01 07:41-07:58/17 17:01 15:34-16:00/26 | 07:59 16:09 | 08:32 10:12-10:21/9 16:02 13:55-14:24/29 |
| 26 | 05:22 06:13-06:48/35 21:25 | 06:15 20:23 | 07:09 17:34-17:58/24 19:09 | 07:03 07:43-07:56/13 16:59 15:33-16:00/27 | 08:01 16:08 | 08:33 10:12-10:20/8 16:03 13:55-14:24/29 |
| 27 | 05:24 06:14-06:48/34 21:23 | 06:16 20:21 | 07:10 17:31-17:58/27 19:06 | 07:05 15:32-16:01/29 16:57 | 08:02 16:07 | 08:33 10:13-10:20/7 16:03 13:55-14:24/29 |
| 28 | 05:25 06:14-06:47/33 21:21 | 06:18 20:19 | 07:12 17:30-17:59/29 19:04 | 07:07 15:31-16:01/30 16:55 | 08:04 16:06 | 08:33 10:14-10:20/6 16:04 13:56-14:24/28 |
| 29 | 05:27 06:15-06:47/32 21:20 | 06:20 20:16 | 07:14 17:29-18:00/31 19:01 | 07:09 15:31-16:02/31 16:53 | 08:06 16:05 | 08:33 10:16-10:19/3 16:05 13:56-14:25/29 |
| 30 | 05:29 06:15-06:46/31 21:18 | 06:22 20:14 | 07:16 17:28-18:01/33 18:59 | 07:11 15:31-16:03/32 16:51 | 08:07 16:04 | 08:33 13:57-14:25/28 16:06 |
| 31 | 05:30 06:16-06:46/30 21:16 | 06:23 20:12 | | 07:13 15:31-16:03/32 16:49 | | 08:33 13:58-14:25/27 16:07 |
| | Sonnenscheinstunden 510 | 458 | 382 | 329 | 261 | 236 |
| | Anzahl Minuten mit Schatten 1031 | 145 | 413 | 1361 | 322 | 923 |

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

| Tag im Monat | Sonnenaufgang (SS:MM) | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2WEA: Vorbelastung 01 - Vorbelastung 01

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 15:19-15:32/13 16:08 14:34-15:06/32 | 08:04 15:20-16:06/46 16:59 | 07:07 17:54 | 06:53 19:51 | 05:45 06:20-06:50/30 20:45 | 04:57 05:37-06:11/34 21:35 05:27-05:36/9 |
| 2 | 08:33 15:19-15:32/13 16:10 14:34-15:06/32 | 08:02 15:20-16:06/46 17:01 | 07:05 17:56 | 06:51 19:53 | 05:43 06:21-06:50/29 20:47 | 04:56 05:26-06:11/45 21:36 |
| 3 | 08:33 15:19-15:34/15 16:11 14:35-15:06/31 | 08:00 15:21-16:06/45 17:03 | 07:03 17:57 | 06:48 19:55 | 05:41 06:21-06:50/29 20:49 | 04:55 05:25-06:11/46 21:37 |
| 4 | 08:33 15:19-15:35/16 16:12 14:36-15:07/31 | 07:59 15:22-16:06/44 17:05 | 07:00 17:59 | 06:46 07:09-07:11/2 19:57 | 05:39 06:21-06:49/28 20:51 | 04:54 05:25-06:12/47 21:38 |
| 5 | 08:32 15:19-15:36/17 16:13 14:36-15:07/31 | 07:57 15:23-16:05/42 17:07 | 06:58 18:01 | 06:44 07:07-07:15/8 19:58 | 05:37 06:22-06:48/26 20:53 | 04:53 05:24-06:12/48 21:39 |
| 6 | 08:32 15:19-15:38/19 16:14 14:37-15:07/30 | 07:55 15:23-16:05/42 17:09 | 06:56 18:03 | 06:41 07:05-07:17/12 20:00 | 05:35 06:22-06:47/25 20:54 | 04:52 05:23-06:11/48 21:40 |
| 7 | 08:32 15:19-15:39/20 16:16 14:38-15:07/29 | 07:53 08:20-08:22/2 17:11 15:24-16:04/40 | 06:53 18:05 | 06:39 07:02-07:17/15 20:02 | 05:33 06:23-06:46/23 20:56 | 04:52 05:23-06:12/49 21:41 |
| 8 | 08:31 15:18-15:41/23 16:17 14:38-15:07/29 | 07:52 08:18-08:24/6 17:13 15:25-16:03/38 | 06:51 18:07 | 06:36 07:00-07:18/18 20:04 | 05:31 06:24-06:45/21 20:58 | 04:51 05:22-06:11/49 21:42 |
| 9 | 08:31 15:18-15:42/24 16:19 14:40-15:07/27 | 07:50 08:16-08:26/10 17:15 15:27-16:02/35 | 06:49 18:09 | 06:34 06:58-07:19/21 20:06 | 05:29 06:25-06:43/18 21:00 | 04:51 05:22-06:12/50 21:43 |
| 10 | 08:30 15:18-15:44/26 16:20 14:41-15:07/26 | 07:48 08:14-08:27/13 17:17 15:28-16:01/33 | 06:46 18:11 | 06:32 06:55-07:18/23 20:08 | 05:28 06:27-06:41/14 21:01 | 04:50 05:22-06:12/50 21:44 |
| 11 | 08:29 15:18-15:46/28 16:21 14:42-15:06/24 | 07:46 08:12-08:28/16 17:19 15:30-16:00/30 | 06:44 18:13 | 06:29 06:53-07:19/26 20:09 | 05:26 06:30-06:40/10 21:03 05:53-05:58/5 | 04:50 05:21-06:12/51 21:45 |
| 12 | 08:29 15:18-15:48/30 16:23 14:43-15:06/23 | 07:44 08:10-08:28/18 17:21 15:32-15:58/26 | 06:42 18:14 | 06:27 06:52-07:19/27 20:11 | 05:24 05:51-06:00/9 21:05 | 04:49 05:21-06:12/51 21:45 |
| 13 | 08:28 15:18-15:49/31 16:25 14:44-15:05/21 | 07:42 08:08-08:29/21 17:23 15:34-15:56/22 | 06:39 18:16 | 06:25 06:52-07:19/27 20:13 | 05:22 05:49-06:02/13 21:06 | 04:49 05:21-06:12/51 21:46 |
| 14 | 08:27 15:18-15:51/33 16:26 14:46-15:05/19 | 07:40 08:06-08:29/23 17:24 15:37-15:52/15 | 06:37 18:18 | 06:22 06:51-07:18/27 20:15 | 05:21 05:48-06:04/16 21:08 | 04:49 05:21-06:13/52 21:47 |
| 15 | 08:26 15:18-15:53/35 16:28 14:48-15:04/16 | 07:38 08:04-08:28/24 17:26 | 06:34 18:20 | 06:20 06:51-07:17/26 20:17 | 05:19 05:46-06:04/18 21:10 | 04:49 05:21-06:13/52 21:47 |
| 16 | 08:25 15:18-15:55/37 16:29 14:50-15:02/12 | 07:36 08:04-08:28/24 17:28 | 06:32 18:22 | 06:18 06:52-07:17/25 20:18 | 05:17 05:45-06:06/21 21:11 | 04:48 05:20-06:12/52 21:48 |
| 17 | 08:24 15:17-15:56/39 16:31 14:53-14:59/6 | 07:34 08:05-08:28/23 17:30 | 06:30 18:24 | 06:15 06:52-07:16/24 20:20 | 05:16 05:43-06:06/23 21:13 | 04:48 05:20-06:12/52 21:48 |
| 18 | 08:23 15:17-15:58/41 16:33 | 07:32 08:05-08:28/23 17:32 | 06:27 18:26 | 06:13 06:52-07:14/22 20:22 06:37-06:42/5 | 05:14 05:42-06:07/25 21:15 | 04:48 05:21-06:12/51 21:49 |
| 19 | 08:22 15:18-16:01/43 16:35 | 07:29 08:06-08:27/21 17:34 | 06:25 18:27 | 06:11 06:53-07:13/20 20:24 06:35-06:45/10 | 05:13 05:41-06:08/27 21:16 | 04:48 05:21-06:13/52 21:49 |
| 20 | 08:21 15:18-16:03/45 16:36 | 07:27 08:07-08:25/18 17:36 | 06:22 18:29 | 06:09 06:55-07:11/16 20:26 06:33-06:47/14 | 05:11 05:39-06:08/29 21:18 | 04:48 05:21-06:13/52 21:49 |
| 21 | 08:20 15:17-16:03/46 16:38 | 07:25 08:08-08:24/16 17:38 | 06:20 18:31 | 06:06 06:57-07:09/12 20:27 06:31-06:49/18 | 05:10 05:38-06:09/31 21:19 | 04:48 05:21-06:13/52 21:50 |
| 22 | 08:18 15:18-16:04/46 16:40 | 07:23 08:10-08:22/12 17:40 | 06:17 18:33 | 06:04 06:29-06:50/21 20:29 | 05:08 05:37-06:09/32 21:21 | 04:49 05:21-06:13/52 21:50 |
| 23 | 08:17 15:17-16:04/47 16:42 | 07:21 08:15-08:18/3 17:42 | 06:15 18:35 | 06:02 06:27-06:50/23 20:31 | 05:07 05:37-06:10/33 21:22 | 04:49 05:21-06:13/52 21:50 |
| 24 | 08:16 15:18-16:05/47 16:44 | 07:19 17:44 | 06:13 18:37 | 06:00 06:24-06:50/26 20:33 | 05:06 05:36-06:09/33 21:24 | 04:49 05:22-06:14/52 21:50 |
| 25 | 08:14 15:18-16:05/47 16:45 | 07:16 17:46 | 06:10 18:38 | 05:58 06:22-06:50/28 20:35 | 05:04 05:36-06:10/34 21:25 | 04:50 05:22-06:14/52 21:50 |
| 26 | 08:13 15:18-16:06/48 16:47 | 07:14 17:48 | 06:08 18:40 | 05:56 06:21-06:51/30 20:37 | 05:03 05:36-06:10/34 21:27 | 04:50 05:23-06:15/52 21:50 |
| 27 | 08:12 15:18-16:06/48 16:49 | 07:12 17:50 | 06:05 18:42 | 05:53 06:20-06:51/31 20:38 | 05:02 05:36-06:10/34 21:28 | 04:50 05:23-06:15/52 21:50 |
| 28 | 08:10 15:18-16:06/48 16:51 | 07:10 17:52 | 06:03 18:44 | 05:51 06:20-06:51/31 20:40 | 05:01 05:36-06:10/34 21:29 | 04:51 05:24-06:16/52 21:50 |
| 29 | 08:09 15:19-16:07/48 16:53 | | 07:00 19:46 | 05:49 06:20-06:51/31 20:42 | 05:00 05:36-06:10/34 21:31 | 04:51 05:24-06:15/51 21:50 |
| 30 | 08:07 15:19-16:07/48 16:55 | | 06:58 19:47 | 05:47 06:20-06:50/30 20:44 | 04:58 05:36-06:11/35 21:32 05:28-05:32/4 | 04:52 05:25-06:16/51 21:49 |
| 31 | 08:05 15:19-16:06/47 16:57 | | 06:56 19:49 | | 04:57 05:37-06:12/35 21:33 05:28-05:35/7 | |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 507 |
| Anzahl Minuten mit Schatten | 1487 | 777 | 0 | 649 | 819 | 1509 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2WEA: Vorbelastung 01 - Vorbelastung 01

Voraussetzungen für Berechnung des Schattenwurfs

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 | 04:53 05:25-06:16/51 21:49 | 05:32 06:42-06:47/5 21:15 06:02-06:10/8 | 06:25 06:52-07:18/26 20:09 | 07:17 18:56 | 07:15 07:44-07:56/12 16:47 14:57-15:31/34 | 08:09 15:00-15:28/28 16:03 14:24-14:49/25 |
| 2 | 04:53 05:26-06:16/50 21:49 | 05:33 06:39-06:51/12 21:13 06:04-06:06/2 | 06:27 06:54-07:17/23 20:07 | 07:19 18:54 | 07:16 07:46-07:55/9 16:45 14:56-15:32/36 | 08:10 15:01-15:27/26 16:03 14:23-14:49/26 |
| 3 | 04:54 05:27-06:17/50 21:48 | 05:35 06:36-06:52/16 21:11 | 06:29 06:56-07:17/21 20:04 | 07:21 18:52 | 07:18 07:48-07:54/6 16:43 14:55-15:33/38 | 08:12 15:02-15:26/24 16:02 14:23-14:50/27 |
| 4 | 04:55 05:28-06:17/49 21:48 | 05:37 06:35-06:54/19 21:09 | 06:30 06:57-07:15/18 20:02 | 07:23 18:49 | 07:20 07:50-07:52/2 16:41 14:54-15:34/40 | 08:13 15:03-15:26/23 16:01 14:24-14:52/28 |
| 5 | 04:56 05:28-06:17/49 21:47 | 05:38 06:33-06:55/22 21:07 | 06:32 06:59-07:14/15 20:00 | 07:24 18:47 | 07:22 14:53-15:35/42 16:39 | 08:14 15:04-15:25/21 16:01 14:23-14:52/29 |
| 6 | 04:57 05:29-06:17/48 21:47 | 05:40 06:33-06:56/23 21:06 | 06:34 07:01-07:13/12 19:57 | 07:26 18:44 | 07:24 14:52-15:35/43 16:37 | 08:16 15:04-15:24/20 16:00 14:24-14:53/29 |
| 7 | 04:58 05:30-06:18/48 21:46 | 05:42 06:31-06:57/26 21:04 | 06:35 07:02-07:10/8 19:55 | 07:28 18:42 | 07:26 14:52-15:36/44 16:36 | 08:17 15:06-15:24/18 16:00 14:23-14:54/31 |
| 8 | 04:59 05:31-06:18/47 21:45 | 05:43 06:31-06:58/27 21:02 | 06:37 07:04-07:07/3 19:52 | 07:30 18:40 | 07:28 14:51-15:36/45 16:34 | 08:18 15:06-15:23/17 15:59 14:23-14:54/31 |
| 9 | 05:00 05:32-06:18/46 21:45 | 05:45 06:30-06:59/29 21:00 | 06:39 19:50 | 07:32 18:37 | 07:30 14:51-15:37/46 16:32 | 08:20 15:08-15:23/15 15:59 14:24-14:55/31 |
| 10 | 05:01 05:33-06:19/46 21:44 | 05:47 06:29-06:58/29 20:58 | 06:41 19:48 | 07:33 18:35 | 07:32 14:50-15:37/47 16:30 | 08:21 15:09-15:22/13 15:59 14:24-14:56/32 |
| 11 | 05:02 05:45-06:19/34 21:43 | 05:49 06:29-06:59/30 20:56 | 06:42 19:45 | 07:35 18:33 | 07:34 14:50-15:37/47 16:29 | 08:22 15:09-15:22/13 15:59 14:24-14:56/32 |
| 12 | 05:03 05:45-06:19/34 21:42 | 05:50 06:28-06:58/30 20:54 | 06:44 19:43 | 07:37 18:30 | 07:36 14:51-15:38/47 16:27 | 08:23 15:10-15:21/11 15:58 14:24-14:57/33 |
| 13 | 05:04 05:45-06:19/34 21:41 | 05:52 06:28-06:59/31 20:52 | 06:46 19:40 | 07:39 18:28 | 07:37 14:51-15:39/48 16:25 | 08:24 15:11-15:21/10 15:58 14:24-14:57/33 |
| 14 | 05:05 05:45-06:19/34 21:40 | 05:54 06:28-06:59/31 20:50 | 06:48 19:38 | 07:41 18:26 | 07:39 14:51-15:39/48 16:24 | 08:25 15:12-15:21/9 15:58 14:25-14:58/33 |
| 15 | 05:07 05:46-06:20/34 21:39 | 05:55 06:28-06:58/30 20:47 | 06:49 19:35 | 07:43 18:23 | 07:41 14:51-15:39/48 16:23 | 08:26 15:13-15:21/8 15:58 14:25-14:58/33 |
| 16 | 05:08 05:46-06:20/34 21:38 | 05:57 06:28-06:58/30 20:45 | 06:51 19:33 | 07:44 18:21 | 07:42 14:51-15:39/48 16:21 | 08:27 15:14-15:21/7 15:58 14:25-14:59/34 |
| 17 | 05:09 05:46-06:20/34 21:37 | 05:59 06:27-06:57/30 20:43 | 06:53 19:31 | 07:46 18:19 | 07:45 14:52-15:39/47 16:19 | 08:28 15:15-15:21/6 15:59 14:26-15:00/34 |
| 18 | 05:11 05:46-06:19/33 21:36 | 06:01 06:29-06:57/28 20:41 | 06:55 19:28 | 07:48 18:17 | 07:47 14:52-15:39/47 16:18 | 08:29 15:16-15:22/6 15:59 14:27-15:00/33 |
| 19 | 05:12 05:47-06:20/33 21:34 | 06:02 06:31-06:57/26 20:39 | 06:56 19:26 | 07:50 08:43-08:50/7 18:14 | 07:48 14:52-15:39/47 16:16 | 08:29 15:16-15:21/5 15:59 14:26-15:00/34 |
| 20 | 05:13 05:47-06:20/33 21:33 | 06:04 06:32-06:55/23 20:37 | 06:58 19:23 | 07:52 08:40-08:53/13 18:12 | 07:50 14:53-15:39/46 16:15 | 08:30 15:17-15:22/5 15:59 14:27-15:01/34 |
| 21 | 05:15 05:47-06:19/32 21:32 | 06:06 07:05-07:10/5 20:34 | 07:00 19:21 | 07:54 08:38-08:55/17 18:10 | 07:52 14:53-15:39/46 16:14 | 08:31 15:17-15:22/5 16:00 14:27-15:01/34 |
| 22 | 05:16 05:48-06:19/31 21:31 | 06:08 07:01-07:14/13 20:32 | 07:01 19:18 | 07:56 08:37-08:56/19 18:08 | 07:54 14:54-15:39/45 16:12 | 08:31 15:18-15:23/5 16:00 14:28-15:02/34 |
| 23 | 05:18 05:49-06:19/30 21:29 | 06:09 06:58-07:15/17 20:30 | 07:03 19:16 | 07:57 08:36-08:57/21 18:05 | 07:56 14:54-15:37/43 16:11 | 08:32 15:18-15:23/5 16:01 14:28-15:02/34 |
| 24 | 05:19 05:50-06:18/28 21:28 | 06:11 06:57-07:17/20 20:28 | 07:05 19:13 | 07:59 08:35-08:57/22 18:03 | 07:57 14:54-15:35/41 16:10 | 08:32 15:19-15:24/5 16:01 14:29-15:03/34 |
| 25 | 05:21 05:52-06:18/26 21:26 | 06:13 06:56-07:18/22 20:25 | 07:07 19:11 | 07:01 07:34-07:58/24 17:01 | 07:59 14:55-15:34/39 16:09 | 08:32 15:19-15:25/6 16:02 14:29-15:03/34 |
| 26 | 05:22 05:53-06:17/24 21:25 | 06:15 06:54-07:18/24 20:23 | 07:09 19:09 | 07:03 07:34-07:58/24 16:59 | 08:01 14:56-15:33/37 16:08 | 08:33 15:19-15:25/6 16:03 14:30-15:04/34 |
| 27 | 05:24 05:55-06:17/22 21:23 | 06:16 06:54-07:19/25 20:21 | 07:10 19:06 | 07:05 07:34-07:58/24 16:57 | 08:02 14:57-15:32/35 16:07 | 08:33 15:19-15:26/7 16:03 14:30-15:04/34 |
| 28 | 05:25 05:56-06:16/20 21:21 | 06:18 06:53-07:19/26 20:19 | 07:12 19:04 | 07:07 07:36-07:59/23 16:55 | 08:04 14:58-15:31/33 16:06 | 08:33 15:19-15:27/8 16:04 14:31-15:04/33 |
| 29 | 05:27 05:58-06:15/17 21:20 | 06:20 06:52-07:19/27 20:16 | 07:14 19:01 | 07:09 07:38-07:58/20 16:53 | 08:06 14:58-15:29/31 16:05 | 08:33 15:19-15:28/9 16:05 14:31-15:05/34 |
| 30 | 05:29 05:59-06:13/14 21:18 | 06:22 06:52-07:19/27 20:14 | 07:16 18:59 | 07:11 07:40-07:58/18 16:51 | 08:07 14:59-15:29/30 16:04 | 08:33 15:19-15:29/10 16:06 14:32-15:05/33 |
| 31 | 05:30 06:01-06:12/11 21:16 | 06:23 06:52-07:19/27 20:12 | | 07:13 07:42-07:57/15 16:49 | | 08:33 15:19-15:30/11 16:07 14:33-15:05/32 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | 261 | 236 |
| Anzahl Minuten mit Schatten | 1100 | 805 | 126 | 349 | 1390 | 1354 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2 WEA: Vorbelastung 02 - Vorbelastung 02

Voraussetzungen für Berechnung des Schattenwurfs

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 | 08:33 | 08:04 | 07:07 | 06:53 | 05:45 | 04:56 | 04:52 | 05:32 | 06:25 | 07:17 | 07:15 | 08:09 |
| | 16:08 | 16:59 | 17:54 | 19:51 | 20:46 | 21:35 | 21:49 | 21:15 | 20:09 | 18:56 | 16:47 | 16:03 |
| 2 | 08:33 | 08:02 | 07:05 | 06:51 | 05:43 | 04:55 | 04:53 | 05:33 | 06:27 | 07:19 | 07:17 | 08:10 |
| | 16:09 | 17:01 | 17:55 | 19:53 | 20:47 | 21:36 | 21:49 | 21:13 | 20:07 | 18:54 | 16:45 | 16:02 |
| 3 | 08:33 | 08:01 | 07:03 | 06:48 | 05:41 | 04:54 | 04:54 | 05:35 | 06:28 | 07:21 | 07:18 | 08:12 |
| | 16:10 | 17:03 | 17:57 | 19:55 | 20:49 | 21:37 | 21:49 | 21:11 | 20:04 | 18:52 | 16:43 | 16:02 |
| 4 | 08:33 | 07:59 | 07:00 | 06:46 | 05:39 | 04:54 | 04:55 | 05:37 | 06:30 | 07:23 | 07:20 | 08:13 |
| | 16:12 | 17:05 | 17:59 | 19:57 | 20:51 | 21:38 | 21:48 | 21:09 | 20:02 | 18:49 | 16:41 | 16:01 |
| 5 | 08:33 | 07:57 | 06:58 | 06:44 | 05:37 | 04:53 | 04:56 | 05:38 | 06:32 | 07:24 | 07:22 | 08:15 |
| | 16:13 | 17:07 | 18:01 | 19:58 | 20:53 | 21:39 | 21:48 | 21:08 | 20:00 | 18:47 | 16:39 | 16:01 |
| 6 | 08:32 | 07:55 | 06:56 | 06:41 | 05:35 | 04:52 | 04:57 | 05:40 | 06:34 | 07:26 | 07:24 | 08:16 |
| | 16:14 | 17:09 | 18:03 | 20:00 | 20:54 | 21:40 | 21:47 | 21:06 | 19:57 | 18:44 | 16:37 | 16:00 |
| 7 | 08:32 | 07:53 | 06:53 | 06:39 | 05:33 | 04:52 | 04:57 | 05:42 | 06:35 | 07:28 | 07:26 | 08:17 |
| | 16:16 | 17:11 | 18:05 | 20:02 | 20:56 | 21:41 | 21:46 | 21:04 | 19:55 | 18:42 | 16:35 | 16:00 |
| 8 | 08:31 | 07:52 | 06:51 | 06:36 | 05:31 | 04:51 | 04:58 | 05:43 | 06:37 | 07:30 | 07:28 | 08:19 |
| | 16:17 | 17:12 | 18:07 | 20:04 | 20:58 | 21:42 | 21:46 | 21:02 | 19:52 | 18:40 | 16:34 | 15:59 |
| 9 | 08:31 | 07:50 | 06:49 | 06:34 | 05:29 | 04:50 | 05:00 | 05:45 | 06:39 | 07:32 | 07:30 | 08:20 |
| | 16:18 | 17:14 | 18:09 | 20:06 | 21:00 | 21:43 | 21:45 | 21:00 | 19:50 | 18:37 | 16:32 | 15:59 |
| 10 | 08:30 | 07:48 | 06:46 | 06:32 | 05:27 | 04:50 | 05:01 | 05:47 | 06:41 | 07:33 | 07:32 | 08:21 |
| | 16:20 | 17:16 | 18:11 | 20:08 | 21:01 | 21:44 | 21:44 | 20:58 | 19:48 | 18:35 | 16:30 | 15:59 |
| 11 | 08:29 | 07:46 | 06:44 | 06:29 | 05:26 | 04:49 | 05:02 | 05:48 | 06:42 | 07:35 | 07:34 | 08:22 |
| | 16:21 | 17:18 | 18:13 | 20:09 | 21:03 | 21:45 | 21:43 | 20:56 | 19:45 | 18:33 | 16:28 | 15:58 |
| 12 | 08:29 | 07:44 | 06:42 | 06:27 | 05:24 | 04:49 | 05:03 | 05:50 | 06:44 | 07:37 | 07:36 | 08:23 |
| | 16:23 | 17:20 | 18:14 | 20:11 | 21:05 | 21:45 | 21:42 | 20:54 | 19:43 | 18:30 | 16:27 | 15:58 |
| 13 | 08:28 | 07:42 | 06:39 | 06:25 | 05:22 | 04:49 | 05:04 | 05:52 | 06:46 | 07:39 | 07:37 | 08:24 |
| | 16:24 | 17:22 | 18:16 | 20:13 | 21:07 | 21:46 | 21:41 | 20:52 | 19:40 | 18:28 | 16:25 | 15:58 |
| 14 | 08:27 | 07:40 | 06:37 | 06:22 | 05:20 | 04:49 | 05:05 | 05:54 | 06:48 | 07:41 | 07:39 | 08:25 |
| | 16:26 | 17:24 | 18:18 | 20:15 | 21:08 | 21:47 | 21:40 | 20:50 | 19:38 | 18:26 | 16:24 | 15:58 |
| 15 | 08:26 | 07:38 | 06:34 | 06:20 | 05:19 | 04:48 | 05:06 | 05:55 | 06:49 | 07:43 | 07:41 | 08:26 |
| | 16:28 | 17:26 | 18:20 | 20:17 | 21:10 | 21:47 | 21:39 | 20:48 | 19:35 | 18:23 | 16:22 | 15:58 |
| 16 | 08:25 | 07:36 | 06:32 | 06:18 | 05:17 | 04:48 | 05:08 | 05:57 | 06:51 | 07:44 | 07:43 | 08:27 |
| | 16:29 | 17:28 | 18:22 | 20:18 | 21:11 | 21:48 | 21:38 | 20:45 | 19:33 | 18:21 | 16:20 | 15:58 |
| 17 | 08:24 | 07:34 | 06:30 | 06:15 | 05:16 | 04:48 | 05:09 | 05:59 | 06:53 | 07:46 | 07:45 | 08:28 |
| | 16:31 | 17:30 | 18:24 | 20:20 | 21:13 | 21:48 | 21:37 | 20:43 | 19:31 | 18:19 | 16:19 | 15:58 |
| 18 | 08:23 | 07:32 | 06:27 | 06:13 | 05:14 | 04:48 | 05:10 | 06:01 | 06:54 | 07:48 | 07:47 | 08:29 |
| | 16:33 | 17:32 | 18:26 | 20:22 | 21:15 | 21:49 | 21:36 | 20:41 | 19:28 | 18:16 | 16:18 | 15:59 |
| 19 | 08:22 | 07:29 | 06:25 | 06:11 | 05:12 | 04:48 | 05:12 | 06:02 | 06:56 | 07:50 | 07:49 | 08:29 |
| | 16:34 | 17:34 | 18:27 | 20:24 | 21:16 | 21:49 | 21:35 | 20:39 | 19:26 | 18:14 | 16:16 | 15:59 |
| 20 | 08:21 | 07:27 | 06:22 | 06:09 | 05:11 | 04:48 | 05:13 | 06:04 | 06:58 | 07:52 | 07:50 | 08:30 |
| | 16:36 | 17:36 | 18:29 | 20:26 | 21:18 | 21:50 | 21:33 | 20:37 | 19:23 | 18:12 | 16:15 | 15:59 |
| 21 | 08:20 | 07:25 | 06:20 | 06:06 | 05:09 | 04:48 | 05:15 | 06:06 | 07:00 | 07:54 | 07:52 | 08:31 |
| | 16:38 | 17:38 | 18:31 | 20:27 | 21:19 | 21:50 | 21:32 | 20:34 | 19:21 | 18:10 | 16:14 | 16:00 |
| 22 | 08:19 | 07:23 | 06:17 | 06:04 | 05:08 | 04:48 | 05:16 | 06:07 | 07:01 | 07:56 | 07:54 | 08:31 |
| | 16:40 | 17:40 | 18:33 | 20:29 | 21:21 | 21:50 | 21:31 | 20:32 | 19:18 | 18:08 | 16:12 | 16:00 |
| 23 | 08:17 | 07:21 | 06:15 | 06:02 | 05:07 | 04:49 | 05:18 | 06:09 | 07:03 | 07:58 | 07:56 | 08:32 |
| | 16:42 | 17:42 | 18:35 | 20:31 | 21:22 | 21:50 | 21:29 | 20:30 | 19:16 | 18:05 | 16:11 | 16:01 |
| 24 | 08:16 | 07:19 | 06:13 | 06:00 | 05:05 | 04:49 | 05:19 | 06:11 | 07:05 | 07:59 | 07:57 | 08:32 |
| | 16:43 | 17:44 | 18:37 | 20:33 | 21:24 | 21:50 | 21:28 | 20:28 | 19:13 | 18:03 | 16:10 | 16:01 |
| 25 | 08:15 | 07:16 | 06:10 | 05:58 | 05:04 | 04:49 | 05:21 | 06:13 | 07:07 | 07:01 | 07:59 | 08:33 |
| | 16:45 | 17:46 | 18:38 | 20:35 | 21:25 | 21:50 | 21:26 | 20:25 | 19:11 | 17:01 | 16:09 | 16:02 |
| 26 | 08:13 | 07:14 | 06:08 | 05:55 | 05:03 | 04:50 | 05:22 | 06:14 | 07:08 | 07:03 | 08:01 | 08:33 |
| | 16:47 | 17:48 | 18:40 | 20:37 | 21:27 | 21:50 | 21:25 | 20:23 | 19:09 | 16:59 | 16:08 | 16:02 |
| 27 | 08:12 | 07:12 | 06:05 | 05:53 | 05:02 | 04:50 | 05:24 | 06:16 | 07:10 | 07:05 | 08:02 | 08:33 |
| | 16:49 | 17:50 | 18:42 | 20:38 | 21:28 | 21:50 | 21:23 | 20:21 | 19:06 | 16:57 | 16:07 | 16:03 |
| 28 | 08:10 | 07:10 | 06:03 | 05:51 | 05:00 | 04:51 | 05:25 | 06:18 | 07:12 | 07:07 | 08:04 | 08:33 |
| | 16:51 | 17:52 | 18:44 | 20:40 | 21:30 | 21:50 | 21:22 | 20:19 | 19:04 | 16:55 | 16:06 | 16:04 |
| 29 | 08:09 | | 07:00 | 05:49 | 04:59 | 04:51 | 05:27 | 06:20 | 07:14 | 07:09 | 08:06 | 08:33 |
| | 16:53 | | 19:46 | 20:42 | 21:31 | 21:50 | 21:20 | 20:16 | 19:01 | 16:53 | 16:05 | 16:05 |
| 30 | 08:07 | | 06:58 | 05:47 | 04:58 | 04:52 | 05:28 | 06:21 | 07:16 | 07:11 | 08:07 | 08:33 |
| | 16:55 | | 19:47 | 20:44 | 21:32 | 21:50 | 21:18 | 20:14 | 18:59 | 16:51 | 16:04 | 16:06 |
| 31 | 08:06 | | 06:56 | | 04:57 | | 05:30 | 06:23 | | 07:13 | | 08:33 |
| | 16:57 | | 19:49 | | 21:33 | | 21:17 | 20:12 | | 16:49 | | 16:07 |
| Sonnenscheinstunden | 252 | 274 | 367 | 419 | 492 | 508 | 510 | 459 | 382 | 329 | 261 | 235 |
| Anzahl Minuten mit Schatten | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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

| Tag im Monat | Sonnenaufgang (SS:MM) | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
|--------------|-----------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2WEA: Vorbelastung 03 - Vorbelastung 03

Voraussetzungen für Berechnung des Schattenwurfs

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

| | Januar | Februar | März | April | Mai | Juni |
|----|----------------------------------------------|----------------------------------------------|-------------------------------|------------------------------------------------------------|----------------------------------------------|----------------|
| 1 | 08:33 11:18-11:41/23 16:08 10:14-10:58/44 | 08:04 16:59 | 07:07 16:11-16:36/25 17:54 | 06:53 18:41-18:52/11 19:51 | 05:45 07:12-08:03/51 20:46 06:14-06:32/18 | 04:57 21:35 |
| 2 | 08:33 11:19-11:41/22 16:10 10:15-10:59/44 | 08:02 17:01 | 07:05 16:12-16:34/22 17:56 | 06:51 19:53 | 05:43 07:13-08:03/50 20:47 06:14-06:34/20 | 04:56 21:36 |
| 3 | 08:33 11:19-11:40/21 16:11 10:15-10:59/44 | 08:01 17:03 | 07:03 16:15-16:31/16 17:58 | 06:48 19:55 | 05:41 07:14-08:02/48 20:49 06:13-06:35/22 | 04:55 21:37 |
| 4 | 08:33 11:21-11:40/19 16:12 10:16-11:00/44 | 07:59 17:05 | 07:00 16:18-16:26/8 17:59 | 06:46 19:57 | 05:39 07:14-08:01/47 20:51 06:12-06:35/23 | 04:54 21:38 |
| 5 | 08:32 11:22-11:39/17 16:13 10:16-11:00/44 | 07:57 17:07 | 06:58 18:01 | 06:44 19:58 | 05:37 07:14-08:00/46 20:53 06:11-06:36/25 | 04:53 21:39 |
| 6 | 08:32 11:24-11:39/15 16:14 10:17-11:01/44 | 07:55 17:09 | 06:56 18:03 | 06:41 07:39-07:50/11 20:00 | 05:35 07:15-07:59/44 20:54 06:11-06:36/25 | 04:52 21:40 |
| 7 | 08:32 11:26-11:37/11 16:16 10:17-11:01/44 | 07:53 16:20-16:28/8 17:11 | 06:53 18:05 | 06:39 07:33-07:54/21 20:02 | 05:33 07:15-07:58/43 20:56 06:10-06:36/26 | 04:52 21:41 |
| 8 | 08:31 11:29-11:34/5 16:17 10:17-11:01/44 | 07:52 16:16-16:32/16 17:13 | 06:51 18:07 | 06:37 07:30-07:57/27 20:04 | 05:31 07:17-07:57/40 20:58 06:10-06:37/27 | 04:51 21:42 |
| 9 | 08:31 10:18-11:02/44 16:19 | 07:50 08:25-08:37/12 17:15 16:14-16:34/20 | 06:49 18:09 | 06:34 07:28-08:00/32 20:06 19:31-19:39/8 | 05:29 07:17-07:56/39 21:00 06:10-06:36/26 | 04:51 21:43 |
| 10 | 08:30 10:19-11:02/43 16:20 | 07:48 08:22-08:39/17 17:17 16:12-16:36/24 | 06:46 18:11 | 06:32 07:25-08:01/36 20:08 19:27-19:40/13 | 05:28 07:18-07:54/36 21:01 06:10-06:36/26 | 04:50 21:44 |
| 11 | 08:29 10:19-11:02/43 16:21 | 07:46 08:21-08:41/20 17:19 16:11-16:38/27 | 06:44 18:13 | 06:29 07:23-08:02/39 20:09 19:25-19:42/17 | 05:26 07:20-07:53/33 21:03 06:10-06:36/26 | 04:50 21:45 |
| 12 | 08:29 10:20-11:02/42 16:23 | 07:44 08:19-08:42/23 17:21 16:10-16:39/29 | 06:42 18:15 | 06:27 07:22-08:04/42 20:11 19:23-19:44/21 | 05:24 07:21-07:52/31 21:05 06:10-06:36/26 | 04:49 21:45 |
| 13 | 08:28 10:20-11:02/42 16:25 | 07:42 08:19-08:44/25 17:23 16:09-16:40/31 | 06:39 18:16 | 06:25 07:21-08:05/44 20:13 19:21-19:45/24 | 05:22 07:22-07:49/27 21:06 06:10-06:35/25 | 04:49 21:46 |
| 14 | 08:27 10:21-11:02/41 16:26 | 07:40 08:18-08:45/27 17:25 16:07-16:40/33 | 06:37 18:18 | 06:22 07:19-08:05/46 20:15 19:20-19:47/27 | 05:21 07:24-07:48/24 21:08 06:11-06:35/24 | 04:49 21:47 |
| 15 | 08:26 10:22-11:03/41 16:28 | 07:38 08:16-08:44/28 17:26 16:07-16:41/34 | 06:34 18:20 | 06:20 07:18-08:06/48 20:17 19:20-19:47/27 | 05:19 07:26-07:45/19 21:10 06:11-06:34/23 | 04:49 21:47 |
| 16 | 08:25 10:22-11:03/41 16:29 | 07:36 08:16-08:45/29 17:28 16:06-16:41/35 | 06:32 17:44-17:55/11 18:22 | 06:18 07:17-08:06/49 20:18 19:19-19:48/29 | 05:17 07:29-07:43/14 21:11 06:12-06:34/22 | 04:48 21:48 |
| 17 | 08:24 10:23-11:03/40 16:31 | 07:34 08:16-08:45/29 17:30 16:06-16:42/36 | 06:30 17:42-17:57/15 18:24 | 06:16 07:17-08:07/50 20:20 19:18-19:47/29 | 05:16 07:34-07:36/2 21:13 06:13-06:33/20 | 04:48 21:48 |
| 18 | 08:23 10:23-11:02/39 16:33 | 07:32 08:16-08:46/30 17:32 16:06-16:42/36 | 06:27 17:40-18:00/20 18:26 | 06:13 07:15-08:06/51 20:22 19:18-19:47/29 | 05:14 06:14-06:32/18 21:15 | 04:48 21:49 |
| 19 | 08:22 10:24-11:02/38 16:35 | 07:29 08:16-08:46/30 17:34 16:06-16:43/37 | 06:25 17:38-18:01/23 18:27 | 06:11 07:14-08:07/53 20:24 19:18-19:47/29 | 05:13 06:15-06:31/16 21:16 | 04:48 21:49 |
| 20 | 08:21 10:26-11:02/36 16:36 | 07:27 08:15-08:45/30 17:36 16:05-16:42/37 | 06:22 17:37-18:03/26 18:29 | 06:09 07:14-08:07/53 20:26 19:18-19:47/29 | 05:11 06:16-06:29/13 21:18 | 04:48 21:49 |
| 21 | 08:20 10:26-11:01/35 16:38 | 07:25 08:15-08:45/30 17:38 16:05-16:42/37 | 06:20 17:36-18:02/26 18:31 | 06:06 07:14-08:07/53 20:28 19:18-19:46/28 | 05:10 06:18-06:28/10 21:19 | 04:48 21:50 |
| 22 | 08:19 10:27-11:01/34 16:40 | 07:23 08:16-08:45/29 17:40 16:05-16:42/37 | 06:17 17:36-18:03/27 18:33 | 06:04 07:13-08:07/54 20:29 19:19-19:46/27 | 05:08 06:21-06:25/4 21:21 | 04:49 21:50 |
| 23 | 08:17 10:28-11:00/32 16:42 | 07:21 08:17-08:44/27 17:42 16:06-16:42/36 | 06:15 17:34-18:02/28 18:35 | 06:02 07:13-08:07/54 20:31 19:18-19:44/26 | 05:07 21:22 | 04:49 21:50 |
| 24 | 08:16 10:30-10:59/29 16:44 | 07:19 08:17-08:43/26 17:44 16:06-16:41/35 | 06:13 17:35-18:03/28 18:37 | 06:00 07:12-08:06/54 20:33 19:19-19:43/24 | 05:06 21:24 | 04:49 21:50 |
| 25 | 08:15 10:31-10:58/27 16:45 | 07:16 08:18-08:42/24 17:46 16:06-16:41/35 | 06:10 17:34-18:02/28 18:38 | 05:58 07:12-08:06/54 20:35 19:20-19:42/22 | 05:04 21:25 | 04:50 21:50 |
| 26 | 08:13 10:33-10:57/24 16:47 | 07:14 08:19-08:41/22 17:48 16:07-16:40/33 | 06:08 17:34-18:01/27 18:40 | 05:56 07:12-08:05/53 20:37 19:21-19:41/20 | 05:03 21:27 | 04:50 21:50 |
| 27 | 08:12 10:35-10:55/20 16:49 | 07:12 08:20-08:38/18 17:50 16:08-16:38/30 | 06:05 17:35-18:01/26 18:42 | 05:53 07:12-08:05/53 20:38 19:22-19:40/18 | 05:02 21:28 | 04:50 21:50 |
| 28 | 08:10 10:38-10:52/14 16:51 | 07:10 08:23-08:36/13 17:52 16:09-16:37/28 | 06:03 17:35-17:59/24 18:44 | 05:51 07:12-08:05/53 20:40 19:24-19:37/13 | 05:01 21:30 | 04:51 21:50 |
| 29 | 08:09 10:45-10:46/1 16:53 | | 07:01 18:36-18:59/23 19:46 | 05:49 07:12-08:04/52 19:27-19:34/7 20:42 06:19-06:29/10 | 05:00 21:31 | 04:51 21:50 |
| 30 | 08:07 16:55 | | 06:58 18:36-18:56/20 19:48 | 05:47 07:12-08:03/51 20:44 06:16-06:31/15 | 04:58 21:32 | 04:52 21:50 |
| 31 | 08:06 16:57 | | 06:56 18:38-18:55/17 19:49 | | 04:57 21:33 | |
| | Sonnenscheinstunden 252 | 274 | 367 | 419 | 492 | 508 |
| | Anzahl Minuten mit Schatten 1191 | 1163 | 440 | 1636 | 1059 | 0 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2WEA: Vorbelastung 03 - Vorbelastung 03

Voraussetzungen für Berechnung des Schattenwurfs

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

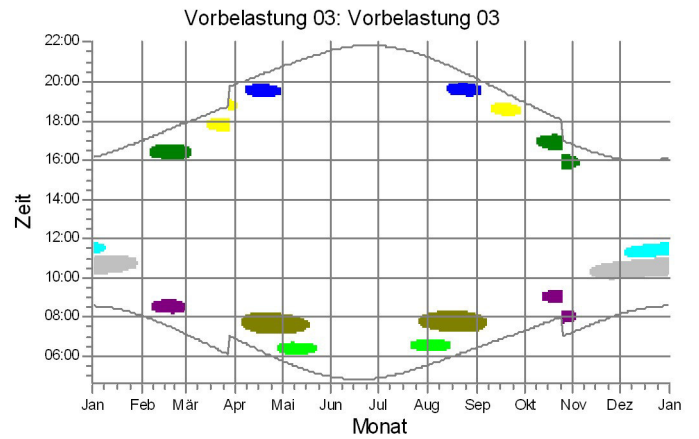
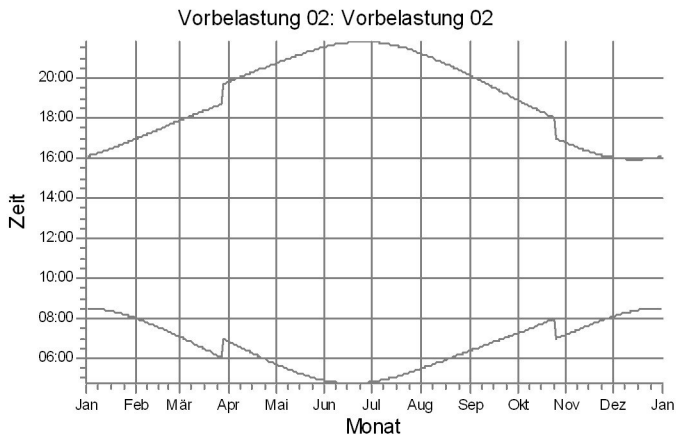
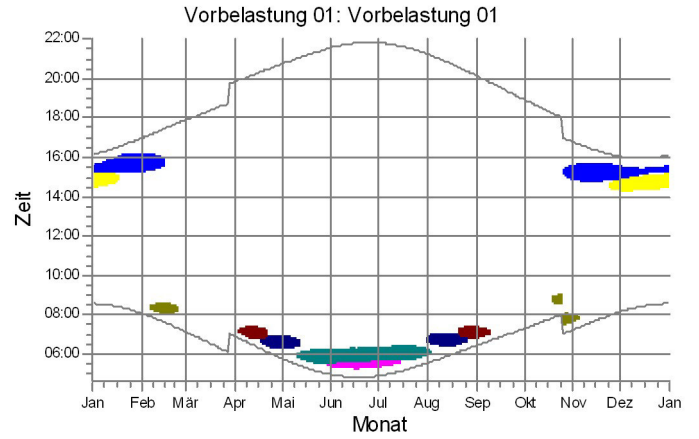
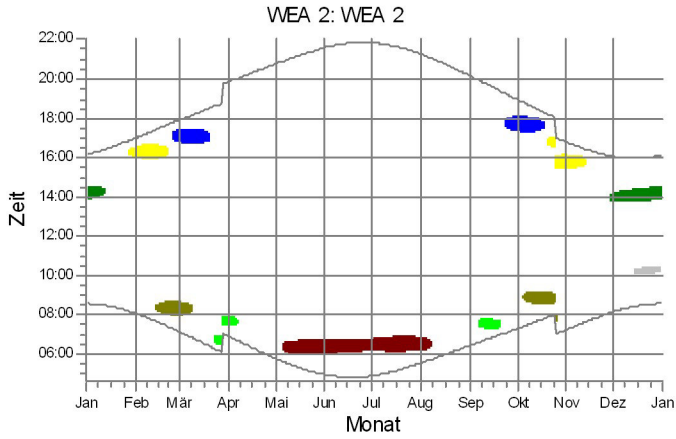
| | July | August | September | Oktober | November | Dezember |
|-----------------------------|----------------------|------------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 | 04:53 | 05:32 07:31-08:02/31 | 06:25 07:22-08:01/39 | 07:17 | 07:15 07:52-08:08/16 | 08:09 10:01-10:44/43 |
| | 21:49 | 21:15 06:21-06:46/25 | 20:09 19:24-19:41/17 | 18:56 | 16:47 15:42-16:05/23 | 16:03 |
| 2 | 04:53 | 05:33 07:30-08:04/34 | 06:27 07:24-08:00/36 | 07:19 | 07:17 07:55-08:06/11 | 08:10 10:02-10:45/43 |
| | 21:49 | 21:13 06:21-06:47/26 | 20:07 19:26-19:39/13 | 18:54 | 16:45 15:44-16:03/19 | 16:03 |
| 3 | 04:54 | 05:35 07:28-08:05/37 | 06:29 07:26-07:58/32 | 07:21 | 07:18 15:46-16:01/15 | 08:12 10:01-10:45/44 |
| | 21:48 | 21:11 06:20-06:46/26 | 20:05 19:28-19:36/8 | 18:52 | 16:43 | 16:02 |
| 4 | 04:55 | 05:37 07:27-08:07/40 | 06:30 07:27-07:54/27 | 07:23 | 07:20 15:51-15:56/5 | 08:13 11:15-11:18/3 |
| | 21:48 | 21:09 06:20-06:47/27 | 20:02 | 18:49 | 16:41 | 16:01 10:02-10:46/44 |
| 5 | 04:56 | 05:38 07:26-08:07/41 | 06:32 07:30-07:51/21 | 07:25 | 07:22 | 08:15 11:11-11:22/11 |
| | 21:47 | 21:08 06:20-06:46/26 | 20:00 | 18:47 | 16:39 | 16:01 10:02-10:46/44 |
| 6 | 04:57 | 05:40 07:25-08:08/43 | 06:34 07:35-07:47/12 | 07:26 | 07:24 | 08:16 11:11-11:24/13 |
| | 21:47 | 21:06 06:20-06:46/26 | 19:57 | 18:44 | 16:37 | 16:00 10:03-10:47/44 |
| 7 | 04:58 | 05:42 07:24-08:09/45 | 06:35 | 07:28 | 07:26 | 08:17 11:09-11:26/17 |
| | 21:46 | 21:04 06:20-06:45/25 | 19:55 | 18:42 | 16:36 | 16:00 10:03-10:47/44 |
| 8 | 04:59 | 05:43 07:24-08:10/46 | 06:37 | 07:30 | 07:28 | 08:19 11:08-11:27/19 |
| | 21:46 | 21:02 06:21-06:45/24 | 19:53 | 18:40 | 16:34 | 15:59 10:03-10:47/44 |
| 9 | 05:00 | 05:45 07:23-08:11/48 | 06:39 | 07:32 | 07:30 | 08:20 11:09-11:29/20 |
| | 21:45 | 21:00 06:22-06:45/23 | 19:50 | 18:37 | 16:32 | 15:59 10:04-10:48/44 |
| 10 | 05:01 | 05:47 07:22-08:11/49 | 06:41 | 07:34 16:51-17:04/13 | 07:32 | 08:21 11:08-11:30/22 |
| | 21:44 | 20:58 06:22-06:43/21 | 19:48 | 18:35 | 16:30 | 15:59 10:04-10:48/44 |
| 11 | 05:02 | 05:49 07:22-08:12/50 | 06:42 18:33-18:44/11 | 07:35 16:47-17:06/19 | 07:34 | 08:22 11:08-11:31/23 |
| | 21:43 | 20:56 06:23-06:43/20 | 19:45 | 18:33 | 16:29 | 15:59 10:04-10:48/44 |
| 12 | 05:03 | 05:50 07:21-08:11/50 | 06:44 18:30-18:46/16 | 07:37 16:45-17:08/23 | 07:36 | 08:23 11:08-11:31/23 |
| | 21:42 | 20:54 06:23-06:41/18 | 19:43 | 18:30 | 16:27 | 15:58 10:05-10:49/44 |
| 13 | 05:04 | 05:52 07:20-08:12/52 | 06:46 18:28-18:48/20 | 07:39 08:58-09:07/9 | 07:37 10:16-10:19/3 | 08:24 11:08-11:32/24 |
| | 21:41 | 20:52 06:25-06:39/14 | 19:40 | 18:28 16:43-17:10/27 | 16:25 | 15:58 10:05-10:49/44 |
| 14 | 05:05 | 05:54 07:20-08:13/53 19:34-19:42/8 | 06:48 18:26-18:49/23 | 07:41 08:55-09:10/15 | 07:39 10:10-10:25/15 | 08:25 11:08-11:33/25 |
| | 21:40 | 20:50 06:28-06:37/9 | 19:38 | 18:26 16:42-17:11/29 | 16:24 | 15:58 10:06-10:50/44 |
| 15 | 05:07 | 05:56 07:19-08:12/53 | 06:49 18:25-18:50/25 | 07:43 08:53-09:12/19 | 07:41 10:08-10:28/20 | 08:26 11:08-11:34/26 |
| | 21:39 | 20:48 19:31-19:45/14 | 19:36 | 18:23 16:40-17:12/32 | 16:22 | 15:58 10:06-10:50/44 |
| 16 | 05:08 | 05:57 07:19-08:13/54 | 06:51 18:23-18:49/26 | 07:45 08:51-09:13/22 | 07:43 10:06-10:30/24 | 08:27 11:08-11:35/27 |
| | 21:38 | 20:45 19:29-19:47/18 | 19:33 | 18:21 16:38-17:11/33 | 16:21 | 15:58 10:07-10:51/44 |
| 17 | 05:09 | 05:59 07:18-08:12/54 | 06:53 18:23-18:50/27 | 07:46 08:50-09:14/24 | 07:45 10:05-10:32/27 | 08:28 11:09-11:35/26 |
| | 21:37 | 20:43 19:27-19:48/21 | 19:31 | 18:19 16:37-17:12/35 | 16:19 | 15:59 10:07-10:51/44 |
| 18 | 05:11 | 06:01 07:18-08:12/54 | 06:55 18:22-18:50/28 | 07:48 08:48-09:14/26 | 07:47 10:04-10:33/29 | 08:29 11:09-11:36/27 |
| | 21:36 | 20:41 19:26-19:49/23 | 19:28 | 18:17 16:37-17:12/35 | 16:18 | 15:59 10:08-10:52/44 |
| 19 | 05:12 | 06:02 07:19-08:13/54 | 06:56 18:21-18:49/28 | 07:50 08:47-09:15/28 | 07:49 10:03-10:35/32 | 08:29 11:09-11:36/27 |
| | 21:35 | 20:39 19:25-19:50/25 | 19:26 | 18:14 16:36-17:12/36 | 16:16 | 15:59 10:08-10:52/44 |
| 20 | 05:13 | 06:04 07:18-08:12/54 | 06:58 18:21-18:49/28 | 07:52 08:46-09:15/29 | 07:50 10:02-10:36/34 | 08:30 11:10-11:37/27 |
| | 21:33 | 20:37 19:24-19:50/26 | 19:23 | 18:12 16:36-17:13/37 | 16:15 | 15:59 10:09-10:52/43 |
| 21 | 05:15 | 06:06 07:18-08:12/54 | 07:00 18:21-18:49/28 | 07:54 08:46-09:15/29 | 07:52 10:02-10:37/35 | 08:31 11:10-11:38/28 |
| | 21:32 | 20:35 19:23-19:51/28 | 19:21 | 18:10 16:35-17:13/38 | 16:14 | 16:00 10:10-10:53/43 |
| 22 | 05:16 06:30-06:37/7 | 06:08 07:18-08:12/54 | 07:02 18:21-18:48/27 | 07:56 08:45-09:15/30 | 07:54 10:02-10:38/36 | 08:31 11:10-11:38/28 |
| | 21:31 | 20:32 19:23-19:51/28 | 19:18 | 18:08 16:35-17:12/37 | 16:13 | 16:00 10:10-10:53/43 |
| 23 | 05:18 06:27-06:39/12 | 06:09 07:18-08:11/53 | 07:03 18:21-18:46/25 | 07:58 08:45-09:15/30 | 07:56 10:01-10:39/38 | 08:32 11:11-11:38/27 |
| | 21:29 | 20:30 19:22-19:51/29 | 19:16 | 18:06 16:35-17:12/37 | 16:11 | 16:01 10:10-10:53/43 |
| 24 | 05:19 06:26-06:40/14 | 06:11 07:18-08:10/52 | 07:05 18:22-18:45/23 | 07:59 08:45-09:15/30 | 07:57 10:01-10:40/39 | 08:32 11:12-11:39/27 |
| | 21:28 | 20:28 19:22-19:51/29 | 19:13 | 18:03 16:35-17:12/37 | 16:10 | 16:01 10:11-10:55/44 |
| 25 | 05:21 06:25-06:42/17 | 06:13 07:19-08:10/51 | 07:07 18:23-18:43/20 | 07:01 07:45-08:15/30 | 07:59 10:00-10:40/40 | 08:32 11:12-11:39/27 |
| | 21:26 | 20:26 19:22-19:51/29 | 19:11 | 17:01 15:35-16:11/36 | 16:09 | 16:02 10:11-10:55/44 |
| 26 | 05:22 06:24-06:43/19 | 06:15 07:18-08:09/51 | 07:09 18:24-18:41/17 | 07:03 07:46-08:14/28 | 08:01 10:00-10:41/41 | 08:33 11:12-11:39/27 |
| | 21:25 | 20:23 19:21-19:50/29 | 19:09 | 16:59 15:36-16:11/35 | 16:08 | 16:03 10:11-10:55/44 |
| 27 | 05:24 07:42-07:51/9 | 06:16 07:19-08:08/49 | 07:10 18:25-18:38/13 | 07:05 07:47-08:15/28 | 08:02 10:01-10:42/41 | 08:33 11:13-11:40/27 |
| | 21:23 06:23-06:44/21 | 20:21 19:21-19:50/29 | 19:06 | 16:57 15:36-16:10/34 | 16:07 | 16:03 10:12-10:55/43 |
| 28 | 05:25 07:38-07:55/17 | 06:18 07:20-08:07/47 | 07:12 18:28-18:35/7 | 07:07 07:48-08:14/26 | 08:04 10:01-10:42/41 | 08:33 11:14-11:40/26 |
| | 21:22 06:22-06:44/22 | 20:19 19:21-19:48/27 | 19:04 | 16:55 15:37-16:09/32 | 16:06 | 16:04 10:12-10:56/44 |
| 29 | 05:27 07:36-07:58/22 | 06:20 07:20-08:06/46 | 07:14 | 07:09 07:48-08:13/25 | 08:06 10:01-10:43/42 | 08:33 11:14-11:40/26 |
| | 21:20 06:22-06:46/24 | 20:16 19:21-19:48/27 | 19:01 | 16:53 15:38-16:09/31 | 16:05 | 16:05 10:12-10:56/44 |
| 30 | 05:29 07:34-07:59/25 | 06:22 07:21-08:05/44 | 07:16 | 07:11 07:49-08:12/23 | 08:07 10:01-10:43/42 | 08:33 11:15-11:40/25 |
| | 21:18 06:21-06:45/24 | 20:14 19:22-19:46/24 | 18:59 | 16:51 15:39-16:08/29 | 16:04 | 16:06 10:13-10:57/44 |
| 31 | 05:30 07:32-08:01/29 | 06:23 07:22-08:03/41 | | 07:13 07:51-08:10/19 | | 08:33 11:16-11:40/24 |
| | 21:17 06:21-06:46/25 | 20:12 19:22-19:43/21 | | 16:49 15:41-16:07/26 | | 16:07 10:14-10:57/43 |
| Sonnenscheinstunden | 510 | 458 | 382 | 329 | 261 | 236 |
| Anzahl Minuten mit Schatten | 287 | 2229 | 597 | 1161 | 668 | 2008 |

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-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |
|--------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
| | Sonnenuntergang (SS:MM) | Zeitpunkt (SS:MM) | Schattenanfang-Zeitpunkt (SS:MM) | Schattenende/Minuten mit Schatten |

SHADOW - Grafischer Kalender pro WEA

Berechnung: Gesamtbelastung WEA 2

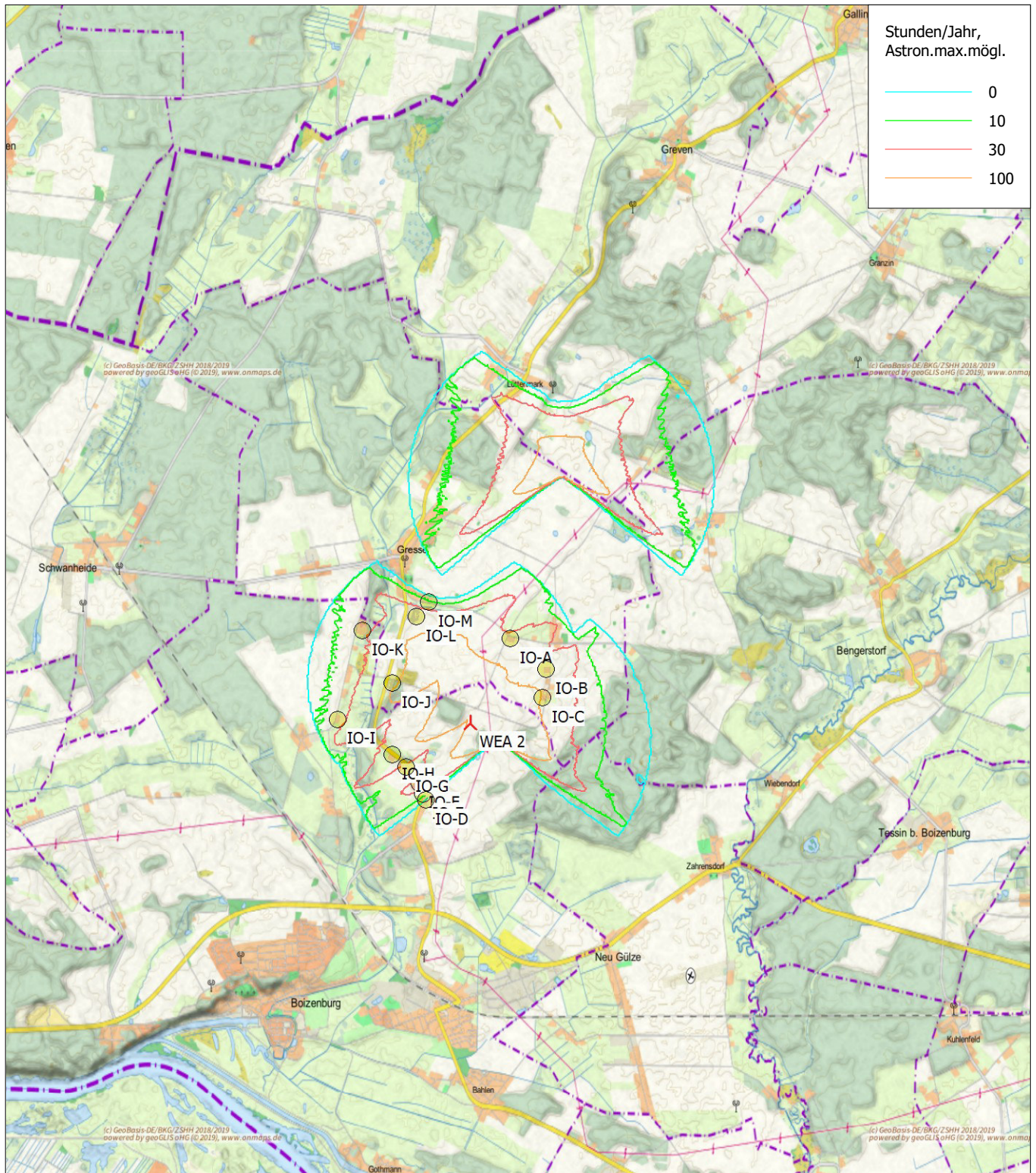


Schattenrezeptoren

| | | | | | |
|-------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------|--------------------------------------|
|  | IO-A: Gresser Strasse 4, Badekow |  | IO-F: Zarriner Strasse 62, Schwar |  | IO-J: Behr Gemüsehandel GmbH, Gresse |
|  | IO-B: Dorfstrasse 5, Badekow |  | IO-G: Zarriner Strasse 71, Schwar |  | IO-K: Heide 6, Heide |
|  | IO-C: Dorfstrasse 1, Badekow |  | IO-H: Zarriner Strasse 77, Schwar |  | IO-L: Gewerbegebiet Gresse, Gresse |
|  | IO-E: Zarriner Strasse 50, Schwar |  | IO-I: An der Torfkoppel 9, Heide |  | IO-M: Badekower Strasse 14, Gresse |

SHADOW - Karte

Berechnung: Gesamtbelastung WEA 2



Karte: OnMaps , Maßstab 1:75.000, Mitte: ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33 Ost: 218.740 Nord: 5.927.880
▲ Neue WEA ● Schattenrezeptor
Höhe der Schattenkarte: Höhenraster-Objekt: 20140305 WP Boizenburg_EMDGrid_0.wpg (5)

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung WEA 2 met. Wahrsch.

Voraussetzungen für Berechnung des Schattenwurfs

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

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [HAMBURG / SASEL]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,38 2,33 3,28 5,21 6,82 6,54 6,22 6,27 4,44 3,10 1,68 1,06

Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten Boizenburg

Betriebsdauer je Sektor

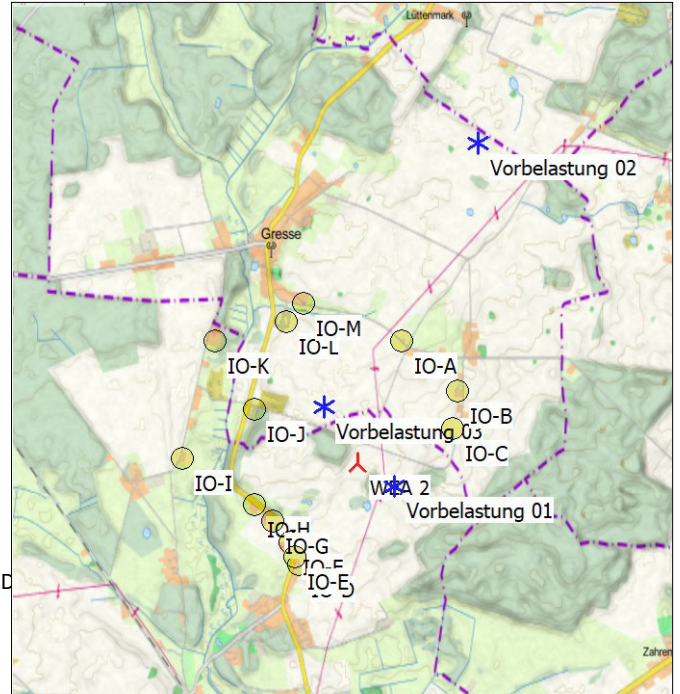
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
271 305 417 591 795 671 568 775 1.172 1.505 847 387 8.303
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:

Verwendete Höhenlinien: Höhenraster-Objekt: 20140305 WP Boizenburg_EMD
Hindernisse in Berechnung nicht verwendet
Berechnungshöhe ü.Gr. für Karte: 1,5 m
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:

ETRS-TMzn Pan-European Transverse Mercator (UTM)-ETRS89 Zone: 33



Maßstab 1:75.000
▲ Neue WEA ✱ Existierende WEA
● Schattenrezeptor

WEA

| | Ost | Nord | Z | Beschreibung | WEA-Typ | | | Nennleistung | Rotor-durchmesser | Nabenhöhe | Schattendaten | |
|-----------------|---------|-----------|------|-----------------|---------|------------|------------|--------------|-------------------|-----------|-------------------|-------|
| | | | | | Aktuell | Hersteller | Typ | | | | Beschatt.-Bereich | U/min |
| | [m] | | | | | | [kW] | [m] | [m] | [m] | [U/min] | |
| Vorbelastung 01 | 218.564 | 5.926.071 | 29,8 | Vorbelastung 01 | Ja | VESTAS | V162-5.600 | 5.600 | 162,0 | 119,0 | 1.996 | 12,1 |
| Vorbelastung 02 | 219.596 | 5.929.422 | 34,0 | Vorbelastung 02 | Ja | VESTAS | V162-5.600 | 5.600 | 162,0 | 166,0 | 1.993 | 12,1 |
| Vorbelastung 03 | 217.915 | 5.926.908 | 27,0 | Vorbelastung 03 | Ja | NORDEX | N163-5.700 | 5.700 | 163,0 | 164,0 | 1.784 | 10,4 |
| WEA 2 | 218.213 | 5.926.327 | 28,9 | WEA 2 | Ja | NORDEX | N163-5.700 | 5.700 | 163,0 | 164,0 | 1.784 | 10,4 |

Schattenrezeptor-Eingabe

| Nr. | Name | Ost | Nord | Z | Breite | Höhe | Höhe ü.Gr. | Neigung des Fensters | Ausrichtungsmodus | Augenhöhe (ZVI) | |
|------|-----------------------------------|---------|-----------|------|--------|------|------------|----------------------|---------------------|-----------------|-----|
| | | | | | | | | | | [m] | [m] |
| IO-A | Gresser Strasse 1, Badekow | 218.727 | 5.927.509 | 26,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-B | Dorfstrasse 5, Badekow | 219.249 | 5.926.974 | 42,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-C | Dorfstrasse 1, Badekow | 219.183 | 5.926.608 | 45,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 217.571 | 5.925.349 | 16,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 217.541 | 5.925.427 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 217.504 | 5.925.574 | 20,0 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 217.345 | 5.925.795 | 17,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 217.173 | 5.925.965 | 18,5 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-I | An der Torfkoppel 9, Heide | 216.484 | 5.926.478 | 13,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 217.226 | 5.926.915 | 17,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-K | Heide 6, Heide | 216.876 | 5.927.620 | 17,9 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-L | Gewerbegebiet Gresse, Gresse | 217.593 | 5.927.763 | 19,8 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |
| IO-M | Badekower Strasse 14, Gresse | 217.771 | 5.927.940 | 19,4 | 1,0 | 1,0 | 1,0 | 90,0 | "Gewächshaus-Modus" | | 2,0 |

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung WEA 2 met. Wahrsch.

Berechnungsergebnisse

Schattenrezeptor

| Nr. | Name | met. wahrsch. Beschattungsdauer |
|------|-----------------------------------|---------------------------------|
| | | Stunden/Jahr [h/a] |
| IO-A | Gresser Strasse 1, Badekow | 4:23 |
| IO-B | Dorfstrasse 5, Badekow | 8:08 |
| IO-C | Dorfstrasse 1, Badekow | 15:13 |
| IO-D | Zarrentiner Strasse 44, Schwartow | 0:00 |
| IO-E | Zarrentiner Strasse 50, Schwartow | 3:40 |
| IO-F | Zarrentiner Strasse 62, Schwartow | 10:55 |
| IO-G | Zarrentiner Strasse 71, Schwartow | 5:13 |
| IO-H | Zarrentiner Strasse 77, Schwartow | 16:03 |
| IO-I | An der Torfkoppel 9, Heide | 6:27 |
| IO-J | Behr Gemüsehandel GmbH, Gresse | 19:52 |
| IO-K | Heide 6, Heide | 2:39 |
| IO-L | Gewerbegebiet Gresse, Gresse | 4:13 |
| IO-M | Badekower Strasse 14, Gresse | 0:56 |

Gesamtmenge der max. mögl. Beschattung an Rezeptoren pro WEA

| Nr. | Name | Maximal | Erwartet |
|-----------------|-----------------|---------|----------|
| | | [h/a] | [h/a] |
| Vorbelastung 01 | Vorbelastung 01 | 172:45 | 32:53 |
| Vorbelastung 02 | Vorbelastung 02 | 0:00 | 0:00 |
| Vorbelastung 03 | Vorbelastung 03 | 211:13 | 39:50 |
| | WEA 2 WEA 2 | 119:02 | 25:43 |

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.