



WINDENERGIEPARK RIEPSDORF-GRÖMITZ

# Schattenwurfberechnung

RWE Wind Onshore & PV Deutschland GmbH

**Berichtsnummer:** 10370730-A-2-A

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**Auftrag:**

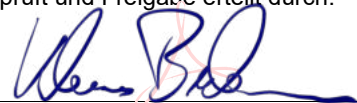
Schattenwurfberechnung für die Umgebung einer geplanten Windenergieanlage im Windpark Riepsdorf-Grömitz

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A	2023-01-11	Erstausgabe	Jörg Dedert	Klaus Buchmann	Klaus Buchmann



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## 1 EINLEITUNG

Von der RWE Wind Onshore & PV Deutschland GmbH wurde der GL Garrad Hassan Deutschland GmbH (GH-D) am 2022-07-13 der Auftrag erteilt, für das geplante Repoweringprojekt im Windenergiepark Riepsdorf-Grömitz die Schattenwurfbelastung an den umliegenden Immissionsorten (IO) unter Berücksichtigung aller immissionsrelevanten Windenergie-anlagen (WEA) zu berechnen.

Die Arbeiten werden auf Grundlage der ISI-RA-MEA-4620 /4/ des Management Systems der GL Garrad Hassan Deutschland GmbH durchgeführt.

## 2 IMMISSIONSRELEVANTE WINDENERGIEANLAGEN

Auf der beplanten Fläche ist von der RWE Wind Onshore & PV Deutschland GmbH eine neue Windenergieanlage (WEA) des Typs Siemens Gamesa SG6.6-155 mit einer Nabenhöhe von 102,5 m und einem Rotordurchmesser von 155 m geplant (WEA RWE01). Im Gegenzug sind drei momentan an diesem Standort vorhandene WEA des Typs Enercon E-66/18.70 (WEA 06 bis WEA 08) mit einer Nabenhöhe von 65 m für den Rückbau vorgesehen.

Als verbleibende Vorbelastung werden die in Tabelle 2.1 aufgelisteten, insgesamt 47 WEA berücksichtigt.

**Tabelle 2.1: WEA der verbleibenden Vorbelastung nach Rückbau**

Bezeichnung	ID	Nabenhöhe	Rotordurchmesser
Easywind 6	WEA 51	19,0	6,0
Enercon E-115 EP3 E3/2,9 MW (TES)	WEA K01 bis WEA K04	92,0	115,7
Enercon E-40/5.40	WEA 36	65,0	40,3
Enercon E-66 18.70	WEA 32	65,0	70,0
Enercon E-66/15.66	WEA 35	85,0	66,0
Enercon E-70 E4	WEA 37 bis WEA 39	64,0	71,0
Enercon E-82	WEA 49 und WEA 50	108,4	82,0
Jacobs MD70	WEA 01 bis WEA 04, WEA 06 bis WEA 17, WEA 33, WEA 40 bis WEA 43	65,0	70,0
Repower MD70	WEA 05	65,0	70,0
NEG Micon NM 1500 C	WEA 22 bis WEA 25	68,0	64,0
Südwind S70	WEA 46 bis WEA 48	65,0	70,0
Vestas V47	WEA 44 und WEA 45	65,0	47,0
Vestas V150-6.0	WEA G1 bis WEA G3	105,0	150,0

Die Reichweite der Schatten der Windenergieanlagen wird gemäß /1/ errechnet. Es wird ein Linke-Trübungsfaktor von 3,5 berücksichtigt. Dies entspricht dem Wert der größten zu erwartenden Schattenwurfreichweite, wie er an klaren Wintertagen vorkommt.

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

## 3 IMMISSIONSORTE

Als Immissionsorte (IO) wurden die nächstgelegenen Wohnbebauungen ausgewählt, für die von erhöhter potenzieller Schattenwurfimmission ausgegangen werden kann. Die ausgewählten IO sind unterschiedlich bewachsen und werden als den zu beurteilenden WEA zugewandt betrachtet. Es wird davon ausgegangen, dass Bewuchs den Schattenwurf nicht wesentlich abschwächt.

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

## 4 BEURTEILUNGSVERFAHREN

Einen Einfluss auf die Schattenwurfbelastung haben die geographische Lage der WEA, der Immissionsorte (IO) und deren Lage zueinander sowie die örtlichen Gegebenheiten. Diese Daten werden als Eingabeparameter für die verwendete Software "WindPRO" der Fa. Energi- og Miljødata, Aalborg, Dänemark, in der Version 3.6.361 /2/ benutzt, mit der über Sonnenstandsdiagramme und die sich dann ergebende Geometrie möglicher Schattenwurf berechnet wird. Die Standortkoordinaten (UTM ETRS89) und die Höhe über N.N. der zu berücksichtigenden WEA sowie deren Nabenhöhe und der Rotordurchmesser werden ermittelt und stellen den ersten Teil der Eingangsgrößen für die Schattenwurfberechnung dar. Der zweite Teil ist die Festlegung der Immissionsorte. Sie werden durch die vor Ort gewonnenen Kenntnisse über Wohnbebauungen anhand der Standortkoordinaten, der Höhe über N.N., der Größe, der Platzierung und der Ausrichtung beschrieben. Die Größe wird hier gemäß den Empfehlungen des Arbeitskreises Schattenwurf unter Federführung des Staatlichen Umweltamtes Schleswig /3/ als annähernd punktförmig festgelegt und durch ein horizontales Quadrat von 1 x 1 m abgebildet, das sich auf einer Höhe von 2 m über dem Boden befindet.

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

- die Sonne scheint durchgehend während der gesamten Zeit zwischen Sonnenauf- und Sonnenuntergang, es wird also stets von einem wolkenlosen Himmel ausgegangen. Eine Ausnahme hiervon sind die Zeiten, in denen die Sonne weniger als 3° über dem Horizont steht. Diese werden wegen zu geringer Strahlungsintensität nicht berücksichtigt.
- die Windrichtung wird stets so angenommen, dass die Rotorfläche senkrecht zur Sonneneinstrahlung steht, also den maximal möglichen Schatten verursacht.
- die WEA sind immer in Betrieb, haben also keine technisch bedingten Stillstandszeiten und immer ausreichend starken Wind.
- der Einwirkungsbereich des Schattens einer WEA beträgt bis zu 3.000 m. Liegen Daten zur Rotorblattgeometrie der WEA vor, wird der Beschattungsbereich anhand der Geometriedaten ermittelt.
- die angenommenen Schattenwurfrezeptoren bzw. Fenster an den IO sind nicht durch Gebäude, Bewuchs oder ähnliches teilweise oder ganz verdeckt.

## 5 BERECHNUNG DER ERGEBNISSE

Die detaillierten Gesamtergebnisse sind dem Anhang zu entnehmen.

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

### 5.1 Vorbelastung momentane Bestandssituation

Am Immissionsort IO 26 (Rütinger Chaussee 1) beträgt die momentane Vorbelastung 105 Stunden und 41 Minuten pro Jahr, verteilt auf 283 Tage. Die maximale Tagesbelastung beträgt dort eine Stunde und drei Minuten. Am zweitstärksten belastet ist mit bis zu 89 Stunden und 33 Minuten pro Jahr, verteilt auf 180 Tage, und einer maximalen Tagesbelastung von einer Stunde und 10 Minuten der IO 20 (Poggenpohler Weg 30, Gosdorf). Am IO 46 (Diekstraat 29) tritt ebenfalls

erheblicher Schattenwurf durch die vorhandenen WEA auf. Dieser beträgt dort bis zu 81 Stunden und 58 Minuten pro Jahr, verteilt auf 247 Tage. Die maximale Tagesbelastung beträgt dort 35 Minuten.

## 5.2 Bestandssituation nach Rückbau

Nach dem Rückbau der drei Enercon E-66/18.70 beträgt am Immissionsort IO 20 (Poggenpohler Weg 30, Gosdorf) die verbleibende Vorbelastung 83 Stunden und 11 Minuten pro Jahr, verteilt auf 144 Tage. Die maximale Tagesbelastung beträgt dort weiterhin eine Stunde und 10 Minuten. Am zweitstärksten und unverändert belastet ist mit bis zu 81 Stunden und 58 Minuten pro Jahr, verteilt auf 247 Tage, und einer maximalen Tagesbelastung von 35 Minuten der IO 46 (Diekstraat 29). Erheblicher Schattenwurf durch die verbleibenden WEA tritt weiterhin am IO 26 (Rüting Chaussee 1) auf. Hier ist nach dem Rückbau der drei Enercon E-66/18.70 eine Belastung von bis zu 80 Stunden und drei Minuten pro Jahr, verteilt auf 215 Tage festzustellen. Die maximale Tagesbelastung beträgt dort unverändert eine Stunde und drei Minuten.

## 5.3 Zusatzbelastung Windenergiepark Riepsdorf-Grömitz

Durch die geplante Anlage entsteht am Immissionsort IO 07 (Hauptstraße 1, Riepsdorf) eine Erhöhung der Schattenwurfbelastung um 15 Stunden und 51 Minuten auf dann 75 Stunden und 38 Minuten. Die maximale Tagesbelastung erhöht sich um 14 Minuten auf 41 Minuten. Am Immissionsort IO 03 (Hauptstraße 24, Riepsdorf) erhöht sich die Jahresbelastung um 15 Stunden und 15 Minuten auf 53 Stunden und neun Minuten pro Jahr, die maximale Tagesbelastung erhöht sich hier nicht und beträgt nach wie vor 30 Minuten. Am Immissionsort IO 06 (Hauptstraße 3, Riepsdorf) erhöht sich die Jahresbelastung um 15 Stunden und 11 Minuten auf 74 Stunden und zwei Minuten pro Jahr. Die maximale Tagesbelastung erhöht sich um 13 Minuten auf dann 37 Minuten.

## 5.4 Gesamtbelastung nach Abschluss des Repowering Vorhabens

Am Immissionsort IO 20 (Poggenpohler Weg 30, Gosdorf) tritt die höchste Belastung durch Schattenwurf auf. Sie beträgt 95 Stunden und 48 Minuten pro Jahr, verteilt auf 181 Tage. Die maximale Tagesbelastung beträgt hier eine Stunde und 10 Minuten. Am zweitstärksten belastet ist mit bis zu 90 Stunden und sieben Minuten pro Jahr, verteilt auf 254 Tage, und einer maximalen Tagesbelastung von einer Stunde und drei Minuten der IO26 (Rüting Chaussee 1). An diesem IO ist durch die Repowering Maßnahme eine Reduzierung der Jahresbelastung um 15 Stunden und 34 Minuten festzustellen. Die dritthöchste Belastung ergibt sich mit 89 Stunden und 34 Minuten pro Jahr, verteilt auf 180 Tage, am IO 15 (Poggenpohler Weg 30, Gosdorf). Die maximale Tagesbelastung beträgt dort eine Stunde und 10 Minuten.

# 6 PROGNOSEGENAUIGKEIT

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

# 7 ABSCHLIEßENDE BEURTEILUNG

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

Unter den oben beschriebenen Vorbedingungen ergibt die Berechnung, dass im Bereich der Ortschaft Gosdorf, an der Bebauung entlang der Bäderstraße, sowie an den Häusern im Bereich Achterhof und im Verlauf des Poggenpohler Weges bis zum Ortsausgang eine Überschreitung der genannten Richtwerte nicht ausgeschlossen werden kann. Auch am östlich der geplanten WEA gelegenen Wohnbebauung Rathjensdorfer Felde 2 (IO 23) ergibt sich durch die geplante WEA eine rechnerische Überschreitung des Richtwertes von 30 Minuten pro Tag. In der gesamten Ortslage Rüting ergeben sich durch das geplante Vorhaben Erhöhungen der bereits durch den momentanen Bestand verursachten

Richtwertüberschreitungen in der Jahresbelastung. Die maximale Tagesbelastung an diesen IO bleibt aber unverändert. Einzig an der Wohnbebauung Rütting Chaussee 1 (IO 26) kommt es durch den Rückbau der drei Enercon E-66/18.70 und der Errichtung der geplanten WEA zu einer verringerten Jahresbelastung. Allerdings bleiben auch hier die Richtwerte weiterhin überschritten.

Die Belastung der Immissionsorte durch die geplanten Anlagen ist somit als beeinträchtigend zu werten.

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

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

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

## 8 ZUSAMMENFASSUNG

Zur Ermittlung der Schattenwurfbelastung in der Umgebung der geplanten Windenergieanlage des Windparks Riepsdorf-Grömitz wurden Berechnungen durchgeführt. Die örtlichen Parameter wurden bei einer Ortsbesichtigung ermittelt bzw. durch Standardvorgaben für die Ermittlung des ungünstigsten Falles festgelegt.

Die Belastung der Immissionsorte durch Schattenwurf beträgt bei einer Berechnung des ungünstigsten Falles unter Berücksichtigung der nach dem Rückbau verbleibenden und als Vorbelastung zu wertenden WEA maximal 95 Stunden und 48 Minuten im Jahr bzw. eine Stunde und 10 Minuten pro Tag am IO 20 (Poggenpohler Weg 30, Gosdorf). An 31 bereits durch die Vorbelastung von einer Richtwertüberschreitung betroffenen IO verursachen die geplanten WEA eine zusätzliche Erhöhung der Überschreitung. Zudem kommt es an drei weiteren IO durch die geplanten WEA erstmalig zu einer Überschreitung der Richtwerte.



## 9 LITERATURVERZEICHNIS

- /1/ Hans D. Freund, Institut für Physik und Allgemeine Elektronik, FH Kiel, "Die Reichweite des Schattenwurfs von Windkraftanlagen", 1999-06.
- /2/ Energi- og Miljødata, Aalborg, Dänemark, " WindPro ", Vers. 3.6.361.
- /3/ Länderausschuss für Immissionsschutz, "Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen Aktualisierung 2019", 2020-01-23.
- /4/ DNV GL Management System, "ISI-RA-MEA-4620 Shadow Flicker Impact Assessment", Revision A, 2017-03-01. (Dieses Dokument ist Teil des DNV GL Management Systems und kann bei Bedarf eingesehen werden.)

## 10 TABELLENVERZEICHNIS

Tabelle 2.1: WEA der verbleibenden Vorbelastung nach Rückbau

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## 11 ANHANG

Auf den folgenden Seiten sind die Berechnungsergebnisse dargestellt.

# 11.1 Hauptergebnis Vorbelastung Bestandssituation (vor Rückbau)

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## SHADOW - Hauptergebnis

**Berechnung:** Vorbelastung Bestandssituation vor dem Rückbau für WP Riepsdorf-Grömitz  
**Annahmen für Schattenschwurberechnung**

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

Minimale relevante Sonnenhöhe über Horizont 3 °  
Tage zwischen Berechnungen 1 Tag(e)  
Berechnungszeitsprung 1 Minuten  
Die dargestellten Zeiten sind die astronomisch maximal mögliche  
Beschattungsdauer, berechnet unter folgenden Annahmen:  
Die Sonne scheint täglich von Sonnenauf- bis -untergang  
Die Rotorfläche steht immer senkrecht zur Sonneneinfallrichtung  
Die Windenergieanlage/n ist/sind immer in Betrieb

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der  
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf  
den folgenden Annahmen:  
Verwendete Höhenlinien: Höhenlinien: oro\_2019-07-25.map (1)  
Rasterauflösung: 10,0 m

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

### WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ		Typ	Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller					Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA 01 (GRN)	626.955	6.009.774	20,8	WEA 01 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 02 (GRN)	627.240	6.009.666	25,0	WEA 02 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 03 (GRN)	627.525	6.009.556	25,0	WEA 03 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 04 (GRN)	626.826	6.009.569	20,0	WEA 04 REP...	Nein	REpower	MD 70-1.500	1.500	70,0	65,0	1.453	19,0
WEA 05 (GRN)	627.037	6.009.390	23,9	WEA 05 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 06 (GRN)	627.377	6.009.189	25,0	WEA 06 Ener...	Nein	ENERCON	E-66/18.70-1.800	1.800	70,0	65,0	1.487	22,0
WEA 07 (GRN)	627.835	6.009.437	25,0	WEA 07 Ener...	Nein	ENERCON	E-66/18.70-1.800	1.800	70,0	65,0	1.487	22,0
WEA 08 (GRN)	627.591	6.009.028	20,6	WEA 08 Ener...	Nein	ENERCON	E-66/18.70-1.800	1.800	70,0	65,0	1.487	22,0
WEA 10 (GRS)	625.825	6.008.222	16,4	WEA 10 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 11 (GRS)	626.145	6.008.219	21,9	WEA 11 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 12 (GRS)	626.491	6.008.169	25,0	WEA 12 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 13 (GRS)	626.067	6.008.014	16,5	WEA 13 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 14 (GRS)	626.378	6.007.889	16,8	WEA 14 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 15 (GCN)	628.439	6.008.420	25,0	WEA 15 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 16 (GCN)	628.861	6.008.454	20,7	WEA 16 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 17 (GCN)	628.721	6.008.093	21,8	WEA 17 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 18 (GCN)	629.006	6.008.251	20,0	WEA 18 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 19 (GCS)	627.286	6.007.351	20,0	WEA 19 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 20 (GCS)	627.481	6.007.592	20,0	WEA 20 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 21 (GCS)	627.404	6.007.112	17,5	WEA 21 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 22 (Kab)	626.313	6.011.135	16,1	WEA 22 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 23 (Kab)	626.606	6.010.014	18,8	WEA 23 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 24 (Kab)	626.513	6.010.960	17,0	WEA 24 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 25 (Kab)	626.649	6.010.300	18,9	WEA 25 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 32 (LR)	624.599	6.009.726	25,0	WEA 32 Ener...	Nein	ENERCON	E-66/18.70-1.800	1.800	70,0	65,0	1.487	22,0
WEA 33 (LR)	624.912	6.009.921	15,0	WEA 33 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 35 (L)	624.386	6.010.378	20,0	WEA 35 Ener...	Nein	ENERCON	E-66/15.66-1.500	1.500	66,0	85,0	1.462	22,0
WEA 36 (L)	623.918	6.010.628	15,0	WEA 36 Ener...	Nein	ENERCON	E-40/5.40-500	500	40,3	65,0	897	38,0
WEA 37 (L)	624.118	6.010.054	24,0	WEA 37 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 38 (L)	624.081	6.010.287	20,0	WEA 38 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 39 (L)	624.003	6.010.476	24,7	WEA 39 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 40 (RW)	626.898	6.010.632	20,0	WEA 40 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 41 (RW)	626.988	6.010.354	23,9	WEA 41 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 42 (RW)	627.526	6.010.398	24,2	WEA 42 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 43 (RW)	627.165	6.009.938	25,0	WEA 43 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 44 (RW)	627.353	6.010.254	25,0	WEA 44 Vest...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA 45 (RW)	627.569	6.009.788	25,0	WEA 45 Vest...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA 46 (Dam)	624.033	6.011.232	25,0	WEA 46 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 47 (Dam)	624.290	6.011.385	20,0	WEA 47 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0

(Fortsetzung nächste Seite)...

Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

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Berechnet:  
10.01.2023 17:19/3.6.361

## SHADOW - Hauptergebnis

Berechnung: Vorbelastung Bestandssituation vor dem Rückbau für WP Riepsdorf-Grömitz

...(Fortsetzung von vorheriger Seite)

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA 48 (Dam)	623.712	6.011.262	15,0	WEA 48 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 49 (Dam)	623.845	6.011.006	18,8	WEA 49 Ener...	Ja	ENERCON	E-82 E2-2.300	2.300	82,0	108,4	1.601	18,0
WEA 50 (Dam)	624.437	6.011.234	20,0	WEA 50 Ener...	Ja	ENERCON	E-82 E2-2.300	2.300	82,0	108,4	1.601	18,0
WEA 51	627.701	6.011.676	7,8	WEA 51 Easy...	Nein	EasyWind	EasyWind 6-6	6	6,0	19,0	3.000	124,0
WEA K01	626.666	6.011.752	12,9	WEA K01 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA K02	626.813	6.011.347	20,0	WEA K02 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA K03	626.913	6.011.037	20,0	WEA K03 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA K04	627.292	6.010.772	20,9	WEA K04 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA_G1	627.652	6.008.659	20,0	WEA G1 Vest...	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0
WEA_G2	628.057	6.008.621	20,0	WEA G2 Vest...	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0
WEA_G3	628.449	6.008.723	20,0	WEA G3 Vest...	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0

## Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	628.558	6.010.372	16,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	628.360	6.010.427	15,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	628.395	6.010.275	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	628.355	6.010.179	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	628.206	6.010.047	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	628.100	6.009.969	20,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäckerstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Bäckerstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Bäckerstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Bäckerstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Bäckerstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Bäckerstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Bäckerstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Rätjendorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 26	IO 26 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 29	IO 29 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 30	IO 30 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rüttinger Kornhof 10 (Rütting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Kathenkamp 19 (Rütting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Kälberhof 5 (Rütting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Kathenkamp 2 (Rütting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Bäckerstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Bäckerstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Bäckerstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Bäckerstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Bäckerstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Grünbeck 15	625.962	6.010.018	12,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenziertes Anwender:

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Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

10.01.2023 17:19/3.6.361

## SHADOW - Hauptergebnis

**Berechnung:** Vorbelastung Bestandssituation vor dem Rückbau für WP Riepsdorf-Grömitz

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe	Neigung des	Ausrichtungsmodus	Augenhöhe
					[m]	[m]	[m]	[°]		(ZVI)
							ü.Gr.	Fensters		ü.Gr.
										[m]
IO 45	IO 45 Grünbeck 26	626.098	6.010.297	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Diekstraat 29	626.049	6.010.467	10,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

## Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag
		[h/a]	[d/a]	[h/d]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	27:04	175	0:23
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	35:29	193	0:33
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	37:19	213	0:30
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	52:23	248	0:27
IO 05	IO 05 Am Teich 4 (Riepsdorf)	55:34	246	0:23
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	58:51	273	0:24
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	59:47	247	0:27
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	66:09	239	0:32
IO 09	IO 09 Bäderstraße 2 (Gosdorf)	47:46	229	0:27
IO 10	IO 10 Bäderstraße 8 (Gosdorf)	37:52	208	0:26
IO 11	IO 11 Bäderstraße 17 (Gosdorf)	33:41	208	0:23
IO 12	IO 12 Bäderstraße 25 (Gosdorf)	21:53	156	0:21
IO 13	IO 13 Bäderstraße 35 (Gosdorf)	24:12	136	0:22
IO 14	IO 14 Bäderstraße 34 (Gosdorf)	24:36	150	0:20
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	31:51	193	0:22
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	38:13	199	0:26
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	46:42	198	0:45
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	63:02	184	0:54
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	71:06	176	0:56
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	89:33	180	1:10
IO 21	IO 21 Bäderstraße 24a (Gosdorf)	39:38	193	0:28
IO 22	IO 22 Achterhof (Gosdorf)	46:19	222	0:26
IO 23	IO 23 Ratjensdorfer Felde 2	19:52	83	0:34
IO 24	IO 24 Morest, Grömitz	32:32	119	0:27
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	14:28	68	0:19
IO 26	IO 26 Rütting Chaussee 1	105:41	283	1:03
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	62:09	205	0:47
IO 28	IO 28 Rüttinger Klosterkamp 5	69:53	254	0:50
IO 29	IO 29 Rüttinger Klosterkamp 9	59:02	206	0:43
IO 30	IO 30 Kathenkamp 11 (Rütting)	42:40	169	0:41
IO 31	IO 31 Rüttinger Kornhof 1 (Rütting)	53:48	217	0:41
IO 32	IO 32 Rüttinger Kornhof 10 (Rütting)	32:26	143	0:36
IO 33	IO 33 Kathenkamp 19 (Rütting)	68:37	225	0:36
IO 34	IO 34 Kälberhof 5 (Rütting)	58:23	212	0:33
IO 35	IO 35 Kathenkamp 2 (Rütting)	29:28	139	0:29
IO 36	IO 36 Bäderstraße 20-22 (Kabelhorst)	20:18	142	0:20
IO 37	IO 37 Bäderstraße 15 (Kabelhorst)	22:06	146	0:19
IO 38	IO 38 Bäderstraße 18 (Kabelhorst)	21:52	125	0:22
IO 39	IO 39 Bäderstraße 13 (Kabelhorst)	11:10	110	0:16
IO 40	IO 40 Bäderstraße 10 (Kabelhorst)	16:24	101	0:19
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	16:47	115	0:15
IO 42	IO 42 Grünbeck 2	58:43	228	0:31
IO 43	IO 43 Grünbeck 15	52:24	216	0:27
IO 44	IO 44 Grünbeck 16	54:15	196	0:41
IO 45	IO 45 Grünbeck 26	54:00	186	0:40
IO 46	IO 46 Diekstraat 29	81:58	247	0:35

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA 01 (GRN)	WEA 01 Jacobs MD70 (R70059)	28:54
WEA 02 (GRN)	WEA 02 Jacobs MD70 (R70067)	45:30
WEA 03 (GRN)	WEA 03 Jacobs MD70 (R70060)	65:18

(Fortsetzung nächste Seite)...

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**

Sommerdeich 14 b

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(0 48 56)901-0

Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

10.01.2023 17:19/3.6.361

## SHADOW - Hauptergebnis

**Berechnung:** Vorbelastung Bestandssituation vor dem Rückbau für WP Riepsdorf-Grömitz

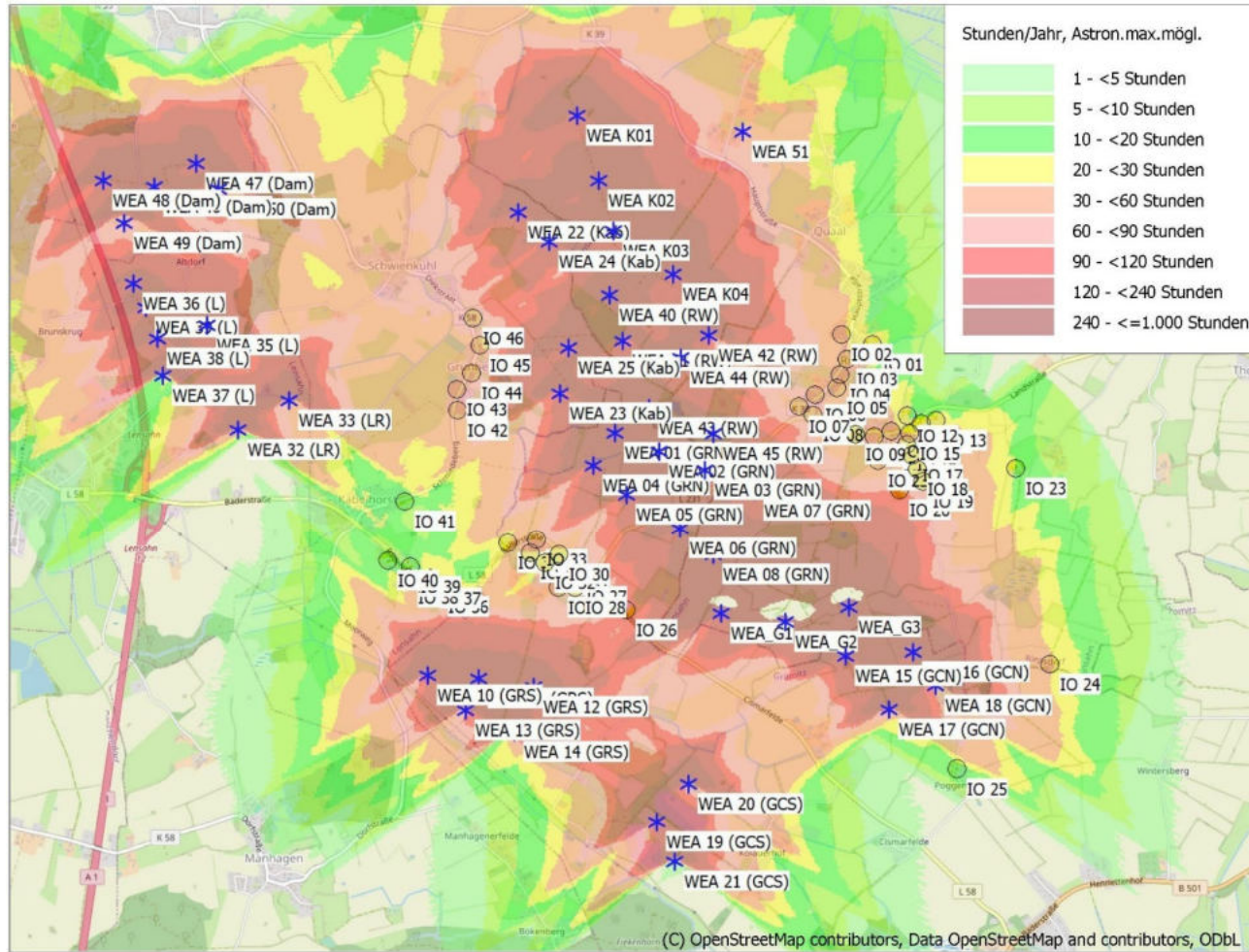
...(Fortsetzung von vorheriger Seite)

Nr.	Name	Maximal [h/a]
WEA 04 (GRN)	WEA 04 REpower MD70	45:52
WEA 05 (GRN)	WEA 05 Jacobs MD70	81:38
WEA 06 (GRN)	WEA 06 Enercon E-66 18.70	74:24
WEA 07 (GRN)	WEA 07 Enercon E-66 18.70	105:34
WEA 08 (GRN)	WEA 08 Enercon E-66 18.70	54:49
WEA 10 (GRS)	WEA 10 Jacobs MD70 (R70027)	25:28
WEA 11 (GRS)	WEA 11 Jacobs MD70 (R70028)	65:01
WEA 12 (GRS)	WEA 12 Jacobs MD70 (R70020)	28:26
WEA 13 (GRS)	WEA 13 Jacobs MD70 (R70029)	17:35
WEA 14 (GRS)	WEA 14 Jacobs MD70 (R70021)	6:42
WEA 15 (GCN)	WEA 15 Jacobs MD70	4:11
WEA 16 (GCN)	WEA 16 Jacobs MD70	5:14
WEA 17 (GCN)	WEA 17 Jacobs MD70	2:54
WEA 18 (GCN)	WEA 18 Jacobs MD70	7:36
WEA 19 (GCS)	WEA 19 Jacobs MD70	0:00
WEA 20 (GCS)	WEA 20 Jacobs MD70	0:04
WEA 21 (GCS)	WEA 21 Jacobs MD70	0:00
WEA 22 (Kab)	WEA 22 NEG Micon NM 1500 C (V63504)	0:00
WEA 23 (Kab)	WEA 23 NEG Micon NM 1500 C (V65431)	61:05
WEA 24 (Kab)	WEA 24 NEG Micon NM 1500 C (V65430)	0:00
WEA 25 (Kab)	WEA 25 NEG Micon NM 1500 C (V65416)	60:10
WEA 32 (LR)	WEA 32 Enercon E-66/18.70	5:51
WEA 33 (LR)	WEA 33 Jacobs MD70 (R70032)	9:39
WEA 35 (L)	WEA 35 Enercon E-66/15.66	0:00
WEA 36 (L)	WEA 36 Enercon E-40/5.40	0:00
WEA 37 (L)	WEA 37 Enercon E-70 E4 (Lensahn 1)	0:00
WEA 38 (L)	WEA 38 Enercon E-70 E4 (Lensahn 2)	0:00
WEA 39 (L)	WEA 39 Enercon E-70 E4 (Lensahn 3)	0:00
WEA 40 (RW)	WEA 40 Jacobs MD70 (R70068)	33:30
WEA 41 (RW)	WEA 41 Jacobs MD70 (R70069)	32:31
WEA 42 (RW)	WEA 42 Jacobs MD70 (R70065)	64:58
WEA 43 (RW)	WEA 43 Jacobs MD70 (R70058)	30:52
WEA 44 (RW)	WEA 44 Vestas V47 (V1839)	7:42
WEA 45 (RW)	WEA 45 Vestas V47 (V1840)	18:26
WEA 46 (Dam)	WEA 46 Südwind S70 (SW70076)	0:00
WEA 47 (Dam)	WEA 47 Südwind S70 (SW70081)	0:00
WEA 48 (Dam)	WEA 48 Südwind S70 (SW70075)	0:00
WEA 49 (Dam)	WEA 49 Enercon E-82 (Schmidt)	0:00
WEA 50 (Dam)	WEA 50 Enercon E-82	0:00
WEA 51	WEA 51 Easywind 6	0:00
WEA K01	WEA K01 Enercon E-115 EP3 E3/2.9 MW (TES)	0:00
WEA K02	WEA K02 Enercon E-115 EP3 E3/2.9 MW (TES)	11:40
WEA K03	WEA K03 Enercon E-115 EP3 E3/2.9 MW (TES)	50:10
WEA K04	WEA K04 Enercon E-115 EP3 E3/2.9 MW (TES)	88:00
WEA_G1	WEA G1 Vestas V150-6.0	170:14
WEA_G2	WEA G2 Vestas V150-6.0	115:10
WEA_G3	WEA G3 Vestas V150-6.0	104:45

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



## 11.2 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau), Stunden pro Jahr



0 500 1000 1500 2000 m

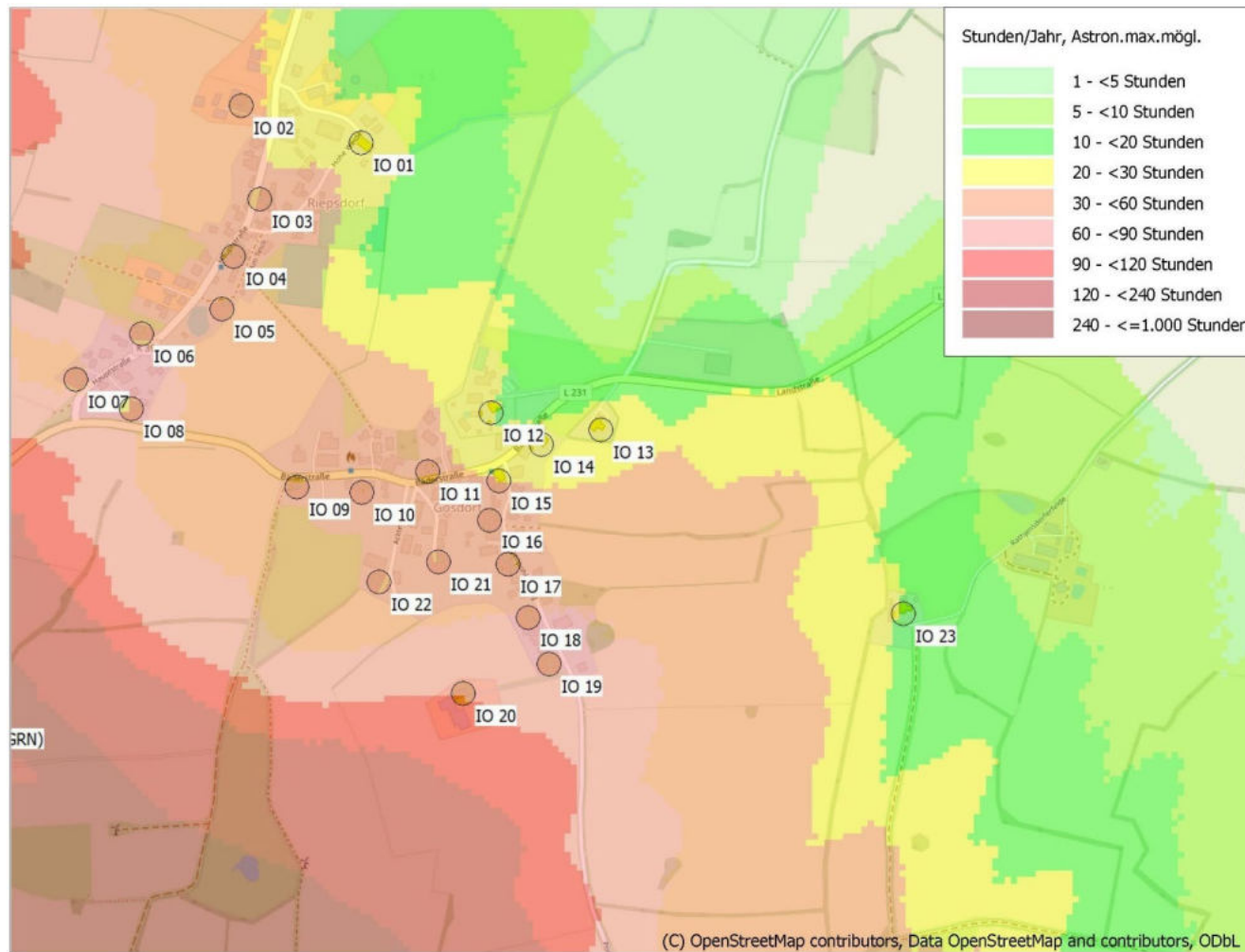
Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387

\* Existierende WEA

● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

### 11.3 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau) Detail Gosdorf, Stunden pro Jahr



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

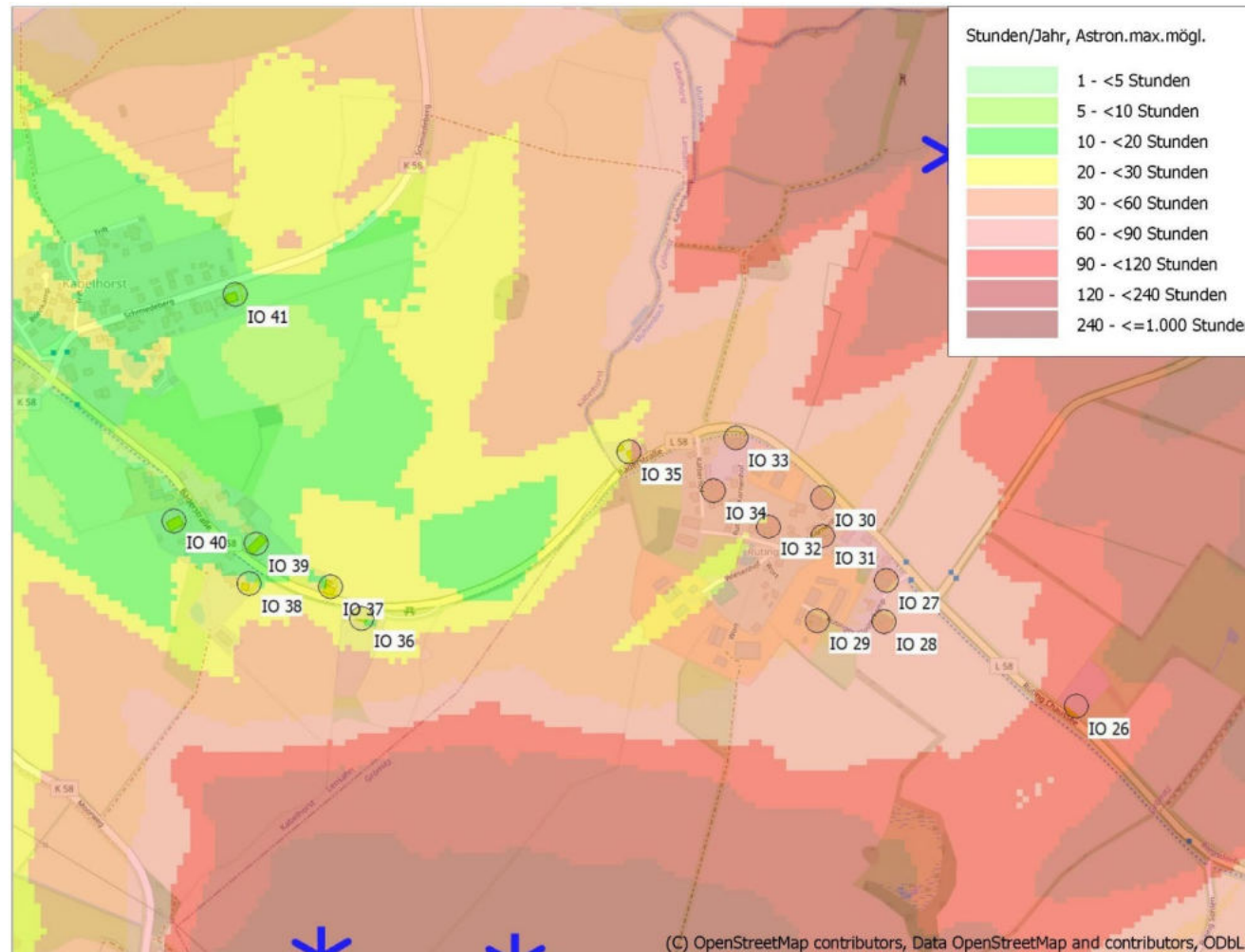
0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800

\* Existierende WEA    Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

## 11.4 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau) Detail Rüting, Stunden pro Jahr



0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.300 Nord: 6.008.990

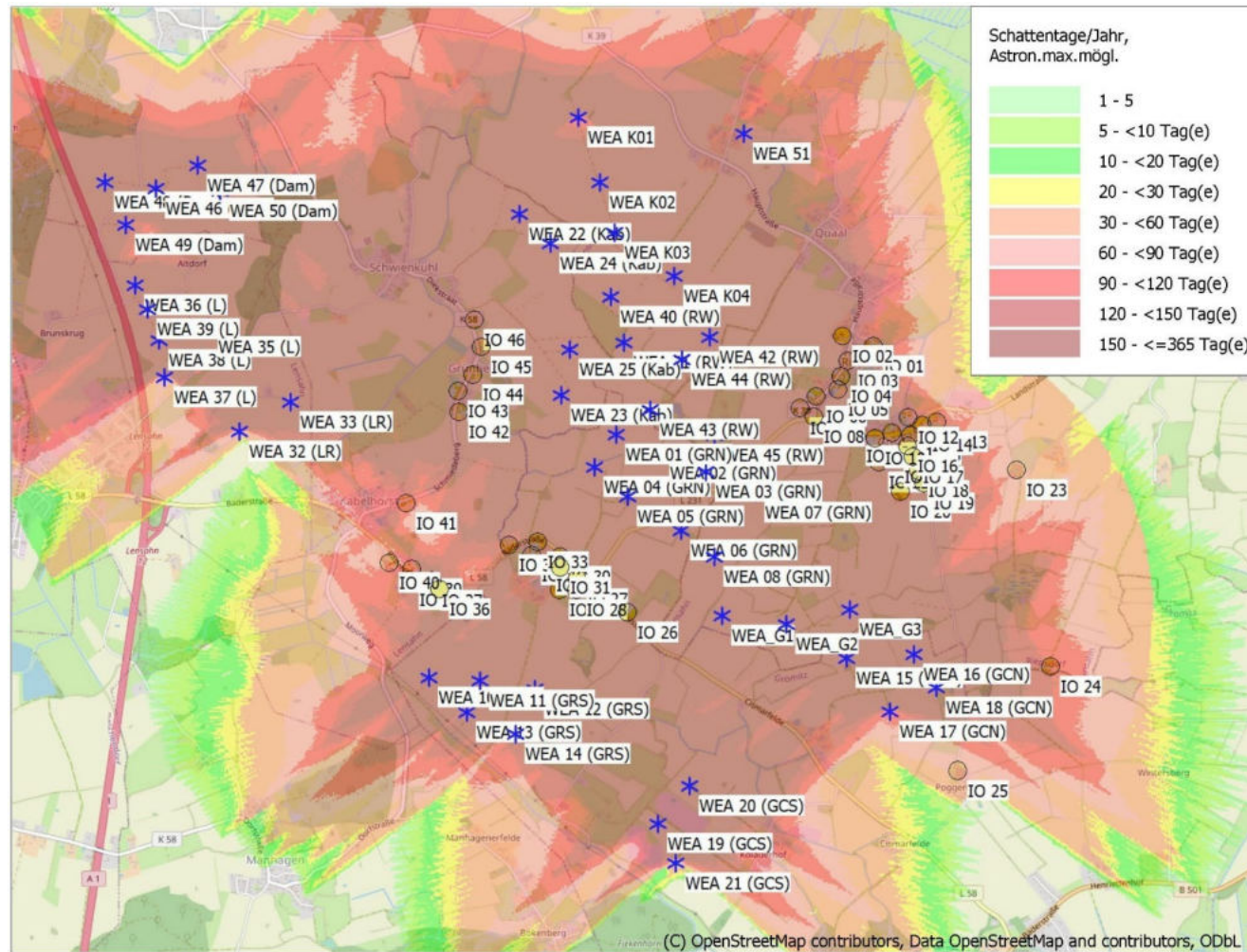
\* Existierende WEA

● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



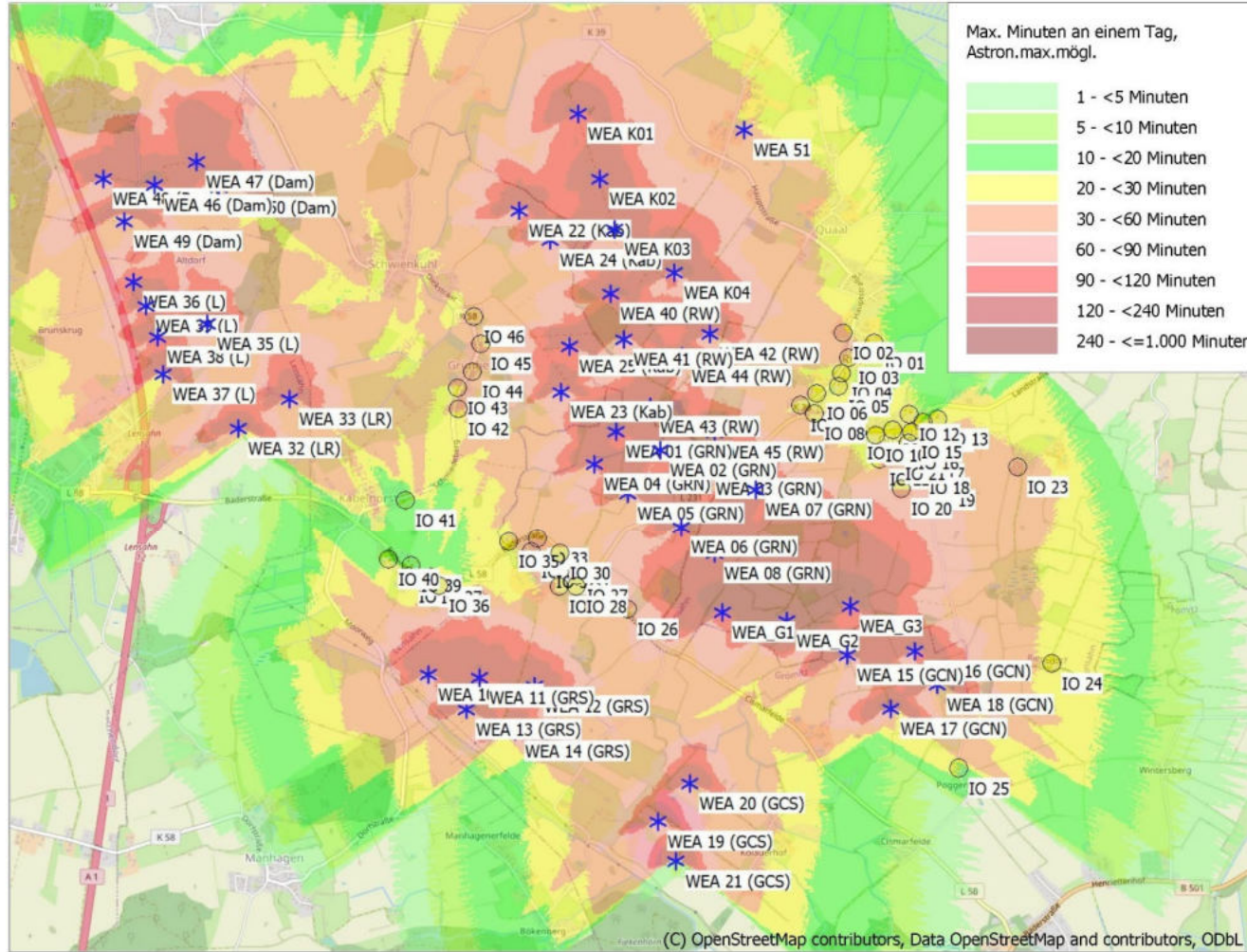
## 11.5 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau), Tage pro Jahr



0 500 1000 1500 2000 m

\* Existierende WEA    ● Schattenrezeptor  
 Karte: EMD OpenStreetMap , Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387  
 Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

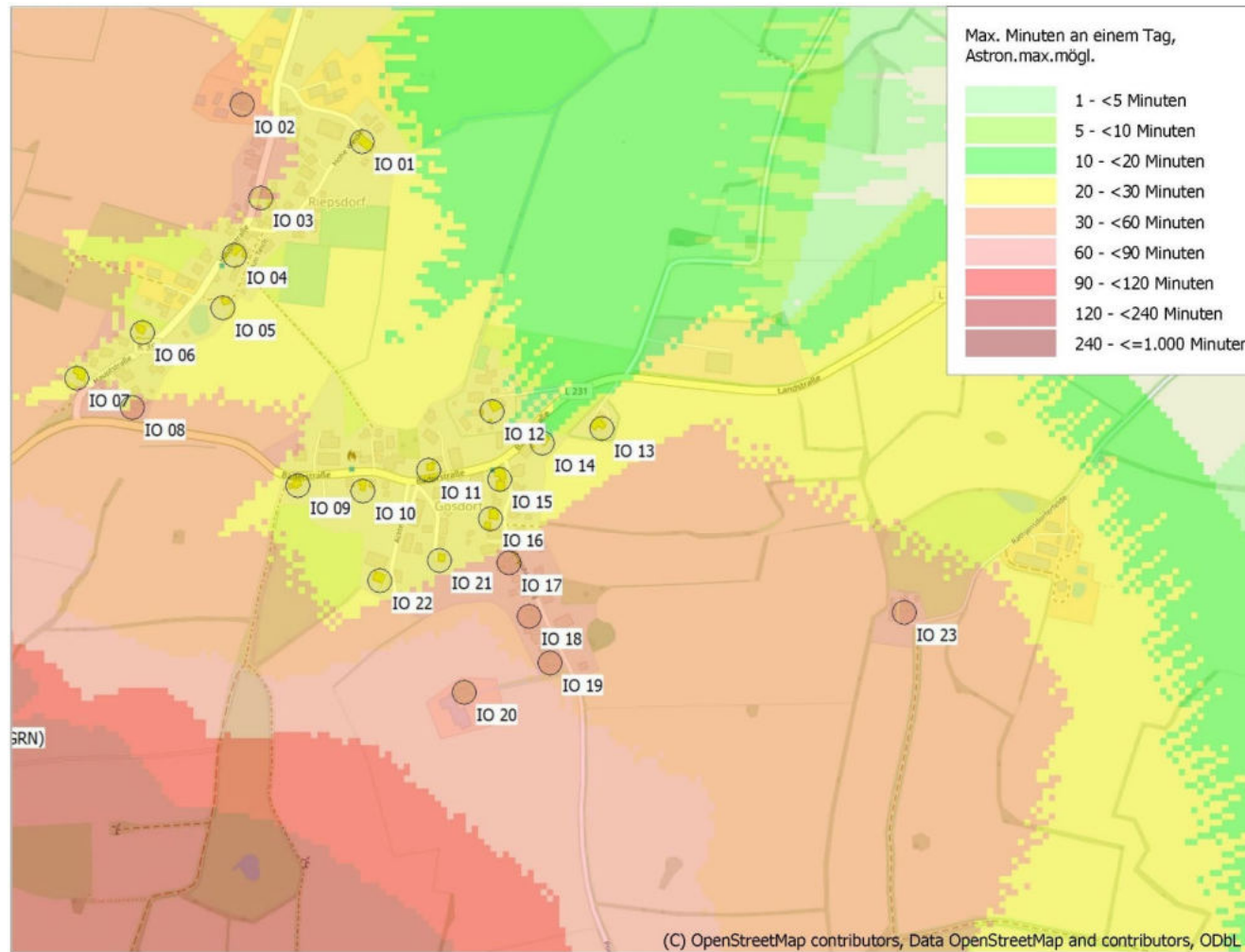
## 11.6 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau), Minuten pro Tag



0 500 1000 1500 2000 m  
 Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387  
 \* Existierende WEA    ● Schattenrezeptor  
 Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.7 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau) Detail Gosdorf, Minuten pro Tag



0 100 200 300 400 m

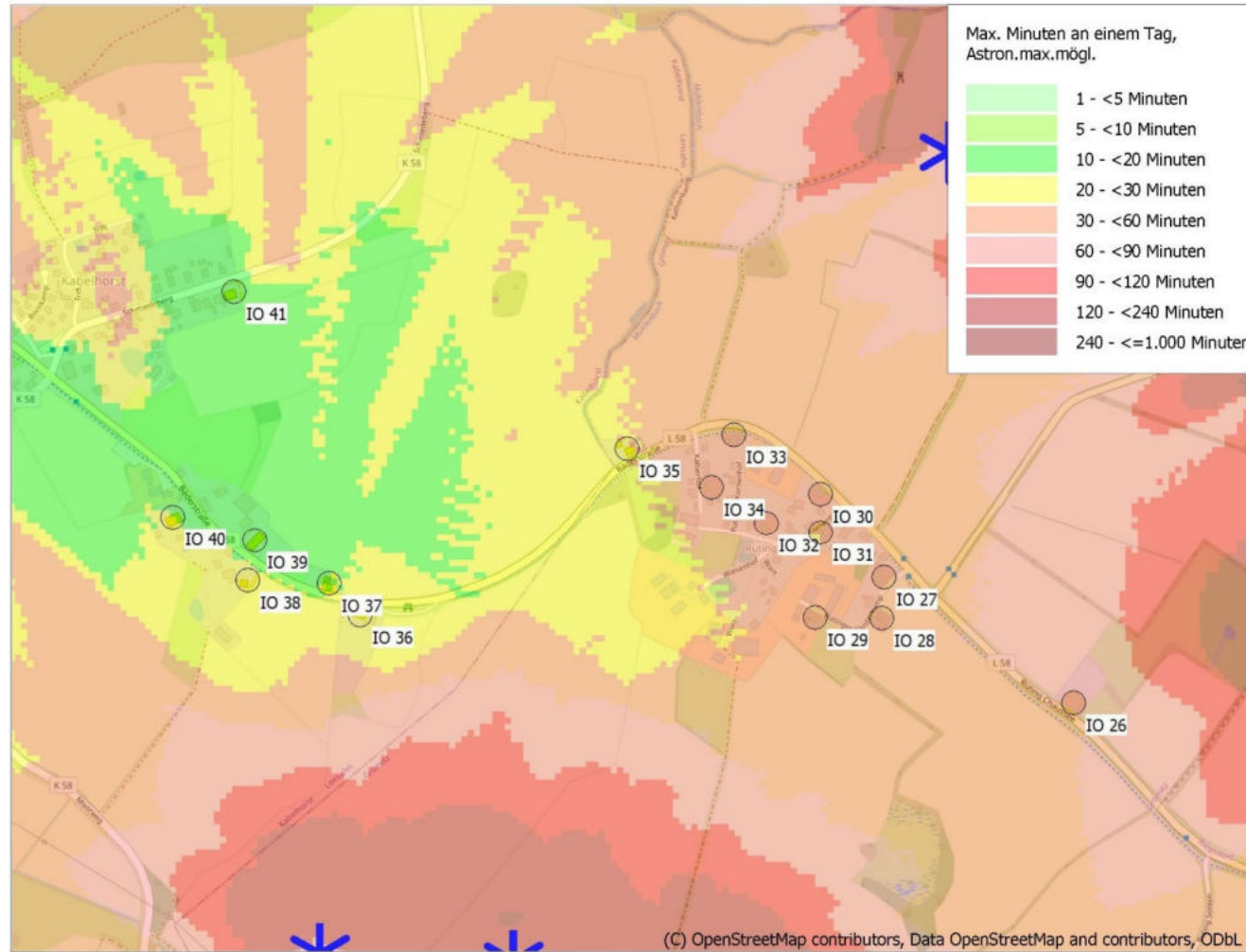
Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800

\* Existierende WEA

● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

## 11.8 Schattenwurfkarte Vorbelastung Bestandssituation (vor Rückbau) Detail Rütting, Minuten pro Tag



0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.300 Nord: 6.008.990

\* Existierende WEA    Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

## 11.9 Hauptergebnis verbleibende Vorbelastung nach Rückbau

Projekt:  
**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:  
**GL Garrad Hassan Deutschland GmbH**  
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(0 48 56)901-0  
Jörg Dedert / joerg.dedert@dnv.com  
Berechnet:  
10.01.2023 19:35/3.6.361

### SHADOW - Hauptergebnis

**Berechnung:** Vorbelastung verbleibender Bestand nach Rückbau für WP Riepsdorf-Grömitz  
**Annahmen für Schattenwurfberechnung**

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

Minimale relevante Sonnenhöhe über Horizont 3 °  
Tage zwischen Berechnungen 1 Tag(e)  
Berechnungszeitsprung 1 Minuten  
Die dargestellten Zeiten sind die astronomisch maximal mögliche  
Beschattungsdauer, berechnet unter folgenden Annahmen:  
Die Sonne scheint täglich von Sonnenauf- bis -untergang  
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung  
Die Windenergieanlage/n ist/sind immer in Betrieb

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der  
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf  
den folgenden Annahmen:  
Verwendete Höhenlinien: Höhenlinien: oro\_2019-07-25.map (1)  
Rasterauflösung: 10,0 m

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

### WEA

WEA	Ost	Nord	Z	Beschreibung	WEA-Typ		Typ	Nennleistung	Rotor-durch-messer	Naben-höhe	Schattendaten	
					Ak-tu-ell	Hersteller					Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA 01 (GRN)	626.955	6.009.774	20,8	WEA 01 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 02 (GRN)	627.240	6.009.666	25,0	WEA 02 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 03 (GRN)	627.525	6.009.556	25,0	WEA 03 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 04 (GRN)	626.826	6.009.569	20,0	WEA 04 REp...	Nein	REpower	MD 70-1.500	1.500	70,0	65,0	1.453	19,0
WEA 05 (GRN)	627.037	6.009.390	23,9	WEA 05 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 10 (GRS)	625.825	6.008.222	16,4	WEA 10 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 11 (GRS)	626.145	6.008.219	21,9	WEA 11 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 12 (GRS)	626.491	6.008.169	25,0	WEA 12 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 13 (GRS)	626.067	6.008.014	16,5	WEA 13 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 14 (GRS)	626.378	6.007.889	16,8	WEA 14 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 15 (GCN)	628.439	6.008.420	25,0	WEA 15 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 16 (GCN)	628.861	6.008.454	20,7	WEA 16 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 17 (GCN)	628.721	6.008.093	21,8	WEA 17 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 18 (GCN)	629.006	6.008.251	20,0	WEA 18 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 19 (GCS)	627.286	6.007.351	20,0	WEA 19 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 20 (GCS)	627.481	6.007.592	20,0	WEA 20 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 21 (GCS)	627.404	6.007.112	17,5	WEA 21 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 22 (Kab)	626.313	6.011.135	16,1	WEA 22 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 23 (Kab)	626.606	6.010.014	18,8	WEA 23 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 24 (Kab)	626.513	6.010.960	17,0	WEA 24 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 25 (Kab)	626.649	6.010.300	18,9	WEA 25 NEG...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 32 (LR)	624.599	6.009.726	25,0	WEA 32 Ener...	Nein	ENERCON	E-66/18.70-1.800	1.800	70,0	65,0	1.487	22,0
WEA 33 (LR)	624.912	6.009.921	15,0	WEA 33 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 35 (L)	624.386	6.010.378	20,0	WEA 35 Ener...	Nein	ENERCON	E-66/15.66-1.500	1.500	66,0	85,0	1.462	22,0
WEA 36 (L)	623.918	6.010.628	15,0	WEA 36 Ener...	Nein	ENERCON	E-40/5.40-500	500	40,3	65,0	897	38,0
WEA 37 (L)	624.118	6.010.054	24,0	WEA 37 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 38 (L)	624.081	6.010.287	20,0	WEA 38 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 39 (L)	624.003	6.010.476	24,7	WEA 39 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 40 (RW)	626.898	6.010.632	20,0	WEA 40 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 41 (RW)	626.988	6.010.354	23,9	WEA 41 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 42 (RW)	627.526	6.010.398	24,2	WEA 42 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 43 (RW)	627.165	6.009.938	25,0	WEA 43 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 44 (RW)	627.353	6.010.254	25,0	WEA 44 Vest...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA 45 (RW)	627.569	6.009.788	25,0	WEA 45 Vest...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA 46 (Dam)	624.033	6.011.232	25,0	WEA 46 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 47 (Dam)	624.290	6.011.385	20,0	WEA 47 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 48 (Dam)	623.712	6.011.262	15,0	WEA 48 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 49 (Dam)	623.845	6.011.006	18,8	WEA 49 Ener...	Ja	ENERCON	E-82 E2-2.300	2.300	82,0	108,4	1.601	18,0
WEA 50 (Dam)	624.437	6.011.234	20,0	WEA 50 Ener...	Ja	ENERCON	E-82 E2-2.300	2.300	82,0	108,4	1.601	18,0

(Fortsetzung nächste Seite)...



Projekt:

SWP Windpark Riepsdorf-Grömitz

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(0 48 56)901-0

Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

10.01.2023 19:35/3.6.361

## SHADOW - Hauptergebnis

**Berechnung:** Vorbelastung verbleibender Bestand nach Rückbau für WP Riepsdorf-Grömitz

...(Fortsetzung von vorheriger Seite)

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min
			[m]				[kW]	[m]	[m]	[m]	[U/min]	
WEA 51	627.701	6.011.676	7,8	WEA 51 Easy...	Nein	EasyWind	EasyWind 6-6	6	6,0	19,0	3.000	124,0
WEA K01	626.666	6.011.752	12,9	WEA K01 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA K02	626.813	6.011.347	20,0	WEA K02 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA K03	626.913	6.011.037	20,0	WEA K03 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA K04	627.292	6.010.772	20,9	WEA K04 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA_G1	627.652	6.008.659	20,0	WEA G1 Vest...	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0
WEA_G2	628.057	6.008.621	20,0	WEA G2 Vest...	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0
WEA_G3	628.449	6.008.723	20,0	WEA G3 Vest...	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0

## Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	628.558	6.010.372	16,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	628.360	6.010.427	15,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	628.395	6.010.275	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	628.355	6.010.179	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	628.206	6.010.047	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	628.100	6.009.969	20,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäderstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Bäderstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Bäderstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Bäderstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Bäderstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Bäderstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Bäderstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Ratjensdorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 26	IO 26 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 29	IO 29 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 30	IO 30 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rüttinger Kornhof 10 (Rütting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Kathenkamp 19 (Rütting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Kälberhof 5 (Rütting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Kathenkamp 2 (Rütting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Bäderstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Bäderstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Bäderstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Bäderstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Bäderstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Grünbeck 15	625.962	6.010.018	12,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Grünbeck 26	626.098	6.010.297	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Diekstraat 29	626.049	6.010.467	10,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenziertes Anwender:

**GL Garrad Hassan Deutschland GmbH**

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(0 48 56)901-0

Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

10.01.2023 19:35/3.6.361

## SHADOW - Hauptergebnis

**Berechnung:** Vorbelastung verbleibender Bestand nach Rückbau für WP Riepsdorf-Grömitz

### Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	19:08	137	0:23
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	35:29	193	0:33
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	33:25	189	0:30
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	39:55	190	0:27
IO 05	IO 05 Am Teich 4 (Riepsdorf)	35:07	174	0:23
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	40:33	209	0:23
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	37:37	183	0:26
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	30:59	157	0:30
IO 09	IO 09 Bäderstraße 2 (Gosdorf)	36:02	177	0:27
IO 10	IO 10 Bäderstraße 8 (Gosdorf)	29:41	164	0:26
IO 11	IO 11 Bäderstraße 17 (Gosdorf)	28:10	172	0:23
IO 12	IO 12 Bäderstraße 25 (Gosdorf)	18:58	137	0:21
IO 13	IO 13 Bäderstraße 35 (Gosdorf)	22:30	122	0:22
IO 14	IO 14 Bäderstraße 34 (Gosdorf)	22:16	134	0:20
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	28:05	164	0:22
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	34:03	170	0:26
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	42:49	170	0:45
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	59:18	156	0:54
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	67:42	151	0:56
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	83:11	144	1:10
IO 21	IO 21 Bäderstraße 24a (Gosdorf)	33:08	149	0:28
IO 22	IO 22 Achterhof (Gosdorf)	36:58	174	0:26
IO 23	IO 23 Ratjensdorfer Felde 2	19:52	83	0:34
IO 24	IO 24 Morest, Grömitz	32:32	119	0:27
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	14:28	68	0:19
IO 26	IO 26 Rütting Chaussee 1	80:03	215	1:03
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	43:15	132	0:47
IO 28	IO 28 Rüttinger Klosterkamp 5	43:04	148	0:50
IO 29	IO 29 Rüttinger Klosterkamp 9	46:48	147	0:43
IO 30	IO 30 Kathenkamp 11 (Rütting)	30:03	115	0:41
IO 31	IO 31 Rüttinger Komenhof 1 (Rütting)	40:44	165	0:41
IO 32	IO 32 Rüttinger Komenhof 10 (Rütting)	22:54	96	0:36
IO 33	IO 33 Kathenkamp 19 (Rütting)	60:40	175	0:36
IO 34	IO 34 Kälberhof 5 (Rütting)	51:16	166	0:33
IO 35	IO 35 Kathenkamp 2 (Rütting)	25:26	109	0:29
IO 36	IO 36 Bäderstraße 20-22 (Kabelhorst)	20:18	142	0:20
IO 37	IO 37 Bäderstraße 15 (Kabelhorst)	22:06	146	0:19
IO 38	IO 38 Bäderstraße 18 (Kabelhorst)	21:52	125	0:22
IO 39	IO 39 Bäderstraße 13 (Kabelhorst)	11:10	110	0:16
IO 40	IO 40 Bäderstraße 10 (Kabelhorst)	16:24	101	0:19
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	16:47	115	0:15
IO 42	IO 42 Grünbeck 2	58:43	228	0:31
IO 43	IO 43 Grünbeck 15	52:24	216	0:27
IO 44	IO 44 Grünbeck 16	54:15	196	0:41
IO 45	IO 45 Grünbeck 26	54:00	186	0:40
IO 46	IO 46 Diekstraat 29	81:58	247	0:35

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA 01 (GRN)	WEA 01 Jacobs MD70 (R70059)	28:54
WEA 02 (GRN)	WEA 02 Jacobs MD70 (R70067)	45:30
WEA 03 (GRN)	WEA 03 Jacobs MD70 (R70060)	65:18
WEA 04 (GRN)	WEA 04 REpower MD70	45:52
WEA 05 (GRN)	WEA 05 Jacobs MD70	81:38
WEA 10 (GRS)	WEA 10 Jacobs MD70 (R70027)	25:28
WEA 11 (GRS)	WEA 11 Jacobs MD70 (R70028)	65:01
WEA 12 (GRS)	WEA 12 Jacobs MD70 (R70020)	28:26
WEA 13 (GRS)	WEA 13 Jacobs MD70 (R70029)	17:35
WEA 14 (GRS)	WEA 14 Jacobs MD70 (R70021)	6:42
WEA 15 (GCN)	WEA 15 Jacobs MD70	4:11
WEA 16 (GCN)	WEA 16 Jacobs MD70	5:14

(Fortsetzung nächste Seite)...



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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Berechnet:

10.01.2023 19:35/3.6.361

## SHADOW - Hauptergebnis

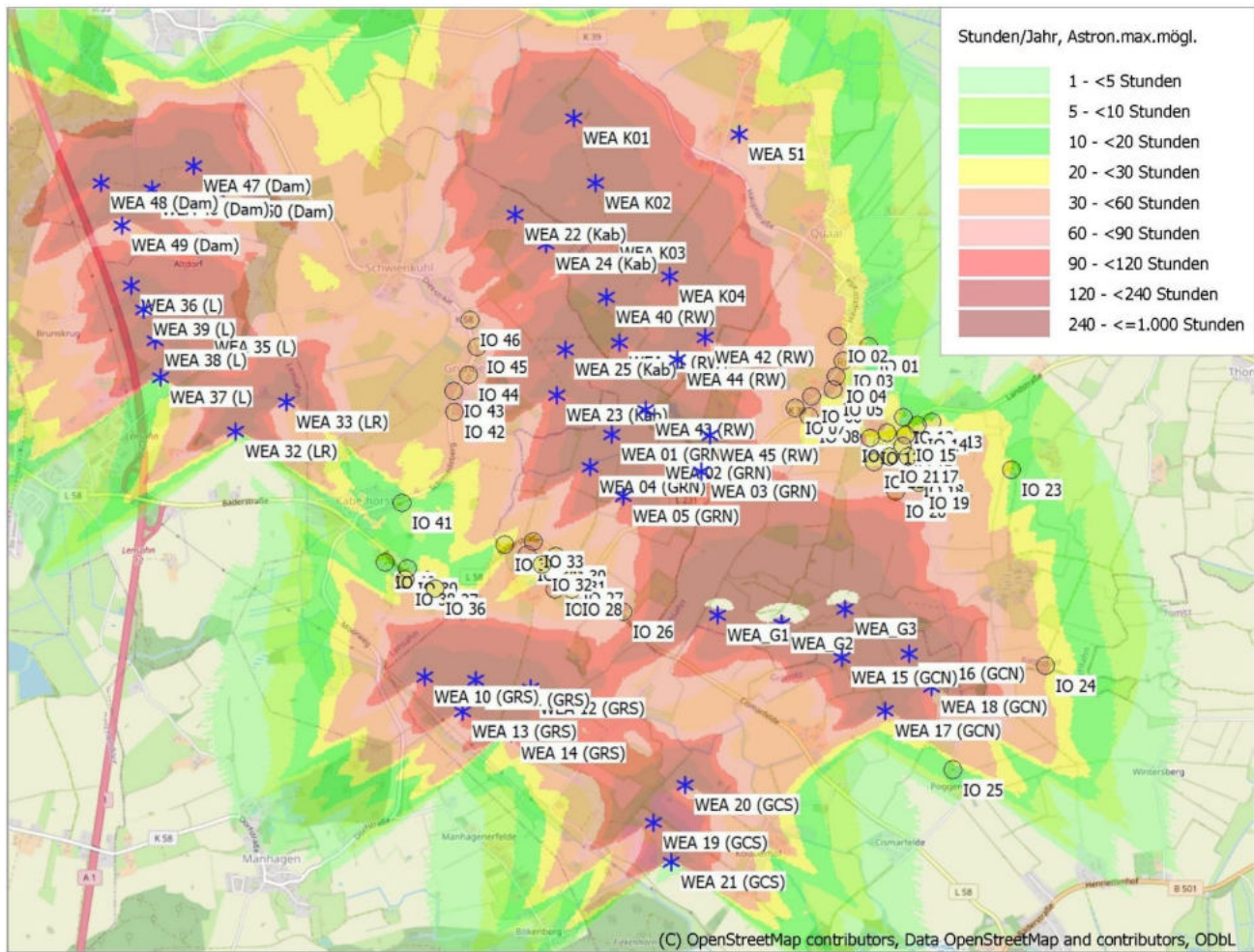
**Berechnung:** Vorbelastung verbleibender Bestand nach Rückbau für WP Riepsdorf-Grömitz

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Maximal [h/a]
WEA 17 (GCN)	WEA 17 Jacobs MD70	2:54
WEA 18 (GCN)	WEA 18 Jacobs MD70	7:36
WEA 19 (GCS)	WEA 19 Jacobs MD70	0:00
WEA 20 (GCS)	WEA 20 Jacobs MD70	0:04
WEA 21 (GCS)	WEA 21 Jacobs MD70	0:00
WEA 22 (Kab)	WEA 22 NEG Micon NM 1500 C (V63504)	0:00
WEA 23 (Kab)	WEA 23 NEG Micon NM 1500 C (V65431)	61:05
WEA 24 (Kab)	WEA 24 NEG Micon NM 1500 C (V65430)	0:00
WEA 25 (Kab)	WEA 25 NEG Micon NM 1500 C (V65416)	60:10
WEA 32 (LR)	WEA 32 Enercon E-66/18.70	5:51
WEA 33 (LR)	WEA 33 Jacobs MD70 (R70032)	9:39
WEA 35 (L)	WEA 35 Enercon E-66/15.66	0:00
WEA 36 (L)	WEA 36 Enercon E-40/5.40	0:00
WEA 37 (L)	WEA 37 Enercon E-70 E4 (Lensahn 1)	0:00
WEA 38 (L)	WEA 38 Enercon E-70 E4 (Lensahn 2)	0:00
WEA 39 (L)	WEA 39 Enercon E-70 E4 (Lensahn 3)	0:00
WEA 40 (RW)	WEA 40 Jacobs MD70 (R70068)	33:30
WEA 41 (RW)	WEA 41 Jacobs MD70 (R70069)	32:31
WEA 42 (RW)	WEA 42 Jacobs MD70 (R70065)	64:58
WEA 43 (RW)	WEA 43 Jacobs MD70 (R70058)	30:52
WEA 44 (RW)	WEA 44 Vestas V47 (V1839)	7:42
WEA 45 (RW)	WEA 45 Vestas V47 (V1840)	18:26
WEA 46 (Dam)	WEA 46 Südwind S70 (SW70076)	0:00
WEA 47 (Dam)	WEA 47 Südwind S70 (SW70081)	0:00
WEA 48 (Dam)	WEA 48 Südwind S70 (SW70075)	0:00
WEA 49 (Dam)	WEA 49 Enercon E-82 (Schmidt)	0:00
WEA 50 (Dam)	WEA 50 Enercon E-82	0:00
WEA 51	WEA 51 Easywind 6	0:00
WEA K01	WEA K01 Enercon E-115 EP3 E3/2,9 MW (TES)	0:00
WEA K02	WEA K02 Enercon E-115 EP3 E3/2,9 MW (TES)	11:40
WEA K03	WEA K03 Enercon E-115 EP3 E3/2,9 MW (TES)	50:10
WEA K04	WEA K04 Enercon E-115 EP3 E3/2,9 MW (TES)	88:00
WEA_G1	WEA G1 Vestas V150-6.0	170:14
WEA_G2	WEA G2 Vestas V150-6.0	115:10
WEA_G3	WEA G3 Vestas V150-6.0	104:45

Summen in Rechnergebnis und WEA-Tabelle können sich unterscheiden, da eine WEA gleichzeitig an zwei oder mehr Rechnergebnis-Beschäftigung verursachen kann und/oder an Rechnergebnis gleichzeitig von zwei oder mehr WEA beschaltet werden kann.

## 11.10 Schattenwurfkarte verbleibende Vorbelastung nach Rückbau, Stunden pro Jahr



0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387

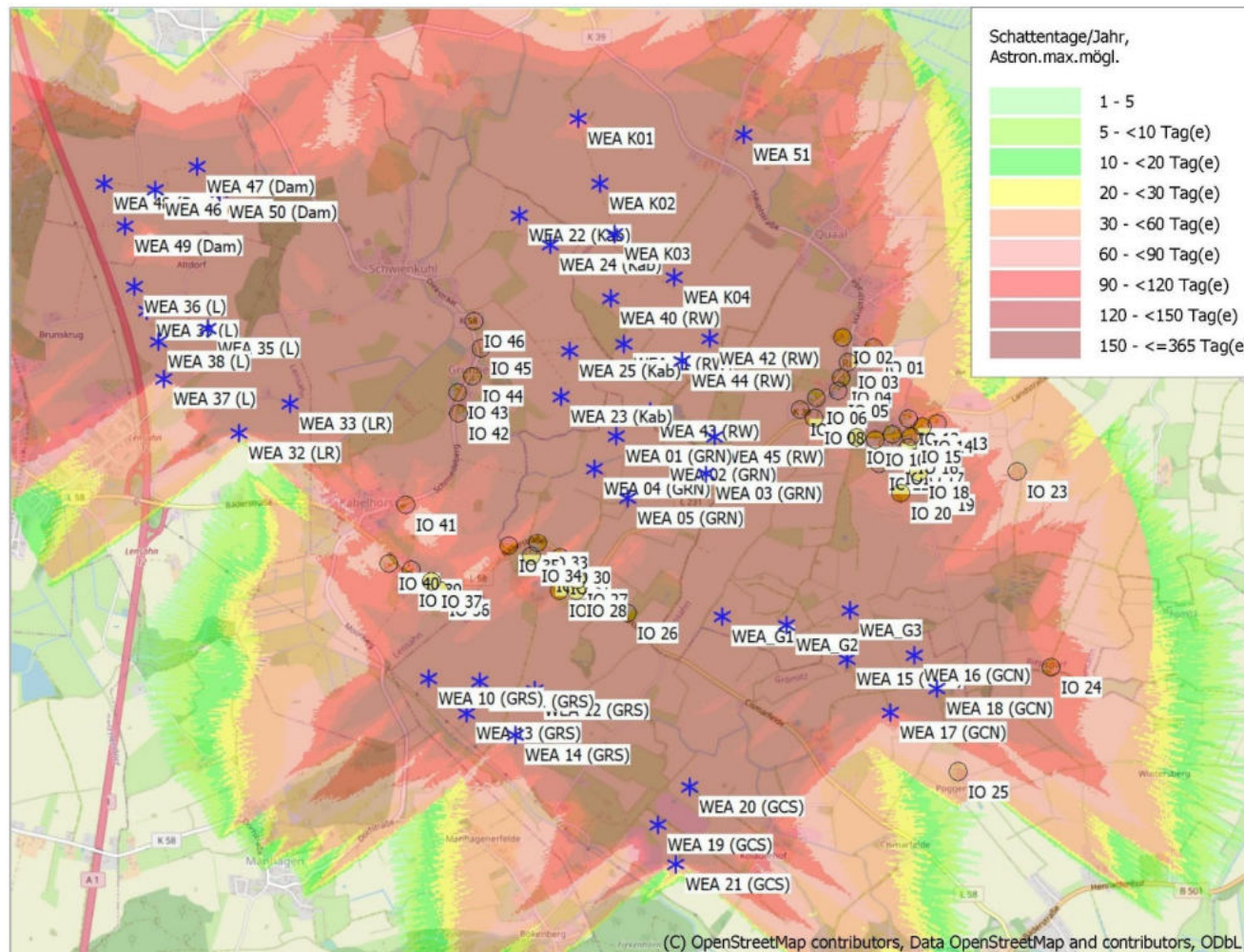
\* Existierende WEA

● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



### 11.11 Schattenwurfkarte verbleibende Vorbelastung nach Rückbau, Tage pro Jahr



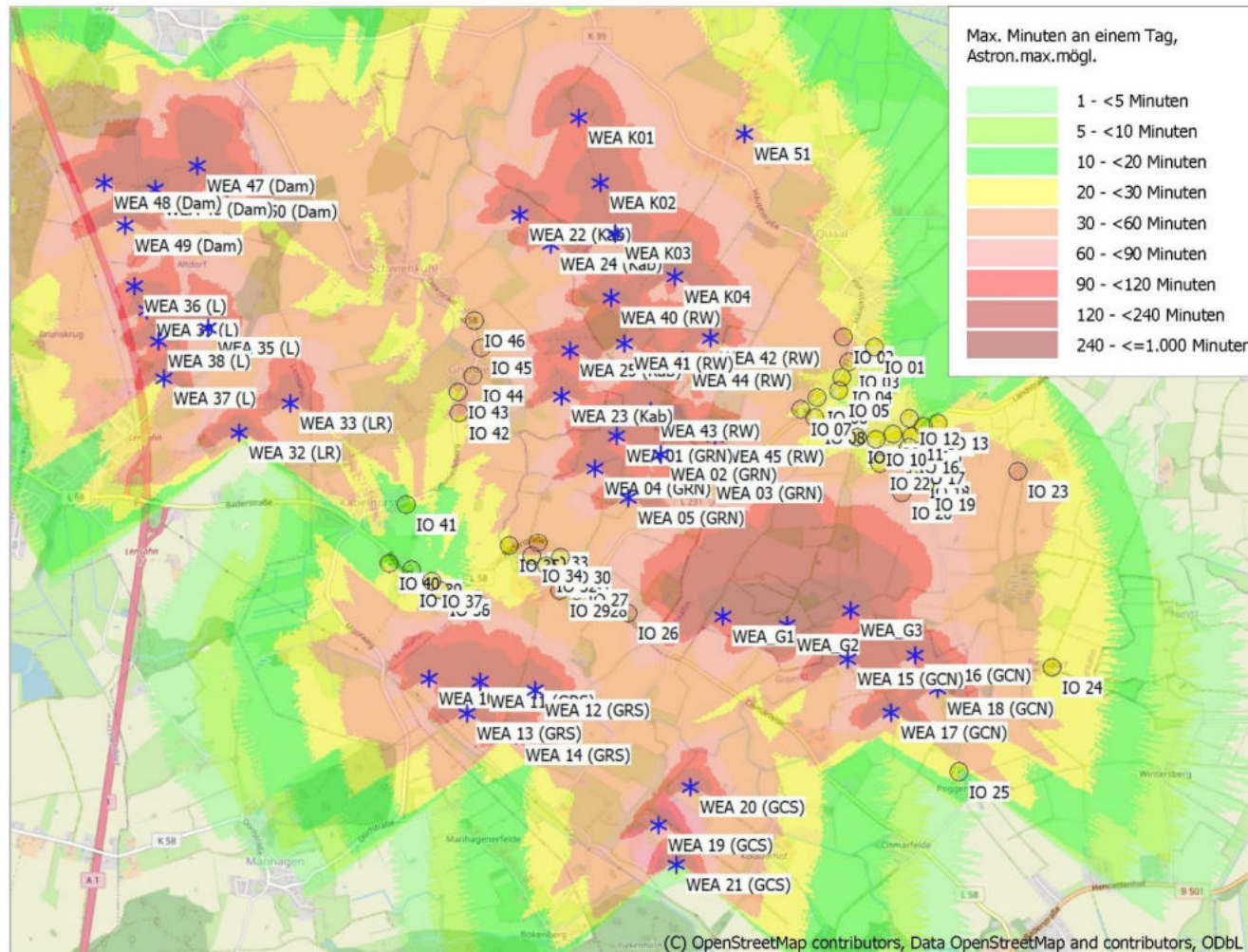
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387

\* Existierende WEA    ● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

## 11.12 Schattenwurfkarte verbleibende Vorbelastung nach Rückbau, Minuten pro Tag



0 500 1000 1500 2000 m  
 Karte: EMD OpenStreetMap , Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387  
 \* Existierende WEA    ● Schattenrezeptor  
 Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.13 Hauptergebnis Zusatzbelastung

Projekt:  
**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:  
**GL Garrad Hassan Deutschland GmbH**  
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Jörg Dedert / joerg.dedert@dnv.com  
Berechnet:  
10.01.2023 19:42/3.6.361

### SHADOW - Hauptergebnis

**Berechnung:** Zusatzbelastung Riepsdorf-Grömitz (1 x SG6.6-155)

#### Annahmen für Schattenwurfberechnung

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

Minimale relevante Sonnenhöhe über Horizont 3 °  
Tage zwischen Berechnungen 1 Tag(e)  
Berechnungszeitsprung 1 Minuten  
Die dargestellten Zeiten sind die astronomisch maximal mögliche  
Beschattungsdauer, berechnet unter folgenden Annahmen:  
Die Sonne scheint täglich von Sonnenauf- bis -untergang  
Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung  
Die Windenergieanlage/n ist/sind immer in Betrieb

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der  
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf  
den folgenden Annahmen:  
Verwendete Höhenlinien: Höhenlinien: ora\_2019-07-25.map (1)  
Rasterauflösung: 10,0 m

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

#### WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Typ	Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Ak-tu-eil	Hersteller						Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]		[m]	[U/min]
WEA RWE01	627.625	6.009.153	22,4	WEA RWE01 S...Ja	Siemens Gamesa	SG 6.0-155-6.600	6.600	155,0	102,5	2.007	9,3		

#### Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	628.558	6.010.372	16,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	628.360	6.010.427	15,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	628.395	6.010.275	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	628.355	6.010.179	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	628.206	6.010.047	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	628.100	6.009.969	20,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäderstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Bäderstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Bäderstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Bäderstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Bäderstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Bäderstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Bäderstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Ratjenstorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Mostest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 26	IO 26 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 29	IO 29 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 30	IO 30 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

## SHADOW - Hauptergebnis

### Berechnung: Zusatzbelastung Riepsdorf-Grömitz (1 x SG6.6-155)

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe	Neigung des	Ausrichtungsmodus	Augenhöhe
					[m]	[m]	ü.Gr.	Fensters		(ZVI)
					[m]	[m]	[m]	[°]		ü.Gr.
										[m]
IO 32	IO 32 Rütiger Kornhof 10 (Rüting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Kathenkamp 19 (Rüting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Kälberhof 5 (Rüting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Kathenkamp 2 (Rüting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Bäderstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Bäderstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Bäderstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Bäderstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Bäderstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Grünbeck 15	625.962	6.010.018	12,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Grünbeck 26	626.098	6.010.297	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Diekstraat 29	626.049	6.010.467	10,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

## Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag
		[h/a]	[d/a]	[h/d]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	19:39	56	0:25
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	4:16	22	0:15
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	19:44	50	0:28
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	26:37	60	0:31
IO 05	IO 05 Am Teich 4 (Riepsdorf)	33:19	70	0:33
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	33:29	64	0:37
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	38:01	66	0:41
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	48:37	82	0:40
IO 09	IO 09 Bäderstraße 2 (Gosdorf)	20:27	52	0:35
IO 10	IO 10 Bäderstraße 8 (Gosdorf)	15:53	44	0:32
IO 11	IO 11 Bäderstraße 17 (Gosdorf)	12:28	39	0:29
IO 12	IO 12 Bäderstraße 25 (Gosdorf)	9:41	34	0:26
IO 13	IO 13 Bäderstraße 35 (Gosdorf)	6:50	28	0:23
IO 14	IO 14 Bäderstraße 34 (Gosdorf)	8:14	31	0:25
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	9:51	34	0:27
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	10:22	36	0:28
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	9:54	33	0:27
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	9:40	33	0:27
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	9:15	32	0:27
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	12:37	37	0:30
IO 21	IO 21 Bäderstraße 24a (Gosdorf)	12:35	38	0:30
IO 22	IO 22 Achterhof (Gosdorf)	15:51	42	0:33
IO 23	IO 23 Ratjensdorfer Felde 2	3:14	20	0:16
IO 24	IO 24 Morest, Grömitz	0:00	0	0:00
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	0:00	0	0:00
IO 26	IO 26 Rüting Chaussee 1	10:04	39	0:22
IO 27	IO 27 Kathenkamp 1 (Rütinger Hof)	28:44	62	0:39
IO 28	IO 28 Rütinger Klosterkamp 5	31:23	69	0:39
IO 29	IO 29 Rütinger Klosterkamp 9	21:47	55	0:35
IO 30	IO 30 Kathenkamp 11 (Rüting)	19:51	48	0:36
IO 31	IO 31 Rütinger Kornhof 1 (Rüting)	20:31	50	0:36
IO 32	IO 32 Rütinger Kornhof 10 (Rüting)	16:26	44	0:33
IO 33	IO 33 Kathenkamp 19 (Rüting)	13:54	40	0:31
IO 34	IO 34 Kälberhof 5 (Rüting)	13:12	38	0:30
IO 35	IO 35 Kathenkamp 2 (Rüting)	9:38	32	0:27
IO 36	IO 36 Bäderstraße 20-22 (Kabelhorst)	4:17	24	0:17
IO 37	IO 37 Bäderstraße 15 (Kabelhorst)	3:44	20	0:16
IO 38	IO 38 Bäderstraße 18 (Kabelhorst)	2:51	18	0:14
IO 39	IO 39 Bäderstraße 13 (Kabelhorst)	2:52	18	0:15
IO 40	IO 40 Bäderstraße 10 (Kabelhorst)	0:00	0	0:00
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	2:53	18	0:15

(Fortsetzung nächste Seite)...



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**

Sommerdeich 14 b

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Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

10.01.2023 19:42/3.6.361

## SHADOW - Hauptergebnis

**Berechnung:** Zusatzbelastung Riepsdorf-Grömitz (1 x SG6.6-155)

...(Fortsetzung von vorheriger Seite)

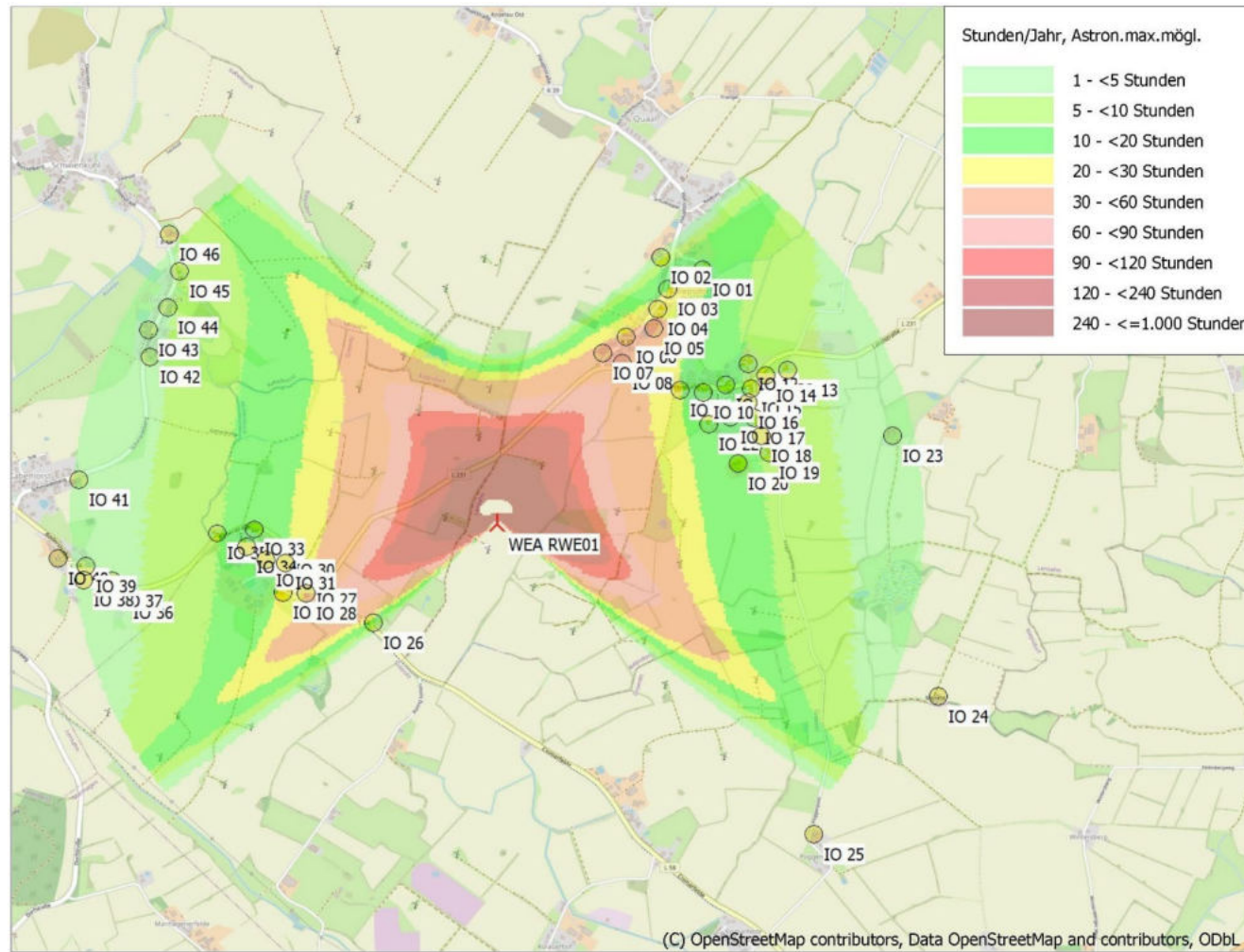
Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO 42	IO 42 Grünbeck 2	4:23	23	0:18
IO 43	IO 43 Grünbeck 15	4:17	24	0:18
IO 44	IO 44 Grünbeck 16	4:44	25	0:18
IO 45	IO 45 Grünbeck 26	5:04	28	0:18
IO 46	IO 46 Diekstraat 29	0:00	0	0:00

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA RWE01	WEA RWE01 Siemens Gamesa SG6.6-155	244:16

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

### 11.14 Schattenwurfkarte Zusatzbelastung, Stunden pro Jahr



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

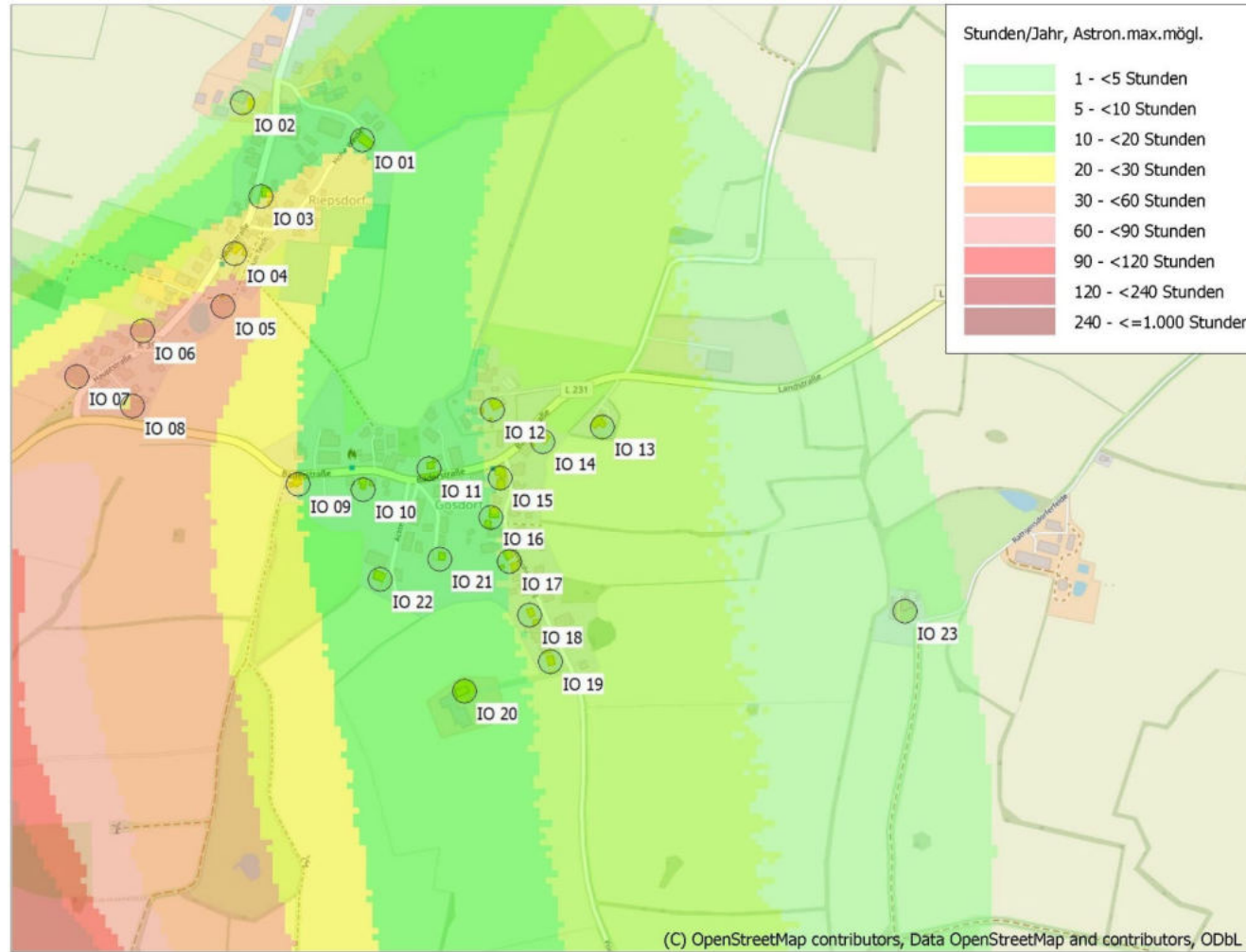
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap, Maßstab 1:28.500, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 628.200 Nord: 6.009.300

Neue WEA Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

### 11.15 Schattenwurfkarte Zusatzbelastung Detail Gosdorf, Stunden pro Jahr



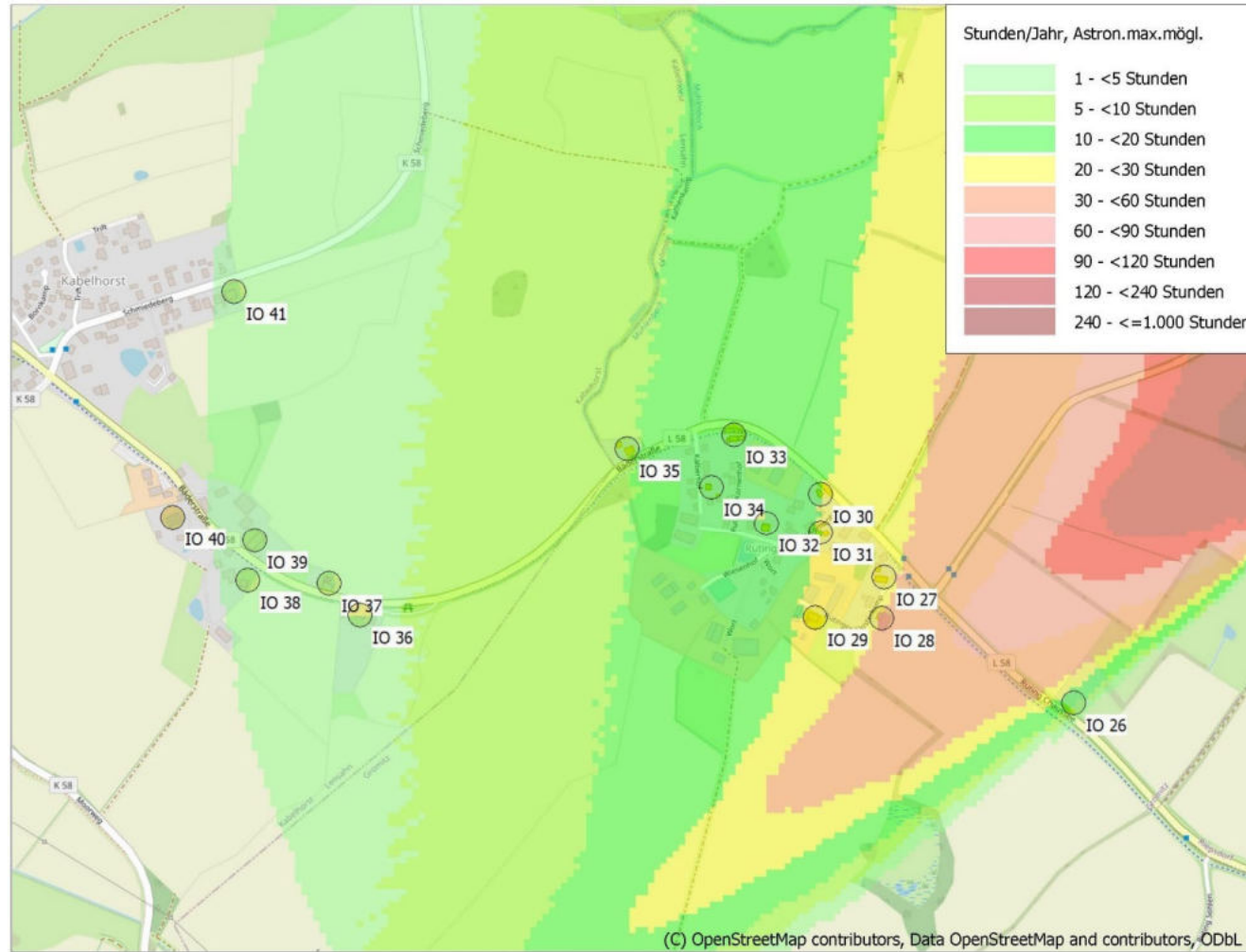
Neue WEA

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800

Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

### 11.16 Schattenwurfkarte Zusatzbelastung Detail Rütting, Stunden pro Jahr



0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.300 Nord: 6.008.990

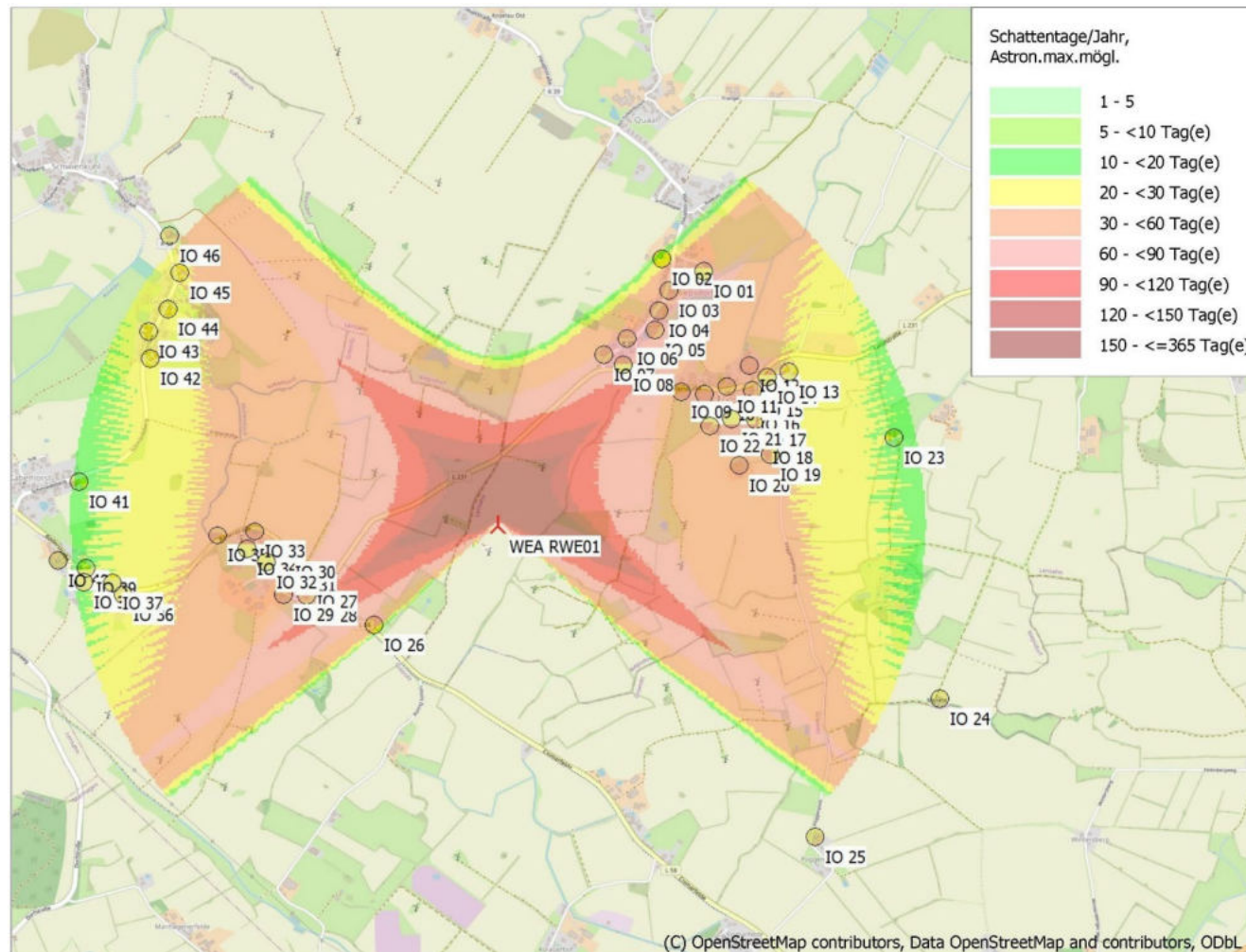
Neue WEA

Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.17 Schattenwurfkarte Zusatzbelastung, Tage pro Jahr



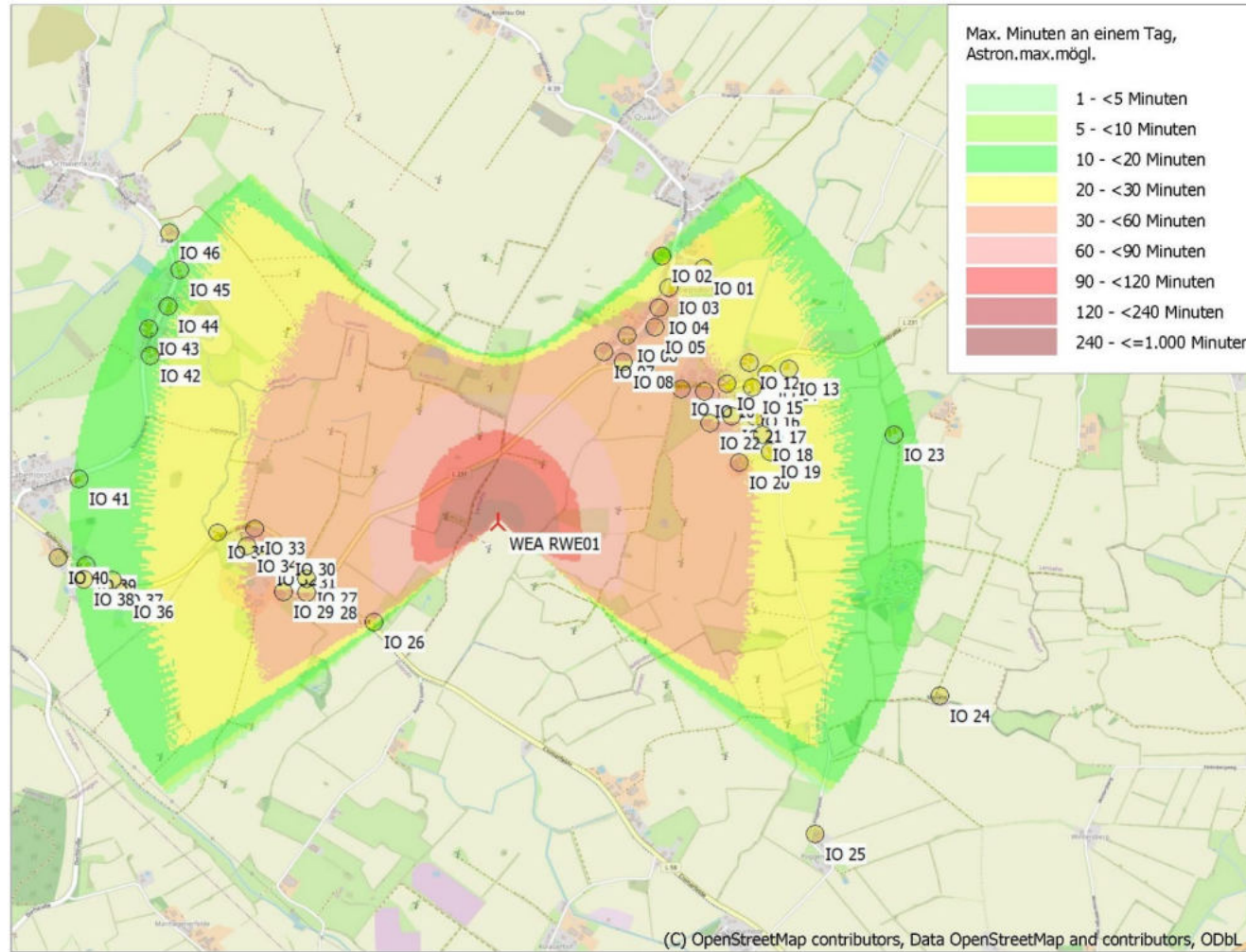
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap, Maßstab 1:28.500, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 628.200 Nord: 6.009.300

Neue WEA Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

### 11.18 Schattenwurfkarte Zusatzbelastung, Minuten pro Tag



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

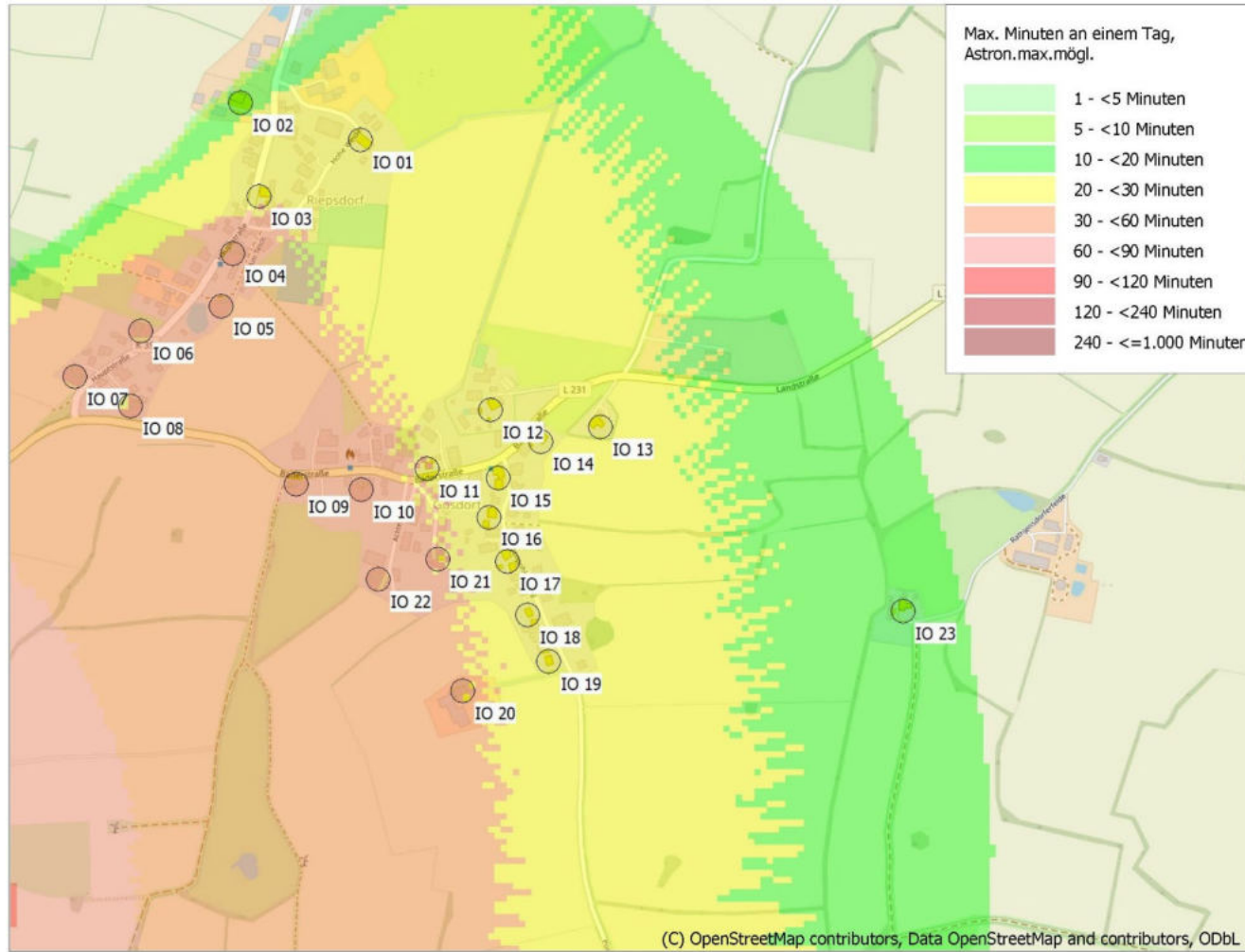
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:28.500, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 628.200 Nord: 6.009.300

Neue WEA Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

### 11.19 Schattenwurfkarte Zusatzbelastung Detail Gosdorf, Minuten pro Tag



0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800

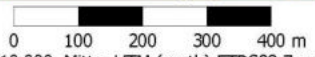
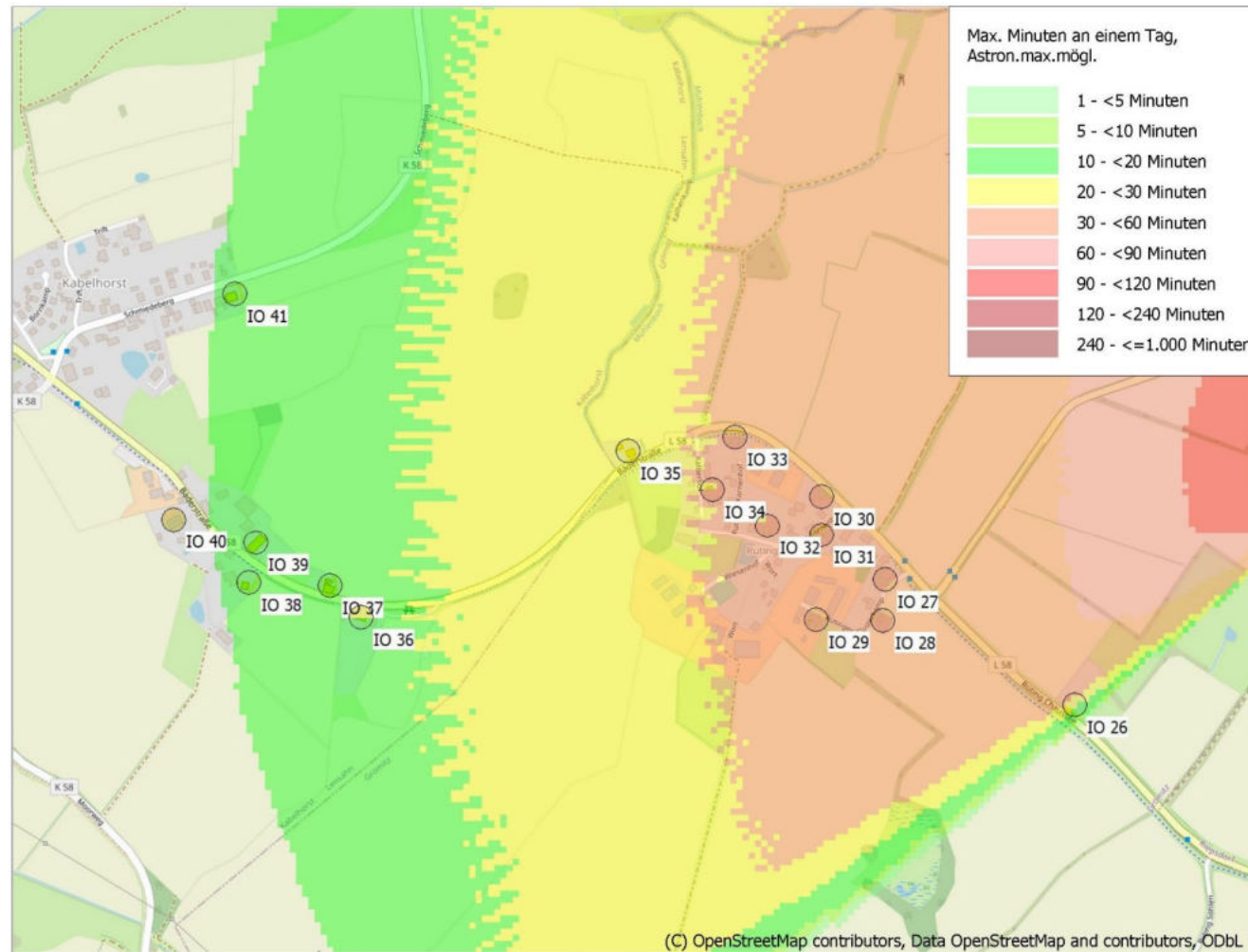
Neue WEA

Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.20 Schattenwurfkarte Zusatzbelastung Detail Rütting, Minuten pro Tag



Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.300 Nord: 6.008.990

Neue WEA

Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.21 Hauptergebnis Gesamtbelastung (nach Repowering)

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**

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DE-25709 Kaiser-Wilhelm-Koog

(0 48 56)901-0

Jörg Dedert / joerg.dedert@dnv.com

Berechnung:

10.01.2023 21:57/3.6.361

### SHADOW - Hauptergebnis

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)

#### Annahmen für Schattenwurfberechnung

Beschattungsbereich der WEA

Schatten nur relevant, wo Rotorblatt mind. 20% der Sonne verdeckt

Siehe WEA-Tabelle

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

Die dargestellten Zeiten sind die astronomisch maximal mögliche

Beschattungsdauer, berechnet unter folgenden Annahmen:

Die Sonne scheint täglich von Sonnenauf- bis -untergang

Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung

Die Windenergieanlage/n ist/sind immer in Betrieb

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

Verwendete Höhenlinien: Höhenlinien: ora\_2019-07-25.map (1)

Rasterauflösung: 10,0 m

Alle Koordinatenangaben in:

UTM (north)-ETRS89 Zone: 32

#### WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ		Typ	Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller					Beschatt.-Bereich	U/min
	[m]										[m]	[U/min]
WEA 01 (GRN)	626.955	6.009.774	20,8	WEA 01 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 02 (GRN)	627.240	6.009.666	25,0	WEA 02 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 03 (GRN)	627.525	6.009.556	25,0	WEA 03 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 04 (GRN)	626.826	6.009.569	20,0	WEA 04 REpo...	Nein	REpower	MD 70-1.500	1.500	70,0	65,0	1.453	19,0
WEA 05 (GRN)	627.037	6.009.390	23,9	WEA 05 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 10 (GRS)	625.825	6.008.222	16,4	WEA 10 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 11 (GRS)	626.145	6.008.219	21,9	WEA 11 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 12 (GRS)	626.491	6.008.169	25,0	WEA 12 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 13 (GRS)	626.067	6.008.014	16,5	WEA 13 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 14 (GRS)	626.378	6.007.889	16,8	WEA 14 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 15 (GCN)	628.439	6.008.420	25,0	WEA 15 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 16 (GCN)	628.861	6.008.454	20,7	WEA 16 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 17 (GCN)	628.721	6.008.093	21,8	WEA 17 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 18 (GCN)	629.006	6.008.251	20,0	WEA 18 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 19 (GCS)	627.286	6.007.351	20,0	WEA 19 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 20 (GCS)	627.481	6.007.592	20,0	WEA 20 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 21 (GCS)	627.404	6.007.112	17,5	WEA 21 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 22 (Kab)	626.313	6.011.135	16,1	WEA 22 NEG ...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 23 (Kab)	626.606	6.010.014	18,8	WEA 23 NEG ...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 24 (Kab)	626.513	6.010.960	17,0	WEA 24 NEG ...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 25 (Kab)	626.649	6.010.300	18,9	WEA 25 NEG ...	Nein	NEG MICON	NM1500/64-1.500/750	1.500	64,0	68,0	3.000	17,1
WEA 32 (LR)	624.599	6.009.726	25,0	WEA 32 Ener...	Nein	ENERCON	E-66/18.70-1.800	1.800	70,0	65,0	1.487	22,0
WEA 33 (LR)	624.912	6.009.921	15,0	WEA 33 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 35 (L)	624.386	6.010.378	20,0	WEA 35 Ener...	Nein	ENERCON	E-66/15.66-1.500	1.500	66,0	85,0	1.462	22,0
WEA 36 (L)	623.918	6.010.628	15,0	WEA 36 Ener...	Nein	ENERCON	E-40/5.40-500	500	40,3	65,0	897	38,0
WEA 37 (L)	624.118	6.010.054	24,0	WEA 37 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 38 (L)	624.081	6.010.287	20,0	WEA 38 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 39 (L)	624.003	6.010.476	24,7	WEA 39 Ener...	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	64,0	1.644	20,0
WEA 40 (RW)	626.898	6.010.632	20,0	WEA 40 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 41 (RW)	626.988	6.010.354	23,9	WEA 41 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 42 (RW)	627.526	6.010.398	24,2	WEA 42 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 43 (RW)	627.165	6.009.938	25,0	WEA 43 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	19,0
WEA 44 (RW)	627.353	6.010.254	25,0	WEA 44 Vest...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA 45 (RW)	627.569	6.009.788	25,0	WEA 45 Vest...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA 46 (Dam)	624.033	6.011.232	25,0	WEA 46 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 47 (Dam)	624.290	6.011.385	20,0	WEA 47 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 48 (Dam)	623.712	6.011.262	15,0	WEA 48 Süd...	Nein	SÜDWIND	S70-1.500	1.500	70,0	65,0	1.467	19,0
WEA 49 (Dam)	623.845	6.011.006	18,8	WEA 49 Ener...	Ja	ENERCON	E-82 E2-2.300	2.300	82,0	108,4	1.601	18,0
WEA 50 (Dam)	624.437	6.011.234	20,0	WEA 50 Ener...	Ja	ENERCON	E-82 E2-2.300	2.300	82,0	108,4	1.601	18,0
WEA 51	627.701	6.011.676	7,8	WEA 51 Easy...	Nein	EasyWind	EasyWind 6-6	6	6,0	19,0	3.000	124,0
WEA K01	626.666	6.011.752	12,9	WEA K01 Ene...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0

(Fortsetzung nächste Seite)...

## SHADOW - Hauptergebnis

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)

...(Fortsetzung von vorheriger Seite)

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min
			[m]				[kW]	[m]	[m]	[m]	[U/min]	
WEA K02	626.813	6.011.347	20,0	WEA K02 Ene...Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0	
WEA K03	626.913	6.011.037	20,0	WEA K03 Ene...Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0	
WEA K04	627.292	6.010.772	20,9	WEA K04 Ene...Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0	
WEA RWE01	627.625	6.009.153	22,4	WEA RWE01 ... Ja	Siemens Gamesa	SG 6.0-155-6.600	6.600	155,0	102,5	2.007	9,3	
WEA_G1	627.652	6.008.659	20,0	WEA G1 Vest... Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0	
WEA_G2	628.057	6.008.621	20,0	WEA G2 Vest... Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0	
WEA_G3	628.449	6.008.723	20,0	WEA G3 Vest... Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0	

## Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	628.558	6.010.372	16,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	628.360	6.010.427	15,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	628.395	6.010.275	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	628.355	6.010.179	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	628.206	6.010.047	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	628.100	6.009.969	20,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäckerstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Bäckerstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Bäckerstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Bäckerstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Bäckerstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Bäckerstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Bäckerstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Rätjendorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 26	IO 26 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 29	IO 29 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 30	IO 30 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rüttinger Kornhof 10 (Rütting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Kathenkamp 19 (Rütting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Kälberhof 5 (Rütting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Kathenkamp 2 (Rütting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Bäckerstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Bäckerstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Bäckerstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Bäckerstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Bäckerstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Grünbeck 15	625.962	6.010.018	12,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Grünbeck 26	626.098	6.010.297	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Diekstraat 29	626.049	6.010.467	10,3	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenziertes Anwender:

**GL Garrad Hassan Deutschland GmbH**

Sommerdeich 14 b

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(0 48 56)901-0

Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

10.01.2023 21:57/3.6.361

## SHADOW - Hauptergebnis

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)

### Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	38:47	193	0:25
IO 02	IO 02 Hauptstraße 29 (Riepsdorf)	39:45	215	0:33
IO 03	IO 03 Hauptstraße 24 (Riepsdorf)	53:09	239	0:30
IO 04	IO 04 Hauptstraße 16 (Riepsdorf)	66:32	250	0:31
IO 05	IO 05 Am Teich 4 (Riepsdorf)	68:26	244	0:33
IO 06	IO 06 Hauptstraße 3 (Riepsdorf)	74:02	273	0:37
IO 07	IO 07 Hauptstraße 1 (Riepsdorf)	75:38	249	0:41
IO 08	IO 08 Hauptstraße 4 (Riepsdorf)	79:36	239	0:40
IO 09	IO 09 Bäderstraße 2 (Gosdorf)	56:29	229	0:35
IO 10	IO 10 Bäderstraße 8 (Gosdorf)	45:34	208	0:32
IO 11	IO 11 Bäderstraße 17 (Gosdorf)	40:38	211	0:29
IO 12	IO 12 Bäderstraße 25 (Gosdorf)	28:39	171	0:26
IO 13	IO 13 Bäderstraße 35 (Gosdorf)	29:20	150	0:23
IO 14	IO 14 Bäderstraße 34 (Gosdorf)	30:30	165	0:25
IO 15	IO 15 Poggenpohler Weg 2 (Gosdorf)	37:56	198	0:27
IO 16	IO 16 Poggenpohler Weg 8 (Gosdorf)	44:25	206	0:28
IO 17	IO 17 Poggenpohler Weg 14 (Gosdorf)	52:43	203	0:45
IO 18	IO 18 Poggenpohler Weg 20 (Gosdorf)	68:58	189	0:54
IO 19	IO 19 Poggenpohler Weg 28 (Gosdorf)	76:57	183	0:56
IO 20	IO 20 Poggenpohler Weg 30 (Gosdorf)	95:48	181	1:10
IO 21	IO 21 Bäderstraße 24a (Gosdorf)	45:43	187	0:30
IO 22	IO 22 Achterhof (Gosdorf)	52:49	216	0:33
IO 23	IO 23 Ratjensdorfer Felde 2	23:06	103	0:34
IO 24	IO 24 Morest, Grömitz	32:32	119	0:27
IO 25	IO 25 Poggenpohl 4 (Cismarfelde)	14:28	68	0:19
IO 26	IO 26 Rütting Chaussee 1	90:07	254	1:03
IO 27	IO 27 Kathenkamp 1 (Rüttinger Hof)	71:59	194	0:47
IO 28	IO 28 Rüttinger Klosterkamp 5	74:27	217	0:50
IO 29	IO 29 Rüttinger Klosterkamp 9	68:35	202	0:43
IO 30	IO 30 Kathenkamp 11 (Rütting)	49:54	163	0:41
IO 31	IO 31 Rüttinger Komenhof 1 (Rütting)	61:15	215	0:41
IO 32	IO 32 Rüttinger Komenhof 10 (Rütting)	39:20	140	0:36
IO 33	IO 33 Kathenkamp 19 (Rütting)	74:34	215	0:36
IO 34	IO 34 Kälberhof 5 (Rütting)	64:28	204	0:33
IO 35	IO 35 Kathenkamp 2 (Rütting)	35:04	141	0:29
IO 36	IO 36 Bäderstraße 20-22 (Kabelhorst)	24:35	166	0:20
IO 37	IO 37 Bäderstraße 15 (Kabelhorst)	25:50	166	0:19
IO 38	IO 38 Bäderstraße 18 (Kabelhorst)	24:43	143	0:22
IO 39	IO 39 Bäderstraße 13 (Kabelhorst)	14:02	128	0:16
IO 40	IO 40 Bäderstraße 10 (Kabelhorst)	16:24	101	0:19
IO 41	IO 41 Schmiedeberg 26 (Kabelhorst)	19:40	133	0:15
IO 42	IO 42 Grünbeck 2	60:08	228	0:31
IO 43	IO 43 Grünbeck 15	52:37	216	0:27
IO 44	IO 44 Grünbeck 16	58:37	206	0:41
IO 45	IO 45 Grünbeck 26	59:04	208	0:40
IO 46	IO 46 Diekstraat 29	81:58	247	0:35

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA 01 (GRN)	WEA 01 Jacobs MD70 (R70059)	28:54
WEA 02 (GRN)	WEA 02 Jacobs MD70 (R70067)	45:30
WEA 03 (GRN)	WEA 03 Jacobs MD70 (R70060)	65:18
WEA 04 (GRN)	WEA 04 REpower MD70	45:52
WEA 05 (GRN)	WEA 05 Jacobs MD70	81:38
WEA 10 (GRS)	WEA 10 Jacobs MD70 (R70027)	25:28
WEA 11 (GRS)	WEA 11 Jacobs MD70 (R70028)	65:01
WEA 12 (GRS)	WEA 12 Jacobs MD70 (R70020)	28:26
WEA 13 (GRS)	WEA 13 Jacobs MD70 (R70029)	17:35
WEA 14 (GRS)	WEA 14 Jacobs MD70 (R70021)	6:42
WEA 15 (GCN)	WEA 15 Jacobs MD70	4:11
WEA 16 (GCN)	WEA 16 Jacobs MD70	5:14

(Fortsetzung nächste Seite)...



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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Jörg Dedert / joerg.dedert@dnv.com

Berechnet:

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## SHADOW - Hauptergebnis

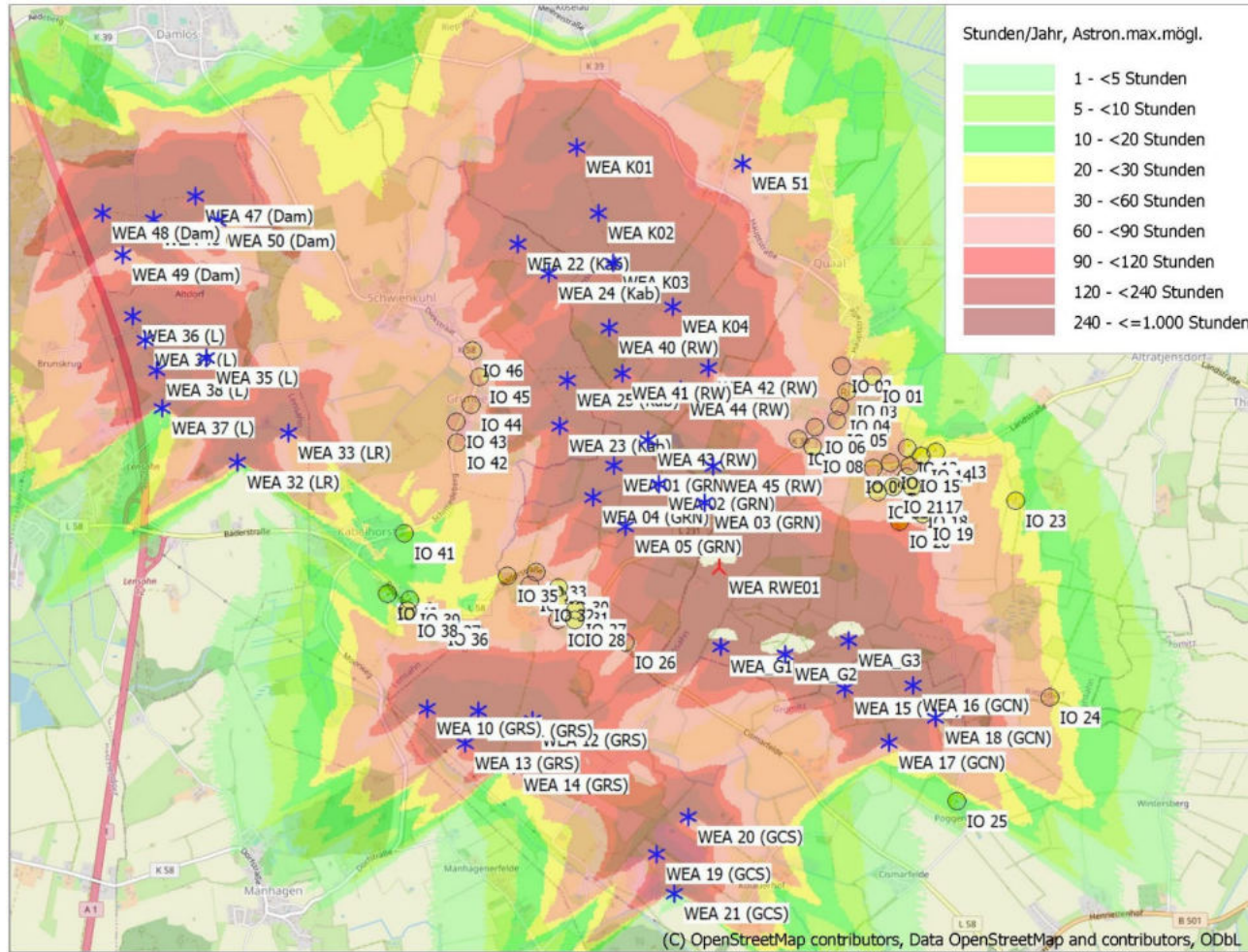
**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Maximal [h/a]
WEA 17 (GCN)	WEA 17 Jacobs MD70	2:54
WEA 18 (GCN)	WEA 18 Jacobs MD70	7:36
WEA 19 (GCS)	WEA 19 Jacobs MD70	0:00
WEA 20 (GCS)	WEA 20 Jacobs MD70	0:04
WEA 21 (GCS)	WEA 21 Jacobs MD70	0:00
WEA 22 (Kab)	WEA 22 NEG Micon NM 1500 C (V63504)	0:00
WEA 23 (Kab)	WEA 23 NEG Micon NM 1500 C (V65431)	61:05
WEA 24 (Kab)	WEA 24 NEG Micon NM 1500 C (V65430)	0:00
WEA 25 (Kab)	WEA 25 NEG Micon NM 1500 C (V65416)	60:10
WEA 32 (LR)	WEA 32 Enercon E-66/18.70	5:51
WEA 33 (LR)	WEA 33 Jacobs MD70 (R70032)	9:39
WEA 35 (L)	WEA 35 Enercon E-66/15.66	0:00
WEA 36 (L)	WEA 36 Enercon E-40/5.40	0:00
WEA 37 (L)	WEA 37 Enercon E-70 E4 (Lensahn 1)	0:00
WEA 38 (L)	WEA 38 Enercon E-70 E4 (Lensahn 2)	0:00
WEA 39 (L)	WEA 39 Enercon E-70 E4 (Lensahn 3)	0:00
WEA 40 (RW)	WEA 40 Jacobs MD70 (R70068)	33:30
WEA 41 (RW)	WEA 41 Jacobs MD70 (R70069)	32:31
WEA 42 (RW)	WEA 42 Jacobs MD70 (R70065)	64:58
WEA 43 (RW)	WEA 43 Jacobs MD70 (R70058)	30:52
WEA 44 (RW)	WEA 44 Vestas V47 (V1839)	7:42
WEA 45 (RW)	WEA 45 Vestas V47 (V1840)	18:26
WEA 46 (Dam)	WEA 46 Südwind S70 (SW70076)	0:00
WEA 47 (Dam)	WEA 47 Südwind S70 (SW70081)	0:00
WEA 48 (Dam)	WEA 48 Südwind S70 (SW70075)	0:00
WEA 49 (Dam)	WEA 49 Enercon E-82 (Schmidt)	0:00
WEA 50 (Dam)	WEA 50 Enercon E-82	0:00
WEA 51	WEA 51 Easywind 6	0:00
WEA K01	WEA K01 Enercon E-115 EP3 E3/2.9 MW (TES)	0:00
WEA K02	WEA K02 Enercon E-115 EP3 E3/2.9 MW (TES)	11:40
WEA K03	WEA K03 Enercon E-115 EP3 E3/2.9 MW (TES)	50:10
WEA K04	WEA K04 Enercon E-115 EP3 E3/2.9 MW (TES)	88:00
WEA RWED1	WEA RWED1 Siemens Gamesa SG6.6-155	244:16
WEA_G1	WEA G1 Vestas V150-6.0	170:14
WEA_G2	WEA G2 Vestas V150-6.0	115:10
WEA_G3	WEA G3 Vestas V150-6.0	104:45

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

## 11.22 Schattenwurfkarte Gesamtbelastung (nach Repowering), Stunden pro Jahr



0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.587

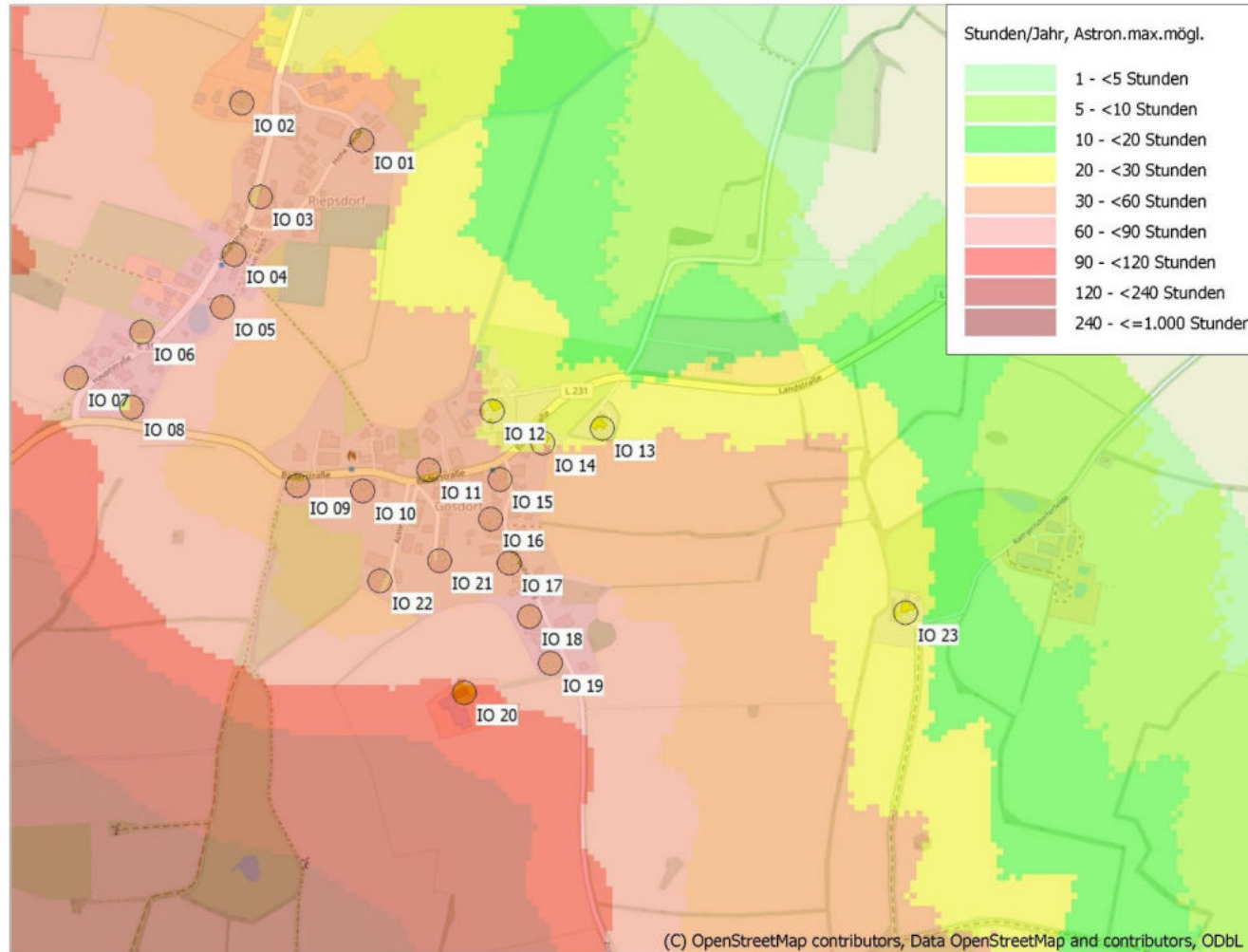
▲ Neue WEA

★ Existierende WEA

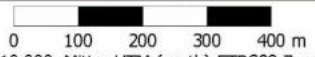
● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

### 11.23 Schattenwurfkarte Gesamtbelastung (nach Repowering) Detail Gosdorf, Stunden pro Jahr



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



Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800

▲ Neue WEA

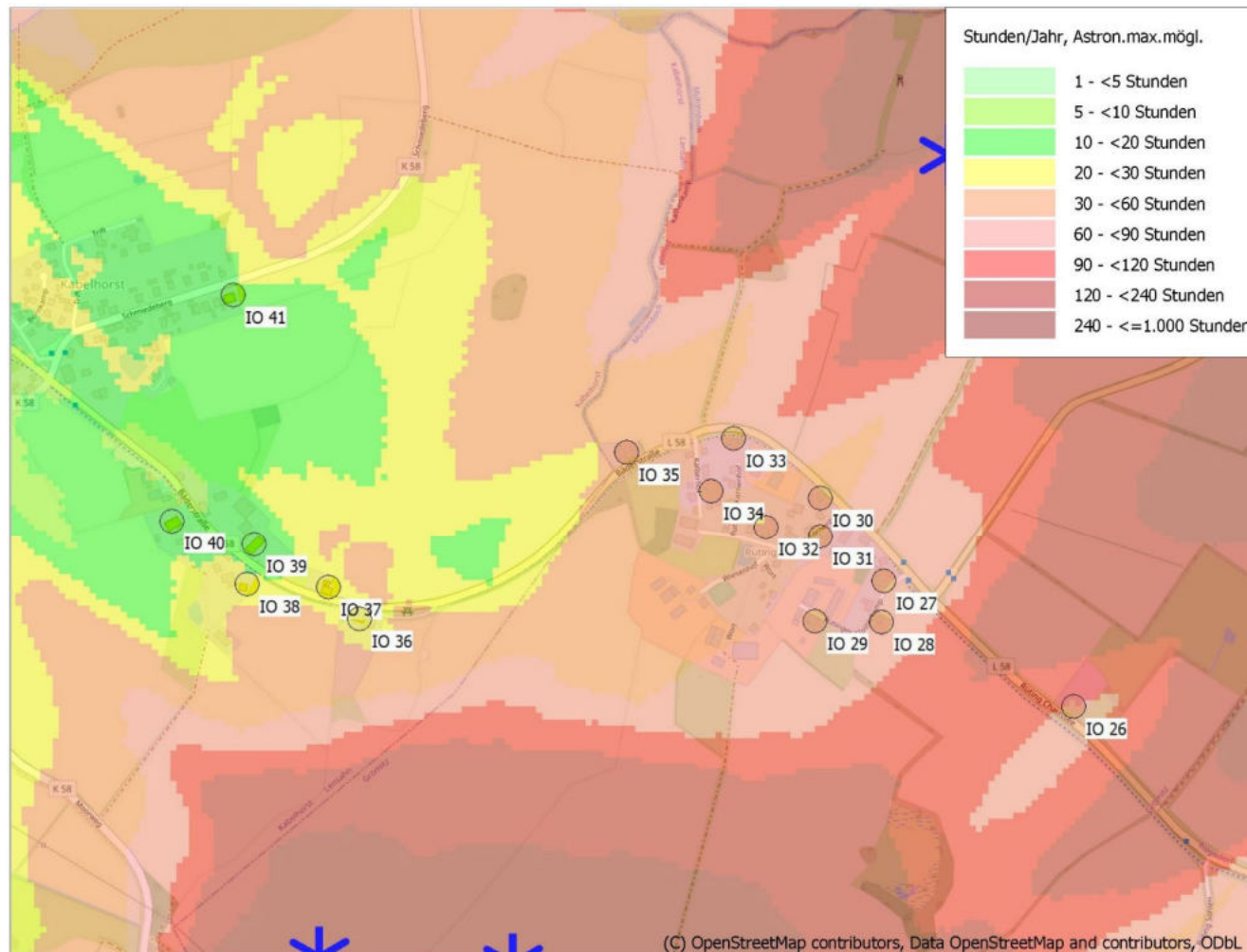
★ Existierende WEA

● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.24 Schattenwurfkarte Gesamtbelastung (nach Repowering) Detail Rütting, Stunden pro Jahr



0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.300 Nord: 6.008.990

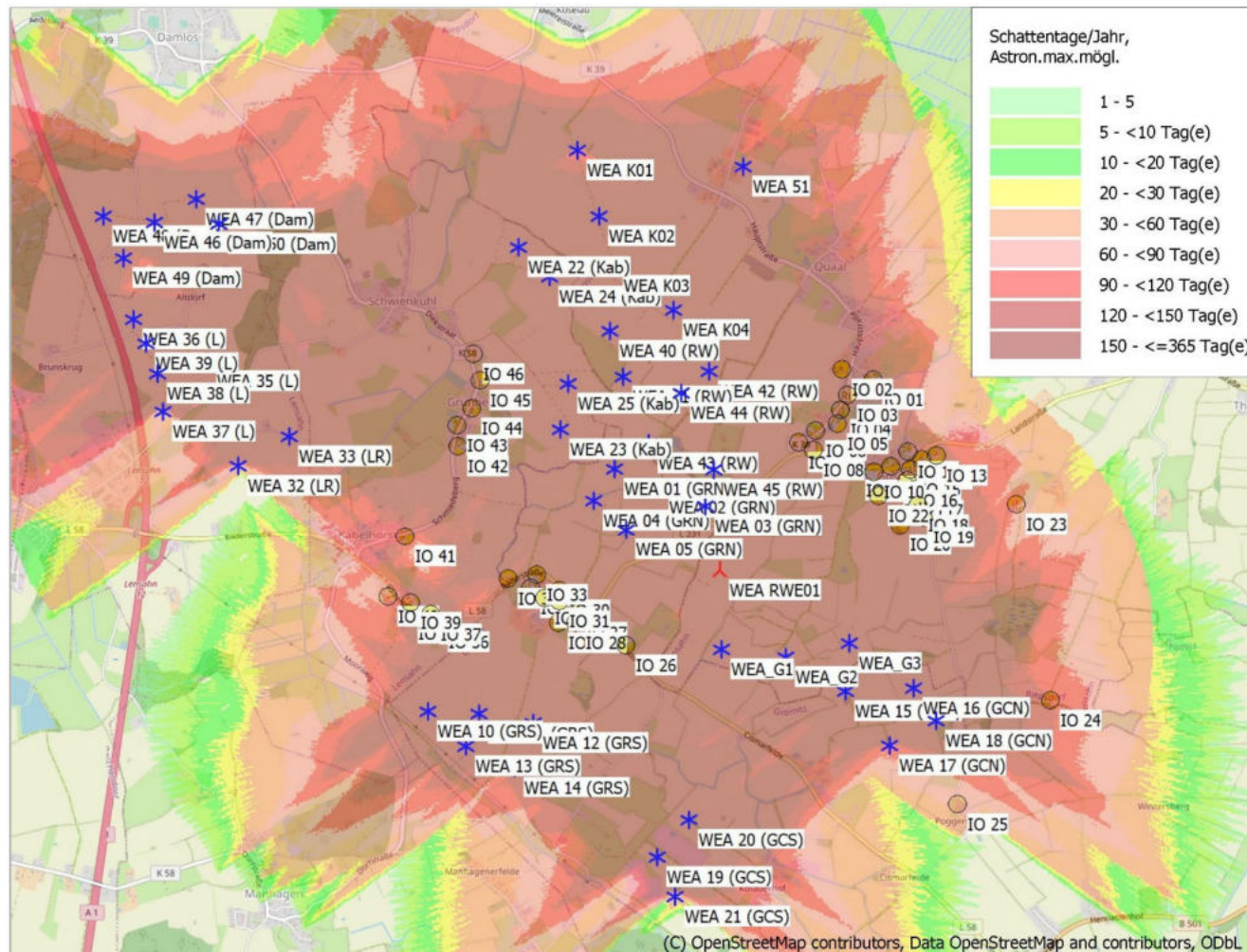
▲ Neue WEA

★ Existierende WEA

● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

## 11.25 Schattenwurfkarte Gesamtbelastung (nach Repowering), Tage pro Jahr



0 500 1000 1500 2000 m

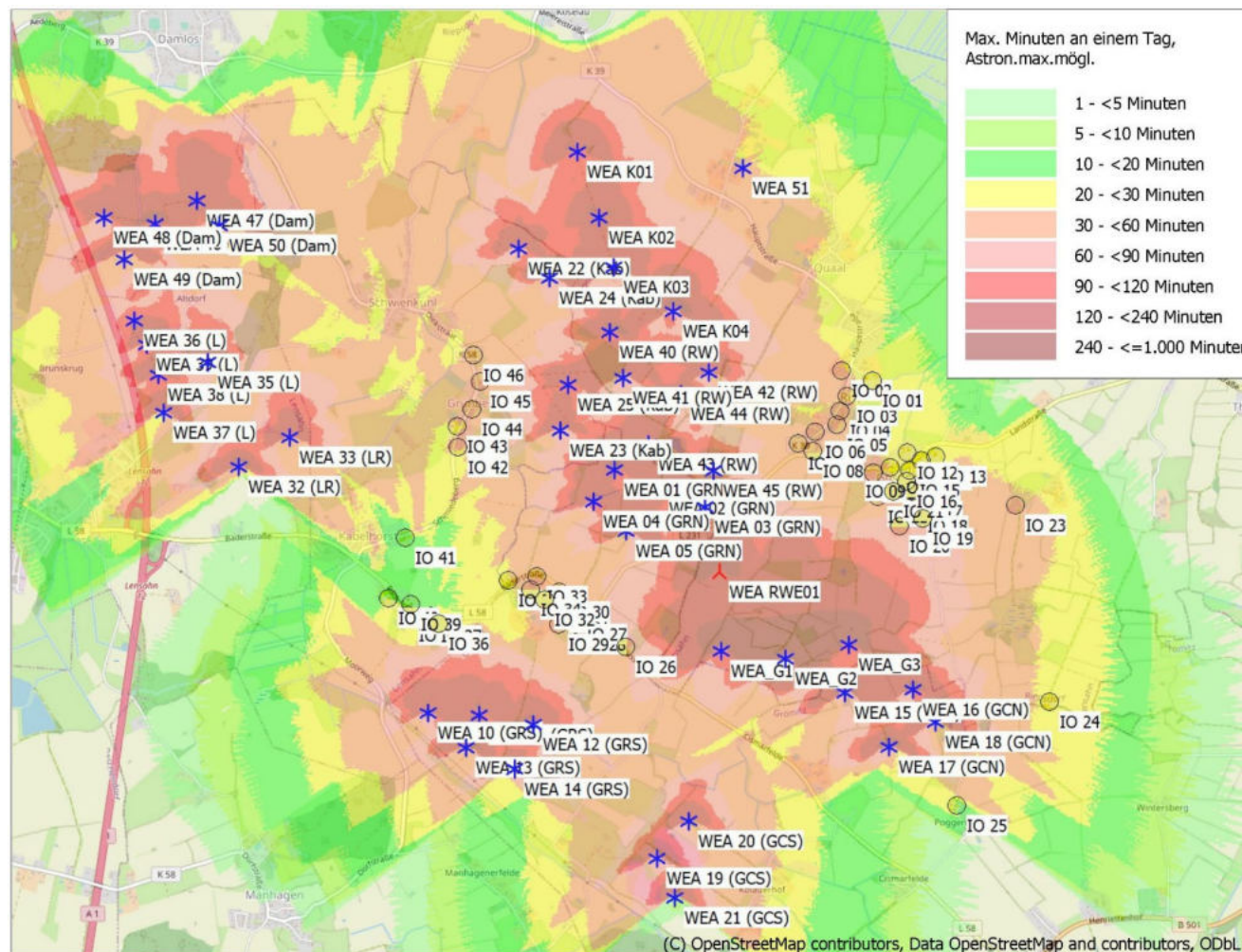
Karte: EMD OpenStreetMap , Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.587

▲ Neue WEA    \* Existierende WEA    ● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



## 11.26 Schattenwurfkarte Gesamtbelastung (nach Repowering), Minuten pro Tag



0 500 1000 1500 2000 m

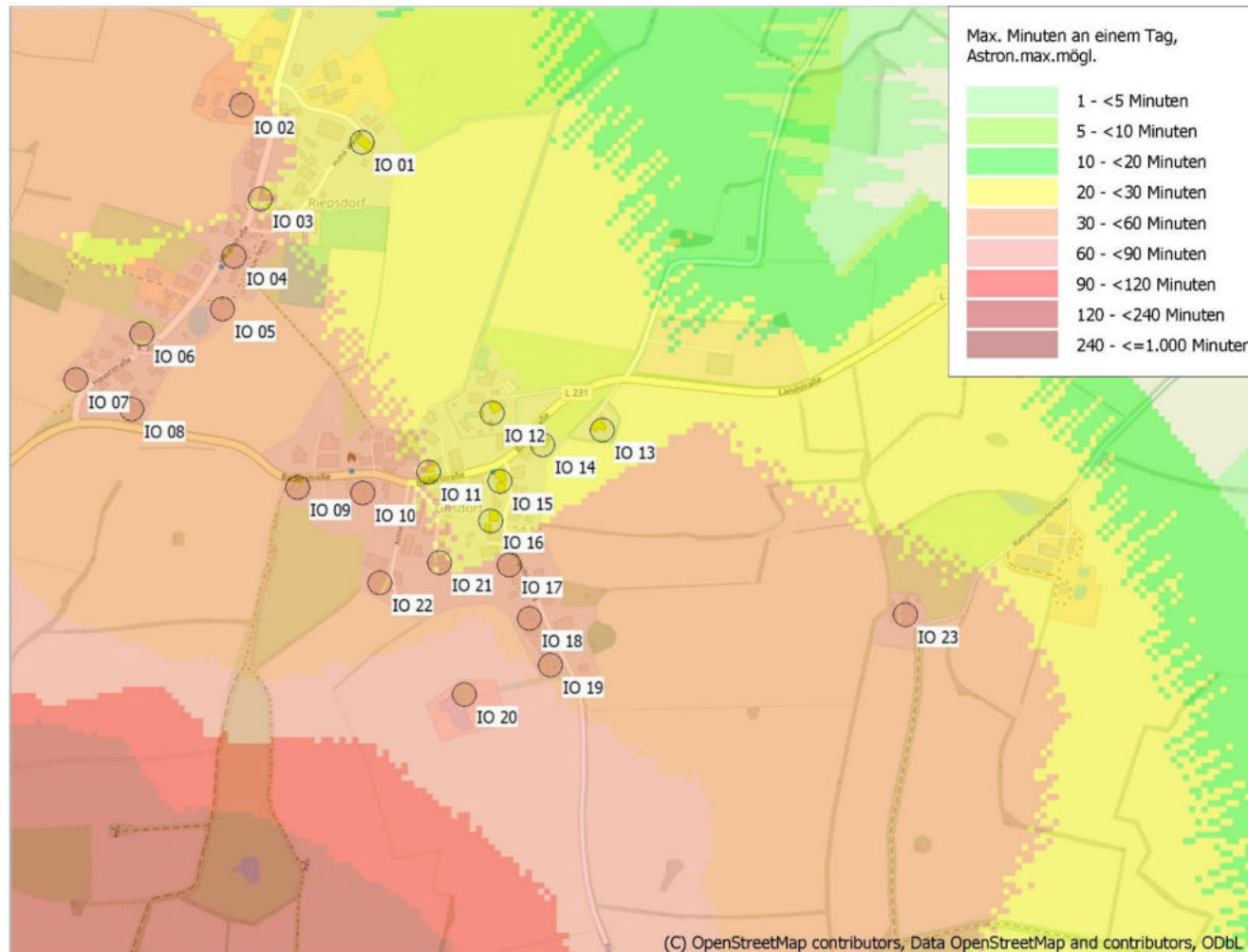
Karte: EMD OpenStreetMap , Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.587

▲ Neue WEA    
 ★ Existierende WEA    
 ● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)



### 11.27 Schattenwurfkarte Gesamtbelastung (nach Repowering) Detail Gosdorf, Minuten pro Tag



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

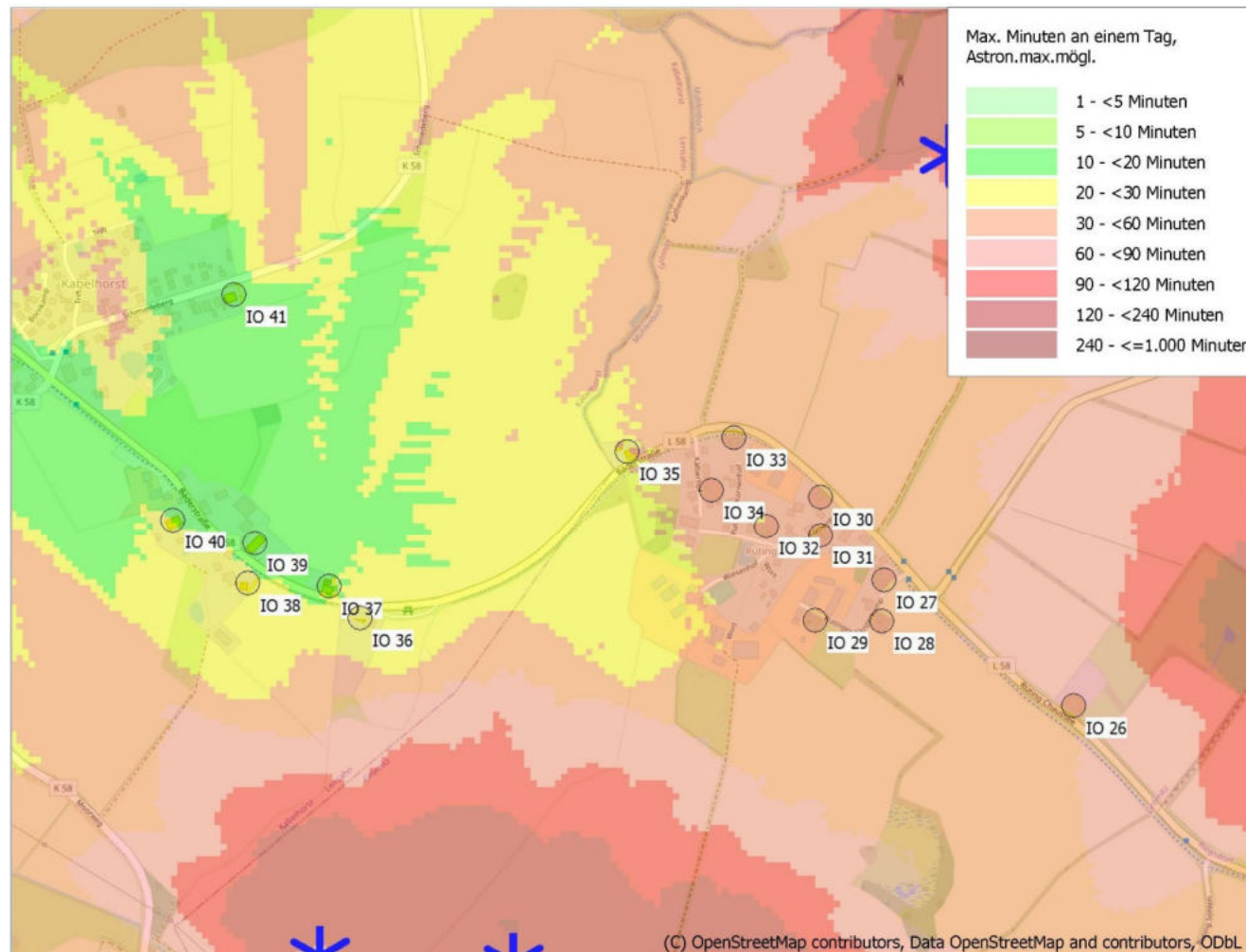
0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800

▲ Neue WEA    
 ★ Existierende WEA    
 ● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

## 11.28 Schattenwurfkarte Gesamtbelastung (nach Repowering) Detail Rütting, Minuten pro Tag



0 100 200 300 400 m

Karte: EMD OpenStreetMap , Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.300 Nord: 6.008.990

 Neue WEA    
  Existierende WEA    
  Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro\_2019-07-25.map (1)

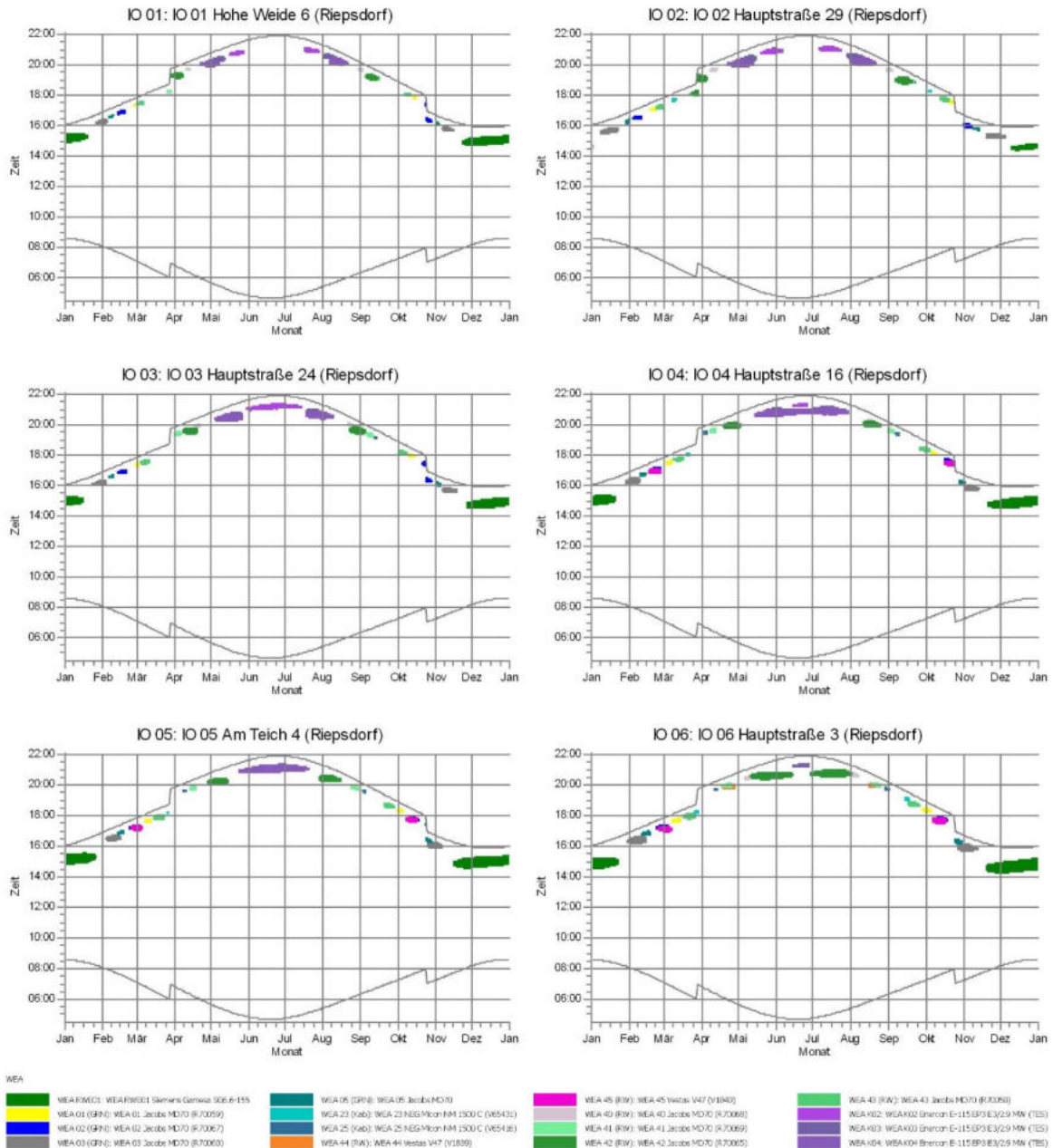
## 11.29 Schattenwurfkalender Gesamtbelastung (nach Repowering), grafisch

Projekt:  
SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:  
GL Garrad Hassan Deutschland GmbH  
Sommerdeich 14 b  
DE-25709 Kaiser-Wilhelm-Koog  
(0 48 56)901-0  
Jörg Dedert / joerg.dedert@dnv.com  
Berechnet:  
10.01.2023 21:57/3.6.361

### SHADOW - Grafischer Kalender

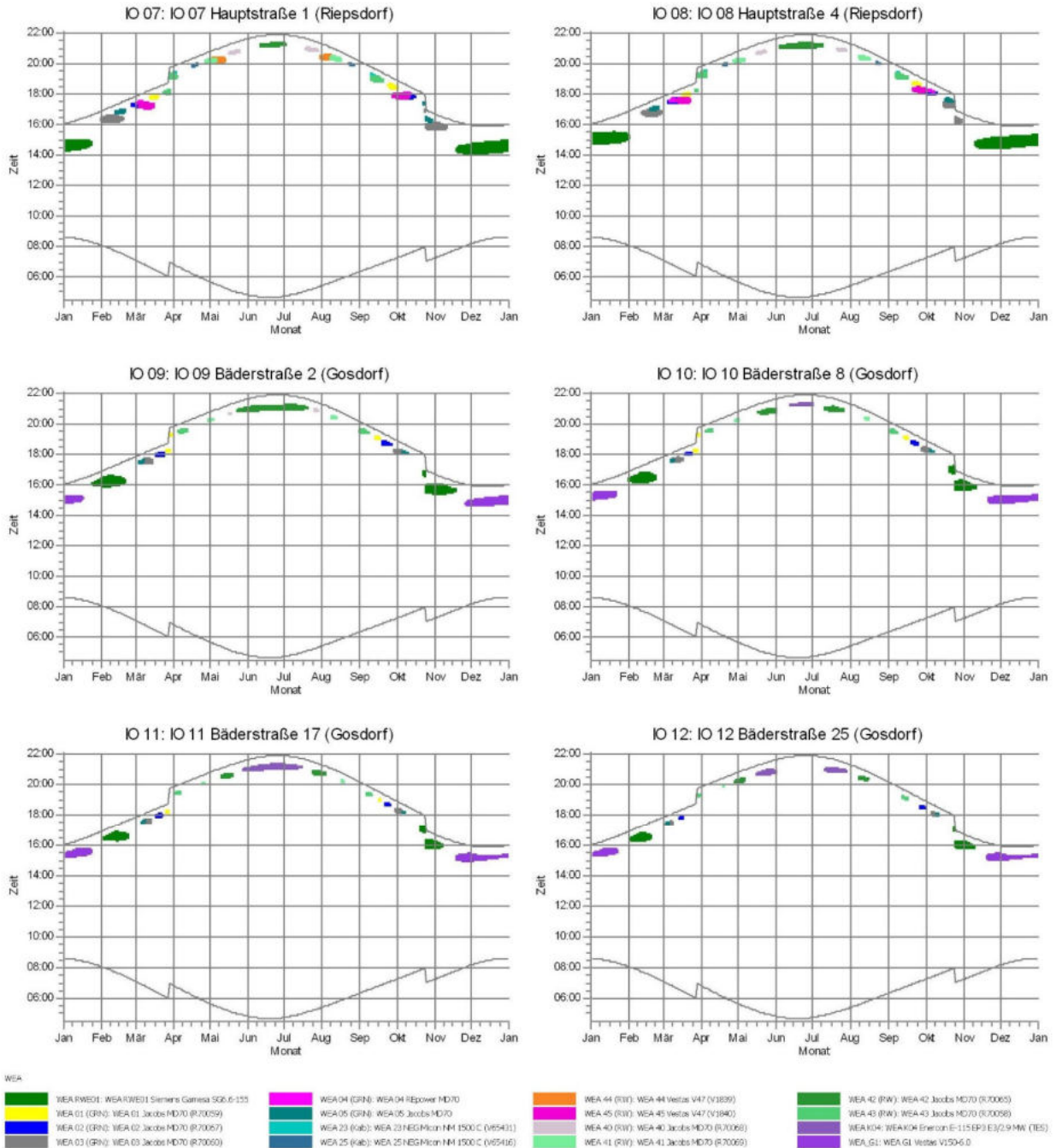
Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)





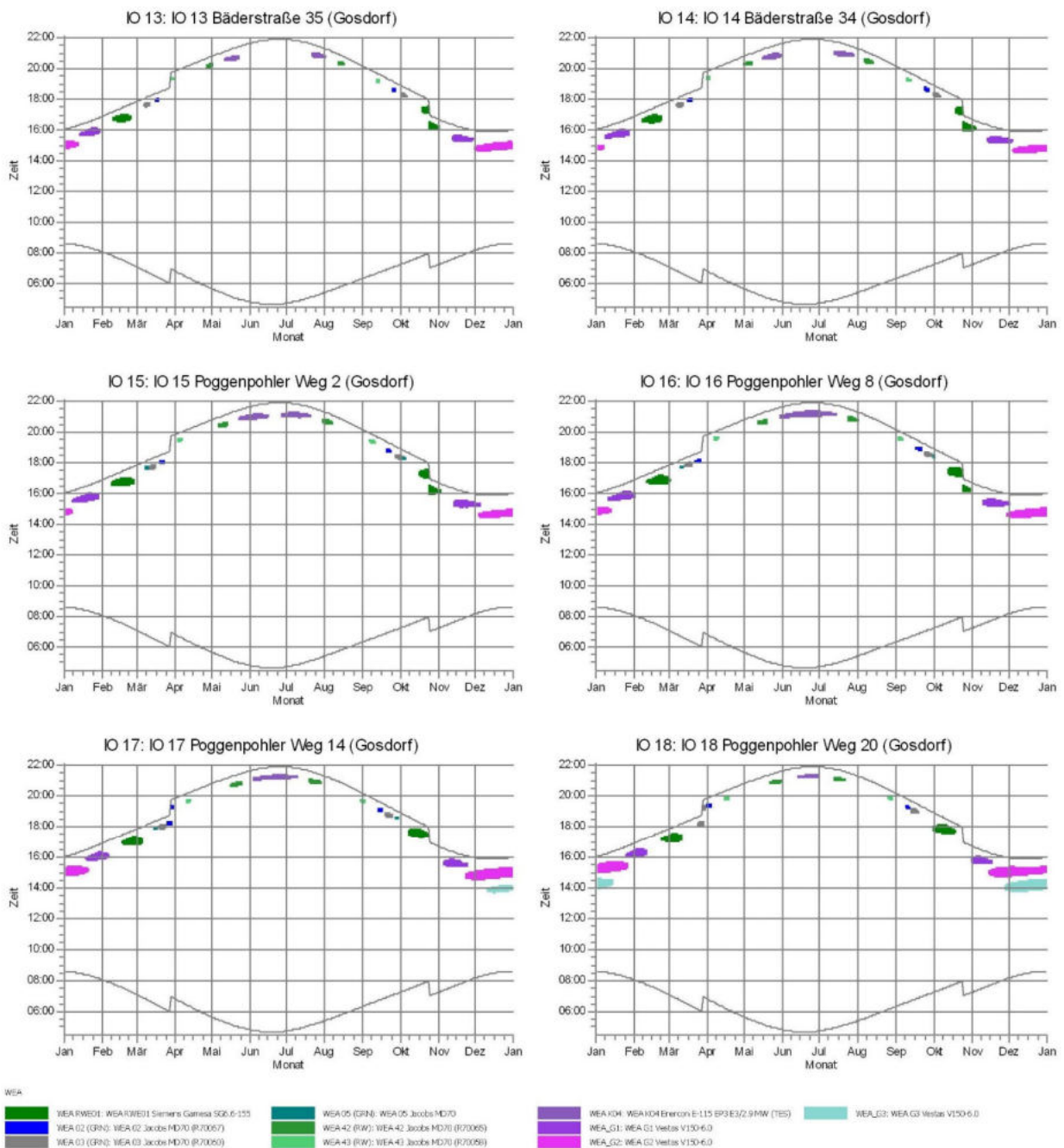
### SHADOW - Grafischer Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)



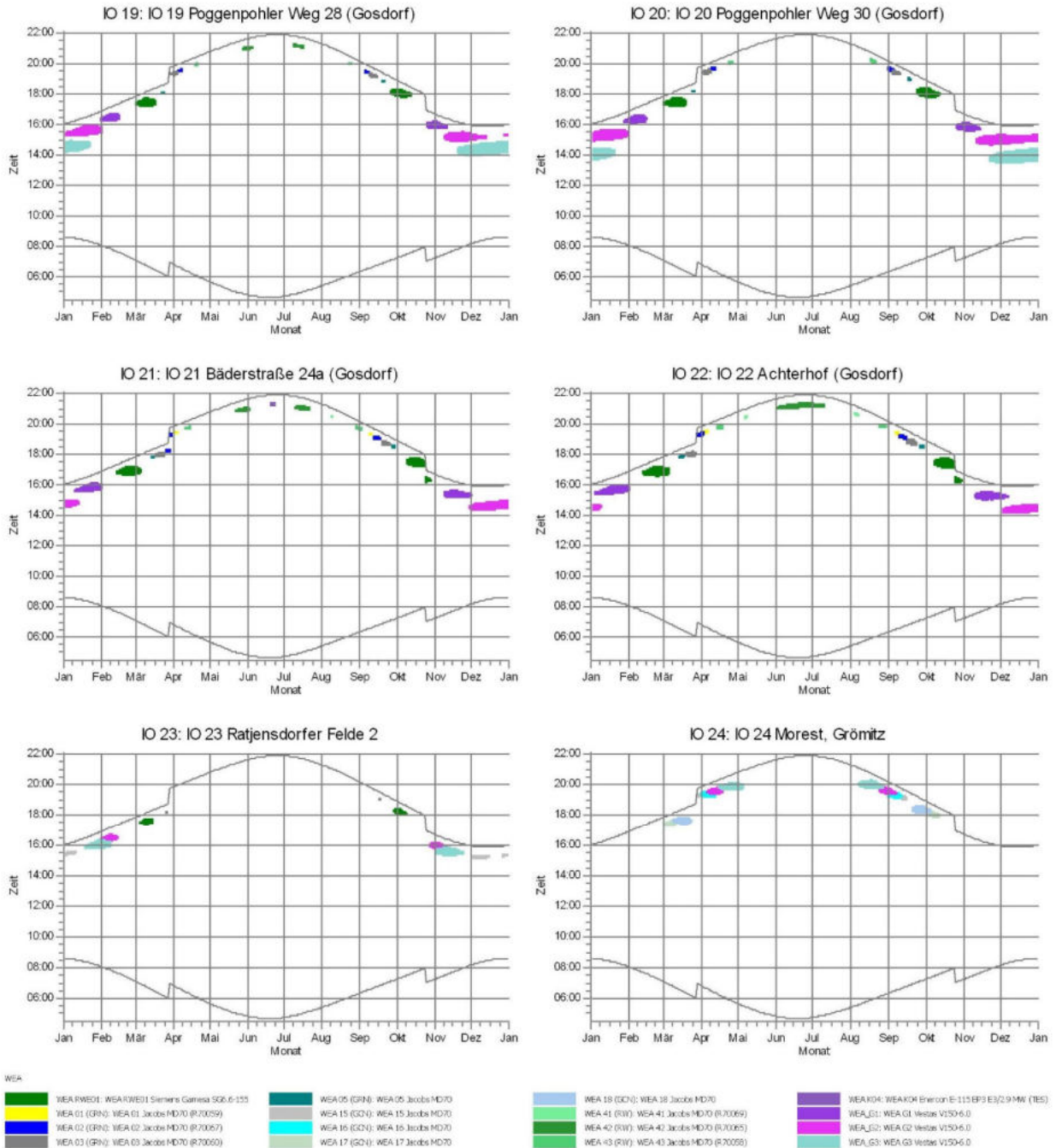
## SHADOW - Grafischer Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)



## SHADOW - Grafischer Kalender

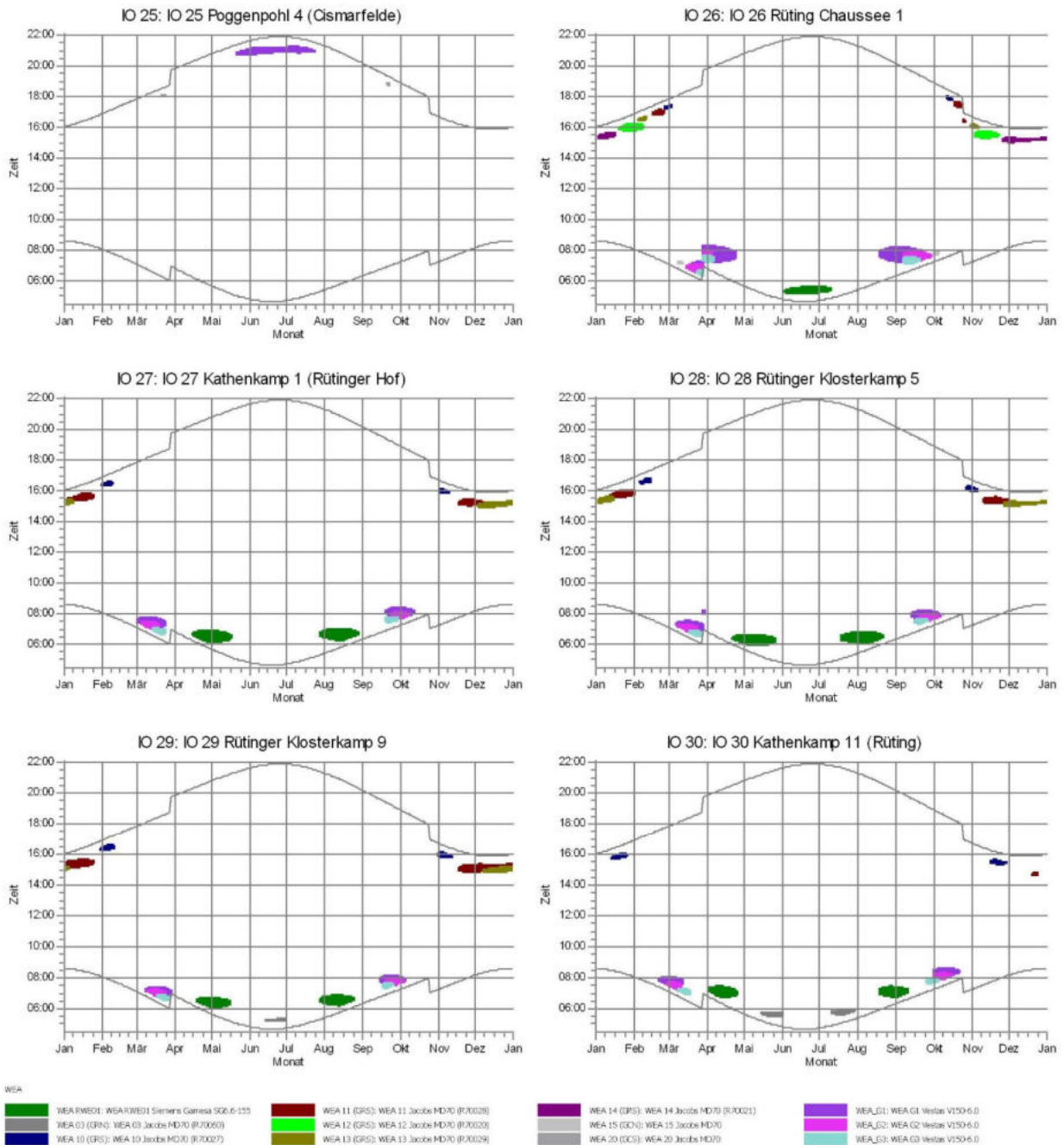
**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)





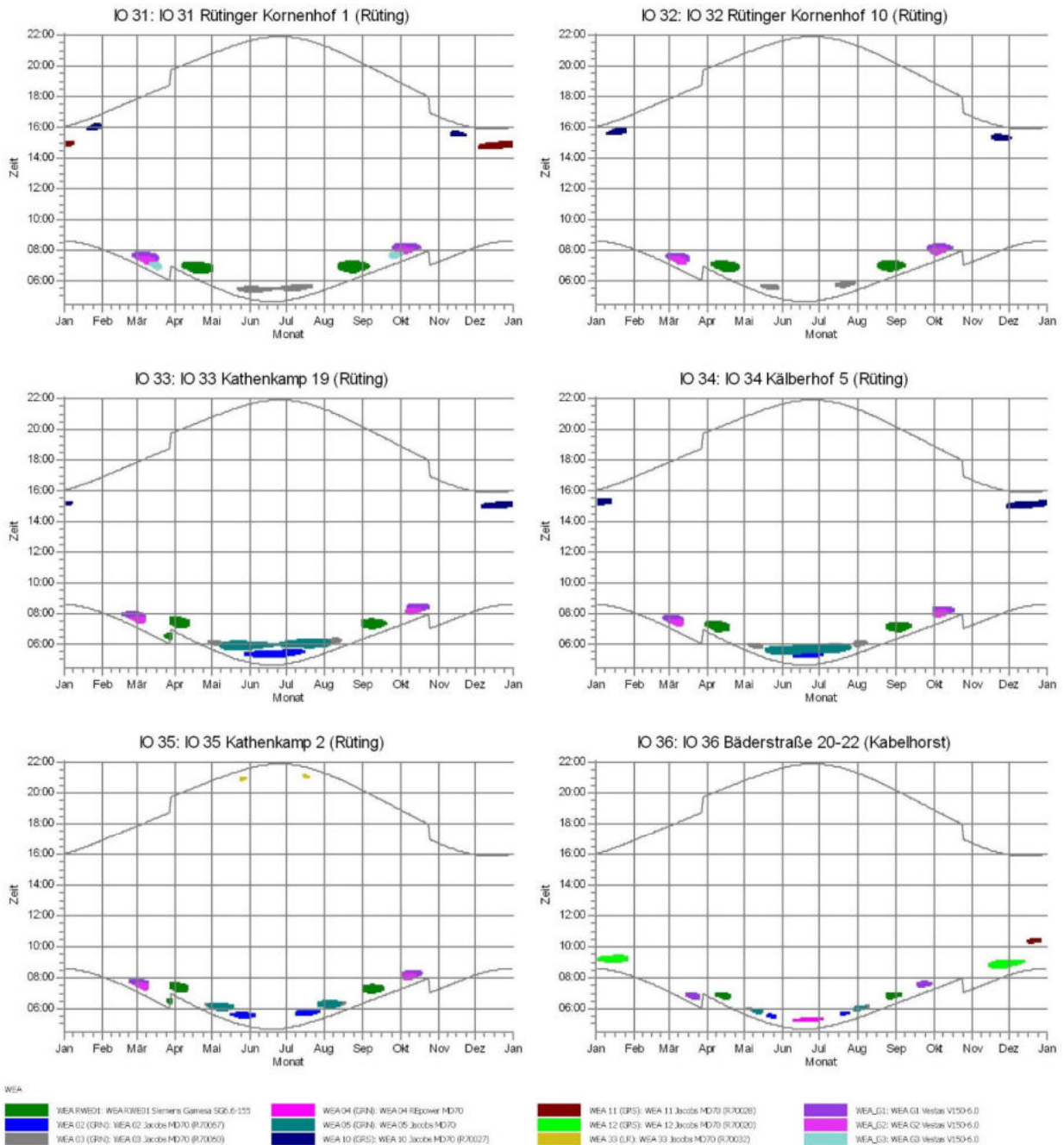
## SHADOW - Grafischer Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)



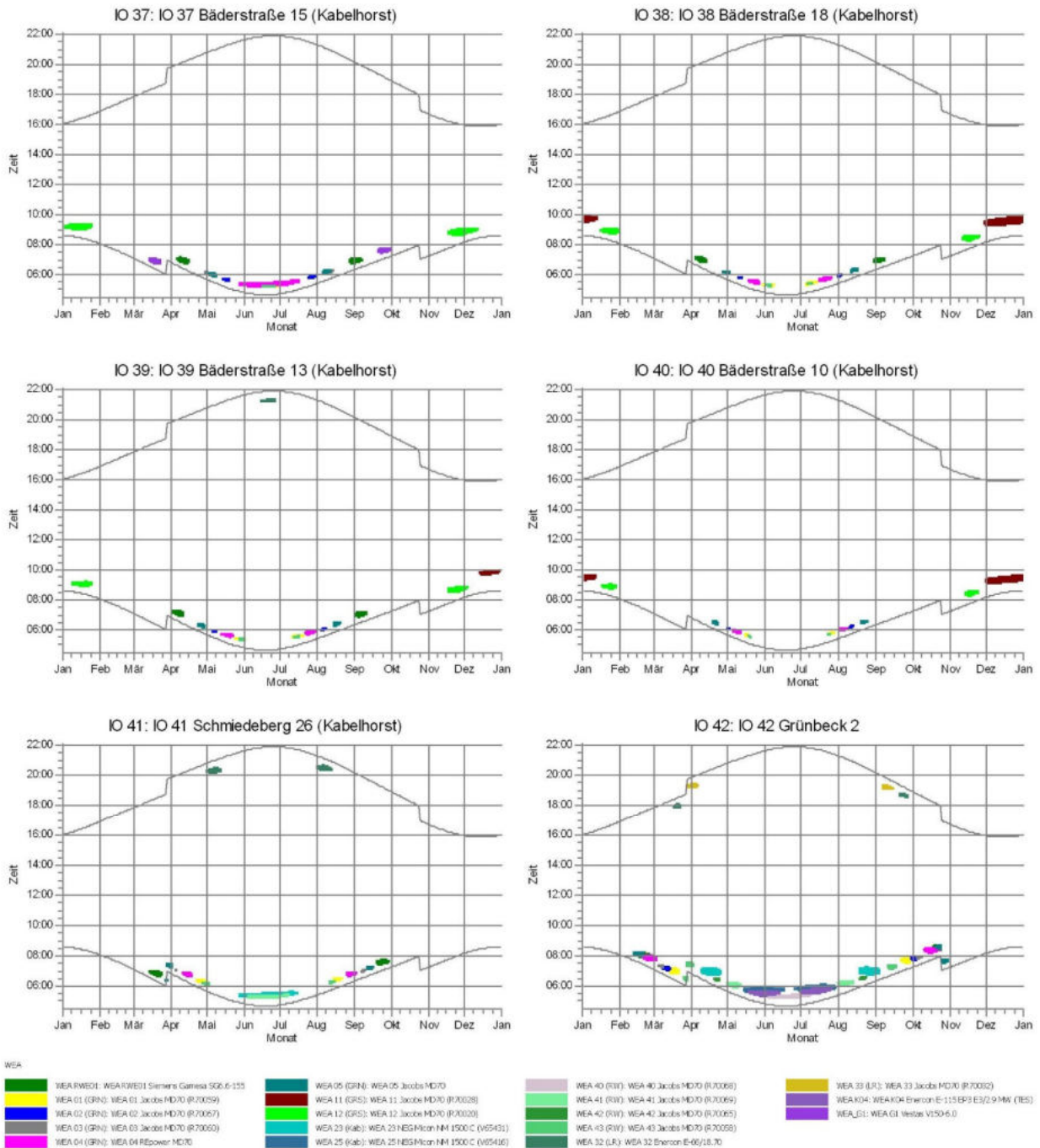
## SHADOW - Grafischer Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)



## SHADOW - Grafischer Kalender

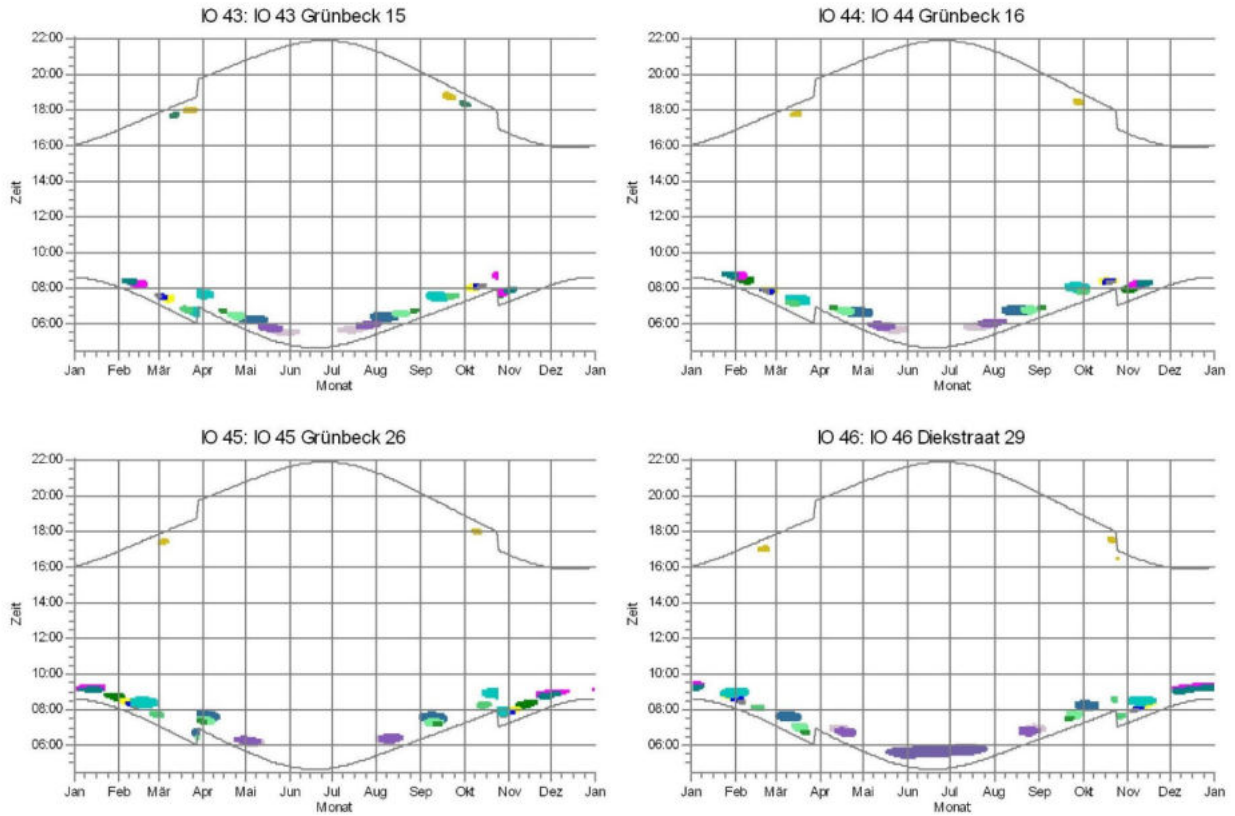
**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)



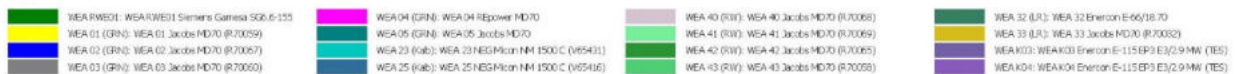


### SHADOW - Grafischer Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155)



WEA



# 11.30 Schattenwurfkalendar Gesamtbelastung (nach Repowering), tabellarisch

Projekt:  
SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:  
GL Garrad Hassan Deutschland GmbH  
Sommerdeich 14 b  
DE-25709 Kaiser-Wilhelm-Koog  
(0 48 56)901-0  
Jörg Dedert / joerg.dedert@dnv.com  
Berechnet:  
10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 01 - IO 01 Hohe Weide 6 (Riepsdorf)  
**Annahmen für Schattenwurfberechnung**

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	14:59 (WEA RW01)	08:06	16:11 (WEA 03 (GRN))	07:08		06:52	19:13 (WEA 42 (RW))	05:41	19:56 (WEA K04)	04:51
2	08:37	15:24 (WEA RW01)	16:55	11 16:22 (WEA 03 (GRN))	17:52		19:51	11 19:24 (WEA 42 (RW))	20:48	20 19:56 (WEA K04)	21:39
3	08:37	15:00 (WEA RW01)	08:04	16:12 (WEA 03 (GRN))	07:05		06:49	19:13 (WEA 42 (RW))	05:39	19:56 (WEA K04)	04:50
4	08:36	15:25 (WEA RW01)	16:57	11 16:23 (WEA 03 (GRN))	17:54	1	17:26 (WEA 43 (RW))	19:53	13 19:26 (WEA 42 (RW))	20:49	22 20:19 (WEA K03)
5	08:36	15:01 (WEA RW01)	08:03	16:14 (WEA 03 (GRN))	07:03		17:25 (WEA 43 (RW))	06:47	19:12 (WEA 42 (RW))	05:37	19:56 (WEA K04)
6	08:36	15:24 (WEA RW01)	16:59	7 16:21 (WEA 03 (GRN))	17:56	4	17:29 (WEA 43 (RW))	19:55	15 19:27 (WEA 42 (RW))	20:51	23 20:20 (WEA K03)
7	08:36	15:01 (WEA RW01)	08:01	16:18 (WEA 03 (GRN))	07:01		17:25 (WEA 43 (RW))	06:44	19:12 (WEA 42 (RW))	05:35	19:56 (WEA K04)
8	08:36	15:25 (WEA RW01)	17:01	2 16:20 (WEA 03 (GRN))	17:58	5	17:30 (WEA 43 (RW))	19:57	15 19:27 (WEA 42 (RW))	20:53	23 20:23 (WEA K03)
9	08:36	15:01 (WEA RW01)	07:59		06:58		17:26 (WEA 43 (RW))	06:42	19:12 (WEA 42 (RW))	05:33	19:56 (WEA K04)
10	08:36	15:25 (WEA RW01)	17:03		18:00		17:33 (WEA 43 (RW))	19:59	13 19:26 (WEA 42 (RW))	20:55	23 20:25 (WEA K03)
11	08:36	15:02 (WEA RW01)	07:57		06:56		17:26 (WEA 43 (RW))	06:39	19:14 (WEA 42 (RW))	05:31	20:00 (WEA K04)
12	08:36	15:26 (WEA RW01)	17:05		18:02	7	17:33 (WEA 43 (RW))	20:01	10 19:24 (WEA 42 (RW))	20:57	21 20:26 (WEA K03)
13	08:35	15:02 (WEA RW01)	07:55		06:53		06:37	19:17 (WEA 42 (RW))	05:29	20:03 (WEA K04)	04:46
14	08:35	15:26 (WEA RW01)	17:07	1 16:35 (WEA 05 (GRN))	18:03		17:02	5 19:22 (WEA 42 (RW))	20:59	17 20:28 (WEA K03)	21:45
15	08:35	15:03 (WEA RW01)	07:52	2 16:36 (WEA 05 (GRN))	18:04		06:34	19:18 (WEA 42 (RW))	05:27	20:04 (WEA K04)	04:45
16	08:35	15:27 (WEA RW01)	17:09	3 16:37 (WEA 05 (GRN))	18:05		17:01	19:19 (WEA 42 (RW))	05:25	20:05 (WEA K04)	04:44
17	08:35	15:03 (WEA RW01)	07:51	4 16:38 (WEA 05 (GRN))	18:06		17:00	19:20 (WEA 42 (RW))	05:23	20:06 (WEA K04)	04:43
18	08:35	15:27 (WEA RW01)	17:11	5 16:39 (WEA 05 (GRN))	18:07		16:59	19:21 (WEA 42 (RW))	05:21	20:07 (WEA K04)	04:42
19	08:35	15:04 (WEA RW01)	07:44	6 16:40 (WEA 05 (GRN))	18:08		16:58	19:22 (WEA 42 (RW))	05:19	20:08 (WEA K04)	04:41
20	08:35	15:28 (WEA RW01)	17:13	7 16:41 (WEA 05 (GRN))	18:09		16:57	19:23 (WEA 42 (RW))	05:17	20:09 (WEA K04)	04:40
21	08:35	15:04 (WEA RW01)	07:37	8 16:42 (WEA 05 (GRN))	18:10		16:56	19:24 (WEA 42 (RW))	05:15	20:10 (WEA K04)	04:39
22	08:35	15:28 (WEA RW01)	17:15	9 16:43 (WEA 05 (GRN))	18:11		16:55	19:25 (WEA 42 (RW))	05:13	20:11 (WEA K04)	04:38
23	08:35	15:05 (WEA RW01)	07:30	10 16:44 (WEA 05 (GRN))	18:12		16:54	19:26 (WEA 42 (RW))	05:11	20:12 (WEA K04)	04:37
24	08:35	15:29 (WEA RW01)	17:17	11 16:45 (WEA 05 (GRN))	18:13		16:53	19:27 (WEA 42 (RW))	05:09	20:13 (WEA K04)	04:36
25	08:35	15:05 (WEA RW01)	07:24	12 16:46 (WEA 05 (GRN))	18:14		16:52	19:28 (WEA 42 (RW))	05:07	20:14 (WEA K04)	04:35
26	08:35	15:29 (WEA RW01)	17:19	13 16:47 (WEA 05 (GRN))	18:15		16:51	19:29 (WEA 42 (RW))	05:05	20:15 (WEA K04)	04:34
27	08:35	15:06 (WEA RW01)	07:17	14 16:48 (WEA 05 (GRN))	18:16		16:50	19:30 (WEA 42 (RW))	05:03	20:16 (WEA K04)	04:33
28	08:35	15:30 (WEA RW01)	17:21	15 16:49 (WEA 05 (GRN))	18:17		16:49	19:31 (WEA 42 (RW))	05:01	20:17 (WEA K04)	04:32
29	08:35	15:06 (WEA RW01)	07:04	16 16:50 (WEA 05 (GRN))	18:18		16:48	19:32 (WEA 42 (RW))	04:59	20:18 (WEA K04)	04:31
30	08:35	15:30 (WEA RW01)	17:23	17 16:51 (WEA 05 (GRN))	18:19		16:47	19:33 (WEA 42 (RW))	04:57	20:19 (WEA K04)	04:30
31	08:35	15:07 (WEA RW01)	06:52	18 16:52 (WEA 05 (GRN))	18:20		16:46	19:34 (WEA 42 (RW))	04:55	20:20 (WEA K04)	04:29
1	08:35	15:31 (WEA RW01)	17:25	19 16:53 (WEA 05 (GRN))	18:21		16:45	19:35 (WEA 42 (RW))	04:53	20:21 (WEA K04)	04:28
2	08:35	15:08 (WEA RW01)	06:40	20 16:54 (WEA 05 (GRN))	18:22		16:44	19:36 (WEA 42 (RW))	04:51	20:22 (WEA K04)	04:27
3	08:35	15:31 (WEA RW01)	17:27	21 16:55 (WEA 05 (GRN))	18:23		16:43	19:37 (WEA 42 (RW))	04:49	20:23 (WEA K04)	04:26
4	08:35	15:08 (WEA RW01)	06:27	22 16:56 (WEA 05 (GRN))	18:24		16:42	19:38 (WEA 42 (RW))	04:47	20:24 (WEA K04)	04:25
5	08:35	15:32 (WEA RW01)	17:29	23 16:57 (WEA 05 (GRN))	18:25		16:41	19:39 (WEA 42 (RW))	04:45	20:25 (WEA K04)	04:24
6	08:35	15:09 (WEA RW01)	06:15	24 16:58 (WEA 05 (GRN))	18:26		16:40	19:40 (WEA 42 (RW))	04:43	20:26 (WEA K04)	04:23
7	08:35	15:32 (WEA RW01)	17:31	25 16:59 (WEA 05 (GRN))	18:27		16:39	19:41 (WEA 42 (RW))	04:41	20:27 (WEA K04)	04:22
8	08:35	15:10 (WEA RW01)	06:03	26 17:00 (WEA 05 (GRN))	18:28		16:38	19:42 (WEA 42 (RW))	04:39	20:28 (WEA K04)	04:21
9	08:35	15:33 (WEA RW01)	17:33	27 17:01 (WEA 05 (GRN))	18:29		16:37	19:43 (WEA 42 (RW))	04:37	20:29 (WEA K04)	04:20
10	08:35	15:11 (WEA RW01)	05:51	28 17:02 (WEA 05 (GRN))	18:30		16:36	19:44 (WEA 42 (RW))	04:35	20:30 (WEA K04)	04:19
11	08:35	15:34 (WEA RW01)	17:35	29 17:03 (WEA 05 (GRN))	18:31		16:35	19:45 (WEA 42 (RW))	04:33	20:31 (WEA K04)	04:18
12	08:35	15:12 (WEA RW01)	05:39	30 17:04 (WEA 05 (GRN))	18:32		16:34	19:46 (WEA 42 (RW))	04:31	20:32 (WEA K04)	04:17
13	08:35	15:35 (WEA RW01)	17:37	31 17:05 (WEA 05 (GRN))	18:33		16:33	19:47 (WEA 42 (RW))	04:29	20:33 (WEA K04)	04:16
14	08:35	15:13 (WEA RW01)	05:27		18:34		16:32	19:48 (WEA 42 (RW))	04:27	20:34 (WEA K04)	04:15
15	08:35	15:36 (WEA RW01)	17:39		18:35		16:31	19:49 (WEA 42 (RW))	04:25	20:35 (WEA K04)	04:14
16	08:35	15:14 (WEA RW01)	05:15		18:36		16:30	19:50 (WEA 42 (RW))	04:23	20:36 (WEA K04)	04:13
17	08:35	15:37 (WEA RW01)	17:41		18:37		16:29	19:51 (WEA 42 (RW))	04:21	20:37 (WEA K04)	04:12
18	08:35	15:15 (WEA RW01)	05:03		18:38		16:28	19:52 (WEA 42 (RW))	04:19	20:38 (WEA K04)	04:11
19	08:35	15:38 (WEA RW01)	17:43		18:39		16:27	19:53 (WEA 42 (RW))	04:17	20:39 (WEA K04)	04:10
20	08:35	15:16 (WEA RW01)	04:51		18:40		16:26	19:54 (WEA 42 (RW))	04:15	20:40 (WEA K04)	04:09
21	08:35	15:39 (WEA RW01)	17:45		18:41		16:25	19:55 (WEA 42 (RW))	04:13	20:41 (WEA K04)	04:08
22	08:35	15:17 (WEA RW01)	04:39		18:42		16:24	19:56 (WEA 42 (RW))	04:11	20:42 (WEA K04)	04:07
23	08:35	15:40 (WEA RW01)	17:47		18:43		16:23	19:57 (WEA 42 (RW))	04:09	20:43 (WEA K04)	04:06
24	08:35	15:18 (WEA RW01)	04:27		18:44		16:22	19:58 (WEA 42 (RW))	04:07	20:44 (WEA K04)	04:05
25	08:35	15:41 (WEA RW01)	17:49		18:45		16:21	19:59 (WEA 42 (RW))	04:05	20:45 (WEA K04)	04:04
26	08:35	15:19 (WEA RW01)	04:15		18:46		16:20	20:00 (WEA 42 (RW))	04:03	20:46 (WEA K04)	04:03
27	08:35	15:42 (WEA RW01)	17:51		18:47		16:19	20:01 (WEA 42 (RW))	04:01	20:47 (WEA K04)	04:02
28	08:35	15:20 (WEA RW01)	04:03		18:48		16:18	20:02 (WEA 42 (RW))	03:59	20:48 (WEA K04)	04:01
29	08:35	15:43 (WEA RW01)	17:53		18:49		16:17	20:03 (WEA 42 (RW))	03:57	20:49 (WEA K04)	04:00
30	08:35	15:21 (WEA RW01)	03:51		18:50		16:16	20:04 (WEA 42 (RW))	03:55	20:50 (WEA K04)	03:59
31	08:35	15:44 (WEA RW01)	17:55		18:51		16:15	20:05 (WEA 42 (RW))	03:53	20:51 (WEA K04)	03:58
1	08:35	15:22 (WEA RW01)	03:39		18:52		16:14	20:06 (WEA 42 (RW))	03:51	20:52 (WEA K04)	03:57
2	08:35	15:45 (WEA RW01)	17:57		18:53		16:13	20:07 (WEA 42 (RW))	03:49	20:53 (WEA K04)	03:56
3	08:35	15:23 (WEA RW01)	03:27		18:54		16:12	20:08 (WEA 42 (RW))	03:47	20:54 (WEA K04)	03:55
4	08:35	15:46 (WEA RW01)	17:59		18:55		16:11	20:09 (WEA 42 (RW))	03:45	20:55 (WEA K04)	03:54
5	08:35	15:24 (WEA RW01)	03:15		18:56		16:10	20:10 (WEA 42 (RW))	03:43	20:56 (WEA K04)	03:53
6	08:35	15:47 (WEA RW01)	18:01		18:57		16:09	20:11 (WEA 42 (RW))	03:41	20:57 (WEA K04)	03:52
7	08:35	15:25 (WEA RW01)	03:03		18:58		16:08	20:12 (WEA 42 (RW))	03:39	20:58 (WEA K04)	03:51
8	08:35	15:48 (WEA RW01)	18:03		18:59		16:07	20:13 (WEA 42 (RW))	03:37	20:59 (WEA K04)	03:50
9	08:35	15:26 (WEA RW01)	02:51		19:00		16:06	20:14 (WEA 42 (RW))	03:35	21:00 (WEA K04)	03:49
10	08:35	15:49 (WEA RW01)	18:05		19:01		16:05	20:15 (WEA 42 (RW))	03:33	21:01 (WEA K04)	03:48
11	08:35	15:27 (WEA RW01)	02:39		19:02		16:04	20:16 (WEA 42 (RW))	03:31	21:02 (WEA K04)	03:47
12	08:35	15:50 (WEA RW01)	18:07		19:03		16:03	20:17 (WEA 42 (RW))	03:29	21:03 (WEA K04)	03:46
13	08:35	15:28 (WEA RW01)	02:27		19:04		16:02	20:18 (WEA 42 (RW))	03:27	21:04 (WEA K04)	

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 01 - IO 01 Hohe Weide 6 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Jul	August	September	Oktober	November	Dezember
1   04:47	05:27	06:23	19:40 (WEA 40 (RW))   07:17	07:16	08:12
2   04:47	05:29	20:30 (WEA K03)   06:24	19:41 (WEA 40 (RW))   07:19	07:18	16:08 (WEA 05 (GRN))   08:14
3   04:48	05:31	21:16   06:27	19:43   07:21	16:42 2   16:10 (WEA 05 (GRN))   08:15	16:42 2   16:10 (WEA 05 (GRN))   08:15
4   04:49	05:32	22:07 (WEA K03)   06:28	19:46   07:22	16:40 1   16:07 (WEA 05 (GRN))   08:17	16:40 1   16:07 (WEA 05 (GRN))   08:17
5   04:50	05:34	23:00 (WEA K03)   06:30	19:50 (WEA 42 (RW))   07:24	16:38	16:38
6   04:51	05:36	23:59 (WEA K03)   06:32	19:55 (WEA 42 (RW))   07:26	16:36	16:36
7   04:52	05:38	20:09 (WEA K04)   06:33	19:59 (WEA 42 (RW))   07:28	16:34	16:34
8   04:53	05:39	20:08 (WEA K04)   06:35	19:57 (WEA 42 (RW))   07:30	16:32 3   16:07 (WEA 43 (RW))   07:30	16:32 3   16:07 (WEA 43 (RW))   07:30
9   04:54	05:41	21:04 23   20:33 (WEA K03)   06:37	19:51 (WEA 42 (RW))   07:32	16:30 8   16:29 (WEA 43 (RW))   07:30	16:30 8   16:29 (WEA 43 (RW))   07:30
10   04:55	05:43	21:01 (WTA K27)   06:39	19:47 (WTA K27)   07:34	16:28 10   16:27 (WTA 43 (RW))   07:30	16:28 10   16:27 (WTA 43 (RW))   07:30
11   04:56	05:45	20:01 (WTA K24)   06:40	19:43 (WTA K24)   07:36	16:26 11   16:25 (WTA 43 (RW))   07:30	16:26 11   16:25 (WTA 43 (RW))   07:30
12   04:57	05:47	20:01 (WEA K01)   06:42	19:45 (WEA 42 (RW))   07:37	16:24 3   16:24 (WEA 43 (RW))   07:30	16:24 3   16:24 (WEA 43 (RW))   07:30
13   04:58	05:49	20:04 (WEA K01)   06:44	19:48 (WEA 42 (RW))   07:39	16:22 7   16:21 (WEA 43 (RW))   07:30	16:22 7   16:21 (WEA 43 (RW))   07:30
14   04:59	05:51	20:04 (WTA K24)   06:46	19:46 (WTA K24)   07:41	16:20 2   16:19 (WEA 43 (RW))   07:30	16:20 2   16:19 (WEA 43 (RW))   07:30
15   05:00	05:53	20:04 (WTA K24)   06:48	19:45 (WTA K24)   07:43	16:18 2   16:17 (WEA 43 (RW))   07:30	16:18 2   16:17 (WEA 43 (RW))   07:30
16   05:01	05:55	20:01 (WEA K01)   06:50	19:43 (WEA 42 (RW))   07:45	16:16 1   16:15 (WEA 43 (RW))   07:30	16:16 1   16:15 (WEA 43 (RW))   07:30
17   05:02	20:00 (WTA K02)   05:57	20:04 (WTA K24)   06:51	19:42 (WTA K24)   07:47	16:14 1   16:13 (WTA 43 (RW))   07:30	16:14 1   16:13 (WTA 43 (RW))   07:30
18   05:03	20:00 (WTA K02)   05:59	20:04 (WTA K24)   06:53	19:40 (WTA K24)   07:49	16:12 1   16:11 (WTA 43 (RW))   07:30	16:12 1   16:11 (WTA 43 (RW))   07:30
19   05:04	20:00 (WTA K02)   06:01	20:01 (WEA K01)   06:55	19:38 (WEA 42 (RW))   07:51	16:10 1   16:09 (WEA 43 (RW))   07:30	16:10 1   16:09 (WEA 43 (RW))   07:30
20   05:05	20:00 (WTA K02)   06:03	20:01 (WEA K01)   06:57	19:36 (WEA 42 (RW))   07:53	16:08 1   16:07 (WEA 43 (RW))   07:30	16:08 1   16:07 (WEA 43 (RW))   07:30
21   05:06	20:00 (WTA K02)   06:05	20:00 (WTA K01)   06:59	19:34 (WEA 42 (RW))   07:55	16:06 1   16:05 (WEA 43 (RW))   07:30	16:06 1   16:05 (WEA 43 (RW))   07:30
22   05:07	20:00 (WTA K02)   06:07	20:00 (WTA K01)   07:01	19:32 (WEA 42 (RW))   07:57	16:04 1   16:03 (WEA 43 (RW))   07:30	16:04 1   16:03 (WEA 43 (RW))   07:30
23   05:08	20:00 (WTA K02)   06:09	20:00 (WTA K01)   07:03	19:30 (WEA 42 (RW))   07:59	16:02 1   16:01 (WEA 43 (RW))   07:30	16:02 1   16:01 (WEA 43 (RW))   07:30
24   05:09	20:00 (WTA K02)   06:11	20:00 (WTA K01)   07:05	19:28 (WEA 42 (RW))   08:01	16:00 1   15:59 (WEA 43 (RW))   07:30	16:00 1   15:59 (WEA 43 (RW))   07:30
25   05:10	20:00 (WTA K02)   06:13	20:00 (WTA K01)   07:07	19:26 (WEA 42 (RW))   08:03	15:58 1   15:57 (WEA 43 (RW))   07:30	15:58 1   15:57 (WEA 43 (RW))   07:30
26   05:11	20:00 (WTA K02)   06:15	20:00 (WTA K01)   07:09	19:24 (WEA 42 (RW))   08:05	15:56 1   15:55 (WEA 43 (RW))   07:30	15:56 1   15:55 (WEA 43 (RW))   07:30
27   05:12	20:00 (WTA K02)   06:17	20:00 (WTA K01)   07:11	19:22 (WEA 42 (RW))   08:07	15:54 1   15:53 (WEA 43 (RW))   07:30	15:54 1   15:53 (WEA 43 (RW))   07:30
28   05:13	20:00 (WTA K02)   06:19	20:00 (WTA K01)   07:13	19:20 (WEA 42 (RW))   08:09	15:52 1   15:51 (WEA 43 (RW))   07:30	15:52 1   15:51 (WEA 43 (RW))   07:30
29   05:14	20:00 (WTA K02)   06:21	20:00 (WTA K01)   07:15	19:18 (WEA 42 (RW))   08:11	15:50 1   15:49 (WEA 43 (RW))   07:30	15:50 1   15:49 (WEA 43 (RW))   07:30
30   05:15	20:00 (WTA K02)   06:23	20:00 (WTA K01)   07:17	19:16 (WEA 42 (RW))   08:13	15:48 1   15:47 (WEA 43 (RW))   07:30	15:48 1   15:47 (WEA 43 (RW))   07:30
31   05:16	20:00 (WTA K02)   06:25	20:00 (WTA K01)   07:19	19:14 (WEA 42 (RW))   08:15	15:46 1   15:45 (WEA 43 (RW))   07:30	15:46 1   15:45 (WEA 43 (RW))   07:30
32   05:17	20:00 (WTA K02)   06:27	20:00 (WTA K01)   07:21	19:12 (WEA 42 (RW))   08:17	15:44 1   15:43 (WEA 43 (RW))   07:30	15:44 1   15:43 (WEA 43 (RW))   07:30
33   05:18	20:00 (WTA K02)   06:29	20:00 (WTA K01)   07:23	19:10 (WEA 42 (RW))   08:19	15:42 1   15:41 (WEA 43 (RW))   07:30	15:42 1   15:41 (WEA 43 (RW))   07:30
34   05:19	20:00 (WTA K02)   06:31	20:00 (WTA K01)   07:25	19:08 (WEA 42 (RW))   08:21	15:40 1   15:39 (WEA 43 (RW))   07:30	15:40 1   15:39 (WEA 43 (RW))   07:30
35   05:20	20:00 (WTA K02)   06:33	20:00 (WTA K01)   07:27	19:06 (WEA 42 (RW))   08:23	15:38 1   15:37 (WEA 43 (RW))   07:30	15:38 1   15:37 (WEA 43 (RW))   07:30
36   05:21	20:00 (WTA K02)   06:35	20:00 (WTA K01)   07:29	19:04 (WEA 42 (RW))   08:25	15:36 1   15:35 (WEA 43 (RW))   07:30	15:36 1   15:35 (WEA 43 (RW))   07:30
37   05:22	20:00 (WTA K02)   06:37	20:00 (WTA K01)   07:31	19:02 (WEA 42 (RW))   08:27	15:34 1   15:33 (WEA 43 (RW))   07:30	15:34 1   15:33 (WEA 43 (RW))   07:30
38   05:23	20:00 (WTA K02)   06:39	20:00 (WTA K01)   07:33	19:00 (WEA 42 (RW))   08:29	15:32 1   15:31 (WEA 43 (RW))   07:30	15:32 1   15:31 (WEA 43 (RW))   07:30
39   05:24	20:00 (WTA K02)   06:41	20:00 (WTA K01)   07:35	18:58 (WEA 42 (RW))   08:31	15:30 1   15:29 (WEA 43 (RW))   07:30	15:30 1   15:29 (WEA 43 (RW))   07:30
40   05:25	20:00 (WTA K02)   06:43	20:00 (WTA K01)   07:37	18:56 (WEA 42 (RW))   08:33	15:28 1   15:27 (WEA 43 (RW))   07:30	15:28 1   15:27 (WEA 43 (RW))   07:30
41   05:26	20:00 (WTA K02)   06:45	20:00 (WTA K01)   07:39	18:54 (WEA 42 (RW))   08:35	15:26 1   15:25 (WEA 43 (RW))   07:30	15:26 1   15:25 (WEA 43 (RW))   07:30
42   05:27	20:00 (WTA K02)   06:47	20:00 (WTA K01)   07:41	18:52 (WEA 42 (RW))   08:37	15:24 1   15:23 (WEA 43 (RW))   07:30	15:24 1   15:23 (WEA 43 (RW))   07:30
43   05:28	20:00 (WTA K02)   06:49	20:00 (WTA K01)   07:43	18:50 (WEA 42 (RW))   08:39	15:22 1   15:21 (WEA 43 (RW))   07:30	15:22 1   15:21 (WEA 43 (RW))   07:30
44   05:29	20:00 (WTA K02)   06:51	20:00 (WTA K01)   07:45	18:48 (WEA 42 (RW))   08:41	15:20 1   15:19 (WEA 43 (RW))   07:30	15:20 1   15:19 (WEA 43 (RW))   07:30
45   05:30	20:00 (WTA K02)   06:53	20:00 (WTA K01)   07:47	18:46 (WEA 42 (RW))   08:43	15:18 1   15:17 (WEA 43 (RW))   07:30	15:18 1   15:17 (WEA 43 (RW))   07:30
46   05:31	20:00 (WTA K02)   06:55	20:00 (WTA K01)   07:49	18:44 (WEA 42 (RW))   08:45	15:16 1   15:15 (WEA 43 (RW))   07:30	15:16 1   15:15 (WEA 43 (RW))   07:30
47   05:32	20:00 (WTA K02)   06:57	20:00 (WTA K01)   07:51	18:42 (WEA 42 (RW))   08:47	15:14 1   15:13 (WEA 43 (RW))   07:30	15:14 1   15:13 (WEA 43 (RW))   07:30
48   05:33	20:00 (WTA K02)   06:59	20:00 (WTA K01)   07:53	18:40 (WEA 42 (RW))   08:49	15:12 1   15:11 (WEA 43 (RW))   07:30	15:12 1   15:11 (WEA 43 (RW))   07:30
49   05:34	20:00 (WTA K02)   07:01	20:00 (WTA K01)   07:55	18:38 (WEA 42 (RW))   08:51	15:10 1   15:09 (WEA 43 (RW))   07:30	15:10 1   15:09 (WEA 43 (RW))   07:30
50   05:35	20:00 (WTA K02)   07:03	20:00 (WTA K01)   07:57	18:36 (WEA 42 (RW))   08:53	15:08 1   15:07 (WEA 43 (RW))   07:30	15:08 1   15:07 (WEA 43 (RW))   07:30
51   05:36	20:00 (WTA K02)   07:05	20:00 (WTA K01)   07:59	18:34 (WEA 42 (RW))   08:55	15:06 1   15:05 (WEA 43 (RW))   07:30	15:06 1   15:05 (WEA 43 (RW))   07:30
52   05:37	20:00 (WTA K02)   07:07	20:00 (WTA K01)   08:01	18:32 (WEA 42 (RW))   08:57	15:04 1   15:03 (WEA 43 (RW))   07:30	15:04 1   15:03 (WEA 43 (RW))   07:30
53   05:38	20:00 (WTA K02)   07:09	20:00 (WTA K01)   08:03	18:30 (WEA 42 (RW))   08:59	15:02 1   15:01 (WEA 43 (RW))   07:30	15:02 1   15:01 (WEA 43 (RW))   07:30
54   05:39	20:00 (WTA K02)   07:11	20:00 (WTA K01)   08:05	18:28 (WEA 42 (RW))   09:01	15:00 1   14:59 (WEA 43 (RW))   07:30	15:00 1   14:59 (WEA 43 (RW))   07:30
55   05:40	20:00 (WTA K02)   07:13	20:00 (WTA K01)   08:07	18:26 (WEA 42 (RW))   09:03	14:58 1   14:57 (WEA 43 (RW))   07:30	14:58 1   14:57 (WEA 43 (RW))   07:30
56   05:41	20:00 (WTA K02)   07:15	20:00 (WTA K01)   08:09	18:24 (WEA 42 (RW))   09:05	14:56 1   14:55 (WEA 43 (RW))   07:30	14:56 1   14:55 (WEA 43 (RW))   07:30
57   05:42	20:00 (WTA K02)   07:17	20:00 (WTA K01)   08:11	18:22 (WEA 42 (RW))   09:07	14:54 1   14:53 (WEA 43 (RW))   07:30	14:54 1   14:53 (WEA 43 (RW))   07:30
58   05:43	20:00 (WTA K02)   07:19	20:00 (WTA K01)   08:13	18:20 (WEA 42 (RW))   09:09	14:52 1   14:51 (WEA 43 (RW))   07:30	14:52 1   14:51 (WEA 43 (RW))   07:30
59   05:44	20:00 (WTA K02)   07:21	20:00 (WTA K01)   08:15	18:18 (WEA 42 (RW))   09:11	14:50 1   14:49 (WEA 43 (RW))   07:30	14:50 1   14:49 (WEA 43 (RW))   07:30
60   05:45	20:00 (WTA K02)   07:23	20:00 (WTA K01)   08:17	18:16 (WEA 42 (RW))   09:13	14:48 1   14:47 (WEA 43 (RW))   07:30	14:48 1   14:47 (WEA 43 (RW))   07:30
61   05:46	20:00 (WTA K02)   07:25	20:00 (WTA K01)   08:19	18:14 (WEA 42 (RW))   09:15	14:46 1   14:45 (WEA 43 (RW))   07:30	14:46 1   14:45 (WEA 43 (RW))   07:30
62   05:47	20:00 (WTA K02)   07:27	20:00 (WTA K01)   08:21	18:12 (WEA 42 (RW))   09:17	14:44 1   14:43 (WEA 43 (RW))   07:30	14:44 1   14:43 (WEA 43 (RW))   07:30
63   05:48	20:00 (WTA K02)   07:29	20:00 (WTA K01)   08:23	18:10 (WEA 42 (RW))   09:19	14:42 1   14:41 (WEA 43 (RW))   07:30	14:42 1   14:41 (WEA 43 (RW))   07:30
64   05:49	20:00 (WTA K02)   07:31	20:00 (WTA K01)   08:25	18:08 (WEA 42 (RW))   09:21	14:40 1   14:39 (WEA 43 (RW))   07:30	14:40 1   14:39 (WEA 43 (RW))   07:30
65   05:50	20:00 (WTA K02)   07:33	20:00 (WTA K01)   08:27	18:06 (WEA 42 (RW))   09:23	14:38 1   14:37 (WEA 43 (RW))   07:30	14:38 1   14:37 (WEA 43 (RW))   07:30
66   05:51	20:00 (WTA K02)   07:35	20:00 (WTA K01)   08:29	18:04 (WEA 42 (RW))   09:25	14:36 1   14:35 (WEA 43 (RW))   07:30	14:36 1   14:35 (WEA 43 (RW))   07:30
67   05:52	20:00 (WTA K02)   07:37	20:00 (WTA K01)   08:31	18:02 (WEA 42 (RW))   09:27	14:34 1   14:33 (WEA 43 (RW))   07:30	14:34 1   14:33 (WEA 43 (RW))   07:30
68   05:53	20:00 (WTA K02)   07:39	20:00 (WTA K01)   08:33	18:00 (WEA 42 (RW))   09:29	14:32 1   14:31 (WEA 43 (RW))   07:30	14:32 1   14:31 (WEA 43 (RW))   07:30
69   05:54	20:00 (WTA K02)   07:41	20:00 (WTA K01)   08:35	17:58 (WEA 42 (RW))   09:31	14:30 1   14:29 (WEA 43 (RW))   07:30	14:30 1   14:29 (WEA 43 (RW))   07:30
70   05:55	20:00 (WTA K02)   07:43	20:00 (WTA K01)   08:37	17:56 (WEA 42 (RW))   09:33	14:28 1   14:27 (WEA 43 (RW))   07:30	14:28 1   14:27 (WEA 43 (RW))   07:30
71   05:56	20:00 (WTA K02)   07:45	20:00 (WTA K01)   08:39	17:54 (WEA 42 (RW))   09:35		





Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 02 - IO 02 Hauptstraße 29 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	14:38 (WEA RWEG1)	08:06	14:18 (WEA 05 (GRN))	07:08	06:52	18:58 (WEA 42 (RW))	05:41	19:53 (WEA K04)	04:51	20:49 (WEA K02)
	16:03	5 14:43 (WEA RWEG1)	16:55	3 16:21 (WEA 05 (GRN))	17:52	19:51	18 19:16 (WEA 42 (RW))	20:48	24 20:17 (WEA K04)	21:39	12 21:01 (WEA K02)
2	08:37		08:04		07:05	06:49	18:59 (WEA 42 (RW))	05:39		19:53 (WEA K04)	04:50
	16:04		16:57		17:54	19:53	16 19:15 (WEA 42 (RW))	20:49	24 20:17 (WEA K04)	21:40	10 21:00 (WEA K02)
3	08:37		08:03		07:03	06:47	19:00 (WEA 42 (RW))	05:37		19:53 (WEA K04)	04:49
	16:05		16:59		17:56	19:55	15 19:15 (WEA 42 (RW))	20:51	26 20:20 (WEA K03)	21:41	8 21:00 (WEA K02)
4	08:36		08:01		07:01	06:44	19:01 (WEA 42 (RW))	05:35		19:54 (WEA K04)	04:48
	16:06		17:01	2 16:30 (WEA 02 (GRN))	17:58	19:57	11 19:12 (WEA 42 (RW))	20:53	28 20:23 (WEA K03)	21:42	7 20:59 (WEA K02)
5	08:36		07:59		06:58	06:42	19:04 (WEA 42 (RW))	05:33		19:54 (WEA K04)	04:47
	16:08		17:07	5 16:32 (WEA 02 (GRN))	18:00	19:59	5 19:09 (WEA 42 (RW))	20:55	31 20:25 (WEA K03)	21:43	5 20:58 (WEA K02)
6	08:36		07:57		06:56	06:39		05:31		19:54 (WEA K04)	04:47
	16:09		17:05	7 16:34 (WEA 02 (GRN))	18:02	20:01		20:57	31 20:26 (WEA K03)	21:44	
7	08:35		07:55		06:53	06:37		05:29		19:54 (WEA K04)	04:46
	16:10		17:07	9 16:36 (WEA 02 (GRN))	18:03	20:02		20:59	33 20:26 (WEA K03)	21:45	
8	08:35		07:53		06:51	06:34		05:27		19:55 (WEA K04)	04:45
	16:12		17:29	10 16:38 (WEA 02 (GRN))	18:05	20:04		21:02	33 20:29 (WEA K03)	21:46	
9	08:34	15:36 (WEA 01 (GRN))	07:51	16:39 (WEA 01 (GRN))	06:45	06:32	17:42 (WEA 23 (RW))	06:32	5 19:37 (WEA 40 (RW))	05:35	19:55 (WEA K04)
	16:13	2 15:36 (WEA 01 (GRN))	17:11	9 16:38 (WEA 01 (GRN))	18:03	19:41	17:41 (WEA 23 (RW))	06:32	11 19:37 (WEA 40 (RW))	05:33	11 20:59 (WEA K03)
10	08:33	15:34 (WEA 01 (GRN))	07:49	16:31 (WEA 01 (GRN))	06:44	06:31	17:41 (WEA 23 (RW))	06:32	4 19:41 (WEA 40 (RW))	05:33	19:56 (WEA K04)
	16:15	3 15:37 (WEA 01 (GRN))	17:11	5 16:36 (WEA 01 (GRN))	18:05	19:40	17:43 (WEA 23 (RW))	06:30	4 19:41 (WEA 40 (RW))	05:34	11 21:00 (WEA K02)
11	08:33	15:36 (WEA 01 (GRN))	07:47		06:44	06:27		05:37 (WEA 40 (RW))	05:32	19:59 (WEA K04)	04:44
	16:16	5 15:39 (WEA 01 (GRN))	17:25		18:11	20:11		5 19:42 (WEA 40 (RW))	05:25	23 20:39 (WEA K03)	21:19
12	08:32	15:34 (WEA 01 (GRN))	07:45		06:41	06:25		5 19:42 (WEA 40 (RW))	05:23	20:02 (WEA K03)	04:45
	16:18	7 15:41 (WEA 01 (GRN))	17:27		18:12	20:12		5 19:44 (WEA 40 (RW))	05:18	20 20:32 (WEA K03)	21:20
13	08:31	15:38 (WEA 01 (GRN))	07:43		06:39	06:22		5 19:44 (WEA 40 (RW))	05:18	19:57 (WEA K04)	04:43
	16:20	8 15:48 (WEA 01 (GRN))	17:29		18:13	20:14		2 19:48 (WEA 40 (RW))	05:19	12 20:31 (WEA K03)	21:20
14	08:30	15:35 (WEA 01 (GRN))	07:41		06:37	06:20		10 19:53 (WEA 40 (RW))	05:18	19:58 (WEA K04)	04:42
	16:21	10 15:46 (WEA 01 (GRN))	17:32		18:14	20:15		12 20:34 (WEA K03)	05:17	10 20:30 (WEA K03)	21:21
15	08:29	15:33 (WEA 01 (GRN))	07:39		06:34	06:18		14 20:38 (WEA K03)	05:16	19:59 (WEA K04)	04:41
	16:23	12 15:47 (WEA 01 (GRN))	17:34		18:15	20:16		16 20:42 (WEA K03)	05:15	19:59 (WEA K04)	04:40
16	08:28	15:36 (WEA 01 (GRN))	07:37		06:31	06:15		18 20:46 (WEA K03)	05:14	19:59 (WEA K04)	04:39
	16:25	13 15:49 (WEA 01 (GRN))	17:36		18:16	20:17		20 20:50 (WEA K03)	05:13	19:59 (WEA K04)	04:38
17	08:27	15:37 (WEA 01 (GRN))	07:35		06:29	06:13		22 20:54 (WEA K03)	05:12	19:59 (WEA K04)	04:37
	16:26	14 15:51 (WEA 01 (GRN))	17:38		18:17	20:18		24 20:58 (WEA K03)	05:11	19:59 (WEA K04)	04:36
18	08:26	15:37 (WEA 01 (GRN))	07:33		06:26	06:11		26 21:02 (WEA K03)	05:10	19:59 (WEA K04)	04:35
	16:28	15 15:50 (WEA 01 (GRN))	17:40		18:18	20:19		28 21:06 (WEA K03)	05:09	19:59 (WEA K04)	04:34
19	08:25	15:38 (WEA 01 (GRN))	07:31	17:01 (WEA 01 (GRN))	06:24	06:08		30 21:10 (WEA K03)	05:08	19:59 (WEA K04)	04:33
	16:30	12 15:50 (WEA 01 (GRN))	17:42	2 17:03 (WEA 01 (GRN))	18:21	20:25		32 21:14 (WEA K03)	05:07	19:59 (WEA K04)	04:32
20	08:24	15:39 (WEA 01 (GRN))	07:28	3 17:05 (WEA 01 (GRN))	06:22	06:05		34 21:18 (WEA K03)	05:06	19:59 (WEA K04)	04:31
	16:32	12 15:51 (WEA 01 (GRN))	17:44	5 17:07 (WEA 01 (GRN))	18:23	20:27		36 21:22 (WEA K03)	05:05	19:59 (WEA K04)	04:30
21	08:23	15:40 (WEA 01 (GRN))	07:26	4 17:10 (WEA 01 (GRN))	06:21	06:04		38 21:26 (WEA K03)	05:04	19:59 (WEA K04)	04:29
	16:34	9 15:49 (WEA 01 (GRN))	17:46	5 17:12 (WEA 01 (GRN))	18:24	20:28		40 21:30 (WEA K03)	05:03	19:59 (WEA K04)	04:28
22	08:21	15:42 (WEA 01 (GRN))	07:24	6 17:15 (WEA 01 (GRN))	06:19	06:02		42 21:34 (WEA K03)	05:02	19:59 (WEA K04)	04:27
	16:35	7 15:49 (WEA 01 (GRN))	17:48	8 17:18 (WEA 01 (GRN))	18:25	20:29		44 21:38 (WEA K03)	05:01	19:59 (WEA K04)	04:26
23	08:20	15:40 (WEA 01 (GRN))	07:22	7 17:21 (WEA 01 (GRN))	06:17	05:59	19:06 (WEA 41 (RW))	05:02	19:59 (WEA K04)	04:25	
	16:37	11 15:40 (WEA 01 (GRN))	17:50	4 17:23 (WEA 01 (GRN))	18:26	20:31	19:06 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
24	08:19	15:40 (WEA 01 (GRN))	07:20	5 17:26 (WEA 01 (GRN))	06:14	05:57	19:08 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:38	12 15:41 (WEA 01 (GRN))	17:52	6 17:29 (WEA 01 (GRN))	18:27	20:32	19:10 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
25	08:17	15:42 (WEA 01 (GRN))	07:18	7 17:32 (WEA 01 (GRN))	06:12	05:54	19:12 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:40	13 15:42 (WEA 01 (GRN))	17:54	8 17:35 (WEA 01 (GRN))	18:28	20:33	19:14 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
26	08:16	15:41 (WEA 01 (GRN))	07:15	9 17:38 (WEA 01 (GRN))	06:09	05:52	19:16 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:43	14 15:43 (WEA 01 (GRN))	17:56	10 17:41 (WEA 01 (GRN))	18:29	20:34	19:18 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
27	08:15	15:43 (WEA 01 (GRN))	07:13	11 17:44 (WEA 01 (GRN))	06:06	05:50	19:20 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:45	14 15:44 (WEA 01 (GRN))	17:58	12 17:47 (WEA 01 (GRN))	18:30	20:35	19:22 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
28	08:13	15:45 (WEA 01 (GRN))	07:10	13 17:50 (WEA 01 (GRN))	06:02	05:48	19:24 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:47	15 15:46 (WEA 01 (GRN))	18:00	14 17:53 (WEA 01 (GRN))	18:31	20:36	19:26 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
29	08:11	15:46 (WEA 01 (GRN))	07:07	15 17:56 (WEA 01 (GRN))	05:59	05:45	19:28 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:49	2 15:46 (WEA 01 (GRN))	18:02	16 17:59 (WEA 01 (GRN))	18:32	20:37	19:30 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
30	08:09	15:47 (WEA 01 (GRN))	07:04	17 18:02 (WEA 01 (GRN))	05:56	05:42	19:32 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:51	3 15:48 (WEA 01 (GRN))	18:04	18 18:05 (WEA 01 (GRN))	18:33	20:38	19:34 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
31	08:06	15:48 (WEA 01 (GRN))	07:01	19 18:08 (WEA 01 (GRN))	05:54	05:40	19:36 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
	16:53	4 15:50 (WEA 01 (GRN))	18:06	20 18:11 (WEA 01 (GRN))	18:34	20:39	19:38 (WEA 41 (RW))	05:02	21:34 (WEA K03)	05:02	4 20:46 (WEA K02)
Sommerzeitbeginn		20:8			20:7						
Sommerzeitbeendigung		21:1	27:2	1:3		11:5	4:51	18:8	4:61	5:13	12

**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)	Schatteneende (WEA mit letztem Schatten)
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Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

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Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 02 - IO 02 Hauptstraße 29 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

Table with columns for months (Juli, August, September, Oktober, November, Dezember) and rows for specific dates and times, detailing shadow cast durations and directions.

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

Summary table with columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM), Schattenanfang, Schattenende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)







Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 03 - IO 03 Hauptstraße 24 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni								
1	08:37	14:46 (WEA RWEG1)	08:06	16:06 (WEA 03 (GRN))	07:08	17:20 (WEA 01 (GRN))	06:52	19:23 (WEA 41 (RW))	05:41	20:48	21:01 (WEA K02)							
1	16:03	26	15:12 (WEA RWEG1)	16:55	12	16:18 (WEA 03 (GRN))	17:52	4	17:24 (WEA 01 (GRN))	19:51	1	19:24 (WEA 41 (RW))	20:48	2	21:03 (WEA K02)			
2	08:37	14:47 (WEA RWEG1)	08:04	16:07 (WEA 03 (GRN))	07:05	17:22 (WEA 01 (GRN))	06:49	19:23 (WEA 41 (RW))	05:39	20:49	21:00 (WEA K02)							
3	08:37	14:47 (WEA RWEG1)	16:57	11	16:18 (WEA 03 (GRN))	17:54	4	17:26 (WEA 01 (GRN))	19:53	3	19:26 (WEA 41 (RW))	20:49	4	21:04 (WEA K02)				
4	08:37	14:47 (WEA RWEG1)	08:03	16:08 (WEA 03 (GRN))	07:03	17:25 (WEA 01 (GRN))	06:47	19:23 (WEA 41 (RW))	05:37	20:49	21:01 (WEA K02)							
5	16:05	26	15:13 (WEA RWEG1)	16:59	8	16:16 (WEA 03 (GRN))	17:56	11:55	5	19:28 (WEA 41 (RW))	20:51	21:41	5	21:06 (WEA K02)				
6	08:36	14:48 (WEA RWEG1)	08:01	16:09 (WEA 03 (GRN))	07:01	17:26 (WEA 01 (GRN))	06:44	19:23 (WEA 41 (RW))	05:35	20:51	21:01 (WEA K02)							
7	16:06	25	15:13 (WEA RWEG1)	17:01	11:58	17:27 (WEA 01 (GRN))	06:42	19:30 (WEA 41 (RW))	20:52	21:42	6	21:07 (WEA K02)						
8	08:36	14:48 (WEA RWEG1)	17:59	16:58	5	16:36 (WEA 05 (GRN))	18:03	3	17:30 (WEA 43 (RW))	19:57	1	19:24 (WEA 41 (RW))	20:53	2	21:08 (WEA K02)			
9	16:08	25	15:13 (WEA RWEG1)	17:03	11:58	16:36 (WEA 05 (GRN))	18:03	8	17:37 (WEA 43 (RW))	20:02	10:59	4	20:28 (WEA K04)	21:45	7	21:08 (WEA K02)		
10	08:36	14:49 (WEA RWEG1)	17:57	16:56	4	16:34 (WEA 05 (GRN))	18:01	3	17:29 (WEA 43 (RW))	19:59	19:26 (WEA 41 (RW))	05:31	20:20 (WEA K04)	21:47	7	21:02 (WEA K02)		
11	16:09	25	15:14 (WEA RWEG1)	17:05	11:58	16:33 (WEA 05 (GRN))	18:02	5	17:34 (WEA 43 (RW))	20:01	3	19:29 (WEA 41 (RW))	20:57	6	20:26 (WEA K04)	21:44	7	21:09 (WEA K02)
12	08:35	14:50 (WEA RWEG1)	17:55	16:53	3	16:33 (WEA 05 (GRN))	18:03	7	17:29 (WEA 43 (RW))	19:57	19:26 (WEA 41 (RW))	05:29	20:18 (WEA K04)	21:46	21:02 (WEA K02)			
13	16:10	25	15:13 (WEA RWEG1)	17:07	11:57	16:36 (WEA 05 (GRN))	18:03	8	17:37 (WEA 43 (RW))	20:02	10:59	4	20:28 (WEA K04)	21:45	8	21:10 (WEA K02)		
14	08:35	14:50 (WEA RWEG1)	17:53	16:54	4	16:34 (WEA 05 (GRN))	18:01	3	17:29 (WEA 43 (RW))	19:54	19:34 (WEA 42 (RW))	05:27	20:17 (WEA K04)	21:45	21:03 (WEA K02)			
15	16:12	24	15:12 (WEA RWEG1)	17:29	11:55	16:30 (WEA 05 (GRN))	18:05	6	17:30 (WEA 43 (RW))	19:54	2	19:36 (WEA 42 (RW))	20:56	13	20:29 (WEA K04)	21:45	6	21:14 (WEA K02)
16	08:34	14:51 (WEA RWEG1)	17:51	16:55 (WEA 05 (GRN))	18:04	17:30 (WEA 43 (RW))	19:54	7	17:37 (WEA 43 (RW))	20:02	10:59	4	20:28 (WEA K04)	21:45	9	21:10 (WEA K02)		
17	16:13	22	15:12 (WEA RWEG1)	17:11	11:54	16:34 (WEA 05 (GRN))	18:07	12	17:40 (WEA 43 (RW))	20:02	7	19:39 (WEA 42 (RW))	21:03	13	20:30 (WEA K04)	21:47	9	21:11 (WEA K02)
18	08:33	14:52 (WEA RWEG1)	17:49	16:56	3	16:35 (WEA 05 (GRN))	18:06	10	17:41 (WEA 43 (RW))	20:00	13	19:41 (WEA 42 (RW))	21:03	13	20:31 (WEA K04)	21:46	9	21:12 (WEA K02)
19	16:15	21	15:11 (WEA RWEG1)	17:17	11:53	16:36 (WEA 05 (GRN))	18:07	10	17:41 (WEA 43 (RW))	20:00	14	19:41 (WEA 42 (RW))	21:04	14	20:31 (WEA K04)	21:46	9	21:12 (WEA K02)
20	08:33	14:51 (WEA RWEG1)	17:47	16:54	4	16:34 (WEA 05 (GRN))	18:07	11	17:42 (WEA 43 (RW))	20:00	15	19:42 (WEA 42 (RW))	21:04	15	20:32 (WEA K04)	21:46	10	21:13 (WEA K02)
21	16:16	19	15:12 (WEA RWEG1)	17:25	11:53	16:36 (WEA 05 (GRN))	18:07	11	17:42 (WEA 43 (RW))	20:00	16	19:42 (WEA 42 (RW))	21:05	16	20:33 (WEA K04)	21:46	10	21:14 (WEA K02)
22	08:32	14:50 (WEA RWEG1)	17:45	16:55	5	16:35 (WEA 05 (GRN))	18:08	12	17:43 (WEA 43 (RW))	20:00	17	19:43 (WEA 42 (RW))	21:05	17	20:34 (WEA K04)	21:46	11	21:15 (WEA K02)
23	16:18	18	15:11 (WEA RWEG1)	17:27	11:53	16:36 (WEA 05 (GRN))	18:08	13	17:44 (WEA 43 (RW))	20:00	18	19:44 (WEA 42 (RW))	21:05	18	20:35 (WEA K04)	21:46	11	21:16 (WEA K02)
24	08:31	14:51 (WEA RWEG1)	17:43	16:56	6	16:36 (WEA 05 (GRN))	18:09	14	17:45 (WEA 43 (RW))	20:00	19	19:45 (WEA 42 (RW))	21:06	19	20:36 (WEA K04)	21:46	12	21:17 (WEA K02)
25	16:20	17	15:11 (WEA RWEG1)	17:29	11:52	16:37 (WEA 05 (GRN))	18:10	15	17:46 (WEA 43 (RW))	20:00	20	19:46 (WEA 42 (RW))	21:06	20	20:37 (WEA K04)	21:46	13	21:18 (WEA K02)
26	08:30	14:51 (WEA RWEG1)	17:41	16:57	7	16:38 (WEA 05 (GRN))	18:11	16	17:47 (WEA 43 (RW))	20:00	21	19:47 (WEA 42 (RW))	21:06	21	20:38 (WEA K04)	21:46	14	21:19 (WEA K02)
27	16:22	16	15:11 (WEA RWEG1)	17:31	11:51	16:39 (WEA 05 (GRN))	18:12	17	17:48 (WEA 43 (RW))	20:00	22	19:48 (WEA 42 (RW))	21:07	22	20:39 (WEA K04)	21:46	15	21:20 (WEA K02)
28	08:29	14:51 (WEA RWEG1)	17:39	16:58	8	16:39 (WEA 05 (GRN))	18:13	18	17:49 (WEA 43 (RW))	20:00	23	19:49 (WEA 42 (RW))	21:07	23	20:40 (WEA K04)	21:46	16	21:21 (WEA K02)
29	16:24	15	15:11 (WEA RWEG1)	17:33	11:50	16:40 (WEA 05 (GRN))	18:14	19	17:50 (WEA 43 (RW))	20:00	24	19:50 (WEA 42 (RW))	21:07	24	20:41 (WEA K04)	21:46	17	21:22 (WEA K02)
30	08:28	14:51 (WEA RWEG1)	17:37	16:59	9	16:41 (WEA 05 (GRN))	18:15	20	17:51 (WEA 43 (RW))	20:00	25	19:51 (WEA 42 (RW))	21:08	25	20:42 (WEA K04)	21:46	18	21:23 (WEA K02)
31	16:26	14	15:11 (WEA RWEG1)	17:35	11:49	16:42 (WEA 05 (GRN))	18:16	21	17:52 (WEA 43 (RW))	20:00	26	19:52 (WEA 42 (RW))	21:08	26	20:43 (WEA K04)	21:46	19	21:24 (WEA K02)
1	08:27	14:51 (WEA RWEG1)	17:35	17:00 (WEA 02 (GRN))	18:17	17:53 (WEA 43 (RW))	20:00	27	17:53 (WEA 43 (RW))	20:00	27	19:53 (WEA 42 (RW))	21:09	27	20:44 (WEA K04)	21:46	20	21:25 (WEA K02)
2	16:28	13	15:11 (WEA RWEG1)	17:37	11:48	16:43 (WEA 05 (GRN))	18:17	22	17:54 (WEA 43 (RW))	20:00	28	19:54 (WEA 42 (RW))	21:09	28	20:45 (WEA K04)	21:46	21	21:26 (WEA K02)
3	08:26	14:51 (WEA RWEG1)	17:35	17:01 (WEA 02 (GRN))	18:18	17:55 (WEA 43 (RW))	20:00	23	17:55 (WEA 43 (RW))	20:00	29	19:55 (WEA 42 (RW))	21:09	29	20:46 (WEA K04)	21:46	22	21:27 (WEA K02)
4	16:30	12	15:11 (WEA RWEG1)	17:39	11:47	16:44 (WEA 05 (GRN))	18:18	24	17:56 (WEA 43 (RW))	20:00	30	19:56 (WEA 42 (RW))	21:10	30	20:47 (WEA K04)	21:46	23	21:28 (WEA K02)
5	08:25	14:51 (WEA RWEG1)	17:33	17:02 (WEA 02 (GRN))	18:19	17:56 (WEA 43 (RW))	20:00	25	17:57 (WEA 43 (RW))	20:00	31	19:57 (WEA 42 (RW))	21:10	31	20:48 (WEA K04)	21:46	24	21:29 (WEA K02)
6	16:32	11	15:11 (WEA RWEG1)	17:41	11:46	16:45 (WEA 05 (GRN))	18:19	26	17:58 (WEA 43 (RW))	20:00	1	19:58 (WEA 42 (RW))	21:10	1	20:49 (WEA K04)	21:46	25	21:30 (WEA K02)
7	08:24	14:51 (WEA RWEG1)	17:31	17:03 (WEA 02 (GRN))	18:20	17:59 (WEA 43 (RW))	20:00	27	17:59 (WEA 43 (RW))	20:00	2	19:59 (WEA 42 (RW))	21:11	2	20:50 (WEA K04)	21:46	26	21:31 (WEA K02)
8	16:34	10	15:11 (WEA RWEG1)	17:43	11:45	16:46 (WEA 05 (GRN))	18:20	28	18:00 (WEA 43 (RW))	20:00	3	19:59 (WEA 42 (RW))	21:11	3	20:51 (WEA K04)	21:46	27	21:32 (WEA K02)
9	08:23	14:51 (WEA RWEG1)	17:29	17:04 (WEA 02 (GRN))	18:21	18:01 (WEA 43 (RW))	20:00	29	18:01 (WEA 43 (RW))	20:00	4	19:59 (WEA 42 (RW))	21:11	4	20:52 (WEA K04)	21:46	28	21:33 (WEA K02)
10	16:36	9	15:11 (WEA RWEG1)	17:45	11:44	16:47 (WEA 05 (GRN))	18:21	30	18:02 (WEA 43 (RW))	20:00	5	19:59 (WEA 42 (RW))	21:12	5	20:53 (WEA K04)	21:46	29	21:34 (WEA K02)
11	08:22	14:51 (WEA RWEG1)	17:27	17:05 (WEA 02 (GRN))	18:22	18:02 (WEA 43 (RW))	20:00	31	18:03 (WEA 43 (RW))	20:00	6	19:59 (WEA 42 (RW))	21:12	6	20:54 (WEA K04)	21:46	30	21:35 (WEA K02)
12	16:38	8	15:11 (WEA RWEG1)	17:47	11:43	16:48 (WEA 05 (GRN))	18:22	1	18:04 (WEA 43 (RW))	20:00	7	19:59 (WEA 42 (RW))	21:12	7	20:55 (WEA K04)	21:46	31	21:36 (WEA K02)
13	08:21	14:51 (WEA RWEG1)	17:25	17:06 (WEA 02 (GRN))	18:23	18:03 (WEA 43 (RW))	20:00	2	18:05 (WEA 43 (RW))	20:00	8	19:59 (WEA 42 (RW))	21:13	8	20:56 (WEA K04)	21:46	1	21:37 (WEA K02)
14	16:40	7	15:11 (WEA RWEG1)	17:49	11:42	16:49 (WEA 05 (GRN))	18:23	3	18:06 (WEA 43 (RW))	20:00	9	19:59 (WEA 42 (RW))	21:13	9	20:57 (WEA K04)	21:46	2	21:38 (WEA K02)
15	08:20	14:51 (WEA RWEG1)	17:23	17:07 (WEA 02 (GRN))	18:24	18:04 (WEA 43 (RW))	20:00	4	18:07 (WEA 43 (RW))	20:00	10	19:59 (WEA 42 (RW))	21:13	10	20:58 (WEA K04)	21:46	3	21:39 (WEA K02)
16	16:42	6	15:11 (WEA RWEG1)	17:51	11:41	16:50 (WEA 05 (GRN))	18:24	5	18:08 (WEA 43 (RW))	20:00	11	19:59 (WEA 42 (RW))	21:14	11	20:59 (WEA K04)	21:46	4	21:40 (WEA K02)
17	08:19	14:51 (WEA RWEG1)	17:21	17:08 (WEA 02 (GRN))	18:25	18:05 (WEA 43 (RW))	20:00	6	18:09 (WEA 43 (RW))	20:00	12	19:59 (WEA 42 (RW))	21:14	12	20:59 (WEA K04)	21:46	5	21:41 (WEA K02)
18	16:44	5	15:11 (WEA RWEG1)	17:53	11:40	16:51 (WEA 05 (GRN))	18:25	7	18:10 (WEA 43 (RW))	20:00	13	19:59 (WEA 42 (RW))	21:14	13	21:00 (WEA K04)	21:46	6	21:42 (WEA K02)
19	08:18	14:51 (WEA RWEG1)	17:19	17:09 (WEA 02 (GRN))	18:26	18:06 (WEA 43 (RW))	20:00	8	18:11 (WEA 43 (RW))	20:00	14	19:59 (WEA 42 (RW))	21:15	14	21:01 (WEA K04)	21:46	7	21:43 (WEA K02)
20	16:46	4	15:11 (WEA RWEG1)	17:55	11:39	16:52 (WEA 05 (GRN))	18:26	9	18:12 (WEA 43 (RW))	20:00	15	19:59 (WEA 42 (RW))	21:15	15	21:02 (WEA K04)	21:46	8	21:44 (WEA K02)
21	08:17	14:51 (WEA RWEG1)	17:17	17:10 (WEA 02 (GRN))	18:27	18:07 (WEA 43 (RW))	20:00	10	18:13 (WEA 43 (RW))	20:00	16	19:59 (WEA 42 (RW))	21:15	16	21:03 (WEA K04)	21:46	9	21:45 (WEA K02)
22	16:48	3	15:11 (WEA RWEG1)	17:57	11:38	16:53 (WEA 05 (GRN))	18:27	11	18:14 (WEA 43 (RW))	20:00	17	19:59 (WEA 42 (RW))	21:16	17	21:04 (WE			





Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

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Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 03 - IO 03 Hauptstraße 24 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (Juli, August, September, Oktober, November, Dezember) and rows for specific dates and times, detailing shadow cast durations and directions.

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

Summary table with columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM), Schattenanfang, Schattenende, (WEA mit erstem Schatten), (WEA mit letztem Schatten).





Projekt:

SWP Windpark Riepsdorf-Grömitz

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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 04 - IO 04 Hauptstraße 16 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

Table with columns for months (Januar, Februar, März, April, Mai, Juni) and rows for specific dates and times, detailing shadow cast durations and directions.

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

Summary table with columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Zeitpunkt (SS:MM) Schatteneende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)







Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 04 - IO 04 Hauptstraße 16 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (Juli, August, September, Oktober, November, Dezember) and rows for specific dates and times, detailing shadow cast times and durations.

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

Table with 5 columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Schattenende (WEA mit erstem Schatten), Schattenende (WEA mit letztem Schatten)







Projekt:

SWP Windpark Riepsdorf-Grömitz

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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 05 - IO 05 Am Teich 4 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (Januar to Juni) and rows for specific dates, showing shadow cast times and durations.

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

Table with 5 columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Zeitpunkt (SS:MM) Schattende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)





Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 05 - IO 05 Am Teich 4 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Jul	August	September	Oktober	November	Dezember
1   04:47	20:55 (WEA K04)   05:27	20:18 (WEA 42 (RW))   06:23	07:17	18:21 (WEA 01 (GRN))   07:16	15:55 (WEA 03 (GRN))   08:12
2   04:47	21:17 (WEA K04)   21:18	20:33 (WEA 42 (RW))   20:10	18:55	18:25 (WEA 01 (GRN))   16:44	17   16:12 (WEA 03 (GRN))   15:58
3   04:48	20:56 (WEA K04)   05:29	20:18 (WEA 42 (RW))   06:24	07:19	18:17 (WEA 01 (GRN))   07:18	15:55 (WEA 03 (GRN))   08:14
4   04:49	21:17 (WEA K04)   21:18	20:34 (WEA 42 (RW))   20:07	18:53	18:23 (WEA 01 (GRN))   16:42	15   16:10 (WEA 03 (GRN))   15:58
5   04:50	20:56 (WEA K04)   05:31	20:17 (WEA 42 (RW))   06:26	07:21	18:16 (WEA 01 (GRN))   07:20	15:55 (WEA 03 (GRN))   08:15
6   04:51	21:17 (WEA K04)   21:14	20:35 (WEA 42 (RW))   20:05	2   19:35 (WEA 25 (Kob))   18:50	5   18:21 (WEA 01 (GRN))   16:40	12   16:07 (WEA 03 (GRN))   15:57
7   04:52	20:56 (WEA K04)   05:32	20:16 (WEA 42 (RW))   06:28	07:22	18:15 (WEA 01 (GRN))   07:22	15:55 (WEA 03 (GRN))   08:17
8   04:53	21:16 (WEA K04)   21:12	20:34 (WEA 42 (RW))   20:03	18:48	18:19 (WEA 01 (GRN))   16:38	10   16:05 (WEA 03 (GRN))   15:56
9   04:54	20:57 (WEA K04)   05:34	20:16 (WEA 42 (RW))   06:30	07:24	18:15 (WEA 01 (GRN))   07:24	15:57 (WEA 03 (GRN))   08:18
10   04:55	21:16 (WEA K04)   21:10	20:35 (WEA 42 (RW))   20:00	18:45	1   18:16 (WEA 01 (GRN))   16:36	7   16:04 (WEA 03 (GRN))   15:56
11   04:56	20:56 (WEA K04)   05:36	20:15 (WEA 42 (RW))   06:32	07:26	18:16 (WEA 01 (GRN))   07:26	15:58 (WEA 03 (GRN))   08:19
12   04:57	21:15 (WEA K04)   21:08	20:35 (WEA 42 (RW))   19:58	18:43	18:19 (WEA 01 (GRN))   16:34	4   16:02 (WEA 03 (GRN))   15:55
13   04:58	20:56 (WEA K04)   05:39	20:16 (WEA 42 (RW))   06:35	07:28	18:16 (WEA 01 (GRN))   07:28	15:59 (WEA 03 (GRN))   08:21
14   04:59	21:14 (WEA K04)   21:06	20:35 (WEA 42 (RW))   19:55	18:40	18:16 (WEA 01 (GRN))   07:30	15:59 (WEA 03 (GRN))   08:22
15   05:00	20:57 (WEA K04)   05:41	20:16 (WEA 42 (RW))   06:38	07:30	18:16 (WEA 01 (GRN))   07:30	15:59 (WEA 03 (GRN))   08:22
16   05:01	21:14 (WEA K04)   21:04	20:33 (WEA 42 (RW))   19:53	18:38	18:16 (WEA 01 (GRN))   07:30	15:59 (WEA 03 (GRN))   08:22
17   05:02	20:57 (WEA K04)   05:44	20:15 (WEA 42 (RW))   06:41	07:32	18:16 (WEA 01 (GRN))   07:32	15:59 (WEA 03 (GRN))   08:23
18   05:03	21:14 (WEA K04)   21:00	20:34 (WEA 42 (RW))   19:51	18:36	18:16 (WEA 01 (GRN))   07:32	15:59 (WEA 03 (GRN))   08:23
19   05:04	20:57 (WEA K04)   05:47	20:15 (WEA 42 (RW))   06:44	07:34	18:16 (WEA 01 (GRN))   07:34	15:59 (WEA 03 (GRN))   08:24
20   05:05	21:14 (WEA K04)   20:59	20:33 (WEA 42 (RW))   19:49	18:34	18:16 (WEA 01 (GRN))   07:34	15:59 (WEA 03 (GRN))   08:24
21   05:06	20:57 (WEA K04)   05:50	20:15 (WEA 42 (RW))   06:47	07:36	18:16 (WEA 01 (GRN))   07:36	15:59 (WEA 03 (GRN))   08:25
22   05:07	21:14 (WEA K04)   20:58	20:33 (WEA 42 (RW))   19:47	18:32	18:16 (WEA 01 (GRN))   07:36	15:59 (WEA 03 (GRN))   08:25
23   05:08	20:57 (WEA K04)   05:53	20:15 (WEA 42 (RW))   06:50	07:38	18:16 (WEA 01 (GRN))   07:38	15:59 (WEA 03 (GRN))   08:26
24   05:09	21:14 (WEA K04)   20:56	20:33 (WEA 42 (RW))   19:45	18:30	18:16 (WEA 01 (GRN))   07:38	15:59 (WEA 03 (GRN))   08:26
25   05:10	20:57 (WEA K04)   05:56	20:15 (WEA 42 (RW))   06:53	07:40	18:16 (WEA 01 (GRN))   07:40	15:59 (WEA 03 (GRN))   08:27
26   05:11	21:14 (WEA K04)   20:54	20:33 (WEA 42 (RW))   19:43	18:28	18:16 (WEA 01 (GRN))   07:40	15:59 (WEA 03 (GRN))   08:27
27   05:12	20:57 (WEA K04)   05:59	20:15 (WEA 42 (RW))   06:56	07:42	18:16 (WEA 01 (GRN))   07:42	15:59 (WEA 03 (GRN))   08:28
28   05:13	21:14 (WEA K04)   20:52	20:33 (WEA 42 (RW))   19:41	18:26	18:16 (WEA 01 (GRN))   07:42	15:59 (WEA 03 (GRN))   08:28
29   05:14	20:57 (WEA K04)   06:02	20:15 (WEA 42 (RW))   06:59	07:44	18:16 (WEA 01 (GRN))   07:44	15:59 (WEA 03 (GRN))   08:29
30   05:15	21:14 (WEA K04)   20:50	20:33 (WEA 42 (RW))   19:39	18:24	18:16 (WEA 01 (GRN))   07:44	15:59 (WEA 03 (GRN))   08:29
31   05:16	20:57 (WEA K04)   06:05	20:15 (WEA 42 (RW))   07:02	07:46	18:16 (WEA 01 (GRN))   07:46	15:59 (WEA 03 (GRN))   08:30
1   05:17	21:14 (WEA K04)   20:48	20:33 (WEA 42 (RW))   19:37	18:22	18:16 (WEA 01 (GRN))   07:46	15:59 (WEA 03 (GRN))   08:30
2   05:18	20:57 (WEA K04)   06:08	20:15 (WEA 42 (RW))   07:05	07:48	18:16 (WEA 01 (GRN))   07:48	15:59 (WEA 03 (GRN))   08:31
3   05:19	21:14 (WEA K04)   20:46	20:33 (WEA 42 (RW))   19:35	18:20	18:16 (WEA 01 (GRN))   07:48	15:59 (WEA 03 (GRN))   08:31
4   05:20	20:57 (WEA K04)   06:11	20:15 (WEA 42 (RW))   07:08	07:50	18:16 (WEA 01 (GRN))   07:50	15:59 (WEA 03 (GRN))   08:32
5   05:21	21:14 (WEA K04)   20:44	20:33 (WEA 42 (RW))   19:33	18:18	18:16 (WEA 01 (GRN))   07:50	15:59 (WEA 03 (GRN))   08:32
6   05:22	20:57 (WEA K04)   06:14	20:15 (WEA 42 (RW))   07:11	07:52	18:16 (WEA 01 (GRN))   07:52	15:59 (WEA 03 (GRN))   08:33
7   05:23	21:14 (WEA K04)   20:42	20:33 (WEA 42 (RW))   19:31	18:16	18:16 (WEA 01 (GRN))   07:52	15:59 (WEA 03 (GRN))   08:33
8   05:24	20:57 (WEA K04)   06:17	20:15 (WEA 42 (RW))   07:14	07:54	18:16 (WEA 01 (GRN))   07:54	15:59 (WEA 03 (GRN))   08:34
9   05:25	21:14 (WEA K04)   20:40	20:33 (WEA 42 (RW))   19:29	18:14	18:16 (WEA 01 (GRN))   07:54	15:59 (WEA 03 (GRN))   08:34
10   05:26	20:57 (WEA K04)   06:20	20:15 (WEA 42 (RW))   07:17	07:56	18:16 (WEA 01 (GRN))   07:56	15:59 (WEA 03 (GRN))   08:35
11   05:27	21:14 (WEA K04)   20:38	20:33 (WEA 42 (RW))   19:27	18:12	18:16 (WEA 01 (GRN))   07:56	15:59 (WEA 03 (GRN))   08:35
12   05:28	20:57 (WEA K04)   06:23	20:15 (WEA 42 (RW))   07:20	07:58	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:36
13   05:29	21:14 (WEA K04)   20:36	20:33 (WEA 42 (RW))   19:25	18:10	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:36
14   05:30	20:57 (WEA K04)   06:26	20:15 (WEA 42 (RW))   07:23	08:00	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:37
15   05:31	21:14 (WEA K04)   20:34	20:33 (WEA 42 (RW))   19:23	18:08	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:37
16   05:32	20:57 (WEA K04)   06:29	20:15 (WEA 42 (RW))   07:26	08:02	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:38
17   05:33	21:14 (WEA K04)   20:32	20:33 (WEA 42 (RW))   19:21	18:06	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:38
18   05:34	20:57 (WEA K04)   06:32	20:15 (WEA 42 (RW))   07:29	08:04	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:39
19   05:35	21:14 (WEA K04)   20:30	20:33 (WEA 42 (RW))   19:19	18:04	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:39
20   05:36	20:57 (WEA K04)   06:35	20:15 (WEA 42 (RW))   07:32	08:06	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:40
21   05:37	21:14 (WEA K04)   20:28	20:33 (WEA 42 (RW))   19:17	18:02	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:40
22   05:38	20:57 (WEA K04)   06:38	20:15 (WEA 42 (RW))   07:35	08:08	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:41
23   05:39	21:14 (WEA K04)   20:26	20:33 (WEA 42 (RW))   19:15	18:00	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:41
24   05:40	20:57 (WEA K04)   06:41	20:15 (WEA 42 (RW))   07:38	08:10	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:42
25   05:41	21:14 (WEA K04)   20:24	20:33 (WEA 42 (RW))   19:13	17:58	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:42
26   05:42	20:57 (WEA K04)   06:44	20:15 (WEA 42 (RW))   07:41	08:12	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:43
27   05:43	21:14 (WEA K04)   20:22	20:33 (WEA 42 (RW))   19:11	17:56	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:43
28   05:44	20:57 (WEA K04)   06:47	20:15 (WEA 42 (RW))   07:44	08:14	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:44
29   05:45	21:14 (WEA K04)   20:20	20:33 (WEA 42 (RW))   19:09	17:54	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:44
30   05:46	20:57 (WEA K04)   06:50	20:15 (WEA 42 (RW))   07:47	08:16	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:45
31   05:47	21:14 (WEA K04)   20:18	20:33 (WEA 42 (RW))   19:07	17:52	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:45
1   05:48	20:57 (WEA K04)   06:53	20:15 (WEA 42 (RW))   07:50	08:18	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:46
2   05:49	21:14 (WEA K04)   20:16	20:33 (WEA 42 (RW))   19:05	17:50	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:46
3   05:50	20:57 (WEA K04)   06:56	20:15 (WEA 42 (RW))   07:53	08:20	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:47
4   05:51	21:14 (WEA K04)   20:14	20:33 (WEA 42 (RW))   19:03	17:48	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:47
5   05:52	20:57 (WEA K04)   06:59	20:15 (WEA 42 (RW))   07:56	08:22	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:48
6   05:53	21:14 (WEA K04)   20:12	20:33 (WEA 42 (RW))   19:01	17:46	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:48
7   05:54	20:57 (WEA K04)   07:02	20:15 (WEA 42 (RW))   07:59	08:24	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:49
8   05:55	21:14 (WEA K04)   20:10	20:33 (WEA 42 (RW))   18:59	17:44	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:49
9   05:56	20:57 (WEA K04)   07:05	20:15 (WEA 42 (RW))   08:02	08:26	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:50
10   05:57	21:14 (WEA K04)   20:08	20:33 (WEA 42 (RW))   18:57	17:42	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:50
11   05:58	20:57 (WEA K04)   07:08	20:15 (WEA 42 (RW))   08:05	08:28	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:51
12   05:59	21:14 (WEA K04)   20:06	20:33 (WEA 42 (RW))   18:55	17:40	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:51
13   06:00	20:57 (WEA K04)   07:11	20:15 (WEA 42 (RW))   08:08	08:30	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:52
14   06:01	21:14 (WEA K04)   20:04	20:33 (WEA 42 (RW))   18:53	17:38	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:52
15   06:02	20:57 (WEA K04)   07:14	20:15 (WEA 42 (RW))   08:11	08:32	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:53
16   06:03	21:14 (WEA K04)   20:02	20:33 (WEA 42 (RW))   18:51	17:36	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:53
17   06:04	20:57 (WEA K04)   07:17	20:15 (WEA 42 (RW))   08:14	08:34	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:54
18   06:05	21:14 (WEA K04)   20:00	20:33 (WEA 42 (RW))   18:49	17:34	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:54
19   06:06	20:57 (WEA K04)   07:20	20:15 (WEA 42 (RW))   08:17	08:36	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:55
20   06:07	21:14 (WEA K04)   19:58	20:33 (WEA 42 (RW))   18:47	17:32	18:16 (WEA 01 (GRN))   07:58	15:59 (WEA 03 (GRN))   08:55
21   06:08	20:57 (				



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 06 - IO 06 Hauptstraße 3 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni		
1	08:37	14:33 (WEA RWED1)	08:06	16:17 (WEA 03 (GRN))	07:08	17:00 (WEA 45 (RW))	06:52	05:41		04:51	20:29 (WEA 42 (RW))	
1	16:03	15:09 (WEA RWED1)	16:55	5	16:22 (WEA 03 (GRN))	17:52	21	17:21 (WEA 02 (GRN))	19:51	21:39	19	20:48 (WEA 42 (RW))
2	08:37	14:34 (WEA RWED1)	08:04	16:16 (WEA 03 (GRN))	07:05	17:00 (WEA 45 (RW))	06:49	05:39		04:50	20:29 (WEA 42 (RW))	
3	16:04	15:10 (WEA RWED1)	16:57	9	16:25 (WEA 03 (GRN))	17:54	21	17:21 (WEA 02 (GRN))	19:53	20:49	18	20:47 (WEA 42 (RW))
3	08:37	14:34 (WEA RWED1)	08:03	16:15 (WEA 03 (GRN))	07:03	17:00 (WEA 45 (RW))	06:47	05:37		04:49	20:29 (WEA 42 (RW))	
4	16:05	15:09 (WEA RWED1)	16:59	12	16:27 (WEA 03 (GRN))	17:56	19	17:19 (WEA 02 (GRN))	19:55	20:51	18	20:48 (WEA 42 (RW))
4	08:36	14:35 (WEA RWED1)	08:01	16:15 (WEA 03 (GRN))	07:01	17:00 (WEA 45 (RW))	06:44	05:35		04:48	20:31 (WEA 42 (RW))	
5	16:07	15:10 (WEA RWED1)	17:01	15	16:30 (WEA 03 (GRN))	17:58	15	17:15 (WEA 05 (RW))	19:57	20:53	16	20:47 (WEA 42 (RW))
5	08:36	14:35 (WEA RWED1)	07:59	16:15 (WEA 03 (GRN))	06:58	17:01 (WEA 45 (RW))	06:42	05:33		04:47	20:33 (WEA 42 (RW))	
6	16:08	15:10 (WEA RWED1)	17:03	17	16:32 (WEA 03 (GRN))	18:00	13	17:14 (WEA 05 (RW))	19:59	20:55	16	20:47 (WEA 42 (RW))
6	08:36	14:36 (WEA RWED1)	07:57	16:14 (WEA 03 (GRN))	06:56	17:02 (WEA 45 (RW))	06:39	05:31		04:47	20:32 (WEA 42 (RW))	
7	16:09	15:11 (WEA RWED1)	17:05	19	16:33 (WEA 03 (GRN))	18:02	10	17:12 (WEA 05 (RW))	20:01	20:57	15	20:47 (WEA 42 (RW))
7	08:35	14:37 (WEA RWED1)	07:55	16:14 (WEA 03 (GRN))	06:53	17:05 (WEA 45 (RW))	06:37	05:29		04:46	20:33 (WEA 42 (RW))	
8	16:10	15:11 (WEA RWED1)	17:07	20	16:34 (WEA 03 (GRN))	18:03	5	17:10 (WEA 45 (RW))	20:02	20:59	2	20:26 (WEA 40 (RW))
8	08:35	14:37 (WEA RWED1)	07:53	16:14 (WEA 03 (GRN))	06:51	17:04 (WEA 45 (RW))	06:34	05:27		04:45	20:34 (WEA 42 (RW))	
9	16:12	15:11 (WEA RWED1)	17:09	20	16:34 (WEA 03 (GRN))	18:05		12:00		21:00	3	20:29 (WEA 40 (RW))
9	08:34	14:37 (WEA RWED1)	07:51	16:14 (WEA 03 (GRN))	06:49	17:04 (WEA 45 (RW))	06:32	05:25		04:45	20:34 (WEA 42 (RW))	
10	16:17	15:11 (WEA RWED1)	17:11	20	16:34 (WEA 03 (GRN))	18:07	1	17:41 (WEA 01 (GRN))	20:02	21:01	4	20:29 (WEA 40 (RW))
10	08:33	14:38 (WEA RWED1)	07:49	16:15 (WEA 03 (GRN))	06:46	17:05 (WEA 45 (RW))	06:30	05:23		04:44	20:35 (WEA 42 (RW))	
11	16:23	15:12 (WEA RWED1)	17:13	19	16:34 (WEA 03 (GRN))	18:09	4	17:42 (WEA 01 (GRN))	20:03	21:04	6	20:29 (WEA 40 (RW))
11	08:32	14:39 (WEA RWED1)	07:47	16:16 (WEA 03 (GRN))	06:44	17:06 (WEA 45 (RW))	06:28	05:22		04:44	20:36 (WEA 42 (RW))	
12	16:28	15:12 (WEA RWED1)	17:15	17	16:33 (WEA 03 (GRN))	18:12	6	17:43 (WEA 01 (GRN))	20:04	21:06	6	20:29 (WEA 40 (RW))
12	08:32	14:39 (WEA RWED1)	07:45	16:17 (WEA 03 (GRN))	06:42	17:07 (WEA 45 (RW))	06:26	05:20		04:43	20:37 (WEA 42 (RW))	
13	16:34	15:12 (WEA RWED1)	17:17	19	16:36 (WEA 03 (GRN))	18:13	8	17:46 (WEA 01 (GRN))	20:05	21:08	6	20:29 (WEA 40 (RW))
13	08:31	14:40 (WEA RWED1)	07:43	16:19 (WEA 03 (GRN))	06:39	17:08 (WEA 45 (RW))	06:24	05:19		04:43	20:38 (WEA 42 (RW))	
14	16:39	15:11 (WEA RWED1)	17:14	17	16:36 (WEA 03 (GRN))	18:15	8	17:46 (WEA 01 (GRN))	20:04	21:08	7	20:29 (WEA 40 (RW))
14	08:30	14:41 (WEA RWED1)	07:41	16:20 (WEA 03 (GRN))	06:36	17:11 (WEA 45 (RW))	06:22	05:16		04:43	20:39 (WEA 42 (RW))	
15	16:43	15:12 (WEA RWED1)	17:19	14	16:33 (WEA 03 (GRN))	18:17	5	17:47 (WEA 01 (GRN))	20:05	21:11	10	20:29 (WEA 40 (RW))
15	08:29	14:42 (WEA RWED1)	07:39	16:24 (WEA 03 (GRN))	06:34	17:12 (WEA 45 (RW))	06:20	05:14		04:42	20:40 (WEA 42 (RW))	
16	16:48	15:12 (WEA RWED1)	17:24	9	16:34 (WEA 03 (GRN))	18:20		20:10		21:16	12	20:29 (WEA 40 (RW))
16	08:28	14:43 (WEA RWED1)	07:37	16:27 (WEA 03 (GRN))	06:32	17:13 (WEA 45 (RW))	06:18	05:13		04:42	20:41 (WEA 42 (RW))	
17	16:53	15:12 (WEA RWED1)	17:29	9	16:36 (WEA 03 (GRN))	18:23		20:15		21:14	14	20:29 (WEA 40 (RW))
17	08:27	14:45 (WEA RWED1)	07:35	16:29 (WEA 03 (GRN))	06:29	17:14 (WEA 45 (RW))	06:16	05:11		04:42	20:42 (WEA 42 (RW))	
18	16:58	15:11 (WEA RWED1)	17:30	1	16:34 (WEA 03 (GRN))	18:25		20:21		21:18	16	20:29 (WEA 40 (RW))
18	08:26	14:46 (WEA RWED1)	07:33	16:32 (WEA 03 (GRN))	06:26	17:15 (WEA 45 (RW))	06:14	05:09		04:42	20:43 (WEA 42 (RW))	
19	17:03	15:10 (WEA RWED1)	17:31	2	16:35 (WEA 03 (GRN))	18:26	2	17:58 (WEA 45 (RW))	20:22	21:19	18	20:29 (WEA 40 (RW))
19	08:25	14:48 (WEA RWED1)	07:30	16:36 (WEA 03 (GRN))	06:24	17:16 (WEA 45 (RW))	06:12	05:08		04:42	20:44 (WEA 42 (RW))	
20	17:08	15:10 (WEA RWED1)	17:32	2	16:37 (WEA 03 (GRN))	18:27	5	18:00 (WEA 45 (RW))	20:23	21:19	20	20:29 (WEA 40 (RW))
20	08:24	14:50 (WEA RWED1)	07:28	16:38 (WEA 03 (GRN))	06:22	17:17 (WEA 45 (RW))	06:10	05:07		04:42	20:45 (WEA 42 (RW))	
21	17:13	15:09 (WEA RWED1)	17:34	2	16:39 (WEA 03 (GRN))	18:29	8	18:04 (WEA 45 (RW))	20:24	21:21	22	20:29 (WEA 40 (RW))
21	08:23	14:51 (WEA RWED1)	07:25	16:41 (WEA 03 (GRN))	06:20	17:18 (WEA 45 (RW))	06:08	05:04		04:42	20:46 (WEA 42 (RW))	
22	17:18	15:08 (WEA RWED1)	17:35	1	16:40 (WEA 03 (GRN))	18:30	12	18:08 (WEA 45 (RW))	20:25	21:23	24	20:29 (WEA 40 (RW))
22	08:22	14:52 (WEA RWED1)	07:26	16:43 (WEA 03 (GRN))	06:18	17:19 (WEA 45 (RW))	06:06	05:03		04:42	20:47 (WEA 42 (RW))	
23	17:23	15:08 (WEA RWED1)	17:36	1	16:42 (WEA 03 (GRN))	18:31	15	18:12 (WEA 45 (RW))	20:26	21:24	26	20:29 (WEA 40 (RW))
23	08:21	14:53 (WEA RWED1)	07:24	16:45 (WEA 03 (GRN))	06:16	17:20 (WEA 45 (RW))	06:04	05:02		04:42	20:48 (WEA 42 (RW))	
24	17:28	15:07 (WEA RWED1)	17:37	2	16:44 (WEA 03 (GRN))	18:32	13	18:16 (WEA 45 (RW))	20:27	21:25	28	20:29 (WEA 40 (RW))
24	08:20	14:54 (WEA RWED1)	07:23	16:47 (WEA 03 (GRN))	06:14	17:21 (WEA 45 (RW))	06:02	05:01		04:42	20:49 (WEA 42 (RW))	
25	17:33	15:06 (WEA RWED1)	17:38	1	16:46 (WEA 03 (GRN))	18:33	11	18:20 (WEA 45 (RW))	20:28	21:26	30	20:29 (WEA 40 (RW))
25	08:19	14:55 (WEA RWED1)	07:22	16:50 (WEA 03 (GRN))	06:12	17:22 (WEA 45 (RW))	06:00	05:00		04:42	20:50 (WEA 42 (RW))	
26	17:38	15:05 (WEA RWED1)	17:39	2	16:48 (WEA 03 (GRN))	18:34	9	18:24 (WEA 45 (RW))	20:29	21:27	32	20:29 (WEA 40 (RW))
26	08:18	14:56 (WEA RWED1)	07:21	16:53 (WEA 03 (GRN))	06:10	17:23 (WEA 45 (RW))	05:58	05:00		04:42	20:51 (WEA 42 (RW))	
27	17:43	15:04 (WEA RWED1)	17:40	1	16:50 (WEA 03 (GRN))	18:35	7	18:28 (WEA 45 (RW))	20:30	21:28	34	20:29 (WEA 40 (RW))
27	08:17	14:57 (WEA RWED1)	07:20	16:56 (WEA 03 (GRN))	06:08	17:24 (WEA 45 (RW))	05:56	05:00		04:42	20:52 (WEA 42 (RW))	
28	17:48	15:03 (WEA RWED1)	17:41	2	16:52 (WEA 03 (GRN))	18:36	5	18:32 (WEA 45 (RW))	20:31	21:29	36	20:29 (WEA 40 (RW))
28	08:16	14:58 (WEA RWED1)	07:19	16:59 (WEA 03 (GRN))	06:06	17:25 (WEA 45 (RW))	05:54	05:00		04:42	20:53 (WEA 42 (RW))	
29	17:53	15:02 (WEA RWED1)	17:42	1	16:54 (WEA 03 (GRN))	18:37	3	18:36 (WEA 45 (RW))	20:32	21:30	38	20:29 (WEA 40 (RW))
29	08:15	14:59 (WEA RWED1)	07:18	17:02 (WEA 03 (GRN))	06:04	17:26 (WEA 45 (RW))	05:52	05:00		04:42	20:54 (WEA 42 (RW))	
30	17:58	15:01 (WEA RWED1)	17:43	2	16:56 (WEA 03 (GRN))	18:38	1	18:40 (WEA 45 (RW))	20:33	21:31	40	20:29 (WEA 40 (RW))
30	08:14	15:00 (WEA RWED1)	07:17	17:05 (WEA 03 (GRN))	06:02	17:27 (WEA 45 (RW))	05:50	05:00		04:42	20:55 (WEA 42 (RW))	
31	18:03	15:00 (WEA RWED1)	17:44	1	16:58 (WEA 03 (GRN))	18:39	1	18:44 (WEA 45 (RW))	20:34	21:32	42	20:29 (WEA 40 (RW))
31	08:13	15:00 (WEA RWED1)	07:16	17:08 (WEA 03 (GRN))	06:00	17:28 (WEA 45 (RW))	05:48	05:00		04:42	20:56 (WEA 42 (RW))	
31	18:08	15:00 (WEA RWED1)	17:45	1	17:00 (WEA 03 (GRN))	18:40	2	18:48 (WEA 45 (RW))	20:35	21:33	44	20:29 (WEA 40 (RW))
31	08:12	15:00 (WEA RWED1)	07:15	17:11 (WEA 03 (GRN))	05:58	17:29 (WEA 45 (RW))	05:46	05:00		04:42	20:57 (WEA 42 (RW))	
31	18:13	15:00 (WEA RWED1)	17:46	1	17:12 (WEA 03 (GRN))	18:41	2	18:50 (WEA 45 (RW))	20:36	21:34	46	20:29 (WEA 40 (RW))
31	08:11	15:00 (WEA RWED1)	07:14	17:14 (WEA 03 (GRN))	05:56	17:30 (WEA 45 (RW))	05:44	05:00		04:42	20:58 (WEA 42 (RW))	
31	18:18	15:00 (WEA RWED1)	17:47	1	17:16 (WEA 03 (GRN))	18:42	1	18:56 (WEA 45 (RW))	20:37	21:35	48	20:29 (WEA 40 (RW))
31	08:10	15:00 (WEA RWED1)	07:13	17:17 (WEA 03 (GRN))	05:54	17:31 (WEA 45 (RW))	05:42	05:00		04:42	20:59 (WEA 42 (RW))	
31	18:23	15:00 (WEA RWED1)	17:48	1	17:20 (WEA 03 (GRN))	18:43	1	19:10 (WEA 45 (RW))	20:38	21:36	50	20:29 (WEA 40 (RW))
31	08:09	15:00 (WEA RWED1)	07:12	17:20 (WEA 03 (GRN))	05:52	17:32 (WEA 45 (RW))	05:40	05:00		04:42	21:00 (WEA 42 (RW))	
31	18:28	15:00 (WEA RWED1)	17:49	1	17:24 (WEA 03 (GRN))	18:44	1	19:24 (WEA 45 (RW))	20:39	21:37	52	20:29 (WEA 40 (RW))
31	08:08	15:00 (WEA RWED1)	07:11	17:23 (WEA 03 (GRN))	05:50	17:33 (WEA 45 (RW))	05:38	05:00		04:42	21:01 (WEA 42 (RW))	
31	18:33	15:00 (WEA RWED1)	17:50	1	17:28 (WEA 03 (GRN))	18:45	1	19:34 (WEA 45 (RW))	20:40	21:38	54	20:29 (WEA 40 (RW))
31	08:07	15:00 (WEA RWED1)	07:10	17:26 (WEA 03 (GRN))	05:48	17:34 (WEA 45 (RW))	05:36	05:00		04:42	21:02 (WEA 42 (RW))	
31	18:38	15:00 (WEA RWED1)	17:51	1	17:32 (WEA 03 (GRN))	18:46	1	19:44 (WEA 45 (RW))	20:41	21:39	56	20:29 (WEA 40 (RW))
31	08:06	15:00 (WEA RWED1)	07:09	17:29 (WEA 03 (GRN))	05:46	17:35 (WEA 45 (RW))	05:34	05:00		04:42		





Projekt:

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(0 48 56)901-0
Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 06 - IO 06 Hauptstraße 3 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (July to December) and rows for specific dates, showing shadowing times and durations.

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

Table with 4 columns: Tag im Monat, Sonnenaufgang (SS:MM) / Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang / Zeitpunkt (SS:MM) Schattende (WEA mit letztem Schatten)





Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0
Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 07 - IO 07 Hauptstraße 1 (Riepsdorf)

Annahmen für Schattenwurfberechnung

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

Table with columns for months (Januar to Juni) and rows for specific dates, listing sunrise, sunset, and shadow times for various wind turbine models (WEA 01, 02, 03, 04, 23, 25, 41, 44).

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

Table with 6 columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Zeitpunkt (SS:MM) Schattende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)







Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 07 - IO 07 Hauptstraße 1 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember			
1	04:47												
2	21:15 (WEA 42 (RW))	05:27	20:20 (WEA 44 (RW))	06:23	17:45 (WEA 45 (RW))	07:16	15:41 (WEA 03 (GRN))	08:12	14:06 (WEA RWEO1)				
3	04:48		21:17 (WEA 42 (RW))	20:10	18:55	18:27 (WEA 01 (GRN))	16:44	23	16:04 (WEA 03 (GRN))	15:58	37		
4	04:49			20:19 (WEA 44 (RW))	06:24	17:43 (WEA 45 (RW))	07:18		15:41 (WEA 03 (GRN))	08:14			
5	04:50		21:16	20:31 (WEA 44 (RW))	20:07	18:53	19	18:02 (WEA 45 (RW))	18:42	23	16:04 (WEA 03 (GRN))	15:58	37
6	04:51		21:14	20:19 (WEA 44 (RW))	06:28	17:43 (WEA 45 (RW))	07:20		15:41 (WEA 03 (GRN))	08:15			14:07 (WEA RWEO1)
7	04:52		21:12	20:32 (WEA 44 (RW))	20:05	18:50	19	18:02 (WEA 45 (RW))	18:40	23	16:04 (WEA 03 (GRN))	15:57	38
8	04:53		21:08	20:18 (WEA 44 (RW))	06:28	17:42 (WEA 45 (RW))	07:22		15:41 (WEA 03 (GRN))	08:17			14:07 (WEA RWEO1)
9	04:54		21:06	20:32 (WEA 44 (RW))	20:03	18:48	20	18:02 (WEA 45 (RW))	18:38	22	16:03 (WEA 03 (GRN))	15:56	38
10	04:55		21:04	20:18 (WEA 44 (RW))	06:23	17:42 (WEA 45 (RW))	07:24		15:42 (WEA 03 (GRN))	08:18			14:07 (WEA RWEO1)
11	04:56		21:02	20:32 (WEA 44 (RW))	20:00	18:45	19	18:01 (WEA 45 (RW))	18:36	22	16:04 (WEA 03 (GRN))	15:56	39
12	04:57		21:00	20:17 (WEA 44 (RW))	06:32	17:42 (WEA 45 (RW))	07:26		15:43 (WEA 03 (GRN))	08:19			14:07 (WEA RWEO1)
13	04:58		20:58	20:31 (WEA 44 (RW))	19:58	18:43	19	18:01 (WEA 45 (RW))	18:34	19	16:02 (WEA 03 (GRN))	15:55	39
14	04:59		20:56	20:18 (WEA 44 (RW))	06:33	17:41 (WEA 45 (RW))	07:28		15:44 (WEA 03 (GRN))	08:21			14:08 (WEA RWEO1)
15	05:00		20:54	20:32 (WEA 44 (RW))	19:55	18:40	21	18:00 (WEA 45 (RW))	18:32	15	15:59 (WEA 03 (GRN))	15:55	39
16	05:01		20:52	20:18 (WEA 44 (RW))	06:35	17:40 (WEA 45 (RW))	07:30		15:45 (WEA 03 (GRN))	08:22			14:08 (WEA RWEO1)
17	05:02		20:50	20:31 (WEA 44 (RW))	19:53	18:38	25	18:00 (WEA 04 (GRN))	18:30	12	15:57 (WEA 03 (GRN))	15:54	39
18	05:03		20:48	20:17 (WEA 44 (RW))	06:37	17:39	21	17:59 (WEA 45 (RW))	18:28	5	15:57 (WEA 03 (GRN))	15:54	39
19	05:04		20:46	20:30 (WEA 44 (RW))	19:51	18:36	21	17:58 (WEA 45 (RW))	18:26	0	15:57 (WEA 03 (GRN))	15:54	39
20	05:05		20:44	20:16 (WEA 44 (RW))	06:40	17:38	18	17:57 (WEA 45 (RW))	18:24	4	15:57 (WEA 03 (GRN))	15:54	39
21	05:06		20:42	20:30 (WEA 44 (RW))	19:49	18:34	18	17:56 (WEA 45 (RW))	18:22				14:08 (WEA RWEO1)
22	05:07		20:40	20:15 (WEA 44 (RW))	06:43	17:37	16	17:55 (WEA 45 (RW))	18:20				14:08 (WEA RWEO1)
23	05:08		20:38	20:30 (WEA 44 (RW))	19:48	18:32	16	17:54 (WEA 45 (RW))	18:18				14:08 (WEA RWEO1)
24	05:09		20:36	20:14 (WEA 44 (RW))	06:46	17:36	13	17:53 (WEA 45 (RW))	18:16				14:08 (WEA RWEO1)
25	05:10		20:34	20:29 (WEA 44 (RW))	19:47	18:30	13	17:52 (WEA 45 (RW))	18:14				14:08 (WEA RWEO1)
26	05:11		20:32	20:13 (WEA 44 (RW))	06:49	17:35	11	17:51 (WEA 45 (RW))	18:12				14:08 (WEA RWEO1)
27	05:12		20:30	20:28 (WEA 44 (RW))	19:46	18:28	11	17:50 (WEA 45 (RW))	18:10				14:08 (WEA RWEO1)
28	05:13		20:28	20:12 (WEA 44 (RW))	06:52	17:34	7	17:49 (WEA 45 (RW))	18:08				14:08 (WEA RWEO1)
29	05:14		20:26	20:27 (WEA 44 (RW))	19:45	18:26	7	17:48 (WEA 45 (RW))	18:06				14:08 (WEA RWEO1)
30	05:15		20:24	20:11 (WEA 44 (RW))	06:55	17:33	4	17:47 (WEA 45 (RW))	18:04				14:08 (WEA RWEO1)
31	05:16		20:22	20:26 (WEA 44 (RW))	19:44	18:24	4	17:46 (WEA 45 (RW))	18:02				14:08 (WEA RWEO1)
1	05:17		20:20	20:10 (WEA 44 (RW))	06:58	17:32	1	17:45 (WEA 45 (RW))	18:00				14:08 (WEA RWEO1)
2	05:18		20:18	20:25 (WEA 44 (RW))	19:43	18:22	1	17:44 (WEA 45 (RW))	17:58				14:08 (WEA RWEO1)
3	05:19		20:16	20:09 (WEA 44 (RW))	07:01	17:31	0	17:43 (WEA 45 (RW))	17:56				14:08 (WEA RWEO1)
4	05:20		20:14	20:24 (WEA 44 (RW))	19:42	18:20	0	17:42 (WEA 45 (RW))	17:54				14:08 (WEA RWEO1)
5	05:21		20:12	20:08 (WEA 44 (RW))	07:04	17:30	0	17:41 (WEA 45 (RW))	17:52				14:08 (WEA RWEO1)
6	05:22		20:10	20:23 (WEA 44 (RW))	19:41	18:18	0	17:40 (WEA 45 (RW))	17:50				14:08 (WEA RWEO1)
7	05:23		20:08	20:07 (WEA 44 (RW))	07:07	17:29	0	17:39 (WEA 45 (RW))	17:48				14:08 (WEA RWEO1)
8	05:24		20:06	20:22 (WEA 44 (RW))	19:40	18:16	0	17:38 (WEA 45 (RW))	17:46				14:08 (WEA RWEO1)
9	05:25		20:04	20:06 (WEA 44 (RW))	07:10	17:28	0	17:37 (WEA 45 (RW))	17:44				14:08 (WEA RWEO1)
10	05:26		20:02	20:21 (WEA 44 (RW))	19:39	18:14	0	17:36 (WEA 45 (RW))	17:42				14:08 (WEA RWEO1)
11	05:27		20:00	20:05 (WEA 44 (RW))	07:13	17:27	0	17:35 (WEA 45 (RW))	17:40				14:08 (WEA RWEO1)
12	05:28		20:00 (WEA 40 (RW))	19:38	18:12	0	17:34 (WEA 45 (RW))	17:38					14:08 (WEA RWEO1)
13	05:29		20:00 (WEA 40 (RW))	19:36	18:10	0	17:33 (WEA 45 (RW))	17:36					14:08 (WEA RWEO1)
14	05:30		20:00 (WEA 40 (RW))	19:34	18:08	0	17:32 (WEA 45 (RW))	17:34					14:08 (WEA RWEO1)
15	05:31		20:00 (WEA 40 (RW))	19:32	18:06	0	17:31 (WEA 45 (RW))	17:32					14:08 (WEA RWEO1)
16	05:32		20:00 (WEA 40 (RW))	19:30	18:04	0	17:30 (WEA 45 (RW))	17:30					14:08 (WEA RWEO1)
17	05:33		20:00 (WEA 40 (RW))	19:28	18:02	0	17:29 (WEA 45 (RW))	17:28					14:08 (WEA RWEO1)
18	05:34		20:00 (WEA 40 (RW))	19:26	18:00	0	17:28 (WEA 45 (RW))	17:26					14:08 (WEA RWEO1)
19	05:35		20:00 (WEA 40 (RW))	19:24	17:58	0	17:27 (WEA 45 (RW))	17:24					14:08 (WEA RWEO1)
20	05:36		20:00 (WEA 40 (RW))	19:22	17:56	0	17:26 (WEA 45 (RW))	17:22					14:08 (WEA RWEO1)
21	05:37		20:00 (WEA 40 (RW))	19:20	17:54	0	17:25 (WEA 45 (RW))	17:20					14:08 (WEA RWEO1)
22	05:38		20:00 (WEA 40 (RW))	19:18	17:52	0	17:24 (WEA 45 (RW))	17:18					14:08 (WEA RWEO1)
23	05:39		20:00 (WEA 40 (RW))	19:16	17:50	0	17:23 (WEA 45 (RW))	17:16					14:08 (WEA RWEO1)
24	05:40		20:00 (WEA 40 (RW))	19:14	17:48	0	17:22 (WEA 45 (RW))	17:14					14:08 (WEA RWEO1)
25	05:41		20:00 (WEA 40 (RW))	19:12	17:46	0	17:21 (WEA 45 (RW))	17:12					14:08 (WEA RWEO1)
26	05:42		20:00 (WEA 40 (RW))	19:10	17:44	0	17:20 (WEA 45 (RW))	17:10					14:08 (WEA RWEO1)
27	05:43		20:00 (WEA 40 (RW))	19:08	17:42	0	17:19 (WEA 45 (RW))	17:08					14:08 (WEA RWEO1)
28	05:44		20:00 (WEA 40 (RW))	19:06	17:40	0	17:18 (WEA 45 (RW))	17:06					14:08 (WEA RWEO1)
29	05:45		20:00 (WEA 40 (RW))	19:04	17:38	0	17:17 (WEA 45 (RW))	17:04					14:08 (WEA RWEO1)
30	05:46		20:00 (WEA 40 (RW))	19:02	17:36	0	17:16 (WEA 45 (RW))	17:02					14:08 (WEA RWEO1)
31	05:47		20:00 (WEA 40 (RW))	19:00	17:34	0	17:15 (WEA 45 (RW))	17:00					14:08 (WEA RWEO1)
1	05:48		20:00 (WEA 40 (RW))	18:58	17:32	0	17:14 (WEA 45 (RW))	16:58					14:08 (WEA RWEO1)
2	05:49		20:00 (WEA 40 (RW))	18:56	17:30	0	17:13 (WEA 45 (RW))	16:56					14:08 (WEA RWEO1)
3	05:50		20:00 (WEA 40 (RW))	18:54	17:28	0	17:12 (WEA 45 (RW))	16:54					14:08 (WEA RWEO1)
4	05:51		20:00 (WEA 40 (RW))	18:52	17:26	0	17:11 (WEA 45 (RW))	16:52					14:08 (WEA RWEO1)
5	05:52		20:00 (WEA 40 (RW))	18:50	17:24	0	17:10 (WEA 45 (RW))	16:50					14:08 (WEA RWEO1)
6	05:53		20:00 (WEA 40 (RW))	18:48	17:22	0	17:09 (WEA 45 (RW))	16:48					14:08 (WEA RWEO1)
7	05:54		20:00 (WEA 40 (RW))	18:46	17:20	0	17:08 (WEA 45 (RW))	16:46					14:08 (WEA RWEO1)
8	05:55		20:00 (WEA 40 (RW))	18:44	17:18	0	17:07 (WEA 45 (RW))	16:44					14:08 (WEA RWEO1)
9	05:56		20:00 (WEA 40 (RW))	18:42	17:16	0	17:06 (WEA 45 (RW))	16:42					14:08 (WEA RWEO1)
10	05:57		20:00 (WEA 40 (RW))	18:40	17:14	0	17:05 (WEA 45 (RW))	16:40					14:08 (WEA RWEO1)
11	05:58		20:00 (WEA 40 (RW))	18:38	17:12	0	17:04 (WEA 45 (RW))	16:38					14:08 (WEA RWEO1)
12	05:59		20:00 (WEA 40 (RW))	18:36	17:10	0	17:03 (WEA 45 (RW))	16:36					14:08 (WEA RWEO1)
13	06:00		20:00 (WEA 40 (RW))	18:34	17:08	0	17:02 (WEA 45 (RW))	16:34					14:08 (WEA RWEO1)
14	06:01		20:00 (WEA 40 (RW))	18:32	17:06	0	17:01 (WEA 45 (RW))	16:32					14:08 (WEA RWEO1)
15	06:02		20:00 (WEA 40 (RW))	18:30	17:04	0	17:00 (WEA 45 (RW))	16:30					14:08 (WEA RWEO1)
16	06:03		20:00 (WEA 40 (RW))	18:28	17:02	0	16:59 (WEA 45 (RW))	16:28					14:08 (WEA RWEO1)
17	06:04		20:00 (WEA 40 (RW))	18:26	17:00	0	16:58 (WEA 45 (RW))	16:26					14:08 (WEA RWEO1)
18	06:05		20:00 (WEA 40 (RW))	18:24	16:58	0	16:57 (WEA 45 (RW))	16:24					14:08 (WEA RWEO1)
19	06:06		20:00 (WEA 40 (RW))	18:22	16:56	0	16:56 (WEA 45 (RW))	16:22					14:08 (WEA RWEO1)
20	06:07		20:00 (WEA 40 (RW))	18:20	16:54	0	16:55 (WEA 45 (RW))	16:20					14:08 (WEA RWEO1)
21	06:08		20:00 (WEA 40 (RW))	18:18	16:52	0	16:54 (WEA 45 (RW))	16:18					14:08 (WEA RWEO1)
22	06:09		20:00 (WEA 40 (RW))	18:16	16:50	0	16:53 (WEA 45 (RW))	16:16					14:08 (WEA RWEO1)
23	06:10		20:00 (WEA 40 (RW))	18:14	16:48	0	16:52 (WEA 45 (RW))	16:1					



## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 08 - IO 08 Hauptstraße 4 (Riepsdorf)  
**Annahmen für Schattenwurfberechnung**

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

Januar	Februar	März	April	Mai	Juni
1   08:37   14:44 (WEA RW001)   08:06		07:08	06:52	19:11 (WEA 43 (RW))   05:41	20:09 (WEA 41 (RW))   04:51
1   16:03   15:23 (WEA RW001)   16:55		17:52	17:51	19:24 (WEA 43 (RW))   20:48	8   20:17 (WEA 41 (RW))   21:39
2   08:37   14:45 (WEA RW001)   08:04		07:05	06:49	19:11 (WEA 43 (RW))   05:39	20:09 (WEA 41 (RW))   04:50
1   16:04   15:24 (WEA RW001)   16:57		17:54	17:53	19:26 (WEA 43 (RW))   20:49	10   20:19 (WEA 41 (RW))   21:40
3   08:37   14:44 (WEA RW001)   08:03		07:03	06:47	19:12 (WEA 43 (RW))   05:37	20:10 (WEA 41 (RW))   04:49
1   16:05   15:24 (WEA RW001)   16:59		17:56	17:55	19:28 (WEA 43 (RW))   20:51	10   20:20 (WEA 41 (RW))   21:41
4   08:36   14:45 (WEA RW001)   08:01		07:01	06:44	19:12 (WEA 43 (RW))   05:35	20:12 (WEA 41 (RW))   04:48
1   16:07   15:25 (WEA RW001)   17:01		17:58	17:57	19:30 (WEA 43 (RW))   20:53	8   20:20 (WEA 41 (RW))   21:42
5   08:36   14:45 (WEA RW001)   07:59		06:58	17:29 (WEA 02 (GRN))   06:42	19:14 (WEA 43 (RW))   05:33	20:14 (WEA 41 (RW))   04:47
1   16:08   15:25 (WEA RW001)   17:03		18:00	4   17:33 (WEA 02 (GRN))   06:37	9   19:23 (WEA 43 (RW))   20:55	3   20:17 (WEA 41 (RW))   21:43
6   08:36   14:46 (WEA RW001)   07:57		06:56	17:27 (WEA 02 (GRN))   06:39		05:31
1   16:09   15:26 (WEA RW001)   17:05		18:02	7   17:34 (WEA 04 (GRN))   20:01		20:57
7   08:35   14:46 (WEA RW001)   07:55		06:53	17:26 (WEA 02 (GRN))   06:37		05:29
1   16:11   15:26 (WEA RW001)   17:07		18:04	11   17:37 (WEA 04 (GRN))   20:02		20:59
8   08:35   14:46 (WEA RW001)   07:53		06:51	17:25 (WEA 02 (GRN))   06:34		05:27
1   16:12   15:26 (WEA RW001)   17:09		18:05	13   17:38 (WEA 04 (GRN))   20:04		21:00
9   08:34   14:47 (WEA RW001)   07:51		06:49	17:25 (WEA 02 (GRN))   06:35		05:25
1   16:17   15:26 (WEA RW001)   17:11		18:07	16   17:41 (WEA 04 (GRN))   20:02		21:01
10   08:33   14:47 (WEA RW001)   07:49		06:46	17:25 (WEA 02 (GRN))   06:32		05:23
1   16:23   15:27 (WEA RW001)   17:13		18:09	18   17:43 (WEA 02 (GRN))   20:00		21:04
11   08:33   14:48 (WEA RW001)   07:47		06:44	17:25 (WEA 02 (GRN))   06:32		05:22
1   16:26   15:27 (WEA RW001)   17:15		18:11	20   17:45 (WEA 02 (GRN))   20:00		21:05
12   08:32   14:47 (WEA RW001)   07:45		06:42	17:25 (WEA 02 (GRN))   06:32		05:20
1   16:31   15:27 (WEA RW001)   17:17	4   16:41 (WEA 02 (GRN))   06:11	18:13	23   17:48 (WEA 02 (GRN))   20:00		21:06
13   08:31   14:48 (WEA RW001)   07:43	5   16:42 (WEA 02 (GRN))   06:10	18:08	17:25 (WEA 02 (GRN))   06:32		05:18
1   16:36   15:28 (WEA RW001)   17:21	6   16:43 (WEA 02 (GRN))   06:09	18:03	14   17:42 (WEA 02 (GRN))   20:00		21:07
14   08:30   14:49 (WEA RW001)   07:41	7   16:44 (WEA 02 (GRN))   06:08	17:58	17:29 (WEA 02 (GRN))   06:32		05:16
1   16:41   15:28 (WEA RW001)   17:23	8   16:45 (WEA 02 (GRN))   06:07	17:53	14   17:43 (WEA 02 (GRN))   20:00		21:08
15   08:29   14:49 (WEA RW001)   07:39	9   16:46 (WEA 02 (GRN))   06:06	17:48	17:33 (WEA 02 (GRN))   06:32		05:14
1   16:46   15:29 (WEA RW001)   17:25	10   16:47 (WEA 02 (GRN))   06:05	17:43	17:27 (WEA 02 (GRN))   06:32		05:13
16   08:28   14:50 (WEA RW001)   07:37	11   16:48 (WEA 02 (GRN))   06:04	17:38	17:27 (WEA 02 (GRN))   06:32		05:12
1   16:51   15:29 (WEA RW001)   17:27	12   16:49 (WEA 02 (GRN))   06:03	17:33	17:27 (WEA 02 (GRN))   06:32		05:11
17   08:27   14:50 (WEA RW001)   07:35	13   16:50 (WEA 02 (GRN))   06:02	17:28	17:27 (WEA 02 (GRN))   06:32		05:10
1   16:56   15:29 (WEA RW001)   17:29	14   16:51 (WEA 02 (GRN))   06:01	17:23	17:27 (WEA 02 (GRN))   06:32		05:09
18   08:26   14:51 (WEA RW001)   07:33	15   16:52 (WEA 02 (GRN))   06:00	17:18	17:27 (WEA 02 (GRN))   06:32		05:08
1   16:59   15:30 (WEA RW001)   17:31	16   16:53 (WEA 02 (GRN))   06:00	17:13	17:27 (WEA 02 (GRN))   06:32		05:07
19   08:25   14:51 (WEA RW001)   07:31	17   16:54 (WEA 02 (GRN))   05:59	17:08	17:27 (WEA 02 (GRN))   06:32		05:06
1   17:04   15:30 (WEA RW001)   17:33	18   16:55 (WEA 02 (GRN))   05:58	17:03	17:27 (WEA 02 (GRN))   06:32		05:05
20   08:24   14:52 (WEA RW001)   07:28	19   16:56 (WEA 02 (GRN))   05:57	16:58	17:27 (WEA 02 (GRN))   06:32		05:04
1   17:09   15:30 (WEA RW001)   17:34	20   16:57 (WEA 02 (GRN))   05:56	16:53	17:27 (WEA 02 (GRN))   06:32		05:03
21   08:23   14:52 (WEA RW001)   07:26	21   16:58 (WEA 02 (GRN))   05:55	16:48	17:27 (WEA 02 (GRN))   06:32		05:02
1   17:14   15:30 (WEA RW001)   17:35	22   16:59 (WEA 02 (GRN))   05:54	16:43	17:27 (WEA 02 (GRN))   06:32		05:01
22   08:23   14:53 (WEA RW001)   07:24	23   17:00 (WEA 02 (GRN))   05:53	16:38	17:27 (WEA 02 (GRN))   06:32		05:00
1   17:19   15:31 (WEA RW001)   17:36	24   17:01 (WEA 02 (GRN))   05:52	16:33	17:27 (WEA 02 (GRN))   06:32		04:59
23   08:22   14:54 (WEA RW001)   07:22	25   17:02 (WEA 02 (GRN))   05:51	16:28	17:27 (WEA 02 (GRN))   06:32		04:58
1   17:24   15:31 (WEA RW001)   17:37	26   17:03 (WEA 02 (GRN))   05:50	16:23	17:27 (WEA 02 (GRN))   06:32		04:57
24   08:21   14:55 (WEA RW001)   07:19	27   17:04 (WEA 02 (GRN))   05:49	16:18	17:27 (WEA 02 (GRN))   06:32		04:56
1   17:29   15:31 (WEA RW001)   17:38	28   17:05 (WEA 02 (GRN))   05:48	16:13	17:27 (WEA 02 (GRN))   06:32		04:55
25   08:20   14:56 (WEA RW001)   07:17	29   17:06 (WEA 02 (GRN))   05:47	16:08	17:27 (WEA 02 (GRN))   06:32		04:54
1   17:34   15:31 (WEA RW001)   17:39	30   17:07 (WEA 02 (GRN))   05:46	16:03	17:27 (WEA 02 (GRN))   06:32		04:53
26   08:19   14:57 (WEA RW001)   07:15	31   17:08 (WEA 02 (GRN))   05:45	15:58	17:27 (WEA 02 (GRN))   06:32		04:52
1   17:39   15:32 (WEA RW001)   17:40		15:53	17:27 (WEA 02 (GRN))   06:32		04:51
27   08:18   14:58 (WEA RW001)   07:12		15:48	17:27 (WEA 02 (GRN))   06:32		04:50
1   17:44   15:32 (WEA RW001)   17:41		15:43	17:27 (WEA 02 (GRN))   06:32		04:49
28   08:17   14:59 (WEA RW001)   07:10		15:38	17:27 (WEA 02 (GRN))   06:32		04:48
1   17:49   15:32 (WEA RW001)   17:42		15:33	17:27 (WEA 02 (GRN))   06:32		04:47
29   08:16   15:00 (WEA RW001)   07:07		15:28	17:27 (WEA 02 (GRN))   06:32		04:46
1   17:54   15:32 (WEA RW001)   17:43		15:23	17:27 (WEA 02 (GRN))   06:32		04:45
30   08:15   15:01 (WEA RW001)   07:05		15:18	17:27 (WEA 02 (GRN))   06:32		04:44
1   17:59   15:32 (WEA RW001)   17:44		15:13	17:27 (WEA 02 (GRN))   06:32		04:43
31   08:14   15:02 (WEA RW001)   07:03		15:08	17:27 (WEA 02 (GRN))   06:32		04:42
1   18:04   15:32 (WEA RW001)   17:45		15:03	17:27 (WEA 02 (GRN))   06:32		04:41
32   08:13   15:03 (WEA RW001)   07:01		14:58	17:27 (WEA 02 (GRN))   06:32		04:40
1   18:09   15:32 (WEA RW001)   17:46		14:53	17:27 (WEA 02 (GRN))   06:32		04:39
33   08:12   15:04 (WEA RW001)   06:59		14:48	17:27 (WEA 02 (GRN))   06:32		04:38
1   18:14   15:32 (WEA RW001)   17:47		14:43	17:27 (WEA 02 (GRN))   06:32		04:37
34   08:11   15:05 (WEA RW001)   06:57		14:38	17:27 (WEA 02 (GRN))   06:32		04:36
1   18:19   15:32 (WEA RW001)   17:48		14:33	17:27 (WEA 02 (GRN))   06:32		04:35
35   08:10   15:06 (WEA RW001)   06:55		14:28	17:27 (WEA 02 (GRN))   06:32		04:34
1   18:24   15:32 (WEA RW001)   17:49		14:23	17:27 (WEA 02 (GRN))   06:32		04:33
36   08:09   15:07 (WEA RW001)   06:53		14:18	17:27 (WEA 02 (GRN))   06:32		04:32
1   18:29   15:32 (WEA RW001)   17:50		14:13	17:27 (WEA 02 (GRN))   06:32		04:31
37   08:08   15:08 (WEA RW001)   06:51		14:08	17:27 (WEA 02 (GRN))   06:32		04:30
1   18:34   15:32 (WEA RW001)   17:51		14:03	17:27 (WEA 02 (GRN))   06:32		04:29
38   08:07   15:09 (WEA RW001)   06:49		13:58	17:27 (WEA 02 (GRN))   06:32		04:28
1   18:39   15:32 (WEA RW001)   17:52		13:53	17:27 (WEA 02 (GRN))   06:32		04:27
39   08:06   15:10 (WEA RW001)   06:47		13:48	17:27 (WEA 02 (GRN))   06:32		04:26
1   18:44   15:32 (WEA RW001)   17:53		13:43	17:27 (WEA 02 (GRN))   06:32		04:25
40   08:05   15:11 (WEA RW001)   06:45		13:38	17:27 (WEA 02 (GRN))   06:32		04:24
1   18:49   15:32 (WEA RW001)   17:54		13:33	17:27 (WEA 02 (GRN))   06:32		04:23
41   08:04   15:12 (WEA RW001)   06:43		13:28	17:27 (WEA 02 (GRN))   06:32		04:22
1   18:54   15:32 (WEA RW001)   17:55		13:23	17:27 (WEA 02 (GRN))   06:32		04:21
42   08:03   15:13 (WEA RW001)   06:41		13:18	17:27 (WEA 02 (GRN))   06:32		04:20
1   18:59   15:32 (WEA RW001)   17:56		13:13	17:27 (WEA 02 (GRN))   06:32		04:19
43   08:02   15:14 (WEA RW001)   06:39		13:08	17:27 (WEA 02 (GRN))   06:32		04:18
1   19:04   15:32 (WEA RW001)   17:57		13:03	17:27 (WEA 02 (GRN))   06:32		04:17
44   08:01   15:15 (WEA RW001)   06:37		12:58	17:27 (WEA 02 (GRN))   06:32		04:16
1   19:09   15:32 (WEA RW001)   17:58		12:53	17:27 (WEA 02 (GRN))   06:32		04:15
45   08:00   15:16 (WEA RW001)   06:35		12:48	17:27 (WEA 02 (GRN))   06:32		04:14
1   19:14   15:32 (WEA RW001)   17:59		12:43	17:27 (WEA 02 (GRN))   06:32		04:13
46   07:59   15:17 (WEA RW001)   06:33		12:38	17:27 (WEA 02 (GRN))   06:32		04:12
1   19:19   15:32 (WEA RW001)   18:00		12:33	17:27 (WEA 02 (GRN))   06:32		04:11
47   07:58   15:18 (WEA RW001)   06:31		12:28	17:27 (WEA 02 (GRN))   06:32		04:10
1   19:24   15:32 (WEA RW001)   18:01		12:23	17:27 (WEA 02 (GRN))   06:32		04:09
48   07:57   15:19 (WEA RW001)   06:29		12:18	17:27 (WEA 02 (GRN))   06:32		04:08
1   19:29   15:32 (WEA RW001)   18:02		12:13	17:27 (WEA 02 (GRN))   06:32		04:07
49   07:56   15:20 (WEA RW001)   06:27		12:08	17:27 (WEA 02 (GRN))   06:32		04:06
1   19:34   15:32 (WEA RW001)   18:03		12:03	17:27 (WEA 02 (GRN))   06:32		04:05
50   07:55   15:21 (WEA RW001)   06:25		11:58	17:27 (WEA 02 (GRN))   06:32		04:04
1   19:39   15:32 (WEA RW001)   18:04		11:53	17:27 (WEA 02 (GRN))   06:32		04:03
51   07:54   15:22 (WEA RW001)   06:23		11:48	17:27 (WEA 02 (GRN))   06:32		04:02
1   19:44   15:32 (WEA RW001)   18:0					



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 08 - IO 08 Hauptstraße 4 (Riepsdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	21:06 (WEA 42 (RW))	05:27	06:23	07:17	18:07 (WEA 02 (GRN))	07:16	08:12	14:29 (WEA RW01)		
2	04:47	21:06 (WEA 42 (RW))	05:29	06:24	07:19	18:04 (WEA 02 (GRN))	07:18	08:14	14:30 (WEA RW01)		
3	04:48	21:07 (WEA 42 (RW))	05:31	06:26	07:21	18:03 (WEA 02 (GRN))	07:20	08:15	14:31 (WEA RW01)		
4	04:49	21:08 (WEA 42 (RW))	05:33	06:28	07:22	18:03 (WEA 02 (GRN))	07:22	08:17	14:30 (WEA RW01)		
5	04:50	21:09 (WEA 42 (RW))	05:34	06:30	07:24	18:02 (WEA 02 (GRN))	07:24	08:18	14:31 (WEA RW01)		
6	04:51	21:09 (WEA 42 (RW))	05:36	06:32	07:26	18:02 (WEA 02 (GRN))	07:26	08:19	14:31 (WEA RW01)		
7	04:52	21:09 (WEA 42 (RW))	05:38	06:33	07:28	18:02 (WEA 02 (GRN))	07:28	08:21	14:32 (WEA RW01)		
8	04:53	21:10 (WEA 42 (RW))	05:40	06:35	07:30	18:03 (WEA 02 (GRN))	07:30	08:22	14:32 (WEA RW01)		
9	04:54	21:10 (WEA 42 (RW))	05:41	06:37	07:32	18:03 (WEA 02 (GRN))	07:32	08:23	14:33 (WEA RW01)		
10	04:55	21:11 (WEA 42 (RW))	05:43	06:39	07:34	18:04 (WEA 02 (GRN))	07:34	08:25	14:34 (WEA RW01)		
11	04:56	21:11 (WEA 42 (RW))	05:44	06:41	07:36	18:04 (WEA 02 (GRN))	07:36	08:26	14:34 (WEA RW01)		
12	04:57	21:12 (WEA 42 (RW))	05:46	06:43	07:38	18:05 (WEA 02 (GRN))	07:38	08:28	14:35 (WEA RW01)		
13	04:58	21:12 (WEA 42 (RW))	05:48	06:45	07:40	18:05 (WEA 02 (GRN))	07:40	08:30	14:36 (WEA RW01)		
14	04:59	21:13 (WEA 42 (RW))	05:50	06:47	07:42	18:06 (WEA 02 (GRN))	07:42	08:32	14:37 (WEA RW01)		
15	05:00	21:13 (WEA 42 (RW))	05:51	06:49	07:44	18:06 (WEA 02 (GRN))	07:44	08:34	14:38 (WEA RW01)		
16	05:01	21:14 (WEA 42 (RW))	05:53	06:51	07:46	18:07 (WEA 02 (GRN))	07:46	08:36	14:39 (WEA RW01)		
17	05:02	21:14 (WEA 42 (RW))	05:54	06:53	07:48	18:07 (WEA 02 (GRN))	07:48	08:38	14:40 (WEA RW01)		
18	05:03	21:15 (WEA 42 (RW))	05:56	06:55	07:50	18:08 (WEA 02 (GRN))	07:50	08:40	14:41 (WEA RW01)		
19	05:04	21:15 (WEA 42 (RW))	05:57	06:57	07:52	18:08 (WEA 02 (GRN))	07:52	08:42	14:42 (WEA RW01)		
20	05:05	21:16 (WEA 42 (RW))	05:59	06:59	07:54	18:09 (WEA 02 (GRN))	07:54	08:44	14:43 (WEA RW01)		
21	05:06	21:16 (WEA 42 (RW))	06:00	07:01	07:56	18:09 (WEA 02 (GRN))	07:56	08:46	14:44 (WEA RW01)		
22	05:07	21:17 (WEA 42 (RW))	06:02	07:03	07:58	18:10 (WEA 02 (GRN))	07:58	08:48	14:45 (WEA RW01)		
23	05:08	21:17 (WEA 42 (RW))	06:04	07:05	08:00	18:10 (WEA 02 (GRN))	08:00	08:50	14:46 (WEA RW01)		
24	05:09	21:18 (WEA 42 (RW))	06:06	07:07	08:02	18:11 (WEA 02 (GRN))	08:02	08:52	14:47 (WEA RW01)		
25	05:10	21:18 (WEA 42 (RW))	06:08	07:09	08:04	18:11 (WEA 02 (GRN))	08:04	08:54	14:48 (WEA RW01)		
26	05:11	21:19 (WEA 42 (RW))	06:10	07:11	08:06	18:12 (WEA 02 (GRN))	08:06	08:56	14:49 (WEA RW01)		
27	05:12	21:19 (WEA 42 (RW))	06:12	07:13	08:08	18:12 (WEA 02 (GRN))	08:08	08:58	14:50 (WEA RW01)		
28	05:13	21:20 (WEA 42 (RW))	06:14	07:15	08:10	18:13 (WEA 02 (GRN))	08:10	09:00	14:51 (WEA RW01)		
29	05:14	21:20 (WEA 42 (RW))	06:16	07:17	08:12	18:13 (WEA 02 (GRN))	08:12	09:02	14:52 (WEA RW01)		
30	05:15	21:21 (WEA 42 (RW))	06:18	07:19	08:14	18:14 (WEA 02 (GRN))	08:14	09:04	14:53 (WEA RW01)		
31	05:16	21:21 (WEA 42 (RW))	06:20	07:21	08:16	18:14 (WEA 02 (GRN))	08:16	09:06	14:54 (WEA RW01)		
Sommerhochstand			161		383		257		231		1108
ab: max mögl. Beschattung			89		277		388		617		3108

**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 (SS:MM)	Schatteneende (SS:MM)	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 09 - IO 09 Bäderstraße 2 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni				
1	08:37	14:50 (WEA_G1)	08:06	15:59 (WEA_RWE01)	07:08		06:52	05:41		20:14 (WEA 41 (RW))	04:51	20:52 (WEA 42 (RW))		
	16:03	26	15:16 (WEA_G1)	16:55	23	16:22 (WEA_RWE01)	17:52	19:51	20:48	3	20:17 (WEA 41 (RW))	21:38	11	21:03 (WEA 42 (RW))
2	08:37	14:51 (WEA_G1)	08:04	15:58 (WEA_RWE01)	07:05		06:49	05:39	20:15 (WEA 41 (RW))	04:50	20:52 (WEA 42 (RW))			
	16:04	26	15:17 (WEA_G1)	16:57	27	16:25 (WEA_RWE01)	17:54	19:53	20:49	4	20:19 (WEA 41 (RW))	21:40	12	21:04 (WEA 42 (RW))
3	08:37	14:51 (WEA_G1)	08:03	15:58 (WEA_RWE01)	07:03		06:47	05:37	20:16 (WEA 41 (RW))	04:49	20:53 (WEA 42 (RW))			
	16:05	25	15:16 (WEA_G1)	16:59	28	16:27 (WEA_RWE01)	17:56	19:55	20:51	4	20:20 (WEA 41 (RW))	21:41	13	21:06 (WEA 42 (RW))
4	08:36	14:53 (WEA_G1)	08:01	15:58 (WEA_RWE01)	07:01		06:44	05:35	20:52		04:48	20:53 (WEA 42 (RW))		
	16:07	24	15:17 (WEA_G1)	17:01	31	16:29 (WEA_RWE01)	17:58	19:57	20:53		21:42	14	21:07 (WEA 42 (RW))	
5	08:36	14:53 (WEA_G1)	07:59	15:58 (WEA_RWE01)	06:58		06:42	05:33	19:31 (WEA 43 (RW))	05:33	04:47	20:53 (WEA 42 (RW))		
	16:08	24	15:17 (WEA_G1)	17:03	33	16:31 (WEA_RWE01)	18:00	19:59	1	19:32 (WEA 43 (RW))	20:55	21:43	14	21:07 (WEA 42 (RW))
6	08:36	14:53 (WEA_G1)	07:57	15:58 (WEA_RWE01)	06:56		06:39	05:31	19:29 (WEA 43 (RW))	05:31	04:47	20:54 (WEA 42 (RW))		
	16:09	24	15:17 (WEA_G1)	17:05	34	16:32 (WEA_RWE01)	18:02	20:01	4	19:33 (WEA 43 (RW))	20:57	21:44	14	21:08 (WEA 42 (RW))
7	08:35	14:55 (WEA_G1)	07:55	15:58 (WEA_RWE01)	06:53		06:37	05:29	19:29 (WEA 43 (RW))	05:29	04:46	20:53 (WEA 42 (RW))		
	16:10	22	15:17 (WEA_G1)	17:07	35	16:33 (WEA_RWE01)	18:03	20:02	6	19:35 (WEA 43 (RW))	20:59	21:45	15	21:08 (WEA 42 (RW))
8	08:35	14:55 (WEA_G1)	07:53	15:58 (WEA_RWE01)	06:51		06:35	05:27	19:29 (WEA 43 (RW))	05:27	04:45	20:54 (WEA 42 (RW))		
	16:12	22	15:17 (WEA_G1)	17:09	35	16:33 (WEA_RWE01)	18:05	20:04	7	19:36 (WEA 43 (RW))	21:00	21:46	14	21:08 (WEA 42 (RW))
9	08:34	14:57 (WEA_G1)	07:51	15:59 (WEA_RWE01)	06:49		06:33	05:25	19:36 (WEA 43 (RW))	05:25	21:45	15	21:08 (WEA 42 (RW))	
	16:17	1	15:19 (WEA_G1)	17:11	34	16:35 (WEA_RWE01)	18:07	20:06	0	19:37 (WEA 43 (RW))	21:02	21:47	13	21:07 (WEA 42 (RW))
10	08:33	14:57 (WEA_G1)	07:49	15:59 (WEA_RWE01)	06:48		06:32	05:23	19:37 (WEA 43 (RW))	05:23	21:44	14	21:07 (WEA 42 (RW))	
	16:20	1	15:19 (WEA_G1)	17:13	34	16:35 (WEA_RWE01)	18:09	20:08	8	19:37 (WEA 43 (RW))	21:04	21:48	13	21:07 (WEA 42 (RW))
11	08:33	14:58 (WEA_G1)	07:47	15:59 (WEA_RWE01)	06:46		06:30	05:22	19:37 (WEA 43 (RW))	05:22	21:43	14	21:07 (WEA 42 (RW))	
	16:23	19	15:19 (WEA_G1)	17:15	32	16:36 (WEA_RWE01)	18:11	20:10	2	19:38 (WEA 43 (RW))	21:06	21:49	12	21:07 (WEA 42 (RW))
12	08:32	14:59 (WEA_G1)	07:45	15:59 (WEA_RWE01)	06:45		06:29	05:20	19:38 (WEA 43 (RW))	05:20	21:42	14	21:07 (WEA 42 (RW))	
	16:26	17	15:19 (WEA_G1)	17:17	32	16:36 (WEA_RWE01)	18:13	20:12	14	19:39 (WEA 43 (RW))	21:08	21:50	11	21:07 (WEA 42 (RW))
13	08:31	14:59 (WEA_G1)	07:43	15:59 (WEA_RWE01)	06:43		06:27	05:19	19:39 (WEA 43 (RW))	05:19	21:43	14	21:07 (WEA 42 (RW))	
	16:30	1	15:19 (WEA_G1)	17:19	31	16:37 (WEA_RWE01)	18:15	20:14	1	19:40 (WEA 43 (RW))	21:10	21:50	12	21:07 (WEA 42 (RW))
14	08:30	14:59 (WEA_G1)	07:41	15:59 (WEA_RWE01)	06:41		06:25	05:18	19:39 (WEA 43 (RW))	05:18	21:43	14	21:07 (WEA 42 (RW))	
	16:33	1	15:19 (WEA_G1)	17:21	29	16:38 (WEA_RWE01)	18:17	20:16	9	19:40 (WEA 43 (RW))	21:12	21:51	11	21:08 (WEA 42 (RW))
15	08:30	14:59 (WEA_G1)	07:39	15:59 (WEA_RWE01)	06:39		06:23	05:16	19:40 (WEA 43 (RW))	05:16	21:42	14	21:07 (WEA 42 (RW))	
	16:36	1	15:19 (WEA_G1)	17:23	26	16:39 (WEA_RWE01)	18:19	20:18	1	19:41 (WEA 43 (RW))	21:14	21:52	10	21:08 (WEA 42 (RW))
16	08:29	14:59 (WEA_G1)	07:37	15:59 (WEA_RWE01)	06:37		06:21	05:15	19:41 (WEA 43 (RW))	05:15	21:41	14	21:07 (WEA 42 (RW))	
	16:39	1	15:19 (WEA_G1)	17:25	24	16:40 (WEA_RWE01)	18:21	20:19	1	19:42 (WEA 43 (RW))	21:16	21:52	10	21:07 (WEA 42 (RW))
17	08:28	14:59 (WEA_G1)	07:35	15:59 (WEA_RWE01)	06:35		06:19	05:14	19:42 (WEA 43 (RW))	05:14	21:40	14	21:07 (WEA 42 (RW))	
	16:42	1	15:19 (WEA_G1)	17:27	19	16:41 (WEA_RWE01)	18:23	20:21	1	19:43 (WEA 43 (RW))	21:18	21:53	10	21:07 (WEA 42 (RW))
18	08:28	14:59 (WEA_G1)	07:33	15:59 (WEA_RWE01)	06:33		06:17	05:13	19:43 (WEA 43 (RW))	05:13	21:39	14	21:07 (WEA 42 (RW))	
	16:45	1	15:19 (WEA_G1)	17:29	15	16:42 (WEA_RWE01)	18:25	20:22	1	19:44 (WEA 43 (RW))	21:20	21:54	10	21:07 (WEA 42 (RW))
19	08:27	14:59 (WEA_G1)	07:31	15:59 (WEA_RWE01)	06:31		06:15	05:12	19:44 (WEA 43 (RW))	05:12	21:38	14	21:07 (WEA 42 (RW))	
	16:48	1	15:19 (WEA_G1)	17:31	6	16:43 (WEA_RWE01)	18:27	20:23	5	19:45 (WEA 43 (RW))	21:22	21:54	10	21:07 (WEA 42 (RW))
20	08:27	14:59 (WEA_G1)	07:29	15:59 (WEA_RWE01)	06:29		06:13	05:11	19:45 (WEA 43 (RW))	05:11	21:37	14	21:07 (WEA 42 (RW))	
	16:51	1	15:19 (WEA_G1)	17:33	3	16:44 (WEA_RWE01)	18:29	20:24	1	19:46 (WEA 43 (RW))	21:24	21:55	10	21:07 (WEA 42 (RW))
21	08:26	14:59 (WEA_G1)	07:27	15:59 (WEA_RWE01)	06:27		06:11	05:10	19:46 (WEA 43 (RW))	05:10	21:36	14	21:07 (WEA 42 (RW))	
	16:54	1	15:19 (WEA_G1)	17:35	1	16:45 (WEA_RWE01)	18:31	20:25	1	19:47 (WEA 43 (RW))	21:26	21:56	10	21:07 (WEA 42 (RW))
22	08:26	14:59 (WEA_G1)	07:25	15:59 (WEA_RWE01)	06:25		06:09	05:09	19:47 (WEA 43 (RW))	05:09	21:35	14	21:07 (WEA 42 (RW))	
	16:57	1	15:19 (WEA_G1)	17:37	1	16:46 (WEA_RWE01)	18:33	20:26	1	19:48 (WEA 43 (RW))	21:28	21:56	10	21:07 (WEA 42 (RW))
23	08:25	14:59 (WEA_G1)	07:23	15:59 (WEA_RWE01)	06:23		06:07	05:08	19:48 (WEA 43 (RW))	05:08	21:34	14	21:07 (WEA 42 (RW))	
	17:00	1	15:19 (WEA_G1)	17:39	1	16:47 (WEA_RWE01)	18:35	20:27	1	19:49 (WEA 43 (RW))	21:30	21:57	10	21:07 (WEA 42 (RW))
24	08:25	14:59 (WEA_G1)	07:21	15:59 (WEA_RWE01)	06:21		06:05	05:07	19:49 (WEA 43 (RW))	05:07	21:33	14	21:07 (WEA 42 (RW))	
	17:03	1	15:19 (WEA_G1)	17:41	1	16:48 (WEA_RWE01)	18:37	20:28	1	19:50 (WEA 43 (RW))	21:32	21:58	10	21:07 (WEA 42 (RW))
25	08:24	14:59 (WEA_G1)	07:19	15:59 (WEA_RWE01)	06:19		06:03	05:06	19:50 (WEA 43 (RW))	05:06	21:32	14	21:07 (WEA 42 (RW))	
	17:06	1	15:19 (WEA_G1)	17:43	1	16:49 (WEA_RWE01)	18:39	20:29	1	19:51 (WEA 43 (RW))	21:34	21:58	10	21:07 (WEA 42 (RW))
26	08:24	14:59 (WEA_G1)	07:17	15:59 (WEA_RWE01)	06:17		06:01	05:05	19:51 (WEA 43 (RW))	05:05	21:31	14	21:07 (WEA 42 (RW))	
	17:09	1	15:19 (WEA_G1)	17:45	1	16:50 (WEA_RWE01)	18:41	20:30	1	19:52 (WEA 43 (RW))	21:36	21:59	10	21:07 (WEA 42 (RW))
27	08:23	14:59 (WEA_G1)	07:15	15:59 (WEA_RWE01)	06:15		05:59	05:04	19:52 (WEA 43 (RW))	05:04	21:30	14	21:07 (WEA 42 (RW))	
	17:12	1	15:19 (WEA_G1)	17:47	1	16:51 (WEA_RWE01)	18:43	20:31	1	19:53 (WEA 43 (RW))	21:38	22:00	10	21:07 (WEA 42 (RW))
28	08:23	14:59 (WEA_G1)	07:13	15:59 (WEA_RWE01)	06:13		05:57	05:03	19:53 (WEA 43 (RW))	05:03	21:29	14	21:07 (WEA 42 (RW))	
	17:15	1	15:19 (WEA_G1)	17:49	1	16:52 (WEA_RWE01)	18:45	20:32	1	19:54 (WEA 43 (RW))	21:40	22:01	10	21:07 (WEA 42 (RW))
29	08:22	14:59 (WEA_G1)	07:11	15:59 (WEA_RWE01)	06:11		05:55	05:02	19:54 (WEA 43 (RW))	05:02	21:28	14	21:07 (WEA 42 (RW))	
	17:18	1	15:19 (WEA_G1)	17:51	1	16:53 (WEA_RWE01)	18:47	20:33	1	19:55 (WEA 43 (RW))	21:42	22:02	10	21:07 (WEA 42 (RW))
30	08:22	14:59 (WEA_G1)	07:09	15:59 (WEA_RWE01)	06:09		05:53	05:01	19:55 (WEA 43 (RW))	05:01	21:27	14	21:07 (WEA 42 (RW))	
	17:21	1	15:19 (WEA_G1)	17:53	1	16:54 (WEA_RWE01)	18:49	20:34	1	19:56 (WEA 43 (RW))	21:44	22:03	10	21:07 (WEA 42 (RW))
31	08:21	14:59 (WEA_G1)	07:07	15:59 (WEA_RWE01)	06:07		05:51	05:00	19:56 (WEA 43 (RW))	05:00	21:26	14	21:07 (WEA 42 (RW))	
	17:24	1	15:19 (WEA_G1)	17:55	1	16:55 (WEA_RWE01)	18:51	20:35	1	19:57 (WEA 43 (RW))	21:46	22:04	10	21:07 (WEA 42 (RW))
1	08:21	14:59 (WEA_G1)	07:05	15:59 (WEA_RWE01)	06:05		05:49	04:59	19:57 (WEA 43 (RW))	04:59	21:25	14	21:07 (WEA 42 (RW))	
	17:27	1	15:19 (WEA_G1)	17:57	1	16:56 (WEA_RWE01)	18:53	20:36	1	19:58 (WEA 43 (RW))	21:48	22:05	10	21:07 (WEA 42 (RW))
2	08:21	14:59 (WEA_G1)	07:03	15:59 (WEA_RWE01)	06:03		05:47	04:58	19:58 (WEA 43 (RW))	04:58	21:24	14	21:07 (WEA 42 (RW))	
	17:30	1	15:19 (WEA_G1)	17:59	1	16:57 (WEA_RWE01)	18:55	20:37	1	19:59 (WEA 43 (RW))	21:48	22:06	10	21:07 (WEA 42 (RW))
3	08:20	14:59 (WEA_G1)	07:01	15:59 (WEA_RWE01)	06:01		05:45	04:57	19:59 (WEA 43 (RW))	04:57	21:23	14	21:07 (WEA 42 (RW))	
	17:33	1	15:19 (WEA_G1)	18:01	1	16:58 (WEA_RWE01)	18:57	20:38	1	20:00 (WEA 43 (RW))	21:49	22:07	10	21:07 (WEA 42 (RW))
4	08:20	14:59 (WEA_G1)	06:59	15:59 (WEA_RWE01)	05:59		05:43	04:56	19:59 (WEA 43 (RW))	04:56	21:22	14	21:07 (WEA 42 (RW))	
	17:36	1	15:19 (WEA_G1)	18:03	1	16:59 (WEA_RWE01)	18:59	20:39	1	20:01 (WEA 43 (RW))	21:50	22:08	10	21:07 (WEA 42 (RW))
5	08:20	14:59 (WEA_G1)	06:57	15:59 (WEA_RWE01)	05:57		05:41	04:55	19:59 (WEA 43 (RW))	04:55	21:21	14	21:07 (WEA 42 (RW))	
	17:39	1	15:19 (WEA_G1)	18:05	1	17:00 (WEA_RWE01								





Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0
Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 09 - IO 09 Bäderstraße 2 (Gosdorf)

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (July to December) and rows for days, showing shadow times and durations for various wind directions and turbine positions.

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

Table with 5 columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Zeitpunkt (SS:MM) Schatteneende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-155) **Schattenrezeptor:** IO 10 - IO 10 Bäderstraße 8 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni				
1	08:37	15:05 (WEA_G1)	08:06	16:19 (WEA_RWE01)	07:08	06:52		05:41		20:14 (WEA_41 (RW))	04:51	20:50 (WEA_42 (RW))		
1	16:03	15:25 (WEA_G1)	16:55	3	16:22 (WEA_RWE01)	17:52	19:51	20:48	3	20:17 (WEA_41 (RW))	21:38	20:53 (WEA_42 (RW))		
2	08:37	15:06 (WEA_G1)	08:04	16:18 (WEA_RWE01)	07:05	06:49		05:39			04:50			
1	16:04	15:26 (WEA_G1)	16:57	7	16:25 (WEA_RWE01)	17:54	19:53	20:49			04:50			
3	08:37	15:06 (WEA_G1)	08:03	16:17 (WEA_RWE01)	07:03	06:47		05:37			04:49			
1	16:05	15:27 (WEA_G1)	16:59	10	16:27 (WEA_RWE01)	17:56	19:55	20:51			04:49			
4	08:36	15:07 (WEA_G1)	08:01	16:16 (WEA_RWE01)	07:01	06:44		05:35			04:48			
1	16:07	15:29 (WEA_G1)	17:01	13	16:29 (WEA_RWE01)	17:58	19:57	20:53			04:42			
5	08:36	15:07 (WEA_G1)	07:59	16:15 (WEA_RWE01)	06:58	06:42		19:31 (WEA_43 (RW))	05:33		04:47			
1	16:08	15:30 (WEA_G1)	17:03	16	16:31 (WEA_RWE01)	18:00	19:59	1	19:32 (WEA_43 (RW))	20:55	21:43			
6	08:36	15:07 (WEA_G1)	07:57	16:15 (WEA_RWE01)	06:56	06:39		19:30 (WEA_43 (RW))	05:31		04:47			
1	16:09	15:31 (WEA_G1)	17:05	18	16:33 (WEA_RWE01)	18:02	20:01	3	19:33 (WEA_43 (RW))	20:57	21:44			
7	08:35	15:08 (WEA_G1)	07:55	16:14 (WEA_RWE01)	06:53	06:37		19:30 (WEA_43 (RW))	05:29		04:46			
1	16:10	15:33 (WEA_G1)	17:07	22	16:36 (WEA_RWE01)	18:03	3	17:37 (WEA_05 (GRN))	20:02	5	19:35 (WEA_43 (RW))	20:59	21:45	
8	08:35	15:08 (WEA_G1)	07:53	16:14 (WEA_RWE01)	06:51	06:34		19:30 (WEA_43 (RW))	05:27		04:45			
1	16:12	15:34 (WEA_G1)	17:09	24	16:38 (WEA_RWE01)	18:05	4	17:38 (WEA_05 (GRN))	20:04	6	19:36 (WEA_43 (RW))	21:00	21:46	
9	08:34	15:09 (WEA_G1)	07:51	16:14 (WEA_RWE01)	06:49	06:37		19:30 (WEA_43 (RW))	05:27		04:45			
1	16:13	15:34 (WEA_G1)	17:11	26	16:40 (WEA_RWE01)	18:07	6	17:41 (WEA_05 (GRN))	20:06	6	19:37 (WEA_43 (RW))	21:03	21:47	
10	08:33	15:09 (WEA_G1)	07:49	16:14 (WEA_RWE01)	06:46	06:32		19:30 (WEA_43 (RW))	05:25		04:44			
1	16:15	15:34 (WEA_G1)	17:13	29	16:43 (WEA_RWE01)	18:09	8	17:43 (WEA_05 (GRN))	20:08		21:04			
11	08:33	15:10 (WEA_G1)	07:47	16:14 (WEA_RWE01)	06:44	06:32		19:30 (WEA_43 (RW))	05:23		04:44			
1	16:16	15:35 (WEA_G1)	17:15	31	16:45 (WEA_RWE01)	18:11	11	17:45 (WEA_05 (GRN))	20:10		21:05			
12	08:32	15:10 (WEA_G1)	07:45	16:14 (WEA_RWE01)	06:41	06:28		19:30 (WEA_43 (RW))	05:21		04:43			
1	16:18	15:36 (WEA_G1)	17:17	32	16:46 (WEA_RWE01)	18:13	13	17:46 (WEA_05 (GRN))	20:12		21:07			
13	08:31	15:11 (WEA_G1)	07:43	16:14 (WEA_RWE01)	06:39	06:22		19:30 (WEA_43 (RW))	05:19		04:43			
1	16:20	15:38 (WEA_G1)	17:19	32	16:48 (WEA_RWE01)	18:15	14	17:48 (WEA_05 (GRN))	20:14		21:09	21:12 (WEA_M04)		
14	08:30	15:12 (WEA_G1)	07:41	16:14 (WEA_RWE01)	06:36	06:22		19:30 (WEA_43 (RW))	05:17		04:43			
1	16:21	15:39 (WEA_G1)	17:22	31	16:49 (WEA_RWE01)	18:17	12	17:48 (WEA_05 (GRN))	20:15		21:11	21:14 (WEA_M04)		
15	08:29	15:13 (WEA_G1)	07:39	16:15 (WEA_RWE01)	06:34	06:18		19:30 (WEA_43 (RW))	05:14		04:42			
1	16:23	15:39 (WEA_G1)	17:24	30	16:49 (WEA_RWE01)	18:19	9	17:46 (WEA_05 (GRN))	20:16		21:12	21:15 (WEA_M04)		
16	08:28	15:14 (WEA_G1)	07:37	16:15 (WEA_RWE01)	06:31	06:15		19:30 (WEA_43 (RW))	05:13		04:42			
1	16:25	15:39 (WEA_G1)	17:26	29	16:44 (WEA_RWE01)	18:20	2	17:44 (WEA_05 (GRN))	20:15		21:14	21:17 (WEA_M04)		
17	08:27	15:15 (WEA_G1)	07:35	16:15 (WEA_RWE01)	06:29	06:13		19:30 (WEA_43 (RW))	05:11		04:42			
1	16:26	15:39 (WEA_G1)	17:28	28	16:44 (WEA_RWE01)	18:23	20:21	21:16		21:19	21:22 (WEA_M04)			
18	08:26	15:16 (WEA_G1)	07:33	16:17 (WEA_RWE01)	06:26	06:12		19:30 (WEA_43 (RW))	05:09		04:42			
1	16:28	15:40 (WEA_G1)	17:30	25	16:42 (WEA_RWE01)	18:25	20:22	21:18	1	20:11 (WEA_42 (RW))	21:21	21:24 (WEA_M04)		
19	08:25	15:17 (WEA_G1)	07:30	16:18 (WEA_RWE01)	06:24	06:08		17:59 (WEA_02 (GRN))	06:08		04:42			
1	16:30	15:40 (WEA_G1)	17:32	23	16:43 (WEA_RWE01)	18:27	1	18:00 (WEA_02 (GRN))	20:25	3	20:17 (WEA_42 (RW))	21:21	21:24 (WEA_M04)	
20	08:24	15:19 (WEA_G1)	07:28	16:20 (WEA_RWE01)	06:21	06:05		17:58 (WEA_02 (GRN))	06:05		04:42			
1	16:32	15:41 (WEA_G1)	17:34	20	16:40 (WEA_RWE01)	18:30	3	18:02 (WEA_02 (GRN))	20:27	5	20:18 (WEA_42 (RW))	21:24	21:27 (WEA_M04)	
21	08:23	15:21 (WEA_G1)	07:26	16:22 (WEA_RWE01)	06:19	06:04		17:58 (WEA_02 (GRN))	06:04		04:42			
1	16:34	15:41 (WEA_G1)	17:36	16	16:38 (WEA_RWE01)	18:30	6	18:04 (WEA_02 (GRN))	20:28	6	20:19 (WEA_42 (RW))	21:26	21:29 (WEA_M04)	
22	08:21	15:22 (WEA_G1)	07:24	16:23 (WEA_RWE01)	06:16	06:02		17:58 (WEA_02 (GRN))	06:02		04:42			
1	16:35	15:40 (WEA_G1)	17:38	9	16:34 (WEA_RWE01)	18:32	7	18:05 (WEA_02 (GRN))	20:31	8	20:21 (WEA_42 (RW))	21:28	21:31 (WEA_M04)	
23	08:20	15:23 (WEA_G1)	07:22	16:24 (WEA_RWE01)	06:14	05:58		17:59 (WEA_02 (GRN))	06:01		04:42			
1	16:37	15:40 (WEA_G1)	17:40	1	16:36 (WEA_RWE01)	18:34	9	18:07 (WEA_02 (GRN))	20:33		21:29	21:32 (WEA_M04)		
24	08:19	15:24 (WEA_G1)	07:20	16:25 (WEA_RWE01)	06:11	05:57		18:00 (WEA_02 (GRN))	06:01		04:42			
1	16:39	15:40 (WEA_G1)	17:42	1	16:37 (WEA_RWE01)	18:34	5	18:07 (WEA_02 (GRN))	20:34		21:30	21:33 (WEA_M04)		
25	08:17	15:25 (WEA_G1)	07:17	16:26 (WEA_RWE01)	06:09	05:54		18:00 (WEA_02 (GRN))	06:00		04:42			
1	16:41	15:40 (WEA_G1)	17:44	1	16:38 (WEA_RWE01)	18:36	20:35	21:32		21:31	21:34 (WEA_M04)			
26	08:16	15:26 (WEA_G1)	07:15	16:27 (WEA_RWE01)	06:07	05:52		18:00 (WEA_02 (GRN))	06:00		04:42			
1	16:43	15:40 (WEA_G1)	17:46	1	16:39 (WEA_RWE01)	18:39	20:38	21:33		21:32	21:35 (WEA_M04)			
27	08:15	15:27 (WEA_G1)	07:12	16:28 (WEA_RWE01)	06:05	05:50		18:01 (WEA_02 (GRN))	06:00		04:42			
1	16:45	15:40 (WEA_G1)	17:48	1	16:40 (WEA_RWE01)	18:42	18:01 (WEA_02 (GRN))	06:02		20:32	21:33	21:36 (WEA_M04)		
28	08:13	15:28 (WEA_G1)	07:10	16:29 (WEA_RWE01)	06:02	05:48		18:01 (WEA_02 (GRN))	06:00		04:42			
1	16:47	15:40 (WEA_G1)	17:50	1	16:41 (WEA_RWE01)	18:44	20:42	21:34		20:45 (WEA_41 (RW))	21:36	21:39 (WEA_M04)		
29	08:11	15:29 (WEA_G1)	07:07	16:30 (WEA_RWE01)	06:00	05:46		18:01 (WEA_02 (GRN))	06:00		04:42			
1	16:49	15:40 (WEA_G1)	17:52	1	16:42 (WEA_RWE01)	18:46	3	18:02 (WEA_02 (GRN))	20:44	2	20:14 (WEA_41 (RW))	21:38	21:41 (WEA_M04)	
30	08:09	15:30 (WEA_G1)	07:04	16:31 (WEA_RWE01)	05:57	05:43		18:02 (WEA_02 (GRN))	06:00		04:42			
1	16:51	15:40 (WEA_G1)	17:54	1	16:43 (WEA_RWE01)	18:47	20:46	2	20:15 (WEA_41 (RW))	21:39	9	20:16 (WEA_41 (RW))	21:40	21:43 (WEA_M04)
31	08:06	15:31 (WEA_G1)	07:01	16:32 (WEA_RWE01)	05:54	05:40		18:02 (WEA_02 (GRN))	06:00		04:42			
1	16:53	15:40 (WEA_G1)	17:56	1	16:44 (WEA_RWE01)	18:49	20:48	2	20:16 (WEA_41 (RW))	21:40	7	20:17 (WEA_41 (RW))	21:41	21:44 (WEA_M04)
Sonneneinstrahlung		248		223		207		421		336		513		
sch. Ausnutz./Beschattung		438		474		519		527		518		47		

**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 (SS:MM)	Schattende (SS:MM)	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-6-155) **Schattenrezeptor:** IO 10 - IO 10 Bäderstraße 8 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	10:47	10:57	10:23	10:17	18:13 (WEA 03 (GRN))	10:16	15:43 (WEA RWEG1)	10:12	14:52 (WEA G1)	10:12	14:52 (WEA G1)
2	10:47	10:57	10:23	10:17	18:13 (WEA 03 (GRN))	10:16	15:43 (WEA RWEG1)	10:12	14:52 (WEA G1)	10:12	14:52 (WEA G1)
3	10:48	10:58	10:24	10:18	18:14 (WEA 03 (GRN))	10:17	15:44 (WEA RWEG1)	10:13	14:53 (WEA G1)	10:13	14:53 (WEA G1)
4	10:49	10:59	10:25	10:19	18:15 (WEA 03 (GRN))	10:18	15:45 (WEA RWEG1)	10:14	14:54 (WEA G1)	10:14	14:54 (WEA G1)
5	10:50	11:00	10:26	10:20	18:16 (WEA 03 (GRN))	10:19	15:46 (WEA RWEG1)	10:15	14:55 (WEA G1)	10:15	14:55 (WEA G1)
6	10:51	11:01	10:27	10:21	18:17 (WEA 03 (GRN))	10:20	15:47 (WEA RWEG1)	10:16	14:56 (WEA G1)	10:16	14:56 (WEA G1)
7	10:52	11:02	10:28	10:22	18:18 (WEA 03 (GRN))	10:21	15:48 (WEA RWEG1)	10:17	14:57 (WEA G1)	10:17	14:57 (WEA G1)
8	10:53	11:03	10:29	10:23	18:19 (WEA 03 (GRN))	10:22	15:49 (WEA RWEG1)	10:18	14:58 (WEA G1)	10:18	14:58 (WEA G1)
9	10:54	11:04	10:30	10:24	18:20 (WEA 03 (GRN))	10:23	15:50 (WEA RWEG1)	10:19	14:59 (WEA G1)	10:19	14:59 (WEA G1)
10	10:55	11:05	10:31	10:25	18:21 (WEA 03 (GRN))	10:24	15:51 (WEA RWEG1)	10:20	15:00 (WEA G1)	10:20	15:00 (WEA G1)
11	10:56	11:06	10:32	10:26	18:22 (WEA 03 (GRN))	10:25	15:52 (WEA RWEG1)	10:21	15:01 (WEA G1)	10:21	15:01 (WEA G1)
12	10:57	11:07	10:33	10:27	18:23 (WEA 03 (GRN))	10:26	15:53 (WEA RWEG1)	10:22	15:02 (WEA G1)	10:22	15:02 (WEA G1)
13	10:58	11:08	10:34	10:28	18:24 (WEA 03 (GRN))	10:27	15:54 (WEA RWEG1)	10:23	15:03 (WEA G1)	10:23	15:03 (WEA G1)
14	10:59	11:09	10:35	10:29	18:25 (WEA 03 (GRN))	10:28	15:55 (WEA RWEG1)	10:24	15:04 (WEA G1)	10:24	15:04 (WEA G1)
15	11:00	11:10	10:36	10:30	18:26 (WEA 03 (GRN))	10:29	15:56 (WEA RWEG1)	10:25	15:05 (WEA G1)	10:25	15:05 (WEA G1)
16	11:01	11:11	10:37	10:31	18:27 (WEA 03 (GRN))	10:30	15:57 (WEA RWEG1)	10:26	15:06 (WEA G1)	10:26	15:06 (WEA G1)
17	11:02	11:12	10:38	10:32	18:28 (WEA 03 (GRN))	10:31	15:58 (WEA RWEG1)	10:27	15:07 (WEA G1)	10:27	15:07 (WEA G1)
18	11:03	11:13	10:39	10:33	18:29 (WEA 03 (GRN))	10:32	15:59 (WEA RWEG1)	10:28	15:08 (WEA G1)	10:28	15:08 (WEA G1)
19	11:04	11:14	10:40	10:34	18:30 (WEA 03 (GRN))	10:33	16:00 (WEA RWEG1)	10:29	15:09 (WEA G1)	10:29	15:09 (WEA G1)
20	11:05	11:15	10:41	10:35	18:31 (WEA 03 (GRN))	10:34	16:01 (WEA RWEG1)	10:30	15:10 (WEA G1)	10:30	15:10 (WEA G1)
21	11:06	11:16	10:42	10:36	18:32 (WEA 03 (GRN))	10:35	16:02 (WEA RWEG1)	10:31	15:11 (WEA G1)	10:31	15:11 (WEA G1)
22	11:07	11:17	10:43	10:37	18:33 (WEA 03 (GRN))	10:36	16:03 (WEA RWEG1)	10:32	15:12 (WEA G1)	10:32	15:12 (WEA G1)
23	11:08	11:18	10:44	10:38	18:34 (WEA 03 (GRN))	10:37	16:04 (WEA RWEG1)	10:33	15:13 (WEA G1)	10:33	15:13 (WEA G1)
24	11:09	11:19	10:45	10:39	18:35 (WEA 03 (GRN))	10:38	16:05 (WEA RWEG1)	10:34	15:14 (WEA G1)	10:34	15:14 (WEA G1)
25	11:10	11:20	10:46	10:40	18:36 (WEA 03 (GRN))	10:39	16:06 (WEA RWEG1)	10:35	15:15 (WEA G1)	10:35	15:15 (WEA G1)
26	11:11	11:21	10:47	10:41	18:37 (WEA 03 (GRN))	10:40	16:07 (WEA RWEG1)	10:36	15:16 (WEA G1)	10:36	15:16 (WEA G1)
27	11:12	11:22	10:48	10:42	18:38 (WEA 03 (GRN))	10:41	16:08 (WEA RWEG1)	10:37	15:17 (WEA G1)	10:37	15:17 (WEA G1)
28	11:13	11:23	10:49	10:43	18:39 (WEA 03 (GRN))	10:42	16:09 (WEA RWEG1)	10:38	15:18 (WEA G1)	10:38	15:18 (WEA G1)
29	11:14	11:24	10:50	10:44	18:40 (WEA 03 (GRN))	10:43	16:10 (WEA RWEG1)	10:39	15:19 (WEA G1)	10:39	15:19 (WEA G1)
30	11:15	11:25	10:51	10:45	18:41 (WEA 03 (GRN))	10:44	16:11 (WEA RWEG1)	10:40	15:20 (WEA G1)	10:40	15:20 (WEA G1)
31	11:16	11:26	10:52	10:46	18:42 (WEA 03 (GRN))	10:45	16:12 (WEA RWEG1)	10:41	15:21 (WEA G1)	10:41	15:21 (WEA G1)
1	11:17	11:27	10:53	10:47	18:43 (WEA 03 (GRN))	10:46	16:13 (WEA RWEG1)	10:42	15:22 (WEA G1)	10:42	15:22 (WEA G1)
2	11:18	11:28	10:54	10:48	18:44 (WEA 03 (GRN))	10:47	16:14 (WEA RWEG1)	10:43	15:23 (WEA G1)	10:43	15:23 (WEA G1)
3	11:19	11:29	10:55	10:49	18:45 (WEA 03 (GRN))	10:48	16:15 (WEA RWEG1)	10:44	15:24 (WEA G1)	10:44	15:24 (WEA G1)
4	11:20	11:30	10:56	10:50	18:46 (WEA 03 (GRN))	10:49	16:16 (WEA RWEG1)	10:45	15:25 (WEA G1)	10:45	15:25 (WEA G1)
5	11:21	11:31	10:57	10:51	18:47 (WEA 03 (GRN))	10:50	16:17 (WEA RWEG1)	10:46	15:26 (WEA G1)	10:46	15:26 (WEA G1)
6	11:22	11:32	10:58	10:52	18:48 (WEA 03 (GRN))	10:51	16:18 (WEA RWEG1)	10:47	15:27 (WEA G1)	10:47	15:27 (WEA G1)
7	11:23	11:33	10:59	10:53	18:49 (WEA 03 (GRN))	10:52	16:19 (WEA RWEG1)	10:48	15:28 (WEA G1)	10:48	15:28 (WEA G1)
8	11:24	11:34	11:00	10:54	18:50 (WEA 03 (GRN))	10:53	16:20 (WEA RWEG1)	10:49	15:29 (WEA G1)	10:49	15:29 (WEA G1)
9	11:25	11:35	11:01	10:55	18:51 (WEA 03 (GRN))	10:54	16:21 (WEA RWEG1)	10:50	15:30 (WEA G1)	10:50	15:30 (WEA G1)
10	11:26	11:36	11:02	10:56	18:52 (WEA 03 (GRN))	10:55	16:22 (WEA RWEG1)	10:51	15:31 (WEA G1)	10:51	15:31 (WEA G1)
11	11:27	11:37	11:03	10:57	18:53 (WEA 03 (GRN))	10:56	16:23 (WEA RWEG1)	10:52	15:32 (WEA G1)	10:52	15:32 (WEA G1)
12	11:28	11:38	11:04	10:58	18:54 (WEA 03 (GRN))	10:57	16:24 (WEA RWEG1)	10:53	15:33 (WEA G1)	10:53	15:33 (WEA G1)
13	11:29	11:39	11:05	10:59	18:55 (WEA 03 (GRN))	10:58	16:25 (WEA RWEG1)	10:54	15:34 (WEA G1)	10:54	15:34 (WEA G1)
14	11:30	11:40	11:06	11:00	18:56 (WEA 03 (GRN))	10:59	16:26 (WEA RWEG1)	10:55	15:35 (WEA G1)	10:55	15:35 (WEA G1)
15	11:31	11:41	11:07	11:01	18:57 (WEA 03 (GRN))	11:00	16:27 (WEA RWEG1)	10:56	15:36 (WEA G1)	10:56	15:36 (WEA G1)
16	11:32	11:42	11:08	11:02	18:58 (WEA 03 (GRN))	11:01	16:28 (WEA RWEG1)	10:57	15:37 (WEA G1)	10:57	15:37 (WEA G1)
17	11:33	11:43	11:09	11:03	18:59 (WEA 03 (GRN))	11:02	16:29 (WEA RWEG1)	10:58	15:38 (WEA G1)	10:58	15:38 (WEA G1)
18	11:34	11:44	11:10	11:04	19:00 (WEA 03 (GRN))	11:03	16:30 (WEA RWEG1)	10:59	15:39 (WEA G1)	10:59	15:39 (WEA G1)
19	11:35	11:45	11:11	11:05	19:01 (WEA 03 (GRN))	11:04	16:31 (WEA RWEG1)	11:00	15:40 (WEA G1)	11:00	15:40 (WEA G1)
20	11:36	11:46	11:12	11:06	19:02 (WEA 03 (GRN))	11:05	16:32 (WEA RWEG1)	11:01	15:41 (WEA G1)	11:01	15:41 (WEA G1)
21	11:37	11:47	11:13	11:07	19:03 (WEA 03 (GRN))	11:06	16:33 (WEA RWEG1)	11:02	15:42 (WEA G1)	11:02	15:42 (WEA G1)
22	11:38	11:48	11:14	11:08	19:04 (WEA 03 (GRN))	11:07	16:34 (WEA RWEG1)	11:03	15:43 (WEA G1)	11:03	15:43 (WEA G1)
23	11:39	11:49	11:15	11:09	19:05 (WEA 03 (GRN))	11:08	16:35 (WEA RWEG1)	11:04	15:44 (WEA G1)	11:04	15:44 (WEA G1)
24	11:40	11:50	11:16	11:10	19:06 (WEA 03 (GRN))	11:09	16:36 (WEA RWEG1)	11:05	15:45 (WEA G1)	11:05	15:45 (WEA G1)
25	11:41	11:51	11:17	11:11	19:07 (WEA 03 (GRN))	11:10	16:37 (WEA RWEG1)	11:06	15:46 (WEA G1)	11:06	15:46 (WEA G1)
26	11:42	11:52	11:18	11:12	19:08 (WEA 03 (GRN))	11:11	16:38 (WEA RWEG1)	11:07	15:47 (WEA G1)	11:07	15:47 (WEA G1)
27	11:43	11:53	11:19	11:13	19:09 (WEA 03 (GRN))	11:12	16:39 (WEA RWEG1)	11:08	15:48 (WEA G1)	11:08	15:48 (WEA G1)
28	11:44	11:54	11:20	11:14	19:10 (WEA 03 (GRN))	11:13	16:40 (WEA RWEG1)	11:09	15:49 (WEA G1)	11:09	15:49 (WEA G1)
29	11:45	11:55	11:21	11:15	19:11 (WEA 03 (GRN))	11:14	16:41 (WEA RWEG1)	11:10	15:50 (WEA G1)	11:10	15:50 (WEA G1)
30	11:46	11:56	11:22	11:16	19:12 (WEA 03 (GRN))	11:15	16:42 (WEA RWEG1)	11:11	15:51 (WEA G1)	11:11	15:51 (WEA G1)
31	11:47	11:57	11:23	11:17	19:13 (WEA 03 (GRN))	11:16	16:43 (WEA RWEG1)	11:12	15:52 (WEA G1)	11:12	15:52 (WEA G1)
1	11:48	11:58	11:24	11:18	19:14 (WEA 03 (GRN))	11:17	16:44 (WEA RWEG1)	11:13	15:53 (WEA G1)	11:13	15:53 (WEA G1)
2	11:49	11:59	11:25	11:19	19:15 (WEA 03 (GRN))	11:18	16:45 (WEA RWEG1)	11:14	15:54 (WEA G1)	11:14	15:54 (WEA G1)
3	11:50	12:00	11:26	11:20	19:16 (WEA 03 (GRN))	11:19	16:46 (WEA RWEG1)	11:15	15:55 (WEA G1)	11:15	15:55 (WEA G1)
4	11:51	12:01	11:27	11:21	19:17 (WEA 03 (GRN))	11:20	16:47 (WEA RWEG1)	11:16	15:56 (WEA G1)	11:16	15:56 (WEA G1)
5	11:52	12:02	11:28	11:22	19:18 (WEA 03 (GRN))	11:21	16:48 (WEA RWEG1)	11:17	15:57 (WEA G1)	11:17	15:57 (WEA G1)
6	11:53	12:03	11:29	11:23	19:19 (WEA 03 (GRN))	11:22	16:49 (WEA RWEG1)	11:18	15:58 (WEA G1)	11:18	15:58 (WEA G1)
7	11:54	12:04	11:30	11:24	19:20 (WEA 03 (GRN))	11:23	16:50 (WEA RWEG1)	11:19	15:59 (WEA G1)	11:19	15:59 (WEA G1)
8	11:55	12:05	11:31	11:25	19:21 (WEA 03 (GRN))	11:24	16:51 (WEA RWEG1)	11:20	16:00 (WEA G1)	11:20	16:00 (WEA G1)
9	11:56	12:06	11:32	11:26	19:22 (WEA 03 (GRN))	11:25	16:52 (WEA RWEG1)	11:21	16:01 (WEA G1)	11:21	16:01 (WEA G1)
10	11:57	12:07	11:33	11:27	19:23 (WEA 03 (GRN))	11:26	16:53 (WEA RWEG1)	11:22	16:02 (WEA G1)	11:22	16:02 (WEA G1)
11	11:58	12:08	11:34	11:28	19:24 (WEA 03 (GRN))	11:27	16:54 (WEA RWEG1)	11:23	16:03 (WEA G1)	11:23	16:03 (WEA G1)
12	11:59	12:09	11:35	11:29	19:25 (WEA 03 (GRN))	11:28	16:55 (WEA RWEG1)	11:24	16:04 (WEA G1)	11:24	16:04 (WEA G1)
13	12:00	12:10	11:36	11:30	19:26 (WEA 03 (GRN))	11:29	16:56 (WEA RWEG1)	11:25	16:05 (WEA G1)	11:25	16:05 (WEA G1)
14	12:01	12:11	11:37	11:31	19:27 (WEA 03 (GRN))	11:30	16:57 (WEA RWEG1)	11:26	16:06 (WEA G1)	11:26	16:06 (WEA G1)
15	12:02	12:12	11:38	11:32	19:28 (WEA 03 (GRN))	11:31	16:58 (WEA RWEG1)	11:27	16:07 (WEA G1)	11:27	16:07 (WEA G1)
16	12:03	12:13	11:39	11:33	19:29 (WEA 03 (GRN))	11:32	16:59 (WEA RWEG1)	11:28	16:08 (WEA G1)	11:28	16:08 (WEA G1)
17	12:04	12:14	11:40	11:34	19						



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 11 - IO 11 Bäderstraße 17 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	15:16 (WEA_G1)	08:06		17:08		06:52		05:41		04:51
2	08:37	15:26 (WEA_G1)	16:55		17:52		19:51		20:40		21:30
3	08:37	15:16 (WEA_G1)	08:03		17:03		06:47		05:37		04:49
4	08:36	15:17 (WEA_G1)	16:59	1	16:27 (WEA_RWE01)	17:56	19:55	2	19:27 (WEA_43 (RW))	20:51	21:41
5	08:36	15:17 (WEA_G1)	17:01	5	16:29 (WEA_RWE01)	17:58	19:57	4	19:30 (WEA_43 (RW))	20:53	21:42
6	08:36	15:17 (WEA_G1)	17:03	8	16:31 (WEA_RWE01)	18:00	19:59	5	19:32 (WEA_43 (RW))	20:55	21:43
7	08:35	15:18 (WEA_G1)	17:05	11	16:33 (WEA_RWE01)	18:02	17:33 (WEA_05 (GRN))	20:01	19:33 (WEA_43 (RW))	20:57	21:44
8	08:35	15:18 (WEA_G1)	17:07	14	16:35 (WEA_RWE01)	18:03	17:35 (WEA_05 (GRN))	20:03	19:35 (WEA_43 (RW))	20:59	21:45
9	08:34	15:19 (WEA_G1)	17:09	17	16:37 (WEA_RWE01)	18:04	17:37 (WEA_05 (GRN))	20:05	19:37 (WEA_43 (RW))	21:01	21:46
10	08:33	15:20 (WEA_G1)	17:11	20	16:39 (WEA_RWE01)	18:05	17:39 (WEA_05 (GRN))	20:07	19:39 (WEA_43 (RW))	21:03	21:47
11	08:32	15:21 (WEA_G1)	17:13	23	16:41 (WEA_RWE01)	18:06	17:41 (WEA_05 (GRN))	20:09	19:41 (WEA_43 (RW))	21:05	21:48
12	08:31	15:22 (WEA_G1)	17:15	26	16:43 (WEA_RWE01)	18:07	17:43 (WEA_05 (GRN))	20:11	19:43 (WEA_43 (RW))	21:07	21:49
13	08:30	15:23 (WEA_G1)	17:17	29	16:45 (WEA_RWE01)	18:08	17:45 (WEA_05 (GRN))	20:13	19:45 (WEA_43 (RW))	21:09	21:50
14	08:29	15:24 (WEA_G1)	17:19	32	16:47 (WEA_RWE01)	18:09	17:47 (WEA_05 (GRN))	20:15	19:47 (WEA_43 (RW))	21:11	21:51
15	08:28	15:25 (WEA_G1)	17:21	35	16:49 (WEA_RWE01)	18:10	17:49 (WEA_05 (GRN))	20:17	19:49 (WEA_43 (RW))	21:13	21:52
16	08:27	15:26 (WEA_G1)	17:23	38	16:51 (WEA_RWE01)	18:11	17:51 (WEA_05 (GRN))	20:19	19:51 (WEA_43 (RW))	21:15	21:53
17	08:26	15:27 (WEA_G1)	17:25	41	16:53 (WEA_RWE01)	18:12	17:53 (WEA_05 (GRN))	20:21	19:53 (WEA_43 (RW))	21:17	21:54
18	08:25	15:28 (WEA_G1)	17:27	44	16:55 (WEA_RWE01)	18:13	17:55 (WEA_05 (GRN))	20:23	19:55 (WEA_43 (RW))	21:19	21:55
19	08:24	15:29 (WEA_G1)	17:29	47	16:57 (WEA_RWE01)	18:14	17:57 (WEA_05 (GRN))	20:25	19:57 (WEA_43 (RW))	21:21	21:56
20	08:23	15:30 (WEA_G1)	17:31	50	16:59 (WEA_RWE01)	18:15	17:59 (WEA_05 (GRN))	20:27	19:59 (WEA_43 (RW))	21:23	21:57
21	08:22	15:31 (WEA_G1)	17:33	53	17:01 (WEA_RWE01)	18:16	18:01 (WEA_05 (GRN))	20:29	20:01 (WEA_43 (RW))	21:25	21:58
22	08:21	15:32 (WEA_G1)	17:35	56	17:03 (WEA_RWE01)	18:17	18:03 (WEA_05 (GRN))	20:31	20:03 (WEA_43 (RW))	21:27	21:59
23	08:20	15:33 (WEA_G1)	17:37	59	17:05 (WEA_RWE01)	18:18	18:05 (WEA_05 (GRN))	20:33	20:05 (WEA_43 (RW))	21:29	22:00
24	08:19	15:34 (WEA_G1)	17:39	62	17:07 (WEA_RWE01)	18:19	18:07 (WEA_05 (GRN))	20:35	20:07 (WEA_43 (RW))	21:31	22:01
25	08:18	15:35 (WEA_G1)	17:41	65	17:09 (WEA_RWE01)	18:20	18:09 (WEA_05 (GRN))	20:37	20:09 (WEA_43 (RW))	21:33	22:02
26	08:17	15:36 (WEA_G1)	17:43	68	17:11 (WEA_RWE01)	18:21	18:11 (WEA_05 (GRN))	20:39	20:11 (WEA_43 (RW))	21:35	22:03
27	08:16	15:37 (WEA_G1)	17:45	71	17:13 (WEA_RWE01)	18:22	18:13 (WEA_05 (GRN))	20:41	20:13 (WEA_43 (RW))	21:37	22:04
28	08:15	15:38 (WEA_G1)	17:47	74	17:15 (WEA_RWE01)	18:23	18:15 (WEA_05 (GRN))	20:43	20:15 (WEA_43 (RW))	21:39	22:05
29	08:14	15:39 (WEA_G1)	17:49	77	17:17 (WEA_RWE01)	18:24	18:17 (WEA_05 (GRN))	20:45	20:17 (WEA_43 (RW))	21:41	22:06
30	08:13	15:40 (WEA_G1)	17:51	80	17:19 (WEA_RWE01)	18:25	18:19 (WEA_05 (GRN))	20:47	20:19 (WEA_43 (RW))	21:43	22:07
31	08:12	15:41 (WEA_G1)	17:53	83	17:21 (WEA_RWE01)	18:26	18:21 (WEA_05 (GRN))	20:49	20:21 (WEA_43 (RW))	21:45	22:08
1	08:11	15:42 (WEA_G1)	17:55	86	17:23 (WEA_RWE01)	18:27	18:23 (WEA_05 (GRN))	20:51	20:23 (WEA_43 (RW))	21:47	22:09
2	08:10	15:43 (WEA_G1)	17:57	89	17:25 (WEA_RWE01)	18:28	18:25 (WEA_05 (GRN))	20:53	20:25 (WEA_43 (RW))	21:49	22:10
3	08:09	15:44 (WEA_G1)	17:59	92	17:27 (WEA_RWE01)	18:29	18:27 (WEA_05 (GRN))	20:55	20:27 (WEA_43 (RW))	21:51	22:11
4	08:08	15:45 (WEA_G1)	18:01	95	17:29 (WEA_RWE01)	18:30	18:29 (WEA_05 (GRN))	20:57	20:29 (WEA_43 (RW))	21:53	22:12
5	08:07	15:46 (WEA_G1)	18:03	98	17:31 (WEA_RWE01)	18:31	18:31 (WEA_05 (GRN))	20:59	20:31 (WEA_43 (RW))	21:55	22:13
6	08:06	15:47 (WEA_G1)	18:05	101	17:33 (WEA_RWE01)	18:32	18:33 (WEA_05 (GRN))	21:01	20:33 (WEA_43 (RW))	21:57	22:14
7	08:05	15:48 (WEA_G1)	18:07	104	17:35 (WEA_RWE01)	18:33	18:35 (WEA_05 (GRN))	21:03	20:35 (WEA_43 (RW))	21:59	22:15
8	08:04	15:49 (WEA_G1)	18:09	107	17:37 (WEA_RWE01)	18:34	18:37 (WEA_05 (GRN))	21:05	20:37 (WEA_43 (RW))	22:01	22:16
9	08:03	15:50 (WEA_G1)	18:11	110	17:39 (WEA_RWE01)	18:35	18:39 (WEA_05 (GRN))	21:07	20:39 (WEA_43 (RW))	22:03	22:17
10	08:02	15:51 (WEA_G1)	18:13	113	17:41 (WEA_RWE01)	18:36	18:41 (WEA_05 (GRN))	21:09	20:41 (WEA_43 (RW))	22:05	22:18
11	08:01	15:52 (WEA_G1)	18:15	116	17:43 (WEA_RWE01)	18:37	18:43 (WEA_05 (GRN))	21:11	20:43 (WEA_43 (RW))	22:07	22:19
12	08:00	15:53 (WEA_G1)	18:17	119	17:45 (WEA_RWE01)	18:38	18:45 (WEA_05 (GRN))	21:13	20:45 (WEA_43 (RW))	22:09	22:20
13	07:59	15:54 (WEA_G1)	18:19	122	17:47 (WEA_RWE01)	18:39	18:47 (WEA_05 (GRN))	21:15	20:47 (WEA_43 (RW))	22:11	22:21
14	07:58	15:55 (WEA_G1)	18:21	125	17:49 (WEA_RWE01)	18:40	18:49 (WEA_05 (GRN))	21:17	20:49 (WEA_43 (RW))	22:13	22:22
15	07:57	15:56 (WEA_G1)	18:23	128	17:51 (WEA_RWE01)	18:41	18:51 (WEA_05 (GRN))	21:19	20:51 (WEA_43 (RW))	22:15	22:23
16	07:56	15:57 (WEA_G1)	18:25	131	17:53 (WEA_RWE01)	18:42	18:53 (WEA_05 (GRN))	21:21	20:53 (WEA_43 (RW))	22:17	22:24
17	07:55	15:58 (WEA_G1)	18:27	134	17:55 (WEA_RWE01)	18:43	18:55 (WEA_05 (GRN))	21:23	20:55 (WEA_43 (RW))	22:19	22:25
18	07:54	15:59 (WEA_G1)	18:29	137	17:57 (WEA_RWE01)	18:44	18:57 (WEA_05 (GRN))	21:25	20:57 (WEA_43 (RW))	22:21	22:26
19	07:53	16:00 (WEA_G1)	18:31	140	17:59 (WEA_RWE01)	18:45	18:59 (WEA_05 (GRN))	21:27	20:59 (WEA_43 (RW))	22:23	22:27
20	07:52	16:01 (WEA_G1)	18:33	143	18:01 (WEA_RWE01)	18:46	19:01 (WEA_05 (GRN))	21:29	21:01 (WEA_43 (RW))	22:25	22:28
21	07:51	16:02 (WEA_G1)	18:35	146	18:03 (WEA_RWE01)	18:47	19:03 (WEA_05 (GRN))	21:31	21:03 (WEA_43 (RW))	22:27	22:29
22	07:50	16:03 (WEA_G1)	18:37	149	18:05 (WEA_RWE01)	18:48	19:05 (WEA_05 (GRN))	21:33	21:05 (WEA_43 (RW))	22:29	22:30
23	07:49	16:04 (WEA_G1)	18:39	152	18:07 (WEA_RWE01)	18:49	19:07 (WEA_05 (GRN))	21:35	21:07 (WEA_43 (RW))	22:31	22:31
24	07:48	16:05 (WEA_G1)	18:41	155	18:09 (WEA_RWE01)	18:50	19:09 (WEA_05 (GRN))	21:37	21:09 (WEA_43 (RW))	22:33	22:32
25	07:47	16:06 (WEA_G1)	18:43	158	18:11 (WEA_RWE01)	18:51	19:11 (WEA_05 (GRN))	21:39	21:11 (WEA_43 (RW))	22:35	22:33
26	07:46	16:07 (WEA_G1)	18:45	161	18:13 (WEA_RWE01)	18:52	19:13 (WEA_05 (GRN))	21:41	21:13 (WEA_43 (RW))	22:37	22:34
27	07:45	16:08 (WEA_G1)	18:47	164	18:15 (WEA_RWE01)	18:53	19:15 (WEA_05 (GRN))	21:43	21:15 (WEA_43 (RW))	22:39	22:35
28	07:44	16:09 (WEA_G1)	18:49	167	18:17 (WEA_RWE01)	18:54	19:17 (WEA_05 (GRN))	21:45	21:17 (WEA_43 (RW))	22:41	22:36
29	07:43	16:10 (WEA_G1)	18:51	170	18:19 (WEA_RWE01)	18:55	19:19 (WEA_05 (GRN))	21:47	21:19 (WEA_43 (RW))	22:43	22:37
30	07:42	16:11 (WEA_G1)	18:53	173	18:21 (WEA_RWE01)	18:56	19:21 (WEA_05 (GRN))	21:49	21:21 (WEA_43 (RW))	22:45	22:38
31	07:41	16:12 (WEA_G1)	18:55	176	18:23 (WEA_RWE01)	18:57	19:23 (WEA_05 (GRN))	21:51	21:23 (WEA_43 (RW))	22:47	22:39
1	07:40	16:13 (WEA_G1)	18:57	179	18:25 (WEA_RWE01)	18:58	19:25 (WEA_05 (GRN))	21:53	21:25 (WEA_43 (RW))	22:49	22:40
2	07:39	16:14 (WEA_G1)	18:59	182	18:27 (WEA_RWE01)	18:59	19:27 (WEA_05 (GRN))	21:55	21:27 (WEA_43 (RW))	22:51	22:41
3	07:38	16:15 (WEA_G1)	19:01	185	18:29 (WEA_RWE01)	19:00	19:29 (WEA_05 (GRN))	21:57	21:29 (WEA_43 (RW))	22:53	22:42
4	07:37	16:16 (WEA_G1)	19:03	188	18:31 (WEA_RWE01)	19:01	19:31 (WEA_05 (GRN))	21:59	21:31 (WEA_43 (RW))	22:55	22:43
5	07:36	16:17 (WEA_G1)	19:05	191	18:33 (WEA_RWE01)	19:02	19:33 (WEA_05 (GRN))	22:01	21:33 (WEA_43 (RW))	22:57	22:44
6	07:35	16:18 (WEA_G1)	19:07	194	18:35 (WEA_RWE01)	19:03	19:35 (WEA_05 (GRN))	22:03	21:35 (WEA_43 (RW))	22:59	22:45
7	07:34	16:19 (WEA_G1)	19:09	197	18:37 (WEA_RWE01)	19:04	19:37 (WEA_05 (GRN))	22:05	21:37 (WEA_43 (RW))	23:01	22:46
8	07:33	16:20 (WEA_G1)	19:11	200	18:39 (WEA_RWE01)	19:05	19:39 (WEA_05 (GRN))	22:07	21:39 (WEA_43 (RW))	23:03	22:47
9	07:32	16:21 (WEA_G1)	19:13	203	18:41 (WEA_RWE01)	19:06	19:41 (WEA_05 (GRN))	22:09	21:41 (WEA_43 (RW))	23:05	22:48
10	07:31	16:22 (WEA_G1)	19:15	206	18:43 (WEA_RWE01)	19:07	19:43 (WEA_05 (GRN))	22:11	21:43 (WEA_43 (RW))	23:07	22:49
11	07:30	16:23 (WEA_G1)	19:17	209	18:45 (WEA_RWE01)	19:08	19:45 (WEA_05 (GRN))	22:13	21:45 (WEA_43 (RW))	23:09	22:50
12	07:29	16:24 (WEA_G1)	19:19	212	18:47 (WEA_RWE01)	19:09	19:47 (WEA_05 (GRN))	22:15	21:47 (WEA_43 (RW))	23:11	22:51
13	07:28	16:25 (WEA_G1)	19:21	215	18:49 (WEA_RWE01)	19:10	19:49 (WEA_05 (GRN))	22:17	21:49 (WEA_43 (RW))	23:13	22:52
14	07:27	16:26 (WEA_G1)	19:23	218	18:51 (WEA_RWE01)	19:11	19:51 (WEA_05 (GRN))	22:19	21:51 (WEA_43 (RW))	23:15	22:53
15	07:26	16:27 (WEA_G1)	19:25	221	18:53 (WEA_RWE01)	19:12	19:53 (WEA_05 (GRN))	22:21	21:53 (WEA_43 (RW))	23:17	22:54
16	07:25	16:28 (WEA_G1)	19:27	224	18:55 (WEA_RWE01)	19:13	19:55 (WEA_05 (GRN))	22:23	21:55 (WEA_43 (RW))	23:19	22:55
17	07:24	16:29 (WEA_G1)	19:29</								

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 11 - IO 11 Bäderstraße 17 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember		
1	04:47	21:04 (WEA K04)	05:27	20:40 (WEA 42 (RW))	06:23	07:17	18:14 (WEA 03 (GRN))	07:16	15:50 (WEA RW01)	08:12	15:01 (WEA_G1)	
	12:54	21:17 (WEA K04)	21:17	5 20:45 (WEA 42 (RW))	20:10	18:55	11 18:25 (WEA 03 (GRN))	16:44	22 16:12 (WEA RW01)	15:58	20 15:21 (WEA_G1)	
2	04:47	21:05 (WEA K04)	05:29	20:41 (WEA 42 (RW))	06:24	07:19	18:12 (WEA 03 (GRN))	07:18	15:51 (WEA RW01)	08:14	15:01 (WEA_G1)	
	12:53	21:17 (WEA K04)	21:18	3 20:44 (WEA 42 (RW))	20:07	18:53	11 18:23 (WEA 03 (GRN))	16:42	19 16:10 (WEA RW01)	15:58	20 15:21 (WEA_G1)	
3	04:48	21:05 (WEA K04)	05:31		06:26	07:21	18:11 (WEA 03 (GRN))	07:20	15:51 (WEA RW01)	08:15	15:02 (WEA_G1)	
	12:53	21:17 (WEA K04)	21:14		20:05	18:50	10 18:21 (WEA 03 (GRN))	16:40	16 16:07 (WEA RW01)	15:57	18 15:20 (WEA_G1)	
4	04:49	21:05 (WEA K04)	05:32		06:28	07:22	18:11 (WEA 03 (GRN))	07:22	15:51 (WEA RW01)	08:17	15:02 (WEA_G1)	
	12:52	21:16 (WEA K04)	21:12		20:03	18:48	8 18:19 (WEA 03 (GRN))	16:38	14 16:05 (WEA RW01)	15:56	17 15:19 (WEA_G1)	
5	04:50	21:06 (WEA K04)	05:34		06:30	07:24	18:11 (WEA 03 (GRN))	07:24	15:52 (WEA RW01)	08:18	15:03 (WEA_G1)	
	12:52	21:16 (WEA K04)	21:10		20:00	18:45	5 18:16 (WEA 03 (GRN))	16:36	11 16:04 (WEA RW01)	15:56	15 15:18 (WEA_G1)	
6	04:51	21:05 (WEA K04)	05:36		06:32	07:26	18:11 (WEA 03 (GRN))	07:26	15:54 (WEA RW01)	08:19	15:03 (WEA_G1)	
	12:51	21:15 (WEA K04)	21:08		19:58	5 19:29 (WEA 43 (RW))	18:43	3 18:14 (WEA 05 (GRN))	16:34	8 16:02 (WEA RW01)	15:55	14 15:17 (WEA_G1)
7	04:52	21:05 (WEA K04)	05:38		06:33	07:28	18:10 (WEA 03 (GRN))	07:28	15:55 (WEA RW01)	08:21	15:04 (WEA_G1)	
	12:50	21:14 (WEA K04)	21:06		19:55	5 19:27 (WEA 43 (RW))	18:40	1 18:11 (WEA 05 (GRN))	16:32	4 15:59 (WEA RW01)	15:54	13 15:17 (WEA_G1)
8	04:53	21:05 (WEA K04)	05:39		06:35	07:30				08:22	15:04 (WEA_G1)	
	12:50	21:14 (WEA K04)	21:04		19:53	4 19:24 (WEA 43 (RW))	18:38		16:30	11:54	12 15:16 (WEA_G1)	
9	04:54	21:05 (WEA K04)	05:41		06:37	07:32	15:52 (WEA RW01)	07:32	15:52	08:23	15:05 (WEA_G1)	
	12:49	21:15 (WEA K04)	21:02		19:50	1 15:52 (WEA 43 (RW))	18:34		16:28	11:52	11 15:15 (WEA_G1)	
10	04:55	21:06 (WEA K04)	05:43		06:39	07:34				08:24	15:05 (WEA_G1)	
	12:48	21:15 (WEA K04)	21:00		19:48	07:36	18:33		16:26	11:50	10 15:14 (WEA_G1)	
11	04:56	21:06 (WEA K04)	05:45		06:41	07:36	15:53 (WEA RW01)	07:36	15:53	08:25	15:06 (WEA_G1)	
	12:47	21:15 (WEA K04)	20:58		19:45	07:38	18:31		16:24	11:48	9 15:13 (WEA_G1)	
12	04:57	21:07 (WEA K04)	05:47		06:42	07:37				08:26	15:06 (WEA_G1)	
	12:46	21:14 (WEA K04)	20:56		19:43	07:39	18:28		16:22	11:46	8 15:11 (WEA_G1)	
13	04:58	21:07 (WEA K04)	05:48		06:44	07:38	15:54 (WEA RW01)	07:38	15:54	08:26	15:07 (WEA_G1)	
	12:45	21:14 (WEA K04)	20:54		19:41	07:40	18:26		16:20	11:44	7 15:08 (WEA_G1)	
14	04:59	21:07 (WEA K04)	05:50		06:46	07:41				08:27	15:07 (WEA_G1)	
	12:44	21:09 (WEA K04)	20:53		19:38	07:42	18:24		16:18	11:42	6 15:04 (WEA_G1)	
15	05:00	21:08 (WEA K04)	05:52		06:48	07:43	15:55 (WEA RW01)	07:43	15:55	08:27	15:08 (WEA_G1)	
	12:43	21:09 (WEA K04)	20:51		19:35	07:45	18:21		16:16	11:40	5 15:01 (WEA_G1)	
16	05:03	21:09 (WEA K04)	05:53		06:50	07:45				08:28	15:08 (WEA_G1)	
	12:42	21:09 (WEA K04)	20:49		19:33	07:47	18:18		16:14	11:38	4 15:00 (WEA_G1)	
17	05:04	21:09	05:55	20:14 (WEA 41 (RW))	06:51	07:49	15:56 (WEA RW01)	07:49	15:56	08:29	15:09 (WEA_G1)	
	12:41	21:09	20:47	1 20:15 (WEA 41 (RW))	19:30 (WEA 01 (GRN))	07:51	18:17		16:12	11:36	3 15:00 (WEA_G1)	
18	05:05	21:09	05:57	20:12 (WEA 41 (RW))	06:53	07:51				08:30	15:10 (WEA_G1)	
	12:40	21:09	20:45	3 20:12 (WEA 41 (RW))	19:28	07:53	18:14		16:10	11:34	2 15:00 (WEA_G1)	
19	05:07	21:09	05:59		06:55	07:53	15:57 (WEA RW01)	07:53	15:57	08:31	15:11 (WEA_G1)	
	12:39	21:09	20:43		19:25	07:55	18:11		16:08	11:32	1 15:00 (WEA_G1)	
20	05:08	21:09	06:01		06:57	07:55	15:58 (WEA RW01)	07:55	15:58	08:32	15:12 (WEA_G1)	
	12:38	21:09	20:41		19:23	07:57	18:08		16:06	11:30	0 15:00 (WEA_G1)	
21	05:10	21:09	06:03		06:59	07:57	15:59 (WEA RW01)	07:57	15:59	08:33	15:13 (WEA_G1)	
	12:37	21:09	20:39		19:21	07:59	18:05		16:04	11:28	15:00 (WEA_G1)	
22	05:11	21:09	06:05		07:00	07:59	15:59 (WEA RW01)	07:59	15:59	08:34	15:14 (WEA_G1)	
	12:36	21:09	20:37		19:19	08:00	18:02		16:02	11:26	15:00 (WEA_G1)	
23	05:12	21:09	06:06		07:02	08:00	15:59 (WEA RW01)	08:00	15:59	08:35	15:15 (WEA_G1)	
	12:35	21:09	20:35		19:17	08:01	17:59 (WEA RW01)	08:01	15:58	08:36	15:16 (WEA_G1)	
24	05:13	21:09	06:08		07:03	08:01	15:59 (WEA RW01)	08:01	15:59	08:37	15:17 (WEA_G1)	
	12:34	21:09	20:33	20:45 (WEA 42 (RW))	19:15	08:02	17:57 (WEA RW01)	08:02	15:57	08:38	15:18 (WEA_G1)	
25	05:14	21:09	06:10	20:42 (WEA 42 (RW))	19:13	08:03	15:58 (WEA RW01)	08:03	15:58	08:39	15:19 (WEA_G1)	
	12:33	21:09	20:31	20:40 (WEA 42 (RW))	19:11	08:04	17:55 (WEA RW01)	08:04	15:56	08:40	15:20 (WEA_G1)	
26	05:15	21:09	06:12	20:39 (WEA 42 (RW))	19:09	08:05	15:57 (WEA RW01)	08:05	15:57	08:41	15:21 (WEA_G1)	
	12:32	21:09	20:29	20:37 (WEA 42 (RW))	19:07	08:06	17:53 (WEA RW01)	08:06	15:55	08:42	15:22 (WEA_G1)	
27	05:16	21:09	06:14	20:36 (WEA 42 (RW))	19:05	08:07	15:56 (WEA RW01)	08:07	15:56	08:43	15:23 (WEA_G1)	
	12:31	21:09	20:27	20:34 (WEA 42 (RW))	19:03	08:08	17:51 (WEA RW01)	08:08	15:54	08:44	15:24 (WEA_G1)	
28	05:17	21:09	06:16	20:33 (WEA 42 (RW))	19:01	08:09	15:55 (WEA RW01)	08:09	15:55	08:45	15:25 (WEA_G1)	
	12:30	21:09	20:25	20:31 (WEA 42 (RW))	18:59	08:10	17:49 (WEA RW01)	08:10	15:53	08:46	15:26 (WEA_G1)	
29	05:18	21:09	06:18	20:29 (WEA 42 (RW))	18:57	08:11	15:54 (WEA RW01)	08:11	15:54	08:47	15:27 (WEA_G1)	
	12:29	21:09	20:23	20:28 (WEA 42 (RW))	18:55	08:12	17:47 (WEA RW01)	08:12	15:52	08:48	15:28 (WEA_G1)	
30	05:19	21:09	06:20	20:26 (WEA 42 (RW))	18:53	08:13	15:53 (WEA RW01)	08:13	15:53	08:49	15:29 (WEA_G1)	
	12:28	21:09	20:21	20:25 (WEA 42 (RW))	18:51	08:14	17:45 (WEA RW01)	08:14	15:51	08:50	15:30 (WEA_G1)	
31	05:20	21:09	06:22	20:24 (WEA 42 (RW))	18:49	08:15	15:52 (WEA RW01)	08:15	15:52	08:51	15:31 (WEA_G1)	
	12:27	21:09	20:19	20:22 (WEA 42 (RW))	18:47	08:16	17:43 (WEA RW01)	08:16	15:50	08:52	15:32 (WEA_G1)	
32	05:21	21:09	06:24	20:21 (WEA 42 (RW))	18:45	08:17	15:51 (WEA RW01)	08:17	15:51	08:53	15:33 (WEA_G1)	
	12:26	21:09	20:17	20:20 (WEA 42 (RW))	18:43	08:18	17:41 (WEA RW01)	08:18	15:49	08:54	15:34 (WEA_G1)	
33	05:22	21:09	06:26	20:18 (WEA 42 (RW))	18:41	08:19	15:50 (WEA RW01)	08:19	15:50	08:55	15:35 (WEA_G1)	
	12:25	21:09	20:15	20:17 (WEA 42 (RW))	18:39	08:20	17:39 (WEA RW01)	08:20	15:48	08:56	15:36 (WEA_G1)	
34	05:23	21:09	06:28	20:15 (WEA 42 (RW))	18:37	08:21	15:49 (WEA RW01)	08:21	15:49	08:57	15:37 (WEA_G1)	
	12:24	21:09	20:13	20:15 (WEA 42 (RW))	18:35	08:22	17:37 (WEA RW01)	08:22	15:47	08:58	15:38 (WEA_G1)	
35	05:24	21:09	06:30	20:12 (WEA 42 (RW))	18:33	08:23	15:48 (WEA RW01)	08:23	15:48	08:59	15:39 (WEA_G1)	
	12:23	21:09	20:11	20:13 (WEA 42 (RW))	18:31	08:24	17:35 (WEA RW01)	08:24	15:46	09:00	15:40 (WEA_G1)	
36	05:25	21:09	06:32	20:10 (WEA 42 (RW))	18:29	08:25	15:47 (WEA RW01)	08:25	15:47	09:01	15:41 (WEA_G1)	
	12:22	21:09	20:09	20:11 (WEA 42 (RW))	18:27	08:26	17:33 (WEA RW01)	08:26	15:45	09:02	15:42 (WEA_G1)	
37	05:26	21:09	06:34	20:08 (WEA 42 (RW))	18:25	08:27	15:46 (WEA RW01)	08:27	15:46	09:03	15:43 (WEA_G1)	
	12:21	21:09	20:07	20:09 (WEA 42 (RW))	18:23	08:28	17:31 (WEA RW01)	08:28	15:44	09:04	15:44 (WEA_G1)	
38	05:27	21:09	06:36	20:06 (WEA 42 (RW))	18:21	08:29	15:45 (WEA RW01)	08:29	15:45	09:05	15:45 (WEA_G1)	
	12:20	21:09	20:05	20:07 (WEA 42 (RW))	18:19	08:30	17:29 (WEA RW01)	08:30	15:43	09:06	15:46 (WEA_G1)	
39	05:28	21:09	06:38	20:04 (WEA 42 (RW))	18:17	08:31	15:44 (WEA RW01)	08:31	15:44	09:07	15:47 (WEA_G1)	
	12:19	21:09	20:03	20:05 (WEA 42 (RW))	18:15	08:32	17:27 (WEA RW01)	08:32	15:42	09:08	15:48 (WEA_G1)	
40	05:29	21:09	06:40	20:03 (WEA 42 (RW))	18:13	08:33	15:43 (WEA RW01)	08:33	15:43	09:09	15:49 (WEA_G1)	
	12:18	21:09	20:01	20:03 (WEA 42 (RW))	18:11	08:34	17:25 (WEA RW01)	08:34	15:41	09		







Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-155) **Schattenrezeptor:** IO 12 - IO 12 Bäderstraße 25 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

	Juli	August	September	Oktober	November	Dezember		
1	04:47	05:27	06:23	07:17	07:16	15:48 (WEA RWEG1) 08:12	15:04 (WEA_G1)	
	12:54	12:17	12:10	12:55	16:44	24 16:12 (WEA RWEG1) 11:50	17 15:21 (WEA_G1)	
2	04:47	05:29	06:24	07:19	07:18	15:48 (WEA RWEG1) 08:14	15:05 (WEA_G1)	
	12:53	12:16	12:07	12:53	16:42	22 16:10 (WEA RWEG1) 11:50	16 15:21 (WEA_G1)	
3	04:48	05:31	06:26	07:21	07:20	15:48 (WEA RWEG1) 08:15	15:05 (WEA_G1)	
	12:53	12:14	12:05	12:50	16:40	19 16:07 (WEA RWEG1) 11:57	15 15:20 (WEA_G1)	
4	04:49	05:32	06:28	07:22	07:22	15:48 (WEA RWEG1) 08:17	15:05 (WEA_G1)	
	12:52	12:12	12:03	12:48	16:38	17 16:05 (WEA RWEG1) 11:56	14 15:19 (WEA_G1)	
5	04:50	05:34	06:30	07:24	07:24	15:49 (WEA RWEG1) 08:18	15:06 (WEA_G1)	
	12:52	12:10	12:00	12:45	16:36	15 16:04 (WEA RWEG1) 11:56	12 15:18 (WEA_G1)	
6	04:51	05:36	06:32	07:26	07:26	15:50 (WEA RWEG1) 08:19	15:06 (WEA_G1)	
	12:51	12:08	11:58	12:43	7 16:11 (WEA 03 (GRN)) 16:34	12 16:02 (WEA RWEG1) 11:55	11 15:17 (WEA_G1)	
7	04:52	05:38	06:33	07:28	07:28	16:02 (WEA 03 (GRN)) 07:28	15:50 (WEA RWEG1) 08:21	15:07 (WEA_G1)
	12:50	12:06	11:55	12:40	9 16:11 (WEA 03 (GRN)) 16:32	9 15:59 (WEA RWEG1) 11:54	10 15:17 (WEA_G1)	
8	04:53	05:39	06:35	07:30	07:30	16:01 (WEA 03 (GRN)) 07:30	15:51 (WEA RWEG1) 08:22	15:07 (WEA_G1)
	12:50	12:06	11:55	12:40	6 16:09 (WEA 23 (GRN)) 16:26	6 15:57 (WEA RWEG1) 11:54	9 15:14 (WEA_G1)	
9	04:55	05:41	06:37	07:32	07:32	16:04 (WEA 23 (GRN)) 07:32	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:49	12:05	11:54	12:39	5 16:06 (WEA 23 (GRN)) 16:28	5 15:54 (WEA RWEG1) 11:54	8 15:12 (WEA_G1)	
10	04:55	05:41	06:39	07:34	07:34	16:04 (WEA 23 (GRN)) 07:34	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:46	12:02	11:50	12:37	4 16:04 (WEA 23 (GRN)) 16:26	4 15:52 (WEA RWEG1) 11:54	7 15:10 (WEA_G1)	
11	04:56	05:45	06:41	07:35	07:35	16:04 (WEA 23 (GRN)) 07:36	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:47	12:03	11:51	12:38	1 16:02 (WEA 23 (GRN)) 16:25	1 15:50 (WEA RWEG1) 11:54	6 15:15 (WEA_G1)	
12	04:57	05:47	06:42	07:37	07:37	16:02 (WEA 23 (GRN)) 07:38	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:46	1 21:58 (WEA K01) 20:35	5 20:25 (WEA 42 (RW)) 13:42	2 19:13 (WEA 43 (RW)) 12:28	15:23	15:23	5 15:14 (WEA_G1)	
13	04:59	05:49	06:43	07:39	07:39	16:02 (WEA 23 (GRN)) 07:40	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:45	6 21:01 (WEA K01) 20:38	3 20:22 (WEA 42 (RW)) 13:40	4 19:12 (WEA 43 (RW)) 12:26	15:21	15:21	4 15:14 (WEA_G1)	
14	04:59	05:50	06:44	07:40	07:40	16:02 (WEA 23 (GRN)) 07:41	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:44	9 21:03 (WEA K01) 20:41	1 20:21 (WEA 42 (RW)) 13:38	2 19:10 (WEA 43 (RW)) 12:24	15:20	15:20	4 15:14 (WEA_G1)	
15	05:01	05:51	06:44	07:41	07:41	16:02 (WEA 23 (GRN)) 07:42	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:43	10 21:03 (WEA K01) 20:42	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:19	15:19	3 15:14 (WEA_G1)	
16	05:03	05:52	06:45	07:42	07:42	16:02 (WEA 23 (GRN)) 07:43	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:42	12 21:04 (WEA K01) 20:43	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:18	15:18	3 15:14 (WEA_G1)	
17	05:04	05:53	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:41	13 21:05 (WEA K01) 20:45	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:17	15:17	3 15:14 (WEA_G1)	
18	05:05	05:53	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:39	14 21:05 (WEA K01) 20:47	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:16	15:16	3 15:14 (WEA_G1)	
19	05:07	05:53	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:38	15 21:06 (WEA K01) 20:49	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:15	15:15	3 15:14 (WEA_G1)	
20	05:08	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:37	16 21:06 (WEA K01) 20:50	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:14	15:14	3 15:14 (WEA_G1)	
21	05:09	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:36	17 21:06 (WEA K01) 20:51	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:13	15:13	3 15:14 (WEA_G1)	
22	05:11	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:35	18 21:06 (WEA K01) 20:52	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:12	15:12	3 15:14 (WEA_G1)	
23	05:11	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:34	19 21:06 (WEA K01) 20:53	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:11	15:11	3 15:14 (WEA_G1)	
24	05:11	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:33	20 21:06 (WEA K01) 20:54	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:10	15:10	3 15:14 (WEA_G1)	
25	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:32	21 21:06 (WEA K01) 20:55	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:09	15:09	3 15:14 (WEA_G1)	
26	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:31	22 21:06 (WEA K01) 20:56	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:08	15:08	3 15:14 (WEA_G1)	
27	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:30	23 21:06 (WEA K01) 20:57	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:07	15:07	3 15:14 (WEA_G1)	
28	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:29	24 21:06 (WEA K01) 20:58	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:06	15:06	3 15:14 (WEA_G1)	
29	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:28	25 21:06 (WEA K01) 20:59	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:05	15:05	3 15:14 (WEA_G1)	
30	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:27	26 21:06 (WEA K01) 21:00	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:04	15:04	3 15:14 (WEA_G1)	
31	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:26	27 21:06 (WEA K01) 21:01	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:03	15:03	3 15:14 (WEA_G1)	
1	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:25	28 21:06 (WEA K01) 21:02	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:02	15:02	3 15:14 (WEA_G1)	
2	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:24	29 21:06 (WEA K01) 21:03	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:01	15:01	3 15:14 (WEA_G1)	
3	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:23	30 21:06 (WEA K01) 21:04	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	15:00	15:00	3 15:14 (WEA_G1)	
4	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:22	31 21:06 (WEA K01) 21:05	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:59	14:59	3 15:14 (WEA_G1)	
5	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:21	1 21:06 (WEA K01) 21:06	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:58	14:58	3 15:14 (WEA_G1)	
6	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:20	2 21:06 (WEA K01) 21:07	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:57	14:57	3 15:14 (WEA_G1)	
7	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:19	3 21:06 (WEA K01) 21:08	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:56	14:56	3 15:14 (WEA_G1)	
8	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:18	4 21:06 (WEA K01) 21:09	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:55	14:55	3 15:14 (WEA_G1)	
9	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:17	5 21:06 (WEA K01) 21:10	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:54	14:54	3 15:14 (WEA_G1)	
10	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:16	6 21:06 (WEA K01) 21:11	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:53	14:53	3 15:14 (WEA_G1)	
11	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:15	7 21:06 (WEA K01) 21:12	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:52	14:52	3 15:14 (WEA_G1)	
12	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:14	8 21:06 (WEA K01) 21:13	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:51	14:51	3 15:14 (WEA_G1)	
13	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:13	9 21:06 (WEA K01) 21:14	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:50	14:50	3 15:14 (WEA_G1)	
14	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:12	10 21:06 (WEA K01) 21:15	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:49	14:49	3 15:14 (WEA_G1)	
15	05:13	05:54	06:45	07:43	07:43	16:02 (WEA 23 (GRN)) 07:44	16:01 (WEA RWEG1) 08:23	15:07 (WEA_G1)
	12:11	11 21:06 (WEA K01) 21:16	1 20:21 (WEA 42 (RW)) 13:38	1 19:09 (WEA 43 (RW)) 12:24	14:48	14:48	3 15:14 (WEA_G1)	
1								

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-155) **Schattenrezeptor:** IO 13 - IO 13 Bäderstraße 35 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni		
1	08:37	14:53 (WEA_G2)	08:06		07:08		06:52		05:41	20:12 (WEA 42 (RW))	04:51	
	16:03	20	15:13 (WEA_G2)	16:55	17:52		19:51		20:47	2	20:14 (WEA 42 (RW))	21:38
2	08:37	14:54 (WEA_G2)	08:04		07:05		06:49		05:39			04:50
	16:04	20	15:14 (WEA_G2)	16:57	17:54		19:53		20:49			21:40
3	08:37	14:54 (WEA_G2)	08:03		07:03		06:47		05:37			04:49
	16:05	19	15:13 (WEA_G2)	16:59	17:56		19:55		20:51			21:41
4	08:36	14:55 (WEA_G2)	08:01		07:01		06:44		05:35			04:48
	16:06	19	15:14 (WEA_G2)	17:01	17:58		19:57		20:53			21:42
5	08:36	14:56 (WEA_G2)	07:59		06:58		06:42		05:33			04:47
	16:08	17	15:13 (WEA_G2)	17:03	18:00		19:59		20:55			21:43
6	08:36	14:56 (WEA_G2)	07:57		06:56		06:39		05:31			04:47
	16:09	17	15:13 (WEA_G2)	17:05	18:01		20:01		20:57			21:44
7	08:35	14:58 (WEA_G2)	07:55		06:53		17:36 (WEA 03 (GRN))	06:37	05:29			04:46
	16:10	15	15:13 (WEA_G2)	17:07	18:03		1	17:37 (WEA 03 (GRN))	20:02			21:45
8	08:35	14:59 (WEA_G1)	07:53		06:51		3	17:35 (WEA 03 (GRN))	18:34			20:45
	16:12	14	15:13 (WEA_G2)	17:00	18:05		3	17:36 (WEA 03 (GRN))	20:04			21:46
9	08:35	15:20 (WEA_G2)	07:51		06:50		5	17:36 (WEA 03 (GRN))	16:32			20:45
	16:13	12	15:20 (WEA_G2)	17:11	18:07		5	17:41 (WEA 03 (GRN))	20:06			21:07
10	08:33	15:22 (WEA_G2)	07:49		16:39 (WEA RWEEU)	06:40		17:26 (WEA 03 (GRN))	18:30			20:44
	16:15	9	15:21 (WEA_G2)	17:13	4	16:43 (WEA RWLUI)	18:09	6	17:42 (WEA 03 (GRN))	20:06		21:40
11	08:33	15:26 (WEA_G2)	07:47		16:35 (WEA RWEEU)	06:44		5	17:38 (WEA 03 (GRN))	18:27		20:44
	16:16	4	15:28 (WEA_G1)	17:15	7	16:45 (WEA RWEEU)	18:11	5	17:43 (WEA 03 (GRN))	20:10		21:40
12	08:32	15:30 (WEA_G2)	07:45		16:33 (WEA RWEEU)	06:41			18:20			20:43
	16:18		17:17	10	16:38 (WEA RWEEU)	18:13			20:12			21:39
13	08:31	15:33 (WEA_G2)	07:43		16:33 (WEA RWEEU)	06:39			18:18	1	20:34 (WEA K04)	20:43
	16:20		17:19	12	16:30 (WEA RWEEU)	18:15			21:09	3	20:36 (WEA K04)	21:00
14	08:30	15:44 (WEA_G1)	07:41		16:37 (WEA RWLUI)	06:38			18:18		20:34 (WEA K04)	20:43
	16:21	1	15:46 (WEA_G1)	17:21	14	16:51 (WEA RWEEU)	18:17		21:11	5	20:38 (WEA K04)	21:01
15	08:29	15:48 (WEA_G1)	07:39		16:37 (WEA RWEEU)	06:34			18:14		20:34 (WEA K04)	20:47
	16:23	2	15:47 (WEA_G1)	17:24	17	16:54 (WEA RWEEU)	18:10		21:13	6	20:40 (WEA K04)	21:02
16	08:28	15:48 (WEA_G1)	07:37		16:37 (WEA RWEEU)	06:31			18:13		20:34 (WEA K04)	20:42
	16:25	3	15:49 (WEA_G1)	17:25	19	16:50 (WEA RWEEU)	18:21		21:14	8	20:42 (WEA K04)	21:02
17	08:27	15:46 (WEA_G1)	07:35		16:37 (WEA RWEEU)	06:29		17:25 (WEA 02 (GRN))	18:12		20:34 (WEA K04)	20:42
	16:26	6	15:51 (WEA_G2)	17:25	22	16:59 (WEA RWLUI)	18:23	1	17:26 (WEA 02 (GRN))	20:12		21:03
18	08:26	15:46 (WEA_G1)	07:33		16:37 (WEA RWEEU)	06:28		2	17:26 (WEA 02 (GRN))	18:10		20:42
	16:28	8	15:50 (WEA_G1)	17:30	27	16:59 (WEA RWEEU)	18:25	2	17:28 (WEA 02 (GRN))	20:15		21:03
19	08:25	15:45 (WEA_G1)	07:30		16:35 (WEA RWEEU)	06:24			18:08		20:36 (WEA K04)	20:42
	16:30	10	15:55 (WEA_G1)	17:32	21	16:50 (WEA RWEEU)	18:27		21:10	11	20:47 (WEA K04)	21:04
20	08:24	15:47 (WEA_G1)	07:28		16:35 (WEA RWEEU)	06:21			18:05		20:36 (WEA K04)	20:42
	16:32	12	15:56 (WEA_G1)	17:34	19	16:50 (WEA RWEEU)	18:28		21:21	11	20:47 (WEA K04)	21:04
21	08:23	15:46 (WEA_G1)	07:26		16:34 (WEA RWLUI)	06:19			18:05		20:35 (WEA K04)	20:42
	16:34	14	15:58 (WEA_G1)	17:36	16	16:58 (WEA RWEEU)	18:30		21:23	8	20:46 (WEA K04)	21:04
22	08:21	15:46 (WEA_G1)	07:24		16:37 (WEA RWEEU)	06:16			18:03		20:40 (WEA K04)	20:47
	16:35	15	15:51 (WEA_G1)	17:35	13	16:55 (WEA RWEEU)	18:32		21:24	4	20:44 (WEA K04)	21:04
23	08:20	15:46 (WEA_G1)	07:22		16:35 (WEA RWEEU)	06:14			18:02		20:44 (WEA K04)	20:43
	16:37	17	15:53 (WEA_G1)	17:37	7	16:52 (WEA RWEEU)	18:31		21:25			21:04
24	08:19	15:46 (WEA_G1)	07:19		16:31		06:11		18:00		20:43	21:03
	16:38	19	15:56 (WEA_G1)	17:42		16:30			21:27			21:05
25	08:17	15:46 (WEA_G1)	07:17		16:09		06:09		18:00		20:43	21:03
	16:41	17	15:57 (WEA_G1)	17:44		16:38			21:29			21:05
26	08:16	15:46 (WEA_G1)	07:15		16:06		06:06		18:00		20:43	21:03
	16:43	17	15:56 (WEA_G1)	17:45		16:30			21:30			21:05
27	08:14	15:49 (WEA_G1)	07:12		16:04		06:04		18:00		20:43	21:01
	16:45	15	15:57 (WEA_G1)	17:45		16:32			21:32			21:04
28	08:13	15:52 (WEA_G2)	07:10		16:02		06:02		18:00		20:43	21:01
	16:47	11	16:03 (WEA_G1)	17:50		16:44			21:33			21:04
29	08:11	15:54 (WEA_G1)	07:08		16:00		06:00		18:00		20:43	21:01
	16:49	7	16:01 (WEA_G1)			16:45			21:34			21:04
30	08:09				16:57		19:19 (WEA 43 (RW))	05:44		5	20:10 (WEA 42 (RW))	04:53
	16:51				19:47	1	19:20 (WEA 43 (RW))	20:46		5	20:15 (WEA 42 (RW))	21:36
31	08:08				16:54		19:21 (WEA 43 (RW))				04:52	
	16:53				19:49	1	19:22 (WEA 43 (RW))				21:37	
Sonneneinstrahlung	248		272		367		421		496			513
astr.max.mögl.Beschattung		343		203		25		16		78		

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

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

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 13 - IO 13 Bäderstraße 35 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli	August	September	Oktober	November	Dezember
1   04:47   21:53	05:27   21:17	06:23   20:10	07:17   18:55	07:16   16:44	08:12   15:58
2   04:47   21:53	05:29   21:16	06:24   20:07	07:19   18:53	07:18   16:42	08:14   15:58
3   04:48   21:53	05:31   21:14	06:26   20:05	07:21   18:50	3   16:12 (WEA RWEE01) 07:21   16:40	4   14:51 (WEA_G2) 08:15   15:57
4   04:49   21:52	05:32   21:12	06:28   20:03	07:22   18:48	6   16:16 (WEA 03 (GRN)) 07:22   16:38	9   14:54 (WEA_G2) 08:17   15:56
5   04:50   21:52	05:34   21:10	06:30   20:00	07:24   18:45	6   16:19 (WEA 03 (GRN)) 07:24   16:36	14   14:57 (WEA_G2) 08:18   15:56
6   04:51   21:51	05:36   21:08	06:32   19:58	07:26   18:43	3   16:16 (WEA 03 (GRN)) 2   16:14 (WEA 03 (GRN)) 07:26   16:34	15   14:58 (WEA_G2) 08:19   15:55
7   04:52   21:50	05:38   21:06	06:33   19:55	07:28   18:40	07:28   16:32	16   14:59 (WEA_G2) 08:21   15:54
8   04:53   21:50	05:39   21:04	06:35   19:52	07:30   18:38	07:30   16:30	17   14:59 (WEA_G2) 08:22   15:54
9   04:55   21:49	05:41   21:02	06:37   19:50	07:32   18:36	16:30   16:28	18   14:59 (WEA_G2) 08:23   15:54
10   04:55   21:46	05:43   21:00	06:39   19:48	07:34   18:34	07:34   16:26	19   14:59 (WEA_G2) 08:25   15:53
11   04:56   21:47	05:45   20:58	06:41   19:45	07:35   18:31	07:36   16:25	20   14:59 (WEA_G2) 08:26   15:53
12   04:57   21:46	05:47   20:56	20:13 (WEA 42 (RW)) 06:42	19:43 (WEA 42 (RW)) 07:37	16:25   16:23	21   14:59 (WEA_G2) 08:28   15:52
13   04:59   21:45	05:48   20:54	20:12 (WEA 42 (RW)) 06:44	19:42 (WEA 42 (RW)) 07:39	16:23   16:21	22   14:59 (WEA_G2) 08:29   15:52
14   05:00   21:44	05:50   20:53	20:11 (WEA 42 (RW)) 06:46	19:41 (WEA 42 (RW)) 07:41	16:21   16:19	23   14:59 (WEA_G2) 08:30   15:52
15   05:01   21:43	05:52   20:49	20:10 (WEA 42 (RW)) 06:48	19:40   07:43	16:19   16:17	24   14:59 (WEA_G2) 08:31   15:52
16   05:03   21:42	05:54   20:47	20:10 (WEA 42 (RW)) 06:50	19:39   07:45	16:17   16:15	25   14:59 (WEA_G2) 08:32   15:52
17   05:04   21:41	05:56   20:45	20:10 (WEA 42 (RW)) 06:51	19:38   07:47	16:15   16:13	26   14:59 (WEA_G2) 08:33   15:52
18   05:05   21:39	05:57   20:43	06:52   19:35	19:37   07:49	16:13   16:11	27   14:59 (WEA_G2) 08:34   15:52
19   05:07   21:38	05:59   20:40	06:53   19:32	19:36   07:51	16:11   16:09	28   14:59 (WEA_G2) 08:35   15:52
20   05:08   21:37	06:00   20:38	06:54   19:29	19:35   07:53	16:09   16:07	29   14:59 (WEA_G2) 08:36   15:52
21   05:09   21:35	06:02   20:36	06:55   19:27	19:34   07:55	16:07   16:05	30   14:59 (WEA_G2) 08:37   15:52
22   05:11   21:34	20:40 (WEA 004) 06:04	06:56   19:24	19:33   07:56	16:05   16:03	31   14:59 (WEA_G2) 08:38   15:52
23   05:13   21:32	20:41 (WEA 004) 06:06	06:57   19:21	19:32   07:58	16:03   16:01	32   14:59 (WEA_G2) 08:39   15:52
24   05:14   21:31	20:42 (WEA 004) 06:08	06:58   19:18	19:31   07:59	16:01   15:59	33   14:59 (WEA_G2) 08:40   15:52
25   05:16   21:29	20:43 (WEA 004) 06:10	06:59   19:15	19:30   08:00	15:57   15:55	34   14:59 (WEA_G2) 08:41   15:52
26   05:17   21:28	20:44 (WEA 004) 06:12	07:00   19:12	19:29   08:01	15:55   15:53	35   14:59 (WEA_G2) 08:42   15:52
27   05:19   21:26	20:45 (WEA 004) 06:14	07:01   19:09	19:28   08:02	15:53   15:51	36   14:59 (WEA_G2) 08:43   15:52
28   05:21   21:24	20:46 (WEA 004) 06:16	07:02   19:06	19:27   08:03	15:51   15:49	37   14:59 (WEA_G2) 08:44   15:52
29   05:22   21:22	20:47 (WEA 004) 06:17	07:03   19:03	19:26   08:04	15:49   15:47	38   14:59 (WEA_G2) 08:45   15:52
30   05:24   21:21	20:48 (WEA 004) 06:19	07:04   19:00	19:25   08:05	15:47   15:45	39   14:59 (WEA_G2) 08:46   15:52
31   05:26   21:19	20:49 (WEA 004) 06:21	07:05   18:58	19:24   08:06	15:45   15:43	40   14:59 (WEA_G2) 08:47   15:52
Sonnenbeschattung ab: rechnerg/Beschattung	0   0   45	1   0   15	1   0   30	1   0   30	1   0   30

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

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



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 14 - IO 14 Bäderstraße 34 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni				
1	08:37	14:45 (WEA_G2)	08:06		07:08		06:52	19:21 (WEA 43 (RW))	05:41	20:15 (WEA 42 (RW))	04:51			
	16:03	15:01 (WEA_G2)	16:55		17:52		19:51	3	19:24 (WEA 43 (RW))	20:47	21:38			
2	08:37	14:46 (WEA_G2)	08:04		07:05		06:49		19:23 (WEA 43 (RW))	05:39	04:50			
	16:04	15:01 (WEA_G2)	16:57		17:54		19:53		3	19:26 (WEA 43 (RW))	20:49	21:40		
3	08:37	14:46 (WEA_G2)	08:03		07:03		06:47			05:37	20:15 (WEA 42 (RW))	04:49		
	16:05	15:00 (WEA_G2)	16:59		17:56		19:55			20:20 (WEA 42 (RW))	21:41			
4	08:36	14:48 (WEA_G2)	08:01		07:01		06:44			05:35	20:16 (WEA 42 (RW))	04:48		
	16:06	15:00 (WEA_G2)	17:01		17:58		19:57			20:53	7	20:23 (WEA 42 (RW))	21:42	
5	08:36	14:49 (WEA_G2)	07:59		06:58		06:42			05:33	20:17 (WEA 42 (RW))	04:47		
	16:08	14:50 (WEA_G2)	17:03		18:00		19:59			20:55	7	20:24 (WEA 42 (RW))	21:43	
6	08:36	14:51 (WEA_G2)	07:57		06:56		06:39			05:31	20:18 (WEA 42 (RW))	04:47		
	16:09	14:58 (WEA_G2)	17:05		18:02		20:01			20:57	3	20:22 (WEA 42 (RW))	21:44	
7	08:35	14:54 (WEA_G2)	07:55		06:53		17:36 (WEA 03 (GRN))			05:29		04:46		
	16:10	14:57 (WEA_G2)	17:07		18:03		1	17:37 (WEA 03 (GRN))		20:02		21:45		
8	08:35		07:53		06:51					17:35 (WEA 03 (GRN))		05:27		
	16:12		17:00		16:33 (WEA RVE01)					17:35 (WEA 03 (GRN))		21:00		
9	08:30	15:35 (WEA_G1)	07:51		06:40					17:35 (WEA 03 (GRN))		05:25		
	16:13	1	17:11		06:38					17:41 (WEA 03 (GRN))		21:02		
10	08:33	15:36 (WEA_G1)	07:49		06:40					17:35 (WEA 03 (GRN))		05:23		
	16:15	1	17:13		16:43 (WEA RVE01)					17:42 (WEA 03 (GRN))		21:04		
11	08:33	15:37 (WEA_G1)	07:47		06:44					17:36 (WEA 03 (GRN))		05:22		
	16:16	4	17:15		16:45 (WEA RVE01)					17:45 (WEA 03 (GRN))		21:06		
12	08:32	15:38 (WEA_G1)	07:45		06:41					17:38 (WEA 03 (GRN))		05:20		
	16:18	6	17:17		16:48 (WEA RVE01)					17:41 (WEA 03 (GRN))		21:07		
13	08:31	15:39 (WEA_G1)	07:43		06:39							05:18		
	16:20	7	17:19		16:50 (WEA RVE01)					20:14		21:09		
14	08:30	15:40 (WEA_G1)	07:41		06:38					06:40		05:16		
	16:21	9	17:21		16:51 (WEA RVE01)					20:16		21:11		
15	08:29	15:41 (WEA_G1)	07:39		06:34					06:38		05:14		
	16:23	11	17:24		16:54 (WEA RVE01)					20:17		21:13		
16	08:28	15:42 (WEA_G1)	07:37		06:31					06:35		05:13		
	16:25	12	17:25		16:50 (WEA RVE01)					20:18		21:14		
17	08:27	15:43 (WEA_G1)	07:35		06:29					17:35 (WEA 02 (GRN))		05:12		
	16:26	14	17:25		16:57 (WEA RVE01)					17:38 (WEA 02 (GRN))		21:16		
18	08:26	15:44 (WEA_G1)	07:33		06:28					17:35 (WEA 02 (GRN))		05:09		
	16:28	15	17:26		16:55 (WEA RVE01)					20:19		21:18		
19	08:25	15:45 (WEA_G1)	07:30		06:24					17:37 (WEA 02 (GRN))		05:08		
	16:30	17	17:28		16:55 (WEA RVE01)					18:00 (WEA 02 (GRN))		21:20		
20	08:24	15:46 (WEA_G1)	07:28		06:21							05:06		
	16:32	18	17:30		16:54 (WEA RVE01)					20:20		21:21		
21	08:23	15:47 (WEA_G1)	07:26		06:19					06:32		05:05		
	16:34	20	17:32		16:52 (WEA RVE01)					20:21		21:23		
22	08:21	15:48 (WEA_G1)	07:24		06:16					05:03		05:03		
	16:35	10	17:33		16:53 (WEA RVE01)					20:24		21:24		
23	08:20	15:49 (WEA_G1)	07:22		06:14					05:02		05:02		
	16:37	10	17:34		16:31					20:25		21:25		
24	08:19	15:41 (WEA_G1)	07:19		06:11					05:01		05:00		
	16:38	17	17:35		16:30					20:28		21:27		
25	08:17	15:43 (WEA_G1)	07:17		06:09					04:59		04:59		
	16:41	15	17:36		06:08					20:30		21:29		
26	08:16	15:44 (WEA_G1)	07:15		06:06					04:58		04:58		
	16:43	12	17:37		06:05					20:32		21:30		
27	08:14	15:46 (WEA_G1)	07:12		06:04					04:57		04:57		
	16:45	8	17:38		06:02					20:34		21:32		
28	08:13		07:10		06:01					04:56		04:56		
	16:47		17:39		06:00					20:36		21:33		
29	08:11				05:59					04:54		04:54		
	16:49				05:47					20:38		21:35		
30	08:09				05:46					04:53		04:53		
	16:51				05:45					20:40		21:36		
31	08:08				05:44					04:52		04:52		
	16:53				05:43					20:42		21:37		
Sonnenscheinstunden	248				367					421		496		
astr.max.mögl.Beschattung	304		243		36				6			135		513

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	Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 14 - IO 14 Bäderstraße 34 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

1. Juli	1. August	1. September	1. Oktober	1. November	1. Dezember
1 04:47	05:27	06:23	07:17	07:16	15:03 (WEA RW01) 08:12
2 04:50	05:29	06:24	07:19	07:18	16:04 (WEA RW01) 08:14
3 04:48	05:31	06:26	07:21	07:20	16:10 (WEA RW01) 15:58
4 04:49	05:32	06:28	07:22	07:22	16:05 (WEA RW01) 15:57
5 04:50	05:34	06:30	07:24	07:24	16:12 (WEA RW01) 15:58
6 04:51	05:36	06:32	07:26	07:26	16:18 (WEA RW01) 15:57
7 04:52	05:38	06:33	07:28	07:28	16:24 (WEA RW01) 15:56
8 04:53	05:39	06:35	07:30	07:30	16:30 (WEA RW01) 15:55
9 04:55	05:41	06:37	07:32	07:32	16:36 (WEA RW01) 15:54
10 04:56	05:43	06:39	07:34	07:34	16:42 (WEA RW01) 15:53
11 04:57	05:45	06:41	07:36	07:36	16:48 (WEA RW01) 15:52
12 04:57	05:47	06:43	07:38	07:38	16:54 (WEA RW01) 15:51
13 04:59	05:49	06:45	07:40	07:40	17:00 (WEA RW01) 15:50
14 05:00	05:51	06:47	07:42	07:42	17:06 (WEA RW01) 15:49
15 05:01	05:53	06:49	07:44	07:44	17:12 (WEA RW01) 15:48
16 05:03	05:55	06:51	07:46	07:46	17:18 (WEA RW01) 15:47
17 05:04	05:57	06:53	07:48	07:48	17:24 (WEA RW01) 15:46
18 05:05	05:59	06:55	07:50	07:50	17:30 (WEA RW01) 15:45
19 05:07	06:01	06:57	07:52	07:52	17:36 (WEA RW01) 15:44
20 05:08	06:03	06:59	07:54	07:54	17:42 (WEA RW01) 15:43
21 05:09	06:05	07:01	07:56	07:56	17:48 (WEA RW01) 15:42
22 05:11	06:07	07:03	07:58	07:58	17:54 (WEA RW01) 15:41
23 05:13	06:09	07:05	08:00	08:00	18:00 (WEA RW01) 15:40
24 05:14	06:11	07:07	08:02	08:02	18:06 (WEA RW01) 15:39
25 05:16	06:13	07:09	08:04	08:04	18:12 (WEA RW01) 15:38
26 05:17	06:15	07:11	08:06	08:06	18:18 (WEA RW01) 15:37
27 05:19	06:17	07:13	08:08	08:08	18:24 (WEA RW01) 15:36
28 05:21	06:19	07:15	08:10	08:10	18:30 (WEA RW01) 15:35
29 05:22	06:21	07:17	08:12	08:12	18:36 (WEA RW01) 15:34
30 05:24	06:23	07:19	08:14	08:14	18:42 (WEA RW01) 15:33
31 05:26	06:25	07:21	08:16	08:16	18:48 (WEA RW01) 15:32
1. Juli	06:27	07:23	08:18	08:18	18:54 (WEA RW01) 15:31
2. Juli	06:29	07:25	08:20	08:20	19:00 (WEA RW01) 15:30
3. Juli	06:31	07:27	08:22	08:22	19:06 (WEA RW01) 15:29
4. Juli	06:33	07:29	08:24	08:24	19:12 (WEA RW01) 15:28
5. Juli	06:35	07:31	08:26	08:26	19:18 (WEA RW01) 15:27
6. Juli	06:37	07:33	08:28	08:28	19:24 (WEA RW01) 15:26
7. Juli	06:39	07:35	08:30	08:30	19:30 (WEA RW01) 15:25
8. Juli	06:41	07:37	08:32	08:32	19:36 (WEA RW01) 15:24
9. Juli	06:43	07:39	08:34	08:34	19:42 (WEA RW01) 15:23
10. Juli	06:45	07:41	08:36	08:36	19:48 (WEA RW01) 15:22
11. Juli	06:47	07:43	08:38	08:38	19:54 (WEA RW01) 15:21
12. Juli	06:49	07:45	08:40	08:40	20:00 (WEA RW01) 15:20
13. Juli	06:51	07:47	08:42	08:42	20:06 (WEA RW01) 15:19
14. Juli	06:53	07:49	08:44	08:44	20:12 (WEA RW01) 15:18
15. Juli	06:55	07:51	08:46	08:46	20:18 (WEA RW01) 15:17
16. Juli	06:57	07:53	08:48	08:48	20:24 (WEA RW01) 15:16
17. Juli	06:59	07:55	08:50	08:50	20:30 (WEA RW01) 15:15
18. Juli	07:01	07:57	08:52	08:52	20:36 (WEA RW01) 15:14
19. Juli	07:03	07:59	08:54	08:54	20:42 (WEA RW01) 15:13
20. Juli	07:05	08:01	08:56	08:56	20:48 (WEA RW01) 15:12
21. Juli	07:07	08:03	08:58	08:58	20:54 (WEA RW01) 15:11
22. Juli	07:09	08:05	09:00	09:00	21:00 (WEA RW01) 15:10
23. Juli	07:11	08:07	09:02	09:02	21:06 (WEA RW01) 15:09
24. Juli	07:13	08:09	09:04	09:04	21:12 (WEA RW01) 15:08
25. Juli	07:15	08:11	09:06	09:06	21:18 (WEA RW01) 15:07
26. Juli	07:17	08:13	09:08	09:08	21:24 (WEA RW01) 15:06
27. Juli	07:19	08:15	09:10	09:10	21:30 (WEA RW01) 15:05
28. Juli	07:21	08:17	09:12	09:12	21:36 (WEA RW01) 15:04
29. Juli	07:23	08:19	09:14	09:14	21:42 (WEA RW01) 15:03
30. Juli	07:25	08:21	09:16	09:16	21:48 (WEA RW01) 15:02
31. Juli	07:27	08:23	09:18	09:18	21:54 (WEA RW01) 15:01
1. August	07:29	08:25	09:20	09:20	22:00 (WEA RW01) 15:00
2. August	07:31	08:27	09:22	09:22	22:06 (WEA RW01) 14:59
3. August	07:33	08:29	09:24	09:24	22:12 (WEA RW01) 14:58
4. August	07:35	08:31	09:26	09:26	22:18 (WEA RW01) 14:57
5. August	07:37	08:33	09:28	09:28	22:24 (WEA RW01) 14:56
6. August	07:39	08:35	09:30	09:30	22:30 (WEA RW01) 14:55
7. August	07:41	08:37	09:32	09:32	22:36 (WEA RW01) 14:54
8. August	07:43	08:39	09:34	09:34	22:42 (WEA RW01) 14:53
9. August	07:45	08:41	09:36	09:36	22:48 (WEA RW01) 14:52
10. August	07:47	08:43	09:38	09:38	22:54 (WEA RW01) 14:51
11. August	07:49	08:45	09:40	09:40	23:00 (WEA RW01) 14:50
12. August	07:51	08:47	09:42	09:42	23:06 (WEA RW01) 14:49
13. August	07:53	08:49	09:44	09:44	23:12 (WEA RW01) 14:48
14. August	07:55	08:51	09:46	09:46	23:18 (WEA RW01) 14:47
15. August	07:57	08:53	09:48	09:48	23:24 (WEA RW01) 14:46
16. August	07:59	08:55	09:50	09:50	23:30 (WEA RW01) 14:45
17. August	08:01	08:57	09:52	09:52	23:36 (WEA RW01) 14:44
18. August	08:03	08:59	09:54	09:54	23:42 (WEA RW01) 14:43
19. August	08:05	09:01	09:56	09:56	23:48 (WEA RW01) 14:42
20. August	08:07	09:03	09:58	09:58	23:54 (WEA RW01) 14:41
21. August	08:09	09:05	10:00	10:00	24:00 (WEA RW01) 14:40
22. August	08:11	09:07	10:02	10:02	24:06 (WEA RW01) 14:39
23. August	08:13	09:09	10:04	10:04	24:12 (WEA RW01) 14:38
24. August	08:15	09:11	10:06	10:06	24:18 (WEA RW01) 14:37
25. August	08:17	09:13	10:08	10:08	24:24 (WEA RW01) 14:36
26. August	08:19	09:15	10:10	10:10	24:30 (WEA RW01) 14:35
27. August	08:21	09:17	10:12	10:12	24:36 (WEA RW01) 14:34
28. August	08:23	09:19	10:14	10:14	24:42 (WEA RW01) 14:33
29. August	08:25	09:21	10:16	10:16	24:48 (WEA RW01) 14:32
30. August	08:27	09:23	10:18	10:18	24:54 (WEA RW01) 14:31
31. August	08:29	09:25	10:20	10:20	25:00 (WEA RW01) 14:30
1. September	08:31	09:27	10:22	10:22	25:06 (WEA RW01) 14:29
2. September	08:33	09:29	10:24	10:24	25:12 (WEA RW01) 14:28
3. September	08:35	09:31	10:26	10:26	25:18 (WEA RW01) 14:27
4. September	08:37	09:33	10:28	10:28	25:24 (WEA RW01) 14:26
5. September	08:39	09:35	10:30	10:30	25:30 (WEA RW01) 14:25
6. September	08:41	09:37	10:32	10:32	25:36 (WEA RW01) 14:24
7. September	08:43	09:39	10:34	10:34	25:42 (WEA RW01) 14:23
8. September	08:45	09:41	10:36	10:36	25:48 (WEA RW01) 14:22
9. September	08:47	09:43	10:38	10:38	25:54 (WEA RW01) 14:21
10. September	08:49	09:45	10:40	10:40	26:00 (WEA RW01) 14:20
11. September	08:51	09:47	10:42	10:42	26:06 (WEA RW01) 14:19
12. September	08:53	09:49	10:44	10:44	26:12 (WEA RW01) 14:18
13. September	08:55	09:51	10:46	10:46	26:18 (WEA RW01) 14:17
14. September	08:57	09:53	10:48	10:48	26:24 (WEA RW01) 14:16
15. September	08:59	09:55	10:50	10:50	26:30 (WEA RW01) 14:15
16. September	09:01	09:57	10:52	10:52	26:36 (WEA RW01) 14:14
17. September	09:03	09:59	10:54	10:54	26:42 (WEA RW01) 14:13
18. September	09:05	10:01	10:56	10:56	26:48 (WEA RW01) 14:12
19. September	09:07	10:03	10:58	10:58	26:54 (WEA RW01) 14:11
20. September	09:09	10:05	11:00	11:00	27:00 (WEA RW01) 14:10
21. September	09:11	10:07	11:02	11:02	27:06 (WEA RW01) 14:09
22. September	09:13	10:09	11:04	11:04	27:12 (WEA RW01) 14:08
23. September	09:15	10:11	11:06	11:06	27:18 (WEA RW01) 14:07
24. September	09:17	10:13	11:08	11:08	27:24 (WEA RW01) 14:06
25. September	09:19	10:15	11:10	11:10	27:30 (WEA RW01) 14:05
26. September	09:21	10:17	11:12	11:12	27:36 (WEA RW01) 14:04
27. September	09:23	10:19	11:14	11:14	27:42 (WEA RW01) 14:03
28. September	09:25	10:21	11:16	11:16	27:48 (WEA RW01) 14:02
29. September	09:27	10:23	11:18	11:18	27:54 (WEA RW01) 14:01
30. September	09:29	10:25	11:20	11:20	28:00 (WEA RW01) 14:00
1. Oktober	09:31	10:27	11:22	11:22	28:06 (WEA RW01) 13:59
2. Oktober	09:33	10:29	11:24	11:24	28:12 (WEA RW01) 13:58
3. Oktober	09:35	10:31	11:26	11:26	28:18 (WEA RW01) 13:57
4. Oktober	09:37	10:33	11:28	11:28	28:24 (WEA RW01) 13:56
5. Oktober	09:39	10:35	11:30	11:30	28:30 (WEA RW01) 13:55
6. Oktober	09:41	10:37	11:32	11:32	28:36 (WEA RW01) 13:54
7. Oktober	09:43	10:39	11:34	11:34	28:42 (WEA RW01) 13:53
8. Oktober	09:45	10:41	11:36	11:36	28:48 (WEA RW01) 13:52
9. Oktober	09:47	10:43	11:38	11:38	28:54 (WEA RW01) 13:51
10. Oktober	09:49	10:45	11:40	11:40	29:00 (WEA RW01) 13:50
11. Oktober	09:51	10:47	11:42	11:42	29:06 (WEA RW01) 13:49
12. Oktober	09:53	10:49	11:44	11:44	29:12 (WEA RW01) 13:48
13. Oktober	09:55	10:51	11:46	11:46	

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 15 - IO 15 Poggenpohler Weg 2 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni				
1	08:37	14:40 (WEA_G2)	08:06		10:08		10:52		10:51		10:53 (WEA_K04)			
1	16:03	17	14:57 (WEA_G2)	16:55		17:52		19:51		20:47	10	21:03 (WEA_K04)		
2	08:37		14:41 (WEA_G2)	08:04		10:05		10:49		10:59		10:50	20:53 (WEA_K04)	
3	08:37	16	14:57 (WEA_G2)	16:57		17:54		19:53		20:49		21:40	11	21:04 (WEA_K04)
4	08:37		14:41 (WEA_G2)	08:03		10:03		10:47		10:57		10:49		20:54 (WEA_K04)
5	16:05	15	14:56 (WEA_G2)	16:59		17:56		19:55		20:51		21:41	12	21:06 (WEA_K04)
6	08:36		14:43 (WEA_G2)	08:01		10:01		10:44		10:54		10:46		20:54 (WEA_K04)
7	16:06	14	14:57 (WEA_G2)	17:01		17:58		19:57		20:53		21:42	13	21:07 (WEA_K04)
8	08:36		14:44 (WEA_G2)	07:59		10:58		10:42		10:53		10:47		20:54 (WEA_K04)
9	16:08	12	14:56 (WEA_G2)	17:03		18:00		19:59		20:55		21:43	13	21:07 (WEA_K04)
10	08:36		14:45 (WEA_G2)	07:57		10:56		10:39		10:51		10:47		20:56 (WEA_K04)
11	16:09	10	14:55 (WEA_G2)	17:05		18:02		20:01		20:57		21:44	12	21:08 (WEA_K04)
12	08:35		14:48 (WEA_G2)	07:55		10:53		10:37		10:49		10:46		20:56 (WEA_K04)
13	16:10	6	14:56 (WEA_G2)	17:07		18:03		20:02		20:58		21:45	11	21:07 (WEA_K04)
14	08:35		14:38 (WEA_G2)	07:53		10:51		10:34		10:46		10:45		20:57 (WEA_K04)
15	16:12	4	15:25 (WEA_G2)	17:09		18:05		20:04		20:59		21:46	11	21:08 (WEA_K04)
16	08:34		15:26 (WEA_G2)	17:09		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
17	16:13	2	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
18	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
19	16:14	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
20	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
21	16:15	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
22	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
23	16:16	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
24	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
25	16:17	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
26	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
27	16:18	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
28	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
29	16:19	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
30	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
31	16:20	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
1	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
2	16:21	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
3	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
4	16:22	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
5	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
6	16:23	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
7	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
8	16:24	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
9	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
10	16:25	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
11	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
12	16:26	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
13	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
14	16:27	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
15	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
16	16:28	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
17	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
18	16:29	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
19	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
20	16:30	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
21	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
22	16:31	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
23	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
24	16:32	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
25	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
26	16:33	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
27	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
28	16:34	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
29	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
30	16:35	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
31	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
1	16:36	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
2	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
3	16:37	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
4	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
5	16:38	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
6	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
7	16:39	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
8	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
9	16:40	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
10	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
11	16:41	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
12	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
13	16:42	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
14	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
15	16:43	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
16	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
17	16:44	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
18	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
19	16:45	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
20	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
21	16:46	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
22	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
23	16:47	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
24	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
25	16:48	1	15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K04)
26	08:33		15:26 (WEA_G2)	17:11		18:07		20:06		20:59		21:47	10	21:07 (WEA_K0





Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 15 - IO 15 Poggenpohler Weg 2 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Jul	August	September	Oktober	November	Dezember
1   04:47	21:02 (WEA K04)   05:27	20:37 (WEA 42 (RW))   06:23	07:17	18:20 (WEA 03 (GRN))   07:16	16:06 (WEA RW01)   08:12
21:54	21:10 (WEA K04)   21:17	8   20:45 (WEA 42 (RW))   20:10	18:55	7   18:27 (WEA 03 (GRN))   16:44	6   16:12 (WEA RW01)   15:58
2   04:47	21:02 (WEA K04)   05:29	20:37 (WEA 42 (RW))   06:24	07:19	18:18 (WEA 03 (GRN))   07:18	16:07 (WEA RW01)   08:14
21:53	21:11 (WEA K04)   21:18	7   20:44 (WEA 42 (RW))   20:07	18:53	5   18:23 (WEA 03 (GRN))   16:42	3   16:10 (WEA RW01)   15:58
3   04:48	21:02 (WEA K04)   05:31	20:36 (WEA 42 (RW))   06:26	07:21	18:18 (WEA 03 (GRN))   07:20	16:07 (WEA RW01)   08:15
21:53	21:12 (WEA K04)   21:14	6   20:42 (WEA 42 (RW))   20:05	18:50	3   18:21 (WEA 03 (GRN))   16:40	1   15:57
4   04:49	21:02 (WEA K04)   05:32	20:36 (WEA 42 (RW))   06:28	07:22	18:18 (WEA 03 (GRN))   07:22	16:07 (WEA RW01)   08:17
21:52	21:13 (WEA K04)   21:12	4   20:40 (WEA 42 (RW))   20:03	18:48	1   18:19 (WEA 03 (GRN))   16:38	1   15:56
5   04:50	21:02 (WEA K04)   05:34	20:36 (WEA 42 (RW))   06:30	07:24	18:18 (WEA 03 (GRN))   07:24	16:07 (WEA RW01)   08:18
21:52	21:14 (WEA K04)   21:10	3   20:39 (WEA 42 (RW))   20:00	18:45	16:36	15:56
6   04:51	21:01 (WEA K04)   05:36	20:35 (WEA 42 (RW))   06:32	07:26	16:36	15:56
21:51	21:13 (WEA K04)   21:08	1   20:36 (WEA 42 (RW))   19:58	1   19:27 (WEA 43 (RW))   07:26	16:34	15:55
7   04:52	21:01 (WEA K04)   05:38	19:58	1   19:28 (WEA 43 (RW))   07:28	16:32	15:54
21:50	21:14 (WEA K04)   21:06	19:55	3   19:27 (WEA 43 (RW))   07:30	16:32	15:54
8   04:53	21:01 (WEA K04)   05:39	19:55	3   19:21 (WEA 43 (RW))   07:30	16:30	15:52
21:50	21:14 (WEA K04)   21:04	19:53	3   19:24 (WEA 43 (RW))   07:30	16:30	15:54
9   04:54	21:01 (WEA K04)   05:41	19:52	15:51 (WEA 43 (RW))   07:32	16:28	15:54
21:49	21:15 (WEA K04)   21:00	19:50	15:52 (WEA 43 (RW))   07:34	16:26	15:52
10   04:55	21:01 (WEA K04)   05:43	19:49	07:34	16:26	15:52
21:48	21:12 (WEA K04)   21:00	19:48	16:24	16:24	15:50
11   04:55	21:01 (WEA K04)   05:45	19:48	16:24	16:22	15:48
21:47	21:13 (WEA K04)   20:58	19:47	16:22	16:20	15:47
12   04:57	21:01 (WEA K04)   05:47	19:46	16:22	16:18	15:46
21:46	21:14 (WEA K04)   20:56	19:45	16:20	16:16	15:45
13   04:59	21:01 (WEA K04)   05:48	19:44	16:18	16:14	15:44
21:45	21:15 (WEA K04)   20:54	19:43	16:16	16:12	15:43
14   04:59	21:01 (WEA K04)   05:50	19:42	16:14	16:08	15:42
21:44	21:15 (WEA K04)   20:52	19:41	16:12	16:04	15:41
15   04:59	21:01 (WEA K04)   05:52	19:40	16:10	16:00	15:40
21:43	21:16 (WEA K04)   20:50	19:39	16:08	15:58	15:39
16   04:59	21:01 (WEA K04)   05:54	19:38	16:06	15:56	15:38
21:42	21:17 (WEA K04)   20:48	19:37	16:04	15:54	15:37
17   04:59	21:01 (WEA K04)   05:56	19:36	16:02	15:52	15:36
21:41	21:18 (WEA K04)   20:46	19:35	16:00	15:50	15:35
18   04:59	21:01 (WEA K04)   05:58	19:34	15:58	15:48	15:34
21:40	21:19 (WEA K04)   20:44	19:33	15:56	15:46	15:33
19   04:59	21:01 (WEA K04)   05:59	19:32	15:54	15:44	15:32
21:39	21:20 (WEA K04)   20:42	19:31	15:52	15:42	15:31
20   04:59	21:01 (WEA K04)   06:00	19:30	15:50	15:40	15:30
21:38	21:21 (WEA K04)   20:40	19:29	15:48	15:38	15:29
21   04:59	21:01 (WEA K04)   06:01	19:28	15:46	15:36	15:28
21:37	21:22 (WEA K04)   20:38	19:27	15:44	15:34	15:27
22   04:59	21:01 (WEA K04)   06:02	19:27	15:42	15:32	15:26
21:36	21:23 (WEA K04)   20:36	19:26	15:40	15:30	15:25
23   04:59	21:01 (WEA K04)   06:03	19:26	15:38	15:28	15:24
21:35	21:24 (WEA K04)   20:34	19:25	15:36	15:26	15:23
24   04:59	21:01 (WEA K04)   06:04	19:25	15:36	15:24	15:22
21:34	21:25 (WEA K04)   20:32	19:24	15:34	15:22	15:21
25   04:59	21:01 (WEA K04)   06:05	19:24	15:32	15:20	15:20
21:33	21:26 (WEA K04)   20:30	19:23	15:30	15:18	15:19
26   04:59	21:01 (WEA K04)   06:06	19:23	15:28	15:16	15:18
21:32	21:27 (WEA K04)   20:28	19:22	15:26	15:14	15:17
27   04:59	21:01 (WEA K04)   06:07	19:22	15:26	15:12	15:16
21:31	21:28 (WEA K04)   20:26	19:21	15:24	15:10	15:15
28   04:59	21:01 (WEA K04)   06:08	19:21	15:24	15:08	15:14
21:30	21:29 (WEA K04)   20:24	19:20	15:22	15:06	15:13
29   04:59	21:01 (WEA K04)   06:09	19:20	15:20	15:04	15:12
21:29	21:30 (WEA K04)   20:22	19:19	15:18	15:02	15:11
30   04:59	21:01 (WEA K04)   06:10	19:19	15:16	15:00	15:10
21:28	21:31 (WEA K04)   20:20	19:18	15:14	14:58	15:09
31   04:59	21:01 (WEA K04)   06:11	19:18	15:12	14:56	15:08
21:27	21:32 (WEA K04)   20:18	19:17	15:10	14:54	15:07
1   04:59	21:01 (WEA K04)   06:12	19:17	15:08	14:52	15:06
21:26	21:33 (WEA K04)   20:16	19:16	15:06	14:50	15:05
2   04:59	21:01 (WEA K04)   06:13	19:16	15:04	14:48	15:04
21:25	21:34 (WEA K04)   20:14	19:15	15:02	14:46	15:03
3   04:59	21:01 (WEA K04)   06:14	19:15	15:00	14:44	15:02
21:24	21:35 (WEA K04)   20:12	19:14	14:58	14:42	15:01
4   04:59	21:01 (WEA K04)   06:15	19:14	14:56	14:40	15:00
21:23	21:36 (WEA K04)   20:10	19:13	14:54	14:38	14:59
5   04:59	21:01 (WEA K04)   06:16	19:13	14:52	14:36	14:58
21:22	21:37 (WEA K04)   20:08	19:12	14:50	14:34	14:57
6   04:59	21:01 (WEA K04)   06:17	19:12	14:48	14:32	14:56
21:21	21:38 (WEA K04)   20:06	19:11	14:46	14:30	14:55
7   04:59	21:01 (WEA K04)   06:18	19:11	14:44	14:28	14:54
21:20	21:39 (WEA K04)   20:04	19:10	14:42	14:26	14:53
8   04:59	21:01 (WEA K04)   06:19	19:10	14:40	14:24	14:52
21:19	21:40 (WEA K04)   20:02	19:09	14:38	14:22	14:51
9   04:59	21:01 (WEA K04)   06:20	19:09	14:36	14:20	14:50
21:18	21:41 (WEA K04)   20:00	19:08	14:34	14:18	14:49
10   04:59	21:01 (WEA K04)   06:21	19:08	14:32	14:16	14:48
21:17	21:42 (WEA K04)   19:58	19:07	14:30	14:14	14:47
11   04:59	21:01 (WEA K04)   06:22	19:07	14:28	14:12	14:46
21:16	21:43 (WEA K04)   19:56	19:06	14:26	14:10	14:45
12   04:59	21:01 (WEA K04)   06:23	19:06	14:26	14:08	14:44
21:15	21:44 (WEA K04)   19:54	19:05	14:24	14:06	14:43
13   04:59	21:01 (WEA K04)   06:24	19:05	14:24	14:04	14:42
21:14	21:45 (WEA K04)   19:52	19:04	14:22	14:02	14:41
14   04:59	21:01 (WEA K04)   06:25	19:04	14:20	14:00	14:40
21:13	21:46 (WEA K04)   19:50	19:03	14:18	13:58	14:39
15   04:59	21:01 (WEA K04)   06:26	19:03	14:16	13:56	14:38
21:12	21:47 (WEA K04)   19:48	19:02	14:14	13:54	14:37
16   04:59	21:01 (WEA K04)   06:27	19:02	14:12	13:52	14:36
21:11	21:48 (WEA K04)   19:46	19:01	14:10	13:50	14:35
17   04:59	21:01 (WEA K04)   06:28	19:01	14:08	13:48	14:34
21:10	21:49 (WEA K04)   19:44	19:00	14:06	13:46	14:33
18   04:59	21:01 (WEA K04)   06:29	18:59	14:04	13:44	14:32
21:09	21:50 (WEA K04)   19:42	18:59	14:02	13:42	14:31
19   04:59	21:01 (WEA K04)   06:30	18:58	14:00	13:40	14:30
21:08	21:51 (WEA K04)   19:40	18:58	13:98	13:38	14:29
20   04:59	21:01 (WEA K04)   06:31	18:57	13:96	13:36	14:28
21:07	21:52 (WEA K04)   19:38	18:57	13:94	13:34	14:27
21   04:59	21:01 (WEA K04)   06:32	18:56	13:92	13:32	14:26
21:06	21:53 (WEA K04)   19:36	18:56	13:90	13:30	14:25
22   04:59	21:01 (WEA K04)   06:33	18:55	13:88	13:28	14:24
21:05	21:54 (WEA K04)   19:34	18:55	13:86	13:26	14:23
23   04:59	21:01 (WEA K04)   06:34	18:54	13:84	13:24	14:22
21:04	21:55 (WEA K04)   19:32	18:54	13:82	13:22	14:21
24   04:59	21:01 (WEA K04)   06:35	18:53	13:80	13:20	14:20
21:03	21:56 (WEA K04)   19:30	18:53	13:78	13:18	14:19
25   04:59	21:01 (WEA K04)   06:36	18:52	13:76	13:16	14:18
21:02	21:57 (WEA K04)   19:28	18:52	13:74	13:14	14:17
26   04:59	21:01 (WEA K04)   06:37	18:51	13:72	13:12	14:16
21:01	21:58 (WEA K04)   19:26	18:51	13:70	13:10	14:15
27   04:59	21:01 (WEA K04)   06:38	18:50	13:68	13:08	14:14
21:00	21:59 (WEA K04)   19:24	18:50	13:66	13:06	14:13
28   04:59	21:01 (WEA K04)   06:39	18:49	13:64	13:04	14:12
20:59	22:00 (WEA K04)   19:22	18:49	13:62	13:02	14:11
29   04:59	21:01 (WEA K04)   06:40	18:48	13:60	13:00	14:10
20:58	22:01 (WEA K04)   19:20	18:48	13:58	12:58	14:09
30   04:59	21:01 (WEA K04)   06:41	18:47	13:56	12:56	14:08
20:57	22:02 (WEA K04)   19:18	18:47	13:54	12:54	14:07
31   04:59	21:01 (WEA K04)   06:42	18:46	13:52	12:52	14:06

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 16 - IO 16 Poggenpohler Weg 8 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar	Februar	März	April	Mai	Juni
1 08:37	14:41 (WEA_G2) 08:06	10:09	16:52 (WEA_RWE01) 06:52	05:41	04:51 21:00 (WEA_K04)
16:03	15:04 (WEA_G2) 16:55	17:52	16:54 (WEA_RWE01) 19:51	20:47	21:38 3 21:03 (WEA_K04)
2 08:37	14:42 (WEA_G2) 08:04	07:05	06:49	05:39	04:50 21:00 (WEA_K04)
16:04	15:04 (WEA_G2) 16:57	17:54	19:53	20:49	21:40 4 21:04 (WEA_K04)
3 08:37	14:42 (WEA_G2) 08:03	07:03	06:47	05:37	04:49 21:01 (WEA_K04)
16:05	15:04 (WEA_G2) 16:59	17:56	19:55	20:51	21:43 5 21:06 (WEA_K04)
4 08:36	14:43 (WEA_G2) 08:01	07:01	06:44	05:35	04:48 21:01 (WEA_K04)
16:06	15:04 (WEA_G2) 17:01	17:58	19:57	20:53	21:42 6 21:07 (WEA_K04)
5 08:36	14:44 (WEA_G2) 07:59	06:58	06:42	05:33	04:47 21:00 (WEA_K04)
16:08	15:04 (WEA_G2) 17:03	18:00	19:59	20:55	21:45 7 21:07 (WEA_K04)
6 08:36	14:44 (WEA_G2) 07:57	06:56	06:39	05:31	04:47 21:01 (WEA_K04)
16:09	15:03 (WEA_G2) 17:05	18:02	20:01	20:57	21:44 8 21:09 (WEA_K04)
7 08:35	14:46 (WEA_G2) 07:55	06:53	06:37	05:29	04:46 21:01 (WEA_K04)
16:10	15:04 (WEA_G2) 17:07	18:03	20:02	1 19:36 (WEA_43 (RW)) 20:59	21:45 8 21:09 (WEA_K04)
8 08:35	14:47 (WEA_G2) 07:53	06:51	06:34	1 19:34 (WEA_43 (RW)) 20:57	04:45 21:02 (WEA_K04)
16:12	15:03 (WEA_G2) 17:09	18:05	20:04	2 18:26 (WEA_42 (RW)) 21:40	21:46 9 21:13 (WEA_K04)
9 08:34	14:48 (WEA_G2) 07:51	06:49	16:37	2 18:17 (WEA_41 (RW)) 20:55	04:44 21:02 (WEA_K04)
16:13	15:03 (WEA_G2) 17:11	18:07	20:06	4 18:29 (WEA_42 (RW)) 21:41	21:47 9 21:13 (WEA_K04)
10 08:33	14:49 (WEA_G2) 07:49	06:46	16:30	4 18:20	04:44 21:02 (WEA_K04)
16:15	15:02 (WEA_G2) 17:13	18:09	20:08	5 20:25	21:48 10 21:17 (WEA_K04)
11 08:33	14:51 (WEA_G2) 07:47	06:44	17:44 (WEA_05 (GRN)) 16:27	5 20:22	04:44 21:02 (WEA_K04)
16:16	15:00 (WEA_G2) 17:15	18:11	1 17:45 (WEA_05 (GRN)) 20:10	6 20:05	21:49 10 21:12 (WEA_K04)
12 08:32	14:53 (WEA_G2) 07:45	1 16:16 (WEA_RWE01) 05:11	1 17:46 (WEA_05 (GRN)) 16:25	6 20:02	04:43 21:02 (WEA_K04)
16:18	15:11 (WEA_G2) 17:17	18:13	1 17:47 (WEA_05 (GRN)) 20:12	7 20:07	21:50 11 21:13 (WEA_K04)
13 08:31	14:54 (WEA_G2) 07:43	1 16:22	1 18:40	7 20:03	04:43 21:02 (WEA_K04)
16:20	15:13 (WEA_G2) 17:19	18:15	2 17:40 (WEA_05 (GRN)) 16:16	8 20:00	21:51 11 21:14 (WEA_K04)
14 08:30	14:56 (WEA_G2) 07:41	1 16:26	2 17:40 (WEA_05 (GRN)) 16:20	8 20:00	04:43 21:02 (WEA_K04)
16:21	15:13 (WEA_G2) 17:21	18:17	2 17:40 (WEA_05 (GRN)) 16:16	9 20:00	21:51 11 21:14 (WEA_K04)
15 08:29	14:58 (WEA_G2) 07:39	1 16:30	3 17:40 (WEA_05 (GRN)) 16:10	9 20:00	04:42 21:02 (WEA_K04)
16:23	15:14 (WEA_G2) 17:23	18:19	4 17:40 (WEA_05 (GRN)) 16:10	10 20:00	21:52 11 21:15 (WEA_K04)
16 08:28	14:59 (WEA_G2) 07:37	1 16:34	4 17:40 (WEA_05 (GRN)) 16:15	10 20:00	04:42 21:02 (WEA_K04)
16:25	15:14 (WEA_G2) 17:25	18:20	5 17:40 (WEA_05 (GRN)) 16:10	11 20:00	21:53 11 21:16 (WEA_K04)
17 08:27	14:59 (WEA_G2) 07:35	1 16:38	5 17:40 (WEA_05 (GRN)) 16:13	11 20:00	04:42 21:02 (WEA_K04)
16:26	15:15 (WEA_G2) 17:26	18:21	6 17:40 (WEA_05 (GRN)) 16:10	12 20:00	21:54 11 21:17 (WEA_K04)
18 08:26	14:59 (WEA_G2) 07:33	1 16:42	6 17:40 (WEA_05 (GRN)) 16:10	12 20:00	04:42 21:02 (WEA_K04)
16:28	15:15 (WEA_G2) 17:28	18:23	7 17:40 (WEA_05 (GRN)) 16:10	13 20:00	21:55 11 21:18 (WEA_K04)
19 08:25	14:59 (WEA_G2) 07:31	1 16:46	7 17:40 (WEA_05 (GRN)) 16:05	13 20:00	04:42 21:02 (WEA_K04)
16:30	15:15 (WEA_G2) 17:30	18:24	7 17:40 (WEA_05 (GRN)) 16:05	14 20:00	21:56 11 21:19 (WEA_K04)
20 08:24	14:59 (WEA_G2) 07:29	1 16:50	8 17:40 (WEA_05 (GRN)) 16:05	14 20:00	04:42 21:02 (WEA_K04)
16:32	15:16 (WEA_G2) 17:31	18:25	8 17:40 (WEA_05 (GRN)) 16:05	15 20:00	21:57 11 21:20 (WEA_K04)
21 08:23	14:59 (WEA_G2) 07:27	1 16:54	8 17:40 (WEA_05 (GRN)) 16:05	15 20:00	04:42 21:02 (WEA_K04)
16:34	15:16 (WEA_G2) 17:33	18:26	9 17:40 (WEA_05 (GRN)) 16:05	16 20:00	21:58 11 21:21 (WEA_K04)
22 08:22	14:59 (WEA_G2) 07:25	1 16:58	9 17:40 (WEA_05 (GRN)) 16:05	16 20:00	04:42 21:02 (WEA_K04)
16:36	15:17 (WEA_G2) 17:34	18:27	10 17:40 (WEA_05 (GRN)) 16:05	17 20:00	21:59 11 21:22 (WEA_K04)
23 08:21	14:59 (WEA_G2) 07:23	1 17:02	10 17:40 (WEA_05 (GRN)) 16:05	17 20:00	04:42 21:02 (WEA_K04)
16:38	15:17 (WEA_G2) 17:35	18:28	11 17:40 (WEA_05 (GRN)) 16:05	18 20:00	22:00 11 21:23 (WEA_K04)
24 08:20	14:59 (WEA_G2) 07:21	1 17:06	11 17:40 (WEA_05 (GRN)) 16:05	18 20:00	04:42 21:02 (WEA_K04)
16:40	15:18 (WEA_G2) 17:36	18:29	12 17:40 (WEA_05 (GRN)) 16:05	19 20:00	22:01 11 21:24 (WEA_K04)
25 08:19	14:59 (WEA_G2) 07:19	1 17:10	12 17:40 (WEA_05 (GRN)) 16:05	19 20:00	04:42 21:02 (WEA_K04)
16:42	15:18 (WEA_G2) 17:37	18:30	13 17:40 (WEA_05 (GRN)) 16:05	20 20:00	22:02 11 21:25 (WEA_K04)
26 08:18	14:59 (WEA_G2) 07:17	1 17:14	13 17:40 (WEA_05 (GRN)) 16:05	20 20:00	04:42 21:02 (WEA_K04)
16:44	15:19 (WEA_G2) 17:38	18:31	14 17:40 (WEA_05 (GRN)) 16:05	21 20:00	22:03 11 21:26 (WEA_K04)
27 08:17	14:59 (WEA_G2) 07:15	1 17:18	14 17:40 (WEA_05 (GRN)) 16:05	21 20:00	04:42 21:02 (WEA_K04)
16:46	15:19 (WEA_G2) 17:39	18:32	15 17:40 (WEA_05 (GRN)) 16:05	22 20:00	22:04 11 21:27 (WEA_K04)
28 08:16	14:59 (WEA_G2) 07:13	1 17:22	15 17:40 (WEA_05 (GRN)) 16:05	22 20:00	04:42 21:02 (WEA_K04)
16:48	15:20 (WEA_G2) 17:40	18:33	16 17:40 (WEA_05 (GRN)) 16:05	23 20:00	22:05 11 21:28 (WEA_K04)
29 08:15	14:59 (WEA_G2) 07:11	1 17:26	16 17:40 (WEA_05 (GRN)) 16:05	23 20:00	04:42 21:02 (WEA_K04)
16:50	15:20 (WEA_G2) 17:41	18:34	17 17:40 (WEA_05 (GRN)) 16:05	24 20:00	22:06 11 21:29 (WEA_K04)
30 08:14	14:59 (WEA_G2) 07:09	1 17:30	17 17:40 (WEA_05 (GRN)) 16:05	24 20:00	04:42 21:02 (WEA_K04)
16:52	15:21 (WEA_G2) 17:42	18:35	18 17:40 (WEA_05 (GRN)) 16:05	25 20:00	22:07 11 21:30 (WEA_K04)
31 08:13	14:59 (WEA_G2) 07:07	1 17:34	18 17:40 (WEA_05 (GRN)) 16:05	25 20:00	04:42 21:02 (WEA_K04)
16:54	15:21 (WEA_G2) 17:43	18:36	19 17:40 (WEA_05 (GRN)) 16:05	26 20:00	22:08 11 21:31 (WEA_K04)
Sonneneinstrahlung	248	273	307	351	395
sch. (maximale) Beschattung	473	507	56	7	13

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 16 - IO 16 Poggenpohler Weg 8 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember					
1	04:47	21:06 (WEA K04)	05:27	06:23		07:17	18:26 (WEA 05 (GRN))	07:16		08:12	14:34 (WEA_G2)				
	21:54	21:17 (WEA K04)	21:17	20:10		18:55	18:27 (WEA 05 (GRN))	16:44		15:58	14:42 (WEA_G2)				
2	04:47	21:07 (WEA K04)	05:29	06:24		07:19		07:18		08:14	14:33 (WEA_G2)				
	21:53	21:17 (WEA K04)	21:16	20:07		18:53		16:42		15:58	14:45 (WEA_G2)				
3	04:48	21:07 (WEA K04)	05:31	06:26		07:21		07:20		08:15	14:32 (WEA_G2)				
	21:53	21:17 (WEA K04)	21:14	20:05	4	19:37 (WEA 43 (RW))		16:40		15:57	14:47 (WEA_G2)				
4	04:49	21:07 (WEA K04)	05:32	06:28		07:22		07:22		08:17	14:31 (WEA_G2)				
	21:52	21:16 (WEA K04)	21:12	20:03	3	19:35 (WEA 43 (RW))		16:38		15:56	14:47 (WEA_G2)				
5	04:50	21:07 (WEA K04)	05:34	06:30		07:24		07:24		08:18	14:31 (WEA_G2)				
	21:52	21:16 (WEA K04)	21:10	20:00	1	19:31 (WEA 43 (RW))		16:36		15:56	14:49 (WEA_G2)				
6	04:51	21:07 (WEA K04)	05:36	06:32		07:26		07:26		08:19	14:30 (WEA_G2)				
	21:51	21:15 (WEA K04)	21:08	19:58		18:43		16:34		15:55	14:49 (WEA_G2)				
7	04:52	21:07 (WEA K04)	05:38	06:33		07:28		07:28		08:21	14:31 (WEA_G2)				
	21:50	21:14 (WEA K04)	21:06	19:55		18:46		16:32		15:54	14:51 (WEA_G2)				
8	04:53	21:07 (WEA K04)	05:39	06:35		07:30		07:30		08:22	14:30 (WEA_G2)				
	21:50	21:14 (WEA K04)	21:04	19:53		18:48		16:30		15:54	14:51 (WEA_G2)				
9	04:54	21:07 (WEA K04)	05:41	06:37		07:32		07:32		08:23	14:31 (WEA_G2)				
	21:49	21:13 (WEA K04)	21:02	19:50		18:46		16:28		15:54	14:51 (WEA_G2)				
10	04:55	21:07 (WEA K04)	05:43	06:39		07:34		07:34		08:25	14:31 (WEA_G2)				
	21:48	21:12 (WEA K04)	21:00	19:48		18:42		16:26		15:53	14:51 (WEA_G2)				
11	04:56	21:08 (WEA K04)	05:45	06:41		07:36		07:36	15:22 (WEA_G1)	08:26	14:31 (WEA_G2)				
	21:47	21:11 (WEA K04)	20:58	19:45		18:42		16:25	9	15:53	14:51 (WEA_G2)				
12	04:57	21:09 (WEA K04)	05:47	06:42		07:37		07:38	15:20 (WEA_G1)	08:27	14:31 (WEA_G2)				
	21:46	21:11 (WEA K04)	20:56	19:43		18:28		16:23	13	15:53	14:51 (WEA_G2)				
13	04:59	21:09 (WEA K04)	05:48	06:44		07:39		07:40	15:19 (WEA_G1)	08:28	14:31 (WEA_G2)				
	21:45	21:10 (WEA K04)	20:56	19:46		18:26	9	16:21	16	15:53 (WEA_G1)	14:51 (WEA_G2)				
14	05:00	21:10 (WEA K04)	05:50	06:46		07:41		07:42	15:18 (WEA_G1)	08:29	14:31 (WEA_G2)				
	21:44	20:51	19:38		18:24	15	17:54 (WEA RWED1)	15:20	18	15:36 (WEA_G1)	14:53	14:55 (WEA_G2)			
15	05:01	20:52	06:48		07:43		17:57 (WEA RWED1)	07:44		08:30	14:31 (WEA_G2)				
	21:43	20:49	19:35		18:21	19	17:58 (WEA RWED1)	15:18	20	15:37 (WEA_G1)	14:53	14:55 (WEA_G2)			
16	05:03	20:54	06:50		07:45		17:59 (WEA RWED1)	07:45		08:31	14:32 (WEA_G2)				
	21:42	20:47	19:33		18:18	22	17:57 (WEA RWED1)	15:16	21	15:37 (WEA_G1)	14:53	14:55 (WEA_G2)			
17	05:04	20:56	06:51		07:47		17:54 (WEA RWED1)	07:47		08:32	14:32 (WEA_G2)				
	21:41	20:45	19:30	3	19:06 (WEA 02 (GRN))	18:17	24	17:59 (WEA RWED1)	15:15	22	15:38 (WEA_G1)	14:53	14:57 (WEA_G2)		
18	05:05	20:55	06:53		07:48		17:53 (WEA RWED1)	07:48		08:32	14:33 (WEA_G2)				
	21:39	20:43	19:28	4	19:28 (WEA 02 (GRN))	18:14	25	17:59 (WEA RWED1)	15:13	22	15:38 (WEA_G1)	14:53	14:59 (WEA_G2)		
19	05:07	20:59	06:55		07:51		17:52 (WEA RWED1)	07:51		08:33	14:34 (WEA_G2)				
	21:38	20:40	19:25	4	19:57 (WEA 02 (GRN))	18:12	26	17:59 (WEA RWED1)	15:12	21	15:37 (WEA_G1)	14:53	14:59 (WEA_G2)		
20	05:09	20:57	06:57		07:53		17:51 (WEA RWED1)	07:53		08:34	14:33 (WEA_G2)				
	21:37	20:38	19:23	2	19:56 (WEA 02 (GRN))	18:10	28	17:59 (WEA RWED1)	15:11	19	15:35 (WEA_G1)	14:54	14:59 (WEA_G2)		
21	05:10	20:58	06:59		07:55		17:51 (WEA RWED1)	07:55		08:34	14:34 (WEA_G2)				
	21:35	20:36	19:20		18:07	26	17:57 (WEA RWED1)	15:09	18	15:35 (WEA_G1)	14:54	14:59 (WEA_G2)			
22	05:11	20:58	07:00		07:56		17:51 (WEA RWED1)	07:57		08:35	14:34 (WEA_G2)				
	21:34	20:34	19:18		18:03	24	17:59 (WEA RWED1)	15:08	16	15:35 (WEA_G1)	14:55	14:59 (WEA_G2)			
23	05:13	20:56	07:02		07:58		17:51 (WEA RWED1)	07:58		08:36	14:35 (WEA_G2)				
	21:32	20:31	19:15		18:03	21	17:52 (WEA RWED1)	15:07	14	15:32 (WEA_G1)	14:55	14:59 (WEA_G2)			
24	05:14	20:59 (WEA 2 (RW))	07:04		07:59		17:51 (WEA RWED1)	08:00		08:36	14:36 (WEA_G2)				
	21:31	20:53 (WEA 2 (RW))	20:29	19:13	6	18:40 (WEA 03 (GRN))	18:01	19	17:50 (WEA RWED1)	15:05	13	15:30 (WEA_G1)	14:56	14:59 (WEA_G2)	
25	05:16	20:48 (WEA 2 (RW))	07:06		08:01		18:31 (WEA 03 (GRN))	07:02		08:37	14:35 (WEA_G2)				
	21:29	20:55 (WEA 2 (RW))	20:27	19:10	10	18:41 (WEA 03 (GRN))	18:08	17	18:29 (WEA RWED1)	15:04	10	15:28 (WEA_G1)	14:56	14:59 (WEA_G2)	
26	05:17	20:47 (WEA 2 (RW))	07:08		08:04		18:30 (WEA 03 (GRN))	07:04		08:37	14:35 (WEA_G2)				
	21:28	20:55 (WEA 2 (RW))	20:24	19:08	9	18:38 (WEA 03 (GRN))	18:06	14	18:21 (WEA RWED1)	15:04	9	15:27 (WEA_G1)	14:57	14:59 (WEA_G2)	
27	05:19	20:47 (WEA 2 (RW))	07:10		08:06		18:28 (WEA 03 (GRN))	07:06		08:37	14:35 (WEA_G2)				
	21:26	20:54 (WEA 2 (RW))	20:22	19:05	7	18:36 (WEA 03 (GRN))	18:04	11	18:11 (WEA RWED1)	15:02	7	15:26 (WEA_G1)	14:58	14:59 (WEA_G2)	
28	05:21	20:46 (WEA 2 (RW))	07:11		08:08		18:25 (WEA 03 (GRN))	07:08		08:37	14:35 (WEA_G2)				
	21:24	20:52 (WEA 2 (RW))	20:19	19:03	5	18:34 (WEA 03 (GRN))	18:02	8	18:20 (WEA RWED1)	15:01	5	15:25 (WEA_G1)	14:59	14:59 (WEA_G2)	
29	05:22	20:46 (WEA 2 (RW))	07:13		08:10		18:28 (WEA 03 (GRN))	07:10		08:37	14:34 (WEA_G2)				
	21:23	20:51 (WEA 2 (RW))	20:17	19:00	3	18:32 (WEA 03 (GRN))	18:00	4	18:19 (WEA RWED1)	15:00	3	15:24 (WEA_G1)	14:59	14:59 (WEA_G2)	
30	05:24	20:45 (WEA 2 (RW))	07:15		08:12		18:16 (WEA RWED1)	07:12		08:37	14:34 (WEA_G2)				
	21:21	20:49 (WEA 2 (RW))	20:15	18:58		18:48	1	18:16 (WEA RWED1)	15:59	2	15:23 (WEA_G1)	16:01	14:39 (WEA_G2)		
31	05:26	20:46 (WEA 2 (RW))	07:17		08:14		18:17 (WEA RWED1)	07:14		08:37	14:39 (WEA_G2)				
	21:19	20:47 (WEA 2 (RW))	20:12		18:46			16:46		16:02	14:39 (WEA_G2)				
Sonnenscheinstunden	515		461	383	61	328	314	257	278	231	691				
astr.mögl.Beschattung	129														

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

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





Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0
Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 17 - IO 17 Poggenpohler Weg 14 (Gosdorf)

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (Januar, Februar, März, April, Mai, Juni) and rows for specific dates, showing sunrise/sunset times and shadowing events.

Sonnenhöhebestimmung:
sch. (maximale) Beschattung | 603 | | 270 | | 245 | | 421 | 7 | | 36 | | 172

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

Table with 6 columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Zeitpunkt (SS:MM) Schattende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 17 - IO 17 Poggenpohler Weg 14 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	21:11 (WEA K04)	05:27	06:23	19:39 (WEA 43 (RW))	07:17	18:55	07:16	18:12	14:37 (WEA_G2)	
	12:53	21:17 (WEA K04)	21:17	20:10	19:41 (WEA 43 (RW))	18:55	18:40	16:44	15:58	24	15:01 (WEA_G2)
2	04:47	21:11 (WEA K04)	05:29	06:24		18:53	18:40	16:42	15:58	24	14:38 (WEA_G2)
	12:53	21:17 (WEA K04)	21:16	20:07		18:53	18:40	16:42	15:58	24	14:38 (WEA_G2)
3	04:48	21:12 (WEA K04)	05:31	06:26		18:53	18:40	16:42	15:58	24	14:38 (WEA_G2)
	12:53	21:17 (WEA K04)	21:14	20:05		18:53	18:40	16:42	15:57	25	15:03 (WEA_G2)
4	04:49	21:12 (WEA K04)	05:32	06:28		18:53	18:40	16:42	15:57	25	14:37 (WEA_G2)
	12:52	21:16 (WEA K04)	21:12	20:03		18:48	18:40	16:38	15:56	26	15:03 (WEA_G2)
5	04:50	21:12 (WEA K04)	05:34	06:30		18:48	18:40	16:38	15:56	26	14:38 (WEA_G2)
	12:52	21:16 (WEA K04)	21:10	20:00		18:48	18:45	16:36	15:56	27	15:05 (WEA_G2)
6	04:51	21:12 (WEA K04)	05:36	06:32		18:48	18:45	16:36	15:56	27	14:38 (WEA_G2)
	12:51	21:15 (WEA K04)	21:08	19:58		18:43	18:43	16:34	15:55	27	15:05 (WEA_G2)
7	04:52	21:12 (WEA K04)	05:38	06:33		18:43	18:43	16:34	15:55	27	14:38 (WEA_G2)
	12:50	21:14 (WEA K04)	21:06	19:55		18:40	18:40	16:32	15:54	28	15:06 (WEA_G2)
8	04:53	21:12 (WEA K04)	05:39	06:35		18:40	18:40	16:32	15:54	28	14:38 (WEA_G2)
	12:50	21:14 (WEA K04)	21:04	19:50		18:36	18:36	16:30	15:54	29	15:06 (WEA_G2)
9	04:54	21:11 (WEA K04)	05:41	06:37		18:36	18:36	16:30	15:54	29	14:38 (WEA_G2)
	12:49	21:11	21:02	19:50		18:36	18:36	16:30	15:54	30	15:06 (WEA_G2)
10	04:55	21:11	05:41	06:39		18:36	18:36	16:30	15:54	30	14:38 (WEA_G2)
	12:48	21:10	21:00	19:49		18:36	18:36	16:30	15:54	31	15:07 (WEA_G2)
11	04:56	21:11	05:41	06:41		18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:47	21:09	20:59	19:48		18:36	18:36	16:30	15:54	31	15:08 (WEA_G2)
12	04:57	21:11	05:41	06:42		18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:46	21:08	20:58	19:47		18:36	18:36	16:30	15:54	31	15:09 (WEA_G2)
13	04:59	21:08	05:40	06:44		18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:45	21:07	20:58	19:46		18:36	18:36	16:30	15:54	31	15:10 (WEA_G2)
14	05:00	21:07	05:40	06:46	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:44	21:06	20:57	19:45	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:11 (WEA_G2)
15	05:01	21:07	05:40	06:48	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:43	21:06	20:56	19:44	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:12 (WEA_G2)
16	05:03	21:07	05:40	06:50	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:42	21:06	20:55	19:43	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:13 (WEA_G2)
17	05:04	21:07	05:40	06:51	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:41	21:06	20:54	19:42	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:14 (WEA_G2)
18	05:05	21:08	05:40	06:52	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:40	21:07	20:53	19:41	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:15 (WEA_G2)
19	05:07	21:08	05:39	06:55	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:38	21:06	20:51	19:38	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:16 (WEA_G2)
20	05:08	21:09	05:39	06:57	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:37	21:08	20:50	19:37	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:17 (WEA_G2)
21	05:09	21:10	05:39	06:59	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:36	21:09	20:49	19:36	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:18 (WEA_G2)
22	05:11	21:10	05:38	07:00	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:35	21:09	20:48	19:35	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:19 (WEA_G2)
23	05:12	21:11	05:38	07:02	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:34	21:10	20:47	19:34	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:20 (WEA_G2)
24	05:14	21:11	05:37	07:04	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:33	21:10	20:46	19:33	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:21 (WEA_G2)
25	05:16	21:11	05:37	07:06	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:32	21:10	20:45	19:32	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:22 (WEA_G2)
26	05:17	21:12	05:37	07:08	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:31	21:11	20:44	19:31	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:23 (WEA_G2)
27	05:19	21:12	05:36	07:10	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:30	21:11	20:43	19:30	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:24 (WEA_G2)
28	05:21	21:13	05:36	07:12	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:29	21:12	20:42	19:29	18:08 (WEA 02 (GRN))	18:36	18:36	16:30	15:54	31	15:25 (WEA_G2)
29	05:24	21:14	05:35	07:15	19:41 (WEA 43 (RW))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:28	21:13	20:41	19:28	19:41 (WEA 43 (RW))	18:36	18:36	16:30	15:54	31	15:26 (WEA_G2)
30	05:26	21:15	05:35	07:17	19:41 (WEA 43 (RW))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:27	21:14	20:40	19:27	19:41 (WEA 43 (RW))	18:36	18:36	16:30	15:54	31	15:27 (WEA_G2)
31	05:29	21:16	05:34	07:20	19:41 (WEA 43 (RW))	18:36	18:36	16:30	15:54	31	14:38 (WEA_G2)
	12:26	21:15	20:39	19:26	19:41 (WEA 43 (RW))	18:36	18:36	16:30	15:54	31	15:28 (WEA_G2)
Sonnenhöhebanden		01 S		461		303		287		231	
abs. max/mgl. Beschattung		32		6		18		299		1128	

**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	Schattenanfang (WEA mit erstem Schatten)	Zeitpunkt (SS:MM) Schattende	Schattende (WEA mit letztem Schatten)
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## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 18 - IO 18 Poggenpöhlter Weg 20 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	14:02 (WEA_G3)	08:06	16:05 (WEA_G1)	07:08	17:04 (WEA_RWE01)	06:52	19:22 (WEA_G2 (GRN))	05:41		04:51
2	08:37	14:03 (WEA_G3)	08:04	16:05 (WEA_G1)	07:05	17:04 (WEA_RWE01)	06:49	19:23 (WEA_G2 (GRN))	05:39		04:50
3	08:37	14:03 (WEA_G3)	08:03	16:06 (WEA_G1)	07:03	17:05 (WEA_RWE01)	06:47	19:23 (WEA_G2 (GRN))	05:37		04:49
4	08:36	14:04 (WEA_G3)	08:01	16:06 (WEA_G1)	07:01	17:04 (WEA_RWE01)	06:44	19:27 (WEA_G2 (GRN))	05:31		04:48
5	08:36	14:05 (WEA_G3)	07:59	16:06 (WEA_G1)	06:58	17:05 (WEA_RWE01)	06:42		05:33		04:47
6	08:36	14:05 (WEA_G3)	07:57	16:07 (WEA_G1)	06:56	17:04 (WEA_RWE01)	06:39		05:31		04:47
7	08:35	14:07 (WEA_G3)	07:55	16:08 (WEA_G1)	06:53	17:05 (WEA_RWE01)	06:37		05:29		04:46
8	08:35	14:08 (WEA_G3)	07:53	16:09 (WEA_G1)	06:51	17:06 (WEA_RWE01)	06:34		05:27		04:45
9	08:34	14:09 (WEA_G3)	07:51	16:11 (WEA_G1)	06:49	17:07 (WEA_RWE01)	06:31		05:25		04:45
10	08:33	14:10 (WEA_G3)	07:49	16:14 (WEA_G1)	06:46	17:08 (WEA_RWE01)	06:28		05:23		04:44
11	08:33	14:12 (WEA_G3)	07:47	16:17 (WEA_G1)	06:44	17:11 (WEA_RWE01)	06:25		05:22		04:44
12	08:32	14:14 (WEA_G3)	07:45	16:21 (WEA_G1)	06:41	17:14 (WEA_RWE01)	06:22		05:20		04:43
13	08:31	14:17 (WEA_G3)	07:43	16:25 (WEA_G1)	06:38	17:18 (WEA_RWE01)	06:19		05:18		04:42
14	08:30	14:21 (WEA_G3)	07:41	16:30 (WEA_G1)	06:35	17:22 (WEA_RWE01)	06:16		05:16		04:42
15	08:29	14:26 (WEA_G3)	07:39	16:35 (WEA_G1)	06:32	17:27 (WEA_RWE01)	06:13		05:14		04:41
16	08:28	14:31 (WEA_G3)	07:37	16:40 (WEA_G1)	06:29	17:32 (WEA_RWE01)	06:10		05:12		04:41
17	08:27	14:37 (WEA_G3)	07:35	16:46 (WEA_G1)	06:26	17:37 (WEA_RWE01)	06:07		05:10		04:41
18	08:26	14:43 (WEA_G3)	07:33	16:52 (WEA_G1)	06:23	17:42 (WEA_RWE01)	06:04		05:08		04:41
19	08:25	14:50 (WEA_G3)	07:31	16:58 (WEA_G1)	06:20	17:47 (WEA_RWE01)	06:01		05:06		04:41
20	08:24	14:57 (WEA_G3)	07:29	17:05 (WEA_G1)	06:17	17:52 (WEA_RWE01)	05:58		05:04		04:41
21	08:23	15:04 (WEA_G3)	07:27	17:12 (WEA_G1)	06:14	17:57 (WEA_RWE01)	05:55		05:02		04:41
22	08:22	15:12 (WEA_G3)	07:25	17:19 (WEA_G1)	06:11	18:02 (WEA_RWE01)	05:52		05:00		04:41
23	08:21	15:20 (WEA_G3)	07:23	17:26 (WEA_G1)	06:08	18:07 (WEA_RWE01)	05:49		04:58		04:41
24	08:20	15:29 (WEA_G3)	07:21	17:33 (WEA_G1)	06:05	18:12 (WEA_RWE01)	05:46		04:56		04:41
25	08:19	15:38 (WEA_G3)	07:19	17:40 (WEA_G1)	06:02	18:17 (WEA_RWE01)	05:43		04:54		04:41
26	08:18	15:47 (WEA_G3)	07:17	17:47 (WEA_G1)	05:59	18:22 (WEA_RWE01)	05:40		04:52		04:41
27	08:17	15:56 (WEA_G3)	07:15	17:54 (WEA_G1)	05:56	18:27 (WEA_RWE01)	05:37		04:50		04:41
28	08:16	16:05 (WEA_G3)	07:13	18:01 (WEA_G1)	05:53	18:32 (WEA_RWE01)	05:34		04:48		04:41
29	08:15	16:14 (WEA_G3)	07:11	18:08 (WEA_G1)	05:50	18:37 (WEA_RWE01)	05:31		04:46		04:41
30	08:14	16:23 (WEA_G3)	07:09	18:15 (WEA_G1)	05:47	18:42 (WEA_RWE01)	05:28		04:44		04:41
31	08:13	16:32 (WEA_G3)	07:07	18:22 (WEA_G1)	05:44	18:47 (WEA_RWE01)	05:25		04:42		04:41
1	08:12	16:41 (WEA_G3)	07:05	18:29 (WEA_G1)	05:41	18:52 (WEA_RWE01)	05:22		04:40		04:41
2	08:11	16:50 (WEA_G3)	07:03	18:36 (WEA_G1)	05:38	18:57 (WEA_RWE01)	05:19		04:38		04:41
3	08:10	16:59 (WEA_G3)	07:01	18:43 (WEA_G1)	05:35	19:02 (WEA_RWE01)	05:16		04:36		04:41
4	08:09	17:08 (WEA_G3)	06:59	18:50 (WEA_G1)	05:32	19:07 (WEA_RWE01)	05:13		04:34		04:41
5	08:08	17:17 (WEA_G3)	06:57	18:57 (WEA_G1)	05:29	19:12 (WEA_RWE01)	05:10		04:32		04:41
6	08:07	17:26 (WEA_G3)	06:55	19:04 (WEA_G1)	05:26	19:17 (WEA_RWE01)	05:07		04:30		04:41
7	08:06	17:35 (WEA_G3)	06:53	19:11 (WEA_G1)	05:23	19:22 (WEA_RWE01)	05:04		04:28		04:41
8	08:05	17:44 (WEA_G3)	06:51	19:18 (WEA_G1)	05:20	19:27 (WEA_RWE01)	05:01		04:26		04:41
9	08:04	17:53 (WEA_G3)	06:49	19:25 (WEA_G1)	05:17	19:32 (WEA_RWE01)	04:58		04:24		04:41
10	08:03	18:02 (WEA_G3)	06:47	19:32 (WEA_G1)	05:14	19:37 (WEA_RWE01)	04:55		04:22		04:41
11	08:02	18:11 (WEA_G3)	06:45	19:39 (WEA_G1)	05:11	19:42 (WEA_RWE01)	04:52		04:20		04:41
12	08:01	18:20 (WEA_G3)	06:43	19:46 (WEA_G1)	05:08	19:47 (WEA_RWE01)	04:49		04:18		04:41
13	08:00	18:29 (WEA_G3)	06:41	19:53 (WEA_G1)	05:05	19:52 (WEA_RWE01)	04:46		04:16		04:41
14	07:59	18:38 (WEA_G3)	06:39	20:00 (WEA_G1)	05:02	19:57 (WEA_RWE01)	04:43		04:14		04:41
15	07:58	18:47 (WEA_G3)	06:37	20:07 (WEA_G1)	04:59	20:02 (WEA_RWE01)	04:40		04:12		04:41
16	07:57	18:56 (WEA_G3)	06:35	20:14 (WEA_G1)	04:56	20:07 (WEA_RWE01)	04:37		04:10		04:41
17	07:56	19:05 (WEA_G3)	06:33	20:21 (WEA_G1)	04:53	20:12 (WEA_RWE01)	04:34		04:08		04:41
18	07:55	19:14 (WEA_G3)	06:31	20:28 (WEA_G1)	04:50	20:17 (WEA_RWE01)	04:31		04:06		04:41
19	07:54	19:23 (WEA_G3)	06:29	20:35 (WEA_G1)	04:47	20:22 (WEA_RWE01)	04:28		04:04		04:41
20	07:53	19:32 (WEA_G3)	06:27	20:42 (WEA_G1)	04:44	20:27 (WEA_RWE01)	04:25		04:02		04:41
21	07:52	19:41 (WEA_G3)	06:25	20:49 (WEA_G1)	04:41	20:32 (WEA_RWE01)	04:22		04:00		04:41
22	07:51	19:50 (WEA_G3)	06:23	20:56 (WEA_G1)	04:38	20:37 (WEA_RWE01)	04:19		03:58		04:41
23	07:50	19:59 (WEA_G3)	06:21	21:03 (WEA_G1)	04:35	20:42 (WEA_RWE01)	04:16		03:56		04:41
24	07:49	20:08 (WEA_G3)	06:19	21:10 (WEA_G1)	04:32	20:47 (WEA_RWE01)	04:13		03:54		04:41
25	07:48	20:17 (WEA_G3)	06:17	21:17 (WEA_G1)	04:29	20:52 (WEA_RWE01)	04:10		03:52		04:41
26	07:47	20:26 (WEA_G3)	06:15	21:24 (WEA_G1)	04:26	20:57 (WEA_RWE01)	04:07		03:50		04:41
27	07:46	20:35 (WEA_G3)	06:13	21:31 (WEA_G1)	04:23	21:02 (WEA_RWE01)	04:04		03:48		04:41
28	07:45	20:44 (WEA_G3)	06:11	21:38 (WEA_G1)	04:20	21:07 (WEA_RWE01)	04:01		03:46		04:41
29	07:44	20:53 (WEA_G3)	06:09	21:45 (WEA_G1)	04:17	21:12 (WEA_RWE01)	03:58		03:44		04:41
30	07:43	21:02 (WEA_G3)	06:07	21:52 (WEA_G1)	04:14	21:17 (WEA_RWE01)	03:55		03:42		04:41
31	07:42	21:11 (WEA_G3)	06:05	21:59 (WEA_G1)	04:11	21:22 (WEA_RWE01)	03:52		03:40		04:41
1	07:41	21:20 (WEA_G3)	06:03	22:06 (WEA_G1)	04:08	21:27 (WEA_RWE01)	03:49		03:38		04:41
2	07:40	21:29 (WEA_G3)	06:01	22:13 (WEA_G1)	04:05	21:32 (WEA_RWE01)	03:46		03:36		04:41
3	07:39	21:38 (WEA_G3)	05:59	22:20 (WEA_G1)	04:02	21:37 (WEA_RWE01)	03:43		03:34		04:41
4	07:38	21:47 (WEA_G3)	05:57	22:27 (WEA_G1)	03:59	21:42 (WEA_RWE01)	03:40		03:32		04:41
5	07:37	21:56 (WEA_G3)	05:55	22:34 (WEA_G1)	03:56	21:47 (WEA_RWE01)	03:37		03:30		04:41
6	07:36	22:05 (WEA_G3)	05:53	22:41 (WEA_G1)	03:53	21:52 (WEA_RWE01)	03:34		03:28		04:41
7	07:35	22:14 (WEA_G3)	05:51	22:48 (WEA_G1)	03:50	21:57 (WEA_RWE01)	03:31		03:26		04:41
8	07:34	22:23 (WEA_G3)	05:49	22:55 (WEA_G1)	03:47	22:02 (WEA_RWE01)	03:28		03:24		04:41
9	07:33	22:32 (WEA_G3)	05:47	23:02 (WEA_G1)	03:44	22:07 (WEA_RWE01)	03:25		03:22		04:41
10	07:32	22:41 (WEA_G3)	05:45	23:09 (WEA_G1)	03:41	22:12 (WEA_RWE01)	03:22		03:20		04:41
11	07:31	22:50 (WEA_G3)	05:43	23:16 (WEA_G1)	03:38	22:17 (WEA_RWE01)	03:19		03:18		04:41
12	07:30	22:59 (WEA_G3)	05:41	23:23 (WEA_G1)	03:35	22:22 (WEA_RWE01)	03:16		03:16		04:41
13	07:29	23:08 (WEA_G3)	05:39	23:30 (WEA_G1)	03:32	22:27 (WEA_RWE01)	03:13		03:14		04:41
14	07:28	23:17 (WEA_G3)	05:37	23:37 (WEA_G1)	03:29	22:32 (WEA_RWE01)	03:10		03:12		04:41
15	07:27	23:26 (WEA_G3)	05:35	23:44 (WEA_G1)	03:26	22:37 (WEA_RWE01)	03:07		03:10		04:41
16	07:26	23:35 (WEA_G3)	05:33	23:51 (WEA_G1)	03:23	22:42 (WEA_RWE01)	03:04		03:08		04:41
17	07:25	23:44 (WEA_G3)	05:31	23:58 (WEA_G1)	03:20	22:47 (WEA_RWE01)	03:01		03:06		04:41
18	07:24	23:53 (WEA_G3)	05:29	24:05 (WEA_G1)	03:17	22:52 (WEA_RWE01)	02:58		03:04		04:41
19	07:23	24:02 (WEA_G3)	05:27	24:12 (WEA_G1)	03:14	22:57 (WEA_RWE01)	02:55		03:02		04:41
20	07:22	24:11 (WEA_G3)	05:25	24:19 (WEA_G1)	03:11	23:02 (WEA_RWE01)	02:52		03:00		04:41
21	07:21	24:20 (WEA_G3)	05:23	24:26 (WEA_G1)	03:08	23:07 (WEA_RWE01)	02:49		02:58		04:41
22	07:20	24:29 (WEA_G3)	05:21	24:33 (WEA_G1)	03:05	23:12 (WEA_RWE01)	02:46		02:56		04:41
23	07:19	24:38 (WEA_G3)	05:19	24:40 (WEA_G1)	03:02	23:17 (WEA_RWE01)	02:43		02:54		04:41
24	07:18	24:47 (WEA_G3)	05:17	24:47 (WEA_G1)	02:59	23:22 (WEA_RWE01)	02:40		02:52		04:41
25	07:17	24:56 (WEA_G3)	05:15	24:54 (WEA_G1)	02:56	23:27 (WEA_RWE01)	02:37		02:50		04:41
26	07:16	25:05 (WEA_G3)	05:13	25:01 (WEA_G1)	02:53	23:32 (WEA_RWE01)	02:34		02:48		04:41
27	07:15	25:14 (WEA_G3)	05:11	25:08 (WEA_G1)	02:50	23:37 (WEA_RWE01)	02:31		02:46		04:41
28	07:14	25:23 (WEA_G3)	05:09	25:15 (WEA_G1)	02:47	23:42 (WEA_RWE01)	02:28		02:44		04:41
29	07:13	25:32 (WEA_G3)	05:07	25:22 (WEA_G1)	02:44	23:47 (WEA_RWE01)	02:25		02:42		04:41
30	07:12	25:41 (WEA_G3)	05:05	25:29							



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 18 - IO 18 Poggenpohler Weg 20 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember				
1	10:47	05:27	06:23	07:17	07:16	15:43 (WEA_G1)	08:12	13:54 (WEA_G3)						
2	10:47	05:29	06:24	07:19	16:44	10	15:53 (WEA_G1)	15:58	47	15:18 (WEA_G2)				
3	10:48	05:31	06:25	07:21	17:51 (WEA_RWE01)	07:18	15:40 (WEA_G1)	08:14	13:54 (WEA_G3)					
4	10:48	05:31	06:25	07:21	18:53	7	17:58 (WEA_RWE01)	16:42	15	15:55 (WEA_G1)	15:58	50	15:19 (WEA_G2)	
5	10:49	05:32	06:26	07:22	17:47 (WEA_RWE01)	07:20	15:39 (WEA_G1)	08:15	13:53 (WEA_G3)					
6	10:49	05:32	06:26	07:22	18:51 (WEA_RWE01)	16:40	17	17:58 (WEA_RWE01)	16:40	17	15:58 (WEA_G1)	15:57	51	15:19 (WEA_G2)
7	10:50	05:34	06:27	07:24	17:45 (WEA_RWE01)	07:22	15:38 (WEA_G1)	08:17	13:52 (WEA_G3)					
8	10:50	05:34	06:27	07:24	18:03 (WEA_RWE01)	16:38	19	15:57 (WEA_G1)	15:56	53	15:19 (WEA_G2)			
9	10:51	05:36	06:28	07:26	17:43 (WEA_RWE01)	07:24	21	15:58 (WEA_G1)	08:18	13:52 (WEA_G3)				
10	10:51	05:36	06:28	07:26	18:04 (WEA_RWE01)	16:36	23	15:59 (WEA_G1)	15:56	52	15:19 (WEA_G2)			
11	10:52	05:38	06:29	07:28	17:42 (WEA_RWE01)	07:26	15:57 (WEA_G1)	08:19	13:52 (WEA_G3)					
12	10:52	05:38	06:29	07:28	18:05 (WEA_RWE01)	16:34	22	15:59 (WEA_G1)	15:55	52	15:17 (WEA_G2)			
13	10:53	05:39	06:30	07:30	17:41 (WEA_RWE01)	07:28	15:57 (WEA_G1)	08:21	13:52 (WEA_G3)					
14	10:53	05:39	06:30	07:30	18:06 (WEA_RWE01)	16:32	23	15:58 (WEA_G1)	15:54	52	15:17 (WEA_G2)			
15	10:54	05:41	06:31	07:32	17:40 (WEA_RWE01)	07:30	15:56 (WEA_G1)	08:22	13:51 (WEA_G3)					
16	10:54	05:41	06:31	07:32	18:06 (WEA_RWE01)	16:30	24	15:57 (WEA_G1)	15:54	53	15:16 (WEA_G2)			
17	10:55	05:42	06:32	07:34	17:39 (WEA_RWE01)	07:32	15:56 (WEA_G1)	15:54	53	15:16 (WEA_G2)				
18	10:55	05:42	06:32	07:34	18:07 (WEA_RWE01)	16:28	25	15:57 (WEA_G1)	15:53	53	15:16 (WEA_G2)			
19	10:56	05:43	06:33	07:36	17:38 (WEA_RWE01)	07:34	15:55 (WEA_G1)	15:53	53	15:16 (WEA_G2)				
20	10:56	05:43	06:33	07:36	18:08 (WEA_RWE01)	16:26	26	15:58 (WEA_G1)	15:52	53	15:16 (WEA_G2)			
21	10:57	05:44	06:34	07:38	17:37 (WEA_RWE01)	07:36	15:54 (WEA_G1)	15:52	53	15:16 (WEA_G2)				
22	10:57	05:44	06:34	07:38	18:09 (WEA_RWE01)	16:24	27	15:59 (WEA_G1)	15:51	53	15:16 (WEA_G2)			
23	10:58	05:45	06:35	07:40	17:36 (WEA_RWE01)	07:38	15:53 (WEA_G1)	15:51	53	15:16 (WEA_G2)				
24	10:58	05:45	06:35	07:40	18:10 (WEA_RWE01)	16:22	28	15:59 (WEA_G1)	15:50	53	15:16 (WEA_G2)			
25	10:59	05:46	06:36	07:42	17:35 (WEA_RWE01)	07:40	15:52 (WEA_G1)	15:50	53	15:16 (WEA_G2)				
26	10:59	05:46	06:36	07:42	18:11 (WEA_RWE01)	16:20	29	15:59 (WEA_G1)	15:49	53	15:16 (WEA_G2)			
27	10:59	05:46	06:36	07:42	17:34 (WEA_RWE01)	07:42	15:51 (WEA_G1)	15:49	53	15:16 (WEA_G2)				
28	10:59	05:46	06:36	07:42	18:12 (WEA_RWE01)	16:18	30	15:59 (WEA_G1)	15:48	53	15:16 (WEA_G2)			
29	11:00	05:47	06:37	07:44	17:33 (WEA_RWE01)	07:44	15:50 (WEA_G1)	15:48	53	15:16 (WEA_G2)				
30	11:00	05:47	06:37	07:44	18:13 (WEA_RWE01)	16:16	31	15:59 (WEA_G1)	15:47	53	15:16 (WEA_G2)			
31	11:01	05:48	06:38	07:46	17:32 (WEA_RWE01)	07:46	15:49 (WEA_G1)	15:47	53	15:16 (WEA_G2)				
1	11:01	05:48	06:38	07:46	18:14 (WEA_RWE01)	16:14	1	15:59 (WEA_G1)	15:46	53	15:16 (WEA_G2)			
2	11:02	05:49	06:39	07:48	17:31 (WEA_RWE01)	07:48	2	15:58 (WEA_G1)	15:45	53	15:16 (WEA_G2)			
3	11:02	05:49	06:39	07:48	18:15 (WEA_RWE01)	16:12	3	15:58 (WEA_G1)	15:44	53	15:16 (WEA_G2)			
4	11:03	05:50	06:40	07:50	17:30 (WEA_RWE01)	07:50	4	15:57 (WEA_G1)	15:43	53	15:16 (WEA_G2)			
5	11:03	05:50	06:40	07:50	18:16 (WEA_RWE01)	16:10	5	15:57 (WEA_G1)	15:42	53	15:16 (WEA_G2)			
6	11:04	05:51	06:41	07:52	17:29 (WEA_RWE01)	07:52	6	15:56 (WEA_G1)	15:41	53	15:16 (WEA_G2)			
7	11:04	05:51	06:41	07:52	18:17 (WEA_RWE01)	16:08	7	15:56 (WEA_G1)	15:40	53	15:16 (WEA_G2)			
8	11:04	05:51	06:41	07:52	17:28 (WEA_RWE01)	07:54	8	15:55 (WEA_G1)	15:39	53	15:16 (WEA_G2)			
9	11:05	05:52	06:42	07:54	18:18 (WEA_RWE01)	16:06	9	15:55 (WEA_G1)	15:38	53	15:16 (WEA_G2)			
10	11:05	05:52	06:42	07:54	17:27 (WEA_RWE01)	07:56	10	15:54 (WEA_G1)	15:37	53	15:16 (WEA_G2)			
11	11:05	05:52	06:42	07:54	18:19 (WEA_RWE01)	16:04	11	15:54 (WEA_G1)	15:36	53	15:16 (WEA_G2)			
12	11:06	05:53	06:43	07:56	17:26 (WEA_RWE01)	07:58	12	15:53 (WEA_G1)	15:35	53	15:16 (WEA_G2)			
13	11:06	05:53	06:43	07:56	18:20 (WEA_RWE01)	16:02	13	15:53 (WEA_G1)	15:34	53	15:16 (WEA_G2)			
14	11:06	05:53	06:43	07:56	17:25 (WEA_RWE01)	08:00	14	15:52 (WEA_G1)	15:33	53	15:16 (WEA_G2)			
15	11:07	05:54	06:44	07:58	18:21 (WEA_RWE01)	16:00	15	15:52 (WEA_G1)	15:32	53	15:16 (WEA_G2)			
16	11:07	05:54	06:44	07:58	17:24 (WEA_RWE01)	08:02	16	15:51 (WEA_G1)	15:31	53	15:16 (WEA_G2)			
17	11:07	05:54	06:44	07:58	18:22 (WEA_RWE01)	15:58	17	15:51 (WEA_G1)	15:30	53	15:16 (WEA_G2)			
18	11:08	05:55	06:45	08:00	17:23 (WEA_RWE01)	08:04	18	15:50 (WEA_G1)	15:29	53	15:16 (WEA_G2)			
19	11:08	05:55	06:45	08:00	18:23 (WEA_RWE01)	15:56	19	15:50 (WEA_G1)	15:28	53	15:16 (WEA_G2)			
20	11:08	05:55	06:45	08:00	17:22 (WEA_RWE01)	08:06	20	15:49 (WEA_G1)	15:27	53	15:16 (WEA_G2)			
21	11:09	05:56	06:46	08:02	18:24 (WEA_RWE01)	15:54	21	15:49 (WEA_G1)	15:26	53	15:16 (WEA_G2)			
22	11:09	05:56	06:46	08:02	17:21 (WEA_RWE01)	08:08	22	15:48 (WEA_G1)	15:25	53	15:16 (WEA_G2)			
23	11:09	05:56	06:46	08:02	18:25 (WEA_RWE01)	15:52	23	15:48 (WEA_G1)	15:24	53	15:16 (WEA_G2)			
24	11:10	05:57	06:47	08:04	17:20 (WEA_RWE01)	08:10	24	15:47 (WEA_G1)	15:23	53	15:16 (WEA_G2)			
25	11:10	05:57	06:47	08:04	18:26 (WEA_RWE01)	15:50	25	15:47 (WEA_G1)	15:22	53	15:16 (WEA_G2)			
26	11:10	05:57	06:47	08:04	17:19 (WEA_RWE01)	08:12	26	15:46 (WEA_G1)	15:21	53	15:16 (WEA_G2)			
27	11:11	05:58	06:48	08:06	18:27 (WEA_RWE01)	15:48	27	15:46 (WEA_G1)	15:20	53	15:16 (WEA_G2)			
28	11:11	05:58	06:48	08:06	17:18 (WEA_RWE01)	08:14	28	15:45 (WEA_G1)	15:19	53	15:16 (WEA_G2)			
29	11:11	05:58	06:48	08:06	18:28 (WEA_RWE01)	15:46	29	15:45 (WEA_G1)	15:18	53	15:16 (WEA_G2)			
30	11:12	05:59	06:49	08:08	17:17 (WEA_RWE01)	08:16	30	15:44 (WEA_G1)	15:17	53	15:16 (WEA_G2)			
31	11:12	05:59	06:49	08:08	18:29 (WEA_RWE01)	15:44	31	15:44 (WEA_G1)	15:16	53	15:16 (WEA_G2)			
1	11:13	05:59	06:49	08:08	17:16 (WEA_RWE01)	08:18	1	15:43 (WEA_G1)	15:15	53	15:16 (WEA_G2)			
2	11:13	05:59	06:49	08:08	18:30 (WEA_RWE01)	15:42	2	15:43 (WEA_G1)	15:14	53	15:16 (WEA_G2)			
3	11:13	05:59	06:49	08:08	17:15 (WEA_RWE01)	08:20	3	15:42 (WEA_G1)	15:13	53	15:16 (WEA_G2)			
4	11:14	06:00	06:50	08:10	18:31 (WEA_RWE01)	15:40	4	15:42 (WEA_G1)	15:12	53	15:16 (WEA_G2)			
5	11:14	06:00	06:50	08:10	17:14 (WEA_RWE01)	08:22	5	15:41 (WEA_G1)	15:11	53	15:16 (WEA_G2)			
6	11:14	06:00	06:50	08:10	18:32 (WEA_RWE01)	15:38	6	15:41 (WEA_G1)	15:10	53	15:16 (WEA_G2)			
7	11:15	06:01	06:51	08:12	17:13 (WEA_RWE01)	08:24	7	15:40 (WEA_G1)	15:09	53	15:16 (WEA_G2)			
8	11:15	06:01	06:51	08:12	18:33 (WEA_RWE01)	15:36	8	15:40 (WEA_G1)	15:08	53	15:16 (WEA_G2)			
9	11:15	06:01	06:51	08:12	17:12 (WEA_RWE01)	08:26	9	15:39 (WEA_G1)	15:07	53	15:16 (WEA_G2)			
10	11:15	06:01	06:51	08:12	18:34 (WEA_RWE01)	15:34	10	15:39 (WEA_G1)	15:06	53	15:16 (WEA_G2)			
11	11:16	06:02	06:52	08:14	17:11 (WEA_RWE01)	08:28	11	15:38 (WEA_G1)	15:05	53	15:16 (WEA_G2)			
12	11:16	06:02	06:52	08:14	18:35 (WEA_RWE01)	15:32	12	15:38 (WEA_G1)	15:04	53	15:16 (WEA_G2)			
13	11:16	06:02	06:52	08:14	17:10 (WEA_RWE01)	08:30	13	15:37 (WEA_G1)	15:03	53	15:16 (WEA_G2)			
14	11:16	06:02	06:52	08:14	18:36 (WEA_RWE01)	15:30	14	15:37 (WEA_G1)	15:02	53	15:16 (WEA_G2)			
15	11:17	06:03	06:53	08:16	17:09 (WEA_RWE01)	08:32	15	15:36 (WEA_G1)	15:01	53	15:16 (WEA_G2)			
16	11:17	06:03	06:53	08:16	18:37 (WEA_RWE01)	15:28	16	15:36 (WEA_G1)	15:00	53	15:16 (WEA_G2)			
17	11:17	06:03	06:53	08:16	17:08 (WEA_RWE01)	08:34	17	15:35 (WEA_G1)	14:59	53	15:16 (WEA_G2)			
18	11:17	06:03	06:53	08:16	18:38 (WEA_RWE01)	15:26	18	15:35 (WEA_G1)	14:58	53	15:16 (WEA_G2)			
19	11:18	06:04	06:54	08:18	17:07 (WEA_RWE01)	08:36	19	15:34 (WEA_G1)	14:57	53	15:16 (WEA_G2)			
20	11:18	06:04	06:54	08:18	18:39 (WEA_RWE01)	15:24	20	15:34 (WEA_G1)	14:56	53	15:16 (WEA_G2)			
21	11:18	06:04	06:54	08:18	17:06 (WEA_RWE01)	08:38	21	15:33 (WEA_G1)	14:55	53	15:16 (WEA_G2)			
22	11:18	06:04	06:54	08:18	18:40 (WEA_RWE01)	15:22	22	15:33 (WEA_G1)	14:54	53	15:16 (WEA_G2)			
23	11:19	06:05	06:55	08:20	17:05 (WEA_RWE01)	08:40	23	15:32 (WEA_G1)	14:53	53	15:16 (WEA_G2)			
24	11:19	06:05	06:55	08:20	18:41 (WEA_RWE01)	15:20	24	15:32 (WEA_G1)	14:52	53	15:16 (WEA_G2)			
25	11:19	06:05	06:55	08:20	17:04 (WEA_RWE01)	08:42	25	15:31 (WEA_G1)	14:51	53	15:16 (WEA_G2)			
26	11:19	06:05	06:55	08:20	18:42 (WEA_RWE01)	15:18	26	15:31 (WEA_G1)	14:50	53	15:16 (WEA_G2)			
27	11:20	06:06	06:56	08:22	17:0									

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 19 - IO 19 Poggenpohler Weg 28 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar	Februar	März	April	Mai	Juni
1 08:37 16:03	14:14 (WEA_G3)   08:06 15:25 (WEA_G2)   16:55	15:36 (WEA_G2)   07:08 16:22 (WEA_G1)   17:52	17:22 (WEA_RWE01)   06:52 17:24 (WEA_RWE01)   19:51	19:17 (WEA_03 (GRN))   05:41 19:24 (WEA_03 (GRN))   20:47	20:59 (WEA_42 (RW))   04:51 21:03 (WEA_42 (RW))   21:38
2 08:37 16:04	14:15 (WEA_G3)   08:04 15:26 (WEA_G2)   16:57	16:18 (WEA_G1)   07:05 16:25 (WEA_G1)   17:54	17:21 (WEA_RWE01)   06:49 17:26 (WEA_RWE01)   19:53	19:18 (WEA_03 (GRN))   05:39 19:26 (WEA_03 (GRN))   20:49	21:00 (WEA_42 (RW))   04:50 21:04 (WEA_42 (RW))   21:40
3 08:37 16:05	14:15 (WEA_G3)   08:03 15:27 (WEA_G2)   16:59	16:19 (WEA_G1)   07:03 16:27 (WEA_G1)   17:56	17:20 (WEA_RWE01)   06:47 17:29 (WEA_RWE01)   19:55	19:19 (WEA_03 (GRN))   05:37 19:25 (WEA_03 (GRN))   20:51	21:02 (WEA_42 (RW))   04:49 21:06 (WEA_42 (RW))   21:41
4 08:36 16:06	14:16 (WEA_G3)   08:01 15:29 (WEA_G2)   17:01	16:17 (WEA_G1)   07:01 16:29 (WEA_G1)   17:58	17:18 (WEA_RWE01)   06:44 17:30 (WEA_RWE01)   19:57	19:20 (WEA_03 (GRN))   05:33 19:30 (WEA_02 (GRN))   20:53	21:03 (WEA_42 (RW))   04:48 21:06 (WEA_42 (RW))   21:42
5 08:36 16:08	14:16 (WEA_G3)   07:59 15:30 (WEA_G2)   17:03	16:17 (WEA_G1)   06:58 16:31 (WEA_G1)   18:00	17:17 (WEA_RWE01)   06:42 17:33 (WEA_RWE01)   19:59	19:30 (WEA_02 (GRN))   05:32 19:32 (WEA_02 (GRN))   20:55	21:04 21:43
6 08:36 16:09	14:16 (WEA_G3)   07:57 15:31 (WEA_G2)   17:05	16:17 (WEA_G1)   06:56 16:34 (WEA_G1)   18:02	17:16 (WEA_RWE01)   06:39 17:34 (WEA_RWE01)   20:01	19:30 (WEA_02 (GRN))   05:31 19:33 (WEA_02 (GRN))   20:57	21:04 21:44
7 08:35 16:10	14:18 (WEA_G3)   07:55 15:33 (WEA_G2)   17:07	16:17 (WEA_G1)   06:53 16:36 (WEA_G1)   18:03	17:16 (WEA_RWE01)   06:37 17:37 (WEA_RWE01)   20:02	19:32 (WEA_02 (GRN))   05:29 19:35 (WEA_02 (GRN))   20:59	21:04 21:45
8 08:35 16:12	14:18 (WEA_G3)   07:53 15:35 (WEA_G2)   17:09	16:17 (WEA_G1)   06:51 16:38 (WEA_G1)   18:05	17:15 (WEA_RWE01)   06:34 17:38 (WEA_RWE01)   20:04	19:35 (WEA_02 (GRN))   05:27 19:40 (WEA_RWE01)   20:04	21:04 21:45
9 08:34 16:13	14:19 (WEA_G3)   07:51 15:36 (WEA_G2)   17:11	16:16 (WEA_G1)   06:48 16:40 (WEA_G1)   18:07	17:14 (WEA_RWE01)   06:32 17:41 (WEA_RWE01)   20:06	19:41 (WEA_RWE01)   20:06 19:45 (WEA_RWE01)   20:06	21:04 21:46
10 08:33 16:14	14:19 (WEA_G3)   07:49 15:37 (WEA_G2)   17:13	16:16 (WEA_G1)   06:45 16:41 (WEA_G1)   18:09	17:13 (WEA_RWE01)   06:30 17:42 (WEA_RWE01)   20:08	19:45 (WEA_RWE01)   20:06 19:49 (WEA_RWE01)   20:06	21:04 21:46
11 08:33 16:15	14:20 (WEA_G3)   07:47 15:39 (WEA_G2)   17:15	16:15 (WEA_G1)   06:44 16:42 (WEA_G1)   18:11	17:12 (WEA_RWE01)   06:27 17:43 (WEA_RWE01)   20:10	19:49 (WEA_RWE01)   20:06 19:53 (WEA_RWE01)   20:06	21:04 21:46
12 08:32 16:16	14:21 (WEA_G3)   07:45 15:41 (WEA_G2)   17:17	16:15 (WEA_G1)   06:41 16:43 (WEA_G1)   18:13	17:11 (WEA_RWE01)   06:25 17:44 (WEA_RWE01)   20:12	19:53 (WEA_RWE01)   20:06 19:57 (WEA_RWE01)   20:06	21:04 21:46
13 08:31 16:17	14:22 (WEA_G3)   07:43 15:42 (WEA_G2)   17:19	16:14 (WEA_G1)   06:39 16:44 (WEA_G1)   18:15	17:10 (WEA_RWE01)   06:22 17:45 (WEA_RWE01)   20:14	19:57 (WEA_RWE01)   20:06 20:01 (WEA_RWE01)   20:06	21:04 21:46
14 08:30 16:18	14:23 (WEA_G3)   07:41 15:44 (WEA_G2)   17:21	16:13 (WEA_G1)   06:37 16:45 (WEA_G1)   18:17	17:09 (WEA_RWE01)   06:20 17:46 (WEA_RWE01)   20:16	20:01 (WEA_RWE01)   20:06 20:05 (WEA_RWE01)   20:06	21:04 21:46
15 08:29 16:19	14:24 (WEA_G3)   07:39 15:45 (WEA_G2)   17:23	16:13 (WEA_G1)   06:34 16:46 (WEA_G1)   18:19	17:08 (WEA_RWE01)   06:18 17:47 (WEA_RWE01)   20:18	20:05 (WEA_RWE01)   20:06 20:09 (WEA_RWE01)   20:06	21:04 21:46
16 08:28 16:20	14:25 (WEA_G3)   07:37 15:46 (WEA_G2)   17:25	16:12 (WEA_G1)   06:32 16:47 (WEA_G1)   18:21	17:07 (WEA_RWE01)   06:16 17:48 (WEA_RWE01)   20:20	20:09 (WEA_RWE01)   20:06 20:13 (WEA_RWE01)   20:06	21:04 21:46
17 08:27 16:21	14:26 (WEA_G3)   07:35 15:47 (WEA_G2)   17:27	16:11 (WEA_G1)   06:30 16:48 (WEA_G1)   18:23	17:06 (WEA_RWE01)   06:14 17:49 (WEA_RWE01)   20:22	20:13 (WEA_RWE01)   20:06 20:17 (WEA_RWE01)   20:06	21:04 21:46
18 08:26 16:22	14:27 (WEA_G3)   07:33 15:48 (WEA_G2)   17:29	16:11 (WEA_G1)   06:27 16:49 (WEA_G1)   18:25	17:05 (WEA_RWE01)   06:12 17:50 (WEA_RWE01)   20:24	20:17 (WEA_RWE01)   20:06 20:21 (WEA_RWE01)   20:06	21:04 21:46
19 08:25 16:23	14:28 (WEA_G3)   07:31 15:49 (WEA_G2)   17:31	16:10 (WEA_G1)   06:25 16:50 (WEA_G1)   18:27	17:04 (WEA_RWE01)   06:10 17:51 (WEA_RWE01)   20:26	20:21 (WEA_RWE01)   20:06 20:25 (WEA_RWE01)   20:06	21:04 21:46
20 08:24 16:24	14:29 (WEA_G3)   07:29 15:50 (WEA_G2)   17:33	16:09 (WEA_G1)   06:23 16:51 (WEA_G1)   18:29	17:03 (WEA_RWE01)   06:08 17:52 (WEA_RWE01)   20:28	20:25 (WEA_RWE01)   20:06 20:29 (WEA_RWE01)   20:06	21:04 21:46
21 08:23 16:25	14:30 (WEA_G3)   07:27 15:51 (WEA_G2)   17:35	16:08 (WEA_G1)   06:21 16:52 (WEA_G1)   18:31	17:02 (WEA_RWE01)   06:06 17:53 (WEA_RWE01)   20:30	20:29 (WEA_RWE01)   20:06 20:33 (WEA_RWE01)   20:06	21:04 21:46
22 08:22 16:26	14:31 (WEA_G3)   07:25 15:52 (WEA_G2)   17:37	16:08 (WEA_G1)   06:19 16:53 (WEA_G1)   18:33	17:01 (WEA_RWE01)   06:04 17:54 (WEA_RWE01)   20:32	20:33 (WEA_RWE01)   20:06 20:37 (WEA_RWE01)   20:06	21:04 21:46
23 08:21 16:27	14:32 (WEA_G3)   07:23 15:53 (WEA_G2)   17:39	16:07 (WEA_G1)   06:17 16:54 (WEA_G1)   18:35	17:00 (WEA_RWE01)   06:02 17:55 (WEA_RWE01)   20:34	20:37 (WEA_RWE01)   20:06 20:41 (WEA_RWE01)   20:06	21:04 21:46
24 08:20 16:28	14:33 (WEA_G3)   07:21 15:54 (WEA_G2)   17:41	16:06 (WEA_G1)   06:15 16:55 (WEA_G1)   18:37	16:59 (WEA_RWE01)   06:00 17:56 (WEA_RWE01)   20:36	20:41 (WEA_RWE01)   20:06 20:45 (WEA_RWE01)   20:06	21:04 21:46
25 08:19 16:29	14:34 (WEA_G3)   07:19 15:55 (WEA_G2)   17:43	16:05 (WEA_G1)   06:13 16:56 (WEA_G1)   18:39	16:58 (WEA_RWE01)   05:58 17:57 (WEA_RWE01)   20:38	20:45 (WEA_RWE01)   20:06 20:49 (WEA_RWE01)   20:06	21:04 21:46
26 08:18 16:30	14:35 (WEA_G3)   07:17 15:56 (WEA_G2)   17:45	16:04 (WEA_G1)   06:11 16:57 (WEA_G1)   18:41	16:57 (WEA_RWE01)   05:56 17:58 (WEA_RWE01)   20:40	20:49 (WEA_RWE01)   20:06 20:53 (WEA_RWE01)   20:06	21:04 21:46
27 08:17 16:31	14:36 (WEA_G3)   07:15 15:57 (WEA_G2)   17:47	16:03 (WEA_G1)   06:09 16:58 (WEA_G1)   18:43	16:56 (WEA_RWE01)   05:54 17:59 (WEA_RWE01)   20:42	20:53 (WEA_RWE01)   20:06 20:57 (WEA_RWE01)   20:06	21:04 21:46
28 08:16 16:32	14:37 (WEA_G3)   07:13 15:58 (WEA_G2)   17:49	16:02 (WEA_G1)   06:07 16:59 (WEA_G1)   18:45	16:55 (WEA_RWE01)   05:52 18:00 (WEA_RWE01)   20:44	20:57 (WEA_RWE01)   20:06 21:01 (WEA_RWE01)   20:06	21:04 21:46
29 08:15 16:33	14:38 (WEA_G3)   07:11 15:59 (WEA_G2)   17:51	16:01 (WEA_G1)   06:05 17:00 (WEA_G1)   18:47	16:54 (WEA_RWE01)   05:50 18:01 (WEA_RWE01)   20:46	21:01 (WEA_RWE01)   20:06 21:05 (WEA_RWE01)   20:06	21:04 21:46
30 08:14 16:34	14:39 (WEA_G3)   07:09 16:00 (WEA_G2)   17:53	16:00 (WEA_G1)   06:03 17:01 (WEA_G1)   18:49	16:53 (WEA_RWE01)   05:48 18:02 (WEA_RWE01)   20:48	21:05 (WEA_RWE01)   20:06 21:09 (WEA_RWE01)   20:06	21:04 21:46
31 08:13 16:35	14:40 (WEA_G3)   07:07 16:01 (WEA_G2)   17:55	15:59 (WEA_G1)   06:01 17:02 (WEA_G1)   18:51	16:52 (WEA_RWE01)   05:46 18:03 (WEA_RWE01)   20:50	21:09 (WEA_RWE01)   20:06 21:13 (WEA_RWE01)   20:06	21:04 21:46
Sonnenhöheänderung ab: rechnergl. Beschattung	1922	237	263	32	15

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 19 - IO 19 Poggenpohler Weg 28 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember					
1	04:47		05:27		06:23		07:17		07:16		15:48 (WEA_G1)   08:12	14:02 (WEA_G3)			
	12:53		12:17		12:10		12:55	23	12:19 (WEA_RWE01)   12:44	22	12:10 (WEA_G1)   15:50	53	15:21 (WEA_G2)		
2	04:47		05:29		06:24		07:19		17:54 (WEA_RWE01)   07:18		15:47 (WEA_G1)   08:14	14:02 (WEA_G3)			
	12:53		12:16		12:07		12:53	25	12:19 (WEA_RWE01)   12:42	23	12:10 (WEA_G1)   15:50	53	15:21 (WEA_G2)		
3	04:48		05:31		06:26		07:21		17:53 (WEA_RWE01)   07:20		15:47 (WEA_G1)   08:15	14:03 (WEA_G3)			
	12:53		12:14		12:05		12:50	26	12:19 (WEA_RWE01)   12:40	20	12:07 (WEA_G1)   15:57	51	15:20 (WEA_G2)		
4	04:49		05:32		06:28		07:22		17:53 (WEA_RWE01)   07:22		15:47 (WEA_G1)   08:17	14:02 (WEA_G3)			
	12:52		12:12		12:03		12:48	26	12:19 (WEA_RWE01)   12:38	18	12:05 (WEA_G1)   15:56	52	15:19 (WEA_G2)		
5	04:50		05:34		06:30		07:24		17:52 (WEA_RWE01)   07:24		15:48 (WEA_G1)   08:18	14:03 (WEA_G3)			
	12:52		12:10		12:00	3	12:00	3	12:31 (WEA_G2 (RWE))   12:45	24	12:16 (WEA_G1)   15:56	49	15:18 (WEA_G2)		
6	04:51		05:36		06:32		07:26		17:52 (WEA_RWE01)   07:26		15:48 (WEA_G1)   08:19	14:02 (WEA_G3)			
	12:51		12:08		12:00	3	12:00	3	12:31 (WEA_G2 (RWE))   12:43	22	12:14 (WEA_G1)   15:54	16	12:02 (WEA_G1)   15:55	49	15:17 (WEA_G2)
7	04:52		05:38		06:33		07:28		17:52 (WEA_RWE01)   07:28		15:48 (WEA_G1)   08:21	14:03 (WEA_G3)			
	12:50		12:06		12:00	2	12:00	2	12:31 (WEA_G2 (RWE))   12:40	19	12:11 (WEA_G1)   15:52	12	12:00 (WEA_G1)   15:55	48	15:17 (WEA_G2)
8	04:53		05:39		06:35		07:30		17:52 (WEA_RWE01)   07:30		15:49 (WEA_G1)   08:22	14:03 (WEA_G3)			
	12:50		12:04		12:00	1	12:00	1	12:31 (WEA_G2 (RWE))   12:38	17	12:09 (WEA_G1)   15:54	46	15:15 (WEA_G2)		
9	04:54	11 02 (WEA_42 (RWE))	05:41		06:37		07:31		17:51 (WEA_RWE01)   07:31		15:49 (WEA_G1)   08:23	14:04 (WEA_G3)			
	12:49	5	12:13 (WEA_42 (RWE))	12:05	12:00	5	12:00	5	12:31 (WEA_G2 (RWE))   12:35	11	12:09 (WEA_G1)   15:54	45	15:15 (WEA_G2)		
10	04:55	11 02 (WEA_42 (RWE))	05:41		06:39		07:34		17:51 (WEA_RWE01)   07:34		15:07 (WEA_G2)   08:23	14:04 (WEA_G3)			
	12:46	4	12:17 (WEA_42 (RWE))	12:02	12:00	8	12:00	8	12:31 (WEA_G2 (RWE))   12:37	14	12:11 (WEA_G1)   15:53	45	15:14 (WEA_G2)		
11	04:56	11 02 (WEA_42 (RWE))	05:45		06:41		07:35		17:50 (WEA_RWE01)   07:35		15:05 (WEA_G2)   08:26	14:04 (WEA_G3)			
	12:47	4	12:18 (WEA_42 (RWE))	12:00	12:00	7	12:00	7	12:31 (WEA_G2 (RWE))   12:39	16	12:12 (WEA_G1)   15:53	44	15:14 (WEA_G2)		
12	04:57	11 02 (WEA_42 (RWE))	05:47		06:42		07:37		17:50 (WEA_RWE01)   07:37		15:04 (WEA_G2)   08:27	14:04 (WEA_G3)			
	12:46	3	12:18 (WEA_42 (RWE))	12:00	12:00	5	12:00	5	12:31 (WEA_G2 (RWE))   12:42	3	12:22 (WEA_G2)   15:53	42	15:14 (WEA_G2)		
13	04:59	11 02 (WEA_42 (RWE))	05:49		06:44		07:38		17:49 (WEA_RWE01)   07:38		15:04 (WEA_G2)   08:28	14:04 (WEA_G3)			
	12:45	2	12:19 (WEA_42 (RWE))	12:00	12:00	3	12:00	3	12:31 (WEA_G2 (RWE))   12:45	22	12:20 (WEA_G2)   15:53	42	15:14 (WEA_G2)		
14	05:00	11 02 (WEA_42 (RWE))	05:52		06:46		07:41		17:48 (WEA_RWE01)   07:41		15:04 (WEA_G2)   08:29	14:04 (WEA_G3)			
	12:44	2	12:20 (WEA_42 (RWE))	12:00	12:00	2	12:00	2	12:31 (WEA_G2 (RWE))   12:47	24	12:21 (WEA_G2)   15:53	40	15:14 (WEA_G2)		
15	05:01	11 02 (WEA_42 (RWE))	05:52		06:48		07:43		17:48 (WEA_RWE01)   07:43		15:04 (WEA_G2)   08:30	14:04 (WEA_G3)			
	12:43	1	12:21 (WEA_42 (RWE))	12:00	12:00	1	12:00	1	12:31 (WEA_G2 (RWE))   12:49	25	12:21 (WEA_G2)   15:53	41	15:14 (WEA_G2)		
16	05:03	11 02 (WEA_42 (RWE))	05:54		06:50		07:45		17:47 (WEA_RWE01)   07:45		15:04 (WEA_G2)   08:31	14:04 (WEA_G3)			
	12:42	1	12:22 (WEA_42 (RWE))	12:00	12:00		12:00		12:31 (WEA_G2 (RWE))   12:51	25	12:22 (WEA_G2)   15:53	40	15:14 (WEA_G2)		
17	05:04		05:55		06:51		07:47		17:47 (WEA_RWE01)   07:47		15:04 (WEA_G2)   08:32	14:04 (WEA_G3)			
	12:41		12:05		12:00		12:00		12:31 (WEA_G2 (RWE))   12:57	27	12:23 (WEA_G2)   15:53	41	15:14 (WEA_G2)		
18	05:05		05:57		06:52		07:49		17:47 (WEA_RWE01)   07:49		15:04 (WEA_G2)   08:32	14:04 (WEA_G3)			
	12:39		12:02		12:00		12:00		12:31 (WEA_G2 (RWE))   12:59	28	12:23 (WEA_G2)   15:53	41	15:14 (WEA_G2)		
19	05:07		05:59		06:55		07:51		17:47 (WEA_RWE01)   07:51		15:04 (WEA_G2)   08:33	14:04 (WEA_G3)			
	12:38		12:01		12:00		12:00		12:31 (WEA_G2 (RWE))   13:01	29	12:23 (WEA_G2)   15:53	40	15:14 (WEA_G2)		
20	05:08		06:02		06:57		07:52		17:47 (WEA_RWE01)   07:52		15:04 (WEA_G2)   08:34	14:04 (WEA_G3)			
	12:37		12:00		12:00	1	12:00	1	12:31 (WEA_G2 (RWE))   13:04	30	12:23 (WEA_G2)   15:54	40	15:14 (WEA_G2)		
21	05:09		06:02		06:59		07:53		17:47 (WEA_RWE01)   07:53		15:04 (WEA_G2)   08:35	14:04 (WEA_G3)			
	12:36		12:00		12:00		12:00		12:31 (WEA_G2 (RWE))   13:06	31	12:23 (WEA_G2)   15:54	41	15:14 (WEA_G2)		
22	05:11		06:03		07:00		07:55		17:47 (WEA_RWE01)   07:55		15:04 (WEA_G2)   08:36	14:04 (WEA_G3)			
	12:34		12:00		12:00		12:00		12:31 (WEA_G2 (RWE))   13:08	32	12:23 (WEA_G2)   15:54	41	15:14 (WEA_G2)		
23	05:13		06:04	20 02 (WEA_43 (RWE))	07:02		07:56		17:47 (WEA_RWE01)   07:56		15:04 (WEA_G2)   08:37	14:04 (WEA_G3)			
	12:32		12:00	2	12:00	2	12:00	2	12:31 (WEA_G2 (RWE))   13:10	33	12:23 (WEA_G2)   15:54	41	15:14 (WEA_G2)		
24	05:14		06:05	19 01 (WEA_43 (RWE))	07:04		07:58		17:47 (WEA_RWE01)   07:58		15:04 (WEA_G2)   08:38	14:04 (WEA_G3)			
	12:31		12:00	1	12:00	1	12:00	1	12:31 (WEA_G2 (RWE))   13:12	34	12:23 (WEA_G2)   15:54	40	15:14 (WEA_G2)		
25	05:16		06:06	18 02 (WEA_43 (RWE))	07:06		07:59		17:47 (WEA_RWE01)   07:59		15:04 (WEA_G2)   08:39	14:04 (WEA_G3)			
	12:29		12:00		12:00		12:00		12:31 (WEA_G2 (RWE))   13:14	35	12:23 (WEA_G2)   15:54	40	15:14 (WEA_G2)		
26	05:17		06:07		07:08		08:00		17:47 (WEA_RWE01)   08:00		15:04 (WEA_G2)   08:40	14:04 (WEA_G3)			
	12:28		12:00		12:00		12:00		12:31 (WEA_G2 (RWE))   13:16	36	12:23 (WEA_G2)   15:54	41	15:14 (WEA_G2)		
27	05:19		06:08		07:10	12 05 (WEA_43 (RWE))	08:02		17:47 (WEA_RWE01)   08:02		15:04 (WEA_G2)   08:41	14:04 (WEA_G3)			
	12:26		12:00		12:00	7	12:00	7	12:31 (WEA_G2 (RWE))   13:18	37	12:23 (WEA_G2)   15:54	40	15:14 (WEA_G2)		
28	05:21		06:10		07:13	12 04 (WEA_43 (RWE))	08:04		17:47 (WEA_RWE01)   08:04		15:04 (WEA_G2)   08:42	14:04 (WEA_G3)			
	12:24		12:00		12:00	15	12:00	15	12:31 (WEA_G2 (RWE))   13:20	38	12:23 (WEA_G2)   15:54	40	15:14 (WEA_G2)		
29	05:22		06:11		07:15	12 03 (WEA_43 (RWE))	08:06		17:47 (WEA_RWE01)   08:06		15:04 (WEA_G2)   08:43	14:04 (WEA_G3)			
	12:22		12:00		12:00	18	12:00	18	12:31 (WEA_G2 (RWE))   13:22	39	12:23 (WEA_G2)   15:54	41	15:14 (WEA_G2)		
30	05:24		06:12		07:17	12 02 (WEA_43 (RWE))	08:08		17:47 (WEA_RWE01)   08:08		15:04 (WEA_G2)   08:44	14:04 (WEA_G3)			
	12:21		12:00		12:00	22	12:00	22	12:31 (WEA_G2 (RWE))   13:24	40	12:23 (WEA_G2)   15:54	41	15:14 (WEA_G2)		
31	05:26		06:13		07:19		08:10		17:47 (WEA_RWE01)   08:10		15:04 (WEA_G2)   08:45	14:04 (WEA_G3)			
	12:19		12:00		12:00		12:00		12:31 (WEA_G2 (RWE))   13:26	41	12:23 (WEA_G2)   15:54	42	15:14 (WEA_G2)		
Sonnenbeschattung ab: rechnet/Boeschung	0 15	461		303	101		158		357		371	1350			

**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)	Schatteneende (WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 20 - IO 20 Poggenpohler Weg 30 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03	13:43 (WEA_G3)   08:06 15:25 (WEA_G2)   16:55	16:10 (WEA_G1)   07:08 17:52	06:52 19:51	05:41 20:47	04:51 21:38
2	08:37 16:04	13:44 (WEA_G3)   08:04 15:26 (WEA_G2)   16:57	16:09 (WEA_G1)   07:05 17:54	06:49 19:53	05:39 20:49	04:50 21:40
3	08:37 16:05	13:44 (WEA_G3)   08:03 15:27 (WEA_G2)   16:59	16:09 (WEA_G1)   07:03 17:56	06:47 19:55	05:37 20:51	04:49 21:41
4	08:36 16:07	13:45 (WEA_G3)   08:01 15:29 (WEA_G2)   17:01	16:09 (WEA_G1)   07:01 17:58	06:44 19:57	05:35 20:53	04:48 21:42
5	08:36 16:08	13:45 (WEA_G3)   07:59 15:30 (WEA_G2)   17:03	16:09 (WEA_G1)   06:58 18:00	06:42 19:59	05:33 20:55	04:47 21:43
6	08:36 16:09	13:46 (WEA_G3)   07:57 15:31 (WEA_G2)   17:05	16:09 (WEA_G1)   06:56 18:02	06:39 20:01	05:31 20:57	04:47 21:44
7	08:35 16:10	13:47 (WEA_G3)   07:55 15:33 (WEA_G2)   17:07	16:10 (WEA_G1)   06:53 18:03	06:37 20:02	05:29 20:59	04:46 21:45
8	08:35 16:12	13:46 (WEA_G3)   07:53 15:35 (WEA_G2)   17:09	16:10 (WEA_G1)   06:51 18:05	06:34 20:04	05:27 21:01	04:45 21:46
9	08:34 16:13	13:46 (WEA_G3)   07:51 15:36 (WEA_G2)   17:11	16:11 (WEA_G1)   06:49 18:07	06:32 20:06	05:25 21:03	04:45 21:47
10	08:32 16:15	13:49 (WEA_G3)   07:49 15:39 (WEA_G2)   17:13	16:11 (WEA_G1)   06:46 18:09	06:30 20:08	05:23 21:05	04:44 21:48
11	08:33 16:16	13:49 (WEA_G3)   07:47 15:41 (WEA_G2)   17:15	16:12 (WEA_G1)   06:44 18:11	06:27 20:10	05:22 21:07	04:44 21:49
12	08:32 16:18	13:49 (WEA_G3)   07:45 15:43 (WEA_G2)   17:17	16:14 (WEA_G1)   06:41 18:13	06:25 20:12	05:20 21:09	04:43 21:50
13	08:31 16:20	13:51 (WEA_G3)   07:43 15:46 (WEA_G2)   17:19	16:15 (WEA_G1)   06:39 18:15	06:23 20:14	05:18 21:11	04:43 21:51
14	08:30 16:21	13:51 (WEA_G3)   07:41 15:48 (WEA_G2)   17:21	16:17 (WEA_G1)   06:36 18:17	06:21 20:16	05:16 21:13	04:43 21:52
15	08:29 16:22	13:51 (WEA_G3)   07:39 15:51 (WEA_G2)   17:23	16:19 (WEA_G1)   06:34 18:19	06:18 20:18	05:14 21:15	04:42 21:53
16	08:28 16:23	13:53 (WEA_G3)   07:37 15:54 (WEA_G2)   17:25	16:21 (WEA_G1)   06:31 18:21	06:15 20:19	05:13 21:17	04:42 21:54
17	08:27 16:24	13:55 (WEA_G3)   07:35 15:57 (WEA_G2)   17:27	16:23 (WEA_G1)   06:29 18:23	06:13 20:21	05:11 21:19	04:42 21:55
18	08:26 16:25	13:56 (WEA_G3)   07:33 16:00 (WEA_G2)   17:29	16:25 (WEA_G1)   06:26 18:25	06:10 20:22	05:09 21:21	04:42 21:56
19	08:25 16:26	13:57 (WEA_G3)   07:31 16:03 (WEA_G2)   17:31	16:27 (WEA_G1)   06:24 18:27	06:08 20:23	05:08 21:23	04:42 21:57
20	08:24 16:27	13:59 (WEA_G3)   07:29 16:06 (WEA_G2)   17:33	16:29 (WEA_G1)   06:21 18:29	06:06 20:24	05:06 21:25	04:42 21:58
21	08:23 16:28	14:01 (WEA_G3)   07:27 16:09 (WEA_G2)   17:35	16:31 (WEA_G1)   06:19 18:31	06:04 20:25	05:05 21:27	04:42 21:59
22	08:21 16:29	14:02 (WEA_G3)   07:25 16:12 (WEA_G2)   17:37	16:33 (WEA_G1)   06:16 18:33	06:01 20:26	05:03 21:29	04:42 22:00
23	08:20 16:30	14:04 (WEA_G3)   07:23 16:15 (WEA_G2)   17:39	16:35 (WEA_G1)   06:14 18:35	05:59 20:27	05:02 21:31	04:42 22:01
24	08:19 16:31	14:06 (WEA_G3)   07:21 16:18 (WEA_G2)   17:41	16:37 (WEA_G1)   06:11 18:37	05:57 20:28	05:01 21:33	04:42 22:02
25	08:17 16:32	14:08 (WEA_G3)   07:19 16:21 (WEA_G2)   17:43	16:39 (WEA_G1)   06:09 18:39	05:55 20:29	05:00 21:35	04:42 22:03
26	08:16 16:33	14:10 (WEA_G3)   07:17 16:24 (WEA_G2)   17:45	16:41 (WEA_G1)   06:06 18:41	05:53 20:30	04:59 21:37	04:42 22:04
27	08:14 16:34	14:12 (WEA_G3)   07:15 16:27 (WEA_G2)   17:47	16:43 (WEA_G1)   06:04 18:43	05:51 20:31	04:58 21:39	04:42 22:05
28	08:13 16:35	14:14 (WEA_G3)   07:13 16:30 (WEA_G2)   17:49	16:45 (WEA_G1)   06:02 18:45	05:49 20:32	04:57 21:41	04:42 22:06
29	08:11 16:36	14:16 (WEA_G3)   07:11 16:33 (WEA_G2)   17:51	16:47 (WEA_G1)   06:00 18:47	05:47 20:33	04:56 21:43	04:42 22:07
30	08:09 16:37	14:18 (WEA_G3)   07:09 16:36 (WEA_G2)   17:53	16:49 (WEA_G1)   05:58 18:49	05:45 20:34	04:55 21:45	04:42 22:08
31	08:08 16:38	14:20 (WEA_G3)   07:07 16:39 (WEA_G2)   17:55	16:51 (WEA_G1)   05:56 18:51	05:43 20:35	04:54 21:47	04:42 22:09
	Sonnenscheinstunden   248	272	367	421	496	513
	astr.max.mögl.Beschattung   1501	286	378	68		

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 20 - IO 20 Poggenpohler Weg 30 (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

	Jul	August	September	Oktober	November	Dezember
1	04:47 21:53 21:53 21:53	05:27 21:17 21:16 21:14	06:23 20:10 20:24 20:07	07:17 18:55 18:53 18:53	07:16 16:44 17:52 18:22	08:12 15:38 16:04 15:58
2	04:47 21:53 21:53 21:53	05:29 21:16 21:16 21:14	06:24 20:10 20:24 20:07	07:19 18:55 18:53 18:53	07:18 16:44 17:52 18:22	08:14 15:38 16:05 15:58
3	04:48 21:53 21:53 21:53	05:31 21:14 21:14 21:14	06:26 20:05 20:05 20:05	07:21 18:50 18:50 18:50	07:20 16:40 17:51 18:21	08:15 15:37 16:05 15:57
4	04:49 21:52 21:52 21:52	05:32 21:12 21:12 21:10	06:28 20:03 20:03 20:00	07:22 18:48 18:48 18:45	07:22 16:38 17:51 18:16	08:17 15:36 16:04 15:56
5	04:50 21:52 21:52 21:52	05:34 21:10 21:10 21:08	06:30 20:00 20:00 19:58	07:24 18:45 18:45 18:43	07:24 16:36 17:51 18:14	08:18 15:35 16:02 15:55
6	04:51 21:51 21:51 21:51	05:36 21:08 21:08 21:06	06:32 19:58 19:58 19:55	07:26 18:43 18:43 18:40	07:26 16:34 17:52 18:08	08:19 15:34 16:00 15:53
7	04:52 21:50 21:50 21:50	05:38 21:06 21:06 21:04	06:33 19:55 19:55 19:52	07:28 18:40 18:40 18:37	07:28 16:32 17:52 18:07	08:21 15:33 16:00 15:52
8	04:53 21:50 21:50 21:50	05:39 21:04 21:04 21:02	06:35 19:53 19:53 19:50	07:30 18:38 18:38 18:35	07:30 16:30 17:52 18:06	08:22 15:32 16:00 15:51
9	04:54 21:49 21:49 21:49	05:41 21:02 21:02 21:00	06:37 19:51 19:51 19:48	07:32 18:36 18:36 18:33	07:32 16:28 17:54 18:08	08:23 15:31 16:00 15:50
10	04:55 21:48 21:48 21:48	05:43 21:00 21:00 20:58	06:39 19:49 19:49 19:46	07:34 18:34 18:34 18:31	07:34 16:26 17:54 18:07	08:25 15:30 16:00 15:49
11	04:56 21:47 21:47 21:47	05:45 20:58 20:58 20:56	06:41 19:47 19:47 19:44	07:36 18:32 18:32 18:29	07:36 16:24 17:56 18:06	08:26 15:29 16:00 15:48
12	04:57 21:46 21:46 21:46	05:47 20:56 20:56 20:54	06:42 19:45 19:45 19:42	07:37 18:30 18:30 18:27	07:38 16:22 17:58 18:05	08:27 15:28 16:00 15:47
13	04:59 21:45 21:45 21:45	05:49 20:54 20:54 20:52	06:44 19:43 19:43 19:40	07:39 18:28 18:28 18:25	07:40 16:20 18:01 18:07	08:28 15:27 16:00 15:46
14	05:00 21:44 21:44 21:44	05:51 20:52 20:52 20:50	06:46 19:41 19:41 19:38	07:41 18:26 18:26 18:23	07:42 16:18 18:03 18:09	08:29 15:26 16:00 15:45
15	05:01 21:43 21:43 21:43	05:52 20:50 20:50 20:48	06:48 19:39 19:39 19:36	07:43 18:24 18:24 18:21	07:43 16:16 18:05 18:11	08:30 15:25 16:00 15:44
16	05:03 21:42 21:42 21:42	05:54 20:47 20:47 20:45	06:50 19:37 19:37 19:34	07:45 18:22 18:22 18:19	07:45 16:14 18:07 18:13	08:31 15:24 16:00 15:43
17	05:04 21:41 21:41 21:41	05:56 20:45 20:45 20:43	06:51 19:35 19:35 19:32	07:47 18:20 18:20 18:17	07:47 16:12 18:09 18:15	08:32 15:23 16:00 15:42
18	05:05 21:39 21:39 21:39	05:57 20:43 20:43 20:41	06:53 19:33 19:33 19:30	07:49 18:18 18:18 18:15	07:49 16:10 18:11 18:17	08:33 15:22 16:00 15:41
19	05:07 21:38 21:38 21:38	05:58 20:41 20:41 20:39	06:55 19:31 19:31 19:28	07:51 18:16 18:16 18:13	07:51 16:08 18:13 18:19	08:34 15:21 16:00 15:40
20	05:09 21:37 21:37 21:37	06:01 20:38 20:38 20:36	06:57 19:29 19:29 19:26	07:53 18:14 18:14 18:11	07:53 16:06 18:15 18:21	08:35 15:20 16:00 15:39
21	05:10 21:35 21:35 21:35	06:03 20:36 20:36 20:34	06:59 19:27 19:27 19:24	07:55 18:12 18:12 18:09	07:55 16:04 18:17 18:23	08:36 15:19 16:00 15:38
22	05:11 21:34 21:34 21:34	06:05 20:34 20:34 20:32	07:01 19:25 19:25 19:22	07:57 18:10 18:10 18:07	07:57 16:02 18:21 18:27	08:37 15:18 16:00 15:37
23	05:13 21:32 21:32 21:32	06:06 20:31 20:31 20:29	07:02 19:23 19:23 19:20	07:59 18:08 18:08 18:05	07:59 16:00 18:23 18:29	08:38 15:17 16:00 15:36
24	05:14 21:31 21:31 21:31	06:08 20:29 20:29 20:27	07:04 19:21 19:21 19:18	08:00 18:06 18:06 18:03	08:00 15:58 18:25 18:31	08:39 15:16 16:00 15:35
25	05:16 21:29 21:29 21:29	06:10 20:27 20:27 20:25	07:06 19:19 19:19 19:16	08:02 18:04 18:04 18:01	08:02 15:56 18:27 18:33	08:40 15:15 16:00 15:34
26	05:17 21:28 21:28 21:28	06:12 20:24 20:24 20:22	07:09 19:17 19:17 19:14	08:04 18:02 18:02 17:59	08:04 15:54 18:29 18:35	08:41 15:14 16:00 15:33
27	05:19 21:26 21:26 21:26	06:14 20:22 20:22 20:20	07:11 19:15 19:15 19:12	08:06 18:00 18:00 17:57	08:06 15:52 18:31 18:37	08:42 15:13 16:00 15:32
28	05:21 21:24 21:24 21:24	06:15 20:19 20:19 20:17	07:13 19:13 19:13 19:10	08:08 17:58 17:58 17:55	08:08 15:50 18:33 18:39	08:43 15:12 16:00 15:31
29	05:22 21:23 21:23 21:23	06:17 20:17 20:17 20:15	07:15 19:11 19:11 19:08	08:10 17:56 17:56 17:53	08:09 15:48 18:35 18:41	08:44 15:11 16:00 15:30
30	05:24 21:21 21:21 21:21	06:19 20:15 20:15 20:13	07:17 19:09 19:09 19:06	08:12 17:54 17:54 17:51	08:10 15:46 18:37 18:43	08:45 15:10 16:00 15:29
31	05:26 21:19 21:19 21:19	06:21 20:12 20:12 20:10	19:04 (WEA 02 (GRN)) 19:41 (WEA 02 (GRN))	07:14 16:46 16:46 16:46	15:42 (WEA_G1) 16:04 (WEA_G1)	08:37 16:02 16:02 16:02
	Sonnenscheinstunden astr.max.mögl.Beschattung	515 461	10 383	215 328	313 257	964 231

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 21 - IO 21 Bäderstraße 24a (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	14:33 (WEA_G2)	08:06	15:49 (WEA_G1)	07:08	16:45 (WEA_RWE01)	06:52	05:41		04:51	20:54 (WEA_42 (RW))
16:03	25	14:58 (WEA_G2)	16:55	15:59 (WEA_G1)	17:52	17:07 (WEA_RWE01)	19:51	21:38		21:38	7 21:01 (WEA_42 (RW))
2	08:37	14:34 (WEA_G2)	08:04		07:05	16:46 (WEA_RWE01)	06:49	05:39		04:50	20:55 (WEA_42 (RW))
16:04	25	14:59 (WEA_G2)	16:57	17:54	20	17:06 (WEA_RWE01)	19:53	20:49		21:40	5 21:00 (WEA_42 (RW))
3	08:37	14:35 (WEA_G2)	08:03	17:03		16:49 (WEA_RWE01)	06:47	05:37	19:26 (WEA_G1 (GRN))	04:49	
16:05	23	14:58 (WEA_G2)	16:59	17:56	15	17:04 (WEA_RWE01)	19:55	20:51	19:27 (WEA_G1 (GRN))	21:41	
4	08:36	14:36 (WEA_G2)	08:01	17:01		16:52 (WEA_RWE01)	06:44	05:35		04:48	
16:07	23	14:59 (WEA_G2)	17:01	17:58	8	17:00 (WEA_RWE01)	19:57	20:53		21:42	
5	08:36	14:36 (WEA_G2)	07:59	16:58		06:42		05:33		04:47	
16:08	22	14:58 (WEA_G2)	17:03	18:03		19:59		20:55		21:43	
6	08:36	14:37 (WEA_G2)	07:57	16:56		06:39		05:31		04:47	
16:09	21	14:58 (WEA_G2)	17:05	18:02		20:01		20:57		21:44	
7	08:35	14:39 (WEA_G2)	07:55	16:53		06:37		05:29		04:46	
16:10	20	14:59 (WEA_G2)	17:07	18:03		20:02		20:58		21:45	
8	08:35	14:39 (WEA_G2)	07:53	16:51		06:34		05:27		04:45	
16:12	19	14:56 (WEA_G2)	17:09	18:05		20:04		21:00		21:46	
9	08:34	14:41 (WEA_G2)	07:51	16:49		06:32		05:25		04:45	
16:13	16	14:57 (WEA_G2)	17:11	18:07		20:05		21:01		21:47	
10	08:33	14:42 (WEA_G2)	07:49	16:46		06:30		05:23		04:44	
16:15	15	14:57 (WEA_G2)	17:13	18:09		20:06		21:02		21:48	
11	08:33	14:44 (WEA_G2)	07:47	16:44		06:27		05:22		04:44	
16:16	14	14:59 (WEA_G2)	17:15	18:11		20:10	19-1 (WEA_43 (RW))	21:06		21:51	
12	08:32	14:46 (WEA_G2)	07:45	16:41		06:25		05:20		04:43	
16:18	11	15:01 (WEA_G2)	17:17	18:13		20:12	2 19-4 (WEA_43 (RW))	21:07		21:52	
13	08:31	14:48 (WEA_G2)	07:43	16:38		06:22		05:18		04:42	
16:20	9	15:03 (WEA_G2)	17:19	18:15		20:14	4 19-3 (WEA_43 (RW))	21:09		21:53	
14	08:30	14:50 (WEA_G2)	07:41	16:40 (WEA_RWE01)	06:20	17:40 (WEA_03 (RW))	06:22	05:16		04:42	
16:21	7	15:03 (WEA_G2)	17:21	18:17	2	17:50 (WEA_03 (RW))	20:12	21:04		21:54	
15	08:29	14:52 (WEA_G2)	07:39	16:47 (WEA_RWE01)	06:18	17:50 (WEA_03 (RW))	06:18	05:14		04:42	
16:23	6	15:07 (WEA_G2)	17:23	18:19	3	17:57 (WEA_03 (RW))	20:16	21:07		21:55	
16	08:28	14:53 (WEA_G2)	07:37	16:44 (WEA_RWE01)	06:16	17:57 (WEA_03 (RW))	06:15	05:13		04:42	
16:25	11	15:09 (WEA_G2)	17:25	18:21	10	16:56 (WEA_RWE01)	18:20	20:15		21:57	
17	08:27	14:54 (WEA_G2)	07:35	16:45 (WEA_RWE01)	06:14	17:59 (WEA_03 (RW))	06:13	05:11		04:42	
16:26	12	15:01 (WEA_G2)	17:26	18:23	14	16:59 (WEA_RWE01)	18:23	20:16		21:58	
18	08:26	14:56 (WEA_G2)	07:33	16:49 (WEA_RWE01)	06:12	17:56 (WEA_03 (RW))	06:12	05:09		04:42	
16:28	13	15:03 (WEA_G2)	17:28	18:25	2	17:58 (WEA_03 (RW))	20:17	21:08		21:59	
19	08:25	14:59 (WEA_G2)	07:31	16:49 (WEA_RWE01)	06:10	17:55 (WEA_03 (RW))	06:09	05:08		04:42	
16:30	16	15:05 (WEA_G2)	17:30	18:27	5	18:00 (WEA_03 (RW))	20:25	21:19		21:59	
20	08:24	14:58 (WEA_G2)	07:29	16:49 (WEA_RWE01)	06:08	17:54 (WEA_03 (RW))	06:08	05:06		04:42	
16:32	15	15:06 (WEA_G2)	17:32	18:28	7	18:01 (WEA_03 (RW))	20:27	21:21		21:54	1 21:15 (WEA_43 (RW))
21	08:23	14:59 (WEA_G2)	07:26	16:44 (WEA_RWE01)	06:06	17:54 (WEA_03 (RW))	06:04	05:04		04:42	1 21:15 (WEA_43 (RW))
16:34	14	15:09 (WEA_G2)	17:34	18:30	10	18:04 (WEA_03 (RW))	20:30	21:23		21:54	1 21:15 (WEA_43 (RW))
22	08:22	14:50 (WEA_G2)	07:24	16:42 (WEA_RWE01)	06:04	17:56 (WEA_03 (RW))	06:02	05:02	20:50 (WEA_42 (RW))	04:42	1 21:15 (WEA_43 (RW))
16:35	13	15:01 (WEA_G2)	17:36	18:29	11	18:05 (WEA_03 (RW))	20:31	21:24	1 20:51 (WEA_42 (RW))	21:54	1 21:15 (WEA_43 (RW))
23	08:21	14:50 (WEA_G2)	07:22	16:40 (WEA_RWE01)	06:02	17:55 (WEA_03 (RW))	06:00	05:00	20:50 (WEA_42 (RW))	04:42	
16:37	12	15:03 (WEA_G2)	17:37	18:31	11	18:06 (WEA_03 (RW))	20:32	21:25	3 20:50 (WEA_42 (RW))	21:54	
24	08:20	14:50 (WEA_G2)	07:19	16:42 (WEA_RWE01)	06:01	17:56 (WEA_03 (RW))	05:57	05:00	20:50 (WEA_42 (RW))	04:42	
16:38	11	15:04 (WEA_G2)	17:38	18:32	8	18:04 (WEA_03 (RW))	20:34	21:26	3 20:50 (WEA_42 (RW))	21:54	
25	08:19	14:51 (WEA_G2)	07:17	16:42 (WEA_RWE01)	05:59	17:56 (WEA_03 (RW))	05:54	04:59	20:50 (WEA_42 (RW))	04:42	
16:41	10	15:05 (WEA_G2)	17:40	18:33	29	17:13 (WEA_RWE01)	18:38	20:35	5 20:55 (WEA_42 (RW))	21:55	
26	08:18	14:51 (WEA_G2)	07:15	16:43 (WEA_RWE01)	05:57	17:56 (WEA_03 (RW))	05:52	04:58	20:50 (WEA_42 (RW))	04:42	
16:43	9	15:06 (WEA_G2)	17:42	18:34	28	17:14 (WEA_RWE01)	18:40	20:38	6 20:56 (WEA_42 (RW))	21:55	
27	08:17	14:51 (WEA_G2)	07:12	16:43 (WEA_RWE01)	05:56	18:03 (WEA_02 (RW))	05:51	04:57	20:51 (WEA_42 (RW))	04:42	
16:45	23	15:06 (WEA_G2)	17:44	18:35	2	18:05 (WEA_02 (RW))	20:42	21:32	7 20:58 (WEA_42 (RW))	21:54	
28	08:16	14:53 (WEA_G2)	07:10	16:44 (WEA_RWE01)	05:54	18:02 (WEA_02 (RW))	05:49	04:55	20:51 (WEA_42 (RW))	04:42	
16:47	21	15:06 (WEA_G2)	17:46	18:36	4	18:03 (WEA_02 (RW))	20:42	21:33	8 20:59 (WEA_42 (RW))	21:54	
29	08:15	14:54 (WEA_G2)	07:08	16:45 (WEA_RWE01)	05:53	18:03 (WEA_02 (RW))	05:48	04:54	20:52 (WEA_42 (RW))	04:42	
16:49	19	15:07 (WEA_G2)	17:48	18:37	6	18:03 (WEA_02 (RW))	20:44	21:35	9 21:00 (WEA_42 (RW))	21:54	
30	08:14	14:54 (WEA_G2)	07:06	16:45 (WEA_RWE01)	05:52	18:04 (WEA_02 (RW))	05:44	04:53	20:52 (WEA_42 (RW))	04:42	
16:51	17	15:07 (WEA_G2)	17:50	18:37	6	18:02 (WEA_02 (RW))	20:46	21:36	9 21:01 (WEA_42 (RW))	21:54	
31	08:14	14:57 (WEA_G2)	07:04	16:46 (WEA_RWE01)	05:51	18:04 (WEA_02 (RW))	05:44	04:52	20:52 (WEA_42 (RW))	04:42	
16:53	16	15:01 (WEA_G2)	17:52	18:39				21:37	8 21:01 (WEA_42 (RW))		
Sonneneinstrahlung		248		277		421		492		513	
sch. (maxim.) Beschattung		553		521		311		57		35	

**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)	Schattende	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 21 - IO 21 Bäderstraße 24a (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	10:47	05:27	06:23	19:40 (WEA 43 (RW))	07:17	07:15		08:12	14:25 (WEA_G2)		
	12:54	07:17	08:10	19:41 (WEA 43 (RW))	08:55	16:44		15:58	12	14:38 (WEA_G2)	
2	10:47	05:29	06:24		07:19	07:18		08:14	14:25 (WEA_G2)		
	12:53	07:16	08:07		08:53	16:42		15:58	15	14:40 (WEA_G2)	
3	10:48	05:31	06:26		07:21	07:20		08:15	14:25 (WEA_G2)		
	12:53	07:14	08:05		08:50	16:40		15:57	16	14:41 (WEA_G2)	
4	10:49	05:32	06:28		07:22	07:22		08:17	14:24 (WEA_G2)		
	12:52	07:12	08:00		08:48	16:38		15:56	18	14:42 (WEA_G2)	
5	10:50	05:34	06:30		07:24	07:24		08:18	14:24 (WEA_G2)		
	12:52	07:10	08:00		08:45	16:36		15:56	20	14:44 (WEA_G2)	
6	10:51	05:36	06:32		07:26	07:26		08:19	14:23 (WEA_G2)		
	12:51	07:08	08:03		08:43	16:34		15:55	21	14:44 (WEA_G2)	
7	10:52	05:38	06:33		07:28	07:28		08:21	14:23 (WEA_G2)		
	12:50	07:06	08:00		08:40	16:32		15:55	23	14:46 (WEA_G2)	
8	10:53	05:39	06:35		07:30	07:30		08:22	14:23 (WEA_G2)		
	12:50	07:04	08:00		08:38	16:30		15:54	23	14:46 (WEA_G2)	
9	10:54	05:41	06:37	19:39 (WEA 41 (RW))	07:31	07:31		08:23	14:24 (WEA_G2)		
	12:49	07:02	08:00	19:39 (WEA 41 (RW))	07:31	07:31		08:23	23	14:47 (WEA_G2)	
10	10:55	05:43	06:39	19:40 (WEA 41 (RW))	07:34	07:34	17:05 (WEA_WEGE1)	07:34	15:18 (WEA_G1)	08:23	14:24 (WEA_G2)
	12:48	07:00	08:00	19:41 (WEA 41 (RW))	07:34	07:34	17:05 (WEA_WEGE1)	07:34	15:18 (WEA_G1)	08:23	14:46 (WEA_G2)
11	10:56	05:45	06:41		07:35	07:35	17:06 (WEA_WEGE1)	07:35	15:18 (WEA_G1)	08:26	14:23 (WEA_G2)
	12:47	06:58	08:00		07:36	07:36	17:06 (WEA_WEGE1)	07:36	15:18 (WEA_G1)	08:26	14:43 (WEA_G2)
12	10:57	05:47	06:42		07:37	07:37	17:07 (WEA_WEGE1)	07:37	15:17 (WEA_G1)	08:27	14:23 (WEA_G2)
	12:46	06:59	08:00		07:38	07:38	17:07 (WEA_WEGE1)	07:38	15:17 (WEA_G1)	08:27	14:43 (WEA_G2)
13	10:59	05:49	06:44	19:40 (WEA 02 (SHF))	07:39	07:39	17:08 (WEA_WEGE1)	07:39	15:16 (WEA_G1)	08:28	14:24 (WEA_G2)
	12:45	07:00	08:00	19:41 (WEA 02 (SHF))	07:39	07:39	17:08 (WEA_WEGE1)	07:39	15:16 (WEA_G1)	08:28	14:44 (WEA_G2)
14	10:59	05:50	06:46	19:40 (WEA 02 (SHF))	07:41	07:41	17:09 (WEA_WEGE1)	07:41	15:15 (WEA_G1)	08:29	14:24 (WEA_G2)
	12:44	07:02	08:00	19:41 (WEA 02 (SHF))	07:41	07:41	17:09 (WEA_WEGE1)	07:41	15:15 (WEA_G1)	08:29	14:44 (WEA_G2)
15	10:59	05:52	06:48	19:41 (WEA 02 (SHF))	07:43	07:43	17:10 (WEA_WEGE1)	07:43	15:14 (WEA_G1)	08:30	14:24 (WEA_G2)
	12:43	07:04	08:00	19:42 (WEA 02 (SHF))	07:43	07:43	17:10 (WEA_WEGE1)	07:43	15:14 (WEA_G1)	08:30	14:44 (WEA_G2)
16	10:59	05:54	06:50	19:41 (WEA 02 (SHF))	07:45	07:45	17:11 (WEA_WEGE1)	07:45	15:14 (WEA_G1)	08:31	14:23 (WEA_G2)
	12:42	07:06	08:00	19:42 (WEA 02 (SHF))	07:45	07:45	17:11 (WEA_WEGE1)	07:45	15:14 (WEA_G1)	08:31	14:43 (WEA_G2)
17	10:59	05:55	06:51	19:41 (WEA 02 (SHF))	07:47	07:47	17:12 (WEA_WEGE1)	07:47	15:13 (WEA_G1)	08:32	14:23 (WEA_G2)
	12:41	07:08	08:00	19:42 (WEA 02 (SHF))	07:47	07:47	17:12 (WEA_WEGE1)	07:47	15:13 (WEA_G1)	08:32	14:43 (WEA_G2)
18	10:59	05:57	06:53	19:41 (WEA 02 (SHF))	07:49	07:49	17:13 (WEA_WEGE1)	07:49	15:12 (WEA_G1)	08:33	14:23 (WEA_G2)
	12:40	07:10	08:00	19:42 (WEA 02 (SHF))	07:49	07:49	17:13 (WEA_WEGE1)	07:49	15:12 (WEA_G1)	08:33	14:43 (WEA_G2)
19	10:59	05:58	06:55	19:41 (WEA 02 (SHF))	07:51	07:51	17:14 (WEA_WEGE1)	07:51	15:11 (WEA_G1)	08:34	14:23 (WEA_G2)
	12:39	07:12	08:00	19:42 (WEA 02 (SHF))	07:51	07:51	17:14 (WEA_WEGE1)	07:51	15:11 (WEA_G1)	08:34	14:43 (WEA_G2)
20	10:59	05:59	06:56	19:41 (WEA 02 (SHF))	07:53	07:53	17:15 (WEA_WEGE1)	07:53	15:10 (WEA_G1)	08:35	14:23 (WEA_G2)
	12:38	07:14	08:00	19:42 (WEA 02 (SHF))	07:53	07:53	17:15 (WEA_WEGE1)	07:53	15:10 (WEA_G1)	08:35	14:43 (WEA_G2)
21	10:59	06:00	06:57	19:41 (WEA 02 (SHF))	07:55	07:55	17:16 (WEA_WEGE1)	07:55	15:09 (WEA_G1)	08:36	14:23 (WEA_G2)
	12:37	07:16	08:00	19:42 (WEA 02 (SHF))	07:55	07:55	17:16 (WEA_WEGE1)	07:55	15:09 (WEA_G1)	08:36	14:43 (WEA_G2)
22	10:59	06:02	06:59	19:41 (WEA 02 (SHF))	07:57	07:57	17:17 (WEA_WEGE1)	07:57	15:08 (WEA_G1)	08:37	14:23 (WEA_G2)
	12:36	07:18	08:00	19:42 (WEA 02 (SHF))	07:57	07:57	17:17 (WEA_WEGE1)	07:57	15:08 (WEA_G1)	08:37	14:43 (WEA_G2)
23	10:59	06:04	07:00	19:41 (WEA 02 (SHF))	07:59	07:59	17:18 (WEA_WEGE1)	07:59	15:07 (WEA_G1)	08:38	14:23 (WEA_G2)
	12:35	07:20	08:00	19:42 (WEA 02 (SHF))	07:59	07:59	17:18 (WEA_WEGE1)	07:59	15:07 (WEA_G1)	08:38	14:43 (WEA_G2)
24	10:59	06:06	07:02	19:41 (WEA 02 (SHF))	08:00	08:00	17:19 (WEA_WEGE1)	08:00	15:06 (WEA_G1)	08:39	14:23 (WEA_G2)
	12:34	07:22	08:00	19:42 (WEA 02 (SHF))	08:00	08:00	17:19 (WEA_WEGE1)	08:00	15:06 (WEA_G1)	08:39	14:43 (WEA_G2)
25	10:59	06:08	07:04	19:41 (WEA 02 (SHF))	08:02	08:02	17:20 (WEA_WEGE1)	08:02	15:05 (WEA_G1)	08:40	14:23 (WEA_G2)
	12:33	07:24	08:00	19:42 (WEA 02 (SHF))	08:02	08:02	17:20 (WEA_WEGE1)	08:02	15:05 (WEA_G1)	08:40	14:43 (WEA_G2)
26	10:59	06:10	07:06	19:41 (WEA 02 (SHF))	08:04	08:04	17:21 (WEA_WEGE1)	08:04	15:04 (WEA_G1)	08:41	14:23 (WEA_G2)
	12:32	07:26	08:00	19:42 (WEA 02 (SHF))	08:04	08:04	17:21 (WEA_WEGE1)	08:04	15:04 (WEA_G1)	08:41	14:43 (WEA_G2)
27	10:59	06:12	07:08	19:41 (WEA 02 (SHF))	08:06	08:06	17:22 (WEA_WEGE1)	08:06	15:03 (WEA_G1)	08:42	14:23 (WEA_G2)
	12:31	07:28	08:00	19:42 (WEA 02 (SHF))	08:06	08:06	17:22 (WEA_WEGE1)	08:06	15:03 (WEA_G1)	08:42	14:43 (WEA_G2)
28	10:59	06:14	07:10	19:41 (WEA 02 (SHF))	08:08	08:08	17:23 (WEA_WEGE1)	08:08	15:02 (WEA_G1)	08:43	14:23 (WEA_G2)
	12:30	07:30	08:00	19:42 (WEA 02 (SHF))	08:08	08:08	17:23 (WEA_WEGE1)	08:08	15:02 (WEA_G1)	08:43	14:43 (WEA_G2)
29	10:59	06:16	07:12	19:41 (WEA 02 (SHF))	08:10	08:10	17:24 (WEA_WEGE1)	08:10	15:01 (WEA_G1)	08:44	14:23 (WEA_G2)
	12:29	07:32	08:00	19:42 (WEA 02 (SHF))	08:10	08:10	17:24 (WEA_WEGE1)	08:10	15:01 (WEA_G1)	08:44	14:43 (WEA_G2)
30	10:59	06:18	07:14	19:41 (WEA 02 (SHF))	08:12	08:12	17:25 (WEA_WEGE1)	08:12	15:00 (WEA_G1)	08:45	14:23 (WEA_G2)
	12:28	07:34	08:00	19:42 (WEA 02 (SHF))	08:12	08:12	17:25 (WEA_WEGE1)	08:12	15:00 (WEA_G1)	08:45	14:43 (WEA_G2)
31	10:59	06:20	07:16	19:41 (WEA 02 (SHF))	08:14	08:14	17:26 (WEA_WEGE1)	08:14	14:59 (WEA_G1)	08:46	14:23 (WEA_G2)
	12:27	07:36	08:00	19:42 (WEA 02 (SHF))	08:14	08:14	17:26 (WEA_WEGE1)	08:14	14:59 (WEA_G1)	08:46	14:43 (WEA_G2)
Sommerfestbelastung		015	461	383	379	357	357	371	732		
sch. max/mgl. Beschattung		73	13	79	379	357	357	371	732		

**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)



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 22 - IO 22 Achterhof (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	14:21 (WEA 02)	08:06		10:08	16:40 (WEA RW01)	06:52	19:16 (WEA 02 (GRN))	05:41		04:51
1	16:03	14:43 (WEA 02)	16:55		17:52	17:06 (WEA RW01)	19:51	8	19:24 (WEA 02 (GRN))	20:47	21:38
2	08:37	14:22 (WEA 02)	08:04		10:05	16:41 (WEA RW01)	06:49		19:18 (WEA 02 (GRN))	05:39	04:50
1	16:04	14:43 (WEA 02)	16:57		17:54	17:05 (WEA RW01)	19:53	6	19:24 (WEA 02 (GRN))	20:49	21:40
3	08:37	14:23 (WEA 02)	08:03		10:03	16:43 (WEA RW01)	06:47		19:20 (WEA 01 (GRN))	05:37	04:49
1	16:05	14:42 (WEA 02)	16:59		17:56	17:04 (WEA RW01)	19:55		19:22 (WEA 01 (GRN))	20:51	21:41
4	08:36	14:24 (WEA 02)	08:01		10:01	16:45 (WEA RW01)	06:44		19:28 (WEA 01 (GRN))	05:35	04:48
1	16:07	14:43 (WEA 02)	17:01		17:58	17:01 (WEA RW01)	19:57	2	19:30 (WEA 01 (GRN))	20:53	21:42
5	08:36	14:25 (WEA 02)	07:59		10:00	16:49 (WEA RW01)	06:42		19:30 (WEA 01 (GRN))	05:33	04:47
1	16:08	14:42 (WEA 02)	17:03		18:00	16:57 (WEA RW01)	19:59	2	19:32 (WEA 01 (GRN))	20:55	21:43
6	08:36	14:26 (WEA 02)	07:57		10:06		06:39		19:32 (WEA 01 (GRN))	05:31	04:47
1	16:09	14:43 (WEA 02)	17:05		18:02	20:01	19:33 (WEA 01 (GRN))	20:57		21:44	21:04 (WEA 42 (RW))
7	08:35	14:29 (WEA 02)	07:55		10:03	06:37		06:29	20:26 (WEA 41 (RW))	04:46	21:04 (WEA 42 (RW))
1	16:10	14:33 (WEA 02)	17:07		18:03	20:02		06:28	1	20:27 (WEA 41 (RW))	21:45
8	08:35	14:30 (WEA 02)	07:53		10:01	06:34		06:24		06:45	21:05 (WEA 42 (RW))
1	16:12	14:35 (WEA 02)	17:09		18:05	20:04		06:23	2	20:28 (WEA 41 (RW))	21:46
9	08:34	14:36 (WEA 02)	07:51		10:00	06:32		06:20		06:45	21:04 (WEA 42 (RW))
1	16:13	14:36 (WEA 02)	17:11		18:07	20:05		06:19	7	21:17 (WEA 42 (RW))	21:47
10	08:33	14:38 (WEA 02)	07:49		10:00	06:32		06:18		06:44	21:05 (WEA 42 (RW))
1	16:15	14:39 (WEA 02)	17:13		18:09	20:06		06:17	7	21:17 (WEA 42 (RW))	21:47
11	08:33	14:38 (WEA 02)	07:47		10:00	06:32		06:16		06:44	21:05 (WEA 42 (RW))
1	16:16	14:39 (WEA 02)	17:15		18:11	20:07		06:15	7	21:17 (WEA 42 (RW))	21:48
12	08:32	14:38 (WEA 02)	07:45		10:00	06:31		06:15		06:43	21:05 (WEA 42 (RW))
1	16:18	14:41 (WEA 02)	17:17		18:13	20:08		06:14	8	21:18 (WEA 42 (RW))	21:50
13	08:31	14:38 (WEA 02)	07:43	16:48 (WEA RW01)	06:29		06:12		06:43	21:05 (WEA 42 (RW))	21:48
1	16:20	14:43 (WEA 02)	17:19	6	18:15 (WEA RW01)	18:15	20:10		20:29	21:50	21:18 (WEA 42 (RW))
14	08:30	14:39 (WEA 02)	07:41	16:48 (WEA RW01)	06:26	17:40 (WEA 03 (RW))	06:12	19:43 (WEA 43 (RW))	06:16	06:43	21:05 (WEA 42 (RW))
1	16:21	14:46 (WEA 02)	17:22	8	18:15 (WEA RW01)	18:17	20:11	19:43 (WEA 43 (RW))	06:16	21:21	21:53
15	08:29	14:39 (WEA 02)	07:39	16:48 (WEA RW01)	06:23	17:40 (WEA 03 (RW))	06:10	19:43 (WEA 43 (RW))	06:14	06:42	21:05 (WEA 42 (RW))
1	16:23	14:47 (WEA 02)	17:24	10	18:16 (WEA RW01)	18:19	20:12	19:43 (WEA 43 (RW))	06:13	21:22	21:54
16	08:28	14:39 (WEA 02)	07:37	16:48 (WEA RW01)	06:21	17:40 (WEA 03 (RW))	06:09	19:43 (WEA 43 (RW))	06:12	06:42	21:05 (WEA 42 (RW))
1	16:25	14:49 (WEA 02)	17:26	15	18:16 (WEA RW01)	18:20	20:13	19:43 (WEA 43 (RW))	06:11	21:22	21:54
17	08:27	14:40 (WEA 02)	07:35	16:48 (WEA RW01)	06:19	17:40 (WEA 03 (RW))	06:08	19:43 (WEA 43 (RW))	06:10	06:42	21:05 (WEA 42 (RW))
1	16:27	14:51 (WEA 02)	17:28	16	18:17 (WEA RW01)	18:22	20:14	19:43 (WEA 43 (RW))	06:09	21:23	21:55
18	08:26	14:40 (WEA 02)	07:33	16:48 (WEA RW01)	06:17	17:40 (WEA 03 (RW))	06:07	19:43 (WEA 43 (RW))	06:09	06:42	21:05 (WEA 42 (RW))
1	16:28	14:53 (WEA 02)	17:30	21	18:17 (WEA RW01)	18:23	20:15	19:43 (WEA 43 (RW))	06:08	21:23	21:55
19	08:25	14:40 (WEA 02)	07:31	16:48 (WEA RW01)	06:15	17:40 (WEA 03 (RW))	06:06	19:43 (WEA 43 (RW))	06:08	06:42	21:05 (WEA 42 (RW))
1	16:30	14:55 (WEA 02)	17:32	21	18:18 (WEA RW01)	18:24	20:16	19:43 (WEA 43 (RW))	06:07	21:24	21:56
20	08:24	14:40 (WEA 02)	07:29	16:48 (WEA RW01)	06:13	17:40 (WEA 03 (RW))	06:05	19:43 (WEA 43 (RW))	06:07	06:42	21:05 (WEA 42 (RW))
1	16:32	14:56 (WEA 02)	17:34	26	18:18 (WEA RW01)	18:25	20:17	19:43 (WEA 43 (RW))	06:06	21:24	21:56
21	08:23	14:41 (WEA 02)	07:27	16:48 (WEA RW01)	06:11	17:40 (WEA 03 (RW))	06:04	19:43 (WEA 43 (RW))	06:06	06:42	21:05 (WEA 42 (RW))
1	16:34	14:57 (WEA 02)	17:36	30	18:19 (WEA RW01)	18:26	20:18	19:43 (WEA 43 (RW))	06:05	21:25	21:56
22	08:22	14:42 (WEA 02)	07:25	16:48 (WEA RW01)	06:09	17:40 (WEA 03 (RW))	06:03	19:43 (WEA 43 (RW))	06:05	06:42	21:05 (WEA 42 (RW))
1	16:35	14:58 (WEA 02)	17:38	31	18:19 (WEA RW01)	18:27	20:19	19:43 (WEA 43 (RW))	06:04	21:25	21:56
23	08:21	14:42 (WEA 02)	07:23	16:48 (WEA RW01)	06:07	17:40 (WEA 03 (RW))	06:02	19:43 (WEA 43 (RW))	06:04	06:42	21:05 (WEA 42 (RW))
1	16:37	14:59 (WEA 02)	17:40	31	18:20 (WEA RW01)	18:28	20:20	19:43 (WEA 43 (RW))	06:03	21:26	21:56
24	08:20	14:43 (WEA 02)	07:21	16:48 (WEA RW01)	06:05	17:40 (WEA 03 (RW))	06:01	19:43 (WEA 43 (RW))	06:03	06:42	21:05 (WEA 42 (RW))
1	16:39	15:00 (WEA 02)	17:42	31	18:20 (WEA RW01)	18:29	20:21	19:43 (WEA 43 (RW))	06:02	21:26	21:56
25	08:19	14:43 (WEA 02)	07:19	16:48 (WEA RW01)	06:03	17:40 (WEA 03 (RW))	06:00	19:43 (WEA 43 (RW))	06:02	06:42	21:05 (WEA 42 (RW))
1	16:41	15:01 (WEA 02)	17:44	32	18:21 (WEA RW01)	18:30	20:22	19:43 (WEA 43 (RW))	06:01	21:27	21:56
26	08:18	14:43 (WEA 02)	07:17	16:48 (WEA RW01)	06:01	17:40 (WEA 03 (RW))	05:59	19:43 (WEA 43 (RW))	06:01	06:42	21:05 (WEA 42 (RW))
1	16:43	15:02 (WEA 02)	17:46	32	18:21 (WEA RW01)	18:30	20:23	19:43 (WEA 43 (RW))	06:00	21:27	21:56
27	08:17	14:43 (WEA 02)	07:15	16:48 (WEA RW01)	05:59	17:40 (WEA 03 (RW))	05:58	19:43 (WEA 43 (RW))	06:00	06:42	21:05 (WEA 42 (RW))
1	16:45	15:03 (WEA 02)	17:48	30	18:22 (WEA RW01)	18:31	20:24	19:43 (WEA 43 (RW))	05:59	21:28	21:56
28	08:16	14:43 (WEA 02)	07:13	16:48 (WEA RW01)	05:57	17:40 (WEA 03 (RW))	05:57	19:43 (WEA 43 (RW))	05:59	06:42	21:05 (WEA 42 (RW))
1	16:47	15:04 (WEA 02)	17:50	29	18:22 (WEA RW01)	18:31	20:25	19:43 (WEA 43 (RW))	05:58	21:28	21:56
29	08:15	14:43 (WEA 02)	07:11	16:48 (WEA RW01)	05:55	17:40 (WEA 03 (RW))	05:56	19:43 (WEA 43 (RW))	05:58	06:42	21:05 (WEA 42 (RW))
1	16:49	15:05 (WEA 02)	17:52	31	18:23 (WEA RW01)	18:32	20:26	19:43 (WEA 43 (RW))	05:57	21:29	21:56
30	08:14	14:43 (WEA 02)	07:09	16:48 (WEA RW01)	05:53	17:40 (WEA 03 (RW))	05:55	19:43 (WEA 43 (RW))	05:57	06:42	21:05 (WEA 42 (RW))
1	16:51	15:06 (WEA 02)	17:54	31	18:23 (WEA RW01)	18:32	20:27	19:43 (WEA 43 (RW))	05:56	21:29	21:56
31	08:13	14:43 (WEA 02)	07:07	16:48 (WEA RW01)	05:51	17:40 (WEA 03 (RW))	05:54	19:43 (WEA 43 (RW))	05:56	06:42	21:05 (WEA 42 (RW))
1	16:53	15:07 (WEA 02)	17:56	6	18:24 (WEA RW01)	18:33	20:28	19:43 (WEA 43 (RW))	05:55	21:30	21:56
Sommerzeitbeginn											
ab: rechnerische Beschattung											
	587		273	378		392		421	411		221

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

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



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 22 - IO 22 Achterhof (Gosdorf)

### Annahmen für Schattenwurfberechnung

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

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

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



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 23 - IO 23 Ratjensdorfer Felde 2

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37	15:22 (WEA 15 (GCN))	08:06	15:51 (WEA_G3)	07:08	06:52
	16:03	3 15:25 (WEA 15 (GCN))	16:55	29 16:22 (WEA_G2)	17:52	19:51
2	08:37	15:21 (WEA 15 (GCN))	08:04	15:51 (WEA_G3)	07:05	06:49
	16:04	4 15:25 (WEA 15 (GCN))	16:57	32 16:25 (WEA_G2)	17:54	19:53
3	08:37	15:22 (WEA 15 (GCN))	08:02	15:52 (WEA_G3)	07:03	06:47
	16:05	5 15:27 (WEA 15 (GCN))	16:59	33 16:27 (WEA_G2)	17:56	19:55
4	08:36	15:24 (WEA 15 (GCN))	08:01	15:53 (WEA_G3)	07:01	06:44
	16:06	5 15:29 (WEA 15 (GCN))	17:01	33 16:29 (WEA_G2)	17:58	19:57
5	08:36	15:24 (WEA 15 (GCN))	07:59	15:54 (WEA_G3)	06:58	17:32 (WEA RWE01)
	16:08	6 15:30 (WEA 15 (GCN))	17:03	34 16:31 (WEA_G2)	18:00	19:59
6	08:36	15:24 (WEA 15 (GCN))	07:57	15:55 (WEA_G3)	06:56	17:30 (WEA RWE01)
	16:09	7 15:31 (WEA 15 (GCN))	17:05	14 16:34 (WEA_G2)	18:01	19:59
7	08:15	15:26 (WEA 15 (GCN))	07:55	15:57 (WEA_G3)	06:53	17:30 (WEA RWE01)
	16:10	7 15:33 (WEA 15 (GCN))	17:07	33 16:36 (WEA_G2)	18:03	19:59
8	08:35	15:26 (WEA 15 (GCN))	07:53	16:00 (WEA_G3)	06:51	17:29 (WEA RWE01)
	16:12	8 15:34 (WEA 15 (GCN))	17:09	29 16:38 (WEA_G2)	18:05	19:59
9	08:14	15:28 (WEA 15 (GCN))	07:51	16:19 (WEA_G2)	06:48	17:29 (WEA RWE01)
	16:13	5 15:33 (WEA 15 (GCN))	17:11	19 16:38 (WEA_G2)	18:07	19:59
10	08:33	15:30 (WEA 15 (GCN))	07:49	16:21 (WEA_G2)	06:46	17:29 (WEA RWE01)
	16:15	1 15:31 (WEA 15 (GCN))	17:13	16 16:37 (WEA_G2)	18:09	19:59
11	08:33		07:47	16:22 (WEA_G2)	06:44	17:29 (WEA RWE01)
	16:16		17:15	14 16:36 (WEA_G2)	18:11	19:59
12	08:32		07:45	16:24 (WEA_G2)	06:41	17:30 (WEA RWE01)
	16:18		17:17	11 16:35 (WEA_G2)	18:13	19:59
13	08:31		07:43	16:28 (WEA_G2)	06:39	17:31 (WEA RWE01)
	16:20		17:19	1 16:31 (WEA_G2)	18:15	19:59
14	08:30		07:41		06:36	17:33 (WEA RWE01)
	16:21		17:21		18:17	19:59
15	08:29		07:39		06:34	17:41 (WEA RWE01)
	16:23		17:23		18:19	19:59
16	08:28		07:37		06:31	17:45 (WEA RWE01)
	16:25		17:26		18:21	19:59
17	08:27		07:35		06:29	17:45 (WEA RWE01)
	16:26		17:28		18:23	19:59
18	08:26		07:33		06:26	17:44 (WEA RWE01)
	16:28		17:30		18:25	19:59
19	08:25	15:52 (WEA_G3)	07:30	06:24	17:42 (WEA RWE01)	19:59
	16:30	3 15:55 (WEA_G3)	17:32	18:27	20:25	21:19
20	08:24	15:51 (WEA_G3)	07:28	06:21	17:45 (WEA RWE01)	19:59
	16:32	5 15:56 (WEA_G3)	17:34	18:28	20:27	21:21
21	08:23	15:51 (WEA_G3)	07:26	06:19	17:45 (WEA RWE01)	19:59
	16:34	8 15:59 (WEA_G3)	17:36	18:30	20:29	21:23
22	08:21	15:50 (WEA_G3)	07:24	06:16	17:45 (WEA RWE01)	19:59
	16:35	10 16:00 (WEA_G3)	17:38	18:32	20:31	21:24
23	08:20	15:50 (WEA_G3)	07:21	06:14	17:45 (WEA RWE01)	19:59
	16:37	13 16:03 (WEA_G3)	17:40	18:34	20:32	21:26
24	08:19	15:50 (WEA_G3)	07:19	06:11	17:45 (WEA RWE01)	19:59
	16:39	15 16:05 (WEA_G3)	17:42	18:36	20:34	21:27
25	08:17	15:50 (WEA_G3)	07:17	06:09	17:45 (WEA RWE01)	19:59
	16:41	18 16:08 (WEA_G3)	17:44	18:38	20:36	21:29
26	08:16	15:50 (WEA_G3)	07:15	06:06	18:12 (WEA 03 (GRN))	20:36
	16:43	19 16:09 (WEA_G3)	17:46	18:40	18:13 (WEA 03 (GRN))	20:38
27	08:14	15:50 (WEA_G3)	07:12	06:04		20:38
	16:45	21 16:11 (WEA_G3)	17:48	18:42		20:40
28	08:13	15:50 (WEA_G3)	07:10	06:01		20:40
	16:47	24 16:14 (WEA_G3)	17:50	18:44		20:42
29	08:11	15:50 (WEA_G3)		06:59		20:44
	16:49	26 16:16 (WEA_G3)		19:45		20:44
30	08:09	15:50 (WEA_G3)		06:57		20:46
	16:51	27 16:17 (WEA_G3)		19:47		20:46
31	08:08	15:51 (WEA_G3)		06:54		20:47
	16:53	26 16:17 (WEA_G3)		19:49		20:47
Sonnenscheinstunden	248	272	367	421	496	513
astr. max. mögl. Beschattung	266	320	99			

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 23 - IO 23 Ratjensdorfer Felde 2

### Annahmen für Schattenwurfberechnung

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

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

	July	August	September	Oktober	November	Dezember
1	04:47 21:53	05:27 21:17	06:23 20:10	07:17 18:55	07:16 16:44	08:12 15:58
2	04:47 21:53	05:29 21:16	06:24 20:07	07:19 18:53	14 18:08 (WEA RWE01) 18:23 (WEA RWE01)	17 16:07 (WEA G2) 16:42 (WEA G2)
3	04:48 21:53	05:31 21:14	06:26 20:05	07:20 18:50	15 18:07 (WEA RWE01) 18:21 (WEA RWE01)	19 15:29 (WEA G3) 16:08 (WEA G2)
4	04:49 21:52	05:32 21:12	06:28 20:03	07:22 18:48	15 18:06 (WEA RWE01) 18:19 (WEA RWE01)	30 15:27 (WEA G3) 16:38 (WEA G2)
5	04:50 21:52	05:34 21:10	06:30 20:00	07:24 18:45	13 18:06 (WEA RWE01) 18:16 (WEA RWE01)	32 15:26 (WEA G3) 16:36 (WEA G2)
6	04:51 21:51	05:36 21:08	06:32 19:58	07:26 18:43	10 18:06 (WEA RWE01) 18:14 (WEA RWE01)	33 15:25 (WEA G3) 16:34 (WEA G2)
7	04:52 21:50	05:38 21:06	06:33 19:55	07:29 18:40	8 18:06 (WEA RWE01) 18:11 (WEA RWE01)	34 15:24 (WEA G3) 16:32 (WEA G2)
8	04:53 21:50	05:39 21:04	06:35 19:53	07:32 18:38	5 18:07 (WEA RWE01) 18:09 (WEA RWE01)	34 15:23 (WEA G3) 16:30 (WEA G2)
9	04:54 21:49	05:41 21:02	06:37 19:50	07:32 18:36	2 18:09 (WEA RWE01) 18:08 (WEA RWE01)	32 15:22 (WEA G3) 16:29 (WEA G2)
10	04:55 21:48	05:43 21:00	06:39 19:48	07:34 18:33	18:09 (WEA RWE01) 18:07 (WEA RWE01)	31 15:22 (WEA G3) 16:28 (WEA G2)
11	04:56 21:47	05:45 20:58	06:41 19:45	07:35 18:31	18:08 (WEA RWE01) 18:06 (WEA RWE01)	29 15:21 (WEA G3) 16:27 (WEA G2)
12	04:57 21:46	05:47 20:56	06:42 19:43	07:37 18:29	18:07 (WEA RWE01) 18:05 (WEA RWE01)	27 15:21 (WEA G3) 16:26 (WEA G2)
13	04:59 21:45	05:48 20:54	06:44 19:40	07:37 18:26	18:06 (WEA RWE01) 18:04 (WEA RWE01)	27 15:20 (WEA G3) 16:25 (WEA G2)
14	05:00 21:44	05:50 20:51	06:46 19:38	07:39 18:24	18:06 (WEA RWE01) 18:03 (WEA RWE01)	26 15:19 (WEA G3) 16:24 (WEA G2)
15	05:01 21:43	05:52 20:49	06:48 19:35	07:40 18:21	18:05 (WEA RWE01) 18:02 (WEA RWE01)	24 15:18 (WEA G3) 16:23 (WEA G2)
16	05:02 21:42	05:54 20:47	06:50 19:33	07:45 18:19	18:05 (WEA RWE01) 18:01 (WEA RWE01)	21 15:17 (WEA G3) 16:22 (WEA G2)
17	05:04 21:41	05:56 20:45	06:51 19:30	07:47 18:17	18:04 (WEA RWE01) 18:00 (WEA RWE01)	19 15:16 (WEA G3) 16:21 (WEA G2)
18	05:05 21:39	05:57 20:43	06:53 19:28	07:48 18:14	18:04 (WEA RWE01) 18:00 (WEA RWE01)	18 15:15 (WEA G3) 16:20 (WEA G2)
19	05:07 21:38	05:59 20:40	06:55 19:25	07:51 18:12	18:03 (WEA RWE01) 18:00 (WEA RWE01)	15 15:14 (WEA G3) 16:19 (WEA G2)
20	05:08 21:37	06:01 20:38	06:57 19:23	07:53 18:10	18:03 (WEA RWE01) 18:00 (WEA RWE01)	13 15:13 (WEA G3) 16:18 (WEA G2)
21	05:10 21:35	06:03 20:36	06:59 19:20	07:54 18:07	18:03 (WEA RWE01) 18:00 (WEA RWE01)	11 15:12 (WEA G3) 16:17 (WEA G2)
22	05:11 21:34	06:05 20:34	07:00 19:18	07:55 18:05	18:03 (WEA RWE01) 18:00 (WEA RWE01)	9 15:11 (WEA G3) 16:16 (WEA G2)
23	05:13 21:32	06:06 20:32	07:02 19:15	07:58 18:03	18:03 (WEA RWE01) 18:00 (WEA RWE01)	8 15:10 (WEA G3) 16:15 (WEA G2)
24	05:14 21:31	06:08 20:30	07:04 19:13	08:00 18:01	18:03 (WEA RWE01) 18:00 (WEA RWE01)	7 15:09 (WEA G3) 16:14 (WEA G2)
25	05:16 21:29	06:10 20:27	07:06 19:10	08:02 18:00	18:03 (WEA RWE01) 18:00 (WEA RWE01)	6 15:08 (WEA G3) 16:13 (WEA G2)
26	05:17 21:28	06:12 20:24	07:08 19:08	08:04 18:00	18:03 (WEA RWE01) 18:00 (WEA RWE01)	5 15:07 (WEA G3) 16:12 (WEA G2)
27	05:19 21:26	06:14 20:22	07:09 19:05	08:06 18:00	18:03 (WEA RWE01) 18:00 (WEA RWE01)	4 15:06 (WEA G3) 16:11 (WEA G2)
28	05:21 21:24	06:15 20:19	07:11 19:03	08:08 18:00	18:03 (WEA RWE01) 18:00 (WEA RWE01)	3 15:05 (WEA G3) 16:10 (WEA G2)
29	05:22 21:23	06:17 20:17	07:13 19:00	08:10 18:00	18:03 (WEA RWE01) 18:00 (WEA RWE01)	2 15:04 (WEA G3) 16:09 (WEA G2)
30	05:24 21:21	06:19 20:15	07:15 18:58	08:12 18:23 (WEA RWE01)	18:03 (WEA RWE01) 18:00 (WEA RWE01)	1 15:03 (WEA G3) 16:08 (WEA G2)
31	05:26 21:19	06:21 20:12		08:14 18:23 (WEA RWE01)	18:03 (WEA RWE01) 18:00 (WEA RWE01)	
	Sonnenscheinstunden astr.max.mögl.Beschattung	515 461	383 16	328 114	257 508	231 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) Schatteneinfang	Zeitpunkt (SS:MM) Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 24 - IO 24 Morest, Grömitz

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März		April		Mai		Juni	
1	08:37 16:03	08:06 16:55	07:08 17:52		06:52 19:51		19:14 (WEA 15 (GCN)) 19:24 (WEA 15 (GCN))	05:41 20:47	19:43 (WEA_G3) 20:04 (WEA_G3)	04:51 21:38
2	08:37 16:04	08:04 16:57	07:05 17:54		06:49 19:53	2	17:24 (WEA 17 (GCN)) 17:26 (WEA 17 (GCN))	06:49 19:53	19:44 (WEA_G3) 20:02 (WEA_G3)	04:50 21:40
3	08:37 16:05	08:02 16:59	07:03 17:56		06:47 19:55	6	17:23 (WEA 17 (GCN)) 17:29 (WEA 17 (GCN))	06:47 19:55	19:45 (WEA_G3) 20:01 (WEA_G3)	04:49 21:41
4	08:36 16:07	08:01 17:01	07:00 17:58		06:44 19:57	9	17:21 (WEA 17 (GCN)) 17:30 (WEA 17 (GCN))	06:44 19:57	19:48 (WEA_G3) 19:59 (WEA_G3)	04:48 21:42
5	08:36 16:08	07:59 17:03	06:58 18:00		06:42 19:59	12	17:21 (WEA 17 (GCN)) 17:33 (WEA 17 (GCN))	06:42 19:59	20:05 20:55	04:47 21:43
6	08:36 16:09	07:57 17:05	06:56 18:01		06:39 20:00	13	17:21 (WEA 17 (GCN)) 17:34 (WEA 17 (GCN))	06:39 20:00	20:53 20:57	04:46 21:44
7	08:15 16:10	07:55 17:07	06:53 18:03		06:37 20:02	15	17:21 (WEA 17 (GCN)) 17:36 (WEA 17 (GCN))	06:37 20:02	05:29 19:35 (WEA_G2)	04:45 21:45
8	08:35 16:12	07:53 17:09	06:51 18:05		06:34 20:04	14	17:21 (WEA 17 (GCN)) 17:35 (WEA 17 (GCN))	06:34 20:04	05:27 19:36 (WEA_G2)	04:45 21:46
9	08:14 16:13	07:51 17:11	06:48 18:07		06:32 20:06	11	17:23 (WEA 17 (GCN)) 17:34 (WEA 17 (GCN))	06:32 20:06	05:25 19:39 (WEA_G2)	04:45 21:47
10	08:33 16:15	07:49 17:13	06:46 18:09		06:29 20:08	12	17:24 (WEA 17 (GCN)) 17:42 (WEA 18 (GCN))	06:29 20:08	05:23 19:41 (WEA_G2)	04:44 21:48
11	08:33 16:16	07:47 17:15	06:44 18:11		06:27 20:10	11	17:34 (WEA 18 (GCN)) 17:45 (WEA 18 (GCN))	06:27 20:10	05:22 19:42 (WEA_G2)	04:44 21:49
12	08:32 16:18	07:45 17:17	06:41 18:13		06:25 20:12	14	17:32 (WEA 18 (GCN)) 17:46 (WEA 18 (GCN))	06:25 20:12	05:20 19:44 (WEA_G2)	04:43 21:49
13	08:31 16:20	07:43 17:19	06:39 18:15		06:22 20:14	17	17:31 (WEA 18 (GCN)) 17:48 (WEA 18 (GCN))	06:22 20:14	05:18 19:45 (WEA_G2)	04:43 21:50
14	08:30 16:21	07:41 17:21	06:36 18:17		06:20 20:16	20	17:30 (WEA 18 (GCN)) 17:50 (WEA 18 (GCN))	06:20 20:16	05:16 19:48 (WEA_G2)	04:43 21:51
15	08:29 16:23	07:39 17:24	06:34 18:19		06:18 20:17	21	17:30 (WEA 18 (GCN)) 17:51 (WEA 18 (GCN))	06:18 20:17	05:14 19:46 (WEA_G2)	04:42 21:51
16	08:28 16:25	07:37 17:26	06:31 18:21		06:15 20:19	17	17:29 (WEA 18 (GCN)) 17:51 (WEA 18 (GCN))	06:15 20:19	05:11 19:52 (WEA_G3)	04:42 21:52
17	08:27 16:26	07:35 17:28	06:29 18:23		06:13 20:21	22	17:29 (WEA 18 (GCN)) 17:51 (WEA 18 (GCN))	06:13 20:21	05:11 19:53 (WEA_G3)	04:42 21:53
18	08:26 16:28	07:33 17:30	06:26 18:25		06:10 20:23	22	17:29 (WEA 18 (GCN)) 17:50 (WEA 18 (GCN))	06:10 20:23	05:09 19:55 (WEA_G3)	04:42 21:53
19	08:25 16:30	07:30 17:32	06:24 18:27		06:08 20:25	12	17:29 (WEA 18 (GCN)) 17:49 (WEA 18 (GCN))	06:08 20:25	05:08 19:57 (WEA_G3)	04:42 21:53
20	08:24 16:17	07:28 17:34	06:21 18:28		06:06 20:27	19	17:29 (WEA 18 (GCN)) 17:48 (WEA 18 (GCN))	06:06 20:27	05:06 19:44 (WEA_G3)	04:42 21:54
21	08:22 16:34	07:26 17:36	06:19 18:30		06:03 20:29	16	17:31 (WEA 18 (GCN)) 17:17 (WEA 18 (GCN))	06:03 20:29	05:05 20:00 (WEA_G3)	04:42 21:54
22	08:21 16:15	07:24 17:38	06:16 18:32		06:01 20:31	12	17:32 (WEA 18 (GCN)) 17:44 (WEA 18 (GCN))	06:01 20:31	05:03 20:02 (WEA_G3)	04:43 21:54
23	08:20 16:37	07:21 17:40	06:14 18:34		05:59 20:32	4	17:36 (WEA 18 (GCN)) 17:40 (WEA 18 (GCN))	05:59 20:32	05:02 20:03 (WEA_G3)	04:43 21:54
24	08:18 16:39	07:19 17:42	06:11 18:36		05:57 20:34	23	19:16 (WEA 15 (GCN)) 19:19 (WEA 15 (GCN))	05:57 20:34	05:00 20:05 (WEA_G3)	04:43 21:54
25	08:17 16:41	07:17 17:44	06:09 18:38		05:54 20:36	26	19:15 (WEA 15 (GCN)) 19:20 (WEA 15 (GCN))	05:54 20:36	04:59 20:07 (WEA_G3)	04:43 21:54
26	08:16 16:43	07:15 17:46	06:06 18:40		05:52 20:38	26	19:15 (WEA 15 (GCN)) 19:15 (WEA 15 (GCN))	05:52 20:38	04:58 20:08 (WEA_G3)	04:44 21:54
27	08:14 16:45	07:12 17:48	06:04 18:42		05:50 20:40	26	19:14 (WEA 15 (GCN)) 19:14 (WEA 15 (GCN))	05:50 20:40	04:57 20:07 (WEA_G3)	04:44 21:54
28	08:13 16:47	07:10 17:50	06:01 18:44		05:48 20:42	25	19:13 (WEA 15 (GCN)) 19:13 (WEA 15 (GCN))	05:48 20:42	04:55 20:06 (WEA_G3)	04:45 21:54
29	08:11 16:49		06:59 19:45	3	05:46 20:44	24	19:12 (WEA 15 (GCN)) 19:12 (WEA 15 (GCN))	05:46 20:44	04:54 20:06 (WEA_G3)	04:45 21:54
30	08:09 16:51		06:57 19:47	5	05:44 20:46	23	19:12 (WEA 15 (GCN)) 19:12 (WEA 15 (GCN))	05:44 20:46	04:53 20:05 (WEA_G3)	04:46 21:54
31	08:08 16:53		06:54 19:49	7	05:42 20:48		19:11 (WEA 15 (GCN)) 19:11 (WEA 15 (GCN))	05:42 20:48	04:52 20:05 (WEA_G3)	04:46 21:54
	Sonnenscheinstunden	248	272	367	421	578		496	66	513
	astr. max. mögl. Beschattung			328						

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 24 - IO 24 Morest, Grömitz

### Annahmen für Schattenwurfberechnung

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

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

	July	August	September	Oktober	November	Dezember	
1	04:47 21:53	05:27 21:17	06:23 20:10	19:16 (WEA 16 (GCN)) 19:41 (WEA_G2)	07:17 18:55	18:10 (WEA 18 (GCN)) 16:44	08:12 15:58
2	04:47 21:53	05:29 21:16	06:24 20:07	19:14 (WEA 16 (GCN)) 19:39 (WEA_G2)	07:19 18:53	18:11 (WEA 18 (GCN)) 16:42	08:13 15:58
3	04:48 21:53	05:31 21:14	06:26 20:05	19:13 (WEA 16 (GCN)) 19:37 (WEA_G2)	07:20 18:50	18:13 (WEA 18 (GCN)) 16:40	08:15 15:57
4	04:49 21:52	05:32 21:12	06:28 20:02	19:12 (WEA 16 (GCN)) 19:33 (WEA_G2)	07:22 18:48	18:01 (WEA 17 (GCN)) 16:38	08:16 15:56
5	04:50 21:51	05:34 21:10	06:30 20:00	19:11 (WEA 16 (GCN)) 19:31 (WEA_G2)	07:24 18:45	17:59 (WEA 17 (GCN)) 16:36	08:18 15:56
6	04:51 21:51	05:36 21:08	06:32 19:58	19:11 (WEA 16 (GCN)) 19:29 (WEA 16 (GCN))	07:26 18:43	17:58 (WEA 17 (GCN)) 16:31	08:19 15:55
7	04:52 21:50	05:38 21:06	06:33 19:55	19:12 (WEA 16 (GCN)) 19:11 (WEA 16 (GCN))	07:28 07:30	17:57 (WEA 17 (GCN)) 16:32	08:21 15:55
8	04:53 21:49	05:39 21:04	06:35 19:53	19:11 (WEA 16 (GCN)) 19:24 (WEA 16 (GCN))	07:30 18:38	17:56 (WEA 17 (GCN)) 16:30	08:22 15:54
9	04:54 21:49	05:41 21:02	06:37 19:50	19:10 (WEA 15 (GCN)) 19:22 (WEA 16 (GCN))	07:32 18:36	17:56 (WEA 17 (GCN)) 16:28	08:23 15:54
10	04:55 21:48	05:43 21:00	06:39 19:51	19:09 (WEA 15 (GCN)) 19:19 (WEA 15 (GCN))	07:34 18:33	17:57 (WEA 17 (GCN)) 16:26	08:24 15:53
11	04:56 21:47	05:45 20:58	06:41 19:45	19:08 (WEA 15 (GCN)) 19:17 (WEA 15 (GCN))	07:35 18:31	17:57 (WEA 17 (GCN)) 16:25	08:26 15:53
12	04:57 21:46	05:47 20:56	06:42 19:43	19:06 (WEA 15 (GCN)) 19:14 (WEA 15 (GCN))	07:37 18:28	17:58 (WEA 17 (GCN)) 16:23	08:27 15:53
13	04:59 21:45	05:48 20:54	06:44 19:40	19:06 (WEA 15 (GCN)) 19:12 (WEA 15 (GCN))	07:39 18:26	17:59 (WEA 17 (GCN)) 16:21	08:28 15:53
14	05:00 21:44	05:50 20:51	06:46 19:38	19:06 (WEA 15 (GCN)) 19:09 (WEA 15 (GCN))	07:41 18:24	17:59 (WEA 17 (GCN)) 16:20	08:29 15:53
15	05:01 21:43	05:52 20:49	06:48 19:35	19:09 (WEA 15 (GCN)) 19:14 (WEA 15 (GCN))	07:43 18:21	17:59 (WEA 17 (GCN)) 16:18	08:30 15:53
16	05:03 21:42	05:54 20:47	06:50 19:33	19:08 (WEA 15 (GCN)) 19:14 (WEA 15 (GCN))	07:45 18:19	17:59 (WEA 17 (GCN)) 16:16	08:31 15:53
17	05:04 21:40	05:56 20:45	06:51 19:30	19:08 (WEA 15 (GCN)) 19:15 (WEA 15 (GCN))	07:47 18:17	17:59 (WEA 17 (GCN)) 16:15	08:32 15:53
18	05:05 21:39	05:57 20:43	06:53 19:28	19:07 (WEA 15 (GCN)) 19:12 (WEA 15 (GCN))	07:49 18:14	17:59 (WEA 17 (GCN)) 16:13	08:33 15:53
19	05:07 21:38	05:59 20:40	06:55 19:25	19:07 (WEA 15 (GCN)) 19:11 (WEA 15 (GCN))	07:51 18:12	17:59 (WEA 17 (GCN)) 16:12	08:33 15:53
20	05:08 21:37	06:01 20:38	06:57 19:23	19:07 (WEA 15 (GCN)) 19:09 (WEA 15 (GCN))	07:53 18:10	17:59 (WEA 17 (GCN)) 16:11	08:34 15:54
21	05:10 21:35	06:03 20:36	06:59 19:20	18:18 (WEA 18 (GCN)) 18:29 (WEA 18 (GCN))	07:54 18:07	17:59 (WEA 17 (GCN)) 16:09	08:34 15:54
22	05:11 21:34	06:05 20:33	07:00 19:18	18:16 (WEA 18 (GCN)) 18:31 (WEA 18 (GCN))	07:56 18:05	17:59 (WEA 17 (GCN)) 16:08	08:35 15:55
23	05:13 21:32	06:06 20:31	07:02 19:15	18:14 (WEA 18 (GCN)) 18:32 (WEA 18 (GCN))	07:58 18:03	17:59 (WEA 17 (GCN)) 16:07	08:35 15:55
24	05:14 21:31	06:08 20:29	07:04 19:13	18:13 (WEA 18 (GCN)) 18:33 (WEA 18 (GCN))	08:00 18:01	17:59 (WEA 17 (GCN)) 16:05	08:36 15:56
25	05:16 21:29	06:10 20:27	07:06 19:10	18:11 (WEA 18 (GCN)) 18:32 (WEA 18 (GCN))	07:02 16:58	17:59 (WEA 17 (GCN)) 16:04	08:36 15:56
26	05:17 21:28	06:12 20:24	07:08 19:08	18:11 (WEA 18 (GCN)) 18:33 (WEA 18 (GCN))	07:04 16:56	17:59 (WEA 17 (GCN)) 16:03	08:36 15:57
27	05:19 21:26	06:14 20:22	07:09 19:05	18:10 (WEA 18 (GCN)) 18:33 (WEA 18 (GCN))	07:06 16:54	17:59 (WEA 17 (GCN)) 16:02	08:37 15:58
28	05:21 21:24	06:15 20:19	07:11 19:03	18:10 (WEA 18 (GCN)) 18:32 (WEA 18 (GCN))	07:08 16:52	17:59 (WEA 17 (GCN)) 16:01	08:37 15:59
29	05:22 21:23	06:17 20:17	07:13 19:00	18:10 (WEA 18 (GCN)) 18:32 (WEA 18 (GCN))	07:10 16:50	17:59 (WEA 17 (GCN)) 16:00	08:37 16:00
30	05:24 21:21	06:19 20:15	07:15 19:00	18:11 (WEA 18 (GCN)) 18:29 (WEA 18 (GCN))	07:12 16:48	17:59 (WEA 17 (GCN)) 15:59	08:37 16:01
31	05:26 21:19	06:21 20:12	07:14 19:00	19:19 (WEA 16 (GCN)) 19:44 (WEA_G2)	07:14 16:46	17:59 (WEA 17 (GCN)) 16:02	08:37 16:02
Sonnenscheinstunden	515	461	383	328	257	231	
astr.max.mögl.Beschattung		454	401	125			

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

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

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 25 - IO 25 Poggenpohl 4 (Cismarfelde)

### Annahmen für Schattenwurfberechnung

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

	Januar	Februar	März		April	Mai		Juni
1	08:37	08:06	07:08		06:52	05:41		04:51
	16:03	16:55	17:52		19:51	20:47		21:38
2	08:37	08:04	07:05		06:49	05:39		04:50
	16:04	16:57	17:54		19:53	20:49		21:40
3	08:37	08:02	07:03		06:47	05:37		04:49
	16:05	16:59	17:56		19:55	20:51		21:41
4	08:36	08:01	07:01		06:44	05:35		04:48
	16:07	17:01	17:58		19:57	20:53		21:42
5	08:36	07:59	06:58		06:42	05:33		04:47
	16:08	17:03	18:00		19:59	20:55		21:43
6	08:36	07:57	06:56		06:39	05:31		04:47
	16:09	17:05	18:02		20:01	20:57		21:44
7	08:35	07:55	06:53		06:37	05:29		04:46
	16:11	17:07	18:03		20:02	20:58		21:45
8	08:35	07:53	06:51		06:34	05:27		04:45
	16:12	17:09	18:05		20:04	21:00		21:46
9	08:34	07:51	06:48		06:32	05:25		04:45
	16:13	17:11	18:07		20:06	21:02		21:47
10	08:33	07:49	06:46		06:30	05:23		04:44
	16:15	17:13	18:09		20:08	21:04		21:48
11	08:33	07:47	06:44		06:27	05:22		04:44
	16:16	17:15	18:11		20:10	21:06		21:49
12	08:32	07:45	06:41		06:25	05:20		04:43
	16:18	17:17	18:13		20:12	21:07		21:49
13	08:31	07:43	06:39		06:22	05:18		04:43
	16:20	17:19	18:15		20:14	21:09		21:50
14	08:30	07:41	06:36		06:20	05:16		04:43
	16:21	17:22	18:17		20:16	21:11		21:51
15	08:29	07:39	06:34		06:18	05:14		04:43
	16:23	17:21	18:19		20:17	21:13		21:51
16	08:28	07:37	06:31		06:15	05:13		04:42
	16:25	17:26	18:21		20:19	21:14		21:52
17	08:27	07:35	06:29		06:13	05:11		04:42
	16:26	17:28	18:23		20:21	21:16		21:53
18	08:26	07:33	06:26		06:10	05:09		04:42
	16:28	17:30	18:25		20:23	21:18		21:53
19	08:25	07:30	06:24		06:08	05:08		04:42
	16:30	17:32	18:27		20:25	21:19		21:53
20	08:24	07:28	06:21		06:06	05:06		04:42
	16:32	17:31	18:28		20:27	21:21		21:54
21	08:22	07:26	06:19		06:04	05:05		04:42
	16:34	17:36	18:30		20:29	21:23	20:47 (WEA_G1)	21:54
22	08:21	07:24	06:16		06:01	05:03	20:49 (WEA_G1)	21:54
	16:36	17:38	18:32	18:04 (WEA 20 (GCS))	20:31	21:24	20:47 (WEA_G1)	21:54
23	08:20	07:21	06:14	18:05 (WEA 20 (GCS))	05:59	05:02	20:51 (WEA_G1)	21:54
	16:37	17:40	18:34	18:07 (WEA 20 (GCS))	20:32	21:26	20:46 (WEA_G1)	21:54
24	08:18	07:19	06:11	18:08 (WEA 20 (GCS))	05:57	05:00	20:52 (WEA_G1)	21:54
	16:39	17:42	18:36		20:34	21:27	20:46 (WEA_G1)	21:54
25	08:17	07:17	06:09		05:54	04:59	20:53 (WEA_G1)	21:54
	16:41	17:44	18:38		20:36	21:29	20:46 (WEA_G1)	21:54
26	08:16	07:15	06:06		05:52	04:58	20:55 (WEA_G1)	21:54
	16:43	17:46	18:40		20:38	21:30	20:46 (WEA_G1)	21:54
27	08:14	07:12	06:04		05:50	04:57	20:56 (WEA_G1)	21:54
	16:45	17:48	18:42		20:40	21:32	20:46 (WEA_G1)	21:54
28	08:13	07:10	06:02		05:48	04:55	20:58 (WEA_G1)	21:54
	16:47	17:50	18:44		20:42	21:33	20:46 (WEA_G1)	21:54
29	08:11		06:59		05:46	04:54	20:59 (WEA_G1)	21:54
	16:49		19:45		20:44	21:34	20:47 (WEA_G1)	21:54
30	08:09		06:57		05:44	04:53	21:00 (WEA_G1)	21:54
	16:51		19:47		20:46	21:36	20:47 (WEA_G1)	21:54
31	08:08		06:54			04:52	21:01 (WEA_G1)	21:54
	16:53		19:49			21:37	20:47 (WEA_G1)	
Sonnenscheinstunden	248	272	367		421	496	513	
astr.max.mögl.Beschattung				2		105		457

**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) Schattensende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 25 - IO 25 Poggenpohl 4 (Cismarfelde)

### Annahmen für Schattenwurfberechnung

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

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

	July	August	September		Oktober	November	Dezember	
1	04:47	20:55 (WEA_G1)	05:27	06:23	07:17	07:16	08:12	
	21:53	21:11 (WEA_G1)	21:17	20:10	18:55	16:44	15:58	
2	04:48	20:55 (WEA_G1)	05:29	06:24	07:19	07:18	08:13	
	21:53	21:11 (WEA_G1)	21:16	20:07	18:53	16:42	15:58	
3	04:48	20:55 (WEA_G1)	05:31	06:26	07:21	07:20	08:15	
	21:53	21:12 (WEA_G1)	21:14	20:05	18:50	16:40	15:57	
4	04:49	20:55 (WEA_G1)	05:33	06:28	07:22	07:22	08:16	
	21:52	21:13 (WEA_G1)	21:12	20:03	18:48	16:38	15:56	
5	04:50	20:56 (WEA_G1)	05:34	06:30	07:24	07:24	08:18	
	21:51	21:13 (WEA_G1)	21:10	20:00	18:45	16:36	15:56	
6	04:51	20:55 (WEA_G1)	05:36	06:32	07:26	07:26	08:19	
	21:51	21:13 (WEA_G1)	21:08	19:58	18:43	16:34	15:55	
7	04:52	20:55 (WEA_G1)	05:38	06:33	07:28	07:28	08:21	
	21:50	21:13 (WEA_G1)	21:06	19:55	18:40	16:32	15:55	
8	04:53	20:55 (WEA_G1)	05:40	06:35	07:30	07:30	08:22	
	21:49	21:13 (WEA_G1)	21:04	19:53	18:38	16:30	15:54	
9	04:54	20:55 (WEA_G1)	05:41	06:37	07:32	07:32	08:23	
	21:49	21:13 (WEA_G1)	21:02	19:50	18:36	16:28	15:54	
10	04:55	20:54 (WEA_G1)	05:43	06:39	07:34	07:34	08:24	
	21:48	21:12 (WEA_G1)	21:00	19:48	18:33	16:26	15:53	
11	04:56	20:54 (WEA_G1)	05:45	06:41	07:35	07:36	08:26	
	21:47	21:11 (WEA_G1)	20:58	19:45	18:31	16:25	15:53	
12	04:58	20:55 (WEA_G1)	05:47	06:42	07:37	07:38	08:27	
	21:46	21:11 (WEA_G1)	20:56	19:43	18:28	16:23	15:53	
13	04:59	20:55 (WEA_G1)	05:48	06:44	07:39	07:40	08:28	
	21:45	21:10 (WEA_G1)	20:54	19:40	18:26	16:21	15:53	
14	05:00	20:55 (WEA_G1)	05:50	06:46	07:41	07:42	08:29	
	21:44	21:09 (WEA_G1)	20:51	19:38	18:24	16:20	15:53	
15	05:01	20:55 (WEA_G1)	05:52	06:48	07:43	07:43	08:30	
	21:43	21:08 (WEA_G1)	20:49	19:35	18:21	16:18	15:53	
16	05:03	20:55 (WEA_G1)	05:54	06:50	07:45	07:45	08:31	
	21:42	21:07 (WEA_G1)	20:47	19:33	18:19	16:17	15:53	
17	05:04	20:56 (WEA_G1)	05:56	06:51	07:47	07:47	08:32	
	21:40	21:06 (WEA_G1)	20:45	19:30	18:17	16:15	15:53	
18	05:05	20:56 (WEA_G1)	05:57	06:53	07:49	07:49	08:32	
	21:39	21:05 (WEA_G1)	20:43	19:28	18:14	16:14	15:53	
19	05:07	20:56 (WEA_G1)	05:59	06:55	07:51	07:51	08:33	
	21:38	21:04 (WEA_G1)	20:40	19:25	18:12	16:12	15:54	
20	05:08	20:57 (WEA_G1)	06:01	06:57	07:53	07:53	08:34	
	21:37	21:03 (WEA_G1)	20:38	19:23	18:10	16:11	15:54	
21	05:10	20:57 (WEA_G1)	06:03	06:59	18:50 (WEA 20 (GCS))	07:54	07:55	08:34
	21:35	21:01 (WEA_G1)	20:36	19:20	18:51 (WEA 20 (GCS))	18:07	16:09	15:54
22	05:11	20:57 (WEA_G1)	06:05	07:00	18:48 (WEA 20 (GCS))	07:56	07:57	08:35
	21:34	21:00 (WEA_G1)	20:33	19:18	18:49 (WEA 20 (GCS))	18:05	16:08	15:55
23	05:13	20:58 (WEA_G1)	06:06	07:02	07:58	07:58	08:35	
	21:32	20:59 (WEA_G1)	20:31	19:15	18:03	16:07	15:55	
24	05:14		06:08	07:04	08:00	08:00	08:36	
	21:31		20:29	19:13	18:01	16:06	15:56	
25	05:16		06:10	07:06	07:02	08:02	08:36	
	21:29		20:27	19:10	16:58	16:04	15:56	
26	05:17		06:12	07:08	07:04	08:04	08:36	
	21:28		20:24	19:08	16:56	16:03	15:57	
27	05:19		06:14	07:10	07:06	08:05	08:37	
	21:26		20:22	19:05	16:54	16:02	15:58	
28	05:21		06:15	07:11	07:08	08:07	08:37	
	21:24		20:19	19:03	16:52	16:01	15:59	
29	05:22		06:17	07:13	07:10	08:09	08:37	
	21:23		20:17	19:00	16:50	16:00	16:00	
30	05:24		06:19	07:15	07:12	08:10	08:37	
	21:21		20:15	18:58	16:48	15:59	16:01	
31	05:26		06:21		07:14		08:37	
	21:19		20:12		16:46		16:02	
	Sonnenscheinstunden	515	461	383	328	257	231	
	astr.max.mögl.Beschattung	302		2				

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 DE-25709 Kaiser-Wilhelm-Koog  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 26 - IO 26 Rütting Chaussee 1

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	15:19 (WEA 14 (GRS))	08:06	15:52 (WEA 12 (GRS))	07:08	17:19 (WEA 10 (GRS))	06:52	07:16 (WEA_G3)	05:42	04:51	
16:03	6	15:25 (WEA 14 (GRS))	16:55	21	16:13 (WEA 12 (GRS))	17:52	19:51	62	06:18 (WEA_G1)	20:48	21:39
2	08:37	15:20 (WEA 14 (GRS))	08:04	15:52 (WEA 12 (GRS))	07:05	17:20 (WEA 10 (GRS))	06:49	07:16 (WEA_G3)	05:39	04:50	
16:04	6	15:26 (WEA 14 (GRS))	16:57	21	16:13 (WEA 12 (GRS))	17:54	19:53	62	06:18 (WEA_G1)	20:49	21:40
3	08:37	15:19 (WEA 14 (GRS))	08:03	15:54 (WEA 12 (GRS))	07:03		06:47	07:17 (WEA_G3)	05:37	04:49	
16:05	8	15:27 (WEA 14 (GRS))	16:59	19	16:13 (WEA 12 (GRS))	17:56	19:55	61	06:18 (WEA_G1)	20:51	21:41
4	08:36	15:20 (WEA 14 (GRS))	08:01	15:55 (WEA 12 (GRS))	07:01		06:44	07:17 (WEA_G3)	05:35	04:48	
16:07	9	15:29 (WEA 14 (GRS))	17:01	18	16:13 (WEA 12 (GRS))	17:58	19:57	60	06:17 (WEA_G1)	20:53	21:42
5	08:36	15:20 (WEA 14 (GRS))	07:59	15:56 (WEA 12 (GRS))	06:58		06:42	07:18 (WEA_G3)	05:33	04:48	
16:08	10	15:30 (WEA 14 (GRS))	17:03	18	16:32 (WEA 13 (GRS))	18:00	19:59	60	06:18 (WEA_G1)	20:55	21:43
6	08:36	15:20 (WEA 14 (GRS))	07:57	15:58 (WEA 12 (GRS))	06:56		06:39	07:19 (WEA_G1)	05:31	04:47	
16:09	11	15:31 (WEA 14 (GRS))	17:05	17	16:35 (WEA 13 (GRS))	18:02	20:01	58	06:17 (WEA_G1)	20:57	21:44
7	08:35	15:22 (WEA 14 (GRS))	07:55	16:00 (WEA 12 (GRS))	06:53		06:37	07:19 (WEA_G1)	05:29	04:46	
16:11	11	15:33 (WEA 14 (GRS))	17:07	14	16:36 (WEA 13 (GRS))	18:04	20:03	58	06:17 (WEA_G1)	20:59	21:45
8	08:35	15:22 (WEA 14 (GRS))	07:53	16:03 (WEA 12 (GRS))	06:51		06:35	07:19 (WEA_G1)	05:27	04:45	
16:12	11	15:34 (WEA 14 (GRS))	17:09	5	16:39 (WEA 13 (GRS))	18:06	20:04	56	06:17 (WEA_G1)	21:00	21:46
9	08:34	15:22 (WEA 14 (GRS))	07:51	16:04 (WEA 12 (GRS))	06:49		06:33	07:19 (WEA_G1)	05:25	04:45	
16:13	11	15:36 (WEA 14 (GRS))	17:11	13	16:41 (WEA 13 (GRS))	18:07	20:05	56	06:17 (WEA_G1)	21:02	21:47
10	08:33	15:23 (WEA 14 (GRS))	07:49	16:05 (WEA 12 (GRS))	06:47		06:30	07:19 (WEA_G1)	05:24	04:44	
16:14	15	15:38 (WEA 14 (GRS))	17:13	8	16:43 (WEA 13 (GRS))	18:09	20:06	56	06:17 (WEA_G1)	21:04	21:48
11	08:33	15:24 (WEA 14 (GRS))	07:47	16:06 (WEA 12 (GRS))	06:45		06:27	07:19 (WEA_G1)	05:22	04:44	
16:15	14	15:39 (WEA 14 (GRS))	17:15	11	16:44 (WEA 13 (GRS))	18:10	20:07	54	06:17 (WEA_G1)	21:06	21:49
12	08:32	15:24 (WEA 14 (GRS))	07:45	16:07 (WEA 12 (GRS))	06:43		06:25	07:19 (WEA_G1)	05:20	04:44	
16:16	14	15:40 (WEA 14 (GRS))	17:17	10	16:45 (WEA 13 (GRS))	18:11	20:08	53	06:17 (WEA_G1)	21:08	21:50
13	08:31	15:25 (WEA 14 (GRS))	07:43	16:08 (WEA 12 (GRS))	06:41		06:22	07:19 (WEA_G1)	05:18	04:43	
16:17	13	15:41 (WEA 14 (GRS))	17:19	9	16:46 (WEA 13 (GRS))	18:12	20:09	52	06:17 (WEA_G1)	21:10	21:51
14	08:30	15:26 (WEA 14 (GRS))	07:41	16:09 (WEA 12 (GRS))	06:39		06:20	07:19 (WEA_G1)	05:16	04:43	
16:18	11	15:42 (WEA 14 (GRS))	17:21	7	16:47 (WEA 13 (GRS))	18:13	20:10	51	06:17 (WEA_G1)	21:12	21:51
15	08:29	15:28 (WEA 14 (GRS))	07:39	16:10 (WEA 12 (GRS))	06:37		06:18	07:19 (WEA_G1)	05:15	04:43	
16:19	10	15:43 (WEA 14 (GRS))	17:23	6	16:48 (WEA 13 (GRS))	18:14	20:11	49	06:17 (WEA_G1)	21:14	21:52
16	08:28	15:30 (WEA 14 (GRS))	07:37	16:11 (WEA 12 (GRS))	06:35		06:15	07:19 (WEA_G1)	05:13	04:42	
16:20	7	15:44 (WEA 14 (GRS))	17:25	2	16:49 (WEA 13 (GRS))	18:15	20:12	47	06:17 (WEA_G1)	21:16	21:52
17	08:27	15:27 (WEA 14 (GRS))	07:35	16:12 (WEA 12 (GRS))	06:33		06:13	07:19 (WEA_G1)	05:11	04:42	
16:21	7	15:45 (WEA 14 (GRS))	17:27	5	16:50 (WEA 13 (GRS))	18:16	20:13	45	06:17 (WEA_G1)	21:18	21:53
18	08:26	15:28 (WEA 14 (GRS))	07:33	16:13 (WEA 12 (GRS))	06:31		06:11	07:19 (WEA_G1)	05:09	04:42	
16:22	6	15:46 (WEA 14 (GRS))	17:29	4	16:51 (WEA 13 (GRS))	18:17	20:14	42	06:17 (WEA_G1)	21:20	21:53
19	08:25	15:29 (WEA 14 (GRS))	07:31	16:14 (WEA 12 (GRS))	06:29		06:09	07:19 (WEA_G1)	05:07	04:42	
16:23	5	15:47 (WEA 14 (GRS))	17:31	11	16:52 (WEA 13 (GRS))	18:18	20:15	40	06:17 (WEA_G1)	21:22	21:54
20	08:24	15:30 (WEA 12 (GRS))	07:29	16:15 (WEA 12 (GRS))	06:27		06:07	07:19 (WEA_G1)	05:05	04:42	
16:24	4	15:48 (WEA 12 (GRS))	17:33	10	16:53 (WEA 13 (GRS))	18:19	20:16	38	06:17 (WEA_G1)	21:24	21:54
21	08:23	15:31 (WEA 12 (GRS))	07:27	16:16 (WEA 12 (GRS))	06:25		06:05	07:19 (WEA_G1)	05:03	04:42	
16:25	3	15:49 (WEA 12 (GRS))	17:35	9	16:54 (WEA 13 (GRS))	18:20	20:17	33	06:17 (WEA_G1)	21:26	21:54
22	08:22	15:32 (WEA 12 (GRS))	07:25	16:17 (WEA 12 (GRS))	06:23		06:03	07:19 (WEA_G1)	05:01	04:42	
16:26	2	15:50 (WEA 12 (GRS))	17:37	14	16:55 (WEA 13 (GRS))	18:21	20:18	29	06:17 (WEA_G1)	21:28	21:54
23	08:21	15:33 (WEA 12 (GRS))	07:23	16:18 (WEA 12 (GRS))	06:21		06:01	07:19 (WEA_G1)	05:00	04:42	
16:27	1	15:51 (WEA 12 (GRS))	17:39	11	16:56 (WEA 13 (GRS))	18:22	20:19	23	06:17 (WEA_G1)	21:30	21:54
24	08:20	15:34 (WEA 12 (GRS))	07:21	16:19 (WEA 12 (GRS))	06:19		05:59	07:19 (WEA_G1)	04:58	04:42	
16:28	1	15:52 (WEA 12 (GRS))	17:41	5	16:57 (WEA 13 (GRS))	18:23	20:20	17	06:17 (WEA_G1)	21:32	21:55
25	08:19	15:35 (WEA 12 (GRS))	07:19	16:20 (WEA 12 (GRS))	06:17		05:57		04:56	04:42	
16:29	1	15:53 (WEA 12 (GRS))	17:43	1	16:58 (WEA 13 (GRS))	18:24	20:21		04:54	04:42	
26	08:18	15:36 (WEA 12 (GRS))	07:17	16:21 (WEA 12 (GRS))	06:15		05:55		04:52	04:42	
16:30	1	15:54 (WEA 12 (GRS))	17:45	1	16:59 (WEA 13 (GRS))	18:25	20:22		04:50	04:42	
27	08:17	15:37 (WEA 12 (GRS))	07:15	16:22 (WEA 12 (GRS))	06:13		05:53		04:48	04:42	
16:31	1	15:55 (WEA 12 (GRS))	17:47	3	17:00 (WEA 13 (GRS))	18:26	20:23		04:46	04:42	
28	08:16	15:40 (WEA 12 (GRS))	07:13	16:23 (WEA 12 (GRS))	06:11		05:51		04:44	04:42	
16:32	1	15:56 (WEA 12 (GRS))	17:49	4	17:01 (WEA 13 (GRS))	18:27	20:24		04:42	04:42	
29	08:15	15:41 (WEA 12 (GRS))	07:11	16:24 (WEA 12 (GRS))	06:09		05:49		04:40	04:42	
16:33	1	15:57 (WEA 12 (GRS))	17:51	5	17:02 (WEA 13 (GRS))	18:28	20:25		04:38	04:42	
30	08:14	15:44 (WEA 12 (GRS))	07:09	16:25 (WEA 12 (GRS))	06:07		05:47		04:36	04:42	
16:34	1	15:58 (WEA 12 (GRS))	17:53	6	17:03 (WEA 13 (GRS))	18:29	20:26		04:34	04:42	
31	08:13	15:47 (WEA 12 (GRS))	07:07	16:26 (WEA 12 (GRS))	06:05		05:45		04:32	04:42	
16:35	1	15:59 (WEA 12 (GRS))	17:55	6	17:04 (WEA 13 (GRS))	18:30	20:27		04:30	04:42	
Sonneneinstrahlung	248			367			421		496		513
astr.max.mögl.Beschattung	361		247		591		1160				494

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 26 - IO 26 Rütting Chaussee 1

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	05:21 (WEA RWED01)	05:27	06:23	07:18 (WEA_G1)	07:17		07:16	16:02 (WEA 13 (GRS))	08:12	15:06 (WEA 14 (GRS))
2	04:48	05:21 (WEA RWED01)	05:29	06:25	07:17 (WEA_G1)	07:19		07:18	16:01 (WEA 13 (GRS))	08:14	15:06 (WEA 14 (GRS))
3	04:49	05:22 (WEA RWED01)	05:31	06:26	07:17 (WEA_G1)	07:21		07:17 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
4	04:49	05:23 (WEA RWED01)	05:33	06:28	07:17 (WEA_G1)	07:22		07:19 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
5	04:50	05:24 (WEA RWED01)	05:34	06:30	07:16 (WEA_G1)	07:24		07:21 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
6	04:51	05:25 (WEA RWED01)	05:36	06:32	07:15 (WEA_G1)	07:26		07:22 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
7	04:52	05:25 (WEA RWED01)	05:38	06:34	07:14 (WEA_G1)	07:28		07:23 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
8	04:53	05:26 (WEA RWED01)	05:40	06:35	07:12 (WEA_G1)	07:30		07:24 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
9	04:54	05:27 (WEA RWED01)	05:42	06:37	07:10 (WEA_G1)	07:32		07:25 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
10	04:55	05:28 (WEA RWED01)	05:44	06:39	07:08 (WEA_G1)	07:34		07:26 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
11	04:56	05:29 (WEA RWED01)	05:46	06:41	07:06 (WEA_G1)	07:36		07:27 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
12	04:57	05:30 (WEA RWED01)	05:48	06:43	07:04 (WEA_G1)	07:38		07:28 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
13	04:58	05:31 (WEA RWED01)	05:50	06:45	07:02 (WEA_G1)	07:40		07:29 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
14	04:59	05:32 (WEA RWED01)	05:52	06:47	07:00 (WEA_G1)	07:42		07:30 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
15	05:00	05:33 (WEA RWED01)	05:54	06:49	06:58 (WEA_G1)	07:44		07:31 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
16	05:01	05:34 (WEA RWED01)	05:56	06:51	06:56 (WEA_G1)	07:46		07:32 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
17	05:02	05:35 (WEA RWED01)	05:58	06:53	06:54 (WEA_G1)	07:48		07:33 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
18	05:03	05:36 (WEA RWED01)	06:00	06:55	06:52 (WEA_G1)	07:50		07:34 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
19	05:04	05:37 (WEA RWED01)	06:02	06:57	06:50 (WEA_G1)	07:52		07:35 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
20	05:05	05:38 (WEA RWED01)	06:04	06:59	06:48 (WEA_G1)	07:54		07:36 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
21	05:06	05:39 (WEA RWED01)	06:06	07:01	06:46 (WEA_G1)	07:56		07:37 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
22	05:07	05:40 (WEA RWED01)	06:08	07:03	06:44 (WEA_G1)	07:58		07:38 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
23	05:08	05:41 (WEA RWED01)	06:10	07:05	06:42 (WEA_G1)	08:00		07:39 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
24	05:09	05:42 (WEA RWED01)	06:12	07:07	06:40 (WEA_G1)	08:02		07:40 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
25	05:10	05:43 (WEA RWED01)	06:14	07:09	06:38 (WEA_G1)	08:04		07:41 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
26	05:11	05:44 (WEA RWED01)	06:16	07:11	06:36 (WEA_G1)	08:06		07:42 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
27	05:12	05:45 (WEA RWED01)	06:18	07:13	06:34 (WEA_G1)	08:08		07:43 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
28	05:13	05:46 (WEA RWED01)	06:20	07:15	06:32 (WEA_G1)	08:10		07:44 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
29	05:14	05:47 (WEA RWED01)	06:22	07:17	06:30 (WEA_G1)	08:12		07:45 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
30	05:15	05:48 (WEA RWED01)	06:24	07:19	06:28 (WEA_G1)	08:14		07:46 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
31	05:16	05:49 (WEA RWED01)	06:26	07:21	06:26 (WEA_G1)	08:16		07:47 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
1	05:17	05:50 (WEA RWED01)	06:28	07:23	06:24 (WEA_G1)	08:18		07:48 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
2	05:18	05:51 (WEA RWED01)	06:30	07:25	06:22 (WEA_G1)	08:20		07:49 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
3	05:19	05:52 (WEA RWED01)	06:32	07:27	06:20 (WEA_G1)	08:22		07:50 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
4	05:20	05:53 (WEA RWED01)	06:34	07:29	06:18 (WEA_G1)	08:24		07:51 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
5	05:21	05:54 (WEA RWED01)	06:36	07:31	06:16 (WEA_G1)	08:26		07:52 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
6	05:22	05:55 (WEA RWED01)	06:38	07:33	06:14 (WEA_G1)	08:28		07:53 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
7	05:23	05:56 (WEA RWED01)	06:40	07:35	06:12 (WEA_G1)	08:30		07:54 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
8	05:24	05:57 (WEA RWED01)	06:42	07:37	06:10 (WEA_G1)	08:32		07:55 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
9	05:25	05:58 (WEA RWED01)	06:44	07:39	06:08 (WEA_G1)	08:34		07:56 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
10	05:26	05:59 (WEA RWED01)	06:46	07:41	06:06 (WEA_G1)	08:36		07:57 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
11	05:27	06:00 (WEA RWED01)	06:48	07:43	06:04 (WEA_G1)	08:38		07:58 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
12	05:28	06:01 (WEA RWED01)	06:50	07:45	06:02 (WEA_G1)	08:40		07:59 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
13	05:29	06:02 (WEA RWED01)	06:52	07:47	06:00 (WEA_G1)	08:42		08:00 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
14	05:30	06:03 (WEA RWED01)	06:54	07:49	05:58 (WEA_G1)	08:44		08:01 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
15	05:31	06:04 (WEA RWED01)	06:56	07:51	05:56 (WEA_G1)	08:46		08:02 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
16	05:32	06:05 (WEA RWED01)	06:58	07:53	05:54 (WEA_G1)	08:48		08:03 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
17	05:33	06:06 (WEA RWED01)	07:00	07:55	05:52 (WEA_G1)	08:50		08:04 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
18	05:34	06:07 (WEA RWED01)	07:02	07:57	05:50 (WEA_G1)	08:52		08:05 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
19	05:35	06:08 (WEA RWED01)	07:04	07:59	05:48 (WEA_G1)	08:54		08:06 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
20	05:36	06:09 (WEA RWED01)	07:06	08:01	05:46 (WEA_G1)	08:56		08:07 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
21	05:37	06:10 (WEA RWED01)	07:08	08:03	05:44 (WEA_G1)	08:58		08:08 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
22	05:38	06:11 (WEA RWED01)	07:10	08:05	05:42 (WEA_G1)	09:00		08:09 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
23	05:39	06:12 (WEA RWED01)	07:12	08:07	05:40 (WEA_G1)	09:02		08:10 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
24	05:40	06:13 (WEA RWED01)	07:14	08:09	05:38 (WEA_G1)	09:04		08:11 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
25	05:41	06:14 (WEA RWED01)	07:16	08:11	05:36 (WEA_G1)	09:06		08:12 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
26	05:42	06:15 (WEA RWED01)	07:18	08:13	05:34 (WEA_G1)	09:08		08:13 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
27	05:43	06:16 (WEA RWED01)	07:20	08:15	05:32 (WEA_G1)	09:10		08:14 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
28	05:44	06:17 (WEA RWED01)	07:22	08:17	05:30 (WEA_G1)	09:12		08:15 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
29	05:45	06:18 (WEA RWED01)	07:24	08:19	05:28 (WEA_G1)	09:14		08:16 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
30	05:46	06:19 (WEA RWED01)	07:26	08:21	05:26 (WEA_G1)	09:16		08:17 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
31	05:47	06:20 (WEA RWED01)	07:28	08:23	05:24 (WEA_G1)	09:18		08:18 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
1	05:48	06:21 (WEA RWED01)	07:30	08:25	05:22 (WEA_G1)	09:20		08:19 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
2	05:49	06:22 (WEA RWED01)	07:32	08:27	05:20 (WEA_G1)	09:22		08:20 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
3	05:50	06:23 (WEA RWED01)	07:34	08:29	05:18 (WEA_G1)	09:24		08:21 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
4	05:51	06:24 (WEA RWED01)	07:36	08:31	05:16 (WEA_G1)	09:26		08:22 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
5	05:52	06:25 (WEA RWED01)	07:38	08:33	05:14 (WEA_G1)	09:28		08:23 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
6	05:53	06:26 (WEA RWED01)	07:40	08:35	05:12 (WEA_G1)	09:30		08:24 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
7	05:54	06:27 (WEA RWED01)	07:42	08:37	05:10 (WEA_G1)	09:32		08:25 (WEA 15 (GCN))	16:00 (WEA 13 (GRS))	08:15	15:07 (WEA 14 (GRS))
8	05:55	06:28 (WEA RWED01)	07:44	08:39	05:08 (WEA_G1)	09:34		08			



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 27 - IO 27 Kathenkamp 1 (Rütinger Hof)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni			
1	08:37	15:10 (WEA 13 (GRS))	08:06	16:22 (WEA 10 (GRS))	07:08	3	07:33 (WEA_G1)	06:52	05:42	39	06:14 (WEA RWED1)	04:51	
16:03	13	15:23 (WEA 13 (GRS))	16:55	16:22 (WEA 10 (GRS))	17:52		07:36 (WEA_G1)	19:51			06:53 (WEA RWED1)	21:39	
2	08:37	15:11 (WEA 13 (GRS))	08:04	16:22 (WEA 10 (GRS))	07:05		07:30 (WEA_G1)	06:49	05:39		06:14 (WEA RWED1)	04:50	
16:04	14	15:26 (WEA 11 (GRS))	16:57	3	16:25 (WEA 10 (GRS))	17:54	8	07:38 (WEA_G1)	19:53	20:49	39	06:53 (WEA RWED1)	21:40
3	08:37	15:11 (WEA 13 (GRS))	08:03	16:23 (WEA 10 (GRS))	07:03		07:28 (WEA 15 (GON))	06:47	05:37		06:14 (WEA RWED1)	04:49	
16:05	14	15:27 (WEA 11 (GRS))	16:59	5	16:28 (WEA 10 (GRS))	17:56	13	07:41 (WEA_G1)	19:55	20:51	38	06:52 (WEA RWED1)	21:41
4	08:36	15:12 (WEA 13 (GRS))	08:01	16:23 (WEA 10 (GRS))	07:01		07:25 (WEA_G1)	06:44	05:35		06:14 (WEA RWED1)	04:48	
16:07	16	15:29 (WEA 11 (GRS))	17:01	7	16:30 (WEA 10 (GRS))	17:58	17	07:42 (WEA_G1)	19:57	20:53	37	06:51 (WEA RWED1)	21:42
5	08:36	15:13 (WEA 13 (GRS))	07:59	16:23 (WEA 10 (GRS))	06:58		07:23 (WEA_G1)	06:42	05:33		06:14 (WEA RWED1)	04:48	
16:08	15	15:30 (WEA 11 (GRS))	17:03	9	16:32 (WEA 10 (GRS))	18:00	20	07:43 (WEA_G1)	19:59	20:55	37	06:51 (WEA RWED1)	21:43
6	08:36	15:15 (WEA 13 (GRS))	07:57	16:24 (WEA 10 (GRS))	06:56		07:20 (WEA_G1)	06:39	05:31		06:15 (WEA RWED1)	04:47	
16:09	16	15:32 (WEA 11 (GRS))	17:05	11	16:35 (WEA 10 (GRS))	18:02	23	07:43 (WEA_G1)	20:01	20:57	35	06:50 (WEA RWED1)	21:44
7	08:35	15:16 (WEA 13 (GRS))	07:55	16:24 (WEA 10 (GRS))	06:53		07:18 (WEA_G1)	06:37	05:29		06:15 (WEA RWED1)	04:46	
16:11	17	15:33 (WEA 11 (GRS))	17:07	12	16:36 (WEA 10 (GRS))	18:04	27	07:45 (WEA_G1)	20:03	20:59	34	06:49 (WEA RWED1)	21:45
8	08:35	15:18 (WEA 13 (GRS))	07:53	16:26 (WEA 10 (GRS))	06:51		07:15 (WEA_G1)	06:35	05:27		06:15 (WEA RWED1)	04:45	
16:12	1,5	15:36 (WEA 11 (GRS))	17:09	9	16:38 (WEA 10 (GRS))	18:06	29	07:46 (WEA_G1)	20:04	21:00	33	06:48 (WEA RWED1)	21:46
9	08:34	15:25 (WEA 11 (GRS))	07:51	16:28 (WEA 10 (GRS))	06:49		07:15 (WEA_G1)	06:32	05:25		06:17 (WEA RWED1)	04:45	
16:14	11	15:36 (WEA 11 (GRS))	17:11	3	16:32 (WEA 10 (GRS))	18:07	32	07:45 (WEA_G1)	20:06	21:02	31	06:48 (WEA RWED1)	21:47
10	08:33	15:25 (WEA 11 (GRS))	07:49	06:46			07:10 (WEA_G1)	06:30	05:24		06:18 (WEA RWED1)	04:44	
16:15	13	15:36 (WEA 11 (GRS))	17:13	18:04			07:45 (WEA_G1)	20:06	21:04	29	06:47 (WEA RWED1)	21:48	
11	08:33	15:25 (WEA 11 (GRS))	07:47	06:47			07:10 (WEA_G1)	06:27	05:22		06:18 (WEA RWED1)	04:44	
16:17	14	15:39 (WEA 11 (GRS))	17:15	18:11			07:46 (WEA_G1)	20:06	21:05	27	06:46 (WEA RWED1)	21:49	
12	08:32	15:26 (WEA 11 (GRS))	07:45	06:41			07:10 (WEA_G1)	06:25	05:20		06:19 (WEA RWED1)	04:44	
16:18	15	15:41 (WEA 11 (GRS))	17:18	18:13			07:46 (WEA_G1)	20:07	21:06	25	06:46 (WEA RWED1)	21:50	
13	08:31	15:28 (WEA 11 (GRS))	07:43	06:39			07:10 (WEA_G1)	06:22	05:18		06:21 (WEA RWED1)	04:43	
16:19	17	15:43 (WEA 11 (GRS))	17:20	18:15			07:46 (WEA_G1)	20:07	21:07	23	06:45 (WEA RWED1)	21:51	
14	08:30	15:26 (WEA 11 (GRS))	07:41	06:36			07:10 (WEA_G1)	06:20	05:15		06:22 (WEA RWED1)	04:43	
16:21	19	15:46 (WEA 11 (GRS))	17:22	18:17			07:46 (WEA_G1)	20:08	21:08	19	06:44 (WEA RWED1)	21:52	
15	08:29	15:27 (WEA 11 (GRS))	07:39	06:34			06:58 (WEA_G1)	06:18	05:13		06:25 (WEA RWED1)	04:43	
16:23	20	15:47 (WEA 11 (GRS))	17:24	18:19			07:45 (WEA_G1)	20:08	21:09	17	06:44 (WEA RWED1)	21:53	
16	08:28	15:30 (WEA 11 (GRS))	07:37	06:31			06:50 (WEA_G1)	06:15	05:10		06:28 (WEA RWED1)	04:42	
16:25	19	15:47 (WEA 11 (GRS))	17:25	18:21			07:42 (WEA_G1)	20:09	21:10	15	06:43 (WEA RWED1)	21:54	
17	08:27	15:29 (WEA 11 (GRS))	07:35	06:29			06:52 (WEA_G1)	06:13	05:08		06:31 (WEA RWED1)	04:42	
16:27	19	15:48 (WEA 11 (GRS))	17:26	18:23			07:41 (WEA_G1)	20:09	21:11	13	06:43 (WEA RWED1)	21:55	
18	08:26	15:28 (WEA 11 (GRS))	07:33	06:27			06:49 (WEA_G1)	06:11	05:06		06:32 (WEA RWED1)	04:42	
16:28	19	15:47 (WEA 11 (GRS))	17:26	18:25			07:40 (WEA_G1)	20:09	21:12	11	06:42 (WEA RWED1)	21:56	
19	08:25	15:30 (WEA 11 (GRS))	07:31	06:24			06:46 (WEA_G1)	06:09	05:04		06:33 (WEA RWED1)	04:42	
16:30	18	15:48 (WEA 11 (GRS))	17:27	18:27			07:39 (WEA_G1)	20:09	21:13	9	06:42 (WEA RWED1)	21:57	
20	08:24	15:31 (WEA 11 (GRS))	07:29	06:22			06:45 (WEA_G1)	06:08	05:03		06:34 (WEA RWED1)	04:42	
16:32	1,7	15:40 (WEA 11 (GRS))	17:28	18:29			07:37 (WEA_G1)	20:09	21:14	8	06:41 (WEA RWED1)	21:58	
21	08:23	15:31 (WEA 11 (GRS))	07:26	06:19			06:43 (WEA_G1)	06:08	05:02		06:35 (WEA RWED1)	04:42	
16:34	19	15:47 (WEA 11 (GRS))	17:29	18:30			07:37 (WEA_G1)	20:09	21:15	7	06:41 (WEA RWED1)	21:59	
22	08:21	15:33 (WEA 11 (GRS))	07:24	06:17			06:43 (WEA_G1)	06:06	05:01		06:36 (WEA RWED1)	04:42	
16:36	14	15:47 (WEA 11 (GRS))	17:30	18:32			07:36 (WEA_G1)	20:09	21:16	6	06:41 (WEA RWED1)	22:00	
23	08:20	15:34 (WEA 11 (GRS))	07:22	06:15			06:43 (WEA_G1)	06:05	05:00		06:37 (WEA RWED1)	04:42	
16:38	12	15:46 (WEA 11 (GRS))	17:30	18:34			07:36 (WEA_G1)	20:09	21:17	5	06:40 (WEA RWED1)	22:01	
24	08:19	15:36 (WEA 11 (GRS))	07:19	06:12			06:42 (WEA_G1)	06:03	04:59		06:38 (WEA RWED1)	04:42	
16:40	8	15:44 (WEA 11 (GRS))	17:32	18:36			06:52 (WEA_G1)	20:09	21:18	4	06:40 (WEA RWED1)	22:02	
25	08:17		07:17	06:09			06:50 (WEA_G1)	20:09	21:19	3	06:40 (WEA RWED1)	22:03	
16:42			17:34	18:38			07:35 (WEA_G1)	20:09	21:20	2	06:40 (WEA RWED1)	22:04	
26	08:16		07:15	06:07			06:50 (WEA_G1)	20:09	21:21	1	06:40 (WEA RWED1)	22:05	
16:44			17:35	18:40			07:35 (WEA_G1)	20:09	21:22	0	06:40 (WEA RWED1)	22:06	
27	08:14		07:13	06:05			06:50 (WEA_G1)	20:09	21:23		06:40 (WEA RWED1)	22:07	
16:46			17:36	18:42			07:35 (WEA_G1)	20:09	21:24		06:40 (WEA RWED1)	22:08	
28	08:13		07:11	06:03			06:50 (WEA_G1)	20:09	21:25		06:40 (WEA RWED1)	22:09	
16:48			17:37	18:44			07:35 (WEA_G1)	20:09	21:26		06:40 (WEA RWED1)	22:10	
29	08:11			06:01			06:50 (WEA_G1)	20:09	21:27		06:40 (WEA RWED1)	22:11	
16:50				18:46			07:35 (WEA_G1)	20:09	21:28		06:40 (WEA RWED1)	22:12	
30	08:09			05:57			06:50 (WEA_G1)	20:09	21:29		06:40 (WEA RWED1)	22:13	
16:52				18:47			07:35 (WEA_G1)	20:09	21:30		06:40 (WEA RWED1)	22:14	
31	08:08			05:54			06:50 (WEA_G1)	20:09	21:31		06:40 (WEA RWED1)	22:15	
16:54				18:49			07:35 (WEA_G1)	20:09	21:32		06:40 (WEA RWED1)	22:16	
Sonnenscheinstunden	248		272	367		421		466				513	
astr.max.mögl.Beschattung	367		60	739		393		466				513	

**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) Schatteneende		



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 27 - IO 27 Kathenkamp 1 (Rütinger Hof)

### Annahmen für Schattenwurfberechnung

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

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

Jul	August	September	Oktober	November	Dezember
1 04:47	05:27	06:29 (WEA RWE01) 06:23	07:17	07:44 (WEA_G2) 07:16	08:12
2 12:54	12:10 25	06:54 (WEA RWE01) 20:10	18:55 40	08:24 (WEA_G1) 16:44	15:59 14
3 04:48	05:29	06:28 (WEA RWE01) 06:25	07:19	07:46 (WEA_G2) 07:18	08:14
4 12:53	12:16 28	06:56 (WEA RWE01) 20:08	18:53 38	08:24 (WEA_G1) 16:42	15:58 (WEA 10 (GRS)) 08:14
5 04:49	05:31	06:28 (WEA RWE01) 06:26	07:21	07:47 (WEA_G1) 07:20	08:15
6 12:52	12:14 29	06:57 (WEA RWE01) 20:05	18:50 36	08:23 (WEA_G1) 16:40	16:04 (WEA 10 (GRS)) 15:57
7 04:50	05:33	06:26 (WEA RWE01) 06:28	07:23	07:49 (WEA_G1) 07:22	08:17
8 12:52	12:12 32	06:58 (WEA RWE01) 20:03	18:48 33	08:22 (WEA_G1) 16:38	11:06 (WEA 10 (GRS)) 15:56
9 04:50	05:34	06:26 (WEA RWE01) 06:30	07:24	07:51 (WEA_G1) 07:24	08:19
10 12:52	12:10 33	06:59 (WEA RWE01) 20:00	18:45 31	08:22 (WEA_G1) 16:36	16:04 (WEA 10 (GRS)) 15:56
11 04:51	05:36	06:25 (WEA RWE01) 06:32	07:26	07:53 (WEA_G1) 07:26	08:19
12 12:51	12:08 35	07:00 (WEA RWE01) 19:58	18:43 28	08:21 (WEA_G1) 16:34	16:02 (WEA 10 (GRS)) 15:55
13 04:52	05:38	06:24 (WEA RWE01) 06:34	07:28	07:55 (WEA_G1) 07:28	08:21
14 12:50	12:06 36	07:00 (WEA RWE01) 19:55	18:41 25	08:20 (WEA_G1) 16:32	16:00 (WEA 10 (GRS)) 15:55
15 04:53	05:40	06:24 (WEA RWE01) 06:35	07:30	07:57 (WEA_G1) 07:30	08:22
16 12:50	12:04 34	07:00 (WEA RWE01) 19:52	18:38 23	08:19 (WEA_G1) 16:28	16:00 (WEA 10 (GRS)) 15:54
17 04:54	05:41	06:23 (WEA RWE01) 06:37	07:31	07:58 (WEA_G1) 07:31	08:23
18 12:49	12:02 37	07:00 (WEA RWE01) 19:52	18:35 18	08:18 (WEA_G1) 16:28	16:00 (WEA 10 (GRS)) 15:54
19 04:55	05:43	06:22 (WEA RWE01) 06:35	07:34	08:01 (WEA 11 (GRS)) 07:34	08:24
20 12:48	12:00 30	07:01 (WEA RWE01) 19:46	18:31 15	08:18 (WEA_G1) 16:27	16:00 (WEA 10 (GRS)) 15:54
21 04:56	05:45	06:22 (WEA RWE01) 06:41	07:36	08:03 (WEA 11 (GRS)) 07:36	08:26
22 12:47	12:01 39	07:01 (WEA RWE01) 19:45	18:31 11	08:18 (WEA_G1) 16:26	16:00 (WEA 10 (GRS)) 15:52
23 04:56	05:47	06:21 (WEA RWE01) 06:45	07:37	08:15 (WEA_G1) 07:36	08:27
24 12:46	12:00 38	07:00 (WEA RWE01) 19:41	18:28 6	08:17 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
25 04:59	05:49	06:22 (WEA RWE01) 06:44	07:39	08:16 (WEA_G1) 16:25	08:28
26 12:45	12:01 39	07:01 (WEA RWE01) 19:41	18:26	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
27 04:59	05:50	06:22 (WEA RWE01) 06:42	07:41	08:16 (WEA_G1) 16:25	08:29
28 12:44	12:01 38	07:01 (WEA RWE01) 19:40	18:24	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
29 04:59	05:51	06:21 (WEA RWE01) 06:46	07:43	08:16 (WEA_G1) 16:25	08:30
30 12:43	12:00 39	07:00 (WEA RWE01) 19:35	18:21	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
31 04:59	05:52	06:21 (WEA RWE01) 06:46	07:43	08:16 (WEA_G1) 16:25	08:31
1 12:42	12:00 37	07:00 (WEA RWE01) 19:31	18:18	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
2 04:59	05:53	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:32
3 12:41	12:00 36	07:00 (WEA RWE01) 19:26	18:15	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
4 04:59	05:54	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:33
5 12:40	12:00 35	07:00 (WEA RWE01) 19:21	18:12	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
6 04:59	05:55	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:34
7 12:39	12:00 34	07:00 (WEA RWE01) 19:16	18:09	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
8 04:59	05:56	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:35
9 12:38	12:00 33	07:00 (WEA RWE01) 19:11	18:06	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
10 04:59	05:57	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:36
11 12:37	12:00 32	07:00 (WEA RWE01) 19:06	18:03	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
12 04:59	05:58	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:37
13 12:36	12:00 31	07:00 (WEA RWE01) 19:01	18:00	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
14 04:59	05:59	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:38
15 12:35	12:00 30	07:00 (WEA RWE01) 18:56	17:57	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
16 04:59	06:00	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:39
17 12:34	12:00 29	07:00 (WEA RWE01) 18:51	17:54	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
18 04:59	06:01	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:40
19 12:33	12:00 28	07:00 (WEA RWE01) 18:46	17:51	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
20 04:59	06:02	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:41
21 12:32	12:00 27	07:00 (WEA RWE01) 18:41	17:48	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
22 04:59	06:03	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:42
23 12:31	12:00 26	07:00 (WEA RWE01) 18:36	17:45	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
24 04:59	06:04	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:43
25 12:30	12:00 25	07:00 (WEA RWE01) 18:31	17:42	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
26 04:59	06:05	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:44
27 12:29	12:00 24	07:00 (WEA RWE01) 18:26	17:39	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
28 04:59	06:06	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:45
29 12:28	12:00 23	07:00 (WEA RWE01) 18:21	17:36	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
30 04:59	06:07	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:46
31 12:27	12:00 22	07:00 (WEA RWE01) 18:16	17:33	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
1 04:59	06:08	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:47
2 12:26	12:00 21	07:00 (WEA RWE01) 18:11	17:30	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
3 04:59	06:09	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:48
4 12:25	12:00 20	07:00 (WEA RWE01) 18:06	17:27	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
5 04:59	06:10	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:49
6 12:24	12:00 19	07:00 (WEA RWE01) 18:01	17:24	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
7 04:59	06:11	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:50
8 12:23	12:00 18	07:00 (WEA RWE01) 17:56	17:21	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
9 04:59	06:12	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:51
10 12:22	12:00 17	07:00 (WEA RWE01) 17:51	17:18	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
11 04:59	06:13	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:52
12 12:21	12:00 16	07:00 (WEA RWE01) 17:46	17:15	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
13 04:59	06:14	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:53
14 12:20	12:00 15	07:00 (WEA RWE01) 17:41	17:12	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
15 04:59	06:15	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:54
16 12:19	12:00 14	07:00 (WEA RWE01) 17:36	17:09	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
17 04:59	06:16	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:55
18 12:18	12:00 13	07:00 (WEA RWE01) 17:31	17:06	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
19 04:59	06:17	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:56
20 12:17	12:00 12	07:00 (WEA RWE01) 17:26	17:03	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
21 04:59	06:18	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:57
22 12:16	12:00 11	07:00 (WEA RWE01) 17:21	16:59	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
23 04:59	06:19	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:58
24 12:15	12:00 10	07:00 (WEA RWE01) 17:16	16:56	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
25 04:59	06:20	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	08:59
26 12:14	12:00 9	07:00 (WEA RWE01) 17:11	16:53	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
27 04:59	06:21	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:00
28 12:13	12:00 8	07:00 (WEA RWE01) 17:06	16:50	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
29 04:59	06:22	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:01
30 12:12	12:00 7	07:00 (WEA RWE01) 17:01	16:47	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
31 04:59	06:23	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:02
1 12:11	12:00 6	07:00 (WEA RWE01) 16:56	16:44	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
2 04:59	06:24	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:03
3 12:10	12:00 5	07:00 (WEA RWE01) 16:51	16:41	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
4 04:59	06:25	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:04
5 12:09	12:00 4	07:00 (WEA RWE01) 16:46	16:38	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
6 04:59	06:26	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:05
7 12:08	12:00 3	07:00 (WEA RWE01) 16:41	16:35	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
8 04:59	06:27	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:06
9 12:07	12:00 2	07:00 (WEA RWE01) 16:36	16:32	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
10 04:59	06:28	06:21 (WEA RWE01) 06:47	07:44	08:16 (WEA_G1) 16:25	09:07
11 12:06	12:00 1	07:00 (WEA RWE01) 16:31	16:29	08:16 (WEA_G1) 16:25	16:00 (WEA 10 (GRS)) 15:52
12 0					

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 28 - IO 28 Rütiger Klosterkamp 5

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni					
1	08:37	15:17 (WEA 13 (GRS))	08:06		07:08		06:52		05:42	06:08 (WEA RWE01)	04:51				
16:03	8	15:25 (WEA 13 (GRS))	16:55		17:52		19:51		20:48	31	06:39 (WEA RWE01)	21:39			
2	08:37	15:17 (WEA 13 (GRS))	08:04		07:05		06:49		05:39		06:06 (WEA RWE01)	04:50			
16:04	9	15:26 (WEA 13 (GRS))	16:57		17:54		19:53		20:49	33	06:39 (WEA RWE01)	21:40			
3	08:37	15:17 (WEA 13 (GRS))	08:03		07:03		06:47		05:37		06:04 (WEA RWE01)	04:49			
16:05	10	15:27 (WEA 13 (GRS))	16:59		17:56		19:55		20:51	35	06:39 (WEA RWE01)	21:41			
4	08:36	15:18 (WEA 13 (GRS))	08:01		07:01		06:44		05:35		06:02 (WEA RWE01)	04:48			
16:07	11	15:29 (WEA 13 (GRS))	17:01		17:58		19:57		20:53	37	06:39 (WEA RWE01)	21:42			
5	08:36	15:18 (WEA 13 (GRS))	07:59		06:58		06:42		05:33		06:00 (WEA RWE01)	04:48			
16:08	12	15:30 (WEA 13 (GRS))	17:03		18:00		19:59		20:55	39	06:39 (WEA RWE01)	21:43			
6	08:36	15:20 (WEA 13 (GRS))	07:57		06:56		06:39		05:31		06:00 (WEA RWE01)	04:47			
16:09	12	15:32 (WEA 13 (GRS))	17:05	1	16:35 (WEA 10 (GRS))	18:02	2	07:22 (WEA 15 (GON))	20:01	20:57	39	06:39 (WEA RWE01)	21:44		
7	08:35	15:20 (WEA 13 (GRS))	07:55		16:32 (WEA 10 (GRS))	06:53		07:18 (WEA 15 (GON))	06:37		05:29		06:00 (WEA RWE01)	04:46	
16:11	13	15:33 (WEA 13 (GRS))	17:07	4	16:36 (WEA 10 (GRS))	18:04	3	07:21 (WEA 15 (GON))	20:03	20:59	38	06:38 (WEA RWE01)	21:45		
8	08:35	15:20 (WEA 13 (GRS))	07:53		16:32 (WEA 10 (GRS))	06:51	3	07:15 (WEA 15 (GON))	06:35		05:27		06:00 (WEA RWE01)	04:46	
16:12	13	15:33 (WEA 13 (GRS))	17:09	6	16:38 (WEA 10 (GRS))	18:06	9	07:24 (WEA 15 (GON))	20:04	21:00	35	06:38 (WEA RWE01)	21:46		
9	08:34	15:21 (WEA 13 (GRS))	07:51		16:33 (WEA 10 (GRS))	06:49		07:13 (WEA 15 (GON))	06:32		05:25		06:00 (WEA RWE01)	04:45	
16:14	15	15:36 (WEA 13 (GRS))	17:11	8	16:41 (WEA 10 (GRS))	18:07	13	07:26 (WEA 15 (GON))	20:06	21:02	32	06:39 (WEA RWE01)	21:47		
10	08:33	15:21 (WEA 13 (GRS))	07:49		16:30 (WEA 10 (GRS))	06:46		07:10 (WEA 15 (GON))	06:30		05:24		06:00 (WEA RWE01)	04:44	
16:15	15	15:36 (WEA 13 (GRS))	17:13	10	16:43 (WEA 10 (GRS))	18:09	17	07:27 (WEA 15 (GON))	20:08	21:04	38	06:38 (WEA RWE01)	21:48		
11	08:33	15:22 (WEA 13 (GRS))	07:47		16:31 (WEA 10 (GRS))	06:44		07:08 (WEA 15 (GON))	06:27		05:22		06:00 (WEA RWE01)	04:44	
16:17	14	15:36 (WEA 13 (GRS))	17:15	11	16:45 (WEA 10 (GRS))	18:11	21	07:28 (WEA 15 (GON))	20:10	21:06	37	06:37 (WEA RWE01)	21:49		
12	08:32	15:23 (WEA 13 (GRS))	07:45		16:35 (WEA 10 (GRS))	06:41		07:05 (WEA 15 (GON))	06:25		05:20		06:00 (WEA RWE01)	04:44	
16:18	13	15:36 (WEA 13 (GRS))	17:15	12	16:47 (WEA 10 (GRS))	18:13	26	07:29 (WEA 15 (GON))	20:12	21:08	37	06:37 (WEA RWE01)	21:50		
13	08:31	15:24 (WEA 13 (GRS))	07:43		16:36 (WEA 10 (GRS))	06:39	27	07:23 (WEA 15 (GON))	06:25		05:18		06:00 (WEA RWE01)	04:43	
16:19	14	15:43 (WEA 11 (GRS))	17:20	10	16:46 (WEA 10 (GRS))	18:15	27	07:30 (WEA 15 (GON))	20:14	21:10	36	06:37 (WEA RWE01)	21:50		
14	08:30	15:25 (WEA 13 (GRS))	07:41		16:38 (WEA 10 (GRS))	06:36		07:20 (WEA 15 (GON))	06:20		05:16		06:00 (WEA RWE01)	04:43	
16:21	15	15:46 (WEA 11 (GRS))	17:22	5	16:44 (WEA 10 (GRS))	18:17	30	07:31 (WEA 15 (GON))	20:16	21:11	35	06:38 (WEA RWE01)	21:51		
15	08:29	15:27 (WEA 13 (GRS))	07:39		06:34		06:18		05:08		05:15		06:00 (WEA RWE01)	04:43	
16:22	15	15:47 (WEA 11 (GRS))	17:24		18:19		18:18		21:13	34	06:38 (WEA RWE01)	21:52			
16	08:28	15:40 (WEA 11 (GRS))	07:37		06:31		06:15		05:05		05:12		06:00 (WEA RWE01)	04:42	
16:23	9	15:49 (WEA 11 (GRS))	17:25		18:21		18:20		21:14	33	06:38 (WEA RWE01)	21:53			
17	08:27	15:40 (WEA 11 (GRS))	07:35		06:29		06:13		05:03		05:10		06:00 (WEA RWE01)	04:42	
16:24	11	15:51 (WEA 11 (GRS))	17:26		18:23		18:22		21:16	31	06:38 (WEA RWE01)	21:53			
18	08:26	15:40 (WEA 11 (GRS))	07:33		06:27		06:11		05:01		05:08		06:00 (WEA RWE01)	04:42	
16:25	13	15:53 (WEA 11 (GRS))	17:28		18:25		18:24		21:18	29	06:38 (WEA RWE01)	21:53			
19	08:25	15:40 (WEA 11 (GRS))	07:31		06:24		06:08		04:59		05:06		06:00 (WEA RWE01)	04:42	
16:26	15	15:55 (WEA 11 (GRS))	17:31		18:27		18:26		21:20	28	06:38 (WEA RWE01)	21:54			
20	08:24	15:40 (WEA 11 (GRS))	07:29		06:22		06:06		04:57		05:04		06:00 (WEA RWE01)	04:42	
16:27	17	15:57 (WEA 11 (GRS))	17:34		18:29		18:28		21:22	26	06:38 (WEA RWE01)	21:54			
21	08:23	15:40 (WEA 11 (GRS))	07:26		06:19		06:04		04:55		05:02		06:00 (WEA RWE01)	04:42	
16:28	19	15:58 (WEA 11 (GRS))	17:36		18:30		18:29		21:23	24	06:38 (WEA RWE01)	21:54			
22	08:21	15:41 (WEA 11 (GRS))	07:24		06:17		06:01		04:53		05:00		06:00 (WEA RWE01)	04:42	
16:29	21	16:02 (WEA 11 (GRS))	17:38		18:32		18:31	1	06:26 (WEA RWE01)	06:03	22	06:38 (WEA RWE01)	21:55		
23	08:20	15:41 (WEA 11 (GRS))	07:22		06:15		06:00		04:51		04:58		06:00 (WEA RWE01)	04:42	
16:30	20	16:01 (WEA 11 (GRS))	17:40		18:34		18:33	6	06:30 (WEA RWE01)	06:05	19	06:38 (WEA RWE01)	21:55		
24	08:19	15:41 (WEA 11 (GRS))	07:19		06:12		06:00		04:49		04:56		06:00 (WEA RWE01)	04:42	
16:31	20	16:01 (WEA 11 (GRS))	17:42		18:36		18:35	11	06:33 (WEA RWE01)	06:07	16	06:38 (WEA RWE01)	21:55		
25	08:17	15:42 (WEA 11 (GRS))	07:17		06:09		06:05		04:47		04:54		06:00 (WEA RWE01)	04:42	
16:32	21	16:02 (WEA 11 (GRS))	17:44		18:38		18:37	14	06:36 (WEA RWE01)	06:09	13	06:38 (WEA RWE01)	21:55		
26	08:16	15:42 (WEA 11 (GRS))	07:15		06:07		06:03		04:45		04:52		06:00 (WEA RWE01)	04:42	
16:33	19	16:01 (WEA 11 (GRS))	17:46		18:40		18:39	17	06:39 (WEA RWE01)	06:11	8	06:38 (WEA RWE01)	21:55		
27	08:14	15:43 (WEA 11 (GRS))	07:13		06:04		06:00		04:43		04:50		06:00 (WEA RWE01)	04:42	
16:34	19	16:01 (WEA 11 (GRS))	17:48		18:42		18:41	20	06:42 (WEA RWE01)	06:13	6	06:38 (WEA RWE01)	21:55		
28	08:13	15:44 (WEA 11 (GRS))	07:11		06:02		06:00		04:41		04:48		06:00 (WEA RWE01)	04:42	
16:35	17	16:01 (WEA 11 (GRS))	17:50		18:44		18:43	23	06:45 (WEA RWE01)	06:15	4	06:38 (WEA RWE01)	21:55		
29	08:11	15:45 (WEA 11 (GRS))	07:09		06:00		06:00		04:39		04:46		06:00 (WEA RWE01)	04:42	
16:36	15	16:00 (WEA 11 (GRS))	17:51		18:46		18:45	26	06:48 (WEA RWE01)	06:17	2	06:38 (WEA RWE01)	21:54		
30	08:09	15:47 (WEA 11 (GRS))	07:07		05:57		06:00		04:37		04:44		06:00 (WEA RWE01)	04:42	
16:37	12	16:00 (WEA 11 (GRS))	17:52		18:47		18:46	28	06:51 (WEA RWE01)	06:19	0	06:38 (WEA RWE01)	21:54		
31	08:08	15:49 (WEA 11 (GRS))	07:05		05:54		06:00		04:35		04:42		06:00 (WEA RWE01)	04:42	
16:38	8	15:57 (WEA 11 (GRS))	17:53		18:49		18:48		21:37				06:00 (WEA RWE01)	04:42	
Sonnenscheinstunden		248			367		421		466		513				
astr. max. mögl. Beschattung		444	272	67	721		146		792						

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 28 - IO 28 Rütiger Klosterkamp 5

### Annahmen für Schattenwurfberechnung

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

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

Jul	August	September	Oktober	November	Dezember		
1   04:47	05:27	06:10 (WEA RW01)   06:23	07:17	07:44 (WEA G1)   07:16	16:03 (WEA 10 (GRS))   08:12	15:04 (WEA 13 (GRS))	
2   04:48	05:29	06:10 (WEA RW01)   06:25	07:19	07:46 (WEA G1)   07:18	16:02 (WEA 10 (GRS))   08:14	15:04 (WEA 13 (GRS))	
3   04:48	05:31	06:11 (WEA RW01)   06:26	07:21	07:47 (WEA G1)   07:20	16:02 (WEA 10 (GRS))   08:15	15:05 (WEA 13 (GRS))	
4   04:49	05:33	06:10 (WEA RW01)   06:26	07:23	07:49 (WEA G1)   07:22	16:03 (WEA 10 (GRS))   08:17	15:04 (WEA 13 (GRS))	
5   04:50	05:34	06:10 (WEA RW01)   06:26	07:24	07:51 (WEA G1)   07:24	16:02 (WEA 10 (GRS))   08:18	15:05 (WEA 13 (GRS))	
6   04:51	05:36	06:10 (WEA RW01)   06:32	07:26	07:53 (WEA G1)   07:26	16:06 (WEA 10 (GRS))   08:19	15:05 (WEA 13 (GRS))	
7   04:52	05:38	06:09 (WEA RW01)   06:34	07:28	07:55 (WEA 15 (GCN))   07:28	16:05 (WEA 10 (GRS))   08:21	15:05 (WEA 13 (GRS))	
8   04:53	05:40	06:10 (WEA RW01)   06:35	07:30	07:57 (WEA 15 (GCN))   07:30	16:05 (WEA 10 (GRS))   08:22	15:05 (WEA 13 (GRS))	
9   04:54	05:41	06:11 (WEA RW01)   06:37	07:32	07:59 (WEA 15 (GCN))   07:32	16:06 (WEA 10 (GRS))   08:23	15:06 (WEA 13 (GRS))	
10   04:55	05:43	06:13 (WEA RW01)   06:38	07:34	08:01 (WEA 15 (GCN))   07:34	16:06 (WEA 10 (GRS))   08:24	15:07 (WEA 13 (GRS))	
11   04:56	05:44	06:13 (WEA RW01)   06:40	07:36	08:03 (WEA 15 (GCN))   07:36	16:06 (WEA 10 (GRS))   08:25	15:08 (WEA 13 (GRS))	
12   04:58	05:47	06:16 (WEA RW01)   06:42	07:38	08:05 (WEA 15 (GCN))   07:38	16:07 (WEA 10 (GRS))   08:26	15:09 (WEA 13 (GRS))	
13   04:59	05:49	06:16 (WEA RW01)   06:44	07:40	08:07 (WEA 15 (GCN))   07:40	16:07 (WEA 10 (GRS))   08:27	15:10 (WEA 13 (GRS))	
14   05:00	05:51	06:16 (WEA RW01)   06:46	07:42	08:09 (WEA 15 (GCN))   07:42	16:08 (WEA 10 (GRS))   08:28	15:11 (WEA 13 (GRS))	
15   05:01	05:52	06:16 (WEA RW01)   06:48	07:44	08:11 (WEA 15 (GCN))   07:44	16:08 (WEA 10 (GRS))   08:29	15:12 (WEA 13 (GRS))	
16   05:03	05:54	06:17 (WEA RW01)   06:50	07:46	08:13 (WEA 15 (GCN))   07:46	16:09 (WEA 10 (GRS))   08:30	15:13 (WEA 13 (GRS))	
17   05:04	05:56	06:17 (WEA RW01)   06:52	07:48	08:15 (WEA 15 (GCN))   07:48	16:09 (WEA 10 (GRS))   08:31	15:14 (WEA 13 (GRS))	
18   05:05	05:57	06:17 (WEA RW01)   06:54	07:50	08:17 (WEA 15 (GCN))   07:50	16:10 (WEA 10 (GRS))   08:32	15:15 (WEA 13 (GRS))	
19   05:07	05:59	06:18 (WEA RW01)   06:56	07:52	08:19 (WEA 15 (GCN))   07:52	16:10 (WEA 10 (GRS))   08:33	15:16 (WEA 13 (GRS))	
20   05:08	06:01	06:18 (WEA RW01)   06:58	07:54	08:21 (WEA 15 (GCN))   07:54	16:11 (WEA 10 (GRS))   08:34	15:17 (WEA 13 (GRS))	
21   05:10	06:03	06:19 (WEA RW01)   07:00	07:56	08:23 (WEA 15 (GCN))   07:56	16:11 (WEA 10 (GRS))   08:35	15:18 (WEA 13 (GRS))	
22   05:11	06:05	06:19 (WEA RW01)   07:02	07:58	08:25 (WEA 15 (GCN))   07:58	16:12 (WEA 10 (GRS))   08:36	15:19 (WEA 13 (GRS))	
23   05:12	06:07	06:19 (WEA RW01)   07:04	07:59	08:27 (WEA 15 (GCN))   07:59	16:12 (WEA 10 (GRS))   08:37	15:20 (WEA 13 (GRS))	
24   05:13	06:09	06:19 (WEA RW01)   07:06	08:01	08:29 (WEA 15 (GCN))   08:01	16:13 (WEA 10 (GRS))   08:38	15:21 (WEA 13 (GRS))	
25   05:14	06:11	06:19 (WEA RW01)   07:08	08:03	08:31 (WEA 15 (GCN))   08:03	16:13 (WEA 10 (GRS))   08:39	15:22 (WEA 13 (GRS))	
26   05:15	06:13	06:19 (WEA RW01)   07:10	08:05	08:33 (WEA 15 (GCN))   08:05	16:14 (WEA 10 (GRS))   08:40	15:23 (WEA 13 (GRS))	
27   05:16	06:15	06:19 (WEA RW01)   07:12	08:07	08:35 (WEA 15 (GCN))   08:07	16:14 (WEA 10 (GRS))   08:41	15:24 (WEA 13 (GRS))	
28   05:17	06:17	06:19 (WEA RW01)   07:14	08:09	08:37 (WEA 15 (GCN))   08:09	16:15 (WEA 10 (GRS))   08:42	15:25 (WEA 13 (GRS))	
29   05:18	06:19	06:19 (WEA RW01)   07:16	08:11	08:39 (WEA 15 (GCN))   08:11	16:15 (WEA 10 (GRS))   08:43	15:26 (WEA 13 (GRS))	
30   05:19	06:21	06:19 (WEA RW01)   07:18	08:13	08:41 (WEA 15 (GCN))   08:13	16:16 (WEA 10 (GRS))   08:44	15:27 (WEA 13 (GRS))	
31   05:20	06:23	06:19 (WEA RW01)   07:20	08:15	08:43 (WEA 15 (GCN))   08:15	16:16 (WEA 10 (GRS))   08:45	15:28 (WEA 13 (GRS))	
Sonnenscheinstunden ab: max mögl. Beschattung	347	451	576	695	811	936	2-0

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

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

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
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Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 29 - IO 29 Rütiger Klosterkamp 9

Annahmen für Schattenwurfberechnung

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

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

Table with columns for months (Januar to Juni) and rows for days, showing sunrise/sunset times and shadow reception data.

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

Table with 5 columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM) Schattenanfang, Schattenanfang (WEA mit erstem Schatten), Schattenende (WEA mit letztem Schatten)



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 29 - IO 29 Rütiger Klosterkamp 9

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	05:27	06:23 (WEA RWED1)	06:23	07:17	07:44 (WEA GL)	07:16	15:54 (WEA 10 (GRS))	08:12	14:54 (WEA 11 (GRS))	
	21:54	21:18	23 06:46 (WEA RWED1)	20:10	18:55	18 08:02 (WEA GL)	16:44	7 16:01 (WEA 10 (GRS))	15:59	23 15:17 (WEA 11 (GRS))	
2	04:48	05:29	06:23 (WEA RWED1)	06:25	07:19	07:46 (WEA GL)	07:18	15:52 (WEA 10 (GRS))	08:14	14:54 (WEA 11 (GRS))	
	21:53	21:16	24 06:47 (WEA RWED1)	20:08	18:53	15 08:01 (WEA GL)	16:42	11 16:03 (WEA 10 (GRS))	15:58	24 15:18 (WEA 11 (GRS))	
3	04:48	05:31	06:22 (WEA RWED1)	06:26	07:21	07:47 (WEA GL)	07:20	15:51 (WEA 10 (GRS))	08:15	14:55 (WEA 11 (GRS))	
	21:53	21:14	27 06:49 (WEA RWED1)	20:05	18:50	11 07:58 (WEA GL)	16:40	13 16:04 (WEA 10 (GRS))	15:57	23 15:18 (WEA 11 (GRS))	
4	04:49	05:33	06:20 (WEA RWED1)	06:28	07:23	07:49 (WEA GL)	07:22	15:51 (WEA 10 (GRS))	08:17	14:55 (WEA 11 (GRS))	
	21:52	21:12	29 06:49 (WEA RWED1)	20:03	18:48	7 07:56 (WEA GL)	16:38	15 16:06 (WEA 10 (GRS))	15:56	23 15:18 (WEA 11 (GRS))	
5	04:50	05:34	06:20 (WEA RWED1)	06:30	07:24	07:50 (WEA GL)	07:24	15:50 (WEA 10 (GRS))	08:18	14:56 (WEA 11 (GRS))	
	21:52	21:10	30 06:50 (WEA RWED1)	20:00	18:45	2 07:53 (WEA GL)	16:36	14 16:04 (WEA 10 (GRS))	15:56	23 15:19 (WEA 11 (GRS))	
6	04:51	05:36	06:20 (WEA RWED1)	06:32	07:26		07:26	15:49 (WEA 10 (GRS))	08:19	14:56 (WEA 11 (GRS))	
	21:51	21:08	31 06:51 (WEA RWED1)	19:58	18:43		16:34	13 16:02 (WEA 10 (GRS))	15:55	21 15:17 (WEA 11 (GRS))	
7	04:52	05:38	06:19 (WEA RWED1)	06:34	07:28		07:28	15:49 (WEA 10 (GRS))	08:21	14:57 (WEA 11 (GRS))	
	21:50	21:06	32 06:51 (WEA RWED1)	19:55	18:41		16:32	11 16:00 (WEA 10 (GRS))	15:55	20 15:17 (WEA 11 (GRS))	
8	04:53	05:40	06:18 (WEA RWED1)	06:35	07:30		07:30	15:49 (WEA 10 (GRS))	08:22	14:51 (WEA 11 (GRS))	
	21:49	21:04	33 06:51 (WEA RWED1)	19:51	18:38		16:30	11 15:57 (WEA 10 (GRS))	15:54	24 15:16 (WEA 11 (GRS))	
9	04:54	05:41	06:17 (WEA RWED1)	06:37	07:32		07:32	15:49 (WEA 10 (GRS))	08:23	14:51 (WEA 11 (GRS))	
	21:49	21:02	34 06:51 (WEA RWED1)	19:50	18:36		16:28	6 15:55 (WEA 10 (GRS))	15:54	25 15:16 (WEA 11 (GRS))	
10	04:55	05:41	06:17 (WEA RWED1)	06:38	07:34		07:34	15:49 (WEA 10 (GRS))	08:24	14:49 (WEA 11 (GRS))	
	21:49	21:00	35 06:51 (WEA RWED1)	19:48	18:33		16:27	3 15:53 (WEA 10 (GRS))	15:54	25 15:16 (WEA 11 (GRS))	
11	04:56	05:42	06:17 (WEA RWED1)	06:41	07:36		07:36	15:49 (WEA 10 (GRS))	08:25	14:48 (WEA 11 (GRS))	
	21:48	20:59	36 06:51 (WEA RWED1)	19:45	18:31		16:25	1 15:51 (WEA 10 (GRS))	15:54	26 15:16 (WEA 11 (GRS))	
12	04:57	05:43	06:16 (WEA RWED1)	06:43	07:37		07:37	15:49 (WEA 10 (GRS))	08:26	14:48 (WEA 11 (GRS))	
	21:46	20:56	37 06:51 (WEA RWED1)	19:43	18:28		16:23	15:49 (WEA 10 (GRS))	15:53	25 15:16 (WEA 11 (GRS))	
13	04:59	05:45	06:15 (WEA RWED1)	06:44	07:38		07:38	15:49 (WEA 10 (GRS))	08:27	14:48 (WEA 11 (GRS))	
	21:45	20:54	38 06:51 (WEA RWED1)	19:40	18:26		16:21	14:48 (WEA 10 (GRS))	15:53	24 15:16 (WEA 11 (GRS))	
14	05:00	05:50	06:15 (WEA RWED1)	06:46	07:41		07:41	15:49 (WEA 10 (GRS))	08:28	14:48 (WEA 11 (GRS))	
	21:44	20:52	39 06:51 (WEA RWED1)	19:38	18:24		16:20	13 15:51 (WEA 10 (GRS))	15:53	24 15:16 (WEA 11 (GRS))	
15	05:01	05:52	06:15 (WEA RWED1)	06:48	07:42	07:42 (WEA GL)	07:42	15:49 (WEA 10 (GRS))	08:29	14:48 (WEA 11 (GRS))	
	21:43	20:49	40 06:51 (WEA RWED1)	19:35	18:22	11 08:04 (WEA GL)	16:20	12 16:00 (WEA 10 (GRS))	15:53	24 15:16 (WEA 11 (GRS))	
16	05:03	05:54	06:15 (WEA RWED1)	06:50	07:43	07:43 (WEA GL)	07:43	15:49 (WEA 10 (GRS))	08:30	14:48 (WEA 11 (GRS))	
	21:42	20:47	41 06:51 (WEA RWED1)	19:33	18:21	17 08:22 (WEA GL)	16:18	11 16:03 (WEA 10 (GRS))	15:53	2 15:16 (WEA 11 (GRS))	
17	05:04	05:56	06:15 (WEA RWED1)	06:52	07:44	07:44 (WEA GL)	07:44	15:49 (WEA 10 (GRS))	08:31	14:48 (WEA 11 (GRS))	
	21:41	20:45	42 06:51 (WEA RWED1)	19:30	18:20	23 08:31 (WEA GL)	16:17	10 16:03 (WEA 10 (GRS))	15:53	1 15:16 (WEA 11 (GRS))	
18	05:05	05:59	06:15 (WEA RWED1)	06:53	07:45	07:45 (WEA GL)	07:45	15:49 (WEA 10 (GRS))	08:32	14:48 (WEA 11 (GRS))	
	21:40	20:43	43 06:51 (WEA RWED1)	19:28	18:19	29 08:32 (WEA GL)	16:14	6 15:53 (WEA 10 (GRS))	15:53	24 15:16 (WEA 11 (GRS))	
19	05:07	06:01	06:15 (WEA RWED1)	06:55	07:46	07:46 (WEA GL)	07:46	15:49 (WEA 10 (GRS))	08:33	14:48 (WEA 11 (GRS))	
	21:39	20:41	44 06:51 (WEA RWED1)	19:25	18:18	35 08:33 (WEA GL)	16:12	11 15:53 (WEA 10 (GRS))	15:54	23 15:16 (WEA 11 (GRS))	
20	05:08	06:03	06:15 (WEA RWED1)	06:57	07:47	07:47 (WEA GL)	07:47	15:49 (WEA 10 (GRS))	08:34	14:48 (WEA 11 (GRS))	
	21:39	20:38	45 06:51 (WEA RWED1)	19:23	18:17	41 08:34 (WEA GL)	16:11	14 15:53 (WEA 10 (GRS))	15:54	23 15:16 (WEA 11 (GRS))	
21	05:10	06:05	06:15 (WEA RWED1)	06:59	07:48	07:48 (WEA GL)	07:48	15:49 (WEA 10 (GRS))	08:35	14:48 (WEA 11 (GRS))	
	21:37	20:36	46 06:51 (WEA RWED1)	19:20	18:16	47 08:35 (WEA GL)	16:09	16 15:53 (WEA 10 (GRS))	15:54	23 15:16 (WEA 11 (GRS))	
22	05:11	06:07	06:15 (WEA RWED1)	07:01	07:49	07:49 (WEA GL)	07:49	15:49 (WEA 10 (GRS))	08:36	14:48 (WEA 11 (GRS))	
	21:36	20:34	47 06:51 (WEA RWED1)	19:18	18:15	53 08:36 (WEA GL)	16:08	19 15:53 (WEA 10 (GRS))	15:55	23 15:16 (WEA 11 (GRS))	
23	05:13	06:09	06:15 (WEA RWED1)	07:02	07:50	07:50 (WEA GL)	07:50	15:49 (WEA 10 (GRS))	08:37	14:48 (WEA 11 (GRS))	
	21:35	20:33	48 06:51 (WEA RWED1)	19:16	18:14	59 08:37 (WEA GL)	16:07	19 15:53 (WEA 10 (GRS))	15:55	23 15:16 (WEA 11 (GRS))	
24	05:14	06:10	06:15 (WEA RWED1)	07:04	07:51	07:51 (WEA GL)	07:51	15:49 (WEA 10 (GRS))	08:38	14:48 (WEA 11 (GRS))	
	21:34	20:29	49 06:51 (WEA RWED1)	19:13	18:13	65 08:38 (WEA GL)	16:06	20 15:53 (WEA 10 (GRS))	15:55	23 15:16 (WEA 11 (GRS))	
25	05:16	06:11	06:15 (WEA RWED1)	07:05	07:52	07:52 (WEA GL)	07:52	15:49 (WEA 10 (GRS))	08:39	14:48 (WEA 11 (GRS))	
	21:33	20:27	50 06:51 (WEA RWED1)	19:10	18:12	71 08:39 (WEA GL)	16:04	21 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
26	05:18	06:12	06:15 (WEA RWED1)	07:06	07:53	07:53 (WEA GL)	07:53	15:49 (WEA 10 (GRS))	08:40	14:48 (WEA 11 (GRS))	
	21:31	20:24	51 06:51 (WEA RWED1)	19:08	18:11	77 08:40 (WEA GL)	16:03	22 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
27	05:19	06:14	06:15 (WEA RWED1)	07:07	07:54	07:54 (WEA GL)	07:54	15:49 (WEA 10 (GRS))	08:41	14:48 (WEA 11 (GRS))	
	21:30	20:22	52 06:51 (WEA RWED1)	19:06	18:10	83 08:41 (WEA GL)	16:02	23 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
28	05:21	06:15 (WEA RWED1)	06:16	07:08	07:55	07:55 (WEA GL)	07:55	15:49 (WEA 10 (GRS))	08:42	14:48 (WEA 11 (GRS))	
	21:29	20:20	53 06:51 (WEA RWED1)	19:03	18:09	89 08:42 (WEA GL)	16:01	24 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
29	05:22	06:16 (WEA RWED1)	06:17	07:09	07:56	07:56 (WEA GL)	07:56	15:49 (WEA 10 (GRS))	08:43	14:48 (WEA 11 (GRS))	
	21:28	20:18	54 06:51 (WEA RWED1)	19:00	18:08	95 08:43 (WEA GL)	16:00	25 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
30	05:24	06:18 (WEA RWED1)	06:19	07:10	07:57	07:57 (WEA GL)	07:57	15:49 (WEA 10 (GRS))	08:44	14:48 (WEA 11 (GRS))	
	21:27	20:17	55 06:51 (WEA RWED1)	18:58	18:07	101 08:44 (WEA GL)	15:59	26 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
31	05:26	06:19 (WEA RWED1)	06:21	07:11	07:58	07:58 (WEA GL)	07:58	15:49 (WEA 10 (GRS))	08:45	14:48 (WEA 11 (GRS))	
	21:26	20:15	56 06:51 (WEA RWED1)	18:56	18:06	107 08:45 (WEA GL)	15:58	27 15:53 (WEA 10 (GRS))	15:55	24 15:16 (WEA 11 (GRS))	
Sommerzeit reibend		51	51	51	51	51	51	51	51	51	51
astr.max.mögl.Beschattung		53	606	383	506	53	341	733			

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

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:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 30 - IO 30 Kathenkamp 11 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

Januar	Februar	März	April	Mai	Juni
1 08:37 16:03	08:06 16:55	07:08 17:52	07:33 (WEA_G1) 06:52 08:03 (WEA_G1) 19:51	05:42 20:40	04:51 05:38 (WEA_03 (GRN)) 21:39 05:41 (WEA_03 (GRN))
2 08:37 16:04	08:04 16:57	07:05 17:54	07:30 (WEA_G1) 06:49 08:02 (WEA_G1) 19:53	07:13 (WEA_RW01) 05:39 07:18 (WEA_RW01) 20:49	04:50 21:40
3 08:37 16:05	08:03 16:59	07:03 17:56	07:28 (WEA_G2) 06:47 08:02 (WEA_G1) 19:55	07:11 (WEA_RW01) 05:37 07:20 (WEA_RW01) 20:55	04:49 21:41
4 08:37 16:07	08:01 17:01	07:01 17:58	07:25 (WEA_G2) 06:44 08:01 (WEA_G1) 19:57	07:08 (WEA_RW01) 05:35 07:21 (WEA_RW01) 20:53	04:48 21:42
5 08:36 16:08	07:59 17:03	06:58 18:00	07:23 (WEA_G2) 06:42 08:01 (WEA_G1) 19:59	07:06 (WEA_RW01) 05:33 07:23 (WEA_RW01) 20:55	04:48 21:43
6 08:36 16:09	07:57 17:05	06:56 18:02	07:20 (WEA_G2) 06:39 08:00 (WEA_G1) 20:01	07:03 (WEA_RW01) 05:31 07:23 (WEA_RW01) 20:57	04:47 21:44
7 08:35 16:11	07:55 17:07	06:53 18:04	07:19 (WEA_G2) 06:37 07:59 (WEA_G1) 20:03	07:01 (WEA_RW01) 05:29 07:24 (WEA_RW01) 20:59	04:46 21:45
8 08:35 16:12	07:53 17:08	06:51 18:05	07:19 (WEA_G2) 06:35 07:58 (WEA_G1) 20:05	06:58 (WEA_RW01) 05:27 07:24 (WEA_RW01) 20:59	04:45 21:46
9 08:34 16:14	07:51 17:11	06:48 18:06	07:17 (WEA_G2) 06:33 07:56 (WEA_G1) 20:07	06:56 (WEA_RW01) 05:25 07:24 (WEA_RW01) 20:59	04:44 21:47
10 08:33 16:15	07:49 17:13	06:46 18:07	07:15 (WEA_G2) 06:31 07:54 (WEA_G1) 20:09	06:54 (WEA_RW01) 05:24 07:25 (WEA_RW01) 21:04	04:44 21:48
11 08:33 16:17	07:47 17:15	06:44 18:08	07:14 (WEA_G2) 06:29 07:53 (WEA_G1) 20:11	06:51 (WEA_RW01) 05:22 07:25 (WEA_RW01) 21:05	04:44 21:49
12 08:32 16:18	07:45 17:18	06:42 18:09	07:12 (WEA_G2) 06:27 07:51 (WEA_G1) 20:12	06:49 (WEA_RW01) 05:20 07:25 (WEA_RW01) 21:06	04:43 21:50
13 08:31 16:20	07:42 17:21	06:40 18:10	07:10 (WEA_G2) 06:25 07:49 (WEA_G1) 20:14	06:47 (WEA_RW01) 05:19 07:25 (WEA_RW01) 21:07	04:43 21:51
14 08:30 16:21	07:40 17:23	06:38 18:11	07:08 (WEA_G2) 06:23 07:47 (WEA_G1) 20:15	06:45 (WEA_RW01) 05:18 07:25 (WEA_RW01) 21:08	04:43 21:52
15 08:29 16:22	07:38 17:25	06:36 18:12	07:06 (WEA_G2) 06:21 07:45 (WEA_G1) 20:16	06:43 (WEA_RW01) 05:17 07:25 (WEA_RW01) 21:09	04:43 21:53
16 08:28 16:23	07:36 17:27	06:34 18:13	07:04 (WEA_G2) 06:19 07:43 (WEA_G1) 20:17	06:41 (WEA_RW01) 05:16 07:25 (WEA_RW01) 21:10	04:43 21:54
17 08:27 16:24	07:34 17:29	06:32 18:14	07:02 (WEA_G2) 06:17 07:41 (WEA_G1) 20:18	06:39 (WEA_RW01) 05:15 07:25 (WEA_RW01) 21:11	04:43 21:55
18 08:26 16:25	07:32 17:31	06:30 18:15	07:00 (WEA_G2) 06:15 07:39 (WEA_G1) 20:19	06:37 (WEA_RW01) 05:14 07:25 (WEA_RW01) 21:12	04:43 21:56
19 08:25 16:26	07:30 17:33	06:28 18:16	06:58 (WEA_G2) 06:13 07:37 (WEA_G1) 20:20	06:35 (WEA_RW01) 05:13 07:25 (WEA_RW01) 21:13	04:43 21:57
20 08:24 16:27	07:28 17:35	06:26 18:17	06:56 (WEA_G2) 06:11 07:35 (WEA_G1) 20:21	06:33 (WEA_RW01) 05:12 07:25 (WEA_RW01) 21:14	04:43 21:58
21 08:23 16:28	07:26 17:37	06:24 18:18	06:54 (WEA_G2) 06:09 07:33 (WEA_G1) 20:22	06:31 (WEA_RW01) 05:11 07:25 (WEA_RW01) 21:15	04:43 21:59
22 08:22 16:29	07:24 17:39	06:22 18:19	06:52 (WEA_G2) 06:07 07:31 (WEA_G1) 20:23	06:29 (WEA_RW01) 05:10 07:25 (WEA_RW01) 21:16	04:43 22:00
23 08:21 16:30	07:22 17:41	06:20 18:20	06:50 (WEA_G2) 06:05 07:29 (WEA_G1) 20:24	06:27 (WEA_RW01) 05:09 07:25 (WEA_RW01) 21:17	04:43 22:01
24 08:20 16:31	07:20 17:43	06:18 18:21	06:48 (WEA_G2) 06:03 07:27 (WEA_G1) 20:25	06:25 (WEA_RW01) 05:08 07:25 (WEA_RW01) 21:18	04:43 22:02
25 08:19 16:32	07:18 17:45	06:16 18:22	06:46 (WEA_G2) 06:01 07:25 (WEA_G1) 20:26	06:23 (WEA_RW01) 05:07 07:25 (WEA_RW01) 21:19	04:43 22:03
26 08:18 16:33	07:16 17:47	06:14 18:23	06:44 (WEA_G2) 05:59 07:23 (WEA_G1) 20:27	06:21 (WEA_RW01) 05:06 07:25 (WEA_RW01) 21:20	04:43 22:04
27 08:17 16:34	07:14 17:49	06:12 18:24	06:42 (WEA_G2) 05:57 07:21 (WEA_G1) 20:28	06:19 (WEA_RW01) 05:05 07:25 (WEA_RW01) 21:21	04:43 22:05
28 08:16 16:35	07:12 17:51	06:10 18:25	06:40 (WEA_G2) 05:55 07:19 (WEA_G1) 20:29	06:17 (WEA_RW01) 05:04 07:25 (WEA_RW01) 21:22	04:43 22:06
29 08:15 16:36	07:10 17:53	06:08 18:26	06:38 (WEA_G2) 05:53 07:17 (WEA_G1) 20:30	06:15 (WEA_RW01) 05:03 07:25 (WEA_RW01) 21:23	04:43 22:07
30 08:14 16:37	07:08 17:55	06:06 18:27	06:36 (WEA_G2) 05:51 07:15 (WEA_G1) 20:31	06:13 (WEA_RW01) 05:02 07:25 (WEA_RW01) 21:24	04:43 22:08
31 08:13 16:38	07:06 17:57	06:04 18:28	06:34 (WEA_G2) 05:49 07:13 (WEA_G1) 20:32	06:11 (WEA_RW01) 05:01 07:25 (WEA_RW01) 21:25	04:43 22:09
32 08:12 16:39	07:04 17:59	06:02 18:29	06:32 (WEA_G2) 05:47 07:11 (WEA_G1) 20:33	06:09 (WEA_RW01) 05:00 07:25 (WEA_RW01) 21:26	04:43 22:10
33 08:11 16:40	07:02 18:01	06:00 18:30	06:30 (WEA_G2) 05:45 07:09 (WEA_G1) 20:34	06:07 (WEA_RW01) 04:59 07:25 (WEA_RW01) 21:27	04:43 22:11
34 08:10 16:41	07:00 18:03	05:58 18:31	06:28 (WEA_G2) 05:43 07:07 (WEA_G1) 20:35	06:05 (WEA_RW01) 04:58 07:25 (WEA_RW01) 21:28	04:43 22:12
35 08:09 16:42	06:58 18:05	05:56 18:32	06:26 (WEA_G2) 05:41 07:05 (WEA_G1) 20:36	06:03 (WEA_RW01) 04:57 07:25 (WEA_RW01) 21:29	04:43 22:13
36 08:08 16:43	06:56 18:07	05:54 18:33	06:24 (WEA_G2) 05:39 07:03 (WEA_G1) 20:37	06:01 (WEA_RW01) 04:56 07:25 (WEA_RW01) 21:30	04:43 22:14
37 08:07 16:44	06:54 18:09	05:52 18:34	06:22 (WEA_G2) 05:37 07:01 (WEA_G1) 20:38	05:59 (WEA_RW01) 04:55 07:25 (WEA_RW01) 21:31	04:43 22:15
38 08:06 16:45	06:52 18:11	05:50 18:35	06:20 (WEA_G2) 05:35 06:59 (WEA_G1) 20:39	05:57 (WEA_RW01) 04:54 07:25 (WEA_RW01) 21:32	04:43 22:16
39 08:05 16:46	06:50 18:13	05:48 18:36	06:18 (WEA_G2) 05:33 06:57 (WEA_G1) 20:40	05:55 (WEA_RW01) 04:53 07:25 (WEA_RW01) 21:33	04:43 22:17
40 08:04 16:47	06:48 18:15	05:46 18:37	06:16 (WEA_G2) 05:31 06:55 (WEA_G1) 20:41	05:53 (WEA_RW01) 04:52 07:25 (WEA_RW01) 21:34	04:43 22:18
41 08:03 16:48	06:46 18:17	05:44 18:38	06:14 (WEA_G2) 05:29 06:53 (WEA_G1) 20:42	05:51 (WEA_RW01) 04:51 07:25 (WEA_RW01) 21:35	04:43 22:19
42 08:02 16:49	06:44 18:19	05:42 18:39	06:12 (WEA_G2) 05:27 06:51 (WEA_G1) 20:43	05:49 (WEA_RW01) 04:50 07:25 (WEA_RW01) 21:36	04:43 22:20
43 08:01 16:50	06:42 18:21	05:40 18:40	06:10 (WEA_G2) 05:25 06:49 (WEA_G1) 20:44	05:47 (WEA_RW01) 04:49 07:25 (WEA_RW01) 21:37	04:43 22:21
44 08:00 16:51	06:40 18:23	05:38 18:41	06:08 (WEA_G2) 05:23 06:47 (WEA_G1) 20:45	05:45 (WEA_RW01) 04:48 07:25 (WEA_RW01) 21:38	04:43 22:22
45 07:59 16:52	06:38 18:25	05:36 18:42	06:06 (WEA_G2) 05:21 06:45 (WEA_G1) 20:46	05:43 (WEA_RW01) 04:47 07:25 (WEA_RW01) 21:39	04:43 22:23
46 07:58 16:53	06:36 18:27	05:34 18:43	06:04 (WEA_G2) 05:19 06:43 (WEA_G1) 20:47	05:41 (WEA_RW01) 04:46 07:25 (WEA_RW01) 21:40	04:43 22:24
47 07:57 16:54	06:34 18:29	05:32 18:44	06:02 (WEA_G2) 05:17 06:41 (WEA_G1) 20:48	05:39 (WEA_RW01) 04:45 07:25 (WEA_RW01) 21:41	04:43 22:25
48 07:56 16:55	06:32 18:31	05:30 18:45	06:00 (WEA_G2) 05:15 06:39 (WEA_G1) 20:49	05:37 (WEA_RW01) 04:44 07:25 (WEA_RW01) 21:42	04:43 22:26
49 07:55 16:56	06:30 18:33	05:28 18:46	05:58 (WEA_G2) 05:13 06:37 (WEA_G1) 20:50	05:35 (WEA_RW01) 04:43 07:25 (WEA_RW01) 21:43	04:43 22:27
50 07:54 16:57	06:28 18:35	05:26 18:47	05:56 (WEA_G2) 05:11 06:35 (WEA_G1) 20:51	05:33 (WEA_RW01) 04:42 07:25 (WEA_RW01) 21:44	04:43 22:28
51 07:53 16:58	06:26 18:37	05:24 18:48	05:54 (WEA_G2) 05:09 06:33 (WEA_G1) 20:52	05:31 (WEA_RW01) 04:41 07:25 (WEA_RW01) 21:45	04:43 22:29
52 07:52 16:59	06:24 18:39	05:22 18:49	05:52 (WEA_G2) 05:07 06:31 (WEA_G1) 20:53	05:29 (WEA_RW01) 04:40 07:25 (WEA_RW01) 21:46	04:43 22:30
53 07:51 17:00	06:22 18:41	05:20 18:50	05:50 (WEA_G2) 05:05 06:29 (WEA_G1) 20:54	05:27 (WEA_RW01) 04:39 07:25 (WEA_RW01) 21:47	04:43 22:31
54 07:50 17:01	06:20 18:43	05:18 18:51	05:48 (WEA_G2) 05:03 06:27 (WEA_G1) 20:55	05:25 (WEA_RW01) 04:38 07:25 (WEA_RW01) 21:48	04:43 22:32
55 07:49 17:02	06:18 18:45	05:16 18:52	05:46 (WEA_G2) 05:01 06:25 (WEA_G1) 20:56	05:23 (WEA_RW01) 04:37 07:25 (WEA_RW01) 21:49	04:43 22:33
56 07:48 17:03	06:16 18:47	05:14 18:53	05:44 (WEA_G2) 04:59 06:23 (WEA_G1) 20:57	05:21 (WEA_RW01) 04:36 07:25 (WEA_RW01) 21:50	04:43 22:34
57 07:47 17:04	06:14 18:49	05:12 18:54	05:42 (WEA_G2) 04:57 06:21 (WEA_G1) 20:58	05:19 (WEA_RW01) 04:35 07:25 (WEA_RW01) 21:51	04:43 22:35
58 07:46 17:05	06:12 18:51	05:10 18:55	05:40 (WEA_G2) 04:55 06:19 (WEA_G1) 20:59	05:17 (WEA_RW01) 04:34 07:25 (WEA_RW01) 21:52	04:43 22:36
59 07:45 17:06	06:10 18:53	05:08 18:56	05:38 (WEA_G2) 04:53 06:17 (WEA_G1) 21:00	05:15 (WEA_RW01) 04:33 07:25 (WEA_RW01) 21:53	04:43 22:37
60 07:44 17:07	06:08 18:55	05:06 18:57	05:36 (WEA_G2) 04:51 06:15 (WEA_G1) 21:01	05:13 (WEA_RW01) 04:32 07:25 (WEA_RW01) 21:54	04:43 22:38
61 07:43 17:08	06:06 18:57	05:04 18:58	05:34 (WEA_G2) 04:49 06:13 (WEA_G1) 21:02	05:11 (WEA_RW01) 04:31 07:25 (WEA_RW01) 21:55	04:43 22:39
62 07:42 17:09	06:04 18:59	05:02 18:59	05:32 (WEA_G2) 04:47 06:11 (WEA_G1) 21:03	05:09 (WEA_RW01) 04:30 07:25 (WEA_RW01) 21:56	04:43 22:40
63 07:41 17:10	06:02 19:01	05:00 19:00	05:30 (WEA_G2) 04:45 06:09 (WEA_G1) 21:04	05:07 (WEA_RW01) 04:29 07:25 (WEA_RW01) 21:57	04:43 22:41
64 07:40 17:11	06:00 19:03	04:58 19:01	05:28 (WEA_G2) 04:43 06:07 (WEA_G1) 21:05	05:05 (WEA_RW01) 04:28 07:25 (WEA_RW01) 21:58	04:43 22:42
65 07:39 17:12	05:58 19:05	04:56 19:02	05:26 (WEA_G2) 04:41 06:05 (WEA_G1) 21:06	05:03 (WEA_RW01) 04:27 07:25 (WEA_RW01) 21:59	04:43 22:43
66 07:38 17:13	05:56 19:07	04:54 19:03	05:24 (WEA_G2) 04:39 06:03 (WEA_G1) 21:07	05:01 (WEA_RW01) 04:26 07:25 (WEA_RW01) 22:00	04:43 22:44
67 07:37 17:14	05:54 19:09	04:52 19:04	05:22 (WEA_G2) 04:37 06:01 (WEA_G1) 21:08	04:59 (WEA_RW01) 04:25 07:25 (WEA_RW01) 22:01	04:43 22:45
68 07:36 17:15	05:52 19:11	04:50 19:05	05:20 (WEA_G2) 04:35 05:59 (WEA_G1) 21:09	04:57 (WEA_RW01) 04:24 07:25 (WEA_RW01) 22:02	04:43 22:46
69 07:35 17:16	05:50 19:13	04:48 19:06	05:18 (WEA_G2) 04:33 05:57 (WEA_G1) 21:10	04:55 (WEA_RW01) 04:23 07:25 (WEA_RW01) 22:03	04:43 22:47



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-155) **Schattenrezeptor:** IO 30 - IO 30 Kathenkamp 11 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

	Juli	August	September	Oktober	November	Dezember
1	10:47	10:27	10:23	06:50 (WEA RWEG1)   07:17	07:44 (WEA_G3)   07:16	08:12
2	12:54	12:18	12:10	07:23 (WEA RWEG1)   18:55	08:25 (WEA_G1)   16:44	15:59
3	14:48	10:29	10:25	06:52 (WEA RWEG1)   07:19	07:46 (WEA_G3)   07:18	08:14
4	15:53	12:16	12:08	07:23 (WEA RWEG1)   18:53	08:30 (WEA_G1)   16:42	15:58
5	16:48	05:31	06:26	06:54 (WEA RWEG1)   07:21	07:47 (WEA_G3)   07:20	08:15
6	17:53	12:14	12:05	07:23 (WEA RWEG1)   18:50	08:31 (WEA_G1)   16:40	15:57
7	18:49	05:33	06:28	06:56 (WEA RWEG1)   07:23	07:49 (WEA_G3)   07:22	08:17
8	19:52	12:12	12:03	07:22 (WEA RWEG1)   18:48	08:33 (WEA_G1)   16:38	15:56
9	20:50	05:34	06:30	06:57 (WEA RWEG1)   07:24	07:51 (WEA_G3)   07:24	08:18
10	21:52	12:10	12:00	07:20 (WEA RWEG1)   18:45	08:34 (WEA_G1)   16:36	15:56
11	22:51	05:36	06:32	06:59 (WEA RWEG1)   07:26	07:56 (WEA_G3)   07:26	08:19
12	23:51	12:08	11:58	07:19 (WEA RWEG1)   18:43	08:35 (WEA_G1)   16:34	15:55
13	24:52	05:38	06:34	07:01 (WEA RWEG1)   07:28	07:55 (WEA_G3)   07:28	08:21
14	25:50	12:06	11:55	07:18 (WEA RWEG1)   18:41	08:36 (WEA_G1)   16:32	15:55
15	26:53	05:40	06:35	07:03 (WEA RWEG1)   07:30	07:57 (WEA_G3)   07:30	08:22
16	27:50	12:04	11:52	07:17 (WEA RWEG1)   18:38	08:36 (WEA_G1)   16:30	15:54
17	28:49	05:41	06:37	07:04 (WEA RWEG1)   07:32	07:55 (WEA_G3)   07:32	08:23
18	29:49	12:02	11:50	07:14 (WEA RWEG1)   18:36	08:37 (WEA_G1)   16:28	15:54
19	30:45	05:43	06:38	07:02 (WEA RWEG1)   07:34	08:01 (WEA_G3)   07:34	08:24
20	31:46	12:00	11:48	07:11 (WEA RWEG1)   18:35	08:37 (WEA_G1)   16:27	15:54
21	01:45	05:45	06:41	07:16	08:02 (WEA_G3)   07:36	08:25
22	02:47	12:58	11:45	18:33	08:38 (WEA_G1)   16:25	15:53
23	03:50	05:47	06:42	07:27	08:05 (WEA_G3)   07:38	08:27
24	04:53	12:56	11:42	18:28	08:38 (WEA_G1)   16:23	15:53
25	05:59	05:49	06:44	07:39	08:07 (WEA_G3)   07:40	08:28
26	06:58	12:54	11:40	18:26	08:38 (WEA_G1)   16:21	15:53
27	07:59	05:50	06:46	07:49	08:08 (WEA_G3)   07:42	08:29
28	08:53	12:52	11:38	18:24	08:39 (WEA_G1)   16:20	15:53
29	09:49	05:52	06:48	07:59	08:11 (WEA_G3)   07:44	08:30
30	10:47	12:50	11:36	18:21	08:39 (WEA_G1)   16:18	15:53
31	11:46	05:54	06:50	08:05	08:13 (WEA_G3)   07:46	08:31
1	12:46	12:48	11:34	18:19	08:34 (WEA_G1)   16:17	15:53
2	13:47	05:55	06:52	08:15	08:15 (WEA_G3)   07:47	15:56 (WEA_G1)   16:15
3	14:48	12:46	11:32	18:17	08:33 (WEA_G1)   16:15	15:53
4	15:49	05:56	06:53	08:21	08:17 (WEA_G3)   07:49	15:53 (WEA_G1)   16:14
5	16:50	12:44	11:30	18:14	08:35 (WEA_G1)   16:14	15:53
6	17:52	05:57	06:55	08:25	08:18 (WEA_G3)   07:51	15:53 (WEA_G1)   16:13
7	18:53	12:42	11:28	18:12	08:30 (WEA_G1)   16:12	15:53
8	19:55	05:58	06:56	08:29	08:22 (WEA_G3)   07:53	15:54 (WEA_G1)   16:12
9	20:56	12:40	11:26	18:10	08:32 (WEA_G1)   16:11	15:54
10	21:58	05:59	06:58	08:35	08:22 (WEA_G3)   07:55	15:54 (WEA_G1)   16:11
11	22:59	12:38	11:24	18:08	08:33 (WEA_G1)   16:10	15:54
12	23:59	06:00	06:59	08:40	08:25 (WEA_G3)   07:57	15:54 (WEA_G1)   16:10
13	24:59	12:36	11:22	18:06	08:34 (WEA_G1)   16:09	15:54
14	25:59	06:01	07:00	08:45	08:26 (WEA_G3)   07:59	15:54 (WEA_G1)   16:09
15	26:59	12:34	11:20	18:04	08:35 (WEA_G1)   16:08	15:54
16	27:59	06:02	07:01	08:46	08:27 (WEA_G3)   08:01	15:54 (WEA_G1)   16:08
17	28:59	12:32	11:18	18:02	08:36 (WEA_G1)   16:07	15:54
18	29:59	06:03	07:02	08:47	08:28 (WEA_G3)   08:03	15:54 (WEA_G1)   16:07
19	30:59	12:30	11:16	18:00	08:37 (WEA_G1)   16:06	15:54
20	31:59	06:04	07:03	08:48	08:29 (WEA_G3)   08:05	15:54 (WEA_G1)   16:06
21	01:59	12:28	11:14	17:58	08:38 (WEA_G1)   16:05	15:54
22	02:59	06:05	07:04	08:49	08:30 (WEA_G3)   08:07	15:54 (WEA_G1)   16:05
23	03:59	12:26	11:12	17:56	08:39 (WEA_G1)   16:04	15:54
24	04:59	06:06	07:05	08:50	08:31 (WEA_G3)   08:09	15:54 (WEA_G1)   16:04
25	05:59	12:24	11:10	17:54	08:40 (WEA_G1)   16:03	15:54
26	06:59	06:07	07:06	08:51	08:32 (WEA_G3)   08:11	15:54 (WEA_G1)   16:03
27	07:59	12:22	11:08	17:52	08:41 (WEA_G1)   16:02	15:54
28	08:59	06:08	07:07	08:52	08:33 (WEA_G3)   08:13	15:54 (WEA_G1)   16:02
29	09:59	12:20	11:06	17:50	08:42 (WEA_G1)   16:01	15:54
30	10:59	06:09	07:08	08:53	08:34 (WEA_G3)   08:15	15:54 (WEA_G1)   16:01
31	11:59	12:18	11:04	17:48	08:43 (WEA_G1)   16:00	15:54
1	12:59	06:10	07:09	08:54	08:35 (WEA_G3)   08:17	15:54 (WEA_G1)   16:00
2	13:59	12:16	11:02	17:46	08:44 (WEA_G1)   15:59	15:54
3	14:59	06:11	07:10	08:55	08:36 (WEA_G3)   08:19	15:54 (WEA_G1)   15:59
4	15:59	12:14	11:00	17:44	08:45 (WEA_G1)   15:58	15:54
5	16:59	06:12	07:11	08:56	08:37 (WEA_G3)   08:21	15:54 (WEA_G1)   15:58
6	17:59	12:12	10:58	17:42	08:46 (WEA_G1)   15:57	15:54
7	18:59	06:13	07:12	08:57	08:38 (WEA_G3)   08:23	15:54 (WEA_G1)   15:57
8	19:59	12:10	10:56	17:40	08:47 (WEA_G1)   15:56	15:54
9	20:59	06:14	07:13	08:58	08:39 (WEA_G3)   08:25	15:54 (WEA_G1)   15:56
10	21:59	12:08	10:54	17:38	08:48 (WEA_G1)   15:55	15:54
11	22:59	06:15	07:14	09:00	08:40 (WEA_G3)   08:27	15:54 (WEA_G1)   15:55
12	23:59	12:06	10:52	17:36	08:49 (WEA_G1)   15:54	15:54
13	24:59	06:16	07:15	09:01	08:41 (WEA_G3)   08:29	15:54 (WEA_G1)   15:54
14	25:59	12:04	10:50	17:34	08:50 (WEA_G1)   15:53	15:54
15	26:59	06:17	07:16	09:02	08:42 (WEA_G3)   08:31	15:54 (WEA_G1)   15:53
16	27:59	12:02	10:48	17:32	08:51 (WEA_G1)   15:52	15:54
17	28:59	06:18	07:17	09:03	08:43 (WEA_G3)   08:33	15:54 (WEA_G1)   15:52
18	29:59	12:00	10:46	17:30	08:52 (WEA_G1)   15:51	15:54
19	30:59	06:19	07:18	09:04	08:44 (WEA_G3)   08:35	15:54 (WEA_G1)   15:51
20	31:59	11:58	10:44	17:28	08:53 (WEA_G1)   15:50	15:54
21	01:59	06:20	07:19	09:05	08:45 (WEA_G3)   08:37	15:54 (WEA_G1)   15:50
22	02:59	11:56	10:42	17:26	08:54 (WEA_G1)   15:49	15:54
23	03:59	06:21	07:20	09:06	08:46 (WEA_G3)   08:39	15:54 (WEA_G1)   15:49
24	04:59	11:54	10:40	17:24	08:55 (WEA_G1)   15:48	15:54
25	05:59	06:22	07:21	09:07	08:47 (WEA_G3)   08:41	15:54 (WEA_G1)   15:48
26	06:59	11:52	10:38	17:22	08:56 (WEA_G1)   15:47	15:54
27	07:59	06:23	07:22	09:08	08:48 (WEA_G3)   08:43	15:54 (WEA_G1)   15:47
28	08:59	11:50	10:36	17:20	08:57 (WEA_G1)   15:46	15:54
29	09:59	06:24	07:23	09:09	08:49 (WEA_G3)   08:45	15:54 (WEA_G1)   15:46
30	10:59	11:48	10:34	17:18	08:58 (WEA_G1)   15:45	15:54
31	11:59	06:25	07:24	09:10	08:50 (WEA_G3)   08:47	15:54 (WEA_G1)   15:45
1	12:59	11:46	10:32	17:16	08:59 (WEA_G1)   15:44	15:54
2	13:59	06:26	07:25	09:11	08:51 (WEA_G3)   08:49	15:54 (WEA_G1)   15:44
3	14:59	11:44	10:30	17:14	09:00 (WEA_G1)   15:43	15:54
4	15:59	06:27	07:26	09:12	08:52 (WEA_G3)   08:51	15:54 (WEA_G1)   15:43
5	16:59	11:42	10:28	17:12	09:01 (WEA_G1)   15:42	15:54
6	17:59	06:28	07:27	09:13	08:53 (WEA_G3)   08:53	15:54 (WEA_G1)   15:42
7	18:59	11:40	10:26	17:10	09:02 (WEA_G1)   15:41	15:54
8	19:59	06:29	07:28	09:14	08:54 (WEA_G3)   08:55	15:54 (WEA_G1)   15:41
9	20:59	11:38	10:24	17:08	09:03 (WEA_G1)   15:40	15:54
10	21:59	06:30	07:29	09:15	08:55 (WEA_G3)   08:57	15:54 (WEA_G1)   15:40
11	22:59	11:36	10:22	17:06	09:04 (WEA_G1)   15:39	15:54
12	23:59	06:31	07:30	09:16	08:56 (WEA_G3)   08:59	15:54 (WEA_G1)   15:39
13	24:59	11:34	10:20	17:04	09:05 (WEA_G1)   15:38	15:54
14	25:59	06:32	07:31	09:17	08:57 (WEA_G3)   09:01	15:54 (WEA_G1)   15:38
15	26:59	11:32	10:18	17:02	09:06 (WEA_G1)   15:37	15:54
16	27:59	06:33	07:32	09:18	08:58 (WEA_G3)   09:03	15:54 (WEA_G1)   15:37
17	28:59	11:30	10:16	17:00	09:07 (WEA_G1)   15:36	15:54
18	29:59	06:34	07:33	09:19	08:59 (WEA_G3)   09:05	15:54 (WEA_G1)   15:36
19	30:59	11:28	10:14	16:58	09:08 (WEA_G1)   15:35	15:54
20	31:59	06:35	07:34	09:20	08:60 (WEA_G3)   09:07	15:54 (WEA_G1)   15:35
21	01:59	11:26	10:12	16:56	09:09 (WEA_G1)   15:34	15:54
22	02:59	06:36	07:35	09:21	08:61 (WEA_G3)   09:09	15:54 (WEA_G1)

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 31 - IO 31 Rüttinger Kornhof 1 (Rütting)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	14:51 (WEA 11 (GRS))	08:06	07:08	07:33 (WEA_G1)	06:52	05:42	06:47 (WEA RWED1)	04:51	05:22 (WEA 03 (GRN))	
15	16:03	15:06 (WEA 11 (GRS))	16:55	17:52	17	07:50 (WEA_G1)	11:51	20:40	8	06:55 (WEA RWED1)	21:39
2	08:37	14:52 (WEA 11 (GRS))	08:04	07:05	07:30 (WEA_G1)	06:49	05:39	06:49	04:50	05:21 (WEA 03 (GRN))	
16	04	15:06 (WEA 11 (GRS))	16:57	17:54	20	07:50 (WEA_G1)	11:53	20:49	15	05:36 (WEA 03 (GRN))	21:40
3	08:37	14:52 (WEA 11 (GRS))	08:03	07:03	07:28 (WEA_G1)	06:47	05:37	06:49	04:49	05:22 (WEA 03 (GRN))	
16	05	15:06 (WEA 11 (GRS))	16:59	17:56	23	07:51 (WEA_G1)	11:55	20:51	12:41	15	05:37 (WEA 03 (GRN))
4	08:37	14:54 (WEA 11 (GRS))	08:01	07:01	07:25 (WEA_G1)	06:44	05:35	06:48	04:48	05:22 (WEA 03 (GRN))	
16	07	15:06 (WEA 11 (GRS))	17:01	17:58	26	07:51 (WEA_G1)	11:57	20:53	12:42	15	05:37 (WEA 03 (GRN))
5	08:36	14:54 (WEA 11 (GRS))	07:59	06:58	07:23 (WEA_G1)	06:42	05:33	06:48	04:48	05:22 (WEA 03 (GRN))	
16	08	15:05 (WEA 11 (GRS))	17:07	18:00	28	07:51 (WEA_G1)	11:59	20:55	12:43	14	05:36 (WEA 03 (GRN))
6	08:36	14:56 (WEA 11 (GRS))	07:57	06:56	07:20 (WEA_G1)	06:39	05:31	06:47	04:47	05:23 (WEA 03 (GRN))	
16	09	15:05 (WEA 11 (GRS))	17:05	18:02	31	07:51 (WEA_G1)	12:01	20:57	12:44	14	05:37 (WEA 03 (GRN))
7	08:35	14:58 (WEA 11 (GRS))	07:55	06:53	07:18 (WEA_G1)	06:37	05:29	06:46	04:46	05:23 (WEA 03 (GRN))	
16	11	15:04 (WEA 11 (GRS))	17:07	18:04	33	07:51 (WEA_G1)	12:03	20:59	12:45	13	05:36 (WEA 03 (GRN))
8	08:35	15:01 (WEA 11 (GRS))	07:53	06:51	07:15 (WEA_G1)	06:35	05:27	06:46	04:46	05:24 (WEA 03 (GRN))	
16	12	15:02 (WEA 11 (GRS))	17:09	18:02	35	07:50 (WEA_G1)	12:04	20:59	12:46	13	05:36 (WEA 03 (GRN))
9	08:34	15:01 (WEA 11 (GRS))	07:51	06:48	07:11 (WEA_G1)	06:33	05:25	06:45	04:45	05:24 (WEA 03 (GRN))	
16	13	15:01 (WEA 11 (GRS))	17:11	18:02	37	07:50 (WEA_G1)	12:05	20:59	12:47	12	05:36 (WEA 03 (GRN))
10	08:33	15:00 (WEA 11 (GRS))	07:49	06:46	07:07 (WEA_G1)	06:31	05:23	06:44	04:44	05:24 (WEA 03 (GRN))	
16	14	15:00 (WEA 11 (GRS))	17:13	18:02	38	07:49 (WEA_G1)	12:06	20:59	12:47	11	05:36 (WEA 03 (GRN))
11	08:33	15:00 (WEA 11 (GRS))	07:47	06:44	07:03 (WEA_G1)	06:29	05:21	06:44	04:44	05:24 (WEA 03 (GRN))	
16	15	15:00 (WEA 11 (GRS))	17:14	18:02	39	07:48 (WEA_G1)	12:07	20:59	12:47	10	05:36 (WEA 03 (GRN))
12	08:32	15:00 (WEA 11 (GRS))	07:45	06:42	06:59 (WEA_G1)	06:27	05:19	06:43	04:43	05:24 (WEA 03 (GRN))	
16	16	15:00 (WEA 11 (GRS))	17:15	18:02	40	07:47 (WEA_G1)	12:08	20:59	12:47	9	05:35 (WEA 03 (GRN))
13	08:31	15:00 (WEA 11 (GRS))	07:43	06:40	06:55 (WEA_G1)	06:25	05:17	06:42	04:42	05:24 (WEA 03 (GRN))	
16	17	15:00 (WEA 11 (GRS))	17:16	18:02	41	07:46 (WEA_G1)	12:09	20:59	12:47	8	05:35 (WEA 03 (GRN))
14	08:30	15:00 (WEA 11 (GRS))	07:41	06:38	06:51 (WEA_G1)	06:23	05:15	06:41	04:41	05:24 (WEA 03 (GRN))	
16	18	15:00 (WEA 11 (GRS))	17:17	18:02	42	07:45 (WEA_G1)	12:10	20:59	12:47	7	05:35 (WEA 03 (GRN))
15	08:29	15:00 (WEA 11 (GRS))	07:39	06:36	06:47 (WEA_G1)	06:21	05:13	06:40	04:40	05:24 (WEA 03 (GRN))	
16	19	15:00 (WEA 11 (GRS))	17:18	18:02	43	07:44 (WEA_G1)	12:11	20:59	12:47	6	05:34 (WEA 03 (GRN))
16	20	15:00 (WEA 11 (GRS))	07:37	06:34	06:43 (WEA_G1)	06:19	05:11	06:39	04:39	05:24 (WEA 03 (GRN))	
16	21	15:00 (WEA 11 (GRS))	17:19	18:02	44	07:43 (WEA_G1)	12:12	20:59	12:47	5	05:34 (WEA 03 (GRN))
16	22	15:00 (WEA 11 (GRS))	07:35	06:32	06:39 (WEA_G1)	06:17	05:09	06:38	04:38	05:24 (WEA 03 (GRN))	
16	23	15:00 (WEA 11 (GRS))	17:20	18:02	45	07:42 (WEA_G1)	12:13	20:59	12:47	4	05:34 (WEA 03 (GRN))
16	24	15:00 (WEA 11 (GRS))	07:33	06:30	06:35 (WEA_G1)	06:15	05:07	06:37	04:37	05:24 (WEA 03 (GRN))	
16	25	15:00 (WEA 11 (GRS))	17:21	18:02	46	07:41 (WEA_G1)	12:14	20:59	12:47	3	05:34 (WEA 03 (GRN))
16	26	15:00 (WEA 11 (GRS))	07:31	06:28	06:31 (WEA_G1)	06:13	05:05	06:36	04:36	05:24 (WEA 03 (GRN))	
16	27	15:00 (WEA 11 (GRS))	17:22	18:02	47	07:40 (WEA_G1)	12:15	20:59	12:47	2	05:34 (WEA 03 (GRN))
16	28	15:00 (WEA 11 (GRS))	07:29	06:26	06:27 (WEA_G1)	06:11	05:03	06:35	04:35	05:24 (WEA 03 (GRN))	
16	29	15:00 (WEA 11 (GRS))	17:23	18:02	48	07:39 (WEA_G1)	12:16	20:59	12:47	1	05:34 (WEA 03 (GRN))
16	30	15:00 (WEA 11 (GRS))	07:27	06:24	06:23 (WEA_G1)	06:09	05:01	06:34	04:34	05:24 (WEA 03 (GRN))	
16	31	15:00 (WEA 11 (GRS))	17:24	18:02	49	07:38 (WEA_G1)	12:17	20:59	12:47	0	05:34 (WEA 03 (GRN))
1	08:28	15:00 (WEA 11 (GRS))	07:25	06:22	06:19 (WEA_G1)	06:07	04:59	06:33	04:33	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:23	06:20	06:15 (WEA_G1)	06:05	04:57	06:32	04:32	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:21	06:18	06:11 (WEA_G1)	06:03	04:55	06:31	04:31	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:19	06:16	06:07 (WEA_G1)	06:01	04:53	06:30	04:30	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:17	06:14	06:03 (WEA_G1)	05:59	04:51	06:29	04:29	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:15	06:12	05:59 (WEA_G1)	05:57	04:49	06:28	04:28	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:13	06:10	05:55 (WEA_G1)	05:55	04:47	06:27	04:27	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:11	06:08	05:51 (WEA_G1)	05:53	04:45	06:26	04:26	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:09	06:06	05:47 (WEA_G1)	05:51	04:43	06:25	04:25	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:07	06:04	05:43 (WEA_G1)	05:49	04:41	06:24	04:24	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:05	06:02	05:39 (WEA_G1)	05:47	04:39	06:23	04:23	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:03	06:00	05:35 (WEA_G1)	05:45	04:37	06:22	04:22	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	07:01	05:58	05:31 (WEA_G1)	05:43	04:35	06:21	04:21	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:59	05:56	05:27 (WEA_G1)	05:41	04:33	06:20	04:20	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:57	05:54	05:23 (WEA_G1)	05:39	04:31	06:19	04:19	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:55	05:52	05:19 (WEA_G1)	05:37	04:29	06:18	04:18	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:53	05:50	05:15 (WEA_G1)	05:35	04:27	06:17	04:17	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:51	05:48	05:11 (WEA_G1)	05:33	04:25	06:16	04:16	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:49	05:46	05:07 (WEA_G1)	05:31	04:23	06:15	04:15	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:47	05:44	05:03 (WEA_G1)	05:29	04:21	06:14	04:14	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:45	05:42	04:59 (WEA_G1)	05:27	04:19	06:13	04:13	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:43	05:40	04:55 (WEA_G1)	05:25	04:17	06:12	04:12	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:41	05:38	04:51 (WEA_G1)	05:23	04:15	06:11	04:11	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:39	05:36	04:47 (WEA_G1)	05:21	04:13	06:10	04:10	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:37	05:34	04:43 (WEA_G1)	05:19	04:11	06:09	04:09	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:35	05:32	04:39 (WEA_G1)	05:17	04:09	06:08	04:08	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:33	05:30	04:35 (WEA_G1)	05:15	04:07	06:07	04:07	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:31	05:28	04:31 (WEA_G1)	05:13	04:05	06:06	04:06	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:29	05:26	04:27 (WEA_G1)	05:11	04:03	06:05	04:05	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:27	05:24	04:23 (WEA_G1)	05:09	04:01	06:04	04:04	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:25	05:22	04:19 (WEA_G1)	05:07	03:59	06:03	04:03	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:23	05:20	04:15 (WEA_G1)	05:05	03:57	06:02	04:02	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:21	05:18	04:11 (WEA_G1)	05:03	03:55	06:01	04:01	05:24 (WEA 03 (GRN))	
1	08:28	15:00 (WEA 11 (GRS))	06:19	05:16	04:07 (WEA_G1)	05:01	03:53	06:00	04:00	05:24 (WEA 03 (GRN))	</

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 31 - IO 31 Rüttinger Kornhof 1 (Rütting)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	05:31 (WEA 03 (GRN))	05:27	06:23	06:50 (WEA RWED1)	07:17	07:44 (WEA G3)	07:16			08:12
2	04:48	05:30 (WEA 03 (GRN))	05:29	06:25	06:52 (WEA RWED1)	07:19	07:46 (WEA G3)	07:18			08:14
3	04:48	05:30 (WEA 03 (GRN))	05:31	06:26	06:54 (WEA RWED1)	07:21	07:48 (WEA G2)	07:20			08:15
4	04:49	05:30 (WEA 03 (GRN))	05:33	06:28	06:56 (WEA RWED1)	07:23	07:49 (WEA G2)	07:22			08:17
5	04:50	05:30 (WEA 03 (GRN))	05:36	06:30	06:57 (WEA RWED1)	07:24	07:51 (WEA G2)	07:24			08:18
6	04:51	05:30 (WEA 03 (GRN))	05:36	06:32	06:59 (WEA RWED1)	07:26	07:53 (WEA G2)	07:26			08:19
7	04:52	05:30 (WEA 03 (GRN))	05:38	06:34	07:00 (WEA RWED1)	07:28	07:55 (WEA G1)	07:28			08:21
8	04:53	05:29 (WEA 03 (GRN))	05:40	06:35	07:01 (WEA RWED1)	07:30	07:57 (WEA G1)	07:30			08:22
9	04:54	05:29 (WEA 03 (GRN))	05:41	06:37	07:02 (WEA RWED1)	07:31	07:59 (WEA G1)	07:31			08:23
10	04:55	05:29 (WEA 03 (GRN))	05:43	06:39	07:03 (WEA RWED1)	07:32	08:01 (WEA G1)	07:32			08:25
11	04:56	05:29 (WEA 03 (GRN))	05:44	06:40	07:04 (WEA RWED1)	07:33	08:02 (WEA G1)	07:33			08:26
12	04:58	05:29 (WEA 03 (GRN))	05:47	06:43	07:05 (WEA RWED1)	07:34	08:03 (WEA G1)	07:34			08:28
13	04:59	05:29 (WEA 03 (GRN))	05:49	06:45	07:06 (WEA RWED1)	07:35	08:04 (WEA G1)	07:35			08:29
14	05:00	05:29 (WEA 03 (GRN))	05:50	06:46	07:07 (WEA RWED1)	07:36	08:05 (WEA G1)	07:36			08:30
15	05:01	05:29 (WEA 03 (GRN))	05:51	06:47	07:08 (WEA RWED1)	07:37	08:06 (WEA G1)	07:37			08:31
16	05:02	05:29 (WEA 03 (GRN))	05:52	06:48	07:09 (WEA RWED1)	07:38	08:07 (WEA G1)	07:38			08:32
17	05:03	05:29 (WEA 03 (GRN))	05:53	06:49	07:10 (WEA RWED1)	07:39	08:08 (WEA G1)	07:39			08:33
18	05:04	05:29 (WEA 03 (GRN))	05:54	06:50	07:11 (WEA RWED1)	07:40	08:09 (WEA G1)	07:40			08:34
19	05:05	05:29 (WEA 03 (GRN))	05:55	06:51	07:12 (WEA RWED1)	07:41	08:10 (WEA G1)	07:41			08:35
20	05:06	05:29 (WEA 03 (GRN))	05:56	06:52	07:13 (WEA RWED1)	07:42	08:11 (WEA G1)	07:42			08:36
21	05:07	05:29 (WEA 03 (GRN))	05:57	06:53	07:14 (WEA RWED1)	07:43	08:12 (WEA G1)	07:43			08:37
22	05:08	05:29 (WEA 03 (GRN))	05:58	06:54	07:15 (WEA RWED1)	07:44	08:13 (WEA G1)	07:44			08:38
23	05:09	05:29 (WEA 03 (GRN))	05:59	06:55	07:16 (WEA RWED1)	07:45	08:14 (WEA G1)	07:45			08:39
24	05:10	05:29 (WEA 03 (GRN))	06:00	06:56	07:17 (WEA RWED1)	07:46	08:15 (WEA G1)	07:46			08:40
25	05:11	05:29 (WEA 03 (GRN))	06:01	06:57	07:18 (WEA RWED1)	07:47	08:16 (WEA G1)	07:47			08:41
26	05:12	05:29 (WEA 03 (GRN))	06:02	06:58	07:19 (WEA RWED1)	07:48	08:17 (WEA G1)	07:48			08:42
27	05:13	05:29 (WEA 03 (GRN))	06:03	06:59	07:20 (WEA RWED1)	07:49	08:18 (WEA G1)	07:49			08:43
28	05:14	05:29 (WEA 03 (GRN))	06:04	07:00	07:21 (WEA RWED1)	07:50	08:19 (WEA G1)	07:50			08:44
29	05:15	05:29 (WEA 03 (GRN))	06:05	07:01	07:22 (WEA RWED1)	07:51	08:20 (WEA G1)	07:51			08:45
30	05:16	05:29 (WEA 03 (GRN))	06:06	07:02	07:23 (WEA RWED1)	07:52	08:21 (WEA G1)	07:52			08:46
31	05:17	05:29 (WEA 03 (GRN))	06:07	07:03	07:24 (WEA RWED1)	07:53	08:22 (WEA G1)	07:53			08:47
1	05:18	05:29 (WEA 03 (GRN))	06:08	07:04	07:25 (WEA RWED1)	07:54	08:23 (WEA G1)	07:54			08:48
2	05:19	05:29 (WEA 03 (GRN))	06:09	07:05	07:26 (WEA RWED1)	07:55	08:24 (WEA G1)	07:55			08:49
3	05:20	05:29 (WEA 03 (GRN))	06:10	07:06	07:27 (WEA RWED1)	07:56	08:25 (WEA G1)	07:56			08:50
4	05:21	05:29 (WEA 03 (GRN))	06:11	07:07	07:28 (WEA RWED1)	07:57	08:26 (WEA G1)	07:57			08:51
5	05:22	05:29 (WEA 03 (GRN))	06:12	07:08	07:29 (WEA RWED1)	07:58	08:27 (WEA G1)	07:58			08:52
6	05:23	05:29 (WEA 03 (GRN))	06:13	07:09	07:30 (WEA RWED1)	07:59	08:28 (WEA G1)	07:59			08:53
7	05:24	05:29 (WEA 03 (GRN))	06:14	07:10	07:31 (WEA RWED1)	08:00	08:29 (WEA G1)	08:00			08:54
8	05:25	05:29 (WEA 03 (GRN))	06:15	07:11	07:32 (WEA RWED1)	08:01	08:30 (WEA G1)	08:01			08:55
9	05:26	05:29 (WEA 03 (GRN))	06:16	07:12	07:33 (WEA RWED1)	08:02	08:31 (WEA G1)	08:02			08:56
10	05:27	05:29 (WEA 03 (GRN))	06:17	07:13	07:34 (WEA RWED1)	08:03	08:32 (WEA G1)	08:03			08:57
11	05:28	05:29 (WEA 03 (GRN))	06:18	07:14	07:35 (WEA RWED1)	08:04	08:33 (WEA G1)	08:04			08:58
12	05:29	05:29 (WEA 03 (GRN))	06:19	07:15	07:36 (WEA RWED1)	08:05	08:34 (WEA G1)	08:05			08:59
13	05:30	05:29 (WEA 03 (GRN))	06:20	07:16	07:37 (WEA RWED1)	08:06	08:35 (WEA G1)	08:06			09:00
14	05:31	05:29 (WEA 03 (GRN))	06:21	07:17	07:38 (WEA RWED1)	08:07	08:36 (WEA G1)	08:07			09:01
15	05:32	05:29 (WEA 03 (GRN))	06:22	07:18	07:39 (WEA RWED1)	08:08	08:37 (WEA G1)	08:08			09:02
16	05:33	05:29 (WEA 03 (GRN))	06:23	07:19	07:40 (WEA RWED1)	08:09	08:38 (WEA G1)	08:09			09:03
17	05:34	05:29 (WEA 03 (GRN))	06:24	07:20	07:41 (WEA RWED1)	08:10	08:39 (WEA G1)	08:10			09:04
18	05:35	05:29 (WEA 03 (GRN))	06:25	07:21	07:42 (WEA RWED1)	08:11	08:40 (WEA G1)	08:11			09:05
19	05:36	05:29 (WEA 03 (GRN))	06:26	07:22	07:43 (WEA RWED1)	08:12	08:41 (WEA G1)	08:12			09:06
20	05:37	05:29 (WEA 03 (GRN))	06:27	07:23	07:44 (WEA RWED1)	08:13	08:42 (WEA G1)	08:13			09:07
21	05:38	05:29 (WEA 03 (GRN))	06:28	07:24	07:45 (WEA RWED1)	08:14	08:43 (WEA G1)	08:14			09:08
22	05:39	05:29 (WEA 03 (GRN))	06:29	07:25	07:46 (WEA RWED1)	08:15	08:44 (WEA G1)	08:15			09:09
23	05:40	05:29 (WEA 03 (GRN))	06:30	07:26	07:47 (WEA RWED1)	08:16	08:45 (WEA G1)	08:16			09:10
24	05:41	05:29 (WEA 03 (GRN))	06:31	07:27	07:48 (WEA RWED1)	08:17	08:46 (WEA G1)	08:17			09:11
25	05:42	05:29 (WEA 03 (GRN))	06:32	07:28	07:49 (WEA RWED1)	08:18	08:47 (WEA G1)	08:18			09:12
26	05:43	05:29 (WEA 03 (GRN))	06:33	07:29	07:50 (WEA RWED1)	08:19	08:48 (WEA G1)	08:19			09:13
27	05:44	05:29 (WEA 03 (GRN))	06:34	07:30	07:51 (WEA RWED1)	08:20	08:49 (WEA G1)	08:20			09:14
28	05:45	05:29 (WEA 03 (GRN))	06:35	07:31	07:52 (WEA RWED1)	08:21	08:50 (WEA G1)	08:21			09:15
29	05:46	05:29 (WEA 03 (GRN))	06:36	07:32	07:53 (WEA RWED1)	08:22	08:51 (WEA G1)	08:22			09:16
30	05:47	05:29 (WEA 03 (GRN))	06:37	07:33	07:54 (WEA RWED1)	08:23	08:52 (WEA G1)	08:23			09:17
31	05:48	05:29 (WEA 03 (GRN))	06:38	07:34	07:55 (WEA RWED1)	08:24	08:53 (WEA G1)	08:24			09:18
Sommerhochstand	513		462		389		288		257		223
ab: max mögl. Beschattung	228		565		248		119		90		426

**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)	Schattende (WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 32 - IO 32 Rütiger Kornhof 10 (Rütig)

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03	08:06 16:55	07:08 17:52	07:33 (WEA_G1) 19:51	05:42 20:48	04:51 21:39
2	08:37 16:04	08:04 16:57	07:05 17:54	07:30 (WEA_G1) 19:53	05:39 20:49	04:50 21:40
3	08:37 16:05	08:03 16:59	07:03 17:56	07:28 (WEA_G1) 19:55	05:37 20:51	04:49 21:41
4	08:37 16:07	08:01 17:01	07:01 17:58	07:25 (WEA_G1) 19:57	05:35 20:53	04:48 21:42
5	08:36 16:08	07:59 17:03	06:58 18:00	07:23 (WEA_G1) 19:59	07:06 (WEA_RWED1) 20:55	04:48 21:43
6	08:36 16:09	07:57 17:05	06:56 18:02	07:20 (WEA_G1) 20:01	07:03 (WEA_RWED1) 20:57	04:47 21:44
7	08:35 16:11	07:55 17:07	06:53 18:04	07:18 (WEA_G1) 20:03	07:01 (WEA_RWED1) 20:59	04:46 21:45
8	08:35 16:12	07:53 17:09	06:51 18:06	07:15 (WEA_G1) 20:04	06:58 (WEA_RWED1) 21:00	04:45 21:46
9	08:34 16:14	07:51 17:11	06:48 18:08	07:13 (WEA_G1) 20:06	06:56 (WEA_RWED1) 21:02	04:44 21:47
10	08:33 16:15	15:37 (WEA_IC (GRS)) 17:13	06:46 18:10	07:10 (WEA_G1) 20:08	06:54 (WEA_RWED1) 21:04	04:44 21:48
11	08:33 16:17	15:37 (WEA_IC (GRS)) 17:16	06:44 18:11	07:08 (WEA_G1) 20:10	06:52 (WEA_RWED1) 21:06	04:44 21:49
12	08:32 16:18	15:37 (WEA_IC (GRS)) 17:18	06:41 18:12	07:06 (WEA_G1) 20:12	06:49 (WEA_RWED1) 21:08	04:44 21:50
13	08:31 16:20	15:37 (WEA_IC (GRS)) 17:19	06:39 18:13	07:04 (WEA_G1) 20:14	06:47 (WEA_RWED1) 21:10	04:43 21:51
14	08:30 16:21	15:37 (WEA_IC (GRS)) 17:21	06:36 18:14	07:02 (WEA_G1) 20:16	06:44 (WEA_RWED1) 21:12	04:43 21:52
15	08:29 16:23	15:36 (WEA_IC (GRS)) 17:24	06:34 18:15	07:00 (WEA_G1) 20:18	06:42 (WEA_RWED1) 21:14	04:42 21:53
16	08:29 16:25	15:36 (WEA_IC (GRS)) 17:26	06:31 18:16	06:58 (WEA_G1) 20:20	06:40 (WEA_RWED1) 21:16	04:42 21:54
17	08:27 16:27	15:36 (WEA_IC (GRS)) 17:28	06:28 18:17	06:56 (WEA_G1) 20:22	06:38 (WEA_RWED1) 21:18	04:42 21:55
18	08:26 16:28	15:35 (WEA_IC (GRS)) 17:30	06:25 18:18	06:54 (WEA_G1) 20:24	06:36 (WEA_RWED1) 21:20	04:42 21:56
19	08:25 16:29	15:35 (WEA_IC (GRS)) 17:31	06:23 18:19	06:52 (WEA_G1) 20:26	06:34 (WEA_RWED1) 21:22	04:42 21:57
20	08:24 16:30	15:34 (WEA_IC (GRS)) 17:32	06:21 18:20	06:50 (WEA_G1) 20:28	06:32 (WEA_RWED1) 21:24	04:42 21:58
21	08:23 16:31	15:34 (WEA_IC (GRS)) 17:33	06:19 18:21	06:48 (WEA_G1) 20:30	06:30 (WEA_RWED1) 21:26	04:42 21:59
22	08:21 16:32	15:33 (WEA_IC (GRS)) 17:34	06:17 18:22	06:46 (WEA_G1) 20:32	06:28 (WEA_RWED1) 21:28	04:42 22:00
23	08:20 16:33	15:33 (WEA_IC (GRS)) 17:35	06:15 18:23	06:44 (WEA_G1) 20:34	06:26 (WEA_RWED1) 21:30	04:42 22:01
24	08:19 16:34	15:32 (WEA_IC (GRS)) 17:36	06:13 18:24	06:42 (WEA_G1) 20:36	06:24 (WEA_RWED1) 21:32	04:42 22:02
25	08:17 16:35	15:32 (WEA_IC (GRS)) 17:37	06:11 18:25	06:40 (WEA_G1) 20:38	06:22 (WEA_RWED1) 21:34	04:42 22:03
26	08:15 16:36	15:31 (WEA_IC (GRS)) 17:38	06:09 18:26	06:38 (WEA_G1) 20:40	06:20 (WEA_RWED1) 21:36	04:42 22:04
27	08:14 16:37	15:31 (WEA_IC (GRS)) 17:39	06:07 18:27	06:36 (WEA_G1) 20:42	06:18 (WEA_RWED1) 21:38	04:42 22:05
28	08:13 16:38	15:30 (WEA_IC (GRS)) 17:40	06:05 18:28	06:34 (WEA_G1) 20:44	06:16 (WEA_RWED1) 21:40	04:42 22:06
29	08:11 16:39	15:29 (WEA_IC (GRS)) 17:41	06:03 18:29	06:32 (WEA_G1) 20:46	06:14 (WEA_RWED1) 21:42	04:42 22:07
30	08:10 16:40	15:28 (WEA_IC (GRS)) 17:42	06:01 18:30	06:30 (WEA_G1) 20:48	06:12 (WEA_RWED1) 21:44	04:42 22:08
31	08:08 16:41	15:27 (WEA_IC (GRS)) 17:43	05:59 18:31	06:28 (WEA_G1) 20:50	06:10 (WEA_RWED1) 21:46	04:42 22:09
	16:53 248	272	367	421	496	513
	Sonnenscheinstunden astr.max.mögl.Beschattung	142	13	401	490	125

**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)



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-155) **Schattenrezeptor:** IO 33 - IO 33 Kathenkamp 19 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni			
1	08:37	15:06 (WEA 10 (GRS))	08:06		07:08	07:33 (WEA G2)	06:52	07:16 (WEA RWEE1)	05:42	06:08 (WEA OS (GRN))	04:51		
	11:03	15:17 (WEA 10 (GRS))	16:55		17:52	08:05 (WEA G1)	19:51	27	07:43 (WEA RWEE1)	20:48	6	06:14 (WEA OS (GRN))	21:39
2	08:37	15:07 (WEA 10 (GRS))	08:04		07:05	07:30 (WEA G2)	06:49		07:13 (WEA RWEE1)	05:39		06:06 (WEA OS (GRN))	04:50
	11:04	15:18 (WEA 10 (GRS))	16:57		17:54	08:04 (WEA G1)	19:53	30	07:43 (WEA RWEE1)	20:49	8	06:14 (WEA OS (GRN))	21:40
3	08:37	15:08 (WEA 10 (GRS))	08:03		07:03	07:28 (WEA G2)	06:47		07:12 (WEA RWEE1)	05:37		06:04 (WEA OS (GRN))	04:49
	11:05	15:17 (WEA 10 (GRS))	16:59		17:56	08:03 (WEA G1)	19:55	31	07:43 (WEA RWEE1)	20:51	10	06:14 (WEA OS (GRN))	21:41
4	08:37	15:09 (WEA 10 (GRS))	08:01		07:01	07:26 (WEA G2)	06:44		07:11 (WEA RWEE1)	05:35		06:02 (WEA OS (GRN))	04:48
	11:07	15:17 (WEA 10 (GRS))	17:01		17:58	08:01 (WEA G1)	19:57	31	07:42 (WEA RWEE1)	20:52	12	06:14 (WEA OS (GRN))	21:42
5	08:36	15:10 (WEA 10 (GRS))	07:59		06:58	07:28 (WEA G2)	06:42		07:11 (WEA RWEE1)	05:33		06:00 (WEA OS (GRN))	04:48
	11:08	15:16 (WEA 10 (GRS))	17:03		18:00	08:00 (WEA G1)	19:59	30	07:41 (WEA RWEE1)	20:55	13	06:13 (WEA OS (GRN))	21:43
6	08:36	15:14 (WEA 10 (GRS))	07:57		06:56	07:28 (WEA G2)	06:39		07:11 (WEA RWEE1)	05:31		06:00 (WEA OS (GRN))	04:47
	11:09	15:15 (WEA 10 (GRS))	17:05		18:02	07:57 (WEA G1)	20:01	29	07:40 (WEA RWEE1)	20:57	13	06:13 (WEA OS (GRN))	21:44
7	08:35		07:55		06:53	07:31 (WEA G2)	06:37		07:12 (WEA RWEE1)	05:29		06:00 (WEA OS (GRN))	04:46
	11:11		17:07		18:04	07:52 (WEA G1)	20:03	27	07:39 (WEA RWEE1)	20:59	12	06:12 (WEA OS (GRN))	21:45
8	08:35		07:53		06:51		06:35		07:13 (WEA RWEE1)	05:27		05:56 (WEA OS (GRN))	04:46
	11:12		17:09		18:06		20:04	26	07:39 (WEA RWEE1)	21:00	11	06:10 (WEA OS (GRN))	21:46
9	08:34		07:51		06:49		06:33		07:13 (WEA RWEE1)	05:25		05:53 (WEA OS (GRN))	04:45
	11:14		17:11		18:09		20:06	23	07:38 (WEA RWEE1)	21:02	15	06:09 (WEA OS (GRN))	21:47
10	08:34		07:49		06:46		06:30		07:13 (WEA RWEE1)	05:24		05:51 (WEA OS (GRN))	04:44
	11:15		17:13		18:10		20:08	20	07:37 (WEA RWEE1)	21:04	14	06:08 (WEA OS (GRN))	21:48
11	08:33		07:47		06:44		06:27		07:13 (WEA RWEE1)	05:22		05:49 (WEA OS (GRN))	04:44
	11:17		17:15		18:12		20:10	16	07:36 (WEA RWEE1)	21:06	17	06:06 (WEA OS (GRN))	21:49
12	08:32		07:45		06:41		06:25		07:13 (WEA RWEE1)	05:20		05:47 (WEA OS (GRN))	04:43
	11:18		17:16		18:13		20:12	10	07:35 (WEA RWEE1)	21:08	20	06:07 (WEA OS (GRN))	21:50
13	08:31		07:43		06:39		06:23		07:13 (WEA RWEE1)	05:18		05:45 (WEA OS (GRN))	04:43
	11:20		17:19		18:14		20:14		07:13 (WEA RWEE1)	05:16		05:43 (WEA OS (GRN))	04:42
14	08:30		07:41		06:36		06:20		07:13 (WEA RWEE1)	05:14		05:41 (WEA OS (GRN))	04:41
	11:21		17:22		18:15		20:16		07:13 (WEA RWEE1)	05:12		05:39 (WEA OS (GRN))	04:40
15	08:29		07:39		06:34		06:18		07:13 (WEA RWEE1)	05:10		05:37 (WEA OS (GRN))	04:39
	11:23		17:24		18:16		20:18		07:13 (WEA RWEE1)	05:08		05:35 (WEA OS (GRN))	04:38
16	08:28		07:37		06:32		06:15		07:13 (WEA RWEE1)	05:06		05:33 (WEA OS (GRN))	04:37
	11:25		17:26		18:17		20:20		07:13 (WEA RWEE1)	05:04		05:31 (WEA OS (GRN))	04:36
17	08:27		07:35		06:30		06:13		07:13 (WEA RWEE1)	05:02		05:29 (WEA OS (GRN))	04:35
	11:27		17:29		18:18		20:22		07:13 (WEA RWEE1)	05:00		05:27 (WEA OS (GRN))	04:34
18	08:26		07:33	07:59 (WEA G1)	06:27		06:11		07:13 (WEA RWEE1)	04:58		05:25 (WEA OS (GRN))	04:33
	11:29		17:32	2	08:01 (WEA G1)	06:25	20:23		07:13 (WEA RWEE1)	04:56		05:23 (WEA OS (GRN))	04:32
19	08:25		07:31	07:56 (WEA G1)	06:23		06:09		07:13 (WEA RWEE1)	04:54		05:21 (WEA OS (GRN))	04:31
	11:31		17:34	6	08:02 (WEA G1)	06:22	20:25		07:13 (WEA RWEE1)	04:52		05:19 (WEA OS (GRN))	04:30
20	08:24		07:29	07:51 (WEA G1)	06:20		06:06		07:13 (WEA RWEE1)	04:50		05:17 (WEA OS (GRN))	04:29
	11:33		17:36	10	08:03 (WEA G1)	06:19	20:27		07:13 (WEA RWEE1)	04:48		05:15 (WEA OS (GRN))	04:28
21	08:23		07:27	07:46 (WEA G1)	06:17		06:04		07:13 (WEA RWEE1)	04:46		05:13 (WEA OS (GRN))	04:27
	11:35		17:38	13	08:04 (WEA G1)	06:16	20:29		07:13 (WEA RWEE1)	04:44		05:11 (WEA OS (GRN))	04:26
22	08:22		07:25	07:41 (WEA G1)	06:14		06:01		07:13 (WEA RWEE1)	04:42		05:09 (WEA OS (GRN))	04:25
	11:37		17:40	16	08:05 (WEA G1)	06:13	20:31		07:13 (WEA RWEE1)	04:40		05:07 (WEA OS (GRN))	04:24
23	08:21		07:23	07:36 (WEA G1)	06:12		05:59		07:13 (WEA RWEE1)	04:38		05:05 (WEA OS (GRN))	04:23
	11:39		17:42	19	08:06 (WEA G1)	06:11	20:33		07:13 (WEA RWEE1)	04:36		05:03 (WEA OS (GRN))	04:22
24	08:20		07:21	07:31 (WEA G1)	06:09	08:25 (WEA RWEE1)	05:57		07:13 (WEA RWEE1)	04:34		05:01 (WEA OS (GRN))	04:21
	11:41		17:44	21	08:07 (WEA G1)	06:08	20:35		07:13 (WEA RWEE1)	04:32		04:59 (WEA OS (GRN))	04:20
25	08:19		07:19	07:26 (WEA G1)	06:06	08:26 (WEA RWEE1)	05:55		07:13 (WEA RWEE1)	04:30		04:57 (WEA OS (GRN))	04:19
	11:43		17:46	24	08:08 (WEA G1)	06:05	20:37		07:13 (WEA RWEE1)	04:28		04:55 (WEA OS (GRN))	04:18
26	08:18		07:17	07:21 (WEA G1)	06:04	08:27 (WEA RWEE1)	05:53		07:13 (WEA RWEE1)	04:26		04:53 (WEA OS (GRN))	04:17
	11:45		17:48	28	08:09 (WEA G1)	06:03	20:39		07:13 (WEA RWEE1)	04:24		04:51 (WEA OS (GRN))	04:16
27	08:17		07:15	07:16 (WEA G1)	06:02	08:28 (WEA RWEE1)	05:51		07:13 (WEA RWEE1)	04:22		04:49 (WEA OS (GRN))	04:15
	11:47		17:50	30	08:10 (WEA G1)	06:01	20:41		07:13 (WEA RWEE1)	04:20		04:47 (WEA OS (GRN))	04:14
28	08:16				06:00	08:29 (WEA RWEE1)	05:49		07:13 (WEA RWEE1)	04:18		04:45 (WEA OS (GRN))	04:13
	11:49				05:59	08:30 (WEA RWEE1)	05:47		07:13 (WEA RWEE1)	04:16		04:43 (WEA OS (GRN))	04:12
29	08:15				05:58	08:31 (WEA RWEE1)	05:45		07:13 (WEA RWEE1)	04:14		04:41 (WEA OS (GRN))	04:11
	11:51				05:57	08:32 (WEA RWEE1)	05:43		07:13 (WEA RWEE1)	04:12		04:39 (WEA OS (GRN))	04:10
30	08:14				05:56	08:33 (WEA RWEE1)	05:41		07:13 (WEA RWEE1)	04:10		04:37 (WEA OS (GRN))	04:09
	11:53				05:55	08:34 (WEA RWEE1)	05:39		07:13 (WEA RWEE1)	04:08		04:35 (WEA OS (GRN))	04:08
31	08:13				05:54	08:35 (WEA RWEE1)	05:37		07:13 (WEA RWEE1)	04:06		04:33 (WEA OS (GRN))	04:07
	11:55				05:53	08:36 (WEA RWEE1)	05:35		07:13 (WEA RWEE1)	04:04		04:31 (WEA OS (GRN))	04:06
1	08:12				05:52	08:37 (WEA RWEE1)	05:33		07:13 (WEA RWEE1)	04:02		04:29 (WEA OS (GRN))	04:05
	11:57				05:51	08:38 (WEA RWEE1)	05:31		07:13 (WEA RWEE1)	04:00		04:27 (WEA OS (GRN))	04:04
2	08:11				05:50	08:39 (WEA RWEE1)	05:29		07:13 (WEA RWEE1)	03:58		04:25 (WEA OS (GRN))	04:03
	11:59				05:49	08:40 (WEA RWEE1)	05:27		07:13 (WEA RWEE1)	03:56		04:23 (WEA OS (GRN))	04:02
3	08:10				05:48	08:41 (WEA RWEE1)	05:25		07:13 (WEA RWEE1)	03:54		04:21 (WEA OS (GRN))	04:01
	12:01				05:47	08:42 (WEA RWEE1)	05:23		07:13 (WEA RWEE1)	03:52		04:19 (WEA OS (GRN))	04:00
4	08:09				05:46	08:43 (WEA RWEE1)	05:21		07:13 (WEA RWEE1)	03:50		04:17 (WEA OS (GRN))	03:59
	12:03				05:45	08:44 (WEA RWEE1)	05:19		07:13 (WEA RWEE1)	03:48		04:15 (WEA OS (GRN))	03:58
5	08:08				05:44	08:45 (WEA RWEE1)	05:17		07:13 (WEA RWEE1)	03:46		04:13 (WEA OS (GRN))	03:57
	12:05				05:43	08:46 (WEA RWEE1)	05:15		07:13 (WEA RWEE1)	03:44		04:11 (WEA OS (GRN))	03:56
6	08:07				05:42	08:47 (WEA RWEE1)	05:13		07:13 (WEA RWEE1)	03:42		04:09 (WEA OS (GRN))	03:55
	12:07				05:41	08:48 (WEA RWEE1)	05:11		07:13 (WEA RWEE1)	03:40		04:07 (WEA OS (GRN))	03:54
7	08:06				05:40	08:49 (WEA RWEE1)	05:09		07:13 (WEA RWEE1)	03:38		04:05 (WEA OS (GRN))	03:53
	12:09				05:39	08:50 (WEA RWEE1)	05:07		07:13 (WEA RWEE1)	03:36		04:03 (WEA OS (GRN))	03:52
8	08:05				05:38	08:51 (WEA RWEE1)	05:05		07:13 (WEA RWEE1)	03:34		04:01 (WEA OS (GRN))	03:51
	12:11				05:37	08:52 (WEA RWEE1)	05:03		07:13 (WEA RWEE1)	03:32		03:59 (WEA OS (GRN))	03:50
9	08:04				05:36	08:53 (WEA RWEE1)	05:01		07:13 (WEA RWEE1)	03:30		03:57 (WEA OS (GRN))	03:49
	12:13				05:35	08:54 (WEA RWEE1)	04:59		07:13 (WEA RWEE1)	03:28		03:55 (WEA OS (GRN))	03:48
10	08:03				05:34	08:55 (WEA RWEE1)	04:57		07:13 (WEA RWEE1)	03:26		03:53 (WEA OS (GRN))	03:47
	12:15				05:33	08:56 (WEA RWEE1)	04:55		07:13 (WEA RWEE1)	03:24		03:51 (WEA OS (GRN))	03:46
11	08:02				05:32	08:57 (WEA RWEE1)	04:53		07:13 (WEA RWEE1)	03:22		03:49 (WEA OS (GRN))	03:45
	12:17				05:31	08:58 (WEA RWEE1)	04:51		07:13 (WEA RWEE1)	03:20		03:47 (WEA OS (GRN))	03:44
12	08:01				05:30	08:59 (WEA RWEE1)	04:49		07:13 (WEA RWEE1)	03:18		03:45 (WEA OS (GRN))	03:43
	12:19				05:29	09:00 (WEA RWEE1)	04:47		07:13 (WEA RWEE1)	03:16		03:43 (WEA OS (GRN))	



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 33 - IO 33 Kathenkamp 19 (Rüting)

### Annahmen für Schattenwurfberechnung

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- Die Rotorfläche steht immer senkrecht zur Sonneneinstrahlung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli		August		September		Oktober		November		Dezember	
1	04:47	05:21 (WEA 02 (GRN))	05:27	05:58 (WEA 05 (GRN))	06:23	07:15 (WEA RWEE01)	07:17	07:16	08:12			
2	04:48	05:21 (WEA 02 (GRN))	05:29	06:00 (WEA 05 (GRN))	06:25	07:31 (WEA RWEE01)	07:19	07:18	08:14			
3	04:48	05:22 (WEA 02 (GRN))	05:31	06:17 (WEA 05 (GRN))	06:26	07:33 (WEA RWEE01)	07:21	07:20	08:15			
4	04:49	05:23 (WEA 02 (GRN))	05:33	06:23 (WEA 05 (GRN))	06:28	07:34 (WEA RWEE01)	07:23	07:22	08:17			
5	04:50	05:24 (WEA 02 (GRN))	05:34	06:19 (WEA 05 (GRN))	06:30	07:36 (WEA RWEE01)	07:24	07:24	08:18			
6	04:51	05:25 (WEA 02 (GRN))	05:36	06:22 (WEA 03 (GRN))	06:32	07:37 (WEA RWEE01)	07:26	07:26	08:20			
7	04:52	05:26 (WEA 02 (GRN))	05:38	06:22 (WEA 03 (GRN))	06:34	07:37 (WEA RWEE01)	07:28	07:28	08:21			
8	04:53	05:26 (WEA 02 (GRN))	05:40	06:22 (WEA 03 (GRN))	06:35	07:37 (WEA RWEE01)	07:30	07:30	08:22			
9	04:54	05:27 (WEA 02 (GRN))	05:41	06:23 (WEA 03 (GRN))	06:37	07:37 (WEA RWEE01)	07:32	07:32	08:23			
10	04:55	05:28 (WEA 02 (GRN))	05:43	06:23 (WEA 03 (GRN))	06:39	07:38 (WEA RWEE01)	07:34	07:34	08:24			
11	04:56	05:29 (WEA 02 (GRN))	05:45	06:23 (WEA 03 (GRN))	06:41	07:38 (WEA RWEE01)	07:36	07:36	08:25			
12	04:56	05:31 (WEA 02 (GRN))	05:47	06:23 (WEA 03 (GRN))	06:43	07:38 (WEA RWEE01)	07:38	07:38	08:26			
13	04:58	05:32 (WEA 02 (GRN))	05:49	06:23 (WEA 03 (GRN))	06:45	07:39 (WEA RWEE01)	07:40	07:40	08:27			
14	04:58	05:34 (WEA 02 (GRN))	05:51	06:23 (WEA 03 (GRN))	06:47	07:39 (WEA RWEE01)	07:42	07:42	08:28			
15	04:59	05:35 (WEA 02 (GRN))	05:53	06:23 (WEA 03 (GRN))	06:49	07:39 (WEA RWEE01)	07:44	07:44	08:29			
16	05:00	05:36 (WEA 02 (GRN))	05:55	06:23 (WEA 03 (GRN))	06:51	07:39 (WEA RWEE01)	07:46	07:46	08:30			
17	05:01	05:37 (WEA 02 (GRN))	05:57	06:23 (WEA 03 (GRN))	06:53	07:39 (WEA RWEE01)	07:48	07:48	08:31			
18	05:02	05:38 (WEA 02 (GRN))	05:59	06:23 (WEA 03 (GRN))	06:55	07:39 (WEA RWEE01)	07:50	07:50	08:32			
19	05:03	05:39 (WEA 02 (GRN))	06:01	06:23 (WEA 03 (GRN))	06:57	07:39 (WEA RWEE01)	07:52	07:52	08:33			
20	05:04	05:40 (WEA 02 (GRN))	06:03	06:23 (WEA 03 (GRN))	06:59	07:39 (WEA RWEE01)	07:54	07:54	08:34			
21	05:05	05:41 (WEA 02 (GRN))	06:05	06:23 (WEA 03 (GRN))	07:01	07:39 (WEA RWEE01)	07:56	07:56	08:35			
22	05:06	05:42 (WEA 02 (GRN))	06:07	06:23 (WEA 03 (GRN))	07:03	07:39 (WEA RWEE01)	07:58	07:58	08:36			
23	05:07	05:43 (WEA 02 (GRN))	06:09	06:23 (WEA 03 (GRN))	07:05	07:39 (WEA RWEE01)	08:00	08:00	08:37			
24	05:08	05:44 (WEA 02 (GRN))	06:11	06:23 (WEA 03 (GRN))	07:07	07:39 (WEA RWEE01)	08:02	08:02	08:38			
25	05:09	05:45 (WEA 02 (GRN))	06:13	06:23 (WEA 03 (GRN))	07:09	07:39 (WEA RWEE01)	08:04	08:04	08:39			
26	05:10	05:46 (WEA 02 (GRN))	06:15	06:23 (WEA 03 (GRN))	07:11	07:39 (WEA RWEE01)	08:06	08:06	08:40			
27	05:11	05:47 (WEA 02 (GRN))	06:17	06:23 (WEA 03 (GRN))	07:13	07:39 (WEA RWEE01)	08:08	08:08	08:41			
28	05:12	05:48 (WEA 02 (GRN))	06:19	06:23 (WEA 03 (GRN))	07:15	07:39 (WEA RWEE01)	08:10	08:10	08:42			
29	05:13	05:49 (WEA 02 (GRN))	06:21	06:23 (WEA 03 (GRN))	07:17	07:39 (WEA RWEE01)	08:12	08:12	08:43			
30	05:14	05:50 (WEA 02 (GRN))	06:23	06:23 (WEA 03 (GRN))	07:19	07:39 (WEA RWEE01)	08:14	08:14	08:44			
31	05:15	05:51 (WEA 02 (GRN))	06:25	06:23 (WEA 03 (GRN))	07:21	07:39 (WEA RWEE01)	08:16	08:16	08:45			
Sonnenscheinstunden		515	461	383	328	257	231					
astr. max. mögl. Beschattung		856	159	410	417	314						

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

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

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 34 - IO 34 Kälberhof 5 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

Januar	Februar	März	April	Mal	Juni
1   08:37   15:08 (WEA 10 (GRS))   08:06		07:08	07:33 (WEA_G1)   06:52	07:16 (WEA_RWE01)   05:42	04:51
1   16:03   15:25 (WEA 10 (GRS))   16:55		17:52	07:51 (WEA_G1)   19:51	07:25 (WEA_RWE01)   20:48	21:39
2   08:37   15:09 (WEA 10 (GRS))   08:04		07:05	07:30 (WEA_G1)   06:49	07:13 (WEA_RWE01)   05:39	04:50
3   16:04   15:26 (WEA 10 (GRS))   16:57		17:54	07:50 (WEA_G1)   19:53	07:23 (WEA_RWE01)   20:49	21:40
3   08:37   15:09 (WEA 10 (GRS))   08:03		07:03	07:28 (WEA_G1)   06:47	07:11 (WEA_RWE01)   05:37	04:49
4   16:05   15:26 (WEA 10 (GRS))   16:59		17:56	07:51 (WEA_G1)   19:55	07:26 (WEA_RWE01)   20:51	21:41
4   08:37   15:10 (WEA 10 (GRS))   08:01		07:01	07:25 (WEA_G1)   06:44	07:08 (WEA_RWE01)   05:35	04:48
5   16:07   15:27 (WEA 10 (GRS))   17:01		17:58	07:50 (WEA_G1)   19:57	07:26 (WEA_RWE01)   20:53	21:42
5   08:36   15:11 (WEA 10 (GRS))   07:59		06:58	07:23 (WEA_G1)   06:42	07:06 (WEA_RWE01)   05:33	04:48
6   16:08   15:26 (WEA 10 (GRS))   17:03		18:00	07:51 (WEA_G1)   19:59	07:27 (WEA_RWE01)   20:55	21:43
6   08:36   15:12 (WEA 10 (GRS))   07:57		06:56	07:20 (WEA_G2)   06:39	07:03 (WEA_RWE01)   05:31	04:47
7   16:09   15:27 (WEA 10 (GRS))   17:05		18:02	07:50 (WEA_G1)   20:01	07:27 (WEA_RWE01)   20:57	21:44
7   08:35   15:12 (WEA 10 (GRS))   07:55		06:53	07:18 (WEA_G2)   06:37	07:01 (WEA_RWE01)   05:29	04:46
8   16:11   15:27 (WEA 10 (GRS))   17:07		18:04	07:49 (WEA_G1)   20:03	07:27 (WEA_RWE01)   20:59	21:45
8   08:35   15:13 (WEA 10 (GRS))   07:53		06:51	07:15 (WEA_G2)   06:35	06:59 (WEA_RWE01)   05:27	04:46
9   16:12   15:27 (WEA 10 (GRS))   17:09		18:06	07:48 (WEA_G1)   20:04	07:27 (WEA_RWE01)   21:00	21:46
9   08:34   15:14 (WEA 10 (GRS))   07:51		07:45	07:15 (WEA_G2)   06:33	06:58 (WEA_RWE01)   05:25	04:45
10   16:14   15:27 (WEA 10 (GRS))   17:11		18:08	07:47 (WEA_G1)   20:05	07:26 (WEA_RWE01)   21:02	21:47
10   08:33   15:15 (WEA 10 (GRS))   07:49		07:46	07:14 (WEA_G2)   06:31	06:56 (WEA_RWE01)   05:24	04:44
11   16:15   15:28 (WEA 10 (GRS))   17:13		18:10	07:46 (WEA_G1)   20:06	07:26 (WEA_RWE01)   21:04	21:48
11   08:32   15:16 (WEA 10 (GRS))   07:47		07:44	07:13 (WEA_G2)   06:29	06:56 (WEA_RWE01)   05:23	04:44
12   16:17   15:29 (WEA 10 (GRS))   17:15		18:12	07:45 (WEA_G1)   20:07	07:26 (WEA_RWE01)   21:06	21:49
12   08:31   15:17 (WEA 10 (GRS))   07:45		07:43	07:12 (WEA_G2)   06:27	06:55 (WEA_RWE01)   05:22	04:43
13   16:18   15:30 (WEA 10 (GRS))   17:17		18:13	07:44 (WEA_G1)   20:08	07:26 (WEA_RWE01)   21:08	21:50
13   08:30   15:18 (WEA 10 (GRS))   07:43		07:42	07:11 (WEA_G2)   06:25	06:54 (WEA_RWE01)   05:21	04:43
14   16:19   15:31 (WEA 10 (GRS))   17:19		18:14	07:43 (WEA_G1)   20:09	07:26 (WEA_RWE01)   21:10	21:51
14   08:29   15:19 (WEA 10 (GRS))   07:42		07:41	07:10 (WEA_G2)   06:23	06:53 (WEA_RWE01)   05:20	04:42
15   16:20   15:32 (WEA 10 (GRS))   17:21		18:15	07:42 (WEA_G1)   20:10	07:26 (WEA_RWE01)   21:12	21:52
15   08:28   15:20 (WEA 10 (GRS))   07:41		07:40	07:09 (WEA_G2)   06:21	06:52 (WEA_RWE01)   05:19	04:42
16   16:21   15:33 (WEA 10 (GRS))   17:23		18:16	07:41 (WEA_G1)   20:11	07:26 (WEA_RWE01)   21:14	21:53
16   08:27   15:21 (WEA 10 (GRS))   07:40		07:39	07:08 (WEA_G2)   06:19	06:51 (WEA_RWE01)   05:18	04:41
17   16:22   15:34 (WEA 10 (GRS))   17:25		18:17	07:40 (WEA_G1)   20:12	07:26 (WEA_RWE01)   21:16	21:54
17   08:26   15:22 (WEA 10 (GRS))   07:39		07:38	07:07 (WEA_G2)   06:17	06:50 (WEA_RWE01)   05:17	04:41
18   16:23   15:35 (WEA 10 (GRS))   17:27		18:18	07:39 (WEA_G1)   20:13	07:26 (WEA_RWE01)   21:18	21:55
18   08:25   15:23 (WEA 10 (GRS))   07:38		07:37	07:06 (WEA_G2)   06:15	06:49 (WEA_RWE01)   05:16	04:40
19   16:24   15:36 (WEA 10 (GRS))   17:29		18:19	07:38 (WEA_G1)   20:14	07:26 (WEA_RWE01)   21:20	21:56
19   08:24   15:24 (WEA 10 (GRS))   07:37		07:36	07:05 (WEA_G2)   06:13	06:48 (WEA_RWE01)   05:15	04:40
20   16:25   15:37 (WEA 10 (GRS))   17:31		18:20	07:37 (WEA_G1)   20:15	07:26 (WEA_RWE01)   21:22	21:57
20   08:23   15:25 (WEA 10 (GRS))   07:36		07:35	07:04 (WEA_G2)   06:11	06:47 (WEA_RWE01)   05:14	04:39
21   16:26   15:38 (WEA 10 (GRS))   17:33		18:21	07:36 (WEA_G1)   20:16	07:26 (WEA_RWE01)   21:24	21:58
21   08:22   15:26 (WEA 10 (GRS))   07:35		07:34	07:03 (WEA_G2)   06:09	06:46 (WEA_RWE01)   05:13	04:39
22   16:27   15:39 (WEA 10 (GRS))   17:35		18:22	07:35 (WEA_G1)   20:17	07:26 (WEA_RWE01)   21:26	21:59
22   08:21   15:27 (WEA 10 (GRS))   07:34		07:33	07:02 (WEA_G2)   06:07	06:45 (WEA_RWE01)   05:12	04:38
23   16:28   15:40 (WEA 10 (GRS))   17:37		18:23	07:34 (WEA_G1)   20:18	07:26 (WEA_RWE01)   21:28	22:00
23   08:20   15:28 (WEA 10 (GRS))   07:33		07:32	07:01 (WEA_G2)   06:05	06:44 (WEA_RWE01)   05:11	04:38
24   16:29   15:41 (WEA 10 (GRS))   17:39		18:24	07:33 (WEA_G1)   20:19	07:26 (WEA_RWE01)   21:30	22:01
24   08:19   15:29 (WEA 10 (GRS))   07:32		07:31	06:59 (WEA_G2)   06:03	06:43 (WEA_RWE01)   05:10	04:37
25   16:30   15:42 (WEA 10 (GRS))   17:41		18:25	07:32 (WEA_G1)   20:20	07:26 (WEA_RWE01)   21:32	22:02
25   08:18   15:30 (WEA 10 (GRS))   07:31		07:30	06:58 (WEA_G2)   06:01	06:42 (WEA_RWE01)   05:09	04:37
26   16:31   15:43 (WEA 10 (GRS))   17:43		18:26	07:31 (WEA_G1)   20:21	07:26 (WEA_RWE01)   21:34	22:03
26   08:17   15:31 (WEA 10 (GRS))   07:30		07:29	06:57 (WEA_G2)   05:59	06:41 (WEA_RWE01)   05:08	04:36
27   16:32   15:44 (WEA 10 (GRS))   17:45		18:27	07:30 (WEA_G1)   20:22	07:26 (WEA_RWE01)   21:36	22:04
27   08:16   15:32 (WEA 10 (GRS))   07:29		07:28	06:56 (WEA_G2)   05:57	06:40 (WEA_RWE01)   05:07	04:36
28   16:33   15:45 (WEA 10 (GRS))   17:47		18:28	07:29 (WEA_G1)   20:23	07:26 (WEA_RWE01)   21:38	22:05
28   08:15   15:33 (WEA 10 (GRS))   07:28		07:27	06:55 (WEA_G2)   05:55	06:39 (WEA_RWE01)   05:06	04:35
29   16:34   15:46 (WEA 10 (GRS))   17:49		18:29	07:28 (WEA_G1)   20:24	07:26 (WEA_RWE01)   21:40	22:06
29   08:14   15:34 (WEA 10 (GRS))   07:27		07:26	06:54 (WEA_G2)   05:53	06:38 (WEA_RWE01)   05:05	04:35
30   16:35   15:47 (WEA 10 (GRS))   17:51		18:30	07:27 (WEA_G1)   20:25	07:26 (WEA_RWE01)   21:42	22:07
30   08:13   15:35 (WEA 10 (GRS))   07:26		07:25	06:53 (WEA_G2)   05:51	06:37 (WEA_RWE01)   05:04	04:34
31   16:36   15:48 (WEA 10 (GRS))   17:53		18:31	07:26 (WEA_G1)   20:26	07:26 (WEA_RWE01)   21:44	22:08
31   08:12   15:36 (WEA 10 (GRS))   07:25		07:24	06:52 (WEA_G2)   05:49	06:36 (WEA_RWE01)   05:03	04:34
Sonnenscheinstunden	218	272	367	422	513
anz max mögl Beschattung	165	39	319	386	621

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	Schattenanfang (WEA mit erstem Schatten)	Zeitpunkt (SS:MM) Schattende	Schattende (WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 34 - IO 34 Kälberhof 5 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	05:21 (WEA 02 (GRN))	05:28	05:59 (WEA 03 (GRN))	06:23	06:55 (WEA RWED1)	07:17	08:09 (WEA_G1)	07:16	08:12	14:58 (WEA 10 (GRS))
2	04:48	05:21 (WEA 02 (GRN))	05:29	06:00 (WEA 03 (GRN))	06:25	06:54 (WEA RWED1)	07:19	07:58 (WEA_G2)	07:18	08:14	14:58 (WEA 10 (GRS))
3	04:48	05:22 (WEA 02 (GRN))	05:31	06:02 (WEA 03 (GRN))	06:26	06:54 (WEA RWED1)	07:21	07:54 (WEA_G2)	07:20	08:15	14:58 (WEA 10 (GRS))
4	04:49	05:24 (WEA 05 (GRN))	05:33	06:03 (WEA 03 (GRN))	06:28	06:56 (WEA RWED1)	07:23	07:53 (WEA_G2)	07:22	08:17	14:57 (WEA 10 (GRS))
5	04:50	05:24 (WEA 05 (GRN))	05:34	06:05 (WEA 03 (GRN))	06:30	06:57 (WEA RWED1)	07:24	07:52 (WEA_G2)	07:24	08:18	14:57 (WEA 10 (GRS))
6	04:51	05:24 (WEA 05 (GRN))	05:36	06:07 (WEA 03 (GRN))	06:32	06:59 (WEA RWED1)	07:26	07:53 (WEA_G2)	07:26	08:20	14:57 (WEA 10 (GRS))
7	04:52	05:25 (WEA 05 (GRN))	05:38	06:08 (WEA 03 (GRN))	06:34	07:01 (WEA RWED1)	07:28	07:55 (WEA_G2)	07:28	08:21	14:58 (WEA 10 (GRS))
8	04:53	05:24 (WEA 05 (GRN))	05:40	06:10 (WEA 03 (GRN))	06:35	07:03 (WEA RWED1)	07:30	07:57 (WEA_G2)	07:30	08:22	14:57 (WEA 10 (GRS))
9	04:54	05:24 (WEA 05 (GRN))	05:41	06:11 (WEA 03 (GRN))	06:36	07:04 (WEA RWED1)	07:31	07:59 (WEA_G2)	07:31	08:23	14:57 (WEA 10 (GRS))
10	04:55	05:25 (WEA 05 (GRN))	05:43	06:12 (WEA 03 (GRN))	06:37	07:05 (WEA RWED1)	07:32	08:01 (WEA_G2)	07:34	08:23	14:58 (WEA 10 (GRS))
11	04:55	05:25 (WEA 05 (GRN))	05:44	06:13 (WEA 03 (GRN))	06:38	07:06 (WEA RWED1)	07:33	08:02 (WEA_G2)	07:35	08:24	14:58 (WEA 10 (GRS))
12	04:56	05:25 (WEA 05 (GRN))	05:45	06:14 (WEA 03 (GRN))	06:39	07:07 (WEA RWED1)	07:34	08:03 (WEA_G2)	07:36	08:24	14:58 (WEA 10 (GRS))
13	04:56	05:25 (WEA 05 (GRN))	05:46	06:15 (WEA 03 (GRN))	06:40	07:08 (WEA RWED1)	07:35	08:04 (WEA_G2)	07:37	08:25	14:58 (WEA 10 (GRS))
14	04:57	05:25 (WEA 05 (GRN))	05:47	06:16 (WEA 03 (GRN))	06:41	07:09 (WEA RWED1)	07:36	08:05 (WEA_G2)	07:38	08:25	14:58 (WEA 10 (GRS))
15	04:57	05:25 (WEA 05 (GRN))	05:48	06:17 (WEA 03 (GRN))	06:42	07:10 (WEA RWED1)	07:37	08:06 (WEA_G2)	07:39	08:26	14:58 (WEA 10 (GRS))
16	04:58	05:25 (WEA 05 (GRN))	05:49	06:18 (WEA 03 (GRN))	06:43	07:11 (WEA RWED1)	07:38	08:07 (WEA_G2)	07:40	08:26	14:58 (WEA 10 (GRS))
17	04:58	05:25 (WEA 05 (GRN))	05:50	06:19 (WEA 03 (GRN))	06:44	07:12 (WEA RWED1)	07:39	08:08 (WEA_G2)	07:41	08:27	14:58 (WEA 10 (GRS))
18	04:59	05:25 (WEA 05 (GRN))	05:51	06:20 (WEA 03 (GRN))	06:45	07:13 (WEA RWED1)	07:40	08:09 (WEA_G2)	07:42	08:27	14:58 (WEA 10 (GRS))
19	04:59	05:25 (WEA 05 (GRN))	05:52	06:21 (WEA 03 (GRN))	06:46	07:14 (WEA RWED1)	07:41	08:10 (WEA_G2)	07:43	08:28	14:58 (WEA 10 (GRS))
20	04:59	05:25 (WEA 05 (GRN))	05:53	06:22 (WEA 03 (GRN))	06:47	07:15 (WEA RWED1)	07:42	08:11 (WEA_G2)	07:44	08:28	14:58 (WEA 10 (GRS))
21	05:00	05:25 (WEA 05 (GRN))	05:54	06:23 (WEA 03 (GRN))	06:48	07:16 (WEA RWED1)	07:43	08:12 (WEA_G2)	07:45	08:29	14:58 (WEA 10 (GRS))
22	05:01	05:25 (WEA 05 (GRN))	05:55	06:24 (WEA 03 (GRN))	06:49	07:17 (WEA RWED1)	07:44	08:13 (WEA_G2)	07:46	08:29	14:58 (WEA 10 (GRS))
23	05:01	05:25 (WEA 05 (GRN))	05:56	06:25 (WEA 03 (GRN))	06:50	07:18 (WEA RWED1)	07:45	08:14 (WEA_G2)	07:47	08:30	14:58 (WEA 10 (GRS))
24	05:02	05:25 (WEA 05 (GRN))	05:57	06:26 (WEA 03 (GRN))	06:51	07:19 (WEA RWED1)	07:46	08:15 (WEA_G2)	07:48	08:30	14:58 (WEA 10 (GRS))
25	05:02	05:25 (WEA 05 (GRN))	05:58	06:27 (WEA 03 (GRN))	06:52	07:20 (WEA RWED1)	07:47	08:16 (WEA_G2)	07:49	08:31	14:58 (WEA 10 (GRS))
26	05:03	05:25 (WEA 05 (GRN))	05:59	06:28 (WEA 03 (GRN))	06:53	07:21 (WEA RWED1)	07:48	08:17 (WEA_G2)	07:50	08:31	14:58 (WEA 10 (GRS))
27	05:03	05:25 (WEA 05 (GRN))	06:00	06:29 (WEA 03 (GRN))	06:54	07:22 (WEA RWED1)	07:49	08:18 (WEA_G2)	07:51	08:32	14:58 (WEA 10 (GRS))
28	05:04	05:25 (WEA 05 (GRN))	06:01	06:30 (WEA 03 (GRN))	06:55	07:23 (WEA RWED1)	07:50	08:19 (WEA_G2)	07:52	08:32	14:58 (WEA 10 (GRS))
29	05:04	05:25 (WEA 05 (GRN))	06:02	06:31 (WEA 03 (GRN))	06:56	07:24 (WEA RWED1)	07:51	08:20 (WEA_G2)	07:53	08:33	14:58 (WEA 10 (GRS))
30	05:05	05:25 (WEA 05 (GRN))	06:03	06:32 (WEA 03 (GRN))	06:57	07:25 (WEA RWED1)	07:52	08:21 (WEA_G2)	07:54	08:33	14:58 (WEA 10 (GRS))
31	05:05	05:25 (WEA 05 (GRN))	06:04	06:33 (WEA 03 (GRN))	06:58	07:26 (WEA RWED1)	07:53	08:22 (WEA_G2)	07:55	08:34	14:58 (WEA 10 (GRS))
1	05:06	05:25 (WEA 05 (GRN))	06:05	06:34 (WEA 03 (GRN))	06:59	07:27 (WEA RWED1)	07:54	08:23 (WEA_G2)	07:56	08:34	14:58 (WEA 10 (GRS))
2	05:06	05:25 (WEA 05 (GRN))	06:06	06:35 (WEA 03 (GRN))	07:00	07:28 (WEA RWED1)	07:55	08:24 (WEA_G2)	07:57	08:35	14:58 (WEA 10 (GRS))
3	05:07	05:25 (WEA 05 (GRN))	06:07	06:36 (WEA 03 (GRN))	07:01	07:29 (WEA RWED1)	07:56	08:25 (WEA_G2)	07:58	08:35	14:58 (WEA 10 (GRS))
4	05:07	05:25 (WEA 05 (GRN))	06:08	06:37 (WEA 03 (GRN))	07:02	07:30 (WEA RWED1)	07:57	08:26 (WEA_G2)	07:59	08:36	14:58 (WEA 10 (GRS))
5	05:08	05:25 (WEA 05 (GRN))	06:09	06:38 (WEA 03 (GRN))	07:03	07:31 (WEA RWED1)	07:58	08:27 (WEA_G2)	08:00	08:36	14:58 (WEA 10 (GRS))
6	05:08	05:25 (WEA 05 (GRN))	06:10	06:39 (WEA 03 (GRN))	07:04	07:32 (WEA RWED1)	07:59	08:28 (WEA_G2)	08:01	08:37	14:58 (WEA 10 (GRS))
7	05:09	05:25 (WEA 05 (GRN))	06:11	06:40 (WEA 03 (GRN))	07:05	07:33 (WEA RWED1)	08:00	08:29 (WEA_G2)	08:02	08:37	14:58 (WEA 10 (GRS))
8	05:09	05:25 (WEA 05 (GRN))	06:12	06:41 (WEA 03 (GRN))	07:06	07:34 (WEA RWED1)	08:01	08:30 (WEA_G2)	08:03	08:38	14:58 (WEA 10 (GRS))
9	05:10	05:25 (WEA 05 (GRN))	06:13	06:42 (WEA 03 (GRN))	07:07	07:35 (WEA RWED1)	08:02	08:31 (WEA_G2)	08:04	08:38	14:58 (WEA 10 (GRS))
10	05:10	05:25 (WEA 05 (GRN))	06:14	06:43 (WEA 03 (GRN))	07:08	07:36 (WEA RWED1)	08:03	08:32 (WEA_G2)	08:05	08:39	14:58 (WEA 10 (GRS))
11	05:11	05:25 (WEA 05 (GRN))	06:15	06:44 (WEA 03 (GRN))	07:09	07:37 (WEA RWED1)	08:04	08:33 (WEA_G2)	08:06	08:39	14:58 (WEA 10 (GRS))
12	05:11	05:25 (WEA 05 (GRN))	06:16	06:45 (WEA 03 (GRN))	07:10	07:38 (WEA RWED1)	08:05	08:34 (WEA_G2)	08:07	08:40	14:58 (WEA 10 (GRS))
13	05:12	05:25 (WEA 05 (GRN))	06:17	06:46 (WEA 03 (GRN))	07:11	07:39 (WEA RWED1)	08:06	08:35 (WEA_G2)	08:08	08:40	14:58 (WEA 10 (GRS))
14	05:12	05:25 (WEA 05 (GRN))	06:18	06:47 (WEA 03 (GRN))	07:12	07:40 (WEA RWED1)	08:07	08:36 (WEA_G2)	08:09	08:41	14:58 (WEA 10 (GRS))
15	05:13	05:25 (WEA 05 (GRN))	06:19	06:48 (WEA 03 (GRN))	07:13	07:41 (WEA RWED1)	08:08	08:37 (WEA_G2)	08:10	08:41	14:58 (WEA 10 (GRS))
16	05:13	05:25 (WEA 05 (GRN))	06:20	06:49 (WEA 03 (GRN))	07:14	07:42 (WEA RWED1)	08:09	08:38 (WEA_G2)	08:11	08:42	14:58 (WEA 10 (GRS))
17	05:14	05:25 (WEA 05 (GRN))	06:21	06:50 (WEA 03 (GRN))	07:15	07:43 (WEA RWED1)	08:10	08:39 (WEA_G2)	08:12	08:42	14:58 (WEA 10 (GRS))
18	05:14	05:25 (WEA 05 (GRN))	06:22	06:51 (WEA 03 (GRN))	07:16	07:44 (WEA RWED1)	08:11	08:40 (WEA_G2)	08:13	08:43	14:58 (WEA 10 (GRS))
19	05:15	05:25 (WEA 05 (GRN))	06:23	06:52 (WEA 03 (GRN))	07:17	07:45 (WEA RWED1)	08:12	08:41 (WEA_G2)	08:14	08:43	14:58 (WEA 10 (GRS))
20	05:15	05:25 (WEA 05 (GRN))	06:24	06:53 (WEA 03 (GRN))	07:18	07:46 (WEA RWED1)	08:13	08:42 (WEA_G2)	08:15	08:44	14:58 (WEA 10 (GRS))
21	05:16	05:25 (WEA 05 (GRN))	06:25	06:54 (WEA 03 (GRN))	07:19	07:47 (WEA RWED1)	08:14	08:43 (WEA_G2)	08:16	08:44	14:58 (WEA 10 (GRS))
22	05:16	05:25 (WEA 05 (GRN))	06:26	06:55 (WEA 03 (GRN))	07:20	07:48 (WEA RWED1)	08:15	08:44 (WEA_G2)	08:17	08:45	14:58 (WEA 10 (GRS))
23	05:17	05:25 (WEA 05 (GRN))	06:27	06:56 (WEA 03 (GRN))	07:21	07:49 (WEA RWED1)	08:16	08:45 (WEA_G2)	08:18	08:45	14:58 (WEA 10 (GRS))
24	05:17	05:25 (WEA 05 (GRN))	06:28	06:57 (WEA 03 (GRN))	07:22	07:50 (WEA RWED1)	08:17	08:46 (WEA_G2)	08:19	08:46	14:58 (WEA 10 (GRS))
25	05:18	05:25 (WEA 05 (GRN))	06:29	06:58 (WEA 03 (GRN))	07:23	07:51 (WEA RWED1)	08:18	08:47 (WEA_G2)	08:20	08:47	14:58 (WEA 10 (GRS))
26	05:18	05:25 (WEA 05 (GRN))	06:30	06:59 (WEA 03 (GRN))	07:24	07:52 (WEA RWED1)	08:19	08:48 (WEA_G2)	08:21	08:47	14:58 (WEA 10 (GRS))
27	05:19	05:25 (WEA 05 (GRN))	06:31	07:00 (WEA 03 (GRN))	07:25	07:53 (WEA RWED1)	08:20	08:49 (WEA_G2)	08:22	08:48	14:58 (WEA 10 (GRS))
28	05:19	05:25 (WEA 05 (GRN))	06:32	07:01 (WEA 03 (GRN))	07:26	07:54 (WEA RWED1)	08:21	08:50 (WEA_G2)	08:23	08:49	14:58 (WEA 10 (GRS))
29	05:20	05:25 (WEA 05 (GRN))	06:33	07:02 (WEA 03 (GRN))	07:27	07:55 (WEA RWED1)	08:22	08:51 (WEA_G2)	08:24	08:49	14:58 (WEA 10 (GRS))
30	05:20	05:25 (WEA 05 (GRN))	06:34	07:03 (WEA 03 (GRN))	07:28	07:56 (WEA RWED1)	08:23	08:52 (WEA_G2)	08:25	08:50	14:58 (WEA 10 (GRS))
31	05:21	05:25 (WEA 05 (GRN))	06:35	07:04 (WEA 03 (GRN))	07:29	07:57 (WEA RWED1)	08:24	08:53 (WEA_G2)	08:26	08:51	14:58 (WEA 10 (GRS))
1	05:21	05:25 (WEA 05 (GRN))	06:36	07:05 (WEA 03 (GRN))	07:30	07:58 (WEA RWED1)	08:25	08:54 (WEA_G2)	08:27	08:51	14:58 (WEA 10 (GRS))
2	05:22	05:25 (WEA 05 (GRN))	06:37	07:06 (WEA 03 (GRN))	07:31	07:59 (WEA RWED1)	08:26	08:55 (WEA_G2)	08:28	08:52	14:58 (WEA 10 (GRS))
3	05:22	05:25 (WEA 05 (GRN))	06:38	07:07 (WEA 03 (GRN))	07:32	08:00 (WEA RWED1)	08:27	08:56 (WEA_G2)	08:29	08:52	14:58 (WEA 10 (GRS))
4	05:23	05:25 (WEA 05 (GRN))	06:39	07:08 (WEA 03 (GRN))	07:33	08:01 (WEA RWED1)	08:28	08:57 (WEA_G2)	08:30	08:53	14:58 (WEA 10 (GRS))
5	05:23	05:25 (WEA 05 (GRN))	06:40	07:09 (WEA 03 (GRN))	07:34	08:02 (WEA RWED1)	08:29	08:58 (WEA_G2)	08:31	08:53	14:58 (WEA 10 (GRS))
6	05:24	05:25 (WEA 05 (GRN))	06:41	07:10 (WEA 03 (GRN))	07:35	08:03 (WEA RWED1)	08:30	08:59 (WEA_G2)	08:32	08:54	14:58 (WEA 10 (GRS))
7	05:24	05:25 (WEA 05 (GRN))	06:42	07:11 (WEA 03 (GRN))	07:36	08:04 (WEA RWED1)	08:31	09:00 (WEA_G2)	08:33	08:54	14:58 (WEA 10 (GRS))
8	05:25	05:25 (WEA 05 (GRN))	06:43	07:12 (WEA 03 (GRN))	07:37	08:05 (WEA RWED1)	08:32	09:01 (WEA_G2)	08:34	08:55	14:58 (WEA 10 (GRS))
9	05:25	05:25 (WEA 05 (GRN))	06:44	07:13 (WEA 03 (GRN))	07:38	08:06 (WEA RWED1)	08:33	09:02 (WEA_G2)	08:35	08:55	14:58 (WEA 10 (GRS))
10	05:26	05:25									



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 35 - IO 35 Kathenkamp 2 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni						
1	08:37	08:06	07:08	07:33 (WEA G1)	06:52	07:16 (WEA RWE01)	05:42	06:06 (WEA 05 (GRN))	04:51	05:31 (WEA 02 (GRN))		
2	16:03	16:55	17:52	18:05	19:51	21	07:37 (WEA RWE01)	20:48	10	06:18 (WEA 05 (GRN))	21:39	05:41 (WEA 02 (GRN))
3	08:37	08:03	07:03	07:28 (WEA G1)	06:47	24	07:11 (WEA RWE01)	05:37	13	06:19 (WEA 05 (GRN))	21:40	05:32 (WEA 02 (GRN))
4	16:05	16:59	17:56	18:00	19:59	26	07:37 (WEA RWE01)	20:51	15	06:19 (WEA 05 (GRN))	21:41	05:34 (WEA 02 (GRN))
5	08:37	08:01	07:01	07:25 (WEA G2)	06:44	26	07:09 (WEA RWE01)	05:35	18	06:02 (WEA 05 (GRN))	21:42	05:36 (WEA 02 (GRN))
6	16:07	17:01	17:58	18:00	19:57	26	07:35 (WEA RWE01)	20:53	18	06:20 (WEA 05 (GRN))	21:42	05:38 (WEA 02 (GRN))
7	08:36	07:59	06:58	07:23 (WEA G2)	06:42	25	07:10 (WEA RWE01)	05:33	20	06:20 (WEA 05 (GRN))	21:43	05:39 (WEA 02 (GRN))
8	16:08	17:03	18:00	18:00	19:59	25	07:35 (WEA RWE01)	20:55	20	06:20 (WEA 05 (GRN))	21:43	05:40 (WEA 02 (GRN))
9	08:36	07:57	06:56	07:20 (WEA G2)	06:39	25	07:09 (WEA RWE01)	05:31	21	05:59 (WEA 05 (GRN))	21:44	05:41 (WEA 02 (GRN))
10	16:09	17:05	18:02	18:02	20:01	25	07:34 (WEA RWE01)	20:57	21	06:20 (WEA 05 (GRN))	21:44	05:42 (WEA 02 (GRN))
11	08:35	07:55	06:54	07:19 (WEA G2)	06:37	23	07:10 (WEA RWE01)	05:29	21	05:59 (WEA 05 (GRN))	21:44	05:43 (WEA 02 (GRN))
12	16:11	17:07	18:04	18:04	20:03	23	07:33 (WEA RWE01)	20:59	21	06:20 (WEA 05 (GRN))	21:45	05:44 (WEA 02 (GRN))
13	08:35	07:53	06:51	07:14 (WEA G1)	06:33	20	07:17 (WEA RWE01)	05:27	21	05:55 (WEA 05 (GRN))	21:46	05:45 (WEA 02 (GRN))
14	16:12	17:09	18:05	18:05	20:04	20	07:35 (WEA RWE01)	21:00	21	06:19 (WEA 05 (GRN))	21:46	05:46 (WEA 02 (GRN))
15	08:34	07:51	06:49	07:21 (WEA G1)	06:32	18	07:13 (WEA RWE01)	05:25	21	05:59 (WEA 05 (GRN))	21:47	05:47 (WEA 02 (GRN))
16	16:14	17:11	18:08	18:08	20:05	16	07:29 (WEA RWE01)	21:02	21	06:20 (WEA 05 (GRN))	21:47	05:48 (WEA 02 (GRN))
17	08:34	07:49	06:46	07:19 (WEA G1)	06:30	12	07:15 (WEA RWE01)	05:24	20	05:59 (WEA 05 (GRN))	21:48	05:49 (WEA 02 (GRN))
18	16:15	17:13	18:09	18:09	20:06	12	07:27 (WEA RWE01)	21:04	20	06:19 (WEA 05 (GRN))	21:49	05:50 (WEA 02 (GRN))
19	08:33	07:47	06:44	07:17	06:27	10	07:10 (WEA RWE01)	05:22	20	05:59 (WEA 05 (GRN))	21:49	05:51 (WEA 02 (GRN))
20	16:17	17:16	18:11	18:11	20:07	10	07:30 (WEA RWE01)	21:06	20	06:19 (WEA 05 (GRN))	21:49	05:52 (WEA 02 (GRN))
21	08:32	07:45	06:41	07:14	06:25	9	07:15 (WEA RWE01)	05:20	19	05:59 (WEA 05 (GRN))	21:50	05:53 (WEA 02 (GRN))
22	16:18	17:18	18:13	18:13	20:08	9	07:28 (WEA RWE01)	21:08	19	06:18 (WEA 05 (GRN))	21:50	05:54 (WEA 02 (GRN))
23	08:31	07:43	06:39	07:12	06:22	8	07:13 (WEA RWE01)	05:18	17	05:59 (WEA 05 (GRN))	21:51	05:55 (WEA 02 (GRN))
24	16:20	17:20	18:15	18:15	20:14	8	07:29 (WEA RWE01)	21:09	17	06:18 (WEA 05 (GRN))	21:51	05:56 (WEA 02 (GRN))
25	08:30	07:41	06:36	07:10	06:20	7	07:15 (WEA RWE01)	05:16	16	05:59 (WEA 05 (GRN))	21:52	05:57 (WEA 02 (GRN))
26	16:21	17:22	18:17	18:17	20:16	7	07:28 (WEA RWE01)	21:11	15	06:18 (WEA 05 (GRN))	21:52	05:58 (WEA 02 (GRN))
27	08:29	07:39	06:34	07:08	06:18	6	07:13 (WEA RWE01)	05:14	13	05:59 (WEA 05 (GRN))	21:53	05:59 (WEA 02 (GRN))
28	16:22	17:24	18:19	18:19	20:18	6	07:29 (WEA RWE01)	21:12	13	06:18 (WEA 05 (GRN))	21:53	05:60 (WEA 02 (GRN))
29	08:28	07:37	06:32	07:06	06:15	5	07:13 (WEA RWE01)	05:12	12	05:59 (WEA 05 (GRN))	21:54	05:61 (WEA 02 (GRN))
30	16:23	17:26	18:21	18:21	20:20	5	07:28 (WEA RWE01)	21:14	12	06:19 (WEA 05 (GRN))	21:54	05:62 (WEA 02 (GRN))
31	08:27	07:35	06:30	07:04	06:13	4	07:13 (WEA RWE01)	05:10	11	05:59 (WEA 05 (GRN))	21:55	05:63 (WEA 02 (GRN))
32	16:24	17:28	18:23	18:23	20:22	4	07:29 (WEA RWE01)	21:15	11	06:19 (WEA 05 (GRN))	21:55	05:64 (WEA 02 (GRN))
33	08:26	07:33	06:28	07:02	06:11	3	07:13 (WEA RWE01)	05:08	10	05:59 (WEA 05 (GRN))	21:56	05:65 (WEA 02 (GRN))
34	16:25	17:30	18:25	18:25	20:24	3	07:28 (WEA RWE01)	21:16	10	06:19 (WEA 05 (GRN))	21:56	05:66 (WEA 02 (GRN))
35	08:25	07:31	06:26	07:00	06:09	2	07:13 (WEA RWE01)	05:06	9	05:59 (WEA 05 (GRN))	21:57	05:67 (WEA 02 (GRN))
36	16:26	17:32	18:27	18:27	20:26	2	07:29 (WEA RWE01)	21:17	9	06:19 (WEA 05 (GRN))	21:57	05:68 (WEA 02 (GRN))
37	08:24	07:29	06:24	06:58	06:05	1	07:13 (WEA RWE01)	05:04	8	05:59 (WEA 05 (GRN))	21:58	05:69 (WEA 02 (GRN))
38	16:27	17:34	18:29	18:29	20:28	1	07:28 (WEA RWE01)	21:18	8	06:19 (WEA 05 (GRN))	21:58	05:70 (WEA 02 (GRN))
39	08:23	07:27	06:22	06:56	06:03	0	07:13 (WEA RWE01)	05:02	7	05:59 (WEA 05 (GRN))	21:59	05:71 (WEA 02 (GRN))
40	16:28	17:36	18:31	18:31	20:30	0	07:29 (WEA RWE01)	21:19	7	06:19 (WEA 05 (GRN))	21:59	05:72 (WEA 02 (GRN))
41	08:22	07:25	06:20	06:54	06:01	0	07:13 (WEA RWE01)	05:00	6	05:59 (WEA 05 (GRN))	22:00	05:73 (WEA 02 (GRN))
42	16:29	17:38	18:33	18:33	20:32	0	07:28 (WEA RWE01)	21:20	6	06:19 (WEA 05 (GRN))	22:00	05:74 (WEA 02 (GRN))
43	08:21	07:23	06:18	06:52	06:00	0	07:13 (WEA RWE01)	04:58	5	05:59 (WEA 05 (GRN))	22:01	05:75 (WEA 02 (GRN))
44	16:30	17:40	18:35	18:35	20:34	0	07:29 (WEA RWE01)	21:21	5	06:19 (WEA 05 (GRN))	22:01	05:76 (WEA 02 (GRN))
45	08:20	07:21	06:16	06:50	05:58	0	07:13 (WEA RWE01)	04:56	4	05:59 (WEA 05 (GRN))	22:02	05:77 (WEA 02 (GRN))
46	16:31	17:42	18:37	18:37	20:36	0	07:28 (WEA RWE01)	21:22	4	06:19 (WEA 05 (GRN))	22:02	05:78 (WEA 02 (GRN))
47	08:19	07:19	06:14	06:48	05:56	0	07:13 (WEA RWE01)	04:54	3	05:59 (WEA 05 (GRN))	22:03	05:79 (WEA 02 (GRN))
48	16:32	17:44	18:39	18:39	20:38	0	07:29 (WEA RWE01)	21:23	3	06:19 (WEA 05 (GRN))	22:03	05:80 (WEA 02 (GRN))
49	08:18	07:17	06:12	06:46	05:54	0	07:13 (WEA RWE01)	04:52	2	05:59 (WEA 05 (GRN))	22:04	05:81 (WEA 02 (GRN))
50	16:33	17:46	18:41	18:41	20:40	0	07:28 (WEA RWE01)	21:24	2	06:19 (WEA 05 (GRN))	22:04	05:82 (WEA 02 (GRN))
51	08:17	07:15	06:10	06:44	05:52	0	07:13 (WEA RWE01)	04:50	1	05:59 (WEA 05 (GRN))	22:05	05:83 (WEA 02 (GRN))
52	16:34	17:48	18:43	18:43	20:42	0	07:29 (WEA RWE01)	21:25	1	06:19 (WEA 05 (GRN))	22:05	05:84 (WEA 02 (GRN))
53	08:16	07:13	06:08	06:42	05:50	0	07:13 (WEA RWE01)	04:48	0	05:59 (WEA 05 (GRN))	22:06	05:85 (WEA 02 (GRN))
54	16:35	17:50	18:45	18:45	20:44	0	07:28 (WEA RWE01)	21:26	0	06:19 (WEA 05 (GRN))	22:06	05:86 (WEA 02 (GRN))
55	08:15	07:11	06:06	06:40	05:48	0	07:13 (WEA RWE01)	04:46	0	05:59 (WEA 05 (GRN))	22:07	05:87 (WEA 02 (GRN))
56	16:36	17:52	18:47	18:47	20:46	0	07:29 (WEA RWE01)	21:27	0	06:19 (WEA 05 (GRN))	22:07	05:88 (WEA 02 (GRN))
57	08:14	07:09	06:04	06:38	05:46	0	07:13 (WEA RWE01)	04:44	0	05:59 (WEA 05 (GRN))	22:08	05:89 (WEA 02 (GRN))
58	16:37	17:54	18:49	18:49	20:48	0	07:28 (WEA RWE01)	21:28	0	06:19 (WEA 05 (GRN))	22:08	05:90 (WEA 02 (GRN))
59	08:13	07:07	06:02	06:36	05:44	0	07:13 (WEA RWE01)	04:42	0	05:59 (WEA 05 (GRN))	22:09	05:91 (WEA 02 (GRN))
60	16:38	17:56	18:51	18:51	20:50	0	07:29 (WEA RWE01)	21:29	0	06:19 (WEA 05 (GRN))	22:09	05:92 (WEA 02 (GRN))
61	08:12	07:05	06:00	06:34	05:42	0	07:13 (WEA RWE01)	04:40	0	05:59 (WEA 05 (GRN))	22:10	05:93 (WEA 02 (GRN))
62	16:39	17:58	18:53	18:53	20:52	0	07:28 (WEA RWE01)	21:30	0	06:19 (WEA 05 (GRN))	22:10	05:94 (WEA 02 (GRN))
63	08:11	07:03	05:58	06:32	05:40	0	07:13 (WEA RWE01)	04:38	0	05:59 (WEA 05 (GRN))	22:11	05:95 (WEA 02 (GRN))
64	16:40	18:00	18:55	18:55	20:54	0	07:29 (WEA RWE01)	21:31	0	06:19 (WEA 05 (GRN))	22:11	05:96 (WEA 02 (GRN))
65	08:10	07:01	05:56	06:30	05:38	0	07:13 (WEA RWE01)	04:36	0	05:59 (WEA 05 (GRN))	22:12	05:97 (WEA 02 (GRN))
66	16:41	18:02	18:57	18:57	20:56	0	07:28 (WEA RWE01)	21:32	0	06:19 (WEA 05 (GRN))	22:12	05:98 (WEA 02 (GRN))
67	08:09	06:59	05:54	06:28	05:36	0	07:13 (WEA RWE01)	04:34	0	05:59 (WEA 05 (GRN))	22:13	05:99 (WEA 02 (GRN))
68	16:42	18:04	19:00	19:00	20:58	0	07:29 (WEA RWE01)	21:33	0	06:19 (WEA 05 (GRN))	22:13	06:00 (WEA 02 (GRN))
69	08:08	06:57	05:52	06:26	05:34	0	07:13 (WEA RWE01)	04:32	0	05:59 (WEA 05 (GRN))	22:14	06:01 (WEA 02 (GRN))
70	16:43	18:06	19:01	19:01								

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 35 - IO 35 Kathenkamp 2 (Rüting)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember			
1	04:47		05:28	06:10 (WEA 05 (GRN))	06:23		07:17		07:16		08:12		
	21:54		21:18	19	06:29 (WEA 05 (GRN))	20:10		18:55		16:44	15:59		
2	04:48		05:29		06:09 (WEA 05 (GRN))	06:25	07:13 (WEA RWEO1)	07:19		07:18	08:14		
	21:53		21:16	20	06:29 (WEA 05 (GRN))	20:08	12	07:25 (WEA RWEO1)	18:53		16:42	15:58	
3	04:48		05:31		06:09 (WEA 05 (GRN))	06:26		07:11 (WEA RWEO1)	07:21		07:20	08:15	
	21:53		21:14	21	06:30 (WEA 05 (GRN))	20:05	16	07:27 (WEA RWEO1)	18:50		16:40	15:57	
4	04:49		05:33		06:08 (WEA 05 (GRN))	06:28		07:09 (WEA RWEO1)	07:23	08:00 (WEA_G2)	07:22	08:17	
	21:52		21:12	21	06:29 (WEA 05 (GRN))	20:03	20	07:29 (WEA RWEO1)	18:48	15	08:18 (WEA_G1)	16:38	15:56
5	04:50		05:34		06:09 (WEA 05 (GRN))	06:30		07:07 (WEA RWEO1)	07:24		07:57 (WEA_G2)	07:24	08:18
	21:52		21:10	21	06:30 (WEA 05 (GRN))	20:00	22	07:29 (WEA RWEO1)	18:45	24	08:21 (WEA_G1)	16:36	15:56
6	04:51		05:36		06:09 (WEA 05 (GRN))	06:32		07:06 (WEA RWEO1)	07:26		07:55 (WEA_G2)	07:26	08:20
	21:51		21:08	21	06:30 (WEA 05 (GRN))	19:58	24	07:30 (WEA RWEO1)	18:43	28	08:23 (WEA_G1)	16:34	15:55
7	04:52		05:38		06:08 (WEA 05 (GRN))	06:34		07:05 (WEA RWEO1)	07:28		07:55 (WEA_G2)	07:28	08:21
	21:50		21:06	21	06:29 (WEA 05 (GRN))	19:55	25	07:32 (WEA RWEO1)	18:41	29	08:24 (WEA_G1)	16:32	15:55
8	04:53		05:40		06:10 (WEA 05 (GRN))	06:35		07:04 (WEA RWEO1)	07:30		07:57 (WEA_G2)	07:30	08:22
	21:50		21:04	19	06:29 (WEA 05 (GRN))	19:53	27	07:31 (WEA RWEO1)	18:38	27	08:24 (WEA_G1)	16:30	15:54
9	04:54	05:41 (WEA_G2 (GRN))	05:41		06:11 (WEA 05 (GRN))	06:37		07:04 (WEA RWEO1)	07:32		07:59 (WEA_G2)	07:32	08:23
	21:49	05:46 (WEA_G2 (GRN))	21:02	17	06:28 (WEA 05 (GRN))	19:50	26	07:32 (WEA RWEO1)	18:46	26	08:25 (WEA_G1)	16:28	15:54
10	04:55	05:41 (WEA_G2 (GRN))	05:42		06:12 (WEA 05 (GRN))	06:39		07:05 (WEA RWEO1)	07:34		08:01 (WEA_G1)	07:34	08:25
	21:49	05:49 (WEA_G2 (GRN))	21:00	15	06:28 (WEA 05 (GRN))	19:49	24	07:32 (WEA RWEO1)	18:33	24	08:25 (WEA_G1)	16:27	15:54
11	04:56	05:40 (WEA_G2 (GRN))	05:45		06:15 (WEA 05 (GRN))	06:41		07:08 (WEA RWEO1)	07:36		08:03 (WEA_G1)	07:36	08:26
	21:47	05:43 (WEA_G2 (GRN))	20:58	12	06:27 (WEA 05 (GRN))	19:45	22	07:32 (WEA RWEO1)	18:31	22	08:25 (WEA_G1)	16:25	15:53
12	04:58	05:39 (WEA_G2 (GRN))	05:47		06:16 (WEA 05 (GRN))	06:43		07:12 (WEA RWEO1)	07:37		08:06 (WEA_G1)	07:38	08:27
	21:46	05:42 (WEA_G2 (GRN))	20:56	10	06:26 (WEA 05 (GRN))	19:43	19	07:32 (WEA RWEO1)	18:29	20	08:25 (WEA_G1)	16:24	15:53
13	04:59	05:39 (WEA_G2 (GRN))	05:49		06:18 (WEA 05 (GRN))	06:44		07:11 (WEA RWEO1)	07:39		08:07 (WEA_G1)	07:40	08:28
	21:45	05:50 (WEA_G2 (GRN))	20:54	9	06:27 (WEA 05 (GRN))	19:40	17	07:29 (WEA RWEO1)	18:26	17	08:24 (WEA_G1)	16:21	15:53
14	05:00	05:39 (WEA_G2 (GRN))	05:50		06:20 (WEA 05 (GRN))	06:46		07:13 (WEA RWEO1)	07:41		08:09 (WEA_G1)	07:42	08:29
	21:44	05:51 (WEA_G2 (GRN))	20:52	7	06:27 (WEA 05 (GRN))	19:38	14	07:27 (WEA RWEO1)	18:24	15	08:24 (WEA_G1)	16:20	15:53
15	05:01	05:38 (WEA_G2 (GRN))	05:52		06:21 (WEA 05 (GRN))	06:48		07:15 (WEA RWEO1)	07:43		08:11 (WEA_G1)	07:44	08:30
	21:43	05:48 (WEA_G2 (GRN))	20:49	5	06:26 (WEA 05 (GRN))	19:42	11	07:29 (WEA RWEO1)	18:21	12	08:23 (WEA_G1)	16:18	15:53
16	05:02	05:37 (WEA_G2 (GRN))	05:54		06:23 (WEA 05 (GRN))	06:50		07:17 (WEA RWEO1)	07:45		08:13 (WEA_G1)	07:46	08:31
	21:42	05:47 (WEA_G2 (GRN))	20:47	3	06:26 (WEA 05 (GRN))	19:33	8	07:25 (WEA RWEO1)	18:19	9	08:22 (WEA_G1)	16:17	15:53
17	05:04	05:36 (WEA_G2 (GRN))	05:56		06:25 (WEA 05 (GRN))	06:52		07:19 (WEA RWEO1)	07:47		08:15 (WEA_G1)	07:47	08:32
	21:41	05:46 (WEA_G2 (GRN))	20:45	1	06:26 (WEA 05 (GRN))	19:30	4	07:22 (WEA RWEO1)	18:17	6	08:21 (WEA_G1)	16:15	15:53
18	05:05	05:35 (WEA_G2 (GRN))	05:58			06:53			07:49		08:17 (WEA_G1)	07:49	08:33
	21:39	05:45 (WEA_G2 (GRN))	20:43			19:28			18:14	2	08:19 (WEA_G1)	16:14	15:53
19	05:07	05:34 (WEA_G2 (GRN))	05:59			06:55			07:51		08:15	08:33	
	21:38	05:44 (WEA_G2 (GRN))	20:41			19:25			18:12		16:12	15:54	
20	05:08	05:41 (WEA_G2 (GRN))	06:01			06:57			07:53		08:13	08:34	
	21:37	05:53 (WEA_G2 (GRN))	20:38			19:23			18:10		16:11	15:54	
21	05:10	05:42 (WEA_G2 (GRN))	06:02			06:59			07:55		08:15	08:35	
	21:35	05:53 (WEA_G2 (GRN))	20:36			19:20			18:08		16:09	15:56	
22	05:11	05:43 (WEA_G2 (GRN))	06:03			07:01			07:57		08:17	08:36	
	21:34	05:52 (WEA_G2 (GRN))	20:34			19:19			18:05		16:08	15:55	
23	05:13	05:45 (WEA_G2 (GRN))	06:07			07:02			07:59		08:19	08:36	
	21:33	05:53 (WEA_G2 (GRN))	20:31			19:15			18:03		16:07	15:55	
24	05:14	05:46 (WEA_G2 (GRN))	06:08			07:04			08:01		08:20	08:38	
	21:31	05:52 (WEA_G2 (GRN))	20:29			19:13			18:01		16:06	15:56	
25	05:16	05:48 (WEA_G2 (GRN))	06:10			07:06			07:52		08:22	08:39	
	21:29	05:52 (WEA_G2 (GRN))	20:27			19:10			16:59		16:04	15:57	
26	05:19	05:49 (WEA_G2 (GRN))	06:12			07:08			07:54		08:24	08:37	
	21:28	05:51 (WEA_G2 (GRN))	20:24			19:08			16:56		16:03	15:57	
27	05:19	06:16 (WEA 05 (GRN))	06:14			07:10			07:06		08:06	08:37	
	21:26	06:23 (WEA 05 (GRN))	20:22			19:05			16:54		16:02	15:58	
28	05:21	06:13 (WEA 05 (GRN))	06:16			07:12			07:08		08:07	08:37	
	21:25	06:25 (WEA 05 (GRN))	20:20			19:03			16:52		16:01	15:59	
29	05:22	06:13 (WEA 05 (GRN))	06:17			07:13			07:10		08:09	08:37	
	21:23	06:26 (WEA 05 (GRN))	20:17			19:00			16:50		16:00	16:00	
30	05:24	06:11 (WEA 05 (GRN))	06:19			07:15			07:12		08:11	08:37	
	21:21	06:27 (WEA 05 (GRN))	20:15			18:58			16:48		15:59	16:01	
31	05:26	06:11 (WEA 05 (GRN))	06:21						07:14			08:37	
	21:19	06:28 (WEA 05 (GRN))	20:12						16:46			16:02	
Sonnenscheinstunden	515		461		383		291		328		257	231	
astr.max.mögl.Beschattung	248		242		291		276						

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 36 - IO 36 Bäderstraße 20-22 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	09:12 (WEA 12 (GRS))	08:06	07:08		06:52		05:42		04:51	
	16:03		16:55	17:52		19:51		20:48		21:39	
2	08:37	09:14 (WEA 12 (GRS))	08:04	07:05		06:49		05:40		04:50	
	16:04		16:57	17:54		19:53		20:49		21:40	
3	08:37	09:11 (WEA 12 (GRS))	08:03	07:03		06:47		05:37		04:49	
	16:05		16:59	17:56		19:55		20:51		21:41	
4	08:37	09:11 (WEA 12 (GRS))	08:01	07:01		06:44		05:35	06:02 (WEA 03 (GRN))	04:48	
	16:07		17:01	17:58		19:57		20:53	1	06:03 (WEA 03 (GRN))	21:42
5	08:36	09:10 (WEA 12 (GRS))	07:59	06:58		06:42		05:33		06:00 (WEA 03 (GRN))	04:48
	16:08		17:03	18:00		19:59		20:55		06:02 (WEA 03 (GRN))	21:43
6	08:36	09:10 (WEA 12 (GRS))	07:57	06:56		06:39		05:31	2		04:47
	16:09		17:05	18:02		20:01		20:57			21:44
7	08:35	09:09 (WEA 12 (GRS))	07:55	06:54		06:37		05:29		05:56 (WEA 05 (GRN))	04:46
	16:11		17:07	18:04		20:03		20:59	2	06:58 (WEA 05 (GRN))	21:45
8	08:35	09:08 (WEA 12 (GRS))	07:53	06:51		06:35	06:50 (WEA RINED1)	05:27		06:54 (WEA 05 (GRN))	04:46
	16:12		17:09	18:06		20:04	1	07:00 (WEA RINED1)	4	06:58 (WEA 05 (GRN))	21:46
9	08:34	09:07 (WEA 12 (GRS))	07:51	06:49		06:32		05:23		06:53 (WEA 05 (GRN))	04:45
	16:14		17:11	18:08		20:05	4	07:00 (WEA RINED1)	1	06:58 (WEA 05 (GRN))	21:47
10	08:34	09:06 (WEA 12 (GRS))	07:49	06:46		06:30		05:24		06:51 (WEA 05 (GRN))	04:44
	16:15		17:14	18:10		20:05	7	07:01 (WEA RINED1)	7	06:58 (WEA 05 (GRN))	21:48
11	08:33	09:06 (WEA 12 (GRS))	07:47	06:44		06:27		05:22		06:49 (WEA 05 (GRN))	04:44
	16:17		17:15	18:11		20:10	9	07:01 (WEA RINED1)	9	06:58 (WEA 05 (GRN))	21:49
12	08:32	09:05 (WEA 12 (GRS))	07:45	06:41		06:25		05:20		06:47 (WEA 05 (GRN))	04:44
	16:18		17:18	18:13		20:12	11	07:00 (WEA RINED1)	11	06:57 (WEA 05 (GRN))	21:50
13	08:31	09:04 (WEA 12 (GRS))	07:43	06:39		06:22		05:18		06:46 (WEA 05 (GRN))	04:43
	16:20		17:20	18:15		20:14	13	07:00 (WEA RINED1)	13	06:57 (WEA 05 (GRN))	21:50
14	08:30	09:04 (WEA 12 (GRS))	07:41	06:36		06:20		05:16		06:47 (WEA 05 (GRN))	04:43
	16:21		17:21	18:17		20:15	15	06:59 (WEA RINED1)	15	06:56 (WEA 05 (GRN))	21:51
15	08:29	09:04 (WEA 12 (GRS))	07:39	06:34		06:18		05:15		06:44 (WEA 05 (GRN))	04:43
	16:22		17:24	18:19		20:16	17	06:59 (WEA RINED1)	17	06:54 (WEA 05 (GRN))	21:52
16	08:28	09:03 (WEA 12 (GRS))	07:37	06:32	05:58 (WEA G1)	06:15		05:13		06:43 (WEA 05 (GRN))	04:43
	16:23		17:25	18:21	3	06:58 (WEA G1)	17	06:59 (WEA RINED1)	17	06:54 (WEA 05 (GRN))	21:52
17	08:27	09:02 (WEA 12 (GRS))	07:35	06:29	06:53 (WEA G1)	06:13		05:11		06:42 (WEA 05 (GRN))	04:42
	16:24		17:26	18:21	6	06:58 (WEA G1)	19	06:59 (WEA RINED1)	19	06:54 (WEA 05 (GRN))	21:53
18	08:26	09:01 (WEA 12 (GRS))	07:33	06:27	06:50 (WEA G1)	06:11		05:10		06:42 (WEA 05 (GRN))	04:42
	16:26		17:29	18:25	9	06:58 (WEA G1)	21	06:59 (WEA RINED1)	21	06:54 (WEA 05 (GRN))	21:53
19	08:25	09:00 (WEA 12 (GRS))	07:31	06:24	06:48 (WEA G1)	06:09		05:08		06:42 (WEA 05 (GRN))	04:42
	16:28		17:32	18:27	11	06:58 (WEA G1)	23	06:59 (WEA RINED1)	23	06:54 (WEA 05 (GRN))	21:54
20	08:24	09:00 (WEA 12 (GRS))	07:29	06:22	06:45 (WEA G1)	06:07		05:06		06:39 (WEA 05 (GRN))	04:42
	16:29		17:34	18:29	13	06:58 (WEA G1)	25	06:59 (WEA RINED1)	25	06:54 (WEA 05 (GRN))	21:54
21	08:23	09:00 (WEA 12 (GRS))	07:27	06:19	06:43 (WEA G1)	06:04		05:05	1	06:38 (WEA 05 (GRN))	04:42
	16:30		17:36	18:31	15	06:58 (WEA G1)	27	06:59 (WEA RINED1)	27	06:54 (WEA 05 (GRN))	21:54
22	08:22	09:00 (WEA 12 (GRS))	07:24	06:17	06:40 (WEA G1)	06:01		05:04	3	06:37 (WEA 05 (GRN))	04:42
	16:31		17:38	18:32	17	06:57 (WEA G1)	29	06:59 (WEA RINED1)	29	06:54 (WEA 05 (GRN))	21:54
23	08:20	09:00 (WEA 12 (GRS))	07:22	06:14	06:37 (WEA G1)	05:59		05:02		06:36 (WEA 05 (GRN))	04:42
	16:32		17:40	18:35	19	06:57 (WEA G1)	31	06:59 (WEA RINED1)	31	06:54 (WEA 05 (GRN))	21:54
24	08:19	09:00 (WEA 12 (GRS))	07:19	06:12	06:34 (WEA G1)	05:57		05:01		06:35 (WEA 05 (GRN))	04:42
	16:33		17:42	18:36	21	06:57 (WEA G1)	33	06:59 (WEA RINED1)	33	06:54 (WEA 05 (GRN))	21:54
25	08:17	09:00 (WEA 12 (GRS))	07:17	06:09	06:31 (WEA G1)	05:55		04:58		06:34 (WEA 05 (GRN))	04:42
	16:34		17:44	18:38	7	06:57 (WEA G1)	35	06:59 (WEA RINED1)	35	06:54 (WEA 05 (GRN))	21:54
26	08:16	09:00 (WEA 12 (GRS))	07:15	06:07		05:53		04:56		06:34 (WEA 05 (GRN))	04:42
	16:35		17:45	18:40		05:51 (WEA G1)		04:55			21:54
27	08:14		07:12	06:05		05:50		04:54		06:33 (WEA 05 (GRN))	04:42
	16:36		17:46	18:42		05:49		04:53		06:33 (WEA 05 (GRN))	04:42
28	08:13		07:10	06:02		05:48		04:52		06:33 (WEA 05 (GRN))	04:42
	16:37		17:50	18:44		05:47		04:51		06:33 (WEA 05 (GRN))	04:42
29	08:11			06:59		05:46		04:50		06:33 (WEA 05 (GRN))	04:42
	16:38			18:46		05:44		04:49		06:33 (WEA 05 (GRN))	04:42
30	08:10			06:57		05:44		04:48		06:33 (WEA 05 (GRN))	04:42
	16:51			19:48		20:46		21:36		06:33 (WEA 05 (GRN))	21:54
31	08:08			06:54				04:52		06:33 (WEA 05 (GRN))	04:42
	16:53			19:49				21:37		06:33 (WEA 05 (GRN))	21:54
Sonnenscheinstunden		248		367		421		496		513	
astr.mögl.Beschattung		352		109		128		85		64	

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) Schatteneinfang	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 36 - IO 36 Bäderstraße 20-22 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47										
	1	05:21 (WEA 04 (GRN))	05:28	9	05:59 (WEA 05 (GRN))	06:23	9	06:51 (WEA RWE01)	07:17	07:16	08:12
											17
	2	04:48	05:21 (WEA 04 (GRN))	05:29	06:00 (WEA 05 (GRN))	06:25	7	06:52 (WEA RWE01)	07:19	07:18	08:14
											15
	3	04:48	05:22 (WEA 04 (GRN))	05:31	06:02 (WEA 05 (GRN))	06:26	4	06:54 (WEA RWE01)	07:21	07:20	08:15
											14
	4	04:49	05:23	05:33	06:03 (WEA 05 (GRN))	06:28	1	06:56 (WEA RWE01)	07:23	07:22	08:17
											12
	5	04:50	05:24	05:34	06:04 (WEA 05 (GRN))	06:30		06:57 (WEA RWE01)	07:24	07:24	08:18
											11
	6	04:51	05:25	05:35	06:05 (WEA 05 (GRN))	06:32					10
											9
	7	04:52	05:26	05:36	06:06 (WEA 05 (GRN))	06:34					8
											7
	8	04:53	05:27	05:37	06:07 (WEA 05 (GRN))	06:36					6
											5
	9	04:54	05:28	05:38	06:08 (WEA 05 (GRN))	06:38					4
											3
	10	04:55	05:29	05:39	06:09 (WEA 05 (GRN))	06:40					2
											1
	11	04:56	05:30	05:40	06:10 (WEA 05 (GRN))	06:42					
	12	04:57	05:31	05:41	06:11 (WEA 05 (GRN))	06:44					
	13	04:58	05:32	05:42	06:12 (WEA 05 (GRN))	06:46					
	14	04:59	05:33	05:43	06:13 (WEA 05 (GRN))	06:48					
	15	05:00	05:34	05:44	06:14 (WEA 05 (GRN))	06:50					
	16	05:01	05:35	05:45	06:15 (WEA 05 (GRN))	06:52					
	17	05:02	05:36	05:46	06:16 (WEA 05 (GRN))	06:54					
	18	05:03	05:37	05:47	06:17 (WEA 05 (GRN))	06:56					
	19	05:04	05:38	05:48	06:18 (WEA 05 (GRN))	06:58					
	20	05:05	05:39	05:49	06:19 (WEA 05 (GRN))	07:00					
	21	05:06	05:40	05:50	06:20 (WEA 05 (GRN))	07:02					
	22	05:07	05:41	05:51	06:21 (WEA 05 (GRN))	07:04					
	23	05:08	05:42	05:52	06:22 (WEA 05 (GRN))	07:06					
	24	05:09	05:43	05:53	06:23 (WEA 05 (GRN))	07:08					
	25	05:10	05:44	05:54	06:24 (WEA 05 (GRN))	07:10					
	26	05:11	05:45	05:55	06:25 (WEA 05 (GRN))	07:12					
	27	05:12	05:46	05:56	06:26 (WEA 05 (GRN))	07:14					
	28	05:13	05:47	05:57	06:27 (WEA 05 (GRN))	07:16					
	29	05:14	05:48	05:58	06:28 (WEA 05 (GRN))	07:18					
	30	05:15	05:49	05:59	06:29 (WEA 05 (GRN))	07:20					
	31	05:16	05:50	06:00	06:30 (WEA 05 (GRN))	07:22					
Sonnenscheinstunden		515		461		383		326		257	
astr. max. mögl. Beschattung		49		145		131		106		82	

### 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) Schatteneende		

Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 37 - IO 37 Bäderstraße 15 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	09:12 (WEA 12 (GRS))	10:06	10:08		06:52		05:42		04:51	
16:03		09:14 (WEA 12 (GRS))	11:55	17:52		19:51		20:46		21:39	
2	08:37	09:12 (WEA 12 (GRS))	10:04	10:05		06:49		05:40		04:50	
16:04		09:15 (WEA 12 (GRS))	11:57	17:54		19:53		20:50		21:40	
3	08:37	09:11 (WEA 12 (GRS))	10:03	10:03		06:47		05:37		04:49	
16:05		09:15 (WEA 12 (GRS))	11:59	17:56		19:55		20:51		21:41	
4	08:37	09:11 (WEA 12 (GRS))	10:01	10:01		06:44		05:35		04:48	
16:07		09:16 (WEA 12 (GRS))	11:07	17:58		19:57		20:53		21:42	
5	08:36	09:10 (WEA 12 (GRS))	10:59	10:58		06:42		05:33		04:48	
16:08		09:17 (WEA 12 (GRS))	11:03	18:00		19:59		20:55		21:43	
6	08:36	09:10 (WEA 12 (GRS))	10:57	10:56		06:39		05:28		04:47	
16:09		09:18 (WEA 12 (GRS))	11:05	18:02		20:01		20:57		21:44	
7	08:35	09:09 (WEA 12 (GRS))	10:55	10:54		06:37		05:29		04:46	
16:11		09:19 (WEA 12 (GRS))	11:07	18:04		20:03		20:59		21:45	
8	08:35	09:06 (WEA 12 (GRS))	10:53	10:51		06:35		05:27		04:46	
20:12		09:19 (WEA 12 (GRS))	11:09	18:06		20:04		20:59		21:46	
9	08:34	09:07 (WEA 12 (GRS))	10:51	10:49		06:32		05:26		04:45	
20:11		09:20 (WEA 12 (GRS))	11:11	18:08		20:06		20:59		21:47	
10	08:34	09:06 (WEA 12 (GRS))	10:49	10:46		06:30		05:24		04:44	
18:15		09:20 (WEA 12 (GRS))	11:14	18:09		20:08		20:59		21:48	
11	08:33	09:06 (WEA 12 (GRS))	10:47	10:44		06:27		05:23		04:44	
18:17		09:22 (WEA 12 (GRS))	11:18	18:11		20:10		21:06		21:49	
12	08:32	09:05 (WEA 12 (GRS))	10:45	10:41		06:25		05:22		04:44	
20:18		09:22 (WEA 12 (GRS))	11:18	18:13		20:12		21:08		21:50	
13	08:31	09:04 (WEA 12 (GRS))	10:43	10:39		06:22		05:20		04:43	
18:19		09:22 (WEA 12 (GRS))	11:20	18:15		20:14		21:10		21:50	
14	08:30	09:04 (WEA 12 (GRS))	10:41	10:36		06:20		05:19		04:43	
20:21		09:22 (WEA 12 (GRS))	11:22	18:17		20:16		21:12		21:51	
15	08:29	09:04 (WEA 12 (GRS))	10:39	10:34		06:18		05:18		04:43	
20:23		09:23 (WEA 12 (GRS))	11:24	18:19		20:18		21:14		21:52	
16	08:28	09:03 (WEA 12 (GRS))	10:37	10:32		06:15		05:17		04:43	
18:25		09:23 (WEA 12 (GRS))	11:26	18:21		20:20		21:16		21:52	
17	08:27	09:03 (WEA 12 (GRS))	10:35	10:30		06:13		05:16		04:43	
18:27		09:24 (WEA 12 (GRS))	11:28	18:23		20:21		21:18		21:53	
18	08:26	09:02 (WEA 12 (GRS))	10:33	10:27		06:11		05:15		04:42	
20:28		09:24 (WEA 12 (GRS))	11:30	18:25		20:23		21:20		21:53	
19	08:25	09:02 (WEA 12 (GRS))	10:31	10:24		06:08		05:14		04:42	
18:30		09:25 (WEA 12 (GRS))	11:32	18:27		20:25		21:22		21:54	
20	08:24	09:00 (WEA 12 (GRS))	10:29	10:22		06:06		05:13		04:42	
20:32		09:25 (WEA 12 (GRS))	11:34	18:29		20:27		21:24		21:54	
21	08:23	09:00 (WEA 12 (GRS))	10:27	10:20		06:04		05:12		04:42	
20:34		09:26 (WEA 12 (GRS))	11:36	18:31		20:29		21:26		21:54	
22	08:22	09:00 (WEA 12 (GRS))	10:24	10:17		06:02		05:11		04:42	
18:36		09:27 (WEA 12 (GRS))	11:38	18:32		20:31		21:28		21:54	
23	08:21	09:00 (WEA 12 (GRS))	10:22	10:14		06:00		05:10		04:42	
18:38		09:27 (WEA 12 (GRS))	11:40	18:34		20:33		21:30		21:55	
24	08:20	09:00 (WEA 12 (GRS))	10:20	10:12		05:57		05:09		04:42	
20:41		09:28 (WEA 12 (GRS))	11:42	18:36		20:35		21:32		21:55	
25	08:19	09:00 (WEA 12 (GRS))	10:18	10:10		05:55		05:08		04:42	
20:43		09:29 (WEA 12 (GRS))	11:44	18:38		20:37		21:34		21:55	
26	08:18	09:00 (WEA 12 (GRS))	10:16	10:07		05:52		05:07		04:42	
18:44		09:30 (WEA 12 (GRS))	11:46	18:40		20:39		21:36		21:55	
27	08:17	09:00 (WEA 12 (GRS))	10:14	10:04		05:50		05:06		04:42	
18:46		09:31 (WEA 12 (GRS))	11:48	18:42		20:41		21:38		21:55	
28	08:16	09:00 (WEA 12 (GRS))	10:12	10:02		05:48		05:05		04:42	
18:47		09:32 (WEA 12 (GRS))	11:50	18:44		20:43		21:40		21:55	
29	08:15	09:00 (WEA 12 (GRS))	10:10	10:00		05:46		05:04		04:42	
18:49		09:33 (WEA 12 (GRS))	11:52	18:46		20:45		21:42		21:55	
30	08:14	09:00 (WEA 12 (GRS))	10:08	10:00		05:44		05:03		04:42	
18:51		09:34 (WEA 12 (GRS))	11:54	18:48		20:47		21:44		21:55	
31	08:13	09:00 (WEA 12 (GRS))	10:06	10:00		05:42		05:02		04:42	
18:53		09:35 (WEA 12 (GRS))	11:56	18:49		20:49		21:46		21:55	
Sonnenscheinstunden		248	272	367		421		496		513	
astr. max. mögl. Beschattung		290		95		112		78		281	

**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	Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 37 - IO 37 Bäderstraße 15 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

	July	August	September	Oktober	November	Dezember					
1	04:47	05:23 (WEA 04 (GRN))	05:28	06:23	06:51 (WEA RWE01)	07:17	07:16	08:12	08:47 (WEA 12 (GRS))		
	10	05:33 (WEA 04 (GRN))	21:18	20:10	15	07:06 (WEA RWE01)	18:55	18:44	15:59	16	09:03 (WEA 12 (GRS))
2	04:48	05:22 (WEA 04 (GRN))	05:29	06:25	06:52 (WEA RWE01)	07:19	07:18	08:14	08:49 (WEA 12 (GRS))		
	11	05:33 (WEA 04 (GRN))	21:16	20:08	13	07:05 (WEA RWE01)	18:53	18:42	15:58	14	09:03 (WEA 12 (GRS))
3	04:48	05:22 (WEA 04 (GRN))	05:31	06:26	06:54 (WEA RWE01)	07:21	07:20	08:15	08:51 (WEA 12 (GRS))		
	12	05:34 (WEA 04 (GRN))	21:14	20:05	11	07:05 (WEA RWE01)	18:50	18:40	15:57	13	09:04 (WEA 12 (GRS))
4	04:49	05:23 (WEA 04 (GRN))	05:33	06:28	06:56 (WEA RWE01)	07:23	07:22	08:17	08:52 (WEA 12 (GRS))		
	11	05:34 (WEA 04 (GRN))	21:12	20:03	9	07:05 (WEA RWE01)	18:48	18:38	15:56	7	09:04 (WEA 12 (GRS))
5	04:50	05:24 (WEA 04 (GRN))	05:34	06:30	06:57 (WEA RWE01)	07:24	07:24	08:18	08:54 (WEA 12 (GRS))		
	11	05:35 (WEA 04 (GRN))	21:10	20:00	6	07:03 (WEA RWE01)	18:46	18:36	15:56	10	09:04 (WEA 12 (GRS))
6	04:51	05:25 (WEA 04 (GRN))	05:36	06:32	06:57 (WEA RWE01)	07:26	07:26	08:20	08:55 (WEA 12 (GRS))		
	10	05:35 (WEA 04 (GRN))	21:08	19:58	3	07:02 (WEA RWE01)	18:43	18:34	15:55	8	09:03 (WEA 12 (GRS))
7	04:52	05:26 (WEA 04 (GRN))	05:38	06:34	06:58 (WEA 05 (GRN))	07:34	07:34	08:21	08:57 (WEA 12 (GRS))		
	10	05:36 (WEA 04 (GRN))	21:06	19:55	9	06:17 (WEA 05 (GRN))	18:41	18:32	15:55	7	09:04 (WEA 12 (GRS))
8	04:53	05:27 (WEA 04 (GRN))	05:40	06:35	06:59 (WEA 05 (GRN))	07:35	07:35	08:22	08:58 (WEA 12 (GRS))		
	9	05:36 (WEA 04 (GRN))	21:04	19:53	8	06:15 (WEA 05 (GRN))	18:39	18:30	15:54	6	09:04 (WEA 12 (GRS))
9	04:54	05:28 (WEA 04 (GRN))	05:41	06:37	06:59 (WEA 05 (GRN))	07:36	07:36	08:23	08:59 (WEA 12 (GRS))		
	8	05:36 (WEA 04 (GRN))	21:02	19:50	6	06:15 (WEA 05 (GRN))	18:36	18:28	15:51	4	09:04 (WEA 12 (GRS))
10	04:55	05:29 (WEA 04 (GRN))	05:43	06:39	06:59 (WEA 05 (GRN))	07:37	07:37	08:24	08:60 (WEA 12 (GRS))		
	8	05:37 (WEA 04 (GRN))	21:00	19:48	4	06:15 (WEA 05 (GRN))	18:33	18:25	15:50	3	09:04 (WEA 12 (GRS))
11	04:56	05:30 (WEA 04 (GRN))	05:45	06:41	06:59 (WEA 05 (GRN))	07:38	07:38	08:25	08:61 (WEA 12 (GRS))		
	7	05:37 (WEA 04 (GRN))	20:58	19:45	2	06:17 (WEA 05 (GRN))	18:31	18:23	15:50	2	09:04 (WEA 12 (GRS))
12	04:56	05:31 (WEA 04 (GRN))	05:47	06:43	06:59 (WEA 05 (GRN))	07:39	07:39	08:26	08:62 (WEA 12 (GRS))		
	6	05:37 (WEA 04 (GRN))	20:56	19:43	1	06:17 (WEA 05 (GRN))	18:29	18:21	15:50		
13	04:58	05:32 (WEA 04 (GRN))	05:49	06:45	06:59 (WEA 05 (GRN))	07:40	07:40	08:27	08:63 (WEA 12 (GRS))		
	5	05:37 (WEA 04 (GRN))	20:54	19:40	1	06:19 (WEA 05 (GRN))	18:28	18:20	15:50		
14	05:00	05:33 (WEA 04 (GRN))	05:50	06:46	06:59 (WEA 05 (GRN))	07:41	07:41	08:28	08:64 (WEA 12 (GRS))		
	4	05:37 (WEA 04 (GRN))	20:52	19:39		07:41	18:28	18:20	15:50		
15	05:01	05:34 (WEA 04 (GRN))	05:52	06:48	06:59 (WEA 05 (GRN))	07:42	07:42	08:29	08:65 (WEA 12 (GRS))		
	2	05:36 (WEA 04 (GRN))	20:50	19:37		07:42	18:27	18:19	15:50		
16	05:03	05:36 (WEA 04 (GRN))	05:54	06:50	06:59 (WEA 05 (GRN))	07:43	07:43	08:30	08:66 (WEA 12 (GRS))		
	1	05:37 (WEA 04 (GRN))	20:47	19:35		07:43	18:26	18:18	15:50		
17	05:04	05:37 (WEA 04 (GRN))	05:56	06:52	06:59 (WEA 05 (GRN))	07:44	07:44	08:31	08:67 (WEA 12 (GRS))		
			20:45	19:33		07:44	18:25	18:17	15:50		
18	05:06	05:38 (WEA 04 (GRN))	05:58	06:53	06:59 (WEA 05 (GRN))	07:45	07:45	08:32	08:68 (WEA 12 (GRS))		
			20:43	19:31		07:45	18:24	18:16	15:50		
19	05:07	05:39 (WEA 04 (GRN))	05:59	06:55	06:59 (WEA 05 (GRN))	07:46	07:46	08:33	08:69 (WEA 12 (GRS))		
			20:41	19:29		07:46	18:23	18:15	15:50		
20	05:08	05:40 (WEA 04 (GRN))	06:01	06:57	06:59 (WEA 05 (GRN))	07:47	07:47	08:34	08:70 (WEA 12 (GRS))		
			20:39	19:27		07:47	18:22	18:14	15:50		
21	05:10	05:41 (WEA 04 (GRN))	06:03	06:59	06:59 (WEA 05 (GRN))	07:48	07:48	08:35	08:71 (WEA 12 (GRS))		
			20:37	19:25		07:48	18:21	18:13	15:50		
22	05:11	05:42 (WEA 04 (GRN))	06:05	07:01	06:59 (WEA 05 (GRN))	07:49	07:49	08:36	08:72 (WEA 12 (GRS))		
			20:35	19:23		07:49	18:20	18:12	15:50		
23	05:13	05:43 (WEA 04 (GRN))	06:07	07:03	06:59 (WEA 05 (GRN))	07:50	07:50	08:37	08:73 (WEA 12 (GRS))		
			20:33	19:21		07:50	18:19	18:11	15:50		
24	05:14	05:44 (WEA 04 (GRN))	06:09	07:05	06:59 (WEA 05 (GRN))	07:51	07:51	08:38	08:74 (WEA 12 (GRS))		
			20:31	19:19		07:51	18:18	18:10	15:50		
25	05:16	05:45 (WEA 04 (GRN))	06:11	07:07	06:59 (WEA 05 (GRN))	07:52	07:52	08:39	08:75 (WEA 12 (GRS))		
			20:29	19:17		07:52	18:17	18:09	15:50		
26	05:18	05:46 (WEA 04 (GRN))	06:13	07:09	06:59 (WEA 05 (GRN))	07:53	07:53	08:40	08:76 (WEA 12 (GRS))		
			20:27	19:15		07:53	18:16	18:08	15:50		
27	05:19	05:47 (WEA 04 (GRN))	06:15	07:11	06:59 (WEA 05 (GRN))	07:54	07:54	08:41	08:77 (WEA 12 (GRS))		
			20:25	19:13		07:54	18:15	18:07	15:50		
28	05:21	05:48 (WEA 04 (GRN))	06:17	07:13	06:59 (WEA 05 (GRN))	07:55	07:55	08:42	08:78 (WEA 12 (GRS))		
			20:23	19:11		07:55	18:14	18:06	15:50		
29	05:23	05:49 (WEA 04 (GRN))	06:19	07:15	06:59 (WEA 05 (GRN))	07:56	07:56	08:43	08:79 (WEA 12 (GRS))		
			20:21	19:09		07:56	18:13	18:05	15:50		
30	05:25	05:50 (WEA 04 (GRN))	06:21	07:17	06:59 (WEA 05 (GRN))	07:57	07:57	08:44	08:80 (WEA 12 (GRS))		
			20:19	19:07		07:57	18:12	18:04	15:50		
31	05:26	05:51 (WEA 04 (GRN))	06:23	07:19	06:59 (WEA 05 (GRN))	07:58	07:58	08:45	08:81 (WEA 12 (GRS))		
			20:17	19:05		07:58	18:11	18:03	15:50		
Sonnenscheinstunden		515	461	383	328	257	197	231			
astr. max. mögl. Beschattung		142	104	157				94			

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 38 - IO 38 Bäderstraße 18 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	09:32 (WEA 11 (GRS))	08:06	07:08	06:52			05:42	06:08 (WEA 05 (GRN))	04:51	05:22 (WEA 01 (GRN))
	16:03	21 09:53 (WEA 11 (GRS))	16:55	17:52	19:51			20:48	6 06:14 (WEA 05 (GRN))	21:39	2 05:24 (WEA 01 (GRN))
2	08:37	09:33 (WEA 11 (GRS))	08:04	07:05	06:49			05:40	06:07 (WEA 05 (GRN))	04:50	05:21 (WEA 01 (GRN))
	16:04	21 09:54 (WEA 11 (GRS))	16:57	17:54	19:53			20:50	6 06:13 (WEA 05 (GRN))	21:40	3 05:24 (WEA 01 (GRN))
3	08:37	09:34 (WEA 11 (GRS))	08:03	07:03	06:47			05:37		04:49	05:21 (WEA 01 (GRN))
	16:05	19 09:53 (WEA 11 (GRS))	16:59	17:56	19:55			20:51		21:41	3 05:24 (WEA 01 (GRN))
4	08:37	09:35 (WEA 11 (GRS))	08:01	07:01	06:44			05:35		04:48	05:20 (WEA 01 (GRN))
	16:07	19 09:54 (WEA 11 (GRS))	17:01	17:58	19:57			20:53		21:42	4 05:24 (WEA 01 (GRN))
5	08:36	09:35 (WEA 11 (GRS))	07:59	06:58	06:42			05:33	07:06 (WEA RWE01)	04:48	05:19 (WEA 01 (GRN))
	16:08	19 09:54 (WEA 11 (GRS))	17:03	18:00	19:59	3	07:09 (WEA RWE01)	20:55		21:43	4 05:23 (WEA 01 (GRN))
6	08:36	09:37 (WEA 11 (GRS))	07:57	06:56	06:39			05:31	07:03 (WEA RWE01)	04:47	05:19 (WEA 01 (GRN))
	16:09	17 09:54 (WEA 11 (GRS))	17:05	18:02	19:01	5	07:08 (WEA RWE01)	20:57		21:44	4 05:23 (WEA 01 (GRN))
7	08:35	09:37 (WEA 11 (GRS))	07:55	06:54	06:37			05:29	07:04 (WEA RWE01)	04:46	05:18 (WEA 01 (GRN))
	16:11	17 09:54 (WEA 11 (GRS))	17:07	18:04	19:03	8	07:05 (WEA RWE01)	20:59		21:45	4 05:22 (WEA 01 (GRN))
8	08:35	09:38 (WEA 11 (GRS))	07:53	06:51	06:35			05:27	06:59 (WEA RWE01)	04:46	05:20 (WEA 01 (GRN))
	16:12	15 09:54 (WEA 11 (GRS))	17:09	18:06	19:05	10	07:05 (WEA RWE01)	21:00		21:46	2 05:22 (WEA 01 (GRN))
9	08:34	09:39 (WEA 11 (GRS))	07:51	06:49	06:32			05:26	06:56 (WEA RWE01)	04:45	
	16:11	14 09:53 (WEA 11 (GRS))	17:11	18:08	19:06	17	07:06 (WEA RWE01)	21:02		21:47	
10	08:34	09:40 (WEA 11 (GRS))	07:49	06:46	06:30			05:24	06:54 (WEA RWE01)	04:44	
	16:15	12 09:52 (WEA 11 (GRS))	17:14	18:10	19:09	13	07:07 (WEA RWE01)	21:04	1	05:52 (WEA 02 (GRN))	21:40
11	08:33	09:43 (WEA 11 (GRS))	07:47	06:44	06:27			05:22	06:51 (WEA RWE01)	04:44	
	16:17	9 09:52 (WEA 11 (GRS))	17:16	18:11	19:10	14	07:05 (WEA RWE01)	21:06	2	06:51 (WEA 02 (GRN))	21:40
12	08:32	09:45 (WEA 11 (GRS))	07:45	06:41	06:25			05:20	06:52 (WEA RWE01)	04:44	
	16:18	5 09:53 (WEA 11 (GRS))	17:18	18:13	19:12	12	07:04 (WEA RWE01)	21:08	2	06:50 (WEA 02 (GRN))	21:39
13	08:31	09:48 (WEA 11 (GRS))	07:43	06:39	06:23			05:18	06:54 (WEA RWE01)	04:43	
	16:20		17:20	18:15	19:14	6	07:02 (WEA RWE01)	21:09		21:50	
14	08:30		07:41	06:36	06:20			05:16		04:43	
	16:21		17:22	18:17	19:16			21:11		21:51	
15	08:29		07:39	06:34	06:18			05:15		04:43	
	16:23		17:24	18:19	19:18			21:13		21:52	
16	08:28		07:37	06:32	06:15			05:13		04:42	
	16:25		17:26	18:21	19:20			21:15		21:52	
17	08:27	08:59 (WEA 12 (GRS))	07:35	06:29	06:13			05:11		04:42	
	16:27	1 09:50 (WEA 12 (GRS))	17:28	18:23	19:21			21:16		21:53	
18	08:26	08:57 (WEA 12 (GRS))	07:33	06:27	06:11			05:10		04:42	
	16:28	3 09:50 (WEA 12 (GRS))	17:30	18:25	19:23			21:18		21:53	
19	08:25	08:58 (WEA 12 (GRS))	07:31	06:24	06:09			05:09	05:37 (WEA 04 (GRN))	04:42	
	16:30	6 09:52 (WEA 12 (GRS))	17:32	18:27	19:25			21:20	2 05:39 (WEA 04 (GRN))	21:54	
20	08:24	08:59 (WEA 12 (GRS))	07:29	06:22	06:06			05:08	06:35 (WEA 04 (GRN))	04:42	
	16:32	8 09:53 (WEA 12 (GRS))	17:34	18:29	19:27			21:21	3 05:38 (WEA 04 (GRN))	21:54	
21	08:23	08:53 (WEA 12 (GRS))	07:26	06:19	06:04			05:06	06:31 (WEA 04 (GRN))	04:42	
	16:34	10 09:51 (WEA 12 (GRS))	17:36	18:31	19:29			21:23	4 06:30 (WEA 04 (GRN))	21:54	
22	08:21	08:52 (WEA 12 (GRS))	07:24	06:17	06:01			05:03	06:33 (WEA 04 (GRN))	04:42	
	16:36	12 09:54 (WEA 12 (GRS))	17:38	18:32	19:31			21:24	6 06:30 (WEA 04 (GRN))	21:54	
23	08:20	08:50 (WEA 12 (GRS))	07:22	06:14	05:59			05:02	05:32 (WEA 04 (GRN))	04:43	
	16:38	14 09:54 (WEA 12 (GRS))	17:40	18:34	19:33			21:26	7 06:30 (WEA 04 (GRN))	21:55	
24	08:19	08:49 (WEA 12 (GRS))	07:19	06:12	05:57			05:01	06:30 (WEA 04 (GRN))	04:43	
	16:39	15 09:54 (WEA 12 (GRS))	17:42	18:36	19:35			21:27	7 06:37 (WEA 04 (GRN))	21:55	
25	08:17	08:48 (WEA 12 (GRS))	07:17	06:09	05:55			04:59	06:29 (WEA 04 (GRN))	04:44	
	16:41	16 09:54 (WEA 12 (GRS))	17:44	18:38	19:36			21:29	8 06:37 (WEA 04 (GRN))	21:55	
26	08:16	08:49 (WEA 12 (GRS))	07:15	06:07	05:52			04:59	06:29 (WEA 04 (GRN))	04:44	
	16:43	16 09:57 (WEA 12 (GRS))	17:46	18:40	19:38			21:30	7 06:36 (WEA 04 (GRN))	21:55	
27	08:14	08:50 (WEA 12 (GRS))	07:13	06:04	05:50			04:57	06:30 (WEA 04 (GRN))	04:43	
	16:45	14 09:54 (WEA 12 (GRS))	17:48	18:42	19:40			21:32	5 05:35 (WEA 04 (GRN))	21:55	
28	08:13	08:50 (WEA 12 (GRS))	07:10	06:02	05:48			04:56	06:14 (WEA 05 (GRN))	04:45	
	16:47	13 09:53 (WEA 12 (GRS))	17:50	18:44	19:42	2	06:16 (WEA 05 (GRN))	21:33		21:54	
29	08:11	08:51 (WEA 12 (GRS))		06:59	05:46			04:54	06:12 (WEA 05 (GRN))	04:46	
	16:49	09:52 (WEA 12 (GRS))		19:46	20:44	4	06:16 (WEA 05 (GRN))	21:35		21:54	
30	08:10	08:53 (WEA 12 (GRS))		06:57	05:44			04:53	06:10 (WEA 05 (GRN))	04:46	
	16:51	7 09:00 (WEA 12 (GRS))		19:48	20:46	5	06:15 (WEA 05 (GRN))	21:36		21:54	
31	08:08			06:54				04:52		05:23 (WEA 01 (GRN))	
	16:53			19:49				21:37	1 05:24 (WEA 01 (GRN))		
Sonnenscheinstunden	248		272		421			496			513
astr.max.mögl.Beschattung		334			96			67			26

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

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

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 38 - IO 38 Bäderstraße 18 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47		05:28		06:23		06:51 (WEA RWED1)		07:16		08:12
	21:54		21:18		20:10		17:05 (WEA RWED1)		16:44		15:59
2	04:48		05:29		06:25		06:52 (WEA RWED1)		07:19		08:14
	21:53		21:16		20:08		17:05 (WEA RWED1)		16:42		15:58
3	04:48		05:31		06:26		06:54 (WEA RWED1)		07:21		08:15
	21:53		21:14		20:05		17:06 (WEA RWED1)		16:40		15:57
4	04:49		05:33		06:28		06:56 (WEA RWED1)		07:23		08:17
	21:52		21:12		20:03		17:06 (WEA RWED1)		16:38		15:56
5	04:50	05:24 (WEA 01 (GRN))	05:34		06:30		06:57 (WEA RWED1)		07:24		08:18
	21:52	4 05:28 (WEA 01 (GRN))	21:10		20:00		8 07:05 (WEA RWED1)		16:36		15:56
6	04:51	05:25 (WEA 01 (GRN))	05:36		06:32		06:59 (WEA RWED1)		07:26		08:20
	21:51	4 05:29 (WEA 01 (GRN))	21:08		19:58		6 07:05 (WEA RWED1)		16:34		15:55
7	04:52	05:26 (WEA 01 (GRN))	05:38		06:34		07:01 (WEA RWED1)		07:28		08:21
	21:50	4 05:30 (WEA 01 (GRN))	21:06		19:55		3 07:04 (WEA RWED1)		16:32		15:55
8	04:53	05:27 (WEA 01 (GRN))	05:40		06:35				07:30		08:22
	21:50	4 05:31 (WEA 01 (GRN))	21:04		19:53				16:30		15:54
9	04:54	05:28 (WEA 01 (GRN))	05:41		06:37				07:32		08:23
	21:49	4 05:32 (WEA 01 (GRN))	21:02		19:50				16:28		15:53
10	04:55	05:29 (WEA 01 (GRN))	05:43		06:39				07:34		08:24
	21:48	3 05:33 (WEA 01 (GRN))	21:00		19:48				16:27		15:54
11	04:56	05:30 (WEA 01 (GRN))	05:45		06:41				07:36		08:25
	21:47	2 05:34 (WEA 01 (GRN))	20:58		19:45				16:25		15:53
12	04:58	05:31 (WEA 01 (GRN))	05:47		06:43				07:38		08:26
	21:46	2 05:35 (WEA 01 (GRN))	20:56		19:43				16:23		15:53
13	04:59	05:32 (WEA 01 (GRN))	05:49		06:44				07:40		08:27
	21:45	1 05:35 (WEA 01 (GRN))	20:54		19:40				16:22		15:53
14	05:00		05:50		06:46				07:42		08:29
	21:44		20:52		19:38				16:20		15:52
15	05:01		05:52		06:48				07:44		08:30
	21:43		20:49		19:35				16:18		15:51
16	05:03		05:54		06:50				07:46		08:31
	21:42	3 05:34 (WEA 01 (GRN))	20:47		19:33				16:17		15:51
17	05:04		05:56		06:52				07:48		08:32
	21:41	7 05:38 (WEA 04 (GRN))	20:45		19:30				16:15		15:50
18	05:06		05:58		06:53				07:50		08:33
	21:40	8 05:39 (WEA 04 (GRN))	20:43		19:28				16:14		15:50
19	05:07		05:59		06:55				07:52		08:34
	21:39	8 05:40 (WEA 04 (GRN))	20:41		19:25				16:12		15:50
20	05:08		06:01		06:57				07:54		08:35
	21:37	7 05:42 (WEA 04 (GRN))	20:39		19:23				16:11		15:49
21	05:10		06:03		06:59				07:56		08:36
	21:35	6 05:44 (WEA 04 (GRN))	20:36		19:20				16:09		15:49
22	05:11		06:05		07:01				07:58		08:37
	21:34	5 05:46 (WEA 04 (GRN))	20:34		19:18				16:08		15:49
23	05:13		06:07		07:02				08:00		08:38
	21:33	4 05:49 (WEA 04 (GRN))	20:31		19:15				16:07		15:49
24	05:14		06:08		07:04				08:02		08:39
	21:31	3 05:49 (WEA 04 (GRN))	20:29		19:13				16:06		15:49
25	05:16		06:10		07:06				08:04		08:40
	21:29	1 05:49 (WEA 04 (GRN))	20:27		19:10				16:04		15:49
26	05:18		06:12		07:08				08:06		08:41
	21:28		20:24		19:08				16:03		15:49
27	05:19		06:14		07:10				08:08		08:42
	21:26		20:22		19:05				16:02		15:49
28	05:21		06:16		07:12				08:10		08:43
	21:25		20:20		19:03				16:01		15:49
29	05:23		06:17		07:13				08:12		08:44
	21:23		20:17		19:00				16:00		15:49
30	05:24		06:19		07:15				08:14		08:45
	21:21		20:15		18:58				15:58		15:49
31	05:26		06:21		07:17				08:16		08:46
	21:19		20:12		18:54				16:00		15:49
Sonnenscheinstunden		515	461	383	328	257	150	231	615		
astr. max. mögl. Beschattung		80	49	66	66	328	150	231	615		

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) Schatteneinfang	Zeitpunkt (SS:MM) Schatteneende	Schattenanfang (WEA mit erstem Schatten)	Schatteneende (WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 39 - IO 39 Bäderstraße 13 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar	März	April	Mai	Juni	
1	08:37	08:06	07:08	06:52	05:42	04:51	05:25 (WEA 01 (GRN))
	16:03	16:55	17:52	19:51	20:48	21:39	1 05:26 (WEA 01 (GRN))
2	08:37	08:04	07:05	06:49	07:13 (WEA RWE01)	05:40	
	16:04	16:57	17:54	19:53	20:50	21:40	
3	08:37	08:03	07:03	06:47	07:11 (WEA RWE01)	05:37	
	16:05	16:59	17:56	19:55	20:51	21:41	
4	08:37	08:01	07:01	06:44	07:08 (WEA RWE01)	05:35	
	16:07	17:01	17:58	19:57	20:53	21:42	
5	08:36	07:59	06:58	06:42	07:06 (WEA RWE01)	05:33	
	16:08	17:03	18:00	19:59	20:55	21:43	
6	08:36	07:57	06:56	06:39	07:03 (WEA RWE01)	05:31	
	16:09	17:05	18:02	20:01	20:57	21:44	
7	08:35	07:56	06:54	06:37	07:01 (WEA RWE01)	05:29	
	16:11	17:07	18:04	20:03	20:59	21:45	
8	08:35	07:53	06:51	06:35	06:59 (WEA RWE01)	05:27	
	16:12	17:09	18:06	20:05	21:01	21:46	
9	08:34	07:52	06:49	06:32	06:59 (WEA RWE01)	05:26	
	16:11	09:08 (WEA 12 (GRN))	17:11	18:08	20:06	21:02	
10	08:34	07:51	06:48	06:30	07:01 (WEA RWE01)	05:24	
	16:15	09:09 (WEA 12 (GRN))	17:14	18:09	20:09	21:04	
11	08:33	07:50	06:47	06:27	07:03 (WEA RWE01)	05:22	
	16:17	09:11 (WEA 12 (GRN))	17:16	18:11	20:10	21:06	
12	08:32	07:49	06:46	06:25	07:05 (WEA RWE01)	05:20	
	16:18	09:11 (WEA 12 (GRN))	17:18	18:13	20:12	21:08	
13	08:31	07:48	06:45	06:23	07:07 (WEA RWE01)	05:18	
	16:20	09:11 (WEA 12 (GRN))	17:20	18:15	20:14	21:09	
14	08:30	07:47	06:44	06:21	07:09 (WEA RWE01)	05:16	
	16:21	09:12 (WEA 12 (GRN))	17:22	18:17	20:16	21:11	
15	08:29	07:46	06:43	06:19	07:11 (WEA RWE01)	05:15	
	16:23	09:12 (WEA 12 (GRN))	17:24	18:19	20:18	21:13	
16	08:28	07:45	06:42	06:17	07:13 (WEA RWE01)	05:13	
	16:25	09:13 (WEA 12 (GRN))	17:26	18:21	20:20	21:15	
17	08:27	07:44	06:41	06:15	07:15 (WEA RWE01)	05:11	
	16:27	09:13 (WEA 12 (GRN))	17:28	18:23	20:22	21:16	
18	08:26	07:43	06:40	06:13	07:17 (WEA RWE01)	05:10	
	16:28	09:13 (WEA 12 (GRN))	17:30	18:25	20:23	21:18	
19	08:25	07:42	06:39	06:11	07:19 (WEA RWE01)	05:08	
	16:30	09:13 (WEA 12 (GRN))	17:32	18:27	20:25	21:20	
20	08:24	07:41	06:38	06:09	07:21 (WEA RWE01)	05:06	
	16:32	09:14 (WEA 12 (GRN))	17:34	18:29	20:27	21:22	
21	08:23	07:40	06:37	06:07	07:23 (WEA RWE01)	05:04	
	16:34	09:14 (WEA 12 (GRN))	17:36	18:31	20:29	21:24	
22	08:21	07:39	06:36	06:05	07:25 (WEA RWE01)	05:02	
	16:36	09:14 (WEA 12 (GRN))	17:38	18:33	20:31	21:24	
23	08:20	07:38	06:35	06:03	07:27 (WEA RWE01)	05:01	
	16:38	09:14 (WEA 12 (GRN))	17:40	18:34	20:33	21:26	
24	08:19	07:37	06:34	06:01	07:29 (WEA RWE01)	05:00	
	16:39	09:14 (WEA 12 (GRN))	17:42	18:36	20:35	21:27	
25	08:17	07:36	06:33	05:59	07:31 (WEA RWE01)	04:59	
	16:41	09:15 (WEA 12 (GRN))	17:44	18:38	20:37	21:29	
26	08:16	07:35	06:32	05:57	07:33 (WEA RWE01)	04:58	
	16:43	09:15 (WEA 12 (GRN))	17:46	18:40	20:39	21:30	
27	08:14	07:34	06:31	05:55	07:35 (WEA RWE01)	04:57	
	16:45	09:15 (WEA 12 (GRN))	17:48	18:42	20:40	21:32	
28	08:13	07:33	06:30	05:53	07:37 (WEA RWE01)	04:56	
	16:47	09:16 (WEA 12 (GRN))	17:50	18:44	20:42	21:33	
29	08:11		06:29	05:51	07:39 (WEA RWE01)	04:54	
	16:49		09:16 (WEA 12 (GRN))	17:52	18:46	20:44	
30	08:10		06:27	05:49	07:41 (WEA RWE01)	04:53	
	16:51		09:17 (WEA 12 (GRN))	17:54	18:48	20:46	
31	08:08		06:25	05:47	07:43 (WEA RWE01)	04:52	
	16:53		09:18 (WEA 12 (GRN))	17:56	18:50	20:48	
Sonnenscheinstunden	248		272	421	496		513
astr.max.mögl.Beschattung	160			112	83		14

**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) Schattensende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 39 - IO 39 Bäderstraße 13 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

	July	August	September	Oktober	November	Dezember
1	04:47 21:54	05:28 21:18	06:23 20:10	07:17 18:55	07:16 16:44	08:12 15:59
2	04:48 21:53	05:29 21:16	06:25 20:08	07:19 18:53	07:18 16:42	08:14 15:58
3	04:48 21:53	05:31 21:14	06:26 20:05	07:21 18:50	07:20 16:40	08:15 15:57
4	04:49 21:52	05:33 21:12	06:28 20:03	07:23 18:48	07:22 16:38	08:17 15:56
5	04:50 21:52	05:34 21:10	06:30 20:00	07:24 18:46	07:24 16:36	08:18 15:56
6	04:51 21:51	05:36 21:08	06:32 19:58	07:26 18:43	07:26 16:34	08:20 15:55
7	04:52 21:50	05:38 21:06	06:34 19:55	07:28 18:41	07:28 16:32	08:21 15:55
8	04:53 21:49	05:40 21:04	06:35 19:53	07:30 18:39	07:30 16:30	08:22 15:54
9	04:54 21:48	05:41 21:02	06:37 19:50	07:32 18:37	07:32 16:28	08:23 15:54
10	04:55 21:48	05:43 21:00	06:39 19:48	07:34 18:35	07:34 16:26	08:25 15:53
11	04:56 21:47	05:45 20:58	06:41 19:45	07:36 18:33	07:36 16:25	08:26 15:53
12	04:58 21:46	05:47 20:56	06:43 19:43	07:38 18:31	07:38 16:23	08:27 15:53
13	04:59 21:45	05:49 20:54	06:44 19:40	07:39 18:29	07:40 16:22	08:28 15:53
14	05:00 21:44	05:50 20:52	06:46 19:38	07:41 18:27	07:42 16:20	08:29 15:53
15	05:01 21:43	05:52 20:49	06:48 19:35	07:43 18:25	07:44 16:18	08:30 15:53
16	05:03 21:42	05:54 20:47	06:50 19:33	07:45 18:23	07:46 16:17	08:31 15:53
17	05:04 21:41	05:56 20:45	06:52 19:30	07:47 18:21	07:48 16:15	08:32 15:53
18	05:06 21:39	05:58 20:43	06:53 19:28	07:49 18:19	07:50 16:14	08:33 15:53
19	05:07 21:38	05:59 20:41	06:55 19:25	07:51 18:17	07:52 16:12	08:34 15:53
20	05:08 21:37	06:01 20:39	06:57 19:23	07:53 18:15	07:54 16:11	08:35 15:53
21	05:10 21:35	06:03 20:36	06:59 19:20	07:55 18:13	07:56 16:09	08:36 15:53
22	05:11 21:34	06:05 20:34	07:01 19:17	07:57 18:11	07:58 16:07	08:37 15:53
23	05:13 21:33	06:07 20:31	07:02 19:15	07:59 18:09	08:00 16:05	08:38 15:53
24	05:14 21:31	06:08 20:29	07:04 19:13	08:01 18:07	08:02 16:03	08:39 15:53
25	05:16 21:29	06:10 20:27	07:06 19:10	08:03 18:05	08:04 16:01	08:40 15:53
26	05:18 21:28	06:12 20:24	07:08 19:08	08:05 18:03	08:06 15:59	08:41 15:53
27	05:19 21:26	06:14 20:22	07:10 19:05	08:07 18:01	08:08 15:57	08:42 15:53
28	05:21 21:25	06:16 20:20	07:12 19:03	08:09 17:59	08:10 15:55	08:43 15:53
29	05:23 21:23	06:18 20:17	07:14 19:00	08:11 17:57	08:12 15:53	08:44 15:53
30	05:24 21:21	06:20 20:15	07:15 18:58	08:13 17:55	08:14 15:51	08:45 15:53
31	05:26 21:19	06:21 20:12	07:17 18:56	08:15 17:53	08:16 15:49	08:47 15:53
Sonnenscheinstunden	515	461	383	328	257	231
astr.max.mögl.Beschattung	79	34	86	106	151	123

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 40 - IO 40 Bäderstraße 10 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	09:22 (WEA 11 (GRS))	08:06	07:08	06:52			05:42	06:08 (WEA 02 (GRN))	04:51	
	16:03	18 09:40 (WEA 11 (GRS))	16:55	17:52	19:51			20:48	1 06:09 (WEA 02 (GRN))	21:39	
2	08:37	09:23 (WEA 11 (GRS))	08:04	07:05	06:49			05:40	06:06 (WEA 02 (GRN))	04:50	
	16:04	18 09:41 (WEA 11 (GRS))	16:57	17:54	19:53			20:50	2 06:08 (WEA 02 (GRN))	21:40	
3	08:37	09:23 (WEA 11 (GRS))	08:03	07:03	06:47			05:37		04:49	
	16:05	17 09:40 (WEA 11 (GRS))	16:59	17:56	19:55			20:51		21:41	
4	08:37	09:25 (WEA 11 (GRS))	08:01	07:01	06:44			05:35		04:48	
	16:07	16 09:41 (WEA 11 (GRS))	17:01	17:58	19:57			20:53		21:42	
5	08:36	09:25 (WEA 11 (GRS))	07:59	06:58	06:42			05:33		04:48	
	16:08	16 09:41 (WEA 11 (GRS))	17:03	18:00	19:59			20:55		21:43	
6	08:36	09:26 (WEA 11 (GRS))	07:57	06:56	06:39			05:31	05:58 (WEA 04 (GRN))	04:47	
	16:09	15 09:41 (WEA 11 (GRS))	17:05	18:02	20:01			20:57	2 06:00 (WEA 01 (GRN))	21:44	
7	08:35	09:27 (WEA 11 (GRS))	07:55	06:54	06:37			05:29	05:56 (WEA 04 (GRN))	04:46	
	16:11	14 09:41 (WEA 11 (GRS))	17:07	18:04	20:03			20:59	4 06:00 (WEA 01 (GRN))	21:45	
8	08:35	09:28 (WEA 11 (GRS))	07:53	06:51	06:35			05:27	05:54 (WEA 04 (GRN))	04:46	
	16:12	13 09:41 (WEA 11 (GRS))	17:09	18:06	20:05			21:01	5 05:59 (WEA 04 (GRN))	21:46	
9	08:34	09:29 (WEA 11 (GRS))	07:51	06:49	06:32			05:26	05:53 (WEA 01 (GRN))	04:45	
	16:14	11 09:40 (WEA 11 (GRS))	17:11	18:08	20:06			21:02	6 05:59 (WEA 04 (GRN))	21:47	
10	08:34	09:30 (WEA 11 (GRS))	07:49	06:46	06:30			05:24	05:51 (WEA 01 (GRN))	04:44	
	16:15	9 09:39 (WEA 11 (GRS))	17:14	18:10	20:08			21:04	7 05:58 (WEA 04 (GRN))	21:48	
11	08:33	09:33 (WEA 11 (GRS))	07:47	06:44	06:27			05:22	05:51 (WEA 01 (GRN))	04:44	
	16:17	6 09:39 (WEA 11 (GRS))	17:16	18:11	20:10			21:06	5 05:56 (WEA 04 (GRN))	21:49	
12	08:32		07:45	06:41	06:25			05:20		04:44	
	16:18		17:18	18:13	20:12			21:08		21:50	
13	08:31		07:43	06:39	06:23			05:18		04:43	
	16:20		17:20	18:15	20:14			21:09		21:50	
14	08:30		07:41	06:36	06:20			05:16		04:43	
	16:21		17:22	18:17	20:16			21:11		21:51	
15	08:29		07:39	06:34	06:18			05:15		04:43	
	16:23		17:24	18:19	20:18			21:13		21:52	
16	08:28		07:37	06:32	06:15			05:13	05:41 (WEA 01 (GRN))	04:43	
	16:25		17:26	18:21	20:20			21:15	2 05:43 (WEA 01 (GRN))	21:52	
17	08:27		07:35	06:29	06:13			05:11	05:40 (WEA 01 (GRN))	04:42	
	16:27		17:28	18:23	20:21			21:16	3 05:43 (WEA 01 (GRN))	21:53	
18	08:26	08:57 (WEA 12 (GRS))	07:33	06:27	06:11			05:10	05:38 (WEA 01 (GRN))	04:42	
	16:28	1 08:58 (WEA 12 (GRS))	17:30	18:25	20:23			21:18	3 05:41 (WEA 01 (GRN))	21:53	
19	08:25	08:56 (WEA 12 (GRS))	07:31	06:24	06:08	06:33 (WEA 05 (GRN))	05:08	05:08	05:37 (WEA 01 (GRN))	04:42	
	16:30	3 08:59 (WEA 12 (GRS))	17:32	18:27	20:25	2 06:35 (WEA 05 (GRN))	21:20	21:20	4 05:41 (WEA 01 (GRN))	21:54	
20	08:24	08:55 (WEA 12 (GRS))	07:28	06:22	06:06	06:31 (WEA 05 (GRN))	05:06	05:06	05:35 (WEA 43 (RW))	04:42	
	16:32	6 09:01 (WEA 12 (GRS))	17:34	18:29	20:27	3 06:34 (WEA 05 (GRN))	21:21	21:21	1 05:36 (WEA 43 (RW))	21:54	
21	08:23	08:53 (WEA 12 (GRS))	07:26	06:19	06:04	06:29 (WEA 05 (GRN))	05:05	05:05		04:43	
	16:34	7 09:00 (WEA 12 (GRS))	17:36	18:31	20:29	5 06:34 (WEA 05 (GRN))	21:23	21:23		21:54	
22	08:21	08:52 (WEA 12 (GRS))	07:24	06:17	06:01	06:26 (WEA 05 (GRN))	05:03	05:03		04:43	
	16:36	9 09:01 (WEA 12 (GRS))	17:38	18:32	20:31	6 06:32 (WEA 05 (GRN))	21:24	21:24		21:54	
23	08:20	08:50 (WEA 12 (GRS))	07:22	06:14	05:59		05:02	05:02		04:43	
	16:38	11 09:01 (WEA 12 (GRS))	17:40	18:34	20:33		21:26	21:26		21:55	
24	08:19	08:49 (WEA 12 (GRS))	07:19	06:12	05:57		05:01	05:01		04:43	
	16:39	13 09:02 (WEA 12 (GRS))	17:42	18:36	20:35		21:27	21:27		21:55	
25	08:17	08:48 (WEA 12 (GRS))	07:17	06:09	05:55		04:59	04:59		04:44	
	16:41	13 09:01 (WEA 12 (GRS))	17:44	18:38	20:36		21:29	21:29		21:55	
26	08:16	08:49 (WEA 12 (GRS))	07:15	06:07	05:52		04:58	04:58		04:44	
	16:43	11 09:00 (WEA 12 (GRS))	17:46	18:40	20:38		21:30	21:30		21:55	
27	08:14	08:51 (WEA 12 (GRS))	07:13	06:04	05:50		04:57	04:57		04:45	
	16:45	9 09:00 (WEA 12 (GRS))	17:48	18:42	20:40		21:32	21:32		21:55	
28	08:13	08:52 (WEA 12 (GRS))	07:10	06:02	05:48		04:56	04:56		04:45	
	16:47	7 08:59 (WEA 12 (GRS))	17:50	18:44	20:42		21:33	21:33		21:54	
29	08:11			06:59	05:46		04:54	04:54		04:46	
	16:49			19:46	20:44		21:35	21:35		21:54	
30	08:10			06:57	05:44		04:53	04:53		04:46	
	16:51			19:48	20:46		21:36	21:36		21:54	
31	08:08			06:54			04:52	04:52			
	16:53			19:49			21:37	21:37			
Sonnenscheinstunden	248							496			513
astr.max.mögl.Beschattung	243	272	367	421	16			45			

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

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



## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 40 - IO 40 Bäderstraße 10 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September/Oktober		November		Dezember		
1	04:47	05:28		06:23	07:17	07:16		08:12	09:15 (WEA 11 (GRS))	
	21:54	21:18		20:10	18:55	16:44		15:59	6 09:21 (WEA 11 (GRS))	
2	04:48	05:29	06:01 (WEA 04 (GRN))	06:25	07:19	07:18		08:14	09:13 (WEA 11 (GRS))	
	21:53	21:16	6 06:07 (WEA 04 (GRN))	20:08	18:53	16:42		15:58	9 09:22 (WEA 11 (GRS))	
3	04:48	05:31	06:02 (WEA 04 (GRN))	06:26	07:21	07:20		08:15	09:13 (WEA 11 (GRS))	
	21:53	21:14	7 06:09 (WEA 04 (GRN))	20:05	18:50	16:40		15:57	11 09:24 (WEA 11 (GRS))	
4	04:49	05:33	06:03 (WEA 04 (GRN))	06:28	07:23	07:22		08:17	09:12 (WEA 11 (GRS))	
	21:52	21:12	6 06:09 (WEA 04 (GRN))	20:03	18:48	16:38		15:56	13 09:25 (WEA 11 (GRS))	
5	04:50	05:34	06:05 (WEA 04 (GRN))	06:30	07:24	07:24		08:18	09:12 (WEA 11 (GRS))	
	21:52	21:10	5 06:10 (WEA 04 (GRN))	20:00	18:46	16:36		15:56	14 09:26 (WEA 11 (GRS))	
6	04:51	05:36	06:07 (WEA 04 (GRN))	06:32	07:26	07:26		08:20	09:12 (WEA 11 (GRS))	
	21:51	21:08	3 06:10 (WEA 04 (GRN))	19:58	18:43	16:34		15:55	15 09:27 (WEA 11 (GRS))	
7	04:52	05:38	06:08 (WEA 04 (GRN))	06:34	07:28	07:28		08:21	09:12 (WEA 11 (GRS))	
	21:50	21:06	2 06:10 (WEA 04 (GRN))	19:55	18:41	16:32		15:55	16 09:28 (WEA 11 (GRS))	
8	04:53	05:40		06:35	07:30	07:30		08:22	09:12 (WEA 11 (GRS))	
	21:50	21:04		19:53	18:38	16:30		15:54	16 09:28 (WEA 11 (GRS))	
9	04:54	05:41		06:37	07:32	07:32		08:23	09:13 (WEA 11 (GRS))	
	21:49	21:02		19:50	18:36	16:28		15:53	16 09:29 (WEA 11 (GRS))	
10	04:55	05:43	06:13 (WEA 02 (GRN))	06:39	07:34	07:34		08:25	09:12 (WEA 11 (GRS))	
	21:48	21:00	1 06:14 (WEA 02 (GRN))	19:49	18:33	16:27		15:54	16 09:30 (WEA 11 (GRS))	
11	04:56	05:45	06:15 (WEA 02 (GRN))	06:41	07:36	07:36		08:26	09:13 (WEA 11 (GRS))	
	21:47	20:58	2 06:17 (WEA 02 (GRN))	19:45	18:31	16:25		15:53	17 09:30 (WEA 11 (GRS))	
12	04:56	05:47	06:17 (WEA 02 (GRN))	06:43	07:38	07:38		08:27	09:13 (WEA 11 (GRS))	
	21:46	20:56	1 06:18 (WEA 02 (GRN))	19:43	18:29	16:23		15:53	18 09:31 (WEA 11 (GRS))	
13	04:58	05:49		06:44	07:39	07:40		08:28	09:13 (WEA 11 (GRS))	
	21:45	20:54		19:40	18:26	16:22		15:53	19 09:31 (WEA 11 (GRS))	
14	05:00	05:50		06:46	07:41	07:42		08:29	09:14 (WEA 11 (GRS))	
	21:44	20:52		19:38	18:24	16:20	7 09:31 (WEA 12 (GRS))	15:53	19 09:33 (WEA 11 (GRS))	
15	05:01	05:52		06:48	07:43	07:44		08:30	09:15 (WEA 11 (GRS))	
	21:43	20:49		19:35	18:21	16:18	10 09:32 (WEA 12 (GRS))	15:53	18 09:33 (WEA 11 (GRS))	
16	05:02	05:54		06:50	07:45	07:46		08:31	09:14 (WEA 11 (GRS))	
	21:42	20:47		19:33	18:19	16:17	11 09:33 (WEA 12 (GRS))	15:53	19 09:33 (WEA 11 (GRS))	
17	05:04	05:56		06:52	07:47	07:48		08:32	09:15 (WEA 11 (GRS))	
	21:41	20:45		19:30	18:17	16:15	13 09:34 (WEA 12 (GRS))	15:53	19 09:33 (WEA 11 (GRS))	
18	05:06	05:58		06:53	07:49	07:49		08:33	09:15 (WEA 11 (GRS))	
	21:39	20:43		19:28	18:14	16:14	13 09:34 (WEA 12 (GRS))	15:53	19 09:34 (WEA 11 (GRS))	
19	05:07	05:59		06:55	07:51	07:51		08:33	09:16 (WEA 11 (GRS))	
	21:38	20:41		19:25	18:12	16:12	11 09:34 (WEA 12 (GRS))	15:53	19 09:35 (WEA 11 (GRS))	
20	05:08	06:01	06:57 (WEA 05 (GRN))	06:57	07:53	07:53		08:34	09:16 (WEA 11 (GRS))	
	21:37	20:38	2 06:55 (WEA 05 (GRN))	19:23	18:10	16:11	9 09:35 (WEA 12 (GRS))	15:53	19 09:35 (WEA 11 (GRS))	
21	05:10	06:03	06:57 (WEA 05 (GRN))	06:59	07:55	07:55		08:35	09:17 (WEA 11 (GRS))	
	21:35	20:36	3 06:57 (WEA 05 (GRN))	19:20	18:08	16:09	8 09:37 (WEA 12 (GRS))	15:54	19 09:36 (WEA 11 (GRS))	
22	05:11	06:05	06:58 (WEA 05 (GRN))	07:01	07:57	07:57		08:35	09:17 (WEA 11 (GRS))	
	21:34	20:34	5 06:58 (WEA 05 (GRN))	19:18	18:05	16:08	6 09:37 (WEA 12 (GRS))	15:55	19 09:36 (WEA 11 (GRS))	
23	05:13	05:45 (WEA 43 (RW))	06:57	06:55 (WEA 05 (GRN))	07:02	07:59	07:59	08:36	09:18 (WEA 11 (GRS))	
	21:33	1 05:46 (WEA 43 (RW))	20:31	3 06:58 (WEA 05 (GRN))	19:15	18:03	15:07	4 09:37 (WEA 12 (GRS))	15:55	19 09:37 (WEA 11 (GRS))
24	05:14	05:46 (WEA 01 (GRN))	06:08	06:57 (WEA 05 (GRN))	07:04	08:01	08:01	08:36	09:18 (WEA 11 (GRS))	
	21:31	4 05:50 (WEA 01 (GRN))	20:29	1 06:58 (WEA 05 (GRN))	19:13	18:01	15:06	1 09:36 (WEA 12 (GRS))	15:56	19 09:37 (WEA 11 (GRS))
25	05:16	05:48 (WEA 01 (GRN))	06:10		07:06	07:03	08:02		08:36	09:18 (WEA 11 (GRS))
	21:30	4 05:52 (WEA 01 (GRN))	20:27		19:10	18:08	16:05		15:57	19 09:37 (WEA 11 (GRS))
26	05:18	05:48 (WEA 01 (GRN))	06:12		07:08	07:04	08:04		08:37	09:20 (WEA 11 (GRS))
	21:28	3 05:52 (WEA 01 (GRN))	20:24		19:08	18:06	16:03		15:57	18 09:38 (WEA 11 (GRS))
27	05:19	05:51 (WEA 01 (GRN))	06:14		07:10	07:06	08:06		08:37	09:20 (WEA 11 (GRS))
	21:26	2 05:53 (WEA 01 (GRN))	20:22		19:05	18:04	16:02		15:58	19 09:39 (WEA 11 (GRS))
28	05:21	05:52 (WEA 01 (GRN))	06:16		07:12	07:08	08:07		08:37	09:20 (WEA 11 (GRS))
	21:25	1 05:53 (WEA 01 (GRN))	20:20		19:03	18:02	16:01		15:59	19 09:39 (WEA 11 (GRS))
29	05:23		06:17		07:13	07:10	08:09		08:37	09:21 (WEA 11 (GRS))
	21:23		20:17		19:00	18:00	16:00		16:00	09:39 (WEA 11 (GRS))
30	05:24		06:19		07:15	07:12	08:11		08:37	09:22 (WEA 11 (GRS))
	21:21		20:15		18:58	18:08	16:09		16:01	18 09:40 (WEA 11 (GRS))
31	05:26		06:21		07:14	07:14			08:37	09:21 (WEA 11 (GRS))
	21:19		20:12			16:46			16:02	18 09:39 (WEA 11 (GRS))
Sonnenscheinstunden	515	461		383	328	257		231	523	
astr.max.mögl.Beschattung	15		49				93			

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) Schatteneende		



Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 41 - IO 41 Schmiedeberg 26 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37	08:06	07:08	06:52	07:17 (WEA 05 (GRN))	05:42
	16:03	16:55	17:52	19:51	8 07:25 (WEA 05 (GRN))	20:48
2	08:37	08:04	07:05	06:49	06:07 (WEA 43 (RW))	7 20:18 (WEA 32 (LR))
	16:04	16:57	17:54	19:53	05:40	21:39
3	08:37	08:03	07:03	06:47	20:50	9 20:20 (WEA 32 (LR))
	16:05	16:59	17:56	19:55	05:37	21:40
4	08:37	08:01	07:01	06:44	20:51	7 20:14 (WEA 32 (LR))
	16:07	17:01	17:58	19:57	05:35	21:41
5	08:36	07:59	06:58	06:42	20:53	9 20:23 (WEA 32 (LR))
	16:08	17:03	18:00	19:59	05:33	21:42
6	08:36	07:57	06:56	06:39	1 07:06 (WEA 03 (GRN))	10 20:24 (WEA 32 (LR))
	16:09	17:05	18:02	19:01	07:07 (WEA 03 (GRN))	21:43
7	08:35	07:55	06:54	06:37	05:31	13 20:13 (WEA 32 (LR))
	16:11	17:07	18:04	19:03	05:29	14 20:27 (WEA 32 (LR))
8	08:35	07:53	06:51	06:35	20:58	11 20:25 (WEA 32 (LR))
	16:12	17:09	18:06	19:05	05:27	14 20:16 (WEA 32 (LR))
9	08:34	07:51	06:49	06:32	21:01	12 20:27 (WEA 32 (LR))
	16:11	17:11	18:08	19:06	05:25	20:15 (WEA 32 (LR))
10	08:34	07:49	06:46	06:30	21:02	7 20:27 (WEA 32 (LR))
	16:15	17:14	18:09	19:08	05:24	10 20:16 (WEA 32 (LR))
11	08:33	07:47	06:44	06:27	21:04	10 20:25 (WEA 32 (LR))
	16:17	17:16	18:11	19:10	05:22	7 20:17 (WEA 32 (LR))
12	08:32	07:45	06:41	06:25	3 06:51 (WEA 04 (GRN))	05:22
	16:18	17:16	18:13	19:12	21:06	7 20:24 (WEA 32 (LR))
13	08:31	07:42	06:39	06:22	6 06:54 (WEA 04 (GRN))	21:06
	16:20	17:20	18:15	19:14	06:47 (WEA 04 (GRN))	05:18
14	08:30	07:41	06:36	06:20	8 06:55 (WEA 04 (GRN))	21:05
	16:21	17:22	18:17	19:16	06:49 (WEA 04 (GRN))	05:16
15	08:29	07:39	06:34	06:18	10 06:54 (WEA 04 (GRN))	21:11
	16:23	17:24	18:19	19:18	11 06:42 (WEA 04 (GRN))	05:15
16	08:28	07:37	06:32	06:15	11 06:53 (WEA 04 (GRN))	21:13
	16:25	17:26	18:21	19:20	06:45 (WEA 04 (GRN))	05:12
17	08:27	07:35	06:29	06:12	10 06:52 (WEA 04 (GRN))	21:15
	16:27	17:28	18:23	19:21	7 06:43 (WEA 04 (GRN))	05:11
18	08:26	07:33	06:27	06:11	06:10	21:16
	16:28	17:30	18:25	19:22	05:08	05:08
19	08:25	07:31	06:24	06:08	10 06:48 (WEA 04 (GRN))	21:18
	16:30	17:32	18:27	19:25	05:06	04:42
20	08:24	07:28	06:22	06:06	12 06:46 (WEA 04 (GRN))	21:20
	16:32	17:34	18:29	19:26	05:04	04:42
21	08:23	07:26	06:19	06:04	11 06:45 (WEA 04 (GRN))	21:21
	16:34	17:36	18:31	19:28	06:38 (WEA 04 (GRN))	05:02
22	08:21	07:24	06:17	06:01	15 06:43 (WEA 04 (GRN))	21:22
	16:36	17:38	18:33	19:31	05:01	04:43
23	08:20	07:22	06:14	05:58	13 06:46 (WEA 04 (GRN))	21:24
	16:38	17:40	18:34	19:33	3 06:27 (WEA 01 (GRN))	05:02
24	08:19	07:19	06:12	05:57	5 06:27 (WEA 01 (GRN))	21:26
	16:39	17:42	18:36	19:35	05:01	04:43
25	08:17	07:17	06:09	05:55	5 06:27 (WEA 01 (GRN))	21:27
	16:41	17:44	18:38	19:37	6 06:26 (WEA 01 (GRN))	04:58
26	08:16	07:15	06:07	05:52	6 06:26 (WEA 01 (GRN))	21:28
	16:43	17:46	18:40	19:38	06:19 (WEA 01 (GRN))	04:58
27	08:14	07:13	06:04	05:50	8 06:26 (WEA 01 (GRN))	21:30
	16:45	17:48	18:42	19:40	9 06:25 (WEA 01 (GRN))	04:57
28	08:13	07:10	06:02	05:48	9 06:25 (WEA 01 (GRN))	21:32
	16:47	17:50	18:44	19:42	6 06:23 (WEA 01 (GRN))	04:55
29	08:11	06:59	05:46	05:46	6 06:23 (WEA 01 (GRN))	21:33
	16:49	17:54	18:48	19:46	06:12 (WEA 43 (RW))	04:54
30	08:10	06:57	05:44	05:44	3 06:15 (WEA 43 (RW))	21:35
	16:51	17:58	18:52	19:48	06:10 (WEA 43 (RW))	04:53
31	08:08	06:54	05:41	05:41	4 06:14 (WEA 43 (RW))	21:36
	16:53	17:59	18:53	19:49	04:52	04:52
Sonnenscheinstunden	248	272	367	421	496	513
astr.max.mögl.Beschattung			109	108	123	386

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 41 - IO 41 Schmiedeberg 26 (Kabelhorst)

### Annahmen für Schattenwurfberechnung

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

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

	Juli		August		September		Oktober		November		Dezember	
1	04:47	05:21 (WEA 41 (RW))	05:28	20:30 (WEA 32 (LR))	06:23	06:51 (WEA 04 (GRN))	07:17	07:16	08:12			
	21:54	13 05:34 (WEA 23 (Kab))	21:18	3 20:33 (WEA 32 (LR))	20:10	3 06:54 (WEA 04 (GRN))	18:55	16:44	15:59			
2	04:48	05:21 (WEA 41 (RW))	05:29	20:27 (WEA 32 (LR))	06:25		07:19	07:18	08:14			
	21:53	13 05:34 (WEA 23 (Kab))	21:16	8 20:35 (WEA 32 (LR))	20:08		18:53	16:42	15:58			
3	04:48	05:22 (WEA 41 (RW))	05:31	20:26 (WEA 32 (LR))	06:26		07:21	07:20	08:15			
	21:53	12 05:34 (WEA 23 (Kab))	21:14	10 20:36 (WEA 32 (LR))	20:05		18:50	16:40	15:57			
4	04:49	05:23 (WEA 41 (RW))	05:33	20:24 (WEA 32 (LR))	06:28		07:23	07:22	08:17			
	21:52	12 05:35 (WEA 23 (Kab))	21:12	13 20:37 (WEA 32 (LR))	20:03		18:48	16:38	15:56			
5	04:50	05:24 (WEA 41 (RW))	05:34	20:24 (WEA 32 (LR))	06:30		07:24	07:24	08:18			
	21:52	11 05:35 (WEA 23 (Kab))	21:10	14 20:38 (WEA 32 (LR))	20:00		18:46	16:36	15:56			
6	04:51	05:25 (WEA 41 (RW))	05:36	20:24 (WEA 32 (LR))	06:32		07:26	07:26	08:20			
	21:51	11 05:36 (WEA 23 (Kab))	21:08	13 20:37 (WEA 32 (LR))	19:58		18:43	16:34	15:55			
7	04:52	05:26 (WEA 41 (RW))	05:38	20:23 (WEA 32 (LR))	06:34		07:01 (WEA 03 (GRN))	07:28	08:21			
	21:50	10 05:36 (WEA 23 (Kab))	21:06	12 20:35 (WEA 32 (LR))	19:55	1 07:02 (WEA 03 (GRN))	18:41	16:32	15:53			
8	04:53	05:27 (WEA 41 (RW))	05:40	20:23 (WEA 32 (LR))	06:35		07:03 (WEA 03 (GRN))	07:30	08:22			
	21:50	9 05:36 (WEA 23 (Kab))	21:04	10 20:33 (WEA 32 (LR))	19:53	1 07:04 (WEA 03 (GRN))	18:38	16:30	15:54			
9	04:54	05:28 (WEA 41 (RW))	05:41	20:23 (WEA 32 (LR))	06:37		07:02	07:32	08:24			
	21:49	9 05:37 (WEA 23 (Kab))	21:02	9 20:32 (WEA 32 (LR))	19:50		18:36	16:28	15:54			
10	04:55	05:29 (WEA 41 (RW))	05:43	20:23 (WEA 32 (LR))	06:39		07:04	07:34	08:25			
	21:48	8 05:37 (WEA 23 (Kab))	21:00	6 20:29 (WEA 32 (LR))	19:48		18:35	16:27	15:54			
11	04:56	05:30 (WEA 41 (RW))	05:45	06:15 (WEA 43 (RW))	06:41		07:10 (WEA 05 (GRN))	07:36	08:26			
	21:47	7 05:37 (WEA 23 (Kab))	20:58	9 20:28 (WEA 32 (LR))	19:45	7 07:17 (WEA 05 (GRN))	18:31	16:25	15:53			
12	04:58	05:31 (WEA 41 (RW))	05:47	06:16 (WEA 43 (RW))	06:43		07:10 (WEA 05 (GRN))	07:38	08:27			
	21:46	5 05:36 (WEA 23 (Kab))	20:56	6 20:25 (WEA 32 (LR))	19:43	8 07:18 (WEA 05 (GRN))	18:29	16:23	15:53			
13	04:59	05:32 (WEA 41 (RW))	05:49	06:18 (WEA 43 (RW))	06:44		07:11 (WEA 05 (GRN))	07:39	08:28			
	21:45	4 05:36 (WEA 23 (Kab))	20:54	4 06:22 (WEA 43 (RW))	19:40	7 07:18 (WEA 05 (GRN))	18:26	16:21	15:53			
14	05:00	05:33 (WEA 41 (RW))	05:50	06:20 (WEA 43 (RW))	06:46		07:13 (WEA 05 (GRN))	07:41	08:29			
	21:44	3 05:36 (WEA 23 (Kab))	20:52	2 06:22 (WEA 43 (RW))	19:38	5 07:18 (WEA 05 (GRN))	18:24	16:20	15:53			
15	05:01	05:34 (WEA 41 (RW))	05:52	06:25 (WEA 43 (RW))	06:48		07:15 (WEA 05 (GRN))	07:43	08:30			
	21:43	1 05:35 (WEA 23 (Kab))	20:49	6 06:31 (WEA 01 (GRN))	19:35	3 07:18 (WEA 05 (GRN))	18:21	16:18	15:53			
16	05:03	05:35	05:54	06:23 (WEA 01 (GRN))	06:50		07:15 (WEA 05 (GRN))	07:45	08:31			
	21:42	05:56	20:47	8 06:31 (WEA 01 (GRN))	19:33		18:19	16:17	15:53			
17	05:04	05:36	05:56	06:25 (WEA 01 (GRN))	06:52		07:17 (WEA 05 (GRN))	07:47	08:32			
	21:41	05:45	20:45	7 06:32 (WEA 01 (GRN))	19:30		18:17	16:15	15:53			
18	05:05	05:37	05:58	06:27 (WEA 01 (GRN))	06:53		07:19 (WEA 05 (GRN))	07:49	08:33			
	21:39	05:43	20:43	6 06:33 (WEA 01 (GRN))	19:28		18:14	16:14	15:53			
19	05:07	05:38	05:59	06:28 (WEA 01 (GRN))	06:55		07:21 (WEA 05 (GRN))	07:51	08:33			
	21:38	05:41	20:41	4 06:33 (WEA 01 (GRN))	19:25		18:12	16:12	15:54			
20	05:08	05:39	06:01	06:30 (WEA 01 (GRN))	06:57		07:23 (WEA RWE01)	07:53	08:34			
	21:37	05:38	20:38	2 06:32 (WEA 01 (GRN))	19:23	6 07:29 (WEA RWE01)	18:10	16:11	15:54			
21	05:10	05:40	06:03	06:30 (WEA 01 (GRN))	06:59		07:29 (WEA RWE01)	07:55	08:35			
	21:35	05:36	20:36	19:20	12 07:41 (WEA RWE01)	18:08	16:09	15:51				
22	05:11	05:41	06:05	07:01	07:01		07:28 (WEA RWE01)	07:57	08:35			
	21:34	05:34	20:34	19:18	14 07:42 (WEA RWE01)	18:05	16:08	15:55				
23	05:13	05:42	06:07	07:02	07:02		07:29 (WEA RWE01)	07:59	08:36			
	21:33	05:31	20:31	19:15	14 07:43 (WEA RWE01)	18:03	16:07	15:55				
24	05:14	05:43	06:08	07:04	07:04		07:31 (WEA RWE01)	08:01	08:00	08:36		
	21:31	05:29	20:29	19:13	12 07:43 (WEA RWE01)	18:01	16:06	15:56				
25	05:16	05:44	06:10	07:06	07:06		07:33 (WEA RWE01)	07:03	08:02	08:36		
	21:30	05:27	20:27	19:10	11 07:44 (WEA RWE01)	16:59	16:04	15:57				
26	05:18	05:45	06:12	06:45 (WEA 04 (GRN))	07:08		07:35 (WEA RWE01)	07:04	08:04	08:37		
	21:28	05:24	20:24	8 06:53 (WEA 04 (GRN))	19:08	8 07:43 (WEA RWE01)	16:56	16:03	15:57			
27	05:19	05:46	06:14	06:44 (WEA 04 (GRN))	07:10		07:36 (WEA RWE01)	07:06	08:06	08:37		
	21:26	05:22	20:22	10 06:54 (WEA 04 (GRN))	19:05	6 07:42 (WEA RWE01)	16:54	16:02	15:58			
28	05:21	05:47	06:16	06:44 (WEA 04 (GRN))	07:12		07:38 (WEA RWE01)	07:08	08:07	08:37		
	21:25	05:20	20:20	11 06:55 (WEA 04 (GRN))	19:03	3 07:41 (WEA RWE01)	16:52	16:01	15:59			
29	05:22	05:48	06:17	06:45 (WEA 04 (GRN))	07:13		07:10	08:09	08:37			
	21:23	05:17	20:17	10 06:55 (WEA 04 (GRN))	19:00		16:50	16:00	16:00			
30	05:24	05:49	06:19	06:47 (WEA 04 (GRN))	07:15		07:12	08:11	08:37			
	21:21	05:15	20:15	8 06:55 (WEA 04 (GRN))	18:58		16:48	15:59	16:01			
31	05:26	05:50	06:21	06:49 (WEA 04 (GRN))	07:16		07:14	08:13	08:37			
	21:19	05:12	20:12	6 06:55 (WEA 04 (GRN))	18:56		16:46	16:02	16:02			
Sonnenscheinstunden	515		461		383		328		257		231	
astr.max.mögl.Beschattung	128		205		121							

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 42 - IO 42 Grünbeck 2

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni	
1	08:37	08:06		07:08		06:52		05:42		04:51	
	16:03	16:55		17:52		19:51		20:46		21:39	
2	08:37	08:04		07:05		06:49		05:39		04:50	
	16:04	16:57		17:54		19:53		20:50		21:40	
3	08:37	08:03		07:03		06:47		05:37		04:49	
	16:05	16:59		17:56		19:55		20:51		21:41	
4	08:37	08:01		07:01		06:44		05:35		04:48	
	16:07	17:01		17:58		19:57		20:53		21:42	
5	08:36	07:59		06:58		06:42		05:33		04:48	
	16:08	17:03		18:00		19:59		20:55		21:43	
6	08:36	07:57		06:56		06:39		05:31		04:47	
	16:09	17:05		18:02		20:01		20:57		21:44	
7	08:35	07:55		06:54		06:37		05:29		04:46	
	16:11	17:07		18:04		20:03		20:59		21:45	
8	08:35	07:53		06:51		06:35		05:27		04:45	
	16:12	17:09		18:05		20:04		21:01		21:46	
9	08:34	07:51		06:49		06:32		05:25		04:44	
	16:14	17:11		18:08		20:06		21:02		21:47	
10	08:34	07:49		06:48		06:30		05:24		04:44	
	16:15	17:13		18:09		20:08		21:04		21:48	
11	08:33	07:47		06:46		06:27		05:22		04:43	
	16:17	17:16		18:11		20:10		21:06		21:49	
12	08:32	07:45		06:44		06:25		05:20		04:44	
	16:18	17:18		18:13		20:12		21:08		21:50	
13	08:31	07:43		06:43		06:23		05:18		04:43	
	16:20	17:20		18:14		20:14		21:10		21:51	
14	08:30	07:41		06:41		06:20		05:16		04:43	
	16:21	17:22		18:15		20:16		21:12		21:51	
15	08:29	07:39		06:40		06:18		05:15		04:43	
	16:23	17:23		18:16		20:18		21:14		21:52	
16	08:28	07:37		06:39		06:16		05:13		04:43	
	16:25	17:25		18:17		20:20		21:16		21:53	
17	08:27	07:35		06:37		06:14		05:11		04:43	
	16:26	17:26		18:18		20:22		21:18		21:53	
18	08:26	07:33		06:36		06:12		05:10		04:43	
	16:28	17:28		18:19		20:24		21:20		21:54	
19	08:25	07:31		06:34		06:10		05:08		04:43	
	16:30	17:30		18:20		20:26		21:22		21:54	
20	08:24	07:29		06:33		06:08		05:06		04:43	
	16:32	17:31		18:21		20:28		21:24		21:54	
21	08:23	07:27		06:31		06:06		05:04		04:43	
	16:34	17:33		18:22		20:30		21:26		21:54	
22	08:22	07:25		06:30		06:04		05:02		04:43	
	16:36	17:35		18:23		20:32		21:28		21:54	
23	08:21	07:23		06:28		06:02		05:00		04:43	
	16:38	17:37		18:24		20:34		21:30		21:54	
24	08:20	07:21		06:27		06:00		04:58		04:43	
	16:40	17:39		18:25		20:36		21:32		21:54	
25	08:19	07:19		06:25		05:58		04:56		04:43	
	16:42	17:41		18:26		20:38		21:34		21:54	
26	08:18	07:17		06:24		05:56		04:54		04:43	
	16:44	17:43		18:27		20:40		21:36		21:54	
27	08:17	07:15		06:22		05:54		04:52		04:43	
	16:46	17:45		18:28		20:42		21:38		21:54	
28	08:16	07:13		06:21		05:52		04:50		04:43	
	16:48	17:47		18:29		20:44		21:40		21:54	
29	08:15	07:11		06:19		05:50		04:48		04:43	
	16:50	17:49		18:30		20:46		21:42		21:54	
30	08:14	07:09		06:18		05:48		04:46		04:43	
	16:52	17:51		18:31		20:48		21:44		21:54	
31	08:13	07:07		06:16		05:46		04:44		04:43	
	16:54	17:53		18:32		20:50		21:46		21:54	
Sonneneinstrahlung		248		367		421		496		513	
astr. max. mögl. Beschattung		272		279		385		477		521	

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 42 - IO 42 Grünbeck 2

### Annahmen für Schattenwurfberechnung

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

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

	Juli		August		September		Oktober		November		Dezember	
1	04:47	05:21 (WEA 40 (RW))	05:27	06:14 (WEA 41 (RW))	06:23	06:53 (WEA 23 (Kab))	07:17	07:44 (WEA 01 (GRN))	07:16	08:12		
	21:54	05:57 (WEA 25 (Kab))	21:18	06:16 (WEA 41 (RW))	20:10	07:08 (WEA 23 (Kab))	18:55	07:56 (WEA 02 (GRN))	16:44	15:59		
2	04:48	05:21 (WEA 40 (RW))	05:29	06:11 (WEA 41 (RW))	06:25	06:55 (WEA 23 (Kab))	07:19	07:46 (WEA 02 (GRN))	07:18	08:14		
	21:53	05:57 (WEA 25 (Kab))	21:16	06:19 (WEA 41 (RW))	20:08	07:04 (WEA 23 (Kab))	18:53	07:57 (WEA 02 (GRN))	16:42	15:58		
3	04:48	05:22 (WEA 40 (RW))	05:31	06:10 (WEA 41 (RW))	06:26		07:21	07:47 (WEA 02 (GRN))	07:20	08:15		
	21:53	05:58 (WEA 25 (Kab))	21:14	06:20 (WEA 41 (RW))	20:05		18:50	07:56 (WEA 02 (GRN))	16:40	15:57		
4	04:49	05:23 (WEA 40 (RW))	05:33	06:08 (WEA 41 (RW))	06:28		07:23	07:49 (WEA 02 (GRN))	07:22	08:17		
	21:52	05:58 (WEA 25 (Kab))	21:12	06:21 (WEA 41 (RW))	20:03		18:48	07:56 (WEA 02 (GRN))	16:38	15:56		
5	04:50	05:24 (WEA 40 (RW))	05:34	06:08 (WEA 41 (RW))	06:30		07:24	07:51 (WEA 02 (GRN))	07:24	08:18		
	21:52	05:59 (WEA 25 (Kab))	21:10	06:22 (WEA 41 (RW))	20:00		18:46	07:57 (WEA 02 (GRN))	16:36	15:56		
6	04:51	05:25 (WEA 40 (RW))	05:36	06:08 (WEA 41 (RW))	06:32	19:15 (WEA 33 (LR))	07:26	07:53 (WEA 03 (GRN))	07:26	08:20		
	21:51	06:00 (WEA 25 (Kab))	21:08	06:22 (WEA 41 (RW))	19:58	19:19 (WEA 33 (LR))	18:43	07:59 (WEA 03 (GRN))	16:34	15:55		
7	04:52	05:25 (WEA 40 (RW))	05:38	06:08 (WEA 41 (RW))	06:34	19:12 (WEA 33 (LR))	07:28	07:55 (WEA 03 (GRN))	07:28	08:21		
	21:50	06:00 (WEA 25 (Kab))	21:06	06:22 (WEA 41 (RW))	19:56	19:12 (WEA 33 (LR))	18:41	07:59 (WEA 03 (GRN))	16:32	15:56		
8	04:53	05:26 (WEA 40 (RW))	05:40	06:10 (WEA 41 (RW))	06:36	19:10 (WEA 33 (LR))	07:30	07:57 (WEA 03 (GRN))	07:30	08:22		
	21:50	06:00 (WEA 25 (Kab))	21:04	06:22 (WEA 41 (RW))	19:53	19:10 (WEA 33 (LR))	18:38	07:59 (WEA 03 (GRN))	16:30	15:54		
9	04:54	05:27 (WEA 40 (RW))	05:41	06:11 (WEA 41 (RW))	06:37	19:09 (WEA 33 (LR))	07:32		07:32	08:24		
	21:49	06:01 (WEA 25 (Kab))	21:02	06:21 (WEA 41 (RW))	19:50	19:07 (WEA 33 (LR))	18:36		16:28	15:54		
10	04:55	05:28 (WEA 40 (RW))	05:43	06:13 (WEA 41 (RW))	06:39	19:08 (WEA 33 (LR))	07:34		07:34	08:25		
	21:48	06:02 (WEA 25 (Kab))	21:00	06:21 (WEA 41 (RW))	19:48	19:19 (WEA 33 (LR))	18:35		16:27	15:54		
11	04:56	05:29 (WEA 40 (RW))	05:45	06:15 (WEA 41 (RW))	06:41	19:14 (WEA 33 (LR))	07:36	06:25 (WEA 04 (GRN))	07:36	08:26		
	21:47	06:03 (WEA 25 (Kab))	20:58	06:21 (WEA 41 (RW))	19:46	19:17 (WEA 33 (LR))	18:31	06:26 (WEA 04 (GRN))	16:25	15:53		
12	04:56	05:29 (WEA 40 (RW))	05:47	06:16 (WEA 41 (RW))	06:43	19:13 (WEA 33 (LR))	07:38	06:28 (WEA 04 (GRN))	07:38	08:27		
	21:46	06:03 (WEA 25 (Kab))	20:56	06:18 (WEA 41 (RW))	19:45	19:15 (WEA 33 (LR))	18:30	06:30 (WEA 04 (GRN))	16:23	15:53		
13	04:56	05:30 (WEA 40 (RW))	05:49	06:19 (WEA 41 (RW))	06:44	19:11 (WEA 33 (LR))	07:39	06:31 (WEA 04 (GRN))	07:40	08:28		
	21:45	06:03 (WEA 25 (Kab))	20:54	19:40	18:40	19:12 (WEA 33 (LR))	18:28	06:32 (WEA 04 (GRN))	16:21	15:53		
14	05:00	05:33 (WEA 40 (RW))	05:50	06:16	06:46	19:13 (WEA 33 (LR))	07:41	06:17 (WEA 04 (GRN))	07:42	08:29		
	21:44	06:04 (WEA 25 (Kab))	20:52	19:38	18:38	19:10 (WEA 33 (LR))	18:24	06:33 (WEA 04 (GRN))	16:20	15:53		
15	05:01	05:34 (WEA 40 (RW))	05:52	06:18	06:48	19:15 (WEA 33 (LR))	07:43	06:18 (WEA 04 (GRN))	07:44	08:30		
	21:43	06:04 (WEA 25 (Kab))	20:49	19:36	18:36	19:14 (WEA 33 (LR))	18:21	06:33 (WEA 04 (GRN))	16:18	15:53		
16	05:02	05:35 (WEA 40 (RW))	05:54	06:20	06:50	19:17 (WEA 33 (LR))	07:45	06:19 (WEA 04 (GRN))	07:46	08:31		
	21:42	06:04 (WEA 25 (Kab))	20:47	19:35	18:35	19:14 (WEA 33 (LR))	18:19	06:33 (WEA 04 (GRN))	16:17	15:53		
17	05:04	05:37 (WEA 40 (RW))	05:56	06:21	06:52	19:18 (WEA 33 (LR))	07:47	06:20 (WEA 04 (GRN))	07:48	08:32		
	21:41	06:05 (WEA 25 (Kab))	20:45	19:30	18:30	19:12 (WEA 33 (LR))	18:17	06:33 (WEA 04 (GRN))	16:15	15:53		
18	05:05	05:38 (WEA 40 (RW))	05:58	06:23	06:53	19:19 (WEA 33 (LR))	07:49	06:17 (WEA 04 (GRN))	07:49	08:33		
	21:39	06:06 (WEA 25 (Kab))	20:43	19:28	18:28	19:14 (WEA 33 (LR))	18:14	06:33 (WEA 04 (GRN))	16:14	15:53		
19	05:07	05:39 (WEA 40 (RW))	05:59	06:25	06:55	19:20 (WEA 33 (LR))	07:51	06:18 (WEA 04 (GRN))	07:51	08:33		
	21:38	06:06 (WEA 25 (Kab))	20:41	19:25	18:25	19:12 (WEA 33 (LR))	18:12	06:33 (WEA 04 (GRN))	16:12	15:54		
20	05:08	05:41 (WEA 40 (RW))	06:01	06:26	06:57	19:21 (WEA 33 (LR))	07:53	06:21 (WEA 04 (GRN))	07:53	08:34		
	21:37	06:06 (WEA 25 (Kab))	20:38	19:23	18:23	19:10 (WEA 33 (LR))	18:10	06:34 (WEA 04 (GRN))	16:11	15:54		
21	05:10	05:42 (WEA 40 (RW))	06:03	06:27	06:59	19:22 (WEA 33 (LR))	07:55	06:23 (WEA 04 (GRN))	07:55	08:35		
	21:35	06:06 (WEA 25 (Kab))	20:36	19:20	18:20	19:12 (WEA 33 (LR))	18:08	06:34 (WEA 04 (GRN))	16:09	15:54		
22	05:11	05:43 (WEA 40 (RW))	06:05	06:28	07:01	19:23 (WEA 33 (LR))	07:57	06:25 (WEA 04 (GRN))	07:57	08:35		
	21:34	06:07 (WEA 25 (Kab))	20:34	19:18	18:18	19:13 (WEA 33 (LR))	18:05	06:35 (WEA 04 (GRN))	16:08	15:55		
23	05:13	05:45 (WEA 40 (RW))	06:07	06:29	07:02	19:24 (WEA 33 (LR))	07:59	06:27 (WEA 04 (GRN))	07:59	08:36		
	21:33	06:08 (WEA 25 (Kab))	20:31	19:15	18:15	19:14 (WEA 33 (LR))	18:03	06:35 (WEA 04 (GRN))	16:07	15:55		
24	05:14	05:46 (WEA 40 (RW))	06:08	06:31	07:04	19:25 (WEA 33 (LR))	08:01	06:29 (WEA 04 (GRN))	08:00	08:36		
	21:31	06:08 (WEA 25 (Kab))	20:28	19:13	18:13	19:14 (WEA 33 (LR))	18:01	06:35 (WEA 04 (GRN))	16:06	15:56		
25	05:16	05:48 (WEA 40 (RW))	06:10	06:32	07:06	19:26 (WEA 33 (LR))	08:03	06:31 (WEA 04 (GRN))	08:02	08:36		
	21:30	06:09 (WEA 25 (Kab))	20:27	19:10	18:10	19:14 (WEA 33 (LR))	18:00	06:36 (WEA 04 (GRN))	16:04	15:57		
26	05:18	05:49 (WEA 40 (RW))	06:12	06:33	07:08	19:27 (WEA 33 (LR))	08:04	06:33 (WEA 04 (GRN))	08:04	08:37		
	21:28	06:10 (WEA 25 (Kab))	20:24	19:08	18:08	19:15 (WEA 33 (LR))	18:00	06:36 (WEA 04 (GRN))	16:03	15:57		
27	05:19	05:51 (WEA 40 (RW))	06:14	06:34	07:10	19:28 (WEA 33 (LR))	08:06	06:35 (WEA 04 (GRN))	08:06	08:37		
	21:26	06:11 (WEA 25 (Kab))	20:22	19:05	18:05	19:15 (WEA 01 (GRN))	18:04	06:36 (WEA 04 (GRN))	16:02	15:58		
28	05:21	05:52 (WEA 40 (RW))	06:16	06:35	07:12	19:29 (WEA 01 (GRN))	08:08	06:38 (WEA 04 (GRN))	08:07	08:37		
	21:25	06:12 (WEA 25 (Kab))	20:20	19:03	18:03	19:16 (WEA 01 (GRN))	18:02	06:38 (WEA 04 (GRN))	16:01	15:59		
29	05:22	05:54 (WEA 40 (RW))	06:17	06:36	07:13	19:30 (WEA 01 (GRN))	08:10	06:39 (WEA 04 (GRN))	08:09	08:37		
	21:23	06:13 (WEA 25 (Kab))	20:17	19:00	18:00	19:16 (WEA 01 (GRN))	18:00	06:39 (WEA 04 (GRN))	16:00	15:59		
30	05:24	05:57 (WEA 40 (RW))	06:19	06:38	07:15	19:31 (WEA 01 (GRN))	08:12	06:42 (WEA 04 (GRN))	08:11	08:37		
	21:21		20:15	18:58	18:58	19:17 (WEA 02 (GRN))	18:04		15:59	16:01		
31	05:26		06:21				07:14			08:37		
	21:19		20:12				16:46			16:02		
Sonnenscheinstunden	515		461		383		328		257	231		
astr.max.mögl.Beschattung	677		405		308		316					

**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	Schattenanfang (WEA mit erstem Schatten)	Zeitpunkt (SS:MM) Schattende	Schattende (WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 43 - IO 43 Grünbeck 15

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03	08:06 16:55	07:08 17:52	06:52 18:51	05:42 20:46	04:51 21:39
2	08:37 16:04	08:04 16:57	07:05 17:54	06:49 18:53	05:39 20:50	04:50 21:40
3	08:37 16:05	08:03 16:59	07:03 17:56	06:47 18:55	05:37 20:51	04:49 21:41
4	08:37 16:07	08:01 17:01	07:01 17:58	06:44 18:57	05:35 20:53	04:48 21:42
5	08:36 16:08	07:59 17:03	06:58 18:00	06:42 19:59	05:33 20:55	04:48 21:43
6	08:36 16:09	07:57 17:05	06:56 18:02	06:39 20:01	05:31 20:57	04:47 21:44
7	08:35 16:11	07:55 17:07	06:54 18:04	06:37 20:03	05:29 20:59	04:46 21:45
8	08:35 16:12	07:53 17:08	06:51 18:05	06:35 20:04	05:27 21:01	04:45 21:46
9	08:34 16:14	07:51 17:10	06:49 18:06	06:33 20:05	05:25 21:02	04:44 21:47
10	08:34 16:15	07:49 17:11	06:47 18:07	06:31 20:06	05:23 21:03	04:43 21:48
11	08:33 16:17	07:47 17:12	06:45 18:08	06:29 20:07	05:21 21:04	04:42 21:49
12	08:32 16:18	07:45 17:13	06:43 18:09	06:27 20:08	05:19 21:05	04:41 21:50
13	08:31 16:19	07:43 17:14	06:41 18:10	06:25 20:09	05:17 21:06	04:40 21:51
14	08:30 16:20	07:41 17:15	06:39 18:11	06:23 20:10	05:15 21:07	04:39 21:52
15	08:29 16:21	07:39 17:16	06:37 18:12	06:21 20:11	05:13 21:08	04:38 21:53
16	08:28 16:22	07:37 17:17	06:35 18:13	06:19 20:12	05:11 21:09	04:37 21:54
17	08:27 16:23	07:35 17:18	06:33 18:14	06:17 20:13	05:09 21:10	04:36 21:55
18	08:26 16:24	07:33 17:19	06:31 18:15	06:15 20:14	05:07 21:11	04:35 21:56
19	08:25 16:25	07:31 17:20	06:29 18:16	06:13 20:15	05:05 21:12	04:34 21:57
20	08:24 16:26	07:29 17:21	06:27 18:17	06:11 20:16	05:03 21:13	04:33 21:58
21	08:23 16:27	07:27 17:22	06:25 18:18	06:09 20:17	05:01 21:14	04:32 21:59
22	08:22 16:28	07:25 17:23	06:23 18:19	06:07 20:18	04:59 21:15	04:31 22:00
23	08:21 16:29	07:23 17:24	06:21 18:20	06:05 20:19	04:57 21:16	04:30 22:01
24	08:20 16:30	07:21 17:25	06:19 18:21	06:03 20:20	04:55 21:17	04:29 22:02
25	08:19 16:31	07:19 17:26	06:17 18:22	06:01 20:21	04:53 21:18	04:28 22:03
26	08:18 16:32	07:17 17:27	06:15 18:23	05:59 20:22	04:51 21:19	04:27 22:04
27	08:17 16:33	07:15 17:28	06:13 18:24	05:57 20:23	04:49 21:20	04:26 22:05
28	08:16 16:34	07:13 17:29	06:11 18:25	05:55 20:24	04:47 21:21	04:25 22:06
29	08:15 16:35	07:11 17:30	06:09 18:26	05:53 20:25	04:45 21:22	04:24 22:07
30	08:14 16:36	07:09 17:31	06:07 18:27	05:51 20:26	04:43 21:23	04:23 22:08
31	08:13 16:37	07:07 17:32	06:05 18:28	05:49 20:27	04:41 21:24	04:22 22:09
Sonnenscheinstunden	248	272	367	421	496	513
astr. max. mögl. Beschattung		202	443	275	599	56

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 43 - IO 43 Grünbeck 15

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember		
1	04:47		05:27	05:58 (WEA K04)	06:23		07:17	18:19 (WEA 32 (LR))	07:16	07:46 (WEA 04 (GRN))	08:12	
	21:54		21:18	24 06:35 (WEA 25 (Kab))	20:10		18:55	8 18:27 (WEA 32 (LR))	16:44	14 08:00 (WEA 05 (GRN))	15:59	
2	04:48		05:29	05:00 (WEA K04)	06:25		07:19	18:18 (WEA 32 (LR))	07:18	07:48 (WEA 05 (GRN))	08:14	
	21:53		21:16	23 06:36 (WEA 25 (Kab))	20:08		18:53	6 18:24 (WEA 32 (LR))	16:42	12 08:00 (WEA 05 (GRN))	15:58	
3	04:48		05:31	06:02 (WEA K04)	06:26		07:21	08:00 (WEA 01 (GRN))	07:20	07:50 (WEA 05 (GRN))	08:15	
	21:53		21:14	22 06:37 (WEA 25 (Kab))	20:05		18:50	12 18:21 (WEA 32 (LR))	16:40	10 08:00 (WEA 05 (GRN))	15:57	
4	04:49		05:33	06:16 (WEA 25 (Kab))	06:28		07:23	07:57 (WEA 01 (GRN))	07:22	07:53 (WEA 05 (GRN))	08:17	
	21:52		21:12	20 06:38 (WEA 25 (Kab))	20:03		18:48	13 18:19 (WEA 32 (LR))	16:38	8 08:01 (WEA 05 (GRN))	15:56	
5	04:50		05:34	06:16 (WEA 25 (Kab))	06:30		07:24	07:56 (WEA 01 (GRN))	07:24	07:55 (WEA 05 (GRN))	08:18	
	21:52		21:10	21 06:37 (WEA 25 (Kab))	20:00	5	07:38 (WEA 23 (Kab))	18:46	14 08:10 (WEA 01 (GRN))	16:36	5 08:00 (WEA 05 (GRN))	15:56
6	04:51		05:36	06:17 (WEA 25 (Kab))	06:32		07:29 (WEA 23 (Kab))	07:26	07:55 (WEA 01 (GRN))	07:26	08:00 (WEA 05 (GRN))	08:20
	21:51	4	05:44 (WEA 40 (RW))	21:08	20 06:37 (WEA 25 (Kab))	19:58	12 07:41 (WEA 23 (Kab))	18:43	16 08:11 (WEA 01 (GRN))	16:34	3 08:00 (WEA 05 (GRN))	15:55
7	04:52		05:38 (WEA 40 (RW))	05:38	06:16 (WEA 25 (Kab))	06:34		07:27 (WEA 23 (Kab))	07:28	07:55 (WEA 01 (GRN))	08:21	
	21:50	6	05:44 (WEA 40 (RW))	21:06	21 06:37 (WEA 25 (Kab))	19:55	16 07:43 (WEA 23 (Kab))	18:41	16 08:11 (WEA 01 (GRN))	16:32	15:55	
8	04:53		05:37 (WEA 40 (RW))	05:40	06:15 (WEA 25 (Kab))	06:33		07:28 (WEA 23 (Kab))	07:30	07:57 (WEA 01 (GRN))	08:20	
	21:50	9	05:46 (WEA 40 (RW))	21:04	21 06:37 (WEA 25 (Kab))	19:54	19 07:45 (WEA 23 (Kab))	18:39	14 08:11 (WEA 01 (GRN))	16:30	15:54	
9	04:54		05:37 (WEA 40 (RW))	05:41	06:15 (WEA 25 (Kab))	06:37		07:24 (WEA 23 (Kab))	07:22	07:59 (WEA 01 (GRN))	08:20	
	21:49	9	05:46 (WEA 40 (RW))	21:02	20 06:35 (WEA 25 (Kab))	19:50	20 07:44 (WEA 23 (Kab))	18:38	12 08:11 (WEA 02 (GRN))	16:38	15:57	
10	04:55		05:37 (WEA 40 (RW))	05:43	06:15 (WEA 25 (Kab))	06:38		07:23 (WEA 23 (Kab))	07:34	08:01 (WEA 01 (GRN))	08:24	
	21:48	11	05:46 (WEA 40 (RW))	21:00	20 06:35 (WEA 25 (Kab))	19:48	12 07:45 (WEA 23 (Kab))	18:37	11 08:11 (WEA 01 (GRN))	16:37	15:54	
11	04:56		05:37 (WEA 40 (RW))	05:45	06:17 (WEA 25 (Kab))	06:41		07:23 (WEA 23 (Kab))	07:30	08:03 (WEA 01 (GRN))	08:26	
	21:47	12	05:44 (WEA 40 (RW))	20:58	18 06:35 (WEA 25 (Kab))	19:43	12 07:45 (WEA 23 (Kab))	18:37	9 08:12 (WEA 01 (GRN))	16:35	15:53	
12	04:58		05:37 (WEA 40 (RW))	05:47	06:17 (WEA 25 (Kab))	06:43		07:23 (WEA 23 (Kab))	07:38	08:05 (WEA 03 (GRN))	08:28	
	21:46	12	05:49 (WEA 40 (RW))	20:50	16 06:33 (WEA 25 (Kab))	19:43	23 07:45 (WEA 23 (Kab))	18:29	0 08:11 (WEA 03 (GRN))	16:23	15:53	
13	04:58		05:36 (WEA 40 (RW))	05:49	06:19 (WEA 25 (Kab))	06:44		07:21 (WEA 23 (Kab))	07:39	08:07 (WEA 03 (GRN))	08:30	
	21:45	14	05:50 (WEA 40 (RW))	20:54	14 06:35 (WEA 41 (RW))	19:40	23 07:44 (WEA 23 (Kab))	18:26	5 08:12 (WEA 03 (GRN))	16:21	15:53	
14	05:00		05:36 (WEA 40 (RW))	05:50	06:21 (WEA 25 (Kab))	06:46		07:21 (WEA 23 (Kab))	07:41	08:09 (WEA 03 (GRN))	08:32	
	21:44	14	05:50 (WEA 40 (RW))	20:52	15 06:40 (WEA 41 (RW))	19:38	22 07:44 (WEA 23 (Kab))	18:24	5 08:12 (WEA 03 (GRN))	16:20	15:53	
15	05:01		05:36 (WEA 40 (RW))	05:52	06:20 (WEA 41 (RW))	06:48		07:21 (WEA 23 (Kab))	07:43	08:11 (WEA 03 (GRN))	08:34	
	21:43	14	05:50 (WEA 40 (RW))	20:49	12 06:41 (WEA 41 (RW))	19:38	21 07:43 (WEA 23 (Kab))	18:21	1 08:12 (WEA 03 (GRN))	16:18	15:53	
16	05:03		05:35 (WEA 40 (RW))	05:54	06:20 (WEA 41 (RW))	06:49		07:21 (WEA 23 (Kab))	07:45	08:12 (WEA 03 (GRN))	08:35	
	21:42	15	05:50 (WEA 40 (RW))	20:47	14 06:42 (WEA 41 (RW))	19:38	20 07:42 (WEA 23 (Kab))	18:19	0 08:12 (WEA 03 (GRN))	16:17	15:53	
17	05:04		05:37 (WEA 40 (RW))	05:50	06:20 (WEA 41 (RW))	06:50		07:21 (WEA 23 (Kab))	07:47	08:12 (WEA 03 (GRN))	08:36	
	21:41	14	05:51 (WEA 40 (RW))	20:45	15 06:43 (WEA 41 (RW))	19:38	16 18:44 (WEA 31 (LR))	18:17	0 08:12 (WEA 03 (GRN))	16:15	15:53	
18	05:05		05:38 (WEA 40 (RW))	05:58	06:20 (WEA 41 (RW))	06:53		07:20 (WEA 23 (Kab))	07:49	08:12 (WEA 03 (GRN))	08:37	
	21:40	20	05:40 (WEA K04)	20:43	15 06:43 (WEA 41 (RW))	19:38	27 18:50 (WEA 32 (LR))	18:14	0 08:12 (WEA 03 (GRN))	16:14	15:53	
19	05:07		05:39 (WEA 40 (RW))	05:59	06:20 (WEA 41 (RW))	06:55		07:20 (WEA 23 (Kab))	07:51	08:12 (WEA 03 (GRN))	08:38	
	21:38	21	05:41 (WEA K04)	20:41	14 06:43 (WEA 41 (RW))	19:38	23 18:58 (WEA 32 (LR))	18:12	0 08:12 (WEA 03 (GRN))	16:12	15:53	
20	05:08		05:41 (WEA 40 (RW))	06:01	06:20 (WEA 41 (RW))	06:57		07:20 (WEA 23 (Kab))	07:53	08:12 (WEA 03 (GRN))	08:39	
	21:37	22	05:42 (WEA K04)	20:39	12 06:43 (WEA 41 (RW))	19:38	21 18:50 (WEA 32 (LR))	18:10	0 08:12 (WEA 03 (GRN))	16:11	15:53	
21	05:10		05:42 (WEA 40 (RW))	06:03	06:20 (WEA 41 (RW))	06:58		07:20 (WEA 23 (Kab))	07:55	08:12 (WEA 03 (GRN))	08:40	
	21:35	22	05:44 (WEA K04)	20:36	10 06:43 (WEA 41 (RW))	19:38	22 18:51 (WEA 32 (LR))	18:08	0 08:12 (WEA 03 (GRN))	16:09	15:53	
22	05:11		05:43 (WEA 40 (RW))	06:05	06:20 (WEA 41 (RW))	07:00		07:20 (WEA 23 (Kab))	07:57	08:12 (WEA 03 (GRN))	08:41	
	21:34	21	05:44 (WEA K04)	20:34	7 06:43 (WEA 41 (RW))	19:38	21 18:49 (WEA 32 (LR))	18:05	0 08:12 (WEA 03 (GRN))	16:08	15:53	
23	05:13		05:45 (WEA 40 (RW))	06:07	06:20 (WEA 41 (RW))	07:02		07:20 (WEA 23 (Kab))	07:59	08:12 (WEA 03 (GRN))	08:42	
	21:33	20	05:45 (WEA K04)	20:31	4 06:43 (WEA 41 (RW))	19:38	18 18:47 (WEA 31 (LR))	18:03	11 08:12 (WEA 03 (GRN))	16:07	15:53	
24	05:14		05:46 (WEA 40 (RW))	06:08	07:04		07:31 (WEA 43 (RW))	08:01	08:38 (WEA RWFC1)	08:00	15:55	
	21:31	19	05:46 (WEA K04)	20:29	19:38	12 18:44 (WEA 32 (LR))	18:01	14 08:12 (WEA 03 (GRN))	16:06	08:00	15:56	
25	05:16		05:46 (WEA 40 (RW))	06:10	07:06		07:31 (WEA 43 (RW))	08:03	08:37 (WEA RWFC1)	08:02	15:56	
	21:30	18	05:46 (WEA K04)	20:27	19:40	7 07:40 (WEA 43 (RW))	18:59	16 07:53 (WEA 04 (GRN))	16:04	08:00	15:57	
26	05:18		05:48 (WEA K04)	06:12	07:06		07:31 (WEA 43 (RW))	08:04	07:25 (WEA RWFC1)	08:04	15:57	
	21:29	17	05:48 (WEA K04)	20:24	2 06:43 (WEA 42 (RW))	19:38	4 07:41 (WEA 43 (RW))	18:06	0 08:14 (WEA 04 (GRN))	16:03	15:57	
27	05:19		05:51 (WEA K04)	06:14	07:06		07:31 (WEA 43 (RW))	08:06	07:25 (WEA RWFC1)	08:06	15:57	
	21:28	18	05:47 (WEA K04)	20:22	0 06:43 (WEA 42 (RW))	19:38	16:04	19 07:34 (WEA 04 (GRN))	16:02	08:00	15:58	
28	05:21		05:51 (WEA K04)	06:15	07:06		07:31 (WEA 43 (RW))	08:07	07:26 (WEA 04 (GRN))	08:07	15:58	
	21:25	17	05:48 (WEA 25 (Kab))	20:20	5 06:43 (WEA 42 (RW))	19:38	16:02	20 07:34 (WEA 04 (GRN))	16:01	08:00	15:59	
29	05:22		05:51 (WEA K04)	06:17	07:06		18:22 (WEA 32 (LR))	07:10	07:26 (WEA 04 (GRN))	08:00	15:59	
	21:23	22	06:31 (WEA 25 (Kab))	20:17	4 06:43 (WEA 42 (RW))	19:38	6 18:28 (WEA 32 (LR))	16:50	14 07:34 (WEA 04 (GRN))	16:00	15:59	
30	05:24		05:53 (WEA K04)	06:19	07:06		18:20 (WEA 32 (LR))	07:12	07:26 (WEA 04 (GRN))	08:00	15:59	
	21:21	24	06:33 (WEA 25 (Kab))	20:15	1 06:43 (WEA 42 (RW))	19:38	9 18:29 (WEA 32 (LR))	16:48	10 07:34 (WEA 04 (GRN))	16:00	15:59	
31	05:26		05:57 (WEA K04)	06:21	10:58		07:14	16:46	15 07:59 (WEA 05 (GRN))	08:07	16:02	
	21:19	24	06:34 (WEA 25 (Kab))	20:12			16:46	15 07:59 (WEA 05 (GRN))	08:07	16:02	16:02	
Sonnenscheinstunden		515	461	383	421	328	292	257	52	231		
astr.max.mögl.Beschattung		417	400									

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

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

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
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 DE-25709 Kaiser-Wilhelm-Koog  
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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 44 - IO 44 Grünbeck 16

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37	08:06	07:08	06:52	05:42	04:51
2	08:37	08:04	07:05	06:49	05:39	04:48
3	08:37	08:03	07:03	06:47	05:37	04:49
4	08:37	08:01	07:01	06:44	05:35	04:48
5	08:36	07:59	06:58	06:42	05:33	04:48
6	08:36	07:57	06:56	06:39	05:31	04:47
7	08:35	07:55	06:54	06:37	05:29	04:46
8	08:35	07:53	06:51	06:35	05:27	04:45
9	08:34	07:51	06:48	06:32	05:25	04:45
10	08:34	07:49	06:46	06:30	05:23	04:44
11	08:33	07:47	06:44	06:27	05:21	04:43
12	08:32	07:45	06:41	06:25	05:19	04:43
13	08:31	07:43	06:39	06:22	05:17	04:43
14	08:30	07:41	06:36	06:20	05:15	04:42
15	08:29	07:39	06:34	06:18	05:13	04:42
16	08:28	07:37	06:32	06:15	05:11	04:42
17	08:27	07:35	06:30	06:13	05:09	04:42
18	08:26	07:33	06:27	06:11	05:07	04:42
19	08:25	07:31	06:25	06:08	05:05	04:42
20	08:24	07:29	06:22	06:06	05:03	04:42
21	08:23	07:27	06:20	06:04	05:01	04:42
22	08:22	07:25	06:18	06:01	04:59	04:42
23	08:21	07:23	06:16	05:59	04:57	04:42
24	08:20	07:21	06:14	05:57	04:55	04:42
25	08:19	07:19	06:12	05:55	04:53	04:42
26	08:18	07:17	06:10	05:53	04:51	04:42
27	08:17	07:15	06:08	05:51	04:49	04:42
28	08:16	07:13	06:06	05:49	04:47	04:42
29	08:15	07:11	06:04	05:47	04:45	04:42
30	08:14	07:09	06:02	05:45	04:43	04:42
31	08:13	07:07	06:00	05:43	04:41	04:42
16:53	16:52	16:51	16:50	16:49	16:48	16:47
Sonnenscheinstunden	248	272	367	421	496	513
astr. max. mögl. Beschattung	74	353	438	364	520	

### 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) Schattensende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

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 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 44 - IO 44 Grünbeck 16

### Annahmen für Schattenwurfberechnung

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

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

Juli		August		September		Oktober		November		Dezember	
1	04:47	05:27	05:58 (WEA K04)	06:23	06:51 (WEA 42 (RW))	07:17	07:44 (WEA 43 (RW))	07:16	07:50 (WEA RWE01)	08:12	08:06 (WEA RWE01)
2	04:48	05:29	06:00 (WEA K04)	06:25	06:52 (WEA 42 (RW))	07:19	07:46 (WEA 43 (RW))	07:18	07:49 (WEA RWE01)	08:14	08:07 (WEA RWE01)
3	04:48	05:31	06:02 (WEA K04)	06:26	06:54 (WEA 42 (RW))	07:21	07:47 (WEA 43 (RW))	07:20	07:50 (WEA RWE01)	08:15	08:08 (WEA RWE01)
4	04:49	05:33	06:03 (WEA K04)	06:28	06:56 (WEA 42 (RW))	07:23	07:49 (WEA 43 (RW))	07:22	07:53 (WEA RWE01)	08:17	08:10 (WEA RWE01)
5	04:50	05:35	06:05 (WEA K04)	06:30	06:58 (WEA 42 (RW))	07:24	08:00 (WEA 23 (Kab))	07:24	08:12 (WEA 04 (GRN))	08:18	08:11 (WEA RWE01)
6	04:51	05:36	06:07 (WEA K04)	06:32	06:59 (WEA 42 (RW))	07:26	08:06 (WEA 23 (Kab))	07:26	08:21 (WEA 04 (GRN))	08:20	08:13 (WEA RWE01)
7	04:52	05:38	06:08 (WEA K04)	06:34	06:59 (WEA 42 (RW))	07:28	08:09 (WEA 23 (Kab))	07:28	08:22 (WEA 04 (GRN))	08:21	08:14 (WEA RWE01)
8	04:53	05:40	06:10 (WEA K04)	06:36	06:59 (WEA 42 (RW))	07:30	08:11 (WEA 23 (Kab))	07:30	08:23 (WEA 04 (GRN))	08:22	08:15 (WEA RWE01)
9	04:54	05:41	06:11 (WEA K04)	06:37	06:59 (WEA 42 (RW))	07:32	08:12 (WEA 23 (Kab))	07:32	08:24 (WEA 04 (GRN))	08:23	08:16 (WEA RWE01)
10	04:55	05:42	06:12 (WEA K04)	06:38	06:59 (WEA 42 (RW))	07:34	08:13 (WEA 23 (Kab))	07:34	08:25 (WEA 04 (GRN))	08:24	08:17 (WEA RWE01)
11	04:56	05:43	06:13 (WEA K04)	06:39	06:59 (WEA 42 (RW))	07:36	08:14 (WEA 23 (Kab))	07:36	08:26 (WEA 04 (GRN))	08:25	08:18 (WEA RWE01)
12	04:56	05:44	06:14 (WEA K04)	06:40	06:59 (WEA 42 (RW))	07:38	08:15 (WEA 23 (Kab))	07:38	08:27 (WEA 04 (GRN))	08:26	08:19 (WEA RWE01)
13	04:58	05:45	06:15 (WEA K04)	06:41	06:59 (WEA 42 (RW))	07:40	08:16 (WEA 23 (Kab))	07:40	08:28 (WEA 04 (GRN))	08:27	08:20 (WEA RWE01)
14	04:58	05:46	06:16 (WEA K04)	06:42	06:59 (WEA 42 (RW))	07:42	08:17 (WEA 23 (Kab))	07:42	08:29 (WEA 04 (GRN))	08:28	08:21 (WEA RWE01)
15	04:59	05:47	06:17 (WEA K04)	06:43	06:59 (WEA 42 (RW))	07:44	08:18 (WEA 23 (Kab))	07:44	08:30 (WEA 04 (GRN))	08:29	08:22 (WEA RWE01)
16	05:00	05:47	06:18 (WEA K04)	06:44	06:59 (WEA 42 (RW))	07:46	08:19 (WEA 23 (Kab))	07:46	08:31 (WEA 04 (GRN))	08:30	08:23 (WEA RWE01)
17	05:01	05:48	06:19 (WEA K04)	06:45	06:59 (WEA 42 (RW))	07:48	08:20 (WEA 23 (Kab))	07:48	08:32 (WEA 04 (GRN))	08:31	08:24 (WEA RWE01)
18	05:02	05:49	06:20 (WEA K04)	06:46	06:59 (WEA 42 (RW))	07:50	08:21 (WEA 23 (Kab))	07:50	08:33 (WEA 04 (GRN))	08:32	08:25 (WEA RWE01)
19	05:03	05:50	06:21 (WEA K04)	06:47	06:59 (WEA 42 (RW))	07:52	08:22 (WEA 23 (Kab))	07:52	08:34 (WEA 04 (GRN))	08:33	08:26 (WEA RWE01)
20	05:04	05:51	06:22 (WEA K04)	06:48	06:59 (WEA 42 (RW))	07:54	08:23 (WEA 23 (Kab))	07:54	08:35 (WEA 04 (GRN))	08:34	08:27 (WEA RWE01)
21	05:05	05:52	06:23 (WEA K04)	06:49	06:59 (WEA 42 (RW))	07:56	08:24 (WEA 23 (Kab))	07:56	08:36 (WEA 04 (GRN))	08:35	08:28 (WEA RWE01)
22	05:06	05:53	06:24 (WEA K04)	06:50	06:59 (WEA 42 (RW))	07:58	08:25 (WEA 23 (Kab))	07:58	08:37 (WEA 04 (GRN))	08:36	08:29 (WEA RWE01)
23	05:07	05:54	06:25 (WEA K04)	06:51	06:59 (WEA 42 (RW))	08:00	08:26 (WEA 23 (Kab))	08:00	08:38 (WEA 04 (GRN))	08:37	08:30 (WEA RWE01)
24	05:08	05:55	06:26 (WEA K04)	06:52	06:59 (WEA 42 (RW))	08:02	08:27 (WEA 23 (Kab))	08:02	08:39 (WEA 04 (GRN))	08:38	08:31 (WEA RWE01)
25	05:09	05:56	06:27 (WEA K04)	06:53	06:59 (WEA 42 (RW))	08:04	08:28 (WEA 23 (Kab))	08:04	08:40 (WEA 04 (GRN))	08:39	08:32 (WEA RWE01)
26	05:10	05:57	06:28 (WEA K04)	06:54	06:59 (WEA 42 (RW))	08:06	08:29 (WEA 23 (Kab))	08:06	08:41 (WEA 04 (GRN))	08:40	08:33 (WEA RWE01)
27	05:11	05:58	06:29 (WEA K04)	06:55	06:59 (WEA 42 (RW))	08:08	08:30 (WEA 23 (Kab))	08:08	08:42 (WEA 04 (GRN))	08:41	08:34 (WEA RWE01)
28	05:12	05:59	06:30 (WEA K04)	06:56	06:59 (WEA 42 (RW))	08:10	08:31 (WEA 23 (Kab))	08:10	08:43 (WEA 04 (GRN))	08:42	08:35 (WEA RWE01)
29	05:13	06:00	06:31 (WEA K04)	06:57	06:59 (WEA 42 (RW))	08:12	08:32 (WEA 23 (Kab))	08:12	08:44 (WEA 04 (GRN))	08:43	08:36 (WEA RWE01)
30	05:14	06:01	06:32 (WEA K04)	06:58	06:59 (WEA 42 (RW))	08:14	08:33 (WEA 23 (Kab))	08:14	08:45 (WEA 04 (GRN))	08:44	08:37 (WEA RWE01)
31	05:15	06:02	06:33 (WEA K04)	06:59	06:59 (WEA 42 (RW))	08:16	08:34 (WEA 23 (Kab))	08:16	08:46 (WEA 04 (GRN))	08:45	08:38 (WEA RWE01)
Sonnenscheinstunden		515	461	383	341	328	267	257	286	231	
astr. max. mögl. Beschattung		351	523	341	341	267	267	257	286	231	

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) Schattensende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 45 - IO 45 Grünbeck 26

### Annahmen für Schattenwurfberechnung

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

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

Januar		Februar		März		April		Mai		Juni		
1	08:37	09:12 (WEA 04 (GRN))	08:06	08:38 (WEA RWED1)	07:08	07:38 (WEA 43 (RW))	06:52	07:16 (WEA 41 (RW))	05:42	06:08 (WEA 40 (RW))	04:51	
16:03	3	09:15 (WEA 04 (GRN))	16:55	08:54 (WEA RWED1)	17:52	17:25 (WEA 33 (LR))	15:51	07:55 (WEA 25 (Kab))	20:48	06:28 (WEA K04)	21:39	
2	08:37	09:12 (WEA 04 (GRN))	08:04	08:33 (WEA 01 (GRN))	07:05	07:38 (WEA 43 (RW))	06:49	07:15 (WEA 41 (RW))	05:39	06:06 (WEA 40 (RW))	04:50	
16:04	4	09:16 (WEA 04 (GRN))	16:57	08:54 (WEA RWED1)	17:54	17:26 (WEA 33 (LR))	15:53	07:54 (WEA 25 (Kab))	20:50	06:27 (WEA K04)	21:40	
3	08:37	09:11 (WEA 04 (GRN))	08:03	08:31 (WEA 01 (GRN))	07:03	07:41 (WEA 43 (RW))	06:47	07:15 (WEA 41 (RW))	05:37	06:04 (WEA 40 (RW))	04:49	
16:05	5	09:16 (WEA 04 (GRN))	16:59	08:53 (WEA RWED1)	17:56	17:29 (WEA 33 (LR))	15:55	07:54 (WEA 25 (Kab))	20:51	06:27 (WEA K04)	21:41	
4	08:37	09:11 (WEA 04 (GRN))	08:01	08:29 (WEA 01 (GRN))	07:01	17:22 (WEA 33 (LR))	06:44	07:14 (WEA 41 (RW))	05:35	06:04 (WEA 40 (RW))	04:48	
16:07	6	09:17 (WEA 04 (GRN))	17:01	08:50 (WEA RWED1)	17:58	17:30 (WEA 33 (LR))	15:57	07:53 (WEA 25 (Kab))	20:53	06:27 (WEA K04)	21:42	
5	08:36	09:10 (WEA 05 (GRN))	07:59	08:27 (WEA 01 (GRN))	06:58	17:23 (WEA 33 (LR))	06:42	07:15 (WEA 41 (RW))	05:33	06:04 (WEA 40 (RW))	04:48	
16:08	7	09:17 (WEA 04 (GRN))	17:03	08:37 (WEA 01 (GRN))	18:00	17:33 (WEA 33 (LR))	15:59	07:53 (WEA 25 (Kab))	20:55	06:26 (WEA K04)	21:43	
6	08:36	09:10 (WEA 05 (GRN))	07:57	08:25 (WEA 01 (GRN))	06:56	17:24 (WEA 33 (LR))	06:39	07:15 (WEA 41 (RW))	05:31	06:04 (WEA 40 (RW))	04:47	
16:09	9	09:19 (WEA 04 (GRN))	17:05	08:38 (WEA 01 (GRN))	18:02	17:32 (WEA 33 (LR))	20:01	07:52 (WEA 25 (Kab))	20:57	06:25 (WEA K04)	21:44	
7	08:35	09:09 (WEA 05 (GRN))	07:55	08:23 (WEA 01 (GRN))	06:54	17:28 (WEA 33 (LR))	06:37	07:17 (WEA 41 (RW))	05:29	21	06:04 (WEA 40 (RW))	04:46
16:11	10	09:19 (WEA 04 (GRN))	17:07	08:38 (WEA 01 (GRN))	18:04	17:29 (WEA 33 (LR))	20:03	07:51 (WEA 25 (Kab))	20:59	06:24 (WEA K04)	21:45	
8	08:35	09:06 (WEA 05 (GRN))	07:53	08:21 (WEA 01 (GRN))	06:51	17:25 (WEA 33 (LR))	06:35	07:21 (WEA 41 (RW))	05:27	06:04 (WEA 40 (RW))	04:45	
16:12	11	09:19 (WEA 04 (GRN))	17:09	08:35 (WEA 01 (GRN))	18:06	17:29 (WEA 33 (LR))	20:03	07:51 (WEA 25 (Kab))	20:59	06:24 (WEA K04)	21:45	
9	08:34	09:07 (WEA 05 (GRN))	07:51	08:18 (WEA 01 (GRN))	06:49	17:24 (WEA 33 (LR))	06:32	07:20 (WEA 41 (RW))	05:25	06:06 (WEA 40 (RW))	04:45	
16:13	13	09:20 (WEA 04 (GRN))	17:11	08:37 (WEA 01 (GRN))	18:08	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:02	06:26 (WEA K04)	21:47	
10	08:34	09:07 (WEA 05 (GRN))	07:49	08:18 (WEA 01 (GRN))	06:48	17:24 (WEA 33 (LR))	06:30	07:21 (WEA 41 (RW))	05:24	06:06 (WEA 40 (RW))	04:44	
16:14	14	09:21 (WEA 04 (GRN))	17:13	08:37 (WEA 01 (GRN))	18:09	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:04	06:24 (WEA K04)	21:48	
11	08:33	09:06 (WEA 05 (GRN))	07:47	08:14 (WEA 01 (GRN))	06:44	17:23 (WEA 33 (LR))	06:27	07:21 (WEA 41 (RW))	05:22	06:07 (WEA 40 (RW))	04:44	
16:15	15	09:21 (WEA 04 (GRN))	17:16	08:36 (WEA 01 (GRN))	18:11	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:49	
12	08:30	09:05 (WEA 05 (GRN))	07:45	08:17 (WEA 01 (GRN))	06:41	17:24 (WEA 33 (LR))	06:25	07:20 (WEA 41 (RW))	05:20	06:07 (WEA 40 (RW))	04:43	
16:16	17	09:22 (WEA 04 (GRN))	17:18	08:37 (WEA 01 (GRN))	18:13	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:50	
13	08:31	09:04 (WEA 05 (GRN))	07:43	08:10 (WEA 01 (GRN))	06:39	17:23 (WEA 33 (LR))	06:22	07:20 (WEA 41 (RW))	05:18	06:07 (WEA 40 (RW))	04:43	
16:17	18	09:22 (WEA 04 (GRN))	17:20	08:38 (WEA 01 (GRN))	18:15	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:51	
14	08:30	09:02 (WEA 05 (GRN))	07:41	08:12 (WEA 01 (GRN))	06:36	17:23 (WEA 33 (LR))	06:20	07:20 (WEA 41 (RW))	05:16	06:07 (WEA 40 (RW))	04:42	
16:18	19	09:21 (WEA 04 (GRN))	17:22	08:39 (WEA 01 (GRN))	18:17	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:51	
15	08:29	09:03 (WEA 05 (GRN))	07:38	08:15 (WEA 01 (GRN))	06:34	17:24 (WEA 33 (LR))	06:18	07:20 (WEA 41 (RW))	05:14	06:07 (WEA 40 (RW))	04:41	
16:19	20	09:21 (WEA 04 (GRN))	17:24	08:39 (WEA 01 (GRN))	18:19	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:52	
16	08:28	09:01 (WEA 05 (GRN))	07:34	08:13 (WEA 01 (GRN))	06:29	17:23 (WEA 33 (LR))	06:15	07:20 (WEA 41 (RW))	05:12	06:07 (WEA 40 (RW))	04:40	
16:20	21	09:21 (WEA 04 (GRN))	17:26	08:39 (WEA 01 (GRN))	18:21	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:52	
17	08:27	09:00 (WEA 05 (GRN))	07:30	08:15 (WEA 01 (GRN))	06:24	17:23 (WEA 33 (LR))	06:13	07:20 (WEA 41 (RW))	05:10	06:07 (WEA 40 (RW))	04:39	
16:21	22	09:22 (WEA 04 (GRN))	17:28	08:40 (WEA 01 (GRN))	18:23	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:53	
18	08:26	09:06 (WEA 05 (GRN))	07:33	08:16 (WEA 01 (GRN))	06:27	17:24 (WEA 33 (LR))	06:12	07:20 (WEA 41 (RW))	05:08	06:07 (WEA 40 (RW))	04:38	
16:22	23	09:21 (WEA 04 (GRN))	17:30	08:40 (WEA 01 (GRN))	18:25	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:53	
19	08:25	09:04 (WEA 05 (GRN))	07:27	08:14 (WEA 01 (GRN))	06:22	17:23 (WEA 33 (LR))	06:10	07:20 (WEA 41 (RW))	05:06	06:07 (WEA 40 (RW))	04:37	
16:23	24	09:21 (WEA 04 (GRN))	17:32	08:40 (WEA 01 (GRN))	18:27	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:54	
20	08:24	09:11 (WEA 05 (GRN))	07:28	08:15 (WEA 01 (GRN))	06:19	17:23 (WEA 33 (LR))	06:05	07:20 (WEA 41 (RW))	05:02	06:07 (WEA 40 (RW))	04:35	
16:24	25	09:21 (WEA 04 (GRN))	17:34	08:40 (WEA 01 (GRN))	18:29	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:54	
21	08:23	09:13 (WEA 05 (GRN))	07:26	08:16 (WEA 01 (GRN))	06:19	17:24 (WEA 33 (LR))	06:04	07:20 (WEA 41 (RW))	05:00	06:07 (WEA 40 (RW))	04:34	
16:25	26	09:21 (WEA 04 (GRN))	17:36	08:40 (WEA 01 (GRN))	18:31	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:54	
22	08:21	09:16 (WEA 05 (GRN))	07:24	08:13 (WEA 01 (GRN))	06:17	17:23 (WEA 33 (LR))	06:01	07:20 (WEA 41 (RW))	04:57	06:07 (WEA 40 (RW))	04:33	
16:26	27	09:21 (WEA 04 (GRN))	17:38	08:40 (WEA 01 (GRN))	18:35	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
23	08:20	09:20 (WEA 05 (GRN))	07:23	08:13 (WEA 01 (GRN))	06:15	17:23 (WEA 33 (LR))	05:57	07:20 (WEA 41 (RW))	04:53	06:07 (WEA 40 (RW))	04:32	
16:27	28	09:21 (WEA 04 (GRN))	17:40	08:40 (WEA 01 (GRN))	18:39	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
24	08:19	09:26 (WEA 05 (GRN))	07:19	08:16 (WEA 01 (GRN))	06:12	17:24 (WEA 33 (LR))	05:52	07:20 (WEA 41 (RW))	04:50	06:07 (WEA 40 (RW))	04:31	
16:28	29	09:21 (WEA 04 (GRN))	17:42	08:40 (WEA 01 (GRN))	18:43	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
25	08:17	09:31 (WEA 05 (GRN))	07:17	08:17 (WEA 01 (GRN))	06:09	17:23 (WEA 33 (LR))	05:45	07:20 (WEA 41 (RW))	04:47	06:07 (WEA 40 (RW))	04:30	
16:29	30	09:21 (WEA 04 (GRN))	17:44	08:40 (WEA 01 (GRN))	18:47	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
26	08:16	09:40 (WEA 05 (GRN))	07:13	08:17 (WEA 01 (GRN))	06:07	17:23 (WEA 33 (LR))	05:42	07:20 (WEA 41 (RW))	04:44	06:07 (WEA 40 (RW))	04:29	
16:30	31	09:21 (WEA 04 (GRN))	17:46	08:40 (WEA 01 (GRN))	18:51	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
27	08:14	09:50 (WEA 05 (GRN))	07:08	08:17 (WEA 01 (GRN))	06:04	17:23 (WEA 33 (LR))	05:38	07:20 (WEA 41 (RW))	04:38	06:07 (WEA 40 (RW))	04:28	
16:31	1	09:21 (WEA 04 (GRN))	17:48	08:40 (WEA 01 (GRN))	18:59	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
28	08:13	09:59 (WEA 05 (GRN))	07:03	08:17 (WEA 01 (GRN))	06:02	17:23 (WEA 33 (LR))	05:35	07:20 (WEA 41 (RW))	04:33	06:07 (WEA 40 (RW))	04:27	
16:32	2	09:21 (WEA 04 (GRN))	17:50	08:40 (WEA 01 (GRN))	19:01	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
29	08:11	09:59 (WEA 05 (GRN))	07:00	08:17 (WEA 01 (GRN))	06:00	17:23 (WEA 33 (LR))	05:32	07:20 (WEA 41 (RW))	04:29	06:07 (WEA 40 (RW))	04:26	
16:33	3	09:21 (WEA 04 (GRN))	17:52	08:40 (WEA 01 (GRN))	19:03	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
30	08:10	09:56 (WEA 05 (GRN))	07:00	08:17 (WEA 01 (GRN))	06:00	17:23 (WEA 33 (LR))	05:31	07:20 (WEA 41 (RW))	04:28	06:07 (WEA 40 (RW))	04:25	
16:34	4	09:21 (WEA 04 (GRN))	17:54	08:40 (WEA 01 (GRN))	19:05	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
31	08:08	09:57 (WEA 05 (GRN))	07:00	08:17 (WEA 01 (GRN))	06:00	17:23 (WEA 33 (LR))	05:30	07:20 (WEA 41 (RW))	04:27	06:07 (WEA 40 (RW))	04:24	
16:35	5	09:21 (WEA 04 (GRN))	17:55	08:40 (WEA 01 (GRN))	19:07	17:30 (WEA 33 (LR))	20:03	07:50 (WEA 25 (Kab))	21:06	06:24 (WEA K04)	21:55	
Sonnenscheinstunden	248		272		367		421		496		513	
astr.max.mögl.Beschattung	353		577		220		398		210			

**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</
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) **Schattenrezeptor:** IO 45 - IO 45 Grünbeck 26

### Annahmen für Schattenwurfberechnung

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

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

	Juli	August	September	Oktober	November	Dezember	
1	04:47 21:54	05:27 21:18	06:19 (WEA 40 (RW)) 20:10	07:33 (WEA 25 (Kab)) 18:55	07:17 18:44	07:16 16:44	
2	04:48 21:53	05:29 21:16	06:17 (WEA 40 (RW)) 20:08	07:29 (WEA 25 (Kab)) 18:53	07:19 18:53	07:18 16:42	
3	04:48 21:53	05:31 21:14	06:16 (WEA 40 (RW)) 20:05	07:27 (WEA 25 (Kab)) 18:50	07:21 18:50	07:20 16:40	
4	04:49 21:52	05:33 21:12	06:15 (WEA 40 (RW)) 20:03	07:19 (WEA 41 (RW)) 18:48	07:23 18:48	07:22 16:38	
5	04:50 21:52	05:34 21:10	06:14 (WEA 40 (RW)) 20:00	07:13 (WEA 41 (RW)) 18:45	07:24 18:45	07:24 16:36	
6	04:51 21:51	05:36 21:08	06:14 (WEA 40 (RW)) 19:58	07:12 (WEA 41 (RW)) 18:43	07:26 18:43	07:26 16:34	
7	04:52 21:50	05:38 21:06	06:13 (WEA 40 (RW)) 19:55	07:10 (WEA 41 (RW)) 18:41	07:28 18:41	07:28 16:32	
8	04:53 21:49	05:40 21:04	06:12 (WEA 40 (RW)) 19:53	07:10 (WEA 41 (RW)) 18:39	07:30 18:39	07:30 16:30	
9	04:54 21:49	05:41 21:02	06:12 (WEA 40 (RW)) 19:50	07:10 (WEA 41 (RW)) 18:37	07:31 18:37	07:31 16:28	
10	04:55 21:48	05:42 21:00	06:11 (WEA 40 (RW)) 19:48	07:10 (WEA 41 (RW)) 18:35	07:32 18:35	07:32 16:26	
11	04:56 21:47	05:43 20:58	06:11 (WEA 40 (RW)) 19:46	07:10 (WEA 41 (RW)) 18:33	07:33 18:33	07:33 16:24	
12	04:58 21:46	05:47 20:56	06:10 (WEA 40 (RW)) 19:43	07:10 (WEA 41 (RW)) 18:31	07:34 18:31	07:34 16:22	
13	04:59 21:45	05:49 20:54	06:10 (WEA 40 (RW)) 19:40	07:11 (WEA 41 (RW)) 18:29	07:35 18:29	07:35 16:20	
14	05:00 21:44	05:50 20:52	06:10 (WEA 40 (RW)) 19:38	07:13 (WEA 41 (RW)) 18:24	07:36 18:24	07:36 16:18	
15	05:01 21:43	05:52 20:50	06:11 (WEA 40 (RW)) 19:36	07:15 (WEA 41 (RW)) 18:21	07:37 18:21	07:37 16:16	
16	05:03 21:42	05:54 20:47	06:11 (WEA 40 (RW)) 19:33	07:17 (WEA 41 (RW)) 18:19	07:38 18:19	07:38 16:14	
17	05:04 21:41	05:56 20:45	06:12 (WEA 40 (RW)) 19:30	07:19 (WEA 41 (RW)) 18:17	07:39 18:17	07:39 16:12	
18	05:05 21:40	05:58 20:43	06:12 (WEA 40 (RW)) 19:28	07:20 (WEA 41 (RW)) 18:15	07:40 18:15	07:40 16:10	
19	05:07 21:39	05:59 20:41	06:13 (WEA 40 (RW)) 19:25	07:22 (WEA 41 (RW)) 18:13	07:41 18:13	07:41 16:08	
20	05:08 21:37	06:01 20:39	06:13 (WEA 40 (RW)) 19:23	07:23 (WEA 41 (RW)) 18:11	07:42 18:11	07:42 16:06	
21	05:10 21:35	06:03 20:36	06:14 (WEA 40 (RW)) 19:20	07:25 (WEA 41 (RW)) 18:09	07:43 18:09	07:43 16:04	
22	05:11 21:34	06:05 20:34	06:14 (WEA 40 (RW)) 19:18	07:26 (WEA 41 (RW)) 18:07	07:44 18:07	07:44 16:02	
23	05:13 21:33	06:07 20:31	06:15 (WEA 40 (RW)) 19:15	07:27 (WEA 41 (RW)) 18:05	07:45 18:05	07:45 16:00	
24	05:14 21:33	06:08 20:29	06:15 (WEA 40 (RW)) 19:13	07:28 (WEA 41 (RW)) 18:03	07:46 18:03	07:46 15:58	
25	05:16 21:30	06:10 20:27	06:16 (WEA 40 (RW)) 19:10	07:29 (WEA 41 (RW)) 18:01	07:47 18:01	07:47 15:56	
26	05:18 21:29	06:12 20:24	06:16 (WEA 40 (RW)) 19:08	07:30 (WEA 41 (RW)) 17:59	07:48 17:59	07:48 15:54	
27	05:19 21:28	06:14 20:22	06:17 (WEA 40 (RW)) 19:05	07:31 (WEA 41 (RW)) 17:57	07:49 17:57	07:49 15:52	
28	05:21 21:27	06:16 20:20	06:17 (WEA 40 (RW)) 19:03	07:32 (WEA 41 (RW)) 17:55	07:50 17:55	07:50 15:50	
29	05:23 21:25	06:17 20:18	06:18 (WEA 40 (RW)) 19:00	07:33 (WEA 41 (RW)) 17:53	07:51 17:53	07:51 15:48	
30	05:25 21:23	06:19 20:15	06:18 (WEA 40 (RW)) 18:58	07:34 (WEA 41 (RW)) 17:51	07:52 17:51	07:52 15:46	
31	05:26 21:19	06:21 20:12	06:19 (WEA 40 (RW)) 18:55	07:35 (WEA 41 (RW)) 17:49	07:53 17:49	07:53 15:44	
Sonnenscheinstunden		515	461	383	328	257	231
astr. max. mögl. Beschattung			284	491	498	410	103

**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 Zeitpunkt (SS:MM)	Schattenanfang (WEA mit erstem Schatten)	Schattenende (WEA mit letztem Schatten)
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Projekt:

**SWP Windpark Riepsdorf-Grömitz**

Lizenzierter Anwender:

**GL Garrad Hassan Deutschland GmbH**  
 Sommerdeich 14 b  
 DE-25709 Kaiser-Wilhelm-Koog  
 (0 48 56)901-0  
 Jörg Dedert / joerg.dedert@dnv.com  
 Berechnet:  
 10.01.2023 21:57/3.6.361

## SHADOW - Kalender

**Berechnung:** Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG.6-155) **Schattenrezeptor:** IO 46 - IO 46 Diekstraat 29

### Annahmen für Schattenwurfberechnung

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

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

	Januar	Februar	März	April	Mai	Juni
1	08:37	09:12 (WEA 05 (GRN))	08:06	08:34 (WEA 02 (GRN))	07:08	04:51
2	08:37	09:31 (WEA 04 (GRN))	16:55	34 09:11 (WEA 23 (Kab))	17:52	19:51
3	08:37	09:12 (WEA 05 (GRN))	08:05	08:33 (WEA 02 (GRN))	07:05	04:49
4	08:37	09:31 (WEA 04 (GRN))	16:57	35 09:12 (WEA 23 (Kab))	17:54	2 07:41 (WEA 25 (Kab))
5	08:37	09:12 (WEA 05 (GRN))	08:03	08:31 (WEA 03 (GRN))	07:03	06:47
6	08:37	09:31 (WEA 04 (GRN))	16:59	31 09:11 (WEA 23 (Kab))	17:56	11 07:46 (WEA 25 (Kab))
7	08:37	09:13 (WEA 05 (GRN))	08:01	08:29 (WEA 03 (GRN))	07:01	06:44
8	08:37	09:32 (WEA 04 (GRN))	17:01	32 09:11 (WEA 23 (Kab))	17:58	16 07:48 (WEA 25 (Kab))
9	08:36	09:13 (WEA 05 (GRN))	07:59	08:27 (WEA 03 (GRN))	06:58	07:30 (WEA 25 (Kab))
10	08:36	09:31 (WEA 04 (GRN))	17:07	29 09:11 (WEA 23 (Kab))	18:04	19 07:49 (WEA 25 (Kab))
11	08:36	09:15 (WEA 05 (GRN))	07:57	08:25 (WEA 03 (GRN))	06:56	07:29 (WEA 25 (Kab))
12	08:36	09:32 (WEA 04 (GRN))	17:05	23 09:10 (WEA 23 (Kab))	18:02	21 07:50 (WEA 25 (Kab))
13	08:35	09:15 (WEA 05 (GRN))	07:55	08:54 (WEA 23 (Kab))	06:54	07:28 (WEA 25 (Kab))
14	08:35	09:31 (WEA 04 (GRN))	17:07	15 09:09 (WEA 23 (Kab))	18:04	22 07:50 (WEA 25 (Kab))
15	08:35	09:17 (WEA 05 (GRN))	07:53	08:56 (WEA 23 (Kab))	06:51	07:27 (WEA 25 (Kab))
16	08:34	09:20 (WEA 04 (GRN))	17:29	13 09:27 (WEA 23 (Kab))	18:26	33 07:50 (WEA 25 (Kab))
17	08:34	09:19 (WEA 05 (GRN))	07:51	08:59 (WEA 23 (Kab))	06:49	07:27 (WEA 25 (Kab))
18	08:34	09:29 (WEA 04 (GRN))	17:11	4 09:25 (WEA 23 (Kab))	18:28	54 07:51 (WEA 25 (Kab))
19	08:33	09:17 (WEA 05 (GRN))	07:50	08:46	06:46	07:26 (WEA 25 (Kab))
20	08:33	09:32 (WEA 04 (GRN))	17:11	1 08:29	18:00	12 07:50 (WEA 25 (Kab))
21	08:33	09:17 (WEA 05 (GRN))	07:47	08:44	06:47	07:25 (WEA 25 (Kab))
22	08:33	09:31 (WEA 04 (GRN))	17:07	18:23	18:23	23 07:50 (WEA 25 (Kab))
23	08:32	09:17 (WEA 05 (GRN))	07:45	08:41	06:45	07:24 (WEA 25 (Kab))
24	08:32	09:30 (WEA 04 (GRN))	17:05	15 09:28 (WEA 23 (Kab))	18:01	15 07:51 (WEA 25 (Kab))
25	08:32	09:18 (WEA 05 (GRN))	07:43	08:38	06:43	07:23 (WEA 25 (Kab))
26	08:32	09:31 (WEA 04 (GRN))	17:03	12 09:27 (WEA 23 (Kab))	18:00	12 07:51 (WEA 25 (Kab))
27	08:31	09:18 (WEA 05 (GRN))	07:41	08:35	06:41	07:22 (WEA 25 (Kab))
28	08:31	09:30 (WEA 04 (GRN))	17:01	9 09:26 (WEA 23 (Kab))	17:57	14 07:51 (WEA 25 (Kab))
29	08:31	09:18 (WEA 05 (GRN))	07:39	08:32	06:39	07:21 (WEA 25 (Kab))
30	08:31	09:31 (WEA 04 (GRN))	17:00	6 09:25 (WEA 23 (Kab))	17:56	11 07:51 (WEA 25 (Kab))
31	08:30	09:18 (WEA 05 (GRN))	07:37	08:29	06:37	07:20 (WEA 25 (Kab))
1	08:30	09:30 (WEA 04 (GRN))	16:58	3 09:24 (WEA 23 (Kab))	17:55	10 07:50 (WEA 25 (Kab))
2	08:29	09:18 (WEA 05 (GRN))	07:35	08:26	06:35	07:19 (WEA 25 (Kab))
3	08:29	09:31 (WEA 04 (GRN))	16:56	0 09:23 (WEA 23 (Kab))	17:54	9 07:49 (WEA 25 (Kab))
4	08:29	09:19 (WEA 05 (GRN))	07:33	08:23	06:33	07:18 (WEA 25 (Kab))
5	08:29	09:32 (WEA 04 (GRN))	16:54	27 09:28 (WEA 23 (Kab))	17:52	20 07:49 (WEA 25 (Kab))
6	08:28	09:19 (WEA 05 (GRN))	07:31	08:20	06:31	07:17 (WEA 25 (Kab))
7	08:28	09:32 (WEA 04 (GRN))	16:52	24 09:29 (WEA 23 (Kab))	17:50	17 07:48 (WEA 25 (Kab))
8	08:28	09:20 (WEA 04 (GRN))	17:29	13 09:27 (WEA 23 (Kab))	18:26	33 07:50 (WEA 25 (Kab))
9	08:28	09:19 (WEA 05 (GRN))	07:29	08:17	06:29	07:16 (WEA 25 (Kab))
10	08:27	09:31 (WEA 04 (GRN))	16:50	1 09:25 (WEA 23 (Kab))	17:53	11 07:48 (WEA 25 (Kab))
11	08:27	09:20 (WEA 04 (GRN))	17:27	11 09:26 (WEA 23 (Kab))	18:24	21 07:49 (WEA 25 (Kab))
12	08:27	09:19 (WEA 05 (GRN))	07:27	08:14	06:27	07:15 (WEA 25 (Kab))
13	08:27	09:32 (WEA 04 (GRN))	16:48	28 09:30 (WEA 23 (Kab))	17:49	21 07:48 (WEA 25 (Kab))
14	08:26	09:20 (WEA 04 (GRN))	17:25	10 09:26 (WEA 23 (Kab))	18:22	20 07:48 (WEA 25 (Kab))
15	08:26	09:19 (WEA 05 (GRN))	07:25	08:11	06:25	07:14 (WEA 25 (Kab))
16	08:26	09:32 (WEA 04 (GRN))	16:46	25 09:29 (WEA 23 (Kab))	17:47	18 07:47 (WEA 25 (Kab))
17	08:25	09:20 (WEA 04 (GRN))	17:23	9 09:26 (WEA 23 (Kab))	18:20	19 07:47 (WEA 25 (Kab))
18	08:25	09:19 (WEA 05 (GRN))	07:23	08:06	06:23	07:13 (WEA 25 (Kab))
19	08:25	09:32 (WEA 04 (GRN))	16:44	22 09:30 (WEA 23 (Kab))	17:46	15 07:46 (WEA 25 (Kab))
20	08:25	09:21 (WEA 04 (GRN))	17:21	8 09:26 (WEA 23 (Kab))	18:19	18 07:46 (WEA 25 (Kab))
21	08:25	09:20 (WEA 04 (GRN))	17:19	7 09:25 (WEA 23 (Kab))	18:17	17 07:46 (WEA 25 (Kab))
22	08:24	09:21 (WEA 04 (GRN))	17:17	6 09:24 (WEA 23 (Kab))	18:15	16 07:45 (WEA 25 (Kab))
23	08:24	09:20 (WEA 04 (GRN))	17:15	5 09:23 (WEA 23 (Kab))	18:13	15 07:45 (WEA 25 (Kab))
24	08:24	09:19 (WEA 05 (GRN))	07:15	4 09:22 (WEA 23 (Kab))	18:11	14 07:44 (WEA 25 (Kab))
25	08:23	09:21 (WEA 04 (GRN))	17:13	3 09:21 (WEA 23 (Kab))	18:09	13 07:44 (WEA 25 (Kab))
26	08:23	09:20 (WEA 04 (GRN))	17:11	2 09:20 (WEA 23 (Kab))	18:07	12 07:43 (WEA 25 (Kab))
27	08:23	09:19 (WEA 05 (GRN))	07:11	1 09:19 (WEA 23 (Kab))	18:05	11 07:43 (WEA 25 (Kab))
28	08:23	09:32 (WEA 04 (GRN))	16:39	29 09:31 (WEA 23 (Kab))	17:44	10 07:42 (WEA 25 (Kab))
29	08:22	09:21 (WEA 04 (GRN))	17:09	18 09:28 (WEA 23 (Kab))	18:14	9 07:42 (WEA 25 (Kab))
30	08:22	09:20 (WEA 04 (GRN))	17:07	17 09:27 (WEA 23 (Kab))	18:12	8 07:41 (WEA 25 (Kab))
31	08:22	09:19 (WEA 05 (GRN))	07:07	16 09:26 (WEA 23 (Kab))	18:10	7 07:41 (WEA 25 (Kab))
1	08:21	09:22 (WEA 04 (GRN))	17:05	15 09:25 (WEA 23 (Kab))	18:08	6 07:40 (WEA 25 (Kab))
2	08:21	09:21 (WEA 04 (GRN))	17:03	14 09:24 (WEA 23 (Kab))	18:06	5 07:40 (WEA 25 (Kab))
3	08:21	09:20 (WEA 04 (GRN))	17:01	13 09:23 (WEA 23 (Kab))	18:04	4 07:39 (WEA 25 (Kab))
4	08:21	09:19 (WEA 05 (GRN))	07:01	12 09:22 (WEA 23 (Kab))	18:02	3 07:39 (WEA 25 (Kab))
5	08:20	09:22 (WEA 04 (GRN))	17:00	11 09:21 (WEA 23 (Kab))	18:00	2 07:38 (WEA 25 (Kab))
6	08:20	09:21 (WEA 04 (GRN))	16:58	10 09:20 (WEA 23 (Kab))	17:58	1 07:38 (WEA 25 (Kab))
7	08:20	09:20 (WEA 04 (GRN))	16:56	9 09:19 (WEA 23 (Kab))	17:56	0 07:37 (WEA 25 (Kab))
8	08:20	09:19 (WEA 05 (GRN))	06:56	8 09:18 (WEA 23 (Kab))	17:54	0 07:37 (WEA 25 (Kab))
9	08:19	09:22 (WEA 04 (GRN))	16:54	7 09:17 (WEA 23 (Kab))	17:52	0 07:36 (WEA 25 (Kab))
10	08:19	09:21 (WEA 04 (GRN))	16:52	6 09:16 (WEA 23 (Kab))	17:50	0 07:36 (WEA 25 (Kab))
11	08:19	09:20 (WEA 04 (GRN))	16:50	5 09:15 (WEA 23 (Kab))	17:48	0 07:35 (WEA 25 (Kab))
12	08:18	09:21 (WEA 04 (GRN))	16:48	4 09:14 (WEA 23 (Kab))	17:46	0 07:35 (WEA 25 (Kab))
13	08:18	09:20 (WEA 04 (GRN))	16:46	3 09:13 (WEA 23 (Kab))	17:44	0 07:34 (WEA 25 (Kab))
14	08:18	09:19 (WEA 05 (GRN))	06:54	2 09:12 (WEA 23 (Kab))	17:42	0 07:34 (WEA 25 (Kab))
15	08:17	09:22 (WEA 04 (GRN))	16:44	1 09:11 (WEA 23 (Kab))	17:40	0 07:33 (WEA 25 (Kab))
16	08:17	09:21 (WEA 04 (GRN))	16:42	0 09:10 (WEA 23 (Kab))	17:38	0 07:33 (WEA 25 (Kab))
17	08:17	09:20 (WEA 04 (GRN))	16:40	0 09:09 (WEA 23 (Kab))	17:36	0 07:32 (WEA 25 (Kab))
18	08:17	09:19 (WEA 05 (GRN))	06:52	0 09:08 (WEA 23 (Kab))	17:34	0 07:32 (WEA 25 (Kab))
19	08:16	09:22 (WEA 04 (GRN))	16:39	0 09:07 (WEA 23 (Kab))	17:32	0 07:31 (WEA 25 (Kab))
20	08:16	09:21 (WEA 04 (GRN))	16:37	0 09:06 (WEA 23 (Kab))	17:30	0 07:31 (WEA 25 (Kab))
21	08:16	09:20 (WEA 04 (GRN))	16:35	0 09:05 (WEA 23 (Kab))	17:28	0 07:30 (WEA 25 (Kab))
22	08:16	09:19 (WEA 05 (GRN))	06:50	0 09:04 (WEA 23 (Kab))	17:26	0 07:30 (WEA 25 (Kab))
23	08:15	09:22 (WEA 04 (GRN))	16:32	0 09:03 (WEA 23 (Kab))	17:24	0 07:29 (WEA 25 (Kab))
24	08:15	09:21 (WEA 04 (GRN))	16:30	0 09:02 (WEA 23 (Kab))	17:22	0 07:29 (WEA 25 (Kab))
25	08:15	09:20 (WEA 04 (GRN))	16:28	0 09:01 (WEA 23 (Kab))	17:20	0 07:28 (WEA 25 (Kab))
26	08:15	09:19 (WEA 05 (GRN))	06:48	0 09:00 (WEA 23 (Kab))	17:18	0 07:28 (WEA 25 (Kab))
27	08:14	09:22 (WEA 04 (GRN))	16:25	0 08:59 (WEA 23 (Kab))	17:16	0 07:27 (WEA 25 (Kab))
28	08:14	09:21 (WEA 04 (GRN))	16:23	0 08:58 (WEA 23 (Kab))	17:14	0 07:27 (WEA 25 (Kab))
29	08:14	09:20 (WEA 04 (GRN))	16:21	0 08:57 (WEA 23 (Kab))	17:12	0 07:26 (WEA 25 (Kab))
30	08:14	09:19 (WEA 05 (GRN))	06:46	0 08:56 (WEA 23 (Kab))	17:10	0 07:26 (WEA 25 (Kab))
31	08:13	09:22 (WEA 04 (GRN))	16:18	0 08:55 (WEA 23 (Kab))	17:08	0 07:25 (WEA 25 (Kab))
1	08:13	09:21 (WEA 04 (GRN))	16:16	0 08:54 (WEA 23 (Kab))	17:06	0 07:25 (WEA 25 (Kab))
2	08:13	09:20 (WEA 04 (GRN))	16:14	0 08:53 (WEA 23 (Kab))	17:04	0 07:24 (WEA 25 (Kab))
3	08:13	09:19 (WEA 05 (GRN))	06:44	0 08:52 (WEA 23 (Kab))	17:02	0 07:24 (WEA 25 (Kab))
4	08:12	09:22 (WEA 04 (GRN))	16:11	0 08:51 (WEA 23 (Kab))	17:00	0 07:23 (WEA 25 (Kab))
5	08:12	09:21 (WEA 04 (GRN))	16:09	0 08:50 (WEA 23 (Kab))	16:58	0 07:23 (WEA 25 (Kab))
6	08:12	09:20 (WEA 04 (GRN))	16:07	0 08:49 (WEA 23 (Kab))	16:56	0 07:22 (WEA 25 (Kab))
7	08:12	09:19 (WEA 05 (GRN))	06:40	0 08:48 (WEA 23 (Kab))	16:54	0 07:22 (WEA 25 (Kab))
8	08:11	09:22 (WEA 04 (GRN))	16:04	0 08:47 (WEA 23 (Kab))	16:52	0 07:21 (WEA 25 (Kab))
9	08:11	09:21 (WEA 04 (GRN))	16:02	0 08:46 (WEA 23 (Kab))	16:50	0 07:21 (WEA 25 (Kab))
10	08:11	09:20 (WEA 04 (GRN))	16:00	0 08:45 (WEA 23 (Kab))	16:48	0 07:20 (WEA 25 (Kab))
11	08:11	09:19 (WEA 05 (GRN))	06:36	0 08:44 (WEA 23 (Kab))	16:46	0 07:20 (WEA 25 (Kab))
12	08:10	09:22 (WEA 04 (GRN))	15:59	0 08:43 (WEA 23 (Kab))	16:44	0 07:19 (WEA 25 (Kab))
13	08:10	09:21 (WEA 04 (GRN))	15:57	0 08:42 (WEA 23 (Kab))	16:42	0 07:19 (WEA 25 (Kab))
14	08:10	09:20 (WEA 04 (GRN))	15:55	0 08:41 (WEA 23 (Kab))	16:40	0 07:18 (WEA 25 (Kab))
15	08:10	09:19 (WEA 05 (GRN))	06:31	0 08:40 (WEA 23 (Kab))	16:38	0 07:18 (WEA 25 (Kab))
16	08:09	09:22 (WEA 04 (GRN))	15:52	0 08:39 (WEA 23 (Kab))	16:36	0 07:17 (WEA 25 (Kab))
17	08:09	09:21 (WEA 04 (GRN))	15:50	0 08:38 (WEA 23 (Kab))	16:34	0 07:17 (WEA 25 (Kab))
18	08:09	09:20 (WEA 04 (GRN))	15:48	0 08:37 (WEA 23 (Kab))	16:32	0 07:16 (WEA 25 (Kab))
19	08:09	09:19 (WEA 05 (GRN))	06:26	0 08:36 (WEA 23 (Kab))	16:30	0 07:16 (WEA 25 (Kab))
20	08:08	09:22 (WEA 04 (GRN))	15:49	0 08:35 (WEA 23 (Kab))	16:28	0 07:15 (WEA 25 (Kab))
21	08:08	09:21 (WEA 04 (GRN))	15:47	0 08:34 (WEA 23 (Kab))	16:26	0 07:15 (WE





Projekt:

SWP Windpark Riepsdorf-Grömitz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0
Jörg Dedert / joerg.dedert@dnv.com
Berechnet:
10.01.2023 21:57/3.6.361

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Riepsdorf-Grömitz (1 x SG6.6-155) Schattenrezeptor: IO 46 - IO 46 Diekstraat 29
Annahmen für Schattenwurfberechnung

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

Table with columns for months (Juli, August, September, Oktober, November, Dezember) and rows for days, listing shadow times and durations.

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

Summary table with columns: Tag im Monat, Sonnenaufgang (SS:MM), Sonnenuntergang (SS:MM), Minuten mit Schatten, Zeitpunkt (SS:MM), Schattenanfang, Schattenende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)







## **ÜBER DNV**

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

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

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