

Bericht

2024PAV01640

Schattenwurfprognose

Standort: ***Olsberg-Bruchhausen, Nordrhein-Westfalen,***
Deutschland

Kunde:

Eurowind Energy GmbH
Untern Bornrain 2
35091 Cölbe / Marburg



Husum, 03/12/2024

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Haftungsausschluss

Die vorliegenden Berechnungsergebnisse in diesem Bericht wurden von der PAVANA GmbH gemäß dem Stand der Technik nach bestem Wissen und Gewissen erstellt. Für die physikalische Einhaltung der abgeschätzten Ergebnisse werden seitens der PAVANA GmbH keine Garantien übernommen. Eine auszugsweise Vervielfältigung dieses Berichtes ist nur mit schriftlicher Zustimmung der PAVANA GmbH erlaubt.

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Aufgabe: Schattenwurfprognose für vier Windenergieanlagen des Typs Vestas V162-6.2 MW auf einer Nabenhöhe von 169,0 m

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Husum, 03/12/2024

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Vorwort

Die vorliegende Schattenwurfprognose für das Projekt *Olsberg-Bruchhausen (Nordrhein-Westfalen)* wurde von der PAVANA GmbH gemäß dem Stand der Technik nach bestem Wissen und Gewissen erstellt.

Für die physikalische Einhaltung der prognostizierten Ergebnisse der Schattenwurfberechnung werden seitens der PAVANA GmbH keine Garantien übernommen. Sie basieren auf den Empfehlungen der Bund/Länder-Arbeitsgemeinschaft für Immissionsschutz (LAI)¹ sowie den von der PAVANA GmbH und dem WEA-Hersteller gestellten Standort- und Anlagendaten.

1 Aufgabenstellung

Die Eurowind Energy GmbH plant im Projekt *Olsberg-Bruchhausen (Nordrhein-Westfalen)* südöstlich der Ortschaft *Andreasberg* und westlich der Ortschaft *Wulmeringhausen* die Errichtung von vier Windenergieanlage des Typs Vestas V162-6.2 MW auf einer Nabenhöhe von 169,0 m.

Es soll eine Ermittlung und Bewertung des periodischen Schattenwurfes für die zu erwartenden optischen Immissionen durch die geplanten WEA durchgeführt werden.

Durch den sich bewegenden Anlagenrotor können störende optische Beeinträchtigungen in der Umgebung verursacht werden. Dieser Effekt ist rechtlich als Immission im Sinne von § 3 (2) des Bundesimmissionsschutzgesetzes anzusehen.

Die Prognose des Schattenwurfs im Umfeld von WEA stützt sich auf eine standortbezogene Berechnung des veränderlichen astronomischen Sonnenstandes. Aufgrund des hiesigen scheinbaren Sonnenlaufes sind insbesondere in westlicher und östlicher Richtung zu einer WEA grundsätzlich große Schattenreichweiten möglich. Ziel ist daher die sichere Begrenzung der Einwirkdauer derartiger Immissionen in schutzwürdigen Wohn- und Arbeitsbereichen.

Die Grenzwerte an den jeweiligen Immissionspunkten, ggf. unter kumulativer Berücksichtigung der Beiträge aller einwirkender WEA, dürfen 30 Stunden pro Jahr sowie 30 Minuten pro Tag für die astronomisch maximal mögliche Beschattungsdauer nicht überschreiten (worst case).

Die Berechnung wird mit der Software WindPRO 4.0.547 (EMD), Modul SHADOW, durchgeführt.

Eine weitere Berechnungsgrundlage für die Schattenwurfprognose ist das Digitale Geländehöhenmodell DGM.

¹ Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windkraftanlagen, Aktualisierung 2019 (WKA-Schattenwurf-Hinweise), 23.01.2020

2 Standortdaten

Abbildung 1 stellt den Standort sowie die geplanten und bestehenden WEA dar.

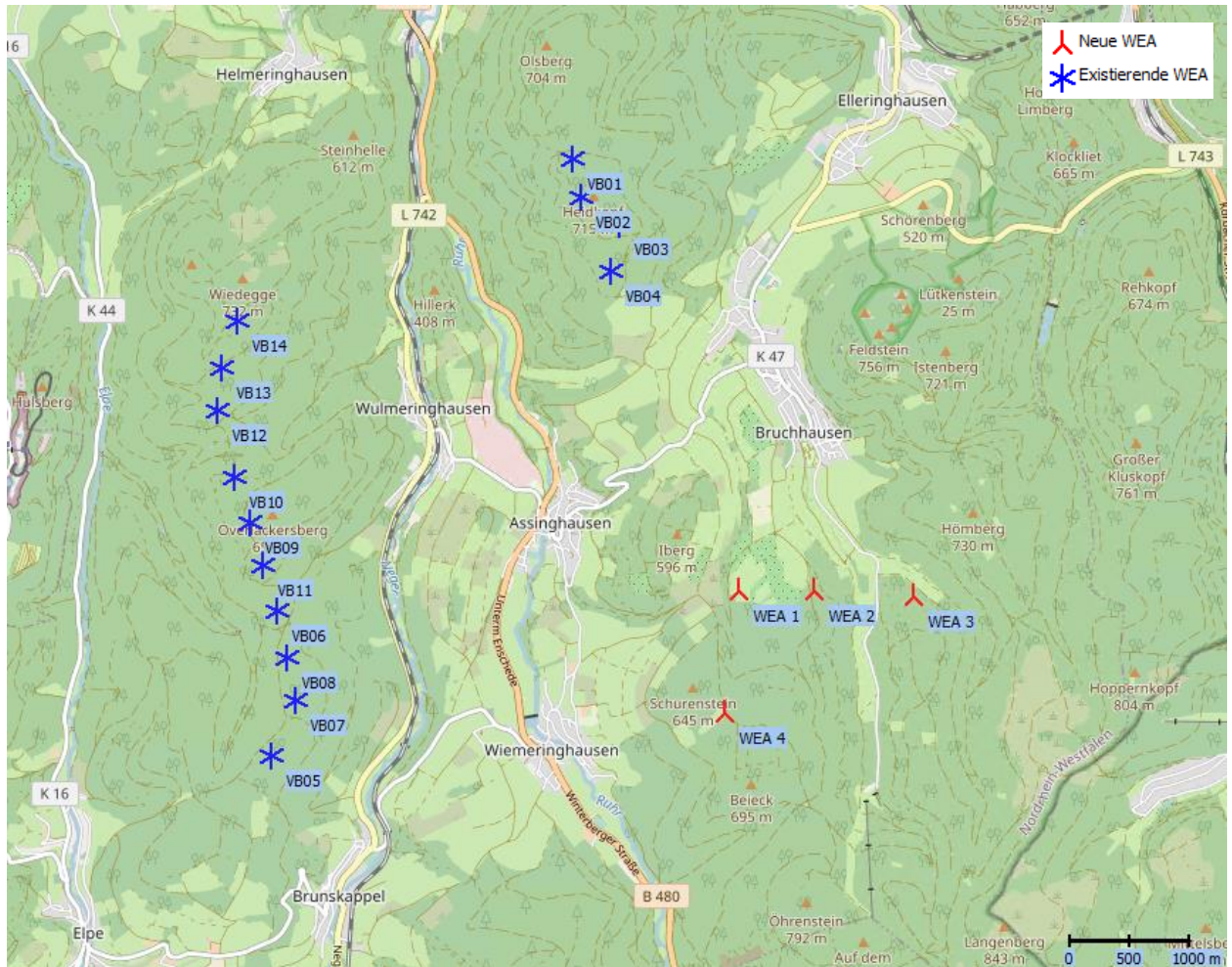


Abbildung 1: WEA-Standorte im Projekt Olsberg-Bruchhausen, Nordrhein-Westfalen (© OpenStreetMap, EMD International A/S)

2.1 Immissionsorte

Für die Berechnung der Schattenimmissionen am Standort *Olsberg-Bruchhausen* wurden innerhalb des Beschattungsbereichs die in der Umgebung des Standortes liegenden Immissionsorte exemplarisch ausgewählt, an denen erhöhte potenzielle Schattenimmissionen möglich sind. Als nicht erheblich belästigend wird der periodische Schattenwurf an einem Immissionsort angesehen, wenn die astronomisch maximal mögliche Beschattungsdauer nicht mehr als 30 Std. pro Kalenderjahr und darüber hinaus nicht mehr als 30 Minuten pro Kalendertag beträgt.

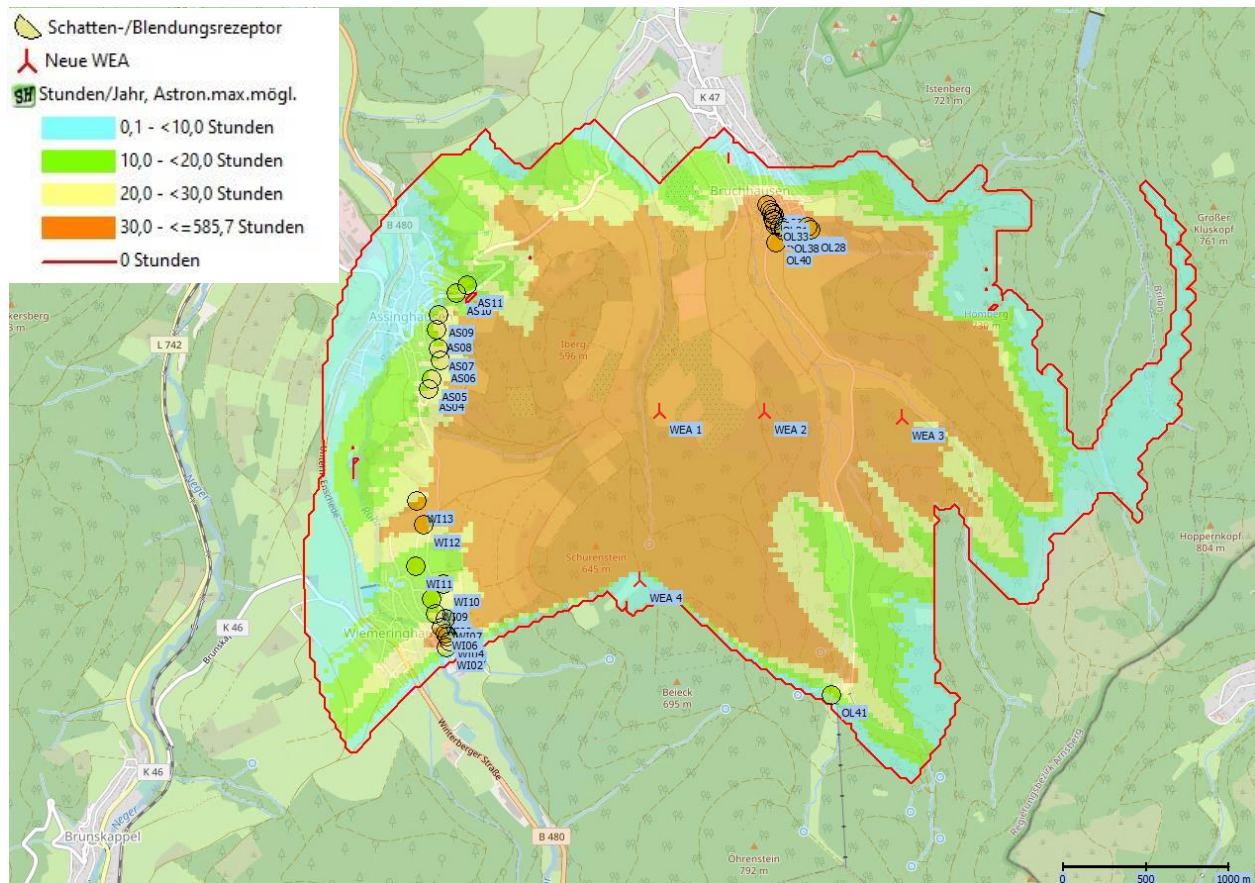


Abbildung 2: Beschattungsbereich der neu geplanten WEA (© OpenStreetMap, EMD International A/S)

In der Umgebung der geplanten Windenergieanlagen wurden 34 Immissionsorte (im folgenden IO genannt) mit Hilfe von topografischen Karten und Satellitendaten definiert und am 16/09/2024 im Rahmen einer Standortbesichtigung verifiziert. Die ausgewählten Immissionsorte stehen stellvertretend für sensible Bereiche in ihrer Nachbarschaft. In nachfolgender Tabelle 1 sind die Koordinaten und die Beschreibungen der Immissionsorte angegeben.

Tabelle 1: Koordinaten der Rezeptoren (UTM ETRS89 Z32)

IO	Beschreibung	X [m]	Y [m]
AS04	Assinghausen, Auf dem Kampe 38	465.577	5.683.616
AS05	Assinghausen, Auf dem Kampe 32	465.598	5.683.679
AS06	Assinghausen, Auf dem Kampe 43	465.654	5.683.787
AS07	Assinghausen, Strücker Weg 4	465.641	5.683.858
AS08	Assinghausen, Strücker Weg 7	465.630	5.683.974
AS09	Assinghausen, Strücker Weg 15	465.640	5.684.065
AS10	Assinghausen, Bruchsberg 26	465.751	5.684.193
AS11	Assinghausen, Bruchsberg 23	465.817	5.684.243
OL28	Olsberg, Zur Schanze 42	467.895	5.684.561
OL29	Olsberg, Am Medebach 10	467.634	5.684.713
OL30	Olsberg, Am Hölchen 2A	467.648	5.684.681
OL31	Olsberg, Am Hölchen 4	467.659	5.684.667
OL32	Olsberg, Am Hölchen 6	467.671	5.684.651
OL33	Olsberg, Am Hölchen 8	467.668	5.684.630
OL34	Olsberg, Am Hölchen 10	467.674	5.684.614
OL35	Olsberg, Am Hölchen 12	467.679	5.684.595
OL36	Olsberg, Am Hölchen 14	467.710	5.684.583
OL37	Olsberg, Am Hölchen 24	467.733	5.684.577
OL38	Olsberg, Am Hölchen 26	467.736	5.684.559
OL39	Olsberg, Zur Schanze 40	467.878	5.684.580
OL40	Olsberg, Am Medebach 21	467.685	5.684.487
OL41	Olsberg, Am Medebach 98	468.005	5.681.759
WI02	Wiemeringhausen, Zur Lieth 35	465.677	5.682.056
WI03	Wiemeringhausen, Alte Landstraße 23	465.697	5.682.095
WI04	Wiemeringhausen, Alte Landstraße 21	465.681	5.682.122
WI05	Wiemeringhausen, Alte Landstraße 19	465.671	5.682.140
WI06	Wiemeringhausen, Alte Landstraße 16	465.650	5.682.179
WI07	Wiemeringhausen, Alte Landstraße 5	465.672	5.682.229
WI08	Wiemeringhausen, Alte Landstraße 10	465.610	5.682.260
WI09	Wiemeringhausen, Alte Landstraße 4	465.592	5.682.349
WI10	Wiemeringhausen, Alte Landstraße 1	465.658	5.682.438
WI11	Wiemeringhausen, Ibergstraße 28	465.492	5.682.549
WI12	Wiemeringhausen, Ibergstraße 21	465.547	5.682.801
WI13	Wiemeringhausen, Ibergstraße 19	465.501	5.682.944

Die Lage und Dokumentation der Immissionsorte ist den nachfolgenden topographischen Karten (Abbildung 3 bis 6) zu entnehmen.

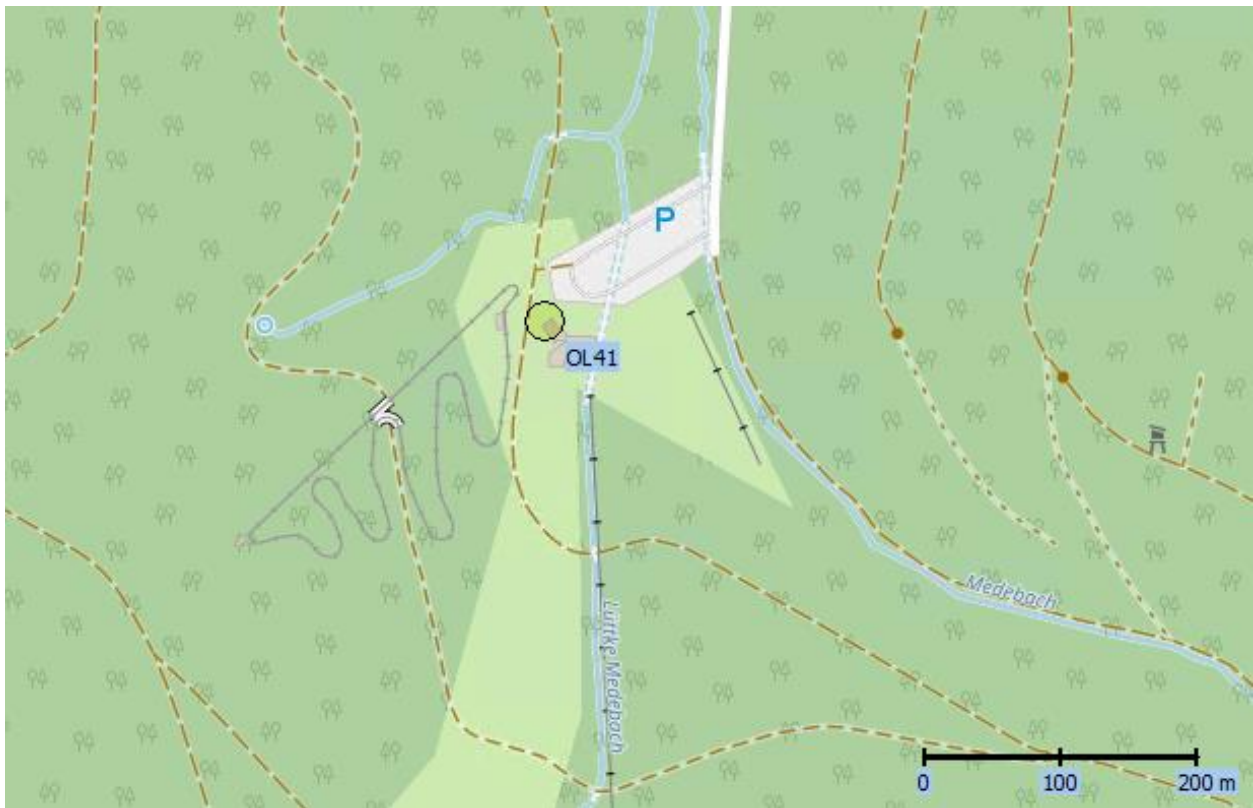


Abbildung 3: Immissionsort OL41 westlich von Willingen (© OpenStreetMap, EMD International A/S)





Abbildung 5: Immissionsorte AS04 – AS11 in Assinghausen (© OpenStreetMap, EMD International A/S)



Abbildung 6: Immissionsorte OL28 – OL40 in Bruchhausen (© OpenStreetMap, EMD International A/S)

2.2 Vorbelastung ohne Einfluss

In der Umgebung befinden sich 14 weitere Windenergieanlagen. Der Beschattungsbereich dieser WEA verursacht an den relevanten Immissionsorten für keine Beschattung, sodass diese Anlagen nicht berücksichtigt werden. Eine Berechnung hierzu ist dem Anhang hinzugefügt. Die folgende Karte in Abbildung 7 zeigt den Beschattungsbereich der Vorbelastung ohne Einfluss an den relevanten Immissionsorten.

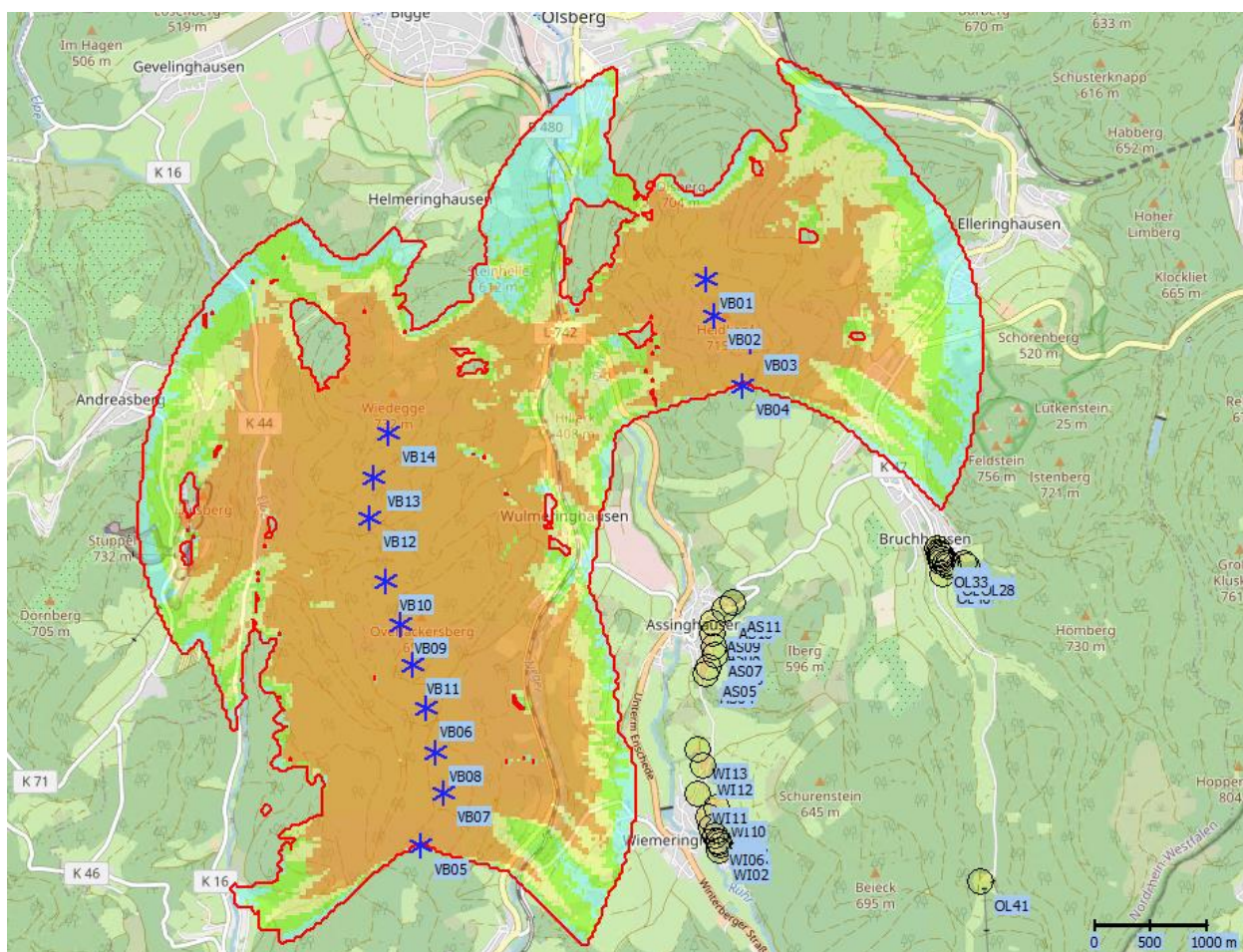


Abbildung 7: Beschattungsbereich Vorbelastung ohne Einfluss (© OpenStreetMap, EMD International A/S)

2.3 Zusatzbelastung

Die Koordinaten und Kenndaten der neu geplanten WEA sind Tabelle 2 zu entnehmen. Die maximale Blatttiefe, die minimale Blatttiefe bei 90% Radius sowie der Beschattungsbereich wurden der Software WindPRO entnommen.

Tabelle 2: Koordinaten und Kenndaten der geplanten WEA (UTM ETRS89 Z32) im Projekt Olsberg-Bruchhausen, Nordrhein-Westfalen

Bez. / Nr.	WEA-Typ	X [m]	Y [m]	Z [m]	RD [m]	NH [m]	max. Blatttiefe [m]	min. Blatttiefe bei 90% Radius [m]	mittlere Blatttiefe [m]	Beschattungsbereich [m]
WEA 1	V162-6.2	466.971	5.683.471	558,2	162,0	169,0	4,32	1,69	3,01	2.041
WEA 2	V162-6.2	467.605	5.683.466	566,6	162,0	169,0	4,32	1,69	3,01	2.041
WEA 3	V162-6.2	468.441	5.683.424	540,0	162,0	169,0	4,32	1,69	3,01	2.041
WEA 4	V162-6.2	466.845	5.682.454	636,6	162,0	169,0	4,32	1,69	3,01	2.041

3 Ergebnisse der Immissionsberechnung

3.1 Astronomisch mögliche Beschattungsdauer

Für einen vertikalen Rezeptor im „Gewächshaus-Modus“ (Öffnungswinkel 360°, 10 cm x 10 cm) mit einer Bezugshöhe über Grund von 2 m wurde die astronomisch maximal mögliche Beschattungsdauer (worst case) berechnet. Dies bedeutet, dass Stillstandzeiten der WEA, die Windrichtung und Bewölkung nicht berücksichtigt werden. Die einzuhaltenden Immissionsrichtwerte betragen:

- Max. 30 Stunden astronomisch maximal mögliche Beschattung pro Jahr
- Max. 30 Minuten astronomisch maximal mögliche Beschattung pro Tag

Für die Beurteilung des Schattenwurfs an den ausgewählten Immissionspunkten wird die Zusatzbelastung berechnet. Die Ergebnisse der „worst case“ Schattenwurfberechnung für die maximale, jährliche Schattenwurfdauer und die maximale, tägliche Schattenwurfdauer sind Tabelle 3 aufgeführt. Überschreitungen der Richtwerte sind **fett** hervorgehoben.

Tabelle 3: Astronomisch maximal mögliche Beschattungsdauer an den Immissionsorten für die Zusatzbelastung

IO	Jährliche Beschattungsdauer (worst case)	Tägliche Beschattungsdauer (worst case)
	Zusatzbelastung	Zusatzbelastung
	[Std/Jahr]	[Std/Tag]
AS04	20:32	00:26
AS05	25:14	00:39
AS06	21:36	00:27
AS07	21:11	00:26
AS08	20:50	00:26
AS09	21:20	00:25

IO	Jährliche Beschattungsdauer (worst case)	Tägliche Beschattungsdauer (worst case)
	Zusatzbelastung	Zusatzbelastung
	[Std/Jahr]	[Std/Tag]
AS10	11:27	00:26
AS11	12:26	00:27
OL28	62:45	01:11
OL29	43:10	01:05
OL30	52:21	01:14
OL31	56:22	01:17
OL32	60:56	01:20
OL33	66:49	01:23
OL34	71:15	01:24
OL35	76:17	01:25
OL36	78:09	01:25
OL37	78:18	01:25
OL38	81:52	01:25
OL39	61:17	01:12
OL40	99:34	01:31
OL41	9:11	00:21
WI02	22:14	00:30
WI03	29:32	00:32
WI04	34:11	00:32
WI05	36:19	00:32
WI06	36:29	00:31
WI07	29:05	00:32
WI08	21:55	00:30
WI09	17:50	00:29
WI10	17:55	00:31
WI11	12:31	00:26
WI12	33:10	00:26
WI13	30:56	00:25

Die detaillierten Ergebnisse sind den beiliegenden Ausdrucken der Berechnungssoftware sowie den Schattenwurf-Übersichtskarten zu entnehmen.

3.2 Meteorologisch wahrscheinliche Beschattungsdauer

Um die tatsächlich auftretenden Beschattungszeiten abzuschätzen, werden folgende statische Daten berücksichtigt.

- anhand der Windstatistik (DWD-Station Kahler Asten) und der Anlaufgeschwindigkeit werden die Betriebsstunden der WEA pro Monat abgeschätzt
- anhand der Windrichtungsverteilung (DWD-Station Kahler Asten) wird die Größe und Ausrichtung des Rotorschattens ermittelt
- die Sonnenscheinwahrscheinlichkeit (mittlere tägliche Sonnenscheindauer pro Monat) wurde der Sonnenschein-Datenbank Bad Lippspringe entnommen

Die berechnete meteorologisch wahrscheinliche Beschattungsdauer pro Jahr kann lediglich als grobe Abschätzung der tatsächlich auftretenden Beschattungsdauer (real case) dienen. Die meteorologischen Eingangsdaten sind mit erheblichen Unsicherheiten behaftet, da sowohl die Sonnenscheindauer als auch die Windrichtungsverteilung naturgemäß einer hohen Schwankungsbreite unterliegt.

Tabelle 4: Meteorologisch wahrscheinliche Beschattungsdauer an den Immissionsorten für die Zusatzbelastung

IO	Abschätzung der jährlichen Beschattungsdauer (real case)
	Zusatzbelastung
	Std./Jahr
AS04	4:04
AS05	4:50
AS06	3:39
AS07	3:27
AS08	3:13
AS09	3:11
AS10	2:07
AS11	2:19
OL28	7:03
OL29	4:42
OL30	5:45
OL31	6:13
OL32	6:45
OL33	7:26
OL34	7:58
OL35	8:33
OL36	8:47
OL37	8:49
OL38	9:15
OL39	6:53

IO	Abschätzung der jährlichen Beschattungsdauer (real case)
	Zusatzbelastung
	Std./Jahr
OL40	11:29
OL41	1:59
WI02	5:18
WI03	7:11
WI04	8:24
WI05	8:59
WI06	9:18
WI07	7:48
WI08	5:59
WI09	4:46
WI10	4:38
WI11	3:02
WI12	7:30
WI13	7:26

Die detaillierten Ergebnisse sind den beiliegenden Ausdrucken der Berechnungssoftware zu entnehmen.

4 Zusammenfassung

Für das Projekt *Olsberg-Bruchhausen* wurde für den verursachten Schattenwurf durch vier geplante WEA eine Schattenimmissionsprognose durchgeführt.

Die Beurteilung der vorliegenden Berechnungsergebnisse erfolgt nach den Hinweisen zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen (LAI)². Darin wird davon ausgegangen, dass pro Jahr max. 30 Std. bzw. pro Tag max. 30 Min. des Schattenwurfes zumutbar sind.

An den Immissionsorten AS04, AS06 – AS11, OL41 sowie WI02, WI08, WI09 und WI11 werden die Immissionsrichtwerte eingehalten.

An den Immissionsorten IO AS05, OL28 – OL40, WI03 – WI07, WI10, WI12 sowie WI13 werden die Immissionsrichtwerte für die astronomisch maximal mögliche Beschattungsdauer durch die neu geplanten WEA überschritten.

Zur Einhaltung der Richtwerte wird empfohlen, den Betrieb der neu geplanten WEA 1, WEA 2, WEA 3 sowie WEA 4 über ein geeignetes Abschaltmodul zu steuern.

Unter Berücksichtigung der Begrenzung der Beschattungszeiten der neu geplanten WEA 1, WEA 2, WEA 3 sowie WEA 4 können die Richtwerte an den Immissionsorten AS05, OL28 – OL40, WI03 – WI07, WI10, WI12 sowie WI13 eingehalten werden.

Tabelle 5: Berechnung der Beschattungszeiten unter Berücksichtigung der Steuerung der WEA 1, WEA 2, WEA 3 sowie WEA 4 durch ein Abschaltmodul

IO	Astronomische max. mögliche Beschattungsdauer		
	[Std./Jahr]	[Std./Tag]	Vermiedene Std./Jahr
AS04	14:47	00:22	5:45
AS05	14:38	00:22	10:36
AS06	19:42	00:26	1:54
AS07	21:11	00:26	-
AS08	20:50	00:26	-
AS09	21:20	00:25	-
AS10	11:27	00:26	-
AS11	12:26	00:27	-
OL28	6:06	00:11	56:39
OL29	0:00	00:00	43:10
OL30	0:05	00:01	52:16
OL31	0:00	00:00	56:22
OL32	0:00	00:00	60:56
OL33	0:06	00:01	66:43

² Hinweise zur Ermittlung und Beurteilung der optischen von Windenergieanlagen Aktualisierung 2019 (WEA-Schattenwurf-Hinweise) Stand 23.01.2020

IO	Astronomische max. mögliche Beschattungsdauer		
	[Std/Jahr]	[Std/Tag]	Vermiedene Std./Jahr
OL34	0:04	00:01	71:11
OL35	0:00	00:00	76:17
OL36	0:09	00:01	78:00
OL37	3:59	00:09	74:19
OL38	5:58	00:12	75:54
OL39	2:00	00:04	59:17
OL40	0:00	00:00	99:34
OL41	9:11	00:21	-
WI02	7:47	00:12	14:27
WI03	6:00	00:09	23:32
WI04	2:49	00:04	31:22
WI05	0:00	00:00	36:19
WI06	8:49	00:24	27:40
WI07	16:58	00:30	12:07
WI08	19:13	00:30	2:42
WI09	11:27	00:27	6:23
WI10	0:00	00:00	17:55
WI11	9:22	00:26	3:09
WI12	11:41	00:26	21:29
WI13	10:23	00:25	20:33
WI14	0:00	00:00	-

Bei der Bewertung der astronomisch maximal möglichen Beschattungsdauer ist zu beachten, dass sie jeweils eine worst-case Annahme darstellen und in der Realität wesentlich geringere Schattenwurfzeiten auftreten. Die berechneten Abschaltzeiten stellen lediglich den Zeitraum dar, in der die jeweilige WEA abgeschaltet wird, wenn die Bedingungen für Schattenwurf tatsächlich auftreten, d.h. durch eine entsprechend hohe Bestrahlungsstärke (mehr als 120 W/m²) Schattenwurf zu erwarten ist.

Die Immissionsorte wurden exemplarisch ausgewählt, sodass nicht jeder potenzielle Immissionsort im Abschaltkalender dargestellt ist. Die Immissionsorte wurden so gewählt, dass in allen Richtungen des auftretenden Schattenwurfs die jeweils am stärksten beschatteten sensiblen Orte betrachtet werden. Die Einhaltung der maximal zulässigen Beschattungsdauer am jeweiligen Immissionsort wird durch die Programmierung einer an der WEA installierten Abschaltautomatik gewährleistet. Im Zuge der Programmierung dieses Abschaltmoduls müssen die Koordinaten der Immissionsorte mittels präziser Lagebestimmung erfasst und in der Software hinterlegt werden. Dabei sind auch besondere örtlichen Gegebenheiten wie Dachfenster oder Terrassen zu berücksichtigen. Alle Änderungen an Koordinaten, Typ sowie Nabenhöhe oder Abmessungen und Lage der Rezeptoren führen zu abweichenden Ergebnissen.

5 Qualität der Prognose

Das Berechnungsverfahren nach den „Hinweisen zur Ermittlung und Beurteilung der optischen Immissionen von Windkraftanlagen“ des Länderausschuss für Immissionsschutz, LAI 2019 legt der Schattenwurfprognose günstige Mitwindsituationen zu Grunde. Es gilt die Annahme einer minimal relevanten Sonnenhöhe von 3° , sodass der Schattenwurf für Sonnenstände unter 3° Erhöhung über Horizont nicht in die Berechnung eingeht. Nicht berücksichtigt werden Lufttrübung, Sonnenausdehnung und Flügelform. Die Berechnungen der Schattenprognose beinhaltet nach sachverständiger Erfahrung ausreichend Sicherheit.

6 Theoretische Grundlagen

Der Sonnenstand bildet die Grundlage für die Berechnung des Schattenwurfs. Der Stand der Sonne ist im Wesentlichen von der Erdrotation, der Neigung der Erdachse und der elliptischen Laufbahn der Erde um die Sonne abhängig. Weiterhin müssen für jeden beliebigen Standort die geographischen, jahreszeitlichen und tageszeitlichen Daten berücksichtigt werden.

Im Allgemeinen wird beim Schattenwurf zwischen Kern- und Halbschatten unterschieden. Der Kernbereich eines Schattens entspricht dem Bereich, in dem die direkten Sonnenstrahlen durch ein Hindernis vollständig verdeckt werden. Der Halbschatten ist der Bereich, auf den nur ein Teil des Sonnenlichts auftritt. Da Windenergieanlagen schmale Rotorblätter besitzen, ist der Kernschatten nur sehr kurz und wird in den Berechnungen nicht berücksichtigt.

Der Verlauf des periodischen Schattenwurfs (Abbildung 8) wird über den Sonnenstand, den Standort bzw. die Standorte der WEA und die Lage der maßgeblichen Immissionspunkte ermittelt. Dazu sind die Koordinaten der WEA und Immissionspunkten sowie die Ausmaße der WEA (Nabenhöhe und Rotordurchmesser) notwendig.

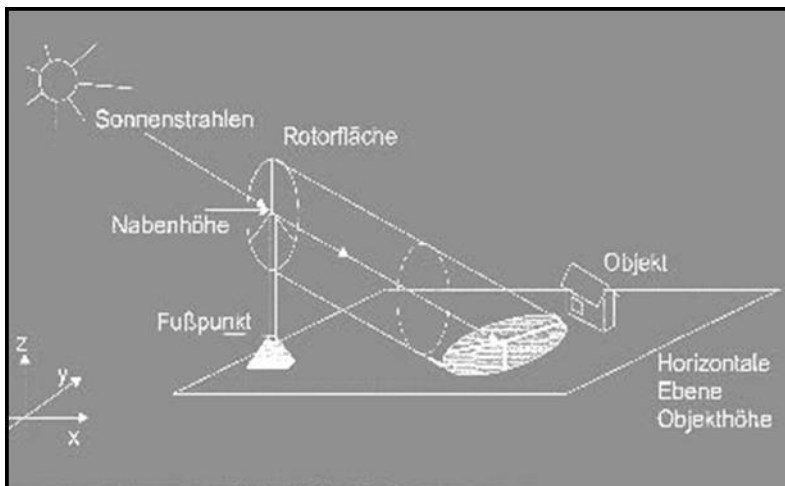


Abbildung 8: Schattenwurf des Rotors

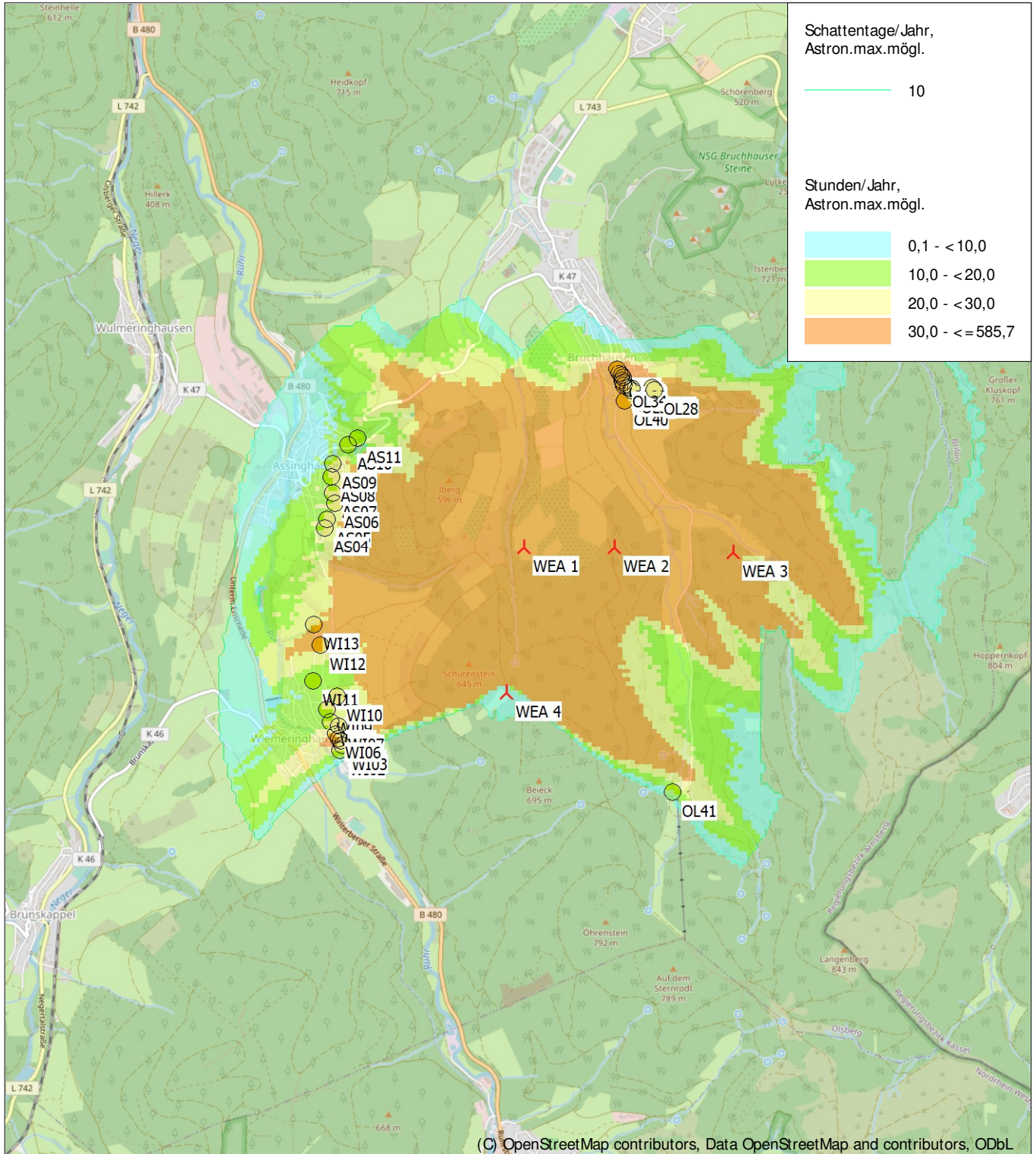
Zur Ermittlung des Schattenwurfs an einem Immissionsort wird dort ein virtueller Schattenrezeptor mit den Ausmaßen der zu untersuchenden Fläche platziert. Bei der Simulation des Sonnenstandes über ein Jahr registriert der virtuelle Rezeptor den Schattenwurf in diesem Zeitraum. Die Simulation des Verlaufs der Sonne wird mit der Software WindPRO (Modul SHADOW) mit einer zeitlichen Auflösung von zwei Minuten von Sonnenaufgang bis Sonnenuntergang über das ganze Jahr durchgeführt. Unter Berücksichtigung einer minimalen Sonnenhöhe, der Koordinaten, der Lage und Größe des Rezeptors sowie der WEA-Daten wird so über die Simulation ermittelt, ob am Rezeptor ein Schattenwurf durch eine oder mehrere Windenergieanlagen auftritt. Tritt ein Schlagschatten auf, werden für diesen das Datum, der Beginn, das Ende und die Dauer sowie die verursachende WEA des Schattens angegeben. Daraus werden wiederum über ein ganzes Jahr die Anzahl der Schattentage und die gesamte Schattenwurfdauer berechnet.

Anhang

- Schattenwurfkarten der astronomisch maximal möglichen Beschattungsdauer (2 Seiten)
- Ausdrücke der Berechnungssoftware (65 Seiten)

SHADOW - Karte

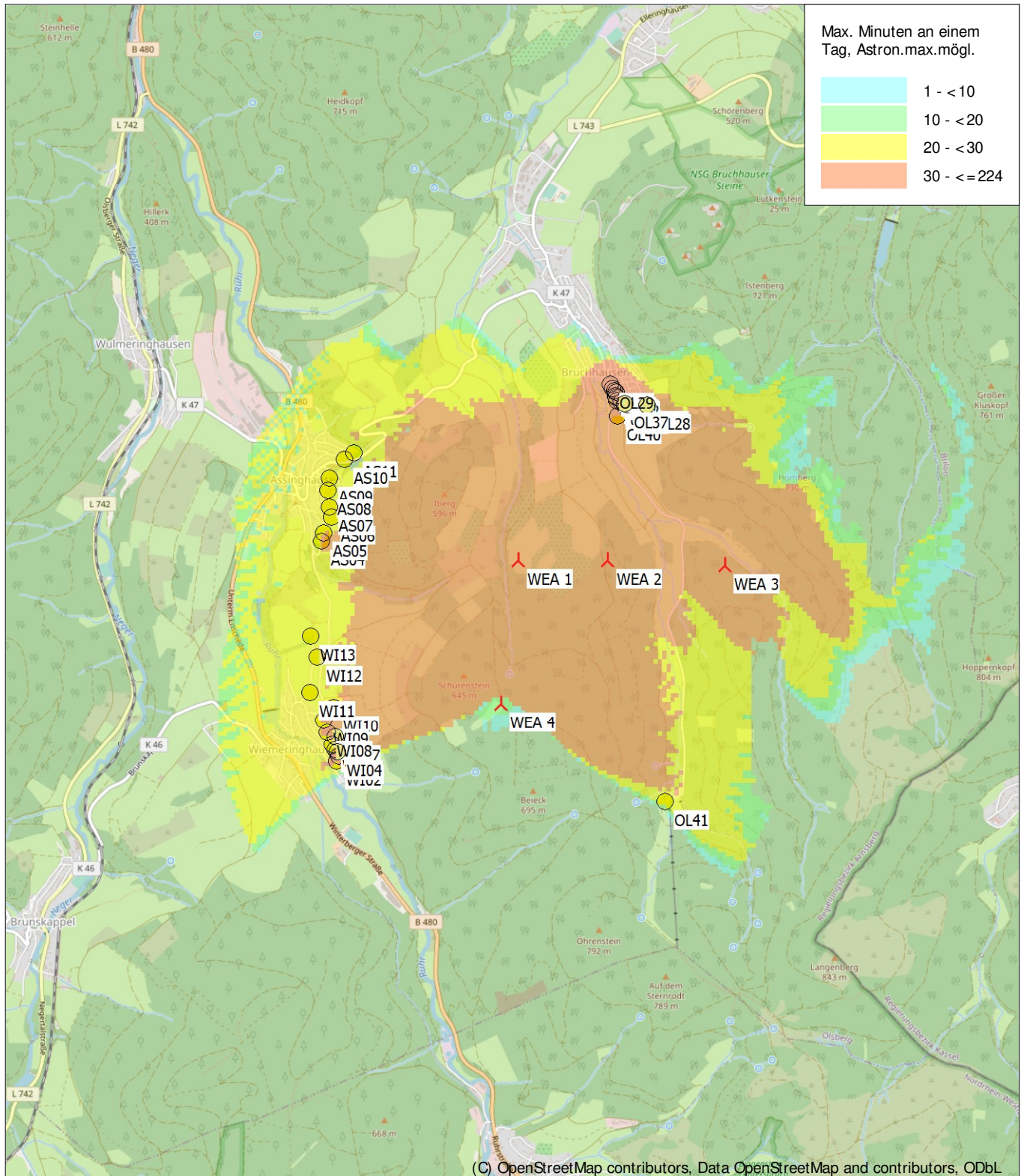
Berechnung: 2024PAV01640 Zusatzbelastung



Karte: EMD OpenStreetMap , Maßstab 1:40.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 466.949 Nord: 5.683.277
Neue WEA Schattenrezeptor
Höhe der Schattenkarte: Höhenlinien: CONTOURLINE_ONLINEDATA_0.wpo (1)
Zeitschritt: 4 Minuten, Schrittweite: 14 Tag(e), Kartenauflösung: 30 m, Sichtbarkeit Auflösung: 15 m, Augenhöhe: 1,5 m

SHADOW - Karte

Berechnung: 2024PAV01640 Zusatzbelastung



0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:40.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 466.949 Nord: 5.683.277

 Neue WEA

 Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: CONTOURLINE_ONLINEDATA_0.wpo (1)

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Vorbelastung ohne Einfluss
Annahmen für Schattenwurfberechnung

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

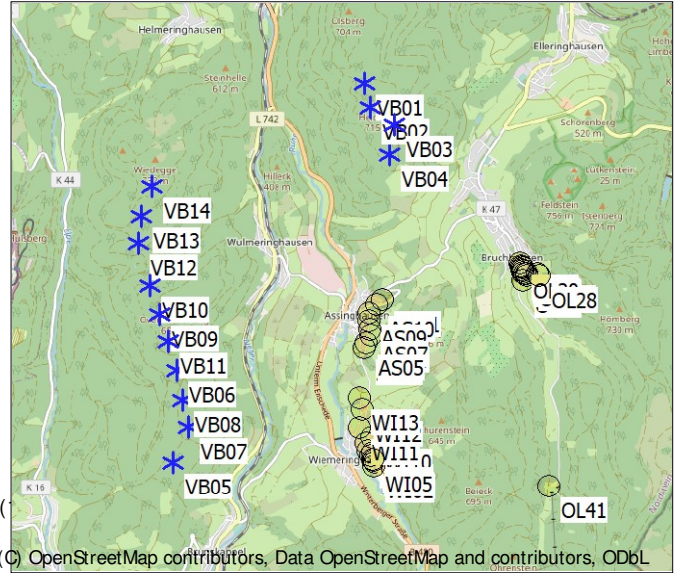
Minimale relevante Sonnenhöhe über Horizont 3 °
Tage zwischen Berechnungen 1 Tag(e)
Berechnungszeitsprung 1 Minuten

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]
Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

Monatliche Aggregation der met. wahrsch. Reduzierung
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_0.wpo (C)
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-ETRS89 Zone: 32



WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nenn- leistung	Rotor- durch- messer	NH	Schattendaten	
					Ak- tu- ell	Hersteller	Typ				Beschatt.- Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
VB01	465.597	5.687.114	679,4	ENERCON E-126 EP4 4200 ...	Nein	ENERCON	E-126 EP4-4.200	4.200	127,0	135,0	2.074	12,4
VB02	465.672	5.686.788	702,1	ENERCON E-126 EP4 4200 ...	Nein	ENERCON	E-126 EP4-4.200	4.200	127,0	135,0	2.074	12,4
VB03	465.990	5.686.559	667,5	ENERCON E-126 EP4 4200 ...	Nein	ENERCON	E-126 EP4-4.200	4.200	127,0	135,0	2.074	12,4
VB04	465.915	5.686.172	623,4	ENERCON E-126 EP4 4200 ...	Nein	ENERCON	E-126 EP4-4.200	4.200	127,0	135,0	2.074	12,4
VB05	463.021	5.682.117	600,0	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB06	463.078	5.683.334	560,0	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB07	463.228	5.682.576	590,0	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB08	463.161	5.682.943	570,0	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB09	462.864	5.684.081	635,0	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB10	462.732	5.684.463	610,9	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB11	462.969	5.683.721	600,0	VESTAS V126-3.45 HTq 34...	Ja	VESTAS	V126-3.45 HTq-3.450	3.450	126,0	137,0	1.718	11,8
VB12	462.596	5.685.017	598,5	VESTAS V162-6.2 6200 16...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-
VB13	462.629	5.685.383	633,7	VESTAS V162-6.2 6200 16...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-
VB14	462.766	5.685.776	685,1	VESTAS V162-6.2 6200 16...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-

Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
					[m]	[m]	[m]	[°]		[m]
AS04	Assinghausen, Auf dem Kampe 38	465.577	5.683.616	428,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS05	Assinghausen, Auf dem Kampe 32	465.598	5.683.679	423,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS06	Assinghausen, Auf dem Kampe 43	465.654	5.683.787	427,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS07	Assinghausen, Strüker Weg 4	465.641	5.683.858	426,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS08	Assinghausen, Strüker Weg 7	465.630	5.683.974	426,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS09	Assinghausen, Strüker Weg 15	465.640	5.684.065	421,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS10	Assinghausen, Bruchsbach 26	465.751	5.684.193	420,9	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS11	Assinghausen, Bruchsbach 23	465.817	5.684.243	434,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL28	Olsberg, Zur Schanze 42	467.895	5.684.561	490,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL29	Olsberg, Am Medebach 10	467.634	5.684.713	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL30	Olsberg, Am Hölchen 2A	467.648	5.684.681	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL31	Olsberg, Am Hölchen 4	467.659	5.684.667	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL32	Olsberg, Am Hölchen 6	467.671	5.684.651	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL33	Olsberg, Am Hölchen 8	467.668	5.684.630	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1

(Fortsetzung nächste Seite)...

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Vorbelastung ohne Einfluss

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
OL34	Olsberg, Am Hölchen 10	467.674	5.684.614	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL35	Olsberg, Am Hölchen 12	467.679	5.684.595	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL36	Olsberg, Am Hölchen 14	467.710	5.684.583	471,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL37	Olsberg, Am Hölchen 24	467.733	5.684.577	473,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL38	Olsberg, Am Hölchen 26	467.736	5.684.559	474,2	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL39	Olsberg, Zur Schanze 40	467.878	5.684.580	489,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL40	Olsberg, Am Medebach 21	467.685	5.684.487	472,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL41	Olsberg, Am Medebach 98	468.005	5.681.759	590,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI02	Wiemeringhausen, Zur Lieth 35	465.677	5.682.056	445,4	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI03	Wiemeringhausen, Alte Landstraße 23	465.697	5.682.095	453,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI04	Wiemeringhausen, Alte Landstraße 21	465.681	5.682.122	454,9	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI05	Wiemeringhausen, Alte Landstraße 19	465.671	5.682.140	455,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI06	Wiemeringhausen, Alte Landstraße 16	465.650	5.682.179	457,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI07	Wiemeringhausen, Alte Landstraße 5	465.672	5.682.229	465,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI08	Wiemeringhausen, Alte Landstraße 10	465.610	5.682.260	457,3	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI09	Wiemeringhausen, Alte Landstraße 4	465.592	5.682.349	458,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI10	Wiemeringhausen, Alte Landstraße 1	465.658	5.682.438	472,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI11	Wiemeringhausen, Ibergstraße 28	465.492	5.682.549	450,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI12	Wiemeringhausen, Ibergstraße 21	465.547	5.682.801	456,4	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI13	Wiemeringhausen, Ibergstraße 19	465.501	5.682.944	455,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1

Berechnungsergebnisse

Schattenrezeptor

		astron. max. mögl. Beschattungsdauer			met. wahrsch. Beschattungsdauer	
Nr.	Name	Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	Stunden/Jahr	
		[h/a]	[d/a]	[h/d]	[h/a]	
AS04	Assinghausen, Auf dem Kampe 38	0:00	0	0:00	0:00	
AS05	Assinghausen, Auf dem Kampe 32	0:00	0	0:00	0:00	
AS06	Assinghausen, Auf dem Kampe 43	0:00	0	0:00	0:00	
AS07	Assinghausen, Strüker Weg 4	0:00	0	0:00	0:00	
AS08	Assinghausen, Strüker Weg 7	0:00	0	0:00	0:00	
AS09	Assinghausen, Strüker Weg 15	0:00	0	0:00	0:00	
AS10	Assinghausen, Bruchsberg 26	0:00	0	0:00	0:00	
AS11	Assinghausen, Bruchsberg 23	0:00	0	0:00	0:00	
OL28	Olsberg, Zur Schanze 42	0:00	0	0:00	0:00	
OL29	Olsberg, Am Medebach 10	0:00	0	0:00	0:00	
OL30	Olsberg, Am Hölchen 2A	0:00	0	0:00	0:00	
OL31	Olsberg, Am Hölchen 4	0:00	0	0:00	0:00	
OL32	Olsberg, Am Hölchen 6	0:00	0	0:00	0:00	
OL33	Olsberg, Am Hölchen 8	0:00	0	0:00	0:00	
OL34	Olsberg, Am Hölchen 10	0:00	0	0:00	0:00	
OL35	Olsberg, Am Hölchen 12	0:00	0	0:00	0:00	
OL36	Olsberg, Am Hölchen 14	0:00	0	0:00	0:00	
OL37	Olsberg, Am Hölchen 24	0:00	0	0:00	0:00	
OL38	Olsberg, Am Hölchen 26	0:00	0	0:00	0:00	
OL39	Olsberg, Zur Schanze 40	0:00	0	0:00	0:00	
OL40	Olsberg, Am Medebach 21	0:00	0	0:00	0:00	
OL41	Olsberg, Am Medebach 98	0:00	0	0:00	0:00	
WI02	Wiemeringhausen, Zur Lieth 35	0:00	0	0:00	0:00	
WI03	Wiemeringhausen, Alte Landstraße 23	0:00	0	0:00	0:00	
WI04	Wiemeringhausen, Alte Landstraße 21	0:00	0	0:00	0:00	
WI05	Wiemeringhausen, Alte Landstraße 19	0:00	0	0:00	0:00	
WI06	Wiemeringhausen, Alte Landstraße 16	0:00	0	0:00	0:00	
WI07	Wiemeringhausen, Alte landstraße 5	0:00	0	0:00	0:00	
WI08	Wiemeringhausen, Alte Landstraße 10	0:00	0	0:00	0:00	
WI09	Wiemeringhausen, Alte landstraße 4	0:00	0	0:00	0:00	
WI10	Wiemeringhausen, Alte Landstraße 1	0:00	0	0:00	0:00	
WI11	Wiemeringhausen, Ibergstraße 28	0:00	0	0:00	0:00	
WI12	Wiemeringhausen, Ibergstraße 21	0:00	0	0:00	0:00	
WI13	Wiemeringhausen, Ibergstraße 19	0:00	0	0:00	0:00	

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Vorbelastung ohne Einfluss

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal	Erwartet
		[h/a]	[h/a]
VB01	ENERCON E-126 EP4 4200 127.0 !O! NH: 135,0 m (Ges:198,5 m) (50)	0:00	0:00
VB02	ENERCON E-126 EP4 4200 127.0 !O! NH: 135,0 m (Ges:198,5 m) (51)	0:00	0:00
VB03	ENERCON E-126 EP4 4200 127.0 !O! NH: 135,0 m (Ges:198,5 m) (52)	0:00	0:00
VB04	ENERCON E-126 EP4 4200 127.0 !O! NH: 135,0 m (Ges:198,5 m) (53)	0:00	0:00
VB05	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (54)	0:00	0:00
VB06	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (55)	0:00	0:00
VB07	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (56)	0:00	0:00
VB08	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (57)	0:00	0:00
VB09	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (58)	0:00	0:00
VB10	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (59)	0:00	0:00
VB11	VESTAS V126-3.45 HTq 3450 126.0 !O! NH: 137,0 m (Ges:200,0 m) (60)	0:00	0:00
VB12	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (61)	0:00	0:00
VB13	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (62)	0:00	0:00
VB14	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (63)	0:00	0:00

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.

Projekt:
KG19062024 Olsberg-Wulmeringhausen

Beschreibung:
Zur Berechnung der meteorologisch
wahrscheinlichen Beschattungsdauer wurden
Windstatistik und Windrichtungsverteilung der
DWD-Station Kahler-Asten entnommen. Die
Sonnenscheinwahrscheinlichkeit wurde der
Sonnenschein-Datenbank Bad Lippspringe
entnommen.

Lizenzierter Anwender:
PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
27.11.2024 11:10/4.0.547

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

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

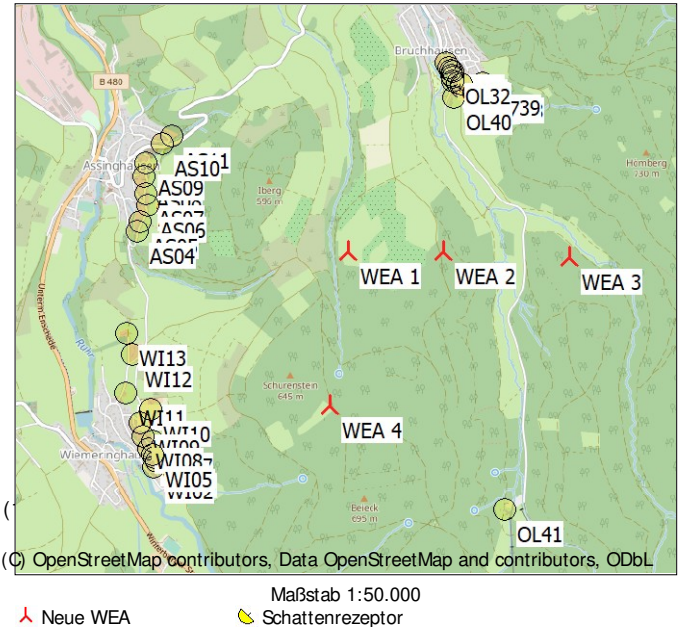
Minimale relevante Sonnenhöhe über Horizont 3 °
Tage zwischen Berechnungen 1 Tag(e)
Berechnungszeitsprung 1 Minuten

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]
Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

Monatliche Aggregation der met. wahrsch. Reduzierung
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_0.wpo ()
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-ETRS89 Zone: 32



WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ	Ak- tu- ell	Hersteller	Typ	Nenn- leistung	Rotor- durch- messer	NH	Schattendaten	
												Beschatt.- Bereich	U/min
			[m]						[kW]	[m]	[m]	[m]	[U/min]
WEA 1	466.971	5.683.471	558,2	VESTAS V162-6.2 6200 162,0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	6.200	162,0	169,0	2.041	-
WEA 2	467.605	5.683.466	566,6	VESTAS V162-6.2 6200 162,0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	6.200	162,0	169,0	2.041	-
WEA 3	468.441	5.683.424	540,0	VESTAS V162-6.2 6200 162,0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	6.200	162,0	169,0	2.041	-
WEA 4	466.845	5.682.454	636,6	VESTAS V162-6.2 6200 162,0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	6.200	162,0	169,0	2.041	-

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]
AS04	Assinghausen, Auf dem Kampe 38	465.577	5.683.616	428,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS05	Assinghausen, Auf dem Kampe 32	465.598	5.683.679	423,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS06	Assinghausen, Auf dem Kampe 43	465.654	5.683.787	427,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS07	Assinghausen, Strüker Weg 4	465.641	5.683.858	426,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS08	Assinghausen, Strüker Weg 7	465.630	5.683.974	426,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS09	Assinghausen, Strüker Weg 15	465.640	5.684.065	421,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS10	Assinghausen, Bruchsbach 26	465.751	5.684.193	420,9	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS11	Assinghausen, Bruchsbach 23	465.817	5.684.243	434,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL28	Olsberg, Zur Schanze 42	467.895	5.684.561	490,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL29	Olsberg, Am Medebach 10	467.634	5.684.713	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL30	Olsberg, Am Hölchen 2A	467.648	5.684.681	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL31	Olsberg, Am Hölchen 4	467.659	5.684.667	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL32	Olsberg, Am Hölchen 6	467.671	5.684.651	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL33	Olsberg, Am Hölchen 8	467.668	5.684.630	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL34	Olsberg, Am Hölchen 10	467.674	5.684.614	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL35	Olsberg, Am Hölchen 12	467.679	5.684.595	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL36	Olsberg, Am Hölchen 14	467.710	5.684.583	471,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL37	Olsberg, Am Hölchen 24	467.733	5.684.577	473,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL38	Olsberg, Am Hölchen 26	467.736	5.684.559	474,2	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL39	Olsberg, Zur Schanze 40	467.878	5.684.580	489,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL40	Olsberg, Am Medebach 21	467.685	5.684.487	472,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL41	Olsberg, Am Medebach 98	468.005	5.681.759	590,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI02	Wiemeringhausen, Zur Lieth 35	465.677	5.682.056	445,4	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI03	Wiemeringhausen, Alte Landstraße 23	465.697	5.682.095	453,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1

(Fortsetzung nächste Seite)...

Projekt:
KG19062024 Olsberg-Wulmeringhausen

Beschreibung:
Zur Berechnung der meteorologisch
wahrscheinlichen Beschattungsdauer wurden
Windstatistik und Windrichtungsverteilung der
DWD-Station Kahler-Asten entnommen. Die
Sonnenscheinwahrscheinlichkeit wurde der
Sonnenschein-Datenbank Bad Lippspringe
entnommen.

Lizenzierter Anwender:
PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
27.11.2024 11:10/4.0.547

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Zusatzbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
WI04	Wiemeringhausen, Alte Landstraße 21	465.681	5.682.122	454,9	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI05	Wiemeringhausen, Alte Landstraße 19	465.671	5.682.140	455,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI06	Wiemeringhausen, Alte Landstraße 16	465.650	5.682.179	457,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI07	Wiemeringhausen, Alte landstraße 5	465.672	5.682.229	465,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI08	Wiemeringhausen, Alte Landstraße 10	465.610	5.682.260	457,3	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI09	Wiemeringhausen, Alte landstraße 4	465.592	5.682.349	458,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI10	Wiemeringhausen, Alte Landstraße 1	465.658	5.682.438	472,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI11	Wiemeringhausen, Ibergstraße 28	465.492	5.682.549	450,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI12	Wiemeringhausen, Ibergstraße 21	465.547	5.682.801	456,4	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI13	Wiemeringhausen, Ibergstraße 19	465.501	5.682.944	455,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer			met. wahrsch. Beschattungsdauer	
		Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	Stunden/Jahr	
		[h/a]	[d/a]	[h/d]	[h/a]	
AS04	Assinghausen, Auf dem Kampe 38	20:32	66	0:26	4:04	
AS05	Assinghausen, Auf dem Kampe 32	25:14	67	0:39	4:50	
AS06	Assinghausen, Auf dem Kampe 43	21:36	71	0:27	3:39	
AS07	Assinghausen, Strüker Weg 4	21:11	70	0:26	3:27	
AS08	Assinghausen, Strüker Weg 7	20:50	72	0:26	3:13	
AS09	Assinghausen, Strüker Weg 15	21:20	76	0:25	3:11	
AS10	Assinghausen, Bruchsberg 26	11:27	34	0:26	2:07	
AS11	Assinghausen, Bruchsberg 23	12:26	36	0:27	2:19	
OL28	Olsberg, Zur Schanze 42	62:45	83	1:11	7:03	
OL29	Olsberg, Am Medebach 10	43:10	54	1:05	4:42	
OL30	Olsberg, Am Hölchen 2A	52:21	58	1:14	5:45	
OL31	Olsberg, Am Hölchen 4	56:22	62	1:17	6:13	
OL32	Olsberg, Am Hölchen 6	60:56	64	1:20	6:45	
OL33	Olsberg, Am Hölchen 8	66:49	66	1:23	7:26	
OL34	Olsberg, Am Hölchen 10	71:15	70	1:24	7:58	
OL35	Olsberg, Am Hölchen 12	76:17	72	1:25	8:33	
OL36	Olsberg, Am Hölchen 14	78:09	74	1:25	8:47	
OL37	Olsberg, Am Hölchen 24	78:18	76	1:25	8:49	
OL38	Olsberg, Am Hölchen 26	81:52	78	1:25	9:15	
OL39	Olsberg, Zur Schanze 40	61:17	80	1:12	6:53	
OL40	Olsberg, Am Medebach 21	99:34	86	1:31	11:29	
OL41	Olsberg, Am Medebach 98	9:11	33	0:21	1:59	
WI02	Wiemeringhausen, Zur Lieth 35	22:14	54	0:30	5:18	
WI03	Wiemeringhausen, Alte Landstraße 23	29:32	64	0:32	7:11	
WI04	Wiemeringhausen, Alte Landstraße 21	34:11	73	0:32	8:24	
WI05	Wiemeringhausen, Alte Landstraße 19	36:19	79	0:32	8:59	
WI06	Wiemeringhausen, Alte Landstraße 16	36:29	90	0:31	9:18	
WI07	Wiemeringhausen, Alte landstraße 5	29:05	75	0:32	7:48	
WI08	Wiemeringhausen, Alte Landstraße 10	21:55	58	0:30	5:59	
WI09	Wiemeringhausen, Alte landstraße 4	17:50	47	0:29	4:46	
WI10	Wiemeringhausen, Alte Landstraße 1	17:55	45	0:31	4:38	
WI11	Wiemeringhausen, Ibergstraße 28	12:31	36	0:26	3:02	
WI12	Wiemeringhausen, Ibergstraße 21	33:10	93	0:26	7:30	
WI13	Wiemeringhausen, Ibergstraße 19	30:56	99	0:25	7:26	

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA 1	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)	195:25	34:01
WEA 2	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (19)	62:38	7:12
WEA 3	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (22)	64:11	6:56
WEA 4	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (20)	165:49	36:38

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.

Die Berechnung der Gesamtsumme für einen Rezeptor arbeitet mit einer gemittelten Richtungskorrektur für alle WEA, die an einem gegebenen Tag zur Beschattung beitragen. Wenn der Schattenwurf durch mehrere WEA an einem Tag nicht gleichzeitig stattfindet, kann die so ermittelte Summe geringfügig von der Summe der Beschattungszeiten abweichen, die für die individuellen WEA berechnet werden.

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: AS04 - Assinghausen, Auf dem Kampe 38

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Jun
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	08:05 (WEA 1) 23 08:28 (WEA 1)	06:01 21:32
2	08:31 16:29	08:04 17:17	07:11 18:07	07:02 20:00	08:04 (WEA 1) 25 08:29 (WEA 1)	05:59 21:33
3	08:31 16:31	08:03 17:19	07:09 18:09	07:00 20:01	08:04 (WEA 1) 25 08:29 (WEA 1)	05:57 21:34
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	08:03 (WEA 1) 26 08:29 (WEA 1)	05:55 21:35
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	08:03 (WEA 1) 26 08:29 (WEA 1)	05:53 21:36
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	08:02 (WEA 1) 26 08:28 (WEA 1)	05:52 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	08:03 (WEA 1) 24 08:27 (WEA 1)	05:50 21:38
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	08:03 (WEA 1) 24 08:27 (WEA 1)	05:48 21:39
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	08:04 (WEA 1) 22 08:26 (WEA 1)	05:46 21:40
10	08:29 16:39	07:51 17:31	06:54 18:21	06:44 20:13	08:05 (WEA 1) 19 08:24 (WEA 1)	05:45 21:02
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	08:05 (WEA 1) 17 08:22 (WEA 1)	05:43 21:04
12	08:28 16:42	07:47 17:35	06:49 18:25	06:40 20:16	08:07 (WEA 1) 12 08:19 (WEA 1)	05:42 21:05
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	08:11 (WEA 1) 4 08:15 (WEA 1)	05:40 21:07
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:28 21:18	05:10 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	05:10 21:46
23	08:18 16:59	07:26 17:55	06:25 18:43	06:16 20:35	05:26 21:21	05:10 21:47
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:23	05:11 21:47
25	08:15 17:03	07:22 17:58	06:20 18:47	06:12 20:38	05:24 21:24	05:11 21:47
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:40	05:23 21:25	05:11 21:47
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47
28	08:11 17:08	07:16 18:04	06:13 18:52	06:07 20:43	05:20 21:28	05:12 21:47
29	08:10 17:10		06:11 19:53	06:05 20:44	05:19 21:29	05:13 21:46
30	08:08 17:12		06:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46
31	08:07 17:13		06:06 19:56	06:02 20:48	05:17 21:31	
Sonnenscheinstunden	262	279	367	415	483	495
astr.max.mögl.Beschattung		272	67	273		
Red.Sonnenscheinwahrsch.		0,32	0,28	0,36		
Reduktion Betriebsdauer		0,98	0,98	0,98		
Reduktion Windrichtung		0,60	0,67	0,67		
Gesamte Reduktion		0,19	0,19	0,24		
Met.wahrsch.Beschattung		52	12	65		

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

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

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: AS04 - Assinghausen, Auf dem Kampe 38

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	July	August	September	Oktober	November	Dezember
1	05:14 21:46	05:50 21:15	06:38 20:15	08:05 (WEA 1) 19:06	07:26 17:02	08:45 (WEA 4) 16:22
2	05:15 21:46	05:51 21:14	06:39 20:12	08:03 (WEA 1) 19:04	07:27 17:00	08:45 (WEA 4) 16:22
3	05:15 21:45	05:52 21:12	06:41 20:10	08:02 (WEA 1) 19:02	07:29 16:58	08:46 (WEA 4) 16:21
4	05:16 21:45	05:54 21:10	06:43 20:08	08:00 (WEA 1) 19:00	07:30 16:56	08:46 (WEA 4) 16:21
5	05:17 21:45	05:56 21:09	06:44 20:06	08:00 (WEA 1) 18:57	07:32 16:55	08:47 (WEA 4) 16:20
6	05:18 21:44	05:57 21:07	06:46 20:03	07:58 (WEA 1) 18:55	07:34 16:53	08:49 (WEA 4) 16:20
7	05:19 21:43	05:59 21:05	06:47 20:01	07:58 (WEA 1) 18:53	07:35 16:51	08:50 (WEA 4) 16:19
8	05:19 21:43	06:00 21:03	06:49 19:59	07:58 (WEA 1) 18:51	07:37 16:50	08:53 (WEA 4) 16:19
9	05:20 21:42	06:02 21:01	06:50 19:57	07:58 (WEA 1) 18:49	07:39 16:48	09:00 (WEA 4) 16:19
10	05:21 21:41	06:03 21:00	06:52 19:54	07:57 (WEA 1) 18:46	07:40 16:46	08:19 16:19
11	05:22 21:41	06:05 20:58	06:54 19:52	07:58 (WEA 1) 18:44	07:42 16:45	08:20 16:18
12	05:23 21:40	06:06 20:56	06:55 19:50	07:58 (WEA 1) 18:42	07:44 16:43	08:21 16:18
13	05:25 21:39	06:08 20:54	06:57 19:48	07:59 (WEA 1) 18:40	07:45 16:42	08:22 16:18
14	05:26 21:38	06:09 20:52	06:58 19:45	08:00 (WEA 1) 18:38	07:47 16:40	08:23 16:18
15	05:27 21:37	06:11 20:50	07:00 19:43	08:02 (WEA 1) 18:35	07:49 16:39	08:24 16:18
16	05:28 21:36	06:13 20:48	07:02 19:41	08:14 (WEA 1) 18:33	18:35 16:38	16:19
17	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	07:46 16:36	08:26 16:19
18	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	07:47 16:35	08:26 16:19
19	05:32 21:33	06:17 20:42	07:06 19:34	07:55 18:27	07:49 16:34	08:27 16:19
20	05:33 21:32	06:19 20:40	07:08 19:32	07:57 18:25	07:51 16:33	08:28 16:20
21	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:32	08:28 16:20
22	05:35 21:30	06:22 20:36	07:11 19:27	08:01 18:21	07:54 16:30	08:29 16:21
23	05:37 21:28	06:24 20:34	07:13 19:25	08:02 18:19	07:56 16:29	08:29 16:21
24	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	08:30 16:22
25	05:39 21:26	06:27 20:30	07:16 19:20	08:06 17:15	09:51 (WEA 4) 10:00 (WEA 4)	08:31 16:22
26	05:41 21:24	06:28 20:28	07:17 19:18	08:07 17:13	09:03 (WEA 4) 08:47 (WEA 4)	08:30 16:22
27	05:42 21:23	06:30 20:25	07:19 19:15	08:09 17:11	14 08:49 (WEA 4) 18 09:05 (WEA 4)	08:31 16:24
28	05:44 21:21	06:32 20:23	07:21 19:13	08:11 17:09	09:04 (WEA 4) 09:06 (WEA 4)	08:31 16:24
29	05:45 21:20	06:33 20:21	07:22 19:11	08:13 17:07	20 09:07 (WEA 4) 21 09:07 (WEA 4)	08:31 16:25
30	05:47 21:18	06:35 20:19	08:11 (WEA 1) 08:16 (WEA 1)	07:24 17:05	08:46 (WEA 4) 09:06 (WEA 4)	08:31 16:26
31	05:48 21:17	06:36 20:17	08:07 (WEA 1) 08:19 (WEA 1)	07:16 17:03	22 08:44 (WEA 4) 22 09:06 (WEA 4)	08:31 16:27
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung		17	327	143	133	
Red.Sonnenscheinwahrsch.		0,40	0,32	0,29	0,22	
Reduktion Betriebsdauer		0,98	0,98	0,98	0,98	
Reduktion Windrichtung		0,67	0,67	0,60	0,60	
Gesamte Reduktion		0,26	0,21	0,17	0,13	
Met.wahrsch.Beschattung		4	68	24	18	

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) Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS05 - Assinghausen, Auf dem Kampe 32
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor												
N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Juni
1	08:31 16:28	08:06 17:15	09:26 (WEA 4) 09:38 (WEA 4)	07:13 18:06	07:04 19:58	08:01 (WEA 2) 20:48
2	08:31 16:29	08:04 17:17	09:25 (WEA 4) 09:40 (WEA 4)	07:11 18:07	07:02 20:00	08:02 (WEA 2) 20:49
3	08:31 16:31	08:03 17:19	09:24 (WEA 4) 09:41 (WEA 4)	07:09 18:09	07:00 20:01	08:04 (WEA 2) 20:51
4	08:31 16:32	08:01 17:21	09:23 (WEA 4) 09:42 (WEA 4)	07:07 18:11	06:57 20:03	08:13 (WEA 1) 20:53
5	08:31 16:33	07:59 17:22	09:22 (WEA 4) 09:42 (WEA 4)	07:05 18:13	06:55 20:05	08:14 (WEA 1) 20:54
6	08:30 16:34	07:58 17:24	09:23 (WEA 4) 09:44 (WEA 4)	07:03 18:14	06:53 20:06	08:13 (WEA 1) 20:56
7	08:30 16:35	07:56 17:26	09:22 (WEA 4) 09:44 (WEA 4)	07:00 18:16	06:51 20:08	08:15 (WEA 1) 20:57
8	08:30 16:37	07:54 17:28	09:22 (WEA 4) 09:44 (WEA 4)	06:58 18:18	06:49 20:10	08:16 (WEA 1) 20:59
9	08:29 16:38	07:53 17:30	09:22 (WEA 4) 09:43 (WEA 4)	06:56 18:19	06:46 20:11	08:19 (WEA 1) 21:01
10	08:29 16:39	07:51 17:31	09:22 (WEA 4) 09:43 (WEA 4)	06:54 18:21	06:44 20:13	08:27 (WEA 1) 21:02
11	08:28 16:41	07:49 17:33	09:24 (WEA 4) 09:43 (WEA 4)	06:52 18:23	06:42 20:15	05:43 21:04
12	08:28 16:42	07:47 17:35	09:24 (WEA 4) 09:42 (WEA 4)	06:49 18:25	06:40 20:16	05:42 21:05
13	08:27 16:44	07:45 17:37	09:25 (WEA 4) 09:41 (WEA 4)	06:47 18:26	06:38 20:18	05:40 21:07
14	08:26 16:45	07:44 17:39	09:27 (WEA 4) 09:40 (WEA 4)	06:45 18:28	06:35 20:20	05:38 21:08
15	08:25 16:47	07:42 17:41	09:29 (WEA 4) 09:37 (WEA 4)	06:43 18:30	06:33 20:21	05:37 21:10
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	06:31 21:11	05:35 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	06:29 21:13	05:34 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	06:27 21:14	05:33 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	06:25 21:16	05:31 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	06:23 21:17	05:30 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	06:21 21:18	05:28 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	06:19 21:20	05:27 21:46
23	08:18 16:59	07:26 17:55	06:25 18:43	06:16 20:35	06:16 21:21	05:26 21:47
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	06:14 21:23	05:25 21:47
25	08:15 17:03	07:22 17:58	06:20 18:47	06:12 20:38	06:12 21:24	05:24 21:47
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:40	06:10 21:25	05:23 21:47
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	06:08 21:26	05:21 21:47
28	08:11 17:08	07:16 18:04	06:13 18:52	06:07 20:43	06:07 21:28	05:20 21:47
29	08:10 17:10		07:11 19:53	06:05 20:44	06:05 21:29	05:19 21:46
30	08:08 17:12		07:09 19:55	06:03 20:46	06:03 21:30	05:18 21:46
31	08:07 17:13	09:28 (WEA 4) 09:36 (WEA 4)	07:06 19:56	08:01 (WEA 2) 08:39 (WEA 1)	07:06 19:56	05:18 21:31
Sonnenscheinstunden	262	279	367	415	483	495
astr.max.mögl.Beschattung	8	264	266	214		
Red.Sonnenscheinwahrsch.	0,19	0,32	0,28	0,36		
Reduktion Betriebsdauer	0,98	0,98	0,98	0,98		
Reduktion Windrichtung	0,59	0,59	0,66	0,66		
Gesamte Reduktion	0,11	0,19	0,18	0,24		
Met.wahrsch.Beschattung	1	50	49	51		

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS05 - Assinghausen, Auf dem Kampe 32
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	July	August	September	Oktober	November	Dezember
1	05:14 21:46	05:50 21:15	06:38 20:15	07:26 19:06	07:18 17:02	08:52 (WEA 4) 16:22
2	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	07:20 17:00	08:52 (WEA 4) 16:22
3	05:15 21:45	05:52 21:12	06:41 20:10	08:17 (WEA 1) 08:25 (WEA 1)	07:21 16:58	08:52 (WEA 4) 16:21
4	05:16 21:45	05:54 21:10	06:43 20:08	08:13 (WEA 1) 08:27 (WEA 1)	07:23 16:56	08:52 (WEA 4) 16:21
5	05:17 21:45	05:56 21:09	06:44 20:06	08:12 (WEA 1) 08:30 (WEA 1)	07:25 16:55	08:52 (WEA 4) 16:20
6	05:18 21:44	05:57 21:07	06:46 20:03	08:10 (WEA 1) 08:30 (WEA 1)	07:27 16:53	08:53 (WEA 4) 16:20
7	05:19 21:43	05:59 21:05	06:47 20:01	08:09 (WEA 1) 08:31 (WEA 1)	07:28 16:51	08:54 (WEA 4) 16:19
8	05:19 21:43	06:00 21:03	06:49 19:59	08:07 (WEA 1) 08:31 (WEA 1)	07:30 16:50	08:55 (WEA 4) 16:19
9	05:20 21:42	06:02 21:01	06:50 19:57	07:59 (WEA 2) 08:32 (WEA 1)	07:32 16:48	08:55 (WEA 4) 16:19
10	05:21 21:41	06:03 21:00	06:52 19:54	07:56 (WEA 2) 08:31 (WEA 1)	07:34 16:46	08:57 (WEA 4) 16:19
11	05:22 21:41	06:05 20:58	06:54 19:52	07:54 (WEA 2) 08:32 (WEA 1)	07:35 16:45	08:59 (WEA 4) 16:18
12	05:23 21:40	06:06 20:56	06:55 19:50	07:53 (WEA 2) 08:31 (WEA 1)	07:37 16:43	09:07 (WEA 4) 16:18
13	05:25 21:39	06:08 20:54	06:57 19:48	07:52 (WEA 2) 08:31 (WEA 1)	07:39 16:42	08:22 16:18
14	05:26 21:38	06:09 20:52	06:58 19:45	07:51 (WEA 2) 08:29 (WEA 1)	07:41 16:40	08:23 16:18
15	05:27 21:37	06:11 20:50	07:00 19:43	07:51 (WEA 2) 08:29 (WEA 1)	07:42 16:39	08:24 16:18
16	05:28 21:36	06:13 20:48	07:02 19:41	07:51 (WEA 2) 08:27 (WEA 1)	07:44 16:38	08:25 16:19
17	05:29 21:35	06:14 20:46	07:03 19:38	07:52 (WEA 2) 08:26 (WEA 1)	07:46 16:36	08:26 16:19
18	05:30 21:34	06:16 20:44	07:05 19:36	07:53 (WEA 2) 08:24 (WEA 1)	07:47 16:35	08:26 16:19
19	05:32 21:33	06:17 20:42	07:06 19:34	07:53 (WEA 2) 08:20 (WEA 1)	07:49 16:34	08:27 16:19
20	05:33 21:32	06:19 20:40	07:08 19:32	07:57 (WEA 2) 08:01 (WEA 2)	07:51 16:33	08:28 16:20
21	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:32	08:28 16:20
22	05:35 21:30	06:22 20:36	07:11 19:27	08:01 18:21	07:54 16:30	08:29 16:21
23	05:37 21:28	06:24 20:34	07:13 19:25	08:02 18:19	07:56 16:29	08:29 16:21
24	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	08:30 16:22
25	05:39 21:26	06:27 20:30	07:16 19:20	07:06 17:15	07:59 16:27	08:30 16:22
26	05:41 21:24	06:28 20:28	07:17 19:18	07:07 17:13	08:00 16:26	08:31 16:23
27	05:42 21:23	06:30 20:25	07:19 19:15	07:09 17:11	08:02 16:26	08:31 16:24
28	05:44 21:21	06:32 20:23	07:21 19:13	07:11 17:09	08:58 (WEA 4) 09:10 (WEA 4)	08:03 16:25
29	05:45 21:20	06:33 20:21	07:22 19:11	07:13 17:07	08:55 (WEA 4) 09:11 (WEA 4)	08:05 16:24
30	05:47 21:18	06:35 20:19	07:24 19:09	07:14 17:05	08:53 (WEA 4) 09:11 (WEA 4)	08:06 16:23
31	05:48 21:17	06:36 20:17		07:16 17:03	08:52 (WEA 4) 09:12 (WEA 4)	08:31 16:27
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung			488	78	196	
Red.Sonnenscheinwahrsch.			0,32	0,29	0,22	
Reduktion Betriebsdauer			0,98	0,98	0,98	
Reduktion Windrichtung			0,66	0,59	0,59	
Gesamte Reduktion			0,21	0,17	0,13	
Met.wahrsch.Beschattung			101	13	26	

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: AS06 - Assinghausen, Auf dem Kampe 43

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Juni
1	08:31 16:28	08:06 17:15	09:34 (WEA 4) 09:55 (WEA 4)	07:13 18:06	07:04 19:58	08:34 (WEA 1) 20:48
2	08:31 16:29	08:04 17:17	09:35 (WEA 4) 09:56 (WEA 4)	07:11 18:07	07:02 20:00	08:38 (WEA 1) 20:49
3	08:31 16:31	08:03 17:19	09:35 (WEA 4) 09:56 (WEA 4)	07:09 18:09	07:00 20:01	08:42 (WEA 1) 20:57
4	08:31 16:32	08:01 17:21	09:35 (WEA 4) 09:55 (WEA 4)	07:07 18:11	06:57 20:03	05:55 20:53
5	08:31 16:33	08:31 17:22	09:36 (WEA 4) 09:54 (WEA 4)	07:05 18:13	06:55 20:05	05:53 20:54
6	08:30 16:34	07:58 17:24	09:37 (WEA 4) 09:55 (WEA 4)	07:03 18:14	06:53 20:06	05:52 20:56
7	08:30 16:35	07:56 17:26	09:38 (WEA 4) 09:53 (WEA 4)	07:00 18:16	06:51 20:08	05:50 20:57
8	08:30 16:37	07:54 17:28	09:39 (WEA 4) 09:52 (WEA 4)	06:58 18:18	06:49 20:10	05:48 20:59
9	08:29 16:38	07:53 17:30	09:42 (WEA 4) 09:49 (WEA 4)	06:56 18:19	06:46 20:11	05:46 21:01
10	08:29 16:39	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41
12	08:28 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	05:11 21:42
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	05:10 21:43
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:28 21:18	05:10 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	05:10 21:46
23	08:18 16:59	09:41 (WEA 4) 09:46 (WEA 4)	06:25 18:43	06:16 20:35	05:26 21:21	05:10 21:47
24	08:16 17:01	09:38 (WEA 4) 09:48 (WEA 4)	06:22 18:45	06:14 20:36	05:25 21:23	05:11 21:47
25	08:15 17:03	09:37 (WEA 4) 09:51 (WEA 4)	06:20 18:47	06:12 20:38	05:24 21:24	05:11 21:47
26	08:14 17:05	09:36 (WEA 4) 09:51 (WEA 4)	06:18 18:48	06:10 20:40	05:22 21:25	05:11 21:47
27	08:13 17:06	09:35 (WEA 4) 09:53 (WEA 4)	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47
28	08:11 17:08	09:35 (WEA 4) 09:54 (WEA 4)	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47
29	08:10 17:10	09:35 (WEA 4) 09:54 (WEA 4)	07:11 19:53	06:05 20:44	05:19 21:29	05:13 21:46
30	08:08 17:12	09:34 (WEA 4) 09:55 (WEA 4)	07:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46
31	08:07 17:13	09:34 (WEA 4) 09:55 (WEA 4)	07:06 19:56	06:03 20:46	05:18 21:31	05:13 21:46
Sonnenscheinstunden	262	279	367	415	483	495
astr.max.mögl.Beschattung	142	154	334	17		
Red.Sonnenscheinwahrsch.	0,19	0,32	0,28	0,36		
Reduktion Betriebsdauer	0,98	0,98	0,98	0,98		
Reduktion Windrichtung	0,60	0,60	0,65	0,65		
Gesamte Reduktion	0,11	0,19	0,18	0,23		
Met.wahrsch.Beschattung	16	29	60	4		

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS06 - Assinghausen, Auf dem Kampe 43
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Juli			August			September			Oktober			November			Dezember		
1	05:14	05:49	06:38							07:26	07:18					08:08		
	21:46	21:15	20:15							19:06	17:02					16:22		
2	05:15	05:51	06:39							07:27	07:20					08:09		
	21:46	21:14	20:12							19:04	17:00	8	09:11 (WEA 4)			16:22		
3	05:15	05:52	06:41							07:29	07:21					08:10		
	21:45	21:12	20:10							19:02	16:58	13	09:22 (WEA 4)			16:21		
4	05:16	05:54	06:43							07:30	07:23					08:12		
	21:45	21:10	20:08							19:00	16:56	15	09:23 (WEA 4)			16:21		
5	05:17	05:56	06:44							07:32	07:25					08:13		
	21:45	21:09	20:06							18:57	16:55	17	09:24 (WEA 4)			16:20		
6	05:18	05:57	06:46							07:34	07:27					08:14		
	21:44	21:07	20:03							18:55	16:53	19	09:25 (WEA 4)			16:20		
7	05:19	05:59	06:47							07:35	07:28					08:16		
	21:43	21:05	20:01							18:53	16:51	20	09:26 (WEA 4)			16:19		
8	05:19	06:00	06:49							07:37	07:30					08:17		
	21:43	21:03	19:59							18:51	16:50	21	09:27 (WEA 4)			16:19		
9	05:20	06:02	06:50							07:39	07:32					08:18		
	21:42	21:01	19:57							18:48	16:48	21	09:28 (WEA 4)			16:19		
10	05:21	06:03	06:52							07:40	07:34					08:19		
	21:41	21:00	19:54	1	08:33 (WEA 1)					18:46	16:46	21	09:29 (WEA 4)			16:19		
11	05:22	06:05	06:54							07:42	07:35					08:20		
	21:41	20:58	19:52	12	08:40 (WEA 1)					18:44	16:45	21	09:30 (WEA 4)			16:18		
12	05:23	06:06	06:55							07:44	07:37					08:21		
	21:40	20:56	19:50	17	08:41 (WEA 1)					18:42	16:43	20	09:31 (WEA 4)			16:18		
13	05:25	06:08	06:57							07:45	07:39					08:22		
	21:39	20:54	19:48	20	08:43 (WEA 1)					18:40	16:42	19	09:32 (WEA 4)			16:18		
14	05:26	06:09	06:58							07:47	07:41					08:23		
	21:38	20:52	19:45	22	08:43 (WEA 1)					18:38	16:40	19	09:33 (WEA 4)			16:18		
15	05:27	06:11	07:00							07:49	07:42					08:24		
	21:37	20:50	19:43	24	08:44 (WEA 1)					18:35	16:39	18	09:34 (WEA 4)			16:18		
16	05:28	06:13	07:02							07:50	07:44					08:25		
	21:36	20:48	19:41	25	08:44 (WEA 1)					18:33	16:38	15	09:35 (WEA 4)			16:19		
17	05:29	06:14	07:03							07:52	07:46					08:26		
	21:35	20:46	19:38	26	08:45 (WEA 1)					18:31	16:36	13	09:36 (WEA 4)			16:19		
18	05:30	06:16	07:05							07:54	07:47					08:26		
	21:34	20:44	19:36	27	08:45 (WEA 1)					18:29	16:35	10	09:37 (WEA 4)			16:19		
19	05:32	06:17	07:06							07:55	07:49					08:27		
	21:33	20:42	19:34	26	08:44 (WEA 1)					18:27	16:34	5	09:38 (WEA 4)			16:19		
20	05:33	06:19	07:08							07:57	07:51					08:28		
	21:32	20:40	19:32	26	08:44 (WEA 1)					18:25	16:33					16:20		
21	05:34	06:20	07:09							07:59	07:52					08:28		
	21:31	20:38	19:29	26	08:43 (WEA 1)					18:23	16:32					16:20		
22	05:35	06:22	07:11							08:01	07:54					08:29		
	21:30	20:36	19:27	24	08:42 (WEA 1)					18:21	16:30					16:21		
23	05:37	06:24	07:13							08:02	07:56					08:29		
	21:28	20:34	19:25	23	08:41 (WEA 1)					18:19	16:29					16:21		
24	05:38	06:25	07:14							08:04	07:57					08:30		
	21:27	20:32	19:22	20	08:39 (WEA 1)					18:17	16:28					16:22		
25	05:39	06:27	07:16							07:06	07:59					08:30		
	21:26	20:30	19:20	18	08:38 (WEA 1)					17:15	16:27					16:22		
26	05:41	06:28	07:17							07:07	08:00					08:31		
	21:24	20:28	19:18	13	08:35 (WEA 1)					17:13	16:26					16:23		
27	05:42	06:30	07:19							07:09	08:02					08:31		
	21:23	20:25	19:15	4	08:30 (WEA 1)					17:11	16:26					16:24		
28	05:44	06:32	07:21							07:11	08:03					08:31		
	21:21	20:23	19:13							17:09	16:25					16:24		
29	05:45	06:33	07:22							07:13	08:05					08:31		
	21:20	20:21	19:11							17:07	16:24					16:25		
30	05:47	06:35	07:24							07:14	08:06					08:31		
	21:18	20:19	19:09							17:05	16:23					16:26		
31	05:48	06:36								07:16						08:31		
	21:17	20:17								17:03						16:27		
Sonnenscheinstunden	499	452	380							332	269					247		
astr.max.mögl.Beschattung				354							295							
Red.Sonnenscheinwahrsch.				0,32							0,22							
Reduktion Betriebsdauer				0,98							0,98							
Reduktion Windrichtung				0,65							0,60							
Gesamte Reduktion				0,20							0,13							
Met.wahrsch.Beschattung				72							39							

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: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: AS07 - Assinghausen, Strüker Weg 4

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Jun
1	08:31 16:28	08:06 17:15	09:39 (WEA 4) 18:06	07:04 19:58	06:01 20:48	05:17 21:32
2	08:31 16:29	08:04 17:17	09:40 (WEA 4) 18:07	07:02 20:00	05:59 20:49	05:16 21:33
3	08:31 16:32	08:03 17:19	09:40 (WEA 4) 18:09	07:00 20:01	05:57 20:51	05:15 21:34
4	08:31 16:32	08:01 17:21	09:41 (WEA 4) 18:11	06:57 20:03	05:55 20:53	05:14 21:35
5	08:31 16:33	07:59 17:22	09:42 (WEA 4) 18:13	06:55 20:05	05:53 20:54	05:14 21:36
6	08:30 16:34	07:58 17:24	09:45 (WEA 4) 18:14	06:53 20:06	05:52 20:56	05:13 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	05:12 21:39
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:01	05:12 21:40
10	08:29 16:39	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41
12	08:28 16:42	07:47 17:35	06:49 18:25	07:54 (WEA 1) 07:58 (WEA 1)	06:40 20:16	05:42 21:05
13	08:27 16:44	07:45 17:37	06:47 18:26	07:49 (WEA 1) 08:02 (WEA 1)	06:38 20:18	05:40 21:07
14	08:26 16:45	07:44 17:39	06:45 18:28	07:46 (WEA 1) 08:03 (WEA 1)	06:35 20:20	05:38 21:08
15	08:25 16:47	07:42 17:41	06:43 18:30	07:44 (WEA 1) 08:05 (WEA 1)	06:33 20:21	05:37 21:10
16	08:25 16:48	07:40 17:42	06:40 18:31	07:43 (WEA 1) 08:06 (WEA 1)	06:31 20:23	05:35 21:11
17	08:24 16:50	07:38 17:44	06:38 18:33	07:43 (WEA 1) 08:07 (WEA 1)	06:29 20:25	05:34 21:13
18	08:23 16:51	07:36 17:46	06:36 18:35	07:41 (WEA 1) 08:06 (WEA 1)	06:27 20:26	05:33 21:14
19	08:22 16:53	07:34 17:48	06:34 18:36	07:41 (WEA 1) 08:06 (WEA 1)	06:25 20:28	05:31 21:16
20	08:21 16:54	09:42 (WEA 4) 09:49 (WEA 4)	07:32 17:50	06:31 18:38	07:40 (WEA 1) 08:06 (WEA 1)	06:23 20:30
21	08:20 16:56	7 09:41 (WEA 4) 09:52 (WEA 4)	07:30 17:51	06:29 18:40	07:39 (WEA 1) 08:05 (WEA 1)	06:21 20:31
22	08:19 16:58	11 09:40 (WEA 4) 09:53 (WEA 4)	07:28 17:53	06:27 18:41	07:40 (WEA 1) 08:05 (WEA 1)	06:19 20:33
23	08:18 16:59	13 09:40 (WEA 4) 09:55 (WEA 4)	07:26 17:55	06:25 18:43	07:40 (WEA 1) 08:04 (WEA 1)	06:16 20:35
24	08:16 17:01	15 09:38 (WEA 4) 09:55 (WEA 4)	07:24 17:57	06:22 18:45	07:41 (WEA 1) 08:04 (WEA 1)	06:14 20:36
25	08:15 17:03	17 09:38 (WEA 4) 09:57 (WEA 4)	07:22 17:58	06:20 18:47	07:41 (WEA 1) 08:01 (WEA 1)	06:12 20:38
26	08:14 17:05	19 09:37 (WEA 4) 09:57 (WEA 4)	07:20 18:00	06:18 18:48	07:42 (WEA 1) 08:00 (WEA 1)	06:10 20:40
27	08:13 17:06	20 09:38 (WEA 4) 09:58 (WEA 4)	07:18 18:02	06:16 18:50	07:44 (WEA 1) 07:58 (WEA 1)	06:08 20:41
28	08:11 17:08	21 09:38 (WEA 4) 09:59 (WEA 4)	07:16 18:04	06:13 18:52	07:46 (WEA 1) 07:53 (WEA 1)	06:06 20:43
29	08:10 17:10	20 09:38 (WEA 4) 09:58 (WEA 4)		07:11 19:53	06:05 20:44	05:19 21:29
30	08:08 17:12	20 09:38 (WEA 4) 09:58 (WEA 4)		07:09 19:55	06:03 20:46	05:18 21:30
31	08:07 17:13	20 09:39 (WEA 4) 09:59 (WEA 4)		07:06 19:56	05:18 21:31	21:46
Sonnenscheinstunden	262	279	367	415	483	495
astr.max.mögl.Beschattung	203	93	335			
Red.Sonnenscheinwahrsch.	0,19	0,32	0,28			
Reduktion Betriebsdauer	0,98	0,98	0,98			
Reduktion Windrichtung	0,60	0,60	0,64			
Gesamte Reduktion	0,11	0,19	0,18			
Met.wahrsch.Beschattung	22	18	60			

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 - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS07 - Assinghausen, Strüker Weg 4
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Jul	August	September	Oktober	November	Dezember	
1	05:14 21:46	05:49 21:15	06:38 20:15	07:26 19:06	08:30 (WEA 1) 9 08:39 (WEA 1)	07:18 17:02	08:08 16:22
2	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	07:20 17:00		08:09 16:22
3	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	07:21 16:58		08:10 16:21
4	05:16 21:45	05:54 21:10	06:43 20:08	07:30 19:00	07:23 16:56		08:12 16:21
5	05:17 21:45	05:56 21:09	06:44 20:06	07:32 18:57	07:25 16:55	09:15 (WEA 4) 9 09:24 (WEA 4)	08:13 16:20
6	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	07:27 16:53	09:13 (WEA 4) 13 09:26 (WEA 4)	08:14 16:20
7	05:19 21:43	05:59 21:05	06:47 20:01	07:35 18:53	07:28 16:51	09:12 (WEA 4) 15 09:27 (WEA 4)	08:16 16:19
8	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	07:30 16:50	09:11 (WEA 4) 18 09:29 (WEA 4)	08:17 16:19
9	05:20 21:42	06:02 21:01	06:50 19:57	07:39 18:48	07:32 16:48	09:10 (WEA 4) 18 09:28 (WEA 4)	08:18 16:19
10	05:21 21:41	06:03 21:00	06:52 19:54	07:40 18:46	07:34 16:46	09:09 (WEA 4) 20 09:29 (WEA 4)	08:19 16:19
11	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	07:35 16:45	09:09 (WEA 4) 21 09:30 (WEA 4)	08:20 16:18
12	05:23 21:40	06:06 20:56	06:55 19:50	07:44 18:42	07:37 16:43	09:10 (WEA 4) 20 09:30 (WEA 4)	08:21 16:18
13	05:25 21:39	06:08 20:54	06:57 19:48	07:45 18:40	07:39 16:42	09:10 (WEA 4) 20 09:30 (WEA 4)	08:22 16:18
14	05:26 21:38	06:09 20:52	06:58 19:45	07:47 18:38	07:41 16:40	09:10 (WEA 4) 21 09:31 (WEA 4)	08:23 16:18
15	05:27 21:37	06:11 20:50	07:00 19:43	08:38 (WEA 1) 4 08:42 (WEA 1)	07:49 18:35	09:11 (WEA 4) 20 09:31 (WEA 4)	08:24 16:18
16	05:28 21:36	06:13 20:48	07:02 19:41	08:33 (WEA 1) 13 08:46 (WEA 1)	07:50 18:33	09:11 (WEA 4) 20 09:31 (WEA 4)	08:25 16:19
17	05:29 21:35	06:14 20:46	07:03 19:38	08:31 (WEA 1) 17 08:48 (WEA 1)	07:52 18:31	09:11 (WEA 4) 19 09:30 (WEA 4)	08:26 16:19
18	05:30 21:34	06:16 20:44	07:05 19:36	08:29 (WEA 1) 21 08:50 (WEA 1)	07:54 18:29	09:12 (WEA 4) 17 09:29 (WEA 4)	08:26 16:19
19	05:32 21:33	06:17 20:42	07:06 19:34	08:27 (WEA 1) 23 08:50 (WEA 1)	07:55 18:27	09:14 (WEA 4) 15 09:29 (WEA 4)	08:27 16:19
20	05:33 21:32	06:19 20:40	07:08 19:32	08:27 (WEA 1) 24 08:51 (WEA 1)	07:57 18:25	09:15 (WEA 4) 13 09:28 (WEA 4)	08:28 16:20
21	05:34 21:31	06:20 20:38	07:09 19:29	08:25 (WEA 1) 25 08:50 (WEA 1)	07:59 18:23	09:17 (WEA 4) 11 09:28 (WEA 4)	08:28 16:20
22	05:35 21:30	06:22 20:36	07:11 19:27	08:25 (WEA 1) 26 08:51 (WEA 1)	08:01 18:21	09:18 (WEA 4) 7 09:25 (WEA 4)	08:29 16:21
23	05:37 21:28	06:24 20:34	07:13 19:25	08:24 (WEA 1) 26 08:50 (WEA 1)	08:02 18:19	07:56 16:29	08:29 16:21
24	05:38 21:27	06:25 20:32	07:14 19:22	08:24 (WEA 1) 26 08:50 (WEA 1)	08:04 18:17	07:57 16:28	08:30 16:22
25	05:39 21:26	06:27 20:30	07:16 19:20	08:24 (WEA 1) 26 08:50 (WEA 1)	07:06 17:15	07:59 16:27	08:30 16:22
26	05:41 21:24	06:28 20:28	07:17 19:18	08:24 (WEA 1) 25 08:49 (WEA 1)	07:07 17:13	08:00 16:26	08:31 16:23
27	05:42 21:23	06:30 20:25	07:19 19:15	08:25 (WEA 1) 23 08:48 (WEA 1)	07:09 17:11	08:02 16:26	08:31 16:24
28	05:44 21:21	06:32 20:23	07:21 19:13	08:25 (WEA 1) 21 08:46 (WEA 1)	07:11 17:09	08:03 16:25	08:31 16:24
29	05:45 21:20	06:33 20:21	07:22 19:11	08:26 (WEA 1) 19 08:45 (WEA 1)	07:13 17:07	08:05 16:24	08:31 16:25
30	05:47 21:18	06:35 20:19	07:24 19:09	08:28 (WEA 1) 15 08:43 (WEA 1)	07:14 17:05	08:06 16:23	08:31 16:26
31	05:48 21:17	06:36 20:17		07:16 17:03			08:31 16:27
Sonnenscheinstunden	499	452	380	332	269	247	
astr.max.mögl.Beschattung			334	9	297		
Red.Sonnenscheinwahrsch.			0,32	0,29	0,22		
Reduktion Betriebsdauer			0,98	0,98	0,98		
Reduktion Windrichtung			0,64	0,64	0,60		
Gesamte Reduktion			0,20	0,18	0,13		
Met.wahrsch.Beschattung			67	2	39		

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 - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: AS08 - Assinghausen, Strüker Weg 7

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Juni
1	08:31 16:28	08:06 17:15	09:50 (WEA 4) 09:59 (WEA 4)	07:13 18:06	07:04 19:58	06:01 20:48
2	08:31 16:29	08:04 17:17		07:11 18:07	07:02 20:00	05:59 20:49
3	08:31 16:32	08:03 17:19		07:09 18:09	07:00 20:01	05:57 20:51
4	08:31 16:32	08:01 17:21		07:07 18:11	06:57 20:03	05:55 20:53
5	08:31 16:33	07:59 17:22		07:05 18:13	06:55 20:05	05:53 20:54
6	08:30 16:34	07:58 17:24	5	08:08 (WEA 1) 08:13 (WEA 1)	06:53 20:06	05:52 20:56
7	08:30 16:35	07:56 17:26	13	08:03 (WEA 1) 08:16 (WEA 1)	06:53 20:08	05:13 20:57
8	08:30 16:37	07:54 17:28	17	08:01 (WEA 1) 08:18 (WEA 1)	06:51 20:10	05:13 20:59
9	08:29 16:38	07:53 17:30	20	07:59 (WEA 1) 08:19 (WEA 1)	06:49 20:11	05:48 21:01
10	08:29 16:39	07:51 17:31	22	07:58 (WEA 1) 08:20 (WEA 1)	06:46 20:13	05:46 21:02
11	08:28 16:41	07:53 17:33	24	08:20 (WEA 1) 07:56 (WEA 1)	06:44 20:15	05:45 21:04
12	08:28 16:42	07:51 17:35	25	08:20 (WEA 1) 08:21 (WEA 1)	06:44 20:16	05:45 21:05
13	08:27 16:44	07:45 17:37	26	07:56 (WEA 1) 07:55 (WEA 1)	06:40 20:18	05:42 21:07
14	08:26 16:45	09:49 (WEA 4) 09:51 (WEA 4)	26	07:55 (WEA 1) 08:21 (WEA 1)	06:38 20:18	05:40 21:07
15	08:25 16:47	09:47 (WEA 4) 09:54 (WEA 4)	26	07:55 (WEA 1) 08:20 (WEA 1)	06:35 20:20	05:38 21:08
16	08:25 16:48	09:46 (WEA 4) 09:44 (WEA 4)	25	07:55 (WEA 1) 08:19 (WEA 1)	06:33 20:23	05:37 21:11
17	08:24 16:50	09:46 (WEA 4) 09:59 (WEA 4)	24	07:55 (WEA 1) 08:18 (WEA 1)	06:33 20:25	05:37 21:13
18	08:23 16:51	09:44 (WEA 4) 10:00 (WEA 4)	22	07:56 (WEA 1) 08:15 (WEA 1)	06:29 20:26	05:34 21:14
19	08:22 16:53	09:43 (WEA 4) 10:00 (WEA 4)	19	07:58 (WEA 1) 08:14 (WEA 1)	06:25 20:28	05:31 21:16
20	08:21 16:54	09:43 (WEA 4) 10:01 (WEA 4)	16	07:58 (WEA 1) 08:11 (WEA 1)	06:25 20:30	05:31 21:17
21	08:20 16:56	09:43 (WEA 4) 10:02 (WEA 4)	11	07:58 (WEA 1) 08:11 (WEA 1)	06:25 20:31	05:31 21:18
22	08:19 16:58	09:43 (WEA 4) 10:03 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:33	05:30 21:20
23	08:18 16:59	09:44 (WEA 4) 10:03 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:35	05:30 21:21
24	08:16 17:01	09:43 (WEA 4) 10:03 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:36	05:30 21:23
25	08:15 17:03	09:44 (WEA 4) 10:04 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:38	05:30 21:24
26	08:14 17:05	09:44 (WEA 4) 10:03 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:40	05:30 21:25
27	08:13 17:06	09:45 (WEA 4) 10:03 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:41	05:30 21:26
28	08:11 17:08	09:46 (WEA 4) 10:04 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:43	05:30 21:28
29	08:10 17:10	09:46 (WEA 4) 10:03 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:44	05:30 21:29
30	08:08 17:12	09:47 (WEA 4) 10:02 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:46	05:30 21:30
31	08:07 17:13	09:49 (WEA 4) 10:01 (WEA 4)		07:58 (WEA 1) 08:11 (WEA 1)	06:23 20:46	05:30 21:31
Sonnenscheinstunden	262	279	367	415	483	495
astr.max.mögl.Beschattung	295	9	317			
Red.Sonnenscheinwahrsch.	0,19	0,32	0,28			
Reduktion Betriebsdauer	0,98	0,98	0,98			
Reduktion Windrichtung	0,60	0,60	0,64			
Gesamte Reduktion	0,11	0,19	0,18			
Met.wahrsch.Beschattung	33	2	57			

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS08 - Assinghausen, Strüker Weg 7
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Jul	August	September	Oktober	November	Dezember
1	05:14 21:46	05:49 21:15	06:38 20:15	07:26 19:06	08:34 (WEA 1) 09:00 (WEA 1)	07:18 17:02
2	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	08:35 (WEA 1) 08:59 (WEA 1)	07:20 17:00
3	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	08:35 (WEA 1) 08:59 (WEA 1)	07:21 16:58
4	05:16 21:45	05:54 21:10	06:43 20:08	07:30 19:00	08:35 (WEA 1) 08:58 (WEA 1)	07:23 16:56
5	05:17 21:45	05:56 21:09	06:44 20:06	07:32 18:57	08:36 (WEA 1) 08:57 (WEA 1)	07:25 16:55
6	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	08:37 (WEA 1) 08:55 (WEA 1)	07:27 16:53
7	05:19 21:43	05:59 21:05	06:47 20:01	07:35 18:53	08:38 (WEA 1) 08:53 (WEA 1)	07:28 16:51
8	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	08:40 (WEA 1) 08:50 (WEA 1)	07:30 16:50
9	05:20 21:42	06:02 21:01	06:50 19:57	07:39 18:48	08:50 (WEA 1)	07:32 16:48
10	05:21 21:41	06:03 21:00	06:52 19:54	07:40 18:46	09:21 (WEA 4) 09:30 (WEA 4)	07:34 16:46
11	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	09:19 (WEA 4) 09:32 (WEA 4)	07:35 16:45
12	05:23 21:40	06:06 20:56	06:55 19:50	07:44 18:42	09:19 (WEA 4) 09:34 (WEA 4)	07:37 16:43
13	05:24 21:39	06:08 20:54	06:57 19:48	07:45 18:40	09:18 (WEA 4) 09:35 (WEA 4)	07:39 16:42
14	05:26 21:38	06:09 20:52	06:58 19:45	07:47 18:38	09:18 (WEA 4) 09:36 (WEA 4)	07:41 16:40
15	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	09:18 (WEA 4) 09:36 (WEA 4)	07:42 16:39
16	05:28 21:36	06:13 20:48	07:02 19:41	07:50 18:33	09:18 (WEA 4) 09:37 (WEA 4)	07:44 16:38
17	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	09:17 (WEA 4) 09:37 (WEA 4)	07:46 16:36
18	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	09:17 (WEA 4) 09:37 (WEA 4)	07:47 16:35
19	05:32 21:33	06:17 20:42	07:06 19:34	07:55 18:27	09:18 (WEA 4) 09:37 (WEA 4)	07:49 16:34
20	05:33 21:32	06:19 20:40	07:08 19:32	07:57 18:25	09:18 (WEA 4) 09:38 (WEA 4)	07:51 16:33
21	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	09:19 (WEA 4) 09:38 (WEA 4)	07:52 16:32
22	05:35 21:30	06:22 20:36	07:11 19:27	08:01 18:21	09:19 (WEA 4) 09:37 (WEA 4)	07:54 16:30
23	05:37 21:28	06:24 20:34	07:13 19:25	08:02 18:19	09:20 (WEA 4) 09:37 (WEA 4)	07:56 16:29
24	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	09:21 (WEA 4) 09:37 (WEA 4)	07:57 16:28
25	05:39 21:26	06:27 20:30	07:16 19:20	08:06 18:15	09:22 (WEA 4) 09:37 (WEA 4)	07:59 16:27
26	05:41 21:24	06:28 20:28	07:17 19:18	08:07 18:13	09:23 (WEA 4) 09:36 (WEA 4)	08:00 16:26
27	05:42 21:23	06:30 20:25	07:19 19:15	08:09 18:11	09:25 (WEA 4) 09:35 (WEA 4)	08:02 16:26
28	05:44 21:21	06:32 20:23	07:21 19:13	08:11 18:09	09:26 (WEA 4) 09:34 (WEA 4)	08:03 16:25
29	05:45 21:20	06:33 20:21	07:22 19:11	08:13 18:07	09:29 (WEA 4) 09:32 (WEA 4)	08:05 16:24
30	05:47 21:18	06:35 20:19	07:24 19:09	08:15 18:05	09:32 (WEA 4)	08:06 16:23
31	05:48 21:17	06:36 20:17		08:17 18:03		08:08 16:27
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung			161	161	307	
Red.Sonnenscheinwahrsch.			0,32	0,29	0,22	
Reduktion Betriebsdauer			0,98	0,98	0,98	
Reduktion Windrichtung			0,64	0,64	0,60	
Gesamte Reduktion			0,20	0,18	0,13	
Met.wahrsch.Beschattung			32	29	41	

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) Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS09 - Assinghausen, Strüker Weg 15
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Jun
1	08:31 16:28	08:06 17:15	07:13 18:06	08:16 (WEA 1) 19:58	07:04 20:48	05:17 21:32
2	08:31 16:29	08:04 17:17	07:11 18:07	08:13 (WEA 1) 20:00	07:02 20:49	05:16 21:33
3	08:31 16:31	08:03 17:19	07:09 18:09	08:11 (WEA 1) 20:01	07:00 20:51	05:15 21:34
4	08:31 16:32	08:01 17:21	07:07 18:11	08:10 (WEA 1) 20:03	06:57 20:53	05:14 21:35
5	08:31 16:33	07:59 17:22	07:05 18:13	08:10 (WEA 1) 20:05	06:55 20:54	05:14 21:36
6	08:30 16:34	07:58 17:24	07:03 18:14	08:08 (WEA 1) 20:06	06:53 20:56	05:13 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	08:08 (WEA 1) 20:08	06:51 20:57	05:13 21:38
8	08:30 16:37	09:51 (WEA 4) 17:28	06:58 18:18	08:08 (WEA 1) 20:10	06:49 20:59	05:12 21:39
9	08:29 16:38	09:51 (WEA 4) 17:30	06:56 18:19	08:08 (WEA 1) 20:11	06:46 21:01	05:12 21:40
10	08:29 16:39	09:50 (WEA 4) 17:31	06:54 18:21	08:07 (WEA 1) 20:13	06:44 21:02	05:11 21:41
11	08:28 16:41	09:49 (WEA 4) 17:33	06:52 18:23	08:08 (WEA 1) 20:15	06:42 21:04	05:11 21:41
12	08:28 16:42	09:49 (WEA 4) 17:35	06:49 18:25	08:09 (WEA 1) 20:16	06:40 21:05	05:11 21:42
13	08:27 16:44	09:49 (WEA 4) 17:37	06:47 18:26	08:10 (WEA 1) 20:18	06:38 21:07	05:10 21:43
14	08:26 16:45	09:49 (WEA 4) 17:39	06:45 18:28	08:10 (WEA 1) 20:20	06:35 21:08	05:10 21:43
15	08:25 16:47	09:49 (WEA 4) 17:41	06:43 18:30	08:26 (WEA 1) 20:21	06:33 21:10	05:10 21:44
16	08:25 16:48	09:49 (WEA 4) 17:42	06:40 18:31	08:23 (WEA 1) 20:23	06:31 21:11	05:10 21:44
17	08:24 16:50	10:07 (WEA 4) 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45
18	08:23 16:51	09:49 (WEA 4) 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45
19	08:22 16:53	10:08 (WEA 4) 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46
20	08:21 16:54	10:09 (WEA 4) 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46
21	08:20 16:56	10:08 (WEA 4) 17:51	06:29 18:40	06:21 20:31	05:28 21:18	05:10 21:46
22	08:19 16:58	10:09 (WEA 4) 17:53	06:27 18:41	06:19 20:33	05:27 21:20	05:10 21:46
23	08:18 16:59	09:51 (WEA 4) 17:55	06:25 18:43	06:16 20:35	05:26 21:21	05:10 21:47
24	08:16 17:01	10:09 (WEA 4) 17:57	06:22 18:45	06:14 20:36	05:25 21:23	05:11 21:47
25	08:15 17:03	09:52 (WEA 4) 17:58	06:20 18:47	06:12 20:38	05:24 21:24	05:11 21:47
26	08:14 17:05	10:09 (WEA 4) 18:00	06:18 18:48	06:10 20:40	05:22 21:25	05:11 21:47
27	08:13 17:06	09:54 (WEA 4) 18:02	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47
28	08:11 17:08	09:56 (WEA 4) 18:04	06:13 18:52	06:06 20:43	05:20 21:28	05:12 21:47
29	08:10 17:10	10:06 (WEA 4) 18:04	07:11 19:53	06:05 20:44	05:19 21:29	05:13 21:46
30	08:08 17:12	10:03 (WEA 4)	07:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46
31	08:07 17:13		07:06 19:56	06:03 20:46	05:18 21:31	
Sonnenscheinstunden	262	279	367	415	483	495
astr.max.mögl.Beschattung	329	5	304			
Red.Sonnenscheinwahrsch.	0,19	0,32	0,28			
Reduktion Betriebsdauer	0,98	0,98	0,98			
Reduktion Windrichtung	0,60	0,64	0,64			
Gesamte Reduktion	0,11	0,20	0,18			
Met.wahrsch.Beschattung	36	1	54			

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS09 - Assinghausen, Strüker Weg 15
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	July	August	September	Oktober	November	Dezember
1	05:14 21:46	05:49 21:15	06:38 20:15	07:26 19:06	08:48 (WEA 1) 09:08 (WEA 1)	07:18 17:02
2	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	08:47 (WEA 1) 09:09 (WEA 1)	07:20 17:00
3	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	08:46 (WEA 1) 09:10 (WEA 1)	07:21 16:58
4	05:16 21:45	05:54 21:10	06:43 20:08	07:30 19:00	08:45 (WEA 1) 09:09 (WEA 1)	07:23 16:56
5	05:17 21:45	05:55 21:09	06:44 20:06	07:32 18:57	08:45 (WEA 1) 09:09 (WEA 1)	07:25 16:55
6	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	08:45 (WEA 1) 09:10 (WEA 1)	07:27 16:53
7	05:19 21:43	05:59 21:05	06:47 20:01	07:35 18:53	08:44 (WEA 1) 09:08 (WEA 1)	07:28 16:51
8	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	08:44 (WEA 1) 09:08 (WEA 1)	07:30 16:50
9	05:20 21:42	06:02 21:02	06:50 19:57	07:39 18:48	08:45 (WEA 1) 09:08 (WEA 1)	07:32 16:48
10	05:21 21:42	06:03 21:00	06:52 19:54	07:40 18:46	08:45 (WEA 1) 09:06 (WEA 1)	07:34 16:46
11	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	08:46 (WEA 1) 09:05 (WEA 1)	07:35 16:45
12	05:23 21:40	06:06 20:56	06:55 19:50	07:44 18:42	08:48 (WEA 1) 09:03 (WEA 1)	07:37 16:43
13	05:24 21:39	06:08 20:54	06:57 19:48	07:45 18:40	08:50 (WEA 1) 09:01 (WEA 1)	07:39 16:42
14	05:26 21:38	06:09 20:52	06:58 19:45	07:47 18:38	09:30 (WEA 4) 09:35 (WEA 4)	07:41 16:42
15	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	09:28 (WEA 4) 09:38 (WEA 4)	07:42 16:41
16	05:28 21:36	06:13 20:48	07:02 19:41	07:50 18:33	09:27 (WEA 4) 09:40 (WEA 4)	07:44 16:40
17	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	09:26 (WEA 4) 09:41 (WEA 4)	07:46 16:39
18	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	09:25 (WEA 4) 09:42 (WEA 4)	07:47 16:38
19	05:32 21:33	06:17 20:42	07:06 19:34	07:55 18:27	09:25 (WEA 4) 09:43 (WEA 4)	07:49 16:37
20	05:33 21:32	06:19 20:40	07:08 19:32	07:57 18:25	09:25 (WEA 4) 09:44 (WEA 4)	07:51 16:36
21	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	09:25 (WEA 4) 09:45 (WEA 4)	07:52 16:35
22	05:35 21:30	06:22 20:36	07:11 19:27	08:01 18:21	09:25 (WEA 4) 09:44 (WEA 4)	07:54 16:34
23	05:37 21:28	06:24 20:34	07:13 19:25	08:02 18:19	09:25 (WEA 4) 09:45 (WEA 4)	07:56 16:33
24	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	09:26 (WEA 4) 09:45 (WEA 4)	07:57 16:32
25	05:39 21:26	06:27 20:30	07:16 19:20	07:06 17:15	09:27 (WEA 4) 09:45 (WEA 4)	07:59 16:31
26	05:41 21:24	06:28 20:28	07:17 19:18	07:07 17:13	09:27 (WEA 4) 09:45 (WEA 4)	08:00 16:30
27	05:42 21:23	06:30 20:25	07:19 19:15	07:09 17:11	09:28 (WEA 4) 09:45 (WEA 4)	08:02 16:29
28	05:44 21:21	06:32 20:23	07:21 19:13	08:55 (WEA 1) 09:02 (WEA 1)	08:03 16:25	07:11 16:28
29	05:45 21:20	06:33 20:21	07:22 19:11	08:52 (WEA 1) 09:05 (WEA 1)	08:05 16:24	07:13 16:27
30	05:47 21:18	06:35 20:19	07:24 19:09	08:50 (WEA 1) 09:07 (WEA 1)	08:06 16:23	07:14 16:26
31	05:48 21:17	06:36 20:17		07:16 17:03	09:31 (WEA 4) 09:45 (WEA 4)	08:31 16:27
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung			37	276	290	39
Red.Sonnenscheinwahrsch.			0,32	0,29	0,22	0,17
Reduktion Betriebsdauer			0,98	0,98	0,98	0,98
Reduktion Windrichtung			0,64	0,64	0,60	0,60
Gesamte Reduktion			0,20	0,18	0,13	0,10
Met.wahrsch.Beschattung			7	50	39	4

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS10 - Assinghausen, Bruchsborg 26
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LI PPSPRINCE]
Jan. Feb. März April Mai Juni Juli Aug. Sep. Okt. Nov. Dez.

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar		März		April	Mai	Juni	Juli	August	September	Oktober		November	Dezember
1	08:31 16:28	08:06 17:15		07:13 18:06	25	08:32 (WEA 1) 08:57 (WEA 1)	07:04 19:58	06:01 20:48	05:17 21:32	05:14 21:46	05:49 21:15	06:38 20:15	07:26 19:06	07:18 17:02	08:08 16:22
2	08:31 16:29	08:04 17:17		07:11 18:07	24	08:31 (WEA 1) 08:55 (WEA 1)	07:02 20:00	05:59 20:49	05:16 21:33	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	07:20 17:00	08:09 16:22
3	08:31 16:31	08:03 17:19		07:09 18:09	23	08:32 (WEA 1) 08:56 (WEA 1)	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	07:21 16:58	08:10 16:21
4	08:31 16:32	08:01 17:21		07:07 18:11	21	08:33 (WEA 1) 08:54 (WEA 1)	06:57 20:03	05:55 20:53	05:14 21:35	05:16 21:45	05:54 21:10	06:43 20:08	07:30 19:00	07:23 16:56	08:12 16:21
5	08:31 16:33	07:59 17:22		07:05 18:13	18	08:34 (WEA 1) 08:52 (WEA 1)	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:45	05:55 21:09	06:44 20:06	07:32 18:57	07:25 16:55	08:13 16:20
6	08:30 16:34	07:58 17:24		07:03 18:14	14	08:35 (WEA 1) 08:49 (WEA 1)	06:53 20:06	05:52 20:56	05:13 21:37	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	07:27 16:53	08:14 16:20
7	08:30 16:35	07:56 17:26		07:00 18:16	8	08:38 (WEA 1) 08:46 (WEA 1)	06:51 20:08	05:50 20:57	05:13 21:38	05:19 21:43	05:59 21:05	06:47 20:01	07:35 18:53	07:28 16:51	08:16 16:19
8	08:30 16:37	07:54 17:28		06:58 18:18			06:49 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	07:30 16:50	08:17 16:19
9	08:29 16:38	07:53 17:30		06:56 18:19			06:46 20:11	05:46 21:01	05:12 21:40	05:20 21:42	06:02 21:01	06:50 19:57	07:39 18:48	07:32 16:48	08:18 16:19
10	08:29 16:39	07:51 17:31		06:54 18:21			06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:42	06:03 21:00	06:52 19:54	07:40 18:46	07:34 16:46	08:19 16:19
11	08:28 16:41	07:49 17:33		06:52 18:23			06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	07:35 16:45	08:20 16:18
12	08:28 16:42	07:47 17:35		06:49 18:25			06:40 20:16	05:41 21:05	05:11 21:42	05:23 21:40	06:06 20:56	06:55 19:50	07:44 18:42	07:37 16:43	08:21 16:18
13	08:27 16:43	07:45 17:37		06:47 18:26			06:38 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:08 20:54	06:57 19:48	07:45 18:40	07:39 16:42	08:22 16:18
14	08:26 16:45	07:44 17:39		06:45 18:28			06:35 20:20	05:38 21:08	05:10 21:43	05:26 21:38	06:09 20:52	06:58 19:45	07:47 18:38	07:41 16:40	08:23 16:18
15	08:25 16:46	07:42 17:41		06:43 18:30			06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	07:42 16:39	08:24 16:18
16	08:25 16:48	07:40 17:42		06:40 18:31			06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:13 20:48	07:02 19:41	07:50 18:33	07:44 16:38	08:25 16:19
17	08:24 16:50	07:38 17:44		06:38 18:33			06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	07:46 16:36	08:26 16:19
18	08:23 16:51	07:36 17:46		06:36 18:35			06:27 20:26	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	07:47 16:35	08:26 16:19
19	08:22 16:53	07:34 17:48	9	06:34 18:36		08:41 (WEA 1) 08:50 (WEA 1)	06:25 20:28	05:31 21:16	05:10 21:46	05:32 21:33	06:17 20:42	07:06 19:34	07:55 18:27	07:49 16:34	08:27 16:19
20	08:21 16:54	07:32 17:50	15	06:31 18:38		08:38 (WEA 1) 08:53 (WEA 1)	06:23 20:30	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:32	07:57 18:25	07:51 16:33	08:28 16:20
21	08:20 16:56	07:30 17:51	18	06:29 18:40		08:36 (WEA 1) 08:54 (WEA 1)	06:21 20:31	05:28 21:18	05:10 21:46	05:34 21:38	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:32	08:28 16:20
22	08:19 16:58	07:28 17:53	21	06:27 18:41		08:35 (WEA 1) 08:56 (WEA 1)	06:19 20:33	05:27 21:20	05:10 21:46	05:35 21:30	06:22 20:36	07:11 19:27	08:01 18:21	07:54 16:30	08:29 16:21
23	08:18 16:59	07:26 17:55	23	06:25 18:43		08:33 (WEA 1) 08:56 (WEA 1)	06:16 20:35	05:26 21:21	05:10 21:47	05:37 21:28	06:24 20:34	07:13 19:25	08:02 18:19	07:56 16:29	08:29 16:21
24	08:16 17:01	07:24 17:57	24	06:22 18:45		08:32 (WEA 1) 08:56 (WEA 1)	06:14 20:36	05:25 21:23	05:11 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	08:30 16:22
25	08:15 17:03	07:22 17:58	25	06:20 18:46		08:31 (WEA 1) 08:57 (WEA 1)	06:12 20:38	05:24 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	07:06 17:15	07:59 16:27	08:30 16:22
26	08:14 17:05	07:20 18:00	25	06:18 18:48		08:32 (WEA 1) 08:57 (WEA 1)	06:10 20:40	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:28	07:17 19:18	07:07 17:13	08:00 16:26	08:31 16:23
27	08:13 17:06	07:18 18:02	26	06:15 18:50		08:31 (WEA 1) 08:57 (WEA 1)	06:08 20:41	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	07:09 17:11	08:02 16:25	08:31 16:24
28	08:11 17:08	07:16 18:04	25	06:13 18:51		08:32 (WEA 1) 08:57 (WEA 1)	06:06 20:43	05:20 21:28	05:12 21:47	05:44 21:21	06:32 20:23	07:21 19:13	07:11 17:09	08:03 16:25	08:31 16:24
29	08:10 17:10			07:11 19:53			06:05 20:44	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	07:13 17:07	08:05 16:24	08:31 16:25
30	08:08 17:12			07:09 19:55			06:03 20:46	05:18 21:30	05:13 21:46	05:47 21:18	06:35 20:19	07:24 19:09	07:14 17:05	08:06 16:23	08:31 16:26
31	08:07 17:13			07:06 19:56				05:18 21:31		05:48 21:17	06:36 20:17	07:16 17:03		08:31 16:27	
Sonnenscheinstunden	262	279	211	367				415	483	495	499	452	380	332	269
astr.max.mögl.Beschattung			0,32		133									343	247
Red.Sonnenscheinwährsch.			0,98		0,28									0,29	
Reduktion Betriebsdauer			0,64		0,98									0,98	
Reduktion Windrichtung			0,20		0,64									0,64	
Gesamte Reduktion			0,43		0,18									0,18	
Met.währsch.Beschattung				24										62	

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

Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang	Zeitpunkt (SS:MM) Schattenende	Schattenanfang (WEA mit erstem Schatten)	Schattenende (WEA mit letztem Schatten)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
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22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: AS11 - Assinghausen, Bruchsberg 23
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]
Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32	05:14 21:46	05:49 21:15	06:38 20:15	07:26 19:06	07:18 17:02	08:08 16:22
2	08:31 16:29	08:04 17:17	07:11 18:07	07:02 19:57	05:59 20:49	05:16 21:33	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	07:20 17:00	08:09 16:22
3	08:31 16:31	08:03 17:19	07:09 18:09	07:00 19:57	05:57 20:51	05:15 21:34	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	07:21 16:58	08:10 16:21
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 19:58	05:55 20:53	05:14 21:35	05:16 21:45	05:54 21:10	06:43 20:08	07:30 19:00	07:23 16:56	08:12 16:21
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 19:58	05:53 20:54	05:14 21:36	05:17 21:45	05:55 21:09	06:44 20:06	07:32 18:57	07:25 16:55	08:13 16:20
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 19:59	05:52 20:56	05:13 21:37	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	07:27 16:53	08:14 16:20
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 19:58	05:50 20:57	05:13 21:38	05:19 21:43	05:59 21:05	06:47 20:01	07:35 18:53	07:28 16:51	08:16 16:19
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 19:59	05:48 20:59	05:12 21:39	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	07:30 16:50	08:17 16:19
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 19:58	05:46 20:58	05:12 21:40	05:20 21:42	06:02 21:01	06:50 19:57	07:39 18:48	07:32 16:48	08:18 16:19
10	08:29 16:39	07:51 17:31	06:54 18:21	06:44 19:59	05:45 21:02	05:11 21:41	05:21 21:41	06:03 21:00	06:52 19:54	07:40 18:46	07:34 16:46	08:19 16:19
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 19:58	05:43 21:04	05:11 21:41	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	07:35 16:45	08:20 16:18
12	08:28 16:42	07:47 17:35	06:49 18:25	06:40 19:59	05:41 21:05	05:10 21:42	05:23 21:40	06:06 20:56	06:55 19:50	07:44 18:42	07:37 16:43	08:21 16:18
13	08:27 16:43	07:45 17:37	06:47 18:26	06:38 19:58	05:40 21:07	05:10 21:43	05:24 21:39	06:08 20:54	06:57 19:48	07:45 18:40	07:39 16:42	08:22 16:18
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 19:59	05:38 21:08	05:10 21:43	05:26 21:38	06:09 20:52	06:58 19:45	07:47 18:38	07:41 16:40	08:23 16:18
15	08:25 16:46	07:42 17:41	06:43 18:30	06:33 19:58	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	07:42 16:39	08:24 16:18
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 19:59	05:35 21:11	05:10 21:44	05:28 21:36	06:13 20:48	07:02 19:41	07:50 18:33	07:44 16:38	08:25 16:19
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 19:59	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	07:46 16:36	08:26 16:19
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 19:58	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	07:47 16:35	08:26 16:19
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 19:59	05:31 21:16	05:10 21:46	05:32 21:33	06:17 20:42	07:06 19:34	07:55 18:27	07:49 16:34	08:27 16:19
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 19:58	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:32	07:57 18:25	07:51 16:33	08:28 16:20
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 19:59	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:32	08:28 16:20
22	08:19 16:58	07:28 17:53	06:27 18:41	06:18 19:58	05:27 21:20	05:10 21:46	05:35 21:30	06:22 20:36	07:11 19:27	08:01 18:21	07:54 16:30	08:29 16:21
23	08:18 16:59	07:26 17:55	06:25 18:43	06:16 19:59	05:26 21:21	05:10 21:47	05:37 21:28	06:24 20:34	07:13 19:25	08:02 18:19	07:56 16:29	08:29 16:21
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 19:58	05:25 21:23	05:11 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	08:30 16:22
25	08:15 17:03	07:22 17:58	06:20 18:46	06:12 19:59	05:24 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	08:06 18:15	07:59 16:27	08:31 16:22
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 19:58	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:28	07:17 19:18	08:07 18:13	07:58 16:26	08:31 16:23
27	08:13 17:06	07:18 18:02	06:15 18:50	06:08 19:59	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:09 18:11	07:59 16:25	08:31 16:24
28	08:11 17:08	07:16 18:04	06:13 18:51	06:06 19:58	05:20 21:28	05:12 21:47	05:44 21:21	06:32 20:23	07:21 19:13	08:11 18:09	07:59 16:25	08:31 16:24
29	08:10 17:10		07:11 19:53	06:05 19:59	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:12 18:07	08:05 16:24	08:31 16:25
30	08:08 17:12		07:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46	05:47 21:18	06:35 20:19	07:24 19:09	08:14 18:05	08:06 16:23	08:31 16:26
31	08:07 17:13		07:06 19:56		05:18 21:31		05:48 21:17	06:36 20:17	07:16 17:03			08:31 16:27
Sonnenscheinstunden	262	279	367	415	483	495	499	452	380	332	269	247
astr.max.mögl.Beschattung		346		26						374		
Red.Sonnenscheinwahrsch.		0,32		0,28						0,29		
Reduktion Betriebsdauer		0,98		0,98						0,98		
Reduktion Windrichtung		0,63		0,63						0,63		
Gesamte Reduktion		0,20		0,17						0,18		
Met.wahrsch.Beschattung		69		5						66		

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL28 - Olsberg, Zur Schanze 42

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	10:21 (WEA 3) 15:25 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:15	06:38 20:14	07:25 19:06		08:08 17:01	10:13 (WEA 3) 15:16 (WEA 1)
2	08:31 16:29	10:22 (WEA 3) 15:27 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:49	05:16 21:33	05:14 21:46	05:51 21:13	06:39 20:12	07:27 19:04		08:09 17:00	10:13 (WEA 3) 15:17 (WEA 1)
3	08:31 16:30	10:22 (WEA 3) 15:27 (WEA 1)	08:02 17:19	07:09 18:09	05:57 20:51	05:15 21:34	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02		08:10 16:58	10:12 (WEA 3) 15:17 (WEA 1)
4	08:31 16:31	10:23 (WEA 3) 15:28 (WEA 1)	08:01 17:20	07:07 18:11	05:57 20:52	05:14 21:35	05:16 21:45	05:54 21:10	06:42 20:08	07:30 18:59		08:12 16:56	10:11 (WEA 3) 15:16 (WEA 1)
5	08:31 16:33	10:24 (WEA 3) 15:30 (WEA 1)	07:59 17:22	07:05 18:12	05:53 20:54	05:14 21:36	05:17 21:44	05:55 21:08	06:44 20:06	07:32 18:57		08:13 16:54	10:11 (WEA 3) 15:17 (WEA 1)
6	08:30 16:34	10:25 (WEA 3) 15:30 (WEA 1)	07:58 17:24	07:03 18:14	05:51 20:56	05:13 21:37	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55		08:14 16:53	10:11 (WEA 3) 15:16 (WEA 1)
7	08:30 16:35	10:26 (WEA 3) 15:31 (WEA 1)	07:56 17:26	07:00 18:16	05:50 20:57	05:12 21:38	05:18 21:43	05:58 21:05	06:47 20:01	07:35 18:53		08:16 16:51	10:11 (WEA 3) 15:16 (WEA 1)
8	08:30 16:36	10:27 (WEA 3) 15:32 (WEA 1)	07:54 17:28	06:58 18:18	05:48 20:59	05:12 21:39	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51		08:17 16:49	10:11 (WEA 3) 15:16 (WEA 1)
9	08:29 16:38	10:28 (WEA 3) 15:32 (WEA 1)	07:52 17:30	06:56 18:19	05:46 20:55	05:11 21:40	05:20 21:42	06:01 21:01	06:50 19:57	07:38 18:48		08:18 16:48	10:11 (WEA 3) 15:16 (WEA 1)
10	08:29 16:39	10:30 (WEA 3) 15:34 (WEA 1)	07:51 17:31	06:54 18:21	05:45 21:02	05:11 21:41	05:21 21:41	06:03 21:00	06:52 19:54	07:40 18:46		08:19 16:46	10:11 (WEA 3) 15:16 (WEA 1)
11	08:28 16:40	10:31 (WEA 3) 15:34 (WEA 1)	07:49 17:33	06:52 18:23	05:43 21:04	05:11 21:41	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44		08:20 16:45	10:11 (WEA 3) 15:16 (WEA 1)
12	08:27 16:42	10:33 (WEA 3) 15:35 (WEA 1)	07:47 17:35	06:49 18:24	05:41 21:05	05:10 21:42	05:23 21:40	06:06 20:56	06:55 19:50	07:43 18:42		08:21 16:43	10:11 (WEA 3) 15:15 (WEA 1)
13	08:27 16:43	10:35 (WEA 3) 15:35 (WEA 1)	07:45 17:37	06:47 18:26	05:40 21:07	05:10 21:43	05:24 21:39	06:08 20:54	06:57 19:47	07:39 18:40		08:22 16:42	10:12 (WEA 3) 15:15 (WEA 1)
14	08:26 16:45	10:36 (WEA 3) 15:36 (WEA 1)	07:43 17:39	06:45 18:28	05:38 21:08	05:10 21:43	05:25 21:38	06:09 20:52	06:58 19:45	07:47 18:37		08:23 16:40	10:12 (WEA 3) 15:15 (WEA 1)
15	08:25 16:46	10:37 (WEA 3) 15:37 (WEA 1)	07:41 17:40	06:43 18:30	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:48 18:35		08:24 16:39	10:12 (WEA 3) 15:15 (WEA 1)
16	08:24 16:48	10:38 (WEA 3) 15:38 (WEA 1)	07:39 17:42	06:41 18:31	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33		08:25 16:38	10:13 (WEA 3) 15:15 (WEA 1)
17	08:24 16:49	10:39 (WEA 3) 15:39 (WEA 1)	07:38 17:44	06:38 18:33	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31		08:26 16:36	10:13 (WEA 3) 15:15 (WEA 1)
18	08:23 16:51	10:40 (WEA 3) 15:40 (WEA 1)	07:36 17:46	06:36 18:35	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29		08:27 16:35	10:13 (WEA 3) 15:14 (WEA 1)
19	08:22 16:53	10:41 (WEA 3) 15:41 (WEA 1)	07:34 17:48	06:34 18:36	05:31 21:16	05:10 21:46	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27		08:28 16:34	10:14 (WEA 3) 15:14 (WEA 1)
20	08:21 16:54	10:42 (WEA 3) 15:42 (WEA 1)	07:32 17:49	06:31 18:38	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25		08:29 16:33	10:15 (WEA 3) 15:15 (WEA 1)
21	08:20 16:56	10:43 (WEA 3) 15:43 (WEA 1)	07:30 17:51	06:29 18:40	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23		08:30 16:31	10:15 (WEA 3) 15:14 (WEA 1)
22	08:19 16:58	10:44 (WEA 3) 15:44 (WEA 1)	07:28 17:53	06:27 18:41	05:27 21:20	05:10 21:46	05:35 21:29	06:22 20:36	07:11 19:27	08:00 18:21		08:31 16:30	10:16 (WEA 3) 15:15 (WEA 1)
23	08:17 16:59	10:45 (WEA 3) 15:45 (WEA 1)	07:26 17:55	06:24 18:43	05:26 21:21	05:10 21:46	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19		08:32 16:29	10:16 (WEA 3) 15:16 (WEA 1)
24	08:16 17:01	10:46 (WEA 3) 15:46 (WEA 1)	07:24 17:57	06:22 18:45	05:25 21:22	05:10 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17		08:33 16:28	10:16 (WEA 3) 15:16 (WEA 1)
25	08:15 17:03	10:47 (WEA 3) 15:47 (WEA 1)	07:22 17:58	06:20 18:46	05:23 21:24	05:11 21:47	05:39 21:25	06:27 20:30	07:16 19:20	08:06 18:15		08:34 16:27	10:17 (WEA 3) 15:16 (WEA 1)
26	08:14 17:04	10:48 (WEA 3) 15:48 (WEA 1)	07:20 18:00	06:18 18:48	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:07 18:13		08:35 16:26	10:17 (WEA 3) 15:16 (WEA 1)
27	08:13 17:06	10:49 (WEA 3) 15:49 (WEA 1)	07:18 18:02	06:15 18:50	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:08 18:11		08:36 16:25	10:18 (WEA 3) 15:16 (WEA 1)
28	08:11 17:08	10:50 (WEA 3) 15:50 (WEA 1)	07:15 18:04	06:13 18:51	05:20 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:09 18:09		08:37 16:24	10:18 (WEA 3) 15:17 (WEA 1)
29	08:10 17:10	10:51 (WEA 3) 15:51 (WEA 1)	07:13 18:06	06:11 18:53	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:10 18:06		08:38 16:23	10:19 (WEA 3) 15:17 (WEA 1)
30	08:08 17:11	10:52 (WEA 3) 15:52 (WEA 1)	07:11 18:08	06:09 18:55	05:18 21:30	05:13 21:46	05:46 21:18	06:35 20:19	07:24 19:09	08:11 18:03		08:39 16:22	10:19 (WEA 3) 15:17 (WEA 1)
31	08:07 17:13	10:53 (WEA 3) 15:53 (WEA 1)	07:06 18:06	06:06 18:56	05:17 21:31	05:12 21:47	05:48 21:17	06:36 20:17	07:16 18:03	08:12 17:03		08:40 16:21	10:20 (WEA 3) 15:18 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	269	247
astr.max.mögl.Beschattung	1224												
Red.Sonnenscheinwahrsch.	0,19												
Reduktion Betriebsdauer	0,98												
Reduktion Windrichtung	0,63												
Gesamte Reduktion	0,12												
Met.wahrsch.Beschattung	143												

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL29 - Olsberg, Am Medebach 10

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:54 (WEA 3) 14:42 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:15	06:38 20:14	07:25 19:06	07:18 17:01	08:08 16:22	09:43 (WEA 3) 14:25 (WEA 1)
2	08:31 16:29	09:55 (WEA 3) 14:43 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:14 21:33	05:14 21:46	06:39 20:12	07:27 19:04	07:20 17:00	08:09 16:22	09:43 (WEA 3) 14:27 (WEA 1)
3	08:31 16:30	09:55 (WEA 3) 14:42 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:52 21:12	06:41 20:10	07:29 19:02	07:21 16:58	08:10 16:21	09:43 (WEA 3) 14:27 (WEA 1)
4	08:31 16:32	09:56 (WEA 3) 14:43 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:54 21:10	06:42 20:08	07:30 19:00	07:23 16:56	08:12 16:21	09:42 (WEA 3) 14:28 (WEA 1)
5	08:31 16:33	09:57 (WEA 3) 14:44 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:55 21:08	06:44 20:06	07:32 18:57	07:25 16:54	08:13 16:20	09:43 (WEA 3) 14:29 (WEA 1)
6	08:30 16:34	09:57 (WEA 3) 14:43 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:57 21:07	06:46 20:03	07:34 18:55	07:27 16:53	08:14 16:20	09:43 (WEA 3) 14:29 (WEA 1)
7	08:30 16:35	09:58 (WEA 3) 14:44 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:58 21:05	06:47 20:01	07:35 18:53	07:28 16:51	08:16 16:19	09:43 (WEA 3) 14:30 (WEA 1)
8	08:30 16:36	09:58 (WEA 3) 14:44 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:59 21:03	06:49 19:59	07:37 18:51	07:30 16:49	08:17 16:19	09:44 (WEA 3) 14:31 (WEA 1)
9	08:29 16:38	09:59 (WEA 3) 14:43 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	06:02 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:19	09:44 (WEA 3) 14:31 (WEA 1)
10	08:29 16:39	10:00 (WEA 3) 14:44 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	06:03 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:18	09:44 (WEA 3) 14:32 (WEA 1)
11	08:28 16:40	10:01 (WEA 3) 14:43 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	06:05 21:41	06:54 20:58	07:42 19:52	07:35 18:44	08:20 16:18	09:44 (WEA 3) 14:32 (WEA 1)
12	08:27 16:42	10:02 (WEA 3) 14:43 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	06:06 21:40	06:55 20:56	07:43 19:50	07:37 18:42	08:21 16:18	09:45 (WEA 3) 14:33 (WEA 1)
13	08:27 16:43	10:03 (WEA 3) 14:42 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	06:08 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:18	09:45 (WEA 3) 14:33 (WEA 1)
14	08:26 16:45	10:05 (WEA 3) 14:43 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	06:09 21:38	06:58 20:52	07:47 19:45	07:40 18:37	08:23 16:18	09:46 (WEA 3) 14:34 (WEA 1)
15	08:25 16:46	10:06 (WEA 3) 14:42 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	06:11 21:37	07:00 20:50	07:49 19:43	07:42 18:35	08:24 16:18	09:46 (WEA 3) 14:34 (WEA 1)
16	08:24 16:48	10:08 (WEA 3) 14:40 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	06:12 21:36	07:01 20:48	07:50 19:41	07:44 18:33	08:25 16:18	09:47 (WEA 3) 14:35 (WEA 1)
17	08:24 16:49	10:11 (WEA 3) 14:37 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	06:14 21:35	07:03 20:46	07:52 19:38	07:46 18:31	08:26 16:19	09:47 (WEA 3) 14:36 (WEA 1)
18	08:23 16:51	10:11 (WEA 3) 14:37 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	06:16 21:34	07:05 20:44	07:54 19:36	07:47 18:29	08:26 16:19	09:47 (WEA 3) 14:36 (WEA 1)
19	08:22 16:53	10:11 (WEA 3) 14:37 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	06:17 21:33	07:06 20:42	07:55 19:34	07:49 18:27	08:27 16:19	09:48 (WEA 3) 14:36 (WEA 1)
20	08:21 16:54	10:11 (WEA 3) 14:37 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	06:19 21:32	07:08 20:40	07:57 19:31	07:51 18:25	08:28 16:20	09:49 (WEA 3) 14:37 (WEA 1)
21	08:20 16:56	10:11 (WEA 3) 14:37 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	06:20 21:31	07:09 20:38	07:59 19:29	07:52 18:23	08:28 16:20	09:49 (WEA 3) 14:37 (WEA 1)
22	08:19 16:58	10:11 (WEA 3) 14:37 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	06:22 21:29	07:11 20:36	08:00 19:27	07:54 18:21	08:29 16:20	09:50 (WEA 3) 14:38 (WEA 1)
23	08:17 16:59	10:11 (WEA 3) 14:37 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:35	05:26 21:21	05:10 21:47	06:23 21:28	07:13 20:34	08:02 19:25	07:55 18:19	08:29 16:21	09:50 (WEA 3) 14:38 (WEA 1)
24	08:16 17:01	10:11 (WEA 3) 14:37 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:10 21:47	06:25 21:27	07:14 20:32	08:04 19:22	07:57 18:17	08:30 16:21	09:50 (WEA 3) 14:38 (WEA 1)
25	08:15 17:03	10:11 (WEA 3) 14:37 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	06:27 21:26	07:16 20:30	08:06 19:20	07:59 17:15	08:30 16:22	09:51 (WEA 3) 14:40 (WEA 1)
26	08:14 17:04	10:11 (WEA 3) 14:37 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	06:28 21:24	07:17 20:27	08:07 19:18	08:00 17:13	08:31 16:26	09:51 (WEA 3) 14:40 (WEA 1)
27	08:13 17:06	10:11 (WEA 3) 14:37 (WEA 1)	07:18 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	06:30 21:23	07:19 20:25	08:09 19:15	08:02 17:11	08:32 16:25	09:52 (WEA 3) 14:40 (WEA 1)
28	08:11 17:08	10:11 (WEA 3) 14:37 (WEA 1)	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	06:31 21:21	07:21 20:23	08:11 19:13	08:03 17:09	08:33 16:25	09:52 (WEA 3) 14:40 (WEA 1)
29	08:10 17:10	10:11 (WEA 3) 14:37 (WEA 1)	07:11 18:04	06:11 18:53	06:04 20:44	05:19 21:29	05:13 21:46	06:33 21:20	07:22 20:21	08:13 19:11	08:05 17:07	08:34 16:24	09:53 (WEA 3) 14:41 (WEA 1)
30	08:08 17:11	10:11 (WEA 3) 14:37 (WEA 1)	07:09 18:04	06:03 18:55	06:03 20:46	05:18 21:30	05:13 21:46	06:35 21:18	07:24 20:19	08:15 19:09	08:06 17:05	08:35 16:23	09:53 (WEA 3) 14:41 (WEA 1)
31	08:07 17:13	10:11 (WEA 3) 14:37 (WEA 1)	07:06 18:04	06:02 18:56	06:02 20:46	05:17 21:31	05:13 21:46	06:36 21:17	07:25 20:17	08:16 19:09	08:07 17:03	08:36 16:24	09:53 (WEA 3) 14:42 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	268	1733
astr.max.mögl.Beschattung		696											
Red.Sonnenscheinwahrsch.		0,19											0,17
Reduktion Betriebsdauer		0,98											0,98
Reduktion Windrichtung		0,63											0,63
Gesamte Reduktion		0,12											0,10
Met.wahrsch.Beschattung		80										22	180

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL30 - Olsberg, Am Hölchen 2A

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28 65	09:53 (WEA 3) 14:47 (WEA 1) 17:15	08:05 07:13 18:05	07:04 07:13 19:58	06:01 20:48 21:32	05:17 20:48 21:32	05:14 21:46 21:15	05:49 21:15 20:14	06:38 19:06 17:01	07:25 17:01 16:22	07:18 17:01 14:32 (WEA 1)		09:41 (WEA 3)
2	08:31 16:29 62	09:54 (WEA 3) 14:48 (WEA 1) 17:17	08:04 07:11 18:07	07:02 07:02 19:59	05:59 20:49 21:33	05:16 20:49 21:33	05:15 21:46 21:14	05:51 20:12 19:04	06:39 17:27 17:00	07:27 17:00 16:22	07:20 17:00 14:33 (WEA 1)	48	09:42 (WEA 3)
3	08:31 16:30 54	09:54 (WEA 3) 14:47 (WEA 1) 17:19	08:02 07:09 18:09	07:00 07:00 19:57	05:57 20:51 21:34	05:15 20:51 21:34	05:15 21:45 21:12	05:52 20:10 19:02	06:41 17:29 16:58	07:21 17:21 16:21	07:21 17:21 14:33 (WEA 1)	49	09:41 (WEA 3)
4	08:31 16:32 54	09:55 (WEA 3) 14:48 (WEA 1) 17:20	08:01 07:07 18:11	07:00 07:00 19:57	05:57 20:52 21:35	05:14 20:52 21:35	05:16 21:45 21:10	05:54 20:08 19:00	06:42 17:30 16:56	07:23 17:23 16:21	07:23 17:23 14:33 (WEA 1)	51	09:41 (WEA 3)
5	08:31 16:33 54	09:56 (WEA 3) 14:49 (WEA 1) 17:22	07:59 07:05 18:12	06:55 06:55 19:58	05:53 20:54 21:36	05:14 20:54 21:36	05:17 21:44 21:08	05:55 20:06 18:57	06:44 17:32 16:54	07:25 17:25 16:20	07:25 17:25 14:34 (WEA 1)	52	09:42 (WEA 3)
6	08:30 16:34 53	09:56 (WEA 3) 14:49 (WEA 1) 17:24	07:58 07:03 18:14	06:53 06:53 19:59	05:51 20:56 21:37	05:13 20:56 21:37	05:18 21:44 21:07	05:57 20:03 18:55	06:46 17:34 16:53	07:27 17:27 16:20	07:27 17:27 14:35 (WEA 1)	53	09:42 (WEA 3)
7	08:30 16:35 52	09:57 (WEA 3) 14:49 (WEA 1) 17:26	07:56 07:00 18:16	06:50 06:50 19:57	05:50 20:57 21:38	05:12 20:57 21:38	05:18 21:43 21:05	05:58 20:01 18:53	06:47 17:35 16:51	07:28 17:28 16:19	07:28 17:28 14:35 (WEA 1)	54	09:42 (WEA 3)
8	08:30 16:36 51	09:57 (WEA 3) 14:49 (WEA 1) 17:28	07:54 06:58 18:18	06:48 06:48 19:59	05:48 20:59 21:39	05:12 20:59 21:39	05:19 21:43 21:03	06:00 19:59 18:51	06:49 17:37 16:49	07:30 17:30 16:19	07:30 17:30 14:36 (WEA 1)	55	09:43 (WEA 3)
9	08:29 16:38 51	09:57 (WEA 3) 14:49 (WEA 1) 17:30	07:52 06:56 18:19	06:46 06:46 19:57	05:11 20:59 21:40	05:11 20:59 21:40	05:20 21:42 21:01	06:02 19:57 18:48	06:50 17:38 16:48	07:32 17:32 16:19	07:32 17:32 14:37 (WEA 1)	56	09:43 (WEA 3)
10	08:29 16:39 49	09:59 (WEA 3) 14:50 (WEA 1) 17:31	07:51 06:54 18:21	06:44 06:44 19:58	05:11 20:59 21:41	05:11 20:59 21:41	05:21 21:41 21:00	06:03 19:54 18:46	06:52 17:40 16:46	07:34 17:34 16:18	07:34 17:34 14:37 (WEA 1)	57	09:43 (WEA 3)
11	08:28 16:40 48	09:59 (WEA 3) 14:50 (WEA 1) 17:33	07:49 06:52 18:23	06:42 06:42 19:59	05:11 20:59 21:41	05:11 20:59 21:41	05:22 21:41 21:00	06:05 19:52 18:44	06:54 17:42 16:45	07:35 17:35 16:18	07:35 17:35 14:37 (WEA 1)	58	09:43 (WEA 3)
12	08:27 16:42 46	10:00 (WEA 3) 14:49 (WEA 1) 17:35	07:47 06:49 18:24	06:40 06:40 19:57	05:41 20:56 21:42	05:10 20:56 21:42	05:23 21:40 20:56	06:06 19:50 18:42	06:55 17:43 16:43	07:37 17:37 16:18	07:37 17:37 14:38 (WEA 1)	59	09:44 (WEA 3)
13	08:27 16:43 43	10:01 (WEA 3) 14:49 (WEA 1) 17:37	07:45 06:47 18:26	06:37 06:37 19:57	05:40 20:57 21:43	05:10 20:57 21:43	05:24 21:39 20:54	06:08 19:47 18:40	06:57 17:44 16:42	07:39 17:39 16:18	07:39 17:39 14:38 (WEA 1)	60	09:44 (WEA 3)
14	08:26 16:45 41	10:03 (WEA 3) 14:50 (WEA 1) 17:39	07:43 06:45 18:28	06:35 06:35 19:58	05:38 20:58 21:43	05:10 20:58 21:43	05:25 21:38 20:52	06:09 19:45 18:37	06:58 17:40 16:40	07:47 17:40 16:18	07:47 17:40 14:39 (WEA 1)	61	09:45 (WEA 3)
15	08:25 16:46 37	10:04 (WEA 3) 14:50 (WEA 1) 17:40	07:42 06:43 18:30	06:33 06:33 19:59	05:37 20:59 21:44	05:10 20:59 21:44	05:27 21:37 20:50	06:11 19:43 18:35	07:00 17:39 16:39	07:49 17:39 16:18	07:49 17:39 14:39 (WEA 1)	62	09:45 (WEA 3)
16	08:24 16:48 35	10:05 (WEA 3) 14:50 (WEA 1) 17:42	07:40 06:40 18:31	06:31 06:31 19:59	05:35 20:59 21:44	05:10 20:59 21:44	05:28 21:36 20:48	06:12 19:41 18:33	07:01 17:38 16:38	07:44 17:38 16:18	07:44 17:38 14:40 (WEA 1)	63	09:46 (WEA 3)
17	08:24 16:49 29	10:07 (WEA 3) 14:50 (WEA 1) 17:44	07:38 06:38 18:33	06:29 06:29 19:59	05:34 20:59 21:45	05:10 20:59 21:45	05:29 21:35 20:46	06:14 19:38 18:31	07:03 17:36 16:36	07:52 17:36 16:19	07:52 17:36 14:41 (WEA 1)	64	09:47 (WEA 3)
18	08:23 16:51 22	10:09 (WEA 3) 14:50 (WEA 1) 17:46	07:36 06:36 18:35	06:27 06:27 19:59	05:32 20:59 21:45	05:10 20:59 21:45	05:30 21:34 20:44	06:16 19:36 18:29	07:05 17:35 16:35	07:54 17:35 16:19	07:54 17:35 14:41 (WEA 1)	65	09:47 (WEA 3)
19	08:22 16:53 9	14:35 (WEA 1) 14:44 (WEA 1) 17:48	07:34 06:34 18:36	06:25 06:25 19:59	05:31 20:59 21:46	05:10 20:59 21:46	05:31 21:33 20:42	06:17 19:34 18:27	07:06 17:34 16:34	07:55 17:34 16:19	07:55 17:34 14:41 (WEA 1)	66	09:47 (WEA 3)
20	08:21 16:54 8	07:32 06:31 18:38	06:23 06:23 19:59	05:30 20:59 21:47	05:10 20:59 21:47	05:33 21:32 20:40	06:19 19:31 18:25	07:08 17:31 16:33	07:57 17:31 16:18	07:51 17:31 16:18	07:51 17:31 14:42 (WEA 1)	67	09:48 (WEA 3)
21	08:20 16:56 7	07:30 06:29 18:40	06:20 06:20 19:59	05:28 20:59 21:48	05:10 20:59 21:48	05:34 21:31 20:38	06:20 19:29 18:23	07:09 17:29 16:31	07:59 17:29 16:18	07:52 17:29 16:18	07:52 17:29 14:43 (WEA 1)	68	09:48 (WEA 3)
22	08:19 16:58 6	07:28 06:27 18:41	06:18 06:18 19:59	05:27 20:59 21:49	05:10 20:59 21:49	05:35 21:29 20:36	06:22 19:27 18:21	07:11 17:27 16:30	08:00 17:27 16:18	07:54 17:27 16:18	07:54 17:27 14:43 (WEA 1)	69	09:49 (WEA 3)
23	08:17 16:59 5	07:26 06:24 18:43	06:16 06:16 19:59	05:26 20:59 21:50	05:10 20:59 21:50	05:37 21:28 20:34	06:23 19:25 18:19	07:13 17:25 16:29	08:02 17:25 16:18	07:55 17:25 16:18	07:55 17:25 14:44 (WEA 1)	70	09:49 (WEA 3)
24	08:16 17:01 4	07:24 06:22 18:45	06:14 06:14 19:59	05:25 20:59 21:51	05:10 20:59 21:51	05:38 21:27 20:32	06:25 19:22 18:17	07:14 17:22 16:28	08:04 17:22 16:18	07:57 17:22 16:18	07:57 17:22 14:44 (WEA 1)	71	09:50 (WEA 3)
25	08:15 17:03 3	07:22 06:20 18:46	06:12 06:12 19:59	05:23 20:59 21:52	05:11 20:59 21:52	05:39 21:26 20:30	06:27 19:20 18:15	07:16 17:20 16:27	07:06 17:20 16:18	07:59 17:20 16:18	07:59 17:20 14:44 (WEA 1)	72	09:50 (WEA 3)
26	08:14 17:04 2	07:20 06:18 18:48	06:10 06:10 19:59	05:22 20:59 21:53	05:11 20:59 21:53	05:41 21:24 20:27	06:28 19:18 18:13	07:17 17:13 16:26	07:07 17:13 16:26	08:00 17:13 16:26	08:00 17:13 14:45 (WEA 1)	73	09:51 (WEA 3)
27	08:13 17:06 1	07:18 06:15 18:50	06:08 06:08 19:59	05:21 20:59 21:54	05:12 20:59 21:54	05:42 21:23 20:25	06:30 19:15 18:11	07:19 17:11 16:25	07:09 17:11 16:25	08:02 17:11 16:25	08:02 17:11 14:45 (WEA 1)	74	09:51 (WEA 3)
28	08:11 17:08 0	07:15 06:13 18:51	06:06 06:06 19:59	05:20 20:59 21:55	05:12 20:59 21:55	05:44 21:21 20:23	06:31 19:13 18:13	07:21 17:09 16:25	07:11 17:09 16:25	08:03 17:09 16:25	08:03 17:09 14:46 (WEA 1)	75	09:52 (WEA 3)
29	08:10 17:10 0	07:11 06:10 18:53	06:04 06:04 19:59	05:19 20:59 21:56	05:13 20:59 21:56	05:45 21:20 20:21	06:33 19:11 18:14	07:22 17:07 16:24	07:13 17:07 16:24	08:05 17:07 16:24	08:05 17:07 14:46 (WEA 1)	76	09:52 (WEA 3)
30	08:08 17:11 0	07:09 06:03 18:55	06:03 06:03 19:59	05:18 20:59 21:57	05:13 20:59 21:57	05:46 21:18 20:19	06:35 19:09 18:15	07:24 17:05 16:23	07:14 17:05 16:23	08:06 17:05 16:23	08:06 17:05 14:47 (WEA 1)	77	09:53 (WEA 3)
31	08:07 17:13 0	07:06 06:02 18:56	06:02 06:02 19:59	05:17 20:59 21:58	05:13 20:59 21:58	05:48 21:17 20:17	06:36 17:03 16:23	07:16 17:03 16:23	07:16 17:03 16:23	08:07 17:03 16:23	08:07 17:03 14:47 (WEA 1)	78	09:53 (WEA 3)
Sonnenscheinstunden	262	279	367	415	483	495	499	452	380	332	268	247	2025
astr.max.mögl.Beschattung	855										261		0,17
Red.Sonnenscheinwahrsch.	0,19										0,22		0,17
Reduktion Betriebsdauer	0,98										0,98		0,98
Reduktion Windrichtung	0,63										0,63		0,63
Gesamte Reduktion	0,12										0,14		0,10
Met.wahrsch.Beschattung	99										36		210

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL31 - Olsberg, Am Hölchen 4

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:54 (WEA 3) 14:50 (WEA 1)	08:05 17:15	07:13 18:05	07:04 19:58	06:01 20:48	05:17 21:32	05:14 21:46	05:49 21:15	06:38 20:14	07:25 19:06	08:08 17:01	09:41 (WEA 3) 16:22 50
2	08:31 16:29	09:54 (WEA 3) 14:51 (WEA 1)	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	08:09 17:00	09:42 (WEA 3) 16:22 51
3	08:31 16:30	09:54 (WEA 3) 14:50 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	08:10 17:02	09:42 (WEA 3) 16:21 51
4	08:31 16:32	09:55 (WEA 3) 14:51 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	05:54 21:10	06:42 20:08	07:30 19:00	08:12 17:06	09:41 (WEA 3) 16:21 53
5	08:31 16:33	09:56 (WEA 3) 14:52 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	05:55 21:08	06:44 20:06	07:32 18:57	08:13 17:04	09:42 (WEA 3) 16:20 54
6	08:30 16:34	09:56 (WEA 3) 14:52 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	08:14 17:05	09:42 (WEA 3) 16:20 54
7	08:30 16:35	09:57 (WEA 3) 14:53 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	05:58 21:05	06:47 20:01	07:35 18:53	08:16 17:06	09:42 (WEA 3) 16:19 54
8	08:30 16:36	09:57 (WEA 3) 14:52 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	08:17 17:09	09:43 (WEA 3) 16:19 60
9	08:29 16:38	09:57 (WEA 3) 14:52 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:02 21:01	06:50 19:57	07:38 18:48	08:18 17:09	09:43 (WEA 3) 16:19 64
10	08:29 16:39	09:59 (WEA 3) 14:53 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:03 21:00	06:52 19:54	07:40 18:46	08:19 17:09	09:43 (WEA 3) 16:18 68
11	08:28 16:40	09:59 (WEA 3) 14:53 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	08:20 17:09	09:44 (WEA 3) 16:18 70
12	08:27 16:42	10:00 (WEA 3) 14:53 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:06 20:56	06:55 19:50	07:43 18:42	08:21 17:09	09:44 (WEA 3) 16:18 71
13	08:27 16:43	10:01 (WEA 3) 14:53 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:08 20:54	06:57 19:47	07:45 18:40	08:22 17:10	09:44 (WEA 3) 16:18 73
14	08:26 16:45	10:03 (WEA 3) 14:53 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:09 20:52	06:58 19:45	07:47 18:37	08:23 17:10	09:45 (WEA 3) 16:18 73
15	08:25 16:46	10:04 (WEA 3) 14:53 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	08:24 17:10	09:46 (WEA 3) 16:18 74
16	08:24 16:48	10:05 (WEA 3) 14:53 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33	08:25 17:10	09:46 (WEA 3) 16:18 75
17	08:24 16:49	10:06 (WEA 3) 14:52 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	08:26 17:10	09:47 (WEA 3) 16:19 74
18	08:23 16:51	10:08 (WEA 3) 14:52 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	08:26 17:10	09:47 (WEA 3) 16:19 76
19	08:22 16:53	10:10 (WEA 3) 14:50 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	08:27 17:10	09:47 (WEA 3) 16:19 77
20	08:21 16:54	14:38 (WEA 1) 10:10 (WEA 3)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	08:28 17:10	09:48 (WEA 3) 16:20 77
21	08:20 16:56	14:42 (WEA 1) 14:45 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	08:29 17:10	09:48 (WEA 3) 16:20 77
22	08:19 16:58	14:45 (WEA 1) 14:45 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	05:35 21:29	06:22 20:36	07:11 19:27	08:00 18:21	08:29 17:10	09:49 (WEA 3) 16:20 77
23	08:17 16:59	14:45 (WEA 1) 14:45 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:35	05:26 21:21	05:10 21:47	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19	08:29 17:10	09:49 (WEA 3) 16:21 77
24	08:16 17:01	14:45 (WEA 1) 14:45 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:10 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	08:30 17:10	09:49 (WEA 3) 16:21 76
25	08:15 17:03	14:45 (WEA 1) 14:45 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	08:06 18:15	08:30 17:10	09:50 (WEA 3) 16:22 77
26	08:14 17:04	14:45 (WEA 1) 14:45 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:07 18:13	08:30 17:10	09:51 (WEA 3) 16:23 75
27	08:13 17:06	14:45 (WEA 1) 14:45 (WEA 1)	07:18 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:09 18:11	08:31 17:10	09:51 (WEA 3) 16:24 75
28	08:11 17:08	14:45 (WEA 1) 14:45 (WEA 1)	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:11 18:09	08:31 17:10	09:51 (WEA 3) 16:24 75
29	08:10 17:10	14:45 (WEA 1) 14:45 (WEA 1)	07:11 18:04	06:11 18:53	06:04 20:44	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:12 18:05	08:31 17:10	09:52 (WEA 3) 16:25 73
30	08:08 17:11	14:45 (WEA 1) 14:45 (WEA 1)	07:09 18:04	06:03 18:55	06:03 20:46	05:18 21:30	05:13 21:46	05:46 21:18	06:35 20:19	07:24 19:09	08:14 18:06	08:31 17:10	09:52 (WEA 3) 16:26 73
31	08:07 17:13	14:45 (WEA 1) 14:45 (WEA 1)	07:06 18:06	06:02 18:56	06:02 20:46	05:17 21:31	05:13 21:46	05:48 21:17	06:36 20:17	07:16 19:03	08:15 18:07	08:31 17:10	09:53 (WEA 3) 16:27 71
Sonnenscheinstunden	262	279	367	415	483	495	499	452	380	332	268	247	2125
astr.max.mögl.Beschattung	945										312		0,17
Red.Sonnenscheinwahrsch.	0,19										0,22		0,17
Reduktion Betriebsdauer	0,98										0,98		0,98
Reduktion Windrichtung	0,63										0,63		0,63
Gesamte Reduktion	0,12										0,14		0,10
Met.wahrsch.Beschattung	110										44		220

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K.Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL32 - Olsberg, Am Hölchen 6

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:54 (WEA 3) 14:53 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 16:22	09:42 (WEA 3) 14:39 (WEA 1)
2	08:31 16:29	09:55 (WEA 3) 14:54 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:15 21:46	06:39 21:14	07:27 20:12	07:20 19:04	08:09 16:22	09:42 (WEA 3) 14:40 (WEA 1)
3	08:31 16:30	09:54 (WEA 3) 14:54 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:58	09:42 (WEA 3) 14:40 (WEA 1)
4	08:31 16:32	09:55 (WEA 3) 14:54 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:56	09:41 (WEA 3) 14:40 (WEA 1)
5	08:31 16:33	09:56 (WEA 3) 14:55 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:54	09:42 (WEA 3) 14:41 (WEA 1)
6	08:30 16:34	09:56 (WEA 3) 14:55 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:53	09:42 (WEA 3) 14:41 (WEA 1)
7	08:30 16:35	09:57 (WEA 3) 14:56 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:51	09:42 (WEA 3) 14:41 (WEA 1)
8	08:30 16:36	09:57 (WEA 3) 14:56 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:49	09:43 (WEA 3) 14:42 (WEA 1)
9	08:29 16:38	09:58 (WEA 3) 14:56 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:48	09:43 (WEA 3) 14:43 (WEA 1)
10	08:29 16:39	09:59 (WEA 3) 14:57 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:46	09:44 (WEA 3) 14:43 (WEA 1)
11	08:28 16:40	09:59 (WEA 3) 14:57 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:54 20:58	07:42 19:52	07:35 18:44	08:20 16:45	09:44 (WEA 3) 14:43 (WEA 1)
12	08:27 16:42	10:00 (WEA 3) 14:56 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:56 20:56	07:43 19:50	07:37 18:42	08:21 16:43	09:44 (WEA 3) 14:44 (WEA 1)
13	08:27 16:43	10:01 (WEA 3) 14:56 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:42	09:45 (WEA 3) 14:44 (WEA 1)
14	08:26 16:45	10:02 (WEA 3) 14:57 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:58 20:52	07:47 19:45	07:40 18:37	08:23 16:40	09:45 (WEA 3) 14:45 (WEA 1)
15	08:25 16:46	10:03 (WEA 3) 14:57 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	08:24 16:39	09:46 (WEA 3) 14:45 (WEA 1)
16	08:24 16:48	10:05 (WEA 3) 14:58 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33	08:25 16:38	09:46 (WEA 3) 14:46 (WEA 1)
17	08:24 16:49	10:06 (WEA 3) 14:58 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	08:26 16:36	09:47 (WEA 3) 14:46 (WEA 1)
18	08:23 16:51	10:08 (WEA 3) 14:59 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	08:27 16:35	09:47 (WEA 3) 14:46 (WEA 1)
19	08:22 16:53	10:09 (WEA 3) 14:59 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	08:27 16:34	09:48 (WEA 3) 14:47 (WEA 1)
20	08:21 16:54	10:10 (WEA 3) 14:59 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	08:28 16:33	09:49 (WEA 3) 14:48 (WEA 1)
21	08:20 16:56	10:11 (WEA 3) 14:59 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	8 14:16 (WEA 1) 07:52 16:31	09:49 (WEA 3) 14:48 (WEA 1)
22	08:19 16:58	10:12 (WEA 3) 14:59 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	05:35 21:29	06:22 20:36	07:11 19:27	08:00 18:21	13 14:14 (WEA 1) 07:54 16:30	09:49 (WEA 3) 14:49 (WEA 1)
23	08:17 16:59	10:13 (WEA 3) 14:59 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:35	05:26 21:21	05:10 21:47	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19	16 14:30 (WEA 1) 07:55 16:29	09:50 (WEA 3) 14:49 (WEA 1)
24	08:16 17:01	10:14 (WEA 3) 14:59 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:10 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	29 14:32 (WEA 1) 07:57 16:28	09:50 (WEA 3) 14:49 (WEA 1)
25	08:15 17:03	10:15 (WEA 3) 14:59 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	08:06 18:15	33 14:34 (WEA 1) 07:59 16:27	09:51 (WEA 3) 14:50 (WEA 1)
26	08:14 17:04	10:16 (WEA 3) 14:59 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:07 18:13	38 14:36 (WEA 1) 08:00 16:26	09:51 (WEA 3) 14:50 (WEA 1)
27	08:13 17:06	10:17 (WEA 3) 14:59 (WEA 1)	07:18 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:02 18:11	41 14:38 (WEA 1) 08:02 16:25	09:51 (WEA 3) 14:51 (WEA 1)
28	08:11 17:08	10:18 (WEA 3) 14:59 (WEA 1)	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:03 18:09	46 14:40 (WEA 1) 08:03 16:25	09:52 (WEA 3) 14:51 (WEA 1)
29	08:10 17:10	10:19 (WEA 3) 14:59 (WEA 1)	07:13 18:06	06:11 18:53	06:04 20:44	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:05 18:07	48 14:42 (WEA 1) 08:05 16:24	09:52 (WEA 3) 14:51 (WEA 1)
30	08:08 17:11	10:20 (WEA 3) 14:59 (WEA 1)	07:11 18:08	06:09 18:55	06:03 20:46	05:18 21:30	05:13 21:46	05:46 21:18	06:35 20:19	07:24 19:09	08:06 18:05	51 14:44 (WEA 1) 08:06 16:23	09:53 (WEA 3) 14:52 (WEA 1)
31	08:07 17:13	10:21 (WEA 3) 14:59 (WEA 1)	07:09 18:09	06:07 18:56	06:01 20:47	05:17 21:31	05:14 21:47	05:48 21:17	06:36 20:17	07:16 18:03	08:07 18:04	16:27 247	09:53 (WEA 3) 14:52 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	268	
astr.max.mögl.Beschattung		1051											2239
Red.Sonnenscheinwahrsch.		0,19										0,22	0,17
Reduktion Betriebsdauer		0,98										0,98	0,98
Reduktion Windrichtung		0,63										0,63	0,63
Gesamte Reduktion		0,12										0,13	0,10
Met.wahrsch.Beschattung		122										51	232

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL33 - Olsberg, Am Hölchen 8
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:52 (WEA 3) 14:54 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 16:22	09:39 (WEA 3) 14:40 (WEA 1)
2	08:31 16:29	09:52 (WEA 3) 14:55 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:15 21:46	06:39 21:14	07:27 20:12	07:20 19:04	08:09 16:22	09:39 (WEA 3) 14:41 (WEA 1)
3	08:31 16:30	09:52 (WEA 3) 14:56 (WEA 1)	08:02 17:19	07:09 18:09	05:57 20:01	05:15 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:21	09:39 (WEA 3) 14:41 (WEA 1)
4	08:31 16:32	09:53 (WEA 3) 14:56 (WEA 1)	08:01 17:20	07:07 18:11	05:57 20:03	05:15 20:52	05:16 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:21	09:39 (WEA 3) 14:41 (WEA 1)
5	08:31 16:33	09:54 (WEA 3) 14:56 (WEA 1)	07:59 17:22	07:05 18:12	05:55 20:05	05:13 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:20	09:40 (WEA 3) 14:42 (WEA 1)
6	08:30 16:34	09:54 (WEA 3) 14:56 (WEA 1)	07:58 17:24	07:03 18:14	05:53 20:06	05:13 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:20	09:40 (WEA 3) 14:42 (WEA 1)
7	08:30 16:35	09:55 (WEA 3) 14:57 (WEA 1)	07:56 17:26	07:00 18:16	05:50 20:08	05:12 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:19	09:40 (WEA 3) 14:43 (WEA 1)
8	08:30 16:36	09:55 (WEA 3) 14:57 (WEA 1)	07:54 17:28	06:58 18:18	05:48 20:10	05:12 20:59	05:19 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:19	09:41 (WEA 3) 14:44 (WEA 1)
9	08:29 16:38	09:55 (WEA 3) 14:57 (WEA 1)	07:52 17:30	06:56 18:19	05:46 20:11	05:11 21:00	05:20 21:40	06:02 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:19	09:41 (WEA 3) 14:44 (WEA 1)
10	08:29 16:39	09:56 (WEA 3) 14:58 (WEA 1)	07:51 17:31	06:54 18:21	05:45 20:13	05:11 21:02	05:21 21:41	06:03 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:18	09:41 (WEA 3) 14:44 (WEA 1)
11	08:28 16:40	09:57 (WEA 3) 14:58 (WEA 1)	07:49 17:33	06:52 18:23	05:44 20:15	05:11 21:04	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	07:35 16:45	08:20 16:18	09:42 (WEA 3) 14:44 (WEA 1)
12	08:27 16:42	09:57 (WEA 3) 14:58 (WEA 1)	07:47 17:35	06:49 18:24	05:41 20:16	05:10 21:05	05:23 21:42	06:06 21:40	06:55 20:56	07:43 19:50	07:37 18:42	08:21 16:18	09:42 (WEA 3) 14:45 (WEA 1)
13	08:27 16:43	09:58 (WEA 3) 14:58 (WEA 1)	07:45 17:37	06:47 18:26	05:40 20:18	05:10 21:07	05:24 21:43	06:08 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:18	09:43 (WEA 3) 14:45 (WEA 1)
14	08:26 16:45	09:59 (WEA 3) 14:59 (WEA 1)	07:43 17:39	06:45 18:28	05:38 20:20	05:10 21:08	05:25 21:43	06:09 20:52	06:58 19:45	07:47 18:37	07:40 16:40	08:23 16:18	09:43 (WEA 3) 14:46 (WEA 1)
15	08:25 16:46	10:00 (WEA 3) 14:59 (WEA 1)	07:42 17:40	06:43 18:30	05:37 20:21	05:10 21:10	05:27 21:44	06:11 21:37	07:00 20:50	07:49 19:43	07:42 18:35	08:24 16:18	09:44 (WEA 3) 14:46 (WEA 1)
16	08:24 16:48	10:01 (WEA 3) 14:59 (WEA 1)	07:40 17:42	06:40 18:31	05:35 20:23	05:10 21:11	05:28 21:44	06:12 21:36	07:01 20:48	07:50 19:41	07:44 18:33	08:25 16:18	09:44 (WEA 3) 14:47 (WEA 1)
17	08:24 16:49	10:02 (WEA 3) 14:59 (WEA 1)	07:38 17:44	06:38 18:33	05:34 20:25	05:10 21:13	05:29 21:45	06:14 21:35	07:03 20:46	07:52 19:38	07:46 18:31	08:26 16:19	09:45 (WEA 3) 14:47 (WEA 1)
18	08:23 16:51	10:03 (WEA 3) 14:59 (WEA 1)	07:36 17:46	06:36 18:35	05:32 20:26	05:10 21:14	05:30 21:45	06:16 20:44	07:05 19:36	07:54 18:29	07:47 16:35	08:26 16:19	09:45 (WEA 3) 14:47 (WEA 1)
19	08:22 16:53	10:04 (WEA 3) 14:57 (WEA 1)	07:34 17:48	06:34 18:36	05:31 20:28	05:10 21:16	05:31 21:46	06:17 21:33	07:06 20:42	07:55 19:34	07:49 16:34	10 08:27 14:18 (WEA 1)	09:46 (WEA 3) 14:48 (WEA 1)
20	08:21 16:54	10:06 (WEA 3) 14:57 (WEA 1)	07:32 17:49	06:31 18:38	05:30 20:30	05:10 21:17	05:33 21:46	06:19 21:32	07:08 20:40	07:57 19:31	07:51 18:25	10 08:28 14:16 (WEA 1)	09:46 (WEA 3) 14:49 (WEA 1)
21	08:20 16:56	10:09 (WEA 3) 14:56 (WEA 1)	07:30 17:51	06:29 18:40	05:28 20:31	05:10 21:18	05:34 21:46	06:20 21:31	07:09 20:38	07:59 19:29	07:52 18:23	14 08:29 14:30 (WEA 1)	09:46 (WEA 3) 14:49 (WEA 1)
22	08:19 16:58	10:11 (WEA 3) 14:55 (WEA 1)	07:28 17:53	06:27 18:41	05:27 20:33	05:10 21:20	05:35 21:46	06:22 21:29	07:11 20:36	08:00 19:27	07:54 18:21	24 08:30 14:32 (WEA 1)	09:47 (WEA 3) 14:50 (WEA 1)
23	08:17 16:59	10:13 (WEA 3) 14:53 (WEA 1)	07:26 17:55	06:24 18:43	05:26 20:35	05:10 21:21	05:37 21:47	06:23 21:28	07:13 20:34	08:02 19:25	07:55 18:19	32 08:31 14:34 (WEA 1)	09:47 (WEA 3) 14:50 (WEA 1)
24	08:16 17:01	10:15 (WEA 3) 14:52 (WEA 1)	07:24 17:57	06:22 18:45	05:25 20:36	05:11 21:22	05:38 21:47	06:25 21:27	07:14 20:32	08:04 19:22	07:57 18:17	37 08:32 14:36 (WEA 1)	09:48 (WEA 3) 14:51 (WEA 1)
25	08:15 17:03	10:17 (WEA 3) 14:51 (WEA 1)	07:22 17:58	06:20 18:46	05:23 20:38	05:11 21:24	05:39 21:47	06:27 21:26	07:16 20:30	08:06 19:20	07:59 17:15	40 08:33 14:38 (WEA 1)	09:49 (WEA 3) 14:52 (WEA 1)
26	08:14 17:04	10:19 (WEA 3) 14:50 (WEA 1)	07:20 18:00	06:18 18:48	05:22 20:39	05:11 21:25	05:41 21:47	06:28 21:24	07:17 20:27	08:07 19:18	08:00 17:13	44 08:34 14:39 (WEA 1)	09:50 (WEA 3) 14:53 (WEA 1)
27	08:13 17:06	10:21 (WEA 3) 14:49 (WEA 1)	07:18 18:02	06:15 18:50	05:21 20:41	05:12 21:26	05:42 21:47	06:30 21:23	07:19 20:25	08:08 19:15	08:02 17:11	46 08:35 14:40 (WEA 1)	09:51 (WEA 3) 14:54 (WEA 1)
28	08:11 17:08	10:23 (WEA 3) 14:48 (WEA 1)	07:15 18:04	06:13 18:51	05:20 20:43	05:12 21:28	05:44 21:47	06:31 21:21	07:21 20:23	08:09 19:13	08:03 17:09	48 08:36 14:41 (WEA 1)	09:52 (WEA 3) 14:55 (WEA 1)
29	08:10 17:10	10:25 (WEA 3) 14:47 (WEA 1)	07:13 18:06	06:11 18:53	05:19 20:44	05:13 21:29	05:45 21:46	06:33 21:20	07:22 20:21	08:10 19:11	08:05 17:07	50 08:37 14:42 (WEA 1)	09:53 (WEA 3) 14:56 (WEA 1)
30	08:08 17:11	10:27 (WEA 3) 14:46 (WEA 1)	07:11 18:08	06:09 18:55	05:18 20:46	05:13 21:30	05:46 21:46	06:35 21:18	07:24 20:19	08:11 19:09	08:06 17:05	52 08:38 14:43 (WEA 1)	09:54 (WEA 3) 14:57 (WEA 1)
31	08:07 17:13	10:29 (WEA 3) 14:45 (WEA 1)	07:09 18:10	06:07 18:56	05:17 20:47	05:14 21:31	05:48 21:47	06:36 21:17	07:25 20:17	08:12 19:07	08:07 17:03	54 08:39 14:44 (WEA 1)	09:55 (WEA 3) 14:58 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	268	247
astr.max.mögl.Beschattung		1196										451	2362
Red.Sonnenscheinwahrsch.		0,19										0,22	0,17
Reduktion Betriebsdauer		0,98										0,98	0,98
Reduktion Windrichtung		0,63										0,63	0,63
Gesamte Reduktion		0,12										0,14	0,10
Met.wahrsch.Beschattung		139										63	245

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL34 - Olsberg, Am Hölchen 10
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:51 (WEA 3) 14:56 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 16:22	09:38 (WEA 3) 14:43 (WEA 1)
2	08:31 16:29	09:52 (WEA 3) 14:57 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:15 21:46	06:39 21:14	07:27 20:12	07:20 19:04	08:09 16:22	09:38 (WEA 3) 14:44 (WEA 1)
3	08:31 16:30	09:51 (WEA 3) 14:57 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:21	09:38 (WEA 3) 14:44 (WEA 1)
4	08:31 16:32	09:52 (WEA 3) 14:58 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:21	09:38 (WEA 3) 14:44 (WEA 1)
5	08:31 16:33	09:53 (WEA 3) 14:59 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:20	09:39 (WEA 3) 14:45 (WEA 1)
6	08:30 16:34	09:53 (WEA 3) 14:58 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:20	09:39 (WEA 3) 14:45 (WEA 1)
7	08:30 16:35	09:54 (WEA 3) 14:59 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:19	09:39 (WEA 3) 14:45 (WEA 1)
8	08:30 16:36	09:54 (WEA 3) 14:59 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:19	09:40 (WEA 3) 14:46 (WEA 1)
9	08:29 16:38	09:54 (WEA 3) 14:59 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:19	09:40 (WEA 3) 14:46 (WEA 1)
10	08:29 16:39	09:55 (WEA 3) 15:00 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:18	09:41 (WEA 3) 14:46 (WEA 1)
11	08:28 16:40	09:56 (WEA 3) 15:01 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:54 20:58	07:42 19:52	07:35 18:44	08:20 16:18	09:41 (WEA 3) 14:46 (WEA 1)
12	08:27 16:42	09:56 (WEA 3) 15:01 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:56 20:56	07:43 19:50	07:37 18:42	08:21 16:18	09:42 (WEA 3) 14:47 (WEA 1)
13	08:27 16:43	09:57 (WEA 3) 15:01 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:18	09:42 (WEA 3) 14:47 (WEA 1)
14	08:26 16:45	09:58 (WEA 3) 15:02 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:58 20:52	07:47 19:45	07:40 18:37	08:23 16:18	09:43 (WEA 3) 14:48 (WEA 1)
15	08:25 16:46	09:59 (WEA 3) 15:02 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	08:24 16:18	09:43 (WEA 3) 14:48 (WEA 1)
16	08:24 16:48	10:00 (WEA 3) 15:02 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33	08:25 16:18	09:44 (WEA 3) 14:49 (WEA 1)
17	08:24 16:49	10:01 (WEA 3) 15:02 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	08:26 16:19	09:45 (WEA 3) 14:49 (WEA 1)
18	08:23 16:51	10:02 (WEA 3) 15:02 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	06:16 20:44	07:05 19:36	07:54 18:29	07:47 17:19	08:26 16:19	09:44 (WEA 3) 14:49 (WEA 1)
19	08:22 16:53	10:02 (WEA 3) 15:00 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	06:17 21:33	07:06 20:42	07:55 19:34	07:49 18:27	08:27 16:19	09:45 (WEA 3) 14:50 (WEA 1)
20	08:21 16:54	10:04 (WEA 3) 15:00 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	06:19 21:32	07:08 20:40	07:57 19:31	07:51 18:25	08:28 16:20	09:46 (WEA 3) 14:50 (WEA 1)
21	08:20 16:56	10:06 (WEA 3) 15:00 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	06:20 21:31	07:09 20:38	07:59 19:29	07:52 18:23	08:28 16:20	09:46 (WEA 3) 14:50 (WEA 1)
22	08:19 16:58	10:10 (WEA 3) 14:59 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	06:22 21:29	07:11 20:36	08:00 19:27	07:54 18:21	08:29 16:20	09:47 (WEA 3) 14:51 (WEA 1)
23	08:17 16:59	14:42 (WEA 1) 14:57 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:35	05:26 21:21	05:10 21:47	06:23 21:28	07:13 20:34	08:02 19:25	07:55 18:19	08:29 16:21	09:47 (WEA 3) 14:51 (WEA 1)
24	08:16 17:01	14:45 (WEA 1) 14:56 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	06:25 21:27	07:14 20:32	08:04 19:22	07:57 18:17	08:30 16:21	09:47 (WEA 3) 14:52 (WEA 1)
25	08:15 17:03	14:51 (WEA 1) 14:52 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	06:27 21:26	07:16 20:30	07:59 19:20	07:58 18:15	08:30 16:22	09:48 (WEA 3) 14:53 (WEA 1)
26	08:14 17:04	18:00 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:00 17:13	07:57 16:26	08:30 16:23	09:48 (WEA 3) 14:53 (WEA 1)
27	08:13 17:06	18:02 18:02	06:15 18:50	05:21 20:41	05:12 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:02 17:11	07:59 16:25	08:31 16:24	09:49 (WEA 3) 14:53 (WEA 1)
28	08:11 17:08	18:04 18:04	06:13 18:51	05:20 20:43	05:12 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:03 17:09	07:58 16:25	08:31 16:24	09:49 (WEA 3) 14:54 (WEA 1)
29	08:10 17:10	19:53 19:53	06:04 20:44	05:19 21:29	05:13 21:46	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:05 17:07	07:59 16:24	08:31 16:25	09:49 (WEA 3) 14:54 (WEA 1)
30	08:08 17:11	19:55 19:55	06:03 20:46	05:18 21:30	05:13 21:46	05:13 21:46	05:46 21:18	06:35 20:19	07:24 19:09	08:06 17:05	07:59 16:23	08:31 16:26	09:50 (WEA 3) 14:55 (WEA 1)
31	08:07 17:13	19:56 19:56	07:06 21:31	05:17 21:31	05:17 21:31	05:17 21:31	05:48 21:17	06:36 20:17	07:16 17:03	08:06 17:03	07:59 16:27	08:31 16:27	09:50 (WEA 3) 14:55 (WEA 1)
Sonnenscheinstunden	262	279	367	415	483	495	499	452	380	332	268	247	2445
astr.max.mögl.Beschattung	1313										517		0,17
Red.Sonnenscheinwahrsch.	0,19										0,22		0,17
Reduktion Betriebsdauer	0,98										0,98		0,98
Reduktion Windrichtung	0,63										0,63		0,63
Gesamte Reduktion	0,12										0,14		0,10
Met.wahrsch.Beschattung	152										72		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) Schattenende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL35 - Olsberg, Am Hölchen 12
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:50 (WEA 3) 14:58 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 16:22	09:37 (WEA 3) 14:45 (WEA 1)
2	08:31 16:29	09:51 (WEA 3) 14:59 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:51 21:46	06:39 21:14	07:27 20:12	07:20 19:04	08:09 16:22	09:38 (WEA 3) 14:46 (WEA 1)
3	08:31 16:30	09:51 (WEA 3) 14:59 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:22	09:37 (WEA 3) 14:46 (WEA 1)
4	08:31 16:32	09:51 (WEA 3) 15:00 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:21	09:37 (WEA 3) 14:46 (WEA 1)
5	08:31 16:33	09:52 (WEA 3) 15:01 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:20	09:38 (WEA 3) 14:47 (WEA 1)
6	08:30 16:34	09:52 (WEA 3) 15:01 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:20	09:38 (WEA 3) 14:47 (WEA 1)
7	08:30 16:35	09:53 (WEA 3) 15:02 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:19	09:38 (WEA 3) 14:47 (WEA 1)
8	08:30 16:36	09:53 (WEA 3) 15:02 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:19	09:39 (WEA 3) 14:48 (WEA 1)
9	08:29 16:38	09:53 (WEA 3) 15:02 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:19	09:40 (WEA 3) 14:48 (WEA 1)
10	08:29 16:39	09:54 (WEA 3) 15:03 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:18	09:40 (WEA 3) 14:48 (WEA 1)
11	08:28 16:40	09:55 (WEA 3) 15:03 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:53 20:58	07:42 19:52	07:35 18:44	08:20 16:18	09:40 (WEA 3) 14:49 (WEA 1)
12	08:27 16:42	09:55 (WEA 3) 15:03 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:56 20:56	07:43 19:50	07:37 18:42	08:21 16:18	09:41 (WEA 3) 14:49 (WEA 1)
13	08:27 16:43	09:56 (WEA 3) 15:03 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:18	09:41 (WEA 3) 14:49 (WEA 1)
14	08:26 16:45	09:57 (WEA 3) 15:04 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:58 20:52	07:47 19:45	07:40 18:37	08:23 16:18	09:42 (WEA 3) 14:50 (WEA 1)
15	08:25 16:46	09:58 (WEA 3) 15:05 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:42 18:35	08:24 16:18	09:43 (WEA 3) 14:50 (WEA 1)
16	08:24 16:48	09:59 (WEA 3) 15:05 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:44 18:33	08:25 16:18	09:44 (WEA 3) 14:51 (WEA 1)
17	08:24 16:49	09:59 (WEA 3) 15:00 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	08:26 16:19	09:44 (WEA 3) 14:51 (WEA 1)
18	08:23 16:51	10:00 (WEA 3) 15:05 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	06:16 20:44	07:05 19:36	07:54 18:29	07:47 17:16	08:27 16:19	09:44 (WEA 3) 14:51 (WEA 1)
19	08:22 16:53	10:01 (WEA 3) 15:04 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	06:17 21:33	07:06 20:42	07:55 19:34	07:49 18:27	08:27 16:19	09:45 (WEA 3) 14:52 (WEA 1)
20	08:21 16:54	10:02 (WEA 3) 15:04 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	06:19 21:32	07:08 20:40	07:57 19:31	07:51 18:25	08:28 16:20	09:45 (WEA 3) 14:52 (WEA 1)
21	08:20 16:56	10:04 (WEA 3) 15:04 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	06:20 21:31	07:09 20:38	07:59 19:29	07:52 18:23	08:29 16:20	09:45 (WEA 3) 14:52 (WEA 1)
22	08:19 16:58	10:06 (WEA 3) 15:03 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	06:22 21:29	07:11 20:36	08:00 19:27	07:54 18:21	08:29 16:20	09:46 (WEA 3) 14:53 (WEA 1)
23	08:17 16:59	10:09 (WEA 3) 15:02 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:35	05:26 21:21	05:10 21:47	06:23 21:28	07:13 20:34	08:02 19:25	07:55 18:19	08:29 16:21	09:46 (WEA 3) 14:53 (WEA 1)
24	08:16 17:01	14:45 (WEA 1) 15:01 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	06:25 21:27	07:14 20:32	08:04 19:22	07:57 18:17	08:30 16:21	09:46 (WEA 3) 14:53 (WEA 1)
25	08:15 17:03	14:47 (WEA 1) 15:00 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	06:27 21:26	07:16 20:30	07:59 19:20	07:59 17:15	08:30 16:22	09:48 (WEA 3) 14:55 (WEA 1)
26	08:14 17:04	14:50 (WEA 1) 14:57 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	06:28 21:24	07:17 20:27	08:00 19:18	08:00 17:13	08:30 16:26	09:48 (WEA 3) 14:55 (WEA 1)
27	08:13 17:06	17:04 18:02	07:18 18:05	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	06:30 21:23	07:19 20:25	08:02 19:15	08:02 17:11	08:31 16:25	09:48 (WEA 3) 14:55 (WEA 1)
28	08:11 17:08	17:06 18:04	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	06:31 21:21	07:21 20:23	08:03 19:13	08:03 17:09	08:31 16:25	09:48 (WEA 3) 14:56 (WEA 1)
29	08:10 17:10	17:08 18:04	07:11 18:04	06:09 18:53	06:04 20:44	05:19 21:29	05:13 21:46	06:33 21:20	07:22 20:21	08:05 19:11	08:05 17:07	08:31 16:24	09:49 (WEA 3) 14:56 (WEA 1)
30	08:08 17:11	17:08 18:04	07:09 18:04	06:03 18:53	06:03 20:46	05:18 21:30	05:13 21:46	06:35 21:18	07:24 20:19	08:06 19:09	08:06 17:05	08:31 16:23	09:49 (WEA 3) 14:57 (WEA 1)
31	08:07 17:13	17:08 18:04	07:06 18:04	06:02 18:53	06:02 20:46	05:17 21:31	05:13 21:46	06:36 21:17	07:16 20:17	08:06 19:09	08:06 17:05	08:31 16:23	09:50 (WEA 3) 14:58 (WEA 1)
Sonnenscheinstunden	262	279	367	415	483	495	499	452	380	332	268	247	2535
astr.max.mögl.Beschattung	1449										593		0,17
Red.Sonnenscheinwahrsch.	0,19										0,22		0,17
Reduktion Betriebsdauer	0,98										0,98		0,98
Reduktion Windrichtung	0,63										0,63		0,63
Gesamte Reduktion	0,12										0,13		0,10
Met.wahrsch.Beschattung	168										83		262

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL36 - Olsberg, Am Hölchen 14
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:53 (WEA 3) 15:03 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 17:01	09:40 (WEA 3) 14:51 (WEA 1)
2	08:31 16:29	09:54 (WEA 3) 15:04 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:51 21:46	06:39 21:13	07:27 20:12	07:20 19:04	08:09 17:00	09:41 (WEA 3) 14:52 (WEA 1)
3	08:31 16:30	09:54 (WEA 3) 15:04 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:58	09:41 (WEA 3) 14:52 (WEA 1)
4	08:31 16:32	09:54 (WEA 3) 15:05 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:56	09:41 (WEA 3) 14:51 (WEA 1)
5	08:31 16:33	09:55 (WEA 3) 15:06 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:54	09:41 (WEA 3) 14:52 (WEA 1)
6	08:30 16:34	09:55 (WEA 3) 15:06 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:53	09:41 (WEA 3) 14:52 (WEA 1)
7	08:30 16:35	09:56 (WEA 3) 15:07 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:51	09:41 (WEA 3) 14:52 (WEA 1)
8	08:30 16:36	09:56 (WEA 3) 15:07 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:49	09:43 (WEA 3) 14:53 (WEA 1)
9	08:29 16:38	09:56 (WEA 3) 15:07 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:48	09:43 (WEA 3) 14:53 (WEA 1)
10	08:29 16:39	09:58 (WEA 3) 15:09 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:46	09:43 (WEA 3) 14:53 (WEA 1)
11	08:28 16:40	09:58 (WEA 3) 15:09 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:54 20:58	07:42 19:52	07:35 18:44	08:20 16:45	09:43 (WEA 3) 14:54 (WEA 1)
12	08:27 16:42	09:58 (WEA 3) 15:09 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:56 20:56	07:43 19:50	07:37 18:42	08:21 16:43	09:44 (WEA 3) 14:54 (WEA 1)
13	08:27 16:43	09:59 (WEA 3) 15:09 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:42	09:44 (WEA 3) 14:54 (WEA 1)
14	08:26 16:45	10:00 (WEA 3) 15:10 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:58 20:52	07:47 19:45	07:40 18:37	08:23 16:40	09:45 (WEA 3) 14:54 (WEA 1)
15	08:25 16:46	10:01 (WEA 3) 15:11 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	08:24 16:39	09:45 (WEA 3) 14:55 (WEA 1)
16	08:24 16:48	10:02 (WEA 3) 15:11 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33	08:25 16:38	09:46 (WEA 3) 14:55 (WEA 1)
17	08:24 16:49	10:03 (WEA 3) 15:11 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	08:26 16:36	09:47 (WEA 3) 14:56 (WEA 1)
18	08:23 16:51	10:04 (WEA 3) 15:11 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	08:27 16:35	09:47 (WEA 3) 14:56 (WEA 1)
19	08:22 16:53	10:04 (WEA 3) 15:10 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	08:27 16:34	09:47 (WEA 3) 14:56 (WEA 1)
20	08:21 16:54	10:06 (WEA 3) 15:10 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	08:28 16:33	09:48 (WEA 3) 14:57 (WEA 1)
21	08:20 16:56	10:08 (WEA 3) 15:10 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	08:29 16:31	09:48 (WEA 3) 14:57 (WEA 1)
22	08:19 16:58	10:11 (WEA 3) 15:10 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	05:35 21:29	06:22 20:36	07:11 19:27	08:00 18:21	08:29 16:30	09:49 (WEA 3) 14:58 (WEA 1)
23	08:17 16:59	14:47 (WEA 1) 15:09 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:34	05:26 21:21	05:10 21:46	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19	08:29 16:29	09:49 (WEA 3) 14:58 (WEA 1)
24	08:16 17:01	14:48 (WEA 1) 15:09 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	08:29 16:28	09:49 (WEA 3) 14:58 (WEA 1)
25	08:15 17:03	14:50 (WEA 1) 15:08 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	08:06 18:15	08:30 16:27	09:50 (WEA 3) 14:59 (WEA 1)
26	08:14 17:04	14:51 (WEA 1) 15:08 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:07 18:13	08:30 16:26	09:51 (WEA 3) 15:00 (WEA 1)
27	08:13 17:06	14:54 (WEA 1) 15:05 (WEA 1)	07:18 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:09 18:11	08:31 16:25	09:51 (WEA 3) 15:01 (WEA 1)
28	08:11 17:08	15:05 (WEA 1)	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:11 18:09	08:32 16:25	09:51 (WEA 3) 15:01 (WEA 1)
29	08:10 17:10		07:11 19:53	06:04 20:44	05:19 21:29	05:13 21:46	05:15 21:20	05:45 20:21	06:33 19:11	07:22 17:07	08:13 16:24	08:33 16:24	09:52 (WEA 3) 15:02 (WEA 1)
30	08:08 17:11		07:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46	05:16 21:18	05:46 20:19	06:35 19:09	07:24 17:05	08:14 16:23	08:34 16:23	09:52 (WEA 3) 15:02 (WEA 1)
31	08:07 17:13		07:06 19:56	06:02 21:31	05:17 21:31	05:14 21:47	05:18 21:17	05:48 20:17	06:36 20:17	07:16 17:03	08:15 17:03	08:35 16:27	09:53 (WEA 3) 15:02 (WEA 1)
Sonnenscheinstunden	262	279	367	415	483	495	499	452	380	332	268	247	2555
astr.max.mögl.Beschattung	1504										630		0,17
Red.Sonnenscheinwahrsch.	0,19										0,22		0,17
Reduktion Betriebsdauer	0,98										0,98		0,98
Reduktion Windrichtung	0,63										0,64		0,62
Gesamte Reduktion	0,12										0,14		0,10
Met.wahrsch.Beschattung	175										89		264

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL37 - Olsberg, Am Hölischen 24

Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:56 (WEA 3) 15:07 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 16:22	09:43 (WEA 3) 14:55 (WEA 1)
2	08:31 16:29	09:57 (WEA 3) 15:08 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:15 21:46	06:39 21:13	07:27 20:12	07:20 19:04	08:09 16:22	09:44 (WEA 3) 14:55 (WEA 1)
3	08:31 16:30	09:56 (WEA 3) 15:08 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:21	09:43 (WEA 3) 14:55 (WEA 1)
4	08:31 16:32	09:57 (WEA 3) 15:09 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:21	09:43 (WEA 3) 14:55 (WEA 1)
5	08:31 16:33	09:58 (WEA 3) 15:10 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:20	09:44 (WEA 3) 14:56 (WEA 1)
6	08:30 16:34	09:58 (WEA 3) 15:10 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:20	09:44 (WEA 3) 14:56 (WEA 1)
7	08:30 16:35	09:59 (WEA 3) 15:11 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:19	09:44 (WEA 3) 14:56 (WEA 1)
8	08:30 16:36	09:59 (WEA 3) 15:11 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:19	09:45 (WEA 3) 14:57 (WEA 1)
9	08:29 16:38	09:59 (WEA 3) 15:11 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:19	09:45 (WEA 3) 14:57 (WEA 1)
10	08:29 16:39	10:00 (WEA 3) 15:12 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:03 21:00	07:40 19:54	07:34 18:46	08:19 16:18	09:46 (WEA 3) 14:57 (WEA 1)
11	08:28 16:40	10:01 (WEA 3) 15:13 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:05 20:58	07:42 19:52	07:35 18:44	08:20 16:20	09:46 (WEA 3) 14:57 (WEA 1)
12	08:27 16:42	10:01 (WEA 3) 15:13 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:06 20:56	07:43 19:50	07:37 18:42	08:21 16:18	09:46 (WEA 3) 14:57 (WEA 1)
13	08:27 16:43	10:02 (WEA 3) 15:13 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:08 20:54	07:45 19:47	07:39 18:40	08:22 16:18	09:47 (WEA 3) 14:57 (WEA 1)
14	08:26 16:45	10:03 (WEA 3) 15:14 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:09 20:52	07:47 19:45	07:40 18:37	08:23 16:18	09:47 (WEA 3) 14:58 (WEA 1)
15	08:25 16:46	10:04 (WEA 3) 15:15 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:48 19:43	07:42 18:35	08:24 16:18	09:48 (WEA 3) 14:58 (WEA 1)
16	08:24 16:48	10:05 (WEA 3) 15:15 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:44 18:33	08:25 16:18	09:49 (WEA 3) 14:59 (WEA 1)
17	08:24 16:49	10:06 (WEA 3) 15:15 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:46 18:31	08:26 16:19	09:49 (WEA 3) 14:59 (WEA 1)
18	08:23 16:51	10:07 (WEA 3) 15:15 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:47 18:29	08:26 16:19	09:49 (WEA 3) 14:59 (WEA 1)
19	08:22 16:53	10:08 (WEA 3) 15:14 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	08:27 16:19	09:50 (WEA 3) 14:59 (WEA 1)
20	08:21 16:54	10:10 (WEA 3) 15:15 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	08:28 16:20	09:51 (WEA 3) 15:00 (WEA 1)
21	08:20 16:56	10:12 (WEA 3) 15:15 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	08:28 16:31	09:51 (WEA 3) 15:00 (WEA 1)
22	08:19 16:58	10:16 (WEA 3) 15:15 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	05:35 21:29	06:22 20:36	07:11 19:27	07:54 18:21	08:29 16:30	09:52 (WEA 3) 15:01 (WEA 1)
23	08:17 16:59	14:50 (WEA 1) 15:14 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:34	05:26 21:21	05:10 21:46	05:37 21:28	06:23 20:34	07:13 19:25	07:55 18:19	08:29 16:29	09:52 (WEA 3) 15:01 (WEA 1)
24	08:16 17:01	14:51 (WEA 1) 15:14 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:10 21:47	05:38 21:27	06:25 20:32	07:14 19:22	07:57 18:17	08:30 16:28	09:52 (WEA 3) 15:01 (WEA 1)
25	08:15 17:03	14:53 (WEA 1) 15:13 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	07:59 18:15	08:30 16:27	09:53 (WEA 3) 15:03 (WEA 1)
26	08:14 17:04	14:54 (WEA 1) 15:12 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:00 18:13	08:30 16:26	09:53 (WEA 3) 15:03 (WEA 1)
27	08:13 17:06	14:56 (WEA 1) 15:11 (WEA 1)	07:18 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:02 18:11	08:31 16:25	09:53 (WEA 3) 15:03 (WEA 1)
28	08:11 17:08	14:59 (WEA 1) 15:08 (WEA 1)	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:03 18:09	08:31 16:25	09:54 (WEA 3) 15:04 (WEA 1)
29	08:10 17:10			07:11 19:53	06:04 20:44	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:05 18:05	08:31 16:24	09:54 (WEA 3) 15:04 (WEA 1)
30	08:08 17:11			07:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46	05:46 21:18	06:35 20:19	07:24 19:09	08:06 18:06	08:31 16:23	09:55 (WEA 3) 15:05 (WEA 1)
31	08:07 17:13			07:06 19:56		05:17 21:31		05:48 21:17	06:36 20:17		07:16 17:03	08:31 16:27	09:55 (WEA 3) 15:06 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	269	2539
astr.max.mögl.Beschattung	1518											641	0,17
Red.Sonnenscheinwahrsch.	0,19											0,22	0,17
Reduktion Betriebsdauer	0,98											0,98	0,98
Reduktion Windrichtung	0,63											0,64	0,62
Gesamte Reduktion	0,12											0,14	0,10
Met.wahrsch.Beschattung	177											91	263

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL38 - Olsberg, Am Hölchen 26

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	09:55 (WEA 3) 15:08 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 16:22	09:41 (WEA 3) 14:56 (WEA 1)
2	08:31 16:29	09:55 (WEA 3) 15:09 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:15 21:33	05:15 21:46	06:39 21:13	07:27 20:12	07:20 19:04	08:09 16:22	09:42 (WEA 3) 14:57 (WEA 1)
3	08:31 16:30	09:55 (WEA 3) 15:09 (WEA 1)	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	06:41 21:12	07:29 20:10	07:21 19:02	08:10 16:21	09:42 (WEA 3) 14:57 (WEA 1)
4	08:31 16:32	09:56 (WEA 3) 15:10 (WEA 1)	08:01 17:20	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	06:42 21:10	07:30 20:08	07:23 19:00	08:12 16:21	09:42 (WEA 3) 14:57 (WEA 1)
5	08:31 16:33	09:57 (WEA 3) 15:11 (WEA 1)	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	05:17 21:44	06:44 21:08	07:32 20:06	07:25 18:57	08:13 16:20	09:43 (WEA 3) 14:58 (WEA 1)
6	08:30 16:34	09:57 (WEA 3) 15:11 (WEA 1)	07:58 17:24	07:03 18:14	06:53 20:06	05:51 20:56	05:13 21:37	05:18 21:44	06:46 21:07	07:34 20:03	07:27 18:55	08:14 16:20	09:43 (WEA 3) 14:58 (WEA 1)
7	08:30 16:35	09:58 (WEA 3) 15:12 (WEA 1)	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:12 21:38	05:18 21:43	06:47 21:05	07:35 20:01	07:28 18:53	08:16 16:19	09:43 (WEA 3) 14:57 (WEA 1)
8	08:30 16:36	09:58 (WEA 3) 15:13 (WEA 1)	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	05:19 21:43	06:49 21:03	07:37 19:59	07:30 18:51	08:17 16:19	09:44 (WEA 3) 14:58 (WEA 1)
9	08:29 16:38	09:58 (WEA 3) 15:13 (WEA 1)	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:11 21:40	05:20 21:42	06:50 21:01	07:38 19:57	07:32 18:48	08:18 16:19	09:44 (WEA 3) 14:58 (WEA 1)
10	08:29 16:39	09:59 (WEA 3) 15:14 (WEA 1)	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	05:21 21:41	06:52 21:00	07:40 19:54	07:34 18:46	08:19 16:18	09:44 (WEA 3) 14:58 (WEA 1)
11	08:28 16:40	09:59 (WEA 3) 15:14 (WEA 1)	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	05:22 21:41	06:54 20:58	07:42 19:52	07:35 18:44	08:20 16:18	09:45 (WEA 3) 14:58 (WEA 1)
12	08:27 16:42	10:00 (WEA 3) 15:15 (WEA 1)	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	05:23 21:40	06:56 20:56	07:43 19:50	07:37 18:42	08:21 16:18	09:45 (WEA 3) 14:58 (WEA 1)
13	08:27 16:43	10:00 (WEA 3) 15:15 (WEA 1)	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	05:24 21:39	06:57 20:54	07:45 19:47	07:39 18:40	08:22 16:18	09:46 (WEA 3) 14:59 (WEA 1)
14	08:26 16:45	10:02 (WEA 3) 15:16 (WEA 1)	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	05:25 21:38	06:58 20:52	07:47 19:45	07:40 18:37	08:23 16:18	09:46 (WEA 3) 14:59 (WEA 1)
15	08:25 16:46	10:03 (WEA 3) 15:17 (WEA 1)	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	05:27 21:37	06:11 20:50	07:00 19:43	07:48 18:35	08:24 16:18	09:47 (WEA 3) 14:59 (WEA 1)
16	08:24 16:48	10:03 (WEA 3) 15:17 (WEA 1)	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33	08:25 16:18	09:47 (WEA 3) 15:00 (WEA 1)
17	08:24 16:49	10:04 (WEA 3) 15:17 (WEA 1)	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	08:26 16:19	09:48 (WEA 3) 15:00 (WEA 1)
18	08:23 16:51	10:06 (WEA 3) 15:18 (WEA 1)	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	08:27 16:19	09:48 (WEA 3) 15:00 (WEA 1)
19	08:22 16:53	10:06 (WEA 3) 15:17 (WEA 1)	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	08:27 16:19	09:49 (WEA 3) 15:01 (WEA 1)
20	08:21 16:54	10:07 (WEA 3) 15:17 (WEA 1)	07:32 17:49	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	08:28 16:20	09:50 (WEA 3) 15:01 (WEA 1)
21	08:20 16:56	10:09 (WEA 3) 15:17 (WEA 1)	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	08:29 16:20	09:50 (WEA 3) 15:01 (WEA 1)
22	08:19 16:58	10:12 (WEA 3) 15:17 (WEA 1)	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	05:35 21:29	06:22 20:36	07:11 19:27	07:54 18:21	08:30 16:20	09:51 (WEA 3) 15:02 (WEA 1)
23	08:17 16:59	10:15 (WEA 3) 15:16 (WEA 1)	07:26 17:55	06:24 18:43	06:16 20:34	05:26 21:21	05:10 21:46	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19	08:31 16:21	09:51 (WEA 3) 15:02 (WEA 1)
24	08:16 17:01	10:16 (WEA 3) 15:16 (WEA 1)	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	08:32 16:21	09:51 (WEA 3) 15:03 (WEA 1)
25	08:15 17:03	10:16 (WEA 3) 15:16 (WEA 1)	07:22 17:58	06:20 18:46	06:12 20:38	05:23 21:24	05:11 21:47	05:39 21:26	06:27 20:30	07:16 19:20	08:06 18:15	08:33 16:22	09:52 (WEA 3) 15:04 (WEA 1)
26	08:14 17:04	10:16 (WEA 3) 15:16 (WEA 1)	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	05:41 21:24	06:28 20:27	07:17 19:18	08:07 18:13	08:34 16:23	09:52 (WEA 3) 15:04 (WEA 1)
27	08:13 17:06	10:16 (WEA 3) 15:16 (WEA 1)	07:18 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:47	05:42 21:23	06:30 20:25	07:19 19:15	08:09 18:11	08:35 16:24	09:52 (WEA 3) 15:05 (WEA 1)
28	08:11 17:08	10:16 (WEA 3) 15:16 (WEA 1)	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:28	05:12 21:47	05:44 21:21	06:31 20:23	07:21 19:13	08:11 18:09	08:36 16:25	09:53 (WEA 3) 15:05 (WEA 1)
29	08:10 17:10	10:16 (WEA 3) 15:16 (WEA 1)	07:11 18:04	06:11 18:53	06:04 20:44	05:19 21:29	05:13 21:46	05:45 21:20	06:33 20:21	07:22 19:11	08:13 18:07	08:37 16:26	09:53 (WEA 3) 15:06 (WEA 1)
30	08:08 17:11	10:16 (WEA 3) 15:16 (WEA 1)	07:09 18:04	06:10 18:55	06:03 20:46	05:18 21:30	05:13 21:46	05:46 21:18	06:35 20:19	07:24 19:09	08:14 18:06	08:38 16:27	09:54 (WEA 3) 15:06 (WEA 1)
31	08:07 17:13	10:16 (WEA 3) 15:16 (WEA 1)	07:07 18:04	06:09 18:56	06:02 20:47	05:17 21:31	05:14 21:47	05:48 21:17	06:36 20:17	07:16 18:03	08:15 17:03	08:39 16:28	09:54 (WEA 3) 15:07 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	269	247
astr.max.mögl.Beschattung	1621											724	2567
Red.Sonnenscheinwahrsch.	0,19											0,22	0,17
Reduktion Betriebsdauer	0,98											0,98	0,98
Reduktion Windrichtung	0,63											0,64	0,62
Gesamte Reduktion	0,12											0,14	0,10
Met.wahrsch.Beschattung	188											102	265

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL39 - Olsberg, Zur Schanze 40
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	10:20 (WEA 3) 15:24 (WEA 1)	08:05 17:15	07:13 18:05	06:01 19:58	05:17 20:48	05:14 21:32	05:49 21:46	06:38 21:15	07:25 20:14	07:18 19:06	08:08 17:01	10:13 (WEA 3) 15:13 (WEA 1)
2	08:31 16:29	10:21 (WEA 3) 15:25 (WEA 1)	08:04 17:17	07:11 18:07	05:59 20:00	05:16 20:49	05:14 21:33	05:51 21:46	06:39 21:13	07:27 20:12	07:20 19:04	08:09 16:22	10:12 (WEA 3) 15:14 (WEA 1)
3	08:31 16:30	10:21 (WEA 3) 15:25 (WEA 1)	08:02 17:19	07:09 18:09	05:57 20:01	05:15 20:51	05:15 21:34	05:52 21:12	06:41 20:10	07:29 19:22	07:21 16:58	08:10 16:21	10:11 (WEA 3) 15:14 (WEA 1)
4	08:31 16:31	10:22 (WEA 3) 15:26 (WEA 1)	08:01 17:20	07:07 18:11	05:57 20:03	05:14 20:52	05:16 21:35	05:54 21:45	06:42 21:10	07:30 20:08	07:23 16:56	08:12 16:21	10:10 (WEA 3) 15:13 (WEA 1)
5	08:31 16:33	10:23 (WEA 3) 15:27 (WEA 1)	07:59 17:22	07:05 18:12	05:55 20:05	05:13 20:54	05:14 21:36	05:55 21:44	06:44 21:08	07:32 20:06	07:25 16:54	08:13 16:20	10:10 (WEA 3) 15:14 (WEA 1)
6	08:30 16:34	10:24 (WEA 3) 15:28 (WEA 1)	07:58 17:24	07:03 18:14	05:53 20:06	05:13 20:56	05:13 21:37	05:57 21:44	06:46 21:07	07:34 20:03	07:27 16:53	08:14 16:20	10:10 (WEA 3) 15:14 (WEA 1)
7	08:30 16:35	10:25 (WEA 3) 15:29 (WEA 1)	07:56 17:26	07:00 18:16	05:51 20:08	05:12 20:57	05:12 21:38	05:58 21:43	06:47 21:05	07:35 20:01	07:28 16:51	08:16 16:19	10:10 (WEA 3) 15:13 (WEA 1)
8	08:30 16:36	10:26 (WEA 3) 15:29 (WEA 1)	07:54 17:28	06:58 18:18	05:48 20:10	05:12 20:59	05:19 21:39	06:00 21:43	06:49 21:03	07:37 19:59	07:30 16:49	08:17 16:19	10:10 (WEA 3) 15:14 (WEA 1)
9	08:29 16:38	10:27 (WEA 3) 15:30 (WEA 1)	07:52 17:30	06:56 18:19	05:46 20:11	05:11 21:00	05:20 21:40	06:01 21:42	06:50 21:01	07:38 19:57	07:32 16:48	08:18 16:19	10:10 (WEA 3) 15:14 (WEA 1)
10	08:29 16:39	10:29 (WEA 3) 15:31 (WEA 1)	07:51 17:31	06:54 18:21	05:44 20:13	05:11 21:02	05:21 21:41	06:03 21:41	06:52 21:00	07:40 19:54	07:34 16:46	08:19 16:18	10:10 (WEA 3) 15:14 (WEA 1)
11	08:28 16:40	10:30 (WEA 3) 15:31 (WEA 1)	07:49 17:33	06:52 18:23	05:42 20:15	05:11 21:04	05:22 21:41	06:05 21:41	06:54 20:58	07:42 19:52	07:35 16:45	08:20 16:18	10:10 (WEA 3) 15:14 (WEA 1)
12	08:27 16:42	10:32 (WEA 3) 15:32 (WEA 1)	07:47 17:35	06:49 18:24	05:40 20:16	05:10 21:05	05:23 21:42	06:06 21:40	06:55 20:56	07:43 19:50	07:37 16:43	08:21 16:18	10:10 (WEA 3) 15:14 (WEA 1)
13	08:27 16:43	15:06 (WEA 1) 15:32 (WEA 1)	07:45 17:37	06:47 18:26	05:40 20:18	05:10 21:07	05:24 21:43	06:08 21:39	06:57 20:54	07:45 19:47	07:39 16:40	08:22 15:03 (WEA 1)	10:11 (WEA 3) 15:14 (WEA 1)
14	08:26 16:45	15:07 (WEA 1) 15:34 (WEA 1)	07:43 17:39	06:45 18:28	05:38 20:20	05:10 21:08	05:25 21:43	06:09 21:38	06:58 20:52	07:47 19:45	07:40 16:37	08:23 15:06 (WEA 1)	10:11 (WEA 3) 15:14 (WEA 1)
15	08:25 16:46	15:07 (WEA 1) 15:34 (WEA 1)	07:42 17:40	06:43 18:30	05:37 20:21	05:10 21:10	05:27 21:44	06:11 21:37	07:00 20:50	07:48 19:43	07:42 16:39	08:24 15:07 (WEA 1)	10:11 (WEA 3) 15:14 (WEA 1)
16	08:24 16:48	15:07 (WEA 1) 15:34 (WEA 1)	07:40 17:42	06:40 18:31	05:35 20:23	05:10 21:11	05:28 21:44	06:12 21:36	07:01 20:48	07:50 19:41	07:44 16:38	08:25 15:07 (WEA 1)	10:12 (WEA 3) 15:15 (WEA 1)
17	08:24 16:49	15:07 (WEA 1) 15:35 (WEA 1)	07:38 17:44	06:38 18:33	05:34 20:25	05:10 21:13	05:29 21:45	06:14 21:35	07:03 20:46	07:52 19:38	07:46 16:36	08:26 15:08 (WEA 1)	10:12 (WEA 3) 15:15 (WEA 1)
18	08:23 16:51	15:08 (WEA 1) 15:35 (WEA 1)	07:36 17:46	06:36 18:35	05:32 20:26	05:10 21:14	05:30 21:45	06:16 21:34	07:05 20:44	07:54 19:36	07:47 16:35	08:26 15:09 (WEA 1)	10:12 (WEA 3) 15:15 (WEA 1)
19	08:22 16:53	15:07 (WEA 1) 15:35 (WEA 1)	07:34 17:48	06:34 18:36	05:31 20:28	05:10 21:16	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	07:49 16:34	08:27 15:10 (WEA 1)	10:13 (WEA 3) 15:15 (WEA 1)
20	08:21 16:54	15:08 (WEA 1) 15:35 (WEA 1)	07:32 17:49	06:31 18:38	05:30 20:30	05:10 21:17	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	07:51 16:33	08:28 15:11 (WEA 1)	10:14 (WEA 3) 15:16 (WEA 1)
21	08:20 16:56	15:09 (WEA 1) 15:35 (WEA 1)	07:30 17:51	06:29 18:40	05:28 20:31	05:10 21:18	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:31	08:28 15:11 (WEA 1)	10:14 (WEA 3) 15:16 (WEA 1)
22	08:19 16:58	15:10 (WEA 1) 15:36 (WEA 1)	07:28 17:53	06:27 18:41	05:27 20:33	05:10 21:20	05:35 21:29	06:22 20:36	07:11 19:27	08:00 18:21	07:54 16:30	08:29 15:12 (WEA 1)	10:15 (WEA 3) 15:17 (WEA 1)
23	08:17 16:59	15:10 (WEA 1) 15:35 (WEA 1)	07:26 17:55	06:24 18:43	05:26 20:34	05:10 21:21	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19	07:55 16:29	08:29 15:12 (WEA 1)	10:15 (WEA 3) 15:17 (WEA 1)
24	08:16 17:01	15:11 (WEA 1) 15:35 (WEA 1)	07:24 17:57	06:22 18:45	05:25 20:36	05:10 21:22	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	08:30 15:12 (WEA 1)	10:15 (WEA 3) 15:17 (WEA 1)
25	08:15 17:03	15:12 (WEA 1) 15:35 (WEA 1)	07:22 17:58	06:20 18:46	05:23 20:38	05:11 21:24	05:39 21:25	06:27 20:30	07:16 19:20	07:59 18:15	07:59 16:27	08:30 15:12 (WEA 1)	10:16 (WEA 3) 15:19 (WEA 1)
26	08:14 17:04	15:13 (WEA 1) 15:34 (WEA 1)	07:20 18:00	06:18 18:48	05:22 20:39	05:11 21:25	05:41 21:24	06:28 20:27	07:17 19:18	08:00 18:13	07:57 16:26	08:30 15:12 (WEA 1)	10:16 (WEA 3) 15:19 (WEA 1)
27	08:13 17:06	15:14 (WEA 1) 15:33 (WEA 1)	07:18 18:02	06:15 18:50	05:21 20:41	05:12 21:26	05:42 21:23	06:30 20:25	07:19 19:15	08:02 18:11	07:59 16:25	08:31 15:13 (WEA 1)	10:17 (WEA 3) 15:20 (WEA 1)
28	08:11 17:08	15:15 (WEA 1) 15:32 (WEA 1)	07:15 18:04	06:13 18:51	05:20 20:43	05:12 21:28	05:44 21:21	06:31 20:23	07:21 19:13	08:03 18:09	07:11 16:25	08:31 15:13 (WEA 1)	10:17 (WEA 3) 15:20 (WEA 1)
29	08:10 17:10	15:18 (WEA 1) 15:31 (WEA 1)		07:11 19:53	05:19 20:44	05:13 21:29	05:45 21:20	06:33 20:21	07:22 19:11	08:05 17:07	07:13 16:24	08:31 15:13 (WEA 1)	10:18 (WEA 3) 15:21 (WEA 1)
30	08:08 17:11	15:20 (WEA 1) 15:28 (WEA 1)		07:09 19:55	06:02 20:46	05:13 21:30	05:46 21:18	06:35 20:19	07:24 19:09	08:06 17:05	07:14 16:23	08:31 15:14 (WEA 1)	10:18 (WEA 3) 15:22 (WEA 1)
31	08:07 17:13			07:06 19:56		05:17 21:31	05:48 21:17	06:36 20:17		07:16 17:03		08:31 16:27	10:19 (WEA 3) 15:23 (WEA 1)
Sonnenscheinstunden	262		279	367	415	483	495	499	452	380	332	269	247
astr.max.mögl.Beschattung		1133											2092
Red.Sonnenscheinwahrsch.		0,19										0,22	0,17
Reduktion Betriebsdauer		0,98										0,98	0,98
Reduktion Windrichtung		0,64										0,66	0,62
Gesamte Reduktion		0,12										0,15	0,10
Met.wahrsch.Beschattung		133										66	214

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL40 - Olsberg, Am Medebach 21
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar			Februar			März	April	Mai	Juni
1	08:31		09:43 (WEA 3)	08:05		14:59 (WEA 1)	07:13	07:04	06:01	05:17
	16:28	83	15:05 (WEA 1)	17:15	12	15:11 (WEA 1)	18:05	19:58	20:48	21:32
2	08:31		09:44 (WEA 3)	08:04		15:03 (WEA 1)	07:11	07:02	05:59	05:16
	16:29	85	15:06 (WEA 1)	17:17	5	15:08 (WEA 1)	18:07	20:00	20:49	21:33
3	08:31		09:43 (WEA 3)	08:02			07:09	07:00	05:57	05:15
	16:30	86	15:06 (WEA 1)	17:19			18:09	20:01	20:51	21:34
4	08:31		09:44 (WEA 3)	08:01			07:07	06:57	05:55	05:14
	16:32	87	15:08 (WEA 1)	17:20			18:11	20:03	20:52	21:35
5	08:31		09:44 (WEA 3)	07:59			07:05	06:55	05:53	05:14
	16:33	89	15:09 (WEA 1)	17:22			18:12	20:05	20:54	21:36
6	08:30		09:44 (WEA 3)	07:58			07:03	06:53	05:51	05:13
	16:34	88	15:09 (WEA 1)	17:24			18:14	20:06	20:56	21:37
7	08:30		09:45 (WEA 3)	07:56			07:00	06:51	05:50	05:12
	16:35	88	15:10 (WEA 1)	17:26			18:16	20:08	20:57	21:38
8	08:30		09:44 (WEA 3)	07:54			06:58	06:48	05:48	05:12
	16:36	90	15:11 (WEA 1)	17:28			18:18	20:10	20:59	21:39
9	08:29		09:44 (WEA 3)	07:52			06:56	06:46	05:46	05:11
	16:38	89	15:11 (WEA 1)	17:30			18:19	20:11	21:00	21:40
10	08:29		09:45 (WEA 3)	07:51			06:54	06:44	05:45	05:11
	16:39	91	15:13 (WEA 1)	17:31			18:21	20:13	21:02	21:41
11	08:28		09:45 (WEA 3)	07:49			06:52	06:42	05:43	05:11
	16:40	90	15:13 (WEA 1)	17:33			18:23	20:15	21:04	21:41
12	08:27		09:45 (WEA 3)	07:47			06:49	06:40	05:41	05:10
	16:42	89	15:13 (WEA 1)	17:35			18:24	20:16	21:05	21:42
13	08:27		09:45 (WEA 3)	07:45			06:47	06:37	05:40	05:10
	16:43	89	15:14 (WEA 1)	17:37			18:26	20:18	21:07	21:43
14	08:26		09:47 (WEA 3)	07:43			06:45	06:35	05:38	05:10
	16:45	87	15:15 (WEA 1)	17:39			18:28	20:20	21:08	21:43
15	08:25		09:47 (WEA 3)	07:42			06:43	06:33	05:37	05:10
	16:46	87	15:16 (WEA 1)	17:40			18:30	20:21	21:10	21:44
16	08:24		09:47 (WEA 3)	07:40			06:40	06:31	05:35	05:10
	16:48	84	15:16 (WEA 1)	17:42			18:31	20:23	21:11	21:44
17	08:24		09:48 (WEA 3)	07:38			06:38	06:29	05:34	05:10
	16:49	81	15:17 (WEA 1)	17:44			18:33	20:25	21:13	21:45
18	08:23		09:48 (WEA 3)	07:36			06:36	06:27	05:32	05:10
	16:51	78	15:17 (WEA 1)	17:46			18:35	20:26	21:14	21:45
19	08:22		09:48 (WEA 3)	07:34			06:34	06:25	05:31	05:10
	16:53	73	15:17 (WEA 1)	17:48			18:36	20:28	21:16	21:46
20	08:21		09:49 (WEA 3)	07:32			06:31	06:23	05:30	05:10
	16:54	62	15:17 (WEA 1)	17:49			18:38	20:30	21:17	21:46
21	08:20		09:50 (WEA 3)	07:30			06:29	06:20	05:28	05:10
	16:56	58	15:18 (WEA 1)	17:51			18:40	20:31	21:18	21:46
22	08:19		09:50 (WEA 3)	07:28			06:27	06:18	05:27	05:10
	16:58	58	15:18 (WEA 1)	17:53			18:41	20:33	21:20	21:46
23	08:17		09:51 (WEA 3)	07:26			06:24	06:16	05:26	05:10
	16:59	55	15:17 (WEA 1)	17:55			18:43	20:34	21:21	21:46
24	08:16		09:52 (WEA 3)	07:24			06:22	06:14	05:25	05:11
	17:01	54	15:18 (WEA 1)	17:57			18:45	20:36	21:22	21:47
25	08:15		09:53 (WEA 3)	07:22			06:20	06:12	05:23	05:11
	17:03	52	15:18 (WEA 1)	17:58			18:46	20:38	21:24	21:47
26	08:14		09:54 (WEA 3)	07:20			06:18	06:10	05:22	05:11
	17:04	48	15:17 (WEA 1)	18:00			18:48	20:39	21:25	21:47
27	08:13		09:56 (WEA 3)	07:18			06:15	06:08	05:21	05:12
	17:06	44	15:17 (WEA 1)	18:02			18:50	20:41	21:26	21:47
28	08:11		09:57 (WEA 3)	07:15			06:13	06:06	05:20	05:12
	17:08	40	15:16 (WEA 1)	18:04			18:51	20:43	21:28	21:47
29	08:10		10:00 (WEA 3)				07:11	06:04	05:19	05:13
	17:10	33	15:16 (WEA 1)				19:53	20:44	21:29	21:46
30	08:08		14:54 (WEA 1)				07:09	06:03	05:18	05:13
	17:11	21	15:15 (WEA 1)				19:55	20:46	21:30	21:46
31	08:07		14:56 (WEA 1)				07:06		05:17	
	17:13	18	15:14 (WEA 1)				19:56		21:31	
Sonnenscheinstunden	262			279			367	415	483	495
astr.max.mögl.Beschattung		2177			17					
Red.Sonnenscheinwahrsch.		0,19			0,32					
Reduktion Betriebsdauer		0,98			0,98					
Reduktion Windrichtung		0,63			0,66					
Gesamte Reduktion		0,12			0,21					
Met.wahrsch.Beschattung		252			4					

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: OL40 - Olsberg, Am Medebach 21
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	July	August	September	Oktober	November	Dezember
1	05:14 21:46	05:49 21:15	06:38 20:14	07:25 19:06	07:18 17:02	08:08 16:22 90
2	05:15 21:46	05:51 21:13	06:39 20:12	07:27 19:04	07:20 17:00	08:09 16:22 91
3	05:15 21:45	05:52 21:12	06:41 20:10	07:29 19:02	07:21 16:58	08:10 16:21 89
4	05:16 21:45	05:54 21:10	06:42 20:08	07:30 19:00	07:23 16:56	08:12 16:21 89
5	05:17 21:44	05:55 21:08	06:44 20:06	07:32 18:57	07:25 16:54	08:13 16:20 89
6	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	07:27 16:53	08:14 16:20 87
7	05:18 21:43	05:58 21:05	06:47 20:01	07:35 18:53	07:28 16:51	08:16 16:19 89
8	05:19 21:43	06:00 21:03	06:49 19:59	07:37 18:51	07:30 16:49	08:17 16:19 87
9	05:20 21:42	06:02 21:01	06:50 19:57	07:38 18:48	07:32 16:48	14:33 (WEA 1) 08:18 6 14:39 (WEA 1) 16:19 87
10	05:21 21:41	06:03 21:00	06:52 19:54	07:40 18:46	07:34 16:46	14:29 (WEA 1) 08:19 14 14:43 (WEA 1) 16:18 84
11	05:22 21:41	06:05 20:58	06:54 19:52	07:42 18:44	07:35 16:45	14:27 (WEA 1) 08:20 18 14:45 (WEA 1) 16:18 83
12	05:23 21:40	06:06 20:56	06:55 19:50	07:43 18:42	07:37 16:43	14:26 (WEA 1) 08:21 21 14:47 (WEA 1) 16:18 82
13	05:24 21:39	06:08 20:54	06:57 19:47	07:45 18:40	07:39 16:42	09:32 (WEA 3) 08:22 33 14:48 (WEA 1) 16:18 82
14	05:25 21:38	06:09 20:52	06:58 19:45	07:47 18:37	07:40 16:40	09:30 (WEA 3) 08:23 40 14:49 (WEA 1) 16:18 82
15	05:27 21:37	06:11 20:50	07:00 19:43	07:49 18:35	07:42 16:39	09:29 (WEA 3) 08:24 44 14:50 (WEA 1) 16:18 81
16	05:28 21:36	06:12 20:48	07:01 19:41	07:50 18:33	07:44 16:38	09:27 (WEA 3) 08:25 49 14:50 (WEA 1) 16:18 79
17	05:29 21:35	06:14 20:46	07:03 19:38	07:52 18:31	07:46 16:36	09:26 (WEA 3) 08:26 52 14:51 (WEA 1) 16:19 79
18	05:30 21:34	06:16 20:44	07:05 19:36	07:54 18:29	07:47 16:35	09:26 (WEA 3) 08:26 54 14:52 (WEA 1) 16:19 79
19	05:31 21:33	06:17 20:42	07:06 19:34	07:55 18:27	07:49 16:34	09:26 (WEA 3) 08:27 55 14:52 (WEA 1) 16:19 78
20	05:33 21:32	06:19 20:40	07:08 19:31	07:57 18:25	07:51 16:33	09:26 (WEA 3) 08:28 57 14:53 (WEA 1) 16:20 77
21	05:34 21:31	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:31	09:26 (WEA 3) 08:28 58 14:54 (WEA 1) 16:20 76
22	05:35 21:29	06:22 20:36	07:11 19:27	08:00 18:21	07:54 16:30	09:25 (WEA 3) 08:29 61 14:53 (WEA 1) 16:20 76
23	05:37 21:28	06:23 20:34	07:13 19:25	08:02 18:19	07:55 16:29	09:25 (WEA 3) 08:29 73 14:54 (WEA 1) 16:21 77
24	05:38 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	09:25 (WEA 3) 08:30 78 14:54 (WEA 1) 16:21 78
25	05:39 21:26	06:27 20:30	07:16 19:20	08:06 17:15	07:59 16:27	09:25 (WEA 3) 08:30 81 14:54 (WEA 1) 16:22 79
26	05:41 21:24	06:28 20:27	07:17 19:18	08:07 17:13	08:00 16:26	09:25 (WEA 3) 08:30 83 14:54 (WEA 1) 16:23 79
27	05:42 21:23	06:30 20:25	07:19 19:15	08:09 17:11	08:02 16:25	09:26 (WEA 3) 08:31 87 14:55 (WEA 1) 16:24 78
28	05:44 21:21	06:31 20:23	07:21 19:13	08:11 17:09	08:03 16:25	09:26 (WEA 3) 08:31 87 14:54 (WEA 1) 16:24 80
29	05:45 21:20	06:33 20:21	07:22 19:11	08:13 17:07	08:05 16:24	09:27 (WEA 3) 08:31 88 14:55 (WEA 1) 16:25 80
30	05:46 21:18	06:35 20:19	07:24 19:09	08:14 17:05	08:06 16:23	09:27 (WEA 3) 08:31 90 14:56 (WEA 1) 16:26 82
31	05:48 21:17	06:36 20:17	07:16 17:03	08:07 17:03	08:07 17:03	08:31 16:27 82
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung					1229	2551
Red.Sonnenscheinwahrsch.					0,22	0,17
Reduktion Betriebsdauer					0,98	0,98
Reduktion Windrichtung					0,63	0,62
Gesamte Reduktion					0,14	0,10
Met.wahrsch.Beschattung					171	263

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	

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: OL41 - Olsberg, Am Medebach 98

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:31 16:28	08:05 17:15	07:13 18:05	07:04 19:58	06:01 20:48	05:17 21:32	05:14 21:46	20:37 (WEA 4) 21:15	06:38 20:14	07:25 19:06	07:18 17:02	08:07 16:22
2	08:31 16:29	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	05:15 21:45	17 20:54 (WEA 4) 21:13	21:15 20:12	20:14 19:04	19:06 17:00	16:22 16:22
3	08:31 16:30	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	16 20:54 (WEA 4) 21:12	20:12 20:10	19:04 19:02	17:00 16:58	16:22 16:21
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:52	05:14 21:35	05:16 21:45	15 20:53 (WEA 4) 21:10	20:39 (WEA 4) 20:08	06:42 19:00	07:30 16:56	08:12 16:21
5	08:31 16:33	07:59 17:22	07:05 18:12	06:55 20:05	05:53 20:54	05:14 21:36	20:37 (WEA 4) 21:44	14 20:53 (WEA 4) 21:10	05:55 20:06	06:44 18:57	07:32 16:55	08:13 16:20
6	08:30 16:34	07:57 17:24	07:02 18:14	06:53 20:06	05:52 20:56	05:13 21:37	20:42 (WEA 4) 21:44	12 20:52 (WEA 4) 21:07	05:57 20:03	06:46 18:55	07:34 16:53	08:14 16:20
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38	20:45 (WEA 4) 21:43	11 20:52 (WEA 4) 21:05	05:58 20:01	06:47 18:53	07:35 16:51	08:15 16:19
8	08:29 16:37	07:54 17:28	06:58 18:18	06:48 20:10	05:48 20:59	05:12 21:39	20:46 (WEA 4) 21:43	8 20:50 (WEA 4) 21:03	21:05 19:59	06:49 18:51	07:37 16:50	08:17 16:19
9	08:29 16:38	07:52 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:12 21:40	20:33 (WEA 4) 21:42	06:02 21:01	06:50 19:56	07:38 18:48	07:32 16:48	08:18 16:19
10	08:28 16:39	07:51 17:31	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:40	20:33 (WEA 4) 21:41	06:03 20:59	06:52 19:54	07:40 18:46	07:33 16:46	08:19 16:19
11	08:28 16:41	07:49 17:33	06:51 18:23	06:42 20:15	05:43 21:03	05:11 21:41	20:33 (WEA 4) 21:41	06:05 20:58	06:54 19:52	07:42 18:44	07:35 16:45	08:20 16:18
12	08:27 16:42	07:47 17:35	06:49 18:24	06:40 20:16	05:41 21:05	05:10 21:42	20:33 (WEA 4) 21:40	06:06 20:56	06:55 19:50	07:43 18:42	07:37 16:43	08:21 16:18
13	08:27 16:43	07:45 17:37	06:47 18:26	06:37 20:18	05:40 21:07	05:10 21:43	20:32 (WEA 4) 21:39	06:08 20:54	06:57 19:47	07:45 18:40	07:39 16:42	08:22 16:18
14	08:26 16:45	07:43 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	20:32 (WEA 4) 21:38	06:09 20:52	06:58 19:45	07:47 18:38	07:40 16:40	08:23 16:18
15	08:25 16:46	07:42 17:40	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	20:32 (WEA 4) 21:37	06:11 20:50	07:00 19:43	07:48 18:35	07:42 16:39	08:24 16:18
16	08:24 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	20:32 (WEA 4) 21:36	06:12 20:48	07:01 19:41	07:50 18:33	07:44 16:38	08:25 16:19
17	08:23 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	20:32 (WEA 4) 21:35	06:14 20:46	07:03 19:38	07:52 18:31	07:45 16:36	08:25 16:19
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:32 21:14	05:10 21:45	20:32 (WEA 4) 21:34	06:16 20:44	07:05 19:36	07:54 18:29	07:47 16:35	08:26 16:19
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:15	05:10 21:45	20:32 (WEA 4) 21:33	06:17 20:42	07:06 19:34	07:55 18:27	07:49 16:34	08:27 16:19
20	08:21 16:54	07:32 17:49	06:31 18:38	06:23 20:29	05:30 21:17	05:10 21:46	20:33 (WEA 4) 21:32	06:19 20:40	07:08 19:31	07:57 18:25	07:50 16:33	08:27 16:20
21	08:20 16:56	07:30 17:51	06:29 18:40	06:20 20:31	05:28 21:18	05:10 21:46	20:33 (WEA 4) 21:31	06:20 20:38	07:09 19:29	07:59 18:23	07:52 16:31	08:28 16:20
22	08:18 16:58	07:28 17:53	06:27 18:41	06:18 20:33	05:27 21:20	05:10 21:46	20:33 (WEA 4) 21:29	06:22 20:36	07:11 19:27	08:00 18:21	07:54 16:30	08:29 16:20
23	08:17 16:59	07:26 17:55	06:24 18:43	06:16 20:34	05:26 21:21	05:10 21:46	20:33 (WEA 4) 21:28	06:24 20:34	07:13 19:24	08:02 18:19	07:55 16:29	08:29 16:21
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:46	20:34 (WEA 4) 21:27	06:25 20:32	07:14 19:22	08:04 18:17	07:57 16:28	08:30 16:22
25	08:15 17:03	07:22 17:58	06:20 18:46	06:12 20:38	05:24 21:24	05:11 21:47	20:34 (WEA 4) 21:25	06:27 20:30	07:16 19:20	07:06 17:15	07:59 16:27	08:30 16:22
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:39	05:22 21:25	05:11 21:47	20:34 (WEA 4) 21:24	06:28 20:27	07:17 19:18	07:07 17:13	08:00 16:26	08:30 16:23
27	08:12 17:06	07:17 18:02	06:15 18:50	06:08 20:41	05:21 21:26	05:12 21:46	20:35 (WEA 4) 21:23	06:30 20:25	07:19 19:15	07:09 17:11	08:02 16:25	08:31 16:24
28	08:11 17:08	07:15 18:04	06:13 18:51	06:06 20:43	05:20 21:27	05:12 21:46	20:35 (WEA 4) 21:21	06:31 20:23	07:21 19:13	07:11 17:09	08:03 16:25	08:31 16:24
29	08:10 17:10		07:11 19:53	06:04 20:44	05:19 21:29	05:13 21:46	20:36 (WEA 4) 21:20	06:33 20:21	07:22 19:11	07:12 17:07	08:05 16:24	08:31 16:25
30	08:08 17:12		07:09 19:55	06:03 20:46	05:18 21:30	05:13 21:46	20:36 (WEA 4) 21:18	06:35 20:19	07:24 19:09	07:14 17:05	08:06 16:23	08:31 16:26
31	08:07 17:13		07:06 19:56	05:18 21:31	05:18 21:31	05:18 21:31	20:36 (WEA 4) 21:17	06:36 20:17		07:16 17:03	08:07 16:27	08:31 16:27
Sonnenscheinstunden	262	279	367	415	482	495	499	452	380	332	269	247
astr. max. mögl. Beschattung						458	93					
Red. Sonnenscheinwahrsch.						0,34	0,39					
Reduktion Betriebsdauer						0,98	0,98					
Reduktion Windrichtung						0,63	0,63					
Gesamte Reduktion						0,21	0,24					
Met. wahrsch. Beschattung						97	23					

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI02 - Wiemeringhausen, Zur Lieth 35

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai		Juni		Juli		August	September	Oktober	November	Dezember		
1	08:31	08:06	07:13	07:04	06:01		05:17		06:54 (WEA 4)	05:14		06:56 (WEA 4)	05:50	06:38	07:26	07:18	08:08
	16:28	17:15	18:06	19:58	20:48		21:32	22	07:16 (WEA 4)	21:46	29	07:25 (WEA 4)	21:15	20:15	19:06	17:02	16:23
2	08:31	08:04	07:11	07:02	05:59		05:16		06:53 (WEA 4)	05:15		06:57 (WEA 4)	05:51	06:39	07:27	07:20	08:09
	16:30	17:17	18:07	20:00	20:49		21:33	24	07:17 (WEA 4)	21:46	28	07:25 (WEA 4)	21:14	20:12	19:04	17:00	16:22
3	08:31	08:02	07:09	07:00	05:57		05:15		06:52 (WEA 4)	05:15		06:57 (WEA 4)	05:53	06:41	07:29	07:21	08:10
	16:31	17:19	18:09	20:01	20:51		21:34	25	07:17 (WEA 4)	21:45	28	07:25 (WEA 4)	21:12	20:10	19:02	16:58	16:21
4	08:31	08:01	07:07	06:57	05:55		05:15		06:53 (WEA 4)	05:16		06:57 (WEA 4)	05:54	06:43	07:30	07:23	08:12
	16:32	17:21	18:11	20:03	20:53		21:35	25	07:18 (WEA 4)	21:45	28	07:25 (WEA 4)	21:10	20:08	19:00	16:56	16:21
5	08:31	07:59	07:05	06:55	05:53		05:14		06:52 (WEA 4)	05:17		06:58 (WEA 4)	05:56	06:44	07:32	07:25	08:13
	16:33	17:22	18:13	20:05	20:54		21:36	26	07:18 (WEA 4)	21:44	27	07:25 (WEA 4)	21:09	20:06	18:57	16:55	16:20
6	08:30	07:58	07:03	06:53	05:52		05:13		06:53 (WEA 4)	05:18		06:59 (WEA 4)	05:57	06:46	07:34	07:27	08:14
	16:34	17:24	18:14	20:06	20:56		21:37	26	07:19 (WEA 4)	21:44	26	07:25 (WEA 4)	21:07	20:03	18:55	16:53	16:20
7	08:30	07:56	07:00	06:51	05:50		05:13		06:52 (WEA 4)	05:19		06:59 (WEA 4)	05:59	06:47	07:35	07:28	08:16
	16:35	17:26	18:16	20:08	20:57		21:38	27	07:19 (WEA 4)	21:43	26	07:25 (WEA 4)	21:05	20:01	18:53	16:51	16:19
8	08:30	07:54	06:58	06:49	05:48		05:12		06:52 (WEA 4)	05:20		06:59 (WEA 4)	06:00	06:49	07:37	07:30	08:17
	16:37	17:28	18:18	20:10	20:59		21:39	28	07:20 (WEA 4)	21:43	25	07:24 (WEA 4)	21:03	19:59	18:51	16:50	16:19
9	08:29	07:53	06:56	06:46	05:46		05:12		06:53 (WEA 4)	05:20		07:00 (WEA 4)	06:02	06:51	07:39	07:32	08:18
	16:38	17:30	18:19	20:11	21:00		21:40	27	07:20 (WEA 4)	21:42	24	07:24 (WEA 4)	21:01	19:57	18:49	16:48	16:19
10	08:29	07:51	06:54	06:44	05:45		05:11		06:52 (WEA 4)	05:21		07:00 (WEA 4)	06:03	06:52	07:40	07:34	08:19
	16:39	17:32	18:21	20:13	21:02		21:41	28	07:20 (WEA 4)	21:41	24	07:24 (WEA 4)	21:00	19:54	18:46	16:46	16:19
11	08:28	07:49	06:52	06:42	05:43		05:11		06:52 (WEA 4)	05:22		07:01 (WEA 4)	06:05	06:54	07:42	07:35	08:20
	16:41	17:33	18:23	20:15	21:04		21:41	29	07:21 (WEA 4)	21:41	23	07:24 (WEA 4)	20:58	19:52	18:44	16:45	16:19
12	08:27	07:47	06:49	06:40	05:42		05:11		06:52 (WEA 4)	05:24		07:02 (WEA 4)	06:06	06:55	07:44	07:37	08:21
	16:42	17:35	18:25	20:16	21:05		21:42	29	07:21 (WEA 4)	21:40	21	07:23 (WEA 4)	20:56	19:50	18:42	16:43	16:18
13	08:27	07:45	06:47	06:38	05:40		05:10		06:53 (WEA 4)	05:25		07:03 (WEA 4)	06:08	06:57	07:45	07:39	08:22
	16:44	17:37	18:26	20:18	21:07		21:43	29	07:22 (WEA 4)	21:39	20	07:23 (WEA 4)	20:54	19:48	18:40	16:42	16:18
14	08:26	07:44	06:45	06:35	05:38		05:10		06:52 (WEA 4)	05:26		07:03 (WEA 4)	06:09	06:58	07:47	07:41	08:23
	16:45	17:39	18:28	20:20	21:08		21:43	29	07:21 (WEA 4)	21:38	19	07:22 (WEA 4)	20:52	19:45	18:38	16:41	16:18
15	08:25	07:42	06:43	06:33	05:37		05:10		06:52 (WEA 4)	05:27		07:05 (WEA 4)	06:11	07:00	07:49	07:42	08:24
	16:47	17:41	18:30	20:21	21:10		21:44	30	07:22 (WEA 4)	21:37	16	07:21 (WEA 4)	20:50	19:43	18:35	16:39	16:19
16	08:25	07:40	06:40	06:31	05:35		05:10		06:52 (WEA 4)	05:28		07:06 (WEA 4)	06:13	07:02	07:50	07:44	08:25
	16:48	17:42	18:31	20:23	21:11		21:44	30	07:22 (WEA 4)	21:36	14	07:20 (WEA 4)	20:48	19:41	18:33	16:38	16:19
17	08:24	07:38	06:38	06:29	05:34		05:10		06:53 (WEA 4)	05:29		07:08 (WEA 4)	06:14	07:03	07:52	07:46	08:26
	16:50	17:44	18:33	20:25	21:13		21:45	29	07:22 (WEA 4)	21:35	11	07:19 (WEA 4)	20:46	19:38	18:31	16:36	16:19
18	08:23	07:36	06:36	06:27	05:33		05:10		06:53 (WEA 4)	05:30		07:11 (WEA 4)	06:16	07:05	07:54	07:47	08:26
	16:51	17:46	18:35	20:26	21:14		21:45	29	07:22 (WEA 4)	21:34	6	07:17 (WEA 4)	20:44	19:36	18:29	16:35	16:19
19	08:22	07:34	06:34	06:25	05:31		05:10		06:54 (WEA 4)	05:32		06:17	07:06	07:55	07:49	08:27	16:19
	16:53	17:48	18:36	20:28	21:16		21:46	29	07:23 (WEA 4)	21:33		20:42	19:34	18:27	16:34	16:19	
20	08:21	07:32	06:31	06:23	05:30		05:10		06:54 (WEA 4)	05:33		06:19	07:08	07:57	07:51	08:28	
	16:54	17:50	18:38	20:30	21:17		21:46	30	07:24 (WEA 4)	21:32		20:40	19:32	18:25	16:33	16:19	
21	08:20	07:30	06:29	06:21	05:29		05:10		06:54 (WEA 4)	05:34		06:20	07:09	07:59	07:52	08:28	
	16:56	17:51	18:40	20:31	21:18		21:46	30	07:24 (WEA 4)	21:31		20:38	19:29	18:23	16:32	16:20	
22	08:19	07:28	06:27	06:19	05:27		05:10		06:54 (WEA 4)	05:35		06:22	07:11	08:00	07:54	08:29	
	16:58	17:53	18:41	20:33	21:20		21:46	30	07:24 (WEA 4)	21:29		20:36	19:27	18:21	16:30	16:21	
23	08:17	07:26	06:25	06:17	05:26		05:10		06:54 (WEA 4)	05:37		06:24	07:13	08:02	07:56	08:29	
	16:59	17:55	18:43	20:35	21:21		21:46	29	07:23 (WEA 4)	21:28		20:34	19:25	18:19	16:29	16:21	
24	08:16	07:24	06:22	06:14	05:25		05:11		06:55 (WEA 4)	05:38		06:25	07:14	08:04	07:57	08:30	
	17:01	17:57	18:45	20:36	21:22		21:47	29	07:24 (WEA 4)	21:27		20:32	19:22	18:17	16:28	16:22	
25	08:15	07:22	06:20	06:12	05:24		05:11		06:55 (WEA 4)	05:40		06:27	07:16	07:06	07:59	08:30	
	17:03	17:59	18:46	20:38	21:24		21:47	29	07:24 (WEA 4)	21:26		20:30	19:20	17:15	16:27	16:22	
26	08:14	07:20	06:18	06:10	05:23		05:11		06:54 (WEA 4)	05:41		06:28	07:17	07:07	08:00	08:30	
	17:05	18:00	18:48	20:39	21:25	9	07:09 (WEA 4)	30	07:24 (WEA 4)	21:24		20:28	19:18	17:13	16:26	16:23	
27	08:13	07:18	06:16	06:08	05:21		05:12		06:55 (WEA 4)	05:42		06:30	07:19	07:09	08:02	08:31	
	17:06	18:02	18:50	20:41	21:26	13	07:11 (WEA 4)	30	07:25 (WEA 4)	21:23		20:25	19:15	17:11	16:26	16:24	
28	08:11	07:16	06:13	06:07	05:20		05:12		06:55 (WEA 4)	05:44		06:32	07:21	07:11	08:03	08:31	
	17:08	18:04	18:51	20:43	21:28	15	07:12 (WEA 4)	29	07:24 (WEA 4)	21:21		20:23	19:13	17:09	16:25	16:25	
29	08:10		07:11	06:05	05:19		05:13		06:56 (WEA 4)	05:45		06:33	07:22	07:13	08:05	08:31	
	17:10		19:53	20:44	21:29	18	07:13 (WEA 4)	29	07:25 (WEA 4)	21:20		20:21	19:11	17:07	16:24	16:25	
30	08:08		07:09	06:03	05:19		05:13		06:56 (WEA 4)	05:47		06:35	07:24	07:14	08:06	08:31	
	17:12		19:55	20:46	21:30	19	07:14 (WEA 4)	28	07:24 (WEA 4)	21:18		20:19	19:09	17:05	16:23	16:26	
31	08:07		07:06		05:18		05:14		06:54 (WEA 4)			06:36		07:16		08:31	
	17:13		19:56		21:31	21	07:15 (WEA 4)			21:17		20:17		17:03		16:27	
Sonnenscheinstunden		262	279	367	415	482		495		499		452	380	332	269	247	
astr.max.mögl.Beschattung						95		844				395					
Red.Sonnenscheinwahrsch.						0,43		0,34				0,39					
Reduktion Betriebsdauer						0,98		0,98				0,98					
Reduktion Windrichtung						0,68		0,68				0,68					
Gesamte Reduktion						0,29		0,22				0,26					
Met.wahrsch.Beschattung						27		190		102							

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	

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI03 - Wiemeringhausen, Alte Landstraße 23

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32	06:55 (WEA 4) 21:46	05:14 21:15	07:00 (WEA 4) 21:15	06:38 20:15	07:25 19:06	07:18 18:23
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	06:55 (WEA 4) 21:46	05:15 21:14	07:00 (WEA 4) 21:14	06:39 20:12	07:27 19:04	07:20 18:22
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	06:55 (WEA 4) 21:45	05:15 21:15	07:00 (WEA 4) 21:12	06:41 20:10	07:29 19:02	07:21 18:10
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	05:15 21:35	06:55 (WEA 4) 21:45	05:16 21:15	07:00 (WEA 4) 21:10	06:43 20:08	07:30 19:00	07:23 18:12
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	05:14 21:36	06:55 (WEA 4) 21:44	05:17 21:14	07:01 (WEA 4) 21:09	06:44 20:06	07:32 18:57	07:25 16:55
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	05:13 21:37	06:55 (WEA 4) 21:44	05:18 21:14	07:01 (WEA 4) 21:07	06:46 20:03	07:34 18:55	07:27 16:53
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38	06:55 (WEA 4) 21:43	05:19 21:15	07:02 (WEA 4) 21:05	06:47 20:01	07:35 18:53	07:28 16:51
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	05:12 21:39	06:55 (WEA 4) 21:43	05:20 21:15	07:01 (WEA 4) 21:03	06:49 19:59	07:37 18:51	07:30 16:50
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:12 21:40	06:56 (WEA 4) 21:42	05:20 21:15	07:02 (WEA 4) 21:01	06:51 19:57	07:39 18:49	07:32 16:48
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	06:55 (WEA 4) 21:41	05:21 21:15	07:02 (WEA 4) 21:00	06:52 19:54	07:40 18:46	07:34 16:46
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	06:55 (WEA 4) 21:41	05:22 21:15	07:03 (WEA 4) 21:00	06:55 19:52	07:42 18:44	07:35 16:45
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	05:11 21:42	06:56 (WEA 4) 21:40	05:24 21:15	07:03 (WEA 4) 21:06	06:55 19:50	07:44 18:42	07:37 16:43
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	05:10 21:43	06:56 (WEA 4) 21:39	05:25 21:15	07:04 (WEA 4) 21:04	06:57 19:48	07:45 18:40	07:39 16:42
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	06:55 (WEA 4) 21:38	05:26 21:15	07:04 (WEA 4) 21:02	06:58 19:45	07:47 18:38	07:41 16:41
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	06:56 (WEA 4) 21:37	05:27 21:15	07:05 (WEA 4) 21:00	06:59 19:43	07:48 18:35	07:42 16:39
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	06:56 (WEA 4) 21:36	05:28 21:15	07:05 (WEA 4) 21:00	06:59 19:43	07:50 18:33	07:44 16:38
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	06:56 (WEA 4) 21:35	05:29 21:15	07:07 (WEA 4) 21:04	06:59 19:38	07:52 18:31	07:46 16:36
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45	06:56 (WEA 4) 21:34	05:30 21:15	07:07 (WEA 4) 21:04	06:59 19:36	07:54 18:29	07:47 16:35
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	06:57 (WEA 4) 21:33	05:32 21:15	07:08 (WEA 4) 21:02	06:59 19:34	07:55 18:27	07:49 16:34
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	06:57 (WEA 4) 21:32	05:33 21:15	07:09 (WEA 4) 21:00	06:59 19:32	07:57 18:25	07:51 16:33
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	05:11 21:46	06:58 (WEA 4) 21:31	05:34 21:15	07:10 (WEA 4) 21:00	06:59 19:29	07:59 18:23	07:52 16:32
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	05:11 21:46	06:58 (WEA 4) 21:30	05:35 21:15	07:11 (WEA 4) 21:00	06:59 19:27	08:00 18:21	07:54 16:30
23	08:17 16:59	07:26 17:55	06:25 18:43	06:17 20:35	05:26 21:21	05:11 21:46	06:57 (WEA 4) 21:28	05:37 21:15	07:13 (WEA 4) 21:00	06:59 19:25	08:02 18:19	07:56 16:29
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	06:58 (WEA 4) 21:27	05:38 21:15	07:14 (WEA 4) 21:00	06:59 19:22	08:04 18:17	07:57 16:28
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	05:24 21:24	05:11 21:47	06:58 (WEA 4) 21:26	05:40 21:15	07:16 (WEA 4) 21:00	06:59 19:20	08:06 18:15	07:59 16:27
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:39	05:23 21:25	05:11 21:47	06:58 (WEA 4) 21:24	05:41 21:15	07:17 (WEA 4) 21:00	06:59 19:18	08:07 18:13	08:00 16:26
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47	06:59 (WEA 4) 21:23	05:42 21:15	07:19 (WEA 4) 21:00	06:59 19:15	08:09 18:11	08:02 16:24
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	05:12 21:47	06:59 (WEA 4) 21:21	05:44 21:15	07:21 (WEA 4) 21:00	06:59 19:13	08:11 18:09	08:03 16:25
29	08:10 17:10		07:11 19:53	06:05 20:44	05:19 21:29	05:13 21:46	06:59 (WEA 4) 21:20	05:45 21:15	07:22 (WEA 4) 21:00	06:59 19:11	08:12 18:05	08:04 16:25
30	08:08 17:12		07:09 19:55	06:03 20:46	05:19 21:30	05:13 21:46	06:59 (WEA 4) 21:18	05:47 21:15	07:24 (WEA 4) 21:00	06:59 19:09	08:14 18:06	08:06 16:26
31	08:07 17:13		07:06 19:56	06:05 21:31	05:18 21:31	05:13 21:46	06:59 (WEA 4) 21:17	05:48 21:15	07:25 (WEA 4) 21:00	06:59 19:08	08:15 18:07	08:07 16:27
Sonnenscheinstunden	262	279	367	415	482	495	499	452	380	332	269	247
astr.max.mögl.Beschattung					240	937	595					
Red.Sonnenscheinwahrsch.					0,43	0,34	0,39					
Reduktion Betriebsdauer					0,98	0,98	0,98					
Reduktion Windrichtung					0,67	0,67	0,67					
Gesamte Reduktion					0,28	0,22	0,26					
Met.wahrsch.Beschattung					68	210	153					

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI04 - Wiemeringhausen, Alte Landstraße 21
Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Jun	Jul	August	September	Oktober	November	Dezember
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32	06:58 (WEA 4) 21:46	05:14 21:15	07:04 (WEA 4) 20:15	06:38 19:06	07:26 17:02	07:18 16:23
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	06:58 (WEA 4) 21:46	05:15 21:14	07:04 (WEA 4) 20:12	06:39 19:04	07:27 17:00	08:09 16:22
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	06:58 (WEA 4) 21:45	05:15 21:12	07:04 (WEA 4) 20:10	06:41 19:02	07:29 16:58	08:10 16:21
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	05:15 21:35	06:58 (WEA 4) 21:45	05:16 21:10	07:04 (WEA 4) 20:08	06:43 19:00	07:30 16:56	08:12 16:21
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	05:14 21:36	06:58 (WEA 4) 21:44	05:17 21:09	07:05 (WEA 4) 20:06	06:44 18:57	07:32 16:55	08:13 16:20
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	05:13 21:37	06:59 (WEA 4) 21:44	05:18 21:07	07:05 (WEA 4) 20:03	06:46 18:55	07:34 16:53	08:14 16:20
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38	06:59 (WEA 4) 21:43	05:19 21:05	07:05 (WEA 4) 20:01	06:47 18:53	07:35 16:51	08:16 16:19
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	05:12 21:39	06:59 (WEA 4) 21:43	05:20 21:03	07:05 (WEA 4) 20:00	06:49 18:51	07:37 16:50	08:17 16:19
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:12 21:40	07:00 (WEA 4) 21:42	05:20 21:01	07:05 (WEA 4) 20:02	06:51 19:57	07:39 18:49	08:18 16:19
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	06:59 (WEA 4) 21:41	05:21 21:00	07:05 (WEA 4) 20:03	06:52 19:54	07:40 18:46	08:19 16:19
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41	07:00 (WEA 4) 21:41	05:22 21:01	07:06 (WEA 4) 20:58	06:05 19:52	07:42 18:44	08:20 16:19
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13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	05:10 21:43	07:00 (WEA 4) 21:39	05:25 21:04	07:06 (WEA 4) 20:54	06:08 19:48	07:45 18:40	08:22 16:18
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	07:00 (WEA 4) 21:38	05:26 21:01	07:06 (WEA 4) 20:52	06:09 19:45	07:47 18:38	08:23 16:18
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	07:00 (WEA 4) 21:37	05:27 21:00	07:07 (WEA 4) 20:50	06:11 19:43	07:00 18:35	08:24 16:19
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	07:00 (WEA 4) 21:36	05:28 21:01	07:07 (WEA 4) 20:48	06:13 19:41	07:02 18:33	08:25 16:19
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	07:01 (WEA 4) 21:35	05:29 21:01	07:08 (WEA 4) 20:46	06:14 19:38	07:03 18:31	08:26 16:19
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45	07:01 (WEA 4) 21:34	05:30 21:02	07:09 (WEA 4) 20:44	06:16 19:36	07:05 18:29	08:27 16:19
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	07:02 (WEA 4) 21:33	05:32 21:03	07:09 (WEA 4) 20:42	06:17 19:34	07:06 18:27	08:28 16:19
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	07:02 (WEA 4) 21:32	05:33 21:04	07:09 (WEA 4) 20:40	06:19 19:32	07:08 18:25	08:29 16:20
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	05:10 21:46	07:02 (WEA 4) 21:31	05:34 21:05	07:10 (WEA 4) 20:38	06:20 19:29	07:09 18:23	08:30 16:20
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	05:10 21:46	07:02 (WEA 4) 21:29	05:35 21:06	07:11 (WEA 4) 20:36	06:22 19:27	07:11 18:21	08:31 16:21
23	08:17 16:59	07:26 17:55	06:25 18:43	06:17 20:35	05:26 21:21	05:10 21:46	07:02 (WEA 4) 21:28	05:37 21:07	07:12 (WEA 4) 20:34	06:24 19:25	07:13 18:19	08:32 16:21
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	07:03 (WEA 4) 21:27	05:38 21:08	07:13 (WEA 4) 20:32	06:25 19:22	07:14 18:17	08:33 16:22
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	05:24 21:24	05:11 21:47	07:03 (WEA 4) 21:26	05:40 21:09	07:14 (WEA 4) 20:30	06:27 19:20	07:16 18:15	08:34 16:22
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:39	05:23 21:25	05:11 21:47	07:02 (WEA 4) 21:24	05:41 21:10	07:16 (WEA 4) 20:28	06:28 19:18	07:17 18:13	08:35 16:23
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47	07:03 (WEA 4) 21:23	05:42 21:10	07:18 (WEA 4) 20:25	06:30 19:15	07:19 18:11	08:36 16:24
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	05:12 21:47	07:03 (WEA 4) 21:21	05:44 21:11	07:28 (WEA 4) 20:23	06:32 19:13	07:21 18:09	08:37 16:25
29	08:10 17:10	07:11 18:05	06:11 19:00	06:05 20:44	05:19 21:29	05:13 21:46	07:04 (WEA 4) 21:20	05:45 21:12	07:29 (WEA 4) 20:21	06:33 19:11	07:22 18:07	08:38 16:26
30	08:08 17:12	07:09 18:09	06:03 19:09	05:19 20:46	05:19 21:30	05:13 21:46	07:05 (WEA 4) 21:18	05:47 21:10	07:30 (WEA 4) 20:19	06:35 19:09	07:24 18:05	08:39 16:27
31	08:07 17:13	07:06 18:06	06:02 19:06	05:18 20:45	05:18 21:31	05:13 21:46	07:06 (WEA 4) 21:17	05:48 21:10	07:31 (WEA 4) 20:17	06:36 19:06	07:25 18:03	08:40 16:28
Sonnenscheinstunden	262	279	367	415	482	495	499	452	380	332	269	247
astr.max.mögl.Beschattung					382	928	741					
Red.Sonnenscheinwahrsch.					0,43	0,34	0,39					
Reduktion Betriebsdauer					0,98	0,98	0,98					
Reduktion Windrichtung					0,67	0,67	0,67					
Gesamte Reduktion					0,28	0,22	0,26					
Met.wahrsch.Beschattung					108	207	190					

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K.Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI05 - Wiemeringhausen, Alte Landstraße 19
Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Jun	Jul	August	September	Oktober	November	Dezember
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32	07:01 (WEA 4) 21:46	05:14 21:15	07:07 (WEA 4) 21:15	06:38 20:15	07:26 19:06	07:18 17:02
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	07:01 (WEA 4) 21:46	05:15 21:14	07:08 (WEA 4) 21:14	06:39 20:12	07:27 19:04	07:20 17:00
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	07:00 (WEA 4) 21:45	05:15 21:12	07:07 (WEA 4) 21:12	06:41 20:10	07:29 19:02	07:21 16:58
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	05:15 21:35	07:01 (WEA 4) 21:45	05:16 21:10	07:07 (WEA 4) 21:10	06:43 20:08	07:30 19:00	07:23 16:56
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	05:14 21:36	07:01 (WEA 4) 21:44	05:17 21:09	07:08 (WEA 4) 21:09	06:44 20:06	07:32 18:57	07:25 16:55
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	05:13 21:37	07:02 (WEA 4) 21:44	05:18 21:07	07:08 (WEA 4) 21:07	06:46 20:03	07:34 18:55	07:27 16:53
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38	07:01 (WEA 4) 21:43	05:19 21:05	07:08 (WEA 4) 21:05	06:47 20:01	07:35 18:53	07:28 16:51
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	05:12 21:39	07:02 (WEA 4) 21:43	05:20 21:03	07:08 (WEA 4) 21:03	06:49 19:59	07:37 18:51	07:30 16:50
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:12 21:40	07:03 (WEA 4) 21:42	05:20 21:01	07:08 (WEA 4) 21:01	06:02 19:57	07:39 18:49	07:32 16:48
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41	07:02 (WEA 4) 21:41	05:21 21:00	07:08 (WEA 4) 21:00	06:03 19:54	07:40 18:46	07:34 16:46
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:42	07:03 (WEA 4) 21:41	05:22 21:01	07:08 (WEA 4) 21:01	06:05 19:52	07:42 18:44	07:35 16:45
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	05:11 21:42	07:03 (WEA 4) 21:40	05:24 21:01	07:08 (WEA 4) 21:01	06:06 19:50	07:44 18:42	07:37 16:43
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	05:10 21:43	07:03 (WEA 4) 21:43	05:25 21:02	07:08 (WEA 4) 21:02	06:08 19:48	07:45 18:40	07:39 16:42
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43	07:03 (WEA 4) 21:43	05:26 21:01	07:09 (WEA 4) 21:01	06:09 19:45	07:47 18:38	07:41 16:41
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44	07:04 (WEA 4) 21:44	05:27 21:03	07:09 (WEA 4) 21:03	06:11 19:43	07:49 18:35	07:42 16:39
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44	07:05 (WEA 4) 21:44	05:28 21:03	07:09 (WEA 4) 21:03	06:13 19:41	07:50 18:33	07:44 16:38
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45	07:04 (WEA 4) 21:45	05:29 21:03	07:10 (WEA 4) 21:03	06:14 19:38	07:52 18:31	07:46 16:36
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45	07:04 (WEA 4) 21:45	05:30 21:04	07:10 (WEA 4) 21:04	06:16 19:36	07:54 18:29	07:47 16:35
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46	07:06 (WEA 4) 21:46	05:32 21:03	07:10 (WEA 4) 21:03	06:17 19:34	07:55 18:27	07:49 16:34
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46	07:06 (WEA 4) 21:46	05:33 21:04	07:11 (WEA 4) 21:04	06:19 19:32	07:57 18:25	07:51 16:33
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	05:10 21:46	07:06 (WEA 4) 21:46	05:34 21:05	07:11 (WEA 4) 21:05	06:20 19:29	07:59 18:23	07:52 16:32
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23	08:17 16:59	07:26 17:55	06:25 18:43	06:17 20:35	05:26 21:21	05:10 21:46	07:06 (WEA 4) 21:46	05:37 21:07	07:12 (WEA 4) 21:07	06:24 19:25	08:02 18:19	07:56 16:29
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47	07:06 (WEA 4) 21:47	05:38 21:08	07:13 (WEA 4) 21:08	06:25 19:22	08:04 18:17	07:57 16:28
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27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47	07:07 (WEA 4) 21:47	05:42 21:11	07:16 (WEA 4) 21:11	06:30 19:15	08:09 18:11	08:02 16:24
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	05:12 21:47	07:07 (WEA 4) 21:47	05:44 21:12	07:17 (WEA 4) 21:12	06:32 19:13	08:03 18:09	08:03 16:25
29	08:10 17:10	07:11 18:04	06:11 18:51	06:05 20:44	05:19 21:29	05:13 21:46	07:07 (WEA 4) 21:46	05:45 21:13	07:19 (WEA 4) 21:13	06:33 19:11	08:05 18:07	08:31 16:24
30	08:08 17:12	07:09 18:05	06:03 18:55	05:19 20:46	05:19 21:30	05:13 21:46	07:07 (WEA 4) 21:46	05:47 21:18	07:21 (WEA 4) 21:18	06:35 19:09	08:06 18:05	08:31 16:26
31	08:07 17:13	07:06 18:06	06:02 18:56	05:18 21:31	05:18 21:31	05:13 21:46	07:07 (WEA 4) 21:46	05:48 21:17	07:22 (WEA 4) 21:17	06:36 19:07	08:07 18:03	08:31 16:27
Sonnenscheinstunden	262	279	367	415	482	495	499	452	380	332	269	247
astr.max.mögl.Beschattung					474	881	824					
Red.Sonnenscheinwahrsch.					0,43	0,34	0,39					
Reduktion Betriebsdauer					0,98	0,98	0,98					
Reduktion Windrichtung					0,67	0,67	0,67					
Gesamte Reduktion					0,28	0,22	0,26					
Met.wahrsch.Beschattung					134	195	210					

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: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI06 - Wiemeringhausen, Alte Landstraße 16
Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]
Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Jun
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	05:15 21:35
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	05:14 21:36
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	05:13 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	05:12 21:39
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:00	05:12 21:40
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	05:11 21:42
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	05:10 21:43
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	05:10 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	05:10 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	05:10 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	05:10 21:46
23	08:18 16:59	07:26 17:55	06:25 18:43	06:17 20:35	05:26 21:21	05:10 21:46
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	05:11 21:47
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	05:24 21:24	05:11 21:47
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:39	05:23 21:25	05:11 21:47
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	05:12 21:47
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	05:12 21:47
29	08:10 17:10		07:11 19:53	06:05 20:44	05:19 21:29	05:13 21:46
30	08:08 17:12		07:09 19:55	06:03 20:46	05:19 21:30	05:13 21:46
31	08:07 17:13		07:06 19:56		05:18 21:31	05:13 21:46
Sonnenscheinstunden	262	279	367	415	482	495
astr.max.mögl.Beschattung					635	631
Red.Sonnenscheinwahrsch.					0,43	0,34
Reduktion Betriebsdauer					0,98	0,98
Reduktion Windrichtung					0,67	0,67
Gesamte Reduktion					0,28	0,22
Met.wahrsch.Beschattung					180	141

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

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

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI06 - Wiemeringhausen, Alte Landstraße 16
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Juli		August		September		Oktober	November	Dezember
1	05:14	07:17 (WEA 4)	05:50	07:21 (WEA 4)	06:38	07:26	07:18	08:08	
	21:46	21 07:38 (WEA 4)	21:15	21 07:42 (WEA 4)	20:15	19:06	17:02	16:23	
2	05:15	07:17 (WEA 4)	05:51	07:21 (WEA 4)	06:39	07:27	07:20	08:09	
	21:46	22 07:39 (WEA 4)	21:14	20 07:41 (WEA 4)	20:12	19:04	17:00	16:22	
3	05:15	07:16 (WEA 4)	05:53	07:23 (WEA 4)	06:41	07:29	07:21	08:10	
	21:45	22 07:38 (WEA 4)	21:12	17 07:40 (WEA 4)	20:10	19:02	16:58	16:21	
4	05:16	07:16 (WEA 4)	05:54	07:25 (WEA 4)	06:43	07:30	07:23	08:12	
	21:45	23 07:39 (WEA 4)	21:10	12 07:37 (WEA 4)	20:08	19:00	16:56	16:21	
5	05:17	07:16 (WEA 4)	05:56	07:29 (WEA 4)	06:44	07:32	07:25	08:13	
	21:44	24 07:40 (WEA 4)	21:09	3 07:32 (WEA 4)	20:06	18:57	16:55	16:20	
6	05:18	07:16 (WEA 4)	05:57		06:46	07:34	07:27	08:14	
	21:44	25 07:41 (WEA 4)	21:07		20:03	18:55	16:53	16:20	
7	05:19	07:16 (WEA 4)	05:59		06:47	07:35	07:28	08:16	
	21:43	25 07:41 (WEA 4)	21:05		20:01	18:53	16:51	16:19	
8	05:20	07:15 (WEA 4)	06:00		06:49	07:37	07:30	08:17	
	21:43	26 07:41 (WEA 4)	21:03		19:59	18:51	16:50	16:19	
9	05:20	07:15 (WEA 4)	06:02		06:51	07:39	07:32	08:18	
	21:42	27 07:42 (WEA 4)	21:01		19:57	18:49	16:48	16:19	
10	05:21	07:15 (WEA 4)	06:03		06:52	07:40	07:34	08:19	
	21:41	27 07:42 (WEA 4)	21:00		19:54	18:46	16:46	16:19	
11	05:22	07:15 (WEA 4)	06:05		06:54	07:42	07:35	08:20	
	21:41	28 07:43 (WEA 4)	20:58		19:52	18:44	16:45	16:19	
12	05:24	07:15 (WEA 4)	06:06		06:55	07:44	07:37	08:21	
	21:40	28 07:43 (WEA 4)	20:56		19:50	18:42	16:43	16:18	
13	05:25	07:15 (WEA 4)	06:08		06:57	07:45	07:39	08:22	
	21:39	29 07:44 (WEA 4)	20:54		19:48	18:40	16:42	16:18	
14	05:26	07:15 (WEA 4)	06:09		06:58	07:47	07:41	08:23	
	21:38	29 07:44 (WEA 4)	20:52		19:45	18:38	16:41	16:18	
15	05:27	07:15 (WEA 4)	06:11		07:00	07:49	07:42	08:24	
	21:37	29 07:44 (WEA 4)	20:50		19:43	18:35	16:39	16:19	
16	05:28	07:15 (WEA 4)	06:13		07:02	07:50	07:44	08:25	
	21:36	30 07:45 (WEA 4)	20:48		19:41	18:33	16:38	16:19	
17	05:29	07:16 (WEA 4)	06:14		07:03	07:52	07:46	08:26	
	21:35	30 07:46 (WEA 4)	20:46		19:38	18:31	16:36	16:19	
18	05:30	07:16 (WEA 4)	06:16		07:05	07:54	07:47	08:26	
	21:34	30 07:46 (WEA 4)	20:44		19:36	18:29	16:35	16:19	
19	05:32	07:15 (WEA 4)	06:17		07:06	07:55	07:49	08:27	
	21:33	31 07:46 (WEA 4)	20:42		19:34	18:27	16:34	16:19	
20	05:33	07:15 (WEA 4)	06:19		07:08	07:57	07:51	08:28	
	21:32	31 07:46 (WEA 4)	20:40		19:32	18:25	16:33	16:20	
21	05:34	07:15 (WEA 4)	06:20		07:09	07:59	07:52	08:28	
	21:31	31 07:46 (WEA 4)	20:38		19:29	18:23	16:32	16:20	
22	05:35	07:16 (WEA 4)	06:22		07:11	08:00	07:54	08:29	
	21:29	31 07:47 (WEA 4)	20:36		19:27	18:21	16:30	16:21	
23	05:37	07:16 (WEA 4)	06:24		07:13	08:02	07:56	08:29	
	21:28	30 07:46 (WEA 4)	20:34		19:25	18:19	16:29	16:21	
24	05:38	07:16 (WEA 4)	06:25		07:14	08:04	07:57	08:30	
	21:27	30 07:46 (WEA 4)	20:32		19:22	18:17	16:28	16:22	
25	05:40	07:16 (WEA 4)	06:27		07:16	07:06	07:59	08:30	
	21:26	30 07:46 (WEA 4)	20:30		19:20	17:15	16:27	16:22	
26	05:41	07:17 (WEA 4)	06:28		07:17	07:07	08:00	08:30	
	21:24	29 07:46 (WEA 4)	20:28		19:18	17:13	16:26	16:23	
27	05:42	07:17 (WEA 4)	06:30		07:19	07:09	08:02	08:31	
	21:23	28 07:45 (WEA 4)	20:25		19:15	17:11	16:26	16:24	
28	05:44	07:17 (WEA 4)	06:32		07:21	07:11	08:03	08:31	
	21:21	28 07:45 (WEA 4)	20:23		19:13	17:09	16:25	16:25	
29	05:45	07:18 (WEA 4)	06:33		07:22	07:13	08:05	08:31	
	21:20	27 07:45 (WEA 4)	20:21		19:11	17:07	16:24	16:25	
30	05:47	07:19 (WEA 4)	06:35		07:24	07:14	08:06	08:31	
	21:18	25 07:44 (WEA 4)	20:19		19:09	17:05	16:23	16:26	
31	05:48	07:19 (WEA 4)	06:36			07:16		08:31	
	21:17	24 07:43 (WEA 4)	20:17			17:03		16:27	
Sonnenscheinstunden	499		452		380	332	269	247	
astr.max.mögl.Beschattung		850		73					
Red.Sonnenscheinwahrsch.		0,39		0,40					
Reduktion Betriebsdauer		0,98		0,98					
Reduktion Windrichtung		0,67		0,67					
Gesamte Reduktion		0,26		0,26					
Met.wahrsch.Beschattung		218		19					

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: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI07 - Wiemeringhausen, Alte landstraße 5
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32	07:18 (WEA 4) 07:38 (WEA 4)
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	07:19 (WEA 4) 07:37 (WEA 4)
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	07:25 (WEA 4) 07:31 (WEA 4)	05:15 21:34
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	07:22 (WEA 4) 07:35 (WEA 4)	05:15 21:35
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	07:19 (WEA 4) 07:37 (WEA 4)	05:14 21:36
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	07:17 (WEA 4) 07:38 (WEA 4)	05:13 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	07:17 (WEA 4) 07:40 (WEA 4)	05:13 21:38
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	07:15 (WEA 4) 07:40 (WEA 4)	05:12 21:39
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:00	07:14 (WEA 4) 07:41 (WEA 4)	05:12 21:40
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	07:14 (WEA 4) 07:42 (WEA 4)	05:11 21:41
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	07:13 (WEA 4) 07:42 (WEA 4)	05:11 21:41
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	07:13 (WEA 4) 07:42 (WEA 4)	05:11 21:42
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	07:12 (WEA 4) 07:42 (WEA 4)	05:10 21:43
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	07:12 (WEA 4) 07:43 (WEA 4)	05:10 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	07:12 (WEA 4) 07:43 (WEA 4)	05:10 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	07:11 (WEA 4) 07:43 (WEA 4)	05:10 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	07:12 (WEA 4) 07:43 (WEA 4)	05:10 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	07:12 (WEA 4) 07:43 (WEA 4)	05:10 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	07:11 (WEA 4) 07:42 (WEA 4)	05:10 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	07:12 (WEA 4) 07:42 (WEA 4)	05:10 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	07:12 (WEA 4) 07:42 (WEA 4)	05:10 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	07:13 (WEA 4) 07:42 (WEA 4)	05:10 21:46
23	08:18 16:59	07:26 17:55	06:25 18:43	06:17 20:35	05:26 21:21	07:13 (WEA 4) 07:42 (WEA 4)	05:10 21:46
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	07:13 (WEA 4) 07:42 (WEA 4)	05:11 21:47
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	05:24 21:24	07:14 (WEA 4) 07:42 (WEA 4)	05:11 21:47
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:39	05:23 21:25	07:14 (WEA 4) 07:41 (WEA 4)	05:11 21:47
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	07:15 (WEA 4) 07:41 (WEA 4)	05:12 21:47
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	07:15 (WEA 4) 07:40 (WEA 4)	05:12 21:47
29	08:10 17:10		07:11 19:53	06:05 20:44	05:19 21:29	07:16 (WEA 4) 07:40 (WEA 4)	05:13 21:46
30	08:08 17:12		07:09 19:55	06:03 20:46	05:19 21:30	07:16 (WEA 4) 07:39 (WEA 4)	05:13 21:46
31	08:07 17:13		07:06 19:56		05:18 21:31	07:17 (WEA 4) 07:38 (WEA 4)	
Sonnenscheinstunden	262	279	367	415	482	495	
astr.max.mögl.Beschattung					757		112
Red.Sonnenscheinwahrsch.					0,43		0,34
Reduktion Betriebsdauer					0,98		0,98
Reduktion Windrichtung					0,67		0,67
Gesamte Reduktion					0,28		0,22
Met.wahrsch.Beschattung					216		25

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

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

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI07 - Wiemeringhausen, Alte landstraße 5
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Juli	August	September	Oktober	November	Dezember
1	05:14 21:46	05:50 21:15	07:23 (WEA 4) 20:15	06:38 19:06	07:18 17:02	08:08 16:23
2	05:15 21:46	05:51 21:14	07:23 (WEA 4) 20:12	06:39 19:04	07:20 17:00	08:09 16:22
3	05:17 21:45	05:53 21:12	07:25 (WEA 4) 20:10	06:41 19:02	07:21 16:58	08:10 16:21
4	05:16 21:45	05:54 21:10	07:25 (WEA 4) 20:08	06:43 19:00	07:30 16:56	08:12 16:21
5	05:17 21:44	05:56 21:09	07:25 (WEA 4) 20:06	06:44 18:57	07:32 16:55	08:13 16:20
6	05:18 21:44	05:57 21:07	07:27 (WEA 4) 20:03	06:46 18:55	07:34 16:53	08:14 16:20
7	05:19 21:43	05:59 21:05	07:27 (WEA 4) 20:01	06:47 18:53	07:35 16:51	08:16 16:19
8	05:20 21:43	06:00 21:03	07:30 (WEA 4) 19:59	06:49 18:51	07:37 16:50	08:17 16:19
9	05:20 21:42	06:02 21:01	07:31 (WEA 4) 19:57	06:51 18:49	07:39 16:48	08:18 16:19
10	05:21 21:41	06:03 21:00	07:43 (WEA 4) 19:54	06:52 18:46	07:40 16:46	08:19 16:19
11	05:22 21:41	06:05 20:58	07:44 (WEA 4) 19:52	06:54 18:44	07:42 16:45	08:20 16:19
12	05:24 21:40	06:06 20:56	07:45 (WEA 4) 19:50	06:55 18:42	07:44 16:43	08:21 16:18
13	05:25 21:39	06:08 20:54	07:46 (WEA 4) 19:48	06:57 18:40	07:45 16:42	08:22 16:18
14	05:26 21:38	06:09 20:52	07:47 (WEA 4) 19:45	06:58 18:38	07:47 16:41	08:23 16:18
15	05:27 21:37	06:11 20:50	07:48 (WEA 4) 19:43	06:59 18:35	07:48 16:39	08:24 16:19
16	05:28 21:36	06:13 20:48	07:48 (WEA 4) 19:41	07:00 18:33	07:49 16:38	08:25 16:19
17	05:29 21:35	06:14 20:46	07:49 (WEA 4) 19:38	07:01 18:31	07:50 16:36	08:26 16:19
18	05:30 21:34	06:16 20:44	07:50 (WEA 4) 19:36	07:02 18:29	07:51 16:35	08:26 16:19
19	05:32 21:33	06:17 20:42	07:51 (WEA 4) 19:34	07:03 18:27	07:52 16:34	08:27 16:19
20	05:33 21:32	06:19 20:40	07:51 (WEA 4) 19:32	07:04 18:25	07:53 16:33	08:28 16:20
21	05:34 21:31	06:20 20:38	07:52 (WEA 4) 19:29	07:05 18:23	07:54 16:32	08:28 16:20
22	05:35 21:29	06:22 20:36	07:53 (WEA 4) 19:27	07:06 18:21	07:55 16:30	08:29 16:21
23	05:37 21:28	06:24 20:34	07:53 (WEA 4) 19:25	07:07 18:19	07:56 16:29	08:29 16:21
24	05:38 21:27	06:25 20:32	07:53 (WEA 4) 19:22	07:08 18:17	07:57 16:28	08:30 16:22
25	05:40 21:26	06:27 20:30	07:54 (WEA 4) 19:20	07:09 17:15	07:58 16:27	08:30 16:22
26	05:41 21:24	06:28 20:28	07:54 (WEA 4) 19:18	07:10 17:13	07:59 16:26	08:30 16:23
27	05:42 21:23	06:30 20:25	07:54 (WEA 4) 19:15	07:11 17:11	08:00 16:26	08:31 16:24
28	05:44 21:21	06:32 20:23	07:55 (WEA 4) 19:13	07:11 17:09	08:01 16:25	08:31 16:25
29	05:45 21:20	06:33 20:21	07:55 (WEA 4) 19:11	07:12 17:07	08:02 16:24	08:31 16:25
30	05:47 21:18	06:35 20:19	07:55 (WEA 4) 19:09	07:13 17:05	08:03 16:23	08:31 16:26
31	05:48 21:17	06:36 20:17	07:55 (WEA 4) 19:07	07:14 17:03	08:04 16:22	08:31 16:27
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung	670	206				
Red.Sonnenscheinwahrsch.	0,39	0,40				
Reduktion Betriebsdauer	0,98	0,98				
Reduktion Windrichtung	0,67	0,67				
Gesamte Reduktion	0,26	0,27				
Met.wahrsch.Beschattung	173	55				

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: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI08 - Wiemeringhausen, Alte Landstraße 10
Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Jun
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	07:24 (WEA 4) 21:32
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	07:23 (WEA 4) 21:33
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	07:21 (WEA 4) 21:34
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	07:21 (WEA 4) 21:35
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	07:20 (WEA 4) 21:36
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	07:19 (WEA 4) 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	07:19 (WEA 4) 21:38
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	07:18 (WEA 4) 21:39
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:01	07:18 (WEA 4) 21:40
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	07:18 (WEA 4) 21:41
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	07:17 (WEA 4) 21:41
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	07:18 (WEA 4) 21:42
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	07:17 (WEA 4) 21:43
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	07:18 (WEA 4) 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	07:18 (WEA 4) 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	07:18 (WEA 4) 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	07:19 (WEA 4) 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	07:20 (WEA 4) 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	07:19 (WEA 4) 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	07:20 (WEA 4) 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	07:21 (WEA 4) 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	07:22 (WEA 4) 21:46
23	08:18 16:59	07:26 17:55	06:25 18:43	06:17 20:35	05:26 21:21	07:23 (WEA 4) 21:47
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	07:25 (WEA 4) 21:47
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	05:24 21:24	07:26 (WEA 4) 21:47
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:40	05:23 21:25	07:28 (WEA 4) 21:47
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	07:32 (WEA 4) 21:47
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	07:33 (WEA 4) 21:47
29	08:10 17:10		07:11 19:53	06:05 20:44	07:29 (WEA 4) 9 07:38 (WEA 4)	05:19 21:29
30	08:08 17:12		07:09 19:55	06:03 20:46	07:27 (WEA 4) 15 07:42 (WEA 4)	05:19 21:30
31	08:07 17:13		07:06 19:56		05:18 21:31	
Sonnenscheinstunden	262	279	367	415	482	495
astr.max.mögl.Beschattung				24	629	
Red.Sonnenscheinwahrsch.				0,36	0,43	
Reduktion Betriebsdauer				0,98	0,98	
Reduktion Windrichtung				0,68	0,68	
Gesamte Reduktion				0,24	0,29	
Met.wahrsch.Beschattung				6	180	

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

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

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI08 - Wiemeringhausen, Alte Landstraße 10
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Juli	August	September	Oktober	November	Dezember
1	05:14 21:46	05:50 21:15	07:28 (WEA 4) 20:15	06:38 19:06	07:18 17:02	08:08 16:23
2	05:15 21:46	05:51 21:14	07:28 (WEA 4) 20:12	06:39 19:04	07:20 17:00	08:09 16:22
3	05:15 21:45	05:53 21:12	07:28 (WEA 4) 20:10	06:41 19:02	07:21 16:58	08:10 16:21
4	05:16 21:45	05:54 21:10	07:28 (WEA 4) 20:08	06:43 19:00	07:23 16:56	08:12 16:21
5	05:17 21:44	05:56 21:09	07:28 (WEA 4) 20:06	06:44 18:57	07:25 16:55	08:13 16:20
6	05:18 21:44	05:57 21:07	07:29 (WEA 4) 20:03	06:46 18:55	07:27 16:53	08:14 16:20
7	05:19 21:43	05:59 21:05	07:29 (WEA 4) 20:01	06:47 18:53	07:28 16:51	08:16 16:19
8	05:20 21:43	06:00 21:03	07:30 (WEA 4) 19:59	06:49 18:51	07:30 16:50	08:17 16:19
9	05:20 21:42	06:02 21:01	07:30 (WEA 4) 19:57	06:51 18:49	07:32 16:48	08:18 16:19
10	05:21 21:41	06:03 21:00	07:31 (WEA 4) 19:54	06:52 18:46	07:34 16:46	08:19 16:19
11	05:22 21:41	06:05 20:58	07:32 (WEA 4) 19:52	06:54 18:44	07:35 16:45	08:20 16:19
12	05:24 21:40	06:06 20:56	07:33 (WEA 4) 19:50	06:55 18:42	07:37 16:43	08:21 16:18
13	05:25 21:39	06:08 20:54	07:35 (WEA 4) 19:48	06:57 18:40	07:39 16:42	08:22 16:18
14	05:26 21:38	06:09 20:52	07:39 (WEA 4) 19:45	06:58 18:38	07:41 16:41	08:23 16:18
15	05:27 21:37	06:11 20:50	07:46 (WEA 4) 19:43	07:00 18:35	07:42 16:39	08:24 16:19
16	05:28 21:36	06:13 20:48		07:02 18:33	07:44 16:38	08:25 16:19
17	05:29 21:35	06:14 20:46		07:03 18:31	07:46 16:36	08:26 16:19
18	05:30 21:34	06:16 20:44		07:05 18:29	07:47 16:35	08:26 16:19
19	05:32 21:33	06:17 20:42		07:06 18:27	07:49 16:34	08:27 16:19
20	05:33 21:32	06:19 20:40		07:08 18:25	07:51 16:33	08:28 16:20
21	05:34 21:31	06:20 20:38		07:09 18:23	07:52 16:32	08:28 16:20
22	05:35 21:29	06:22 20:36		07:11 18:21	07:54 16:30	08:29 16:21
23	05:37 21:28	06:24 20:34		07:13 18:19	07:56 16:29	08:29 16:21
24	05:38 21:27	06:25 20:32		07:14 18:17	07:57 16:28	08:30 16:22
25	05:40 21:26	06:27 20:30		07:16 18:15	07:59 16:27	08:30 16:22
26	05:41 21:24	06:28 20:28		07:17 18:13	08:00 16:26	08:30 16:23
27	05:42 21:23	06:30 20:25		07:19 18:11	08:02 16:26	08:31 16:24
28	05:44 21:21	06:32 20:23		07:21 18:09	08:03 16:25	08:31 16:25
29	05:45 21:20	06:33 20:21		07:22 18:07	08:05 16:24	08:31 16:25
30	05:47 21:18	06:35 20:19		07:24 18:05	08:06 16:23	08:31 16:26
31	05:48 21:17	06:36 20:17		07:26 18:03	08:08 16:22	08:31 16:27
Sonnenscheinstunden	499	452	380	332	269	247
astr.max.mögl.Beschattung	327	335				
Red.Sonnenscheinwahrsch.	0,39	0,40				
Reduktion Betriebsdauer	0,98	0,98				
Reduktion Windrichtung	0,68	0,68				
Gesamte Reduktion	0,26	0,27				
Met.wahrsch.Beschattung	85	89				

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)

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI09 - Wiemeringhausen, Alte landstraße 4

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April		Mai	Jun
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58		06:01 20:48	07:31 (WEA 4) 29 08:00 (WEA 4)
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00		05:59 20:49	07:31 (WEA 4) 29 08:00 (WEA 4)
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01		05:57 20:51	07:31 (WEA 4) 28 07:59 (WEA 4)
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03		05:55 20:53	07:31 (WEA 4) 29 08:00 (WEA 4)
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05		05:53 20:54	07:31 (WEA 4) 28 07:59 (WEA 4)
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06		05:52 20:56	07:31 (WEA 4) 27 07:58 (WEA 4)
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08		05:50 20:57	07:32 (WEA 4) 26 07:58 (WEA 4)
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10		05:48 20:59	07:33 (WEA 4) 23 07:56 (WEA 4)
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11		05:46 21:01	07:33 (WEA 4) 22 07:55 (WEA 4)
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13		05:45 21:02	07:34 (WEA 4) 20 07:54 (WEA 4)
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15		05:43 21:04	07:35 (WEA 4) 18 07:53 (WEA 4)
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16		05:42 21:05	07:37 (WEA 4) 14 07:51 (WEA 4)
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18		05:40 21:07	07:39 (WEA 4) 9 07:48 (WEA 4)
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20		05:38 21:08	07:40 (WEA 4) 05:10 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21		05:37 21:10	07:41 (WEA 4) 05:10 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23		05:35 21:11	07:42 (WEA 4) 05:10 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25		05:34 21:13	07:43 (WEA 4) 05:10 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26		05:33 21:14	07:44 (WEA 4) 05:10 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28		05:31 21:16	07:45 (WEA 4) 05:10 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30		05:30 21:17	07:46 (WEA 4) 05:10 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	10	07:43 (WEA 4) 07:53 (WEA 4)	05:29 21:18
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	16	07:40 (WEA 4) 07:56 (WEA 4)	05:27 21:20
23	08:18 16:59	07:26 17:55	06:25 18:43	06:17 20:35	19	07:38 (WEA 4) 07:57 (WEA 4)	05:26 21:21
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	22	07:36 (WEA 4) 07:58 (WEA 4)	05:25 21:22
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	24	07:35 (WEA 4) 07:59 (WEA 4)	05:24 21:24
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:40	26	07:34 (WEA 4) 08:00 (WEA 4)	05:23 21:25
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	27	07:33 (WEA 4) 08:00 (WEA 4)	05:21 21:26
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	28	07:32 (WEA 4) 08:00 (WEA 4)	05:20 21:28
29	08:10 17:10		07:11 19:53	06:05 20:44	29	07:31 (WEA 4) 08:00 (WEA 4)	05:19 21:29
30	08:08 17:12		07:09 19:55	06:03 20:46	29	07:32 (WEA 4) 08:01 (WEA 4)	05:19 21:30
31	08:07 17:13		07:06 19:56			05:18 21:31	21:46
Sonnenscheinstunden	262	279	367	415		482	495
astr.max.mögl.Beschattung				230		302	
Red.Sonnenscheinwahrsch.				0,36		0,43	
Reduktion Betriebsdauer				0,98		0,98	
Reduktion Windrichtung				0,68		0,68	
Gesamte Reduktion				0,24		0,29	
Met.wahrsch.Beschattung				56		87	

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

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

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI09 - Wiemeringhausen, Alte landstraße 4
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Juli	August	September	Oktober	November	Dezember
1	05:14 21:46	05:50 21:15	07:47 (WEA 4) 08:02 (WEA 4)	06:38 20:15	07:26 19:06	08:08 17:02
2	05:15 21:46	05:51 21:14	07:45 (WEA 4) 08:04 (WEA 4)	06:39 20:12	07:27 19:04	08:09 17:00
3	05:15 21:45	05:53 21:12	07:44 (WEA 4) 08:05 (WEA 4)	06:41 20:10	07:29 19:02	08:10 16:58
4	05:16 21:45	05:54 21:10	07:43 (WEA 4) 08:06 (WEA 4)	06:43 20:08	07:30 19:00	08:12 16:56
5	05:17 21:44	05:56 21:09	07:42 (WEA 4) 08:06 (WEA 4)	06:44 20:06	07:32 18:57	08:13 16:55
6	05:18 21:44	05:57 21:07	07:42 (WEA 4) 08:07 (WEA 4)	06:46 20:03	07:34 18:55	08:14 16:53
7	05:19 21:43	05:59 21:05	07:41 (WEA 4) 08:07 (WEA 4)	06:47 20:01	07:35 18:53	08:16 16:51
8	05:20 21:43	06:00 21:03	07:41 (WEA 4) 08:08 (WEA 4)	06:49 19:59	07:37 18:51	08:17 16:50
9	05:20 21:42	06:02 21:01	07:40 (WEA 4) 08:08 (WEA 4)	06:51 19:57	07:39 18:49	08:18 16:48
10	05:21 21:41	06:03 21:00	07:40 (WEA 4) 08:09 (WEA 4)	06:52 19:54	07:40 18:46	08:19 16:46
11	05:22 21:41	06:05 20:58	07:39 (WEA 4) 08:08 (WEA 4)	06:54 19:52	07:42 18:44	08:20 16:45
12	05:24 21:40	06:06 20:56	07:40 (WEA 4) 08:09 (WEA 4)	06:55 19:50	07:44 18:42	08:21 16:43
13	05:25 21:39	06:08 20:54	07:39 (WEA 4) 08:08 (WEA 4)	06:57 19:48	07:45 18:40	08:22 16:42
14	05:26 21:38	06:09 20:52	07:40 (WEA 4) 08:08 (WEA 4)	06:58 19:45	07:47 18:38	08:23 16:41
15	05:27 21:37	06:11 20:50	07:40 (WEA 4) 08:07 (WEA 4)	07:00 19:43	07:49 18:35	08:24 16:39
16	05:28 21:36	06:13 20:48	07:40 (WEA 4) 08:07 (WEA 4)	07:02 19:41	07:50 18:33	08:25 16:38
17	05:29 21:35	06:14 20:46	07:40 (WEA 4) 08:06 (WEA 4)	07:03 19:38	07:52 18:31	08:26 16:36
18	05:30 21:34	06:16 20:44	07:42 (WEA 4) 08:06 (WEA 4)	07:05 19:36	07:54 18:29	08:26 16:35
19	05:32 21:33	06:17 20:42	07:42 (WEA 4) 08:04 (WEA 4)	07:06 19:34	07:55 18:27	08:27 16:34
20	05:33 21:32	06:19 20:40	07:44 (WEA 4) 08:03 (WEA 4)	07:08 19:32	07:57 18:25	08:28 16:33
21	05:34 21:31	06:20 20:38	07:45 (WEA 4) 08:00 (WEA 4)	07:09 19:29	07:59 18:23	08:28 16:32
22	05:35 21:29	06:22 20:36	07:47 (WEA 4) 07:56 (WEA 4)	07:11 19:27	08:00 18:21	08:29 16:30
23	05:37 21:28	06:24 20:34		07:13 19:25	08:02 18:19	08:29 16:29
24	05:38 21:27	06:25 20:32		07:14 19:22	08:04 18:17	08:30 16:28
25	05:40 21:26	06:27 20:30		07:16 19:20	08:06 17:15	08:30 16:27
26	05:41 21:24	06:28 20:28		07:17 19:18	08:07 17:13	08:30 16:26
27	05:42 21:23	06:30 20:25		07:19 19:15	08:09 17:11	08:31 16:26
28	05:44 21:21	06:32 20:23		07:21 19:13	08:11 17:09	08:31 16:25
29	05:45 21:20	06:33 20:21		07:22 19:11	08:13 17:07	08:31 16:24
30	05:47 21:18	07:52 (WEA 4) 07:57 (WEA 4)	06:35 20:19	07:24 19:09	08:14 17:05	08:31 16:23
31	05:48 21:17	07:48 (WEA 4) 08:00 (WEA 4)	06:36 20:17		07:16 17:03	08:31 16:27
Sonnenscheinstunden	499	452		380	332	247
astr.max.mögl.Beschattung	17	521				
Red.Sonnenscheinwahrsch.	0,39	0,40				
Reduktion Betriebsdauer	0,98	0,98				
Reduktion Windrichtung	0,68	0,68				
Gesamte Reduktion	0,26	0,27				
Met.wahrsch.Beschattung	4	140				

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)

Projekt:

KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:

PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
14.11.2024 13:47/4.0.547

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI10 - Wiemeringhausen, Alte Landstraße 1
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Jun	Juli	August	September	Oktober	November	Dezember	
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	24 07:46 (WEA 4) 08:10 (WEA 4)	05:17 21:32	05:14 21:46	05:50 21:15	06:38 20:15	07:26 19:06	07:18 17:02	08:08 16:23
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	22 07:47 (WEA 4) 08:09 (WEA 4)	05:16 21:33	05:15 21:46	05:51 21:14	06:39 20:12	07:27 19:04	07:20 17:00	08:09 16:22
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	19 07:48 (WEA 4) 08:07 (WEA 4)	05:15 21:34	05:15 21:45	05:53 21:12	06:41 20:10	07:29 19:02	07:21 16:58	08:10 16:21
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	16 07:50 (WEA 4) 08:06 (WEA 4)	05:15 21:35	05:16 21:45	05:54 21:10	06:43 20:08	07:30 19:00	07:23 16:56	08:12 16:21
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	05:53 20:54	11 07:52 (WEA 4) 08:03 (WEA 4)	05:14 21:36	05:17 21:44	05:56 21:09	06:44 20:06	07:32 18:57	07:25 16:55	08:13 16:20
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56		05:13 21:37	05:18 21:44	05:57 21:07	06:46 20:03	07:34 18:55	07:27 16:53	08:14 16:20
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57		05:13 21:38	05:19 21:43	05:59 21:05	5 08:04 (WEA 4) 08:09 (WEA 4)	06:47 20:01	07:35 18:53	07:28 16:51
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:49 20:59		05:12 21:39	05:20 21:43	06:00 21:03	12 08:01 (WEA 4) 08:13 (WEA 4)	06:49 19:59	07:37 18:51	07:30 16:50
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:01		05:12 21:40	05:20 21:42	06:02 21:01	17 07:58 (WEA 4) 08:15 (WEA 4)	06:51 19:57	07:39 18:49	07:32 16:48
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02		05:11 21:41	05:21 21:41	06:03 21:00	20 07:57 (WEA 4) 08:17 (WEA 4)	06:52 19:54	07:40 18:46	07:34 16:46
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04		05:11 21:41	05:22 21:41	06:05 20:58	23 07:55 (WEA 4) 08:18 (WEA 4)	06:54 19:52	07:42 18:44	07:35 16:45
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05		05:11 21:42	05:23 21:40	06:06 20:56	24 07:55 (WEA 4) 08:19 (WEA 4)	06:55 19:50	07:44 18:42	07:37 16:43
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07		05:10 21:43	05:25 21:39	06:08 20:54	26 07:53 (WEA 4) 08:19 (WEA 4)	06:57 19:48	07:45 18:40	07:39 16:42
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	11 07:57 (WEA 4) 08:08 (WEA 4)	05:10 21:43	05:26 21:38	06:09 20:52	27 07:53 (WEA 4) 08:20 (WEA 4)	06:58 19:45	07:47 18:38	07:41 16:41
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	17 07:54 (WEA 4) 08:11 (WEA 4)	05:10 21:44	05:27 21:37	06:11 20:50	28 07:52 (WEA 4) 08:20 (WEA 4)	07:00 19:43	07:49 18:35	07:42 16:39
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	20 07:52 (WEA 4) 08:12 (WEA 4)	05:10 21:44	05:28 21:36	06:13 20:48	29 07:52 (WEA 4) 08:21 (WEA 4)	07:02 19:41	07:50 18:33	07:44 16:38
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	23 07:50 (WEA 4) 08:13 (WEA 4)	05:10 21:45	05:29 21:35	06:14 20:46	30 07:51 (WEA 4) 08:21 (WEA 4)	07:03 19:38	07:52 18:31	07:46 16:36
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	25 07:49 (WEA 4) 08:14 (WEA 4)	05:10 21:45	05:30 21:34	06:16 20:44	30 07:51 (WEA 4) 08:21 (WEA 4)	07:05 19:36	07:54 18:29	07:47 16:35
19	08:23 16:53	07:34 17:48	06:34 18:36	06:25 20:28	05:31 21:16	27 07:48 (WEA 4) 08:15 (WEA 4)	05:10 21:46	05:32 21:33	06:17 20:42	31 07:50 (WEA 4) 08:21 (WEA 4)	07:06 19:34	07:55 18:27	07:49 16:34
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	05:30 21:17	28 07:47 (WEA 4) 08:15 (WEA 4)	05:10 21:46	05:33 21:32	06:19 20:40	30 07:50 (WEA 4) 08:20 (WEA 4)	07:08 19:32	07:57 18:25	07:51 16:33
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	05:29 21:18	29 07:46 (WEA 4) 08:15 (WEA 4)	05:10 21:46	05:34 21:31	06:20 20:38	30 07:50 (WEA 4) 08:20 (WEA 4)	07:09 19:29	07:59 18:23	07:52 16:32
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	05:27 21:20	30 07:45 (WEA 4) 08:15 (WEA 4)	05:10 21:46	05:35 21:29	06:22 20:36	29 07:50 (WEA 4) 08:19 (WEA 4)	07:11 19:27	08:00 18:21	07:54 16:30
23	08:18 16:59	07:26 17:55	06:25 18:43	06:16 20:35	05:26 21:21	30 07:45 (WEA 4) 08:15 (WEA 4)	05:10 21:47	05:37 21:28	06:24 20:34	28 07:51 (WEA 4) 08:19 (WEA 4)	07:13 19:25	08:02 18:19	07:56 16:29
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	05:25 21:22	30 07:45 (WEA 4) 08:15 (WEA 4)	05:11 21:47	05:38 21:27	06:25 20:32	27 07:51 (WEA 4) 08:18 (WEA 4)	07:14 19:22	08:04 18:17	07:57 16:28
25	08:15 17:03	07:22 17:59	06:20 18:46	06:12 20:38	05:24 21:24	31 07:44 (WEA 4) 08:15 (WEA 4)	05:11 21:47	05:40 21:26	06:27 20:30	25 07:52 (WEA 4) 08:17 (WEA 4)	07:16 19:20	07:06 17:15	07:59 16:27
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:40	05:23 21:25	30 07:44 (WEA 4) 08:14 (WEA 4)	05:11 21:47	05:41 21:24	06:28 20:28	23 07:53 (WEA 4) 08:16 (WEA 4)	07:17 19:18	07:07 17:13	08:00 16:26
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	05:21 21:26	29 07:44 (WEA 4) 08:13 (WEA 4)	05:12 21:47	05:42 21:23	06:30 20:25	20 07:54 (WEA 4) 08:14 (WEA 4)	07:19 19:15	07:09 17:11	08:02 16:26
28	08:11 17:08	07:16 18:04	06:13 18:51	06:07 20:43	05:20 21:28	29 07:44 (WEA 4) 08:13 (WEA 4)	05:12 21:47	05:44 21:21	06:32 20:23	16 07:56 (WEA 4) 08:12 (WEA 4)	07:21 19:13	07:11 17:09	08:03 16:25
29	08:10 17:10		07:11 19:53	06:05 20:44	05:19 21:29	27 07:45 (WEA 4) 08:12 (WEA 4)	05:13 21:46	05:45 21:20	06:33 20:21	11 07:58 (WEA 4) 08:09 (WEA 4)	07:22 19:11	07:13 17:07	08:05 16:24
30	08:08 17:12		07:09 19:55	06:03 20:46	05:19 21:30	26 07:46 (WEA 4) 08:12 (WEA 4)	05:13 21:46	05:47 21:18	06:35 20:19		07:24 19:09	07:14 17:05	08:06 16:26
31	08:07 17:13		07:06 19:56		05:18 21:31		05:18 21:17	06:36 20:17			07:16 17:03		08:31 16:27
Sonnenscheinstunden	262	279	367	415	482	92	495	499	452	380	332	269	247
astr.max.mögl.Beschattung				442	92	0,43			541				
Red.Sonnenscheinwahrsch.				0,36	0,43				0,40				
Reduktion Betriebsdauer				0,98	0,98				0,98				
Reduktion Windrichtung				0,68	0,68				0,68				
Gesamte Reduktion				0,24	0,29				0,27				
Met.wahrsch.Beschattung				107	26				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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)
	Minuten mit Schatten	

SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI11 - Wiemeringhausen, Ibergstraße 28
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	06:01 20:48	05:17 21:32	05:14 21:46	05:50 21:15	06:38 20:15	08:02 (WEA 4) 19:06	07:26 17:02	07:18 16:23
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	05:59 20:49	05:16 21:33	05:15 21:46	05:51 21:14	06:39 20:12	08:01 (WEA 4) 19:04	07:27 17:00	08:09 16:22
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	05:57 20:51	05:15 21:34	05:15 21:45	05:53 21:12	06:41 20:10	08:02 (WEA 4) 19:02	07:29 16:58	08:10 16:21
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	05:55 20:53	05:15 21:35	05:16 21:45	05:54 21:10	06:43 20:08	08:02 (WEA 4) 19:00	07:30 16:56	08:12 16:21
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	08:13 (WEA 4) 20:54	05:53 21:36	05:14 21:44	05:56 21:09	06:44 20:06	08:04 (WEA 4) 18:57	07:32 16:55	08:13 16:20
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	08:09 (WEA 4) 20:56	05:52 21:37	05:13 21:44	05:57 21:07	06:46 20:03	08:05 (WEA 4) 18:55	07:34 16:53	08:14 16:20
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	08:07 (WEA 4) 20:57	05:50 21:38	05:13 21:43	05:59 21:05	06:47 20:01	08:08 (WEA 4) 18:53	07:35 16:51	08:16 16:19
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	08:05 (WEA 4) 20:59	05:48 21:39	05:12 21:43	06:00 21:03	06:49 19:59	08:17 (WEA 4) 18:49	07:37 16:50	08:17 16:19
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	08:04 (WEA 4) 21:01	05:46 21:40	05:12 21:42	06:02 21:01	06:51 19:57	08:08 (WEA 4) 18:49	07:39 16:48	08:18 16:19
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	08:03 (WEA 4) 21:02	05:45 21:41	05:11 21:41	06:03 21:00	06:52 19:54	08:08 (WEA 4) 18:46	07:40 16:46	08:19 16:19
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	08:02 (WEA 4) 21:04	05:43 21:41	05:11 21:41	06:05 20:58	06:54 19:52	08:08 (WEA 4) 18:44	07:42 16:45	08:20 16:19
12	08:27 16:42	07:47 17:35	06:49 18:25	06:40 20:16	08:01 (WEA 4) 21:05	05:42 21:42	05:11 21:40	06:06 20:56	06:55 19:50	08:08 (WEA 4) 18:42	07:44 16:43	08:21 16:18
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	08:01 (WEA 4) 21:07	05:40 21:43	05:10 21:39	06:08 20:54	06:57 19:48	08:08 (WEA 4) 18:40	07:45 16:42	08:22 16:18
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	08:01 (WEA 4) 21:08	05:38 21:43	05:10 21:38	06:09 20:52	06:58 19:45	08:08 (WEA 4) 18:38	07:47 16:41	08:23 16:18
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	08:01 (WEA 4) 21:10	05:37 21:44	05:10 21:37	06:11 20:50	07:00 19:43	08:08 (WEA 4) 18:35	07:49 16:39	08:24 16:19
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	08:01 (WEA 4) 21:11	05:35 21:44	05:10 21:36	06:13 20:48	07:02 19:41	08:09 (WEA 4) 18:33	07:50 16:38	08:25 16:19
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	08:01 (WEA 4) 21:13	05:34 21:45	05:10 21:35	06:14 20:46	07:03 19:38	08:09 (WEA 4) 18:31	07:52 16:36	08:26 16:19
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	08:02 (WEA 4) 21:14	05:33 21:45	05:10 21:34	06:16 20:44	07:05 19:36	08:09 (WEA 4) 18:29	07:54 16:35	08:26 16:19
19	08:22 16:53	07:34 17:48	06:34 18:36	06:25 20:28	08:02 (WEA 4) 21:16	05:31 21:46	05:10 21:33	06:17 20:42	07:06 19:34	08:09 (WEA 4) 18:27	07:55 16:34	08:27 16:19
20	08:21 16:54	07:32 17:50	06:31 18:38	06:23 20:30	08:03 (WEA 4) 21:17	05:30 21:46	05:10 21:32	06:19 20:40	07:08 19:32	08:10 (WEA 4) 18:25	07:57 16:33	08:28 16:20
21	08:20 16:56	07:30 17:51	06:29 18:40	06:21 20:31	08:05 (WEA 4) 21:18	05:29 21:46	05:10 21:31	06:20 20:38	07:09 19:29	08:12 (WEA 4) 18:23	07:59 16:32	08:28 16:20
22	08:19 16:58	07:28 17:53	06:27 18:41	06:19 20:33	08:07 (WEA 4) 21:20	05:27 21:46	05:10 21:29	06:22 20:36	07:11 19:27	08:13 (WEA 4) 18:24	08:01 16:30	08:29 16:21
23	08:18 16:59	07:26 17:55	06:25 18:43	06:17 20:35	08:16 (WEA 4) 21:21	05:26 21:47	05:10 21:28	06:24 20:34	07:13 19:25	08:14 (WEA 4) 18:25	08:02 16:29	08:29 16:21
24	08:16 17:01	07:24 17:57	06:22 18:45	06:14 20:36	08:06 (WEA 4) 21:22	05:25 21:47	05:11 21:27	06:25 20:32	07:14 19:22	08:15 (WEA 4) 18:27	08:04 16:28	08:30 16:22
25	08:15 17:03	07:22 17:59	06:20 18:47	06:12 20:38	08:07 (WEA 4) 21:24	05:24 21:47	05:11 21:26	06:27 20:30	07:16 19:20	08:16 (WEA 4) 18:28	07:06 16:27	08:30 16:22
26	08:14 17:05	07:20 18:00	06:18 18:48	06:10 20:40	08:08 (WEA 4) 21:25	05:23 21:47	05:11 21:24	06:28 20:28	07:17 19:18	08:17 (WEA 4) 18:29	07:07 16:26	08:30 16:23
27	08:13 17:06	07:18 18:02	06:16 18:50	06:08 20:41	08:09 (WEA 4) 21:26	05:22 21:47	05:12 21:23	06:30 20:25	07:19 19:15	08:18 (WEA 4) 18:30	07:09 16:26	08:31 16:24
28	08:11 17:08	07:16 18:04	06:13 18:52	06:07 20:43	08:10 (WEA 4) 21:28	05:20 21:47	05:12 21:21	06:32 20:23	07:21 19:13	08:19 (WEA 4) 18:31	07:11 16:25	08:31 16:25
29	08:10 17:10	07:11 19:53	06:11 20:44	06:05 20:44	08:11 (WEA 4) 21:29	05:19 21:46	05:13 21:20	06:33 20:21	07:22 19:11	08:20 (WEA 4) 18:33	07:13 16:24	08:31 16:25
30	08:08 17:12	07:09 19:55	06:03 20:46	06:03 20:46	08:12 (WEA 4) 21:30	05:19 21:46	05:13 21:18	06:35 20:19	07:24 19:09	08:21 (WEA 4) 18:35	07:14 16:23	08:31 16:26
31	08:07 17:13	07:06 19:56	06:02 20:46	06:02 20:46	08:13 (WEA 4) 21:31	05:18 21:47	05:14 21:17	06:36 20:17	07:25 19:10	08:22 (WEA 4) 18:36	07:16 16:24	08:31 16:27
Sonnenscheinstunden	262	279	367	415	482	495	499	452	380	332	269	247
astr.max.mögl.Beschattung				374				239				
Red.Sonnenscheinwahrsch.				0,36				0,40				
Reduktion Betriebsdauer				0,98				0,98				
Reduktion Windrichtung				0,67				0,67				
Gesamte Reduktion				0,24				0,26				
Met.wahrsch.Beschattung				90				63				

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) Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI12 - Wiemeringhausen, Ibergstraße 21
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor												
N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Januar	Februar	März	April	Mai	Jun
1	08:31 16:28	08:06 17:15	07:13 18:06	07:04 19:58	08:40 (WEA 4) 20:48	05:17 21:32
2	08:31 16:30	08:04 17:17	07:11 18:07	07:02 20:00	08:41 (WEA 4) 20:49	05:16 21:33
3	08:31 16:31	08:02 17:19	07:09 18:09	07:00 20:01	08:43 (WEA 4) 20:51	05:15 21:34
4	08:31 16:32	08:01 17:21	07:07 18:11	06:57 20:03	08:47 (WEA 4) 20:53	05:15 21:35
5	08:31 16:33	07:59 17:22	07:05 18:13	06:55 20:05	08:52 (WEA 4) 20:53	05:14 21:36
6	08:30 16:34	07:58 17:24	07:03 18:14	06:53 20:06	05:52 20:56	05:13 21:37
7	08:30 16:35	07:56 17:26	07:00 18:16	06:51 20:08	05:50 20:57	05:13 21:38
8	08:30 16:37	07:54 17:28	06:58 18:18	06:49 20:10	05:48 20:59	05:12 21:39
9	08:29 16:38	07:53 17:30	06:56 18:19	06:46 20:11	05:46 21:01	05:12 21:40
10	08:29 16:39	07:51 17:32	06:54 18:21	06:44 20:13	05:45 21:02	05:11 21:41
11	08:28 16:41	07:49 17:33	06:52 18:23	06:42 20:15	05:43 21:04	05:11 21:41
12	08:28 16:42	07:47 17:35	06:49 18:25	06:40 20:16	05:42 21:05	05:11 21:42
13	08:27 16:44	07:45 17:37	06:47 18:26	06:38 20:18	05:40 21:07	05:10 21:43
14	08:26 16:45	07:44 17:39	06:45 18:28	06:35 20:20	05:38 21:08	05:10 21:43
15	08:25 16:47	07:42 17:41	06:43 18:30	06:33 20:21	05:37 21:10	05:10 21:44
16	08:25 16:48	07:40 17:42	06:40 18:31	06:31 20:23	05:35 21:11	05:10 21:44
17	08:24 16:50	07:38 17:44	06:38 18:33	06:29 20:25	05:34 21:13	05:10 21:45
18	08:23 16:51	07:36 17:46	06:36 18:35	06:27 20:26	05:33 21:14	05:10 21:45
19	08:22 16:53	07:34 17:48	06:34 18:36	07:50 (WEA 4) 20:28	06:25 21:16	05:10 21:46
20	08:21 16:54	07:32 17:50	06:31 18:38	07:47 (WEA 4) 20:30	06:23 21:17	05:10 21:46
21	08:20 16:56	07:30 17:51	06:29 18:40	07:44 (WEA 4) 20:31	06:21 21:18	05:10 21:46
22	08:19 16:58	07:28 17:53	06:27 18:41	07:43 (WEA 4) 20:33	06:19 21:20	05:10 21:46
23	08:18 16:59	07:26 17:55	06:25 18:43	07:42 (WEA 4) 20:35	06:16 21:21	05:10 21:47
24	08:16 17:01	07:24 17:57	06:22 18:45	07:41 (WEA 4) 20:36	06:14 21:22	05:11 21:47
25	08:15 17:03	07:22 17:59	06:20 18:47	07:40 (WEA 4) 20:38	06:12 21:24	05:11 21:47
26	08:14 17:05	07:20 18:00	06:18 18:48	07:40 (WEA 4) 20:40	06:10 21:25	05:11 21:47
27	08:13 17:06	07:18 18:02	06:16 18:50	07:40 (WEA 4) 20:41	06:08 21:26	05:12 21:47
28	08:11 17:08	07:16 18:04	06:13 18:52	07:39 (WEA 4) 20:43	06:07 21:28	05:12 21:47
29	08:10 17:10		07:11 19:53	08:39 (WEA 4) 20:44	06:05 21:29	05:13 21:46
30	08:08 17:12		07:09 19:55	08:39 (WEA 4) 20:46	06:03 21:30	05:13 21:46
31	08:07 17:13		07:06 19:56	08:40 (WEA 4) 20:46	06:03 21:31	05:13 21:46
Sonneneinstrahlung	262	279	367	415	482	495
astr.max.mögl.Beschattung			295	56	138	742
Red.Sonneneinstrahlung			0,28	0,36	0,43	0,34
Reduktion Betriebsdauer			0,98	0,98	0,98	0,98
Reduktion Windrichtung			0,64	0,64	0,68	0,68
Gesamte Reduktion			0,18	0,23	0,29	0,23
Met.wahrsch.Beschattung			52	13	40	169

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) Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung
Annahmen für Schattenwurfberechnung

Schattenrezeptor: WI12 - Wiemeringhausen, Ibergstraße 21

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,58	3,21	3,35	5,03	6,68	5,58	6,26	5,85	4,04	3,08	2,01	1,34

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
539	347	303	495	561	498	652	939	1.354	1.260	940	734	8.622

	Juli		August		September		Oktober		November		Dezember	
1	05:14	06:19 (WEA 1)	05:50	06:38			07:26	07:18	08:08			
	21:46	25 06:44 (WEA 1)	21:15	20:15			19:06	17:02	16:23			
2	05:15	06:20 (WEA 1)	05:51	06:39			07:27	07:20	08:09			
	21:46	25 06:45 (WEA 1)	21:14	20:12			19:04	17:00	16:22			
3	05:15	06:19 (WEA 1)	05:53	06:41			07:29	07:21	08:10			
	21:45	25 06:44 (WEA 1)	21:12	20:10			19:02	16:58	16:21			
4	05:16	06:20 (WEA 1)	05:54	06:43			07:30	07:23	08:12			
	21:45	24 06:44 (WEA 1)	21:10	20:08			19:00	16:56	16:21			
5	05:17	06:20 (WEA 1)	05:56	06:44			07:32	07:25	08:13			
	21:44	25 06:45 (WEA 1)	21:09	20:06			18:57	16:55	16:20			
6	05:18	06:21 (WEA 1)	05:57	06:46			07:34	07:27	08:14			
	21:44	24 06:45 (WEA 1)	21:07	20:03			18:55	16:53	16:20			
7	05:19	06:21 (WEA 1)	05:59	06:47			07:35	07:28	08:16			
	21:43	24 06:45 (WEA 1)	21:05	20:01			18:53	16:51	16:19			
8	05:20	06:21 (WEA 1)	06:00	06:49		08:42 (WEA 4)	07:37	07:30	08:17			
	21:43	23 06:44 (WEA 1)	21:03	19:59	3	08:45 (WEA 4)	18:51	16:50	16:19			
9	05:20	06:21 (WEA 1)	06:02	06:51		08:38 (WEA 4)	07:39	07:32	08:18			
	21:42	23 06:44 (WEA 1)	21:01	19:57	12	08:50 (WEA 4)	18:49	16:48	16:19			
10	05:21	06:22 (WEA 1)	06:03	06:52		08:35 (WEA 4)	07:40	07:34	08:19			
	21:41	22 06:44 (WEA 1)	21:00	19:54	17	08:52 (WEA 4)	18:46	16:46	16:19			
11	05:22	06:22 (WEA 1)	06:05	06:54		08:33 (WEA 4)	07:42	07:35	08:20			
	21:41	22 06:44 (WEA 1)	20:58	19:52	20	08:53 (WEA 4)	18:44	16:45	16:19			
12	05:23	06:22 (WEA 1)	06:06	06:55		08:31 (WEA 4)	07:44	07:37	08:21			
	21:40	22 06:44 (WEA 1)	20:56	19:50	23	08:54 (WEA 4)	18:42	16:43	16:18			
13	05:25	06:23 (WEA 1)	06:08	06:57		08:31 (WEA 4)	07:45	07:39	08:22			
	21:39	21 06:44 (WEA 1)	20:54	19:48	24	08:55 (WEA 4)	18:40	16:42	16:18			
14	05:26	06:24 (WEA 1)	06:09	06:58		08:29 (WEA 4)	07:47	07:41	08:23			
	21:38	20 06:44 (WEA 1)	20:52	19:45	25	08:54 (WEA 4)	18:38	16:41	16:18			
15	05:27	06:24 (WEA 1)	06:11	07:00		08:29 (WEA 4)	07:49	07:42	08:24			
	21:37	19 06:43 (WEA 1)	20:50	19:43	26	08:55 (WEA 4)	18:35	16:39	16:18			
16	05:28	06:25 (WEA 1)	06:13	07:02		08:28 (WEA 4)	07:50	07:44	08:25			
	21:36	17 06:42 (WEA 1)	20:48	19:41	26	08:54 (WEA 4)	18:33	16:38	16:19			
17	05:29	06:27 (WEA 1)	06:14	07:03		08:28 (WEA 4)	07:52	07:46	08:26			
	21:35	16 06:43 (WEA 1)	20:46	19:38	26	08:54 (WEA 4)	18:31	16:36	16:19			
18	05:30	06:28 (WEA 1)	06:16	07:05		08:28 (WEA 4)	07:54	07:47	08:26			
	21:34	14 06:42 (WEA 1)	20:44	19:36	26	08:54 (WEA 4)	18:29	16:35	16:19			
19	05:32	06:29 (WEA 1)	06:17	07:06		08:28 (WEA 4)	07:55	07:49	08:27			
	21:33	11 06:40 (WEA 1)	20:42	19:34	25	08:53 (WEA 4)	18:27	16:34	16:19			
20	05:33	06:31 (WEA 1)	06:19	07:08		08:28 (WEA 4)	07:57	07:51	08:28			
	21:32	7 06:38 (WEA 1)	20:40	19:32	25	08:53 (WEA 4)	18:25	16:33	16:20			
21	05:34		06:20	07:09		08:28 (WEA 4)	07:59	07:52	08:28			
	21:31		20:38	19:29	23	08:51 (WEA 4)	18:23	16:32	16:20			
22	05:35		06:22	07:11		08:30 (WEA 4)	08:01	07:54	08:29			
	21:29		20:36	19:27	20	08:50 (WEA 4)	18:21	16:30	16:21			
23	05:37		06:24	07:13		08:30 (WEA 4)	08:02	07:56	08:29			
	21:28		20:34	19:25	17	08:47 (WEA 4)	18:19	16:29	16:21			
24	05:38		06:25	07:14		08:33 (WEA 4)	08:04	07:57	08:30			
	21:27		20:32	19:22	12	08:45 (WEA 4)	18:17	16:28	16:22			
25	05:39		06:27	07:16			07:06	07:59	08:30			
	21:26		20:30	19:20			17:15	16:27	16:22			
26	05:41		06:28	07:17			07:07	08:00	08:30			
	21:24		20:28	19:18			17:13	16:26	16:23			
27	05:42		06:30	07:19			07:09	08:02	08:31			
	21:23		20:25	19:15			17:11	16:26	16:24			
28	05:44		06:32	07:21			07:11	08:03	08:31			
	21:21		20:23	19:13			17:09	16:25	16:25			
29	05:45		06:33	07:22			07:13	08:05	08:31			
	21:20		20:21	19:11			17:07	16:24	16:25			
30	05:47		06:35	07:24			07:14	08:06	08:31			
	21:18		20:19	19:09			17:05	16:23	16:26			
31	05:48		06:36				07:16		08:31			
	21:17		20:17				17:03		16:27			
Sonnenscheinstunden	499		452	380		332	269	247				
astr.max.mögl.Beschattung	409			350								
Red.Sonnenscheinwahrsch.	0,39			0,32								
Reduktion Betriebsdauer	0,98			0,98								
Reduktion Windrichtung	0,68			0,64								
Gesamte Reduktion	0,26			0,20								
Met.wahrsch.Beschattung	107			70								

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) Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI13 - Wiemeringhausen, Ibergstraße 19
Annahmen für Schattenwurfberechnung

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

	Januar	Februar	März		April	Mai		Juni	
1	08:31 16:28	08:06 17:15	07:13 18:06		07:04 19:58	06:01 20:48		05:17 21:32	06:35 (WEA 1) 19 06:54 (WEA 1)
2	08:31 16:29	08:04 17:17	07:11 18:07		07:02 20:00	05:59 20:49		05:16 21:33	06:35 (WEA 1) 18 06:53 (WEA 1)
3	08:31 16:31	08:02 17:19	07:09 18:09		07:00 20:01	05:57 20:51		05:15 21:34	06:35 (WEA 1) 17 06:52 (WEA 1)
4	08:31 16:32	08:01 17:21	07:07 18:11		06:57 20:03	05:55 20:53		05:15 21:35	06:37 (WEA 1) 15 06:52 (WEA 1)
5	08:31 16:33	07:59 17:22	07:05 18:13		06:55 20:05	05:53 20:54		05:14 21:36	06:37 (WEA 1) 14 06:51 (WEA 1)
6	08:30 16:34	07:58 17:24	07:03 18:14		06:53 20:06	05:52 20:56		05:13 21:37	06:39 (WEA 1) 12 06:51 (WEA 1)
7	08:30 16:35	07:56 17:26	07:00 18:16		06:51 20:08	05:50 20:57		05:13 21:38	06:39 (WEA 1) 11 06:50 (WEA 1)
8	08:30 16:37	07:54 17:28	06:58 18:18		06:49 20:10	05:48 20:59		05:12 21:39	06:40 (WEA 1) 10 06:50 (WEA 1)
9	08:29 16:38	07:53 17:30	06:56 18:19		06:46 20:11	05:46 21:01	06:39 (WEA 1) 7 06:46 (WEA 1)	05:12 21:40	06:42 (WEA 1) 7 06:49 (WEA 1)
10	08:29 16:39	07:51 17:32	06:54 18:21	08:07 (WEA 4) 8 08:15 (WEA 4)	06:44 20:13	05:45 21:02	06:37 (WEA 1) 12 06:49 (WEA 1)	05:11 21:41	06:43 (WEA 1) 4 06:47 (WEA 1)
11	08:28 16:41	07:49 17:33	06:52 18:23	08:04 (WEA 4) 14 08:18 (WEA 4)	06:42 20:15	05:43 21:04	06:35 (WEA 1) 15 06:50 (WEA 1)	05:11 21:41	
12	08:28 16:42	07:47 17:35	06:49 18:25	08:02 (WEA 4) 18 08:20 (WEA 4)	06:40 20:16	05:42 21:05	06:34 (WEA 1) 18 06:52 (WEA 1)	05:11 21:42	
13	08:27 16:44	07:45 17:37	06:47 18:26	08:01 (WEA 4) 20 08:21 (WEA 4)	06:38 20:18	05:40 21:07	06:33 (WEA 1) 19 06:52 (WEA 1)	05:10 21:43	
14	08:26 16:45	07:44 17:39	06:45 18:28	07:59 (WEA 4) 22 08:21 (WEA 4)	06:35 20:20	05:38 21:08	06:32 (WEA 1) 21 06:53 (WEA 1)	05:10 21:43	
15	08:25 16:47	07:42 17:41	06:43 18:30	07:58 (WEA 4) 24 08:22 (WEA 4)	06:33 20:21	05:37 21:10	06:32 (WEA 1) 22 06:54 (WEA 1)	05:10 21:44	
16	08:25 16:48	07:40 17:42	06:40 18:31	07:58 (WEA 4) 24 08:22 (WEA 4)	06:31 20:23	05:35 21:11	06:31 (WEA 1) 23 06:54 (WEA 1)	05:10 21:44	
17	08:24 16:50	07:38 17:44	06:38 18:33	07:57 (WEA 4) 25 08:22 (WEA 4)	06:29 20:25	05:34 21:13	06:31 (WEA 1) 24 06:55 (WEA 1)	05:10 21:45	
18	08:23 16:51	07:36 17:46	06:36 18:35	07:56 (WEA 4) 25 08:21 (WEA 4)	06:27 20:26	05:33 21:14	06:31 (WEA 1) 24 06:55 (WEA 1)	05:10 21:45	
19	08:22 16:53	07:34 17:48	06:34 18:36	07:57 (WEA 4) 24 08:21 (WEA 4)	06:25 20:28	05:31 21:16	06:30 (WEA 1) 25 06:55 (WEA 1)	05:10 21:46	
20	08:21 16:54	07:32 17:50	06:31 18:38	07:57 (WEA 4) 24 08:21 (WEA 4)	06:23 20:30	05:30 21:17	06:30 (WEA 1) 25 06:55 (WEA 1)	05:10 21:46	
21	08:20 16:56	07:30 17:51	06:29 18:40	07:57 (WEA 4) 22 08:19 (WEA 4)	06:21 20:31	05:29 21:18	06:30 (WEA 1) 25 06:55 (WEA 1)	05:10 21:46	
22	08:19 16:58	07:28 17:53	06:27 18:41	07:57 (WEA 4) 21 08:18 (WEA 4)	06:19 20:33	05:27 21:20	06:31 (WEA 1) 24 06:55 (WEA 1)	05:10 21:46	
23	08:18 16:59	07:26 17:55	06:25 18:43	07:59 (WEA 4) 17 08:16 (WEA 4)	06:16 20:35	05:26 21:21	06:31 (WEA 1) 25 06:56 (WEA 1)	05:10 21:47	
24	08:16 17:01	07:24 17:57	06:22 18:45	08:00 (WEA 4) 14 08:14 (WEA 4)	06:14 20:36	05:25 21:23	06:31 (WEA 1) 25 06:56 (WEA 1)	05:11 21:47	
25	08:15 17:03	07:22 17:59	06:20 18:47	08:03 (WEA 4) 7 08:10 (WEA 4)	06:12 20:38	05:24 21:24	06:31 (WEA 1) 24 06:55 (WEA 1)	05:11 21:47	
26	08:14 17:05	07:20 18:00	06:18 18:48		06:10 20:40	05:23 21:25	06:32 (WEA 1) 23 06:55 (WEA 1)	05:11 21:47	
27	08:13 17:06	07:18 18:02	06:16 18:50		06:08 20:41	05:21 21:26	06:32 (WEA 1) 23 06:55 (WEA 1)	05:12 21:47	
28	08:11 17:08	07:16 18:04	06:13 18:52		06:07 20:43	05:20 21:28	06:32 (WEA 1) 23 06:55 (WEA 1)	05:12 21:47	
29	08:10 17:10		07:11 19:53		06:05 20:44	05:19 21:29	06:33 (WEA 1) 21 06:54 (WEA 1)	05:13 21:46	
30	08:08 17:12		07:09 19:55		06:03 20:46	05:19 21:30	06:33 (WEA 1) 21 06:54 (WEA 1)	05:13 21:46	
31	08:07 17:13		07:06 19:56			05:18 21:31	06:33 (WEA 1) 20 06:53 (WEA 1)		
Sonnenscheinstunden	262	279	367		415	482		495	
astr.max.mögl.Beschattung			309			489		127	
Red.Sonnenscheinwahrsch.			0,28			0,43		0,34	
Reduktion Betriebsdauer			0,98			0,98		0,98	
Reduktion Windrichtung			0,64			0,68		0,68	
Gesamte Reduktion			0,18			0,29		0,23	
Met.wahrsch.Beschattung			55			140		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 (WEA mit erstem Schatten)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: 2024PAV01640 Zusatzbelastung Schattenrezeptor: WI13 - Wiemeringhausen, Ibergstraße 19
Annahmen für Schattenwurfberechnung Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [BAD LIPPSPRINGE]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,58 3,21 3,35 5,03 6,68 5,58 6,26 5,85 4,04 3,08 2,01 1,34

Betriebsdauer je Sektor
N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
539 347 303 495 561 498 652 939 1.354 1.260 940 734 8.622

Juli			August			September			Oktober			November			Dezember		
1	05:14 21:46		05:50 21:15	17	06:45 (WEA 1) 07:02 (WEA 1)	06:38 20:15		07:26 19:06		08:40 (WEA 4) 08:59 (WEA 4)	07:18 17:02	08:08 16:23					
2	05:15 21:46	06:49 (WEA 1) 06:51 (WEA 1)	05:51 21:14	14	06:46 (WEA 1) 07:00 (WEA 1)	06:39 20:12		07:27 19:04	19	08:42 (WEA 4) 08:58 (WEA 4)	07:20 17:00	08:09 16:22					
3	05:15 21:45	06:47 (WEA 1) 06:53 (WEA 1)	05:53 21:12	11	06:48 (WEA 1) 06:59 (WEA 1)	06:41 20:10		07:29 19:02	16	08:45 (WEA 4) 08:55 (WEA 4)	07:21 16:58	08:10 16:21					
4	05:16 21:45	06:46 (WEA 1) 06:54 (WEA 1)	05:54 21:10	2	06:52 (WEA 1) 06:54 (WEA 1)	06:43 20:08		07:30 19:00	10		07:23 16:56	08:12 16:21					
5	05:17 21:44	06:46 (WEA 1) 06:56 (WEA 1)	05:56 21:09			06:44 20:06		07:32 18:57			07:25 16:55	08:13 16:20					
6	05:18 21:44	06:45 (WEA 1) 06:57 (WEA 1)	05:57 21:07			06:46 20:03		07:34 18:55			07:27 16:53	08:14 16:20					
7	05:19 21:43	06:45 (WEA 1) 06:58 (WEA 1)	05:59 21:05			06:47 20:01		07:35 18:53			07:28 16:51	08:16 16:19					
8	05:20 21:43	06:43 (WEA 1) 06:58 (WEA 1)	06:00 21:03			06:49 19:59		07:37 18:51			07:30 16:50	08:17 16:19					
9	05:20 21:42	06:43 (WEA 1) 06:59 (WEA 1)	06:02 21:01			06:51 19:57		07:39 18:49			07:32 16:48	08:18 16:19					
10	05:21 21:41	06:43 (WEA 1) 07:00 (WEA 1)	06:03 21:00			06:52 19:54		07:40 18:46			07:34 16:46	08:19 16:19					
11	05:22 21:41	06:42 (WEA 1) 07:01 (WEA 1)	06:05 20:58			06:54 19:52		07:42 18:44			07:35 16:45	08:20 16:19					
12	05:23 21:40	06:42 (WEA 1) 07:01 (WEA 1)	06:06 20:56			06:55 19:50		07:44 18:42			07:37 16:43	08:21 16:18					
13	05:25 21:39	06:42 (WEA 1) 07:02 (WEA 1)	06:08 20:54			06:57 19:48		07:45 18:40			07:39 16:42	08:22 16:18					
14	05:26 21:38	06:41 (WEA 1) 07:02 (WEA 1)	06:09 20:52			06:58 19:45		07:47 18:38			07:41 16:41	08:23 16:18					
15	05:27 21:37	06:41 (WEA 1) 07:03 (WEA 1)	06:11 20:50			07:00 19:43		07:49 18:35			07:42 16:39	08:24 16:18					
16	05:28 21:36	06:41 (WEA 1) 07:03 (WEA 1)	06:13 20:48			07:02 19:41		07:50 18:33			07:44 16:38	08:25 16:19					
17	05:29 21:35	06:41 (WEA 1) 07:05 (WEA 1)	06:14 20:46			07:03 19:38		07:52 18:31			07:46 16:36	08:26 16:19					
18	05:30 21:34	06:41 (WEA 1) 07:05 (WEA 1)	06:16 20:44			07:05 19:36	08:52 (WEA 4) 08:57 (WEA 4)	07:54 18:29			07:47 16:35	08:26 16:19					
19	05:32 21:33	06:41 (WEA 1) 07:05 (WEA 1)	06:17 20:42			07:06 19:34	08:47 (WEA 4) 09:00 (WEA 4)	07:55 18:27			07:49 16:34	08:27 16:19					
20	05:33 21:32	06:41 (WEA 1) 07:05 (WEA 1)	06:19 20:40			07:08 19:32	08:45 (WEA 4) 09:02 (WEA 4)	07:57 18:25			07:51 16:33	08:28 16:20					
21	05:34 21:31	06:40 (WEA 1) 07:05 (WEA 1)	06:20 20:38			07:09 19:29	08:43 (WEA 4) 09:03 (WEA 4)	07:59 18:23			07:52 16:32	08:28 16:20					
22	05:35 21:29	06:41 (WEA 1) 07:06 (WEA 1)	06:22 20:36			07:11 19:27	08:42 (WEA 4) 09:04 (WEA 4)	08:01 18:21			07:54 16:30	08:29 16:21					
23	05:37 21:28	06:41 (WEA 1) 07:06 (WEA 1)	06:24 20:34			07:13 19:25	08:41 (WEA 4) 09:04 (WEA 4)	08:02 18:19			07:56 16:29	08:29 16:21					
24	05:38 21:27	06:41 (WEA 1) 07:06 (WEA 1)	06:25 20:32			07:14 19:22	08:40 (WEA 4) 09:05 (WEA 4)	08:04 18:17			07:57 16:28	08:30 16:22					
25	05:39 21:26	06:41 (WEA 1) 07:05 (WEA 1)	06:27 20:30			07:16 19:20	08:40 (WEA 4) 09:05 (WEA 4)	07:06 17:15			07:59 16:27	08:30 16:22					
26	05:41 21:24	06:42 (WEA 1) 07:06 (WEA 1)	06:28 20:28			07:17 19:18	08:39 (WEA 4) 09:04 (WEA 4)	07:07 17:13			08:00 16:26	08:30 16:23					
27	05:42 21:23	06:42 (WEA 1) 07:05 (WEA 1)	06:30 20:25			07:19 19:15	08:39 (WEA 4) 09:04 (WEA 4)	07:09 17:11			08:02 16:26	08:31 16:24					
28	05:44 21:21	06:42 (WEA 1) 07:04 (WEA 1)	06:32 20:23			07:21 19:13	08:39 (WEA 4) 09:03 (WEA 4)	07:11 17:09			08:03 16:25	08:31 16:25					
29	05:45 21:20	06:43 (WEA 1) 07:05 (WEA 1)	06:33 20:21			07:22 19:11	08:39 (WEA 4) 09:02 (WEA 4)	07:13 17:07			08:05 16:24	08:31 16:25					
30	05:47 21:18	06:43 (WEA 1) 07:04 (WEA 1)	06:35 20:19			07:24 19:09	08:40 (WEA 4) 09:02 (WEA 4)	07:14 17:05			08:06 16:23	08:31 16:26					
31	05:48 21:17	06:43 (WEA 1) 07:02 (WEA 1)	06:36 20:17					07:16 17:03				08:31 16:27					
Sonnenscheinstunden		499	452			380		332		269		247					
astr.max.mögl.Beschattung		573	44			269		45									
Red.Sonnenscheinwahrsch.		0,39	0,40			0,32		0,29									
Reduktion Betriebsdauer		0,98	0,98			0,98		0,98									
Reduktion Windrichtung		0,68	0,68			0,64		0,64									
Gesamte Reduktion		0,26	0,27			0,20		0,18									
Met.wahrsch.Beschattung		149	12			54		8									

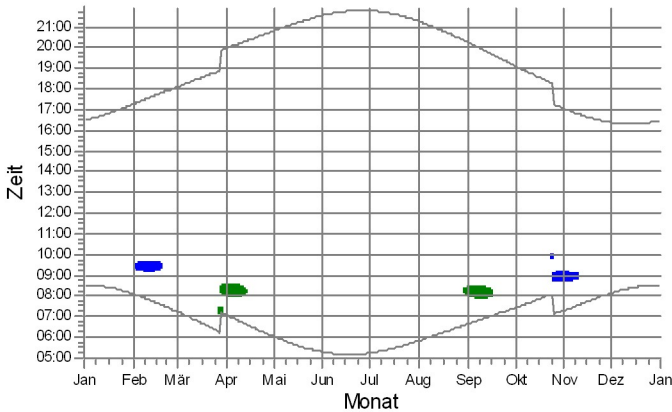
Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

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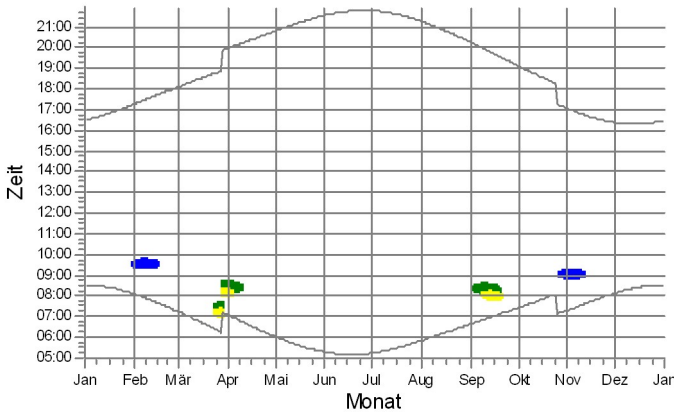
SHADOW - Grafischer Kalender

Berechnung: 2024PAV01640 Zusatzbelastung

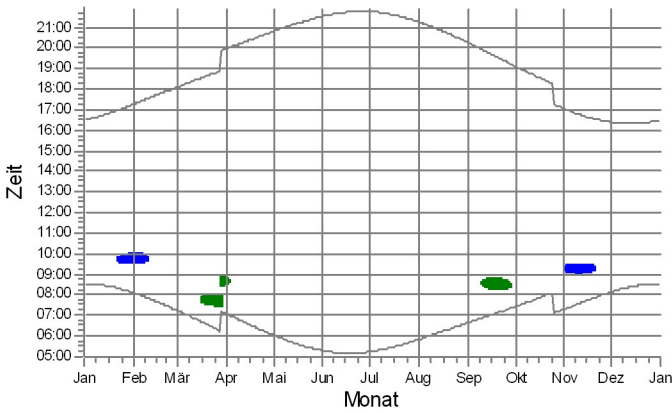
AS04: Assinghausen, Auf dem Kampe 38



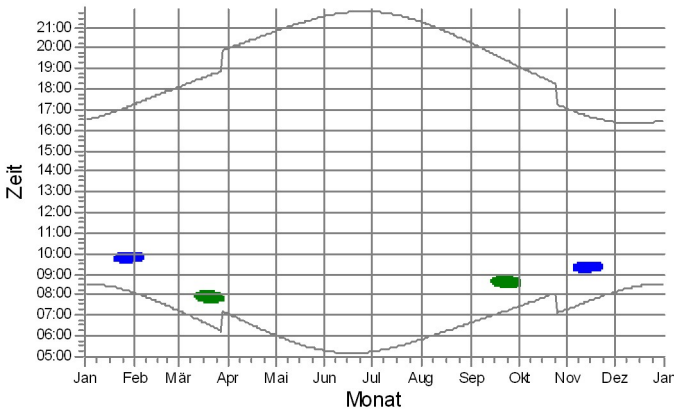
AS05: Assinghausen, Auf dem Kampe 32



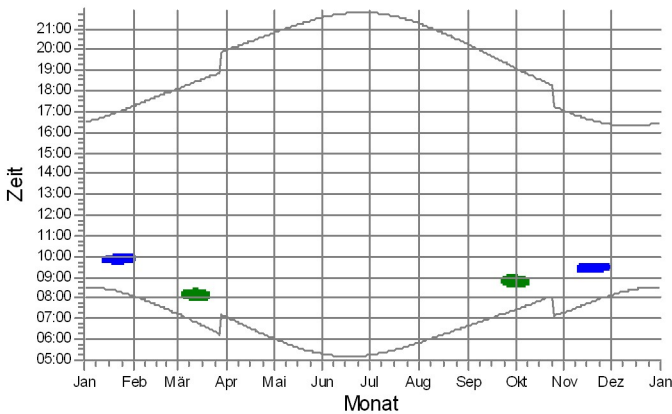
AS06: Assinghausen, Auf dem Kampe 43



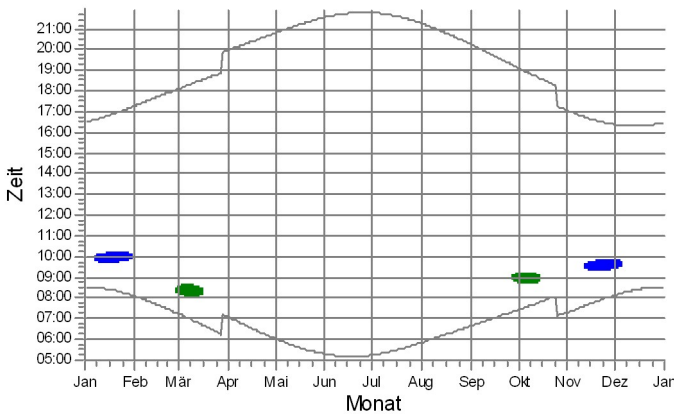
AS07: Assinghausen, Strücker Weg 4



AS08: Assinghausen, Strücker Weg 7



AS09: Assinghausen, Strücker Weg 15

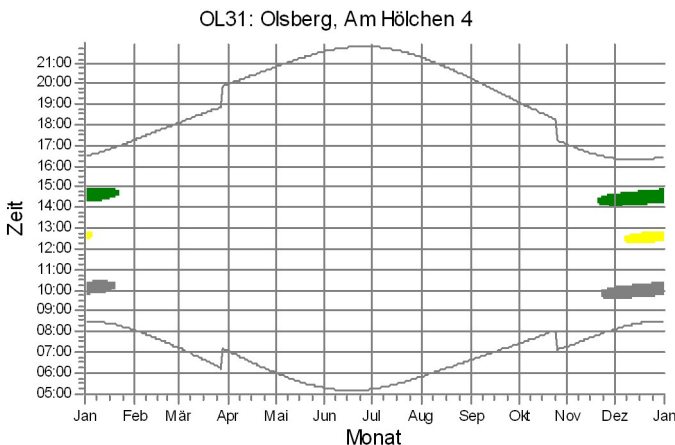
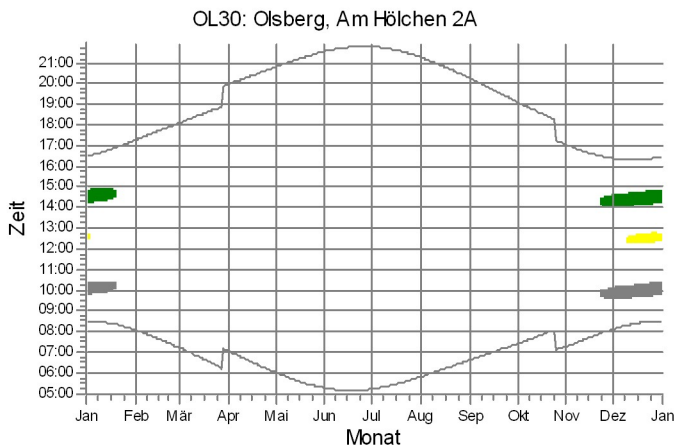
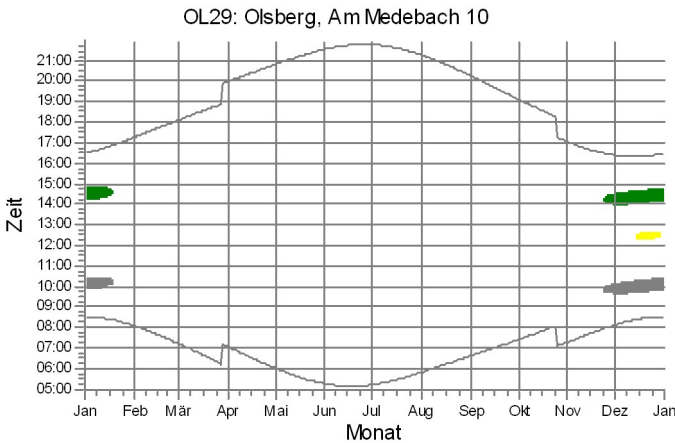
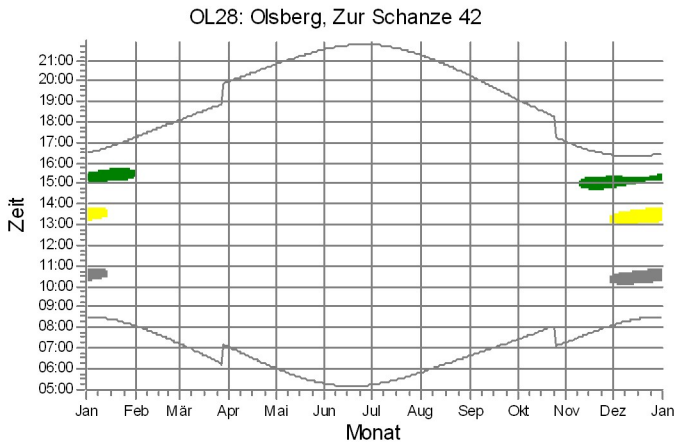
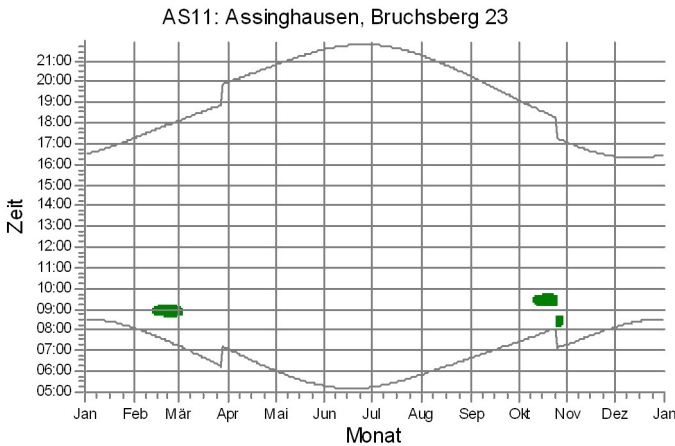
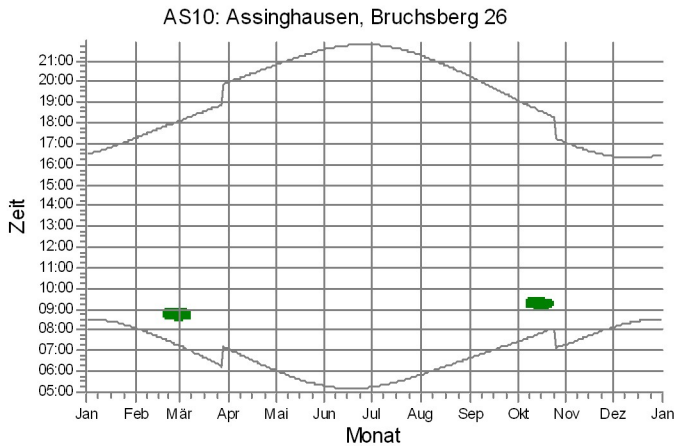


WEA

- WEA 1: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)
- WEA 2: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (19)
- WEA 4: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (20)

SHADOW - Grafischer Kalender

Berechnung: 2024PAV01640 Zusatzbelastung



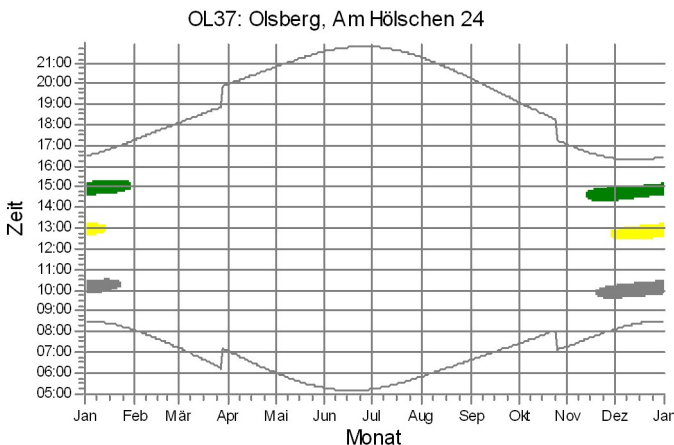
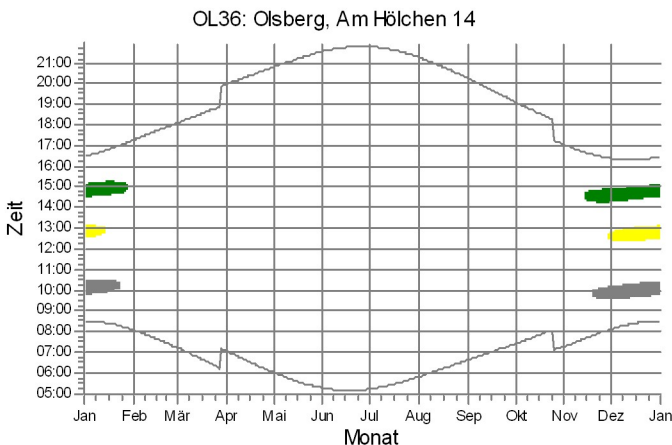
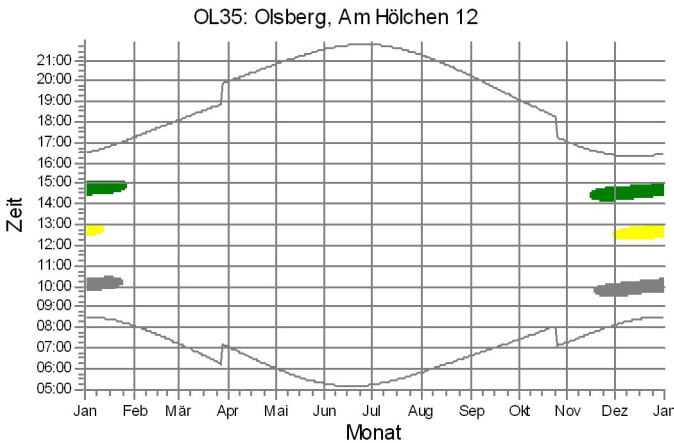
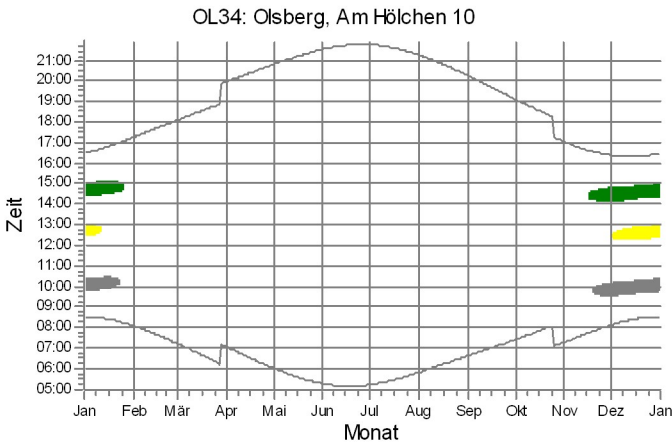
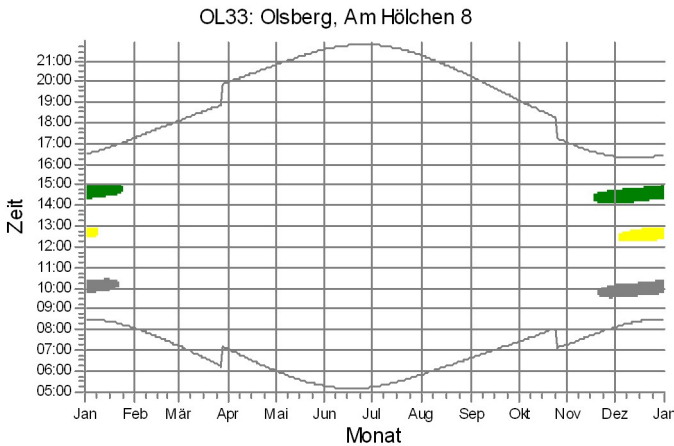
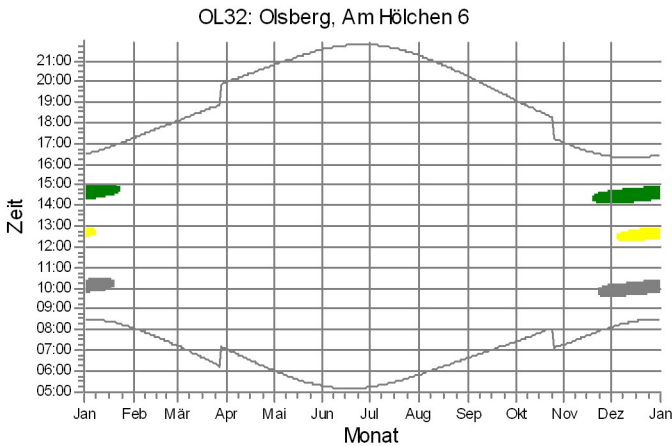
WEA



- WEA 1: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)
- WEA 2: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (19)
- WEA 3: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (22)

SHADOW - Grafischer Kalender

Berechnung: 2024PAV01640 Zusatzbelastung



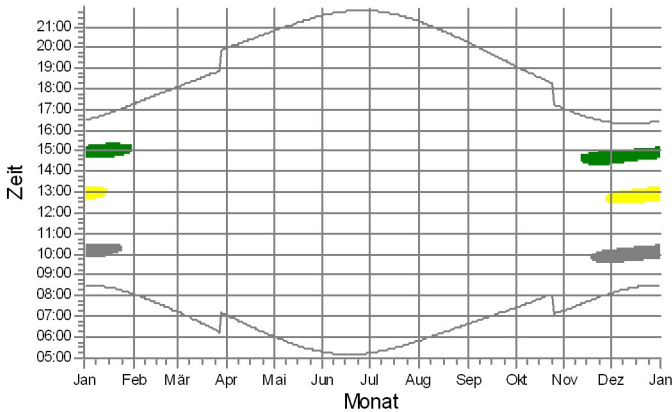
WEA

- WEA 1: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)
- WEA 2: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (19)
- WEA 3: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (22)

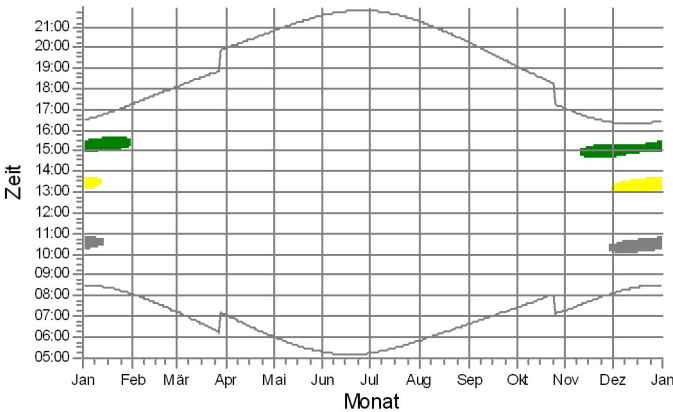
SHADOW - Grafischer Kalender

Berechnung: 2024PAV01640 Zusatzbelastung

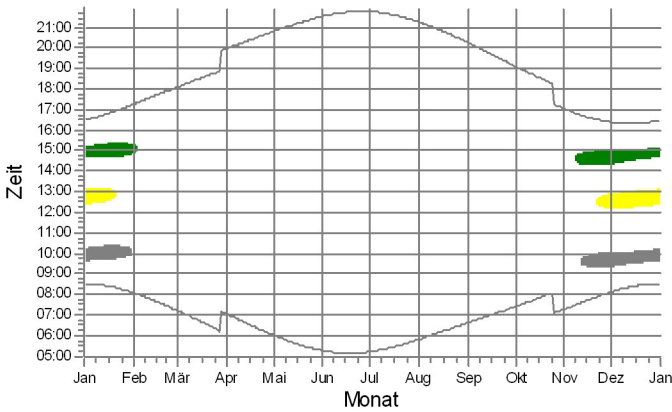
OL38: Olsberg, Am Hölchen 26



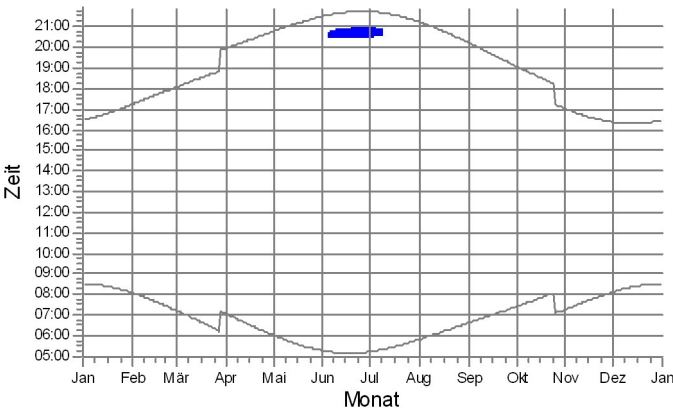
OL39: Olsberg, Zur Schanze 40



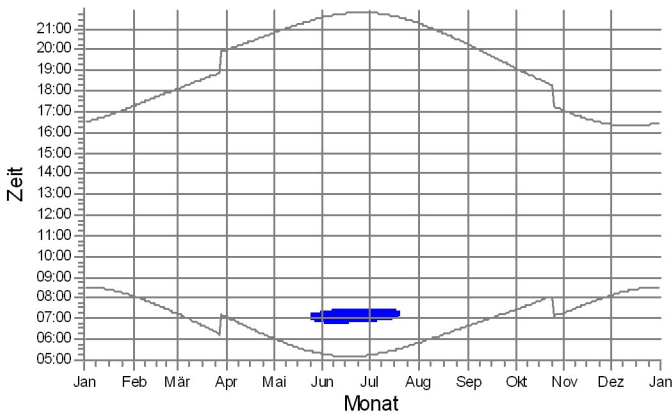
OL40: Olsberg, Am Medebach 21



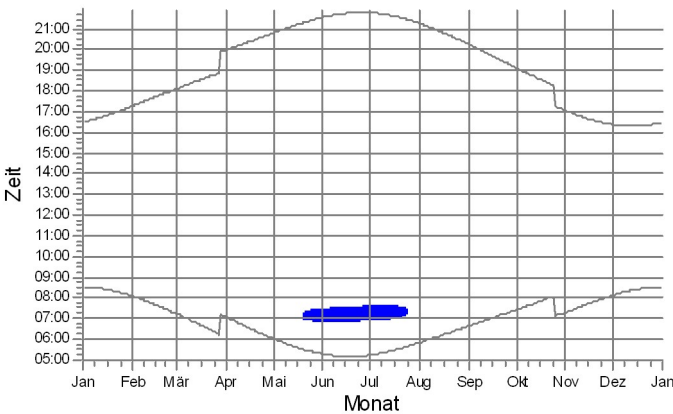
OL41: Olsberg, Am Medebach 98



WM02: Wiemeringhausen, Zur Lieth 35



WM03: Wiemeringhausen, Alte Landstraße 23



WEA

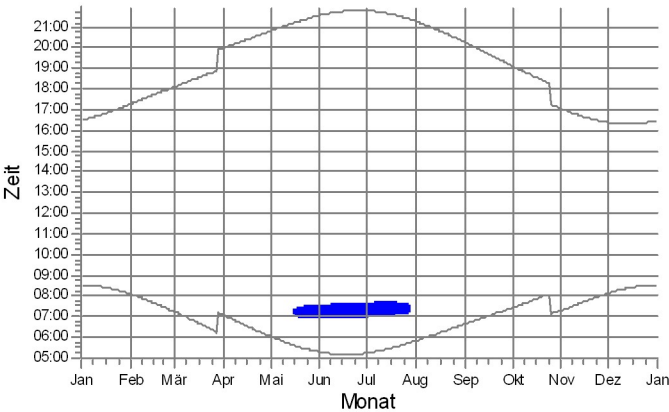


- WEA 1: VESTAS V162-6.2 6200 162.0 !OI NH: 169,0 m (Ges:250,0 m) (18)
- WEA 2: VESTAS V162-6.2 6200 162.0 !OI NH: 169,0 m (Ges:250,0 m) (19)
- WEA 4: VESTAS V162-6.2 6200 162.0 !OI NH: 169,0 m (Ges:250,0 m) (20)
- WEA 3: VESTAS V162-6.2 6200 162.0 !OI NH: 169,0 m (Ges:250,0 m) (22)

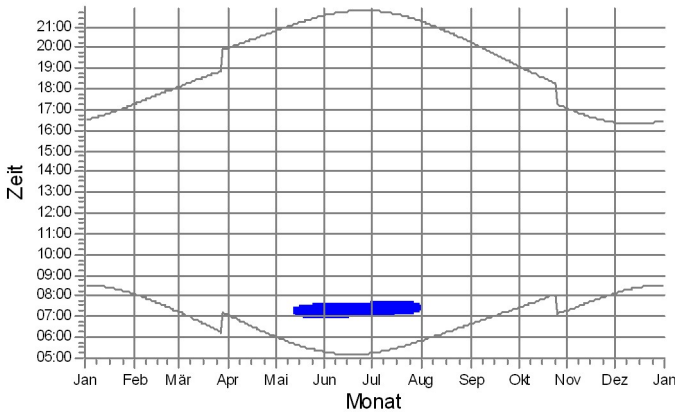
SHADOW - Grafischer Kalender

Berechnung: 2024PAV01640 Zusatzbelastung

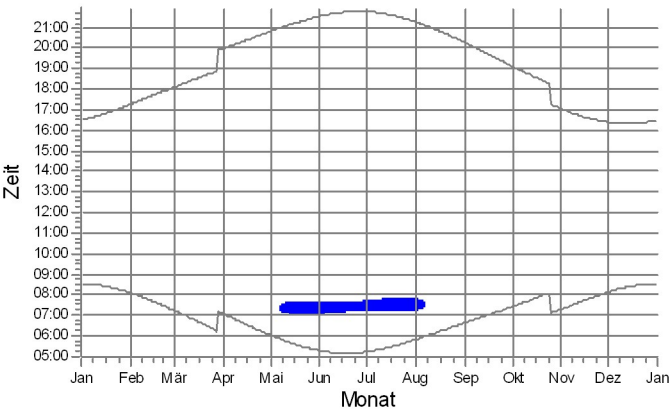
WM04: Wiemeringhausen, Alte Landstraße 21



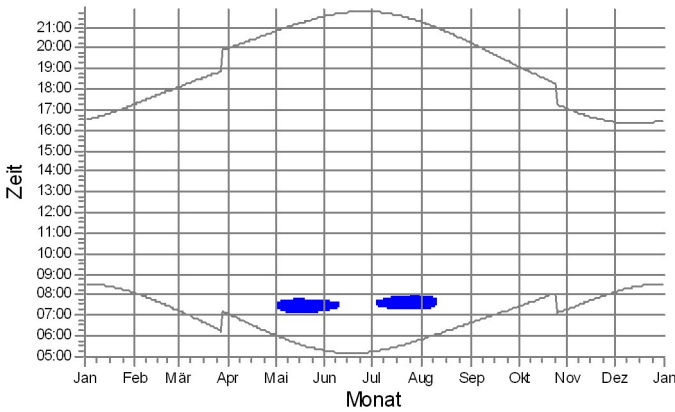
WM05: Wiemeringhausen, Alte Landstraße 19



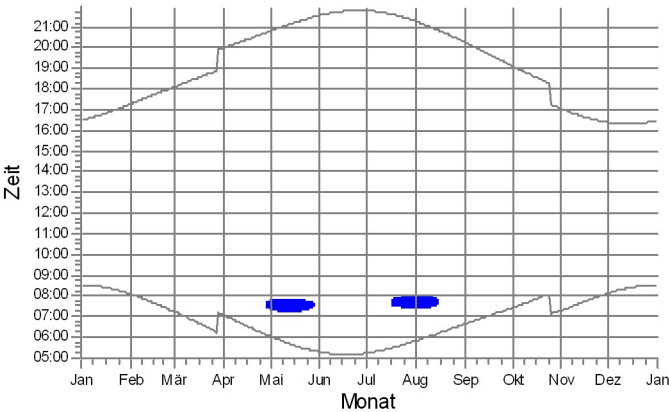
WM06: Wiemeringhausen, Alte Landstraße 16



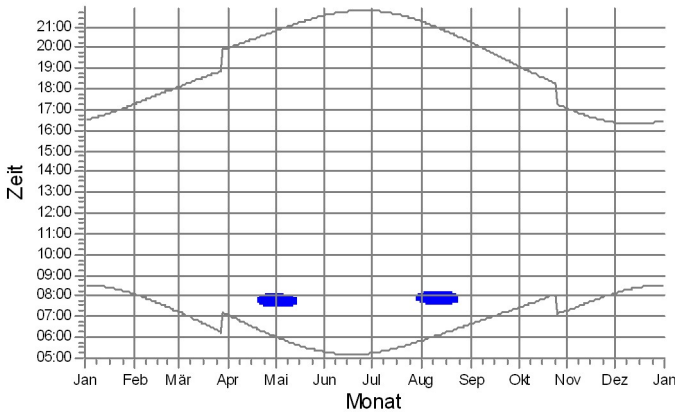
WM07: Wiemeringhausen, Alte Landstraße 5



WM08: Wiemeringhausen, Alte Landstraße 10



WM09: Wiemeringhausen, Alte Landstraße 4

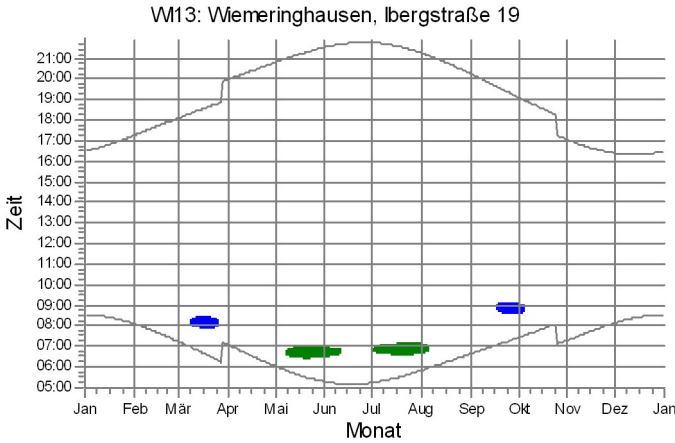
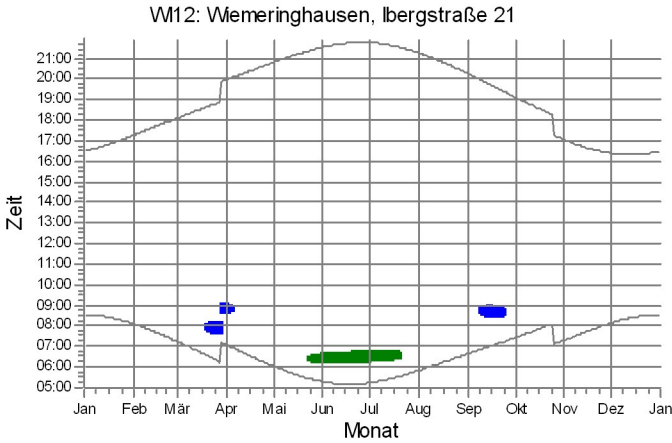
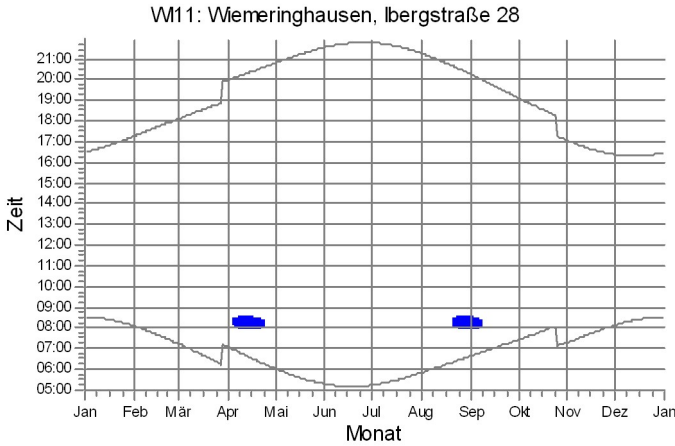
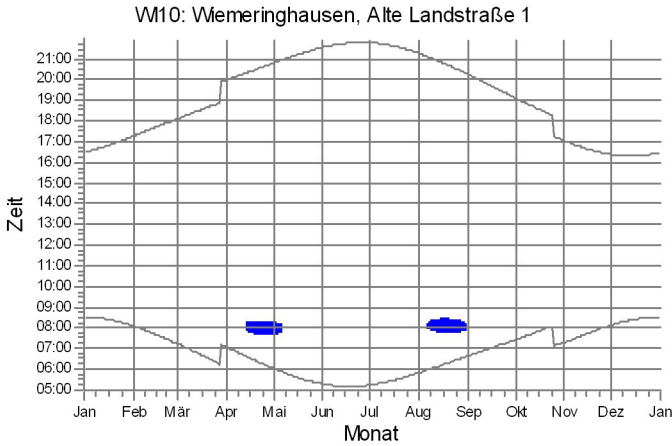


WEA

WEA 4: VESTAS V162-6.2 6200 162.0 !OI NH: 169,0 m (Ges:250,0 m) (20)

SHADOW - Grafischer Kalender

Berechnung: 2024PAV01640 Zusatzbelastung



WEA



WEA 1: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)

WEA 4: VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (20)

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul
Annahmen für Schattenwurfberechnung

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

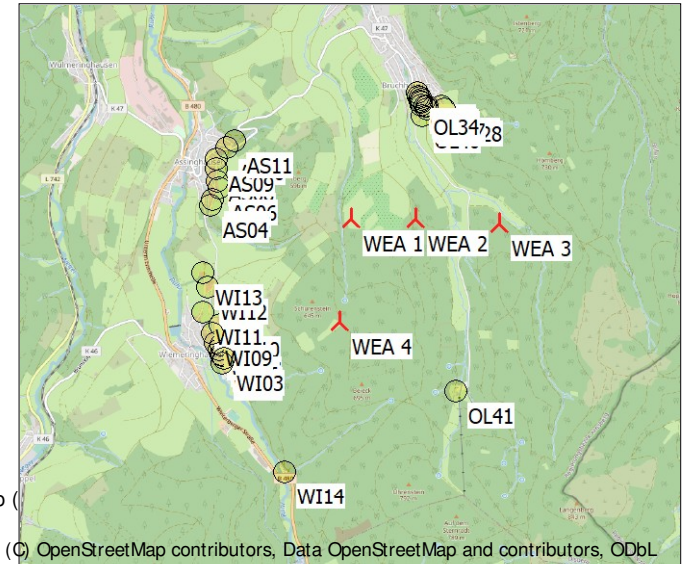
Minimale relevante Sonnenhöhe über Horizont 3 °
Tage zwischen Berechnungen 1 Tag(e)
Berechnungszeitsprung 1 Minuten

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

Schattenabschaltung für spez. WEA

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:
Verwendete Höhenlinien: CONTOURLINE_ONLINEDATA_0.wpo
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-ETRS89 Zone: 32



WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nenn- leistung	Rotor- durch- messer	NH	Schattendaten	
					Ak- tu- ell	Hersteller	Typ				Beschatt.- Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA 1	466.971	5.683.471	558,2	VESTAS V162-6.2 6200 162.0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-
WEA 2	467.605	5.683.466	566,6	VESTAS V162-6.2 6200 162.0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-
WEA 3	468.441	5.683.424	540,0	VESTAS V162-6.2 6200 162.0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-
WEA 4	466.845	5.682.454	636,6	VESTAS V162-6.2 6200 162.0 !...	Ja	VESTAS	V162-6.2-6.200	6.200	162,0	169,0	2.041	-

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]
AS04	Assinghausen, Auf dem Kampe 38	465.577	5.683.616	428,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS05	Assinghausen, Auf dem Kampe 32	465.598	5.683.679	423,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS06	Assinghausen, Auf dem Kampe 43	465.654	5.683.787	427,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS07	Assinghausen, Strüker Weg 4	465.641	5.683.858	426,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS08	Assinghausen, Strüker Weg 7	465.630	5.683.974	426,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS09	Assinghausen, Strüker Weg 15	465.640	5.684.065	421,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS10	Assinghausen, Bruchsberg 26	465.751	5.684.193	420,9	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
AS11	Assinghausen, Bruchsberg 23	465.817	5.684.243	434,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL28	Olsberg, Zur Schanze 42	467.895	5.684.561	490,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL29	Olsberg, Am Medebach 10	467.634	5.684.713	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL30	Olsberg, Am Hölchen 2A	467.648	5.684.681	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL31	Olsberg, Am Hölchen 4	467.659	5.684.667	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL32	Olsberg, Am Hölchen 6	467.671	5.684.651	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL33	Olsberg, Am Hölchen 8	467.668	5.684.630	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL34	Olsberg, Am Hölchen 10	467.674	5.684.614	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL35	Olsberg, Am Hölchen 12	467.679	5.684.595	470,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL36	Olsberg, Am Hölchen 14	467.710	5.684.583	471,6	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL37	Olsberg, Am Hölchen 24	467.733	5.684.577	473,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL38	Olsberg, Am Hölchen 26	467.736	5.684.559	474,2	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL39	Olsberg, Zur Schanze 40	467.878	5.684.580	489,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL40	Olsberg, Am Medebach 21	467.685	5.684.487	472,5	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
OL41	Olsberg, Am Medebach 98	468.005	5.681.759	590,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI02	Wiemeringhausen, Zur Lieth 35	465.677	5.682.056	445,4	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI03	Wiemeringhausen, Alte Landstraße 23	465.697	5.682.095	453,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1

(Fortsetzung nächste Seite)...

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
WI04	Wiemeringhausen, Alte Landstraße 21	465.681	5.682.122	454,9	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI05	Wiemeringhausen, Alte Landstraße 19	465.671	5.682.140	455,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI06	Wiemeringhausen, Alte Landstraße 16	465.650	5.682.179	457,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI07	Wiemeringhausen, Alte landstraße 5	465.672	5.682.229	465,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI08	Wiemeringhausen, Alte Landstraße 10	465.610	5.682.260	457,3	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI09	Wiemeringhausen, Alte landstraße 4	465.592	5.682.349	458,8	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI10	Wiemeringhausen, Alte Landstraße 1	465.658	5.682.438	472,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI11	Wiemeringhausen, Ibergstraße 28	465.492	5.682.549	450,0	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI12	Wiemeringhausen, Ibergstraße 21	465.547	5.682.801	456,4	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI13	Wiemeringhausen, Ibergstraße 19	465.501	5.682.944	455,7	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1
WI14	Wiewmeringhausen, Winterberger Str. 35	466.303	5.680.975	469,1	0,1	0,1	2,0	90,0	"Gewächshaus-Modus"	2,1

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer			Vermiedene Stunden pro Jahr	Vermiedene Tage pro Jahr
		Stunden/Jahr	Schattentage/Jahr	Max.Schatten- dauer/Tag		
		[h/a]	[d/a]	[h/d]	[h/a]	[d/a]
AS04*	Assinghausen, Auf dem Kampe 38	14:47	66	0:22	5:45	
AS05*	Assinghausen, Auf dem Kampe 32	14:38	55	0:22	10:36	12
AS06*	Assinghausen, Auf dem Kampe 43	19:42	71	0:26	1:54	
AS07	Assinghausen, Strüker Weg 4	21:11	70	0:26		
AS08	Assinghausen, Strüker Weg 7	20:50	72	0:26		
AS09	Assinghausen, Strüker Weg 15	21:20	76	0:25		
AS10	Assinghausen, Bruchsberg 26	11:27	34	0:26		
AS11	Assinghausen, Bruchsberg 23	12:26	36	0:27		
OL28*	Olsberg, Zur Schanze 42	6:06	83	0:11	56:39	
OL29*	Olsberg, Am Medebach 10	0:00	0	0:00	43:10	54
OL30*	Olsberg, Am Hölchen 2A	0:05	5	0:01	52:16	53
OL31*	Olsberg, Am Hölchen 4	0:00	0	0:00	56:22	62
OL32*	Olsberg, Am Hölchen 6	0:00	0	0:00	60:56	64
OL33*	Olsberg, Am Hölchen 8	0:06	6	0:01	66:43	60
OL34*	Olsberg, Am Hölchen 10	0:04	4	0:01	71:11	66
OL35*	Olsberg, Am Hölchen 12	0:00	0	0:00	76:17	72
OL36*	Olsberg, Am Hölchen 14	0:09	9	0:01	78:00	65
OL37*	Olsberg, Am Hölchen 24	3:59	40	0:09	74:19	36
OL38*	Olsberg, Am Hölchen 26	5:58	52	0:12	75:54	26
OL39*	Olsberg, Zur Schanze 40	2:00	40	0:04	59:17	40
OL40*	Olsberg, Am Medebach 21	0:00	0	0:00	99:34	86
OL41	Olsberg, Am Medebach 98	9:11	33	0:21		
WI02*	Wiemeringhausen, Zur Lieth 35	7:47	53	0:12	14:27	1
WI03*	Wiemeringhausen, Alte Landstraße 23	6:00	60	0:09	23:32	4
WI04*	Wiemeringhausen, Alte Landstraße 21	2:49	63	0:04	31:22	10
WI05*	Wiemeringhausen, Alte Landstraße 19	0:00	0	0:00	36:19	79
WI06*	Wiemeringhausen, Alte Landstraße 16	8:49	78	0:24	27:40	12
WI07*	Wiemeringhausen, Alte landstraße 5	16:58	72	0:30	12:07	3
WI08*	Wiemeringhausen, Alte Landstraße 10	19:13	58	0:30	2:42	
WI09*	Wiemeringhausen, Alte landstraße 4	11:27	47	0:27	6:23	
WI10*	Wiemeringhausen, Alte Landstraße 1	0:00	0	0:00	17:55	45
WI11*	Wiemeringhausen, Ibergstraße 28	9:22	36	0:26	3:09	
WI12*	Wiemeringhausen, Ibergstraße 21	11:41	34	0:26	21:29	59
WI13*	Wiemeringhausen, Ibergstraße 19	10:23	32	0:25	20:33	67
WI14	Wiewmeringhausen, Winterberger Str. 35	0:00	0	0:00		

* Rezeptoren, an denen Schattenwurf durch Abschaltung reduziert ist.

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Angehalten wg. Schattenabschaltung [h/a]
WEA 1	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)	60:08	135:17
WEA 2	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (19)	12:28	50:10
WEA 3	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (22)	2:00	62:11
WEA 4	VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (20)	111:35	54:14

Projekt:
KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:
PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K_Gutbrod / gutbrod@pavana-wind.com
Berechnet:
13.11.2024 14:42/4.0.547

SHADOW - Hauptergebnis

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul

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.

Projekt:
KG19062024 Olsberg-Wulmeringhausen

Lizenzierter Anwender:
PAVANA GmbH
Otto-Hahn-Strasse 12-16
DE-25813 Husum
+49 4841 8944 281
K. Gutbrod / gutbrod@pavana-wind.com
Berechnet:
13.11.2024 14:42/4.0.547

SHADOW - Schattenabschaltung: WEA-Abschaltkalender

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul WEA: WEA 1 - VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (18)
Schattenabschaltung für spez. WEA

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

SHADOW - Schattenabschaltung: WEA-Abschaltkalender

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul WEA: WEA 2 - VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (19)
Schattenabschaltung für spez. WEA

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

SHADOW - Schattenabschaltung: WEA-Abschaltkalender

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul WEA: WEA 3 - VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (22)
Schattenabschaltung für spez. WEA

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

SHADOW - Schattenabschaltung: WEA-Abschaltkalender

Berechnung: 2024PAV01640 Zusatzbelastung mit Abschaltmodul WEA: WEA 4 - VESTAS V162-6.2 6200 162.0 !O! NH: 169,0 m (Ges:250,0 m) (20)
Schattenabschaltung für spez. WEA

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