

WINDPARK GROßENHOLZ

Schattenwurfberechnung

Gosdorfer Windenergie GmbH & Co. KG

Berichtsnummer: 10330604-A-2-A

Datum: 2022-06-24



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Auftrag:


Schattenwurfberechnung für die Umgebung des geplanten Windenergieparks Großenholz

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A	2022-06-24	Erstausgabe	Jörg Dedert	Klaus Buchmann	Klaus Buchmann



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1 EINLEITUNG

Von der Gosdorfer Windenergie GmbH & Co. KG wurde der GL Garrad Hassan Deutschland GmbH (GH-D) am 2021-01-03 der Auftrag erteilt, für das geplante Repoweringprojekt im Windenergiepark Großenholz die Schattenwurfbelastung an den umliegenden Immissionsorten (IO) unter Berücksichtigung aller immissionsrelevanten Windenergieanlagen (WEA) zu berechnen.

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

2 IMMISSIONSRELEVANTE WINDENERGIEANLAGEN

Auf der beplanten Fläche sind von der Gosdorfer Windenergie GmbH & Co. KG drei neue Windenergieanlagen (WEA) des Typs Vestas V150-6.0 MW mit einer Nabenhöhe von 105 m und einem Rotordurchmesser von 150 m geplant (WEA G1 bis WEA G3). Im Gegenzug sind sechs momentan an diesem Standort vorhandene WEA des Typs Vestas V47 (WEA R07 bis WEA R 12) 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 06 bis WEA 08 und 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 10, WEA 11 bis WEA 21, WEA 33, WEA 40 bis WEA 43	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 48	65,0	47,0

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 3.5.584 /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 Gesamtimmisionen bestimmt. Dabei ergibt sich folgendes Ergebnis für den ungünstigsten Fall:

5.1 Vorbelastung momentane Bestandssituation

Am Immissionsort IO 32 (Rüting Söhlen 5) beträgt die momentane Vorbelastung 94 Stunden und 16 Minuten pro Jahr, verteilt auf 239 Tage. Die maximale Tagesbelastung beträgt dort 45 Minuten. Am zweitstärksten belastet ist mit bis zu 66 Stunden und 42 Minuten pro Jahr, verteilt auf 196 Tage, und einer maximalen Tagesbelastung von 33 Minuten der IO 33 (Rüting Söhlen 7). Am IO 03 (Hauptstraße 4, Riepsdorf) tritt ebenfalls erheblicher Schattenwurf durch die

vorhandenen WEA auf. Dieser beträgt dort bis zu 66 Stunden und neun Minuten pro Jahr, verteilt auf 293 Tage. Die maximale Tagesbelastung beträgt dort 32 Minuten.

5.2 Bestandssituation nach Rückbau

Nach dem Rückbau der sechs Vestas V47 beträgt am Immissionsort IO 32 (Rüting Söhlen 5) die verbleibende Vorbelastung unverändert 94 Stunden und 16 Minuten pro Jahr, verteilt auf 239 Tage. Die maximale Tagesbelastung beträgt dort weiterhin 45 Minuten. Am zweitstärksten und ebenfalls unverändert belastet ist mit bis zu 66 Stunden und 42 Minuten pro Jahr, verteilt auf 196 Tage, und einer maximalen Tagesbelastung von 33 Minuten der IO 33 (Rüting Söhlen 7). Erheblicher Schattenwurf durch die verbleibenden WEA tritt weiterhin am IO 03 (Hauptstraße 4, Riepsdorf) auf. Auch hier ist unverändert eine Belastung von bis zu 66 Stunden und neun Minuten pro Jahr, verteilt auf 293 Tage festzustellen. Die maximale Tagesbelastung beträgt dort 32 Minuten.

5.3 Zusatzbelastung Windenergiepark Großenholz

Durch die drei geplante Anlage entsteht am Immissionsort IO 15 (Poggenpohler Weg 30, Gosdorf) eine Erhöhung der Schattenwurfbelastung um 64 Stunden und sieben Minuten auf dann 89 Stunden und 34 Minuten. Die maximale Tagesbelastung erhöht sich um 43 Minuten auf eine Stunde und 10 Minuten. Am Immissionsort IO 35 (Rüting Chaussee 1) erhöht sich die Jahresbelastung um 54 Stunden und acht Minuten auf 105 Stunden und 42 Minuten pro Jahr, die maximale Tagesbelastung erhöht sich um 36 Minuten auf eine Stunde und drei Minuten. Am Immissionsort IO 31 (Rüting Söhlen 2) erhöht sich die Jahresbelastung um 51 Stunden und 57 Minuten auf 70 Stunden und 20 Minuten pro Jahr. Die maximale Tagesbelastung erhöht sich um sechs Minuten auf dann 38 Minuten.

5.4 Gesamtbelastung nach Abschluss des Repowering Vorhabens

Am Immissionsort IO 32 (Rüting Söhlen 5) tritt die höchste Belastung durch Schattenwurf auf. Sie beträgt 119 Stunden und 46 Minuten pro Jahr, verteilt auf 253 Tage. Die maximale Tagesbelastung beträgt hier 45 Minuten. Am zweitstärksten belastet ist mit bis zu 105 Stunden und 42 Minuten pro Jahr, verteilt auf 283 Tage, und einer maximalen Tagesbelastung von einer Stunde und drei Minuten der IO35 (Rüting Chaussee 1). 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 bis zur Einmündung Poggenpohler Weg, 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 an der östlich bzw. südöstlich der geplanten WEA gelegenen Wohnbebauung Rathjensdorfer Felde 2 und Morest (IO 21, Grömitz) ergibt sich durch die geplanten WEA eine rechnerische Überschreitung der Richtwerte. Die Immissionsorte entlang der Straße Rüting Söhlen sind ebenfalls von einer Erhöhung der bereits durch die Vorbelastung verursachten Überschreitung der Richtwerte betroffen. Auch in der gesamten Ortslage Rüting ergibt sich durch das geplante Vorhaben eine Erhöhung der bereits durch den momentanen

Bestand verursachten Richtwertüberschreitungen. An der Wohnbebauung Rüttinger Kornenhof 10 und am Kathenkamp 11 werden durch die geplanten WEA die Richtwerte erstmalig 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 Windenergieanlagen des Windparks Großenholz 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 119 Stunden und 46 Minuten im Jahr am IO 32 (Rütting Söhlen 5) bzw. 1 Stunde und 10 Minuten pro Tag am IO 15 (Poggenpohler Weg 30, Gosdorf). An 12 bereits durch die Vorbelastung von einer Richtwertüberschreitung betroffenen IO verursachen die geplanten WEA eine zusätzliche Erhöhung der Überschreitung. Zudem kommt es an 12 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. 3.5.584.
- /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

5

11 ANHANG

Auf den folgenden Seiten sind die Berechnungsergebnisse dargestellt.

11.1 Hauptergebnis Vorbelastung Bestandssituation (vor Rückbau)

Projekt:
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SHADOW - Hauptergebnis

Berechnung: Vorbelastung Bestandssituation vor dem Rückbau WP Großenholz

Annahmen für Schattenwurfberechnung

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

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

Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der
Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf
den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: oro_2019-07-25.map (1)
Hindernisse in Berechnung nicht verwendet
Rasterauflösung: 10,0 m

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

WEA

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 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 16:34/3.5.584

SHADOW - Hauptergebnis

Berechnung: Vorbelastung Bestandssituation vor dem Rückbau WP Großenholz

...(Fortsetzung von vorheriger Seite)

	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 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	6.010.722	21,5	WEA K04 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	0,0
WEA R07 (Gro)	628.186	6.009.230	20,0	WEA R07 Ve...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA R08 (Gro)	628.491	6.008.984	20,0	WEA R08 Ve...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA R09 (Gro)	628.841	6.008.778	20,0	WEA R09 Ve...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA R10 (Gro)	627.802	6.008.856	20,0	WEA R10 Ve...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA R11 (Gro)	627.996	6.008.658	20,0	WEA R11 Ve...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5
WEA R12 (Gro)	628.332	6.008.623	20,0	WEA R12 Ve...	Nein	VESTAS	V47-660	660	47,0	65,0	880	28,5

Schattenrezeptor-Eingabe

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IO 01	IO 01 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 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Ratjensdorfer Felde 1	629.789	6.009.880	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Ratjensdorfer Felde 3	629.701	6.009.765	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Ratjensdorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	629.211	6.007.586	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Wintersberg	630.455	6.007.797	8,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Cismarfelde 15	627.807	6.008.129	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rütting Söhlen 2	627.197	6.008.174	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rütting Söhlen 5	626.892	6.007.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Rütting Söhlen 7	626.798	6.007.622	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Rütting Söhlen 11	626.671	6.007.415	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Rüttinger Kornhof 10 (Rütting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Kathenkamp 19 (Rütting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Kathenkamp 2 (Rütting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Kälberhof 5 (Rütting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 16:34/3.5.584

SHADOW - Hauptergebnis

Berechnung: Vorbelastung Bestandssituation vor dem Rückbau WP Großenholz

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe	Neigung des	Ausrichtungsmodus	Augenhöhe
					[m]	[m]	ü.Gr.	°		(ZVI)
										ü.Gr.
										[m]
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 51	IO 51 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 52	IO 52 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

astron. max. mögl. Beschattungsdauer

Nr.	Name	Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag
		[h/a]	[d/a]	[h/d]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	26:57	182	0:21
IO 02	IO 02 Am Teich 4 (Riepsdorf)	64:05	257	0:30
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	66:09	239	0:32
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	28:47	178	0:24
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	32:51	211	0:20
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	32:09	209	0:18
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	10:27	88	0:15
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	8:08	76	0:13
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	5:31	62	0:11
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	16:25	134	0:15
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	20:25	153	0:16
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	17:32	138	0:16
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	15:38	129	0:17
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	23:49	146	0:21
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	25:27	119	0:27
IO 16	IO 16 Achterhof (Gosdorf)	27:29	175	0:20
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	20:07	164	0:18
IO 18	IO 18 Ratjensdorfer Felde 1	0:02	2	0:01
IO 19	IO 19 Ratjensdorfer Felde 3	0:19	8	0:03
IO 20	IO 20 Ratjensdorfer Felde 2	1:56	31	0:08
IO 21	IO 21 Morest, Grömitz	16:44	74	0:23
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	0:04	4	0:01
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	0:03	3	0:01
IO 24	IO 24 Wintersberg	1:35	27	0:08
IO 28	IO 28 Cismarfelde 15	46:49	161	0:34
IO 31	IO 31 Rütting Söhlen 2	18:23	74	0:32
IO 32	IO 32 Rütting Söhlen 5	94:16	239	0:45
IO 33	IO 33 Rütting Söhlen 7	66:42	196	0:33
IO 34	IO 34 Rütting Söhlen 11	24:33	87	0:26
IO 35	IO 35 Rütting Chaussee 1	51:34	221	0:27
IO 36	IO 36 Kathenkamp 1 (Rüttinger Hof)	37:26	161	0:25
IO 37	IO 37 Rüttinger Klosterkamp 5	45:42	209	0:24
IO 38	IO 38 Rüttinger Klosterkamp 9	40:37	165	0:26
IO 39	IO 39 Rüttinger Kornhof 1 (Rütting)	33:36	170	0:27
IO 40	IO 40 Rüttinger Kornhof 10 (Rütting)	18:29	106	0:20
IO 41	IO 41 Kathenkamp 11 (Rütting)	21:49	118	0:22
IO 42	IO 42 Kathenkamp 19 (Rütting)	54:58	188	0:31
IO 43	IO 43 Kathenkamp 2 (Rütting)	20:25	110	0:21
IO 44	IO 44 Kälberhof 5 (Rütting)	46:29	179	0:30
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	16:39	121	0:20
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	18:51	127	0:19
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	21:52	125	0:22
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	11:10	110	0:16
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	16:24	101	0:19
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	16:47	115	0:15
IO 51	IO 51 Grünbeck 2	54:15	228	0:26
IO 52	IO 52 Grünbeck 16	55:16	196	0:41

SHADOW - Hauptergebnis

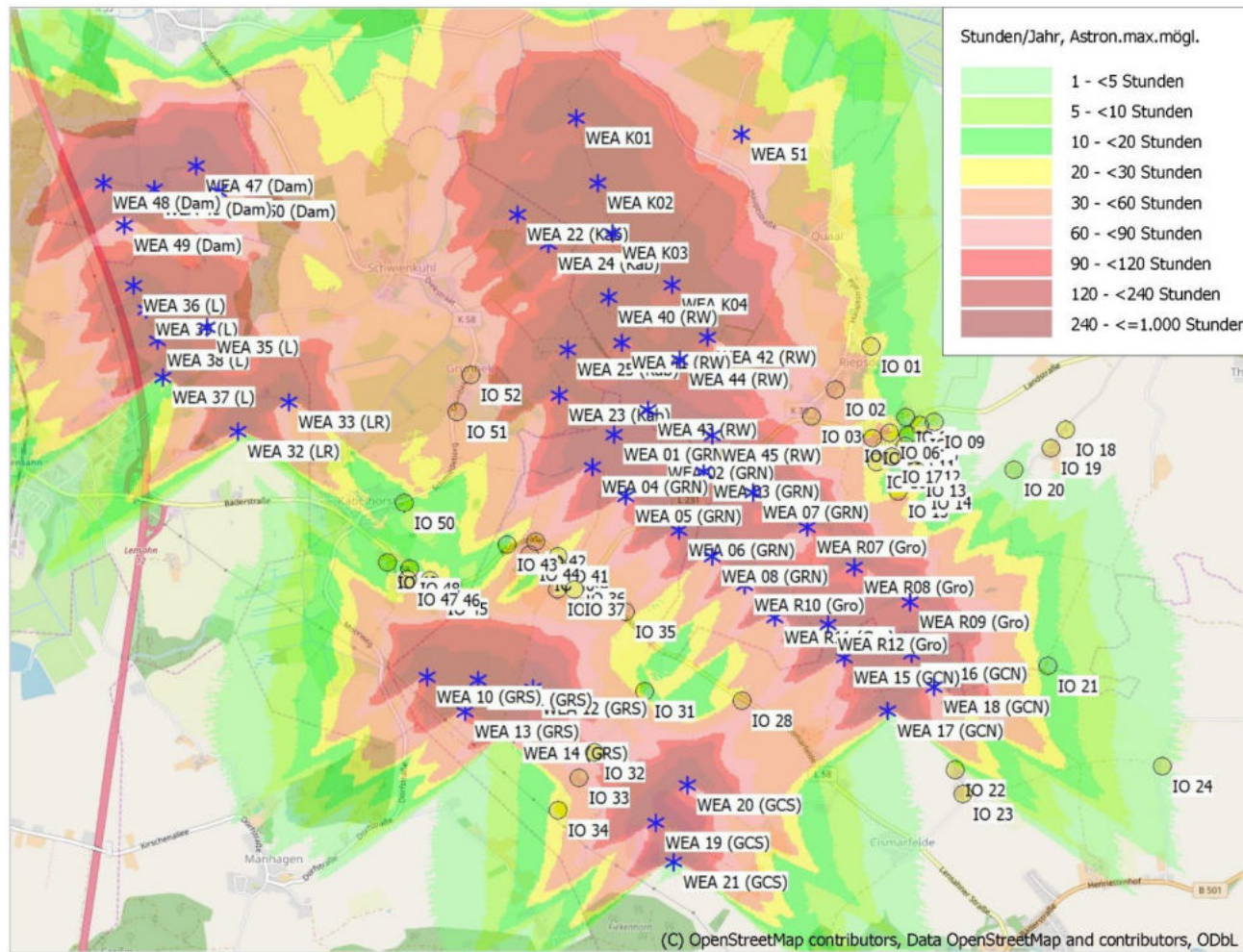
Berechnung: Vorbelastung Bestandssituation vor dem Rückbau WP Großenholz

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA 01 (GRN)	WEA 01 Jacobs MD70	13:58
WEA 02 (GRN)	WEA 02 Jacobs MD70	32:33
WEA 03 (GRN)	WEA 03 Jacobs MD70	50:13
WEA 04 (GRN)	WEA 04 Jacobs MD70	24:59
WEA 05 (GRN)	WEA 05 Jacobs MD70	68:30
WEA 06 (GRN)	WEA 06 Enercon E-66 18.70	67:31
WEA 07 (GRN)	WEA 07 Enercon E-66 18.70	79:53
WEA 08 (GRN)	WEA 08 Enercon E-66 18.70	54:49
WEA 10 (GRS)	WEA 10 Jacobs MD70	33:11
WEA 11 (GRS)	WEA 11 Jacobs MD70	84:48
WEA 12 (GRS)	WEA 12 Jacobs MD70	37:41
WEA 13 (GRS)	WEA 13 Jacobs MD70	36:25
WEA 14 (GRS)	WEA 14 Jacobs MD70	55:11
WEA 15 (GCN)	WEA 15 Jacobs MD70	20:59
WEA 16 (GCN)	WEA 16 Jacobs MD70	8:26
WEA 17 (GCN)	WEA 17 Jacobs MD70	7:22
WEA 18 (GCN)	WEA 18 Jacobs MD70	10:03
WEA 19 (GCS)	WEA 19 Jacobs MD70	63:40
WEA 20 (GCS)	WEA 20 Jacobs MD70	46:36
WEA 21 (GCS)	WEA 21 Jacobs MD70	26:01
WEA 22 (Kab)	WEA 22 NEG Micon NM 1500 C	0:00
WEA 23 (Kab)	WEA 23 NEG Micon NM 1500 C	29:07
WEA 24 (Kab)	WEA 24 NEG Micon NM 1500 C	0:00
WEA 25 (Kab)	WEA 25 NEG Micon NM 1500 C	28:02
WEA 32 (LR)	WEA 32 Enercon E-66/18.70	4:44
WEA 33 (LR)	WEA 33 Jacobs MD70	4:22
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	0:00
WEA 38 (L)	WEA 38 Enercon E-70 E4	0:00
WEA 39 (L)	WEA 39 Enercon E-70 E4	0:00
WEA 40 (RW)	WEA 40 Jacobs MD70	12:51
WEA 41 (RW)	WEA 41 Jacobs MD70	13:50
WEA 42 (RW)	WEA 42 Jacobs MD70	31:35
WEA 43 (RW)	WEA 43 Jacobs MD70	14:30
WEA 44 (RW)	WEA 44 Vestas V47	0:00
WEA 45 (RW)	WEA 45 Vestas V47	7:54
WEA 46 (Dam)	WEA 46 Südwind S70	0:00
WEA 47 (Dam)	WEA 47 Südwind S70	0:00
WEA 48 (Dam)	WEA 48 Südwind S70	0:00
WEA 49 (Dam)	WEA 49 Enercon E-82	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)	2:17
WEA K03	WEA K03 Enercon E-115 EP3 E3/2,9 MW (TES)	11:21
WEA K04	WEA K04 Enercon E-115 EP3 E3/2,9 MW (TES)	50:12
WEA R07 (Gro)	WEA R07 Vestas V47	53:59
WEA R08 (Gro)	WEA R08 Vestas V47	28:03
WEA R09 (Gro)	WEA R09 Vestas V47	0:00
WEA R10 (Gro)	WEA R10 Vestas V47	3:37
WEA R11 (Gro)	WEA R11 Vestas V47	0:00
WEA R12 (Gro)	WEA R12 Vestas V47	0:00

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

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



0 500 1000 1500 2000 m

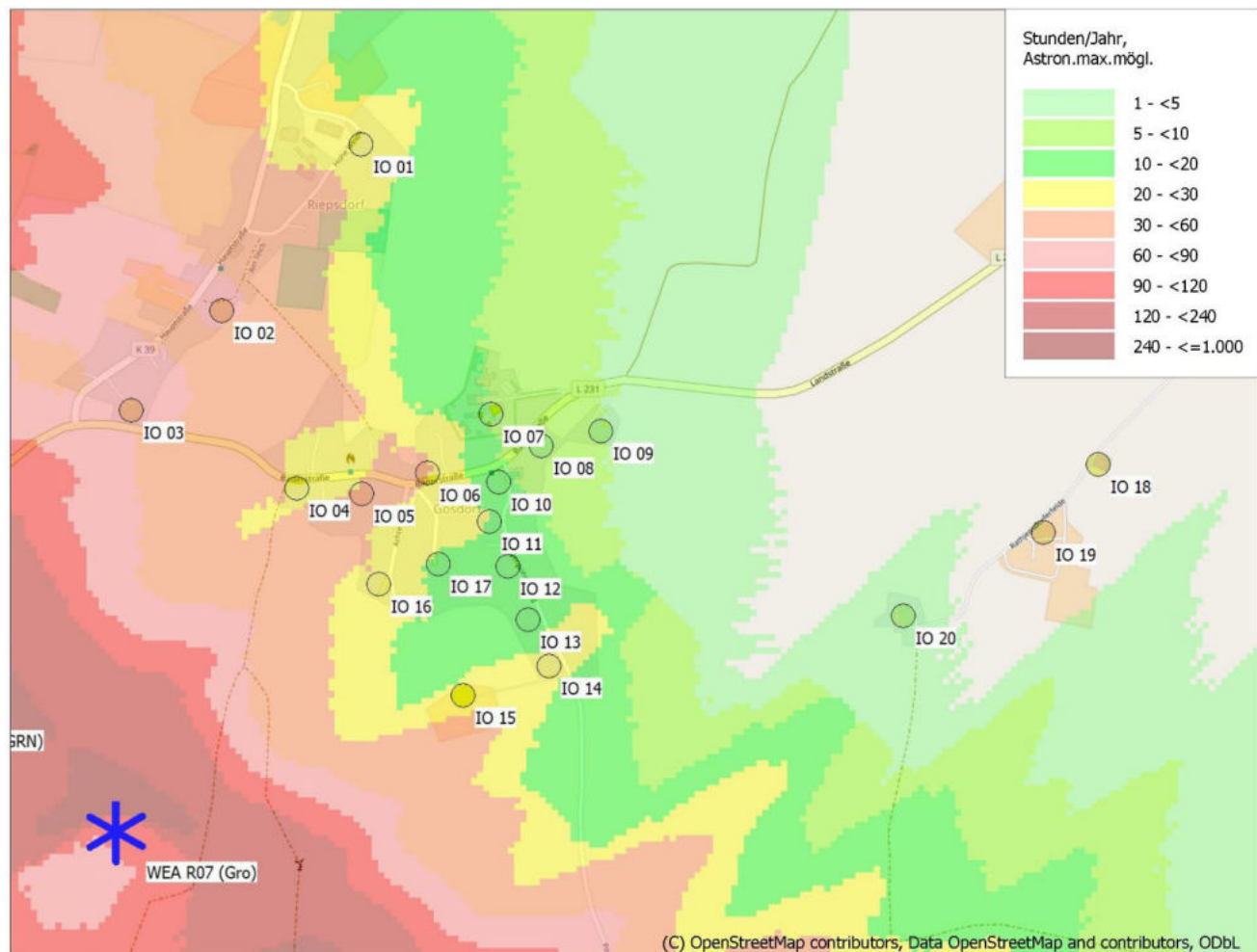
Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387

* 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

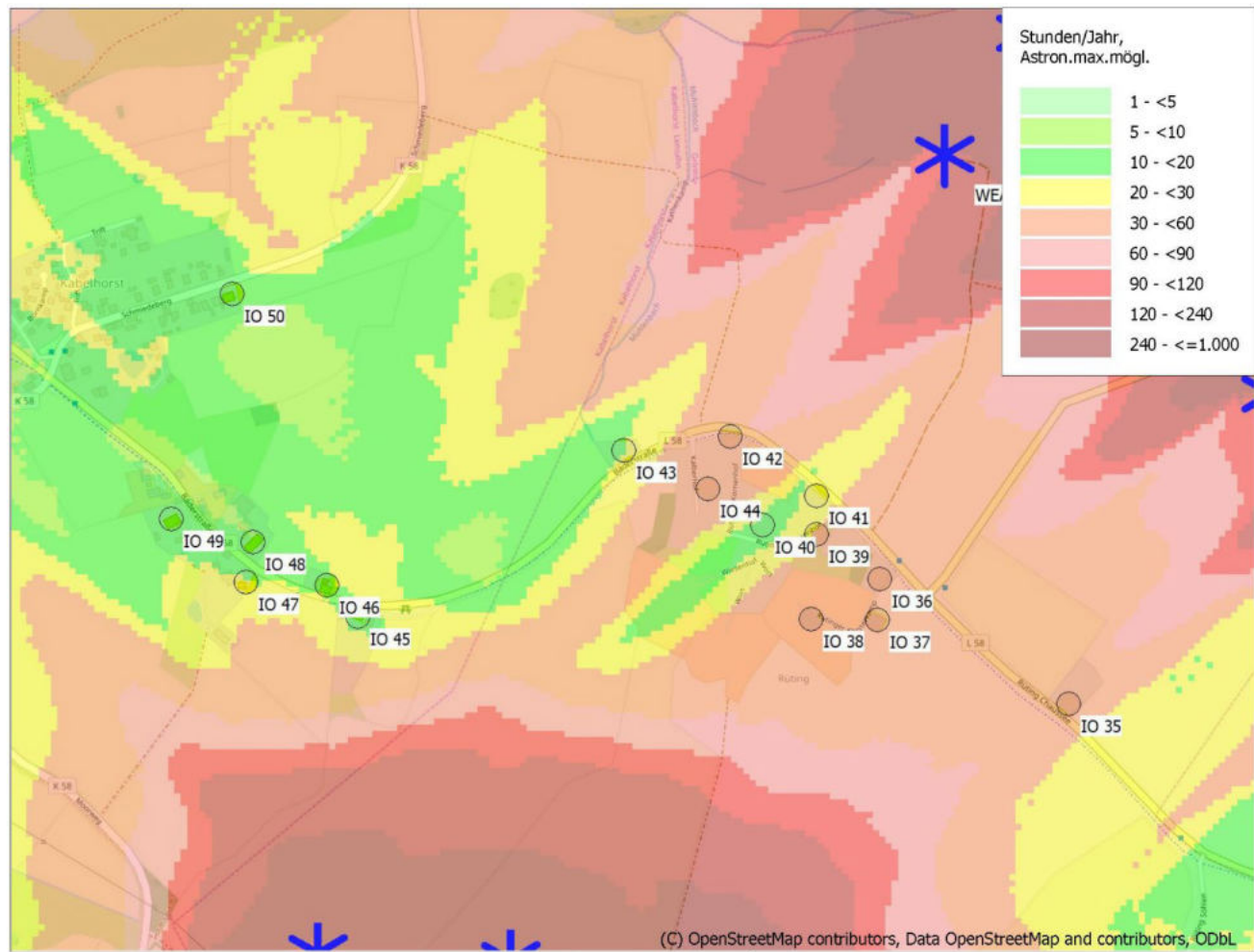
0 100 200 300 400 m

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 Rütting, Stunden pro Jahr



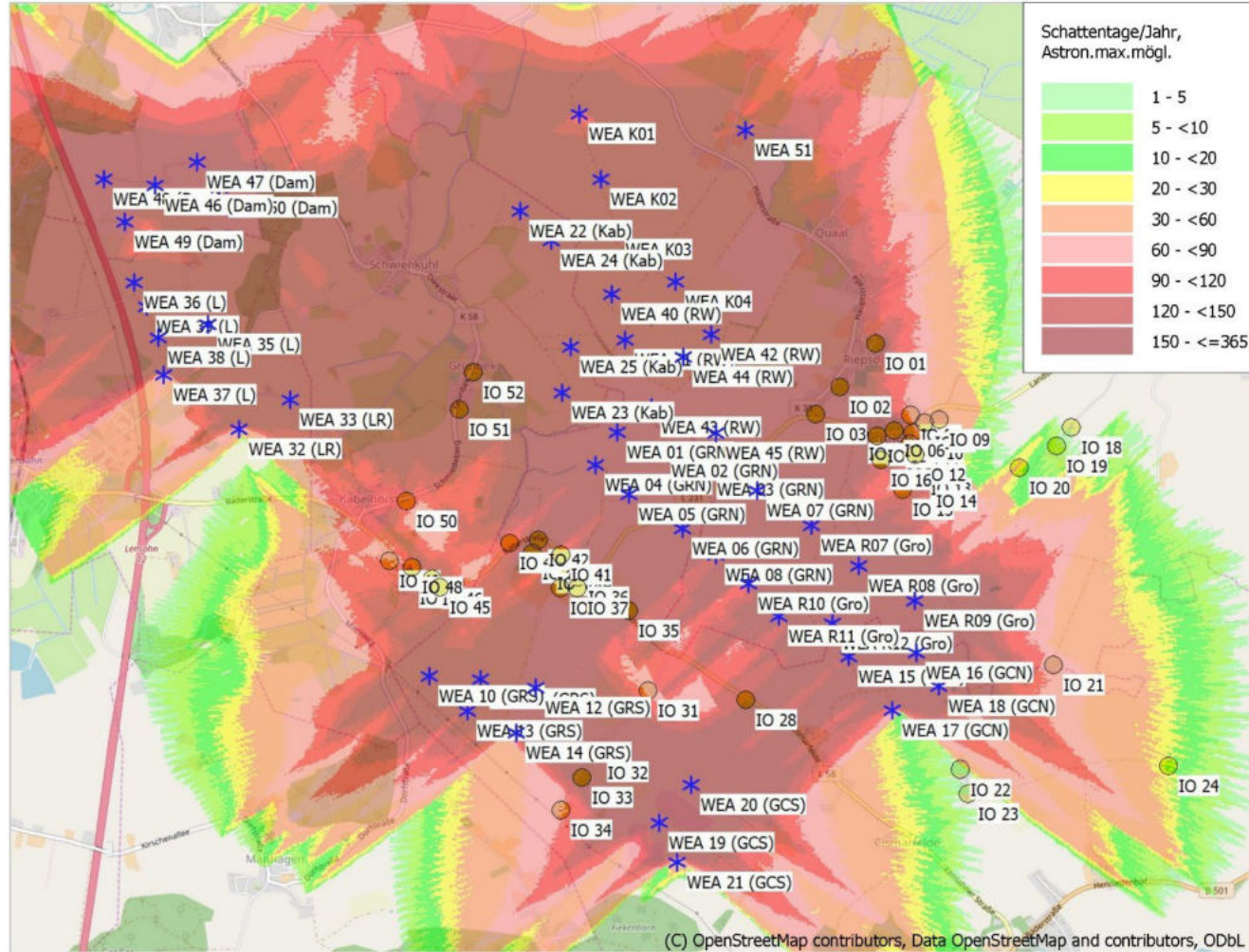
0 100 200 300 400 m

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

* 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

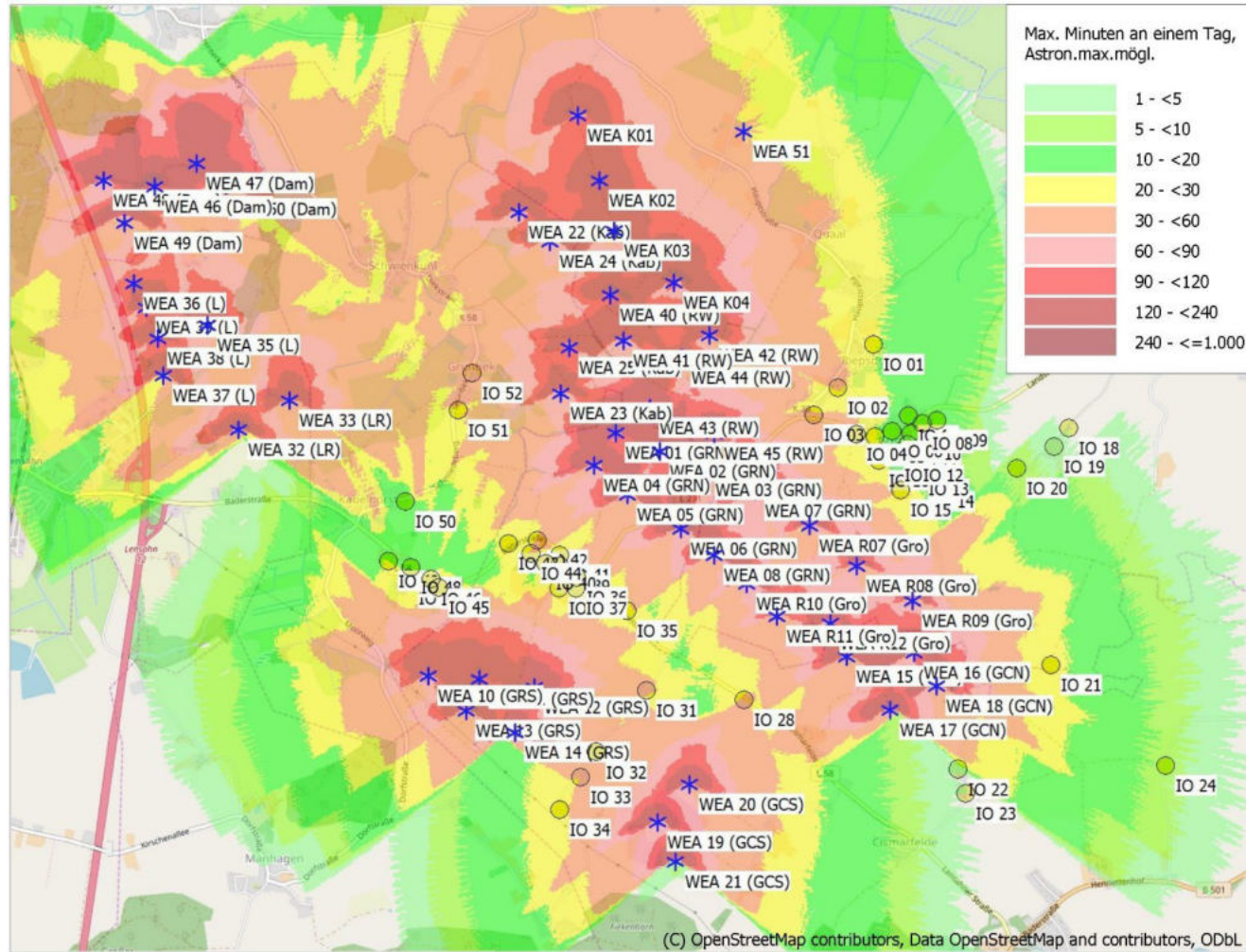
Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387

* Existierende WEA

● Schattenrezeptor

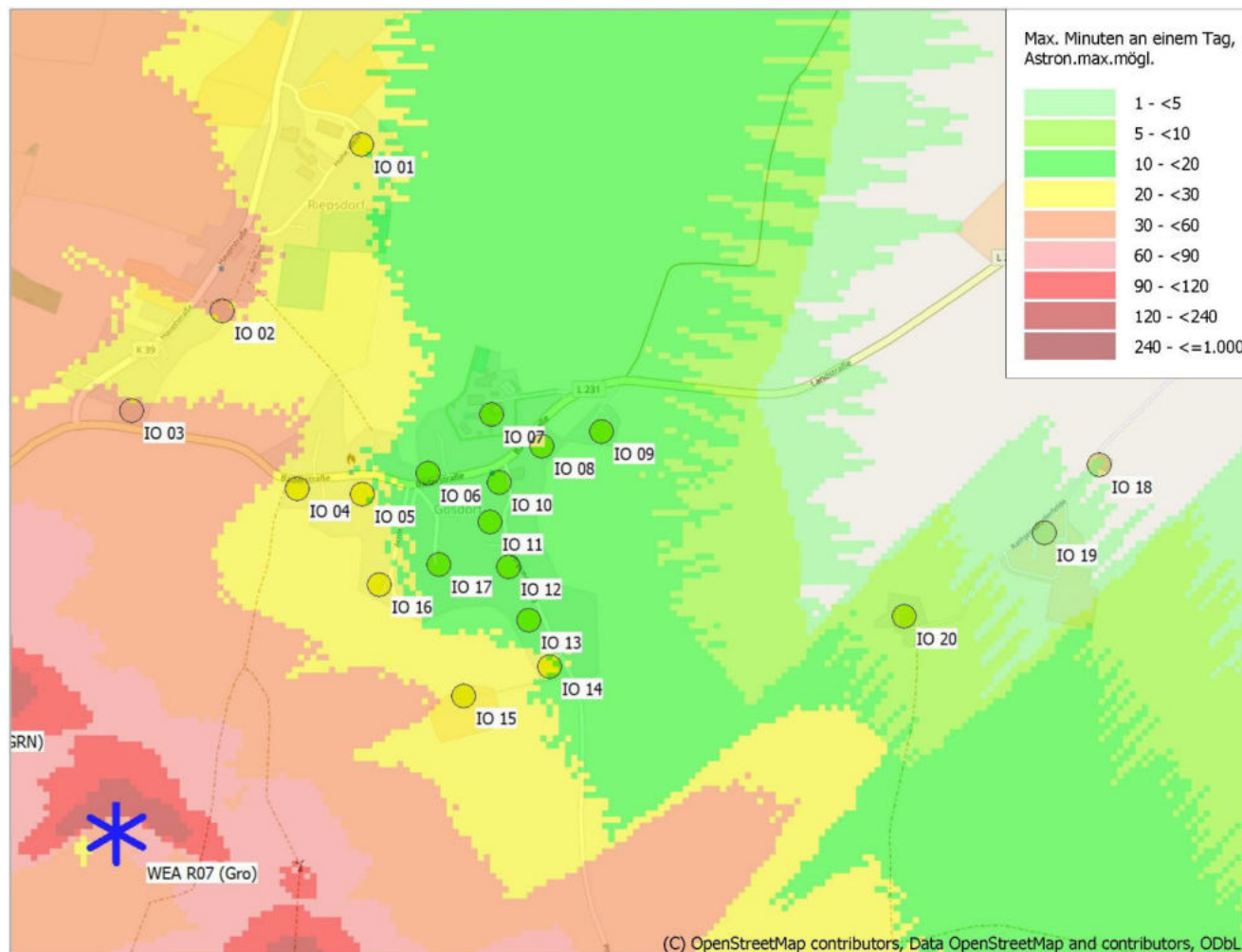
Höhe der Schattenkarte: Höhenlinien: oro_2019-07-25.map (1)

11.6 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



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

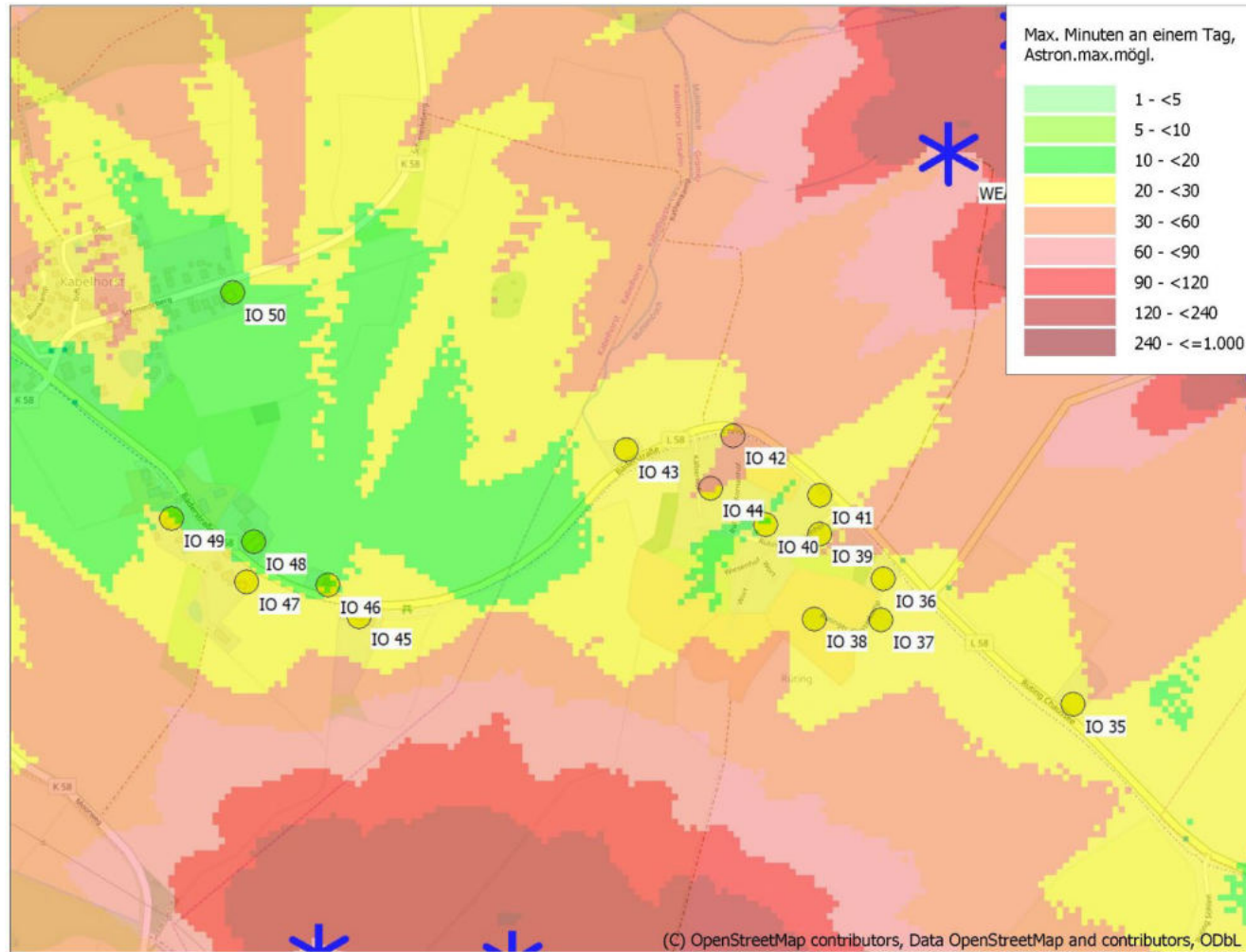
0 100 200 300 400 m

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)

11.8 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 Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:
22.06.2022 18:22/3.5.584

SHADOW - Hauptergebnis

Berechnung: Vorbelastung verbleibender Bestand nach Rückbau Großenholz
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)
Hindernisse in Berechnung nicht verwendet
Rasterauflösung: 10,0 m

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

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Schattendaten				
					Ak- tu- ell	Hersteller	Typ	Nenn- leistung	Rotor- durch- messer	Naben- höhe	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 Jaco...	Nein	JACOBS	MD 70-1.500	1.500	70,0	65,0	3.000	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

(Fortsetzung nächste Seite)...

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 18:22/3.5.584

SHADOW - Hauptergebnis

Berechnung: Vorbelastung verbleibender Bestand nach Rückbau Großenholz

...(Fortsetzung von vorheriger Seite)

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller	Type				Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
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 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	6.010.722	21,5	WEA K04 En...	Ja	ENERCON	E-115 EP3 E3 TES-2.900	2.900	115,7	92,0	2.069	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 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Ratjensdorfer Felde 1	629.789	6.009.880	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Ratjensdorfer Felde 3	629.701	6.009.765	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Ratjensdorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	629.211	6.007.586	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Wintersberg	630.455	6.007.797	8,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Cismarfelde 15	627.807	6.008.129	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rütting Söhlen 2	627.197	6.008.174	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rütting Söhlen 5	626.892	6.007.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Rütting Söhlen 7	626.798	6.007.622	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Rütting Söhlen 11	626.671	6.007.415	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Rüttinger Kornhof 10 (Rütting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Kathenkamp 19 (Rütting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Kathenkamp 2 (Rütting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Kälberhof 5 (Rütting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 51	IO 51 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 52	IO 52 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 18:22/3.5.584

SHADOW - Hauptergebnis

Berechnung: Vorbelastung verbleibender Bestand nach Rückbau Großenholz

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)	26:57	182	0:21
IO 02	IO 02 Am Teich 4 (Riepsdorf)	64:05	257	0:30
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	66:09	239	0:32
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	28:47	178	0:24
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	21:03	165	0:20
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	21:07	151	0:18
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	10:27	88	0:15
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	8:08	76	0:13
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	5:31	62	0:11
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	11:58	106	0:15
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	15:47	127	0:16
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	13:22	115	0:16
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	8:52	97	0:15
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	6:02	80	0:14
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	8:48	68	0:18
IO 16	IO 16 Achterhof (Gosdorf)	18:36	140	0:20
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	13:58	134	0:18
IO 18	IO 18 Ratjensdorfer Felde 1	0:02	2	0:01
IO 19	IO 19 Ratjensdorfer Felde 3	0:19	8	0:03
IO 20	IO 20 Ratjensdorfer Felde 2	1:56	31	0:08
IO 21	IO 21 Morest, Grömitz	16:44	74	0:23
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	0:04	4	0:01
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	0:03	3	0:01
IO 24	IO 24 Wintersberg	1:35	27	0:08
IO 28	IO 28 Cismarfelde 15	46:49	161	0:34
IO 31	IO 31 Rütting Söhlen 2	18:23	74	0:32
IO 32	IO 32 Rütting Söhlen 5	94:16	239	0:45
IO 33	IO 33 Rütting Söhlen 7	66:42	196	0:33
IO 34	IO 34 Rütting Söhlen 11	24:33	87	0:26
IO 35	IO 35 Rütting Chaussee 1	47:57	201	0:27
IO 36	IO 36 Kathenkamp 1 (Rüttinger Hof)	37:26	161	0:25
IO 37	IO 37 Rüttinger Klosterkamp 5	45:42	209	0:24
IO 38	IO 38 Rüttinger Klosterkamp 9	40:37	165	0:26
IO 39	IO 39 Rüttinger Kornhof 1 (Rütting)	33:36	170	0:27
IO 40	IO 40 Rüttinger Kornhof 10 (Rütting)	18:29	106	0:20
IO 41	IO 41 Kathenkamp 11 (Rütting)	21:49	118	0:22
IO 42	IO 42 Kathenkamp 19 (Rütting)	54:58	188	0:31
IO 43	IO 43 Kathenkamp 2 (Rütting)	20:25	110	0:21
IO 44	IO 44 Kälberhof 5 (Rütting)	46:29	179	0:30
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	16:39	121	0:20
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	18:51	127	0:19
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	21:52	125	0:22
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	11:10	110	0:16
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	16:24	101	0:19
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	16:47	115	0:15
IO 51	IO 51 Grünbeck 2	54:15	228	0:26
IO 52	IO 52 Grünbeck 16	55:16	196	0:41

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA 01 (GRN)	WEA 01 Jacobs MD70	13:58
WEA 02 (GRN)	WEA 02 Jacobs MD70	32:33
WEA 03 (GRN)	WEA 03 Jacobs MD70	50:13
WEA 04 (GRN)	WEA 04 Jacobs MD70	24:59
WEA 05 (GRN)	WEA 05 Jacobs MD70	68:30
WEA 06 (GRN)	WEA 06 Enercon E-66 18.70	67:31
WEA 07 (GRN)	WEA 07 Enercon E-66 18.70	79:53
WEA 08 (GRN)	WEA 08 Enercon E-66 18.70	54:49
WEA 10 (GRS)	WEA 10 Jacobs MD70	33:11
WEA 11 (GRS)	WEA 11 Jacobs MD70	84:48
WEA 12 (GRS)	WEA 12 Jacobs MD70	37:41

(Fortsetzung nächste Seite)...

SHADOW - Hauptergebnis

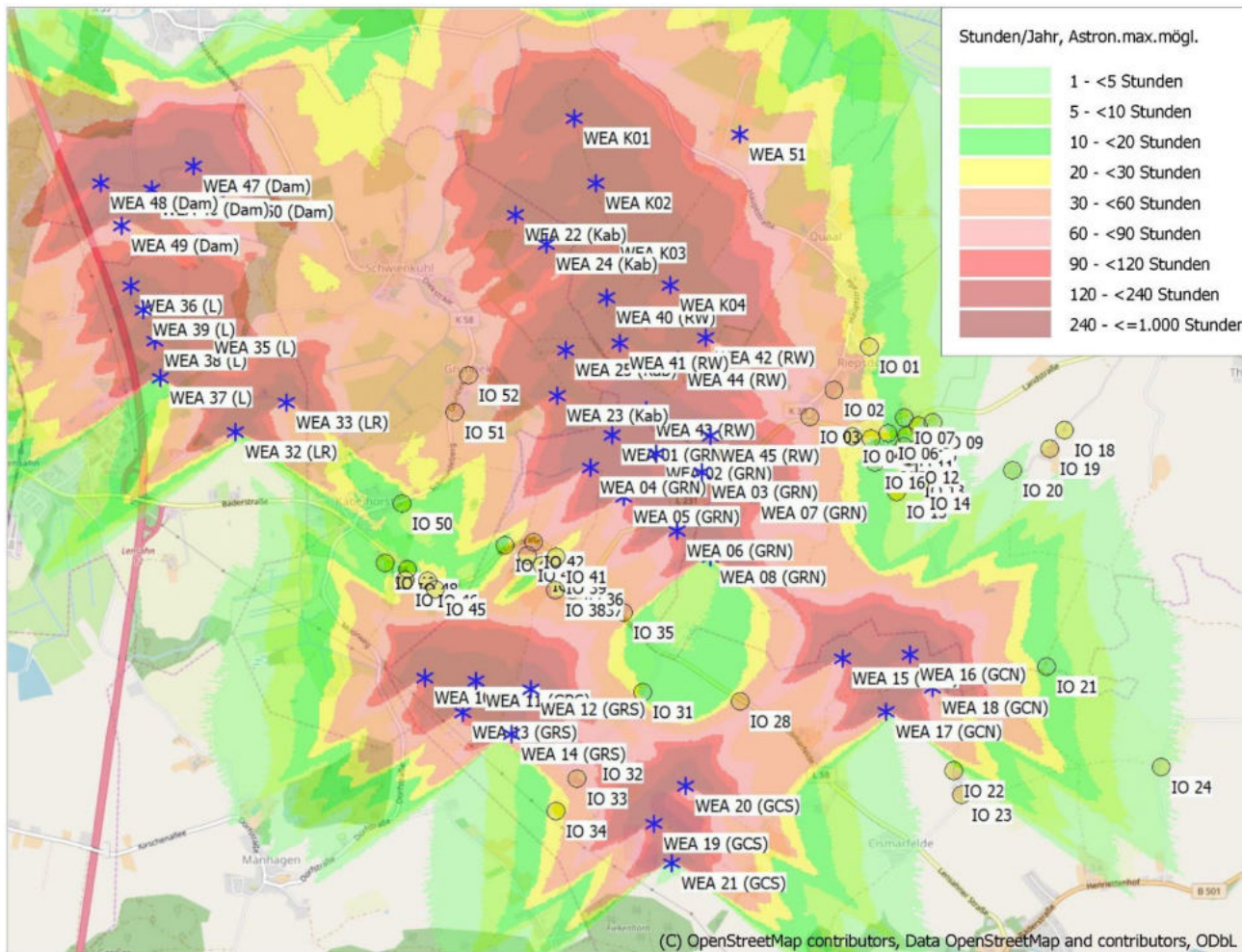
Berechnung: Vorbelastung verbleibender Bestand nach Rückbau Großenholz

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Maximal [h/a]
WEA 13 (GRS)	WEA 13 Jacobs MD70	36:25
WEA 14 (GRS)	WEA 14 Jacobs MD70	55:11
WEA 15 (GCN)	WEA 15 Jacobs MD70	20:59
WEA 16 (GCN)	WEA 16 Jacobs MD70	8:26
WEA 17 (GCN)	WEA 17 Jacobs MD70	7:22
WEA 18 (GCN)	WEA 18 Jacobs MD70	10:03
WEA 19 (GCS)	WEA 19 Jacobs MD70	63:40
WEA 20 (GCS)	WEA 20 Jacobs MD70	46:36
WEA 21 (GCS)	WEA 21 Jacobs MD70	26:01
WEA 22 (Kab)	WEA 22 NEG Micon NM 1500 C	0:00
WEA 23 (Kab)	WEA 23 NEG Micon NM 1500 C	29:07
WEA 24 (Kab)	WEA 24 NEG Micon NM 1500 C	0:00
WEA 25 (Kab)	WEA 25 NEG Micon NM 1500 C	28:02
WEA 32 (LR)	WEA 32 Enercon E-66/18.70	4:44
WEA 33 (LR)	WEA 33 Jacobs MD70	4:22
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	0:00
WEA 38 (L)	WEA 38 Enercon E-70 E4	0:00
WEA 39 (L)	WEA 39 Enercon E-70 E4	0:00
WEA 40 (RW)	WEA 40 Jacobs MD70	12:51
WEA 41 (RW)	WEA 41 Jacobs MD70	13:50
WEA 42 (RW)	WEA 42 Jacobs MD70	31:35
WEA 43 (RW)	WEA 43 Jacobs MD70	14:30
WEA 44 (RW)	WEA 44 Vestas V47	0:00
WEA 45 (RW)	WEA 45 Vestas V47	7:54
WEA 46 (Dam)	WEA 46 Südwind S70	0:00
WEA 47 (Dam)	WEA 47 Südwind S70	0:00
WEA 48 (Dam)	WEA 48 Südwind S70	0:00
WEA 49 (Dam)	WEA 49 Enercon E-82	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)	2:17
WEA K03	WEA K03 Enercon E-115 EP3 E3/2.9 MW (TES)	11:21
WEA K04	WEA K04 Enercon E-115 EP3 E3/2.9 MW (TES)	50:12

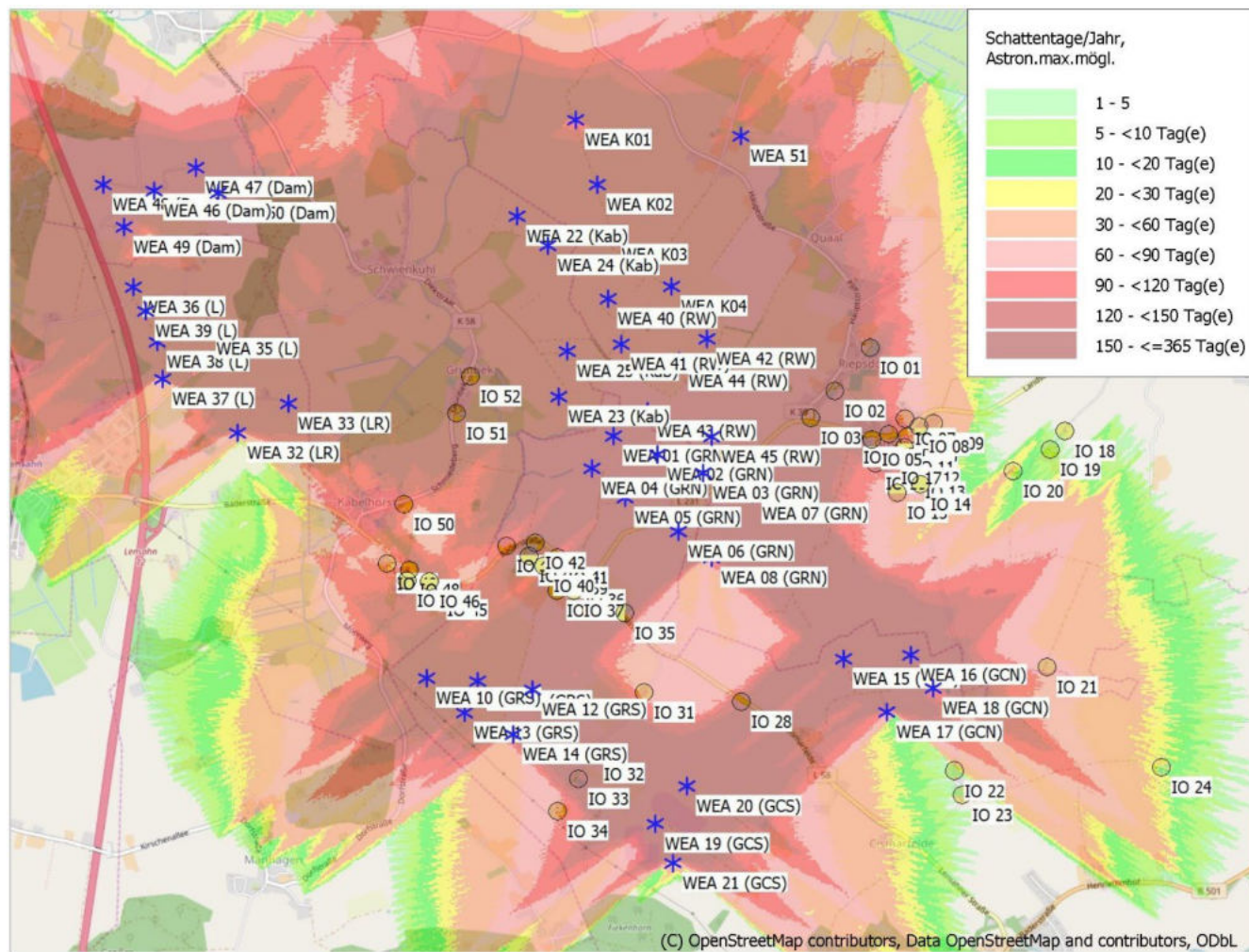
Summen in Rezeptortabelle und WEA-Tabelle können sich unterscheiden, da eine WEA gleichzeitig an zwei oder mehr Rezeptoren Beschattung verursachen kann und/oder ein Rezeptor gleichzeitig von zwei oder mehr WEA beschattet werden kann.

11.10 Schattenwurfkarte verbleibende Vorbelastung nach Rückbau, Stunden pro Jahr



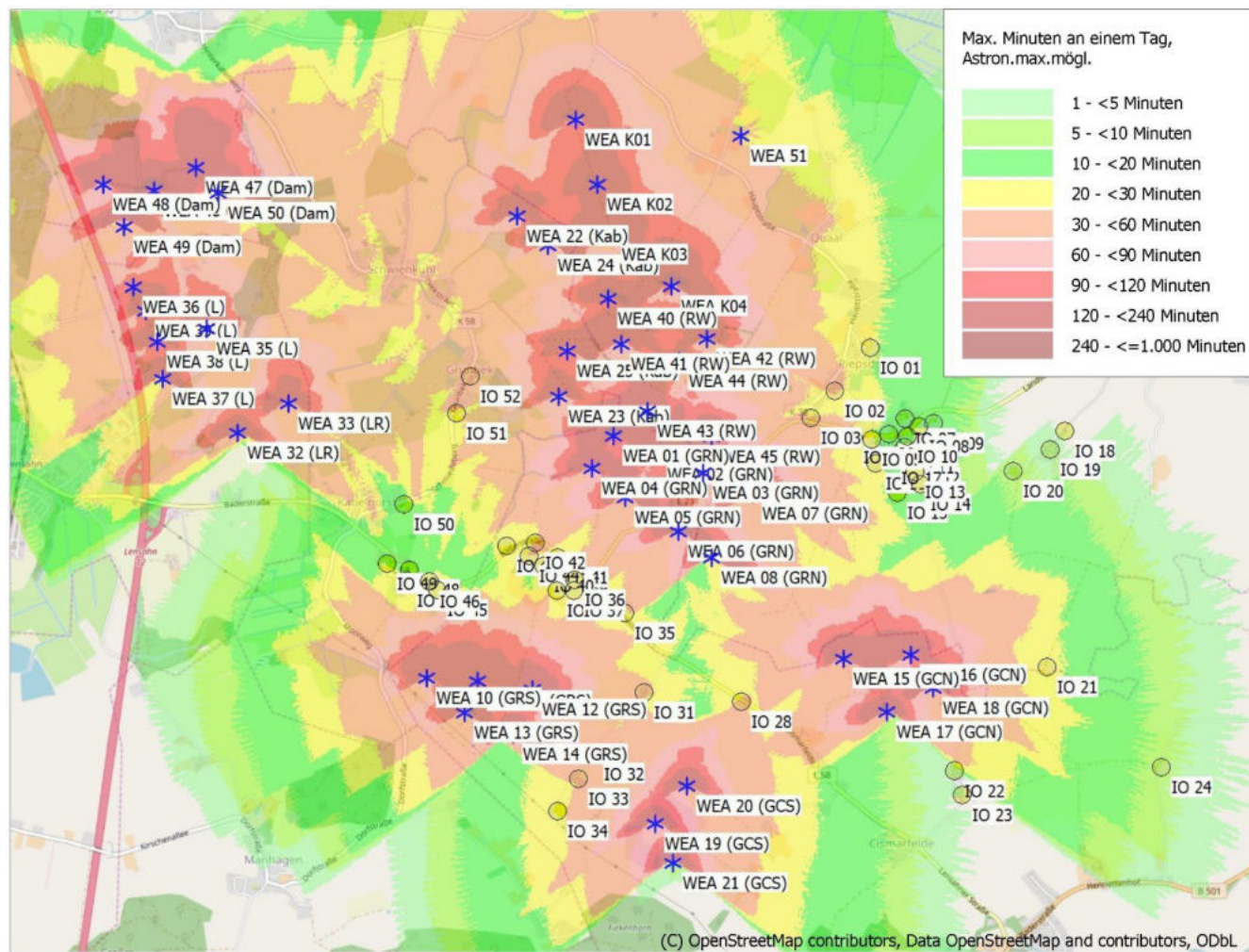
0 500 1000 1500 2000 m
 Karte: EMD OpenStreetMap, Maßstab 1:38.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 626.999 Nord: 6.009.387
 * Existierende WEA ● Schattenrezeptor
 Höhe der Schattenkarte: Höhenlinien: oro_2019-07-25.map (1)

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 Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:
22.06.2022 18:31/3.5.584

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung Großenholz (3 x V150-6.0)

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)
Hindernisse in Berechnung nicht verwendet
Rasterauflösung: 10,0 m

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

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ			Nennleistung	Rotor-durchmesser	Nabenhöhe	Schattendaten	
					Aktuell	Hersteller	Typ				Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[U/min]	
WEA_G1	627.652	6.008.659	20,0	WEA G1 Vestas V150-6.0	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 Vestas V150-6.0	Ja	VESTAS	V150-6.0-6.000	6.000	150,0	105,0	1.902	0,0
WEA_G3	628.449	6.008.722	20,0	WEA G3 Vestas V150-6.0	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 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Ratjensdorfer Felde 1	629.789	6.009.880	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Ratjensdorfer Felde 3	629.701	6.009.765	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Ratjensdorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	629.211	6.007.586	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Wintersberg	630.455	6.007.797	8,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Cismarfelde 15	627.807	6.008.129	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rütting Söhlen 2	627.197	6.008.174	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rütting Söhlen 5	626.892	6.007.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Rütting Söhlen 7	626.798	6.007.622	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 18:31/3.5.584

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung Großenholz (3 x V150-6.0)

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr. [m]
IO 34	IO 34 Rütig Söhlen 11	626.671	6.007.415	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Rütig Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Kathenkamp 1 (Rütiger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Rütiger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Rütiger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Rütiger Kornenhof 1 (Rütig)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Rütiger Kornenhof 10 (Rütig)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Kathenkamp 11 (Rütig)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Kathenkamp 19 (Rütig)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Kathenkamp 2 (Rütig)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Kälberhof 5 (Rütig)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 51	IO 51 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 52	IO 52 Grünbeck 16	626.050	6.010.124	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

astron. max. mögl. Beschattungsdauer

Nr.	Name	Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO 01	IO 01 Hohe Weide 6 (Riepsdorf)	0:00	0	0:00
IO 02	IO 02 Am Teich 4 (Riepsdorf)	0:00	0	0:00
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	0:00	0	0:00
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	19:01	52	0:27
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	20:02	62	0:26
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	14:44	66	0:23
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	11:04	64	0:21
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	16:19	71	0:20
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	18:36	74	0:22
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	18:37	76	0:22
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	24:04	82	0:26
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	36:18	92	0:45
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	56:12	102	0:54
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	65:28	112	0:56
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	80:46	112	1:10
IO 16	IO 16 Achterhof (Gosdorf)	27:40	82	0:26
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	27:43	84	0:28
IO 18	IO 18 Ratjensdorfer Felde 1	6:02	30	0:19
IO 19	IO 19 Ratjensdorfer Felde 3	7:24	32	0:21
IO 20	IO 20 Ratjensdorfer Felde 2	17:55	52	0:34
IO 21	IO 21 Morest, Grömitz	16:23	59	0:27
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	14:23	64	0:19
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	7:36	45	0:14
IO 24	IO 24 Wintersberg	0:00	0	0:00
IO 28	IO 28 Cismarfelde 15	0:00	0	0:00
IO 31	IO 31 Rütig Söhlen 2	51:57	112	0:38
IO 32	IO 32 Rütig Söhlen 5	25:30	81	0:26
IO 33	IO 33 Rütig Söhlen 7	7:50	44	0:15
IO 34	IO 34 Rütig Söhlen 11	0:18	12	0:02
IO 35	IO 35 Rütig Chaussee 1	57:45	82	1:03
IO 36	IO 36 Kathenkamp 1 (Rütiger Hof)	24:51	48	0:47
IO 37	IO 37 Rütiger Klosterkamp 5	24:13	46	0:50
IO 38	IO 38 Rütiger Klosterkamp 9	18:26	41	0:43
IO 39	IO 39 Rütiger Kornenhof 1 (Rütig)	20:11	47	0:41
IO 40	IO 40 Rütiger Kornenhof 10 (Rütig)	13:58	37	0:36
IO 41	IO 41 Kathenkamp 11 (Rütig)	20:52	51	0:41
IO 42	IO 42 Kathenkamp 19 (Rütig)	13:40	37	0:36

(Fortsetzung nächste Seite)...

Projekt:
SWP Windpark Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:
22.06.2022 18:31/3.5.584

SHADOW - Hauptergebnis

Berechnung: Zusatzbelastung Großenholz (3 x V150-6.0)

...(Fortsetzung von vorheriger Seite)

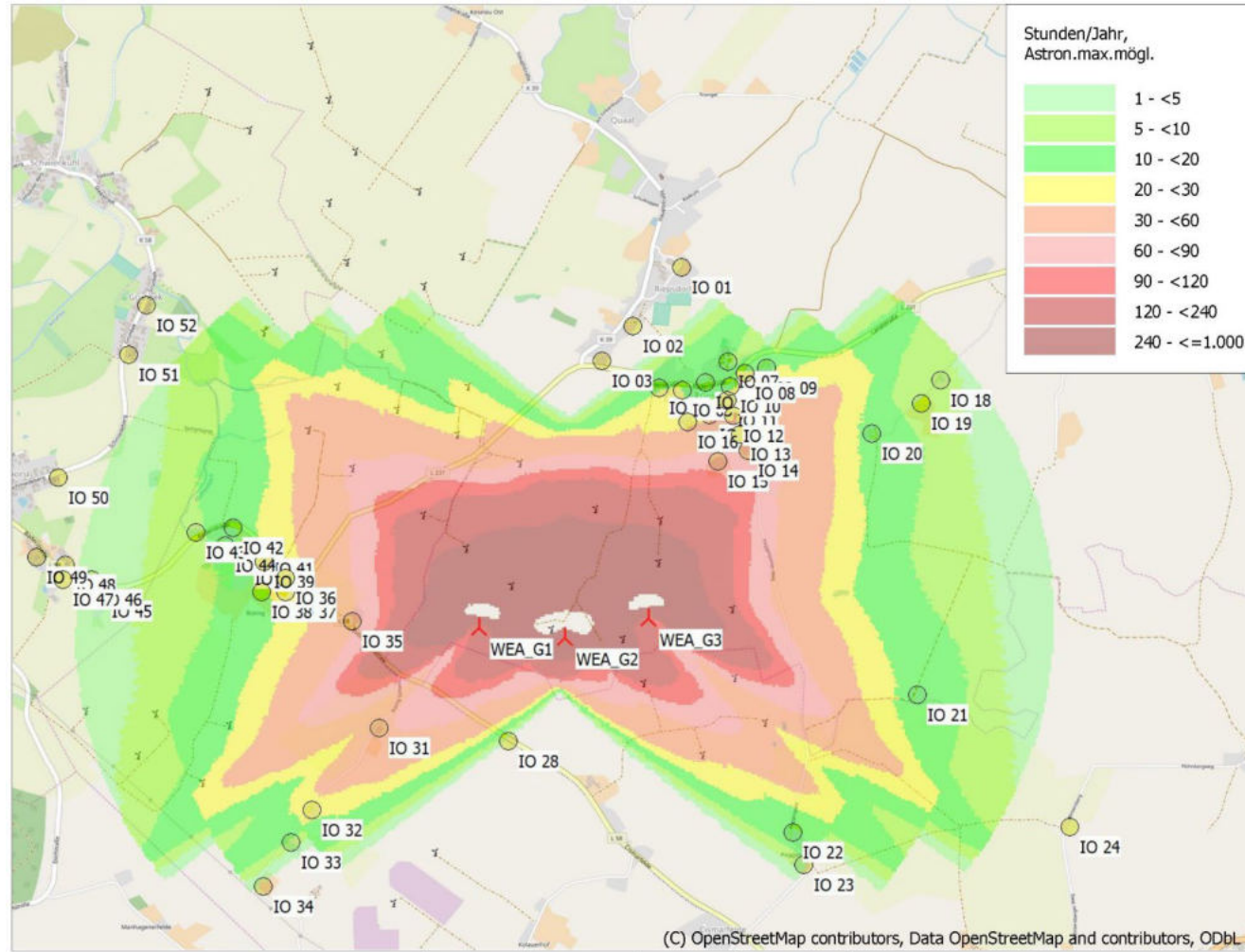
Nr.	Name	astron. max. mögl. Beschattungsdauer		
		Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]
IO 43	IO 43 Kathenkamp 2 (Rüting)	9:04	29	0:29
IO 44	IO 44 Kälberhof 5 (Rüting)	11:55	33	0:33
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	3:37	21	0:17
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	3:14	19	0:16
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	0:00	0	0:00
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	0:00	0	0:00
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	0:00	0	0:00
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	0:00	0	0:00
IO 51	IO 51 Grünbeck 2	0:00	0	0:00
IO 52	IO 52 Grünbeck 16	0:00	0	0:00

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA_G1	WEA G1 Vestas V150-6.0	173:40
WEA_G2	WEA G2 Vestas V150-6.0	181:32
WEA_G3	WEA G3 Vestas V150-6.0	125:11

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

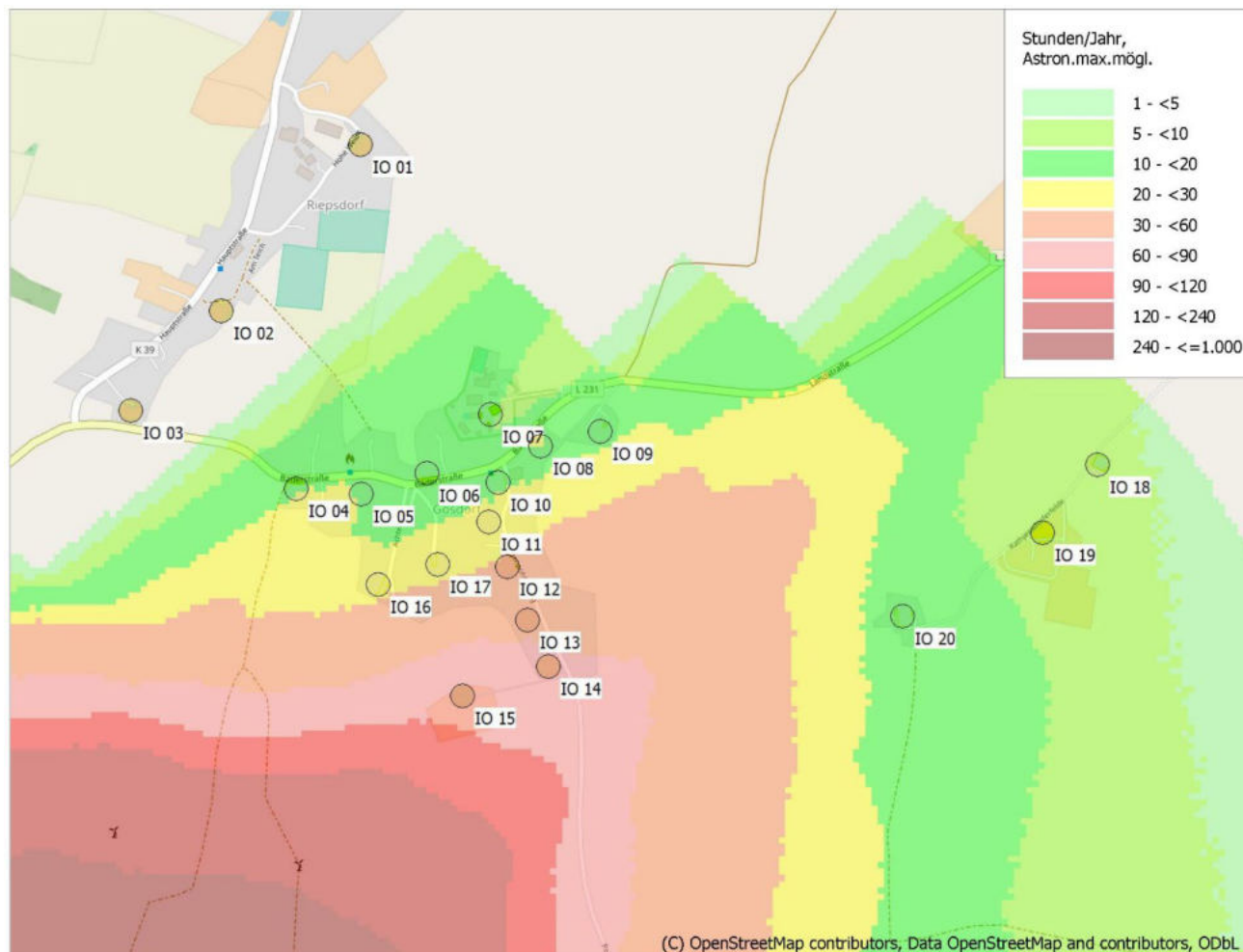
0 500 1000 1500 2000 m

Karte: EMD OpenStreetMap , Maßstab 1:28.500, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 628.300 Nord: 6.009.300

▲ Neue WEA ● Schattenrezeptor

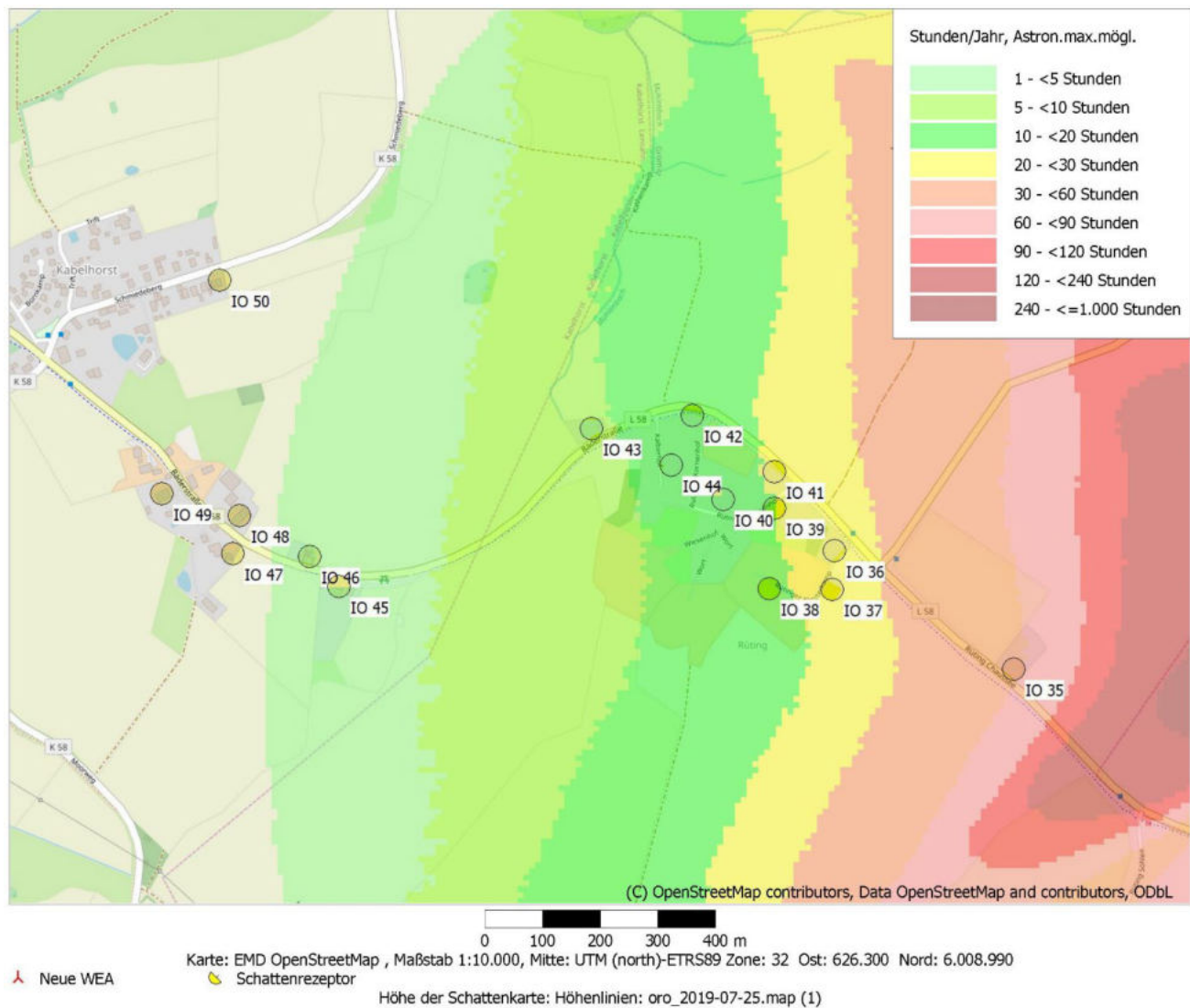
Höhe der Schattenkarte: Höhenlinien: oro_2019-07-25.map (1)

11.15 Schattenwurfkarte Zusatzbelastung Detail Gosdorf, Stunden pro Jahr

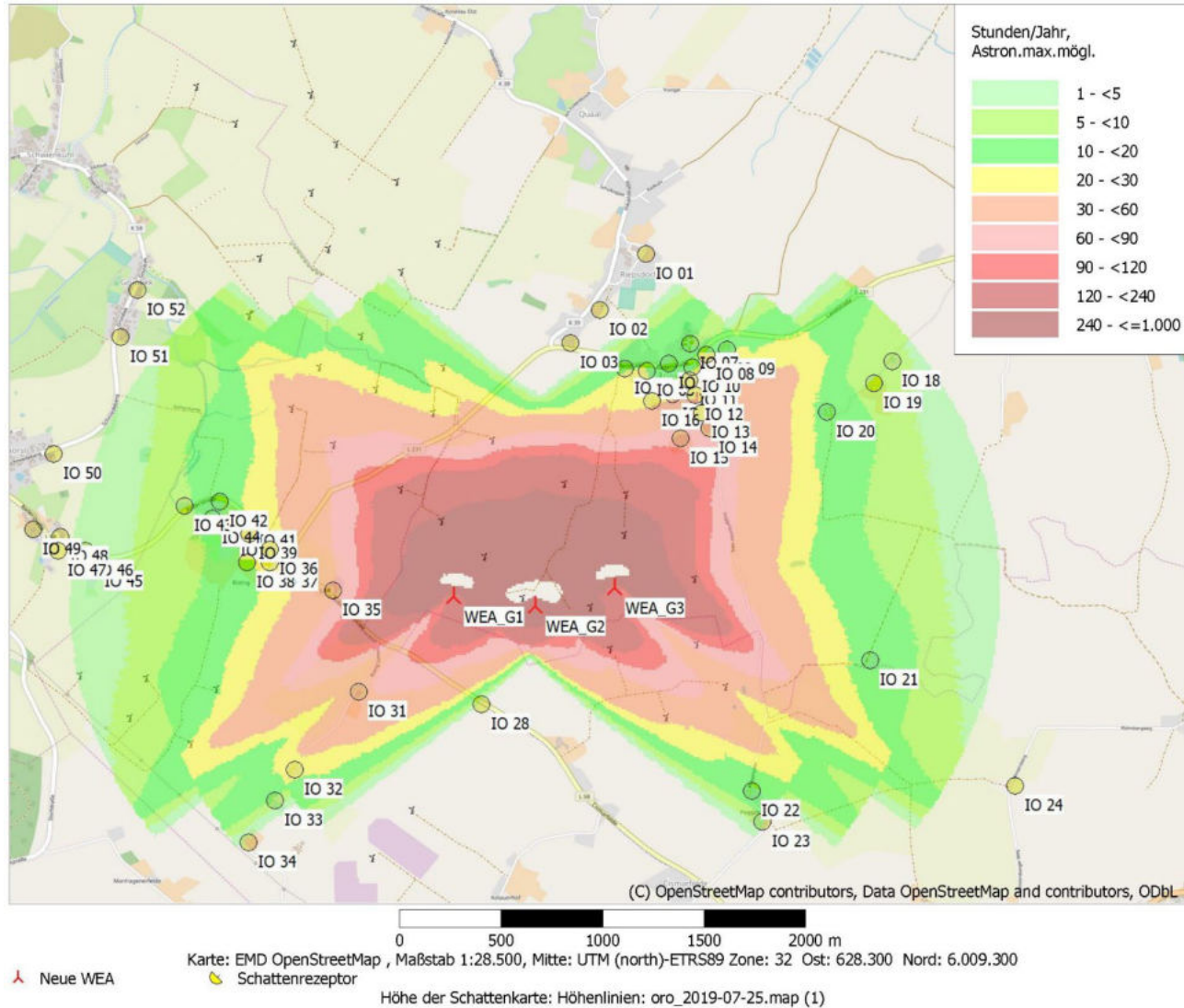


(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL
 0 100 200 300 400 m
 Karte: EMD OpenStreetMap, Maßstab 1:10.000, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 629.000 Nord: 6.009.800
 Neue WEA Schattenrezeptor
 Höhe der Schattenkarte: Höhenlinien: oro_2019-07-25.map (1)

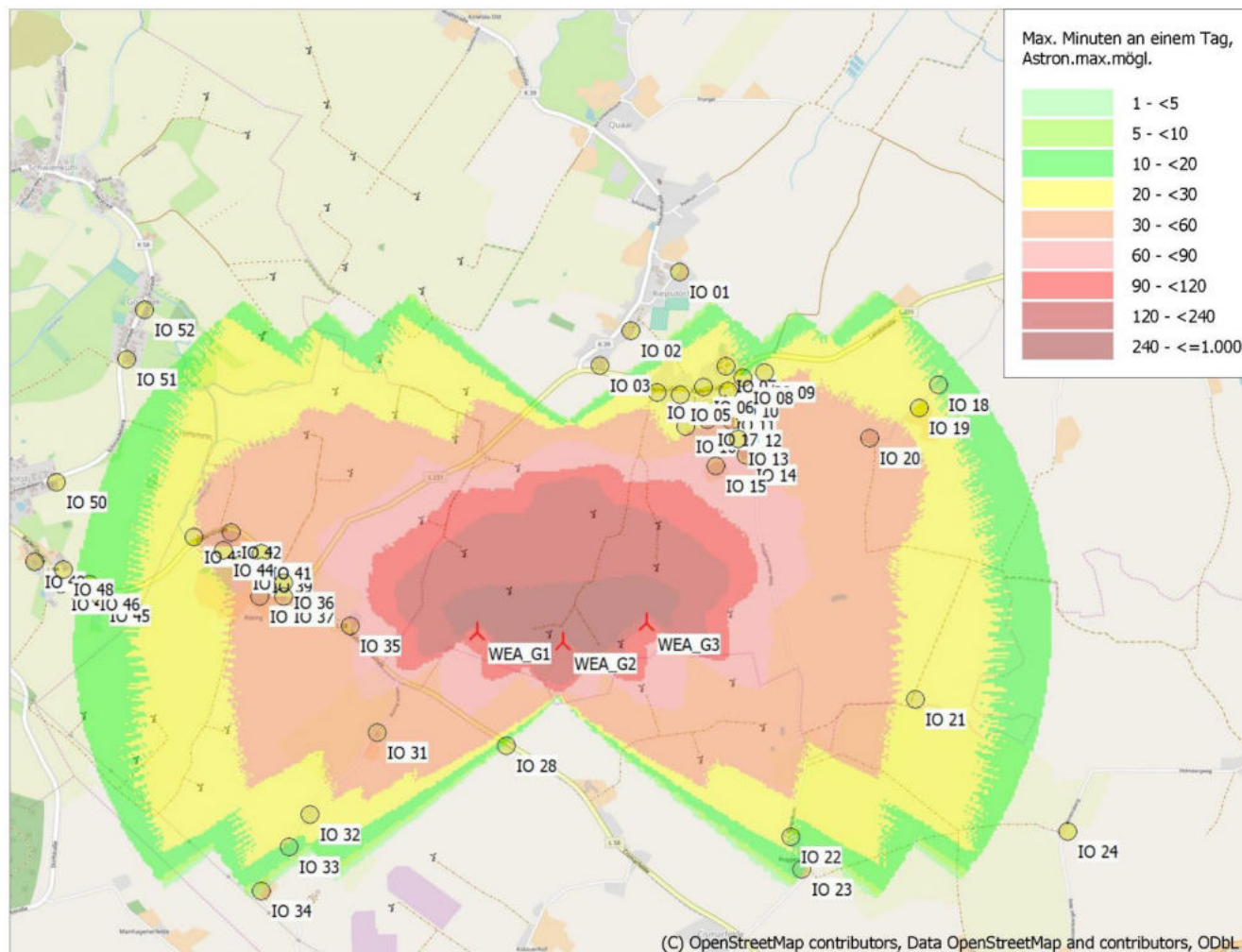
11.16 Schattenwurfkarte Zusatzbelastung Detail Rütting, Stunden pro Jahr



11.17 Schattenwurfkarte Zusatzbelastung, Tage pro Jahr

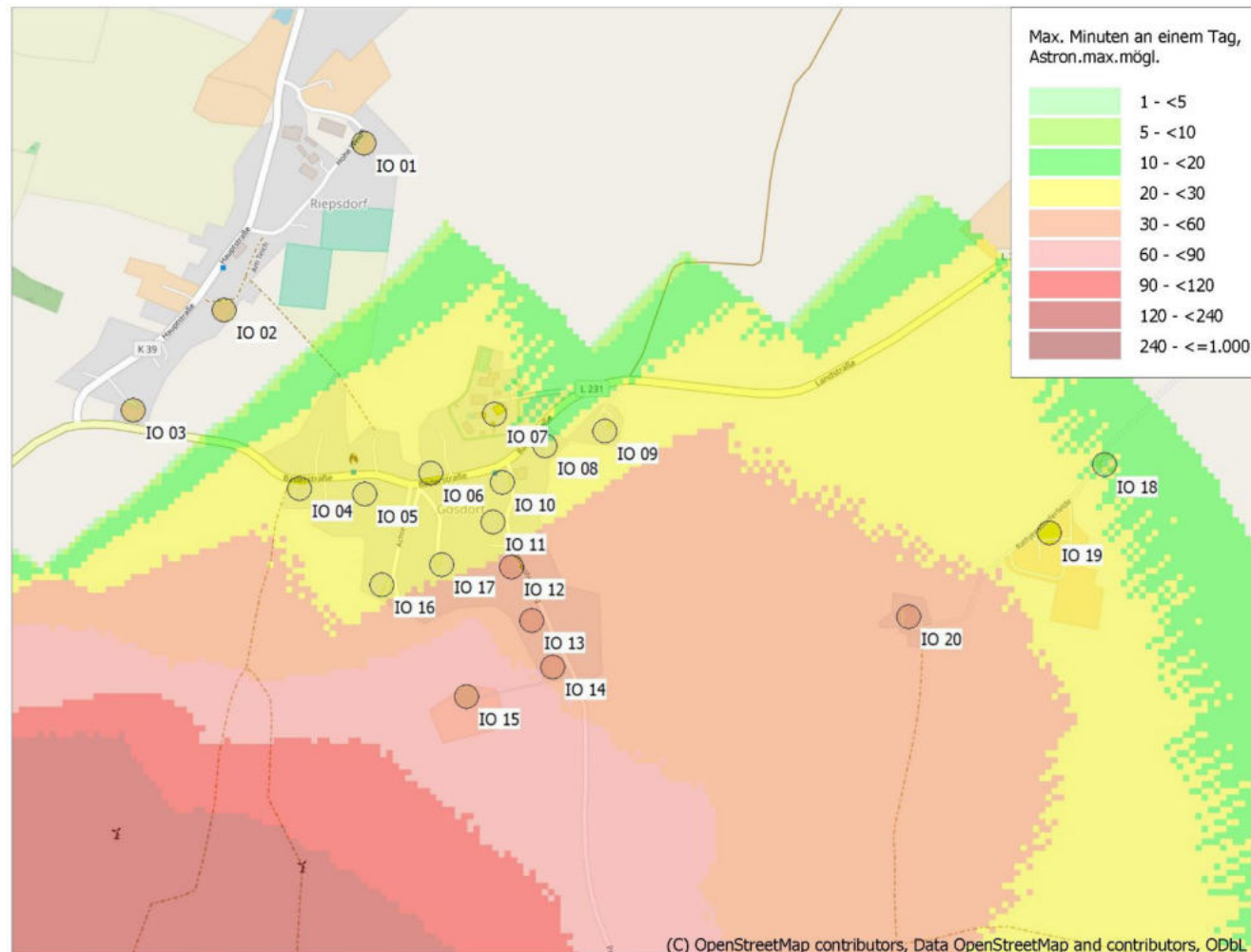


11.18 Schattenwurfkarte Zusatzbelastung, Minuten pro Tag



0 500 1000 1500 2000 m
 Karte: EMD OpenStreetMap, Maßstab 1:28.500, Mitte: UTM (north)-ETRS89 Zone: 32 Ost: 628.300 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



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

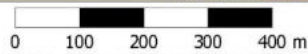
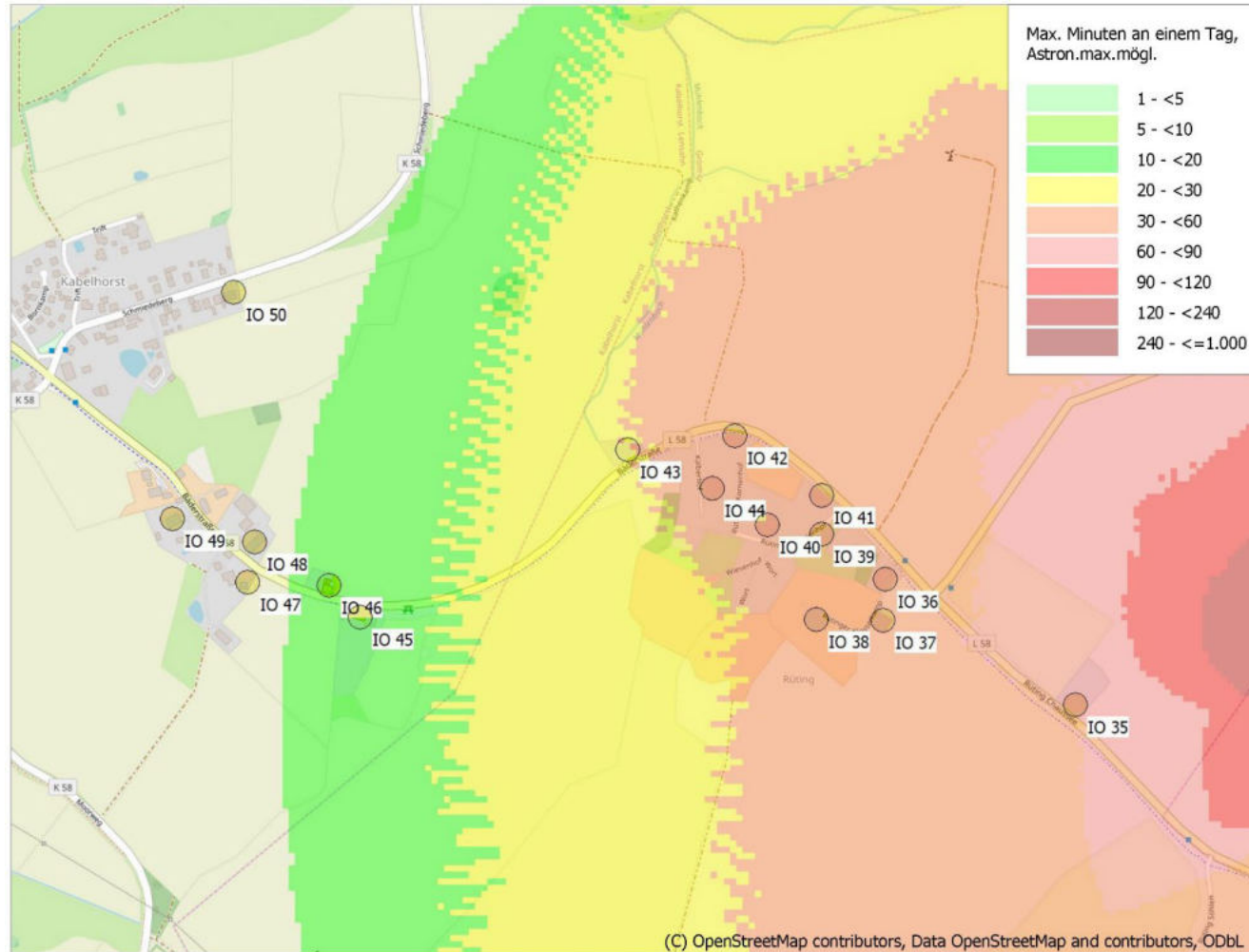
0 100 200 300 400 m

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

Neue WEA 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)

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)

...(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 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 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	6.010.722	21,5	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	6.008.722	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 Am Teich 4 (Riepsdorf)	628.337	6.010.091	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	628.192	6.009.924	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	628.468	6.009.804	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	628.577	6.009.796	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	628.683	6.009.834	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	628.786	6.009.934	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	628.870	6.009.884	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	628.968	6.009.911	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	628.801	6.009.822	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	628.788	6.009.756	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	628.820	6.009.685	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	628.856	6.009.598	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	628.894	6.009.522	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	628.752	6.009.469	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 16	IO 16 Achterhof (Gosdorf)	628.608	6.009.649	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	628.706	6.009.684	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 18	IO 18 Ratjensdorfer Felde 1	629.789	6.009.880	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 19	IO 19 Ratjensdorfer Felde 3	629.701	6.009.765	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 20	IO 20 Ratjensdorfer Felde 2	629.474	6.009.621	15,1	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 21	IO 21 Morest, Grömitz	629.723	6.008.400	16,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	629.157	6.007.735	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	629.211	6.007.586	19,5	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 24	IO 24 Wintersberg	630.455	6.007.797	8,2	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 28	IO 28 Cismarfelde 15	627.807	6.008.129	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 31	IO 31 Rütting Söhlen 2	627.197	6.008.174	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 32	IO 32 Rütting Söhlen 5	626.892	6.007.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 33	IO 33 Rütting Söhlen 7	626.798	6.007.622	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 34	IO 34 Rütting Söhlen 11	626.671	6.007.415	15,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 35	IO 35 Rütting Chaussee 1	627.056	6.008.668	25,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 36	IO 36 Kathenkamp 1 (Rüttinger Hof)	626.737	6.008.865	24,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 37	IO 37 Rüttinger Klosterkamp 5	626.737	6.008.797	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 38	IO 38 Rüttinger Klosterkamp 9	626.626	6.008.796	23,6	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 39	IO 39 Rüttinger Kornhof 1 (Rütting)	626.632	6.008.936	23,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 40	IO 40 Rüttinger Kornhof 10 (Rütting)	626.542	6.008.948	21,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 41	IO 41 Kathenkamp 11 (Rütting)	626.629	6.008.999	22,7	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 42	IO 42 Kathenkamp 19 (Rütting)	626.484	6.009.093	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 43	IO 43 Kathenkamp 2 (Rütting)	626.309	6.009.066	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 44	IO 44 Kälberhof 5 (Rütting)	626.450	6.009.007	20,4	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	625.876	6.008.779	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	625.824	6.008.830	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	625.689	6.008.831	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	625.700	6.008.897	22,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Hauptergebnis

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe	Neigung des	Ausrichtungsmodus	Augenhöhe
					[m]	[m]	[m]	ü.Gr. Fensters		(ZVI)
								[°]		ü.Gr.
										[m]
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	625.563	6.008.931	20,0	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	625.655	6.009.307	16,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 51	IO 51 Grünbeck 2	625.972	6.009.891	14,9	1,0	1,0	2,0	0,0	"Gewächshaus-Modus"	2,0
IO 52	IO 52 Grünbeck 16	626.050	6.010.124	15,0	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)	26:57	182	0:21
IO 02	IO 02 Am Teich 4 (Riepsdorf)	64:05	257	0:30
IO 03	IO 03 Hauptstraße 4 (Riepsdorf)	66:09	239	0:32
IO 04	IO 04 Bäderstraße 2 (Gosdorf)	47:48	230	0:27
IO 05	IO 05 Bäderstraße 8 (Gosdorf)	41:05	227	0:26
IO 06	IO 06 Bäderstraße 17 (Gosdorf)	35:51	217	0:23
IO 07	IO 07 Bäderstraße 25 (Gosdorf)	21:31	152	0:21
IO 08	IO 08 Bäderstraße 34 (Gosdorf)	24:27	147	0:20
IO 09	IO 09 Bäderstraße 35 (Gosdorf)	24:07	136	0:22
IO 10	IO 10 Poggenpohler Weg 2 (Gosdorf)	30:35	182	0:22
IO 11	IO 11 Poggenpohler Weg 8 (Gosdorf)	39:51	209	0:26
IO 12	IO 12 Poggenpohler Weg 14 (Gosdorf)	49:40	207	0:45
IO 13	IO 13 Poggenpohler Weg 20 (Gosdorf)	65:04	199	0:54
IO 14	IO 14 Poggenpohler Weg 28 (Gosdorf)	71:30	192	0:56
IO 15	IO 15 Poggenpohler Weg 30 (Gosdorf)	89:34	180	1:10
IO 16	IO 16 Achterhof (Gosdorf)	46:16	222	0:26
IO 17	IO 17 Bäderstraße 24a (Gosdorf)	41:41	218	0:28
IO 18	IO 18 Ratjensdorfer Felde 1	6:04	32	0:19
IO 19	IO 19 Ratjensdorfer Felde 3	7:43	40	0:21
IO 20	IO 20 Ratjensdorfer Felde 2	19:51	83	0:34
IO 21	IO 21 Morest, Grömitz	32:33	119	0:27
IO 22	IO 22 Poggenpohl 4 (Cismarfelde)	14:27	68	0:19
IO 23	IO 23 Poggenpohl 1 (Cismarfelde)	7:39	48	0:14
IO 24	IO 24 Wintersberg	1:35	27	0:08
IO 28	IO 28 Cismarfelde 15	46:49	161	0:34
IO 31	IO 31 Rütting Söhlen 2	70:20	186	0:38
IO 32	IO 32 Rütting Söhlen 5	119:46	253	0:45
IO 33	IO 33 Rütting Söhlen 7	74:32	196	0:48
IO 34	IO 34 Rütting Söhlen 11	24:51	99	0:26
IO 35	IO 35 Rütting Chaussee 1	105:42	283	1:03
IO 36	IO 36 Kathenkamp 1 (Rütting Hof)	62:14	206	0:47
IO 37	IO 37 Rüttinger Klosterkamp 5	69:54	254	0:50
IO 38	IO 38 Rüttinger Klosterkamp 9	59:03	206	0:43
IO 39	IO 39 Rüttinger Kornhof 1 (Rütting)	53:47	217	0:41
IO 40	IO 40 Rüttinger Kornhof 10 (Rütting)	32:27	143	0:36
IO 41	IO 41 Kathenkamp 11 (Rütting)	42:41	169	0:41
IO 42	IO 42 Kathenkamp 19 (Rütting)	68:38	225	0:36
IO 43	IO 43 Kathenkamp 2 (Rütting)	29:29	139	0:29
IO 44	IO 44 Kälberhof 5 (Rütting)	58:24	212	0:33
IO 45	IO 45 Bäderstraße 20-22 (Kabelhorst)	20:16	142	0:20
IO 46	IO 46 Bäderstraße 15 (Kabelhorst)	22:05	146	0:19
IO 47	IO 47 Bäderstraße 18 (Kabelhorst)	21:52	125	0:22
IO 48	IO 48 Bäderstraße 13 (Kabelhorst)	11:10	110	0:16
IO 49	IO 49 Bäderstraße 10 (Kabelhorst)	16:24	101	0:19
IO 50	IO 50 Schmiedeberg 26 (Kabelhorst)	16:47	115	0:15
IO 51	IO 51 Grünbeck 2	54:15	228	0:26
IO 52	IO 52 Grünbeck 16	55:16	196	0:41

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Hauptergebnis

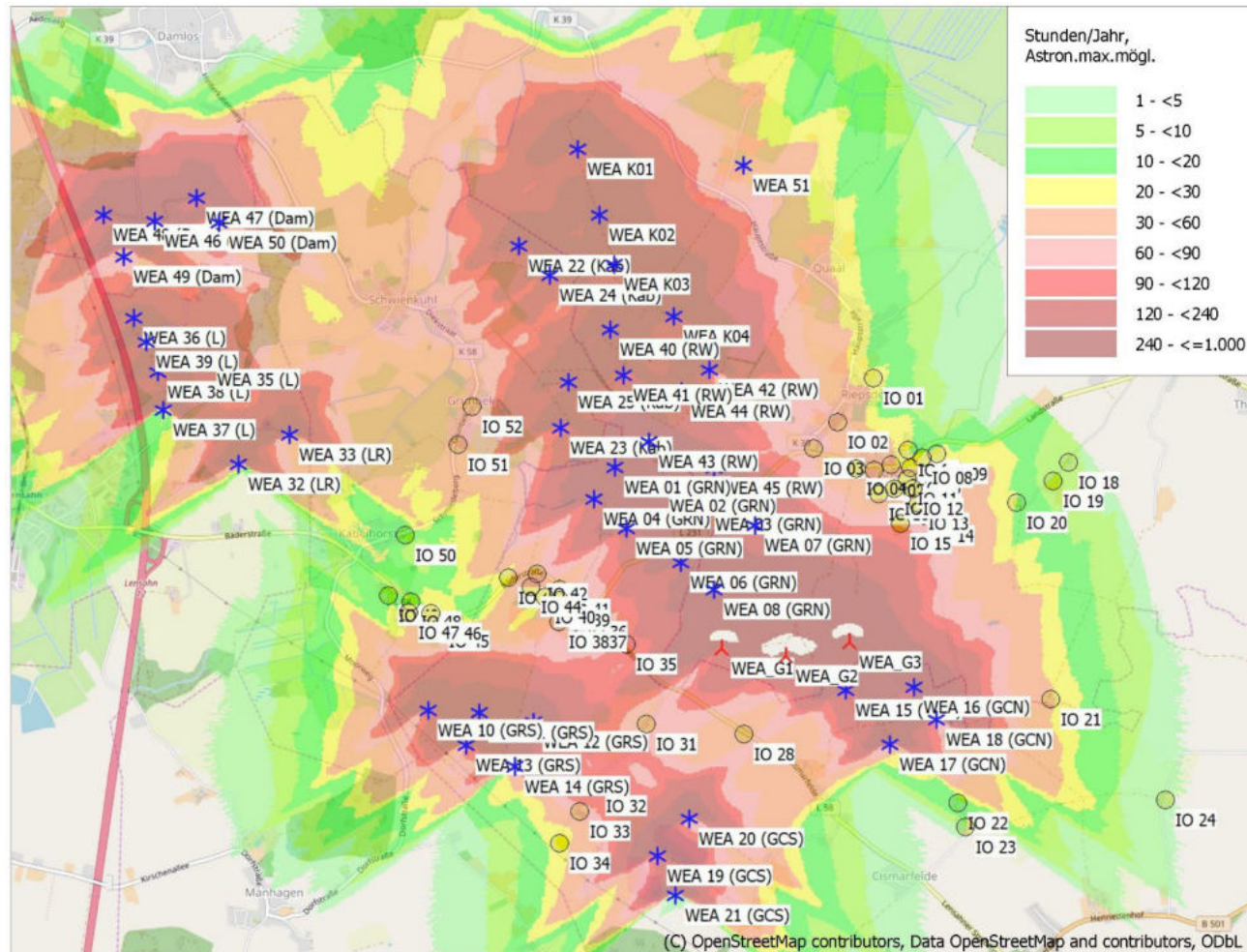
Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]
WEA 01 (GRN)	WEA 01 Jacobs MD70	13:58
WEA 02 (GRN)	WEA 02 Jacobs MD70	32:33
WEA 03 (GRN)	WEA 03 Jacobs MD70	50:13
WEA 04 (GRN)	WEA 04 Jacobs MD70	24:59
WEA 05 (GRN)	WEA 05 Jacobs MD70	68:30
WEA 06 (GRN)	WEA 06 Enercon E-66 18.70	67:31
WEA 07 (GRN)	WEA 07 Enercon E-66 18.70	79:53
WEA 08 (GRN)	WEA 08 Enercon E-66 18.70	54:49
WEA 10 (GRS)	WEA 10 Jacobs MD70	33:11
WEA 11 (GRS)	WEA 11 Jacobs MD70	84:48
WEA 12 (GRS)	WEA 12 Jacobs MD70	37:41
WEA 13 (GRS)	WEA 13 Jacobs MD70	36:25
WEA 14 (GRS)	WEA 14 Jacobs MD70	55:11
WEA 15 (GCN)	WEA 15 Jacobs MD70	20:59
WEA 16 (GCN)	WEA 16 Jacobs MD70	8:26
WEA 17 (GCN)	WEA 17 Jacobs MD70	7:22
WEA 18 (GCN)	WEA 18 Jacobs MD70	10:03
WEA 19 (GCS)	WEA 19 Jacobs MD70	63:40
WEA 20 (GCS)	WEA 20 Jacobs MD70	46:36
WEA 21 (GCS)	WEA 21 Jacobs MD70	26:01
WEA 22 (Kab)	WEA 22 NEG Micon NM 1500 C	0:00
WEA 23 (Kab)	WEA 23 NEG Micon NM 1500 C	29:07
WEA 24 (Kab)	WEA 24 NEG Micon NM 1500 C	0:00
WEA 25 (Kab)	WEA 25 NEG Micon NM 1500 C	28:02
WEA 32 (LR)	WEA 32 Enercon E-66/18.70	4:44
WEA 33 (LR)	WEA 33 Jacobs MD70	4:22
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	0:00
WEA 38 (L)	WEA 38 Enercon E-70 E4	0:00
WEA 39 (L)	WEA 39 Enercon E-70 E4	0:00
WEA 40 (RW)	WEA 40 Jacobs MD70	12:51
WEA 41 (RW)	WEA 41 Jacobs MD70	13:50
WEA 42 (RW)	WEA 42 Jacobs MD70	31:35
WEA 43 (RW)	WEA 43 Jacobs MD70	14:30
WEA 44 (RW)	WEA 44 Vestas V47	0:00
WEA 45 (RW)	WEA 45 Vestas V47	7:54
WEA 46 (Dam)	WEA 46 Südwind S70	0:00
WEA 47 (Dam)	WEA 47 Südwind S70	0:00
WEA 48 (Dam)	WEA 48 Südwind S70	0:00
WEA 49 (Dam)	WEA 49 Enercon E-82	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)	2:17
WEA K03	WEA K03 Enercon E-115 EP3 E3/2,9 MW (TES)	11:21
WEA K04	WEA K04 Enercon E-115 EP3 E3/2,9 MW (TES)	50:12
WEA_G1	WEA G1 Vestas V150-6.0	173:40
WEA_G2	WEA G2 Vestas V150-6.0	181:32
WEA_G3	WEA G3 Vestas V150-6.0	125:11

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.

11.22 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

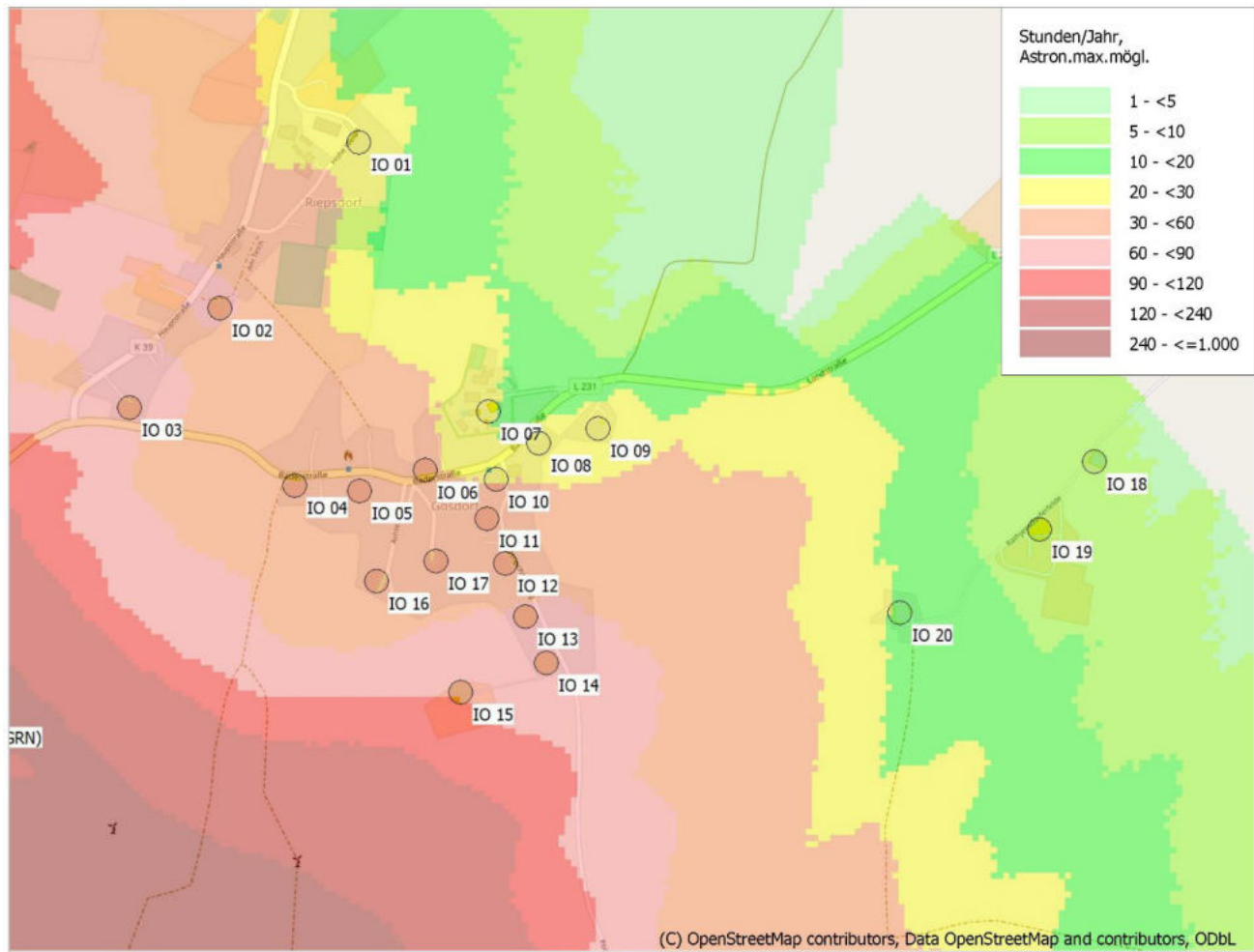
▲ Neue WEA

★ 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

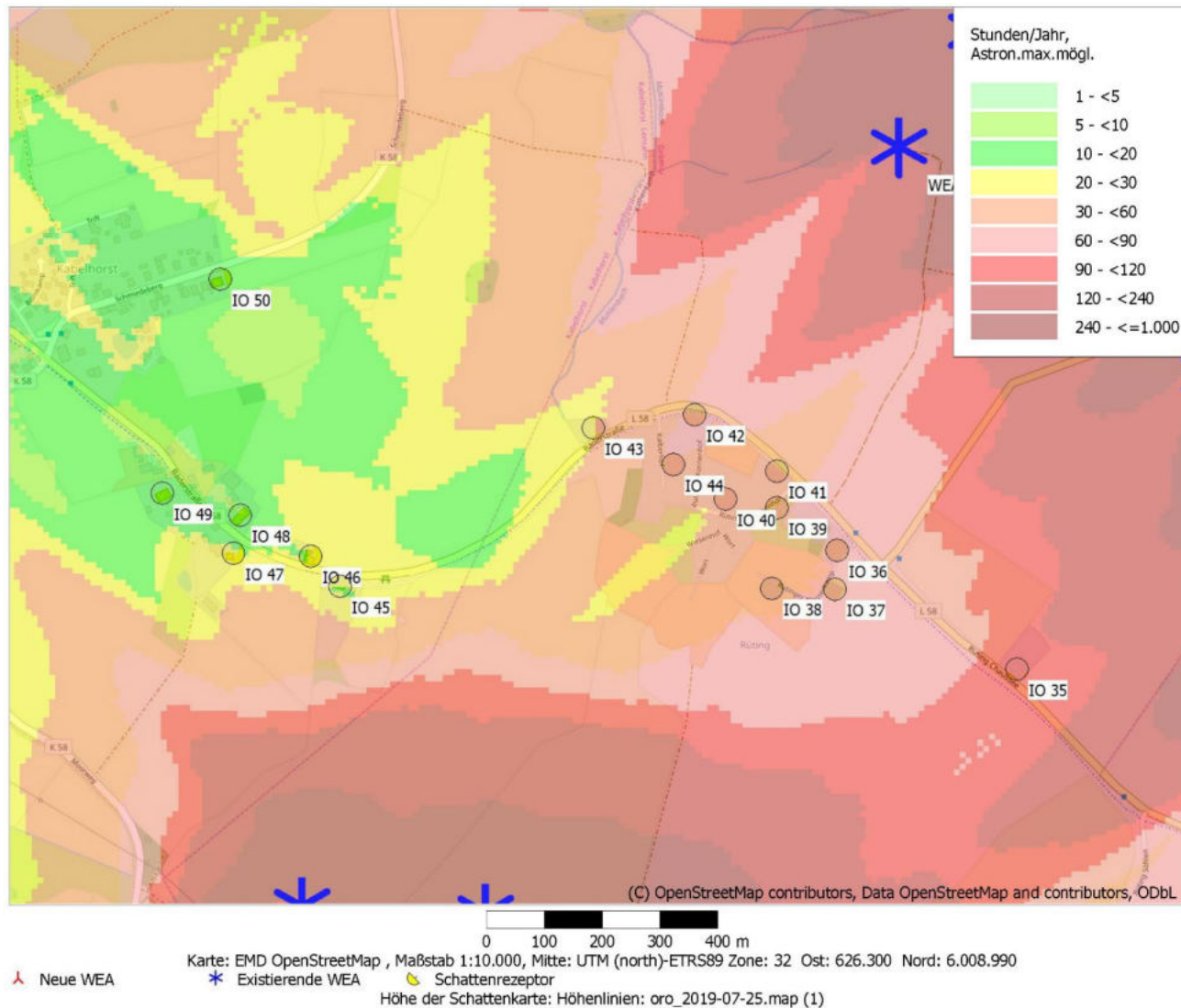
0 100 200 300 400 m

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

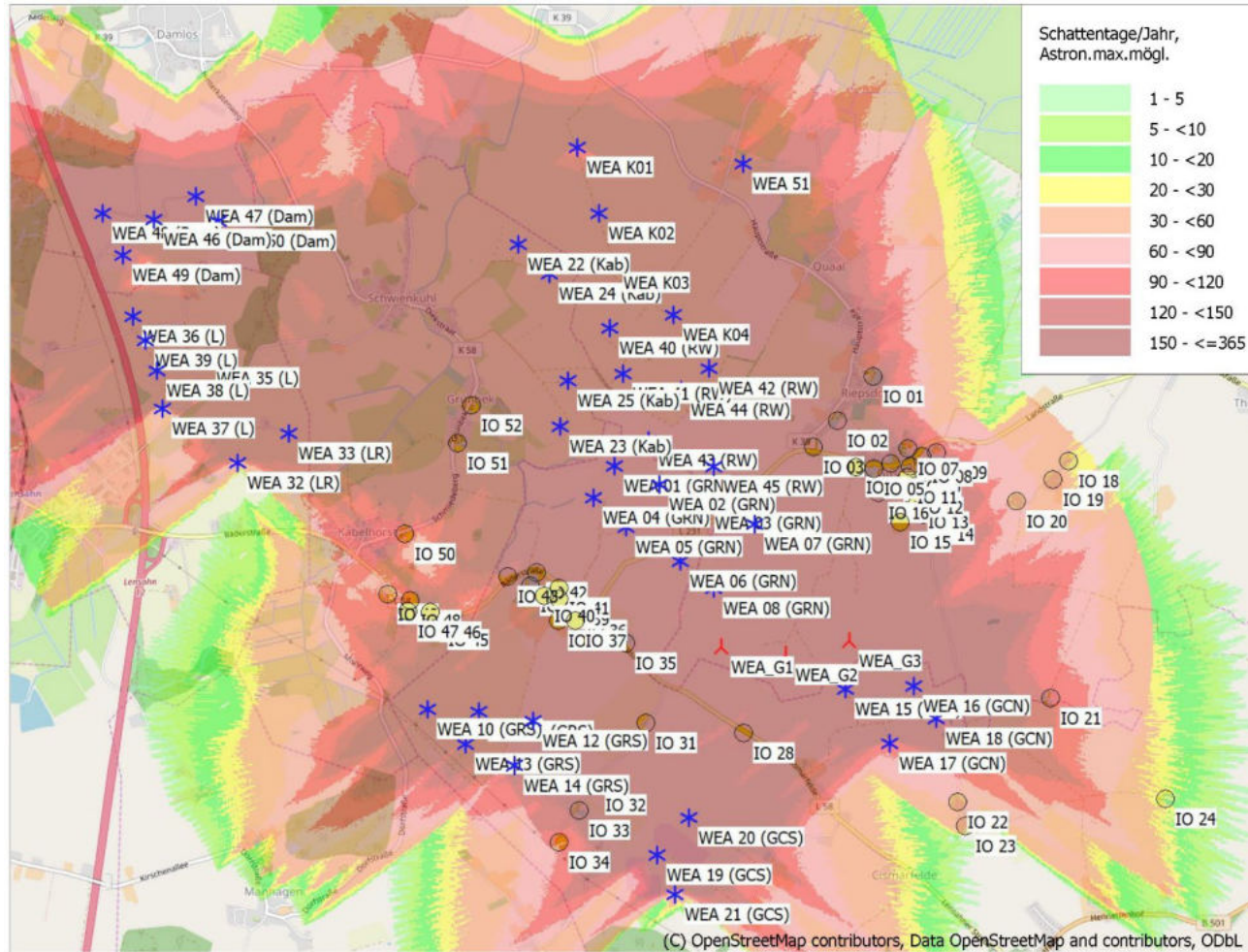
▲ Neue WEA
 ✱ Existierende WEA
 ● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro_2019-07-25.map (1)

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



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

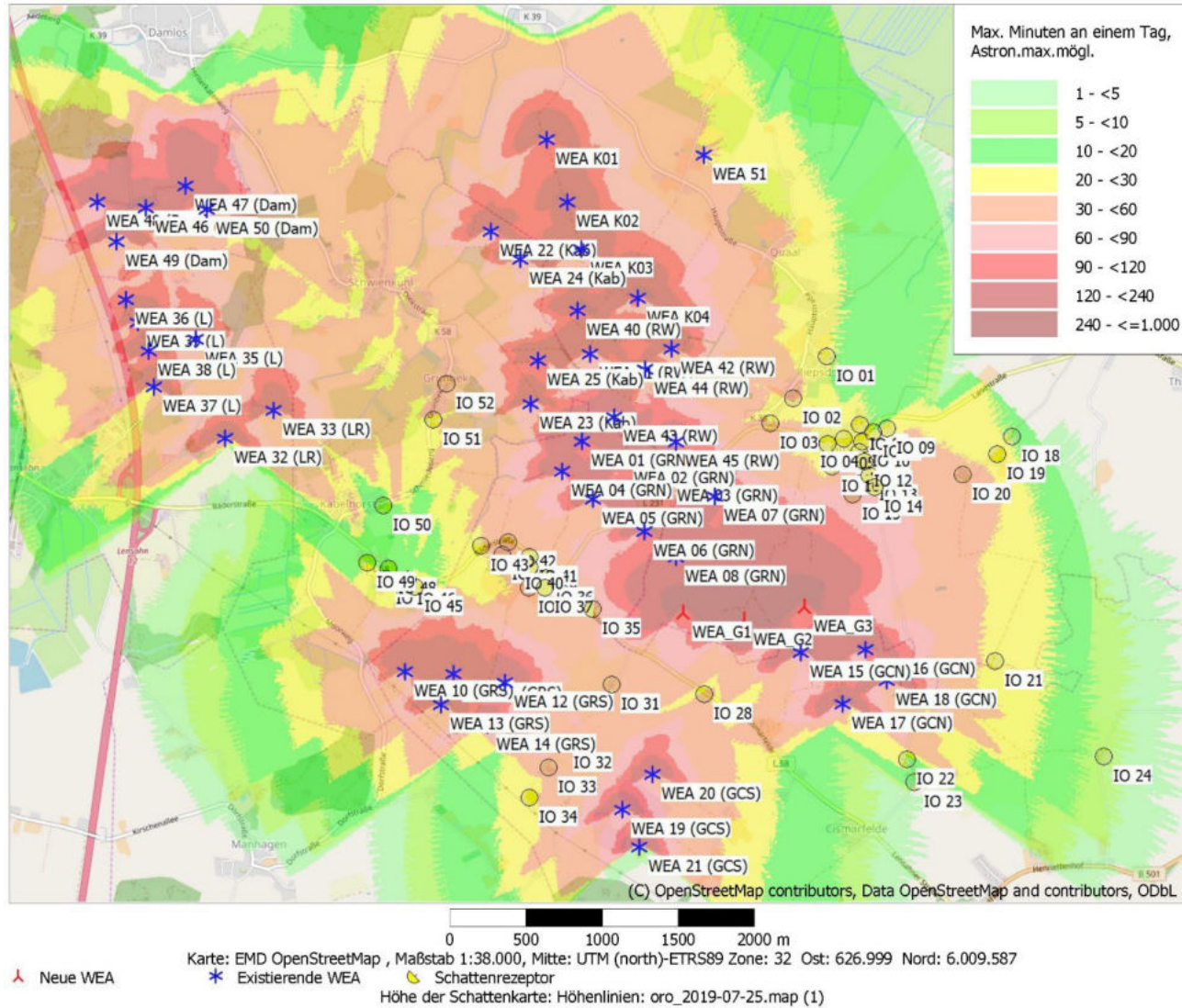
▲ Neue WEA

* Existierende WEA

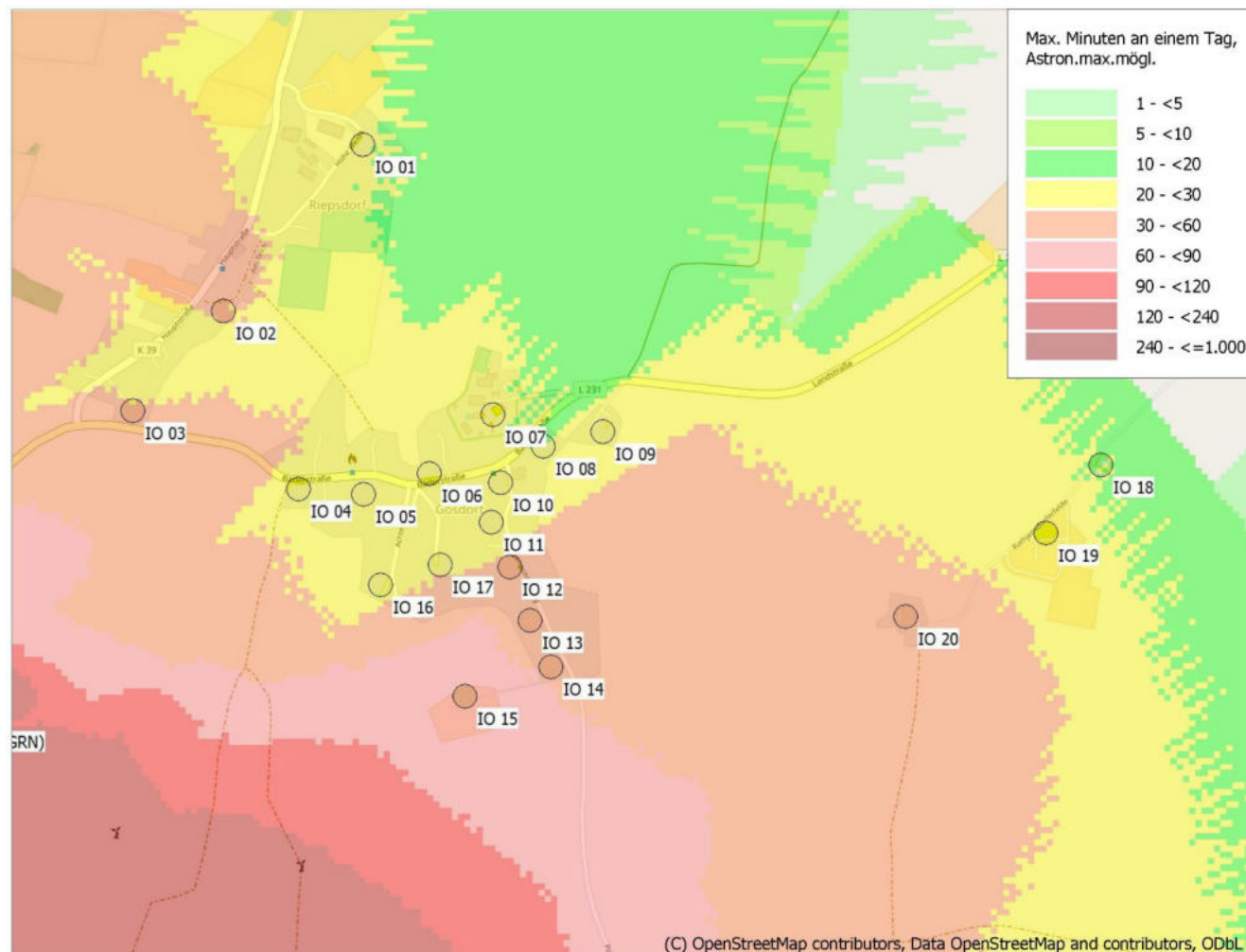
● Schattenrezeptor

Höhe der Schattenkarte: Höhenlinien: oro_2019-07-25.map (1)

11.26 Schattenwurfkarte Gesamtbelastung (nach Repowering), Minuten pro Tag



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



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

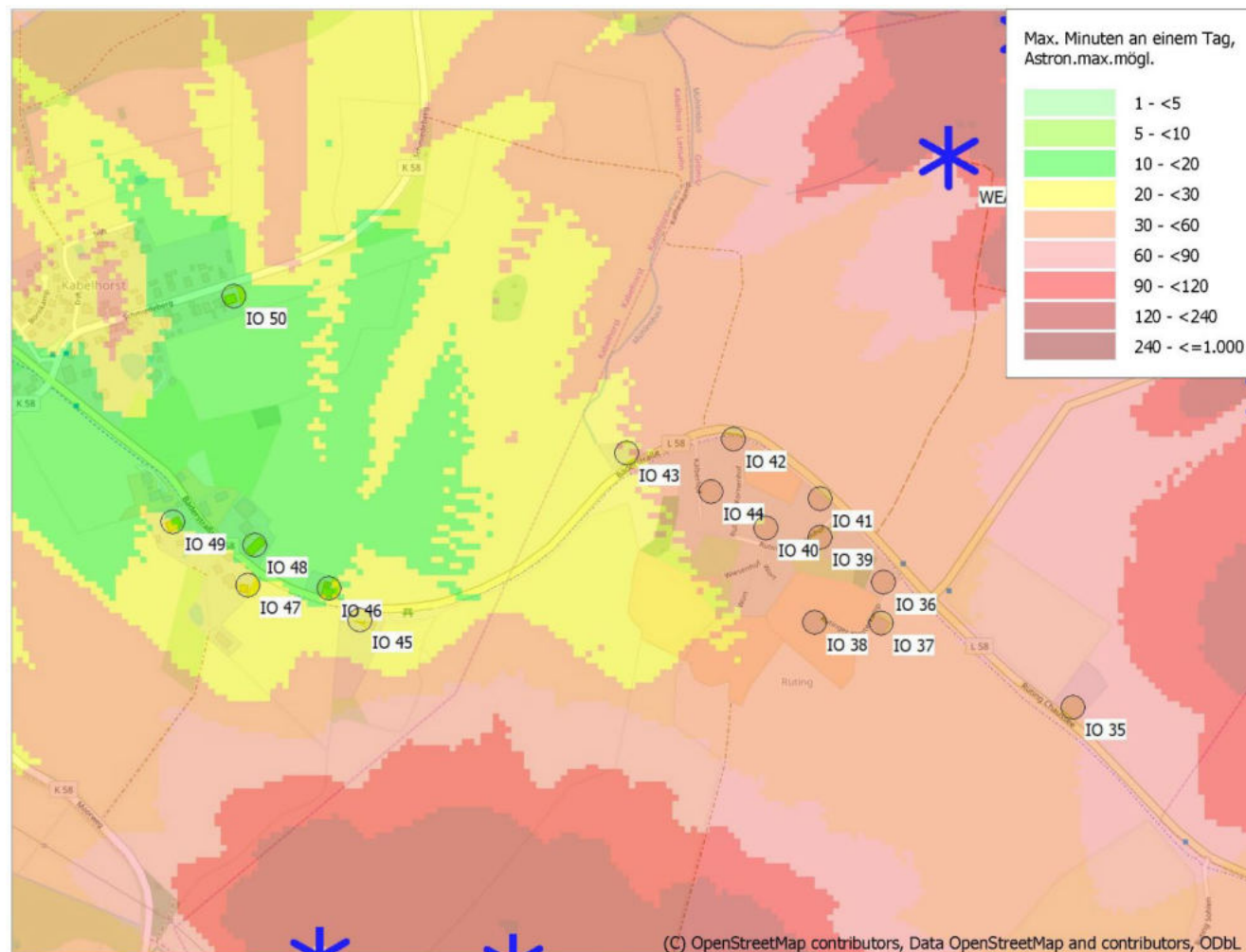
0 100 200 300 400 m

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 Großenholz

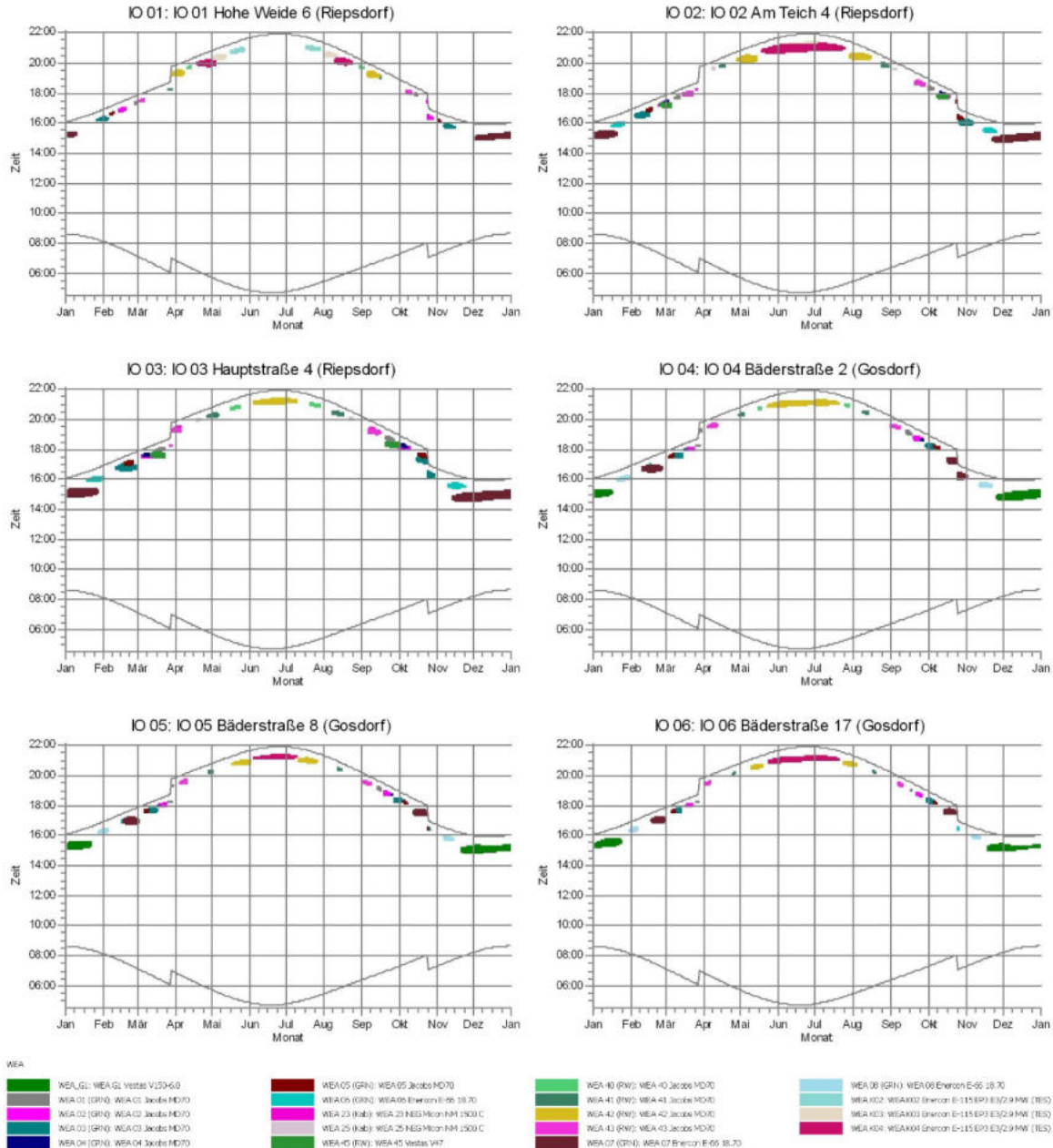
Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:
22.06.2022 20:19/3.5.584

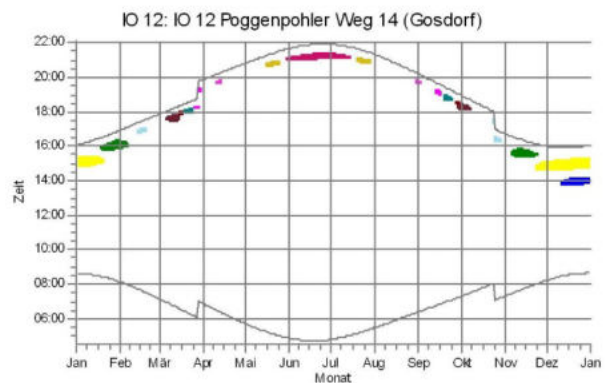
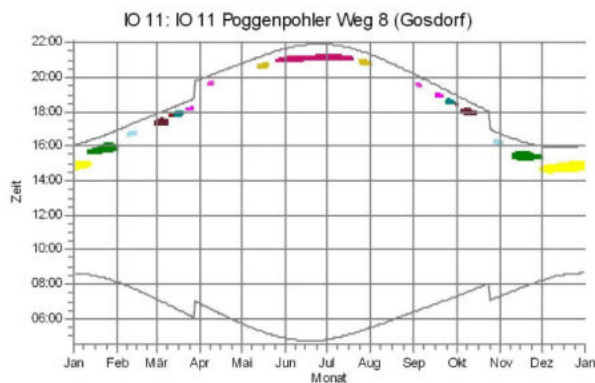
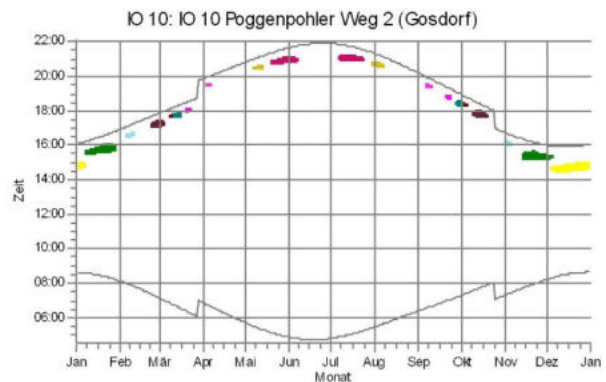
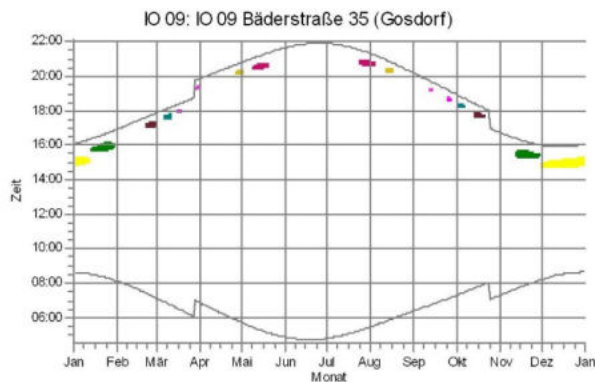
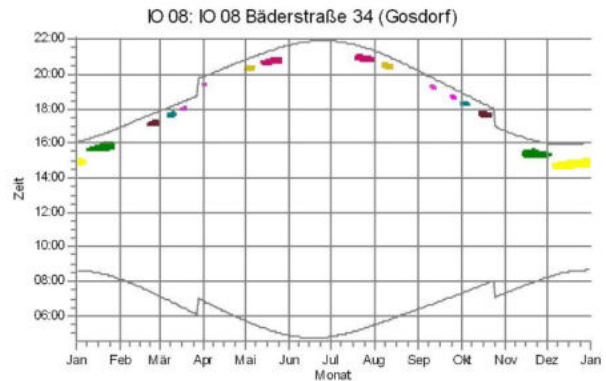
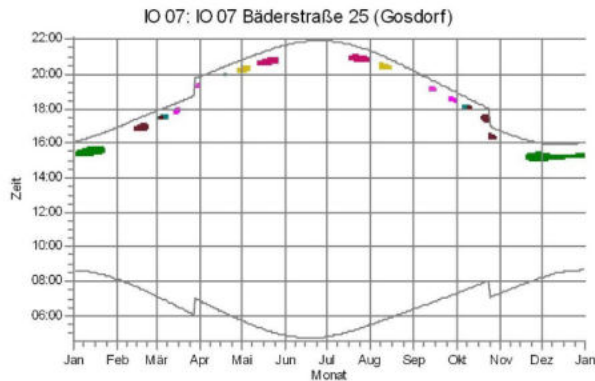
SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



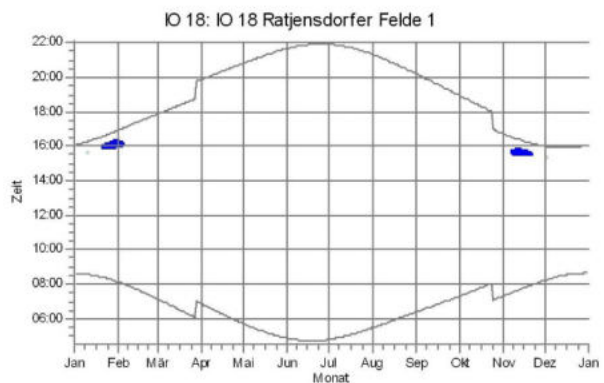
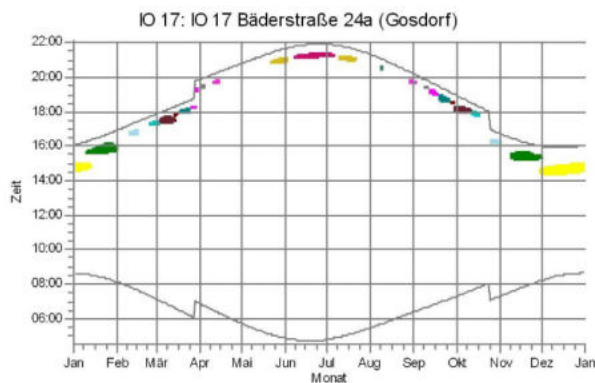
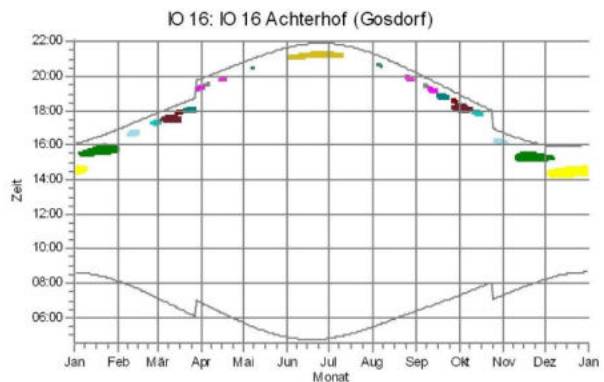
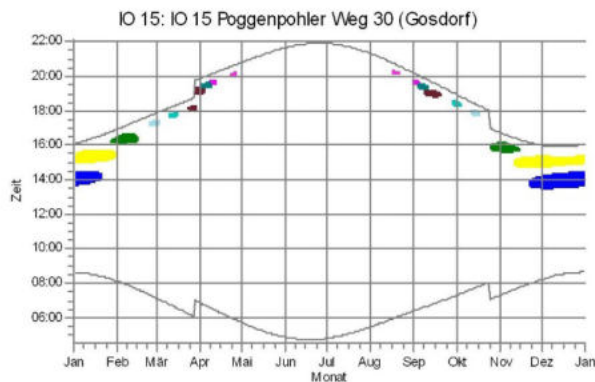
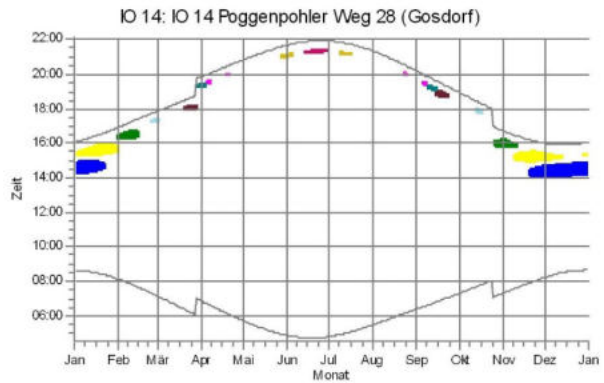
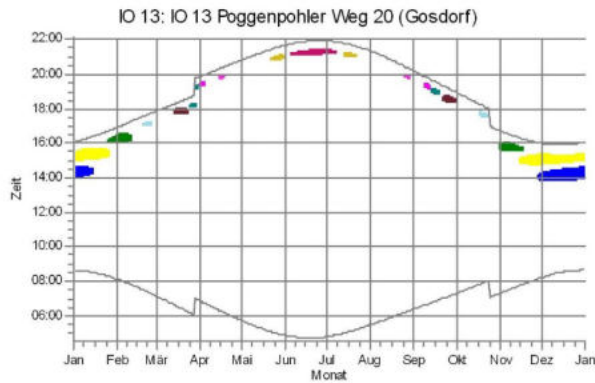
SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



SHADOW - Grafischer Kalender

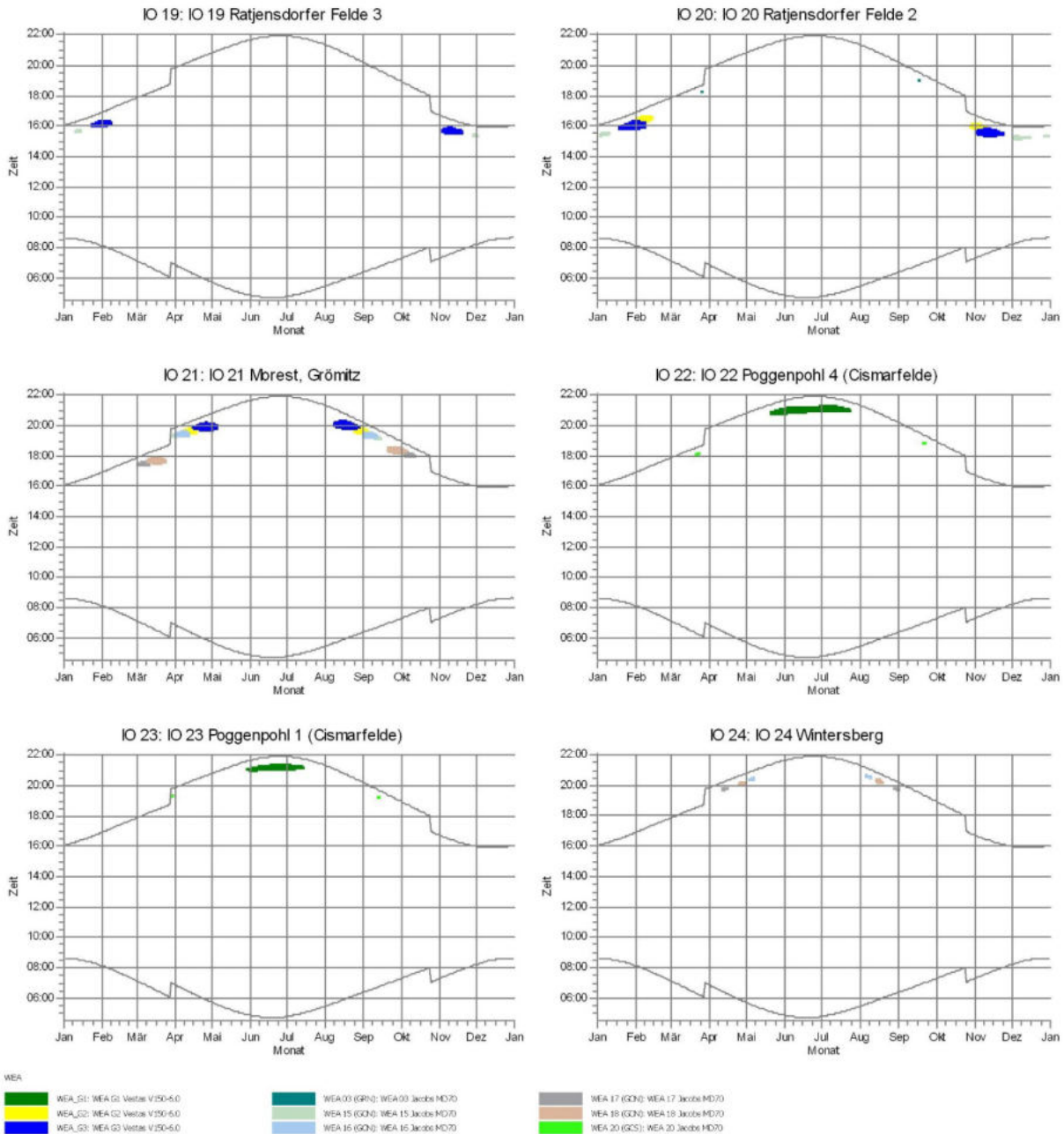
Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



WEA	WEA_01 (GRN): WEA 01 Jacobs MD70	WEA_02 (GRN): WEA 02 Jacobs MD70	WEA_06 (GRN): WEA 06 Enercon E-66 18.70	WEA_07 (GRN): WEA 07 Enercon E-66 18.70
WEA_S1: WEA G1 Vestas V150-6.0	WEA_03 (GRN): WEA 03 Jacobs MD70	WEA_04 (RW): WEA 41 Jacobs MD70	WEA_08 (GRN): WEA 08 Enercon E-66 18.70	WEA_09 (GRN): WEA 09 Enercon E-66 18.70
WEA_S2: WEA G2 Vestas V150-6.0	WEA_05 (GRN): WEA 05 Jacobs MD70	WEA_10 (RW): WEA 42 Jacobs MD70	WEA_11 (RW): WEA 43 Jacobs MD70	WEA_12 (RW): WEA 44 Jacobs MD70
WEA_S3: WEA G3 Vestas V150-6.0	WEA_15 (GRN): WEA 15 Jacobs MD70	WEA_13 (RW): WEA 45 Jacobs MD70	WEA_14 (RW): WEA 46 Jacobs MD70	WEA_16 (RW): WEA 47 Jacobs MD70
WEA_01 (GRN): WEA 01 Jacobs MD70				WEA_17 (RW): WEA 48 Jacobs MD70

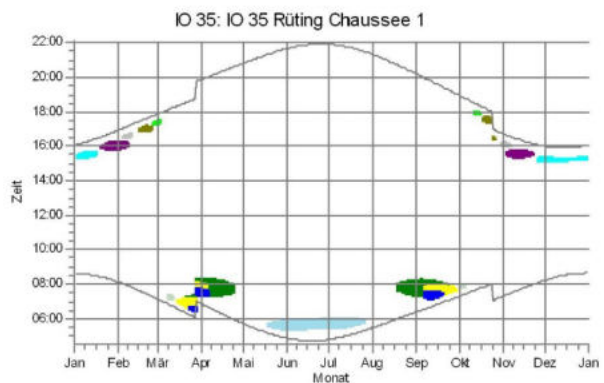
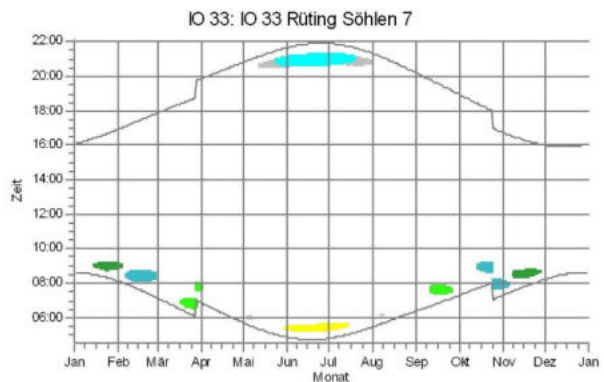
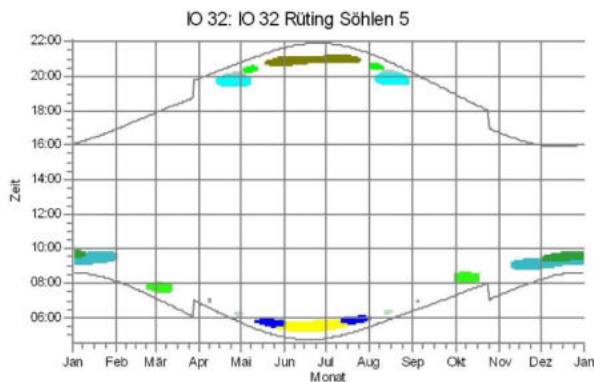
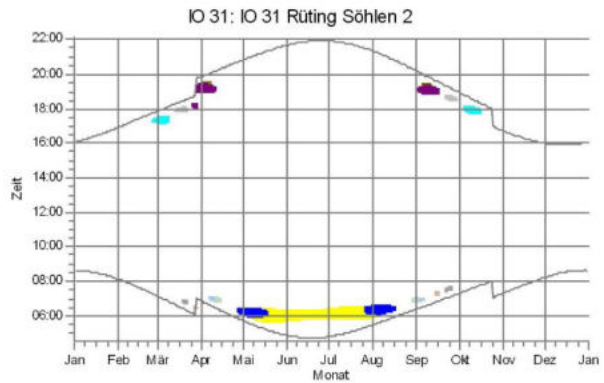
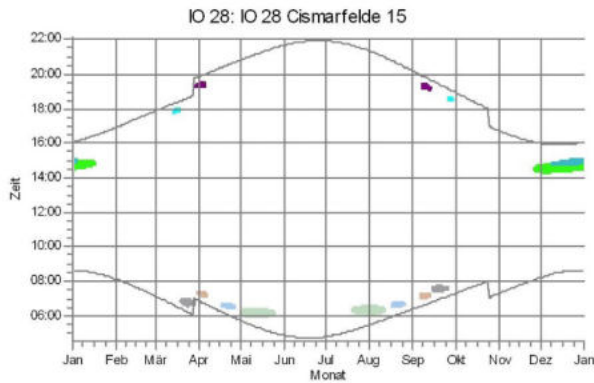
SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



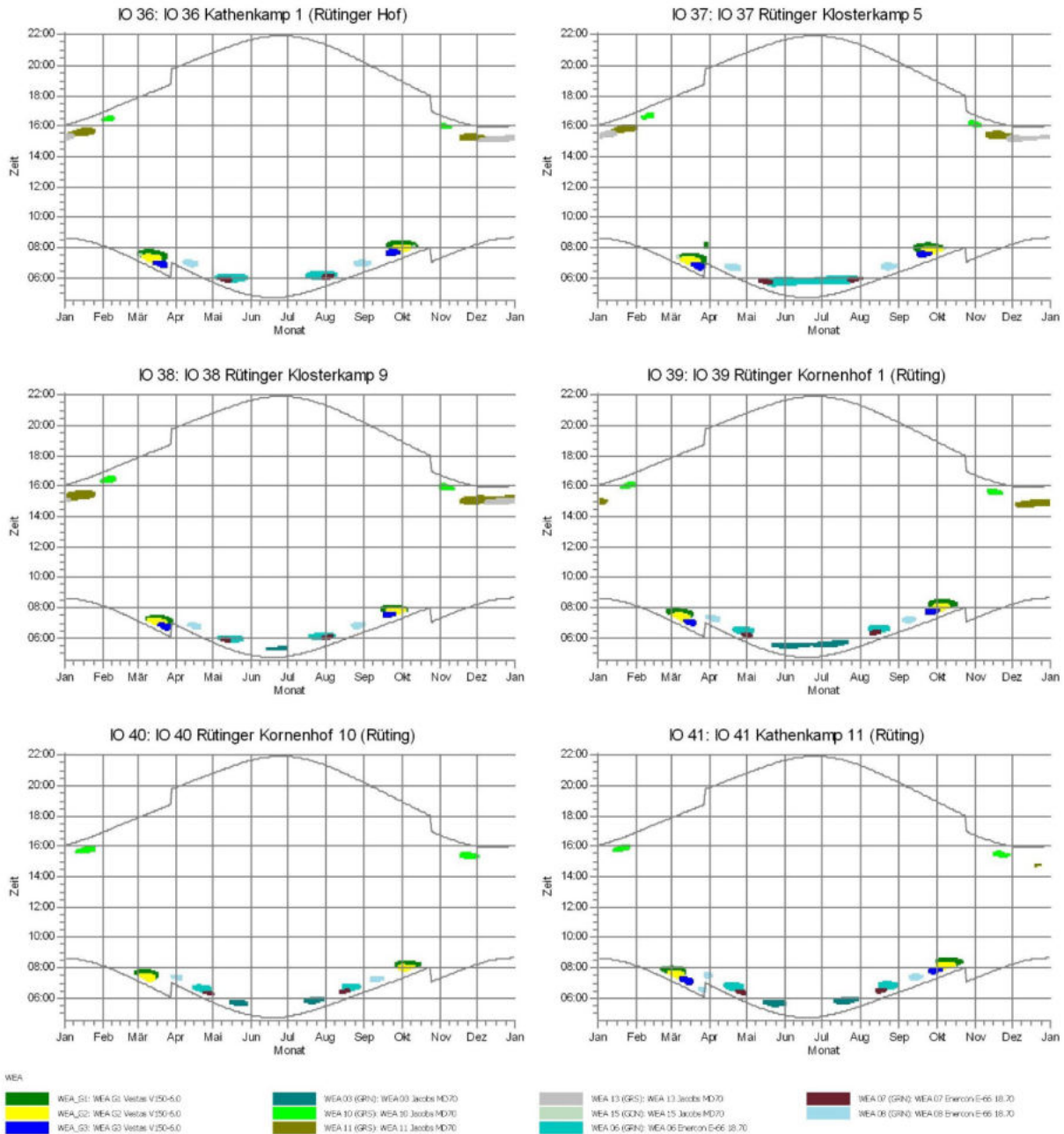
SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



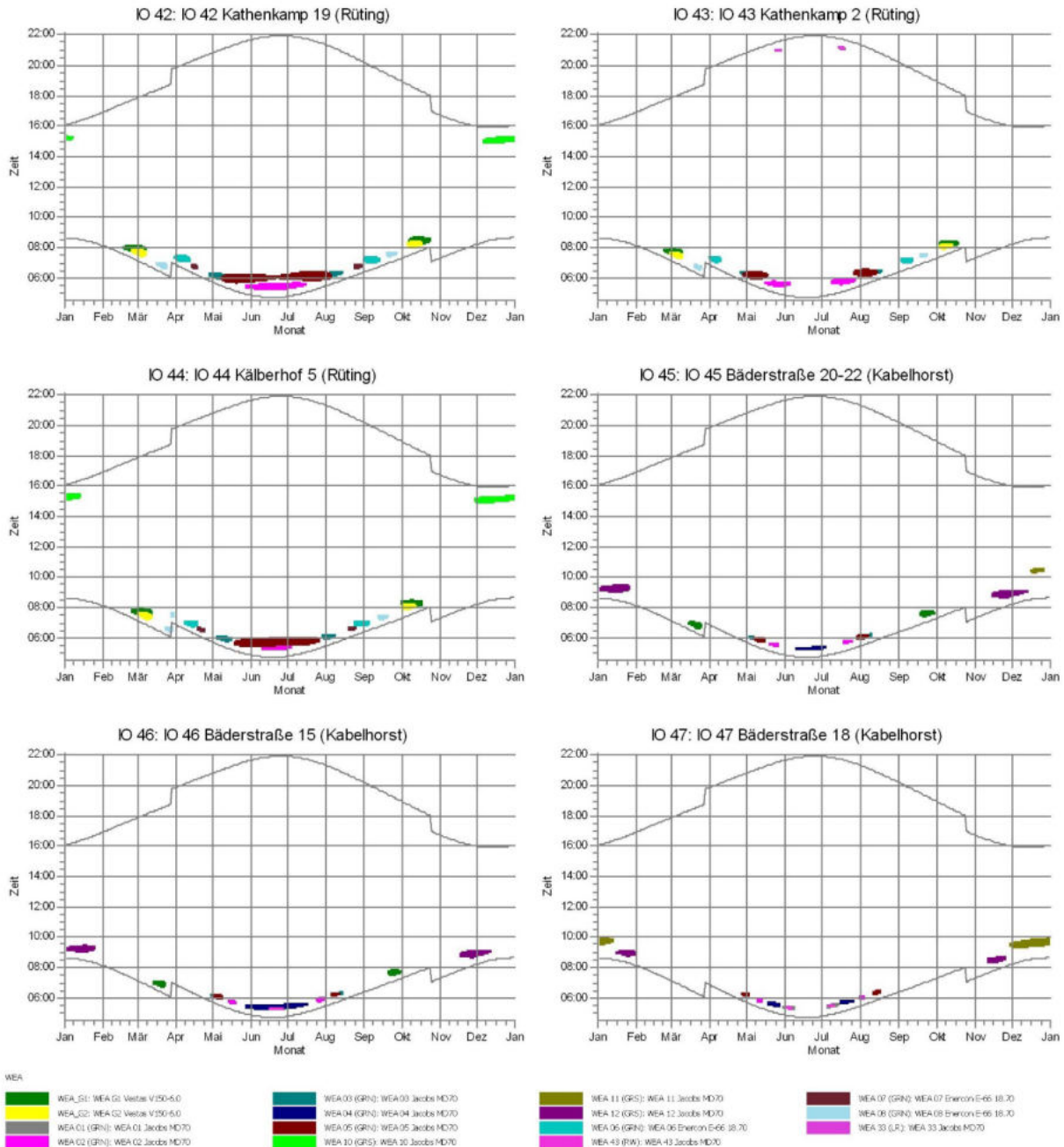
SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



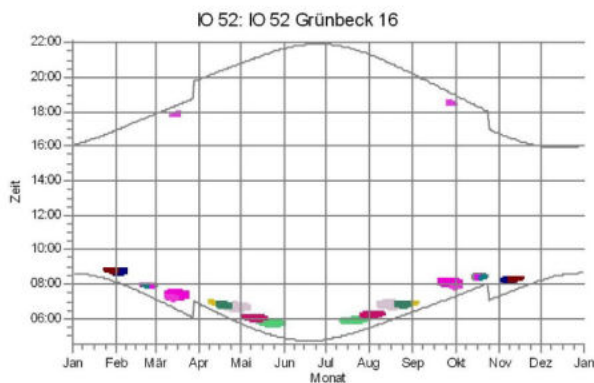
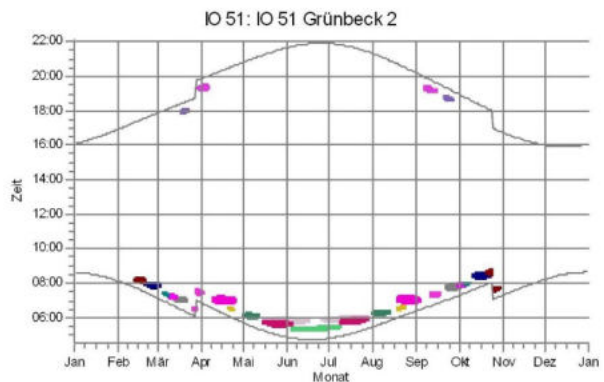
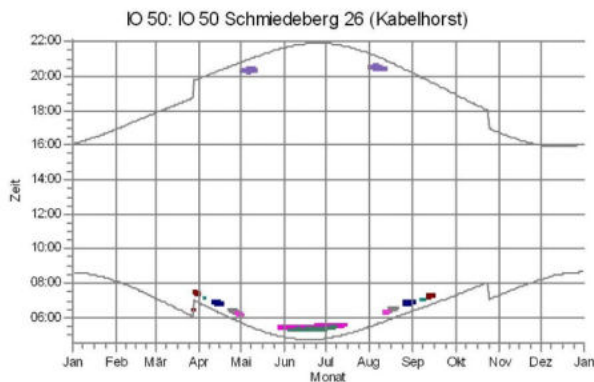
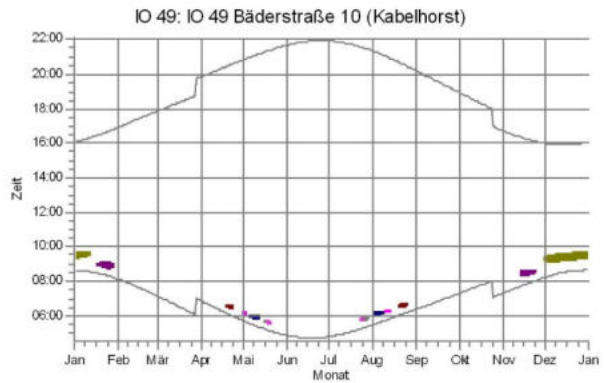
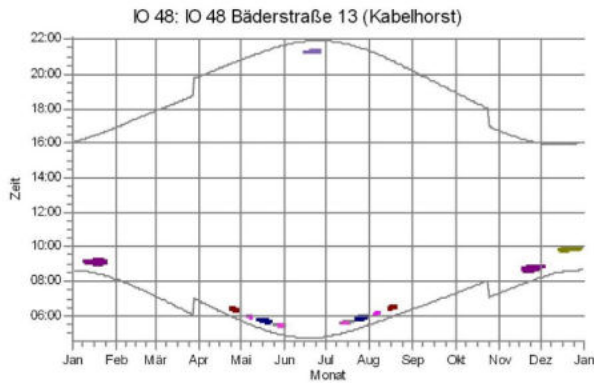
SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



SHADOW - Grafischer Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0)



11.30 Schattenwurfkalender Gesamtbelastung (nach Repowering), tabellarisch

Projekt:
SWP Windpark Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:
22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **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	15:07 (WEA 07 (GRN))	08:06	16:11 (WEA 03 (GRN))	07:08		06:52	19:13 (WEA 42 (RW))	05:41	19:51 (WEA K04)	04:51					
	16:03	15:20 (WEA 07 (GRN))	16:55	11	16:22 (WEA 03 (GRN))	17:52		19:51	11	19:24 (WEA 42 (RW))	20:48					
2	08:37	15:08 (WEA 07 (GRN))	08:04		16:12 (WEA 03 (GRN))	07:05		19:13 (WEA 42 (RW))	05:39		19:53 (WEA K04)	04:50				
	16:04	15:21 (WEA 07 (GRN))	16:57	11	16:23 (WEA 03 (GRN))	17:54	1	17:25 (WEA 43 (RW))	19:53	13	19:26 (WEA 42 (RW))	20:49				
3	08:37	15:08 (WEA 07 (GRN))	08:03		16:14 (WEA 03 (GRN))	07:03		17:25 (WEA 43 (RW))	06:47		19:12 (WEA 42 (RW))	05:37				
	16:05	15:20 (WEA 07 (GRN))	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				
4	08:36	15:09 (WEA 07 (GRN))	08:01		16:18 (WEA 03 (GRN))	07:01		17:25 (WEA 43 (RW))	06:44		19:12 (WEA 42 (RW))	05:35				
	16:06	15:21 (WEA 07 (GRN))	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				
5	08:36	15:09 (WEA 07 (GRN))	07:59			06:58		17:28 (WEA 43 (RW))	06:42		19:13 (WEA 42 (RW))	05:33				
	16:08	15:21 (WEA 07 (GRN))	17:03			18:00	7	17:33 (WEA 43 (RW))	19:59	13	19:28 (WEA 42 (RW))	20:55				
6	08:36	15:11 (WEA 07 (GRN))	07:57			06:56		17:28 (WEA 43 (RW))	06:39		19:14 (WEA 42 (RW))	05:31				
	16:09	15:21 (WEA 07 (GRN))	17:05			18:02	7	17:33 (WEA 43 (RW))	20:01	10	19:24 (WEA 42 (RW))	20:57				
7	08:35	15:12 (WEA 07 (GRN))	07:55		16:35 (WEA 05 (GRN))	06:53		06:37			19:17 (WEA 42 (RW))	05:29				
	16:10	9	15:21 (WEA 07 (GRN))	17:07	1	16:36 (WEA 05 (GRN))	18:03		06:20	5	19:22 (WEA 42 (RW))	20:59				
8	08:35	15:13 (WEA 07 (GRN))	07:53		16:36 (WEA 05 (GRN))	06:51		06:34			05:27					
	16:12	7	15:20 (WEA 07 (GRN))	17:09	2	16:38 (WEA 05 (GRN))	18:05		20:04		21:00	13	20:29 (WEA K03)	21:46		
9	08:34	15:14 (WEA 07 (GRN))	07:51		16:39 (WEA 05 (GRN))	06:49		06:32			05:25		20:17 (WEA K03)	04:45		
	16:13	5	15:19 (WEA 07 (GRN))	17:11	1	16:40 (WEA 05 (GRN))	18:07		20:06		21:02	11	20:28 (WEA K03)	21:47		
10	08:33		07:49			06:46			06:30		05:23		20:19 (WEA K03)	04:44		
	16:15		17:13			18:09			20:08		21:04	9	20:28 (WEA K03)	21:48		
11	08:33		07:47			06:44			06:27		05:22		20:21 (WEA K03)	04:44		
	16:16		17:15			18:11			20:10	1	19:42 (WEA 40 (RW))	21:06	4	20:25 (WEA K03)	21:49	
12	08:32		07:45			06:41			06:25		05:20				04:43	
	16:18		17:17			18:13			20:12	2	19:44 (WEA 40 (RW))	21:08			21:50	
13	08:31		07:43			06:39			06:22		05:18				04:43	
	16:20		17:19			18:15			20:14	2	19:46 (WEA 40 (RW))	21:09			21:50	
14	08:30		07:41		16:49 (WEA 02 (GRN))	06:36			06:20		05:16				04:43	
	16:21		17:21	2	16:53 (WEA 02 (GRN))	18:17			20:16		21:11				21:51	
15	08:29		07:39		16:50 (WEA 02 (GRN))	06:34			06:18		05:14				04:42	
	16:23		17:24	4	16:54 (WEA 02 (GRN))	18:19			20:18		21:13				21:52	
16	08:28		07:37		16:50 (WEA 02 (GRN))	06:31			06:15		05:13				04:42	
	16:25		17:26	6	16:56 (WEA 02 (GRN))	18:21			20:19		21:14				21:52	
17	08:27		07:35		16:53 (WEA 02 (GRN))	06:29			06:13		05:11		20:42 (WEA K02)		04:42	
	16:26		17:28	6	16:59 (WEA 02 (GRN))	18:23			20:21		21:16	1	20:43 (WEA K02)	21:53		
18	08:26		07:33		16:53 (WEA 02 (GRN))	06:26			06:10		05:09		20:42 (WEA K02)	04:42		
	16:28		17:30	4	16:57 (WEA 02 (GRN))	18:25			20:23		21:18	3	20:45 (WEA K02)	21:53		
19	08:25		07:30			06:24			06:08		05:08		20:42 (WEA K02)	04:42		
	16:30		17:32			18:27			20:25	1	19:57 (WEA K04)	21:19	5	20:47 (WEA K02)	21:54	
20	08:24		07:28			06:21			06:06		05:06		20:42 (WEA K02)	04:42		
	16:32		17:34			18:28			20:27	5	19:59 (WEA K04)	21:21	6	20:48 (WEA K02)	21:54	
21	08:23		07:26			06:19			06:04		05:05		20:42 (WEA K02)	04:42		
	16:34		17:36			18:30			20:29	8	19:52 (WEA K04)	21:23	7	20:49 (WEA K02)	21:54	
22	08:21		07:24			06:16			06:01		05:03		20:43 (WEA K02)	04:42		
	16:35		17:38			18:32			20:31	11	20:02 (WEA K04)	21:24	8	20:51 (WEA K02)	21:54	
23	08:20		07:22			06:14			05:59		05:02		20:43 (WEA K02)	04:43		
	16:37		17:40			18:34			20:33	14	20:04 (WEA K04)	21:26	9	20:52 (WEA K02)	21:55	
24	08:19		07:19			06:11			05:57		05:00		20:44 (WEA K02)	04:43		
	16:39		17:42			18:36			20:34	15	20:05 (WEA K04)	21:27	9	20:53 (WEA K02)	21:55	
25	08:17		07:17			06:09			05:54		04:59		20:45 (WEA K02)	04:43		
	16:41		17:44			18:38			20:36	17	20:07 (WEA K04)	21:29	9	20:54 (WEA K02)	21:55	
26	08:16		07:15			06:07			05:52		04:58		20:46 (WEA K02)	04:44		
	16:43		17:46			18:40			20:38	19	20:09 (WEA K04)	21:30	7	20:53 (WEA K02)	21:55	
27	08:14	16:10 (WEA 03 (GRN))	07:12		17:18 (WEA 01 (GRN))	06:04		18:14 (WEA 41 (RW))	05:50		04:56		20:46 (WEA K02)	04:44		
	16:45	1	16:11 (WEA 03 (GRN))	17:48	2	17:20 (WEA 01 (GRN))	18:42	1	18:15 (WEA 41 (RW))	20:40	20	20:09 (WEA K04)	21:32	4	20:52 (WEA K02)	21:55
28	08:13	16:11 (WEA 03 (GRN))	07:10		17:20 (WEA 01 (GRN))	06:02		18:13 (WEA 41 (RW))	05:48		04:55		19:49 (WEA K04)	04:45		
	16:47	3	16:14 (WEA 03 (GRN))	17:50	2	17:22 (WEA 01 (GRN))	18:44	3	18:16 (WEA 41 (RW))	20:42	20	20:09 (WEA K04)	21:33		21:54	
29	08:11	16:11 (WEA 03 (GRN))				06:59		19:14 (WEA 41 (RW))	05:46		04:54		19:50 (WEA K04)	04:54		04:45
	16:49	5	16:16 (WEA 03 (GRN))			19:45		5	19:19 (WEA 41 (RW))	20:44	18	20:08 (WEA K04)	21:35		21:54	
30	08:09	16:11 (WEA 03 (GRN))				06:57		19:15 (WEA 41 (RW))	05:44		04:53		19:50 (WEA K04)	04:53		04:46
	16:51	7	16:19 (WEA 03 (GRN))			19:47		5	19:20 (WEA 41 (RW))	20:46	17	20:07 (WEA K04)	21:36		21:54	
31	08:08	16:11 (WEA 03 (GRN))				06:54		19:14 (WEA 42 (RW))			04:52					
	16:53	9	16:20 (WEA 03 (GRN))			19:49		8	19:22 (WEA 42 (RW))		21:37					
	Sonnenscheinstunden	248		272		367		421		496			513			
	astr.max.mögl.Beschattung	118		63		46		252		184						

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 01 - IO 01 Hohe Weide 6 (Riepsdorf)

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- Die Windenergieanlage/n ist/sind immer in Betrieb

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

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 02 - IO 02 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

Januar		Februar		März		April		Mai		Juni		
1	08:37	15:06 (WEA 07 (GRN))	08:06		07:00	17:05 (WEA 45 (RW))	06:52	05:41	20:06 (WEA 42 (RW))	04:51	20:42 (WEA K04)	
1	16:03	21 15:21 (WEA 07 (GRN))	16:55		17:52	19 17:24 (WEA 04 (GRN))	19:51	20:48	9 20:17 (WEA 40 (RW))	21:39	21 21:03 (WEA K04)	
2	08:37	15:01 (WEA 07 (GRN))	08:04		07:05	17:06 (WEA 45 (RW))	06:49	05:39	20:07 (WEA 42 (RW))	04:50	20:42 (WEA K04)	
1	16:04	21 15:22 (WEA 07 (GRN))	16:57		17:54	18 17:26 (WEA 04 (GRN))	19:53	20:49	12 20:19 (WEA 40 (RW))	21:40	22 21:04 (WEA K04)	
3	08:37	15:00 (WEA 07 (GRN))	08:03		07:03	17:06 (WEA 45 (RW))	06:47	05:37	20:06 (WEA 42 (RW))	04:49	20:42 (WEA K04)	
1	16:05	22 15:22 (WEA 07 (GRN))	16:59		17:56	12 17:18 (WEA 45 (RW))	19:55	20:51	14 20:20 (WEA 40 (RW))	21:41	23 21:06 (WEA K04)	
4	08:36	15:01 (WEA 07 (GRN))	08:01		07:01	16:29 (WEA 03 (GRN))	06:44	05:35	20:07 (WEA 42 (RW))	04:48	20:42 (WEA K04)	
1	16:07	22 15:23 (WEA 07 (GRN))	17:01	1	16:30 (WEA 03 (GRN))	17:58	9 17:16 (WEA 45 (RW))	19:57	20:53	16 20:23 (WEA 42 (RW))	21:42	25 21:07 (WEA K03)
5	08:36	15:01 (WEA 07 (GRN))	07:59		06:58	16:28 (WEA 03 (GRN))	06:50	05:33	20:06 (WEA 42 (RW))	04:47	20:42 (WEA K04)	
1	16:08	22 15:23 (WEA 07 (GRN))	17:03	4	16:32 (WEA 03 (GRN))	18:00	4 17:14 (WEA 45 (RW))	19:59	20:55	18 20:24 (WEA 42 (RW))	21:43	26 21:08 (WEA K03)
6	08:36	15:02 (WEA 07 (GRN))	07:57		06:56	16:26 (WEA 03 (GRN))	06:56	05:31	20:06 (WEA 42 (RW))	04:47	20:43 (WEA K04)	
1	16:09	22 15:24 (WEA 07 (GRN))	17:05	7	16:33 (WEA 03 (GRN))	18:02		20:01	20:57	19 20:25 (WEA 42 (RW))	21:44	26 21:09 (WEA K03)
7	08:35	15:03 (WEA 07 (GRN))	07:55		06:53	16:26 (WEA 03 (GRN))	06:53	05:29	20:06 (WEA 42 (RW))	04:46	20:43 (WEA K04)	
1	16:10	21 15:24 (WEA 07 (GRN))	17:07	10	16:36 (WEA 03 (GRN))	18:03		20:02	20:59	19 20:26 (WEA 42 (RW))	21:45	27 21:10 (WEA K03)
8	08:35	15:03 (WEA 07 (GRN))	07:53		06:51	16:25 (WEA 03 (GRN))	06:51	05:27	20:05 (WEA 42 (RW))	04:45	20:44 (WEA K04)	
1	16:12	21 15:24 (WEA 07 (GRN))	17:09	13	16:38 (WEA 03 (GRN))	18:05		20:04	21:00	19 20:26 (WEA 42 (RW))	21:46	27 21:11 (WEA K03)
9	08:34	15:03 (WEA 07 (GRN))	07:51		06:49	16:25 (WEA 03 (GRN))	06:49	05:25	20:06 (WEA 42 (RW))	04:45	20:44 (WEA K04)	
1	16:13	21 15:24 (WEA 07 (GRN))	17:11	15	16:40 (WEA 03 (GRN))	18:07	3 17:41 (WEA 01 (GRN))	20:06	2 19:37 (WEA 25 (Kob))	21:02	27 21:11 (WEA K03)	
10	08:33	15:04 (WEA 07 (GRN))	07:49		06:46	16:26 (WEA 03 (GRN))	06:46	05:23	20:07 (WEA 42 (RW))	04:44	20:44 (WEA K04)	
1	16:15	20 15:24 (WEA 07 (GRN))	17:13	17	16:43 (WEA 03 (GRN))	18:09	4 17:42 (WEA 01 (GRN))	20:08	21:04	17 20:24 (WEA 42 (RW))	21:48	28 21:12 (WEA K03)
11	08:33	15:04 (WEA 07 (GRN))	07:47		06:44	16:26 (WEA 03 (GRN))	06:44	05:22	20:07 (WEA 42 (RW))	04:44	20:44 (WEA K04)	
1	16:16	20 15:24 (WEA 07 (GRN))	17:15	17	16:43 (WEA 03 (GRN))	18:11	6 17:45 (WEA 01 (GRN))	20:10	21:06	16 20:23 (WEA 42 (RW))	21:49	28 21:12 (WEA K03)
12	08:32	15:05 (WEA 07 (GRN))	07:45		06:41	16:27 (WEA 03 (GRN))	06:41	05:20	20:08 (WEA 42 (RW))	04:43	20:45 (WEA K04)	
1	16:18	19 15:24 (WEA 07 (GRN))	17:17	16	16:43 (WEA 03 (GRN))	18:13	6 17:46 (WEA 01 (GRN))	20:12	21:08	14 20:22 (WEA 42 (RW))	21:50	28 21:13 (WEA K03)
13	08:31	15:06 (WEA 07 (GRN))	07:43		06:39	16:28 (WEA 03 (GRN))	06:39	05:18	20:10 (WEA 42 (RW))	04:43	20:45 (WEA K04)	
1	16:20	18 15:24 (WEA 07 (GRN))	17:19	14	16:42 (WEA 03 (GRN))	18:15		20:14	21:09	11 20:21 (WEA 42 (RW))	21:50	29 21:14 (WEA K03)
14	08:30	15:07 (WEA 07 (GRN))	07:41		06:36	16:28 (WEA 03 (GRN))	06:36	05:20	20:11 (WEA 42 (RW))	04:43	20:46 (WEA K04)	
1	16:21	17 15:24 (WEA 07 (GRN))	17:22	14	16:51 (WEA 05 (GRN))	18:17		20:16	2 19:47 (WEA 41 (RW))	21:11	29 21:15 (WEA K03)	
15	08:29	15:08 (WEA 07 (GRN))	07:39		06:34	16:30 (WEA 03 (GRN))	06:34	05:14	8 20:19 (WEA 42 (RW))	04:42	20:46 (WEA K04)	
1	16:23	16 15:24 (WEA 07 (GRN))	17:24	12	16:54 (WEA 05 (GRN))	18:19		20:18	4 19:49 (WEA 41 (RW))	21:13	30 21:16 (WEA K03)	
16	08:28	15:09 (WEA 07 (GRN))	07:37		06:31	16:50 (WEA 05 (GRN))	06:31	05:13	19:45 (WEA 41 (RW))	05:13	04:42	20:46 (WEA K04)
1	16:25	15 15:24 (WEA 07 (GRN))	17:26	6	16:56 (WEA 05 (GRN))	18:21	2 17:52 (WEA 43 (RW))	20:15	7 19:52 (WEA 41 (RW))	21:14	31 21:32	29 21:15 (WEA K03)
17	08:27	15:11 (WEA 07 (GRN))	07:35		06:29	16:52 (WEA 05 (GRN))	06:29	05:11	19:45 (WEA 41 (RW))	05:11	04:42	20:46 (WEA K04)
1	16:26	14 15:51 (WEA 06 (GRN))	17:28	7	16:59 (WEA 05 (GRN))	18:23	4 17:56 (WEA 43 (RW))	20:21	6 19:53 (WEA 41 (RW))	21:16	31 21:53	29 21:15 (WEA K03)
18	08:26	15:12 (WEA 07 (GRN))	07:33		06:26	17:51 (WEA 43 (RW))	06:10	05:09	19:46 (WEA 41 (RW))	05:09	04:42	20:46 (WEA K04)
1	16:28	13 15:52 (WEA 06 (GRN))	17:30		06:25	17:58 (WEA 43 (RW))	20:23	7 19:53 (WEA 41 (RW))	21:18	31 21:53	29 21:15 (WEA K03)	
19	08:25	15:13 (WEA 07 (GRN))	07:30		06:24	17:51 (WEA 43 (RW))	06:08	05:08	20:46 (WEA K04)	04:42	20:47 (WEA K04)	
1	16:30	11 15:55 (WEA 06 (GRN))	17:32		06:23	18:00 (WEA 43 (RW))	20:25	21:19	1 20:47 (WEA K04)	21:54	29 21:16 (WEA K03)	
20	08:24	15:14 (WEA 07 (GRN))	07:28		06:21	17:50 (WEA 43 (RW))	06:06	05:06	20:45 (WEA K04)	04:42	20:47 (WEA K04)	
1	16:32	6 15:57 (WEA 06 (GRN))	17:34		06:20	18:01 (WEA 43 (RW))	20:27	21:21	3 20:48 (WEA K04)	21:54	29 21:16 (WEA K03)	
21	08:23	15:14 (WEA 07 (GRN))	07:26		06:19	17:51 (WEA 43 (RW))	06:04	05:05	20:44 (WEA K04)	04:42	20:47 (WEA K04)	
1	16:34	8 15:59 (WEA 06 (GRN))	17:36		06:18	18:03 (WEA 43 (RW))	20:29	21:23	5 20:49 (WEA K04)	21:54	29 21:16 (WEA K03)	
22	08:21	15:12 (WEA 07 (GRN))	07:24		06:16	17:52 (WEA 43 (RW))	06:01	05:03	20:44 (WEA K04)	04:43	20:47 (WEA K04)	
1	16:35	9 16:01 (WEA 06 (GRN))	17:38		06:15	18:00 (WEA 43 (RW))	20:31	21:24	7 20:51 (WEA K04)	21:54	29 21:16 (WEA K03)	
23	08:20	15:12 (WEA 07 (GRN))	07:22		06:14		05:59	05:02	20:42 (WEA K04)	04:43	20:47 (WEA K04)	
1	16:37	11 16:03 (WEA 06 (GRN))	17:40		06:13		05:57	21:26	10 20:52 (WEA K04)	21:55	29 21:16 (WEA K03)	
24	08:19	15:13 (WEA 07 (GRN))	07:19		06:12	17:11 (WEA 02 (GRN))	06:12	05:57	20:42 (WEA K04)	04:43	20:48 (WEA K04)	
1	16:39	9 16:02 (WEA 06 (GRN))	17:42	2	17:13 (WEA 02 (GRN))	18:36		20:24	11 20:53 (WEA K04)	21:55	29 21:17 (WEA K03)	
25	08:17	15:15 (WEA 07 (GRN))	07:17		06:10	17:10 (WEA 45 (RW))	06:09	05:54	20:42 (WEA K04)	04:43	20:48 (WEA K04)	
1	16:41	7 16:02 (WEA 06 (GRN))	17:44	6	17:16 (WEA 02 (GRN))	18:38		20:26	12 20:55 (WEA K04)	21:55	29 21:17 (WEA K03)	
26	08:16	15:16 (WEA 07 (GRN))	07:15		06:07	17:08 (WEA 45 (RW))	06:07	05:52	18:12 (WEA 23 (Kob))	05:52	04:44	20:49 (WEA K04)
1	16:43	1 15:59 (WEA 06 (GRN))	17:46	10	17:18 (WEA 45 (RW))	18:40	1 18:13 (WEA 23 (Kob))	20:38	14 20:56 (WEA K04)	21:55	29 21:18 (WEA K03)	
27	08:14		07:12		06:04	17:06 (WEA 45 (RW))	06:04	05:50	20:42 (WEA K04)	04:44	20:48 (WEA K04)	
1	16:45		17:48	14	17:20 (WEA 02 (GRN))	18:42		20:40	16 20:58 (WEA K04)	21:55	30 21:18 (WEA K03)	
28	08:13		07:10		06:02	17:06 (WEA 45 (RW))	06:02	05:48	20:42 (WEA K04)	04:45	20:49 (WEA K04)	
1	16:47		17:50	16	17:22 (WEA 04 (GRN))	18:44		20:42	17 20:59 (WEA K04)	21:54	29 21:18 (WEA K03)	
29	08:11				06:59			05:46	20:42 (WEA K04)	04:45	20:48 (WEA K04)	
1	16:49				06:57			20:44	3 20:14 (WEA 42 (RW))	21:35	18 21:00 (WEA K04)	
30	08:09				06:57			05:44	20:09 (WEA 42 (RW))	04:53	18 20:42 (WEA K04)	
1	16:51				06:54			20:46	6 20:15 (WEA 42 (RW))	21:36	19 21:01 (WEA K04)	
31	08:08				06:54			05:42		04:52	20:42 (WEA K04)	
1	16:53				06:54			20:46		04:52	20:42 (WEA K04)	
Sommerscheinstunden	248		272		367		421		496		513	
astr max mögl Beschattung	407		201		135		39		364		833	

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 02 - IO 02 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

Juli		August		September		Oktober		November		Dezember	
1	04:47	20:49 (WEA K04)	05:27	20:10 (WEA 42 (RW))	06:23	07:17	18:21 (WEA 01 (GRN))	07:16	15:55 (WEA 03 (GRN))	08:12	14:46 (WEA 07 (GRN))
2	04:47	20:49 (WEA K04)	05:29	20:18 (WEA 42 (RW))	06:24	07:19	18:25 (WEA 01 (GRN))	07:18	15:55 (WEA 03 (GRN))	08:14	14:47 (WEA 07 (GRN))
3	04:48	20:49 (WEA K04)	05:31	20:17 (WEA 42 (RW))	06:26	07:21	18:23 (WEA 01 (GRN))	07:20	15:55 (WEA 03 (GRN))	08:15	14:47 (WEA 07 (GRN))
4	04:49	20:49 (WEA K04)	05:32	20:16 (WEA 42 (RW))	06:28	07:22	18:21 (WEA 01 (GRN))	07:22	15:55 (WEA 03 (GRN))	08:17	14:47 (WEA 07 (GRN))
5	04:50	20:49 (WEA K04)	05:34	20:16 (WEA 42 (RW))	06:30	07:24	18:19 (WEA 01 (GRN))	07:24	15:57 (WEA 03 (GRN))	08:18	14:48 (WEA 07 (GRN))
6	04:51	20:49 (WEA K04)	05:36	20:15 (WEA 42 (RW))	06:32	07:26	18:17 (WEA 01 (GRN))	07:26	15:58 (WEA 03 (GRN))	08:19	14:47 (WEA 07 (GRN))
7	04:52	20:49 (WEA K04)	05:38	20:15 (WEA 42 (RW))	06:33	07:28	18:16 (WEA 01 (GRN))	07:28	15:59 (WEA 03 (GRN))	08:21	14:48 (WEA 07 (GRN))
8	04:53	20:49 (WEA K04)	05:39	20:16 (WEA 42 (RW))	06:35	07:30	18:15 (WEA 01 (GRN))	07:30	15:59 (WEA 03 (GRN))	08:22	14:48 (WEA 07 (GRN))
9	04:54	20:49 (WEA K04)	05:41	20:17 (WEA 42 (RW))	06:37	07:32	17:43 (WEA 45 (RW))	07:32	15:57 (WEA 03 (GRN))	08:23	14:49 (WEA 07 (GRN))
10	04:55	20:49 (WEA K04)	05:43	20:16 (WEA 42 (RW))	06:39	07:34	17:41 (WEA 45 (RW))	07:34	15:54 (WEA 03 (GRN))	08:25	14:50 (WEA 07 (GRN))
11	04:56	20:49 (WEA K04)	05:45	20:17 (WEA 42 (RW))	06:41	07:36	17:40 (WEA 45 (RW))	07:36	15:53 (WEA 03 (GRN))	08:26	14:50 (WEA 07 (GRN))
12	04:57	20:49 (WEA K04)	05:47	20:17 (WEA 42 (RW))	06:42	07:37	17:39 (WEA 45 (RW))	07:38	15:53 (WEA 03 (GRN))	08:27	14:51 (WEA 07 (GRN))
13	04:59	20:49 (WEA K04)	05:48	20:18 (WEA 42 (RW))	06:44	07:39	17:39 (WEA 45 (RW))	07:40	15:53 (WEA 03 (GRN))	08:28	14:51 (WEA 07 (GRN))
14	05:00	20:49 (WEA K04)	05:50	20:20 (WEA 42 (RW))	06:46	07:41	17:39 (WEA 45 (RW))	07:42	15:53 (WEA 03 (GRN))	08:29	14:51 (WEA 07 (GRN))
15	05:01	20:50 (WEA K04)	05:52	20:22 (WEA 42 (RW))	06:48	07:43	17:40 (WEA 45 (RW))	07:44	15:53 (WEA 03 (GRN))	08:30	14:52 (WEA 07 (GRN))
16	05:03	20:50 (WEA K04)	05:54	19:35	06:50	07:45	18:21 (WEA 02 (GRN))	07:46	15:51 (WEA 06 (GRN))	08:31	14:52 (WEA 07 (GRN))
17	05:04	20:51 (WEA K04)	05:56	19:33	06:51	07:47	18:19 (WEA 02 (GRN))	07:48	15:32 (WEA 06 (GRN))	08:32	14:53 (WEA 07 (GRN))
18	05:05	20:51 (WEA K04)	05:57	19:30	06:53	07:49	18:17 (WEA 02 (GRN))	07:50	15:28 (WEA 06 (GRN))	08:33	14:54 (WEA 07 (GRN))
19	05:07	20:52 (WEA K04)	05:59	19:28	06:55	07:51	18:14 (WEA 02 (GRN))	07:52	15:27 (WEA 06 (GRN))	08:34	14:54 (WEA 07 (GRN))
20	05:08	20:53 (WEA K04)	06:01	19:25	06:57	07:53	18:12 (WEA 02 (GRN))	07:54	15:27 (WEA 06 (GRN))	08:35	14:55 (WEA 07 (GRN))
21	05:10	20:53 (WEA K04)	06:03	19:23	06:59	07:55	18:11 (WEA 02 (GRN))	07:56	15:27 (WEA 06 (GRN))	08:36	14:55 (WEA 07 (GRN))
22	05:11	20:53 (WEA K04)	06:05	19:20	07:00	07:57	18:10 (WEA 02 (GRN))	07:58	15:27 (WEA 06 (GRN))	08:37	14:55 (WEA 07 (GRN))
23	05:13	20:55 (WEA K04)	06:06	19:18	07:02	07:59	18:09 (WEA 02 (GRN))	08:00	15:27 (WEA 06 (GRN))	08:38	14:56 (WEA 07 (GRN))
24	05:14	20:55 (WEA K04)	06:08	19:15	07:04	08:00	18:08 (WEA 02 (GRN))	08:02	15:27 (WEA 06 (GRN))	08:39	14:56 (WEA 07 (GRN))
25	05:16	20:57 (WEA K04)	06:10	19:13	07:06	08:01	18:07 (WEA 02 (GRN))	08:04	15:27 (WEA 06 (GRN))	08:40	14:57 (WEA 07 (GRN))
26	05:17	20:57 (WEA K04)	06:12	19:11	07:08	08:02	18:06 (WEA 02 (GRN))	08:06	15:27 (WEA 06 (GRN))	08:41	14:57 (WEA 07 (GRN))
27	05:19	20:58 (WEA K04)	06:14	19:09	07:10	08:03	18:05 (WEA 02 (GRN))	08:08	15:27 (WEA 06 (GRN))	08:42	14:58 (WEA 07 (GRN))
28	05:21	20:59 (WEA K04)	06:16	19:07	07:12	08:04	18:04 (WEA 02 (GRN))	08:10	15:27 (WEA 06 (GRN))	08:43	14:58 (WEA 07 (GRN))
29	05:22	20:24 (WEA 42 (RW))	06:17	19:06	07:13	08:05	18:03 (WEA 02 (GRN))	08:12	15:27 (WEA 06 (GRN))	08:44	14:59 (WEA 07 (GRN))
30	05:24	20:21 (WEA 42 (RW))	06:19	19:05	07:15	08:06	18:02 (WEA 02 (GRN))	08:14	15:27 (WEA 06 (GRN))	08:45	14:59 (WEA 07 (GRN))
31	05:26	20:20 (WEA 42 (RW))	06:21	19:04	07:17	08:07	18:01 (WEA 02 (GRN))	08:16	15:27 (WEA 06 (GRN))	08:46	14:59 (WEA 07 (GRN))
Sommerstundenzahl		515		383		328		257		231	
astr. max. mögl. Beschattung		478	224	58	221	239	646				

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 03 - IO 03 Hauptstraße 4 (Riesdorf)

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 14:49 (WEA 07 (GRN)) 17:01	1 08:06 14:59 (WEA 07 (GRN)) 17:01	1 07:00 14:59 (WEA 07 (GRN)) 17:01	1 06:52 14:59 (WEA 07 (GRN)) 17:01	1 05:41 14:59 (WEA 07 (GRN)) 17:01	1 04:51 14:59 (WEA 07 (GRN)) 17:01
2 08:37 14:50 (WEA 07 (GRN)) 17:04	2 08:06 15:00 (WEA 07 (GRN)) 17:04	2 07:05 15:00 (WEA 07 (GRN)) 17:04	2 06:49 15:00 (WEA 07 (GRN)) 17:04	2 05:39 15:00 (WEA 07 (GRN)) 17:04	2 04:49 15:00 (WEA 07 (GRN)) 17:04
3 08:37 14:50 (WEA 07 (GRN)) 17:03	3 08:06 15:00 (WEA 07 (GRN)) 17:03	3 07:03 15:00 (WEA 07 (GRN)) 17:03	3 06:49 15:00 (WEA 07 (GRN)) 17:03	3 05:39 15:00 (WEA 07 (GRN)) 17:03	3 04:49 15:00 (WEA 07 (GRN)) 17:03
4 08:36 14:50 (WEA 07 (GRN)) 17:01	4 08:05 15:00 (WEA 07 (GRN)) 17:01	4 07:01 15:00 (WEA 07 (GRN)) 17:01	4 06:44 15:00 (WEA 07 (GRN)) 17:01	4 05:34 15:00 (WEA 07 (GRN)) 17:01	4 04:44 15:00 (WEA 07 (GRN)) 17:01
5 08:07 15:18 (WEA 07 (GRN)) 17:01	5 07:38 15:18 (WEA 07 (GRN)) 17:01	5 06:59 15:18 (WEA 07 (GRN)) 17:01	5 06:42 15:18 (WEA 07 (GRN)) 17:01	5 05:32 15:18 (WEA 07 (GRN)) 17:01	5 04:42 15:18 (WEA 07 (GRN)) 17:01
6 08:36 15:18 (WEA 07 (GRN)) 17:03	6 08:05 15:18 (WEA 07 (GRN)) 17:03	6 07:06 15:18 (WEA 07 (GRN)) 17:03	6 06:49 15:18 (WEA 07 (GRN)) 17:03	6 05:39 15:18 (WEA 07 (GRN)) 17:03	6 04:49 15:18 (WEA 07 (GRN)) 17:03
7 08:35 14:51 (WEA 07 (GRN)) 17:55	7 08:04 14:51 (WEA 07 (GRN)) 17:55	7 06:53 14:51 (WEA 07 (GRN)) 17:55	7 06:49 14:51 (WEA 07 (GRN)) 17:55	7 05:39 14:51 (WEA 07 (GRN)) 17:55	7 04:49 14:51 (WEA 07 (GRN)) 17:55
8 08:35 14:51 (WEA 07 (GRN)) 17:07	8 08:04 14:51 (WEA 07 (GRN)) 17:07	8 06:54 14:51 (WEA 07 (GRN)) 17:07	8 06:44 14:51 (WEA 07 (GRN)) 17:07	8 05:34 14:51 (WEA 07 (GRN)) 17:07	8 04:44 14:51 (WEA 07 (GRN)) 17:07
9 08:34 14:51 (WEA 07 (GRN)) 17:09	9 08:03 14:51 (WEA 07 (GRN)) 17:09	9 06:54 14:51 (WEA 07 (GRN)) 17:09	9 06:49 14:51 (WEA 07 (GRN)) 17:09	9 05:39 14:51 (WEA 07 (GRN)) 17:09	9 04:49 14:51 (WEA 07 (GRN)) 17:09
10 08:33 14:52 (WEA 07 (GRN)) 17:11	10 08:02 14:52 (WEA 07 (GRN)) 17:11	10 06:54 14:52 (WEA 07 (GRN)) 17:11	10 06:49 14:52 (WEA 07 (GRN)) 17:11	10 05:39 14:52 (WEA 07 (GRN)) 17:11	10 04:49 14:52 (WEA 07 (GRN)) 17:11
11 08:33 14:52 (WEA 07 (GRN)) 17:13	11 08:02 14:52 (WEA 07 (GRN)) 17:13	11 06:54 14:52 (WEA 07 (GRN)) 17:13	11 06:49 14:52 (WEA 07 (GRN)) 17:13	11 05:39 14:52 (WEA 07 (GRN)) 17:13	11 04:49 14:52 (WEA 07 (GRN)) 17:13
12 08:32 14:52 (WEA 07 (GRN)) 17:15	12 08:01 14:52 (WEA 07 (GRN)) 17:15	12 06:54 14:52 (WEA 07 (GRN)) 17:15	12 06:49 14:52 (WEA 07 (GRN)) 17:15	12 05:39 14:52 (WEA 07 (GRN)) 17:15	12 04:49 14:52 (WEA 07 (GRN)) 17:15
13 08:31 14:53 (WEA 07 (GRN)) 17:17	13 08:00 14:53 (WEA 07 (GRN)) 17:17	13 06:54 14:53 (WEA 07 (GRN)) 17:17	13 06:49 14:53 (WEA 07 (GRN)) 17:17	13 05:39 14:53 (WEA 07 (GRN)) 17:17	13 04:49 14:53 (WEA 07 (GRN)) 17:17
14 08:30 14:53 (WEA 07 (GRN)) 17:19	14 07:59 14:53 (WEA 07 (GRN)) 17:19	14 06:54 14:53 (WEA 07 (GRN)) 17:19	14 06:49 14:53 (WEA 07 (GRN)) 17:19	14 05:39 14:53 (WEA 07 (GRN)) 17:19	14 04:49 14:53 (WEA 07 (GRN)) 17:19
15 08:29 14:54 (WEA 07 (GRN)) 17:21	15 07:58 14:54 (WEA 07 (GRN)) 17:21	15 06:54 14:54 (WEA 07 (GRN)) 17:21	15 06:49 14:54 (WEA 07 (GRN)) 17:21	15 05:39 14:54 (WEA 07 (GRN)) 17:21	15 04:49 14:54 (WEA 07 (GRN)) 17:21
16 08:28 14:54 (WEA 07 (GRN)) 17:23	16 07:57 14:54 (WEA 07 (GRN)) 17:23	16 06:54 14:54 (WEA 07 (GRN)) 17:23	16 06:49 14:54 (WEA 07 (GRN)) 17:23	16 05:39 14:54 (WEA 07 (GRN)) 17:23	16 04:49 14:54 (WEA 07 (GRN)) 17:23
17 08:27 14:55 (WEA 07 (GRN)) 17:25	17 07:56 14:55 (WEA 07 (GRN)) 17:25	17 06:54 14:55 (WEA 07 (GRN)) 17:25	17 06:49 14:55 (WEA 07 (GRN)) 17:25	17 05:39 14:55 (WEA 07 (GRN)) 17:25	17 04:49 14:55 (WEA 07 (GRN)) 17:25
18 08:26 14:55 (WEA 07 (GRN)) 17:27	18 07:55 14:55 (WEA 07 (GRN)) 17:27	18 06:54 14:55 (WEA 07 (GRN)) 17:27	18 06:49 14:55 (WEA 07 (GRN)) 17:27	18 05:39 14:55 (WEA 07 (GRN)) 17:27	18 04:49 14:55 (WEA 07 (GRN)) 17:27
19 08:25 14:56 (WEA 07 (GRN)) 17:29	19 07:54 14:56 (WEA 07 (GRN)) 17:29	19 06:54 14:56 (WEA 07 (GRN)) 17:29	19 06:49 14:56 (WEA 07 (GRN)) 17:29	19 05:39 14:56 (WEA 07 (GRN)) 17:29	19 04:49 14:56 (WEA 07 (GRN)) 17:29
20 08:24 14:58 (WEA 07 (GRN)) 17:31	20 07:52 14:58 (WEA 07 (GRN)) 17:31	20 06:54 14:58 (WEA 07 (GRN)) 17:31	20 06:49 14:58 (WEA 07 (GRN)) 17:31	20 05:39 14:58 (WEA 07 (GRN)) 17:31	20 04:49 14:58 (WEA 07 (GRN)) 17:31
21 08:23 14:58 (WEA 07 (GRN)) 17:33	21 07:51 14:58 (WEA 07 (GRN)) 17:33	21 06:54 14:58 (WEA 07 (GRN)) 17:33	21 06:49 14:58 (WEA 07 (GRN)) 17:33	21 05:39 14:58 (WEA 07 (GRN)) 17:33	21 04:49 14:58 (WEA 07 (GRN)) 17:33
22 08:22 14:59 (WEA 07 (GRN)) 17:35	22 07:50 14:59 (WEA 07 (GRN)) 17:35	22 06:54 14:59 (WEA 07 (GRN)) 17:35	22 06:49 14:59 (WEA 07 (GRN)) 17:35	22 05:39 14:59 (WEA 07 (GRN)) 17:35	22 04:49 14:59 (WEA 07 (GRN)) 17:35
23 08:21 14:59 (WEA 07 (GRN)) 17:37	23 07:49 14:59 (WEA 07 (GRN)) 17:37	23 06:54 14:59 (WEA 07 (GRN)) 17:37	23 06:49 14:59 (WEA 07 (GRN)) 17:37	23 05:39 14:59 (WEA 07 (GRN)) 17:37	23 04:49 14:59 (WEA 07 (GRN)) 17:37
24 08:19 15:01 (WEA 07 (GRN)) 17:39	24 07:47 15:01 (WEA 07 (GRN)) 17:39	24 06:54 15:01 (WEA 07 (GRN)) 17:39	24 06:49 15:01 (WEA 07 (GRN)) 17:39	24 05:39 15:01 (WEA 07 (GRN)) 17:39	24 04:49 15:01 (WEA 07 (GRN)) 17:39
25 08:17 15:02 (WEA 07 (GRN)) 17:41	25 07:45 15:02 (WEA 07 (GRN)) 17:41	25 06:54 15:02 (WEA 07 (GRN)) 17:41	25 06:49 15:02 (WEA 07 (GRN)) 17:41	25 05:39 15:02 (WEA 07 (GRN)) 17:41	25 04:49 15:02 (WEA 07 (GRN)) 17:41
26 08:16 15:03 (WEA 07 (GRN)) 17:43	26 07:43 15:03 (WEA 07 (GRN)) 17:43	26 06:54 15:03 (WEA 07 (GRN)) 17:43	26 06:49 15:03 (WEA 07 (GRN)) 17:43	26 05:39 15:03 (WEA 07 (GRN)) 17:43	26 04:49 15:03 (WEA 07 (GRN)) 17:43
27 08:14 15:05 (WEA 07 (GRN)) 17:45	27 07:41 15:05 (WEA 07 (GRN)) 17:45	27 06:54 15:05 (WEA 07 (GRN)) 17:45	27 06:49 15:05 (WEA 07 (GRN)) 17:45	27 05:39 15:05 (WEA 07 (GRN)) 17:45	27 04:49 15:05 (WEA 07 (GRN)) 17:45
28 08:13 15:06 (WEA 07 (GRN)) 17:47	28 07:39 15:06 (WEA 07 (GRN)) 17:47	28 06:54 15:06 (WEA 07 (GRN)) 17:47	28 06:49 15:06 (WEA 07 (GRN)) 17:47	28 05:39 15:06 (WEA 07 (GRN)) 17:47	28 04:49 15:06 (WEA 07 (GRN)) 17:47
29 08:11 15:07 (WEA 07 (GRN)) 17:49	29 07:37 15:07 (WEA 07 (GRN)) 17:49	29 06:54 15:07 (WEA 07 (GRN)) 17:49	29 06:49 15:07 (WEA 07 (GRN)) 17:49	29 05:39 15:07 (WEA 07 (GRN)) 17:49	29 04:49 15:07 (WEA 07 (GRN)) 17:49
30 08:09 15:08 (WEA 07 (GRN)) 17:51	30 07:35 15:08 (WEA 07 (GRN)) 17:51	30 06:54 15:08 (WEA 07 (GRN)) 17:51	30 06:49 15:08 (WEA 07 (GRN)) 17:51	30 05:39 15:08 (WEA 07 (GRN)) 17:51	30 04:49 15:08 (WEA 07 (GRN)) 17:51
31 08:08 15:09 (WEA 07 (GRN)) 17:53	31 07:33 15:09 (WEA 07 (GRN)) 17:53	31 06:54 15:09 (WEA 07 (GRN)) 17:53	31 06:49 15:09 (WEA 07 (GRN)) 17:53	31 05:39 15:09 (WEA 07 (GRN)) 17:53	31 04:49 15:09 (WEA 07 (GRN)) 17:53
Sommerscheinstunden 248	272	367	421	496	513
astr. max. mögl. Beschattung 807	279	302	89	65	312

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 Großholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großholz (3 x V150-6.0) Schattenrezeptor: IO 03 - IO 03 Hauptstraße 4 (Riesdorf)

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 Sonneneinfallrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Table with columns for months (Juli, August, September, Oktober, November, Dezember) and rows for days of the month. It lists times for sunrise, sunset, and shadow duration for various wind turbine models.

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.

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) Schattenrezeptor: IO 04 - IO 04 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 Sonneneinstrahlungsrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

Calendar table showing shadow times for months January through June. Columns include month names and specific dates with times. Includes summary rows for 'Sommerstunden' and 'astr. max mögl. Beschattung'.

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

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



Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 04 - IO 04 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

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

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
 Sommerdeich 14 b
 DE-25709 Kaiser-Wilhelm-Koog
 (0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 05 - IO 05 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

Januar		Februar		März		April		Mai		Juni	
1	08:37	15:05 (WEA_G1) 08:06	16:13 (WEA_08 (GRN)) 07:00	16:55 (WEA_07 (GRN)) 06:52	19:31 (WEA_43 (RW)) 05:33	20:14 (WEA_41 (RW)) 04:51	20:48	20:53 (WEA_42 (RW)) 04:51	20:50 (WEA_42 (RW)) 04:51	20:53 (WEA_42 (RW)) 04:51	
2	08:37	15:06 (WEA_G1) 08:04	16:14 (WEA_08 (GRN)) 07:05	17:00 (WEA_07 (GRN)) 06:49	19:30 (WEA_43 (RW)) 05:29	20:17 (WEA_41 (RW)) 04:47	20:48	20:53 (WEA_42 (RW)) 04:47	20:50 (WEA_42 (RW)) 04:47	20:53 (WEA_42 (RW)) 04:47	
3	08:37	15:06 (WEA_G1) 08:03	16:15 (WEA_08 (GRN)) 07:03	17:54	19:30 (WEA_43 (RW)) 05:27	20:17 (WEA_41 (RW)) 04:45	20:48	20:53 (WEA_42 (RW)) 04:45	20:50 (WEA_42 (RW)) 04:45	20:53 (WEA_42 (RW)) 04:45	
4	08:36	15:07 (WEA_G1) 08:01	16:17 (WEA_08 (GRN)) 07:01	17:58	19:30 (WEA_43 (RW)) 05:25	20:17 (WEA_41 (RW)) 04:43	20:47	20:52 (WEA_42 (RW)) 04:43	20:49 (WEA_42 (RW)) 04:43	20:52 (WEA_42 (RW)) 04:43	
5	08:36	15:07 (WEA_G1) 07:59	16:22 (WEA_08 (GRN)) 07:00	18:00	19:30 (WEA_43 (RW)) 05:23	20:16 (WEA_40 (RW)) 04:41	20:46	20:51 (WEA_41 (RW)) 04:41	20:48 (WEA_41 (RW)) 04:41	20:51 (WEA_41 (RW)) 04:41	
6	08:36	15:07 (WEA_G1) 07:57	16:23 (WEA_08 (GRN)) 07:01	18:02	19:30 (WEA_43 (RW)) 05:21	20:15 (WEA_40 (RW)) 04:39	20:45	20:50 (WEA_41 (RW)) 04:39	20:47 (WEA_41 (RW)) 04:39	20:50 (WEA_41 (RW)) 04:39	
7	08:35	15:08 (WEA_G1) 07:55	16:24 (WEA_08 (GRN)) 07:02	18:05	19:30 (WEA_43 (RW)) 05:19	20:14 (WEA_39 (RW)) 04:37	20:44	20:49 (WEA_40 (RW)) 04:37	20:46 (WEA_40 (RW)) 04:37	20:49 (WEA_40 (RW)) 04:37	
8	08:35	15:09 (WEA_G1) 07:53	16:25 (WEA_08 (GRN)) 07:03	18:08	19:30 (WEA_43 (RW)) 05:17	20:13 (WEA_38 (RW)) 04:35	20:43	20:48 (WEA_39 (RW)) 04:35	20:45 (WEA_39 (RW)) 04:35	20:48 (WEA_39 (RW)) 04:35	
9	08:34	15:10 (WEA_G1) 07:51	16:26 (WEA_08 (GRN)) 07:04	18:11	19:30 (WEA_43 (RW)) 05:15	20:12 (WEA_37 (RW)) 04:33	20:42	20:47 (WEA_38 (RW)) 04:33	20:44 (WEA_38 (RW)) 04:33	20:47 (WEA_38 (RW)) 04:33	
10	08:33	15:11 (WEA_G1) 07:49	16:27 (WEA_08 (GRN)) 07:05	18:14	19:30 (WEA_43 (RW)) 05:13	20:11 (WEA_36 (RW)) 04:31	20:41	20:46 (WEA_37 (RW)) 04:31	20:43 (WEA_37 (RW)) 04:31	20:46 (WEA_37 (RW)) 04:31	
11	08:33	15:11 (WEA_G1) 07:47	16:28 (WEA_08 (GRN)) 07:06	18:17	19:30 (WEA_43 (RW)) 05:11	20:10 (WEA_35 (RW)) 04:29	20:40	20:45 (WEA_36 (RW)) 04:29	20:42 (WEA_36 (RW)) 04:29	20:45 (WEA_36 (RW)) 04:29	
12	08:32	15:12 (WEA_G1) 07:45	16:29 (WEA_08 (GRN)) 07:07	18:20	19:30 (WEA_43 (RW)) 05:09	20:09 (WEA_34 (RW)) 04:27	20:39	20:44 (WEA_35 (RW)) 04:27	20:41 (WEA_35 (RW)) 04:27	20:44 (WEA_35 (RW)) 04:27	
13	08:31	15:13 (WEA_G1) 07:43	16:30 (WEA_08 (GRN)) 07:08	18:23	19:30 (WEA_43 (RW)) 05:07	20:08 (WEA_33 (RW)) 04:25	20:38	20:43 (WEA_34 (RW)) 04:25	20:40 (WEA_34 (RW)) 04:25	20:43 (WEA_34 (RW)) 04:25	
14	08:30	15:14 (WEA_G1) 07:41	16:31 (WEA_08 (GRN)) 07:09	18:26	19:30 (WEA_43 (RW)) 05:05	20:07 (WEA_32 (RW)) 04:23	20:37	20:42 (WEA_33 (RW)) 04:23	20:39 (WEA_33 (RW)) 04:23	20:42 (WEA_33 (RW)) 04:23	
15	08:29	15:15 (WEA_G1) 07:39	16:32 (WEA_08 (GRN)) 07:10	18:29	19:30 (WEA_43 (RW)) 05:03	20:06 (WEA_31 (RW)) 04:21	20:36	20:41 (WEA_32 (RW)) 04:21	20:38 (WEA_32 (RW)) 04:21	20:41 (WEA_32 (RW)) 04:21	
16	08:28	15:16 (WEA_G1) 07:37	16:33 (WEA_08 (GRN)) 07:11	18:32	19:30 (WEA_43 (RW)) 05:01	20:05 (WEA_30 (RW)) 04:19	20:35	20:40 (WEA_31 (RW)) 04:19	20:37 (WEA_31 (RW)) 04:19	20:40 (WEA_31 (RW)) 04:19	
17	08:27	15:17 (WEA_G1) 07:35	16:34 (WEA_08 (GRN)) 07:12	18:35	19:30 (WEA_43 (RW)) 04:59	20:04 (WEA_29 (RW)) 04:17	20:34	20:39 (WEA_30 (RW)) 04:17	20:36 (WEA_30 (RW)) 04:17	20:39 (WEA_30 (RW)) 04:17	
18	08:26	15:18 (WEA_G1) 07:33	16:35 (WEA_08 (GRN)) 07:13	18:38	19:30 (WEA_43 (RW)) 04:57	20:03 (WEA_28 (RW)) 04:15	20:33	20:38 (WEA_29 (RW)) 04:15	20:35 (WEA_29 (RW)) 04:15	20:38 (WEA_29 (RW)) 04:15	
19	08:25	15:19 (WEA_G1) 07:30	16:36 (WEA_08 (GRN)) 07:14	18:41	19:30 (WEA_43 (RW)) 04:55	20:02 (WEA_27 (RW)) 04:13	20:32	20:37 (WEA_28 (RW)) 04:13	20:34 (WEA_28 (RW)) 04:13	20:37 (WEA_28 (RW)) 04:13	
20	08:24	15:20 (WEA_G1) 07:28	16:37 (WEA_08 (GRN)) 07:15	18:44	19:30 (WEA_43 (RW)) 04:53	20:01 (WEA_26 (RW)) 04:11	20:31	20:36 (WEA_27 (RW)) 04:11	20:33 (WEA_27 (RW)) 04:11	20:36 (WEA_27 (RW)) 04:11	
21	08:23	15:21 (WEA_G1) 07:26	16:38 (WEA_08 (GRN)) 07:16	18:47	19:30 (WEA_43 (RW)) 04:51	20:00 (WEA_25 (RW)) 04:09	20:30	20:35 (WEA_26 (RW)) 04:09	20:32 (WEA_26 (RW)) 04:09	20:35 (WEA_26 (RW)) 04:09	
22	08:22	15:22 (WEA_G1) 07:24	16:39 (WEA_08 (GRN)) 07:17	18:50	19:30 (WEA_43 (RW)) 04:49	19:59 (WEA_24 (RW)) 04:07	20:29	20:34 (WEA_25 (RW)) 04:07	20:31 (WEA_25 (RW)) 04:07	20:34 (WEA_25 (RW)) 04:07	
23	08:21	15:23 (WEA_G1) 07:22	16:40 (WEA_08 (GRN)) 07:18	18:53	19:30 (WEA_43 (RW)) 04:47	19:58 (WEA_23 (RW)) 04:05	20:28	20:33 (WEA_24 (RW)) 04:05	20:30 (WEA_24 (RW)) 04:05	20:33 (WEA_24 (RW)) 04:05	
24	08:19	15:24 (WEA_G1) 07:20	16:41 (WEA_08 (GRN)) 07:19	18:56	19:30 (WEA_43 (RW)) 04:45	19:57 (WEA_22 (RW)) 04:03	20:27	20:32 (WEA_23 (RW)) 04:03	20:29 (WEA_23 (RW)) 04:03	20:32 (WEA_23 (RW)) 04:03	
25	08:18	15:25 (WEA_G1) 07:18	16:42 (WEA_08 (GRN)) 07:20	18:59	19:30 (WEA_43 (RW)) 04:43	19:56 (WEA_21 (RW)) 04:01	20:26	20:31 (WEA_22 (RW)) 04:01	20:28 (WEA_22 (RW)) 04:01	20:31 (WEA_22 (RW)) 04:01	
26	08:16	15:26 (WEA_G1) 07:16	16:43 (WEA_08 (GRN)) 07:21	19:02	19:30 (WEA_43 (RW)) 04:41	19:55 (WEA_20 (RW)) 03:59	20:25	20:30 (WEA_21 (RW)) 03:59	20:27 (WEA_21 (RW)) 03:59	20:30 (WEA_21 (RW)) 03:59	
27	08:14	15:27 (WEA_G1) 07:14	16:44 (WEA_08 (GRN)) 07:22	19:05	19:30 (WEA_43 (RW)) 04:39	19:54 (WEA_19 (RW)) 03:57	20:24	20:29 (WEA_20 (RW)) 03:57	20:26 (WEA_20 (RW)) 03:57	20:29 (WEA_20 (RW)) 03:57	
28	08:13	15:28 (WEA_G1) 07:12	16:45 (WEA_08 (GRN)) 07:23	19:08	19:30 (WEA_43 (RW)) 04:37	19:53 (WEA_18 (RW)) 03:55	20:23	20:28 (WEA_19 (RW)) 03:55	20:25 (WEA_19 (RW)) 03:55	20:28 (WEA_19 (RW)) 03:55	
29	08:11	15:29 (WEA_G1) 07:10	16:46 (WEA_08 (GRN)) 07:24	19:11	19:30 (WEA_43 (RW)) 04:35	19:52 (WEA_17 (RW)) 03:53	20:22	20:27 (WEA_18 (RW)) 03:53	20:24 (WEA_18 (RW)) 03:53	20:27 (WEA_18 (RW)) 03:53	
30	08:09	15:30 (WEA_G1) 07:08	16:47 (WEA_08 (GRN)) 07:25	19:14	19:30 (WEA_43 (RW)) 04:33	19:51 (WEA_16 (RW)) 03:51	20:21	20:26 (WEA_17 (RW)) 03:51	20:23 (WEA_17 (RW)) 03:51	20:26 (WEA_17 (RW)) 03:51	
31	08:08	15:31 (WEA_G1) 07:06	16:48 (WEA_08 (GRN)) 07:26	19:17	19:30 (WEA_43 (RW)) 04:31	19:50 (WEA_15 (RW)) 03:49	20:20	20:25 (WEA_16 (RW)) 03:49	20:22 (WEA_16 (RW)) 03:49	20:25 (WEA_16 (RW)) 03:49	
Sommerscheinstunden	248	272	367	421	496	513					
astr. max. mögl. Beschattung	498	218	125	27	118	202					

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 05 - IO 05 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	04:47	21:10 (WEA K04)	05:27	06:23		07:17	18:13 (WEA 03 (GRN))	07:16		06:12	14:52 (WEA_G1)
2	04:47	21:10 (WEA K04)	05:29	06:24		07:19	18:12 (WEA 03 (GRN))	07:18		06:14	14:52 (WEA_G1)
3	04:48	21:11 (WEA K04)	05:31	06:26		07:21	18:12 (WEA 03 (GRN))	07:20		06:15	14:53 (WEA_G1)
4	04:49	21:11 (WEA K04)	05:32	06:28		07:22	18:12 (WEA 03 (GRN))	07:22		06:17	14:52 (WEA_G1)
5	04:50	21:12 (WEA K04)	05:34	06:30		07:24	18:12 (WEA 05 (GRN))	07:24		06:18	14:53 (WEA_G1)
6	04:51	21:11 (WEA K04)	05:36	06:32		07:26	18:11 (WEA 05 (GRN))	07:26		06:19	14:53 (WEA_G1)
7	04:52	21:12 (WEA K04)	05:38	06:33		07:28	18:10 (WEA 05 (GRN))	07:28		06:21	14:54 (WEA_G1)
8	04:53	21:12 (WEA K04)	05:39	06:35		07:30	18:11 (WEA 05 (GRN))	07:30	6	15:47 (WEA 08 (GRN))	15:55 24 15:17 (WEA_G1)
9	04:54	21:14 (WEA K04)	05:41	06:37		07:32	18:11 (WEA 05 (GRN))	07:32	10	15:44 (WEA 08 (GRN))	15:54 22 15:16 (WEA_G1)
10	04:55	21:15 (WEA K04)	05:43	06:39		07:34	18:11 (WEA 05 (GRN))	07:34	11	15:44 (WEA 08 (GRN))	15:54 21 15:16 (WEA_G1)
11	04:56	21:15 (WEA K04)	05:45	06:41		07:35	18:11 (WEA 05 (GRN))	07:35	9	15:44 (WEA 08 (GRN))	15:53 21 15:16 (WEA_G1)
12	04:57	20:57 (WEA 42 (RW))	05:47	06:42		07:37	18:12 (WEA 07 (GRN))	07:37	8	15:44 (WEA 08 (GRN))	15:53 20 15:15 (WEA_G1)
13	04:58	21:02 (WEA 42 (RW))	05:48	06:44		07:39	18:12 (WEA 07 (GRN))	07:39	6	15:50 (WEA 08 (GRN))	15:53 18 15:14 (WEA_G1)
14	05:00	20:55 (WEA 42 (RW))	05:50	06:46		07:41	18:12 (WEA 07 (GRN))	07:41	4	15:44 (WEA 08 (GRN))	15:53 18 15:14 (WEA_G1)
15	05:01	21:04 (WEA 42 (RW))	05:51	06:48		07:43	18:12 (WEA 07 (GRN))	07:43	2	15:46 (WEA 08 (GRN))	15:53 17 15:14 (WEA_G1)
16	05:03	21:05 (WEA 42 (RW))	05:52	06:50		07:45	18:12 (WEA 07 (GRN))	07:45			15:53 17 15:14 (WEA_G1)
17	05:04	21:05 (WEA 42 (RW))	05:54	06:51		07:47	18:12 (WEA 07 (GRN))	07:47			15:53 16 15:14 (WEA_G1)
18	05:05	21:07 (WEA 42 (RW))	05:55	06:53		07:49	18:12 (WEA 07 (GRN))	07:49			15:53 16 15:14 (WEA_G1)
19	05:07	21:05 (WEA 42 (RW))	05:57	06:55		07:51	18:12 (WEA 07 (GRN))	07:51			15:53 16 15:14 (WEA_G1)
20	05:08	21:04 (WEA 42 (RW))	05:59	06:57		07:53	18:12 (WEA 07 (GRN))	07:53			15:53 15 15:15 (WEA_G1)
21	05:10	21:04 (WEA 42 (RW))	06:01	06:59		07:55	18:12 (WEA 07 (GRN))	07:55			15:53 15 15:15 (WEA_G1)
22	05:11	21:03 (WEA 42 (RW))	06:03	07:00		07:57	18:12 (WEA 07 (GRN))	07:57	8	14:58 (WEA_G1)	15:54 15 15:16 (WEA_G1)
23	05:13	21:02 (WEA 42 (RW))	06:05	07:02		07:59	18:12 (WEA 07 (GRN))	07:59			15:54 15 15:16 (WEA_G1)
24	05:14	21:02 (WEA 42 (RW))	06:06	07:04		08:00	18:12 (WEA 07 (GRN))	08:00			15:54 15 15:16 (WEA_G1)
25	05:16	21:01 (WEA 42 (RW))	06:08	07:06		08:02	18:12 (WEA 07 (GRN))	08:02			15:54 15 15:16 (WEA_G1)
26	05:17	21:01 (WEA 42 (RW))	06:10	07:08		08:04	18:12 (WEA 07 (GRN))	08:04			15:54 15 15:16 (WEA_G1)
27	05:19	21:00 (WEA 42 (RW))	06:12	07:10		08:06	18:12 (WEA 07 (GRN))	08:06			15:54 15 15:16 (WEA_G1)
28	05:21	21:00 (WEA 42 (RW))	06:15	07:11		08:08	18:12 (WEA 07 (GRN))	08:08			15:54 15 15:16 (WEA_G1)
29	05:22	21:00 (WEA 42 (RW))	06:17	07:13		08:10	18:12 (WEA 07 (GRN))	08:10			15:54 15 15:16 (WEA_G1)
30	05:24	21:00 (WEA 42 (RW))	06:19	07:15		08:12	18:12 (WEA 07 (GRN))	08:12			15:54 15 15:16 (WEA_G1)
31	05:26	21:00 (WEA 42 (RW))	06:21	07:17		08:14	18:12 (WEA 07 (GRN))	08:14			15:54 15 15:16 (WEA_G1)
Sommerstundenzahl		515	461	383	328	241	257	237			
astr. max. mögl. Beschattung		194	7	95	241	237	237	237			

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 06 - IO 06 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni	
1	08:37	15:16 (WEA_G1) 08:06	16:19 (WEA_08 (GRN)) 07:00	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:51	20:53 (WEA_K04)
1	16:03	15:25 (WEA_G1) 16:55	16:22 (WEA_08 (GRN)) 17:52	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:38	21:03 (WEA_K04)
2	08:37	15:16 (WEA_G1) 08:04	16:19 (WEA_08 (GRN)) 07:05	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:50	20:53 (WEA_K04)
3	16:04	15:26 (WEA_G1) 16:57	16:25 (WEA_08 (GRN)) 17:54	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:40	21:04 (WEA_K04)
4	08:36	15:17 (WEA_G1) 08:01	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:48	20:54 (WEA_K04)
5	16:06	15:29 (WEA_G1) 17:01	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:42	21:07 (WEA_K04)
6	08:36	15:17 (WEA_G1) 07:59	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:47	20:54 (WEA_K04)
7	16:03	15:18 (WEA_G1) 07:55	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:43	21:07 (WEA_K04)
8	08:36	15:17 (WEA_G1) 07:57	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:47	20:55 (WEA_K04)
9	16:09	15:31 (WEA_G1) 17:05	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:44	21:09 (WEA_K04)
10	08:35	15:18 (WEA_G1) 07:55	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:46	20:54 (WEA_K04)
11	16:10	15:33 (WEA_G1) 17:07	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:45	21:09 (WEA_K04)
12	08:35	15:18 (WEA_G1) 07:53	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:45	20:55 (WEA_K04)
13	16:12	15:35 (WEA_G1) 17:09	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:46	21:11 (WEA_K04)
14	08:34	15:18 (WEA_G1) 07:51	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:45	20:55 (WEA_K04)
15	16:13	15:36 (WEA_G1) 17:11	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:47	21:10 (WEA_K04)
16	08:33	15:18 (WEA_G1) 07:49	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:44	20:56 (WEA_K04)
17	16:15	15:38 (WEA_G1) 17:13	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:48	21:10 (WEA_K04)
18	08:33	15:19 (WEA_G1) 07:47	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:44	20:56 (WEA_K04)
19	16:16	15:39 (WEA_G1) 17:15	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:49	21:10 (WEA_K04)
20	08:32	15:19 (WEA_G1) 07:45	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:43	20:57 (WEA_K04)
21	16:18	15:41 (WEA_G1) 17:17	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:50	21:10 (WEA_K04)
22	08:31	15:20 (WEA_G1) 07:43	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:43	20:57 (WEA_K04)
23	16:20	15:43 (WEA_G1) 17:19	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:50	21:10 (WEA_K04)
24	08:30	15:20 (WEA_G1) 07:41	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:43	20:58 (WEA_K04)
25	16:21	15:43 (WEA_G1) 17:21	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:51	21:10 (WEA_K04)
26	08:29	15:21 (WEA_G1) 07:39	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	20:58 (WEA_K04)
27	16:23	15:44 (WEA_G1) 17:24	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:52	21:11 (WEA_K04)
28	08:28	15:22 (WEA_G1) 07:37	16:21 (WEA_08 (GRN)) 07:01	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	20:58 (WEA_K04)
29	16:25	15:44 (WEA_G1) 17:26	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:52	21:10 (WEA_K04)
30	08:27	15:23 (WEA_G1) 07:35	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	20:58 (WEA_K04)
31	16:26	15:44 (WEA_G1) 17:28	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:53	21:10 (WEA_K04)
1	08:26	15:23 (WEA_G1) 07:33	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	20:59 (WEA_K04)
2	16:28	15:43 (WEA_G1) 17:30	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:53	21:10 (WEA_K04)
3	08:25	15:24 (WEA_G1) 07:30	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	21:00 (WEA_K04)
4	16:30	15:43 (WEA_G1) 17:32	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:11 (WEA_K04)
5	08:24	15:25 (WEA_G1) 07:28	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	21:00 (WEA_K04)
6	16:32	15:42 (WEA_G1) 17:34	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:11 (WEA_K04)
7	08:23	15:27 (WEA_G1) 07:26	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	21:00 (WEA_K04)
8	16:34	15:42 (WEA_G1) 17:36	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:11 (WEA_K04)
9	08:22	15:29 (WEA_G1) 07:24	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	21:00 (WEA_K04)
10	16:35	15:42 (WEA_G1) 17:38	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:11 (WEA_K04)
11	08:20	15:31 (WEA_G1) 07:22	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:42	21:00 (WEA_K04)
12	16:37	15:40 (WEA_G1) 17:40	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:11 (WEA_K04)
13	08:19	15:33 (WEA_G1) 07:19	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:43	21:01 (WEA_K04)
14	16:39	15:42 (WEA_G1) 17:42	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:55	21:12 (WEA_K04)
15	08:17	15:34 (WEA_G1) 07:17	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:43	21:00 (WEA_K04)
16	16:41	15:41 (WEA_G1) 17:44	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:55	21:12 (WEA_K04)
17	08:16	15:35 (WEA_G1) 07:15	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:44	21:00 (WEA_K04)
18	16:43	15:42 (WEA_G1) 17:46	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:55	21:12 (WEA_K04)
19	08:14	15:27 (WEA_G1) 07:12	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:44	21:01 (WEA_K04)
20	16:45	15:40 (WEA_G1) 17:48	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:13 (WEA_K04)
21	08:13	15:30 (WEA_G1) 07:10	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:45	21:01 (WEA_K04)
22	16:47	15:40 (WEA_G1) 17:50	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:13 (WEA_K04)
23	08:11	15:31 (WEA_G1) 07:09	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:45	21:00 (WEA_K04)
24	16:49	15:41 (WEA_G1) 17:49	16:29 (WEA_08 (GRN)) 17:58	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	21:54	21:13 (WEA_K04)
25	08:09	15:32 (WEA_G1) 07:07	16:22 (WEA_08 (GRN)) 06:59	18:02	17:34 (WEA_05 (GRN)) 06:39	19:57	19:25 (WEA_43 (RW)) 05:37	20:48	20:53 (WEA_K04)	04:46	21:01 (WEA_K04)
26	16:51	15:42 (WEA_G1) 17:49	16:29 (WEA_08 (GRN)) 17:58	18:02							

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 06 - IO 06 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember		
1	04:47	21:00 (WEA K04)	05:27	20:40 (WEA 42 (RW))	06:23	07:17	18:14 (WEA 03 (GRN))	07:16		08:12	15:01 (WEA_G1)	
2	04:47	21:14 (WEA K04)	05:29	20:41 (WEA 42 (RW))	06:24	07:19	18:12 (WEA 03 (GRN))	07:18		08:14	15:01 (WEA_G1)	
3	04:48	21:00 (WEA K04)	05:31	20:44 (WEA 42 (RW))	06:26	07:21	18:11 (WEA 03 (GRN))	07:20		08:15	15:02 (WEA_G1)	
4	04:49	21:01 (WEA K04)	05:32		06:28	07:22	18:10 (WEA 03 (GRN))	07:22		08:17	15:02 (WEA_G1)	
5	04:50	21:00 (WEA K04)	05:34		06:30	07:24	18:11 (WEA 03 (GRN))	07:24		08:18	15:03 (WEA_G1)	
6	04:51	21:00 (WEA K04)	05:36		06:32	07:26	18:11 (WEA 05 (GRN))	07:26	15:53 (WEA 08 (GRN))	08:19	15:03 (WEA_G1)	
7	04:52	21:00 (WEA K04)	05:38		06:33	07:28	18:10 (WEA 05 (GRN))	07:28	15:51 (WEA 08 (GRN))	08:21	15:04 (WEA_G1)	
8	04:53	21:00 (WEA K04)	05:39		06:35	07:30	18:11 (WEA 05 (GRN))	07:30	15:50 (WEA 08 (GRN))	08:22	15:04 (WEA_G1)	
9	04:54	21:00 (WEA K04)	05:41		06:37	07:32	18:12 (WEA 05 (GRN))	07:32	15:50 (WEA 08 (GRN))	08:23	15:05 (WEA_G1)	
10	04:55	21:00 (WEA K04)	05:43		06:39	07:34	18:13 (WEA 05 (GRN))	07:34	15:50 (WEA 08 (GRN))	08:25	15:05 (WEA_G1)	
11	04:56	21:00 (WEA K04)	05:45		06:41	07:35	18:13 (WEA 05 (GRN))	07:35	15:51 (WEA 08 (GRN))	08:26	15:06 (WEA_G1)	
12	04:57	21:01 (WEA K04)	05:47		06:42	07:37	18:13 (WEA 05 (GRN))	07:37	15:52 (WEA 08 (GRN))	08:27	15:06 (WEA_G1)	
13	04:59	21:01 (WEA K04)	05:48		06:44	07:39	18:14 (WEA 05 (GRN))	07:39	15:53 (WEA 08 (GRN))	08:28	15:07 (WEA_G1)	
14	05:00	21:01 (WEA K04)	05:50		06:46	07:41	17:31 (WEA 07 (GRN))	07:42		08:29	15:07 (WEA_G1)	
15	05:01	21:01 (WEA K04)	05:52		06:48	07:43	17:29 (WEA 07 (GRN))	07:44		08:30	15:08 (WEA_G1)	
16	05:03	21:01 (WEA K04)	05:54		06:50	07:45	17:27 (WEA 07 (GRN))	07:45		08:31	15:08 (WEA_G1)	
17	05:04	21:02 (WEA K04)	05:56	20:14 (WEA 41 (RW))	06:51	07:47	17:26 (WEA 07 (GRN))	07:47		08:32	15:09 (WEA_G1)	
18	05:05	21:02 (WEA K04)	05:57	20:12 (WEA 41 (RW))	06:53	07:49	17:25 (WEA 07 (GRN))	07:49		08:32	15:10 (WEA_G1)	
19	05:07	21:02 (WEA K04)	05:59	20:13 (WEA 41 (RW))	06:55	07:51	17:25 (WEA 07 (GRN))	07:51	15:05 (WEA_G1)	08:33	15:11 (WEA_G1)	
20	05:08	21:04 (WEA K04)	06:01		06:57	07:53	17:25 (WEA 07 (GRN))	07:53	15:14 (WEA_G1)	08:34	15:11 (WEA_G1)	
21	05:10	21:03 (WEA K04)	06:03		06:59	07:55	17:25 (WEA 07 (GRN))	07:55	15:13 (WEA_G1)	08:34	15:12 (WEA_G1)	
22	05:11	21:03 (WEA K04)	06:05		07:00	07:56	17:25 (WEA 07 (GRN))	07:57	15:12 (WEA_G1)	08:35	15:12 (WEA_G1)	
23	05:13	21:03 (WEA K04)	06:06		07:02	07:58	17:25 (WEA 07 (GRN))	07:58	15:12 (WEA_G1)	08:36	15:13 (WEA_G1)	
24	05:14	21:03 (WEA K04)	06:08		07:05	07:59	17:26 (WEA 06 (GRN))	08:00	15:10 (WEA_G1)	08:36	15:13 (WEA_G1)	
25	05:16	20:45 (WEA 42 (RW))	06:10		07:06	08:01	17:30 (WEA 06 (GRN))	08:05	15:20 (WEA_G1)	08:37	15:14 (WEA_G1)	
26	05:17	20:43 (WEA 42 (RW))	06:12		07:08	08:02	17:32 (WEA 06 (GRN))	08:07	15:20 (WEA_G1)	08:37	15:14 (WEA_G1)	
27	05:19	20:43 (WEA 42 (RW))	06:14		07:10	08:04	17:32 (WEA 06 (GRN))	08:09	15:20 (WEA_G1)	08:37	15:14 (WEA_G1)	
28	05:21	20:41 (WEA 42 (RW))	06:15		07:11	08:06	17:32 (WEA 06 (GRN))	08:11	15:20 (WEA_G1)	08:37	15:15 (WEA_G1)	
29	05:22	20:41 (WEA 42 (RW))	06:17		07:13	08:08	17:32 (WEA 06 (GRN))	08:13	15:20 (WEA_G1)	08:37	15:15 (WEA_G1)	
30	05:24	20:41 (WEA 42 (RW))	06:19		07:15	08:10	17:32 (WEA 06 (GRN))	08:15	15:20 (WEA_G1)	08:37	15:16 (WEA_G1)	
31	05:26	20:41 (WEA 42 (RW))	06:21		07:17	08:12	17:32 (WEA 06 (GRN))	08:17	15:20 (WEA_G1)	08:37	15:16 (WEA_G1)	
	11:19	20:47 (WEA 42 (RW))	20:12								16:02	15:23 (WEA_G1)
Sommerscheinstunden		515	461								231	
astr max mögl Beschattung		259	10	44	104	257	272					

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)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 07 - IO 07 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03	15:19 (WEA_G1) 08:06 15:25 (WEA_G1) 16:55	07:08 17:52	06:52 19:51	05:41 20:47	20:11 (WEA 42 (RW)) 04:51 20:17 (WEA 42 (RW)) 21:38
2	08:37 16:04	15:19 (WEA_G1) 08:04 15:26 (WEA_G1) 16:57	07:05 17:54	06:49 19:53	05:39 20:49	20:11 (WEA 42 (RW)) 04:50 20:19 (WEA 42 (RW)) 21:40
3	08:37 16:05	15:19 (WEA_G1) 08:03 15:27 (WEA_G1) 16:59	07:03 17:56	06:47 19:55	05:37 20:51	20:12 (WEA 42 (RW)) 04:49 20:20 (WEA 42 (RW)) 21:41
4	08:36 16:06	15:20 (WEA_G1) 08:01 15:29 (WEA_G1) 17:01	07:01 17:58	06:44 19:57	05:35 20:53	20:14 (WEA 42 (RW)) 04:48 20:23 (WEA 42 (RW)) 21:42
5	08:36 16:06	15:20 (WEA_G1) 07:59 15:30 (WEA_G1) 17:03	06:58 18:00	06:42 19:59	05:33 20:55	20:15 (WEA 42 (RW)) 04:47 20:21 (WEA 42 (RW)) 21:43
6	08:36 16:09	15:20 (WEA_G1) 07:57 15:31 (WEA_G1) 17:05	06:56 18:02	06:39 20:01	05:31 20:57	20:15 (WEA 42 (RW)) 04:47 20:21 (WEA 42 (RW)) 21:43
7	08:35 16:10	15:21 (WEA_G1) 07:55 15:33 (WEA_G1) 17:07	06:53 18:03	06:37 20:02	05:29 20:59	20:16 (WEA 42 (RW)) 04:46 20:22 (WEA 42 (RW)) 21:44
8	08:35 16:12	15:21 (WEA_G1) 07:53 15:35 (WEA_G1) 17:09	06:51 18:05	06:34 20:04	05:27 21:00	20:17 (WEA 42 (RW)) 04:45 20:23 (WEA 42 (RW)) 21:45
9	08:34 16:13	15:21 (WEA_G1) 07:51 15:36 (WEA_G1) 17:11	06:49 18:07	06:32 20:06	05:25 21:02	20:18 (WEA 42 (RW)) 04:44 20:24 (WEA 42 (RW)) 21:46
10	08:33 16:15	15:21 (WEA_G1) 07:49 15:38 (WEA_G1) 17:13	06:46 18:09	06:30 20:08	05:23 21:04	20:19 (WEA 42 (RW)) 04:43 20:25 (WEA 42 (RW)) 21:47
11	08:33 16:16	15:22 (WEA_G1) 07:47 15:39 (WEA_G1) 17:15	06:44 18:11	06:27 20:10	05:22 21:06	20:20 (WEA 42 (RW)) 04:42 20:26 (WEA 42 (RW)) 21:48
12	08:32 16:18	15:22 (WEA_G1) 07:45 15:41 (WEA_G1) 17:17	06:41 18:13	06:25 20:12	05:20 21:07	20:21 (WEA 42 (RW)) 04:41 20:27 (WEA 42 (RW)) 21:49
13	08:31 16:20	15:23 (WEA_G1) 07:43 15:43 (WEA_G1) 17:19	06:39 18:15	06:22 20:14	05:18 21:09	20:22 (WEA 42 (RW)) 04:40 20:28 (WEA 42 (RW)) 21:50
14	08:30 16:21	15:24 (WEA_G1) 07:41 15:44 (WEA_G1) 17:21	06:36 18:17	06:20 20:16	05:16 21:11	20:29 (WEA 42 (RW)) 04:39 20:35 (WEA 42 (RW)) 21:51
15	08:29 16:23	15:24 (WEA_G1) 07:39 15:45 (WEA_G1) 17:24	06:34 18:19	06:18 20:18	05:14 21:13	20:36 (WEA 42 (RW)) 04:38 20:40 (WEA 42 (RW)) 21:52
16	08:28 16:25	15:25 (WEA_G1) 07:37 15:46 (WEA_G1) 17:26	06:31 18:21	06:15 20:19	05:13 21:14	20:37 (WEA 42 (RW)) 04:37 20:41 (WEA 42 (RW)) 21:53
17	08:27 16:26	15:27 (WEA_G1) 07:35 15:45 (WEA_G1) 17:28	06:29 18:23	06:13 20:21	05:11 21:16	20:38 (WEA 42 (RW)) 04:36 20:42 (WEA 42 (RW)) 21:54
18	08:26 16:28	15:27 (WEA_G1) 07:33 15:44 (WEA_G1) 17:30	06:26 18:25	06:10 20:23	05:09 21:18	20:39 (WEA 42 (RW)) 04:35 20:43 (WEA 42 (RW)) 21:55
19	08:25 16:30	15:28 (WEA_G1) 07:30 15:44 (WEA_G1) 17:32	06:24 18:27	06:08 20:25	05:08 21:19	20:40 (WEA 42 (RW)) 04:34 20:44 (WEA 42 (RW)) 21:56
20	08:24 16:32	15:29 (WEA_G1) 07:28 15:42 (WEA_G1) 17:34	06:21 18:28	06:06 20:27	05:06 21:21	20:41 (WEA 42 (RW)) 04:33 20:45 (WEA 42 (RW)) 21:57
21	08:23 16:34	15:31 (WEA_G1) 07:26 15:42 (WEA_G1) 17:36	06:19 18:30	06:04 20:29	05:05 21:23	20:42 (WEA 42 (RW)) 04:32 20:46 (WEA 42 (RW)) 21:58
22	08:21 16:35	15:34 (WEA_G1) 07:24 15:40 (WEA_G1) 17:38	06:16 18:32	06:01 20:31	05:03 21:24	20:43 (WEA 42 (RW)) 04:31 20:47 (WEA 42 (RW)) 21:59
23	08:20 16:37	07:22 17:40	06:14 18:34	05:59 20:33	05:02 21:26	20:44 (WEA 42 (RW)) 04:30 20:48 (WEA 42 (RW)) 21:54
24	08:19 16:39	07:19 17:42	06:11 18:36	05:57 20:34	05:00 21:27	20:45 (WEA 42 (RW)) 04:29 20:49 (WEA 42 (RW)) 21:55
25	08:17 16:41	07:17 17:44	06:09 18:38	05:54 20:36	04:59 21:29	20:46 (WEA 42 (RW)) 04:28 20:50 (WEA 42 (RW)) 21:56
26	08:16 16:43	07:15 17:46	06:06 18:40	05:52 20:38	04:58 21:30	20:47 (WEA 42 (RW)) 04:27 20:51 (WEA 42 (RW)) 21:57
27	08:14 16:45	07:12 17:48	06:04 18:42	05:50 20:40	04:56 21:32	20:48 (WEA 42 (RW)) 04:26 20:52 (WEA 42 (RW)) 21:58
28	08:13 16:47	07:10 17:50	06:02 18:44	05:48 20:42	04:55 21:33	20:49 (WEA 42 (RW)) 04:25 20:53 (WEA 42 (RW)) 21:59
29	08:11 16:49	07:08 17:52	06:00 18:46	05:46 20:44	04:54 21:35	20:50 (WEA 42 (RW)) 04:24 20:54 (WEA 42 (RW)) 22:00
30	08:09 16:51	07:06 17:54	05:58 18:48	05:44 20:46	04:53 21:36	20:51 (WEA 42 (RW)) 04:23 20:55 (WEA 42 (RW)) 22:01
31	08:06 16:53	07:04 17:56	05:56 18:50	05:42 20:48	04:52 21:37	20:52 (WEA 42 (RW)) 04:22 20:56 (WEA 42 (RW)) 22:02
Sonnenscheinstunden	248	272	367	421	496	513
astr.max.mögl.Beschattung	307	88	57	6	165	

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 07 - IO 07 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	04:47 21:54	05:27 21:17	06:23 20:10	07:17 18:55	07:16 18:44	08:12 15:58 17 15:04 (WEA_GL) 15:21 (WEA_GL)
2	04:47 21:53	05:29 21:16	06:24 20:07	07:19 18:53	07:18 18:42	08:14 15:58 16 15:05 (WEA_GL) 15:21 (WEA_GL)
3	04:48 21:53	05:31 21:14	06:26 20:05	07:21 18:50	07:20 18:40	08:15 15:57 15 15:05 (WEA_GL) 15:20 (WEA_GL)
4	04:49 21:52	05:32 21:12	06:28 20:03	07:22 18:48	07:22 18:38	08:17 15:56 14 15:19 (WEA_GL) 15:08 (WEA_GL)
5	04:50 21:52	05:34 21:10	06:30 20:00	07:24 18:45	07:24 18:36	08:18 15:56 12 15:18 (WEA_GL) 15:08 (WEA_GL)
6	04:51 21:51	05:36 21:08	06:32 19:58	07:26 18:43	07:26 18:34	08:19 15:55 11 15:17 (WEA_GL) 15:08 (WEA_GL)
7	04:52 21:50	05:38 21:06	06:33 19:55	07:28 18:40	07:28 18:32	08:21 15:54 10 15:07 (WEA_GL) 15:17 (WEA_GL)
8	04:53 21:50	05:39 21:04	06:35 19:53	07:30 18:38	07:30 18:24 (WEA 03 (GRN))	08:22 15:54 9 15:16 (WEA_GL) 15:08 (WEA_GL)
9	04:54 21:49	05:41 21:02	06:37 19:50	07:32 18:36	07:32 18:11 (WEA 03 (GRN))	08:23 15:54 8 15:16 (WEA_GL) 15:08 (WEA_GL)
10	04:55 21:48	05:43 21:00	06:39 19:48	07:34 18:33	07:34 18:06 (WEA 03 (GRN))	08:25 15:53 7 15:15 (WEA_GL) 15:09 (WEA_GL)
11	04:56 21:47	05:45 20:58	06:41 19:45	07:35 18:31	07:35 18:01 (WEA 03 (GRN))	08:26 15:53 6 15:15 (WEA_GL) 15:09 (WEA_GL)
12	04:57 21:46	05:47 20:56	06:42 19:43	07:37 18:28	07:37 18:01 (WEA 03 (GRN))	08:27 15:53 5 15:14 (WEA_GL) 15:10 (WEA_GL)
13	04:59 21:45	05:49 20:54	06:44 19:40	07:39 18:26	07:39 18:00 (WEA 03 (GRN))	08:28 15:53 4 15:14 (WEA_GL) 15:10 (WEA_GL)
14	05:00 21:44	05:50 20:51	06:46 19:38	07:41 18:24	07:41 18:00 (WEA 03 (GRN))	08:29 15:53 3 15:14 (WEA_GL) 15:10 (WEA_GL)
15	05:01 21:43	05:52 20:49	06:48 19:35	07:43 18:21	07:43 18:00 (WEA 03 (GRN))	08:30 15:53 2 15:14 (WEA_GL) 15:10 (WEA_GL)
16	05:03 21:42	05:54 20:47	06:50 19:33	07:45 18:19	07:45 18:00 (WEA 03 (GRN))	08:31 15:53 1 15:14 (WEA_GL) 15:10 (WEA_GL)
17	05:04 21:41	05:56 20:45	06:51 19:30	07:47 18:17	07:47 18:00 (WEA 03 (GRN))	08:32 15:53 1 15:14 (WEA_GL) 15:10 (WEA_GL)
18	05:05 21:39	05:57 20:43	06:52 19:28	07:49 18:14	07:49 18:00 (WEA 03 (GRN))	08:33 15:53 1 15:14 (WEA_GL) 15:10 (WEA_GL)
19	05:07 21:38	05:59 20:40	06:55 19:25	07:51 18:12	07:51 17:25 (WEA 07 (GRN))	08:33 15:53 1 15:14 (WEA_GL) 15:10 (WEA_GL)
20	05:08 21:37	06:01 20:38	06:57 19:23	07:53 18:10	07:53 17:22 (WEA 07 (GRN))	08:34 15:54 1 15:15 (WEA_GL) 15:10 (WEA_GL)
21	05:10 21:35	06:03 20:36	06:59 19:20	07:55 18:07	07:55 17:20 (WEA 07 (GRN))	08:34 15:54 1 15:15 (WEA_GL) 15:10 (WEA_GL)
22	05:11 21:34	06:05 20:34	07:00 19:18	07:56 18:05	07:56 17:19 (WEA 07 (GRN))	08:35 15:55 1 15:16 (WEA_GL) 15:10 (WEA_GL)
23	05:13 21:32	06:06 20:31	07:02 19:15	07:59 18:03	07:59 17:18 (WEA 07 (GRN))	08:36 15:56 1 15:17 (WEA_GL) 15:10 (WEA_GL)
24	05:14 21:31	06:08 20:29	07:04 19:13	08:00 18:01	08:00 17:18 (WEA 07 (GRN))	08:36 15:56 1 15:17 (WEA_GL) 15:10 (WEA_GL)
25	05:16 21:29	06:10 20:27	07:06 19:10	08:02 18:00	08:02 17:30 (WEA 07 (GRN))	08:36 15:56 1 15:17 (WEA_GL) 15:10 (WEA_GL)
26	05:17 21:28	06:12 20:24	07:08 19:08	08:04 18:00	08:04 17:28 (WEA 07 (GRN))	08:37 15:57 1 15:17 (WEA_GL) 15:10 (WEA_GL)
27	05:19 21:26	06:14 20:22	07:10 19:05	08:06 18:00	08:06 17:25 (WEA 07 (GRN))	08:37 15:57 1 15:17 (WEA_GL) 15:10 (WEA_GL)
28	05:21 21:24	06:15 20:20	07:11 19:03	08:08 18:00	08:08 17:24 (WEA 07 (GRN))	08:37 15:58 1 15:18 (WEA_GL) 15:10 (WEA_GL)
29	05:22 21:23	06:17 20:17	07:13 19:00	08:10 18:00	08:10 17:22 (WEA 07 (GRN))	08:37 15:59 1 15:18 (WEA_GL) 15:10 (WEA_GL)
30	05:24 21:21	06:19 20:15	07:15 18:58	08:12 18:00	08:12 17:20 (WEA 07 (GRN))	08:37 16:01 1 15:22 (WEA_GL) 15:10 (WEA_GL)
31	05:26 21:19	06:21 20:12	07:17 18:56	08:14 18:00	08:14 17:19 (WEA 07 (GRN))	08:37 16:02 1 15:18 (WEA_GL) 15:10 (WEA_GL)
Sonnenscheinstunden	515	461	383	328	257	231
astr.max.mögl.Beschattung	129	40	22	120	180	177

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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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 08 - IO 08 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni	
1	08:37 16:03	14:45 (WEA_G2) 08:06 15:01 (WEA_G2) 16:55	07:08 17:52	06:52 19:51	19:21 (WEA 43 (RW)) 05:41 19:24 (WEA 43 (RW)) 20:47	20:15 (WEA 42 (RW)) 04:51 20:17 (WEA 42 (RW)) 21:38	
2	08:37 16:04	14:46 (WEA_G2) 08:04 15:01 (WEA_G2) 16:57	07:05 17:54	06:49 19:53	19:23 (WEA 43 (RW)) 05:39 19:26 (WEA 43 (RW)) 20:49	20:15 (WEA 42 (RW)) 04:50 20:19 (WEA 42 (RW)) 21:40	
3	08:37 16:05	14:46 (WEA_G2) 08:03 15:00 (WEA_G2) 16:59	07:03 17:56	06:47 19:55	06:47 19:55	20:15 (WEA 42 (RW)) 04:49 20:20 (WEA 42 (RW)) 21:41	
4	08:36 16:06	14:48 (WEA_G2) 08:01 15:00 (WEA_G2) 17:01	07:01 17:58	06:44 19:57	06:44 19:57	20:16 (WEA 42 (RW)) 04:48 20:23 (WEA 42 (RW)) 21:42	
5	08:36 16:06	14:49 (WEA_G2) 07:59 15:00 (WEA_G2) 17:03	06:58 18:00	06:42 19:59	06:42 19:59	20:17 (WEA 42 (RW)) 04:47 20:24 (WEA 42 (RW)) 21:43	
6	08:36 16:09	14:51 (WEA_G2) 07:57 14:58 (WEA_G2) 17:05	06:56 18:02	06:39 20:01	06:39 20:01	20:19 (WEA 42 (RW)) 04:47 20:22 (WEA 42 (RW)) 21:44	
7	08:35 16:10	14:54 (WEA_G2) 07:55 14:57 (WEA_G2) 17:07	06:53 18:03	06:37 20:02	06:37 20:02	20:20 (WEA 42 (RW)) 21:41 20:25 (WEA 42 (RW)) 21:45	
8	08:35 16:12	14:57 (WEA_G2) 07:53 15:00 (WEA_G2) 17:09	06:51 18:05	06:34 20:04	06:34 20:04	20:26 (WEA 42 (RW)) 21:46 20:31 (WEA 42 (RW)) 21:49	
9	08:34 16:13	15:35 (WEA_G1) 07:51 15:36 (WEA_G1) 17:11	06:49 18:07	06:32 20:06	06:32 20:06	20:36 (WEA 42 (RW)) 21:47 20:41 (WEA 42 (RW)) 21:47	
10	08:33 16:15	15:35 (WEA_G1) 07:49 15:38 (WEA_G1) 17:13	06:46 18:09	06:30 20:08	06:30 20:08	20:44 (WEA 42 (RW)) 21:48 20:49 (WEA 42 (RW)) 21:48	
11	08:33 16:16	15:35 (WEA_G1) 07:47 15:39 (WEA_G1) 17:15	06:44 18:11	06:27 20:10	06:27 20:10	20:52 (WEA 42 (RW)) 21:49 20:57 (WEA 42 (RW)) 21:49	
12	08:32 16:18	15:35 (WEA_G1) 07:45 15:41 (WEA_G1) 17:17	06:41 18:13	06:25 20:12	06:25 20:12	20:52 (WEA 42 (RW)) 21:49 20:57 (WEA 42 (RW)) 21:50	
13	08:31 16:20	15:36 (WEA_G1) 07:43 15:43 (WEA_G1) 17:19	06:39 18:15	06:22 20:14	06:22 20:14	20:58 (WEA 42 (RW)) 21:50 20:37 (WEA 42 (RW)) 21:50	
14	08:30 16:21	15:36 (WEA_G1) 07:41 15:45 (WEA_G1) 17:21	06:36 18:17	06:20 20:16	06:20 20:16	20:36 (WEA 42 (RW)) 21:50 20:39 (WEA 42 (RW)) 21:51	
15	08:29 16:23	15:36 (WEA_G1) 07:39 15:47 (WEA_G1) 17:24	06:34 18:19	06:18 20:17	06:18 20:17	20:39 (WEA 42 (RW)) 21:51 20:40 (WEA 42 (RW)) 21:52	
16	08:28 16:25	15:37 (WEA_G1) 07:37 15:49 (WEA_G1) 17:26	06:31 18:21	06:15 20:19	06:15 20:19	20:36 (WEA 42 (RW)) 21:52 20:42 (WEA 42 (RW)) 21:52	
17	08:27 16:26	15:37 (WEA_G1) 07:35 15:51 (WEA_G1) 17:28	06:29 18:23	06:13 20:21	06:13 20:21	20:36 (WEA 42 (RW)) 21:52 20:43 (WEA 42 (RW)) 21:53	
18	08:26 16:28	15:37 (WEA_G1) 07:33 15:52 (WEA_G1) 17:30	06:26 18:25	06:10 20:23	06:10 20:23	20:36 (WEA 42 (RW)) 21:53 20:45 (WEA 42 (RW)) 21:53	
19	08:25 16:30	15:38 (WEA_G1) 07:30 15:55 (WEA_G1) 17:32	06:24 18:27	06:08 20:25	06:08 20:25	20:37 (WEA 42 (RW)) 21:54 20:47 (WEA 42 (RW)) 21:54	
20	08:24 16:32	15:38 (WEA_G1) 07:28 15:56 (WEA_G1) 17:34	06:21 18:28	06:06 20:27	06:06 20:27	20:37 (WEA 42 (RW)) 21:54 20:48 (WEA 42 (RW)) 21:54	
21	08:23 16:34	15:39 (WEA_G1) 07:26 15:59 (WEA_G1) 17:36	06:19 18:30	06:03 20:29	06:03 20:29	20:37 (WEA 42 (RW)) 21:54 20:49 (WEA 42 (RW)) 21:54	
22	08:21 16:35	15:40 (WEA_G1) 07:24 15:59 (WEA_G1) 17:38	06:16 18:32	06:01 20:31	06:01 20:31	20:38 (WEA 42 (RW)) 21:54 20:51 (WEA 42 (RW)) 21:54	
23	08:20 16:37	15:40 (WEA_G1) 07:22 15:59 (WEA_G1) 17:40	06:14 18:34	05:59 20:33	05:59 20:33	20:38 (WEA 42 (RW)) 21:54 20:50 (WEA 42 (RW)) 21:54	
24	08:19 16:39	15:41 (WEA_G1) 07:19 15:58 (WEA_G1) 17:42	06:11 18:36	05:57 20:34	05:57 20:34	20:40 (WEA 42 (RW)) 21:54 20:49 (WEA 42 (RW)) 21:55	
25	08:17 16:41	15:43 (WEA_G1) 07:17 15:58 (WEA_G1) 17:44	06:09 18:38	05:54 20:36	05:54 20:36	20:41 (WEA 42 (RW)) 21:55 20:48 (WEA 42 (RW)) 21:55	
26	08:16 16:43	15:44 (WEA_G1) 07:15 15:58 (WEA_G1) 17:46	06:06 18:40	05:52 20:38	05:52 20:38	20:44 (WEA 42 (RW)) 21:55 20:50 (WEA 42 (RW)) 21:55	
27	08:14 16:45	15:46 (WEA_G1) 07:12 15:54 (WEA_G1) 17:48	06:04 18:42	05:50 20:40	05:50 20:40	20:44 (WEA 42 (RW)) 21:55 20:52 (WEA 42 (RW)) 21:55	
28	08:13 16:47	15:47 (WEA_G1) 07:10 15:50 (WEA_G1) 17:50	06:02 18:44	05:48 20:42	05:48 20:42	20:44 (WEA 42 (RW)) 21:55 20:53 (WEA 42 (RW)) 21:55	
29	08:11 16:49	15:49 (WEA_G1) 07:08 15:51 (WEA_G1) 17:52	05:59 18:46	05:46 20:44	05:46 20:44	20:44 (WEA 42 (RW)) 21:55 20:54 (WEA 42 (RW)) 21:55	
30	08:09 16:51	15:51 (WEA_G1) 07:06 15:53 (WEA_G1) 17:54	05:57 18:48	05:44 20:46	05:44 20:46	20:44 (WEA 42 (RW)) 21:55 20:55 (WEA 42 (RW)) 21:55	
31	08:06 16:53	15:53 (WEA_G1) 07:04 15:55 (WEA_G1) 17:56	05:54 18:50	05:42 20:48	05:42 20:48	20:44 (WEA 42 (RW)) 21:55 20:56 (WEA 42 (RW)) 21:55	
	Sonnenscheinstunden astr.max.mögl.Beschattung	248 304	272 70	367 36	421 6	496 132	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	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 08 - IO 08 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 Sonneneinstrahlungsrichtung

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		08:12	15:17 (WEA_G1)
	21:54	21:17		20:10		18:55		16:44		15:58	4 15:21 (WEA_G1)
2	04:47	05:29		06:24		07:19		07:18		08:14	15:18 (WEA_G1)
	21:53	21:16		20:07		18:53	7 18:22 (WEA 03 (GRN))	16:42		15:58	3 15:21 (WEA_G1)
3	04:48	05:31		06:26		07:21		07:20		08:15	15:19 (WEA_G1)
	21:53	21:14		20:05		18:50		16:40		15:57	1 15:20 (WEA_G1)
4	04:49	05:32		06:28		07:22		07:22		08:17	
	21:52	21:12		20:03		18:48	7 18:19 (WEA 03 (GRN))	16:38		15:56	
5	04:50	05:34		06:30		07:24		07:24		08:18	
	21:52	21:10		20:00		18:45	4 18:16 (WEA 03 (GRN))	16:36		15:56	
6	04:51	05:36		06:32		07:25		07:25		08:19	
	21:51	21:08		19:58		18:43	2 18:14 (WEA 03 (GRN))	16:34		15:55	7 14:47 (WEA_G2)
7	04:52	05:38	20:28 (WEA 42 (RW))	06:33		07:28		07:28		08:21	14:46 (WEA_G2)
	21:50	21:06	4 20:32 (WEA 42 (RW))	19:55		18:40		16:32		15:54	10 14:46 (WEA_G2)
8	04:53	05:39	20:35 (WEA 42 (RW))	06:35		07:30		07:30		08:22	14:35 (WEA_G2)
	21:50	21:04	7 20:33 (WEA 42 (RW))	19:53		18:39		16:30		15:54	12 14:47 (WEA_G2)
9	04:54	05:41	20:24 (WEA 42 (RW))	06:37		07:32		07:32		08:23	14:36 (WEA_G2)
	21:49	21:02	7 20:31 (WEA 42 (RW))	19:50		18:36		16:28		15:54	13 14:49 (WEA_G2)
10	04:55	05:43	20:24 (WEA 42 (RW))	06:39		07:34		07:34		08:25	14:35 (WEA_G2)
	21:48	21:00	5 20:29 (WEA 42 (RW))	19:48	2 19:17 (WEA 43 (RW))	18:33		16:26		15:53	15 14:50 (WEA_G2)
11	04:56	05:45	20:24 (WEA 42 (RW))	06:41		07:35		07:35		08:26	14:35 (WEA_G2)
	21:47	20:58	4 20:28 (WEA 42 (RW))	19:45	2 19:17 (WEA 43 (RW))	18:31		16:25		15:53	16 14:51 (WEA_G2)
12	04:57	05:47	20:23 (WEA 42 (RW))	06:42		07:37		07:38		08:27	14:35 (WEA_G2)
	21:46	20:56	2 20:25 (WEA 42 (RW))	19:43	1 19:14 (WEA 43 (RW))	18:28		16:23		15:53	16 14:51 (WEA_G2)
13	04:59	05:49		06:44		07:39		07:40		08:28	14:35 (WEA_G2)
	21:45	20:54		19:40		18:26		16:21		15:53	17 14:52 (WEA_G2)
14	05:00	05:50		06:46		07:41		07:42		08:29	14:35 (WEA_G2)
	21:44	20:51		19:38		18:24	7 17:46 (WEA 07 (GRN))	16:20		15:53	18 14:53 (WEA_G2)
15	05:01	05:52		06:48		07:43		07:44		08:30	14:35 (WEA_G2)
	21:43	20:49		19:35		18:21	11 17:48 (WEA 07 (GRN))	16:18	8 15:27 (WEA_G1)	15:53	18 14:53 (WEA_G2)
16	05:03	05:54		06:50		07:45		07:45		08:31	14:35 (WEA_G2)
	21:42	20:47		19:33		18:19	13 17:48 (WEA 07 (GRN))	16:16	12 15:29 (WEA_G1)	15:53	19 14:54 (WEA_G2)
17	05:04	05:56		06:51		07:47		07:47		08:32	14:36 (WEA_G2)
	21:41	20:45		19:30		18:17	12 17:47 (WEA 07 (GRN))	16:15	15 15:31 (WEA_G1)	15:53	19 14:55 (WEA_G2)
18	05:05	20:52 (WEA K04)	05:57	06:53		07:49		07:49		08:32	14:36 (WEA_G2)
	21:39	4 20:55 (WEA K04)	20:43	19:28		18:14	11 17:45 (WEA 07 (GRN))	16:13	17 15:32 (WEA_G1)	15:53	20 14:56 (WEA_G2)
19	05:07	20:50 (WEA K04)	05:59	06:55		07:51		07:51		08:33	14:37 (WEA_G2)
	21:38	8 20:58 (WEA K04)	20:40	19:25		18:12	8 17:42 (WEA 07 (GRN))	16:12	19 15:33 (WEA_G1)	15:53	20 14:57 (WEA_G2)
20	05:08	20:50 (WEA K04)	06:01	06:57		07:53		07:53		08:34	14:37 (WEA_G2)
	21:37	10 21:00 (WEA K04)	20:38	19:23		18:10	6 17:40 (WEA 07 (GRN))	16:11	19 15:33 (WEA_G1)	15:54	20 14:57 (WEA_G2)
21	05:10	20:48 (WEA K04)	06:03	06:59		07:55		07:55		08:34	14:38 (WEA_G2)
	21:35	12 21:00 (WEA K04)	20:36	19:20		18:07	2 17:37 (WEA 07 (GRN))	16:09	20 15:35 (WEA_G1)	15:54	19 14:57 (WEA_G2)
22	05:11	20:47 (WEA K04)	06:05	07:00		07:57		07:57		08:35	14:38 (WEA_G2)
	21:34	13 21:00 (WEA K04)	20:34	19:18		18:05		16:08	18 15:33 (WEA_G1)	15:55	19 14:57 (WEA_G2)
23	05:13	20:48 (WEA K04)	06:06	07:02		07:59		07:59		08:36	14:39 (WEA_G2)
	21:32	11 20:59 (WEA K04)	20:31	19:15		18:03		16:07	17 15:32 (WEA_G1)	15:55	20 14:59 (WEA_G2)
24	05:14	20:47 (WEA K04)	06:08	07:04		08:00		08:00		08:36	14:39 (WEA_G2)
	21:31	10 20:57 (WEA K04)	20:29	19:13	3 18:44 (WEA 02 (GRN))	18:01		16:05	16 15:30 (WEA_G1)	15:56	20 14:59 (WEA_G2)
25	05:16	20:47 (WEA K04)	06:10	07:06		08:02		08:02		08:36	14:39 (WEA_G2)
	21:29	10 20:57 (WEA K04)	20:27	19:10	3 18:41 (WEA 02 (GRN))	18:00		16:04	14 15:28 (WEA_G1)	15:56	20 14:59 (WEA_G2)
26	05:17	20:46 (WEA K04)	06:12	07:08		08:04		08:04		08:37	14:40 (WEA_G2)
	21:28	9 20:55 (WEA K04)	20:24	19:08	2 18:39 (WEA 02 (GRN))	16:56		16:03	12 15:27 (WEA_G1)	15:57	19 14:59 (WEA_G2)
27	05:19	20:47 (WEA K04)	06:14	07:10		08:06		08:06		08:37	14:41 (WEA_G2)
	21:26	7 20:54 (WEA K04)	20:22	19:05		16:54		16:02	11 15:26 (WEA_G1)	15:58	19 15:00 (WEA_G2)
28	05:21	20:47 (WEA K04)	06:15	07:11		08:08		08:07		08:37	14:42 (WEA_G2)
	21:24	5 20:52 (WEA K04)	20:19	19:03		16:52		16:01	9 15:25 (WEA_G1)	15:59	18 15:00 (WEA_G2)
29	05:22	20:47 (WEA K04)	06:17	07:13		08:10		08:09		08:37	14:43 (WEA_G2)
	21:23	4 20:51 (WEA K04)	20:17	19:00		16:50		16:00	7 15:24 (WEA_G1)	16:00	18 15:01 (WEA_G2)
30	05:24	20:47 (WEA K04)	06:19	07:15		08:12		08:10		08:37	14:42 (WEA_G2)
	21:21	1 20:48 (WEA K04)	20:15	18:58		16:48		15:59	6 15:23 (WEA_G1)	16:01	18 15:00 (WEA_G2)
31	05:26		06:21			07:14				08:37	14:43 (WEA_G2)
	21:19		20:12			16:46				16:02	17 15:00 (WEA_G2)
Sonnenscheinstunden	515	461		383		328			257	231	
astr.max.mögl.Beschattung	104	29		13		98			220	455	

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) Schattenrezeptor: IO 09 - IO 09 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni	
1 08:37 16:03	14:53 (WEA_G2) 08:06 15:13 (WEA_G2) 16:55	07:08 17:52	06:52 19:51	05:41 20:47	20:12 (WEA 42 (RW)) 04:51 20:14 (WEA 42 (RW)) 21:38	
2 08:37 16:04	14:54 (WEA_G2) 08:04 15:14 (WEA_G2) 16:57	07:05 17:54	06:49 19:53	05:39 20:49	04:50 21:40	
3 08:37 16:05	14:54 (WEA_G2) 08:03 15:13 (WEA_G2) 16:59	07:03 17:56	06:47 19:55	05:37 20:51	04:49 21:41	
4 08:36 16:06	14:55 (WEA_G2) 08:01 15:14 (WEA_G2) 17:01	07:01 17:58	06:44 19:57	05:35 20:53	04:48 21:42	
5 08:36 16:06	14:56 (WEA_G2) 07:59 15:13 (WEA_G2) 17:03	06:58 18:00	06:42 19:59	05:33 20:55	04:47 21:43	
6 08:36 16:09	14:56 (WEA_G2) 07:57 15:13 (WEA_G2) 17:05	06:56 18:01	06:39 20:01	05:31 20:57	04:47 21:44	
7 08:35 16:10	14:58 (WEA_G2) 07:55 15:13 (WEA_G2) 17:07	06:53 18:03	17:36 (WEA 03 (GRN)) 06:37 17:37 (WEA 03 (GRN)) 20:02	05:29 20:59	20:12 (WEA 42 (RW)) 04:46 20:14 (WEA 42 (RW)) 21:45	
8 08:35 16:12	14:59 (WEA_G2) 07:53 15:13 (WEA_G2) 17:09	06:51 18:05	17:35 (WEA 03 (GRN)) 06:34 17:38 (WEA 03 (GRN)) 20:04	05:27 21:00	04:45 21:46	
9 08:34 16:13	14:59 (WEA_G2) 07:51 15:12 (WEA_G2) 17:11	06:49 18:07	17:36 (WEA 03 (GRN)) 06:32 17:41 (WEA 03 (GRN)) 20:06	05:25 21:02	20:29 (WEA K04) 04:45 20:30 (WEA K04) 21:47	
10 08:33 16:15	15:02 (WEA_G2) 07:49 15:11 (WEA_G2) 17:13	06:46 18:09	17:36 (WEA 03 (GRN)) 06:30 17:42 (WEA 03 (GRN)) 20:08	05:23 21:04	20:30 (WEA K04) 04:44 20:33 (WEA K04) 21:48	
11 08:33 16:16	15:05 (WEA_G2) 07:47 15:09 (WEA_G2) 17:15	06:44 18:11	17:36 (WEA 03 (GRN)) 06:27 17:43 (WEA 03 (GRN)) 20:10	05:22 21:06	20:29 (WEA K04) 04:44 20:34 (WEA K04) 21:49	
12 08:32 16:18	07:45 17:17	06:41 18:13	06:25 18:12	05:20 21:07	20:29 (WEA K04) 04:43 20:35 (WEA K04) 21:50	
13 08:31 16:20	07:43 17:19	06:39 18:15	06:22 20:14	05:18 21:09	20:30 (WEA K04) 04:43 20:38 (WEA K04) 21:50	
14 08:30 16:21	15:44 (WEA_G1) 07:41 15:45 (WEA_G1) 17:21	06:36 18:17	06:20 20:16	05:16 21:11	20:30 (WEA K04) 04:43 20:39 (WEA K04) 21:51	
15 08:29 16:23	15:44 (WEA_G1) 07:39 15:47 (WEA_G1) 17:24	06:34 18:19	06:18 20:17	05:14 21:13	20:30 (WEA K04) 04:42 20:40 (WEA K04) 21:52	
16 08:28 16:25	15:44 (WEA_G1) 07:37 15:49 (WEA_G1) 17:26	06:31 18:21	06:15 20:19	05:13 21:14	20:31 (WEA K04) 04:42 20:42 (WEA K04) 21:52	
17 08:27 16:26	15:44 (WEA_G1) 07:35 15:51 (WEA_G1) 17:28	06:29 18:23	17:55 (WEA 02 (GRN)) 06:13 17:56 (WEA 02 (GRN)) 20:21	05:11 21:16	20:31 (WEA K04) 04:42 20:41 (WEA K04) 21:53	
18 08:26 16:28	15:44 (WEA_G1) 07:33 15:52 (WEA_G1) 17:30	06:26 18:25	17:56 (WEA 02 (GRN)) 06:10 17:58 (WEA 02 (GRN)) 20:23	05:09 21:18	20:33 (WEA K04) 04:42 20:40 (WEA K04) 21:53	
19 08:25 16:30	15:45 (WEA_G1) 07:30 15:55 (WEA_G1) 17:32	06:24 18:27	06:08 20:25	05:08 21:19	20:36 (WEA K04) 04:42 20:38 (WEA K04) 21:54	
20 08:24 16:32	15:44 (WEA_G1) 07:28 15:56 (WEA_G1) 17:34	06:21 18:28	06:06 20:27	05:06 21:21	04:42 21:54	
21 08:23 16:34	15:45 (WEA_G1) 07:26 15:59 (WEA_G1) 17:36	06:19 18:30	06:03 20:29	05:05 21:23	04:42 21:54	
22 08:21 16:35	15:46 (WEA_G1) 07:24 16:01 (WEA_G1) 17:38	06:16 18:32	06:01 20:31	05:03 21:24	04:42 21:54	
23 08:20 16:37	15:46 (WEA_G1) 07:22 16:03 (WEA_G1) 17:40	06:14 18:34	06:01 20:33	05:02 21:26	04:43 21:54	
24 08:19 16:39	15:46 (WEA_G1) 07:19 16:05 (WEA_G1) 17:42	06:11 18:36	05:57 20:34	05:00 21:27	04:43 21:55	
25 08:17 16:41	15:48 (WEA_G1) 07:17 16:05 (WEA_G1) 17:44	06:09 18:38	05:54 20:36	04:59 21:29	04:43 21:55	
26 08:16 16:43	15:48 (WEA_G1) 07:15 16:05 (WEA_G1) 17:46	06:06 18:40	05:52 20:38	04:58 21:30	04:44 21:55	
27 08:14 16:45	15:49 (WEA_G1) 07:12 16:04 (WEA_G1) 17:48	06:04 18:42	05:50 20:40	04:56 21:32	04:44 21:54	
28 08:13 16:47	15:52 (WEA_G1) 07:10 16:03 (WEA_G1) 17:50	06:02 18:44	05:48 20:42	04:55 21:33	04:45 21:54	
29 08:11 16:49	15:54 (WEA_G1) 07:08 16:01 (WEA_G1) 17:52	06:01 18:45	05:46 20:44	04:54 21:35	04:45 21:54	
30 08:09 16:51	16:01 (WEA_G1) 07:06 16:01 (WEA_G1) 17:54	06:00 18:47	05:44 19:20 (WEA 43 (RW)) 20:46 19:21 (WEA 43 (RW)) 20:46	04:53 21:36	04:46 21:54	
31 08:06 16:53	16:01 (WEA_G1) 07:04 16:01 (WEA_G1) 17:56	06:00 18:49	05:44 19:22 (WEA 43 (RW)) 20:46 19:22 (WEA 43 (RW)) 20:46	04:53 21:37	04:46 21:54	
Sonnenscheinstunden astr.max.mögl.Beschattung	248 344	272 53	367 25	421 16	495 74	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	Schattenende (WEA mit erstem Schatten)	Zeitpunkt (SS:MM) Schattenende	Schattenende (WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 09 - IO 09 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember			
1	04:47	05:27	20:39 (WEA KD4)	06:23		07:17		07:16		08:12	14:47 (WEA_G2)		
	21:53	21:17	20:45 (WEA KD4)	20:10		18:55		16:44		15:58	14:51 (WEA_G2)		
2	04:47	05:29	20:40 (WEA KD4)	06:24		07:19		07:18		08:14	14:45 (WEA_G2)		
	21:53	21:16	20:44 (WEA KD4)	20:07		18:53		16:42		15:58	14:54 (WEA_G2)		
3	04:48	05:31	20:40 (WEA KD4)	06:26		07:21	18:15 (WEA 03 (GRN))	07:20		08:15	14:45 (WEA_G2)		
	21:53	21:14	20:43 (WEA KD4)	20:05		18:50	6 18:21 (WEA 03 (GRN))	16:40		15:57	14:56 (WEA_G2)		
4	04:49	05:32		06:28		07:22	18:13 (WEA 03 (GRN))	07:22		08:17	14:43 (WEA_G2)		
	21:52	21:12		20:03		18:48	6 18:19 (WEA 03 (GRN))	16:38		15:56	14:43 (WEA_G2)		
5	04:50	05:34		06:30		07:24	18:13 (WEA 03 (GRN))	07:24		08:18	14:43 (WEA_G2)		
	21:52	21:10		20:00		18:45	3 18:16 (WEA 03 (GRN))	16:36		15:56	14:58 (WEA_G2)		
6	04:51	05:36		06:32		07:26	18:12 (WEA 03 (GRN))	07:26		08:19	14:43 (WEA_G2)		
	21:51	21:08		19:58		18:43	2 18:14 (WEA 03 (GRN))	16:34		15:55	14:59 (WEA_G2)		
7	04:52	05:38		06:33		07:28		07:28		08:21	14:43 (WEA_G2)		
	21:50	21:06		19:55		18:40		16:32		15:54	17 15:00 (WEA_G2)		
8	04:53	05:39		06:35		07:30		07:30		08:22	14:43 (WEA_G2)		
	21:50	21:04		19:53		18:38		16:30		15:54	18 15:01 (WEA_G2)		
9	04:54	05:41		06:37		07:32		07:32		08:23	14:43 (WEA_G2)		
	21:49	21:02		19:50		18:36		16:28		15:54	19 15:02 (WEA_G2)		
10	04:55	05:43		06:39		07:34		07:34		08:25	14:43 (WEA_G2)		
	21:48	21:00		19:48		18:33		16:26		15:53	20 15:03 (WEA_G2)		
11	04:56	05:45		06:41		07:35		07:35		08:26	14:43 (WEA_G2)		
	21:47	20:58		19:45		18:31		16:25		15:53	20 15:03 (WEA_G2)		
12	04:57	05:47	20:19 (WEA 42 (RW))	06:42		07:37	19:13 (WEA 43 (RW))	07:37		08:27	14:43 (WEA_G2)		
	21:46	20:56	5 20:24 (WEA 42 (RW))	19:43		18:28	1 19:14 (WEA 43 (RW))	18:28		15:53	21 15:04 (WEA_G2)		
13	04:59	05:48	20:18 (WEA 42 (RW))	06:44		07:39	19:11 (WEA 43 (RW))	07:39		08:28	14:43 (WEA_G2)		
	21:45	20:54	5 20:23 (WEA 42 (RW))	19:40		18:26	1 19:12 (WEA 43 (RW))	18:26		15:53	21 15:04 (WEA_G2)		
14	05:00	05:50	20:17 (WEA 42 (RW))	06:46		07:41		07:41	17:42 (WEA 07 (GRN))	07:42	15:24 (WEA_G1)	15:53	14:43 (WEA_G2)
	21:44	20:51	5 20:22 (WEA 42 (RW))	19:38		18:24	7 17:49 (WEA 07 (GRN))	16:20	11 15:35 (WEA_G1)	15:53	22 15:05 (WEA_G2)		
15	05:01	05:52	20:16 (WEA 42 (RW))	06:48		07:43	17:40 (WEA 07 (GRN))	07:44	14 15:22 (WEA_G1)	08:30	14:44 (WEA_G2)		
	21:43	20:49	3 20:19 (WEA 42 (RW))	19:35		18:21	10 17:50 (WEA 07 (GRN))	16:18	14 15:36 (WEA_G1)	15:53	21 15:05 (WEA_G2)		
16	05:03	05:54	20:16 (WEA 42 (RW))	06:50		07:45	17:39 (WEA 07 (GRN))	07:45	15:21 (WEA_G1)	08:31	14:44 (WEA_G2)		
	21:42	20:47	1 20:17 (WEA 42 (RW))	19:33		18:19	10 17:49 (WEA 07 (GRN))	16:16	16 15:37 (WEA_G1)	15:53	22 15:06 (WEA_G2)		
17	05:04	05:56		06:51		07:47	17:38 (WEA 07 (GRN))	07:47	15:21 (WEA_G1)	08:32	14:45 (WEA_G2)		
	21:41	20:45		19:30		18:17	9 17:47 (WEA 07 (GRN))	16:15	17 15:38 (WEA_G1)	15:53	22 15:07 (WEA_G2)		
18	05:05	05:57		06:53		07:49	17:38 (WEA 07 (GRN))	07:49	15:20 (WEA_G1)	08:32	14:45 (WEA_G2)		
	21:39	20:43		19:28		18:14	7 17:45 (WEA 07 (GRN))	16:13	19 15:39 (WEA_G1)	15:53	22 15:07 (WEA_G2)		
19	05:07	05:59		06:55		07:51	17:38 (WEA 07 (GRN))	07:51	15:37 (WEA_G1)	08:33	14:46 (WEA_G2)		
	21:38	20:40		19:25		18:12	4 17:42 (WEA 07 (GRN))	16:12	17 15:37 (WEA_G1)	15:53	22 15:08 (WEA_G2)		
20	05:08	06:01		06:57		07:53	17:38 (WEA 07 (GRN))	07:53	15:20 (WEA_G1)	08:34	14:46 (WEA_G2)		
	21:37	20:38		19:23		18:10	2 17:40 (WEA 07 (GRN))	16:11	15 15:35 (WEA_G1)	15:54	22 15:08 (WEA_G2)		
21	05:10	06:03		06:59		07:55		07:55	15:20 (WEA_G1)	08:34	14:47 (WEA_G2)		
	21:35	20:36		19:20		18:07		16:09	14 15:34 (WEA_G1)	15:54	22 15:09 (WEA_G2)		
22	05:11	06:05		07:00		07:56		07:57	15:21 (WEA_G1)	08:35	14:47 (WEA_G2)		
	21:34	20:34		19:18		18:05		16:08	12 15:33 (WEA_G1)	15:55	22 15:09 (WEA_G2)		
23	05:13	06:06		07:02		07:58		07:58	15:21 (WEA_G1)	08:35	14:48 (WEA_G2)		
	21:32	20:31		19:15		18:03		16:07	10 15:31 (WEA_G1)	15:55	22 15:10 (WEA_G2)		
24	05:14	06:08		07:04		08:00		08:00	15:21 (WEA_G1)	08:36	14:48 (WEA_G2)		
	21:31	20:29		19:13		18:01		16:05	9 15:30 (WEA_G1)	15:56	22 15:10 (WEA_G2)		
25	05:16	20:45 (WEA KD4)	06:10	07:06		08:02	18:40 (WEA 02 (GRN))	08:02	15:22 (WEA_G1)	08:36	14:48 (WEA_G2)		
	21:29	20:50 (WEA KD4)	20:27	19:10		16:58	1 18:41 (WEA 02 (GRN))	16:58	6 15:28 (WEA_G1)	15:56	22 15:10 (WEA_G2)		
26	05:17	20:43 (WEA KD4)	06:12	07:08		08:04	18:37 (WEA 02 (GRN))	08:04	15:22 (WEA_G1)	08:37	14:49 (WEA_G2)		
	21:28	20:51 (WEA KD4)	20:24	19:08		16:56	2 18:39 (WEA 02 (GRN))	16:56	5 15:27 (WEA_G1)	15:57	22 15:11 (WEA_G2)		
27	05:19	20:42 (WEA KD4)	06:14	07:10		08:06		08:05	15:23 (WEA_G1)	08:37	14:50 (WEA_G2)		
	21:26	20:53 (WEA KD4)	20:22	19:05		16:54		16:02	3 15:26 (WEA_G1)	15:58	22 15:12 (WEA_G2)		
28	05:21	20:41 (WEA KD4)	06:15	07:11		08:08		08:07	15:24 (WEA_G1)	08:37	14:51 (WEA_G2)		
	21:24	20:52 (WEA KD4)	20:19	19:03		16:52		16:01	1 15:25 (WEA_G1)	15:59	21 15:12 (WEA_G2)		
29	05:22	20:41 (WEA KD4)	06:17	07:13		08:10		08:09		08:37	14:51 (WEA_G2)		
	21:23	20:51 (WEA KD4)	20:17	19:00		16:50		16:00		16:00	22 15:13 (WEA_G2)		
30	05:24	20:40 (WEA KD4)	06:19	07:15		08:10		08:10		08:37	14:51 (WEA_G2)		
	21:21	20:48 (WEA KD4)	20:15	18:58		16:48		15:59		16:01	21 15:12 (WEA_G2)		
31	05:26	20:40 (WEA KD4)	06:21			07:14				08:37	14:52 (WEA_G2)		
	21:19	20:47 (WEA KD4)	20:12			16:46				16:02	20 15:12 (WEA_G2)		
Sonnenscheinstunden	515	461		383		328		257		231			
astr.mögl.Beschattung	60		32		5		66		176		596		

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 10 - IO 10 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni
1 08:37 16:03	14:40 (WEA_G2) 08:06 14:57 (WEA_G2) 16:55	07:08 17:52	17:06 (WEA 07 (GRN)) 06:52 17:20 (WEA 07 (GRN)) 19:51	05:41 20:47	04:51 20:49 (WEA K04)
2 08:37 16:04	14:41 (WEA_G2) 08:04 14:57 (WEA_G2) 16:57	07:05 17:54	17:08 (WEA 07 (GRN)) 06:49 17:20 (WEA 07 (GRN)) 19:53	05:39 20:49	04:50 20:50 (WEA K04)
3 08:37 16:05	14:41 (WEA_G2) 08:03 14:56 (WEA_G2) 16:59	07:03 17:56	17:10 (WEA 07 (GRN)) 06:47 17:18 (WEA 07 (GRN)) 19:55	05:37 20:51	04:49 20:51 (WEA K04)
4 08:36 16:06	14:43 (WEA_G2) 08:01 14:57 (WEA_G2) 17:01	07:01 17:58	06:44 19:27 (WEA 43 (RW)) 05:35 19:30 (WEA 43 (RW)) 20:53	20:01 20:53	04:48 20:52 (WEA K04)
5 08:36 16:08	14:44 (WEA_G2) 07:59 14:56 (WEA_G2) 17:03	06:58 18:00	06:42 19:28 (WEA 43 (RW)) 05:33 19:32 (WEA 43 (RW)) 20:55	20:01 20:53	04:47 20:53 (WEA K04)
6 08:36 16:08	14:45 (WEA_G2) 07:57 14:54 (WEA_G2) 17:05	06:56 18:02	06:39 19:30 (WEA 43 (RW)) 05:31 19:32 (WEA 43 (RW)) 20:57	20:01 20:57	04:47 20:55 (WEA K04)
7 08:35 16:10	14:48 (WEA_G2) 07:55 14:54 (WEA_G2) 17:07	06:53 18:03	06:37 20:02 16:36 (WEA 08 (GRN)) 18:03 16:33 (WEA 08 (GRN)) 19:51	05:29 20:59	04:46 20:58 (WEA K04)
8 08:35 16:12	15:34 (WEA_G1) 07:53 15:35 (WEA_G1) 17:09	06:51 18:05	06:34 20:04	05:27 21:00	04:45 20:29 (WEA 42 (RW)) 21:46
9 08:34 16:13	14:54 (WEA_G2) 07:51 15:34 (WEA_G1) 07:51	06:49 18:07	06:32 17:40 (WEA 05 (GRN)) 20:06 17:41 (WEA 05 (GRN)) 20:06	05:25 21:02	04:45 20:30 (WEA 42 (RW)) 21:47
10 08:33 16:15	15:34 (WEA_G1) 07:49 15:30 (WEA_G1) 17:13	06:46 18:09	06:30 21:42 (WEA 03 (GRN)) 20:08 17:40 (WEA 03 (GRN)) 20:08	05:23 21:04	04:44 20:26 (WEA 42 (RW)) 21:48
11 08:33 16:16	15:34 (WEA_G1) 07:47 15:39 (WEA_G1) 17:15	06:44 18:11	06:27 20:10	05:22 21:06	04:44 20:26 (WEA 42 (RW)) 21:49
12 08:32 16:18	15:34 (WEA_G1) 07:45 15:41 (WEA_G1) 17:17	06:41 18:13	06:25 20:12	05:20 21:07	04:43 20:27 (WEA 42 (RW)) 21:50
13 08:31 16:20	15:34 (WEA_G1) 07:43 15:43 (WEA_G1) 17:19	06:39 18:15	06:22 20:14	05:18 21:09	04:43 20:29 (WEA 42 (RW)) 21:50
14 08:30 16:21	15:34 (WEA_G1) 07:41 15:45 (WEA_G1) 17:21	06:36 18:17	06:20 20:16	05:16 21:11	04:43 21:01
15 08:29 16:23	15:35 (WEA_G1) 07:39 15:47 (WEA_G1) 17:24	06:34 18:19	06:18 20:18	05:14 21:13	04:42 21:52
16 08:28 16:25	15:35 (WEA_G1) 07:37 15:49 (WEA_G1) 17:26	06:31 18:21	06:15 20:19	05:13 21:14	04:42 21:53
17 08:27 16:26	15:36 (WEA_G1) 07:35 15:51 (WEA_G1) 17:28	06:29 18:23	06:13 20:21	05:11 21:16	04:42 21:53
18 08:26 16:28	15:35 (WEA_G1) 07:33 15:52 (WEA_G1) 17:30	06:26 18:25	06:10 20:23	05:09 21:18	04:42 21:54
19 08:25 16:30	15:36 (WEA_G1) 07:30 15:55 (WEA_G1) 17:32	06:24 18:27	06:08 20:25	05:08 21:19	04:42 21:54
20 08:24 16:32	15:36 (WEA_G1) 07:28 15:56 (WEA_G1) 17:34	06:21 18:28	06:06 20:27	05:06 21:21	04:42 20:47 (WEA K04) 21:54
21 08:23 16:34	15:37 (WEA_G1) 07:26 15:59 (WEA_G1) 17:36	06:19 18:30	06:04 20:29	05:05 21:23	04:42 20:47 (WEA K04) 21:54
22 08:21 16:35	15:38 (WEA_G1) 07:24 15:59 (WEA_G1) 17:38	06:16 18:32	06:01 20:31	05:03 21:24	04:42 20:47 (WEA K04) 21:54
23 08:20 16:37	15:38 (WEA_G1) 07:22 15:58 (WEA_G1) 17:40	06:14 18:34	05:59 20:33	05:02 21:26	04:43 20:46 (WEA K04) 21:54
24 08:19 16:39	15:39 (WEA_G1) 07:19 15:58 (WEA_G1) 17:42	06:11 18:36	05:57 20:34	05:00 21:27	04:43 20:46 (WEA K04) 21:55
25 08:17 16:41	15:41 (WEA_G1) 07:17 15:58 (WEA_G1) 17:44	06:09 18:38	05:54 20:36	04:59 21:29	04:43 20:46 (WEA K04) 21:55
26 08:16 16:43	15:41 (WEA_G1) 07:15 15:57 (WEA_G1) 17:46	06:06 18:40	05:52 20:38	04:58 21:30	04:44 20:47 (WEA K04) 21:55
27 08:14 16:45	15:43 (WEA_G1) 07:12 15:55 (WEA_G1) 17:48	06:04 18:42	05:50 20:40	04:56 21:32	04:44 20:47 (WEA K04) 21:54
28 08:13 16:47	15:46 (WEA_G1) 07:10 15:54 (WEA_G1) 17:50	06:02 18:44	05:48 20:42	04:55 21:33	04:45 20:48 (WEA K04) 21:54
29 08:11 16:49		06:59 19:45	05:46 20:44	04:54 21:35	04:45 20:48 (WEA K04) 21:54
30 08:09 16:51		06:57 19:47	05:44 20:46	04:53 21:36	04:46 20:48 (WEA K04) 21:54
31 08:08 16:53		06:54 19:49		04:52 21:37	04:45 20:49 (WEA K04) 21:54
Sonnenscheinstunden 249	272	367	421	496	513
astr. max.mögl. Beschattung 360	77	84	9	138	51

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

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

Projekt:
SWP Windpark Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:
22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 10 - IO 10 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Jul	August	September	Oktober	November	Dezember	
1 04:47	05:27	20:37 (WEA 42 (RW)) 06:23	07:17	18:20 (WEA 03 (GRN)) 07:16	16:06 (WEA 08 (GRN)) 08:12	15:16 (WEA_G1)
2 04:47	05:29	8 20:45 (WEA 42 (RW)) 06:24	07:19	7 18:27 (WEA 03 (GRN)) 07:18	3 16:09 (WEA 08 (GRN)) 08:14	5 15:21 (WEA_G1)
3 04:48	05:31	7 20:44 (WEA 42 (RW)) 06:25	07:21	5 18:23 (WEA 03 (GRN)) 07:20	7 16:10 (WEA 08 (GRN)) 08:15	4 15:21 (WEA_G1)
4 04:49	05:32	6 20:42 (WEA 42 (RW)) 06:26	07:22	3 18:21 (WEA 03 (GRN)) 07:21	5 16:07 (WEA 08 (GRN)) 08:16	2 15:20 (WEA_G1)
5 04:50	05:34	4 20:40 (WEA 42 (RW)) 06:27	07:24	1 18:19 (WEA 03 (GRN)) 07:22	4 16:05 (WEA 08 (GRN)) 08:17	1 15:19 (WEA_G1)
6 04:51	05:36	3 20:39 (WEA 42 (RW)) 06:28	07:26	18:45	2 16:04 (WEA 08 (GRN)) 08:18	5 14:39 (WEA_G2)
7 04:52	21:00 (WEA K04) 05:38	1 20:36 (WEA 42 (RW)) 06:29	19:27 (WEA 43 (RW)) 07:26	17:46 (WEA 07 (GRN)) 07:26	15:54	14:45 (WEA_G2)
8 04:53	5 21:05 (WEA K04) 05:39	19:58 07:28	1 19:28 (WEA 43 (RW)) 07:28	17:40 (WEA 07 (GRN)) 07:26	15:55	14:40 (WEA_G2)
9 04:54	7 21:06 (WEA K04) 05:41	19:55 07:30	3 19:27 (WEA 43 (RW)) 07:30	17:43 (WEA 07 (GRN)) 07:26	15:54	14:40 (WEA_G2)
10 04:55	9 21:07 (WEA K04) 05:43	19:53 07:32	3 19:24 (WEA 43 (RW)) 07:32	17:41 (WEA 07 (GRN)) 07:26	15:54	14:44 (WEA_G2)
11 04:56	11 21:09 (WEA K04) 05:45	19:50 07:34	1 19:22 (WEA 43 (RW)) 07:34	17:40 (WEA 07 (GRN)) 07:26	15:54	14:45 (WEA_G2)
12 04:57	12 21:10 (WEA K04) 05:47	19:48 07:36	17:46 (WEA 07 (GRN)) 07:34	17:39 (WEA 07 (GRN)) 07:26	15:53	14:40 (WEA_G2)
13 04:59	13 21:11 (WEA K04) 05:48	19:46 07:38	4 17:30 (WEA 07 (GRN)) 07:34	17:40 (WEA 07 (GRN)) 07:26	15:53	14:47 (WEA_G2)
14 05:00	14 21:12 (WEA K04) 05:50	19:45 07:40	10 17:33 (WEA 07 (GRN)) 07:36	17:43 (WEA 07 (GRN)) 07:26	15:53	14:47 (WEA_G2)
15 05:01	15 21:13 (WEA K04) 05:52	19:44 07:42	13 17:31 (WEA 07 (GRN)) 07:38	17:41 (WEA 07 (GRN)) 07:26	15:53	14:47 (WEA_G2)
16 05:03	16 21:14 (WEA K04) 05:54	19:43 07:44	15 17:30 (WEA 07 (GRN)) 07:40	17:40 (WEA 07 (GRN)) 07:26	15:53	14:48 (WEA_G2)
17 05:04	17 21:15 (WEA K04) 05:56	19:42 07:46	17:39 (WEA 07 (GRN)) 07:42	17:39 (WEA 07 (GRN)) 07:26	15:53	14:49 (WEA_G2)
18 05:05	18 21:16 (WEA K04) 05:57	19:41 07:48	15 17:34 (WEA 07 (GRN)) 07:44	17:39 (WEA 07 (GRN)) 07:26	15:53	14:50 (WEA_G2)
19 05:07	19 21:17 (WEA K04) 05:59	19:40 07:50	13 17:32 (WEA 07 (GRN)) 07:46	17:39 (WEA 07 (GRN)) 07:26	15:53	14:51 (WEA_G2)
20 05:08	20 21:18 (WEA K04) 06:01	19:39 07:52	15 17:31 (WEA 07 (GRN)) 07:48	17:39 (WEA 07 (GRN)) 07:26	15:53	14:52 (WEA_G2)
21 05:10	21 21:19 (WEA K04) 06:03	19:38 07:54	17:40 (WEA 07 (GRN)) 07:50	17:39 (WEA 07 (GRN)) 07:26	15:53	14:53 (WEA_G2)
22 05:11	22 21:20 (WEA K04) 06:05	19:37 07:56	13 17:30 (WEA 07 (GRN)) 07:52	17:39 (WEA 07 (GRN)) 07:26	15:53	14:54 (WEA_G2)
23 05:13	23 21:21 (WEA K04) 06:06	19:36 07:58	15 17:29 (WEA 07 (GRN)) 07:54	17:39 (WEA 07 (GRN)) 07:26	15:53	14:55 (WEA_G2)
24 05:14	24 21:22 (WEA K04) 06:08	19:35 07:59	17:40 (WEA 07 (GRN)) 07:56	17:39 (WEA 07 (GRN)) 07:26	15:53	14:56 (WEA_G2)
25 05:16	25 21:23 (WEA K04) 06:10	19:34 08:00	13 17:28 (WEA 07 (GRN)) 07:58	17:39 (WEA 07 (GRN)) 07:26	15:53	14:57 (WEA_G2)
26 05:17	26 21:24 (WEA K04) 06:12	19:33 08:01	15 17:27 (WEA 07 (GRN)) 08:00	17:39 (WEA 07 (GRN)) 07:26	15:53	14:58 (WEA_G2)
27 05:19	27 21:25 (WEA K04) 06:14	19:32 08:02	17:40 (WEA 07 (GRN)) 08:01	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
28 05:21	28 21:26 (WEA K04) 06:15	19:31 08:03	13 17:26 (WEA 07 (GRN)) 08:03	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
29 05:22	29 21:27 (WEA K04) 06:17	19:30 08:04	15 17:25 (WEA 07 (GRN)) 08:05	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
30 05:24	30 21:28 (WEA K04) 06:19	19:29 08:06	17:40 (WEA 07 (GRN)) 08:07	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
31 05:26	31 21:29 (WEA K04) 06:21	19:28 08:08	13 17:24 (WEA 07 (GRN)) 08:09	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
1 05:28	1 20:41 (WEA 42 (RW)) 06:23	19:27 08:11	15 17:23 (WEA 07 (GRN)) 08:11	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
2 05:30	2 20:42 (WEA 42 (RW)) 06:25	19:26 08:13	17:40 (WEA 07 (GRN)) 08:13	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
3 05:32	3 20:43 (WEA 42 (RW)) 06:27	19:25 08:15	13 17:22 (WEA 07 (GRN)) 08:15	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
4 05:34	4 20:44 (WEA 42 (RW)) 06:29	19:24 08:17	15 17:21 (WEA 07 (GRN)) 08:17	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
5 05:36	5 20:45 (WEA 42 (RW)) 06:31	19:23 08:19	17:40 (WEA 07 (GRN)) 08:19	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
6 05:38	6 20:46 (WEA 42 (RW)) 06:33	19:22 08:21	13 17:20 (WEA 07 (GRN)) 08:21	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
7 05:40	7 20:47 (WEA 42 (RW)) 06:35	19:21 08:23	15 17:19 (WEA 07 (GRN)) 08:23	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
8 05:42	8 20:48 (WEA 42 (RW)) 06:37	19:20 08:25	17:40 (WEA 07 (GRN)) 08:25	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
9 05:44	9 20:49 (WEA 42 (RW)) 06:39	19:19 08:27	13 17:18 (WEA 07 (GRN)) 08:27	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
10 05:46	10 20:50 (WEA 42 (RW)) 06:41	19:18 08:29	15 17:17 (WEA 07 (GRN)) 08:29	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
11 05:48	11 20:51 (WEA 42 (RW)) 06:43	19:17 08:31	17:40 (WEA 07 (GRN)) 08:31	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
12 05:50	12 20:52 (WEA 42 (RW)) 06:45	19:16 08:33	13 17:16 (WEA 07 (GRN)) 08:33	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
13 05:52	13 20:53 (WEA 42 (RW)) 06:47	19:15 08:35	15 17:15 (WEA 07 (GRN)) 08:35	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
14 05:54	14 20:54 (WEA 42 (RW)) 06:49	19:14 08:37	17:40 (WEA 07 (GRN)) 08:37	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
15 05:56	15 20:55 (WEA 42 (RW)) 06:51	19:13 08:39	13 17:14 (WEA 07 (GRN)) 08:39	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
16 05:58	16 20:56 (WEA 42 (RW)) 06:53	19:12 08:41	15 17:13 (WEA 07 (GRN)) 08:41	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
17 05:59	17 20:57 (WEA 42 (RW)) 06:55	19:11 08:43	17:40 (WEA 07 (GRN)) 08:43	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
18 06:01	18 20:58 (WEA 42 (RW)) 06:57	19:10 08:45	13 17:12 (WEA 07 (GRN)) 08:45	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
19 06:03	19 20:59 (WEA 42 (RW)) 06:59	19:09 08:47	15 17:11 (WEA 07 (GRN)) 08:47	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
20 06:05	20 21:00 (WEA 42 (RW)) 07:01	19:08 08:49	17:40 (WEA 07 (GRN)) 08:49	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
21 06:07	21 21:01 (WEA 42 (RW)) 07:03	19:07 08:51	13 17:10 (WEA 07 (GRN)) 08:51	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
22 06:09	22 21:02 (WEA 42 (RW)) 07:05	19:06 08:53	15 17:09 (WEA 07 (GRN)) 08:53	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
23 06:11	23 21:03 (WEA 42 (RW)) 07:07	19:05 08:55	17:40 (WEA 07 (GRN)) 08:55	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
24 06:13	24 21:04 (WEA 42 (RW)) 07:09	19:04 08:57	13 17:08 (WEA 07 (GRN)) 08:57	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
25 06:15	25 21:05 (WEA 42 (RW)) 07:11	19:03 08:59	15 17:07 (WEA 07 (GRN)) 08:59	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
26 06:17	26 21:06 (WEA 42 (RW)) 07:13	19:02 09:01	17:40 (WEA 07 (GRN)) 09:01	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
27 06:19	27 21:07 (WEA 42 (RW)) 07:15	19:01 09:03	13 17:06 (WEA 07 (GRN)) 09:03	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
28 06:21	28 21:08 (WEA 42 (RW)) 07:17	19:00 09:05	15 17:05 (WEA 07 (GRN)) 09:05	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
29 06:23	29 21:09 (WEA 42 (RW)) 07:19	18:59 09:07	17:40 (WEA 07 (GRN)) 09:07	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
30 06:25	30 21:10 (WEA 42 (RW)) 07:21	18:58 09:09	13 17:04 (WEA 07 (GRN)) 09:09	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
31 06:27	31 21:11 (WEA 42 (RW)) 07:23	18:57 09:11	15 17:03 (WEA 07 (GRN)) 09:11	17:39 (WEA 07 (GRN)) 07:26	15:53	14:59 (WEA_G2)
Sommereinheiten	515	461	383	328	257	231
astr. max mögl. Beschattung	160	29	39	110	282	496

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		

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 11 - IO 11 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni
1 08:37 16:03	14:41 (WEA_G2) 08:06 15:04 (WEA_G2) 16:55	07:08 17:52	17:17 (WEA 07 (GRN)) 06:52 17:24 (WEA 07 (GRN)) 19:51	05:41 20:47	04:51 20:55 (WEA K04)
2 08:37 16:04	14:42 (WEA_G2) 08:04 15:04 (WEA_G2) 16:57	07:05 17:54	17:16 (WEA 07 (GRN)) 06:49 17:26 (WEA 07 (GRN)) 19:53	05:39 20:49	04:50 20:55 (WEA K04)
3 08:37 16:05	14:42 (WEA_G2) 08:03 15:04 (WEA_G2) 16:59	07:03 17:56	17:16 (WEA 07 (GRN)) 06:47 17:29 (WEA 07 (GRN)) 19:55	05:37 20:51	04:49 21:56 (WEA K04)
4 08:36 16:06	14:43 (WEA_G2) 08:01 15:04 (WEA_G2) 17:01	07:01 17:58	17:15 (WEA 07 (GRN)) 06:44 17:30 (WEA 07 (GRN)) 19:57	05:35 20:53	04:48 21:42 (WEA K04)
5 08:36 16:08	14:44 (WEA_G2) 07:59 15:04 (WEA_G2) 17:03	06:58 18:00	17:16 (WEA 07 (GRN)) 06:42 17:32 (WEA 07 (GRN)) 19:59	05:33 20:55	04:47 21:57 (WEA K04)
6 08:36 16:09	14:44 (WEA_G2) 07:57 15:03 (WEA_G2) 17:05	06:56 18:02	17:16 (WEA 07 (GRN)) 06:39 17:30 (WEA 07 (GRN)) 20:01	05:31 20:57	04:47 21:59 (WEA K04)
7 08:35 16:10	14:46 (WEA_G2) 07:55 15:04 (WEA_G2) 17:07	06:53 18:03	17:17 (WEA 07 (GRN)) 06:37 17:29 (WEA 07 (GRN)) 20:02	05:29 20:59	04:46 21:59 (WEA K04)
8 08:35 16:12	14:47 (WEA_G2) 07:53 15:03 (WEA_G2) 17:09	06:51 18:05	17:18 (WEA 07 (GRN)) 06:34 17:27 (WEA 07 (GRN)) 20:04	05:27 21:00	04:45 21:11 (WEA K04)
9 08:34 16:13	14:48 (WEA_G2) 07:51 15:03 (WEA_G2) 17:11	06:49 18:05	17:30 (WEA 07 (GRN)) 20:01 17:44 (WEA 05 (GRN)) 06:27	05:25 21:02	04:45 21:11 (WEA K04)
10 08:33 16:15	14:49 (WEA_G2) 07:49 15:02 (WEA_G2) 17:13	06:46 18:08	17:45 (WEA 05 (GRN)) 06:25 17:46 (WEA 05 (GRN)) 20:12	05:23 21:04	04:44 21:11 (WEA K04)
11 08:33 16:16	14:51 (WEA_G2) 07:47 15:00 (WEA_G2) 17:15	06:44 18:11	17:44 (WEA 05 (GRN)) 06:27 17:45 (WEA 05 (GRN)) 20:10	05:22 21:06	04:44 21:10 (WEA K04)
12 08:32 16:18	14:55 (WEA_G2) 07:45 15:41 (WEA_G1) 17:17	06:41 18:13	17:45 (WEA 05 (GRN)) 06:25 17:46 (WEA 05 (GRN)) 20:12	05:20 21:07	04:43 21:10 (WEA K04)
13 08:31 16:20	15:43 (WEA_G1) 07:43 15:43 (WEA_G1) 17:19	06:39 18:15	16:42 (WEA 08 (GRN)) 06:29 17:48 (WEA 03 (GRN)) 06:22	05:18 21:09	20:35 (WEA 42 (RW)) 04:43 21:00 (WEA K04)
14 08:30 16:21	15:40 (WEA_G1) 07:41 15:45 (WEA_G1) 17:21	06:36 18:17	16:48 (WEA 08 (GRN)) 06:20 17:50 (WEA 03 (GRN)) 20:16	05:16 21:11	20:35 (WEA 42 (RW)) 21:50 21:01 (WEA K04)
15 08:29 16:23	15:40 (WEA_G1) 07:39 15:47 (WEA_G1) 17:24	06:34 18:19	17:48 (WEA 03 (GRN)) 06:18 17:52 (WEA 03 (GRN)) 20:18	05:14 21:13	20:35 (WEA 42 (RW)) 04:42 21:00 (WEA K04)
16 08:28 16:25	15:40 (WEA_G1) 07:37 15:49 (WEA_G1) 17:26	06:31 18:21	17:47 (WEA 03 (GRN)) 06:15 17:54 (WEA 03 (GRN)) 20:19	05:13 21:14	20:35 (WEA 42 (RW)) 04:42 21:01 (WEA K04)
17 08:27 16:26	15:41 (WEA_G1) 07:35 15:51 (WEA_G1) 17:28	06:29 18:23	17:48 (WEA 03 (GRN)) 06:13 17:56 (WEA 03 (GRN)) 20:21	05:11 21:16	20:35 (WEA 42 (RW)) 04:42 21:03 (WEA K04)
18 08:26 16:28	15:40 (WEA_G1) 07:33 15:52 (WEA_G1) 17:30	06:26 18:25	17:48 (WEA 03 (GRN)) 06:10 17:58 (WEA 03 (GRN)) 20:23	05:09 21:18	20:37 (WEA 42 (RW)) 04:42 21:01 (WEA K04)
19 08:25 16:30	15:41 (WEA_G1) 07:30 15:55 (WEA_G1) 17:32	06:24 18:27	17:50 (WEA 03 (GRN)) 06:08 17:57 (WEA 03 (GRN)) 20:25	05:08 21:19	20:38 (WEA 42 (RW)) 04:42 21:04 (WEA K04)
20 08:24 16:32	15:40 (WEA_G1) 07:28 15:56 (WEA_G1) 17:34	06:21 18:28	18:25 (WEA 02 (GRN)) 06:06 18:06 (WEA 02 (GRN)) 20:31	05:06 21:21	20:44 (WEA 42 (RW)) 21:54 21:03 (WEA K04)
21 08:23 16:34	15:41 (WEA_G1) 07:26 15:59 (WEA_G1) 17:36	06:19 18:30	18:06 (WEA 02 (GRN)) 06:04 18:06 (WEA 02 (GRN)) 20:33	05:05 21:23	21:54 (WEA K04)
22 08:21 16:35	15:42 (WEA_G1) 07:24 16:01 (WEA_G1) 17:38	06:16 18:32	18:06 (WEA 02 (GRN)) 06:01 18:06 (WEA 02 (GRN)) 20:33	05:03 21:24	21:54 (WEA K04)
23 08:20 16:37	15:42 (WEA_G1) 07:22 16:03 (WEA_G1) 17:40	06:14 18:34	18:06 (WEA 02 (GRN)) 05:59 18:06 (WEA 02 (GRN)) 20:33	05:02 21:26	21:54 (WEA K04)
24 08:19 16:39	15:42 (WEA_G1) 07:19 16:04 (WEA_G1) 17:42	06:11 18:36	18:06 (WEA 02 (GRN)) 05:57 18:09 (WEA 02 (GRN)) 20:34	05:00 21:27	21:54 (WEA K04)
25 08:17 16:41	15:43 (WEA_G1) 07:17 16:05 (WEA_G1) 17:44	06:09 18:38	18:07 (WEA 02 (GRN)) 05:54 18:11 (WEA 02 (GRN)) 20:36	04:59 21:29	21:53 (WEA K04)
26 08:16 16:43	15:44 (WEA_G1) 07:15 16:04 (WEA_G1) 17:46	06:06 18:40	18:08 (WEA 02 (GRN)) 05:52 18:13 (WEA 02 (GRN)) 20:38	04:58 21:30	20:55 (WEA K04) 04:44 21:03 (WEA K04)
27 08:14 16:45	15:44 (WEA_G1) 07:12 16:04 (WEA_G1) 17:48	06:04 18:42	18:13 (WEA 02 (GRN)) 05:50 18:40 (WEA 02 (GRN)) 20:40	04:56 21:32	20:55 (WEA K04) 21:55 21:12 (WEA K04)
28 08:13 16:47	15:46 (WEA_G1) 07:10 16:04 (WEA_G1) 17:50	06:02 18:44	17:19 (WEA 07 (GRN)) 06:02 17:22 (WEA 07 (GRN)) 18:44	04:55 21:33	20:55 (WEA K04) 04:45 21:14 (WEA K04)
29 08:11 16:49	15:47 (WEA_G1) 16:03 (WEA_G1)	06:59 19:45	06:59 19:45	04:54 21:35	20:55 (WEA K04) 04:45 21:14 (WEA K04)
30 08:09 16:51	15:48 (WEA_G1) 16:01 (WEA_G1)	06:57 19:47	06:57 19:47	04:53 21:36	20:55 (WEA K04) 04:46 21:15 (WEA K04)
31 08:08 16:53	15:51 (WEA_G1) 15:59 (WEA_G1)	06:54 19:49	06:54 19:49	04:52 21:37	20:55 (WEA K04) 04:46 21:15 (WEA K04)
Sonnenscheinstunden astr. max.mögl. Beschattung	249 475	272 28	150	421 7	496 302

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 11 - IO 11 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember	
1	04:47 21:54	21:03 (WEA K04) 21:17 (WEA K04)	05:27 06:23	07:17 18:55	18:26 (WEA 05 (GRN)) 18:27 (WEA 05 (GRN))	07:16 16:44	
2	04:47 21:53	21:03 (WEA K04) 21:16 (WEA K04)	05:29 20:07	07:19 18:53	18:27 (WEA 05 (GRN)) 16:42	16:08 (WEA 08 (GRN)) 15:58	
3	04:48 21:53	21:03 (WEA K04) 21:14 (WEA K04)	05:31 20:05	07:21 18:50	16:40 16:40	15:57 15:57	
4	04:49 21:52	21:03 (WEA K04) 21:16 (WEA K04)	05:32 20:03	07:22 18:48	16:38 16:38	15:56 15:56	
5	04:50 21:52	21:03 (WEA K04) 21:16 (WEA K04)	05:34 20:00	07:24 18:45	17:57 (WEA 07 (GRN)) 18:02 (WEA 07 (GRN))	16:36 16:36	
6	04:51 21:51	21:02 (WEA K04) 21:15 (WEA K04)	05:36 19:58	07:26 18:43	17:54 (WEA 07 (GRN)) 18:05 (WEA 07 (GRN))	16:34 16:34	
7	04:52 21:50	21:02 (WEA K04) 21:14 (WEA K04)	05:38 19:55	07:28 18:40	17:53 (WEA 07 (GRN)) 18:06 (WEA 07 (GRN))	16:32 16:32	
8	04:53 21:50	21:02 (WEA K04) 21:14 (WEA K04)	05:39 19:53	07:30 18:38	17:51 (WEA 07 (GRN)) 18:07 (WEA 07 (GRN))	16:30 16:30	
9	04:54 21:49	21:02 (WEA K04) 21:13 (WEA K04)	05:41 19:50	07:32 18:36	17:51 (WEA 07 (GRN)) 18:06 (WEA 07 (GRN))	16:28 16:28	
10	04:55 21:48	21:02 (WEA K04) 21:12 (WEA K04)	05:43 19:48	07:34 18:33	17:50 (WEA 07 (GRN)) 18:04 (WEA 07 (GRN))	16:26 16:26	
11	04:56 21:47	21:02 (WEA K04) 21:11 (WEA K04)	05:45 19:45	07:35 18:31	17:50 (WEA 07 (GRN)) 18:02 (WEA 07 (GRN))	16:24 16:25	
12	04:57 21:46	21:03 (WEA K04) 21:11 (WEA K04)	05:47 19:43	07:37 18:28	18:02 (WEA 07 (GRN)) 17:59 (WEA 07 (GRN))	16:23 16:23	
13	04:59 21:45	21:03 (WEA K04) 21:10 (WEA K04)	05:48 19:40	07:39 18:26	17:51 (WEA 07 (GRN)) 17:57 (WEA 07 (GRN))	16:21 16:21	
14	05:00 21:44	21:03 (WEA K04) 21:09 (WEA K04)	05:50 19:38	07:41 18:24	17:52 (WEA 07 (GRN)) 17:54 (WEA 07 (GRN))	16:19 16:19	
15	05:01 21:43	21:03 (WEA K04) 21:08 (WEA K04)	05:52 19:35	07:43 18:21	17:54 (WEA 07 (GRN)) 17:44	16:18 16:18	
16	05:03 21:42	21:03 (WEA K04) 21:07 (WEA K04)	05:54 19:33	07:45 18:19	17:50 (WEA 07 (GRN)) 18:04 (WEA 07 (GRN))	16:16 16:16	
17	05:04 21:41	21:04 (WEA K04) 21:07 (WEA K04)	05:56 19:30	07:47 18:17	18:57 (WEA 02 (GRN)) 19:00 (WEA 02 (GRN))	16:15 16:15	
18	05:05 21:39	21:04 (WEA K04) 21:05 (WEA K04)	05:57 19:28	07:49 18:14	18:55 (WEA 02 (GRN)) 18:59 (WEA 02 (GRN))	16:14 16:14	
19	05:07 21:38	21:05 (WEA K04) 21:04 (WEA K04)	05:59 19:25	07:51 18:12	18:53 (WEA 02 (GRN)) 18:57 (WEA 02 (GRN))	16:13 16:12	
20	05:08 21:37	21:05 (WEA K04) 21:03 (WEA K04)	06:01 19:23	07:53 18:10	18:53 (WEA 02 (GRN)) 18:55 (WEA 02 (GRN))	16:12 16:11	
21	05:10 21:35	21:06 (WEA K04) 21:03 (WEA K04)	06:03 19:20	07:55 18:07	18:55 (WEA 02 (GRN)) 18:07	16:11 16:09	
22	05:11 21:34	21:06 (WEA K04) 21:04 (WEA K04)	06:05 19:18	07:56 18:05	18:07 18:05	16:09 16:08	
23	05:13 21:32	21:06 (WEA K04) 21:03 (WEA K04)	06:06 19:15	07:58 18:03	18:05 18:03	16:07 16:07	
24	05:14 21:31	20:49 (WEA 42 (RW)) 20:53 (WEA 42 (RW))	06:08 19:13	08:00 18:01	18:34 (WEA 03 (GRN)) 18:40 (WEA 03 (GRN))	16:06 16:05	
25	05:16 21:29	20:48 (WEA 42 (RW)) 20:55 (WEA 42 (RW))	06:10 19:10	08:02 18:00	18:31 (WEA 03 (GRN)) 18:41 (WEA 03 (GRN))	16:04 16:04	
26	05:17 21:28	20:47 (WEA 42 (RW)) 20:55 (WEA 42 (RW))	06:12 19:08	08:04 18:00	18:30 (WEA 03 (GRN)) 18:39 (WEA 03 (GRN))	16:04 16:03	
27	05:19 21:26	20:47 (WEA 42 (RW)) 20:54 (WEA 42 (RW))	06:14 19:05	08:06 18:00	18:29 (WEA 03 (GRN)) 18:36 (WEA 03 (GRN))	16:03 16:02	
28	05:21 21:24	20:46 (WEA 42 (RW)) 20:52 (WEA 42 (RW))	06:15 19:03	08:08 18:00	18:29 (WEA 03 (GRN)) 18:34 (WEA 03 (GRN))	16:02 16:01	
29	05:22 21:23	20:46 (WEA 42 (RW)) 20:51 (WEA 42 (RW))	06:17 19:00	08:10 18:00	18:29 (WEA 03 (GRN)) 18:32 (WEA 03 (GRN))	16:00 16:00	
30	05:24 21:21	20:45 (WEA 42 (RW)) 20:48 (WEA 42 (RW))	06:19 18:58	08:12 18:00	18:29 (WEA 03 (GRN)) 18:32 (WEA 03 (GRN))	16:00 16:00	
31	05:26 21:19	20:46 (WEA 42 (RW)) 20:47 (WEA 42 (RW))	06:21 18:58	08:14 18:00	18:29 (WEA 03 (GRN)) 18:32 (WEA 03 (GRN))	16:00 16:00	
	Sonnenscheinstunden astr. max. mögl. Beschattung	515 205	461 383	383 61	328 121	257 284	231 691

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 12 - IO 12 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni		
1 08:37	14:49 (WEA_G2) 08:06	15:55 (WEA_G1) 07:08		06:52	05:41	04:51		
1 16:03	15:18 (WEA_G2) 16:55	16:15 (WEA_G1) 17:52		19:51	20:47	21:38		
2 08:37	14:50 (WEA_G2) 08:04	15:56 (WEA_G1) 07:05		06:49	05:39	04:50		
1 16:04	15:18 (WEA_G2) 16:57	16:14 (WEA_G1) 17:54		19:53	20:49	21:40		
3 08:37	14:50 (WEA_G2) 08:03	15:58 (WEA_G1) 07:03		06:47	05:37	04:49		
1 16:05	15:18 (WEA_G2) 16:59	16:13 (WEA_G1) 17:56		19:55	20:51	21:41		
4 08:36	14:51 (WEA_G2) 08:01	15:59 (WEA_G1) 07:01		06:44	05:35	04:48		
1 16:06	15:19 (WEA_G2) 17:01	16:11 (WEA_G1) 17:58		19:57	20:53	21:42		
5 08:36	14:51 (WEA_G2) 07:59	16:03 (WEA_G1) 06:58		06:42	05:33	04:47		
1 16:08	15:19 (WEA_G2) 17:03	16:08 (WEA_G1) 17:00		19:59	20:55	21:43		
6 08:36	14:52 (WEA_G2) 07:57	16:06	17:32 (WEA 07 (GRN)) 06:39	05:31	04:47	04:57		
1 16:09	15:19 (WEA_G2) 17:05	16:02	17:34 (WEA 07 (GRN)) 20:01	20:57	21:44	21:54		
7 08:35	14:53 (WEA_G2) 07:55	06:53	17:31 (WEA 07 (GRN)) 06:37	05:29	04:46	04:56		
1 16:10	15:19 (WEA_G2) 17:07	16:03	17:37 (WEA 07 (GRN)) 20:02	20:59	21:45	21:55		
8 08:35	14:53 (WEA_G2) 07:53	06:51	17:30 (WEA 07 (GRN)) 06:34	05:27	04:45	04:55		
1 16:12	15:19 (WEA_G2) 17:09	16:05	17:38 (WEA 07 (GRN)) 20:04	21:00	21:46	21:56		
9 08:34	14:54 (WEA_G2) 07:51	06:49	17:29 (WEA 07 (GRN)) 06:32	05:25	04:45	04:55		
1 16:13	15:19 (WEA_G2) 17:11	16:07	17:41 (WEA 07 (GRN)) 20:06	21:02	21:47	21:57		
10 08:33	14:54 (WEA_G2) 07:49	06:46	17:29 (WEA 07 (GRN)) 06:30	05:23	04:44	04:54		
1 16:15	15:19 (WEA_G2) 17:13	16:09	17:42 (WEA 07 (GRN)) 20:08	21:04	21:48	21:58		
11 08:33	14:55 (WEA_G2) 07:47	06:44	17:29 (WEA 07 (GRN)) 06:27	19:40 (WEA 43 (RW)) 05:22	04:44	04:54		
1 16:16	15:19 (WEA_G2) 17:15	16:11	17:45 (WEA 07 (GRN)) 20:10	21:06	21:49	21:59		
12 08:32	14:56 (WEA_G2) 07:45	06:41	17:29 (WEA 07 (GRN)) 06:25	19:41 (WEA 43 (RW)) 05:20	04:43	04:53		
1 16:18	15:19 (WEA_G2) 17:17	16:13	17:43 (WEA 07 (GRN)) 20:12	3 19:44 (WEA 43 (RW)) 21:07	21:50	21:60		
13 08:31	14:57 (WEA_G2) 07:43	06:39	17:30 (WEA 07 (GRN)) 06:22	19:44 (WEA 43 (RW)) 05:18	04:43	04:53		
1 16:20	15:19 (WEA_G2) 17:19	16:15	17:43 (WEA 07 (GRN)) 20:14	2 19:46 (WEA 43 (RW)) 21:09	21:50	21:60		
14 08:30	14:58 (WEA_G2) 07:41	16:50 (WEA 08 (GRN)) 06:36	06:41	17:31 (WEA 07 (GRN)) 06:20	05:16	04:43		
1 16:21	15:19 (WEA_G2) 17:21	16:51 (WEA 08 (GRN)) 16:17	9 17:40 (WEA 07 (GRN)) 20:16	21:11	21:51	21:61		
15 08:29	15:00 (WEA_G2) 07:39	16:50 (WEA 08 (GRN)) 06:34	06:18	05:14	04:42	04:52		
1 16:23	15:18 (WEA_G2) 17:24	4 16:54 (WEA 08 (GRN)) 16:19	20:17	21:13	21:52	21:62		
16 08:28	15:01 (WEA_G2) 07:37	16:51 (WEA 08 (GRN)) 06:31	17:53 (WEA 05 (GRN)) 06:15	05:13	04:42	04:52		
1 16:25	15:18 (WEA_G2) 17:26	5 16:56 (WEA 08 (GRN)) 16:21	1 17:54 (WEA 05 (GRN)) 20:19	21:14	21:52	21:62		
17 08:27	15:03 (WEA_G2) 07:35	16:52 (WEA 08 (GRN)) 06:29	06:13	05:11	20:42 (WEA 42 (RW)) 04:42	04:52		
1 16:26	15:17 (WEA_G2) 17:28	7 16:59 (WEA 08 (GRN)) 16:23	20:21	21:16	1 20:43 (WEA 42 (RW)) 21:53	21:62		
18 08:26	15:05 (WEA_G2) 07:33	16:53 (WEA 08 (GRN)) 06:26	06:10	05:09	20:42 (WEA 42 (RW)) 04:42	04:52		
1 16:28	15:15 (WEA_G2) 17:30	5 16:58 (WEA 08 (GRN)) 16:25	20:23	21:18	3 20:45 (WEA 42 (RW)) 21:53	21:62		
19 08:25	15:10 (WEA_G2) 07:30	06:24	17:58 (WEA 03 (GRN)) 06:08	05:08	20:43 (WEA 42 (RW)) 04:42	04:52		
1 16:30	3 15:55 (WEA_G1) 17:32	18:27	2 18:00 (WEA 03 (GRN)) 20:25	21:19	4 20:47 (WEA 42 (RW)) 21:53	21:62		
20 08:24	15:52 (WEA_G1) 07:28	06:21	17:57 (WEA 03 (GRN)) 06:06	05:06	20:42 (WEA 42 (RW)) 04:42	04:52		
1 16:32	4 15:56 (WEA_G1) 17:34	18:28	4 18:01 (WEA 03 (GRN)) 20:27	21:21	6 20:48 (WEA 42 (RW)) 21:54	21:62		
21 08:23	15:52 (WEA_G1) 07:26	06:19	17:57 (WEA 03 (GRN)) 06:04	05:05	20:43 (WEA 42 (RW)) 04:42	04:52		
1 16:34	7 15:59 (WEA_G1) 17:36	18:30	7 18:04 (WEA 03 (GRN)) 20:29	21:23	6 20:49 (WEA 42 (RW)) 21:54	21:62		
22 08:21	15:53 (WEA_G1) 07:24	06:16	17:57 (WEA 03 (GRN)) 06:01	05:03	20:44 (WEA 42 (RW)) 04:43	04:52		
1 16:35	8 16:01 (WEA_G1) 17:38	18:32	8 18:05 (WEA 03 (GRN)) 20:31	21:24	7 20:51 (WEA 42 (RW)) 21:54	21:62		
23 08:20	15:52 (WEA_G1) 07:22	06:14	17:58 (WEA 03 (GRN)) 05:59	05:02	20:45 (WEA 42 (RW)) 04:43	04:52		
1 16:37	11 16:03 (WEA_G1) 17:40	18:34	10 18:08 (WEA 03 (GRN)) 20:33	21:26	6 20:51 (WEA 42 (RW)) 21:54	21:62		
24 08:19	15:52 (WEA_G1) 07:19	06:11	17:59 (WEA 03 (GRN)) 05:57	05:00	20:47 (WEA 42 (RW)) 04:43	04:52		
1 16:39	13 16:05 (WEA_G1) 17:42	18:36	6 18:05 (WEA 03 (GRN)) 20:34	21:27	3 20:50 (WEA 42 (RW)) 21:55	21:62		
25 08:17	15:52 (WEA_G1) 07:17	06:09	05:54	04:59	04:43	04:52	04:52	
1 16:41	16 16:08 (WEA_G1) 17:44	18:38	06:06	20:36	21:29	21:55	21:62	
26 08:16	15:52 (WEA_G1) 07:15	06:06	05:52	04:58	04:44	04:52	04:52	
1 16:43	17 16:09 (WEA_G1) 17:46	18:40	06:04	20:38	21:30	21:55	21:62	
27 08:14	15:52 (WEA_G1) 07:12	06:04	18:14 (WEA 02 (GRN)) 05:50	04:56	04:44	04:52	04:52	
1 16:45	19 16:11 (WEA_G1) 17:48	18:42	1 18:15 (WEA 02 (GRN)) 20:40	21:32	21:54	21:62	21:62	
28 08:13	15:53 (WEA_G1) 07:10	06:02	18:13 (WEA 02 (GRN)) 05:48	04:55	04:45	04:52	04:52	
1 16:47	21 16:14 (WEA_G1) 17:50	18:44	3 18:16 (WEA 02 (GRN)) 20:42	21:33	21:54	21:62	21:62	
29 08:11	15:53 (WEA_G1)	06:59	19:14 (WEA 02 (GRN)) 05:46	04:54	04:45	04:52	04:52	
1 16:49	23 16:16 (WEA_G1)	19:45	5 19:19 (WEA 02 (GRN)) 20:44	21:35	21:54	21:62	21:62	
30 08:09	15:54 (WEA_G1)	06:57	19:16 (WEA 02 (GRN)) 05:44	04:53	04:46	04:52	04:52	
1 16:51	22 16:16 (WEA_G1)	19:47	3 19:19 (WEA 02 (GRN)) 20:46	21:36	21:54	21:62	21:62	
31 08:08	15:54 (WEA_G1)	06:54			04:52	21:00 (WEA 404)		
1 16:53	21 16:15 (WEA_G1)	19:49			21:37	21:02 (WEA 404)		
	Sonnenscheinstunden 249					496		513
	astr. max.mögl. Beschattung 249	604	92	143	7	38		296

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

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 12 - IO 12 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 Sonneneinstrahlungsrichtung
- 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	19:39 (WEA 43 (RW))	07:17	18:09 (WEA 07 (GRN))	07:16		08:12	14:37 (WEA G2)					
	21:53	11	21:17 (WEA K04)	21:17	20:10	2	19:41 (WEA 43 (RW))	18:55	14	18:23 (WEA 07 (GRN))	16:44	15:58	24	15:01 (WEA G2)		
2	04:47	21:07 (WEA K04)	05:29	06:24			07:19	18:07 (WEA 07 (GRN))	07:18		08:14	14:38 (WEA G2)				
	21:53	10	21:17 (WEA K04)	21:16	20:07		18:53	15	18:22 (WEA 07 (GRN))	16:42	15:58	24	15:02 (WEA G2)			
3	04:48	21:07 (WEA K04)	05:31	06:26			07:21	18:07 (WEA 07 (GRN))	07:20		08:15	14:38 (WEA G2)				
	21:53	10	21:17 (WEA K04)	21:14	20:05		18:50	14	18:21 (WEA 07 (GRN))	16:40	15:57	25	15:03 (WEA G2)			
4	04:49	21:07 (WEA K04)	05:32	06:28			07:22	18:06 (WEA 07 (GRN))	07:22		08:17	14:37 (WEA G2)				
	21:52	9	21:16 (WEA K04)	21:12	20:03		18:48	13	18:19 (WEA 07 (GRN))	16:38	15:56	26	15:03 (WEA G2)			
5	04:50	21:08 (WEA K04)	05:34	06:30			07:24	18:06 (WEA 07 (GRN))	07:24		08:18	14:38 (WEA G2)				
	21:52	8	21:16 (WEA K04)	21:10	20:00		18:45	10	18:16 (WEA 07 (GRN))	16:36	15:56	26	15:04 (WEA G2)			
6	04:51	21:07 (WEA K04)	05:36	06:32			07:26	18:07 (WEA 07 (GRN))	07:26		15:33 (WEA G1)	08:19	27	15:05 (WEA G2)		
	21:51	8	21:15 (WEA K04)	21:08	19:58		18:43	7	18:14 (WEA 07 (GRN))	16:34	15:30 (WEA G1)	08:21	28	15:06 (WEA G2)		
7	04:52	21:07 (WEA K04)	05:38	06:33			07:28	18:08 (WEA 07 (GRN))	07:28		15:30 (WEA G1)	08:21	28	15:07 (WEA G2)		
	21:50	7	21:14 (WEA K04)	21:06	19:55		18:40	3	18:11 (WEA 07 (GRN))	16:32	15:28 (WEA G1)	08:22	28	15:08 (WEA G2)		
8	04:53	21:07 (WEA K04)	05:39	06:35			07:30		07:30		15:28 (WEA G1)	08:25	28	15:09 (WEA G2)		
	21:50	7	21:14 (WEA K04)	21:04	19:53		18:38		16:30	16	15:44 (WEA G1)	08:25	28	15:06 (WEA G2)		
9	04:54	21:07 (WEA K04)	05:41	06:37			07:32		07:32		15:27 (WEA G1)	08:23	28	15:09 (WEA G2)		
	21:49	6	21:13 (WEA K04)	21:02	19:50		18:36		16:28	18	15:45 (WEA G1)	08:24	28	15:07 (WEA G2)		
10	04:55	21:08 (WEA K04)	05:43	06:39			07:34		07:34		15:26 (WEA G1)	08:25	28	15:08 (WEA G2)		
	21:48	4	21:12 (WEA K04)	21:00	19:48		18:33		16:26	20	15:46 (WEA G1)	08:25	28	15:07 (WEA G2)		
11	04:56	21:08 (WEA K04)	05:45	06:41			07:35		07:36		15:26 (WEA G1)	08:26	28	15:09 (WEA G2)		
	21:47	3	21:11 (WEA K04)	20:58	19:45		18:31		16:25	21	15:47 (WEA G1)	08:26	29	15:08 (WEA G2)		
12	04:57	21:09 (WEA K04)	05:47	06:42			07:37		07:38		15:26 (WEA G1)	08:27	29	15:09 (WEA G2)		
	21:46	2	21:11 (WEA K04)	20:56	19:43		18:28		16:23	22	15:48 (WEA G1)	08:27	30	15:08 (WEA G2)		
13	04:59	21:09 (WEA K04)	05:49	06:44			07:39		07:40		15:25 (WEA G1)	08:28	30	15:09 (WEA G2)		
	21:45	1	21:10 (WEA K04)	20:54	19:40		18:26		16:21	23	15:48 (WEA G1)	08:28	31	15:08 (WEA G2)		
14	05:00	21:10 (WEA K04)	05:50	06:46			07:41		07:42		15:25 (WEA G1)	08:29	31	15:09 (WEA G2)		
	21:44		20:51	19:38	5	19:10 (WEA 02 (GRN))	18:24		16:20	21	15:46 (WEA G1)	08:29	40	15:09 (WEA G2)		
15	05:01	21:05	05:52	06:48			19:04 (WEA 02 (GRN))	18:24		16:20	21	15:46 (WEA G1)	08:30	40	15:09 (WEA G2)	
	21:43		20:49	19:35	3	19:07 (WEA 02 (GRN))	18:21		16:18	19	15:44 (WEA G1)	08:30	40	15:09 (WEA G2)		
16	05:03	21:04	05:54	06:50			19:02 (WEA 02 (GRN))	18:19		16:16	17	15:42 (WEA G1)	08:31	42	15:10 (WEA G2)	
	21:42		20:47	19:33	2	19:04 (WEA 02 (GRN))	18:19		16:16	17	15:42 (WEA G1)	08:31	42	15:10 (WEA G2)		
17	05:04	21:04	05:56	06:51			19:04 (WEA 02 (GRN))	18:19		16:16	17	15:42 (WEA G1)	08:31	42	15:10 (WEA G2)	
	21:41		20:45	19:30			18:17		16:15	16	15:41 (WEA G1)	08:31	42	15:10 (WEA G2)		
18	05:05	21:05	05:57	06:52			19:05 (WEA 02 (GRN))	18:17		16:15	16	15:41 (WEA G1)	08:31	42	15:10 (WEA G2)	
	21:39		20:43	19:28			18:14		16:13	13	15:39 (WEA G1)	08:32	44	15:11 (WEA G2)		
19	05:07	21:06	05:59	06:55			19:06 (WEA 02 (GRN))	18:12		16:12	11	15:37 (WEA G1)	08:33	44	15:11 (WEA G2)	
	21:38		20:40	19:25	4	18:48 (WEA 03 (GRN))	18:12		16:12	11	15:37 (WEA G1)	08:33	44	15:11 (WEA G2)		
20	05:08	20:56 (WEA 42 (RW))	06:01	06:57			18:44 (WEA 03 (GRN))	18:10		16:11	8	15:35 (WEA G1)	08:34	45	15:12 (WEA G2)	
	21:37	5	21:01 (WEA 42 (RW))	20:38	19:23	9	18:53 (WEA 03 (GRN))	18:10		16:11	8	15:35 (WEA G1)	08:34	45	15:12 (WEA G2)	
21	05:10	20:54 (WEA 42 (RW))	06:03	06:59			18:43 (WEA 03 (GRN))	18:09		16:10	7	15:34 (WEA G1)	08:34	45	15:12 (WEA G2)	
	21:35	8	21:02 (WEA 42 (RW))	20:36	19:20	8	18:51 (WEA 03 (GRN))	18:07		16:09	7	15:34 (WEA G1)	08:34	45	15:13 (WEA G2)	
22	05:11	20:53 (WEA 42 (RW))	06:05	07:00			18:42 (WEA 03 (GRN))	18:07		16:09	7	15:34 (WEA G1)	08:34	45	15:13 (WEA G2)	
	21:34	7	21:00 (WEA 42 (RW))	20:34	19:18	7	18:49 (WEA 03 (GRN))	18:05		16:08	4	15:33 (WEA G1)	08:35	45	15:13 (WEA G2)	
23	05:13	20:53 (WEA 42 (RW))	06:06	07:01			18:42 (WEA 03 (GRN))	18:04		16:07	2	15:31 (WEA G1)	08:35	45	15:14 (WEA G2)	
	21:32	6	20:59 (WEA 42 (RW))	20:31	19:15	5	18:47 (WEA 03 (GRN))	18:03		16:07	2	15:31 (WEA G1)	08:35	45	15:14 (WEA G2)	
24	05:14	20:53 (WEA 42 (RW))	06:08	07:04			18:42 (WEA 03 (GRN))	18:02		16:06	1	15:29 (WEA G1)	08:36	45	15:14 (WEA G2)	
	21:31	4	20:57 (WEA 42 (RW))	20:29	19:13	2	18:44 (WEA 03 (GRN))	18:01		16:05	10	14:42 (WEA G2)	08:36	45	15:14 (WEA G2)	
25	05:16	20:53 (WEA 42 (RW))	06:10	07:06			18:42 (WEA 03 (GRN))	18:01		16:05	10	14:42 (WEA G2)	08:36	45	15:14 (WEA G2)	
	21:29	4	20:57 (WEA 42 (RW))	20:27	19:10		18:40 (WEA 03 (GRN))	18:00		16:04	13	14:54 (WEA G2)	08:37	44	15:14 (WEA G2)	
26	05:17	20:52 (WEA 42 (RW))	06:12	07:07			18:40 (WEA 03 (GRN))	18:00		16:04	13	14:54 (WEA G2)	08:37	44	15:14 (WEA G2)	
	21:28	3	20:55 (WEA 42 (RW))	20:24	19:08		18:38 (WEA 03 (GRN))	18:00		16:03	16	14:56 (WEA G2)	08:37	43	15:14 (WEA G2)	
27	05:19	20:53 (WEA 42 (RW))	06:14	07:10			18:36 (WEA 03 (GRN))	18:00		16:03	16	14:56 (WEA G2)	08:37	43	15:14 (WEA G2)	
	21:26	1	20:54 (WEA 42 (RW))	20:22	19:05		18:34 (WEA 03 (GRN))	18:00		16:02	18	14:57 (WEA G2)	08:37	43	15:15 (WEA G2)	
28	05:21	20:51	06:15	07:11			18:33 (WEA 03 (GRN))	18:00		16:02	18	14:57 (WEA G2)	08:37	43	15:15 (WEA G2)	
	21:24		20:19	19:03	1	18:34 (WEA 05 (GRN))	18:00		16:02	21	14:59 (WEA G2)	08:37	41	15:16 (WEA G2)		
29	05:22	20:51	06:17	07:13			18:32 (WEA 05 (GRN))	18:00		16:02	21	14:59 (WEA G2)	08:37	41	15:16 (WEA G2)	
	21:23		20:17	19:00	7	18:20 (WEA 07 (GRN))	18:00		16:00	22	15:00 (WEA G2)	08:37	41	15:17 (WEA G2)		
30	05:24	20:52	06:19	07:15			18:30 (WEA 07 (GRN))	18:00		16:00	22	15:00 (WEA G2)	08:37	41	15:17 (WEA G2)	
	21:21		20:15	3	19:46 (WEA 43 (RW))	18:58	12	18:22 (WEA 07 (GRN))	18:00		15:59	23	15:01 (WEA G2)	16:01	37	15:16 (WEA G2)
31	05:26	20:52	06:21	07:16			18:30 (WEA 07 (GRN))	18:00		16:00	22	15:00 (WEA G2)	08:37	41	15:17 (WEA G2)	
	21:19		20:12	3	19:44 (WEA 43 (RW))	18:56	12	18:20 (WEA 07 (GRN))	18:00		15:59	23	15:01 (WEA G2)	16:01	37	15:16 (WEA G2)
Sonnenscheinstunden	515		481		383		328		257		231		162		36	15:17 (WEA G2)
astr.zmax.mögl.Beschattung	124		6		67		99		380		1124					

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 13 - IO 13 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 Sonneneinstrahlungsrichtung

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	06:52	19:22 (WEA_O2 (GRN)) 05:41	04:51
16:03	52 15:25 (WEA_G2) 16:55	17 16:22 (WEA_G1) 17:52	19:51	2 19:24 (WEA_O2 (GRN)) 20:47	21:38
2 08:37 14:03 (WEA_G3) 08:04		16:05 (WEA_G1) 07:05	06:49	19:23 (WEA_O2 (GRN)) 05:39	04:50
16:04	52 15:26 (WEA_G2) 16:57	20 16:25 (WEA_G1) 17:54	19:53	3 19:26 (WEA_O2 (GRN)) 20:49	21:40
3 08:37 14:03 (WEA_G3) 08:03		16:06 (WEA_G1) 07:03	06:47	19:23 (WEA_O2 (GRN)) 05:37	04:49
16:05	52 15:27 (WEA_G2) 16:59	21 16:27 (WEA_G1) 17:56	19:55	4 19:27 (WEA_O2 (GRN)) 20:51	21:41
4 08:36 14:04 (WEA_G3) 08:01		16:06 (WEA_G1) 07:01	06:44	05:35	04:48
16:06	53 15:29 (WEA_G2) 17:01	23 16:29 (WEA_G1) 17:58	19:57	20:53	21:42
5 08:36 14:05 (WEA_G3) 07:59		16:06 (WEA_G1) 06:58	06:42	05:33	04:47
16:08	53 15:30 (WEA_G2) 17:03	22 16:28 (WEA_G1) 18:00	19:59	20:55	21:43
6 08:36 14:05 (WEA_G3) 07:57		16:07 (WEA_G1) 06:56	06:39	05:31	04:47
16:09	54 15:31 (WEA_G2) 17:05	21 16:28 (WEA_G1) 18:02	20:01	20:57	21:44
7 08:35 14:07 (WEA_G3) 07:55		16:08 (WEA_G1) 06:53	06:37	05:29	04:46
16:10	52 15:33 (WEA_G2) 17:07	19 16:27 (WEA_G1) 18:03	20:02	20:59	21:45
8 08:35 14:08 (WEA_G3) 07:53		16:09 (WEA_G1) 06:51	06:34	05:27	04:45
16:12	53 15:35 (WEA_G2) 17:09	17 16:26 (WEA_G1) 18:05	20:04	21:00	21:46
9 08:34 14:09 (WEA_G3) 07:51		16:11 (WEA_G1) 06:49	06:32	05:25	04:45
16:13	51 15:35 (WEA_G2) 17:11	14 16:25 (WEA_G1) 18:07	20:06	21:02	21:47
10 08:33 14:11 (WEA_G3) 07:49		16:14 (WEA_G1) 06:46	06:30	05:23	04:44
16:15	50 15:36 (WEA_G2) 17:13	9 16:23 (WEA_G1) 18:09	20:08	21:04	21:48
11 08:33 14:12 (WEA_G3) 07:47		06:44	06:22	05:22	04:44
16:16	48 15:36 (WEA_G2) 17:15	18 16:11	20:10	21:06	21:49
12 08:32 14:14 (WEA_G3) 07:45		06:41	06:25	05:20	04:43
16:18	43 15:36 (WEA_G2) 17:17	18 16:13	20:12	21:07	21:50
13 08:31 14:17 (WEA_G3) 07:43		06:39	06:22	05:18	04:43
16:20	40 15:37 (WEA_G2) 17:19	18 16:15	20:14	21:09	21:50
14 08:30 14:18 (WEA_G3) 07:41		06:36	17:47 (WEA_O7 (GRN)) 06:20	05:16	04:43
16:21	29 15:37 (WEA_G2) 17:21	18 16:17	3 17:50 (WEA_O7 (GRN)) 20:16	21:11	21:51
15 08:29 15:09 (WEA_G2) 07:39		06:34	17:46 (WEA_O7 (GRN)) 06:18	05:14	04:42
16:23	28 15:37 (WEA_G2) 17:24	18 16:19	6 17:52 (WEA_O7 (GRN)) 20:17	21:13	21:52
16 08:28 15:10 (WEA_G2) 07:37		06:31	17:44 (WEA_O7 (GRN)) 06:15	05:13	04:42
16:25	28 15:38 (WEA_G2) 17:26	18 16:21	10 17:54 (WEA_O7 (GRN)) 20:19	21:14	21:52
17 08:27 15:11 (WEA_G2) 07:35		06:29	17:44 (WEA_O7 (GRN)) 06:13	3 19:52 (WEA_A3 (RW)) 05:11	04:42
16:26	27 15:38 (WEA_G2) 17:28	18 16:23	12 17:56 (WEA_O7 (GRN)) 20:21	3 19:53 (WEA_A3 (RW)) 21:16	21:53
18 08:26 15:11 (WEA_G2) 07:33		06:26	17:44 (WEA_O7 (GRN)) 06:10	05:09	04:42
16:28	26 15:37 (WEA_G2) 17:30	18 16:25	14 17:58 (WEA_O7 (GRN)) 20:23	21:18	21:53
19 08:25 15:12 (WEA_G2) 07:30		06:24	17:44 (WEA_O7 (GRN)) 06:08	05:08	04:42
16:30	25 15:37 (WEA_G2) 17:32	18 16:27	15 17:59 (WEA_O7 (GRN)) 20:25	21:19	21:53
20 08:24 15:12 (WEA_G2) 07:28		17:03 (WEA_O8 (GRN)) 06:21	17:44 (WEA_O7 (GRN)) 06:06	05:06	04:42
16:32	24 15:36 (WEA_G2) 17:34	2 17:05 (WEA_O8 (GRN)) 18:28	13 17:57 (WEA_O7 (GRN)) 20:27	21:21	21:54
21 08:23 15:14 (WEA_G2) 07:26		17:02 (WEA_O8 (GRN)) 06:19	17:46 (WEA_O7 (GRN)) 06:04	05:05	04:42
16:34	23 15:37 (WEA_G2) 17:36	5 17:07 (WEA_O8 (GRN)) 18:30	10 17:56 (WEA_O7 (GRN)) 20:29	21:23	21:54
22 08:21 15:14 (WEA_G2) 07:24		17:03 (WEA_O8 (GRN)) 06:16	17:48 (WEA_O7 (GRN)) 06:01	05:03	04:43
16:35	22 15:36 (WEA_G2) 17:38	6 17:09 (WEA_O8 (GRN)) 18:32	5 17:53 (WEA_O7 (GRN)) 20:31	21:24	21:54
23 08:20 15:16 (WEA_G2) 07:22		17:05 (WEA_O8 (GRN)) 06:14	17:46 (WEA_O7 (GRN)) 06:00	05:02	04:43
16:37	19 15:35 (WEA_G2) 17:40	7 17:12 (WEA_O8 (GRN)) 18:34	20:33	2 20:52 (WEA_A4 (RW)) 21:54	21:54
24 08:19 15:17 (WEA_G2) 07:19		17:06 (WEA_O8 (GRN)) 06:11	06:57	05:00	04:43
16:39	17 15:34 (WEA_G2) 17:42	4 17:10 (WEA_O8 (GRN)) 18:36	20:34	21:27	2 20:53 (WEA_A4 (RW)) 21:55
25 08:17 15:20 (WEA_G2) 07:17		06:09	18:09 (WEA_O3 (GRN)) 05:54	04:59	20:51 (WEA_A4 (RW)) 04:43
16:41	13 15:33 (WEA_G2) 17:44	18 16:08	2 18:11 (WEA_O3 (GRN)) 20:36	21:29	4 20:55 (WEA_A4 (RW)) 21:55
26 08:16 15:23 (WEA_G2) 07:15		06:06	18:08 (WEA_O3 (GRN)) 05:52	04:58	20:52 (WEA_A4 (RW)) 04:44
16:43	9 16:09 (WEA_G1) 17:46	18 16:40	5 18:13 (WEA_O3 (GRN)) 20:38	21:30	4 20:56 (WEA_A4 (RW)) 21:55
27 08:14 16:06 (WEA_G1) 07:12		06:04	18:08 (WEA_O3 (GRN)) 05:50	04:57	20:53 (WEA_A4 (RW)) 04:44
16:45	5 16:11 (WEA_G1) 17:48	18 16:42	7 18:15 (WEA_O3 (GRN)) 20:40	21:32	5 20:58 (WEA_A4 (RW)) 21:54
28 08:13 16:06 (WEA_G1) 07:10		06:02	18:08 (WEA_O3 (GRN)) 05:48	04:55	20:53 (WEA_A4 (RW)) 04:45
16:47	8 16:14 (WEA_G1) 17:50	18 16:44	8 18:16 (WEA_O3 (GRN)) 20:42	21:33	6 20:59 (WEA_A4 (RW)) 21:54
29 08:11 16:06 (WEA_G1) 07:07		06:59	19:10 (WEA_O3 (GRN)) 05:46	04:54	20:54 (WEA_A4 (RW)) 04:45
16:49	10 16:16 (WEA_G1) 17:54	19 16:45	8 19:18 (WEA_O3 (GRN)) 20:44	21:35	6 21:00 (WEA_A4 (RW)) 21:54
30 08:09 16:05 (WEA_G1) 07:05		06:57	19:12 (WEA_O3 (GRN)) 05:44	04:53	20:56 (WEA_A4 (RW)) 04:46
16:51	13 16:18 (WEA_G1) 17:59	19 16:47	2 19:14 (WEA_O3 (GRN)) 20:46	21:36	2 20:58 (WEA_A4 (RW)) 21:54
31 08:08 16:53 (WEA_G1) 07:03		06:54	19:49	04:52	21:37
16:53	15 16:20 (WEA_G1) 17:59	06:51	19:49	04:50	21:37
Sonnenscheinstunden 249	272	387	421	496	513
astr. max. mögl. Beschattung 994	207	120	15	31	134

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		

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 13 - IO 13 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	04:47																
1	21:53	5	21:12 (WEA K04)	05:27		06:23		07:17		07:16	15:43 (WEA G1)	08:12	13:54 (WEA G3)				
2	04:47																
2	21:53	4	21:17 (WEA K04)	05:29		06:24		07:19		07:18	15:40 (WEA G1)	08:14	13:54 (WEA G3)				
3	04:48																
3	21:53																
4	04:49																
4	21:52	4	21:13 (WEA K04)	05:31		06:26		07:21		07:20	15:39 (WEA G1)	08:15	13:53 (WEA G3)				
5	04:50																
5	21:52																
6	04:51																
6	21:51	2	21:13 (WEA K04)	05:32		06:28		07:22		07:22	15:38 (WEA G1)	08:17	13:52 (WEA G3)				
7	04:52																
7	21:50																
8	04:53																
8	21:50																
9	04:54																
9	21:49																
10	04:55																
10	21:48																
11	04:56																
11	21:47																
12	04:57																
12	21:46																
13	04:59																
13	21:45																
14	05:00																
14	21:44	4	21:04 (WEA 42 (RW))	05:30		06:46		07:41		07:42	15:38 (WEA G1)	08:29	13:52 (WEA G3)				
15	05:01																
15	21:43	6	21:08 (WEA 42 (RW))	05:32		06:48		07:43		07:44	15:39 (WEA G1)	08:30	13:52 (WEA G3)				
16	05:03																
16	21:42	6	21:07 (WEA 42 (RW))	05:34		06:50		07:45		07:45	15:44 (WEA G1)	08:31	13:53 (WEA G3)				
17	05:04																
17	21:41	5	21:07 (WEA 42 (RW))	05:36		06:51		07:47		07:47	15:43 (WEA G1)	08:32	13:53 (WEA G3)				
18	05:05																
18	21:39	4	21:05 (WEA 42 (RW))	05:37		06:53		07:49		07:49	15:44 (WEA G1)	08:33	13:54 (WEA G3)				
19	05:07																
19	21:38	3	21:04 (WEA 42 (RW))	05:39		06:55		07:51		07:51	15:45 (WEA G1)	08:34	13:54 (WEA G3)				
20	05:08																
20	21:37	2	21:03 (WEA 42 (RW))	05:40		06:57		07:53		07:53	15:46 (WEA G1)	08:35	13:54 (WEA G3)				
21	05:10																
21	21:35	1	21:02 (WEA 42 (RW))	05:41		06:59		07:55		07:55	15:47 (WEA G1)	08:36	13:55 (WEA G3)				
22	05:11																
22	21:34																
23	05:13																
23	21:32																
24	05:14																
24	21:31																
25	05:16																
25	21:29																
26	05:17																
26	21:28																
27	05:19																
27	21:26																
28	05:21																
28	21:24																
29	05:22																
29	21:23																
30	05:24																
30	21:21																
31	05:26																
31	21:19																
Sonnenscheinstunden		51		5		383		128		24		257		607		1588	
astr. max.mögl. Beschattung																	

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

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

SWP Windpark Großholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großholz (3 x V150-6.0) **Schattenrezeptor:** IO 14 - IO 14 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni	
1 08:37	14-14 (WEA_G3) 08:06	15-36 (WEA_G2) 07:08	17-17 (WEA_08 (GRN)) 06:52	19-17 (WEA_03 (GRN)) 05:41	20:59 (WEA_42 (RW)) 04:51	
1 16:03	44 15:25 (WEA_G2) 16:55	13 16:22 (WEA_G1) 17:52	5 17:22 (WEA_08 (GRN)) 19:51	7 19:24 (WEA_03 (GRN)) 20:47	4 21:03 (WEA_42 (RW)) 21:38	
2 08:37	14-15 (WEA_G3) 08:04	16:18 (WEA_G1) 07:05	19:53	8 19:18 (WEA_03 (GRN)) 05:39	4 21:00 (WEA_42 (RW)) 04:50	
3 16:04	43 15:26 (WEA_G2) 16:57	16:25 (WEA_G1) 17:54	19:53	8 19:26 (WEA_03 (GRN)) 20:49	4 21:04 (WEA_42 (RW)) 21:40	
3 08:37	14-15 (WEA_G3) 08:03	16:18 (WEA_G1) 07:03	19:53	19:19 (WEA_03 (GRN)) 05:37	4 21:02 (WEA_42 (RW)) 04:49	
3 16:05	45 15:27 (WEA_G2) 16:59	16:27 (WEA_G1) 17:56	19:55	6 19:25 (WEA_03 (GRN)) 20:51	4 21:06 (WEA_42 (RW)) 21:41	
4 08:36	14-16 (WEA_G3) 08:01	16:17 (WEA_G1) 07:01	19:54	19:30 (WEA_02 (GRN)) 05:33	4 21:03 (WEA_42 (RW)) 04:48	
4 16:06	46 15:29 (WEA_G2) 17:01	16:29 (WEA_G1) 17:58	19:57	19:32 (WEA_02 (GRN)) 20:53	3 21:06 (WEA_42 (RW)) 21:42	
5 08:36	14-16 (WEA_G3) 07:59	16:17 (WEA_G1) 06:58	19:57	2 19:32 (WEA_02 (GRN)) 20:55	21:47	
5 16:08	46 15:30 (WEA_G2) 17:03	16:31 (WEA_G1) 18:00	19:59	3 19:30 (WEA_02 (GRN)) 20:57	21:43	
6 08:36	14-16 (WEA_G3) 07:57	16:17 (WEA_G1) 06:56	19:59	3 19:33 (WEA_02 (GRN)) 20:57	21:44	
6 16:09	49 15:31 (WEA_G2) 17:05	16:34 (WEA_G1) 18:02	20:01	3 19:35 (WEA_02 (GRN)) 20:57	21:44	
7 08:35	14-20 (WEA_G3) 07:55	16:17 (WEA_G1) 06:53	19:57	19:32 (WEA_02 (GRN)) 20:59	21:45	
7 16:10	49 15:33 (WEA_G2) 17:07	16:36 (WEA_G1) 18:03	20:02	3 19:35 (WEA_02 (GRN)) 20:59	21:45	
8 08:35	14-18 (WEA_G3) 07:53	16:17 (WEA_G1) 06:51	19:54	19:35 (WEA_02 (GRN)) 20:59	21:45	
8 16:12	51 15:35 (WEA_G2) 17:09	16:38 (WEA_G1) 18:05	20:04	20:02	21:46	
9 08:34	14-19 (WEA_G3) 07:51	16:18 (WEA_G1) 06:49	19:57	20:06	21:46	
9 16:13	51 15:36 (WEA_G2) 17:11	16:40 (WEA_G1) 18:07	20:06	20:06	21:47	
10 08:33	14-19 (WEA_G3) 07:49	16:18 (WEA_G1) 06:46	19:57	20:06	21:47	
10 16:15	53 15:38 (WEA_G2) 17:13	16:41 (WEA_G1) 18:09	20:08	20:08	21:48	
11 08:33	14-20 (WEA_G3) 07:47	16:19 (WEA_G1) 06:44	19:57	20:08	21:48	
11 16:16	53 15:39 (WEA_G2) 17:15	16:40 (WEA_G1) 18:11	20:10	20:10	21:49	
12 08:32	14-21 (WEA_G3) 07:45	16:20 (WEA_G1) 06:41	19:57	20:10	21:49	
12 16:18	54 15:41 (WEA_G2) 17:17	16:40 (WEA_G1) 18:13	20:12	20:12	21:50	
13 08:31	14-22 (WEA_G3) 07:43	16:22 (WEA_G1) 06:39	19:57	20:14	21:50	
13 16:20	54 15:43 (WEA_G2) 17:19	16:39 (WEA_G1) 18:15	20:14	20:14	21:50	
14 08:30	14-23 (WEA_G3) 07:41	16:23 (WEA_G1) 06:36	19:57	20:16	21:50	
14 16:21	55 15:45 (WEA_G2) 17:21	16:36 (WEA_G1) 18:17	20:16	20:16	21:51	
15 08:29	14-24 (WEA_G3) 07:39	16:25 (WEA_G1) 06:34	19:57	19:56 (WEA_43 (RW)) 05:00	1 21:51 (WEA_K04) 21:51	
15 16:23	56 15:47 (WEA_G2) 17:24	16:34 (WEA_G1) 18:19	20:17	19:57 (WEA_43 (RW)) 21:19	2 21:56 (WEA_K04) 21:52	
16 08:28	14-25 (WEA_G3) 07:37	16:26 (WEA_G1) 06:31	19:57	20:17	2 21:54 (WEA_K04) 21:52	
16 16:25	56 15:49 (WEA_G2) 17:26	16:28	19:59	20:17	2 21:54 (WEA_K04) 21:52	
17 08:27	14-27 (WEA_G3) 07:35	16:29 (WEA_G1) 06:29	19:57	20:18	2 21:54 (WEA_K04) 21:52	
17 16:26	56 15:51 (WEA_G2) 17:28	16:28	20:21	20:18	2 21:54 (WEA_K04) 21:52	
18 08:26	14-28 (WEA_G3) 07:33	16:30 (WEA_G1) 06:26	19:57	20:19	2 21:54 (WEA_K04) 21:52	
18 16:28	55 15:53 (WEA_G2) 17:30	16:25	20:23	20:18	2 21:54 (WEA_K04) 21:52	
19 08:25	14-30 (WEA_G3) 07:30	16:32 (WEA_G1) 06:24	19:57	19:56 (WEA_43 (RW)) 05:00	2 21:55 (WEA_K04) 21:53	
19 16:30	53 15:53 (WEA_G2) 17:32	16:27	20:25	19:57 (WEA_43 (RW)) 21:19	2 21:57 (WEA_K04) 21:53	
20 08:24	14-31 (WEA_G3) 07:28	16:31 (WEA_G1) 06:21	19:57	20:25	2 21:57 (WEA_K04) 21:53	
20 16:32	50 15:53 (WEA_G2) 17:34	16:28	18:00 (WEA_07 (GRN)) 06:06	20:25	2 21:57 (WEA_K04) 21:53	
21 08:23	14-34 (WEA_G3) 07:26	16:31 (WEA_G1) 06:19	19:57	18:01 (WEA_07 (GRN)) 20:27	3 21:58 (WEA_K04) 21:54	
21 16:34	46 15:54 (WEA_G2) 17:36	16:30	17:59 (WEA_07 (GRN)) 06:04	18:04 (WEA_07 (GRN)) 20:29	3 21:58 (WEA_K04) 21:54	
22 08:21	14-36 (WEA_G3) 07:24	16:32	18:05 (WEA_07 (GRN)) 06:01	17:57 (WEA_07 (GRN)) 05:58	3 21:58 (WEA_K04) 21:54	
22 16:35	40 15:53 (WEA_G2) 17:38	16:32	18:05 (WEA_07 (GRN)) 20:31	17:57 (WEA_07 (GRN)) 05:59	3 21:58 (WEA_K04) 21:54	
23 08:20	15:25 (WEA_G2) 07:21	16:34	17:57 (WEA_07 (GRN)) 05:59	18:05 (WEA_05 (GRN)) 20:33	3 21:58 (WEA_K04) 21:54	
23 16:37	29 15:54 (WEA_G2) 17:40	16:34	18:08 (WEA_05 (GRN)) 20:33	17:56 (WEA_07 (GRN)) 05:57	3 21:58 (WEA_K04) 21:54	
24 08:19	15:25 (WEA_G2) 07:19	16:34	17:56 (WEA_07 (GRN)) 05:57	18:09 (WEA_07 (GRN)) 20:34	3 21:58 (WEA_K04) 21:54	
24 16:39	28 15:53 (WEA_G2) 17:42	16:36	18:09 (WEA_07 (GRN)) 20:34	18:11 (WEA_07 (GRN)) 20:36	3 21:58 (WEA_K04) 21:54	
25 08:17	15:27 (WEA_G2) 07:17	16:36	17:57 (WEA_07 (GRN)) 05:54	17:57 (WEA_07 (GRN)) 05:52	3 21:58 (WEA_K04) 21:54	
25 16:41	27 15:54 (WEA_G2) 17:44	2 17:16 (WEA_08 (GRN)) 18:30	14 18:11 (WEA_07 (GRN)) 20:36	18:10 (WEA_07 (GRN)) 20:38	3 21:58 (WEA_K04) 21:54	
26 08:16	15:27 (WEA_G2) 07:15	16:37	17:57 (WEA_07 (GRN)) 05:52	18:10 (WEA_07 (GRN)) 20:38	3 21:58 (WEA_K04) 21:54	
26 16:43	26 15:53 (WEA_G2) 17:46	3 17:18 (WEA_08 (GRN)) 18:40	13 18:10 (WEA_07 (GRN)) 20:38	18:09 (WEA_07 (GRN)) 20:40	3 21:58 (WEA_K04) 21:54	
27 08:14	15:28 (WEA_G2) 07:12	16:38	17:58 (WEA_07 (GRN)) 05:50	18:09 (WEA_07 (GRN)) 20:40	3 21:58 (WEA_K04) 21:54	
27 16:45	25 15:53 (WEA_G2) 17:48	6 17:20 (WEA_08 (GRN)) 18:42	11 18:09 (WEA_07 (GRN)) 20:40	18:00 (WEA_07 (GRN)) 20:42	3 21:58 (WEA_K04) 21:54	
28 08:13	15:29 (WEA_G2) 07:10	7 17:22 (WEA_08 (GRN)) 18:44	6 18:06 (WEA_07 (GRN)) 20:42	20:42	3 21:58 (WEA_K04) 21:54	
28 16:47	24 15:53 (WEA_G2) 17:50	7 17:22 (WEA_08 (GRN)) 18:44	6 18:06 (WEA_07 (GRN)) 20:42	20:42	3 21:58 (WEA_K04) 21:54	
29 08:11	15:31 (WEA_G2) 07:08	16:39	17:59 (WEA_07 (GRN)) 05:48	18:06 (WEA_07 (GRN)) 20:42	3 21:58 (WEA_K04) 21:54	
29 16:49	21 15:52 (WEA_G2) 17:52	16:40	18:07 (WEA_07 (GRN)) 20:42	19:45	3 21:58 (WEA_K04) 21:54	
30 08:09	15:32 (WEA_G2) 07:06	16:40	19:18 (WEA_03 (GRN)) 05:44	19:45	3 21:58 (WEA_K04) 21:54	
30 16:51	18 15:50 (WEA_G2) 17:54	16:41	19:20 (WEA_03 (GRN)) 20:46	19:45	3 21:58 (WEA_K04) 21:54	
31 08:08	15:34 (WEA_G2) 07:04	16:42	19:18 (WEA_03 (GRN)) 05:42	20:46	3 21:58 (WEA_K04) 21:54	
31 16:53	15 15:49 (WEA_G2) 17:58	16:43	19:22 (WEA_03 (GRN)) 20:48	20:46	3 21:58 (WEA_K04) 21:54	
Sommerscheinstunden 248		272		421		513
astr max mögl Beschattung 1320		255		93		44

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		

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 14 - IO 14 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 Sonneneinstrahlungsrichtung
- 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)					
1	21:53		21:17		20:10		18:55		16:44	22	16:10 (WEA G1)	15:58	53	15:21 (WEA G2)			
2	04:47		05:29		06:24		07:19		07:18		15:47 (WEA G1)	08:14		14:02 (WEA G3)			
2	21:53		21:16		20:07		18:53		16:42	23	16:10 (WEA G1)	15:58	53	15:21 (WEA G2)			
3	04:48		05:31		06:26		07:21		07:20		15:47 (WEA G1)	08:15		14:03 (WEA G3)			
3	21:53		21:14		20:05		18:50		16:40	20	16:07 (WEA G1)	15:57	51	15:20 (WEA G2)			
4	04:49		05:32		06:28		07:22		07:22		15:47 (WEA G1)	08:17		14:02 (WEA G3)			
4	21:52		21:12		20:03		18:48		16:38	18	16:05 (WEA G1)	15:56	52	15:19 (WEA G2)			
5	04:50		05:34		06:30		19:28 (WEA 02 (GRN))	07:24	07:24		15:48 (WEA G1)	08:18		14:03 (WEA G3)			
5	21:52		21:10		20:00		19:31 (WEA 02 (GRN))	18:45	16:36	16	16:04 (WEA G1)	15:56	49	15:18 (WEA G2)			
6	04:51		05:36		06:32	3	19:26 (WEA 02 (GRN))	07:26	07:26		15:48 (WEA G1)	08:19		14:02 (WEA G3)			
6	21:51		21:08		19:58	3	19:29 (WEA 02 (GRN))	18:43	16:34	14	16:02 (WEA G1)	15:55	49	15:17 (WEA G2)			
7	04:52		05:38		06:33	3	19:25 (WEA 02 (GRN))	07:28	07:28		15:48 (WEA G1)	08:21		14:03 (WEA G3)			
7	21:50		21:06		19:55	2	19:27 (WEA 02 (GRN))	18:40	16:32	12	16:00 (WEA G1)	15:55	48	15:17 (WEA G2)			
8	04:53		05:39		06:35		19:27	07:30	07:30		15:49 (WEA G1)	08:22		14:03 (WEA G3)			
8	21:50		21:04		19:53		18:38		16:30	8	15:57 (WEA G1)	15:54	46	15:16 (WEA G2)			
9	04:54		21:08 (WEA 42 (RW))		05:41		19:13 (WEA 03 (GRN))	07:32	07:32		15:49 (WEA G1)	08:23		14:04 (WEA G3)			
9	21:49	5	21:13 (WEA 42 (RW))		21:02		19:19 (WEA 03 (GRN))	18:36	16:28	6	15:55 (WEA G1)	15:54	45	15:16 (WEA G2)			
10	04:55		21:08 (WEA 42 (RW))		05:43		19:11 (WEA 03 (GRN))	07:34	07:34		15:07 (WEA G2)	08:25		14:04 (WEA G3)			
10	21:48	4	21:12 (WEA 42 (RW))		21:00		19:19 (WEA 03 (GRN))	18:33	16:26	13	15:53 (WEA G1)	15:53	45	15:16 (WEA G2)			
11	04:56		21:07 (WEA 42 (RW))		05:45		19:10 (WEA 03 (GRN))	07:35	07:36		15:05 (WEA G2)	08:26		14:04 (WEA G3)			
11	21:47	4	21:11 (WEA 42 (RW))		20:58		19:17 (WEA 03 (GRN))	18:31	16:25	16	15:21 (WEA G2)	15:53	44	15:15 (WEA G2)			
12	04:57		21:08 (WEA 42 (RW))		05:47		19:09 (WEA 03 (GRN))	07:37	07:38		15:04 (WEA G2)	08:27		14:04 (WEA G3)			
12	21:46	3	21:11 (WEA 42 (RW))		20:56		19:14 (WEA 03 (GRN))	18:28	16:23	18	15:22 (WEA G2)	15:53	42	15:14 (WEA G2)			
13	04:59		21:07 (WEA 42 (RW))		05:48		19:09 (WEA 03 (GRN))	07:39	07:40		17:50 (WEA 08 (GRN))	07:40		14:04 (WEA G3)			
13	21:45	3	21:10 (WEA 42 (RW))		20:54		19:12 (WEA 03 (GRN))	18:26	16:21	22	15:24 (WEA G2)	15:53	42	15:14 (WEA G2)			
14	05:00		21:07 (WEA 42 (RW))		05:50		19:09 (WEA 03 (GRN))	07:41	07:42		17:48 (WEA 08 (GRN))	07:42		14:05 (WEA G3)			
14	21:44	2	21:09 (WEA 42 (RW))		20:51		19:10 (WEA 03 (GRN))	18:24	16:20	6	17:54 (WEA 08 (GRN))	16:20	24	15:25 (WEA G2)	15:53	40	14:45 (WEA G3)
15	05:01		21:06 (WEA 42 (RW))		05:52		18:51 (WEA 07 (GRN))	07:43	07:44		17:47 (WEA 08 (GRN))	07:44		14:05 (WEA G3)			
15	21:43	2	21:08 (WEA 42 (RW))		20:49		18:55 (WEA 07 (GRN))	18:21	16:17	5	17:52 (WEA 08 (GRN))	16:10	24	15:25 (WEA G2)	15:53	41	14:46 (WEA G3)
16	05:03		21:06 (WEA 42 (RW))		05:54		18:47 (WEA 07 (GRN))	07:45	07:45		17:47 (WEA 08 (GRN))	07:45		14:06 (WEA G3)			
16	21:42	1	21:07 (WEA 42 (RW))		20:47		18:57 (WEA 07 (GRN))	18:19	16:16	2	17:49 (WEA 08 (GRN))	16:16	26	15:26 (WEA G2)	15:53	40	14:46 (WEA G3)
17	05:04		20:45		05:56		18:46 (WEA 07 (GRN))	07:47	07:47		15:00 (WEA G2)	08:32		14:06 (WEA G3)			
17	21:41		20:45		19:30	12	18:58 (WEA 07 (GRN))	18:17	16:15	27	15:27 (WEA G2)	15:53	41	14:47 (WEA G3)			
18	05:05		05:57		06:53		18:45 (WEA 07 (GRN))	07:49	07:49		14:59 (WEA G2)	08:32		14:07 (WEA G3)			
18	21:39		20:43		19:28	14	18:59 (WEA 07 (GRN))	18:14	16:13	28	15:27 (WEA G2)	15:53	41	14:48 (WEA G3)			
19	05:07		05:59		06:55		18:44 (WEA 07 (GRN))	07:51	07:51		14:59 (WEA G2)	08:33		14:08 (WEA G3)			
19	21:38		20:40		19:25	13	18:57 (WEA 07 (GRN))	18:12	16:12	29	15:28 (WEA G2)	15:53	40	14:48 (WEA G3)			
20	05:08		06:01		06:57		18:43 (WEA 07 (GRN))	07:53	07:53		14:11 (WEA G3)	08:34		14:08 (WEA G3)			
20	21:37		20:38		19:23	11	18:54 (WEA 05 (GRN))	18:10	16:11	40	15:28 (WEA G2)	15:54	40	14:48 (WEA G3)			
21	05:10		06:03		06:59		18:43 (WEA 07 (GRN))	07:55	07:55		14:09 (WEA G3)	08:34		14:08 (WEA G3)			
21	21:35		20:36		19:20	8	18:51 (WEA 07 (GRN))	18:07	16:09	46	15:29 (WEA G2)	15:54	41	14:49 (WEA G3)			
22	05:11		06:05		07:00		18:43 (WEA 07 (GRN))	07:56	07:57		14:07 (WEA G3)	08:35		14:08 (WEA G3)			
22	21:34		20:34		19:18	6	18:49 (WEA 07 (GRN))	18:05	16:08	50	15:29 (WEA G2)	15:55	41	14:49 (WEA G3)			
23	05:13		06:06	20:00 (WEA 43 (RW))	07:02		18:44 (WEA 07 (GRN))	07:58	07:58		14:06 (WEA G3)	08:35		14:10 (WEA G3)			
23	21:32		20:31	2	20:02 (WEA 43 (RW))	19:15	3	18:47 (WEA 07 (GRN))	18:03	16:07	53	15:29 (WEA G2)	15:55	40	14:50 (WEA G3)		
24	05:14		06:08		19:59 (WEA 43 (RW))	07:04		08:00	08:00		14:05 (WEA G3)	08:36		14:10 (WEA G3)			
24	21:31		20:29	1	20:00 (WEA 43 (RW))	19:13		18:01	16:05	55	15:30 (WEA G2)	15:56	40	14:50 (WEA G3)			
25	05:16		06:10		07:06			07:02	08:02		14:04 (WEA G3)	08:36		14:10 (WEA G3)			
25	21:29		20:27		19:10			16:58	16:04	56	15:28 (WEA G2)	15:56	40	14:50 (WEA G3)			
26	05:17		06:12		07:08			07:04	08:04		14:03 (WEA G3)	08:37		14:10 (WEA G3)			
26	21:28		20:24		19:08			16:56	16:03	56	15:27 (WEA G2)	15:57	41	14:51 (WEA G3)			
27	05:19		06:14		07:10			07:06			15:54 (WEA G1)	08:05		14:11 (WEA G3)			
27	21:26		20:22		19:05			16:54	16:04 (WEA G1)	16:02	56	15:26 (WEA G2)	15:58	40	14:51 (WEA G3)		
28	05:21		06:15		07:11			07:08			15:52 (WEA G1)	08:07		14:12 (WEA G3)			
28	21:24		20:19		19:03			16:52	14	55	15:25 (WEA G2)	15:59	40	14:52 (WEA G3)			
29	05:22		06:17		07:13			07:10			15:51 (WEA G1)	08:09		14:12 (WEA G3)			
29	21:23		20:17		19:00			16:50	17	54	16:08 (WEA G1)	16:00	41	15:21 (WEA G2)			
30	05:24		06:19		07:15			07:12			15:50 (WEA G1)	08:10		14:12 (WEA G3)			
30	21:21		20:15		18:58			16:48	19	54	16:09 (WEA G1)	15:59	41	15:22 (WEA G2)			
31	05:26		06:21					07:14			15:49 (WEA G1)			14:13 (WEA G3)			
31	21:19		20:12					16:46	21		16:10 (WEA G1)			14:13 (WEA G3)			
Sonnenscheinstunden	515		461		383		328			257		231		42	15:23 (WEA G2)		
astr. max.mögl. Beschattung	24		3		119		101			941		1349					

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 15 - IO 15 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	13:43 (WEA_G3)	08:06	16:10 (WEA_G1)	07:08	17:13 (WEA_08 (GRN))	06:52	19:01 (WEA_07 (GRN))	05:41	04:51	
	16:03	65	15:25 (WEA_G2)	16:55	12	16:22 (WEA_G1)	17:52	10	17:23 (WEA_08 (GRN))	19:51	14
2	08:37	13:44 (WEA_G3)	08:04	16:09 (WEA_G1)	07:05	17:16 (WEA_08 (GRN))	06:49	19:03 (WEA_07 (GRN))	05:39	04:50	
	16:04	65	15:26 (WEA_G2)	16:57	16	16:25 (WEA_G1)	17:54	6	17:22 (WEA_08 (GRN))	19:53	12
3	08:37	13:44 (WEA_G3)	08:03	16:09 (WEA_G1)	07:03	17:22 (WEA_08 (GRN))	06:47	19:05 (WEA_07 (GRN))	05:37	04:49	
	16:05	67	15:27 (WEA_G2)	16:59	18	16:27 (WEA_G1)	17:56	8	19:27 (WEA_03 (GRN))	20:51	21:41
4	08:36	13:45 (WEA_G3)	08:01	16:09 (WEA_G1)	07:01	16:09 (WEA_G1)	07:01	19:23 (WEA_03 (GRN))	05:35	04:48	
	16:07	67	15:29 (WEA_G2)	17:01	20	16:29 (WEA_G1)	17:58	7	19:30 (WEA_03 (GRN))	20:53	21:42
5	08:36	13:45 (WEA_G3)	07:59	16:09 (WEA_G1)	06:58	16:09 (WEA_G1)	06:58	19:24 (WEA_03 (GRN))	05:33	04:47	
	16:08	68	15:30 (WEA_G2)	17:03	22	16:31 (WEA_G1)	18:00	19:59	8	19:32 (WEA_03 (GRN))	20:55
6	08:36	13:46 (WEA_G3)	07:57	16:09 (WEA_G1)	06:56	16:09 (WEA_G1)	06:56	19:23 (WEA_03 (GRN))	05:31	04:47	
	16:09	68	15:31 (WEA_G2)	17:05	25	16:34 (WEA_G1)	18:02	20:01	10	19:33 (WEA_03 (GRN))	20:57
7	08:35	13:47 (WEA_G3)	07:55	16:10 (WEA_G1)	06:53	16:10 (WEA_G1)	06:53	19:24 (WEA_03 (GRN))	05:29	04:46	
	16:10	68	15:33 (WEA_G2)	17:07	25	16:35 (WEA_G1)	18:03	20:02	11	19:35 (WEA_03 (GRN))	20:59
8	08:35	13:48 (WEA_G3)	07:53	16:10 (WEA_G1)	06:51	16:10 (WEA_G1)	06:51	19:25 (WEA_03 (GRN))	05:27	04:45	
	16:12	69	15:35 (WEA_G2)	17:09	25	16:35 (WEA_G1)	18:05	20:04	7	19:32 (WEA_03 (GRN))	21:00
9	08:34	13:48 (WEA_G3)	07:51	16:11 (WEA_G1)	06:49	16:11 (WEA_G1)	06:49	19:36 (WEA_02 (GRN))	05:25	04:45	
	16:13	70	15:36 (WEA_G2)	17:11	24	16:35 (WEA_G1)	18:07	20:06	3	19:39 (WEA_02 (GRN))	21:02
10	08:33	13:49 (WEA_G3)	07:49	16:11 (WEA_G1)	06:46	16:11 (WEA_G1)	06:46	19:36 (WEA_02 (GRN))	05:23	04:44	
	16:15	70	15:37 (WEA_G2)	17:13	24	16:35 (WEA_G1)	18:09	20:08	5	19:41 (WEA_02 (GRN))	21:04
11	08:33	13:50 (WEA_G3)	07:47	16:12 (WEA_G1)	06:44	16:12 (WEA_G1)	06:44	19:37 (WEA_02 (GRN))	05:22	04:44	
	16:16	68	15:37 (WEA_G2)	17:15	22	16:34 (WEA_G1)	18:11	20:10	5	19:42 (WEA_02 (GRN))	21:06
12	08:32	13:51 (WEA_G3)	07:45	16:14 (WEA_G1)	06:41	16:14 (WEA_G1)	06:41	19:42 (WEA_02 (GRN))	05:20	04:43	
	16:18	66	15:37 (WEA_G2)	17:17	19	16:33 (WEA_G1)	18:13	20:12	5	17:46 (WEA_06 (GRN))	21:07
13	08:31	13:53 (WEA_G3)	07:43	16:15 (WEA_G1)	06:39	16:15 (WEA_G1)	06:39	17:42 (WEA_06 (GRN))	06:22	05:18	04:43
	16:20	65	15:38 (WEA_G2)	17:19	17	16:32 (WEA_G1)	18:15	20:14	6	17:48 (WEA_06 (GRN))	21:10
14	08:30	13:54 (WEA_G3)	07:41	16:17 (WEA_G1)	06:36	16:17 (WEA_G1)	06:36	17:42 (WEA_06 (GRN))	06:20	05:16	04:43
	16:21	62	15:38 (WEA_G2)	17:22	12	16:29 (WEA_G1)	18:17	20:16	8	17:50 (WEA_06 (GRN))	21:11
15	08:29	13:56 (WEA_G3)	07:39	16:21 (WEA_G1)	06:34	16:21 (WEA_G1)	06:34	17:45 (WEA_06 (GRN))	06:18	05:14	04:42
	16:23	61	15:39 (WEA_G2)	17:24	5	16:26 (WEA_G1)	18:19	20:17	4	17:49 (WEA_06 (GRN))	21:13
16	08:28	13:57 (WEA_G3)	07:37	16:22 (WEA_G1)	06:31	16:22 (WEA_G1)	06:31	17:49 (WEA_06 (GRN))	06:15	05:13	04:42
	16:25	58	15:39 (WEA_G2)	17:26		18:21	20:19	20:19	6	17:51 (WEA_06 (GRN))	21:14
17	08:27	14:00 (WEA_G3)	07:35	16:23 (WEA_G1)	06:29	16:23 (WEA_G1)	06:29	17:51 (WEA_06 (GRN))	06:13	05:11	04:42
	16:26	54	15:40 (WEA_G2)	17:28		18:23	20:21	20:21	7	17:52 (WEA_06 (GRN))	21:16
18	08:26	14:01 (WEA_G3)	07:33	16:24 (WEA_G1)	06:26	16:24 (WEA_G1)	06:26	17:52 (WEA_06 (GRN))	06:10	05:09	04:42
	16:28	51	15:39 (WEA_G2)	17:30		18:25	20:23	20:23	8	17:53 (WEA_06 (GRN))	21:18
19	08:25	14:05 (WEA_G3)	07:30	16:24 (WEA_G1)	06:24	16:24 (WEA_G1)	06:24	17:53 (WEA_06 (GRN))	06:08	05:08	04:42
	16:30	45	15:40 (WEA_G2)	17:32		18:27	20:25	20:25	9	17:54 (WEA_06 (GRN))	21:19
20	08:24	15:07 (WEA_G2)	07:28	16:25 (WEA_G1)	06:21	16:25 (WEA_G1)	06:21	17:54 (WEA_06 (GRN))	06:06	05:06	04:42
	16:32	32	15:39 (WEA_G2)	17:34		18:28	20:27	20:27	10	17:55 (WEA_06 (GRN))	21:21
21	08:23	15:08 (WEA_G2)	07:26	16:26 (WEA_G1)	06:19	16:26 (WEA_G1)	06:19	17:55 (WEA_06 (GRN))	06:04	05:05	04:42
	16:34	32	15:40 (WEA_G2)	17:36		18:30	20:29	20:29	11	17:56 (WEA_06 (GRN))	21:23
22	08:21	15:09 (WEA_G2)	07:24	16:27 (WEA_G1)	06:16	16:27 (WEA_G1)	06:16	17:56 (WEA_06 (GRN))	06:01	05:03	04:43
	16:35	30	15:39 (WEA_G2)	17:38		18:32	20:31	20:31	12	17:57 (WEA_06 (GRN))	21:24
23	08:20	15:10 (WEA_G2)	07:22	16:28 (WEA_G1)	06:14	16:28 (WEA_G1)	06:14	17:57 (WEA_06 (GRN))	05:59	05:02	04:43
	16:37	29	15:39 (WEA_G2)	17:40		18:34	20:33	20:33	13	17:58 (WEA_06 (GRN))	21:26
24	08:19	15:11 (WEA_G2)	07:19	16:29 (WEA_G1)	06:11	16:29 (WEA_G1)	06:11	17:58 (WEA_06 (GRN))	05:57	05:00	04:43
	16:39	28	15:39 (WEA_G2)	17:42		18:36	20:35	20:35	14	17:59 (WEA_06 (GRN))	21:27
25	08:17	15:12 (WEA_G2)	07:17	17:13 (WEA_08 (GRN))	06:09	18:06 (WEA_07 (GRN))	05:57	20:03 (WEA_43 (RW))	05:00	04:43	
	16:41	27	15:39 (WEA_G2)	17:44	3	18:09 (WEA_07 (GRN))	20:34	2	20:05 (WEA_43 (RW))	21:27	21:55
26	08:16	15:13 (WEA_G2)	07:15	17:13 (WEA_08 (GRN))	06:07	18:04 (WEA_07 (GRN))	05:54	20:04 (WEA_43 (RW))	04:59	04:43	
	16:43	25	15:38 (WEA_G2)	17:46	5	18:11 (WEA_05 (GRN))	20:36	3	20:07 (WEA_43 (RW))	21:29	21:55
27	08:14	15:14 (WEA_G2)	07:12	17:18 (WEA_08 (GRN))	06:04	18:03 (WEA_07 (GRN))	05:52	20:06 (WEA_43 (RW))	04:58	04:44	
	16:45	23	15:37 (WEA_G2)	17:48	8	18:13 (WEA_05 (GRN))	20:38	3	20:09 (WEA_43 (RW))	21:30	21:55
28	08:13	15:17 (WEA_G2)	07:10	17:12 (WEA_08 (GRN))	06:04	18:02 (WEA_07 (GRN))	05:50	20:09 (WEA_43 (RW))	04:57	04:44	
	16:47	20	16:14 (WEA_G1)	17:50	9	18:15 (WEA_07 (GRN))	20:40	13	18:15 (WEA_07 (GRN))	21:32	21:54
29	08:11	15:18 (WEA_G2)	07:08	17:13 (WEA_08 (GRN))	06:02	18:01 (WEA_07 (GRN))	05:48	18:01 (WEA_07 (GRN))	05:48	04:55	04:45
	16:49	20	16:16 (WEA_G1)	17:52		18:16 (WEA_07 (GRN))	20:42	15	18:16 (WEA_07 (GRN))	21:33	21:54
30	08:09	15:21 (WEA_G2)	07:06	17:22 (WEA_08 (GRN))	06:59	19:01 (WEA_07 (GRN))	05:46	19:01 (WEA_07 (GRN))	05:46	04:54	04:45
	16:51	18	16:18 (WEA_G1)	17:54		19:04 (WEA_07 (GRN))	05:44	18	19:19 (WEA_07 (GRN))	21:35	21:54
31	08:08	16:10 (WEA_G1)	07:04	17:20 (WEA_08 (GRN))	06:57	19:01 (WEA_07 (GRN))	05:44	19:01 (WEA_07 (GRN))	05:44	04:53	04:46
	16:53	10	16:20 (WEA_G1)	17:56		19:07 (WEA_07 (GRN))	05:42	17	19:18 (WEA_07 (GRN))	21:36	21:54
Sonnenscheinstunden	248		272		367		421		496		513
astr.max.mögl.Beschattung	1501		311		141		98				

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 15 - IO 15 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

Juli		August		September		Oktober		November		Dezember		
1	04:47	05:27		06:23	19:35 (WEA 02 (GRN))	07:17		18:21 (WEA 06 (GRN))	07:16	15:41 (WEA_G1)	08:12	13:32 (WEA_G3)
	21:53	21:17		20:10	6 19:41 (WEA 02 (GRN))	18:55		6 18:27 (WEA 06 (GRN))	16:44	23 16:04 (WEA_G1)	15:58	69 15:19 (WEA_G2)
2	04:47	05:29		06:24	5 19:34 (WEA 02 (GRN))	07:19		3 18:20 (WEA 06 (GRN))	07:18	25 16:05 (WEA_G1)	08:14	69 13:32 (WEA_G3)
	21:53	21:16		20:07	5 19:39 (WEA 02 (GRN))	18:53		3 18:23 (WEA 06 (GRN))	16:42	25 16:05 (WEA_G1)	15:58	70 15:20 (WEA_G2)
3	04:48	05:31		06:26	19:34 (WEA 02 (GRN))	07:21		18:20 (WEA 06 (GRN))	07:20	25 16:05 (WEA_G1)	08:15	70 13:33 (WEA_G3)
	21:53	21:14		20:05	3 19:37 (WEA 02 (GRN))	18:50		1 18:21 (WEA 06 (GRN))	16:40	25 16:05 (WEA_G1)	15:57	69 15:20 (WEA_G2)
4	04:49	05:32		06:28	19:23 (WEA 03 (GRN))	07:22			07:22	25 16:05 (WEA_G1)	08:17	70 13:32 (WEA_G3)
	21:52	21:12		20:03	8 19:35 (WEA 02 (GRN))	18:48			16:38	26 16:05 (WEA_G1)	15:56	69 15:19 (WEA_G2)
5	04:50	05:34		06:30	19:20 (WEA 03 (GRN))	07:24			16:38	26 16:05 (WEA_G1)	15:56	69 13:32 (WEA_G3)
	21:52	21:10		20:00	11 19:31 (WEA 03 (GRN))	18:45			16:36	24 16:04 (WEA_G1)	15:56	69 15:18 (WEA_G2)
6	04:51	05:36		06:32	19:19 (WEA 03 (GRN))	07:26			16:32	24 16:04 (WEA_G1)	15:54	69 13:32 (WEA_G3)
	21:51	21:08		19:58	10 19:29 (WEA 03 (GRN))	18:43			16:34	22 16:02 (WEA_G1)	15:55	68 15:17 (WEA_G2)
7	04:52	05:38		06:33	19:19 (WEA 03 (GRN))	07:28			16:32	22 16:02 (WEA_G1)	15:55	68 13:32 (WEA_G3)
	21:50	21:06		19:55	8 19:27 (WEA 03 (GRN))	18:40			16:32	20 16:00 (WEA_G1)	15:55	68 15:17 (WEA_G2)
8	04:53	05:39		06:35	19:18 (WEA 03 (GRN))	07:30			16:30	17 15:57 (WEA_G1)	15:54	67 15:16 (WEA_G2)
	21:50	21:04		19:53	6 19:24 (WEA 03 (GRN))	18:39			16:30	17 15:57 (WEA_G1)	15:54	67 13:33 (WEA_G3)
9	04:54	05:41		06:37	19:00 (WEA 07 (GRN))	07:32			16:28	15 15:55 (WEA_G1)	15:54	67 15:16 (WEA_G2)
	21:49	21:02		19:50	8 19:22 (WEA 03 (GRN))	18:36			16:28	15 15:55 (WEA_G1)	15:54	67 13:33 (WEA_G3)
10	04:55	05:43		06:39	18:57 (WEA 07 (GRN))	07:34			16:26	12 15:53 (WEA_G1)	15:53	66 15:16 (WEA_G2)
	21:48	21:00		19:48	11 19:19 (WEA 03 (GRN))	18:33			16:26	12 15:53 (WEA_G1)	15:53	66 13:33 (WEA_G3)
11	04:56	05:45		06:41	18:55 (WEA 07 (GRN))	07:35			16:25	10 15:52 (WEA_G1)	15:53	65 15:15 (WEA_G2)
	21:47	20:58		19:45	14 19:09 (WEA 07 (GRN))	18:31			16:25	10 15:52 (WEA_G1)	15:53	65 13:33 (WEA_G3)
12	04:57	05:47		06:42	18:53 (WEA 07 (GRN))	07:37			16:23	8 17:49 (WEA 08 (GRN))	07:38	65 15:14 (WEA_G2)
	21:46	20:56		19:43	15 19:08 (WEA 07 (GRN))	18:28			16:23	18 14:53 (WEA_G2)	08:27	65 13:33 (WEA_G3)
13	04:59	05:48		06:44	18:52 (WEA 07 (GRN))	07:39			16:23	18 14:50 (WEA_G2)	08:28	65 15:14 (WEA_G2)
	21:45	20:54		19:40	17 19:09 (WEA 07 (GRN))	18:26			16:21	20 15:48 (WEA_G1)	15:53	64 15:14 (WEA_G2)
14	05:00	05:50		06:46	18:52 (WEA 07 (GRN))	07:41			16:21	20 15:48 (WEA_G1)	15:53	64 13:34 (WEA_G3)
	21:44	20:51		19:38	17 19:09 (WEA 07 (GRN))	18:24			16:20	21 15:46 (WEA_G1)	15:53	64 15:14 (WEA_G2)
15	05:01	05:52		06:48	18:51 (WEA 07 (GRN))	07:43			16:20	21 15:46 (WEA_G1)	15:53	64 13:34 (WEA_G3)
	21:43	20:49		19:35	16 19:07 (WEA 07 (GRN))	18:21			16:18	23 15:10 (WEA_G2)	15:53	64 15:14 (WEA_G2)
16	05:03	05:54		06:50	18:50 (WEA 07 (GRN))	07:45			16:18	23 15:10 (WEA_G2)	15:53	64 13:34 (WEA_G3)
	21:42	20:47		19:33	14 19:04 (WEA 07 (GRN))	18:19			16:16	25 15:11 (WEA_G2)	15:53	63 15:14 (WEA_G2)
17	05:04	05:56	20:12 (WEA 43 (RW))	06:51	18:51 (WEA 07 (GRN))	07:47			16:15	27 15:12 (WEA_G2)	15:53	62 13:35 (WEA_G3)
	21:41	20:45	3 20:15 (WEA 43 (RW))	19:30	11 19:02 (WEA 05 (GRN))	18:17			16:15	27 15:12 (WEA_G2)	15:53	62 15:14 (WEA_G2)
18	05:05	05:57	20:09 (WEA 43 (RW))	06:53	18:52 (WEA 07 (GRN))	07:49			16:13	28 14:45 (WEA_G2)	08:32	62 13:35 (WEA_G3)
	21:39	20:43	3 20:12 (WEA 43 (RW))	19:28	7 18:59 (WEA 05 (GRN))	18:14			16:13	28 15:13 (WEA_G2)	15:53	64 15:15 (WEA_G2)
19	05:07	05:59	20:09 (WEA 43 (RW))	06:55	18:53 (WEA 07 (GRN))	07:51			16:12	29 14:44 (WEA_G2)	08:33	62 13:36 (WEA_G3)
	21:38	20:40	2 20:11 (WEA 43 (RW))	19:25	4 18:57 (WEA 07 (GRN))	18:12			16:12	29 15:13 (WEA_G2)	15:53	62 15:15 (WEA_G2)
20	05:08	06:01	20:08 (WEA 43 (RW))	06:57		07:53			16:11	30 15:14 (WEA_G2)	15:54	62 13:36 (WEA_G3)
	21:37	20:38	1 20:09 (WEA 43 (RW))	19:23		18:10			16:11	30 15:14 (WEA_G2)	15:54	62 15:15 (WEA_G2)
21	05:10	06:03		06:59		07:55			16:09	31 15:15 (WEA_G2)	15:54	62 13:37 (WEA_G3)
	21:35	20:36		19:20		18:07			16:09	31 15:15 (WEA_G2)	15:54	62 15:16 (WEA_G2)
22	05:11	06:05		07:00		07:56			16:08	32 15:16 (WEA_G2)	15:55	62 13:37 (WEA_G3)
	21:34	20:34		19:18		18:05			16:08	32 15:16 (WEA_G2)	15:55	62 15:16 (WEA_G2)
23	05:13	06:06		07:02		07:58			16:07	33 14:41 (WEA_G2)	08:35	62 13:38 (WEA_G3)
	21:32	20:31		19:15		18:03			16:07	45 15:16 (WEA_G2)	15:55	62 15:17 (WEA_G2)
24	05:14	06:08		07:04		08:00			16:05	51 13:38 (WEA_G3)	08:36	62 13:38 (WEA_G3)
	21:31	20:29		19:13		18:01			16:05	51 15:16 (WEA_G2)	15:56	62 15:17 (WEA_G2)
25	05:16	06:10		07:06		08:02			16:02	54 13:37 (WEA_G3)	08:36	63 13:38 (WEA_G3)
	21:29	20:27		19:10		16:58			16:04	54 15:17 (WEA_G2)	15:56	63 15:17 (WEA_G2)
26	05:17	06:12		07:08		07:04			16:03	57 13:36 (WEA_G3)	08:37	63 13:38 (WEA_G3)
	21:28	20:24		19:08		16:56			16:03	57 15:17 (WEA_G2)	15:57	64 15:18 (WEA_G2)
27	05:19	06:14		07:10		07:06			16:05	15:49 (WEA_G1)	08:05	63 13:39 (WEA_G3)
	21:26	20:22		19:05		16:54			16:02	61 15:18 (WEA_G2)	15:58	63 15:19 (WEA_G2)
28	05:21	06:15		07:11		07:08			16:07	61 15:18 (WEA_G2)	15:58	63 13:40 (WEA_G3)
	21:24	20:19		19:03		16:52			16:01	62 15:18 (WEA_G2)	15:59	64 15:21 (WEA_G2)
29	05:22	06:17		07:13	18:24 (WEA 06 (GRN))	07:10			16:09	62 15:18 (WEA_G2)	15:59	64 13:40 (WEA_G3)
	21:23	20:17		19:00	7 18:31 (WEA 06 (GRN))	16:50			16:00	65 15:19 (WEA_G2)	16:00	65 15:21 (WEA_G2)
30	05:24	06:19		07:15	18:22 (WEA 06 (GRN))	07:12			16:00	66 15:19 (WEA_G2)	16:01	65 13:41 (WEA_G3)
	21:21	20:15		18:58	7 18:29 (WEA 06 (GRN))	16:48			16:03	66 15:19 (WEA_G2)	16:01	64 15:22 (WEA_G2)
31	05:26	06:21	19:40 (WEA 02 (GRN))			07:14			16:04		08:37	65 13:41 (WEA_G3)
	21:19	20:12	1 19:41 (WEA 02 (GRN))			16:46			16:04		16:02	66 15:23 (WEA_G2)
Sonnenscheinstunden		515	461		383		328		257		231	2014
astr.max.mögl.Beschattung			10		205		130		964			

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 Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:
22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 16 - IO 16 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 Sonneneinstrahlungsrichtung
 - Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni						
1	08:37	14:21 (WEA_G2)	08:06		07:08	17:14 (WEA_06 (GRN))	06:52	19:16 (WEA_02 (GRN))	05:41		04:51					
1	16:03	22	14:43 (WEA_G2)	16:55		17:52	10	17:24 (WEA_06 (GRN))	19:51		12:38					
2	08:37	14:22 (WEA_G2)	08:04		07:05	17:16 (WEA_06 (GRN))	06:49	19:18 (WEA_02 (GRN))	05:39		04:50					
1	16:04	21	14:43 (WEA_G2)	16:57		17:54	7	17:23 (WEA_06 (GRN))	19:53	6	19:24 (WEA_02 (GRN))	20:49				
3	08:37	14:23 (WEA_G2)	08:03		07:03						05:37	04:49				
1	16:05	19	14:42 (WEA_G2)	16:59		17:56		19:55			20:51	21:41				
4	08:36	14:24 (WEA_G2)	08:01		07:01	17:29 (WEA_07 (GRN))	06:44	19:28 (WEA_01 (GRN))	05:35		04:48	21:04 (WEA_42 (RW))				
1	16:07	19	14:43 (WEA_G2)	17:01		17:58	1	17:30 (WEA_07 (GRN))	19:57	2	19:30 (WEA_01 (GRN))	20:53	21:42			
5	08:36	14:25 (WEA_G2)	07:59		06:58	17:26 (WEA_07 (GRN))	06:42	19:26 (WEA_01 (GRN))	05:33		04:47	21:04 (WEA_42 (RW))				
1	16:08	18	15:30 (WEA_G1)	17:03		18:00	7	17:33 (WEA_07 (GRN))	19:59	2	19:32 (WEA_01 (GRN))	20:55	21:43			
6	08:36	14:26 (WEA_G2)	07:57		06:56	17:24 (WEA_07 (GRN))	06:39	19:24 (WEA_01 (GRN))	05:31		04:47	21:04 (WEA_42 (RW))				
1	16:09	18	15:31 (WEA_G1)	17:05		18:02	10	17:34 (WEA_07 (GRN))	20:01	1	19:33 (WEA_01 (GRN))	20:57	21:44			
7	08:35	14:29 (WEA_G2)	07:55		06:53	17:23 (WEA_07 (GRN))	06:37				05:29	20:26 (WEA_41 (RW))	04:46			
1	16:10	16	15:33 (WEA_G1)	17:07		18:03	14	17:37 (WEA_07 (GRN))	20:02		20:59	1	20:27 (WEA_41 (RW))	21:45		
8	08:35	14:30 (WEA_G2)	07:53		06:51	17:21 (WEA_07 (GRN))	06:35	19:28 (WEA_01 (GRN))	05:27		04:45	21:05 (WEA_42 (RW))	04:45			
1	16:12	16	15:35 (WEA_G1)	17:09	2	18:38 (WEA_08 (GRN))	18:05	17:38 (WEA_07 (GRN))	20:04		21:00	2	20:29 (WEA_41 (RW))	21:46		
9	08:34	14:34 (WEA_G2)	07:51		06:49	16:36 (WEA_08 (GRN))	06:49	17:21 (WEA_07 (GRN))	06:32		05:25		04:45	21:04 (WEA_42 (RW))		
1	16:13	11	15:36 (WEA_G1)	17:11	4	16:40 (WEA_08 (GRN))	18:07	20	17:41 (WEA_07 (GRN))	20:06		21:02	21:47	7	21:11 (WEA_42 (RW))	
10	08:33	15:28 (WEA_G1)	07:49		06:46	16:36 (WEA_08 (GRN))	06:46	17:20 (WEA_07 (GRN))	06:30		05:23		04:44	21:05 (WEA_42 (RW))		
1	16:15	10	15:38 (WEA_G1)	17:13	7	16:43 (WEA_08 (GRN))	18:09	20	17:40 (WEA_07 (GRN))	20:08		21:04	21:48	7	21:12 (WEA_42 (RW))	
11	08:33	15:28 (WEA_G1)	07:47		06:44	16:36 (WEA_08 (GRN))	06:44	17:20 (WEA_07 (GRN))	06:27		05:22		04:44	21:05 (WEA_42 (RW))		
1	16:16	11	15:39 (WEA_G1)	17:15	9	16:45 (WEA_08 (GRN))	18:11	20	17:40 (WEA_07 (GRN))	20:10		21:06	21:49	7	21:12 (WEA_42 (RW))	
12	08:32	15:28 (WEA_G1)	07:45		06:41	16:37 (WEA_08 (GRN))	06:41	17:20 (WEA_07 (GRN))	06:25		05:20		04:43	21:06 (WEA_42 (RW))		
1	16:18	13	15:41 (WEA_G1)	17:17	11	16:48 (WEA_08 (GRN))	18:13	19	17:39 (WEA_07 (GRN))	20:12		21:07	21:50	8	21:13 (WEA_42 (RW))	
13	08:31	15:28 (WEA_G1)	07:43		06:39	16:38 (WEA_08 (GRN))	06:39	17:21 (WEA_07 (GRN))	06:22		05:18		04:43	21:06 (WEA_42 (RW))		
1	16:20	15	15:43 (WEA_G1)	17:19	12	16:50 (WEA_08 (GRN))	18:15	18	17:39 (WEA_07 (GRN))	20:14		21:09	21:50	8	21:14 (WEA_42 (RW))	
14	08:30	15:29 (WEA_G1)	07:41		06:36	16:39 (WEA_08 (GRN))	06:36	17:21 (WEA_07 (GRN))	06:20		05:16	19:46 (WEA_43 (RW))	04:43	21:06 (WEA_42 (RW))		
1	16:21	16	15:45 (WEA_G1)	17:22	9	16:48 (WEA_08 (GRN))	18:17	17	17:50 (WEA_08 (GRN))	20:16	1	19:47 (WEA_43 (RW))	21:11	21:51	9	21:15 (WEA_42 (RW))
15	08:29	15:29 (WEA_G1)	07:39		06:34	16:41 (WEA_08 (GRN))	06:34	17:23 (WEA_07 (GRN))	06:18		05:14		04:42	21:07 (WEA_42 (RW))		
1	16:23	18	15:47 (WEA_G1)	17:24	4	16:45 (WEA_08 (GRN))	18:19	15	17:52 (WEA_08 (GRN))	20:18	3	19:49 (WEA_43 (RW))	21:13	21:52	9	21:16 (WEA_42 (RW))
16	08:28	15:29 (WEA_G1)	07:37		06:31	16:31	06:31	17:24 (WEA_07 (GRN))	06:15		05:13		04:42	21:06 (WEA_42 (RW))		
1	16:25	20	15:49 (WEA_G1)	17:26		18:21	13	17:54 (WEA_08 (GRN))	20:19	5	19:52 (WEA_43 (RW))	21:14	21:52	9	21:15 (WEA_42 (RW))	
17	08:27	15:30 (WEA_G1)	07:35		06:29	16:29	06:29	17:53 (WEA_08 (GRN))	06:13		05:11	19:46 (WEA_43 (RW))	04:42	21:06 (WEA_42 (RW))		
1	16:26	21	15:51 (WEA_G1)	17:28		18:23	2	17:55 (WEA_08 (GRN))	20:21	7	19:53 (WEA_43 (RW))	21:16	21:53	10	21:16 (WEA_42 (RW))	
18	08:26	15:29 (WEA_G1)	07:33		06:26			16:10	06:10		05:09	19:48 (WEA_43 (RW))	04:42	21:06 (WEA_42 (RW))		
1	16:28	24	15:53 (WEA_G1)	17:30		18:25		20:23	06:08	6	19:54 (WEA_43 (RW))	21:18	21:53	10	21:16 (WEA_42 (RW))	
19	08:25	15:30 (WEA_G1)	07:30		06:24			16:08			05:08		04:42	21:06 (WEA_42 (RW))		
1	16:30	25	15:55 (WEA_G1)	17:32		18:27		20:25			21:19	21:54	9	21:17 (WEA_42 (RW))		
20	08:24	15:30 (WEA_G1)	07:28		06:21	17:58 (WEA_03 (GRN))	06:06				05:06		04:42	21:08 (WEA_42 (RW))		
1	16:32	26	15:56 (WEA_G1)	17:34		18:28	3	18:01 (WEA_03 (GRN))	20:27		21:21	21:54	10	21:18 (WEA_42 (RW))		
21	08:23	15:31 (WEA_G1)	07:26		06:19	17:58 (WEA_03 (GRN))	06:04				05:05		04:42	21:08 (WEA_42 (RW))		
1	16:34	26	15:57 (WEA_G1)	17:36		18:30	6	18:04 (WEA_03 (GRN))	20:29		21:23	21:54	10	21:18 (WEA_42 (RW))		
22	08:21	15:32 (WEA_G1)	07:24		06:16	17:56 (WEA_03 (GRN))	06:01				05:03		04:43	21:08 (WEA_42 (RW))		
1	16:35	26	15:58 (WEA_G1)	17:38		18:32	9	18:05 (WEA_03 (GRN))	20:31		21:24	21:54	10	21:18 (WEA_42 (RW))		
23	08:20	15:32 (WEA_G1)	07:22		06:14	17:56 (WEA_03 (GRN))	05:59				05:02		04:43	21:08 (WEA_42 (RW))		
1	16:37	25	15:57 (WEA_G1)	17:40		18:34	12	18:08 (WEA_03 (GRN))	20:33		21:26	21:54	9	21:17 (WEA_42 (RW))		
24	08:19	15:32 (WEA_G1)	07:19		06:11	17:56 (WEA_03 (GRN))	05:57				05:00		04:43	21:09 (WEA_42 (RW))		
1	16:39	25	15:57 (WEA_G1)	17:42		18:36	13	18:09 (WEA_03 (GRN))	20:34		21:27	21:55	9	21:18 (WEA_42 (RW))		
25	08:17	15:33 (WEA_G1)	07:17		06:09	17:57 (WEA_03 (GRN))	05:54				04:59		04:43	21:08 (WEA_42 (RW))		
1	16:41	24	15:57 (WEA_G1)	17:44	2	17:16 (WEA_06 (GRN))	18:38	13	18:10 (WEA_03 (GRN))	20:36		21:29	21:55	10	21:18 (WEA_42 (RW))	
26	08:16	15:34 (WEA_G1)	07:15		06:07	17:14 (WEA_06 (GRN))	06:07				04:58		04:44	21:09 (WEA_42 (RW))		
1	16:43	23	15:57 (WEA_G1)	17:46	4	17:18 (WEA_06 (GRN))	18:40	11	18:08 (WEA_03 (GRN))	20:38		21:30	21:55	9	21:18 (WEA_42 (RW))	
27	08:14	15:35 (WEA_G1)	07:12		06:04	17:13 (WEA_06 (GRN))	06:04				04:57		04:44	21:09 (WEA_42 (RW))		
1	16:45	21	15:56 (WEA_G1)	17:48	7	17:20 (WEA_06 (GRN))	18:42	7	18:06 (WEA_03 (GRN))	20:40		21:32	21:54	9	21:18 (WEA_42 (RW))	
28	08:13	15:37 (WEA_G1)	07:10		06:02	17:14 (WEA_06 (GRN))	06:02				04:58		04:45	21:09 (WEA_42 (RW))		
1	16:47	19	15:56 (WEA_G1)	17:50	8	17:22 (WEA_06 (GRN))	18:44				20:42	21:33	21:54	9	21:18 (WEA_42 (RW))	
29	08:11	15:38 (WEA_G1)			06:59			19:16 (WEA_02 (GRN))	05:46		04:54		04:45	21:09 (WEA_42 (RW))		
1	16:49	17	15:55 (WEA_G1)		06:57	19:45	3	19:19 (WEA_02 (GRN))	20:44		21:35	21:54	9	21:18 (WEA_42 (RW))		
30	08:09	15:40 (WEA_G1)			06:57	19:45	5	19:15 (WEA_02 (GRN))	20:44		04:53		04:46	21:09 (WEA_42 (RW))		
1	16:51	13	15:53 (WEA_G1)		06:54	19:47	5	19:20 (WEA_02 (GRN))	20:46		21:36	21:54	9	21:18 (WEA_42 (RW))		
31	08:08	15:42 (WEA_G1)			06:54	19:47	6	19:16 (WEA_02 (GRN))			04:52		04:46	21:09 (WEA_42 (RW))		
1	16:53	8	15:50 (WEA_G1)		06:54	19:49	6	19:22 (WEA_02 (GRN))			21:37		04:46	21:09 (WEA_42 (RW))		
Sommerscheinstunden	248		272		367		421		496		513		221			
astr max mögl Beschattung	586		79		298		41		3							

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 16 - IO 16 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember	
1	04:47	21:09 (WEA 42 (RW))	05:27		06:23		07:17	18:00 (WEA 07 (GRN))	07:16	16:06 (WEA 08 (GRN))	08:12
2	04:47	21:17 (WEA 42 (RW))	05:29		06:24		07:19	18:19 (WEA 07 (GRN))	07:18	16:12 (WEA 08 (GRN))	08:14
3	04:48	21:10 (WEA 42 (RW))	05:31		06:26		07:21	18:30 (WEA 07 (GRN))	07:20	16:06 (WEA 08 (GRN))	08:15
4	04:49	21:10 (WEA 42 (RW))	05:32		06:28		07:22	18:40 (WEA 07 (GRN))	07:22	16:07 (WEA 08 (GRN))	08:17
5	04:50	21:10 (WEA 42 (RW))	05:34		06:30		07:24	18:50 (WEA 07 (GRN))	07:24	16:06 (WEA 08 (GRN))	08:18
6	04:51	21:10 (WEA 42 (RW))	05:36		06:32		07:26	19:00 (WEA 07 (GRN))	07:26	16:06 (WEA 08 (GRN))	08:19
7	04:52	21:10 (WEA 42 (RW))	05:38		06:33		07:28	19:10 (WEA 07 (GRN))	07:28	16:06 (WEA 08 (GRN))	08:21
8	04:53	21:10 (WEA 42 (RW))	05:39		06:35		07:30	19:20 (WEA 07 (GRN))	07:30	16:06 (WEA 08 (GRN))	08:22
9	04:54	21:10 (WEA 42 (RW))	05:41		06:37		07:32	19:30 (WEA 07 (GRN))	07:32	16:06 (WEA 08 (GRN))	08:23
10	04:55	21:11 (WEA 42 (RW))	05:43		06:39		07:34	19:40 (WEA 07 (GRN))	07:34	16:06 (WEA 08 (GRN))	08:25
11	04:56	21:12 (WEA 42 (RW))	05:45		06:41		07:36	19:50 (WEA 07 (GRN))	07:36	16:06 (WEA 08 (GRN))	08:26
12	04:57	21:12 (WEA 42 (RW))	05:47		06:42		07:37	20:00 (WEA 07 (GRN))	07:37	16:06 (WEA 08 (GRN))	08:27
13	04:59	21:10 (WEA 42 (RW))	05:48		06:44		07:39	20:10 (WEA 07 (GRN))	07:39	16:06 (WEA 08 (GRN))	08:28
14	05:00	21:10 (WEA 42 (RW))	05:50		06:46		07:41	20:20 (WEA 07 (GRN))	07:41	16:06 (WEA 08 (GRN))	08:29
15	05:01	21:10 (WEA 42 (RW))	05:52		06:48		07:43	20:30 (WEA 07 (GRN))	07:43	16:06 (WEA 08 (GRN))	08:30
16	05:03	21:10 (WEA 42 (RW))	05:54		06:50		07:45	20:40 (WEA 07 (GRN))	07:45	16:06 (WEA 08 (GRN))	08:31
17	05:04	21:10 (WEA 42 (RW))	05:56		06:51		07:47	20:50 (WEA 07 (GRN))	07:47	16:06 (WEA 08 (GRN))	08:32
18	05:05	21:10 (WEA 42 (RW))	05:57		06:53		07:49	21:00 (WEA 07 (GRN))	07:49	16:06 (WEA 08 (GRN))	08:33
19	05:07	21:10 (WEA 42 (RW))	05:59		06:55		07:51	21:10 (WEA 07 (GRN))	07:51	16:06 (WEA 08 (GRN))	08:34
20	05:08	21:10 (WEA 42 (RW))	06:01		06:57		07:53	21:20 (WEA 07 (GRN))	07:53	16:06 (WEA 08 (GRN))	08:35
21	05:10	21:10 (WEA 42 (RW))	06:03		06:59		07:55	21:30 (WEA 07 (GRN))	07:55	16:06 (WEA 08 (GRN))	08:36
22	05:11	21:10 (WEA 42 (RW))	06:05		07:00		07:56	21:40 (WEA 07 (GRN))	07:56	16:06 (WEA 08 (GRN))	08:37
23	05:13	21:10 (WEA 42 (RW))	06:06		07:02		07:58	21:50 (WEA 07 (GRN))	07:58	16:06 (WEA 08 (GRN))	08:38
24	05:14	21:10 (WEA 42 (RW))	06:08		07:04		08:00	22:00 (WEA 07 (GRN))	08:00	16:06 (WEA 08 (GRN))	08:39
25	05:16	21:10 (WEA 42 (RW))	06:10		07:06		08:01	22:10 (WEA 07 (GRN))	08:01	16:06 (WEA 08 (GRN))	08:40
26	05:17	21:10 (WEA 42 (RW))	06:12		07:08		08:02	22:20 (WEA 07 (GRN))	08:02	16:06 (WEA 08 (GRN))	08:41
27	05:19	21:10 (WEA 42 (RW))	06:14		07:10		08:04	22:30 (WEA 07 (GRN))	08:04	16:06 (WEA 08 (GRN))	08:42
28	05:21	21:10 (WEA 42 (RW))	06:15		07:11		08:05	22:40 (WEA 07 (GRN))	08:05	16:06 (WEA 08 (GRN))	08:43
29	05:22	21:10 (WEA 42 (RW))	06:17		07:13		08:07	22:50 (WEA 07 (GRN))	08:07	16:06 (WEA 08 (GRN))	08:44
30	05:24	21:10 (WEA 42 (RW))	06:19		07:15		08:08	23:00 (WEA 07 (GRN))	08:08	16:06 (WEA 08 (GRN))	08:45
31	05:26	21:10 (WEA 42 (RW))	06:21		07:17		08:10	23:10 (WEA 07 (GRN))	08:10	16:06 (WEA 08 (GRN))	08:46
	05:28	21:10 (WEA 42 (RW))	06:23		07:19		08:11	23:20 (WEA 07 (GRN))	08:11	16:06 (WEA 08 (GRN))	08:47
	05:30	21:10 (WEA 42 (RW))	06:25		07:21		08:12	23:30 (WEA 07 (GRN))	08:12	16:06 (WEA 08 (GRN))	08:48
	05:32	21:10 (WEA 42 (RW))	06:27		07:23		08:13	23:40 (WEA 07 (GRN))	08:13	16:06 (WEA 08 (GRN))	08:49
	05:34	21:10 (WEA 42 (RW))	06:29		07:25		08:14	23:50 (WEA 07 (GRN))	08:14	16:06 (WEA 08 (GRN))	08:50
	05:36	21:10 (WEA 42 (RW))	06:31		07:27		08:15	24:00 (WEA 07 (GRN))	08:15	16:06 (WEA 08 (GRN))	08:51
	05:38	21:10 (WEA 42 (RW))	06:33		07:29		08:16	24:10 (WEA 07 (GRN))	08:16	16:06 (WEA 08 (GRN))	08:52
	05:40	21:10 (WEA 42 (RW))	06:35		07:31		08:17	24:20 (WEA 07 (GRN))	08:17	16:06 (WEA 08 (GRN))	08:53
	05:42	21:10 (WEA 42 (RW))	06:37		07:33		08:18	24:30 (WEA 07 (GRN))	08:18	16:06 (WEA 08 (GRN))	08:54
	05:44	21:10 (WEA 42 (RW))	06:39		07:35		08:19	24:40 (WEA 07 (GRN))	08:19	16:06 (WEA 08 (GRN))	08:55
	05:46	21:10 (WEA 42 (RW))	06:41		07:37		08:20	24:50 (WEA 07 (GRN))	08:20	16:06 (WEA 08 (GRN))	08:56
	05:48	21:10 (WEA 42 (RW))	06:43		07:39		08:21	25:00 (WEA 07 (GRN))	08:21	16:06 (WEA 08 (GRN))	08:57
	05:50	21:10 (WEA 42 (RW))	06:45		07:41		08:22	25:10 (WEA 07 (GRN))	08:22	16:06 (WEA 08 (GRN))	08:58
	05:52	21:10 (WEA 42 (RW))	06:47		07:43		08:23	25:20 (WEA 07 (GRN))	08:23	16:06 (WEA 08 (GRN))	08:59
	05:54	21:10 (WEA 42 (RW))	06:49		07:45		08:24	25:30 (WEA 07 (GRN))	08:24	16:06 (WEA 08 (GRN))	09:00
	05:56	21:10 (WEA 42 (RW))	06:51		07:47		08:25	25:40 (WEA 07 (GRN))	08:25	16:06 (WEA 08 (GRN))	09:01
	05:58	21:10 (WEA 42 (RW))	06:53		07:49		08:26	25:50 (WEA 07 (GRN))	08:26	16:06 (WEA 08 (GRN))	09:02
	05:60	21:10 (WEA 42 (RW))	06:55		07:51		08:27	26:00 (WEA 07 (GRN))	08:27	16:06 (WEA 08 (GRN))	09:03
	05:62	21:10 (WEA 42 (RW))	06:57		07:53		08:28	26:10 (WEA 07 (GRN))	08:28	16:06 (WEA 08 (GRN))	09:04
	05:64	21:10 (WEA 42 (RW))	06:59		07:55		08:29	26:20 (WEA 07 (GRN))	08:29	16:06 (WEA 08 (GRN))	09:05
	05:66	21:10 (WEA 42 (RW))	07:01		07:57		08:30	26:30 (WEA 07 (GRN))	08:30	16:06 (WEA 08 (GRN))	09:06
	05:68	21:10 (WEA 42 (RW))	07:03		07:59		08:31	26:40 (WEA 07 (GRN))	08:31	16:06 (WEA 08 (GRN))	09:07
	05:70	21:10 (WEA 42 (RW))	07:05		08:01		08:32	26:50 (WEA 07 (GRN))	08:32	16:06 (WEA 08 (GRN))	09:08
	05:72	21:10 (WEA 42 (RW))	07:07		08:03		08:33	27:00 (WEA 07 (GRN))	08:33	16:06 (WEA 08 (GRN))	09:09
	05:74	21:10 (WEA 42 (RW))	07:09		08:05		08:34	27:10 (WEA 07 (GRN))	08:34	16:06 (WEA 08 (GRN))	09:10
	05:76	21:10 (WEA 42 (RW))	07:11		08:07		08:35	27:20 (WEA 07 (GRN))	08:35	16:06 (WEA 08 (GRN))	09:11
	05:78	21:10 (WEA 42 (RW))	07:13		08:09		08:36	27:30 (WEA 07 (GRN))	08:36	16:06 (WEA 08 (GRN))	09:12
	05:80	21:10 (WEA 42 (RW))	07:15		08:11		08:37	27:40 (WEA 07 (GRN))	08:37	16:06 (WEA 08 (GRN))	09:13
	05:82	21:10 (WEA 42 (RW))	07:17		08:13		08:38	27:50 (WEA 07 (GRN))	08:38	16:06 (WEA 08 (GRN))	09:14
	05:84	21:10 (WEA 42 (RW))	07:19		08:15		08:39	28:00 (WEA 07 (GRN))	08:39	16:06 (WEA 08 (GRN))	09:15
	05:86	21:10 (WEA 42 (RW))	07:21		08:17		08:40	28:10 (WEA 07 (GRN))	08:40	16:06 (WEA 08 (GRN))	09:16
	05:88	21:10 (WEA 42 (RW))	07:23		08:19		08:41	28:20 (WEA 07 (GRN))	08:41	16:06 (WEA 08 (GRN))	09:17
	05:90	21:10 (WEA 42 (RW))	07:25		08:21		08:42	28:30 (WEA 07 (GRN))	08:42	16:06 (WEA 08 (GRN))	09:18
	05:92	21:10 (WEA 42 (RW))	07:27		08:23		08:43	28:40 (WEA 07 (GRN))	08:43	16:06 (WEA 08 (GRN))	09:19
	05:94	21:10 (WEA 42 (RW))	07:29		08:25		08:44	28:50 (WEA 07 (GRN))	08:44	16:06 (WEA 08 (GRN))	09:20
	05:96	21:10 (WEA 42 (RW))	07:31		08:27		08:45	29:00 (WEA 07 (GRN))	08:45	16:06 (WEA 08 (GRN))	09:21
	05:98	21:10 (WEA 42 (RW))	07:33		08:29		08:46	29:10 (WEA 07 (GRN))	08:46	16:06 (WEA 08 (GRN))	09:22
	06:00	21:10 (WEA 42 (RW))	07:35		08:31		08:47	29:20 (WEA 07 (GRN))	08:47	16:06 (WEA 08 (GRN))	09:23
	06:02	21:10 (WEA 42 (RW))	07:37		08:33		08:48	29:30 (WEA 07 (GRN))	08:48	16:06 (WEA 08 (GRN))	09:24
	06:04	21:10 (WEA 42 (RW))	07:39		08:35		08:49	29:40 (WEA 07 (GRN))	08:49	16:06 (WEA 08 (GRN))	09:25
	06:06	21:10 (WEA 42 (RW))	07:41		08:37		08:50	29:50 (WEA 07 (GRN))	08:50	16:06 (WEA 08 (GRN))	09:26
	06:08	21:10 (WEA 42 (RW))	07:43		08:39		08:51	30:00 (WEA 07 (GRN))	08:51	16:06 (WEA 08 (GRN))	09:27
	06:10	21:10 (WEA 42 (RW))	07:45		08:41		08:52	30:10 (WEA 07 (GRN))	08:52	16:06 (WEA 08 (GRN))	09:28
	06:12	21:10 (WEA 42 (RW))	07:47		08:43		08:53	30:20 (WEA 07 (GRN))	08:53	16:06 (WEA 08 (GRN))	09:29
	06:14	21:10 (WEA 42 (RW))	07:49		08:45		08:54	30:30 (WEA 07 (GRN))	08:54	16:06 (WEA 08 (GRN))	09:30
	06:16	21:10 (WEA 42 (RW))	07:51		08:47		08:55	30:40 (WEA 07 (GRN))	08:55	16:06 (WEA 08 (GRN))	09:31
	06:18	21:10 (WEA 42 (RW))	07:53		08:49		08:56	30:50 (WEA 07 (GRN))	08:56	16:06 (WEA 08 (GRN))	09:32
	06:20	21:10 (WEA 42 (RW))	07:55		08:51		08:57	31:00 (WEA 07 (GRN))	08:57	16:06 (WEA 08 (GRN))	09:33
	06:22	21:10 (WEA 42 (RW))	07:57		08:53		08:58	31:10 (WEA 07 (GRN))	08:58	16:06 (WEA 08 (GRN))	09:34
	06:24	21:10 (WEA 42 (RW))	07:59		08:55		08:59	31:20 (WEA 07 (GRN))	08:59	16:06 (WEA 08 (GRN))	09:35
	06:26	21:10 (WEA 42 (RW))	08:01		08:57		09:00	31:30 (WEA 07 (GRN))	09:00	16:06 (WEA 08 (GRN))	09:36
	06:28	21:10 (WEA 42 (RW))	08:03		08:59		09:01	31:40 (WEA 07 (GRN))	09:01	16:06 (WEA 08 (GRN))	09:37
	06:30	21:10 (WEA 42 (RW))	08:05		09:01		09:02	31:50 (WEA 07 (GRN))	09:02	16:06 (WEA 08 (GRN))	09:38
	06:32	21:10 (WEA 42 (RW))	08:07		09:0						

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 17 - IO 17 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 Sonneneinstrahlungsrichtung
- 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	17:16 (WEA 06 (GRN))	06:52		05:41	20:54 (WEA 42 (RW))
1	16:03	25	14:58 (WEA_G2)	16:55	10	15:59 (WEA_G1)	17:52	8	17:24 (WEA 06 (GRN))	19:51	21:38
2	08:37	14:34 (WEA_G2)	08:04		17:05		17:19 (WEA 06 (GRN))	06:49		05:39	20:49
1	16:04	25	14:59 (WEA_G2)	16:57		17:54	2	17:21 (WEA 06 (GRN))	19:53		21:40
3	08:37	14:35 (WEA_G2)	08:03		07:03				19:26 (WEA 01 (GRN))	05:37	20:49
1	16:05	23	14:58 (WEA_G2)	16:59		17:56			19:27 (WEA 01 (GRN))	05:31	21:41
4	08:36	14:36 (WEA_G2)	08:01		07:01		17:26 (WEA 07 (GRN))	06:44		05:35	20:48
1	16:07	23	14:59 (WEA_G2)	17:01		17:58	4	17:30 (WEA 07 (GRN))	19:57		21:42
5	08:36	14:36 (WEA_G2)	07:59		06:58		17:24 (WEA 07 (GRN))	06:42		05:33	20:47
1	16:08	22	14:58 (WEA_G2)	17:03		18:00	9	17:33 (WEA 07 (GRN))	19:59		21:43
6	08:36	14:37 (WEA_G2)	07:57		06:56		17:23 (WEA 07 (GRN))	06:39		05:31	20:47
1	16:09	21	14:58 (WEA_G2)	17:05		18:02	11	17:34 (WEA 07 (GRN))	20:01		21:44
7	08:35	14:39 (WEA_G2)	07:55		06:53		17:22 (WEA 07 (GRN))	06:37		05:29	20:46
1	16:10	20	14:59 (WEA_G2)	17:07		18:03	15	17:37 (WEA 07 (GRN))	20:02		21:45
8	08:35	14:39 (WEA_G2)	07:53		06:51		17:21 (WEA 07 (GRN))	06:34		05:27	21:10 (WEA K04)
1	16:12	19	14:58 (WEA_G2)	17:09		18:05	17	17:38 (WEA 07 (GRN))	20:04		21:46
9	08:34	14:41 (WEA_G2)	07:51		06:49		18:07	18	17:40 (WEA 07 (GRN))	20:06	21:47
1	16:13	16	14:57 (WEA_G2)	17:11		18:07	17	17:40 (WEA 07 (GRN))	20:06		21:47
10	08:33	14:42 (WEA_G2)	07:49		06:46		17:21 (WEA 07 (GRN))	06:30		05:23	21:10 (WEA K04)
1	16:15	15	14:57 (WEA_G2)	17:13	2	16:43 (WEA 08 (GRN))	18:09	18	17:39 (WEA 07 (GRN))	20:08	21:48
11	08:33	14:44 (WEA_G2)	07:47		06:44		17:22 (WEA 07 (GRN))	06:27		05:22	21:09 (WEA K04)
1	16:16	13	15:39 (WEA_G1)	17:15	4	16:45 (WEA 08 (GRN))	18:11	16	17:38 (WEA 07 (GRN))	20:10	21:49
12	08:32	14:46 (WEA_G2)	07:45		06:41		17:23 (WEA 07 (GRN))	06:25		05:20	21:09 (WEA K04)
1	16:18	11	15:41 (WEA_G1)	17:17	7	16:48 (WEA 08 (GRN))	18:13	13	17:36 (WEA 07 (GRN))	20:12	21:50
13	08:31	15:38 (WEA_G1)	07:43		06:39		17:25 (WEA 07 (GRN))	06:22		05:18	21:10 (WEA K04)
1	16:20	5	15:43 (WEA_G1)	17:19	8	16:50 (WEA 08 (GRN))	18:15	10	17:35 (WEA 07 (GRN))	20:14	21:50
14	08:30	15:38 (WEA_G1)	07:41		06:36		17:28 (WEA 07 (GRN))	06:20		05:16	21:10 (WEA K04)
1	16:21	7	15:45 (WEA_G1)	17:21	9	16:51 (WEA 08 (GRN))	18:17	4	17:50 (WEA 08 (GRN))	20:16	21:51
15	08:29	15:38 (WEA_G1)	07:39		06:34		17:50 (WEA 08 (GRN))	06:18		05:14	21:10 (WEA K04)
1	16:23	9	15:47 (WEA_G1)	17:24	7	16:51 (WEA 08 (GRN))	18:19	2	17:52 (WEA 08 (GRN))	20:18	21:52
16	08:28	15:38 (WEA_G1)	07:37		06:31		06:15			05:13	21:10 (WEA K04)
1	16:25	11	15:49 (WEA_G1)	17:26		18:21				20:19	21:52
17	08:27	15:39 (WEA_G1)	07:35		06:29		06:13			05:11	21:10 (WEA K04)
1	16:26	12	15:51 (WEA_G1)	17:28		18:23				20:21	21:53
18	08:26	15:38 (WEA_G1)	07:33		06:26		17:56 (WEA 03 (GRN))	06:10		05:09	21:10 (WEA K04)
1	16:28	15	15:53 (WEA_G1)	17:30		18:25	2	17:58 (WEA 03 (GRN))	20:23		21:53
19	08:25	15:39 (WEA_G1)	07:30		06:24		17:55 (WEA 03 (GRN))	06:08		05:08	21:11 (WEA K04)
1	16:30	16	15:55 (WEA_G1)	17:32		18:27	5	18:00 (WEA 03 (GRN))	20:25		21:54
20	08:24	15:38 (WEA_G1)	07:28		06:21		17:54 (WEA 03 (GRN))	06:06		05:06	21:11 (WEA K04)
1	16:32	18	15:56 (WEA_G1)	17:34		18:28	7	18:01 (WEA 03 (GRN))	20:27		21:54
21	08:23	15:39 (WEA_G1)	07:26		06:19		17:54 (WEA 03 (GRN))	06:04		05:05	21:11 (WEA K04)
1	16:34	20	15:59 (WEA_G1)	17:36		18:30	10	18:04 (WEA 03 (GRN))	20:29		21:54
22	08:21	15:40 (WEA_G1)	07:24		06:16		17:54 (WEA 03 (GRN))	06:01		05:03	20:50 (WEA 42 (RW))
1	16:35	21	16:01 (WEA_G1)	17:38		18:32	11	18:05 (WEA 03 (GRN))	20:31		21:54
23	08:20	15:40 (WEA_G1)	07:22		06:14		17:55 (WEA 03 (GRN))	05:59		05:02	20:50 (WEA 42 (RW))
1	16:37	23	16:03 (WEA_G1)	17:40		18:34	11	18:06 (WEA 03 (GRN))	20:33		21:54
24	08:19	15:40 (WEA_G1)	07:19		06:11		17:56 (WEA 03 (GRN))	05:57		05:00	20:50 (WEA 42 (RW))
1	16:39	24	16:04 (WEA_G1)	17:42		18:36	8	18:04 (WEA 03 (GRN))	20:34		21:55
25	08:17	15:41 (WEA_G1)	07:17		06:09		17:16 (WEA 06 (GRN))	06:09		05:54	21:11 (WEA K04)
1	16:41	24	16:05 (WEA_G1)	17:44	1	17:16 (WEA 06 (GRN))	18:38			21:29	21:55
26	08:16	15:41 (WEA_G1)	07:15		06:07		17:15 (WEA 06 (GRN))	06:07		05:58	21:12 (WEA K04)
1	16:43	23	16:04 (WEA_G1)	17:46	3	17:18 (WEA 06 (GRN))	18:40			21:30	21:55
27	08:14	15:41 (WEA_G1)	07:12		06:04		18:13 (WEA 02 (GRN))	05:50		04:57	20:51 (WEA 42 (RW))
1	16:45	23	16:04 (WEA_G1)	17:48	5	17:20 (WEA 06 (GRN))	18:42	2	18:15 (WEA 02 (GRN))	20:40	21:54
28	08:13	15:43 (WEA_G1)	07:10		06:02		18:12 (WEA 02 (GRN))	05:48		04:55	21:10 (WEA K04)
1	16:47	21	16:04 (WEA_G1)	17:50	6	17:22 (WEA 06 (GRN))	18:44	4	18:16 (WEA 02 (GRN))	20:42	21:54
29	08:11	15:44 (WEA_G1)			06:59		19:13 (WEA 02 (GRN))	05:46		04:54	21:11 (WEA K04)
1	16:49	19	16:03 (WEA_G1)		06:57		19:15 (WEA 02 (GRN))	05:44		04:53	20:52 (WEA 42 (RW))
30	08:09	15:45 (WEA_G1)			06:54		19:14 (WEA 02 (GRN))	05:44		04:53	21:10 (WEA K04)
1	16:51	17	16:02 (WEA_G1)		06:54		19:20 (WEA 02 (GRN))	05:46		04:52	20:53 (WEA 42 (RW))
31	08:08	15:47 (WEA_G1)			06:54					04:52	21:10 (WEA K04)
1	16:53	14	16:01 (WEA_G1)		06:54					04:52	21:10 (WEA K04)
Sommerstunden		248		272		367		421		496	
astr max mögl Beschattung		555		62		219		13		57	
										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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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
 Sommerdeich 14 b
 DE-25709 Kaiser-Wilhelm-Koog
 (0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 17 - IO 17 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 Sonneneinfallrichtung
 - Die Windenergieanlage/n ist/sind immer in Betrieb

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 18 - IO 18 Ratjensdorfer Felde 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03	08:06 16:55	15:59 (WEA_G3) 07:08 16:15 (WEA_G3) 17:52	06:52 19:51	05:41 20:47	04:51 21:38
2	08:37 16:04	08:04 16:57	16:01 (WEA_G3) 07:05 16:14 (WEA_G3) 17:54	06:49 19:53	05:39 20:49	04:50 21:40
3	08:37 16:05	08:02 16:59	16:03 (WEA_G3) 07:03 16:13 (WEA_G3) 17:56	06:47 19:55	05:37 20:51	04:49 21:41
4	08:36 16:06	08:01 17:01	16:06 (WEA_G3) 07:00 3 16:09 (WEA_G3) 17:58	06:44 19:57	05:35 20:53	04:48 21:42
5	08:36 16:08	07:59 17:03	06:58 17:59	06:42 19:59	05:33 20:55	04:47 21:43
6	08:36 16:09	07:57 17:05	06:56 18:01	06:39 20:00	05:31 20:57	04:47 21:44
7	08:35 16:10	07:55 17:07	06:53 18:03	06:37 20:02	05:29 20:58	04:46 21:45
8	08:35 16:12	07:53 17:09	06:51 18:05	06:34 20:04	05:27 21:00	04:45 21:46
9	08:34 16:13	07:51 17:11	06:48 18:07	06:32 20:06	05:25 21:02	04:45 21:47
10	08:33 16:15	15:37 (WEA 15 (GCN)) 07:49 1 15:38 (WEA 15 (GCN)) 17:13	06:46 18:09	06:29 20:08	05:23 21:04	04:44 21:48
11	08:33 16:16	07:47 17:15	06:44 18:11	06:27 20:10	05:21 21:06	04:44 21:49
12	08:32 16:18	07:45 17:17	06:41 18:13	06:25 20:12	05:20 21:07	04:43 21:50
13	08:31 16:20	07:43 17:19	06:39 18:15	06:22 20:14	05:18 21:09	04:43 21:50
14	08:30 16:21	07:41 17:21	06:36 18:17	06:20 20:16	05:16 21:11	04:43 21:51
15	08:29 16:23	07:39 17:23	06:34 18:19	06:17 20:17	05:14 21:13	04:42 21:52
16	08:28 16:25	07:37 17:25	06:31 18:21	06:15 20:19	05:13 21:14	04:42 21:52
17	08:27 16:26	07:35 17:28	06:29 18:23	06:13 20:21	05:11 21:16	04:42 21:53
18	08:26 16:28	07:33 17:30	06:26 18:25	06:10 20:23	05:09 21:18	04:42 21:53
19	08:25 16:30	07:30 17:32	06:24 18:27	06:08 20:25	05:08 21:19	04:42 21:53
20	08:24 16:32	07:28 17:34	06:21 18:28	06:06 20:27	05:06 21:21	04:42 21:54
21	08:22 16:34	15:56 (WEA_G3) 07:26 3 15:59 (WEA_G3) 17:36	06:19 18:30	06:03 20:29	05:05 21:23	04:42 21:54
22	08:21 16:35	15:55 (WEA_G3) 07:24 5 16:00 (WEA_G3) 17:38	06:16 18:32	06:01 20:31	05:03 21:24	04:42 21:54
23	08:20 16:37	15:56 (WEA_G3) 07:21 7 16:03 (WEA_G3) 17:40	06:14 18:34	05:59 20:32	05:02 21:26	04:43 21:54
24	08:18 16:39	15:55 (WEA_G3) 07:19 10 16:05 (WEA_G3) 17:42	06:11 18:36	05:57 20:34	05:00 21:27	04:43 21:54
25	08:17 16:41	15:56 (WEA_G3) 07:17 12 16:08 (WEA_G3) 17:44	06:09 18:38	05:54 20:36	04:59 21:29	04:43 21:55
26	08:16 16:43	15:56 (WEA_G3) 07:15 13 16:09 (WEA_G3) 17:46	06:06 18:40	05:52 20:38	04:58 21:30	04:44 21:54
27	08:14 16:45	15:56 (WEA_G3) 07:12 15 16:11 (WEA_G3) 17:48	06:04 18:42	05:50 20:40	04:56 21:32	04:44 21:54
28	08:13 16:47	15:57 (WEA_G3) 07:10 17 16:14 (WEA_G3) 17:50	06:01 18:44	05:48 20:42	04:55 21:33	04:45 21:54
29	08:11 16:49	15:57 (WEA_G3) 19 16:16 (WEA_G3)	06:59 19:45	05:46 20:44	04:54 21:34	04:45 21:54
30	08:09 16:51	15:58 (WEA_G3) 19 16:17 (WEA_G3)	06:56 19:47	05:43 20:46	04:53 21:36	04:46 21:54
31	08:08 16:53	15:59 (WEA_G3) 17 16:16 (WEA_G3)	06:54 19:49	 21:37	04:52 21:37	 21:54
Sonnenscheinstunden 248		272		367	421	496
astr.max.mögl.Beschattung 138		42				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	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 18 - IO 18 Ratjensdorfer Felde 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 Sonneneinstrahlungsrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November		Dezember
1	04:47	05:27	06:23	07:17	07:16		08:12
	21:53	21:17	20:10	18:55	16:44		15:58
2	04:47	05:29	06:24	07:19	07:18		08:14
	21:53	21:16	20:07	18:53	16:42		15:58
						1	15:20 (WEA 15 (GCN))
							15:21 (WEA 15 (GCN))
3	04:48	05:31	06:26	07:20	07:20		08:15
	21:53	21:14	20:05	18:50	16:40		15:57
4	04:49	05:32	06:28	07:22	07:22		08:17
	21:52	21:12	20:03	18:48	16:38		15:56
5	04:50	05:34	06:30	07:24	07:24		08:18
	21:52	21:10	20:00	18:45	16:36		15:55
6	04:51	05:36	06:32	07:26	07:26		08:19
	21:51	21:08	19:58	18:43	16:34		15:55
7	04:52	05:38	06:33	07:28	07:28		08:21
	21:50	21:06	19:55	18:40	16:32	5	15:36 (WEA_G3)
							15:41 (WEA_G3)
8	04:53	05:39	06:35	07:30	07:30		08:22
	21:50	21:04	19:53	18:38	16:30	11	15:44 (WEA_G3)
9	04:54	05:41	06:37	07:32	07:32		08:23
	21:49	21:02	19:50	18:36	16:28	14	15:45 (WEA_G3)
10	04:55	05:43	06:39	07:34	07:34		08:24
	21:48	21:00	19:48	18:33	16:26	16	15:46 (WEA_G3)
							15:53
11	04:56	05:45	06:41	07:35	07:36		08:26
	21:47	20:58	19:45	18:31	16:25	18	15:47 (WEA_G3)
							15:53
12	04:57	05:47	06:42	07:37	07:38		08:27
	21:46	20:56	19:43	18:28	16:23	19	15:49 (WEA_G3)
							15:53
13	04:59	05:48	06:44	07:39	07:40		08:28
	21:45	20:54	19:40	18:26	16:21	19	15:48 (WEA_G3)
							15:53
14	05:00	05:50	06:46	07:41	07:42		08:29
	21:44	20:51	19:38	18:24	16:20	17	15:46 (WEA_G3)
							15:53
15	05:01	05:52	06:48	07:43	07:43		08:30
	21:43	20:49	19:35	18:21	16:18	15	15:44 (WEA_G3)
							15:53
16	05:02	05:54	06:50	07:45	07:45		08:31
	21:42	20:47	19:33	18:19	16:16	13	15:42 (WEA_G3)
							15:53
17	05:04	05:55	06:51	07:47	07:47		08:32
	21:41	20:45	19:30	18:16	16:15	12	15:41 (WEA_G3)
							15:53
18	05:05	05:57	06:53	07:49	07:49		08:32
	21:39	20:43	19:28	18:14	16:13	10	15:39 (WEA_G3)
							15:53
19	05:07	05:59	06:55	07:51	07:51		08:33
	21:38	20:40	19:25	18:12	16:12	7	15:37 (WEA_G3)
							15:53
20	05:08	06:01	06:57	07:53	07:53		08:34
	21:37	20:38	19:23	18:10	16:11	4	15:35 (WEA_G3)
							15:54
21	05:10	06:03	06:59	07:54	07:55		08:34
	21:35	20:36	19:20	18:07	16:09	3	15:34 (WEA_G3)
							15:54
22	05:11	06:05	07:00	07:56	07:57		08:35
	21:34	20:34	19:18	18:05	16:08		15:55
23	05:13	06:06	07:02	07:58	07:58		08:35
	21:32	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	16:05		15:56
25	05:16	06:10	07:06	08:02	08:02		08:36
	21:29	20:27	19:10	16:58	16:04		15:56
26	05:17	06:12	07:08	08:04	08:04		08:37
	21:28	20:24	19:08	16:56	16:03		15:57
27	05:19	06:14	07:09	08:05	08:05		08:37
	21:26	20:22	19:05	16:54	16:02		15:58
28	05:21	06:15	07:11	08:07	08:07		08:37
	21:24	20:19	19:03	16:52	16:01		15:59
29	05:22	06:17	07:13	08:09	08:09		08:37
	21:23	20:17	19:00	16:50	16:00		16:00
30	05:24	06:19	07:15	08:10	08:10		08:37
	21:21	20:15	18:58	16:48	15:59		16:00
31	05:26	06:21		07:14			08:37
	21:19	20:12		16:46			16:02
							231
	Sonnenscheinstunden	515	461	383	328	257	
	astr.max.mögl.Beschattung					183	1

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)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 19 - IO 19 Ratjensdorfer Felde 3

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	08:06 16:55	21 16:00 (WEA_G3) 07:08 16:21 (WEA_G3) 17:52	06:52 19:51	05:41 20:47	04:51 21:38
2	08:37 16:04	08:04 16:57	21 16:00 (WEA_G3) 07:05 16:21 (WEA_G3) 17:54	06:49 19:53	05:39 20:49	04:50 21:40
3	08:37 16:05	08:02 16:59	19 16:01 (WEA_G3) 07:03 16:20 (WEA_G3) 17:56	06:47 19:55	05:37 20:51	04:49 21:41
4	08:36 16:06	08:01 17:01	18 16:02 (WEA_G3) 07:00 16:20 (WEA_G3) 17:58	06:44 19:57	05:35 20:53	04:48 21:42
5	08:36 16:08	07:59 17:03	14 16:04 (WEA_G3) 06:58 16:18 (WEA_G3) 17:59	06:42 19:59	05:33 20:55	04:47 21:43
6	08:36 16:09	07:57 17:05	12 16:05 (WEA_G3) 06:56 16:17 (WEA_G3) 18:01	06:39 20:00	05:31 20:57	04:47 21:44
7	08:35 16:10	07:55 17:07	5 16:09 (WEA_G3) 06:53 16:14 (WEA_G3) 18:03	06:37 20:02	05:29 20:58	04:46 21:45
8	08:35 16:12	07:53 17:09	06:51 18:05	06:34 20:04	05:27 21:00	04:45 21:46
9	08:34 16:13	07:51 17:11	06:48 18:07	06:32 20:06	05:25 21:02	04:45 21:47
10	08:33 16:15	15:36 (WEA 15 (GCN)) 07:49 2 15:38 (WEA 15 (GCN)) 17:13	06:46 18:09	06:29 20:08	05:23 21:04	04:44 21:48
11	08:33 16:16	15:37 (WEA 15 (GCN)) 07:47 2 15:39 (WEA 15 (GCN)) 17:15	06:44 18:11	06:27 20:10	05:21 21:06	04:44 21:49
12	08:32 16:18	15:38 (WEA 15 (GCN)) 07:45 3 15:41 (WEA 15 (GCN)) 17:17	06:41 18:13	06:25 20:12	05:20 21:07	04:43 21:50
13	08:31 16:20	15:40 (WEA 15 (GCN)) 07:43 3 15:43 (WEA 15 (GCN)) 17:19	06:39 18:15	06:22 20:14	05:18 21:09	04:43 21:50
14	08:30 16:21	07:41 17:21	06:36 18:17	06:20 20:16	05:16 21:11	04:43 21:51
15	08:29 16:23	07:39 17:23	06:34 18:19	06:17 20:17	05:14 21:13	04:42 21:52
16	08:28 16:25	07:37 17:26	06:31 18:21	06:15 20:19	05:13 21:14	04:42 21:52
17	08:27 16:26	07:35 17:28	06:29 18:23	06:13 20:21	05:11 21:16	04:42 21:53
18	08:26 16:28	07:33 17:30	06:26 18:25	06:10 20:23	05:09 21:18	04:42 21:53
19	08:25 16:30	07:30 17:32	06:24 18:27	06:08 20:25	05:08 21:19	04:42 21:53
20	08:24 16:32	07:28 17:34	06:21 18:28	06:06 20:27	05:06 21:21	04:42 21:54
21	08:22 16:34	07:26 17:36	06:19 18:30	06:03 20:29	05:05 21:23	04:42 21:54
22	08:21 16:35	07:24 17:38	06:16 18:32	06:01 20:31	05:03 21:24	04:42 21:54
23	08:20 16:37	16:00 (WEA_G3) 07:21 3 16:03 (WEA_G3) 17:40	06:14 18:34	05:59 20:32	05:02 21:26	04:43 21:54
24	08:18 16:39	15:59 (WEA_G3) 07:19 6 16:05 (WEA_G3) 17:42	06:11 18:36	05:57 20:34	05:00 21:27	04:43 21:54
25	08:17 16:41	15:59 (WEA_G3) 07:17 9 16:08 (WEA_G3) 17:44	06:09 18:38	05:54 20:36	04:59 21:29	04:43 21:55
26	08:16 16:43	15:59 (WEA_G3) 07:15 10 16:09 (WEA_G3) 17:46	06:06 18:40	05:52 20:38	04:58 21:30	04:44 21:54
27	08:14 16:45	15:59 (WEA_G3) 07:12 12 16:11 (WEA_G3) 17:48	06:04 18:42	05:50 20:40	04:56 21:32	04:44 21:54
28	08:13 16:47	15:59 (WEA_G3) 07:10 15 16:14 (WEA_G3) 17:50	06:01 18:44	05:48 20:42	04:55 21:33	04:45 21:54
29	08:11 16:49	15:59 (WEA_G3) 17 16:16 (WEA_G3)	06:59 19:45	05:46 20:44	04:54 21:34	04:45 21:54
30	08:09 16:51	15:59 (WEA_G3) 19 16:18 (WEA_G3)	06:56 19:47	05:43 20:46	04:53 21:36	04:46 21:54
31	08:08 16:53	16:00 (WEA_G3) 20 16:20 (WEA_G3)	06:54 19:49	 21:37	04:52 21:37	
	Sonnenscheinstunden 248	272	367	421	496	513
	astr.max.mögl.Beschattung 121	110				

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 19 - IO 19 Ratjensdorfer Felde 3
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 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	07:20 18:50	07:20 16:40	08:15 15:57	
4	04:49 21:52	05:32 21:12	06:28 20:03	07:22 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 18:45	07:24 16:36	08:18 15:55	
6	04:51 21:51	05:36 21:08	06:32 19:58	07:26 18:43	07:26 16:34	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	08:21 15:54	
8	04:53 21:50	05:39 21:04	06:35 19:53	07:30 18:38	07:30 16:30	08:22 15:54	
9	04:54 21:49	05:41 21:02	06:37 19:50	07:32 18:36	07:32 16:28	08:23 15:54	
10	04:55 21:48	05:43 21:00	06:39 19:48	07:34 18:33	07:34 16:26	08:24 15:53	
11	04:56 21:47	05:45 20:58	06:41 19:45	07:35 18:31	07:36 16:25	08:26 15:53	
12	04:57 21:46	05:47 20:56	06:42 19:43	07:37 18:28	07:38 16:23	08:27 15:53	
13	04:59 21:45	05:48 20:54	06:44 19:40	07:39 18:26	07:40 16:21	08:28 15:53	
14	05:00 21:44	05:50 20:51	06:46 19:38	07:41 18:24	07:42 16:20	08:29 15:53	
15	05:01 21:43	05:52 20:49	06:48 19:35	07:43 18:21	07:43 16:18	08:30 15:53	
16	05:02 21:42	05:54 20:47	06:50 19:33	07:45 18:19	07:45 16:16	08:31 15:53	
17	05:04 21:41	05:55 20:45	06:51 19:30	07:47 18:16	07:47 16:15	08:32 15:53	
18	05:05 21:39	05:57 20:43	06:53 19:28	07:49 18:14	07:49 16:13	08:32 15:53	
19	05:07 21:38	05:59 20:40	06:55 19:25	07:51 18:12	07:51 16:12	08:33 15:53	
20	05:08 21:37	06:01 20:38	06:57 19:23	07:53 18:10	07:53 16:11	08:34 15:54	
21	05:10 21:35	06:03 20:36	06:59 19:20	07:54 18:07	07:55 16:09	08:34 15:54	
22	05:11 21:34	06:05 20:34	07:00 19:18	07:56 18:05	07:57 16:08	08:35 15:55	
23	05:13 21:32	06:06 20:31	07:02 19:15	07:58 18:03	07:58 16:07	08:35 15:55	
24	05:14 21:31	06:08 20:29	07:04 19:13	08:00 18:01	08:00 16:05	08:36 15:56	
25	05:16 21:29	06:10 20:27	07:06 19:10	08:02 16:58	08:02 16:04	08:36 15:56	
26	05:17 21:28	06:12 20:24	07:08 19:08	08:04 16:56	08:04 16:03	08:37 15:57	
27	05:19 21:26	06:14 20:22	07:09 19:05	08:06 16:54	08:05 16:02	08:37 15:58	
28	05:21 21:24	06:15 20:19	07:11 19:03	08:08 16:52	08:07 16:01	08:37 15:59	
29	05:22 21:23	06:17 20:17	07:13 19:00	08:09 16:50	08:09 16:00	08:37 16:00	
30	05:24 21:21	06:19 20:15	07:15 18:58	08:10 16:48	08:10 15:59	08:37 16:01	
31	05:26 21:19	06:21 20:12		07:14 16:46		08:37 16:02	
Sonnenscheinstunden		515	461	383	328	257	231
astr.max.mögl.Beschattung							
						229	3

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 20 - IO 20 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03	15:22 (WEA 15 (GCN)) 15:25 (WEA 15 (GCN))	08:06 16:55	15:51 (WEA_G3) 16:22 (WEA_G2)	07:08 17:52	06:52 19:51
2	08:37 16:04	15:21 (WEA 15 (GCN)) 15:25 (WEA 15 (GCN))	08:04 16:57	15:51 (WEA_G3) 16:25 (WEA_G2)	07:05 17:54	06:49 19:53
3	08:37 16:05	15:22 (WEA 15 (GCN)) 15:27 (WEA 15 (GCN))	08:02 16:59	15:52 (WEA_G3) 16:27 (WEA_G2)	07:03 17:56	06:47 19:55
4	08:36 16:06	15:24 (WEA 15 (GCN)) 15:29 (WEA 15 (GCN))	08:01 17:01	15:53 (WEA_G3) 16:29 (WEA_G2)	07:01 17:58	06:44 19:57
5	08:36 16:08	15:24 (WEA 15 (GCN)) 15:30 (WEA 15 (GCN))	07:59 17:03	15:54 (WEA_G3) 16:31 (WEA_G2)	06:58 18:00	06:42 19:59
6	08:36 16:09	15:24 (WEA 15 (GCN)) 15:31 (WEA 15 (GCN))	07:57 17:05	15:55 (WEA_G3) 16:34 (WEA_G2)	06:56 18:01	06:39 20:01
7	08:35 16:10	15:26 (WEA 15 (GCN)) 15:33 (WEA 15 (GCN))	07:55 17:07	15:57 (WEA_G3) 16:36 (WEA_G2)	06:53 18:03	06:37 20:02
8	08:35 16:12	15:26 (WEA 15 (GCN)) 15:34 (WEA 15 (GCN))	07:53 17:09	16:00 (WEA_G3) 16:38 (WEA_G2)	06:51 18:05	06:34 20:04
9	08:34 16:13	15:28 (WEA 15 (GCN)) 15:33 (WEA 15 (GCN))	07:51 17:11	16:19 (WEA_G2) 16:38 (WEA_G2)	06:48 18:07	06:32 20:06
10	08:33 16:15	15:30 (WEA 15 (GCN)) 15:31 (WEA 15 (GCN))	07:49 17:13	16:21 (WEA_G2) 16:37 (WEA_G2)	06:46 18:09	06:29 20:08
11	08:33 16:16		07:47 17:15	16:22 (WEA_G2) 16:36 (WEA_G2)	06:44 18:11	06:27 20:10
12	08:32 16:18		07:45 17:17	16:24 (WEA_G2) 16:35 (WEA_G2)	06:41 18:13	06:25 20:12
13	08:31 16:20		07:43 17:19	16:28 (WEA_G2) 16:31 (WEA_G2)	06:39 18:15	06:22 20:14
14	08:30 16:21		07:41 17:21	06:36 18:17	06:36 18:17	06:20 20:16
15	08:29 16:23		07:39 17:23	06:34 18:19	06:34 18:19	06:17 20:17
16	08:28 16:25		07:37 17:26	06:31 18:21	06:31 18:21	06:15 20:19
17	08:27 16:26		07:35 17:28	06:29 18:23	06:29 18:23	06:13 20:21
18	08:26 16:28		07:33 17:30	06:26 18:25	06:26 18:25	06:10 20:23
19	08:25 16:30	15:52 (WEA_G3) 15:55 (WEA_G3)	07:30 17:32	06:24 18:27	06:24 18:27	06:08 20:25
20	08:24 16:32	15:51 (WEA_G3) 15:56 (WEA_G3)	07:28 17:34	06:21 18:28	06:21 18:28	06:06 20:27
21	08:23 16:34	15:51 (WEA_G3) 15:59 (WEA_G3)	07:26 17:36	06:19 18:30	06:19 18:30	06:03 20:29
22	08:21 16:35	15:50 (WEA_G3) 16:00 (WEA_G3)	07:24 17:38	06:16 18:32	06:16 18:32	06:01 20:31
23	08:20 16:37	15:50 (WEA_G3) 16:03 (WEA_G3)	07:21 17:40	06:14 18:34	06:14 18:34	05:59 20:32
24	08:19 16:39	15:50 (WEA_G3) 16:05 (WEA_G3)	07:19 17:42	06:11 18:36	06:11 18:36	05:57 20:34
25	08:17 16:41	15:50 (WEA_G3) 16:08 (WEA_G3)	07:17 17:44	06:09 18:38	06:09 18:38	05:54 20:36
26	08:16 16:43	15:50 (WEA_G3) 16:09 (WEA_G3)	07:15 17:46	06:06 18:40	06:06 18:40	05:52 20:38
27	08:14 16:45	15:50 (WEA_G3) 16:11 (WEA_G3)	07:12 17:48	06:04 18:42	06:04 18:42	05:50 20:40
28	08:13 16:47	15:50 (WEA_G3) 16:14 (WEA_G3)	07:10 17:50	06:01 18:44	06:01 18:44	05:48 20:42
29	08:11 16:49	15:50 (WEA_G3) 16:16 (WEA_G3)		06:59 19:45	06:59 19:45	05:46 20:44
30	08:09 16:51	15:50 (WEA_G3) 16:17 (WEA_G3)		06:57 19:47	06:57 19:47	05:43 20:46
31	08:08 16:53	15:51 (WEA_G3) 16:17 (WEA_G3)		06:54 19:49	06:54 19:49	05:42 21:37
Sonnenscheinstunden	248	272	367	421	496	513
astr. max. mögl. Beschattung	266	319	1			

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 20 - IO 20 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	July	August	September	Oktober	November	Dezember
1	04:47	05:27	06:23	07:17	07:16	15:50 (WEA_G2) 08:12
	21:53	21:17	20:10	18:55	16:44	17 16:07 (WEA_G2) 15:58
2	04:47	05:29	06:24	07:19	07:18	15:49 (WEA_G2) 08:14
	21:53	21:16	20:07	18:53	16:42	19 16:08 (WEA_G2) 15:58
3	04:48	05:31	06:26	07:20	07:20	15:29 (WEA_G3) 08:15
	21:53	21:14	20:05	18:50	16:40	30 16:07 (WEA_G2) 15:57
4	04:49	05:32	06:28	07:22	07:22	15:27 (WEA_G3) 08:17
	21:52	21:12	20:03	18:48	16:38	32 16:05 (WEA_G2) 15:56
5	04:50	05:34	06:30	07:24	07:24	15:26 (WEA_G3) 08:18
	21:52	21:10	20:00	18:45	16:36	33 16:04 (WEA_G2) 15:56
6	04:51	05:36	06:32	07:26	07:26	15:25 (WEA_G3) 08:19
	21:51	21:08	19:58	18:43	16:34	34 16:02 (WEA_G2) 15:55
7	04:52	05:38	06:33	07:28	07:28	15:24 (WEA_G3) 08:21
	21:50	21:06	19:55	18:40	16:32	34 16:00 (WEA_G2) 15:54
8	04:53	05:39	06:35	07:30	07:30	15:23 (WEA_G3) 08:22
	21:50	21:04	19:53	18:38	16:30	32 15:57 (WEA_G2) 15:54
9	04:54	05:41	06:37	07:32	07:32	15:22 (WEA_G3) 08:23
	21:49	21:02	19:50	18:36	16:28	31 15:55 (WEA_G2) 15:54
10	04:55	05:43	06:39	07:34	07:34	15:22 (WEA_G3) 08:25
	21:48	21:00	19:48	18:33	16:26	28 15:53 (WEA_G2) 15:53
11	04:56	05:45	06:41	07:35	07:35	15:21 (WEA_G3) 08:26
	21:47	20:58	19:45	18:31	16:25	28 15:51 (WEA_G2) 15:53
12	04:57	05:47	06:42	07:37	07:37	15:22 (WEA_G3) 08:27
	21:46	20:56	19:43	18:28	16:23	27 15:49 (WEA_G3) 15:53
13	04:59	05:48	06:44	07:39	07:39	15:22 (WEA_G3) 08:28
	21:45	20:54	19:40	18:26	16:21	26 15:48 (WEA_G3) 15:53
14	05:00	05:50	06:46	07:41	07:42	15:22 (WEA_G3) 08:29
	21:44	20:51	19:38	18:24	16:20	24 15:46 (WEA_G3) 15:53
15	05:01	05:52	06:48	07:43	07:44	15:23 (WEA_G3) 08:30
	21:43	20:49	19:35	18:21	16:18	21 15:44 (WEA_G3) 15:53
16	05:02	05:54	06:50	07:45	07:45	15:23 (WEA_G3) 08:31
	21:42	20:47	19:33	18:19	16:16	19 15:42 (WEA_G3) 15:53
17	05:04	05:56	06:51	07:47	07:47	15:23 (WEA_G3) 08:32
	21:41	20:45	19:30	18:17	16:15	18 15:41 (WEA_G3) 15:53
18	05:05	05:57	06:53	07:49	07:49	15:24 (WEA_G3) 08:32
	21:39	20:43	19:28	18:14	16:13	15 15:39 (WEA_G3) 15:53
19	05:07	05:59	06:55	07:51	07:51	15:24 (WEA_G3) 08:33
	21:38	20:40	19:25	18:12	16:12	13 15:37 (WEA_G3) 15:53
20	05:08	06:01	06:57	07:53	07:53	15:25 (WEA_G3) 08:34
	21:37	20:38	19:23	18:10	16:11	11 15:36 (WEA_G3) 15:54
21	05:10	06:03	06:59	07:54	07:55	15:26 (WEA_G3) 08:34
	21:35	20:36	19:20	18:07	16:09	8 15:34 (WEA_G3) 15:54
22	05:11	06:05	07:00	07:56	07:57	15:27 (WEA_G3) 08:35
	21:34	20:34	19:18	18:05	16:08	5 15:32 (WEA_G3) 15:55
23	05:13	06:06	07:02	07:58	07:58	15:28 (WEA_G3) 08:35
	21:32	20:31	19:15	18:03	16:07	3 15:31 (WEA_G3) 15:55
24	05:14	06:08	07:04	08:00	08:00	08:36
	21:31	20:29	19:13	18:01	16:05	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	08:37
	21:28	20:24	19:08	16:56	16:03	15:57
27	05:19	06:14	07:09	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	15:59
	21:24	20:19	19:03	16:52	16:01	15:59
29	05:22	06:17	07:13	07:10	08:09	15:59
	21:23	20:17	19:00	16:50	6 16:01 (WEA_G2) 16:00	16:00
30	05:24	06:19	07:15	07:12	15:53 (WEA_G2) 08:10	16:00
	21:21	20:15	18:58	16:48	12 16:05 (WEA_G2) 15:59	16:01
31	05:26	06:21		07:14	15:51 (WEA_G2)	08:37
	21:19	20:12		16:46	15 16:06 (WEA_G2)	16:02
Sonnenscheinstunden	515	461	383	328	257	231
astr.max.mögl.Beschattung			1	33	508	63

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

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

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 21 - IO 21 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 Sonneneinstrahlungsrichtung
- 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	2	17:24 (WEA 17 (GCN)) 19:53	10	19:15 (WEA 15 (GCN)) 19:26 (WEA 15 (GCN))	05:39 20:49	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	3	17:23 (WEA 17 (GCN)) 19:55	11	19:16 (WEA 15 (GCN)) 19:27 (WEA 16 (GCN))	05:37 20:51	19:45 (WEA_G3) 20:00 (WEA_G3)	04:49 21:41
4	08:36 16:07	08:01 17:01	07:00 17:58	4	17:21 (WEA 17 (GCN)) 19:57	12	19:17 (WEA 16 (GCN)) 19:30 (WEA 16 (GCN))	05:35 20:53	19:49 (WEA_G3) 19:59 (WEA_G3)	04:48 21:42
5	08:36 16:08	07:59 17:03	06:58 18:00	5	17:21 (WEA 17 (GCN)) 19:59	13	19:16 (WEA 16 (GCN)) 19:32 (WEA 16 (GCN))	05:33 20:55		04:47 21:43
6	08:36 16:09	07:57 17:05	06:56 18:01	6	17:21 (WEA 17 (GCN)) 20:00	14	19:15 (WEA 16 (GCN)) 19:33 (WEA 16 (GCN))	05:31 20:57		04:47 21:44
7	08:35 16:10	07:55 17:07	06:53 18:03	7	17:21 (WEA 17 (GCN)) 20:02	15	19:15 (WEA 16 (GCN)) 19:35 (WEA_G2)	05:29 20:58		04:46 21:45
8	08:35 16:12	07:53 17:09	06:51 18:05	8	17:21 (WEA 17 (GCN)) 20:04	16	19:15 (WEA 16 (GCN)) 19:36 (WEA_G2)	05:27 21:00		04:45 21:46
9	08:34 16:13	07:51 17:11	06:48 18:07	9	17:23 (WEA 17 (GCN)) 20:06	17	19:15 (WEA 16 (GCN)) 19:39 (WEA_G2)	05:25 21:02		04:45 21:47
10	08:33 16:15	07:49 17:13	06:46 18:09	10	17:24 (WEA 17 (GCN)) 20:08	18	19:16 (WEA 16 (GCN)) 19:41 (WEA_G2)	05:23 21:04		04:44 21:48
11	08:33 16:16	07:47 17:15	06:44 18:11	11	17:42 (WEA 18 (GCN)) 20:10	19	19:17 (WEA 16 (GCN)) 19:42 (WEA_G2)	05:22 21:06		04:44 21:49
12	08:32 16:18	07:45 17:17	06:41 18:13	12	17:32 (WEA 18 (GCN)) 20:12	20	19:19 (WEA 16 (GCN)) 19:44 (WEA_G2)	05:20 21:07		04:43 21:49
13	08:31 16:20	07:43 17:19	06:39 18:15	13	17:46 (WEA 18 (GCN)) 20:14	21	19:27 (WEA_G2) 19:45 (WEA_G2)	05:18 21:09		04:43 21:50
14	08:30 16:21	07:41 17:21	06:36 18:17	14	17:31 (WEA 18 (GCN)) 20:16	22	19:28 (WEA_G2) 19:47 (WEA_G2)	05:16 21:11		04:43 21:51
15	08:29 16:23	07:39 17:24	06:34 18:19	15	17:50 (WEA 18 (GCN)) 20:18	23	19:29 (WEA_G2) 19:46 (WEA_G2)	05:14 21:13		04:42 21:51
16	08:28 16:25	07:37 17:26	06:31 18:21	16	17:51 (WEA 18 (GCN)) 20:19	24	19:30 (WEA_G2) 19:52 (WEA_G3)	05:13 21:14		04:42 21:52
17	08:27 16:26	07:35 17:28	06:29 18:23	17	17:29 (WEA 18 (GCN)) 20:21	25	19:31 (WEA_G2) 19:53 (WEA_G3)	05:11 21:16		04:42 21:53
18	08:26 16:28	07:33 17:30	06:26 18:25	18	17:29 (WEA 18 (GCN)) 20:23	26	19:35 (WEA_G2) 19:55 (WEA_G3)	05:09 21:18		04:42 21:53
19	08:25 16:30	07:30 17:32	06:24 18:27	19	17:29 (WEA 18 (GCN)) 20:25	27	19:45 (WEA_G3) 19:57 (WEA_G3)	05:08 21:19		04:42 21:53
20	08:24 16:32	07:28 17:34	06:21 18:28	20	17:29 (WEA 18 (GCN)) 20:27	28	19:44 (WEA_G3) 19:59 (WEA_G3)	05:06 21:21		04:42 21:54
21	08:22 16:34	07:26 17:36	06:19 18:30	21	17:48 (WEA 18 (GCN)) 20:29	29	19:42 (WEA_G3) 20:00 (WEA_G3)	05:05 21:23		04:42 21:54
22	08:21 16:35	07:24 17:38	06:16 18:32	22	17:31 (WEA 18 (GCN)) 20:31	30	19:42 (WEA_G3) 20:02 (WEA_G3)	05:03 21:24		04:43 21:54
23	08:20 16:37	07:21 17:40	06:14 18:34	23	17:44 (WEA 18 (GCN)) 20:32	31	19:42 (WEA_G3) 20:03 (WEA_G3)	05:02 21:26		04:43 21:54
24	08:18 16:39	07:19 17:42	06:11 18:36	24	17:40 (WEA 18 (GCN)) 20:34		19:41 (WEA_G3) 20:05 (WEA_G3)	05:00 21:27		04:43 21:54
25	08:17 16:41	07:17 17:44	06:09 18:38	25	05:57 20:36	2	19:41 (WEA_G3) 20:07 (WEA_G3)	05:00 21:29		04:43 21:54
26	08:16 16:43	07:15 17:45	06:06 18:40	26	05:52 20:38	3	19:41 (WEA_G3) 20:08 (WEA_G3)	04:58 21:30		04:44 21:54
27	08:14 16:45	07:12 17:48	06:04 18:42	27	05:50 20:40	4	19:41 (WEA_G3) 20:07 (WEA_G3)	04:57 21:32		04:44 21:54
28	08:13 16:47	07:10 17:50	06:01 18:44	28	05:48 20:42	5	19:41 (WEA_G3) 20:06 (WEA_G3)	04:55 21:33		04:45 21:54
29	08:11 16:49		06:59 19:45	29	05:46 20:44	6	19:42 (WEA_G3) 20:05 (WEA_G3)	04:54 21:34		04:45 21:54
30	08:09 16:51		06:57 19:47	30	05:44 20:46	7	19:42 (WEA_G3) 20:05 (WEA_G3)	04:53 21:36		04:46 21:54
31	08:08 16:53		06:54 19:49	31	05:42 20:46		20:05 (WEA_G3) 04:52 21:37			04:46 21:54
	Sonnenscheinstunden astr. max. mögl. Beschattung	248 272	367 328		421 579		496 64			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	Zeitpunkt (SS:MM) Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 21 - IO 21 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember
1	04:47	05:27	06:23	19:16 (WEA 16 (GCN))	07:16	08:12
	21:53	21:17	20:10	19:41 (WEA_G2)	18:55	16:44
2	04:47	05:29	06:24	19:14 (WEA 16 (GCN))	07:19	08:13
	21:53	21:16	20:07	19:39 (WEA_G2)	18:53	16:42
3	04:48	05:31	06:26	19:13 (WEA 16 (GCN))	07:20	08:15
	21:53	21:14	20:05	19:37 (WEA_G2)	18:50	16:40
4	04:49	05:32	06:28	19:12 (WEA 16 (GCN))	07:22	08:16
	21:52	21:12	20:02	19:31 (WEA_G2)	18:48	16:38
5	04:50	05:34	06:30	19:11 (WEA 16 (GCN))	07:24	08:18
	21:51	21:10	20:00	19:31 (WEA_G2)	18:45	16:36
6	04:51	05:36	06:32	19:11 (WEA 16 (GCN))	07:26	08:19
	21:51	21:08	19:58	19:29 (WEA 16 (GCN))	18:43	16:34
7	04:52	05:38	06:33	19:12 (WEA 16 (GCN))	07:28	08:21
	21:50	21:06	19:55	19:27 (WEA 16 (GCN))	18:40	16:32
8	04:53	05:39	06:35	19:11 (WEA 16 (GCN))	07:30	08:22
	21:49	21:04	20:06 (WEA_G3)	19:24 (WEA 16 (GCN))	18:38	16:30
9	04:54	05:41	06:37	19:56 (WEA_G3)	18:38	08:23
	21:49	21:02	20:08 (WEA_G3)	19:10 (WEA 15 (GCN))	07:32	08:23
10	04:55	05:43	06:39	19:54 (WEA_G3)	18:36	15:54
	21:48	21:00	20:10 (WEA_G3)	19:22 (WEA 16 (GCN))	18:36	16:28
11	04:56	05:45	06:41	19:09 (WEA 15 (GCN))	07:34	08:24
	21:47	20:58	20:12 (WEA_G3)	19:19 (WEA 15 (GCN))	18:33	16:26
12	04:57	05:47	06:42	19:08 (WEA 15 (GCN))	07:35	08:26
	21:46	20:56	20:12 (WEA_G3)	19:17 (WEA 15 (GCN))	18:31	16:25
13	04:59	05:48	06:44	19:06 (WEA 15 (GCN))	07:37	08:27
	21:45	20:54	20:13 (WEA_G3)	19:14 (WEA 15 (GCN))	18:28	16:23
14	05:00	05:50	06:46	19:06 (WEA 15 (GCN))	07:41	15:53
	21:44	20:51	20:14 (WEA_G3)	19:09 (WEA 15 (GCN))	18:24	16:20
15	05:01	05:52	06:48		07:43	08:30
	21:43	20:49	20:14 (WEA_G3)		18:21	16:18
16	05:03	05:54	06:50		07:45	08:31
	21:42	20:47	20:14 (WEA_G3)		18:19	16:16
17	05:04	05:56	06:51		07:47	08:32
	21:40	20:45	20:15 (WEA_G3)		18:17	16:15
18	05:05	05:57	06:53		07:49	08:32
	21:39	20:43	20:12 (WEA_G3)		18:14	16:13
19	05:07	05:59	06:55		07:51	08:33
	21:38	20:40	20:11 (WEA_G3)		18:12	16:12
20	05:08	06:01	06:57		07:53	08:34
	21:37	20:38	20:09 (WEA_G3)		18:10	16:11
21	05:10	06:03	06:59	18:18 (WEA 18 (GCN))	07:54	08:34
	21:35	20:36	20:06 (WEA_G3)	18:29 (WEA 18 (GCN))	18:07	16:09
22	05:11	06:05	07:00	18:16 (WEA 18 (GCN))	07:56	08:35
	21:34	20:33	20:04 (WEA_G3)	18:31 (WEA 18 (GCN))	18:05	16:08
23	05:13	06:06	07:02	18:14 (WEA 18 (GCN))	07:58	08:35
	21:32	20:31	20:02 (WEA_G3)	18:32 (WEA 18 (GCN))	18:03	16:07
24	05:14	06:08	07:04	18:13 (WEA 18 (GCN))	08:00	08:36
	21:31	20:29	20:00 (WEA_G3)	18:33 (WEA 18 (GCN))	18:01	16:05
25	05:16	06:10	07:06	18:11 (WEA 18 (GCN))	07:02	08:36
	21:29	20:27	19:57 (WEA_G3)	18:32 (WEA 18 (GCN))	16:58	16:04
26	05:17	06:12	07:08	18:11 (WEA 18 (GCN))	07:04	08:36
	21:28	20:24	19:55 (WEA_G3)	18:33 (WEA 18 (GCN))	16:56	16:03
27	05:19	06:14	07:09	18:10 (WEA 18 (GCN))	07:06	08:37
	21:26	20:22	19:53 (WEA_G3)	18:33 (WEA 18 (GCN))	16:54	16:02
28	05:21	06:15	07:11	18:10 (WEA 18 (GCN))	07:08	08:37
	21:24	20:19	19:47 (WEA_G2)	18:32 (WEA 18 (GCN))	16:52	16:01
29	05:22	06:17	07:13	18:10 (WEA 18 (GCN))	07:10	08:37
	21:23	20:17	19:48 (WEA_G2)	18:32 (WEA 18 (GCN))	16:50	16:00
30	05:24	06:19	07:15	18:11 (WEA 18 (GCN))	07:12	08:37
	21:21	20:15	19:46 (WEA_G2)	18:29 (WEA 18 (GCN))	16:48	15:59
31	05:26	06:21	19:19 (WEA 16 (GCN))		07:14	08:37
	21:19	20:12	19:44 (WEA_G2)		16:46	16:02
Sonnenscheinstunden	515	461	383		328	257
astr.max.mögl.Beschattung		456	401	125		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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 22 - IO 22 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

	Januar	Februar	März		April	Mai		Juni	
1	08:37	08:06	07:08		06:52	05:41		04:51	20:47 (WEA_G1)
	16:03	16:55	17:52		19:51	20:47		21:38	16 21:03 (WEA_G1)
2	08:37	08:04	07:05		06:49	05:39		04:50	20:47 (WEA_G1)
	16:04	16:57	17:54		19:53	20:49		21:40	17 21:04 (WEA_G1)
3	08:37	08:02	07:03		06:47	05:37		04:49	20:48 (WEA_G1)
	16:05	16:59	17:56		19:55	20:51		21:41	18 21:06 (WEA_G1)
4	08:36	08:01	07:01		06:44	05:35		04:48	20:48 (WEA_G1)
	16:07	17:01	17:58		19:57	20:53		21:42	19 21:07 (WEA_G1)
5	08:36	07:59	06:58		06:42	05:33		04:47	20:48 (WEA_G1)
	16:08	17:03	18:00		19:59	20:55		21:43	19 21:07 (WEA_G1)
6	08:36	07:57	06:56		06:39	05:31		04:47	20:49 (WEA_G1)
	16:09	17:05	18:02		20:01	20:57		21:44	19 21:08 (WEA_G1)
7	08:35	07:55	06:53		06:37	05:29		04:46	20:49 (WEA_G1)
	16:11	17:07	18:03		20:02	20:58		21:45	18 21:07 (WEA_G1)
8	08:35	07:53	06:51		06:34	05:27		04:45	20:50 (WEA_G1)
	16:12	17:09	18:05		20:04	21:00		21:46	18 21:08 (WEA_G1)
9	08:34	07:51	06:48		06:32	05:25		04:45	20:50 (WEA_G1)
	16:13	17:11	18:07		20:06	21:02		21:47	17 21:07 (WEA_G1)
10	08:33	07:49	06:46		06:30	05:23		04:44	20:51 (WEA_G1)
	16:15	17:13	18:09		20:08	21:04		21:48	16 21:07 (WEA_G1)
11	08:33	07:47	06:44		06:27	05:22		04:44	20:51 (WEA_G1)
	16:16	17:15	18:11		20:10	21:06		21:49	16 21:07 (WEA_G1)
12	08:32	07:45	06:41		06:25	05:20		04:43	20:51 (WEA_G1)
	16:18	17:17	18:13		20:12	21:07		21:49	16 21:07 (WEA_G1)
13	08:31	07:43	06:39		06:22	05:18		04:43	20:52 (WEA_G1)
	16:20	17:19	18:15		20:14	21:09		21:50	15 21:07 (WEA_G1)
14	08:30	07:41	06:36		06:20	05:16		04:43	20:53 (WEA_G1)
	16:21	17:22	18:17		20:16	21:11		21:51	14 21:07 (WEA_G1)
15	08:29	07:39	06:34		06:18	05:14		04:43	20:53 (WEA_G1)
	16:23	17:24	18:19		20:17	21:13		21:51	14 21:07 (WEA_G1)
16	08:28	07:37	06:31		06:15	05:13		04:42	20:53 (WEA_G1)
	16:25	17:26	18:21		20:19	21:14		21:52	13 21:06 (WEA_G1)
17	08:27	07:35	06:29		06:13	05:11		04:42	20:53 (WEA_G1)
	16:26	17:28	18:23		20:21	21:16		21:53	13 21:06 (WEA_G1)
18	08:26	07:33	06:26		06:10	05:09		04:42	20:54 (WEA_G1)
	16:28	17:30	18:25		20:23	21:18		21:53	14 21:08 (WEA_G1)
19	08:25	07:30	06:24		06:08	05:08		04:42	20:55 (WEA_G1)
	16:30	17:32	18:27		20:25	21:19		21:53	13 21:08 (WEA_G1)
20	08:24	07:28	06:21		06:06	05:06		04:42	20:55 (WEA_G1)
	16:32	17:34	18:28		20:27	21:21		21:54	13 21:08 (WEA_G1)
21	08:22	07:26	06:19		06:04	05:05	20:47 (WEA_G1)	04:42	20:55 (WEA_G1)
	16:34	17:36	18:30		20:29	21:23	2 20:49 (WEA_G1)	21:54	13 21:08 (WEA_G1)
22	08:21	07:24	06:16	18:04 (WEA 20 (GCS))	06:01	05:03	20:47 (WEA_G1)	04:43	20:55 (WEA_G1)
	16:36	17:38	18:32	1 18:05 (WEA 20 (GCS))	20:31	21:24	4 20:51 (WEA_G1)	21:54	13 21:08 (WEA_G1)
23	08:20	07:21	06:14	18:07 (WEA 20 (GCS))	05:59	05:02	20:46 (WEA_G1)	04:43	20:55 (WEA_G1)
	16:37	17:40	18:34	1 18:08 (WEA 20 (GCS))	20:32	21:26	6 20:52 (WEA_G1)	21:54	13 21:08 (WEA_G1)
24	08:18	07:19	06:11		05:57	05:00	20:46 (WEA_G1)	04:43	20:56 (WEA_G1)
	16:39	17:42	18:36		20:34	21:27	7 20:53 (WEA_G1)	21:54	13 21:09 (WEA_G1)
25	08:17	07:17	06:09		05:54	04:59	20:46 (WEA_G1)	04:43	20:55 (WEA_G1)
	16:41	17:44	18:38		20:36	21:29	9 20:55 (WEA_G1)	21:54	14 21:09 (WEA_G1)
26	08:16	07:15	06:06		05:52	04:58	20:46 (WEA_G1)	04:44	20:56 (WEA_G1)
	16:43	17:46	18:40		20:38	21:30	10 20:56 (WEA_G1)	21:54	13 21:09 (WEA_G1)
27	08:14	07:12	06:04		05:50	04:57	20:46 (WEA_G1)	04:44	20:55 (WEA_G1)
	16:45	17:48	18:42		20:40	21:32	12 20:58 (WEA_G1)	21:54	14 21:09 (WEA_G1)
28	08:13	07:10	06:02		05:48	04:55	20:46 (WEA_G1)	04:45	20:56 (WEA_G1)
	16:47	17:50	18:44		20:42	21:33	13 20:59 (WEA_G1)	21:54	14 21:10 (WEA_G1)
29	08:11		06:59		05:46	04:54	20:46 (WEA_G1)	04:45	20:55 (WEA_G1)
	16:49		19:45		20:44	21:34	14 21:00 (WEA_G1)	21:54	15 21:10 (WEA_G1)
30	08:09		06:57		05:44	04:53	20:47 (WEA_G1)	04:46	20:56 (WEA_G1)
	16:51		19:47		20:46	21:36	14 21:01 (WEA_G1)	21:54	15 21:11 (WEA_G1)
31	08:08		06:54			04:52	20:47 (WEA_G1)		
	16:53		19:49			21:37	15 21:02 (WEA_G1)		
Sonnenscheinstunden	248	272	367		421	496		513	
astr.max.mögl.Beschattung			2			106		455	

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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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 22 - IO 22 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

	Juli	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	1	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	1	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		08:00	08:00	08:36	
	21:31		20:29		18:01	16:06	15:56	
25	05:16		06:10		07:02	08:02	08:36	
	21:29		20:27		16:58	16:04	15:56	
26	05:17		06:12		07:04	08:04	08:36	
	21:28		20:24		16:56	16:03	15:57	
27	05:19		06:14		07:06	08:05	08:37	
	21:26		20:22		16:54	16:02	15:58	
28	05:21		06:15		07:08	08:07	08:37	
	21:24		20:19		16:52	16:01	15:59	
29	05:22		06:17		07:10	08:09	08:37	
	21:23		20:17		16:50	16:00	16:00	
30	05:24		06:19		07:12	08:10	08:37	
	21:21		20:15		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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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 23 - IO 23 Poggenpohl 1 (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

	Januar	Februar	März		April	Mai		Juni
1	08:37 16:03	08:06 16:55	07:08 17:52		06:52 19:51	05:41 20:47		04:51 21:38
2	08:37 16:04	08:04 16:57	07:05 17:54		06:49 19:53	05:39 20:49		04:50 21:40
3	08:37 16:05	08:02 16:59	07:03 17:56		06:47 19:55	05:37 20:51		04:49 21:41
4	08:36 16:07	08:01 17:01	07:01 17:58		06:44 19:57	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	06:53 18:03		06:37 20:02	05:29 20:58		04:46 21:45
8	08:35 16:12	07:53 17:09	06:51 18:05		06:34 20:04	05:27 21:00		04:45 21:46
9	08:34 16:13	07:51 17:11	06:48 18:07		06:32 20:06	05:25 21:02		04:45 21:47
10	08:33 16:15	07:49 17:13	06:46 18:09		06:30 20:08	05:23 21:04		04:44 21:48
11	08:33 16:16	07:47 17:15	06:44 18:11		06:27 20:10	05:22 21:06		04:44 21:49
12	08:32 16:18	07:45 17:17	06:41 18:13		06:25 20:12	05:20 21:07		04:43 21:49
13	08:31 16:20	07:43 17:19	06:39 18:15		06:22 20:14	05:18 21:09		04:43 21:50
14	08:30 16:21	07:41 17:22	06:36 18:17		06:20 20:16	05:16 21:11		04:43 21:51
15	08:29 16:23	07:39 17:24	06:34 18:19		06:18 20:17	05:14 21:13		04:43 21:51
16	08:28 16:25	07:37 17:26	06:31 18:21		06:15 20:19	05:13 21:14		04:42 21:52
17	08:27 16:26	07:35 17:28	06:29 18:23		06:13 20:21	05:11 21:16		04:42 21:53
18	08:26 16:28	07:33 17:30	06:26 18:25		06:10 20:23	05:09 21:18		04:42 21:53
19	08:25 16:30	07:30 17:32	06:24 18:27		06:08 20:25	05:08 21:19		04:42 21:53
20	08:24 16:32	07:28 17:34	06:21 18:28		06:06 20:27	05:06 21:21		04:42 21:54
21	08:22 16:34	07:26 17:36	06:19 18:30		06:04 20:29	05:05 21:23		04:42 21:54
22	08:21 16:36	07:24 17:38	06:16 18:32		06:01 20:31	05:03 21:24		04:43 21:54
23	08:20 16:37	07:21 17:40	06:14 18:34		05:59 20:32	05:02 21:26		04:43 21:54
24	08:18 16:39	07:19 17:42	06:11 18:36		05:57 20:34	05:00 21:27		04:43 21:54
25	08:17 16:41	07:17 17:44	06:09 18:38		05:54 20:36	04:59 21:29		04:44 21:54
26	08:16 16:43	07:15 17:46	06:06 18:40		05:52 20:38	04:58 21:30		04:44 21:54
27	08:14 16:45	07:12 17:48	06:04 18:42		05:50 20:40	04:57 21:32		04:44 21:54
28	08:13 16:47	07:10 17:50	06:02 18:44		05:48 20:42	04:55 21:33		04:45 21:54
29	08:11 16:49		06:59 19:45	19:18 (WEA 20 (GCS))	05:46 20:44	04:54 21:34		04:45 21:54
30	08:09 16:51		06:57 19:47	19:19 (WEA 20 (GCS))	05:44 20:46	04:53 21:36	21:00 (WEA_G1)	04:46 21:54
31	08:08 16:53		06:54 19:49	19:20 (WEA 20 (GCS))		04:52 21:37	21:00 (WEA_G1) 21:02 (WEA_G1)	
Sonnenscheinstunden	248	272	367		421	496		513
astr.max.mögl.Beschattung				2			3	351

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

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

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 23 - IO 23 Poggenpohl 1 (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

	Juli	August	September		Oktober	November	Dezember	
1	04:47	21:04 (WEA_G1)	05:27	06:23	07:17	07:16	08:12	
	21:53	21:17 (WEA_G1)	21:17	20:10	18:55	16:44	15:58	
2	04:48	21:05 (WEA_G1)	05:29	06:24	07:19	07:18	08:13	
	21:53	21:17 (WEA_G1)	21:16	20:07	18:53	16:42	15:58	
3	04:48	21:05 (WEA_G1)	05:31	06:26	07:21	07:20	08:15	
	21:53	21:16 (WEA_G1)	21:14	20:05	18:50	16:40	15:57	
4	04:49	21:06 (WEA_G1)	05:33	06:28	07:22	07:22	08:16	
	21:52	21:16 (WEA_G1)	21:12	20:03	18:48	16:38	15:56	
5	04:50	21:06 (WEA_G1)	05:34	06:30	07:24	07:24	08:18	
	21:51	21:16 (WEA_G1)	21:10	20:00	18:45	16:36	15:56	
6	04:51	21:05 (WEA_G1)	05:36	06:32	07:26	07:26	08:19	
	21:51	21:14 (WEA_G1)	21:08	19:58	18:43	16:34	15:55	
7	04:52	21:06 (WEA_G1)	05:38	06:33	07:28	07:28	08:21	
	21:50	21:14 (WEA_G1)	21:06	19:55	18:40	16:32	15:55	
8	04:53	21:06 (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	21:06 (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	21:06 (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	21:07 (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	21:08 (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	21:08 (WEA_G1)	05:48	06:44	19:11 (WEA 20 (GCS))	07:39	07:40	08:28
	21:45	21:10 (WEA_G1)	20:54	19:40	19:12 (WEA 20 (GCS))	18:26	16:21	15:53
14	05:00		05:50	06:46	07:41	07:42	08:29	
	21:44		20:51	19:38	18:24	16:20	15:53	
15	05:01		05:52	06:48	07:43	07:43	08:30	
	21:43		20:49	19:35	18:21	16:18	15:53	
16	05:03		05:54	06:50	07:45	07:45	08:31	
	21:42		20:47	19:33	18:19	16:17	15:53	
17	05:04		05:56	06:51	07:47	07:47	08:32	
	21:40		20:45	19:30	18:17	16:15	15:53	
18	05:05		05:57	06:53	07:49	07:49	08:32	
	21:39		20:43	19:28	18:14	16:14	15:53	
19	05:07		05:59	06:55	07:51	07:51	08:33	
	21:38		20:40	19:25	18:12	16:12	15:54	
20	05:08		06:01	06:57	07:53	07:53	08:34	
	21:37		20:38	19:23	18:10	16:11	15:54	
21	05:10		06:03	06:59	07:54	07:55	08:34	
	21:35		20:36	19:20	18:07	16:09	15:54	
22	05:11		06:05	07:00	07:56	07:57	08:35	
	21:34		20:33	19:18	18:05	16:08	15:55	
23	05:13		06:06	07:02	07:58	07:58	08:35	
	21:32		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		514	461	383	328	257	231	
astr.max.mögl.Beschattung		102		1				

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 24 - IO 24 Wintersberg
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		05:41		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		21:39
3	08:36	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	07:00	06:44		05:35	20:21 (WEA 16 (GCN))	04:48
	16:06	17:01	17:58	19:57		20:53	1 20:22 (WEA 16 (GCN))	21:42
5	08:36	07:59	06:58	06:42		05:33	20:22 (WEA 16 (GCN))	04:47
	16:08	17:03	17:59	19:59		20:55	2 20:24 (WEA 16 (GCN))	21:43
6	08:35	07:57	06:56	06:39		05:31	20:22 (WEA 16 (GCN))	04:47
	16:09	17:05	18:01	20:00		20:57	4 20:26 (WEA 16 (GCN))	21:44
7	08:35	07:55	06:53	06:37		05:29	20:23 (WEA 16 (GCN))	04:46
	16:10	17:07	18:03	20:02		20:58	4 20:27 (WEA 16 (GCN))	21:45
8	08:34	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	06:29		05:23		04:44
	16:15	17:13	18:09	20:08		21:04		21:48
11	08:32	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	19:43 (WEA 17 (GCN))	05:20		04:43
	16:18	17:17	18:13	20:12	1 19:44 (WEA 17 (GCN))	21:07		21:49
13	08:31	07:43	06:39	06:22	19:43 (WEA 17 (GCN))	05:18		04:43
	16:20	17:19	18:15	20:14	2 19:45 (WEA 17 (GCN))	21:09		21:50
14	08:30	07:41	06:36	06:20	19:44 (WEA 17 (GCN))	05:16		04:43
	16:21	17:21	18:17	20:15	3 19:47 (WEA 17 (GCN))	21:11		21:51
15	08:29	07:39	06:34	06:17	19:46 (WEA 17 (GCN))	05:14		04:42
	16:23	17:23	18:19	20:17	2 19:48 (WEA 17 (GCN))	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		21:52
18	08:26	07:32	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	18:26	20:25		21:19		21:53
20	08:24	07:28	06:21	06:06		05:06		04:42
	16:32	17:34	18:28	20:27		21:21		21:54
21	08:22	07:26	06:19	06:03		05:05		04:42
	16:34	17:36	18:30	20:29		21:22		21:54
22	08:21	07:24	06:16	06:01		05:03		04:43
	16:35	17:38	18:32	20:31		21:24		21:54
23	08:20	07:21	06:14	05:59		05:02		04:43
	16:37	17:40	18:34	20:32		21:26		21:54
24	08:18	07:19	06:11	05:57		05:00		04:43
	16:39	17:42	18:36	20:34		21:27		21:54
25	08:17	07:17	06:09	05:54	20:04 (WEA 18 (GCN))	04:59		04:43
	16:41	17:44	18:38	20:36	3 20:07 (WEA 18 (GCN))	21:29		21:54
26	08:15	07:15	06:06	05:52	20:04 (WEA 18 (GCN))	04:58		04:44
	16:43	17:46	18:40	20:38	5 20:09 (WEA 18 (GCN))	21:30		21:54
27	08:14	07:12	06:04	05:50	20:04 (WEA 18 (GCN))	04:56		04:44
	16:45	17:48	18:42	20:40	6 20:10 (WEA 18 (GCN))	21:32		21:54
28	08:12	07:10	06:01	05:48	20:04 (WEA 18 (GCN))	04:55		04:45
	16:47	17:50	18:43	20:42	8 20:12 (WEA 18 (GCN))	21:33		21:54
29	08:11		06:59	05:46	20:06 (WEA 18 (GCN))	04:54		04:45
	16:49		19:45	20:44	5 20:11 (WEA 18 (GCN))	21:34		21:54
30	08:09		06:56	05:43		04:53		04:46
	16:51		19:47	20:45		21:36		21:54
31	08:08		06:54			04:52		
	16:53		19:49			21:37		
Sonnenscheinstunden	248	272	367	421		496		513
astr.max.mögl.Beschattung				35		11		

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

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 24 - IO 24 Wintersberg
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	05:27	06:23	07:17	07:16	08:12	
	21:53	21:17	20:10	18:55	16:44	15:58	
2	04:47	05:29	06:24	07:19	07:18	08:13	
	21:53	21:15	20:07	18:53	16:42	15:58	
3	04:48	05:31	06:26	07:20	07:20	08:15	
	21:52	21:14	20:05	18:50	16:40	15:57	
4	04:49	05:32	06:28	07:22	07:22	08:16	
	21:52	21:12	20:02	18:48	16:38	15:56	
5	04:50	05:34	20:34 (WEA 16 (GCN))	06:30	07:24	07:24	08:18
	21:51	21:10	3 20:37 (WEA 16 (GCN))	20:00	18:45	16:36	15:56
6	04:51	05:36	20:32 (WEA 16 (GCN))	06:32	07:26	07:26	08:19
	21:51	21:08	4 20:36 (WEA 16 (GCN))	19:58	18:43	16:34	15:55
7	04:52	05:38	20:31 (WEA 16 (GCN))	06:33	07:28	07:28	08:21
	21:50	21:06	4 20:35 (WEA 16 (GCN))	19:55	18:40	16:32	15:54
8	04:53	05:39	20:31 (WEA 16 (GCN))	06:35	07:30	07:30	08:22
	21:49	21:04	2 20:33 (WEA 16 (GCN))	19:53	18:38	16:30	15:54
9	04:54	05:41	20:30 (WEA 16 (GCN))	06:37	07:32	07:32	08:23
	21:49	21:02	1 20:31 (WEA 16 (GCN))	19:50	18:35	16:28	15:54
10	04:55	05:43	06:39	07:33	07:34	08:24	
	21:48	21:00	19:48	18:33	16:26	15:53	
11	04:56	05:45	06:41	07:35	07:36	08:26	
	21:47	20:58	19:45	18:31	16:25	15:53	
12	04:57	05:47	06:42	07:37	07:38	08:27	
	21:46	20:56	19:43	18:28	16:23	15:53	
13	04:59	05:48	06:44	07:39	07:40	08:28	
	21:45	20:53	19:40	18:26	16:21	15:53	
14	05:00	05:50	20:14 (WEA 18 (GCN))	06:46	07:41	07:41	08:29
	21:44	20:51	6 20:20 (WEA 18 (GCN))	19:38	18:24	16:20	15:53
15	05:01	05:52	20:12 (WEA 18 (GCN))	06:48	07:43	07:43	08:30
	21:43	20:49	7 20:19 (WEA 18 (GCN))	19:35	18:21	16:18	15:53
16	05:03	05:54	20:11 (WEA 18 (GCN))	06:50	07:45	07:45	08:31
	21:42	20:47	6 20:17 (WEA 18 (GCN))	19:33	18:19	16:16	15:53
17	05:04	05:56	20:11 (WEA 18 (GCN))	06:51	07:47	07:47	08:31
	21:40	20:45	4 20:15 (WEA 18 (GCN))	19:30	18:16	16:15	15:53
18	05:05	05:57	20:10 (WEA 18 (GCN))	06:53	07:49	07:49	08:32
	21:39	20:42	2 20:12 (WEA 18 (GCN))	19:28	18:14	16:13	15:53
19	05:07	05:59	06:55	07:51	07:51	08:33	
	21:38	20:40	19:25	18:12	16:12	15:53	
20	05:08	06:01	06:57	07:52	07:53	08:34	
	21:36	20:38	19:23	18:10	16:11	15:54	
21	05:10	06:03	06:59	07:54	07:55	08:34	
	21:35	20:36	19:20	18:07	16:09	15:54	
22	05:11	06:05	07:00	07:56	07:56	08:35	
	21:34	20:33	19:18	18:05	16:08	15:55	
23	05:13	06:06	07:02	07:58	07:58	08:35	
	21:32	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	16:05	15:56	
25	05:16	06:10	07:06	07:02	08:02	08:36	
	21:29	20:26	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	07:09	07:06	08:05	08:37	
	21:26	20:22	19:05	16:54	16:02	15:58	
28	05:21	06:15	19:47 (WEA 17 (GCN))	07:11	07:08	08:07	08:37
	21:24	20:19	2 19:49 (WEA 17 (GCN))	19:03	16:52	16:01	15:59
29	05:22	06:17	19:44 (WEA 17 (GCN))	07:13	07:10	08:09	08:37
	21:23	20:17	4 19:48 (WEA 17 (GCN))	19:00	16:50	16:00	16:00
30	05:24	06:19	19:43 (WEA 17 (GCN))	07:15	07:12	08:10	08:37
	21:21	20:15	3 19:46 (WEA 17 (GCN))	18:58	16:48	15:59	16:01
31	05:26	06:21	19:43 (WEA 17 (GCN))	07:14	07:14	08:37	
	21:19	20:12	1 19:44 (WEA 17 (GCN))	16:46	16:46	16:02	
Sonnenscheinstunden	515	461	383	328	257	231	
astr.max.mögl.Beschattung		49					

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 28 - IO 28 Cismarfelde 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni
1	08:37 16:03 31	14:30 (WEA 20 (GCS)) 08:06 15:01 (WEA 19 (GCS)) 16:55 14:30 (WEA 20 (GCS)) 08:04	07:08 17:52 07:05	06:52 19:51 11	07:15 (WEA 18 (GCN)) 05:42 19:24 (WEA 12 (GRS)) 20:48 07:13 (WEA 18 (GCN)) 05:39	06:07 (WEA 15 (GCN)) 04:51 06:11 (WEA 15 (GCN)) 21:38 06:05 (WEA 15 (GCN)) 04:50
2	08:37 16:04 30	14:30 (WEA 20 (GCS)) 08:03 15:00 (WEA 19 (GCS)) 16:59 14:33 (WEA 20 (GCS)) 08:01	07:03 17:56 07:01	06:47 19:55 18	07:11 (WEA 18 (GCN)) 05:37 19:28 (WEA 12 (GRS)) 20:51 07:08 (WEA 18 (GCN)) 05:35	06:04 (WEA 15 (GCN)) 04:49 06:17 (WEA 15 (GCN)) 21:41 06:02 (WEA 15 (GCN)) 04:48
3	08:37 16:05 29	14:31 (WEA 20 (GCS)) 08:03 15:00 (WEA 19 (GCS)) 16:59 14:33 (WEA 20 (GCS)) 08:01	07:03 17:56 07:01	06:47 19:55 18	07:11 (WEA 18 (GCN)) 05:37 19:28 (WEA 12 (GRS)) 20:51 07:08 (WEA 18 (GCN)) 05:35	06:04 (WEA 15 (GCN)) 04:49 06:17 (WEA 15 (GCN)) 21:41 06:02 (WEA 15 (GCN)) 04:48
4	08:36 16:07 25	14:33 (WEA 20 (GCS)) 08:01 15:00 (WEA 19 (GCS)) 16:59 14:33 (WEA 20 (GCS)) 08:01	07:01 17:58 07:01	06:44 19:57 19	07:08 (WEA 18 (GCN)) 05:33 19:30 (WEA 11 (GRS)) 20:53 07:08 (WEA 18 (GCN)) 05:33	06:18 (WEA 15 (GCN)) 21:42 06:00 (WEA 15 (GCN)) 04:48 06:19 (WEA 15 (GCN)) 21:43
5	08:36 16:08 25	14:33 (WEA 20 (GCS)) 08:01 15:00 (WEA 19 (GCS)) 16:59 14:33 (WEA 20 (GCS)) 08:01	07:01 17:58 07:01	06:44 19:57 19	07:08 (WEA 18 (GCN)) 05:33 19:30 (WEA 11 (GRS)) 20:53 07:08 (WEA 18 (GCN)) 05:33	06:18 (WEA 15 (GCN)) 21:42 06:00 (WEA 15 (GCN)) 04:48 06:19 (WEA 15 (GCN)) 21:43
6	08:36 16:09 25	14:33 (WEA 20 (GCS)) 08:01 15:00 (WEA 19 (GCS)) 16:59 14:33 (WEA 20 (GCS)) 08:01	07:01 17:58 07:01	06:44 19:57 19	07:08 (WEA 18 (GCN)) 05:33 19:30 (WEA 11 (GRS)) 20:53 07:08 (WEA 18 (GCN)) 05:33	06:18 (WEA 15 (GCN)) 21:42 06:00 (WEA 15 (GCN)) 04:48 06:19 (WEA 15 (GCN)) 21:43
7	08:35 16:11 23	14:35 (WEA 20 (GCS)) 07:59 15:00 (WEA 19 (GCS)) 16:59 14:35 (WEA 20 (GCS)) 07:59	06:58 18:00 18:04	06:42 19:59 9	07:08 (WEA 18 (GCN)) 05:33 07:17 (WEA 18 (GCN)) 20:55 07:09 (WEA 18 (GCN)) 05:31	06:19 (WEA 15 (GCN)) 21:43 05:58 (WEA 15 (GCN)) 04:47 06:19 (WEA 15 (GCN)) 21:44
8	08:35 16:12 23	14:35 (WEA 20 (GCS)) 07:59 15:00 (WEA 19 (GCS)) 16:59 14:35 (WEA 20 (GCS)) 07:59	06:58 18:00 18:04	06:42 19:59 9	07:08 (WEA 18 (GCN)) 05:33 07:17 (WEA 18 (GCN)) 20:55 07:09 (WEA 18 (GCN)) 05:31	06:19 (WEA 15 (GCN)) 21:43 05:58 (WEA 15 (GCN)) 04:47 06:19 (WEA 15 (GCN)) 21:44
9	08:34 16:13 22	14:36 (WEA 20 (GCS)) 07:57 15:00 (WEA 19 (GCS)) 16:59 14:36 (WEA 20 (GCS)) 07:57	06:56 18:02 18:04	06:39 20:01 5	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:43 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
10	08:33 16:15 21	14:37 (WEA 20 (GCS)) 07:57 15:00 (WEA 19 (GCS)) 16:59 14:37 (WEA 20 (GCS)) 07:57	06:46 18:09 18:09	06:30 20:08 20:08	07:08 (WEA 18 (GCN)) 05:35 07:08 (WEA 18 (GCN)) 05:35 07:08 (WEA 18 (GCN)) 05:35	06:19 (WEA 15 (GCN)) 21:44 06:21 (WEA 15 (GCN)) 21:48 06:19 (WEA 15 (GCN)) 21:44
11	08:33 16:17 19	14:38 (WEA 20 (GCS)) 07:47 15:00 (WEA 19 (GCS)) 16:59 14:38 (WEA 20 (GCS)) 07:47	06:44 18:11 18:11	06:27 20:10 20:10	07:08 (WEA 18 (GCN)) 05:33 07:17 (WEA 18 (GCN)) 20:55 07:09 (WEA 18 (GCN)) 05:31	06:19 (WEA 15 (GCN)) 21:43 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
12	08:32 16:18 18	14:39 (WEA 20 (GCS)) 07:45 15:00 (WEA 19 (GCS)) 16:59 14:39 (WEA 20 (GCS)) 07:45	06:41 18:13 18:13	06:25 20:12 20:12	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
13	08:31 16:20 16	14:40 (WEA 20 (GCS)) 07:43 15:00 (WEA 19 (GCS)) 16:59 14:40 (WEA 20 (GCS)) 07:43	06:39 18:15 18:15	06:22 20:14 20:14	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
14	08:30 16:21 14	14:42 (WEA 20 (GCS)) 07:41 15:00 (WEA 19 (GCS)) 16:59 14:42 (WEA 20 (GCS)) 07:41	06:36 18:17 18:17	06:20 20:16 20:16	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
15	08:29 16:23 11	14:44 (WEA 20 (GCS)) 07:39 15:00 (WEA 19 (GCS)) 16:59 14:44 (WEA 20 (GCS)) 07:39	06:34 18:19 18:19	06:18 20:18 20:18	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
16	08:28 16:25 4	14:48 (WEA 20 (GCS)) 07:37 15:00 (WEA 19 (GCS)) 16:59 14:48 (WEA 20 (GCS)) 07:37	06:31 18:21 18:21	06:15 20:19 20:19	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
17	08:27 16:27 3	14:52 (WEA 20 (GCS)) 07:35 15:00 (WEA 19 (GCS)) 16:59 14:52 (WEA 20 (GCS)) 07:35	06:29 18:23 18:23	06:13 20:21 20:21	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
18	08:26 16:28 2	14:53 (WEA 20 (GCS)) 07:33 15:00 (WEA 19 (GCS)) 16:59 14:53 (WEA 20 (GCS)) 07:33	06:26 18:25 18:25	06:11 20:23 20:23	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
19	08:25 16:30 1	14:54 (WEA 20 (GCS)) 07:31 15:00 (WEA 19 (GCS)) 16:59 14:54 (WEA 20 (GCS)) 07:31	06:24 18:27 18:27	06:08 20:25 20:25	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
20	08:24 16:32 1	14:55 (WEA 20 (GCS)) 07:29 15:00 (WEA 19 (GCS)) 16:59 14:55 (WEA 20 (GCS)) 07:29	06:21 18:29 18:29	06:06 20:27 20:27	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
21	08:23 16:34 1	14:56 (WEA 20 (GCS)) 07:27 15:00 (WEA 19 (GCS)) 16:59 14:56 (WEA 20 (GCS)) 07:27	06:19 18:31 18:31	06:04 20:29 20:29	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
22	08:21 16:36 1	14:57 (WEA 20 (GCS)) 07:25 15:00 (WEA 19 (GCS)) 16:59 14:57 (WEA 20 (GCS)) 07:25	06:17 18:33 18:33	06:01 20:31 20:31	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
23	08:20 16:37 1	14:58 (WEA 20 (GCS)) 07:23 15:00 (WEA 19 (GCS)) 16:59 14:58 (WEA 20 (GCS)) 07:23	06:14 18:34 18:34	05:59 20:33 20:33	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
24	08:19 16:39 1	14:59 (WEA 20 (GCS)) 07:21 15:00 (WEA 19 (GCS)) 16:59 14:59 (WEA 20 (GCS)) 07:21	06:12 18:36 18:36	05:57 20:34 20:34	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
25	08:17 16:41 1	15:00 (WEA 20 (GCS)) 07:19 15:00 (WEA 19 (GCS)) 16:59 15:00 (WEA 20 (GCS)) 07:19	06:09 18:38 18:38	05:55 20:36 20:36	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
26	08:16 16:43 1	15:01 (WEA 20 (GCS)) 07:17 15:00 (WEA 19 (GCS)) 16:59 15:01 (WEA 20 (GCS)) 07:17	06:07 18:40 18:40	05:52 20:38 20:38	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
27	08:14 16:45 1	15:02 (WEA 20 (GCS)) 07:15 15:00 (WEA 19 (GCS)) 16:59 15:02 (WEA 20 (GCS)) 07:15	06:04 18:42 18:42	05:50 20:40 20:40	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
28	08:13 16:47 1	15:03 (WEA 20 (GCS)) 07:13 15:00 (WEA 19 (GCS)) 16:59 15:03 (WEA 20 (GCS)) 07:13	06:02 18:44 18:44	05:48 20:42 20:42	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
29	08:11 16:49 1	15:04 (WEA 20 (GCS)) 07:11 15:00 (WEA 19 (GCS)) 16:59 15:04 (WEA 20 (GCS)) 07:11	06:00 18:46 18:46	05:46 20:44 20:44	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
30	08:09 16:51 1	15:05 (WEA 20 (GCS)) 07:09 15:00 (WEA 19 (GCS)) 16:59 15:05 (WEA 20 (GCS)) 07:09	06:57 18:47 18:47	05:44 20:46 20:46	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
31	08:08 16:53 1	15:06 (WEA 20 (GCS)) 07:07 15:00 (WEA 19 (GCS)) 16:59 15:06 (WEA 20 (GCS)) 07:07	06:54 18:49 18:49	05:42 20:48 20:48	07:09 (WEA 18 (GCN)) 05:31 07:14 (WEA 18 (GCN)) 20:57 07:14 (WEA 18 (GCN)) 20:57	06:19 (WEA 15 (GCN)) 21:44 05:57 (WEA 15 (GCN)) 04:46 06:20 (WEA 15 (GCN)) 21:45
	Sonnenscheinstunden 248 astr.max.mögl.Beschattung 336	272 367	145	421	154	437

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 28 - IO 28 Cismarfelde 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli	August	September	Oktober	November	Dezember				
1	04:47	05:27	06:06 (WEA 15 (GCN))	06:23	07:17	07:16	08:12	14:20 (WEA 20 (GCS))		
	21:53	21:17	24 06:30 (WEA 15 (GCN))	20:10	18:55	16:44	15:59	19 14:35 (WEA 20 (GCS))		
2	04:48	05:29	06:06 (WEA 15 (GCN))	06:25	07:19	07:18	06:14	14:20 (WEA 20 (GCS))		
	21:53	21:16	25 06:31 (WEA 15 (GCN))	20:07	18:53	16:42	15:58	21 14:41 (WEA 20 (GCS))		
3	04:48	05:31	06:07 (WEA 15 (GCN))	06:26	07:21	07:20	06:15	14:20 (WEA 20 (GCS))		
	21:53	21:14	24 06:31 (WEA 15 (GCN))	20:05	18:50	16:40	15:57	22 14:42 (WEA 20 (GCS))		
4	04:49	05:33	06:06 (WEA 15 (GCN))	06:28	07:22	07:22	06:17	14:19 (WEA 20 (GCS))		
	21:52	21:12	24 06:30 (WEA 15 (GCN))	20:03	18:46	16:36	15:56	23 14:42 (WEA 20 (GCS))		
5	04:50	05:34	06:07 (WEA 15 (GCN))	06:30	07:24	07:24	06:18	14:20 (WEA 20 (GCS))		
	21:52	21:10	23 06:30 (WEA 15 (GCN))	20:00	18:45	16:36	15:56	23 14:43 (WEA 20 (GCS))		
6	04:51	05:36	06:07 (WEA 15 (GCN))	06:32	07:26	07:26	06:19	14:19 (WEA 20 (GCS))		
	21:51	21:08	22 06:29 (WEA 15 (GCN))	19:58	5 07:10 (WEA 18 (GCN))	18:43	16:34	15:55	25 14:44 (WEA 20 (GCS))	
7	04:52	05:38	06:08 (WEA 15 (GCN))	06:34	07:03 (WEA 18 (GCN))	07:28	07:28	06:21	14:20 (WEA 20 (GCS))	
	21:50	21:06	21 06:29 (WEA 15 (GCN))	19:55	9 07:12 (WEA 18 (GCN))	18:41	16:32	15:55	25 14:45 (WEA 20 (GCS))	
8	04:53	05:40	06:10 (WEA 15 (GCN))	06:35	07:03 (WEA 18 (GCN))	07:30	07:30	06:22	14:20 (WEA 20 (GCS))	
	21:50	21:04	18 06:28 (WEA 15 (GCN))	19:53	18 19:25 (WEA 11 (GRS))	18:38	16:30	15:54	25 14:45 (WEA 20 (GCS))	
9	04:54	05:41	06:11 (WEA 15 (GCN))	06:37	07:04 (WEA 18 (GCN))	07:32	07:32	06:23	14:21 (WEA 20 (GCS))	
	21:49	21:02	15 06:26 (WEA 15 (GCN))	19:50	19 19:22 (WEA 12 (GRS))	18:36	16:28	15:54	28 14:49 (WEA 19 (GCS))	
10	04:55	05:43	06:13 (WEA 15 (GCN))	06:39	07:06 (WEA 18 (GCN))	07:34	07:34	06:25	14:21 (WEA 20 (GCS))	
	21:48	21:00	12 06:25 (WEA 15 (GCN))	19:48	15 19:19 (WEA 12 (GRS))	18:33	16:27	15:54	29 14:50 (WEA 19 (GCS))	
11	04:56	05:45	06:15 (WEA 15 (GCN))	06:41	07:08 (WEA 18 (GCN))	07:35	07:36	06:26	14:21 (WEA 20 (GCS))	
	21:47	20:58	8 06:23 (WEA 15 (GCN))	19:45	11 19:17 (WEA 12 (GRS))	18:31	16:25	15:53	30 14:51 (WEA 19 (GCS))	
12	04:58	05:47	06:43	06:43	07:09 (WEA 18 (GCN))	07:37	07:38	06:27	14:21 (WEA 20 (GCS))	
	21:46	20:56	19:43	7 19:14 (WEA 12 (GRS))	18:28	16:23	15:53	31 14:52 (WEA 19 (GCS))		
13	04:59	05:48	06:44	06:44	7 19:14 (WEA 12 (GRS))	07:39	07:40	06:28	14:21 (WEA 20 (GCS))	
	21:45	20:54	19:40	2 19:12 (WEA 12 (GRS))	18:26	16:21	15:53	32 14:53 (WEA 19 (GCS))		
14	05:00	05:50	06:46	06:46	07:41	07:42	06:29	14:21 (WEA 20 (GCS))		
	21:44	20:51	19:38	18:24	16:20	15:53	33 14:54 (WEA 19 (GCS))			
15	05:01	05:52	06:48	07:29 (WEA 17 (GCN))	07:43	07:44	06:30	14:22 (WEA 20 (GCS))		
	21:43	20:49	19:35	8 07:37 (WEA 17 (GCN))	18:21	16:18	15:53	33 14:55 (WEA 19 (GCS))		
16	05:03	05:54	06:50	07:26 (WEA 17 (GCN))	07:45	07:45	06:31	14:22 (WEA 20 (GCS))		
	21:42	20:47	19:33	12 07:38 (WEA 17 (GCN))	18:19	16:17	15:53	34 14:56 (WEA 19 (GCS))		
17	05:04	05:56	06:51	07:25 (WEA 17 (GCN))	07:47	07:47	06:32	14:23 (WEA 20 (GCS))		
	21:41	20:45	6 06:40 (WEA 16 (GCN))	19:30	14 07:39 (WEA 17 (GCN))	18:17	16:15	15:53	33 14:56 (WEA 19 (GCS))	
18	05:05	05:57	06:51	06:51	07:40 (WEA 17 (GCN))	07:49	07:49	06:32	14:23 (WEA 20 (GCS))	
	21:39	20:43	10 06:41 (WEA 16 (GCN))	19:28	16 07:40 (WEA 17 (GCN))	18:14	16:14	15:53	34 14:57 (WEA 19 (GCS))	
19	05:07	05:59	06:55	06:55	07:23 (WEA 17 (GCN))	07:51	07:51	06:33	14:24 (WEA 20 (GCS))	
	21:38	20:40	12 06:42 (WEA 16 (GCN))	19:25	17 07:40 (WEA 17 (GCN))	18:12	16:12	15:54	34 14:58 (WEA 19 (GCS))	
20	05:08	06:15 (WEA 15 (GCN))	06:57	06:57	07:24 (WEA 17 (GCN))	07:53	07:53	06:34	14:24 (WEA 20 (GCS))	
	21:37	7 06:22 (WEA 15 (GCN))	20:38	13 06:43 (WEA 16 (GCN))	19:23	16 07:40 (WEA 17 (GCN))	18:10	16:11	15:54	34 14:58 (WEA 19 (GCS))
21	05:10	06:13 (WEA 15 (GCN))	06:03	06:32 (WEA 16 (GCN))	06:59	07:25 (WEA 17 (GCN))	07:55	07:55	06:34	14:25 (WEA 20 (GCS))
	21:35	11 06:24 (WEA 15 (GCN))	20:36	12 06:44 (WEA 16 (GCN))	19:20	14 07:39 (WEA 17 (GCN))	18:07	16:09	15:54	34 14:59 (WEA 19 (GCS))
22	05:11	06:11 (WEA 15 (GCN))	06:05	06:33 (WEA 16 (GCN))	07:01	07:27 (WEA 17 (GCN))	07:57	07:57	06:35	14:25 (WEA 20 (GCS))
	21:34	14 06:25 (WEA 15 (GCN))	20:34	10 06:43 (WEA 16 (GCN))	19:18	12 07:39 (WEA 17 (GCN))	18:05	16:08	15:55	34 14:59 (WEA 19 (GCS))
23	05:13	06:11 (WEA 15 (GCN))	06:06	06:35 (WEA 16 (GCN))	07:02	07:29 (WEA 17 (GCN))	07:58	07:58	06:35	14:26 (WEA 20 (GCS))
	21:32	16 06:27 (WEA 15 (GCN))	20:31	8 06:43 (WEA 16 (GCN))	19:15	9 07:38 (WEA 17 (GCN))	18:03	16:07	15:55	34 15:00 (WEA 19 (GCS))
24	05:14	06:09 (WEA 15 (GCN))	06:08	06:37 (WEA 16 (GCN))	07:04	07:31 (WEA 17 (GCN))	08:00	08:00	06:36	14:26 (WEA 20 (GCS))
	21:31	18 06:27 (WEA 15 (GCN))	20:29	6 06:43 (WEA 16 (GCN))	19:13	5 07:36 (WEA 17 (GCN))	18:01	16:06	15:56	34 15:00 (WEA 19 (GCS))
25	05:16	06:09 (WEA 15 (GCN))	06:10	06:38 (WEA 16 (GCN))	07:06	07:33 (WEA 17 (GCN))	07:02	06:02	06:36	14:26 (WEA 20 (GCS))
	21:29	20 06:29 (WEA 15 (GCN))	20:27	3 06:41 (WEA 16 (GCN))	19:10	1 07:34 (WEA 17 (GCN))	16:59	16:04	15:57	34 15:00 (WEA 19 (GCS))
26	05:18	06:08 (WEA 15 (GCN))	06:12	07:08	16:56	16:03	3 14:27 (WEA 20 (GCS))	06:37	14:27 (WEA 20 (GCS))	
	21:28	21 06:29 (WEA 15 (GCN))	20:24	19:08	16:56	16:03	3 14:30 (WEA 20 (GCS))	15:57	33 15:00 (WEA 19 (GCS))	
27	05:19	06:08 (WEA 15 (GCN))	06:14	07:10	18:32 (WEA 14 (GRS))	07:06	08:05	06:37	14:27 (WEA 20 (GCS))	
	21:26	22 06:30 (WEA 15 (GCN))	20:22	19:05	4 18:36 (WEA 14 (GRS))	16:54	16:02	10 14:34 (WEA 20 (GCS))	15:58	34 15:01 (WEA 19 (GCS))
28	05:21	06:07 (WEA 15 (GCN))	06:16	07:11	18:30 (WEA 14 (GRS))	07:08	08:07	06:37	14:28 (WEA 20 (GCS))	
	21:24	23 06:30 (WEA 15 (GCN))	20:20	19:03	4 18:34 (WEA 14 (GRS))	16:52	16:01	14 14:36 (WEA 20 (GCS))	15:59	34 15:02 (WEA 19 (GCS))
29	05:22	06:07 (WEA 15 (GCN))	06:17	07:13	18:29 (WEA 14 (GRS))	07:10	08:09	14:22 (WEA 20 (GCS))	06:37	14:28 (WEA 20 (GCS))
	21:23	24 06:31 (WEA 15 (GCN))	20:17	19:00	3 18:32 (WEA 14 (GRS))	16:50	16:00	15 14:37 (WEA 20 (GCS))	16:00	33 15:01 (WEA 19 (GCS))
30	05:24	06:06 (WEA 15 (GCN))	06:19	07:15	07:12	08:10	14:21 (WEA 20 (GCS))	06:37	14:29 (WEA 20 (GCS))	
	21:21	24 06:30 (WEA 15 (GCN))	20:15	18:58	16:48	15:59	18 14:39 (WEA 20 (GCS))	16:01	32 15:01 (WEA 19 (GCS))	
31	05:26	06:07 (WEA 15 (GCN))	06:21	07:14	16:46	15:59	18 14:39 (WEA 20 (GCS))	06:37	14:29 (WEA 20 (GCS))	
	21:19	24 06:31 (WEA 15 (GCN))	20:12	16:46	328	257	60	16:02	32 15:01 (WEA 19 (GCS))	
Sonnenscheinstunden	515	461	363	221	328	257	60	231	936	
astr.max.mögl.Beschattung	224	296	221	221	328	257	60	231	936	

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 31 - IO 31 Rütting Söhlen 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 Sonneneinstrahlungsrichtung

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 17:25 (WEA 14 (GRS))	05:42 18:59 (WEA 12 (GRS))	04:51 06:07 (WEA_G3)
2	08:37 16:04	08:04 16:57	07:05 17:54	06:49 17:12 (WEA 14 (GRS))	05:39 19:26 (WEA 11 (GRS))	04:50 06:23 (WEA_G3)
3	08:37 16:05	08:03 16:59	07:03 17:56	06:47 17:13 (WEA 14 (GRS))	05:37 18:59 (WEA 12 (GRS))	04:49 06:04 (WEA_G3)
4	08:36 16:07	08:01 17:01	07:01 17:58	06:44 17:30 (WEA 14 (GRS))	05:35 19:30 (WEA 11 (GRS))	04:48 06:23 (WEA_G3)
5	08:36 16:08	07:59 17:03	06:58 18:00	06:42 17:30 (WEA 14 (GRS))	05:33 18:59 (WEA 12 (GRS))	04:48 06:23 (WEA_G3)
6	08:36 16:09	07:57 17:05	06:56 18:02	06:39 17:13 (WEA 14 (GRS))	05:31 18:59 (WEA 12 (GRS))	04:47 06:23 (WEA_G3)
7	08:35 16:11	07:55 17:07	06:53 18:04	06:37 17:14 (WEA 14 (GRS))	05:29 07:01 (WEA 16 (GCN))	04:46 06:22 (WEA_G3)
8	08:35 16:12	07:53 17:09	06:51 18:06	06:35 17:16 (WEA 14 (GRS))	05:27 06:58 (WEA 15 (GCN))	04:46 06:22 (WEA_G3)
9	08:34 16:14	07:51 17:11	06:49 18:07	06:32 17:25 (WEA 14 (GRS))	05:25 19:17 (WEA 12 (GRS))	04:45 06:21 (WEA_G3)
10	08:33 16:15	07:49 17:13	06:46 18:09	06:30 20:08	05:24 19:11 (WEA 12 (GRS))	04:44 06:21 (WEA_G3)
11	08:33 16:17	07:47 17:16	06:44 18:11	06:27 20:10	05:22 06:51 (WEA 15 (GCN))	04:44 06:20 (WEA_G3)
12	08:32 16:18	07:45 17:18	06:41 18:13	06:25 20:12	05:20 06:59 (WEA 15 (GCN))	04:44 06:19 (WEA_G3)
13	08:31 16:20	07:43 17:20	06:39 18:15	06:22 20:14	05:18 11:06:58 (WEA 15 (GCN))	04:43 06:19 (WEA_G3)
14	08:30 16:21	07:41 17:22	06:36 18:17	06:20 20:16	05:16 8:06:56 (WEA 15 (GCN))	04:43 06:18 (WEA_G2)
15	08:29 16:23	07:39 17:24	06:34 18:19	06:18 17:51 (WEA 13 (GRS))	05:15 05:43 (WEA_G2)	04:43 05:52 (WEA_G2)
16	08:28 16:25	07:37 17:26	06:31 18:21	06:15 17:52 (WEA 13 (GRS))	05:13 21:14	04:42 06:18 (WEA_G2)
17	08:27 16:27	07:35 17:28	06:29 18:23	06:13 17:50 (WEA 13 (GRS))	05:11 06:19 (WEA_G2)	04:42 06:18 (WEA_G2)
18	08:26 16:28	07:33 17:30	06:26 18:25	06:11 17:58 (WEA 13 (GRS))	05:10 21:18	04:42 06:18 (WEA_G2)
19	08:25 16:30	07:31 17:32	06:24 18:27	06:08 18:00 (WEA 13 (GRS))	05:08 21:19	04:42 06:19 (WEA_G2)
20	08:24 16:32	07:28 17:34	06:22 18:29	06:06 06:45 (WEA 17 (GCN))	05:06 21:21	04:42 06:18 (WEA_G2)
21	08:23 16:34	07:26 17:36	06:19 18:30	06:04 17:59 (WEA 13 (GRS))	05:05 21:23	04:43 06:19 (WEA_G2)
22	08:21 16:36	07:24 17:38	06:17 18:32	06:01 20:31	05:03 21:24	04:43 06:19 (WEA_G2)
23	08:20 16:38	07:22 17:40	06:14 18:34	05:59 20:33	05:02 21:26	04:43 06:18 (WEA_G2)
24	08:19 16:39	07:19 17:42	06:12 18:36	05:57 20:34	05:01 21:27	04:43 06:18 (WEA_G2)
25	08:17 16:41	07:17 17:44	06:09 18:38	05:55 20:36	04:59 21:29	04:44 06:18 (WEA_G2)
26	08:16 16:43	07:15 17:46	06:07 18:40	05:52 20:38	04:58 21:30	04:44 06:18 (WEA_G2)
27	08:14 16:45	07:12 17:48	06:04 18:42	05:50 18:08 (WEA 12 (GRS))	04:57 06:16 (WEA_G3)	04:44 05:43 (WEA_G2)
28	08:13 16:47	07:10 17:50	06:02 18:44	05:48 18:15 (WEA 12 (GRS))	04:55 06:19 (WEA_G3)	04:45 06:18 (WEA_G2)
29	08:11 16:49	07:07 17:52	05:59 18:46	05:46 18:25 (WEA 18 (GCN))	04:54 06:20 (WEA_G3)	04:46 06:18 (WEA_G2)
30	08:09 16:51	07:04 17:54	05:57 18:48	05:44 19:03 (WEA 12 (GRS))	04:53 06:21 (WEA_G3)	04:46 06:18 (WEA_G2)
31	08:06 16:53	07:01 17:56	05:54 18:49	05:42 19:19 (WEA 12 (GRS))	04:52 06:21 (WEA_G3)	04:46 06:18 (WEA_G2)
Sonnenscheinstunden	248	272	367	421	496	513
astr.max.mögl.Beschattung		15	249	314	974	764

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)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 31 - IO 31 Rütting Söhlen 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Juli		August		September		Oktober		November		Dezember			
1	04:47	05:55 (WEA_G2)	05:27	05:58 (WEA_G2)	06:23	06:50 (WEA 15 (GCN))	07:17		07:16	08:12			
	21:54	25	06:20 (WEA_G2)	21:17	32	06:30 (WEA_G3)	20:10	8	06:58 (WEA 15 (GCN))	18:55	16:44	15:59	
2	04:48	05:54 (WEA_G2)	05:29	06:00 (WEA_G2)	06:25	06:52 (WEA 15 (GCN))	07:19		07:19	08:14		15:58	
	21:53	26	06:20 (WEA_G2)	21:16	31	06:31 (WEA_G3)	20:08	11	19:09 (WEA 12 (GRS))	18:53	16:42	15:58	
3	04:48	05:54 (WEA_G2)	05:31	06:02 (WEA_G2)	06:26	06:54 (WEA 15 (GCN))	07:21		07:20	08:15		15:57	
	21:53	27	06:21 (WEA_G2)	21:14	30	06:32 (WEA_G3)	20:05	15	19:13 (WEA 12 (GRS))	18:50	16:40	15:57	
4	04:49	05:54 (WEA_G2)	05:33	06:03 (WEA_G2)	06:28	06:56 (WEA 15 (GCN))	07:22		07:22	08:17		15:56	
	21:52	27	06:21 (WEA_G2)	21:12	28	06:31 (WEA_G3)	20:03	18	19:15 (WEA 12 (GRS))	18:48	16:38	15:56	
5	04:50	05:54 (WEA_G2)	05:34	06:05 (WEA_G2)	06:30	06:57 (WEA 16 (GCN))	07:24		17:54 (WEA 14 (GRS))	18:24	16:34	15:55	
	21:52	28	06:22 (WEA_G2)	21:10	27	06:32 (WEA_G3)	20:00	29	19:24 (WEA 11 (GRS))	18:45	6	18:00 (WEA 14 (GRS))	15:56
6	04:51	05:54 (WEA_G2)	05:36	06:07 (WEA_G3)	06:32	18:55 (WEA 12 (GRS))	07:26		17:51 (WEA 14 (GRS))	18:26	12	18:03 (WEA 14 (GRS))	15:55
	21:51	29	06:23 (WEA_G2)	21:08	25	06:32 (WEA_G3)	19:58	30	19:25 (WEA 11 (GRS))	18:43	16	18:03 (WEA 14 (GRS))	15:55
7	04:52	05:54 (WEA_G2)	05:38	06:08 (WEA_G3)	06:34	18:54 (WEA 12 (GRS))	07:28		17:49 (WEA 14 (GRS))	18:28	17	18:04 (WEA 14 (GRS))	15:55
	21:50	29	06:23 (WEA_G2)	21:06	24	06:32 (WEA_G3)	19:55	32	19:26 (WEA 11 (GRS))	18:41	15	18:04 (WEA 14 (GRS))	15:55
8	04:53	05:53 (WEA_G2)	05:40	06:10 (WEA_G3)	06:35	18:54 (WEA 12 (GRS))	07:30		17:48 (WEA 14 (GRS))	18:30	17	18:05 (WEA 14 (GRS))	15:54
	21:50	30	06:23 (WEA_G2)	21:04	22	06:32 (WEA_G3)	19:53	31	19:25 (WEA 11 (GRS))	18:38	17	18:05 (WEA 14 (GRS))	15:54
9	04:54	05:52 (WEA_G2)	05:41	06:11 (WEA_G3)	06:37	18:53 (WEA 12 (GRS))	07:32		17:47 (WEA 14 (GRS))	18:32	18	18:05 (WEA 14 (GRS))	15:54
	21:49	32	06:24 (WEA_G2)	21:02	20	06:31 (WEA_G3)	19:50	29	19:22 (WEA 11 (GRS))	18:36	18	18:05 (WEA 14 (GRS))	15:54
10	04:55	05:53 (WEA_G2)	05:43	06:13 (WEA_G3)	06:39	18:53 (WEA 12 (GRS))	07:34		17:47 (WEA 14 (GRS))	18:34	17	18:04 (WEA 14 (GRS))	15:54
	21:48	32	06:25 (WEA_G2)	21:00	18	06:31 (WEA_G3)	19:48	26	19:19 (WEA 11 (GRS))	18:33	17	18:04 (WEA 14 (GRS))	15:54
11	04:56	05:53 (WEA_G2)	05:45	06:15 (WEA_G3)	06:41	18:53 (WEA 12 (GRS))	07:36		17:47 (WEA 14 (GRS))	18:36	15	18:02 (WEA 14 (GRS))	15:53
	21:47	32	06:25 (WEA_G2)	20:58	16	06:31 (WEA_G3)	19:45	24	19:17 (WEA 11 (GRS))	18:31	15	18:02 (WEA 14 (GRS))	15:53
12	04:58	05:53 (WEA_G2)	05:47	06:16 (WEA_G3)	06:43	18:53 (WEA 12 (GRS))	07:37		17:46 (WEA 14 (GRS))	18:38	13	17:59 (WEA 14 (GRS))	15:53
	21:46	33	06:26 (WEA_G2)	20:56	14	06:30 (WEA_G3)	19:43	22	19:15 (WEA 11 (GRS))	18:28	13	17:59 (WEA 14 (GRS))	15:53
13	04:59	05:52 (WEA_G2)	05:49	06:18 (WEA_G3)	06:44	18:52 (WEA 12 (GRS))	07:39		17:47 (WEA 14 (GRS))	18:40	10	17:57 (WEA 14 (GRS))	15:53
	21:45	34	06:26 (WEA_G2)	20:54	11	06:29 (WEA_G3)	19:40	20	19:12 (WEA 12 (GRS))	18:26	10	17:57 (WEA 14 (GRS))	15:53
14	05:00	05:52 (WEA_G2)	05:50	06:20 (WEA_G3)	06:46	18:53 (WEA 12 (GRS))	07:41		17:47 (WEA 14 (GRS))	18:42	7	17:54 (WEA 14 (GRS))	15:53
	21:44	34	06:26 (WEA_G2)	20:52	9	06:29 (WEA_G3)	19:38	16	19:09 (WEA 12 (GRS))	18:24	7	17:54 (WEA 14 (GRS))	15:53
15	05:01	05:52 (WEA_G2)	05:52	06:21 (WEA_G3)	06:48	18:51 (WEA 12 (GRS))	07:43		17:48 (WEA 14 (GRS))	18:44	4	17:52 (WEA 14 (GRS))	15:53
	21:43	35	06:27 (WEA_G2)	20:49	6	06:27 (WEA_G3)	19:35	13	19:07 (WEA 12 (GRS))	18:21	4	17:52 (WEA 14 (GRS))	15:53
16	05:03	05:51 (WEA_G2)	05:54	06:23 (WEA_G3)	06:50	18:57 (WEA 12 (GRS))	07:45		17:48 (WEA 14 (GRS))	18:46		16:18	15:53
	21:42	36	06:27 (WEA_G2)	20:47	2	06:25 (WEA_G3)	19:33	8	19:05 (WEA 12 (GRS))	18:19		16:17	15:53
17	05:04	05:52 (WEA_G2)	05:56		06:52		07:47		18:19	18:19		16:17	15:53
	21:41	36	06:28 (WEA_G2)	20:45		19:30	07:47		18:17	18:17		16:15	15:53
18	05:05	05:52 (WEA_G2)	05:57		06:53		07:49		18:14	18:14		16:14	15:53
	21:39	36	06:28 (WEA_G2)	20:43		19:28	07:51		18:14	18:14		16:14	15:53
19	05:07	05:51 (WEA_G2)	05:59		06:55		07:51		18:12	18:12		16:12	15:54
	21:38	37	06:28 (WEA_G2)	20:40		19:25	07:53		18:12	18:12		16:12	15:54
20	05:08	05:52 (WEA_G2)	06:01		06:57		07:53		18:10	18:10		16:11	15:54
	21:37	37	06:29 (WEA_G2)	20:38		19:23	07:55		18:07	18:07		16:11	15:54
21	05:10	05:51 (WEA_G2)	06:03		06:59		07:55		18:07	18:07		16:09	15:54
	21:35	38	06:29 (WEA_G2)	20:36		19:20	07:57		18:05	18:05		16:08	15:55
22	05:11	05:51 (WEA_G2)	06:05		07:01		07:57		18:05	18:05		16:08	15:55
	21:34	37	06:28 (WEA_G2)	20:34		19:18	07:58		18:03	18:03		16:07	15:55
23	05:13	05:51 (WEA_G2)	06:07		07:02		07:58		18:01	18:01		16:06	15:56
	21:32	38	06:29 (WEA_G2)	20:31		19:15	07:58		18:01	18:01		16:06	15:56
24	05:14	05:51 (WEA_G2)	06:08		07:04		07:58		18:00	18:00		16:05	15:56
	21:31	38	06:29 (WEA_G2)	20:29		19:13	07:59		18:00	18:00		16:05	15:56
25	05:16	05:52 (WEA_G2)	06:10		07:06		07:59		18:00	18:00		16:04	15:57
	21:29	37	06:29 (WEA_G2)	20:27		19:10	07:59		18:00	18:00		16:04	15:57
26	05:18	05:51 (WEA_G2)	06:12		07:08		07:59		18:00	18:00		16:03	15:57
	21:28	38	06:29 (WEA_G2)	20:24		19:08	07:59		18:00	18:00		16:03	15:57
27	05:19	05:52 (WEA_G2)	06:14		07:10		07:59		18:00	18:00		16:02	15:58
	21:26	37	06:29 (WEA_G2)	20:22		19:05	07:59		18:00	18:00		16:02	15:58
28	05:21	05:52 (WEA_G2)	06:16		07:11		07:59		18:00	18:00		16:01	15:59
	21:24	36	06:28 (WEA_G2)	20:20		19:03	07:59		18:00	18:00		16:01	15:59
29	05:22	05:54 (WEA_G2)	06:17		07:13		07:59		18:00	18:00		16:00	16:00
	21:23	35	06:29 (WEA_G2)	20:17	7	06:49 (WEA 15 (GCN))	07:13		18:00	18:00		16:00	16:00
30	05:24	05:55 (WEA_G2)	06:19		07:15		07:59		18:00	18:00		16:00	16:00
	21:21	33	06:28 (WEA_G3)	20:15	11	06:58 (WEA 15 (GCN))	07:15		18:00	18:00		16:00	16:00
31	05:26	05:57 (WEA_G2)	06:21		07:14		07:59		18:00	18:00		16:00	16:00
	21:19	32	06:29 (WEA_G3)	20:12	10	06:59 (WEA 15 (GCN))	07:14		18:00	18:00		16:00	16:00
Sonnenscheinstunden		515	461		383		328		257	231			
astr.max.mögl.Beschattung		1034	343		393		134						

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	

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 32 - IO 32 Rütting Söhlen 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar		Februar		März		April		Mai		Juni					
1	08:37	09:12 (WEA 19 (GCS))	10:06	10:08	07:33 (WEA 20 (GCS))	10:6:52		10:5:12	06:08 (WEA 15 (GCON))	10:4:51	05:22 (WEA_G2)				
1	16:03	35	09:47 (WEA 21 (GCS))	11:55	17:52	24	07:57 (WEA 20 (GCS))	11:51	20:48	43	20:08 (WEA 13 (GRS))	21:28	37	21:01 (WEA 11 (GRS))	
2	08:37	09:12 (WEA 19 (GCS))	10:04	10:05	07:33 (WEA 20 (GCS))	10:6:49		10:5:39	19:29 (WEA 14 (GRS))	10:4:50	05:21 (WEA_G2)				
1	16:04	35	09:47 (WEA 21 (GCS))	11:57	17:54	25	07:57 (WEA 20 (GCS))	11:49:57	20:49	37	20:06 (WEA 13 (GRS))	21:40	38	21:01 (WEA 11 (GRS))	
3	08:37	09:11 (WEA 19 (GCS))	10:03	10:03	07:32 (WEA 20 (GCS))	10:6:47		10:5:37	19:30 (WEA 14 (GRS))	10:4:49	05:21 (WEA_G2)				
1	16:05	36	09:47 (WEA 21 (GCS))	11:59	17:56	26	07:58 (WEA 20 (GCS))	11:49:55	20:51	30	20:21 (WEA 10 (GRS))	21:41	39	21:02 (WEA 11 (GRS))	
4	08:36	09:12 (WEA 19 (GCS))	10:01	10:01	07:31 (WEA 20 (GCS))	10:6:44		10:5:35	19:31 (WEA 14 (GRS))	10:4:48	05:20 (WEA_G2)				
1	16:07	35	09:47 (WEA 21 (GCS))	11:59	17:58	26	07:57 (WEA 20 (GCS))	11:49:57	20:53	26	20:23 (WEA 10 (GRS))	21:42	39	21:01 (WEA 11 (GRS))	
5	08:36	09:12 (WEA 19 (GCS))	10:50	10:50	07:31 (WEA 20 (GCS))	10:6:42		10:5:33	19:33 (WEA 14 (GRS))	10:4:48	05:19 (WEA_G2)				
1	16:08	35	09:47 (WEA 21 (GCS))	11:03	18:00	26	07:57 (WEA 20 (GCS))	11:49:59	20:55	25	20:24 (WEA 10 (GRS))	21:43	40	21:01 (WEA 11 (GRS))	
6	08:36	09:11 (WEA 19 (GCS))	10:57	10:56	07:31 (WEA 20 (GCS))	10:6:39		10:5:31	19:34 (WEA 14 (GRS))	10:4:47	05:19 (WEA_G2)				
1	16:09	35	09:46 (WEA 21 (GCS))	11:05	18:02	25	07:56 (WEA 20 (GCS))	11:49:51	20:57	24	20:26 (WEA 10 (GRS))	21:44	41	21:02 (WEA 11 (GRS))	
7	08:35	09:12 (WEA 19 (GCS))	10:55	10:53	07:31 (WEA 20 (GCS))	10:6:37		10:5:29	19:36 (WEA 14 (GRS))	10:4:46	05:18 (WEA_G2)				
1	16:11	34	09:46 (WEA 21 (GCS))	11:07	18:04	25	07:56 (WEA 20 (GCS))	11:49:51	20:59	20	20:27 (WEA 10 (GRS))	21:45	40	21:01 (WEA 11 (GRS))	
8	08:35	09:12 (WEA 19 (GCS))	10:53	10:51	07:31 (WEA 20 (GCS))	10:6:35		10:5:27	20:18 (WEA 10 (GRS))	10:4:46	05:18 (WEA_G2)				
1	16:12	33	09:45 (WEA 21 (GCS))	11:09	18:06	24	07:55 (WEA 20 (GCS))	11:49:51	21:00	11	20:29 (WEA 10 (GRS))	21:46	41	21:02 (WEA 11 (GRS))	
9	08:34	09:12 (WEA 19 (GCS))	10:51	10:49	07:32 (WEA 20 (GCS))	10:6:32		10:5:25	20:20 (WEA 10 (GRS))	10:4:45	05:17 (WEA_G2)				
1	16:14	29	09:43 (WEA 21 (GCS))	11:11	18:07	22	07:54 (WEA 20 (GCS))	11:49:51	21:02	11	20:31 (WEA 10 (GRS))	21:47	41	21:01 (WEA 11 (GRS))	
10	08:33	09:12 (WEA 19 (GCS))	10:49	10:46	07:33 (WEA 20 (GCS))	10:6:30		10:5:24	20:21 (WEA 10 (GRS))	10:4:44	05:17 (WEA_G2)				
1	16:15	27	09:39 (WEA 21 (GCS))	11:13	18:09	19	07:52 (WEA 20 (GCS))	11:49:51	21:04	9	20:30 (WEA 10 (GRS))	21:48	40	21:01 (WEA 11 (GRS))	
11	08:33	09:12 (WEA 19 (GCS))	10:47	10:44	07:34 (WEA 20 (GCS))	10:6:27		10:5:22	20:22 (WEA 10 (GRS))	10:4:44	05:17 (WEA_G2)				
1	16:17	28	09:40 (WEA 21 (GCS))	11:16	18:11	17	07:51 (WEA 20 (GCS))	11:49:51	21:06	6	20:28 (WEA 10 (GRS))	21:49	42	21:02 (WEA 11 (GRS))	
12	08:32	09:12 (WEA 19 (GCS))	10:45	10:41	07:36 (WEA 20 (GCS))	10:6:25		10:5:20	05:17 (WEA_G2)	10:4:44	05:16 (WEA_G2)				
1	16:18	28	09:40 (WEA 21 (GCS))	11:18	18:13	11	07:47 (WEA 20 (GCS))	11:49:51	21:08	1	05:46 (WEA_G3)	11:50	41	21:01 (WEA 11 (GRS))	
13	08:31	09:12 (WEA 19 (GCS))	10:43	10:39	07:37 (WEA 20 (GCS))	10:6:22		10:5:18	05:46 (WEA_G3)	10:4:43	05:16 (WEA_G2)				
1	16:20	29	09:41 (WEA 21 (GCS))	11:20	18:15	10	07:46 (WEA 20 (GCS))	11:49:51	21:09	3	05:49 (WEA_G3)	11:50	40	21:01 (WEA 11 (GRS))	
14	08:30	09:12 (WEA 19 (GCS))	10:41	10:36	07:38 (WEA 20 (GCS))	10:6:20		10:5:16	05:44 (WEA_G3)	10:4:43	05:16 (WEA_G2)				
1	16:21	29	09:41 (WEA 21 (GCS))	11:22	18:17	10	07:46 (WEA 20 (GCS))	11:49:51	21:11	5	05:49 (WEA_G3)	11:51	41	21:01 (WEA 11 (GRS))	
15	08:29	09:13 (WEA 19 (GCS))	10:39	10:34	07:39 (WEA 20 (GCS))	10:6:18		10:5:15	05:43 (WEA_G3)	10:4:43	05:17 (WEA_G2)				
1	16:23	29	09:42 (WEA 21 (GCS))	11:24	18:19	10	07:46 (WEA 20 (GCS))	11:49:51	21:13	7	05:50 (WEA_G3)	11:52	40	21:02 (WEA 11 (GRS))	
16	08:28	09:13 (WEA 19 (GCS))	10:37	10:31	07:40 (WEA 20 (GCS))	10:6:15		10:5:13	05:41 (WEA_G3)	10:4:43	05:17 (WEA_G2)				
1	16:25	30	09:43 (WEA 21 (GCS))	11:26	18:21	15	07:45 (WEA 20 (GCS))	11:49:51	21:14	9	05:50 (WEA_G3)	11:52	40	21:02 (WEA 11 (GRS))	
17	08:27	09:14 (WEA 19 (GCS))	10:35	10:29	07:41 (WEA 20 (GCS))	10:6:13		10:5:11	05:40 (WEA_G3)	10:4:42	05:17 (WEA_G2)				
1	16:27	29	09:43 (WEA 21 (GCS))	11:28	18:23	20	07:45 (WEA 20 (GCS))	11:49:51	21:16	10	05:50 (WEA_G3)	11:53	40	21:02 (WEA 11 (GRS))	
18	08:26	09:13 (WEA 19 (GCS))	10:33	10:27	07:42 (WEA 20 (GCS))	10:6:11		10:5:10	05:38 (WEA_G3)	10:4:42	05:17 (WEA_G2)				
1	16:28	30	09:43 (WEA 21 (GCS))	11:30	18:25	23	07:45 (WEA 20 (GCS))	11:49:51	21:18	12	05:50 (WEA_G3)	11:53	40	21:02 (WEA 11 (GRS))	
19	08:25	09:14 (WEA 19 (GCS))	10:31	10:24	07:43 (WEA 20 (GCS))	10:6:08		10:5:08	05:37 (WEA_G3)	10:4:42	05:17 (WEA_G2)				
1	16:30	30	09:44 (WEA 21 (GCS))	11:32	18:27	26	07:45 (WEA 20 (GCS))	11:49:51	21:19	15	20:37 (WEA 11 (GRS))	21:54	40	21:02 (WEA 11 (GRS))	
20	08:24	09:14 (WEA 19 (GCS))	10:28	10:22	07:44 (WEA 20 (GCS))	10:6:06		10:5:06	05:35 (WEA_G3)	10:4:42	05:18 (WEA_G2)				
1	16:32	29	09:43 (WEA 21 (GCS))	11:34	18:29	29	07:45 (WEA 20 (GCS))	11:49:51	21:21	20	20:48 (WEA 11 (GRS))	21:54	39	21:02 (WEA 11 (GRS))	
21	08:23	09:15 (WEA 19 (GCS))	10:26	10:19	07:45 (WEA 20 (GCS))	10:6:04		10:5:05	05:34 (WEA_G3)	10:4:43	05:18 (WEA_G2)				
1	16:34	29	09:44 (WEA 21 (GCS))	11:36	18:30	31	07:46 (WEA 20 (GCS))	11:49:51	21:23	22	20:49 (WEA 11 (GRS))	21:54	39	21:02 (WEA 11 (GRS))	
22	08:21	09:16 (WEA 19 (GCS))	10:24	10:17	07:46 (WEA 20 (GCS))	10:6:01		10:5:03	05:33 (WEA_G3)	10:4:43	05:18 (WEA_G2)				
1	16:36	29	09:45 (WEA 21 (GCS))	11:38	18:32	34	07:46 (WEA 20 (GCS))	11:49:51	21:24	26	20:51 (WEA 11 (GRS))	21:54	39	21:02 (WEA 11 (GRS))	
23	08:20	09:16 (WEA 19 (GCS))	10:22	10:14	07:47 (WEA 20 (GCS))	10:5:59		10:5:02	05:32 (WEA_G3)	10:4:43	05:19 (WEA_G2)				
1	16:38	28	09:44 (WEA 21 (GCS))	11:40	18:34	35	07:46 (WEA 20 (GCS))	11:49:51	21:26	29	20:53 (WEA 11 (GRS))	21:54	39	21:03 (WEA 11 (GRS))	
24	08:19	09:16 (WEA 19 (GCS))	10:19	10:12	07:48 (WEA 20 (GCS))	10:5:57		10:5:01	05:30 (WEA_G3)	10:4:43	05:18 (WEA_G2)				
1	16:39	27	09:43 (WEA 21 (GCS))	11:42	3	07:48 (WEA 20 (GCS))	11:36	10:5:55	20:53 (WEA 11 (GRS))	21:55	40	21:03 (WEA 11 (GRS))			
25	08:17	09:18 (WEA 19 (GCS))	10:17	10:09	07:49 (WEA 20 (GCS))	10:5:53		10:5:00	05:29 (WEA_G3)	10:4:44	05:18 (WEA_G2)				
1	16:41	26	09:44 (WEA 21 (GCS))	11:44	10	07:52 (WEA 20 (GCS))	11:38	10:5:52	20:55 (WEA 11 (GRS))	21:55	40	21:03 (WEA 11 (GRS))			
26	08:16	09:18 (WEA 19 (GCS))	10:15	10:07	07:49 (WEA 20 (GCS))	10:5:52		10:5:00	05:28 (WEA_G3)	10:4:44	05:19 (WEA_G2)				
1	16:43	25	09:43 (WEA 21 (GCS))	11:46	14	07:54 (WEA 20 (GCS))	11:40	10:5:50	20:56 (WEA 11 (GRS))	21:55	39	21:04 (WEA 11 (GRS))			
27	08:14	09:19 (WEA 19 (GCS))	10:12	10:04	07:51 (WEA 20 (GCS))	10:5:48		10:5:00	05:27 (WEA_G3)	10:4:45	05:19 (WEA_G2)				
1	16:45	23	09:42 (WEA 21 (GCS))	11:48	18	07:55 (WEA 20 (GCS))	11:42	10:5:48	20:58 (WEA 11 (GRS))	21:54	40	21:04 (WEA 11 (GRS))			
28	08:13	09:21 (WEA 19 (GCS))	10:10	10:02	07:55 (WEA 20 (GCS))	10:5:46		10:5:00	05:26 (WEA_G3)	10:4:45	05:19 (WEA_G2)				
1	16:47	21	09:42 (WEA 21 (GCS))	11:50	21	07:56 (WEA 20 (GCS))	11:44	10:5:46	05:25 (WEA_G3)	10:4:46	05:19 (WEA_G2)				
29	08:11	09:22 (WEA 19 (GCS))	1	10:50				10:5:46					41	21:04 (WEA 11 (GRS))	
1	16:49	19	09:41 (WEA 21 (GCS))	1	19:46			10:5:44	44	20:10 (WEA 13 (GRS))	21:55	41	21:04 (WEA 11 (GRS))		
30	08:09	09:24 (WEA 19 (GCS))	1	10:57				10:5:41	45	20:09 (WEA 13 (GRS))	21:54	41	21:05 (WEA 11 (GRS))		
1	16:51	15	09:39 (WEA 21 (GCS))	1	19:47			10:5:38					41	21:05 (WEA 11 (GRS))	
31	08:08	09:26 (WEA 19 (GCS))	1	10:54				10:5:37					41	21:05 (WEA 11 (GRS))	
1	16:53	11	09:37 (WEA 21 (GCS))	1	19:49			10:5:35					41	21:05 (WEA 11 (GRS))	
Sonnenscheinstunden		248		272		367		421		496		513		1198	
anz max mögl Beschattung		878		66		270		520		694					

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 32 - IO 32 Rütting Söhlen 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Jul	August	September	Oktober	November	Dezember
1 04:47	05:21 (WEA_G2) 105:28	06:23	07:17	08:18 (WEA 20 (GCS)) 107:16	08:12
2 1:04:48	41 21:06 (WEA 11 (GRS)) 121:18	20:10	18:55 7	08:25 (WEA 20 (GCS)) 107:16	11:59 28
3 1:04:48	05:21 (WEA_G2) 105:29	20:32 (WEA 10 (GRS)) 106:25	17:19	08:13 (WEA 20 (GCS)) 107:18	08:14
4 1:04:48	41 21:06 (WEA 11 (GRS)) 121:16	7 20:29 (WEA 10 (GRS)) 106:08	18:33 15	08:26 (WEA 20 (GCS)) 107:18	11:58 27
5 1:04:48	05:21 (WEA_G2) 105:31	19:49 (WEA 14 (GRS)) 106:20	17:21	08:11 (WEA 20 (GCS)) 107:20	08:15
6 1:04:48	41 21:06 (WEA 11 (GRS)) 121:14	11 20:41 (WEA 10 (GRS)) 106:03	18:50 18	08:29 (WEA 20 (GCS)) 107:16	11:57 29
7 1:04:49	05:23 (WEA_G2) 105:33	20:29 (WEA 10 (GRS)) 106:28	17:22	08:10 (WEA 20 (GCS)) 107:22	08:17
8 1:04:49	41 21:07 (WEA 11 (GRS)) 121:12	11 20:40 (WEA 10 (GRS)) 106:03	1 06:56 (WEA 17 (GCR)) 107:22	21 08:31 (WEA 20 (GCS)) 107:20	11:56 33
9 1:04:50	05:24 (WEA_G2) 105:34	19:49 (WEA 14 (GRS)) 106:20	18:34 24	08:06 (WEA 20 (GCS)) 107:24	08:18
10 1:04:51	41 21:07 (WEA 11 (GRS)) 121:10	16 20:39 (WEA 10 (GRS)) 106:00	18:45 24	08:32 (WEA 20 (GCS)) 107:36	11:56 34
11 1:04:51	05:25 (WEA_G2) 105:36	19:46 (WEA 14 (GRS)) 106:32	17:26	08:08 (WEA 20 (GCS)) 107:26	08:19
12 1:04:51	40 21:08 (WEA 11 (GRS)) 121:08	21 20:37 (WEA 10 (GRS)) 105:58	18:43 24	08:32 (WEA 20 (GCS)) 107:34	11:55 35
13 1:04:52	05:26 (WEA_G2) 105:38	19:43 (WEA 14 (GRS)) 106:34	17:28	08:07 (WEA 20 (GCS)) 107:28	08:21
14 1:04:52	39 21:08 (WEA 11 (GRS)) 121:06	25 20:35 (WEA 10 (GRS)) 105:55	18:41 25	08:32 (WEA 20 (GCS)) 107:32	11:55 35
15 1:04:53	05:27 (WEA_G2) 105:40	19:41 (WEA 14 (GRS)) 106:35	17:30	08:06 (WEA 20 (GCS)) 107:30	08:22
16 1:04:53	39 21:09 (WEA 11 (GRS)) 121:04	25 20:33 (WEA 10 (GRS)) 105:53	18:38 26	08:32 (WEA 20 (GCS)) 107:30	11:54 35
17 1:04:54	05:28 (WEA_G2) 105:41	19:39 (WEA 14 (GRS)) 106:37	17:32	08:06 (WEA 20 (GCS)) 107:32	08:23
18 1:04:54	38 21:09 (WEA 11 (GRS)) 121:02	27 20:31 (WEA 10 (GRS)) 105:50	18:36 26	08:32 (WEA 20 (GCS)) 107:32	11:54 36
19 1:04:55	05:29 (WEA_G2) 105:43	19:38 (WEA 14 (GRS)) 106:39	17:34	08:06 (WEA 20 (GCS)) 107:34	08:25
20 1:04:55	37 21:09 (WEA 11 (GRS)) 121:00	33 20:29 (WEA 10 (GRS)) 105:48	18:33 26	08:32 (WEA 20 (GCS)) 107:34	11:54 35
21 1:04:56	05:30 (WEA_G2) 105:45	19:38 (WEA 14 (GRS)) 106:41	17:36	08:06 (WEA 20 (GCS)) 107:36	08:26
22 1:04:56	36 21:09 (WEA 11 (GRS)) 120:58	37 20:15 (WEA 13 (GRS)) 106:45	18:31 26	08:32 (WEA 20 (GCS)) 107:36	11:54 35
23 1:04:56	05:31 (WEA_G2) 105:47	06:16 (WEA 15 (GCR)) 106:46	17:37	08:06 (WEA 20 (GCS)) 107:38	08:27
24 1:04:56	36 21:10 (WEA 11 (GRS)) 120:56	44 20:16 (WEA 13 (GRS)) 106:43	18:28 25	08:31 (WEA 20 (GCS)) 107:38	11:53 35
25 1:04:59	05:32 (WEA_G2) 105:49	06:18 (WEA 15 (GCR)) 106:44	17:39	08:07 (WEA 20 (GCS)) 107:40	08:28
26 1:04:59	41 21:10 (WEA 11 (GRS)) 120:54	44 20:17 (WEA 13 (GRS)) 106:40	18:26 23	08:30 (WEA 20 (GCS)) 107:40	11:53 34
27 1:04:59	05:33 (WEA_G2) 105:50	06:20 (WEA 15 (GCR)) 106:46	17:41	08:09 (WEA 20 (GCS)) 107:42	08:29
28 1:04:59	41 21:09 (WEA 11 (GRS)) 120:52	45 20:18 (WEA 13 (GRS)) 106:38	18:24 20	08:29 (WEA 20 (GCS)) 107:40	11:53 34
29 1:05:01	05:34 (WEA_G2) 105:52	06:21 (WEA 15 (GCR)) 106:48	17:43	08:11 (WEA 20 (GCS)) 107:44	08:30
30 1:05:01	40 21:08 (WEA 11 (GRS)) 120:49	44 20:17 (WEA 13 (GRS)) 106:35	18:21 17	08:28 (WEA 20 (GCS)) 107:42	11:53 33
31 1:05:03	05:35 (WEA_G2) 105:54	19:34 (WEA 14 (GRS)) 106:50	17:45	08:13 (WEA 20 (GCS)) 107:46	08:31
1 1:05:04	39 21:08 (WEA 11 (GRS)) 120:47	43 20:17 (WEA 13 (GRS)) 106:33	18:19 13	08:26 (WEA 20 (GCS)) 107:46	11:53 33
2 1:05:04	05:37 (WEA_G2) 105:56	19:34 (WEA 14 (GRS)) 106:52	17:47	08:15 (WEA 20 (GCS)) 107:47	08:32
3 1:05:04	36 21:08 (WEA 11 (GRS)) 120:45	41 20:15 (WEA 13 (GRS)) 106:30	18:17 8	08:23 (WEA 20 (GCS)) 107:49	11:53 33
4 1:05:06	05:38 (WEA_G2) 105:58	19:34 (WEA 14 (GRS)) 106:53	17:49	08:15 (WEA 20 (GCS)) 107:49	08:33
5 1:05:06	35 21:05 (WEA 11 (GRS)) 120:43	39 20:13 (WEA 13 (GRS)) 106:28	18:14	16:14 27	09:17 (WEA 19 (GCS)) 11:53 32
6 1:05:07	05:39 (WEA_G2) 105:59	19:33 (WEA 14 (GRS)) 106:55	17:51	07:51	08:50 (WEA 19 (GCS)) 108:33
7 1:05:07	33 21:04 (WEA 11 (GRS)) 120:40	38 20:14 (WEA 13 (GRS)) 106:25	18:12	16:12	09:18 (WEA 19 (GCS)) 11:54 32
8 1:05:08	05:41 (WEA_G2) 106:01	19:33 (WEA 14 (GRS)) 106:57	17:53	07:53	08:50 (WEA 19 (GCS)) 108:34
9 1:05:08	30 21:03 (WEA 11 (GRS)) 120:38	36 20:09 (WEA 13 (GRS)) 106:23	18:10	16:11 29	09:19 (WEA 19 (GCS)) 11:54 32
10 1:05:10	05:42 (WEA_G2) 106:03	19:34 (WEA 14 (GRS)) 106:59	17:55	07:55	08:51 (WEA 19 (GCS)) 108:34
11 1:05:10	26 21:01 (WEA 11 (GRS)) 120:36	33 20:07 (WEA 13 (GRS)) 106:20	18:08	16:09 29	09:20 (WEA 19 (GCS)) 11:54 32
12 1:05:11	05:44 (WEA_G2) 106:05	19:33 (WEA 14 (GRS)) 106:57	17:57	07:57	08:51 (WEA 19 (GCS)) 108:35
13 1:05:11	24 21:01 (WEA 11 (GRS)) 120:34	31 20:04 (WEA 13 (GRS)) 106:19	18:05	16:08 29	09:21 (WEA 19 (GCS)) 11:55 32
14 1:05:12	05:45 (WEA_G2) 106:07	19:34 (WEA 14 (GRS)) 107:02	17:59	07:58	08:51 (WEA 19 (GCS)) 108:36
15 1:05:12	31 21:02 (WEA 11 (GRS)) 120:32	28 20:02 (WEA 13 (GRS)) 106:15	18:03	16:07 30	09:21 (WEA 19 (GCS)) 11:55 32
16 1:05:14	05:46 (WEA_G2) 106:08	19:35 (WEA 14 (GRS)) 107:04	18:00	16:06 29	08:51 (WEA 19 (GCS)) 108:36
17 1:05:14	17 20:57 (WEA 11 (GRS)) 120:29	25 20:00 (WEA 14 (GRS)) 106:13	18:01	16:06 29	09:21 (WEA 19 (GCS)) 11:56 32
18 1:05:16	05:48 (WEA_G2) 106:10	19:35 (WEA 14 (GRS)) 107:06	17:52	08:02	08:51 (WEA 19 (GCS)) 108:36
19 1:05:16	13 21:29 06:01 (WEA_G2) 120:27	22 19:57 (WEA 14 (GRS)) 106:19	18:39	16:04 30	09:21 (WEA 19 (GCS)) 11:57 32
20 1:05:18	05:49 (WEA_G2) 106:12	19:36 (WEA 14 (GRS)) 107:08	17:54	08:04	08:51 (WEA 19 (GCS)) 108:37
21 1:05:18	11 21:28 06:00 (WEA_G2) 120:24	19 19:55 (WEA 14 (GRS)) 106:08	18:36	16:03 30	09:21 (WEA 19 (GCS)) 11:57 33
22 1:05:19	05:51 (WEA_G2) 106:14	19:36 (WEA 14 (GRS)) 107:10	17:56	08:05	08:52 (WEA 19 (GCS)) 108:37
23 1:05:21	06:01 (WEA_G2) 120:22	15 19:53 (WEA 14 (GRS)) 106:05	18:34	16:02 30	09:21 (WEA 19 (GCS)) 11:58 33
24 1:05:21	05:52 (WEA_G2) 106:16	19:41 (WEA 14 (GRS)) 107:11	17:58	08:07	08:53 (WEA 19 (GCS)) 108:37
25 1:05:22	8 21:24 06:00 (WEA_G2) 120:20	10 19:51 (WEA 14 (GRS)) 106:03	18:32	16:01 29	09:22 (WEA 19 (GCS)) 11:59 33
26 1:05:22	05:54 (WEA_G2) 106:17	19:42 (WEA 14 (GRS)) 107:13	17:59	08:09	08:53 (WEA 19 (GCS)) 108:37
27 1:05:23	06:00 (WEA_G2) 120:17	19:00	18:30	16:00 29	09:22 (WEA 19 (GCS)) 11:60 34
28 1:05:24	05:55 (WEA_G2) 106:19	19:42 (WEA 14 (GRS)) 107:15	17:52	08:10	08:54 (WEA 19 (GCS)) 108:37
29 1:05:24	4 21:21 05:59 (WEA_G2) 120:15	18:58	18:48	15:59 28	09:22 (WEA 19 (GCS)) 11:61 34
30 1:05:26	05:57 (WEA_G2) 106:21	19:43	17:14	16:46	08:57
31 1:05:29	2 21:19 05:59 (WEA_G2) 120:12	18:58	18:46	16:02	09:12 (WEA 19 (GCS))
Sommerrechenstunden	315	461	383	328	231
anz max mögl Beschattung	907	770	1	344	1021

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 33 - IO 33 Rütting Söhlen 7

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	08:33 (WEA 21 (GCS)) 07:08	06:52	07:41 (WEA 20 (GCS)) 05:42	04:51
1 16:03	16:55	14 09:07 (WEA 21 (GCS)) 17:52	19:51	10 07:51 (WEA 20 (GCS)) 20:40	21:38
2 08:37	08:04	08:55 (WEA 21 (GCS)) 07:05	06:49	05:39	04:50
1 16:04	16:57	11 09:06 (WEA 21 (GCS)) 17:54	19:53	20:49	21:40
3 08:37	08:03	08:59 (WEA 21 (GCS)) 07:03	06:47	05:37	04:49
1 16:05	16:59	3 09:02 (WEA 21 (GCS)) 17:56	19:55	20:51	21:41
4 08:36	08:01	07:01	06:44	05:35	04:48
1 16:07	17:01	11:58	19:57	20:53	21:42
5 08:36	08:50	06:58	06:42	05:33	04:48
1 16:08	17:03	18:00	19:59	20:55	21:43
6 08:36	08:57	06:56	06:39	05:31	04:47
1 16:09	17:05	18:02	20:01	20:57	21:44
7 08:35	08:55	08:22 (WEA 19 (GCS)) 06:53	06:37	05:29	04:46
1 16:11	17:07	8 08:30 (WEA 19 (GCS)) 18:04	20:03	20:59	21:45
8 08:35	08:53	08:20 (WEA 19 (GCS)) 06:51	06:35	05:27	04:46
1 16:12	17:09	13 08:33 (WEA 19 (GCS)) 18:06	20:04	21:00	21:46
9 08:34	08:51	08:18 (WEA 19 (GCS)) 06:49	06:32	05:25	04:45
1 16:14	17:11	17 08:35 (WEA 19 (GCS)) 18:08	20:06	21:02	21:47
10 08:33	08:49	08:16 (WEA 19 (GCS)) 06:46	06:30	05:24	04:44
1 16:15	17:14	21 08:37 (WEA 19 (GCS)) 18:09	20:08	21:04	21:48
11 08:33	08:47	08:15 (WEA 19 (GCS)) 06:44	06:27	05:22	04:44
1 16:17	17:16	23 08:38 (WEA 19 (GCS)) 18:11	20:10	21:06	21:49
12 08:32	08:45	08:14 (WEA 19 (GCS)) 06:41	06:25	05:20	04:44
1 16:18	17:18	25 08:39 (WEA 19 (GCS)) 18:13	20:12	21:08	21:50
13 08:31	08:43	08:13 (WEA 19 (GCS)) 06:39	06:22	05:18	04:43
1 16:20	17:20	27 08:40 (WEA 19 (GCS)) 18:15	20:14	21:09	21:50
14 08:30	08:41	08:12 (WEA 19 (GCS)) 06:36	06:20	05:16	04:43
1 16:21	17:22	28 08:40 (WEA 19 (GCS)) 18:17	20:16	21:11	21:51
15 08:29	09:01 (WEA 21 (GCS)) 07:39	08:12 (WEA 19 (GCS)) 06:34	06:18	05:15	04:43
1 16:23	1 09:02 (WEA 21 (GCS)) 17:24	29 08:41 (WEA 19 (GCS)) 18:19	20:18	21:13	21:52
16 08:28	09:00 (WEA 21 (GCS)) 07:37	08:12 (WEA 19 (GCS)) 06:31	06:15	05:13	04:43
1 16:25	4 09:04 (WEA 21 (GCS)) 17:26	29 08:41 (WEA 19 (GCS)) 18:21	20:19	21:14	21:52
17 08:27	08:59 (WEA 21 (GCS)) 07:35	08:12 (WEA 19 (GCS)) 06:29	06:13	05:11	04:42
1 16:27	7 09:06 (WEA 21 (GCS)) 17:38	29 08:41 (WEA 19 (GCS)) 18:23	20:21	21:16	21:53
18 08:26	08:57 (WEA 21 (GCS)) 07:33	08:11 (WEA 19 (GCS)) 06:27	06:50 (WEA 20 (GCS)) 10:11	05:10	04:42
1 16:28	9 09:06 (WEA 21 (GCS)) 17:30	30 08:41 (WEA 19 (GCS)) 18:25	3 06:53 (WEA 20 (GCS)) 10:23	21:18	21:53
19 08:25	08:56 (WEA 21 (GCS)) 07:31	08:11 (WEA 19 (GCS)) 06:24	06:48 (WEA 20 (GCS)) 10:08	05:08	04:42
1 16:30	11 09:07 (WEA 21 (GCS)) 17:32	30 08:41 (WEA 19 (GCS)) 18:27	9 06:57 (WEA 20 (GCS)) 10:25	21:19	21:54
20 08:24	08:54 (WEA 21 (GCS)) 07:28	08:12 (WEA 19 (GCS)) 06:22	06:45 (WEA 20 (GCS)) 10:06	05:06	04:42
1 16:32	13 09:07 (WEA 21 (GCS)) 17:34	28 08:40 (WEA 19 (GCS)) 18:29	13 06:58 (WEA 20 (GCS)) 10:27	21:21	21:54
21 08:23	08:53 (WEA 21 (GCS)) 07:26	08:13 (WEA 19 (GCS)) 06:19	06:43 (WEA 20 (GCS)) 10:04	05:05	04:43
1 16:34	16 09:09 (WEA 21 (GCS)) 17:36	27 08:40 (WEA 19 (GCS)) 18:30	16 06:59 (WEA 20 (GCS)) 10:29	21:23	21:54
22 08:21	08:52 (WEA 21 (GCS)) 07:24	08:13 (WEA 19 (GCS)) 06:17	06:40 (WEA 20 (GCS)) 10:01	05:03	04:43
1 16:36	18 09:10 (WEA 21 (GCS)) 17:38	26 08:39 (WEA 19 (GCS)) 18:32	19 06:59 (WEA 20 (GCS)) 10:31	21:24	21:54
23 08:20	08:50 (WEA 21 (GCS)) 07:22	08:14 (WEA 19 (GCS)) 06:14	06:38 (WEA 20 (GCS)) 10:59	05:02	04:43
1 16:38	20 09:10 (WEA 21 (GCS)) 17:40	24 08:38 (WEA 19 (GCS)) 18:34	22 07:00 (WEA 20 (GCS)) 10:33	21:26	21:54
24 08:19	08:48 (WEA 21 (GCS)) 07:19	08:13 (WEA 19 (GCS)) 06:12	06:36 (WEA 20 (GCS)) 10:57	05:01	04:43
1 16:39	22 09:10 (WEA 21 (GCS)) 17:42	22 08:37 (WEA 19 (GCS)) 18:36	24 07:00 (WEA 20 (GCS)) 10:34	21:27	21:55
25 08:17	08:49 (WEA 21 (GCS)) 07:17	08:16 (WEA 19 (GCS)) 06:09	06:36 (WEA 20 (GCS)) 10:55	04:59	04:44
1 16:41	21 09:10 (WEA 21 (GCS)) 17:44	19 08:35 (WEA 19 (GCS)) 18:38	24 07:00 (WEA 20 (GCS)) 10:36	21:29	21:55
26 08:16	08:49 (WEA 21 (GCS)) 07:15	08:18 (WEA 19 (GCS)) 06:07	06:35 (WEA 20 (GCS)) 10:52	04:58	04:44
1 16:43	21 09:10 (WEA 21 (GCS)) 17:46	15 08:35 (WEA 19 (GCS)) 18:40	24 06:59 (WEA 20 (GCS)) 10:38	21:30	21:55
27 08:14	08:49 (WEA 21 (GCS)) 07:12	08:21 (WEA 19 (GCS)) 06:04	06:36 (WEA 20 (GCS)) 10:50	04:57	04:45
1 16:45	21 09:10 (WEA 21 (GCS)) 17:48	7 08:28 (WEA 19 (GCS)) 18:42	23 06:59 (WEA 20 (GCS)) 10:40	21:32	21:54
28 08:13	08:50 (WEA 21 (GCS)) 07:10	06:02	06:36 (WEA 20 (GCS)) 10:58	04:56	04:45
1 16:47	21 09:11 (WEA 21 (GCS)) 17:50	18:44	21 06:57 (WEA 20 (GCS)) 10:42	21:33	21:54
29 08:11	08:51 (WEA 21 (GCS))	06:59	07:36 (WEA 20 (GCS)) 10:54	04:54	04:46
1 16:49	19 09:10 (WEA 21 (GCS))	19:46	21 07:57 (WEA 20 (GCS)) 10:44	21:35	21:54
30 08:09	08:51 (WEA 21 (GCS))	06:57	07:37 (WEA 20 (GCS)) 10:54	04:53	04:46
1 16:51	19 09:10 (WEA 21 (GCS))	19:47	18 07:55 (WEA 20 (GCS)) 10:46	21:36	21:54
31 08:08	08:52 (WEA 21 (GCS))	06:54	07:38 (WEA 20 (GCS))	04:52	04:46
1 16:53	17 09:09 (WEA 21 (GCS))	19:49	15 07:53 (WEA 20 (GCS))	21:37	21:54
Sonnenscheinstunden abz. max. mögl. Beschattung	248	272	367	421	513
	260	305	252	10	334

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 33 - IO 33 Rütting Söhnen 7

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 21:54	05:21 (WEA_G2) 05:28 21:15 (WEA 14 (GRS)) 21:18	06:23 20:10	07:17 18:55	07:15 16:44	08:12 15:59	
2	04:48 21:53	05:21 (WEA_G2) 05:29 21:14 (WEA 14 (GRS)) 21:16	06:25 20:08	07:19 18:53	07:18 16:42	08:14 15:58	
3	04:48 21:53	05:22 (WEA_G2) 05:31 21:14 (WEA 14 (GRS)) 21:14	06:26 20:05	07:21 18:50	07:20 16:40	08:15 15:57	
4	04:49 21:52	05:23 (WEA_G2) 05:33 21:14 (WEA 14 (GRS)) 21:12	06:28 20:03	07:23 18:48	07:22 16:38	08:17 15:56	
5	04:50 21:52	05:24 (WEA_G2) 05:34 21:14 (WEA 14 (GRS)) 21:10	06:30 20:00	07:24 18:45	07:24 16:36	08:18 15:56	
6	04:51 21:51	05:25 (WEA_G2) 05:36 21:14 (WEA 14 (GRS)) 21:08	06:32 19:58	07:26 18:43	07:26 16:34	08:19 15:55	
7	04:52 21:50	05:26 (WEA_G2) 05:38 21:14 (WEA 14 (GRS)) 21:06	06:34 19:55	07:28 18:41	07:28 16:32	08:21 15:55	
8	04:53 21:50	05:27 (WEA_G2) 05:40 21:14 (WEA 14 (GRS)) 21:04	06:35 19:53	07:30 18:38	07:30 16:30	08:22 15:54	
9	04:54 21:49	05:28 (WEA_G2) 05:41 21:14 (WEA 14 (GRS)) 21:02	06:37 19:50	07:32 18:36	07:32 16:28	08:23 15:54	
10	04:55 21:48	05:29 (WEA_G2) 05:43 21:13 (WEA 10 (GRS)) 21:00	06:39 19:48	07:34 18:33	07:34 16:27	08:25 15:54	
11	04:56 21:47	05:30 (WEA_G2) 05:45 21:12 (WEA 10 (GRS)) 20:58	06:41 19:45	07:36 18:31	07:36 16:25	08:26 15:53	
12	04:58 21:46	05:31 (WEA_G2) 05:47 21:11 (WEA 10 (GRS)) 20:56	06:43 19:43	07:37 18:29	07:38 16:23	08:27 15:53	
13	04:59 21:45	05:32 (WEA_G2) 05:49 21:10 (WEA 10 (GRS)) 20:54	06:44 19:40	07:39 18:26	07:40 16:21	08:28 15:53	
14	04:59 21:44	05:33 (WEA_G2) 05:50 21:09 (WEA 10 (GRS)) 20:52	06:46 19:38	07:41 18:24	07:42 16:20	08:29 15:53	
15	05:01 21:43	20:42 (WEA 13 (GRS)) 05:52 21:08 (WEA 10 (GRS)) 20:49	06:48 19:35	07:43 18:21	07:44 16:18	08:30 15:53	
16	05:03 21:42	20:43 (WEA 13 (GRS)) 05:54 21:08 (WEA 10 (GRS)) 20:47	06:50 19:33	07:45 18:19	07:46 16:17	08:31 15:53	
17	05:04 21:41	20:43 (WEA 13 (GRS)) 05:56 21:06 (WEA 10 (GRS)) 20:45	06:52 19:30	07:47 18:17	07:47 16:15	08:32 15:53	
18	05:06 21:39	20:42 (WEA 13 (GRS)) 05:58 21:05 (WEA 10 (GRS)) 20:43	06:53 19:28	07:49 18:14	07:49 16:14	08:33 15:53	
19	05:07 21:38	20:42 (WEA 13 (GRS)) 05:59 21:04 (WEA 10 (GRS)) 20:40	06:55 19:25	07:51 18:12	07:51 16:12	08:33 15:54	
20	05:08 21:37	20:42 (WEA 13 (GRS)) 06:01 21:03 (WEA 10 (GRS)) 20:38	06:57 19:23	07:53 18:10	07:53 16:11	08:34 15:54	
21	05:10 21:35	20:42 (WEA 13 (GRS)) 06:03 21:01 (WEA 10 (GRS)) 20:36	06:59 19:20	07:55 18:08	07:55 16:09	08:34 15:54	
22	05:11 21:34	20:42 (WEA 13 (GRS)) 06:05 21:01 (WEA 10 (GRS)) 20:34	07:01 19:18	07:57 18:05	07:57 16:08	08:35 15:55	
23	05:13 21:32	20:42 (WEA 13 (GRS)) 06:07 20:59 (WEA 13 (GRS)) 20:31	07:02 19:15	07:59 18:03	07:58 16:07	08:36 15:55	
24	05:14 21:31	20:42 (WEA 13 (GRS)) 06:08 20:57 (WEA 13 (GRS)) 20:29	07:04 19:13	08:00 18:01	08:00 16:06	08:36 15:56	
25	05:16 21:29	20:43 (WEA 13 (GRS)) 06:10 20:56 (WEA 13 (GRS)) 20:27	07:06 19:10	08:01 17:59	08:02 16:05	08:36 15:57	
26	05:18 21:28	20:43 (WEA 13 (GRS)) 06:12 20:54 (WEA 13 (GRS)) 20:24	07:08 19:08	08:04 17:56	08:04 16:03	08:37 15:57	
27	05:19 21:26	20:44 (WEA 13 (GRS)) 06:14 20:54 (WEA 13 (GRS)) 20:22	07:10 19:05	08:06 17:54	08:05 16:02	08:37 15:58	
28	05:21 21:24	20:44 (WEA 13 (GRS)) 06:16 20:51 (WEA 13 (GRS)) 20:20	07:11 19:03	08:07 17:52	08:07 16:01	08:37 15:59	
29	05:23 21:23	20:45 (WEA 13 (GRS)) 06:17 20:50 (WEA 13 (GRS)) 20:17	07:13 19:00	08:09 17:50	08:09 16:00	08:37 16:00	
30	05:24 21:21	20:45 (WEA 13 (GRS)) 06:19 20:48 (WEA 13 (GRS)) 20:15	07:15 18:58	08:10 17:48	08:10 15:59	08:37 16:01	
31	05:26 21:19	20:45 (WEA 13 (GRS)) 06:21 20:12	07:16 18:56	08:11 17:46	08:11 15:58	08:37 16:02	
Sonnenscheinstunden		515	461	383	328	257	231
astr.max.mögl.Beschattung		761	3	265	428	343	

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 34 - IO 34 Rütting Söhlen 11
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	08:06 16:55	07:08 17:52	07:54 (WEA 21 (GCS)) 19:51	06:52 20:48	04:51 21:38
2	08:37 16:04	08:04 16:57	07:05 17:54	07:05 19:53	06:49 20:49	04:50 21:40
3	08:37 16:06	08:03 16:59	07:03 17:56	06:47 19:55	06:47 20:51	04:49 21:41
4	08:36 16:07	08:01 17:01	07:01 17:58	06:44 19:57	06:44 20:53	04:48 21:42
5	08:36 16:08	07:59 17:03	06:58 18:00	06:42 19:59	06:42 20:55	04:48 21:43
6	08:36 16:09	07:57 17:05	06:56 18:02	06:39 20:01	06:39 20:57	04:47 21:44
7	08:35 16:11	07:55 17:07	06:53 18:04	06:37 20:03	06:37 20:59	04:46 21:45
8	08:35 16:12	07:53 17:09	06:51 18:06	06:35 20:04	06:35 21:00	04:46 21:46
9	08:34 16:14	07:51 17:11	06:49 18:08	06:32 20:06	06:32 21:02	04:45 21:47
10	08:33 16:15	07:49 17:14	06:46 18:09	06:30 20:08	06:54 (WEA 20 (GCS)) 21:04	04:44 21:48
11	08:33 16:17	07:47 17:16	06:44 18:11	06:27 20:10	06:51 (WEA 20 (GCS)) 21:06	04:44 21:49
12	08:32 16:18	07:45 17:18	06:41 18:13	06:25 20:12	06:49 (WEA 20 (GCS)) 21:08	04:44 21:50
13	08:31 16:20	07:43 17:20	06:39 18:15	06:22 20:14	07:01 (WEA 20 (GCS)) 21:09	04:43 21:50
14	08:30 16:21	07:41 17:22	06:36 18:17	06:20 20:16	06:47 (WEA 20 (GCS)) 21:11	04:43 21:51
15	08:29 16:23	07:39 17:24	06:34 18:19	06:18 20:18	07:01 (WEA 20 (GCS)) 21:13	04:43 21:52
16	08:28 16:25	07:37 17:26	06:31 18:21	06:15 20:19	07:02 (WEA 20 (GCS)) 21:14	04:43 21:52
17	08:27 16:27	07:35 17:28	06:29 18:23	06:13 20:21	06:41 (WEA 20 (GCS)) 21:16	04:42 21:53
18	08:26 16:28	07:33 17:30	06:27 18:25	06:11 20:23	07:01 (WEA 20 (GCS)) 21:18	04:42 21:53
19	08:25 16:30	07:31 17:32	06:24 18:27	06:08 20:25	06:42 (WEA 20 (GCS)) 21:19	04:42 21:53
20	08:24 16:32	07:28 17:34	06:22 18:29	06:06 20:27	07:00 (WEA 20 (GCS)) 21:21	04:42 21:54
21	08:23 16:34	07:26 17:36	06:19 18:30	06:04 20:29	06:43 (WEA 20 (GCS)) 21:23	04:43 21:54
22	08:21 16:36	07:24 17:38	06:17 18:32	06:01 20:31	06:58 (WEA 20 (GCS)) 21:24	04:43 21:54
23	08:20 16:38	07:22 17:40	06:14 18:34	05:59 20:33	06:55 (WEA 20 (GCS)) 21:26	04:43 21:54
24	08:19 16:39	07:19 17:42	06:12 18:36	05:57 20:34	06:49 (WEA 19 (GCS)) 21:27	04:43 21:55
25	08:17 16:41	07:17 17:44	06:09 18:38	05:55 20:36	06:48 (WEA 19 (GCS)) 21:29	04:44 21:55
26	08:16 16:43	07:15 17:46	06:07 18:40	05:52 20:38	06:49 (WEA 19 (GCS)) 21:30	04:44 21:55
27	08:14 16:45	07:12 17:48	06:04 18:42	05:50 20:40	06:50 (WEA 19 (GCS)) 21:32	04:45 21:54
28	08:13 16:47	07:10 17:50	06:02 18:44	05:48 20:42	06:45 (WEA 19 (GCS)) 21:33	04:45 21:54
29	08:11 16:49		06:59 19:46	05:46 20:44	06:50 (WEA 19 (GCS)) 21:35	04:46 21:54
30	08:09 16:51		06:57 19:47	05:44 20:46	07:54 (WEA 19 (GCS)) 21:36	04:46 21:54
31	08:08 16:53		06:54 19:49	05:42 20:48	08:04 (WEA 19 (GCS)) 21:37	04:46 21:54
	Sonnenscheinstunden astr.max.mögl.Beschattung	248 272	191 367	347 421	192 496	18 513

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

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 34 - IO 34 Rütting Söhlen 11
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	October	November	Dezember	
1	04:47 05:28		06:23	06:51 (WEA 20 (GCS)) 07:17		07:16 08:12	
	21:53 21:18		20:10	06:59 (WEA 20 (GCS)) 18:55		16:44 15:59	
2	04:48 05:29		06:25	06:52 (WEA 20 (GCS)) 07:19		07:18 08:14	
	21:53 21:16		20:08	06:56 (WEA 20 (GCS)) 18:53		16:42 15:58	
3	04:48 05:31		06:26		07:21	07:20 08:15	
	21:53 21:14		20:05		18:50	16:40 15:57	
4	04:49 05:33		06:28		07:23	07:22 08:17	
	21:52 21:12		20:03		18:48	16:38 15:56	
5	04:50 05:34		06:30		07:24	07:24 08:18	
	21:52 21:10		20:00		18:45	16:36 15:56	
6	04:51 05:36		06:32		07:26	07:26 08:19	
	21:51 21:08		19:58		18:43	16:34 15:55	
7	04:52 05:38		06:34		07:28	07:28 08:21	
	21:50 21:06		19:55		18:41	16:32 15:55	
8	04:53 05:40		06:35		07:30	07:30 08:22	
	21:50 21:04		19:53		18:38	16:30 15:54	
9	04:54 05:41		06:37		07:32	07:32 08:23	
	21:49 21:02		19:50		18:36	16:28 15:54	
10	04:55 05:43		06:39		07:34	07:34 08:25	
	21:48 21:00		19:48		18:33	16:27 15:54	
11	04:56 05:45		06:41		07:36	07:36 08:26	
	21:47 20:58		19:45		18:31	16:25 15:53	
12	04:58 05:47		06:43		07:37	07:37 08:27	
	21:46 20:56		19:43		18:29	16:23 15:53	
13	04:59 05:49		06:44	07:46 (WEA 19 (GCS)) 07:39	6 08:35 (WEA 21 (GCS)) 16:23	15:53	
	21:45 20:54		19:40	07:54 (WEA 19 (GCS)) 18:26	12 08:38 (WEA 21 (GCS)) 16:22	15:53	
14	05:00 05:50		06:46	07:43 (WEA 19 (GCS)) 07:41	12 08:24 (WEA 21 (GCS)) 16:22	15:53	
	21:44 20:52		19:38	07:57 (WEA 19 (GCS)) 18:24	16 08:40 (WEA 21 (GCS)) 16:20	15:53	
15	05:01 05:52		06:48	07:41 (WEA 19 (GCS)) 07:43	16 08:23 (WEA 21 (GCS)) 16:20	15:53	
	21:43 20:49		19:35	07:59 (WEA 19 (GCS)) 18:21	17 08:40 (WEA 21 (GCS)) 16:18	15:53	
16	05:03 05:54		06:50	07:40 (WEA 19 (GCS)) 07:45	17 08:22 (WEA 21 (GCS)) 16:18	15:53	
	21:42 20:47		19:33	08:00 (WEA 19 (GCS)) 18:19	19 08:41 (WEA 21 (GCS)) 16:17	15:53	
17	05:04 05:56		06:52	07:38 (WEA 19 (GCS)) 07:47	19 08:21 (WEA 21 (GCS)) 16:17	15:53	
	21:41 20:45		19:30	08:00 (WEA 19 (GCS)) 18:17	20 08:41 (WEA 21 (GCS)) 16:15	15:53	
18	05:06 05:58		06:53	07:37 (WEA 19 (GCS)) 07:49	20 08:21 (WEA 21 (GCS)) 16:15	15:53	
	21:39 20:43		19:28	08:01 (WEA 19 (GCS)) 18:14	20 08:41 (WEA 21 (GCS)) 16:14	15:53	
19	05:07 05:59		06:55	07:36 (WEA 19 (GCS)) 07:51	20 08:21 (WEA 21 (GCS)) 16:14	15:53	
	21:38 20:40		19:25	08:01 (WEA 19 (GCS)) 18:12	20 08:41 (WEA 21 (GCS)) 16:12	15:53	
20	05:08 06:01	4 06:53 (WEA 20 (GCS)) 06:57	06:57	07:36 (WEA 19 (GCS)) 07:53	20 08:21 (WEA 21 (GCS)) 16:12	15:53	
	21:37 20:38	4 06:57 (WEA 20 (GCS)) 19:23	19:23	08:02 (WEA 19 (GCS)) 18:10	20 08:41 (WEA 21 (GCS)) 16:11	15:53	
21	05:10 06:03	11 06:50 (WEA 20 (GCS)) 06:59	06:59	07:34 (WEA 19 (GCS)) 07:55	20 08:23 (WEA 21 (GCS)) 16:09	15:53	
	21:35 20:36	11 07:01 (WEA 20 (GCS)) 19:20	19:20	08:00 (WEA 19 (GCS)) 18:08	17 08:40 (WEA 21 (GCS)) 16:09	15:53	
22	05:11 06:05	14 06:48 (WEA 20 (GCS)) 07:01	07:01	07:34 (WEA 19 (GCS)) 07:57	17 08:25 (WEA 21 (GCS)) 16:07	15:53	
	21:34 20:34	14 07:02 (WEA 20 (GCS)) 19:18	19:18	08:00 (WEA 19 (GCS)) 18:05	14 08:39 (WEA 21 (GCS)) 16:08	15:53	
23	05:13 06:07	17 06:46 (WEA 20 (GCS)) 07:02	07:02	07:35 (WEA 19 (GCS)) 07:59	14 08:27 (WEA 21 (GCS)) 16:07	15:53	
	21:32 20:31	17 07:03 (WEA 20 (GCS)) 19:15	19:15	08:00 (WEA 19 (GCS)) 18:03	11 08:38 (WEA 21 (GCS)) 16:07	15:53	
24	05:14 06:08	18 06:46 (WEA 20 (GCS)) 07:04	07:04	07:35 (WEA 19 (GCS)) 08:00	11 08:29 (WEA 21 (GCS)) 16:06	15:53	
	21:31 20:29	18 07:04 (WEA 20 (GCS)) 19:13	19:13	07:59 (WEA 19 (GCS)) 18:01	8 08:37 (WEA 21 (GCS)) 16:06	15:53	
25	05:16 06:10	19 06:44 (WEA 20 (GCS)) 07:06	07:06	07:35 (WEA 19 (GCS)) 07:02	8 07:31 (WEA 21 (GCS)) 16:05	15:53	
	21:29 20:27	19 07:03 (WEA 20 (GCS)) 19:10	19:10	07:58 (WEA 19 (GCS)) 16:59	3 07:34 (WEA 21 (GCS)) 16:05	15:53	
26	05:18 06:12	20 06:44 (WEA 20 (GCS)) 07:08	07:08	07:36 (WEA 19 (GCS)) 07:04		16:04 15:57	
	21:28 20:24	20 07:04 (WEA 20 (GCS)) 19:08	19:08	07:56 (WEA 19 (GCS)) 16:56		16:03 15:57	
27	05:19 06:14	21 06:44 (WEA 20 (GCS)) 07:10	07:10	07:37 (WEA 19 (GCS)) 07:06		16:03 15:57	
	21:26 20:22	21 07:04 (WEA 20 (GCS)) 19:05	19:05	07:55 (WEA 19 (GCS)) 16:54		16:02 15:58	
28	05:21 06:16	22 06:44 (WEA 20 (GCS)) 07:11	07:11	07:38 (WEA 19 (GCS)) 07:08		16:02 15:58	
	21:24 20:20	22 07:04 (WEA 20 (GCS)) 19:03	19:03	07:52 (WEA 19 (GCS)) 16:52		16:01 15:59	
29	05:23 06:17	23 06:45 (WEA 20 (GCS)) 07:13	07:13	07:42 (WEA 19 (GCS)) 07:10		16:01 15:59	
	21:23 20:17	23 07:02 (WEA 20 (GCS)) 19:00	19:00	07:49 (WEA 19 (GCS)) 16:50		16:00 16:00	
30	05:24 06:19	24 06:47 (WEA 20 (GCS)) 07:15	07:15			16:00 16:00	
	21:21 20:15	24 07:02 (WEA 20 (GCS)) 18:58	18:58			16:00 16:00	
31	05:26 06:21	25 06:49 (WEA 20 (GCS)) 07:16	07:16			16:00 16:00	
	21:19 20:12	25 07:01 (WEA 20 (GCS)) 18:56	18:56			16:00 16:00	
Sonnenscheinstunden		514	461	383	328	257	231
astr.max.mögl.Beschattung			187	353	203		

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 35 - IO 35 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 Sonneneinstrahlungsrichtung
Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni
1 08:37 16:03	15:19 (WEA 14 (GRS)) 08:06 15:25 (WEA 14 (GRS)) 16:55	15:52 (WEA 12 (GRS)) 07:08 16:13 (WEA 12 (GRS)) 17:52	17:19 (WEA 10 (GRS)) 06:52 17:25 (WEA 10 (GRS)) 19:51	07:16 (WEA_G3) 05:42 08:19 (WEA_G1) 20:48	04:51 21:39
2 08:37 16:04	15:20 (WEA 14 (GRS)) 08:04 15:26 (WEA 14 (GRS)) 16:57	15:52 (WEA 12 (GRS)) 07:05 16:13 (WEA 12 (GRS)) 17:54	17:20 (WEA 10 (GRS)) 06:49 17:25 (WEA 10 (GRS)) 19:53	07:16 (WEA_G3) 05:39 08:18 (WEA_G1) 20:49	04:50 21:40
3 08:37 16:05	15:19 (WEA 14 (GRS)) 08:03 15:27 (WEA 14 (GRS)) 16:59	15:54 (WEA 12 (GRS)) 07:03 16:13 (WEA 12 (GRS)) 17:56	17:19 (WEA 10 (GRS)) 06:47 17:25 (WEA 10 (GRS)) 19:55	07:17 (WEA_G3) 05:37 08:18 (WEA_G1) 20:51	04:49 21:41
4 08:36 16:07	15:20 (WEA 14 (GRS)) 08:01 15:29 (WEA 14 (GRS)) 17:01	15:55 (WEA 12 (GRS)) 07:01 16:13 (WEA 12 (GRS)) 17:58	17:19 (WEA 10 (GRS)) 06:44 17:20 (WEA 10 (GRS)) 19:57	07:17 (WEA_G3) 05:35 08:18 (WEA_G1) 20:53	04:48 21:42
5 08:36 16:08	15:20 (WEA 14 (GRS)) 07:59 15:30 (WEA 14 (GRS)) 17:03	15:56 (WEA 12 (GRS)) 06:58 16:32 (WEA 13 (GRS)) 18:00	17:19 (WEA 10 (GRS)) 06:42 17:25 (WEA 10 (GRS)) 19:59	07:19 (WEA_G3) 05:33 08:18 (WEA_G1) 20:55	04:48 21:43
6 08:36 16:09	15:20 (WEA 14 (GRS)) 07:57 15:31 (WEA 14 (GRS)) 17:05	15:58 (WEA 12 (GRS)) 06:56 16:35 (WEA 13 (GRS)) 18:02	17:19 (WEA 10 (GRS)) 06:40 17:25 (WEA 10 (GRS)) 19:59	07:19 (WEA_G3) 05:31 08:17 (WEA_G1) 20:57	04:47 21:44
7 08:35 16:11	15:22 (WEA 14 (GRS)) 07:55 15:33 (WEA 14 (GRS)) 17:07	16:00 (WEA 12 (GRS)) 06:53 16:36 (WEA 13 (GRS)) 18:04	17:19 (WEA 10 (GRS)) 06:37 17:25 (WEA 10 (GRS)) 19:59	07:20 (WEA_G3) 05:29 08:17 (WEA_G1) 20:59	04:46 21:45
8 08:35 16:12	15:22 (WEA 14 (GRS)) 07:53 15:35 (WEA 14 (GRS)) 17:09	16:30 (WEA 13 (GRS)) 06:51 16:38 (WEA 13 (GRS)) 18:06	07:15 (WEA 15 (GCN)) 06:35 07:17 (WEA 15 (GCN)) 20:06	07:19 (WEA_G1) 05:27 08:15 (WEA_G1) 21:00	04:45 21:46
9 08:34 16:14	15:22 (WEA 14 (GRS)) 07:51 15:36 (WEA 14 (GRS)) 17:11	16:31 (WEA 13 (GRS)) 06:49 16:41 (WEA 13 (GRS)) 18:07	07:13 (WEA 15 (GCN)) 06:32 07:17 (WEA 15 (GCN)) 20:06	07:19 (WEA_G1) 05:25 08:15 (WEA_G1) 21:02	04:45 21:47
10 08:33 16:15	15:23 (WEA 14 (GRS)) 07:49 15:38 (WEA 14 (GRS)) 17:13	16:33 (WEA 13 (GRS)) 06:46 16:41 (WEA 13 (GRS)) 18:09	07:10 (WEA 15 (GCN)) 06:30 07:16 (WEA 15 (GCN)) 20:08	07:20 (WEA_G1) 05:24 08:15 (WEA_G1) 21:04	04:44 21:48
11 08:33 16:17	15:24 (WEA 14 (GRS)) 07:47 15:38 (WEA 14 (GRS)) 17:16	16:44 (WEA 13 (GRS)) 06:44 16:41 (WEA 13 (GRS)) 18:09	07:08 (WEA 15 (GCN)) 06:27 07:15 (WEA 15 (GCN)) 20:10	07:19 (WEA_G1) 05:22 08:13 (WEA_G1) 21:06	04:44 21:49
12 08:32 16:18	15:24 (WEA 14 (GRS)) 07:45 15:38 (WEA 14 (GRS)) 17:18	16:44 (WEA 13 (GRS)) 06:41 16:41 (WEA 13 (GRS)) 18:09	07:09 (WEA 15 (GCN)) 06:25 07:11 (WEA 15 (GCN)) 20:12	07:20 (WEA_G1) 05:20 08:13 (WEA_G1) 21:08	04:44 21:50
13 08:31 16:20	15:25 (WEA 14 (GRS)) 07:43 15:38 (WEA 14 (GRS)) 17:20	16:44 (WEA 13 (GRS)) 06:39 16:41 (WEA 13 (GRS)) 18:10	07:09 (WEA 15 (GCN)) 06:22 07:11 (WEA 15 (GCN)) 20:14	07:20 (WEA_G1) 05:18 08:12 (WEA_G1) 21:09	04:43 21:50
14 08:30 16:21	15:27 (WEA 14 (GRS)) 07:41 15:38 (WEA 14 (GRS)) 17:22	16:44 (WEA 13 (GRS)) 06:36 16:41 (WEA 13 (GRS)) 18:11	07:09 (WEA 15 (GCN)) 06:20 07:11 (WEA 15 (GCN)) 20:16	07:20 (WEA_G1) 05:16 08:11 (WEA_G1) 21:11	04:43 21:51
15 08:29 16:23	15:28 (WEA 14 (GRS)) 07:39 15:38 (WEA 14 (GRS)) 17:24	16:44 (WEA 13 (GRS)) 06:34 16:41 (WEA 13 (GRS)) 18:12	07:09 (WEA 15 (GCN)) 06:18 07:11 (WEA 15 (GCN)) 20:18	07:21 (WEA_G1) 05:15 08:10 (WEA_G1) 21:13	04:43 21:52
16 08:28 16:25	15:30 (WEA 14 (GRS)) 07:37 15:37 (WEA 14 (GRS)) 17:26	16:44 (WEA 13 (GRS)) 06:31 16:54 (WEA 11 (GRS)) 18:21	06:55 (WEA_G2) 06:15 07:00 (WEA_G2) 20:19	07:22 (WEA_G1) 05:13 08:09 (WEA_G1) 21:14	04:42 21:52
17 08:27 16:27	15:32 (WEA 14 (GRS)) 07:35 15:37 (WEA 14 (GRS)) 17:28	16:54 (WEA 11 (GRS)) 18:29 16:59 (WEA 11 (GRS)) 18:23	06:53 (WEA_G2) 06:13 07:02 (WEA_G2) 20:21	07:22 (WEA_G1) 05:11 08:07 (WEA_G1) 21:16	04:42 21:53
18 08:26 16:28	15:33 (WEA 14 (GRS)) 07:33 15:39 (WEA 14 (GRS)) 17:30	16:54 (WEA 11 (GRS)) 18:27 16:52 (WEA 11 (GRS)) 18:25	06:50 (WEA_G1) 06:11 07:03 (WEA_G2) 20:23	07:23 (WEA_G1) 05:10 08:05 (WEA_G1) 21:18	04:42 21:53
19 08:25 16:30	15:34 (WEA 14 (GRS)) 07:31 15:40 (WEA 14 (GRS)) 17:32	16:54 (WEA 11 (GRS)) 18:24 16:52 (WEA 11 (GRS)) 18:23	06:48 (WEA_G1) 06:08 07:05 (WEA_G2) 20:25	07:24 (WEA_G1) 05:08 08:04 (WEA_G1) 21:19	04:42 21:54
20 08:24 16:32	15:34 (WEA 12 (GRS)) 07:28 15:57 (WEA 12 (GRS)) 17:34	16:53 (WEA 11 (GRS)) 18:22 17:05 (WEA 11 (GRS)) 18:29	06:45 (WEA_G1) 06:06 07:07 (WEA_G1) 20:27	07:26 (WEA_G1) 05:06 08:02 (WEA_G1) 21:21	04:42 21:54
21 08:23 16:34	15:35 (WEA 12 (GRS)) 07:26 15:59 (WEA 12 (GRS)) 17:36	16:53 (WEA 11 (GRS)) 18:19 17:08 (WEA 11 (GRS)) 18:30	06:43 (WEA_G1) 06:04 07:10 (WEA_G1) 20:29	07:26 (WEA_G1) 05:05 08:03 (WEA_G1) 21:23	04:42 21:54
22 08:21 16:36	15:35 (WEA 12 (GRS)) 07:24 16:02 (WEA 12 (GRS)) 17:38	16:53 (WEA 11 (GRS)) 18:17 17:07 (WEA 11 (GRS)) 18:32	06:40 (WEA_G1) 06:01 07:11 (WEA_G1) 20:31	07:28 (WEA_G1) 05:03 08:03 (WEA_G1) 21:24	04:43 21:54
23 08:20 16:38	15:35 (WEA 12 (GRS)) 07:22 16:03 (WEA 12 (GRS)) 17:40	16:55 (WEA 11 (GRS)) 18:14 17:06 (WEA 11 (GRS)) 18:34	06:38 (WEA_G1) 05:59 07:13 (WEA_G1) 20:33	07:31 (WEA_G1) 05:02 08:04 (WEA_G1) 21:26	04:43 21:54
24 08:19 16:39	15:31 (WEA 12 (GRS)) 07:19 16:05 (WEA 12 (GRS)) 17:42	16:58 (WEA 11 (GRS)) 18:12 17:04 (WEA 11 (GRS)) 18:36	06:35 (WEA_G3) 05:57 07:14 (WEA_G1) 20:34	07:34 (WEA_G1) 05:01 08:05 (WEA_G1) 21:27	04:43 21:55
25 08:17 16:41	15:31 (WEA 12 (GRS)) 07:17 16:08 (WEA 12 (GRS)) 17:44	16:59 (WEA 11 (GRS)) 18:09 17:04 (WEA 11 (GRS)) 18:38	06:33 (WEA_G3) 05:55 07:15 (WEA_G1) 20:36	08:05 (WEA_G1) 05:00 08:06 (WEA_G1) 21:29	04:44 21:55
26 08:16 16:43	15:31 (WEA 12 (GRS)) 07:15 16:10 (WEA 12 (GRS)) 17:46	17:04 (WEA 11 (GRS)) 18:07 17:18 (WEA 10 (GRS)) 18:40	06:30 (WEA_G3) 05:52 07:16 (WEA_G1) 20:38	08:06 (WEA_G1) 05:00 08:07 (WEA_G1) 21:30	04:44 21:55
27 08:14 16:45	15:30 (WEA 12 (GRS)) 07:12 16:11 (WEA 12 (GRS)) 17:48	17:17 (WEA 10 (GRS)) 18:04 17:20 (WEA 10 (GRS)) 18:42	06:28 (WEA_G3) 05:50 07:17 (WEA_G1) 20:40	08:07 (WEA_G1) 05:00 08:08 (WEA_G1) 21:32	04:44 21:55
28 08:13 16:47	15:31 (WEA 12 (GRS)) 07:10 16:13 (WEA 12 (GRS)) 17:50	17:18 (WEA 10 (GRS)) 18:02 17:22 (WEA 10 (GRS)) 18:44	06:25 (WEA_G3) 05:48 07:17 (WEA_G1) 20:42	08:08 (WEA_G1) 05:00 08:09 (WEA_G1) 21:33	04:45 21:55
29 08:11 16:49	15:31 (WEA 12 (GRS)) 07:08 16:14 (WEA 12 (GRS)) 17:52	17:19 (WEA 10 (GRS)) 18:01 17:26 (WEA 10 (GRS)) 18:46	06:23 (WEA_G3) 05:46 07:18 (WEA_G1) 20:44	08:09 (WEA_G1) 05:00 08:10 (WEA_G1) 21:34	04:45 21:55
30 08:09 16:51	15:31 (WEA 12 (GRS)) 07:06 16:14 (WEA 12 (GRS)) 17:54	17:20 (WEA 10 (GRS)) 18:00 17:26 (WEA 10 (GRS)) 18:48	06:21 (WEA_G3) 05:44 07:20 (WEA_G3) 20:46	08:10 (WEA_G1) 05:00 08:11 (WEA_G1) 21:36	04:45 21:56
31 08:08 16:53	15:31 (WEA 12 (GRS)) 07:04 16:13 (WEA 12 (GRS)) 17:56	17:21 (WEA 10 (GRS)) 18:00 17:27 (WEA 10 (GRS)) 18:50	06:19 (WEA_G3) 05:42 07:21 (WEA_G3) 20:48	08:11 (WEA_G1) 05:00 08:12 (WEA_G1) 21:37	04:46 21:56
Sommerscheinstunden 248	272	367	421	496	513
astr max mögl. Beschattung 248	361	347	391	421	513

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

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 35 - IO 35 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

	1. Juli	1. August	1. September	1. Oktober	1. November	1. Dezember
1 04:47	05:29 (WEA 08 (GRN)) 05:27		06:23	07:18 (WEA_G1) 07:17	07:16	16:02 (WEA 13 (GRS)) 08:12
21:54	05:56 (WEA 08 (GRN)) 21:18		20:10	08:12 (WEA_G1) 18:55	16:44	16:11 (WEA 13 (GRS)) 15:59
2 04:48	05:28 (WEA 08 (GRN)) 05:29		06:25	07:18 (WEA_G1) 07:19	07:18	16:01 (WEA 13 (GRS)) 08:14
21:53	05:55 (WEA 08 (GRN)) 21:16		20:08	08:13 (WEA_G1) 18:53	16:42	16:10 (WEA 13 (GRS)) 15:58
3 04:48	05:29 (WEA 08 (GRN)) 05:31		06:26	07:17 (WEA_G1) 07:21	07:20	16:00 (WEA 13 (GRS)) 08:15
21:53	05:56 (WEA 08 (GRN)) 21:14		20:05	08:13 (WEA_G1) 18:50	16:40	16:07 (WEA 13 (GRS)) 15:57
4 04:49	05:29 (WEA 08 (GRN)) 05:33		06:28	07:17 (WEA_G1) 07:22	07:22	15:29 (WEA 12 (GRS)) 08:17
21:52	05:56 (WEA 08 (GRN)) 21:12		20:03	08:14 (WEA_G1) 18:48	16:38	16:05 (WEA 13 (GRS)) 15:56
5 04:50	05:30 (WEA 08 (GRN)) 05:34		06:30	07:16 (WEA_G1) 07:24	07:24	15:27 (WEA 12 (GRS)) 08:18
21:52	05:57 (WEA 08 (GRN)) 21:10		20:00	08:13 (WEA_G1) 18:45	16:36	16:04 (WEA 13 (GRS)) 15:56
6 04:51	05:30 (WEA 08 (GRN)) 05:36		06:32	07:15 (WEA_G1) 07:26	07:26	15:26 (WEA 12 (GRS)) 08:19
21:51	05:57 (WEA 08 (GRN)) 21:08		19:58	08:13 (WEA_G1) 18:43	16:34	16:02 (WEA 13 (GRS)) 15:55
7 04:52	05:29 (WEA 08 (GRN)) 05:38		06:34	07:14 (WEA_G1) 07:28	07:28	15:24 (WEA 12 (GRS)) 08:21
21:50	05:56 (WEA 08 (GRN)) 21:06		19:55	08:13 (WEA_G1) 18:41	16:32	15:23 (WEA 12 (GRS)) 15:55
8 04:53	05:29 (WEA 08 (GRN)) 05:40		06:35	07:12 (WEA_G1) 07:30	07:30	15:23 (WEA 12 (GRS)) 08:22
21:50	05:56 (WEA 08 (GRN)) 21:04		19:53	08:13 (WEA_G1) 18:38	16:30	15:43 (WEA 12 (GRS)) 15:54
9 04:54	05:30 (WEA 08 (GRN)) 05:41		06:37	07:10 (WEA_G1) 07:32	07:32	15:23 (WEA 12 (GRS)) 08:23
21:49	05:57 (WEA 08 (GRN)) 21:02		19:50	08:11 (WEA_G1) 18:36	16:28	15:44 (WEA 12 (GRS)) 15:54
10 04:55	05:31 (WEA 08 (GRN)) 05:43		06:39	07:09 (WEA_G1) 07:34	07:34	15:22 (WEA 12 (GRS)) 08:25
21:48	05:58 (WEA 08 (GRN)) 21:00		19:48	08:11 (WEA_G1) 18:33	16:27	15:44 (WEA 12 (GRS)) 15:54
11 04:56	05:31 (WEA 08 (GRN)) 05:45		06:41	07:08 (WEA_G1) 07:36	07:36	15:23 (WEA 12 (GRS)) 08:26
21:47	05:58 (WEA 08 (GRN)) 20:59		19:45	08:11 (WEA_G1) 18:31	16:25	15:45 (WEA 12 (GRS)) 15:53
12 04:58	05:31 (WEA 08 (GRN)) 05:47		06:43	07:10 (WEA_G1) 07:37	07:38	15:23 (WEA 12 (GRS)) 08:27
21:46	05:58 (WEA 08 (GRN)) 20:56		19:43	08:10 (WEA_G1) 18:28	16:23	15:45 (WEA 12 (GRS)) 15:53
13 04:59	05:32 (WEA 08 (GRN)) 05:49		06:44	07:11 (WEA_G1) 07:39	07:40	15:23 (WEA 12 (GRS)) 08:28
21:45	05:57 (WEA 08 (GRN)) 20:54		19:40	08:09 (WEA_G1) 18:26	16:21	15:45 (WEA 12 (GRS)) 15:53
14 05:00	05:33 (WEA 08 (GRN)) 05:50		06:46	07:13 (WEA_G1) 07:41	07:42	15:23 (WEA 12 (GRS)) 08:29
21:44	05:57 (WEA 08 (GRN)) 20:52		19:38	08:08 (WEA_G1) 18:24	16:20	15:45 (WEA 12 (GRS)) 15:53
15 05:01	05:34 (WEA 08 (GRN)) 05:52		06:48	07:15 (WEA_G1) 07:43	07:44	15:23 (WEA 12 (GRS)) 08:30
21:43	05:57 (WEA 08 (GRN)) 20:49		19:35	08:07 (WEA_G1) 18:21	16:18	15:44 (WEA 12 (GRS)) 15:53
16 05:03	05:35 (WEA 08 (GRN)) 05:54		06:50	07:17 (WEA_G1) 07:45	07:46	15:24 (WEA 12 (GRS)) 08:31
21:42	05:56 (WEA 08 (GRN)) 20:47		19:33	08:06 (WEA_G1) 18:19	16:17	15:42 (WEA 12 (GRS)) 15:53
17 05:04	05:37 (WEA 08 (GRN)) 05:56		06:52	07:18 (WEA_G1) 07:47	07:47	15:24 (WEA 12 (GRS)) 08:32
21:41	05:57 (WEA 08 (GRN)) 20:45		19:30	08:04 (WEA_G1) 18:17	16:15	15:41 (WEA 12 (GRS)) 15:53
18 05:05	05:38 (WEA 08 (GRN)) 05:57		06:53	07:20 (WEA_G1) 07:49	07:49	15:25 (WEA 12 (GRS)) 08:32
21:39	05:56 (WEA 08 (GRN)) 20:43	6 07:52 (WEA_G1) 19:28	08:01 (WEA_G1) 18:14	16:14	14 15:39 (WEA 12 (GRS)) 15:53	2 15:13 (WEA 14 (GRS))
19 05:07	05:39 (WEA 08 (GRN)) 05:59		06:55	07:22 (WEA_G1) 07:51	07:51	15:26 (WEA 12 (GRS)) 08:33
21:38	05:56 (WEA 08 (GRN)) 20:40	18 07:57 (WEA_G1) 19:25	08:02 (WEA_G1) 18:12	16:12	11 15:37 (WEA 12 (GRS)) 15:54	2 15:13 (WEA 14 (GRS))
20 05:08	05:41 (WEA 08 (GRN)) 06:01		06:57	07:24 (WEA_G1) 07:53	07:53	15:28 (WEA 12 (GRS)) 08:34
21:37	05:56 (WEA 08 (GRN)) 20:38	25 08:01 (WEA_G1) 19:23	08:00 (WEA_G1) 18:10	16:10	14 15:38 (WEA 12 (GRS)) 15:54	2 15:13 (WEA 14 (GRS))
21 05:10	05:42 (WEA 08 (GRN)) 06:03		06:59	07:25 (WEA_G1) 07:55	07:55	15:29 (WEA 12 (GRS)) 08:35
21:35	05:55 (WEA 08 (GRN)) 20:36	29 08:03 (WEA_G1) 19:20	08:03 (WEA_G1) 18:07	16:07	14 15:37 (WEA 12 (GRS)) 15:54	2 15:16 (WEA 14 (GRS))
22 05:11	05:43 (WEA 08 (GRN)) 06:05		07:01	07:27 (WEA_G1) 07:57	07:57	15:30 (WEA 12 (GRS)) 08:35
21:34	05:53 (WEA 08 (GRN)) 20:34	33 08:04 (WEA_G1) 19:18	08:04 (WEA_G1) 18:05	16:05	12 15:35 (WEA 12 (GRS)) 15:55	2 15:16 (WEA 14 (GRS))
23 05:13	05:45 (WEA 08 (GRN)) 06:07		07:02	07:29 (WEA_G1) 07:59	07:59	15:31 (WEA 12 (GRS)) 08:36
21:32	05:53 (WEA 08 (GRN)) 20:31	37 08:06 (WEA_G1) 19:15	08:05 (WEA_G1) 18:03	16:03	9 15:32 (WEA 12 (GRS)) 15:57	2 15:15 (WEA 14 (GRS))
24 05:14	05:46 (WEA 08 (GRN)) 06:08		07:04	07:31 (WEA_G1) 08:00	08:00	15:32 (WEA 12 (GRS)) 08:36
21:31	05:51 (WEA 08 (GRN)) 20:29	40 08:08 (WEA_G1) 19:13	08:08 (WEA_G1) 18:01	16:01	7 15:30 (WEA 12 (GRS)) 15:56	2 15:17 (WEA 14 (GRS))
25 05:16	05:48 (WEA 08 (GRN)) 06:10		07:06	07:33 (WEA_G1) 08:02	08:02	15:33 (WEA 12 (GRS)) 08:36
21:29	05:49 (WEA 08 (GRN)) 20:27	42 08:08 (WEA_G1) 19:10	08:08 (WEA_G1) 17:59	16:04	5 15:28 (WEA 12 (GRS)) 15:57	2 15:18 (WEA 14 (GRS))
26 05:18	05:51 (WEA 08 (GRN)) 06:12		07:08	07:34 (WEA_G1) 08:04	08:04	15:34 (WEA 12 (GRS)) 08:37
21:28	05:58 (WEA 08 (GRN)) 20:24	46 08:10 (WEA_G1) 19:08	08:10 (WEA_G1) 17:57	16:03	6 15:15 (WEA 14 (GRS)) 15:57	2 15:18 (WEA 14 (GRS))
27 05:19	05:59 (WEA 08 (GRN)) 06:14		07:10	07:36 (WEA_G1) 08:06	08:06	15:35 (WEA 12 (GRS)) 08:37
21:26	05:56 (WEA 08 (GRN)) 20:22	48 08:11 (WEA_G1) 19:05	08:11 (WEA_G1) 17:56	16:02	10 15:17 (WEA 14 (GRS)) 15:58	3 15:20 (WEA 14 (GRS))
28 05:21	05:58 (WEA 08 (GRN)) 06:16		07:11	07:38 (WEA_G1) 08:08	08:08	15:36 (WEA 12 (GRS)) 08:37
21:25	05:56 (WEA 08 (GRN)) 20:20	49 08:12 (WEA_G1) 19:03	08:12 (WEA_G1) 17:54	16:01	11 15:18 (WEA 14 (GRS)) 15:59	4 15:21 (WEA 14 (GRS))
29 05:22	05:58 (WEA 08 (GRN)) 06:17		07:13	07:40 (WEA_G1) 08:10	08:10	15:37 (WEA 12 (GRS)) 08:37
21:23	05:57 (WEA 08 (GRN)) 20:17	51 08:13 (WEA_G1) 19:00	08:13 (WEA_G1) 17:52	16:00	12 15:19 (WEA 14 (GRS)) 16:00	4 15:22 (WEA 14 (GRS))
30 05:24	05:59 (WEA 08 (GRN)) 06:19		07:15	07:42 (WEA_G1) 08:12	08:12	15:38 (WEA 12 (GRS)) 08:37
21:21	05:57 (WEA 08 (GRN)) 20:15	52 08:14 (WEA_G1) 18:58	08:14 (WEA_G1) 17:50	15:59	13 15:20 (WEA 14 (GRS)) 16:01	5 15:22 (WEA 14 (GRS))
31 05:26	05:59 (WEA 08 (GRN)) 06:21		07:17	07:44 (WEA_G1) 08:14	08:14	15:39 (WEA 12 (GRS)) 08:37
21:19	05:58 (WEA 08 (GRN)) 20:12	54 08:15 (WEA_G1) 18:55	08:15 (WEA_G1) 17:48	15:58	3 16:00 (WEA 14 (GRS)) 16:02	5 15:23 (WEA 14 (GRS))
Sonnenscheinstunden 515		461	383	328	257	231
astr. max.mögl. Beschattung 524		530	461	417	396	418

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

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 36 - IO 36 Kathenkamp 1 (Rütiger 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

	Januar	Februar	März	April	Mai	Juni				
1	08:37 16:03	15:10 (WEA 13 (GRS)) 16:55	08:06 16:22 (WEA 10 (GRS))	07:08 17:52		04:51 21:39				
2	08:37 16:04	15:11 (WEA 13 (GRS)) 16:57	08:04 16:23 (WEA 10 (GRS))	07:05 17:54		04:50 21:40				
3	08:37 16:05	15:11 (WEA 13 (GRS)) 16:59	08:03 16:23 (WEA 10 (GRS))	07:03 17:56		04:49 21:41				
4	08:36 16:07	15:12 (WEA 13 (GRS)) 17:01	08:01 16:23 (WEA 10 (GRS))	07:01 17:58		04:48 21:42				
5	08:36 16:08	15:13 (WEA 13 (GRS)) 17:03	07:59 16:23 (WEA 10 (GRS))	06:58 18:00		04:45 21:43				
6	08:36 16:09	15:15 (WEA 13 (GRS)) 17:05	07:57 16:24 (WEA 10 (GRS))	06:56 18:02		04:47 21:44				
7	08:35 16:11	15:16 (WEA 13 (GRS)) 17:07	07:55 16:24 (WEA 10 (GRS))	06:53 18:04		04:46 21:45				
8	08:35 16:12	15:19 (WEA 13 (GRS)) 17:09	07:53 16:25 (WEA 10 (GRS))	06:51 18:06		04:45 21:46				
9	08:34 16:14	15:25 (WEA 11 (GRS)) 17:11	07:51 16:29 (WEA 10 (GRS))	06:49 18:07		04:45 21:47				
10	08:33 16:15	15:25 (WEA 11 (GRS)) 17:13	07:49 16:30 (WEA 10 (GRS))	06:46 18:09		04:44 21:48				
11	08:33 16:17	15:25 (WEA 11 (GRS)) 17:16	07:47 16:31 (WEA 10 (GRS))	06:44 18:11		04:44 21:49				
12	08:32 16:18	15:26 (WEA 11 (GRS)) 17:18	07:45 16:32 (WEA 10 (GRS))	06:41 18:13		04:44 21:50				
13	08:31 16:20	15:26 (WEA 11 (GRS)) 17:20	07:43 16:33 (WEA 10 (GRS))	06:39 18:15		04:43 21:50				
14	08:30 16:21	15:26 (WEA 11 (GRS)) 17:22	07:41 16:34 (WEA 10 (GRS))	06:36 18:17		04:43 21:51				
15	08:29 16:23	15:27 (WEA 11 (GRS)) 17:24	07:39 16:35 (WEA 10 (GRS))	06:34 18:19		04:43 21:52				
16	08:28 16:25	15:28 (WEA 11 (GRS)) 17:26	07:37 16:36 (WEA 10 (GRS))	06:31 18:21		04:42 21:52				
17	08:27 16:27	15:29 (WEA 11 (GRS)) 17:28	07:35 16:37 (WEA 10 (GRS))	06:29 18:23		04:42 21:53				
18	08:26 16:28	15:28 (WEA 11 (GRS)) 17:30	07:33 16:38 (WEA 10 (GRS))	06:27 18:25		04:42 21:53				
19	08:25 16:30	15:30 (WEA 11 (GRS)) 17:32	07:31 16:39 (WEA 10 (GRS))	06:24 18:27		04:42 21:54				
20	08:24 16:32	15:31 (WEA 11 (GRS)) 17:34	07:29 16:40 (WEA 10 (GRS))	06:22 18:29		04:42 21:54				
21	08:23 16:34	15:31 (WEA 11 (GRS)) 17:36	07:27 16:41 (WEA 10 (GRS))	06:19 18:30		04:42 21:54				
22	08:21 16:36	15:33 (WEA 11 (GRS)) 17:38	07:24 16:42 (WEA 10 (GRS))	06:17 18:32		04:43 21:54				
23	08:20 16:38	15:34 (WEA 11 (GRS)) 17:40	07:22 16:43 (WEA 10 (GRS))	06:14 18:34		04:43 21:55				
24	08:19 16:39	15:36 (WEA 11 (GRS)) 17:42	07:19 16:44 (WEA 10 (GRS))	06:12 18:36		04:43 21:55				
25	08:17 16:41	15:44 (WEA 11 (GRS)) 17:44	07:17 16:45 (WEA 10 (GRS))	06:09 18:38		04:44 21:55				
26	08:16 16:43	17:46	07:15 16:46 (WEA 10 (GRS))	06:07 18:40		04:44 21:55				
27	08:14 16:45	17:48	07:12 16:47 (WEA 10 (GRS))	06:04 18:42		04:44 21:55				
28	08:13 16:47	17:50	07:10 16:48 (WEA 10 (GRS))	06:02 18:44		04:45 21:54				
29	08:11 16:49		07:07 16:49 (WEA 10 (GRS))	06:00 18:46		04:46 21:54				
30	08:09 16:51		07:05 16:50 (WEA 10 (GRS))	05:57 18:48		04:46 21:54				
31	08:08 16:53		07:03 16:51 (WEA 10 (GRS))	05:55 18:50		04:46 21:54				
	Sonnenscheinstunden astr.max.mögl.Beschattung	367	272	60	367	742	421	141	424	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	Zeitpunkt (SS:MM) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 36 - IO 36 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 37 - IO 37 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 Sonneneinfallrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Januar	Februar	März	April	Mai	Juni
1 08:37 1 16:03	15:17 (WEA 13 (GRS)) 108:06 15:25 (WEA 13 (GRS)) 116:55	10:08 17:52	106:52 119:51	105:42 120:48	104:51 121:39
2 08:37 1 16:04	15:17 (WEA 13 (GRS)) 108:04 15:26 (WEA 13 (GRS)) 116:57	10:05 17:54	106:49 119:53	105:39 120:49	104:50 121:40
3 08:37 1 16:05	15:17 (WEA 13 (GRS)) 108:03 15:27 (WEA 13 (GRS)) 116:59	10:03 17:56	106:47 119:55	105:37 120:51	104:49 121:41
4 08:36 1 16:07	15:18 (WEA 13 (GRS)) 108:01 15:29 (WEA 13 (GRS)) 117:01	10:01 17:58	106:44 119:57	105:35 120:53	104:48 121:42
5 08:36 1 16:08	15:18 (WEA 13 (GRS)) 107:59 15:30 (WEA 13 (GRS)) 117:03	100:58 18:00	106:42 119:59	105:33 120:55	104:48 121:43
6 08:36 1 16:09	15:20 (WEA 13 (GRS)) 107:57 15:32 (WEA 13 (GRS)) 117:05	16:34 (WEA 10 (GRS)) 06:36 16:32 (WEA 10 (GRS)) 06:33	07:20 (WEA 15 (GCH)) 106:39 07:18 (WEA 15 (GCH)) 106:37	105:31 120:57	104:47 121:44
7 08:35 1 16:11	15:20 (WEA 13 (GRS)) 107:55 15:33 (WEA 13 (GRS)) 117:07	16:36 (WEA 10 (GRS)) 06:31 16:38 (WEA 10 (GRS)) 06:36	07:21 (WEA G1) 120:03 07:15 (WEA G1) 106:35	105:29 120:59	104:46 121:45
8 08:35 1 16:12	15:20 (WEA 13 (GRS)) 107:53 15:35 (WEA 13 (GRS)) 117:09	16:33 (WEA 10 (GRS)) 06:29 16:33 (WEA 10 (GRS)) 06:49	07:24 (WEA G1) 120:04 07:13 (WEA G1) 106:32	105:27 121:00	104:46 121:46
9 08:34 1 16:14	15:21 (WEA 13 (GRS)) 107:51 15:36 (WEA 13 (GRS)) 117:11	16:33 (WEA 10 (GRS)) 06:49 16:41 (WEA 10 (GRS)) 18:07	07:26 (WEA G1) 120:06 07:30 (WEA G1) 106:30	105:25 121:02	104:45 121:47
10 08:33 1 16:15	15:21 (WEA 13 (GRS)) 107:49 15:36 (WEA 13 (GRS)) 117:13	16:33 (WEA 10 (GRS)) 06:46 16:43 (WEA 10 (GRS)) 18:09	07:30 (WEA G1) 106:29 07:27 (WEA G1) 106:27	105:24 121:04	104:44 121:48
11 08:33 1 16:17	15:22 (WEA 13 (GRS)) 107:47 15:36 (WEA 13 (GRS)) 117:16	16:34 (WEA 10 (GRS)) 06:44 16:45 (WEA 10 (GRS)) 18:11	07:08 (WEA G1) 106:27 07:29 (WEA G1) 120:10	105:22 121:06	104:44 121:49
12 08:32 1 16:18	15:23 (WEA 13 (GRS)) 107:45 15:36 (WEA 13 (GRS)) 117:18	16:35 (WEA 10 (GRS)) 06:41 16:47 (WEA 10 (GRS)) 18:12	07:05 (WEA G1) 106:25 07:29 (WEA G1) 120:12	105:20 121:08	104:44 121:50
13 08:31 1 16:20	15:24 (WEA 13 (GRS)) 107:43 15:43 (WEA 11 (GRS)) 117:20	16:36 (WEA 10 (GRS)) 06:39 16:39 (WEA 10 (GRS)) 18:15	07:03 (WEA G1) 106:22 07:30 (WEA G1) 120:14	105:18 121:09	104:43 121:50
14 08:30 1 16:21	15:25 (WEA 13 (GRS)) 107:41 15:45 (WEA 11 (GRS)) 117:22	16:39 (WEA 10 (GRS)) 06:36 16:44 (WEA 10 (GRS)) 18:17	07:00 (WEA G1) 106:20 07:30 (WEA G1) 120:16	105:16 121:11	104:43 121:51
15 08:29 1 16:23	15:27 (WEA 13 (GRS)) 107:39 15:47 (WEA 11 (GRS)) 117:24	16:34 (WEA 10 (GRS)) 06:34 18:19	06:58 (WEA G1) 106:18 07:31 (WEA G1) 120:18	105:15 121:13	104:43 121:52
16 08:28 1 16:25	15:40 (WEA 11 (GRS)) 107:37 15:49 (WEA 11 (GRS)) 117:26	18:21 18:21	06:55 (WEA G1) 106:15 07:30 (WEA G1) 120:19	105:13 121:14	104:42 121:52
17 08:27 1 16:27	15:40 (WEA 11 (GRS)) 107:35 15:51 (WEA 11 (GRS)) 117:28	18:23 18:23	06:53 (WEA G1) 106:13 07:31 (WEA G1) 120:21	105:11 121:16	104:42 121:53
18 08:26 1 16:28	15:40 (WEA 11 (GRS)) 107:33 15:53 (WEA 11 (GRS)) 117:30	18:23 18:25	06:50 (WEA G1) 106:11 07:30 (WEA G1) 120:23	105:10 121:18	104:42 121:53
19 08:25 1 16:30	15:40 (WEA 11 (GRS)) 107:31 15:55 (WEA 11 (GRS)) 117:32	18:24 18:27	06:48 (WEA G1) 106:09 07:30 (WEA G1) 120:25	105:08 121:19	104:42 121:54
20 08:24 1 16:32	15:40 (WEA 11 (GRS)) 107:28 15:57 (WEA 11 (GRS)) 117:34	18:22 18:29	06:45 (WEA G1) 106:06 07:29 (WEA G1) 120:27	105:06 121:21	104:42 121:54
21 08:23 1 16:34	15:40 (WEA 11 (GRS)) 107:26 15:59 (WEA 11 (GRS)) 117:36	18:19 18:30	06:43 (WEA G1) 106:04 07:28 (WEA G1) 120:29	105:05 121:23	104:42 121:54
22 08:21 1 16:36	15:41 (WEA 11 (GRS)) 107:24 16:02 (WEA 11 (GRS)) 117:38	18:17 18:32	06:40 (WEA G1) 106:01 07:28 (WEA G1) 120:31	105:03 121:24	104:43 121:54
23 08:20 1 16:38	15:41 (WEA 11 (GRS)) 107:22 16:01 (WEA 11 (GRS)) 117:40	18:14 18:34	06:38 (WEA G1) 106:08 07:25 (WEA G1) 120:33	105:02 121:26	104:43 121:55
24 08:19 1 16:39	15:41 (WEA 11 (GRS)) 107:19 16:01 (WEA 11 (GRS)) 117:42	18:12 18:36	06:35 (WEA G1) 105:57 07:25 (WEA G1) 120:35	105:01 121:27	104:43 121:55
25 08:17 1 16:41	15:42 (WEA 11 (GRS)) 107:17 16:02 (WEA 11 (GRS)) 117:44	18:09 18:38	06:33 (WEA G1) 105:55 07:24 (WEA G1) 120:36	105:00 121:29	104:44 121:55
26 08:16 1 16:43	15:42 (WEA 11 (GRS)) 107:15 16:01 (WEA 11 (GRS)) 117:46	18:07 18:40	06:36 (WEA G1) 105:52 07:22 (WEA G1) 120:38	104:58 121:30	104:44 121:55
27 08:14 1 16:45	15:43 (WEA 11 (GRS)) 107:12 16:01 (WEA 11 (GRS)) 117:48	18:04 18:42	06:38 (WEA G1) 105:50 07:21 (WEA G1) 120:40	104:57 121:32	104:44 121:55
28 08:13 1 16:47	15:44 (WEA 11 (GRS)) 107:10 16:01 (WEA 11 (GRS)) 117:50	18:02 18:44	06:38 (WEA G1) 105:48 07:18 (WEA G1) 120:42	104:55 121:33	104:45 121:54
29 08:11 1 16:49	15:45 (WEA 11 (GRS)) 107:08 16:00 (WEA 11 (GRS)) 117:52	18:00 18:46	06:35 (WEA G1) 105:46 08:15 (WEA G1) 120:44	104:54 121:35	104:46 121:54
30 08:09 1 16:51	15:47 (WEA 11 (GRS)) 107:06 15:50 (WEA 11 (GRS)) 117:54	18:02 18:47	06:37 (WEA G1) 105:44 19:47	104:53 121:36	104:46 121:54
31 08:08 1 16:53	15:49 (WEA 11 (GRS)) 107:04 15:57 (WEA 11 (GRS)) 117:56	18:01 18:49	06:54 19:49	104:52 121:37	104:46 121:54
Sonnenscheitelpunkt abz. max. mögl. Beschattung	248 444	272 67	367 722	421 144	496 330

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 37 - IO 37 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

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



Projekt:
SWP Windpark Großenholz

Lizenzierter Anwender:
GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:
22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 38 - IO 38 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

Januar	Februar	März	April	Mai	Juni				
1 08:37 15:00 (WEA 13 (GRS)) 08:06 16:19 (WEA 10 (GRS)) 07:00 06:52 05:42 04:51									
1 16:03 25 15:25 (WEA 11 (GRS)) 16:55 4 16:23 (WEA 10 (GRS)) 17:52 19:51 20:48 21:39									
2 08:37 15:01 (WEA 13 (GRS)) 08:04 16:18 (WEA 10 (GRS)) 07:05 06:49 05:39 04:50									
1 16:04 25 15:26 (WEA 11 (GRS)) 16:57 7 16:25 (WEA 10 (GRS)) 17:54 19:53 20:49 21:40									
3 08:37 15:02 (WEA 13 (GRS)) 08:03 16:19 (WEA 10 (GRS)) 07:03 06:47 05:37 04:49									
1 16:05 25 15:27 (WEA 11 (GRS)) 16:59 9 16:26 (WEA 10 (GRS)) 17:56 19:55 20:51 21:41									
4 08:36 15:04 (WEA 13 (GRS)) 08:01 16:19 (WEA 10 (GRS)) 07:01 06:44 05:35 04:48									
1 16:07 24 15:29 (WEA 11 (GRS)) 17:01 11 16:30 (WEA 10 (GRS)) 17:58 19:57 20:53 21:42									
5 08:36 15:10 (WEA 13 (GRS)) 07:59 16:20 (WEA 10 (GRS)) 06:50 06:42 05:33 04:48									
1 16:08 20 15:30 (WEA 11 (GRS)) 17:03 12 16:32 (WEA 10 (GRS)) 18:00 19:59 20:55 21:43									
6 08:36 15:11 (WEA 13 (GRS)) 07:57 16:20 (WEA 10 (GRS)) 06:56 06:39 05:31 04:47				05:58 (WEA 06 (GRN))	21:44				
1 16:09 21 15:32 (WEA 11 (GRS)) 17:05 15 16:35 (WEA 10 (GRS)) 18:02 20:01 05:25 04:45				06:01 (WEA 06 (GRN))	21:44				
7 08:35 15:12 (WEA 13 (GRS)) 07:55 16:21 (WEA 10 (GRS)) 06:53 06:37 05:29 04:46				06:02 (WEA 06 (GRN))	21:45				
8 08:35 15:11 (WEA 13 (GRS)) 07:53 16:21 (WEA 10 (GRS)) 06:51 06:35 05:27 04:46				06:03 (WEA 06 (GRN))	21:46				
1 16:12 23 15:34 (WEA 11 (GRS)) 17:09 13 16:34 (WEA 10 (GRS)) 18:06 20:04 05:24 04:44				06:04 (WEA 06 (GRN))	21:47				
9 08:34 15:11 (WEA 13 (GRS)) 07:51 16:23 (WEA 10 (GRS)) 06:49 07:13 (WEA_G1) 06:32 05:22 04:44				06:05 (WEA 06 (GRN))	21:48				
1 16:14 23 15:34 (WEA 11 (GRS)) 17:11 10 16:33 (WEA 10 (GRS)) 18:08 5 07:18 (WEA_G1) 20:06 05:20 04:44				06:06 (WEA 06 (GRN))	21:49				
10 08:33 15:11 (WEA 13 (GRS)) 07:49 16:26 (WEA 10 (GRS)) 06:46 07:10 (WEA_G1) 06:30 05:24 04:44				06:07 (WEA 06 (GRN))	21:50				
1 16:15 24 15:35 (WEA 11 (GRS)) 17:13 4 16:30 (WEA 10 (GRS)) 18:09 9 07:19 (WEA_G1) 20:08 05:24 04:44				06:08 (WEA 06 (GRN))	21:51				
11 08:33 15:12 (WEA 13 (GRS)) 07:47 16:21 (WEA 10 (GRS)) 06:44 07:08 (WEA_G1) 06:27 06:51 (WEA 08 (GRN)) 05:22 04:44				06:09 (WEA 06 (GRN))	21:52				
1 16:17 23 15:35 (WEA 11 (GRS)) 17:16 18:11 13 07:21 (WEA_G1) 20:10 1 06:52 (WEA 08 (GRN)) 21:06 16 06:05 (WEA 06 (GRN)) 21:49				06:10 (WEA 06 (GRN))	21:50				
12 08:32 15:12 (WEA 13 (GRS)) 07:45 16:21 (WEA 10 (GRS)) 06:41 07:05 (WEA_G1) 06:25 06:47 (WEA 08 (GRN)) 05:20 04:44				06:11 (WEA 06 (GRN))	21:51				
1 16:18 23 15:35 (WEA 11 (GRS)) 17:18 18:13 17 07:22 (WEA_G1) 20:12 4 06:53 (WEA 08 (GRN)) 21:08 18 06:05 (WEA 06 (GRN)) 21:50				06:12 (WEA 06 (GRN))	21:51				
13 08:31 15:13 (WEA 13 (GRS)) 07:43 16:29 07:03 (WEA_G1) 06:22 06:47 (WEA 08 (GRN)) 05:18 05:46 (WEA 06 (GRN)) 04:43				06:13 (WEA 06 (GRN))	21:50				
1 16:20 23 15:36 (WEA 11 (GRS)) 17:20 18:15 20 07:23 (WEA_G1) 20:14 7 06:54 (WEA 08 (GRN)) 21:09 19 06:05 (WEA 06 (GRN)) 21:50				06:14 (WEA 06 (GRN))	21:50				
14 08:30 15:13 (WEA 13 (GRS)) 07:41 16:30 07:00 (WEA_G1) 06:20 06:44 (WEA 08 (GRN)) 05:16 05:45 (WEA 06 (GRN)) 04:43				06:15 (WEA 06 (GRN))	21:51				
1 16:21 23 15:36 (WEA 11 (GRS)) 17:22 18:17 23 07:23 (WEA_G1) 20:16 9 06:53 (WEA 08 (GRN)) 21:11 20 06:05 (WEA 06 (GRN)) 21:51				06:16 (WEA 06 (GRN))	21:51				
15 08:29 15:14 (WEA 13 (GRS)) 07:39 16:34 06:58 (WEA_G1) 06:10 06:42 (WEA 08 (GRN)) 05:15 05:46 (WEA 06 (GRN)) 04:43				06:17 (WEA 06 (GRN))	21:52				
1 16:23 22 15:36 (WEA 11 (GRS)) 17:24 18:19 26 07:24 (WEA_G1) 20:18 11 06:53 (WEA 08 (GRN)) 21:13 19 06:05 (WEA 06 (GRN)) 21:52				06:18 (WEA 06 (GRN))	21:52				
16 08:28 15:15 (WEA 13 (GRS)) 07:37 16:35 06:55 (WEA_G1) 06:15 06:40 (WEA 08 (GRN)) 05:13 05:45 (WEA 06 (GRN)) 04:42				06:19 (WEA 06 (GRN))	21:52				
1 16:25 22 15:37 (WEA 11 (GRS)) 17:26 18:21 29 07:24 (WEA_G1) 20:19 13 06:53 (WEA 08 (GRN)) 21:14 20 06:05 (WEA 06 (GRN)) 21:52				06:20 (WEA 06 (GRN))	21:52				
17 08:27 15:16 (WEA 13 (GRS)) 07:35 16:39 06:53 (WEA_G1) 06:13 06:37 (WEA 08 (GRN)) 05:11 05:46 (WEA 06 (GRN)) 04:42				06:21 (WEA 06 (GRN))	21:52				
1 16:27 21 15:37 (WEA 11 (GRS)) 17:28 18:23 31 07:24 (WEA_G1) 20:21 15 06:52 (WEA 08 (GRN)) 21:16 19 06:05 (WEA 06 (GRN)) 21:53				06:22 (WEA 06 (GRN))	21:53				
18 08:26 15:16 (WEA 13 (GRS)) 07:33 16:40 06:50 (WEA_G1) 06:11 06:37 (WEA 08 (GRN)) 05:10 05:46 (WEA 06 (GRN)) 04:42				06:23 (WEA 06 (GRN))	21:53				
1 16:28 20 15:38 (WEA 11 (GRS)) 17:30 18:25 33 07:25 (WEA_G1) 20:23 14 06:51 (WEA 08 (GRN)) 21:18 18 06:04 (WEA 06 (GRN)) 21:53				06:24 (WEA 06 (GRN))	21:53				
19 08:25 15:17 (WEA 13 (GRS)) 07:31 16:41 06:48 (WEA_G1) 06:08 06:38 (WEA 08 (GRN)) 05:08 05:47 (WEA 06 (GRN)) 04:42				06:25 (WEA 06 (GRN))	21:53				
1 16:30 19 15:36 (WEA 11 (GRS)) 17:32 18:27 35 07:23 (WEA_G1) 20:25 12 06:50 (WEA 08 (GRN)) 21:19 17 06:04 (WEA 06 (GRN)) 21:54				06:26 (WEA 06 (GRN))	21:54				
20 08:24 15:18 (WEA 13 (GRS)) 07:28 16:45 06:45 (WEA_G1) 06:06 06:40 (WEA 08 (GRN)) 05:06 05:47 (WEA 06 (GRN)) 04:42				06:27 (WEA 06 (GRN))	21:54				
1 16:32 19 15:37 (WEA 11 (GRS)) 17:34 18:29 37 07:22 (WEA_G1) 20:27 8 06:48 (WEA 08 (GRN)) 21:21 16 06:03 (WEA 06 (GRN)) 21:54				06:28 (WEA 06 (GRN))	21:54				
21 08:23 15:19 (WEA 13 (GRS)) 07:26 16:49 06:43 (WEA_G1) 06:04 07:22 (WEA_G1) 20:29 21:23 14 06:02 (WEA 06 (GRN)) 21:54				06:29 (WEA 06 (GRN))	21:54				
1 16:34 16 15:35 (WEA 11 (GRS)) 17:36 18:31 39 07:22 (WEA_G1) 20:29 06:03 (WEA 06 (GRN)) 04:43				06:30 (WEA 06 (GRN))	21:54				
22 08:21 15:21 (WEA 13 (GRS)) 07:24 16:47 06:40 (WEA_G1) 06:01 06:40 (WEA 08 (GRN)) 05:03 05:49 (WEA 06 (GRN)) 04:43				06:31 (WEA 06 (GRN))	21:54				
1 16:36 14 15:35 (WEA 11 (GRS)) 17:38 18:32 41 07:21 (WEA_G1) 20:31 21:24 13 06:02 (WEA 06 (GRN)) 21:54				06:32 (WEA 06 (GRN))	21:54				
23 08:20 15:22 (WEA 13 (GRS)) 07:22 16:51 06:38 (WEA_G1) 05:59 06:38 (WEA 08 (GRN)) 05:02 05:51 (WEA 06 (GRN)) 04:43				06:33 (WEA 06 (GRN))	21:54				
1 16:38 11 15:33 (WEA 11 (GRS)) 17:40 18:34 42 07:20 (WEA_G1) 20:33 21:26 10 06:01 (WEA 06 (GRN)) 21:55				06:34 (WEA 06 (GRN))	21:55				
24 08:19 15:25 (WEA 13 (GRS)) 07:19 16:52 06:35 (WEA_G1) 05:57 06:35 (WEA 08 (GRN)) 05:01 05:52 (WEA 06 (GRN)) 04:43				06:35 (WEA 06 (GRN))	21:55				
1 16:39 6 15:31 (WEA 11 (GRS)) 17:42 18:36 42 07:18 (WEA_G1) 20:35 21:27 6 05:58 (WEA 06 (GRN)) 21:55				06:36 (WEA 06 (GRN))	21:55				
25 08:17 15:26 (WEA 13 (GRS)) 07:17 16:53 06:34 (WEA_G1) 05:56 07:17 (WEA_G1) 20:36 21:29 21:55				06:37 (WEA 06 (GRN))	21:55				
1 16:41 17:44 18:38 39 07:17 (WEA_G1) 20:36 06:03 (WEA 06 (GRN)) 04:44				06:38 (WEA 06 (GRN))	21:55				
26 08:16 15:27 (WEA 13 (GRS)) 07:15 16:54 06:36 (WEA_G1) 05:52 07:16 (WEA_G1) 20:37 21:30 21:55				06:39 (WEA 06 (GRN))	21:55				
1 16:43 17:46 18:40 33 07:15 (WEA_G1) 20:38 06:40 (WEA 08 (GRN)) 05:50 05:48 (WEA 06 (GRN)) 04:44				06:40 (WEA 06 (GRN))	21:55				
27 08:14 15:28 (WEA 13 (GRS)) 07:12 16:55 06:38 (WEA_G1) 05:50 07:15 (WEA_G1) 20:40 21:32 21:55				06:41 (WEA 06 (GRN))	21:55				
1 16:45 17:48 18:42 21 07:13 (WEA_G1) 20:40 06:57 (WEA 08 (GRN)) 05:48 05:45 (WEA 06 (GRN)) 04:45				06:42 (WEA 06 (GRN))	21:55				
28 08:13 15:29 (WEA 13 (GRS)) 07:10 16:56 06:37 (WEA_G1) 05:48 07:09 (WEA_G1) 20:42 21:33 21:54				06:43 (WEA 06 (GRN))	21:54				
1 16:47 17:50 18:44 12 07:09 (WEA_G1) 20:42 06:59 06:54 04:46				06:44 (WEA 06 (GRN))	21:54				
29 08:11 15:30 (WEA 13 (GRS)) 07:07 16:57 06:39 07:09 (WEA_G1) 20:44 21:35 21:54				06:45 (WEA 06 (GRN))	21:54				
1 16:49 17:51 18:46 06:57 05:44 04:46				06:46 (WEA 06 (GRN))	21:54				
30 08:09 15:31 (WEA 13 (GRS)) 07:05 16:58 06:37 05:44 04:46				06:47 (WEA 06 (GRN))	21:54				
1 16:51 17:52 18:47 06:59 05:46 04:46				06:48 (WEA 06 (GRN))	21:54				
31 08:08 15:32 (WEA 13 (GRS)) 07:03 16:59 06:36 05:44 04:46				06:49 (WEA 06 (GRN))	21:54				
1 16:53 1 16:20 (WEA 10 (GRS)) 17:49 19:49 21:37 496				06:50 (WEA 06 (GRN))	21:54				
Sommerscheinstunden 248									
astr. max. mögl. Beschattung 495	272	100	367	547	421	94	269	513	34

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 38 - IO 38 Rütiger Klosterkamp 9

Annahmen für Schattenwurfberechnung

- Die dargestellten Zeiten sind die astronomisch maximal mögliche Beschattungsdauer, berechnet unter folgenden Annahmen:
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- Die Windenergieanlage/n ist/sind immer in Betrieb

Jul	August	September	Oktober	November	Dezember
1 04:47	05:27	05:58 (WEA 07 (GRN)) 06:23	07:17	07:44 (WEA G1) 07:16	15:54 (WEA 10 (GRS)) 08:12
12:54	17 21:18	06:15 (WEA 06 (GRN)) 20:10	18:55	08:02 (WEA G1) 16:44	7 16:01 (WEA 10 (GRS)) 15:59
2 04:48	05:29	06:00 (WEA 07 (GRN)) 06:25	07:19	07:46 (WEA G1) 07:18	15:52 (WEA 10 (GRS)) 08:14
12:53	15 21:16	06:15 (WEA 06 (GRN)) 20:08	18:53	08:01 (WEA G1) 16:42	11 16:03 (WEA 10 (GRS)) 15:58
3 04:48	05:31	06:02 (WEA 07 (GRN)) 06:26	07:21	07:47 (WEA G1) 07:20	15:51 (WEA 10 (GRS)) 08:15
12:53	13 21:14	06:15 (WEA 06 (GRN)) 20:05	18:50	07:58 (WEA G1) 16:40	13 16:04 (WEA 10 (GRS)) 15:57
4 04:49	05:33	06:03 (WEA 07 (GRN)) 06:28	07:23	07:49 (WEA G1) 07:22	15:51 (WEA 10 (GRS)) 08:17
12:52	11 21:12	06:14 (WEA 06 (GRN)) 20:03	18:48	7 07:56 (WEA G1) 16:38	15 16:06 (WEA 10 (GRS)) 15:56
5 04:50	05:34	06:05 (WEA 07 (GRN)) 06:30	07:24	07:51 (WEA G1) 07:24	15:50 (WEA 10 (GRS)) 08:18
12:52	8 21:10	06:13 (WEA 06 (GRN)) 20:00	18:45	2 07:53 (WEA G1) 16:36	14 16:04 (WEA 10 (GRS)) 15:56
6 04:51	05:36	06:07 (WEA 07 (GRN)) 06:32	07:26	07:26	15:49 (WEA 10 (GRS)) 08:19
12:51	5 21:08	06:12 (WEA 06 (GRN)) 19:58	18:43	16:34	13 16:02 (WEA 10 (GRS)) 15:55
7 04:52	05:38	06:08 (WEA 07 (GRN)) 06:34	07:28	07:28	15:49 (WEA 10 (GRS)) 08:21
12:50	2 21:06	06:10 (WEA 06 (GRN)) 19:55	18:41	11 16:32	11 16:50 (WEA 10 (GRS)) 15:55
8 04:53	05:40	06:35	07:30	07:30	15:50 (WEA 10 (GRS)) 08:22
12:50	21:04	19:53	18:38	16:30	8 15:57 (WEA 10 (GRS)) 15:54
9 04:54	05:41	06:37	07:32	07:32	15:49 (WEA 10 (GRS)) 08:23
12:49	21:02	19:50	18:36	16:28	6 15:55 (WEA 10 (GRS)) 15:54
10 04:55	05:43	06:39	07:34	07:34	15:50 (WEA 10 (GRS)) 08:25
12:48	21:00	19:48	18:33	16:27	3 15:53 (WEA 10 (GRS)) 15:54
11 04:56	05:45	06:41	07:36	07:36	15:51 (WEA 10 (GRS)) 08:26
12:47	20:59	19:45	18:31	16:25	1 15:52 (WEA 10 (GRS)) 15:53
12 04:58	05:47	06:43	07:37	07:37	15:50 (WEA 10 (GRS)) 08:27
12:46	20:56	19:43	18:28	16:23	15:53
13 04:59	05:49	06:44	07:39	07:40	15:53
12:45	20:54	19:40	18:26	16:21	24 15:14 (WEA 11 (GRS))
14 05:00	05:50	06:46	07:41	07:42	15:50 (WEA 10 (GRS)) 08:29
12:44	20:52	19:38	18:24	16:20	15:53
15 05:01	05:52	06:48	07:48 (WEA G1) 07:43	07:44	15:50 (WEA 10 (GRS)) 08:30
12:43	20:49	19:35	11 07:59 (WEA G1) 18:21	16:18	15:53
16 05:03	05:54	06:50	07:45 (WEA G1) 07:45	07:46	15:50 (WEA 10 (GRS)) 08:31
12:42	20:47	19:33	17 08:02 (WEA G1) 18:19	16:17	15:53
17 05:04	05:56	06:52	07:25 (WEA G3) 07:47	07:47	15:50 (WEA 10 (GRS)) 08:32
12:41	20:45	19:30	31 08:03 (WEA G1) 18:17	16:15	15:53
18 05:05	05:58	06:53	07:23 (WEA G3) 07:49	07:49	6 14:59 (WEA 11 (GRS)) 08:33
12:39	20:43	19:28	39 08:05 (WEA G1) 18:14	16:14	15:05 (WEA 11 (GRS)) 15:53
19 05:07	06:03 (WEA 06 (GRN)) 05:59	06:55	07:22 (WEA G3) 07:51	07:51	14:57 (WEA 11 (GRS)) 08:33
12:37	4 06:07 (WEA 06 (GRN)) 20:41	19:25	43 08:06 (WEA G1) 18:12	16:12	11 15:08 (WEA 11 (GRS)) 15:54
20 05:08	06:01 (WEA 06 (GRN)) 06:01	06:57	07:24 (WEA G3) 07:53	07:53	14:56 (WEA 11 (GRS)) 08:34
12:37	9 06:10 (WEA 06 (GRN)) 20:38	19:23	43 08:07 (WEA G1) 18:10	16:11	14 15:10 (WEA 11 (GRS)) 15:54
21 05:10	06:00 (WEA 06 (GRN)) 06:03	06:59	07:25 (WEA G3) 07:55	07:55	14:55 (WEA 11 (GRS)) 08:35
12:35	11 06:11 (WEA 06 (GRN)) 20:36	19:20	41 08:06 (WEA G1) 18:08	16:09	16 15:11 (WEA 11 (GRS)) 15:54
22 05:11	05:58 (WEA 06 (GRN)) 06:05	06:47 (WEA 08 (GRN)) 07:01	07:27 (WEA G3) 07:57	07:57	14:54 (WEA 11 (GRS)) 08:35
12:34	14 06:12 (WEA 06 (GRN)) 20:34	2 06:49 (WEA 08 (GRN)) 19:18	40 08:07 (WEA G1) 18:05	16:08	19 15:13 (WEA 11 (GRS)) 15:55
23 05:13	05:58 (WEA 06 (GRN)) 06:07	06:43 (WEA 08 (GRN)) 07:02	07:29 (WEA G3) 07:59	07:59	14:54 (WEA 11 (GRS)) 08:36
12:32	15 06:13 (WEA 06 (GRN)) 20:31	9 06:52 (WEA 08 (GRN)) 19:15	38 08:07 (WEA G1) 18:03	16:07	19 15:13 (WEA 11 (GRS)) 15:55
24 05:14	05:57 (WEA 06 (GRN)) 06:08	06:42 (WEA 08 (GRN)) 07:04	07:31 (WEA G3) 08:00	08:00	14:54 (WEA 11 (GRS)) 08:36
12:31	16 06:13 (WEA 06 (GRN)) 20:29	12 06:54 (WEA 08 (GRN)) 19:13	36 08:07 (WEA G1) 18:01	16:06	20 15:14 (WEA 11 (GRS)) 15:56
25 05:16	05:57 (WEA 06 (GRN)) 06:10	06:40 (WEA 08 (GRN)) 07:06	07:33 (WEA G3) 07:02	08:02	14:53 (WEA 11 (GRS)) 08:36
12:29	18 06:15 (WEA 06 (GRN)) 20:27	14 06:54 (WEA 08 (GRN)) 19:10	34 08:07 (WEA G1) 17:59	16:04	21 15:14 (WEA 11 (GRS)) 15:57
26 05:18	05:56 (WEA 06 (GRN)) 06:12	06:40 (WEA 08 (GRN)) 07:08	07:34 (WEA G1) 07:04	08:04	14:53 (WEA 11 (GRS)) 08:37
12:28	19 06:15 (WEA 06 (GRN)) 20:24	15 06:55 (WEA 08 (GRN)) 19:08	32 08:06 (WEA G1) 17:56	16:03	22 15:15 (WEA 11 (GRS)) 15:57
27 05:19	05:56 (WEA 06 (GRN)) 06:14	06:42 (WEA 08 (GRN)) 07:10	07:36 (WEA G1) 07:06	08:06	14:53 (WEA 11 (GRS)) 08:37
12:26	20 06:16 (WEA 06 (GRN)) 20:22	13 06:55 (WEA 08 (GRN)) 19:05	29 08:05 (WEA G1) 17:54	16:02	22 15:15 (WEA 11 (GRS)) 15:58
28 05:21	05:56 (WEA 06 (GRN)) 06:16	06:44 (WEA 08 (GRN)) 07:11	07:38 (WEA G1) 07:08	08:07	14:53 (WEA 11 (GRS)) 08:37
12:25	19 06:15 (WEA 06 (GRN)) 20:20	11 06:55 (WEA 08 (GRN)) 19:03	27 08:05 (WEA G1) 17:52	16:01	23 15:16 (WEA 11 (GRS)) 15:59
29 05:22	05:56 (WEA 06 (GRN)) 06:17	06:45 (WEA 08 (GRN)) 07:13	07:40 (WEA G1) 07:10	08:09	14:54 (WEA 11 (GRS)) 08:37
12:23	20 06:16 (WEA 06 (GRN)) 20:17	9 06:54 (WEA 08 (GRN)) 19:00	24 08:04 (WEA G1) 17:50	16:00	23 15:17 (WEA 11 (GRS)) 16:00
30 05:24	05:55 (WEA 06 (GRN)) 06:19	06:47 (WEA 08 (GRN)) 07:15	07:42 (WEA G1) 07:12	08:11	14:54 (WEA 11 (GRS)) 08:37
12:21	20 06:15 (WEA 06 (GRN)) 20:15	7 06:54 (WEA 08 (GRN)) 18:58	21 08:03 (WEA G1) 17:48	15:59	23 15:17 (WEA 11 (GRS)) 16:01
31 05:26	05:57 (WEA 07 (GRN)) 06:21	06:49 (WEA 08 (GRN)) 07:14	07:14		
12:19	19 06:16 (WEA 06 (GRN)) 20:12	4 06:53 (WEA 08 (GRN)) 18:56	18:46		
Sonnenscheinstunden	515	461	383	328	257
astr. max.mögl. Beschattung	204	167	506	53	341
					733

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 Großenholz

Lizenzierter Anwender: GL Garrad Hassan Deutschland GmbH Sommerdeich 14 b DE-25709 Kaiser-Wilhelm-Koog (0 48 56)901-0

Berechnet: 22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) Schattenrezeptor: IO 39 - IO 39 Rütiger Kornenhof 1 (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 Sonneneinstrahlungsrichtung Die Windenergieanlage/n ist/sind immer in Betrieb

Table with columns for months (Januar to Juni) and rows for specific dates, showing sunrise/sunset times and shadow cast durations for various wind turbine models (WEA 01-08, GRN).

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) Schattende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) Schattenrezeptor: IO 39 - IO 39 Rüttinger Kornenhof 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

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

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) Schattende, (WEA mit erstem Schatten), (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 40 - IO 40 Rütiger Kornenhof 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 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_08 (GRN))	05:42	04:51		
	16:03	16:55	17:52	07:45 (WEA_G1)	19:51	07:27 (WEA_08 (GRN))	20:48	21:39		
2	08:37	08:04	07:05	07:30 (WEA_G1)	06:49	07:13 (WEA_08 (GRN))	05:39	04:50		
	16:04	16:57	17:54	07:46 (WEA_G1)	19:53	07:26 (WEA_08 (GRN))	20:49	21:40		
3	08:37	08:03	07:03	07:28 (WEA_G1)	06:47	07:12 (WEA_08 (GRN))	05:37	04:49		
	16:05	16:59	17:56	07:47 (WEA_G1)	19:55	07:25 (WEA_08 (GRN))	20:51	21:41		
4	08:37	08:01	07:01	07:25 (WEA_G1)	06:44	07:12 (WEA_08 (GRN))	05:35	04:48		
	16:07	17:01	17:58	07:47 (WEA_G1)	19:57	07:23 (WEA_08 (GRN))	20:53	21:42		
5	08:36	07:59	06:58	07:23 (WEA_G1)	06:42	07:14 (WEA_08 (GRN))	05:33	04:48		
	16:08	17:03	18:00	07:47 (WEA_G1)	19:59	07:21 (WEA_08 (GRN))	20:55	21:43		
6	08:36	07:57	06:56	07:20 (WEA_G1)	06:39		05:31	04:47		
	16:09	17:05	18:02	07:47 (WEA_G1)	20:01		20:57	21:44		
7	08:35	07:55	06:53	07:18 (WEA_G1)	06:37		05:29	04:46		
	16:11	17:07	18:04	07:47 (WEA_G1)	20:03		20:59	21:45		
8	08:35	07:53	06:51	07:15 (WEA_G2)	06:35		05:27	04:46		
	16:12	17:09	18:06	07:46 (WEA_G1)	20:04		21:00	21:46		
9	08:34	07:51	06:49	07:13 (WEA_G2)	06:32		05:25	04:45		
	16:14	17:11	18:08	07:46 (WEA_G1)	20:06		21:02	21:47		
10	08:33	15:37 (WEA_10 (GRS))	07:49	07:10 (WEA_G2)	06:30		05:24	04:44		
	16:15	15:38 (WEA_10 (GRS))	17:13	07:45 (WEA_G1)	20:08		21:04	21:48		
11	08:33	15:37 (WEA_10 (GRS))	07:47	07:10 (WEA_G2)	06:27		05:22	04:44		
	16:17	2 15:39 (WEA_10 (GRS))	17:16	18:11	35 07:45 (WEA_G1)	20:10	21:06	21:49		
12	08:32	15:37 (WEA_10 (GRS))	07:45	06:41	07:10 (WEA_G2)	06:25	05:20	04:44		
	16:18	4 15:41 (WEA_10 (GRS))	17:18	18:13	33 07:43 (WEA_G1)	20:12	21:08	21:50		
13	08:31	15:37 (WEA_10 (GRS))	07:43	06:39	07:12 (WEA_G2)	06:22	05:18	04:43		
	16:20	6 15:43 (WEA_10 (GRS))	17:20	18:15	30 07:42 (WEA_G1)	20:14	21:09	21:50		
14	08:30	15:37 (WEA_10 (GRS))	07:41	06:36	07:13 (WEA_G2)	06:20	05:16	04:43		
	16:21	8 15:45 (WEA_10 (GRS))	17:22	18:17	27 07:40 (WEA_G1)	20:16	21:11	21:51		
15	08:29	15:38 (WEA_10 (GRS))	07:39	06:34	07:21 (WEA_G1)	06:18	05:15	04:43		
	16:23	9 15:47 (WEA_10 (GRS))	17:24	18:19	17 07:38 (WEA_G1)	20:18	21:13	2 05:43 (WEA_03 (GRN))	04:43	
16	08:28	15:38 (WEA_10 (GRS))	07:37	06:31	07:23 (WEA_G1)	06:15	05:13	05:41 (WEA_03 (GRN))	04:42	
	16:25	11 15:49 (WEA_10 (GRS))	17:26	18:21	11 07:34 (WEA_G1)	20:20	4 06:40 (WEA_06 (GRN))	05:13	4 05:45 (WEA_03 (GRN))	21:52
17	08:27	15:39 (WEA_10 (GRS))	07:35	06:29	06:13	06:37 (WEA_06 (GRN))	05:11	05:40 (WEA_03 (GRN))	04:42	
	16:27	12 15:51 (WEA_10 (GRS))	17:28	18:23	20:21	8 06:45 (WEA_06 (GRN))	21:16	6 05:46 (WEA_03 (GRN))	21:53	
18	08:26	15:39 (WEA_10 (GRS))	07:33	06:27	06:11	06:35 (WEA_06 (GRN))	05:10	05:37 (WEA_03 (GRN))	04:42	
	16:28	14 15:53 (WEA_10 (GRS))	17:30	18:25	20:23	11 06:46 (WEA_06 (GRN))	21:18	7 05:45 (WEA_03 (GRN))	21:53	
19	08:25	15:40 (WEA_10 (GRS))	07:31	06:24	06:08	06:33 (WEA_06 (GRN))	05:08	05:37 (WEA_03 (GRN))	04:42	
	16:30	15 15:55 (WEA_10 (GRS))	17:32	18:27	20:25	14 06:47 (WEA_06 (GRN))	21:20	9 05:46 (WEA_03 (GRN))	21:54	
20	08:24	15:41 (WEA_10 (GRS))	07:28	06:22	06:06	06:31 (WEA_06 (GRN))	05:06	05:35 (WEA_03 (GRN))	04:42	
	16:32	15 15:56 (WEA_10 (GRS))	17:34	18:29	20:27	16 06:47 (WEA_06 (GRN))	21:21	10 05:45 (WEA_03 (GRN))	21:54	
21	08:23	15:41 (WEA_10 (GRS))	07:26	06:19	06:04	06:28 (WEA_06 (GRN))	05:05	05:34 (WEA_03 (GRN))	04:43	
	16:34	14 15:55 (WEA_10 (GRS))	17:36	18:31	20:29	18 06:46 (WEA_06 (GRN))	21:23	12 05:46 (WEA_03 (GRN))	21:54	
22	08:21	15:43 (WEA_10 (GRS))	07:24	06:17	06:01	06:27 (WEA_06 (GRN))	05:03	05:33 (WEA_03 (GRN))	04:43	
	16:36	13 15:56 (WEA_10 (GRS))	17:38	18:32	20:31	19 06:46 (WEA_06 (GRN))	21:24	13 05:46 (WEA_03 (GRN))	21:54	
23	08:20	15:44 (WEA_10 (GRS))	07:22	06:14	05:59	06:27 (WEA_06 (GRN))	05:02	05:32 (WEA_03 (GRN))	04:43	
	16:38	10 15:54 (WEA_10 (GRS))	17:40	18:34	20:33	19 06:46 (WEA_06 (GRN))	21:26	14 05:46 (WEA_03 (GRN))	21:55	
24	08:19	15:45 (WEA_10 (GRS))	07:19	06:12	05:57	06:22 (WEA_07 (GRN))	05:01	05:32 (WEA_03 (GRN))	04:43	
	16:39	8 15:53 (WEA_10 (GRS))	17:42	18:36	20:35	18 06:45 (WEA_06 (GRN))	21:27	13 05:45 (WEA_03 (GRN))	21:55	
25	08:17	07:17	06:09	05:55	05:55	06:20 (WEA_07 (GRN))	04:59	05:33 (WEA_03 (GRN))	04:44	
	16:41	17:44	18:38	20:36	20:36	20 06:45 (WEA_06 (GRN))	21:29	11 05:44 (WEA_03 (GRN))	21:55	
26	08:16	07:15	06:07	05:52	05:52	06:19 (WEA_07 (GRN))	04:58	05:34 (WEA_03 (GRN))	04:44	
	16:43	17:46	18:40	20:38	20:38	20 06:44 (WEA_06 (GRN))	21:30	10 05:44 (WEA_03 (GRN))	21:55	
27	08:14	07:12	06:04	05:50	05:50	06:16 (WEA_07 (GRN))	04:57	05:35 (WEA_03 (GRN))	04:44	
	16:45	4 07:41 (WEA_G1)	18:42	20:40	19 06:42 (WEA_06 (GRN))	21:32	8 05:43 (WEA_03 (GRN))	21:55		
28	08:13	07:10	06:02	05:48	05:48	06:14 (WEA_07 (GRN))	04:55	05:36 (WEA_03 (GRN))	04:45	
	16:47	17:50	9 07:44 (WEA_G1)	18:44	20:42	15 06:40 (WEA_06 (GRN))	21:33	6 05:42 (WEA_03 (GRN))	21:54	
29	08:11	06:59	05:59	05:46	05:46	06:13 (WEA_07 (GRN))	04:54		04:46	
	16:49	19:46	4 07:23 (WEA_08 (GRN))	20:44	8 06:21 (WEA_07 (GRN))	21:35		21:54		
30	08:10	06:57	05:57	05:44	05:44	06:16 (WEA_07 (GRN))	04:53		04:46	
	16:51	19:47	6 07:26 (WEA_08 (GRN))	20:46	1 06:17 (WEA_07 (GRN))	21:36		21:54		
31	08:08	06:54	05:54	05:42	05:42	06:15 (WEA_07 (GRN))	04:52			
	16:53	19:49	9 07:27 (WEA_08 (GRN))	20:47		21:37	496			
Sonnenscheinstunden	248	272	367	421	421	496		513		
astr.max.mögl.Beschattung	142	13	420	265	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) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 40 - IO 40 Rütiger Komenhof 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

Jul	August	September	Oktober	November	Dezember
1 04:47	05:27	06:23	07:17	07:51 (WEA_G2) 07:16	08:12
2 04:48	05:29	06:25	07:19	08:23 (WEA_G1) 16:44	15:59 2 15:21 (WEA 10 (GRS))
3 04:48	05:31	06:26	07:21	07:49 (WEA_G2) 07:18	08:14 15:20 (WEA 10 (GRS))
4 04:49	05:33	06:28	07:23	08:23 (WEA_G1) 16:40	08:15 1 15:21 (WEA 10 (GRS))
5 04:50	05:34	06:29	07:24	07:51 (WEA_G2) 07:20	08:16
6 04:51	05:36	06:32	07:26	08:23 (WEA_G1) 16:38	08:17
7 04:52	05:38	06:34	07:28	07:55 (WEA_G1) 07:28	08:18
8 04:53	05:40	06:35	07:30	08:23 (WEA_G1) 16:32	08:21
9 04:54	05:41	06:37	07:32	07:57 (WEA_G1) 07:30	08:22
10 04:55	05:43	06:39	07:34	08:23 (WEA_G1) 16:30	08:25
11 04:56	05:45	06:41	07:36	07:59 (WEA_G1) 07:32	08:26
12 04:58	05:47	06:43	07:37	08:22 (WEA_G1) 16:28	08:27
13 04:59	05:49	06:44	07:39	08:01 (WEA_G1) 07:34	08:28
14 05:00	05:50	06:46	07:41	08:21 (WEA_G1) 16:27	08:29
15 05:01	05:45 (WEA 03 (GRN)) 05:52	06:22 (WEA 07 (GRN)) 06:44	07:18 (WEA 08 (GRN)) 07:39	08:07 (WEA_G1) 07:40	08:30
16 05:03	05:44 (WEA 03 (GRN)) 05:54	06:20 (WEA 07 (GRN)) 06:46	07:16 (WEA 08 (GRN)) 07:41	08:18 (WEA_G1) 16:21	08:31
17 05:04	05:44 (WEA 03 (GRN)) 05:56	06:21 (WEA 07 (GRN)) 06:48	07:15 (WEA 08 (GRN)) 07:43	08:19 (WEA_G1) 16:20	08:32
18 05:05	05:43 (WEA 03 (GRN)) 05:58	06:22 (WEA 07 (GRN)) 06:50	07:14 (WEA 08 (GRN)) 07:45	08:18 (WEA_G1) 16:18	08:33
19 05:07	05:42 (WEA 03 (GRN)) 05:59	06:23 (WEA 07 (GRN)) 06:52	07:13 (WEA 08 (GRN)) 07:47	08:17 (WEA_G1) 16:15	08:34
20 05:08	05:42 (WEA 03 (GRN)) 06:01	06:23 (WEA 06 (GRN)) 06:53	07:12 (WEA 08 (GRN)) 07:49	15:19 (WEA 10 (GRS)) 08:33	08:35
21 05:10	05:42 (WEA 03 (GRN)) 06:03	06:23 (WEA 06 (GRN)) 06:55	07:11 (WEA 08 (GRN)) 07:51	15:19 (WEA 10 (GRS)) 08:33	08:36
22 05:11	05:43 (WEA 03 (GRN)) 06:05	06:23 (WEA 06 (GRN)) 06:57	07:10 (WEA 08 (GRN)) 07:53	15:19 (WEA 10 (GRS)) 08:33	08:37
23 05:13	05:43 (WEA 03 (GRN)) 06:07	06:23 (WEA 06 (GRN)) 06:59	07:09 (WEA 08 (GRN)) 07:55	15:17 (WEA 10 (GRS)) 08:35	08:38
24 05:14	05:44 (WEA 03 (GRN)) 06:09	06:23 (WEA 06 (GRN)) 07:01	07:08 (WEA 08 (GRN)) 07:57	15:17 (WEA 10 (GRS)) 08:35	08:39
25 05:16	05:44 (WEA 03 (GRN)) 06:10	06:23 (WEA 06 (GRN)) 07:02	07:07 (WEA 08 (GRN)) 07:59	15:17 (WEA 10 (GRS)) 08:36	08:40
26 05:18	05:45 (WEA 03 (GRN)) 06:12	06:23 (WEA 06 (GRN)) 07:04	07:06 (WEA 08 (GRN)) 08:00	15:17 (WEA 10 (GRS)) 08:36	08:41
27 05:19	05:45 (WEA 03 (GRN)) 06:14	06:23 (WEA 06 (GRN)) 07:06	07:05 (WEA 08 (GRN)) 08:01	15:16 (WEA 10 (GRS)) 08:37	08:42
28 05:21	05:46 (WEA 03 (GRN)) 06:16	06:23 (WEA 06 (GRN)) 07:08	07:04 (WEA 08 (GRN)) 08:02	15:16 (WEA 10 (GRS)) 08:37	08:43
29 05:22	05:46 (WEA 03 (GRN)) 06:17	06:23 (WEA 06 (GRN)) 07:10	07:03 (WEA 08 (GRN)) 08:03	15:16 (WEA 10 (GRS)) 08:37	08:44
30 05:24	05:47 (WEA 03 (GRN)) 06:19	06:23 (WEA 06 (GRN)) 07:12	07:02 (WEA 08 (GRN)) 08:04	15:16 (WEA 10 (GRS)) 08:37	08:45
31 05:26	05:47 (WEA 03 (GRN)) 06:21	06:23 (WEA 06 (GRN)) 07:14	07:01 (WEA 08 (GRN)) 08:05	15:16 (WEA 10 (GRS)) 08:37	08:46
Sommerscheinstunden 515	461	383	328	257	231
astr. max mögl. Beschattung 127	213	152	347	140	3

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

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 41 - IO 41 Kathenkamp 11 (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 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	07:23 (WEA_06 (GRN)) 05:42	04:51
1 16:03	16:55	30 17:52	08:03 (WEA_G1) 19:51	11 07:34 (WEA_06 (GRN)) 20:48	3 05:38 (WEA_03 (GRN))
2 08:37	08:04	07:05	07:30 (WEA_G1) 06:49	07:24 (WEA_06 (GRN)) 05:39	04:50
3 08:37	16:04	16:57	17:54	7 07:31 (WEA_06 (GRN)) 20:49	21:40
3 08:37	08:03	08:03	07:03	07:28 (WEA_G2) 06:47	04:49
4 08:37	16:05	16:59	17:56	8 07:25 (WEA_G2) 19:55	21:41
4 08:37	08:01	08:01	07:01	07:25 (WEA_G2) 06:44	04:48
5 08:36	16:07	17:01	17:58	9 08:01 (WEA_G1) 19:57	21:42
5 08:36	08:02	07:59	06:58	07:23 (WEA_G2) 06:42	04:48
6 08:36	16:08	17:03	18:00	10 08:01 (WEA_G1) 19:59	21:43
6 08:36	08:03	07:57	06:56	07:20 (WEA_G2) 06:39	04:47
7 08:35	16:09	17:05	18:02	11 08:00 (WEA_G1) 20:01	21:44
7 08:35	08:04	07:55	06:53	07:19 (WEA_G2) 06:37	04:46
8 08:35	16:11	17:07	18:04	12 07:59 (WEA_G1) 20:03	21:45
8 08:35	08:05	07:53	06:51	07:19 (WEA_G2) 06:35	04:45
9 08:34	16:12	17:09	18:06	13 07:58 (WEA_G1) 20:04	21:46
9 08:34	08:06	07:51	06:49	07:19 (WEA_G2) 06:33	04:45
10 08:33	16:14	17:11	18:08	14 07:57 (WEA_G1) 20:06	21:47
10 08:33	08:07	07:49	06:46	07:10 (WEA_G3) 06:30	04:44
11 08:33	16:15	17:13	18:09	15 07:56 (WEA_G1) 20:08	21:48
11 08:33	08:08	07:47	06:44	07:08 (WEA_G3) 06:27	04:44
12 08:32	16:17	17:16	18:11	16 07:55 (WEA_G1) 20:10	21:49
12 08:32	08:09	07:45	06:41	07:05 (WEA_G3) 06:25	04:44
13 08:31	16:18	17:18	18:13	17 07:48 (WEA_G1) 20:12	21:50
13 08:31	08:10	07:43	06:39	07:03 (WEA_G3) 06:22	04:43
14 08:30	16:20	17:20	18:15	18 07:46 (WEA_G1) 20:14	21:50
14 08:30	15:44 (WEA_10 (GRS)) 07:41	06:36	07:00 (WEA_G3) 06:20	5 06:52 (WEA_06 (GRN)) 21:09	21:50
15 08:29	16:21	17:22	18:17	6 06:44 (WEA_06 (GRN)) 21:16	21:51
15 08:29	15:45 (WEA_10 (GRS)) 07:39	06:34	07:14 (WEA_G3) 20:16	9 06:53 (WEA_06 (GRN)) 21:11	21:51
16 08:28	16:23	17:24	18:19	10 06:42 (WEA_06 (GRN)) 21:15	21:52
16 08:28	15:47 (WEA_10 (GRS)) 07:37	06:31	07:14 (WEA_G3) 20:18	12 06:54 (WEA_06 (GRN)) 21:13	21:52
17 08:27	16:25	17:26	18:21	13 06:40 (WEA_06 (GRN)) 21:13	21:52
17 08:27	15:49 (WEA_10 (GRS)) 07:35	06:29	07:12 (WEA_G3) 20:20	15 06:55 (WEA_06 (GRN)) 21:14	21:52
18 08:26	16:27	17:28	18:23	16 06:37 (WEA_06 (GRN)) 21:11	21:52
18 08:26	15:51 (WEA_10 (GRS)) 07:28	06:27	07:10 (WEA_G3) 20:21	18 06:55 (WEA_06 (GRN)) 21:16	21:53
19 08:25	16:28	17:30	18:25	19 06:35 (WEA_06 (GRN)) 21:10	21:53
19 08:25	15:53 (WEA_10 (GRS)) 07:21	06:24	07:09 (WEA_G3) 20:22	21 06:56 (WEA_06 (GRN)) 21:18	21:53
20 08:24	16:30	17:32	18:27	22 06:34 (WEA_06 (GRN)) 21:18	21:53
20 08:24	15:47 (WEA_10 (GRS)) 07:28	06:22	07:08 (WEA_G3) 20:23	24 06:56 (WEA_06 (GRN)) 21:20	21:54
21 08:23	16:32	17:34	18:29	25 06:34 (WEA_06 (GRN)) 21:20	21:54
21 08:23	15:47 (WEA_10 (GRS)) 07:26	07:52 (WEA_G1) 06:19	07:07 (WEA_G3) 20:24	27 06:56 (WEA_06 (GRN)) 21:21	21:54
22 08:21	16:34	17:36	18:31	28 06:34 (WEA_06 (GRN)) 21:21	21:54
22 08:21	15:59 (WEA_10 (GRS)) 07:24	07:49 (WEA_G1) 06:17	07:06 (WEA_G3) 20:25	30 06:56 (WEA_06 (GRN)) 21:22	21:54
23 08:20	16:36	17:38	18:32	31 06:34 (WEA_06 (GRN)) 21:22	21:54
23 08:20	15:49 (WEA_10 (GRS)) 07:22	07:47 (WEA_G1) 06:14	07:05 (WEA_G3) 20:26	1 06:34 (WEA_06 (GRN)) 21:22	21:54
24 08:19	16:38	17:40	18:34	2 06:34 (WEA_06 (GRN)) 21:22	21:55
24 08:19	15:50 (WEA_10 (GRS)) 07:19	07:45 (WEA_G1) 06:12	06:35 (WEA_06 (GRN)) 21:23	3 06:34 (WEA_06 (GRN)) 21:22	21:55
25 08:17	16:39	17:42	18:36	4 06:34 (WEA_06 (GRN)) 21:22	21:55
25 08:17	15:53 (WEA_10 (GRS)) 07:17	08:01 (WEA_G1) 06:10	07:44 (WEA_G1) 06:11	5 06:34 (WEA_06 (GRN)) 21:22	21:55
26 08:16	16:41	17:44	18:38	6 06:34 (WEA_06 (GRN)) 21:22	21:55
26 08:16	15:58 (WEA_10 (GRS)) 07:15	07:40 (WEA_G1) 06:07	06:30 (WEA_06 (GRN)) 21:23	7 06:34 (WEA_06 (GRN)) 21:22	21:55
27 08:14	16:43	17:46	18:40	8 06:34 (WEA_06 (GRN)) 21:22	21:55
27 08:14	08:12	07:12	06:04	9 06:34 (WEA_06 (GRN)) 21:22	21:55
28 08:13	16:45	17:48	18:42	10 06:34 (WEA_06 (GRN)) 21:22	21:55
28 08:13	08:13	07:10	06:02	11 06:34 (WEA_06 (GRN)) 21:22	21:55
29 08:11	16:47	17:50	18:44	12 06:34 (WEA_06 (GRN)) 21:22	21:55
29 08:11	08:14	07:11	06:03	13 06:34 (WEA_06 (GRN)) 21:22	21:55
30 08:10	16:49	17:52	18:46	14 06:34 (WEA_06 (GRN)) 21:22	21:55
30 08:10	08:15	07:13	06:05	15 06:34 (WEA_06 (GRN)) 21:22	21:55
31 08:08	16:51	17:54	18:48	16 06:34 (WEA_06 (GRN)) 21:22	21:55
31 08:08	08:16	07:14	06:06	17 06:34 (WEA_06 (GRN)) 21:22	21:55
16:53	17:56	18:50	19:44	18 06:34 (WEA_06 (GRN)) 21:22	21:55
Sommerscheinstunden 248	272	367	421	496	513
astr max mögl Beschattung 89	133	167	200	240	273

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)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 41 - IO 41 Kathenkamp 11 (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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

Jul	August	September	Oktober	November	Dezember
1 04:47	05:27	06:23	07:17	07:44 (WEA_G3) 07:16	08:12
21:54	21:18	20:10	18:55	16 08:25 (WEA_G1) 16:44	15:59
2 04:48	05:29	06:25	07:19	07:46 (WEA_G3) 07:18	08:14
21:53	21:16	20:08	18:53	31 08:30 (WEA_G1) 16:42	15:58
3 04:48	05:31	06:26	07:21	07:47 (WEA_G3) 07:20	08:15
21:53	21:14	20:05	18:50	38 08:31 (WEA_G1) 16:40	15:57
4 04:49	05:33	06:28	07:23	07:49 (WEA_G3) 07:22	08:17
21:52	21:12	20:03	18:48	39 08:33 (WEA_G1) 16:38	15:56
5 04:50	05:34	06:30	07:24	07:51 (WEA_G3) 07:24	08:18
21:52	21:10	20:00	18:45	38 08:34 (WEA_G1) 16:36	15:56
6 04:51	05:36	06:32	07:26	07:56 (WEA_G2) 07:26	08:19
21:51	21:08	19:58	18:43	39 08:35 (WEA_G1) 16:34	15:55
7 04:52	05:38	06:34	07:28	07:55 (WEA_G2) 07:28	08:21
21:50	21:06	19:55	18:41	41 08:36 (WEA_G1) 16:32	15:55
8 04:53	05:40	06:35	07:30	07:57 (WEA_G2) 07:30	08:22
21:50	21:04	19:53	18:38	39 08:36 (WEA_G1) 16:30	15:54
9 04:54	05:41	06:37	07:32	07:59 (WEA_G2) 07:32	08:23
21:49	21:02	19:50	18:36	37 08:36 (WEA_G1) 16:28	15:54
10 04:55	05:43	06:39	07:18 (WEA_06 (GRN)) 07:34	08:01 (WEA_G2) 07:34	08:25
21:48	21:00	19:48	6 07:24 (WEA_08 (GRN)) 18:33	35 08:36 (WEA_G1) 16:27	15:54
11 04:56	05:45	06:41	07:15 (WEA_06 (GRN)) 07:36	08:03 (WEA_G2) 07:36	08:26
21:47	20:58	19:45	11 07:26 (WEA_08 (GRN)) 18:31	33 08:36 (WEA_G1) 16:25	15:53
12 04:58	05:45 (WEA_03 (GRN)) 05:47	06:43	07:14 (WEA_06 (GRN)) 07:37	08:05 (WEA_G1) 07:38	08:27
21:46	5 05:50 (WEA_03 (GRN)) 20:56	19:43	14 07:28 (WEA_08 (GRN)) 18:28	31 08:36 (WEA_G1) 16:23	15:53
13 04:59	05:44 (WEA_03 (GRN)) 05:49	06:44	07:12 (WEA_06 (GRN)) 07:39	08:07 (WEA_G1) 07:40	08:28
21:45	8 05:52 (WEA_03 (GRN)) 20:54	19:40	15 07:27 (WEA_08 (GRN)) 18:26	29 08:36 (WEA_G1) 16:21	15:53
14 05:00	05:43 (WEA_03 (GRN)) 05:50	06:24 (WEA_07 (GRN)) 06:46	07:13 (WEA_06 (GRN)) 07:41	08:09 (WEA_G1) 07:42	08:29
21:44	10 05:53 (WEA_03 (GRN)) 20:52	7 06:31 (WEA_07 (GRN)) 19:38	15 07:28 (WEA_08 (GRN)) 18:24	26 08:35 (WEA_G1) 16:20	15:53
15 05:01	05:42 (WEA_03 (GRN)) 05:52	06:22 (WEA_07 (GRN)) 06:48	07:15 (WEA_06 (GRN)) 07:43	08:11 (WEA_G1) 07:44	08:30
21:43	11 05:53 (WEA_03 (GRN)) 20:49	9 06:31 (WEA_07 (GRN)) 19:35	13 07:28 (WEA_08 (GRN)) 18:21	24 08:35 (WEA_G1) 16:18	15:53
16 05:03	05:41 (WEA_03 (GRN)) 05:54	06:23 (WEA_07 (GRN)) 06:50	07:17 (WEA_06 (GRN)) 07:45	08:13 (WEA_G1) 07:46	08:31
21:42	13 05:54 (WEA_03 (GRN)) 20:47	17 06:54 (WEA_06 (GRN)) 19:33	11 07:28 (WEA_08 (GRN)) 18:19	21 08:34 (WEA_G1) 16:17	15:53
17 05:04	05:42 (WEA_03 (GRN)) 05:56	06:25 (WEA_07 (GRN)) 06:52	07:18 (WEA_06 (GRN)) 07:47	08:15 (WEA_G1) 07:47	08:32
21:41	13 05:55 (WEA_03 (GRN)) 20:45	20 06:56 (WEA_06 (GRN)) 19:30	8 07:26 (WEA_08 (GRN)) 18:17	18 08:33 (WEA_G1) 16:15	5 15:31 (WEA_10 (GR5)) 15:53
18 05:05	05:41 (WEA_03 (GRN)) 05:58	06:27 (WEA_07 (GRN)) 06:53	8 07:20 (WEA_06 (GRN)) 07:49	08:17 (WEA_G1) 07:49	15:24 (WEA_10 (GR5)) 08:33
21:39	15 05:56 (WEA_03 (GRN)) 20:43	21 06:58 (WEA_06 (GRN)) 19:28	5 07:25 (WEA_08 (GRN)) 18:14	14 08:31 (WEA_G1) 16:14	9 15:33 (WEA_10 (GR5)) 15:53
19 05:07	05:40 (WEA_03 (GRN)) 05:59	06:28 (WEA_07 (GRN)) 06:55	07:22 (WEA_06 (GRN)) 07:51	08:19 (WEA_G1) 07:51	15:24 (WEA_10 (GR5)) 08:33
21:38	16 05:56 (WEA_03 (GRN)) 20:41	21 06:58 (WEA_06 (GRN)) 19:25	2 07:24 (WEA_08 (GRN)) 18:12	11 08:30 (WEA_G1) 16:12	12 15:36 (WEA_10 (GR5)) 15:54
20 05:08	05:41 (WEA_03 (GRN)) 06:01	06:30 (WEA_07 (GRN)) 06:57	07:53	08:21 (WEA_G1) 07:53	15:24 (WEA_10 (GR5)) 08:34
21:37	16 05:57 (WEA_03 (GRN)) 20:38	21 06:59 (WEA_06 (GRN)) 19:23	18:10	7 08:28 (WEA_G1) 16:11	12 15:36 (WEA_10 (GR5)) 15:54
21 05:10	05:42 (WEA_03 (GRN)) 06:03	06:39 (WEA_06 (GRN)) 06:59	07:55	08:23 (WEA_G1) 07:55	15:23 (WEA_10 (GR5)) 08:35
21:35	15 05:57 (WEA_03 (GRN)) 20:36	21 07:00 (WEA_06 (GRN)) 19:20	18:08	2 08:25 (WEA_G1) 16:09	12 15:35 (WEA_10 (GR5)) 15:54
22 05:11	05:43 (WEA_03 (GRN)) 06:05	06:38 (WEA_06 (GRN)) 07:01	07:57	07:57	15:23 (WEA_10 (GR5)) 08:35
21:34	13 05:56 (WEA_03 (GRN)) 20:34	21 06:59 (WEA_06 (GRN)) 19:18	18:05	16:08	10 15:33 (WEA_10 (GR5)) 15:55
23 05:13	05:45 (WEA_03 (GRN)) 06:07	06:38 (WEA_06 (GRN)) 07:02	07:59	07:59	15:23 (WEA_10 (GR5)) 08:36
21:32	12 05:57 (WEA_03 (GRN)) 20:31	21 06:59 (WEA_06 (GRN)) 19:15	18:03	16:07	9 15:32 (WEA_10 (GR5)) 15:55
24 05:14	05:46 (WEA_03 (GRN)) 06:08	06:38 (WEA_06 (GRN)) 07:04	08:00	08:00	08:36
21:31	11 05:57 (WEA_03 (GRN)) 20:29	21 06:59 (WEA_06 (GRN)) 19:13	18:01	16:06	8 15:31 (WEA_10 (GR5)) 15:56
25 05:16	05:48 (WEA_03 (GRN)) 06:10	06:38 (WEA_06 (GRN)) 07:06	07:52	08:02	15:23 (WEA_10 (GR5)) 08:36
21:29	9 05:57 (WEA_03 (GRN)) 20:27	20 06:58 (WEA_06 (GRN)) 19:10	16:59	16:04	5 15:28 (WEA_10 (GR5)) 15:57
26 05:18	05:49 (WEA_03 (GRN)) 06:12	06:40 (WEA_06 (GRN)) 07:08	07:44 (WEA_G3) 07:04	08:04	15:23 (WEA_10 (GR5)) 08:37
21:28	7 05:56 (WEA_03 (GRN)) 20:24	18 06:58 (WEA_06 (GRN)) 19:08	6 07:50 (WEA_G3) 16:56	16:03	4 15:27 (WEA_10 (GR5)) 15:57
27 05:19	05:51 (WEA_03 (GRN)) 06:14	06:42 (WEA_06 (GRN)) 07:10	07:41 (WEA_G3) 07:06	08:06	15:24 (WEA_10 (GR5)) 08:37
21:26	5 05:56 (WEA_03 (GRN)) 20:22	15 06:57 (WEA_06 (GRN)) 19:05	12 07:53 (WEA_G3) 16:54	16:02	2 15:26 (WEA_10 (GR5)) 15:58
28 05:21	05:52 (WEA_03 (GRN)) 06:16	06:44 (WEA_06 (GRN)) 07:11	07:39 (WEA_G3) 07:08	08:07	15:24 (WEA_10 (GR5)) 08:37
21:25	3 05:53 (WEA_03 (GRN)) 20:20	12 06:56 (WEA_06 (GRN)) 19:03	15 07:54 (WEA_G3) 16:52	16:01	1 15:25 (WEA_10 (GR5)) 15:59
29 05:22	05:54 (WEA_03 (GRN)) 06:17	06:45 (WEA_06 (GRN)) 07:13	07:40 (WEA_G3) 07:10	08:09	08:37
21:23	1 05:55 (WEA_03 (GRN)) 20:17	9 06:54 (WEA_06 (GRN)) 19:00	15 07:55 (WEA_G3) 16:50	16:00	16:00
30 05:24	06:19	06:47 (WEA_06 (GRN)) 19:00	07:42 (WEA_G3) 16:50	16:01	08:37
21:21	20:15	5 06:52 (WEA_06 (GRN)) 18:58	13 07:55 (WEA_G3) 16:48	15:59	16:01
31 05:26	06:21		07:14		08:37
21:19	20:12		16:46		16:02
Sommerscheinstunden 515	461	383		257	231
astr max mögl Beschattung 183	279	161	569	89	8

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)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 42 - IO 42 Kathenkamp 19 (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 Sonneneinstrahlungsrichtung
- 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 06 (GRN)) 05:42	06:06 (WEA 03 (GRN)) 04:51
1 16:03 15:17 (WEA 10 (GRS)) 16:55		17:52	08:05 (WEA_G1) 19:51	6 07:22 (WEA 06 (GRN)) 20:48	6 06:14 (WEA 03 (GRN)) 21:39
2 08:37 15:07 (WEA 10 (GRS)) 08:04		07:05	07:30 (WEA_G2) 06:49	7 07:13 (WEA 06 (GRN)) 05:39	7 06:06 (WEA 03 (GRN)) 04:50
1 16:04 15:18 (WEA 10 (GRS)) 16:57		17:54	08:04 (WEA_G1) 19:53	10 07:23 (WEA 06 (GRN)) 20:49	8 06:14 (WEA 03 (GRN)) 21:40
3 08:37 15:08 (WEA 10 (GRS)) 08:03		07:03	07:28 (WEA_G2) 06:47	11 07:11 (WEA 06 (GRN)) 05:37	9 06:04 (WEA 03 (GRN)) 04:49
1 16:05 15:17 (WEA 10 (GRS)) 16:59		17:56	08:03 (WEA_G1) 19:55	13 07:24 (WEA 06 (GRN)) 20:51	10 06:14 (WEA 03 (GRN)) 21:41
4 08:37 15:09 (WEA 10 (GRS)) 08:01		07:01	07:26 (WEA_G2) 06:44	14 07:08 (WEA 06 (GRN)) 05:35	11 06:02 (WEA 03 (GRN)) 04:48
1 16:07 15:17 (WEA 10 (GRS)) 17:01		17:58	08:01 (WEA_G1) 19:57	15 07:23 (WEA 06 (GRN)) 20:53	12 06:14 (WEA 03 (GRN)) 21:42
5 08:36 15:10 (WEA 10 (GRS)) 07:59		06:58	07:28 (WEA_G2) 06:42	16 07:06 (WEA 06 (GRN)) 05:33	13 06:00 (WEA 03 (GRN)) 04:48
1 16:08 15:16 (WEA 10 (GRS)) 17:03		18:00	08:00 (WEA_G1) 19:59	17 07:23 (WEA 06 (GRN)) 20:55	13 06:13 (WEA 03 (GRN)) 21:43
6 08:36 15:14 (WEA 10 (GRS)) 07:57		06:56	07:28 (WEA_G2) 06:39	18 07:05 (WEA 06 (GRN)) 05:31	14 06:00 (WEA 03 (GRN)) 04:47
1 16:09 15:15 (WEA 10 (GRS)) 17:05		18:02	07:57 (WEA_G1) 20:01	17 07:22 (WEA 06 (GRN)) 20:57	13 06:13 (WEA 03 (GRN)) 21:44
7 08:35 15:11 17:07		06:53	07:31 (WEA_G2) 06:37	19 07:05 (WEA 06 (GRN)) 05:29	15 06:00 (WEA 03 (GRN)) 04:46
8 08:35 15:11 17:07		06:51	07:52 (WEA_G1) 20:03	17 07:22 (WEA 06 (GRN)) 20:59	12 06:12 (WEA 03 (GRN)) 21:45
9 08:34 15:10 17:06		06:49	06:35	17 07:06 (WEA 06 (GRN)) 05:27	12 06:12 (WEA 03 (GRN)) 21:45
10 08:34 15:09 17:05		06:47	06:33	16 07:22 (WEA 06 (GRN)) 21:00	11 06:10 (WEA 03 (GRN)) 21:46
11 08:33 15:08 17:04		06:44	06:31	14 07:20 (WEA 06 (GRN)) 21:02	15 06:09 (WEA 03 (GRN)) 21:47
12 08:32 15:07 17:03		06:42	06:29	14 07:07 (WEA 06 (GRN)) 05:24	15 06:09 (WEA 03 (GRN)) 21:47
13 08:31 15:06 17:02		06:40	06:27	11 07:18 (WEA 06 (GRN)) 21:04	14 06:05 (WEA 03 (GRN)) 21:48
14 08:30 15:05 17:01		06:38	06:25	5 07:14 (WEA 06 (GRN)) 21:06	17 06:06 (WEA 03 (GRN)) 21:49
15 08:29 15:04 17:00		06:36	06:23	5 07:14 (WEA 06 (GRN)) 21:06	17 06:06 (WEA 03 (GRN)) 21:49
16 08:28 15:03 16:59		06:34	06:21	3 06:47 (WEA 07 (GRN)) 21:11	24 06:09 (WEA 03 (GRN)) 21:51
17 08:27 15:02 16:58		06:32	06:19	5 06:47 (WEA 07 (GRN)) 21:13	25 06:10 (WEA 03 (GRN)) 21:52
18 08:26 15:01 16:57		06:30	06:17	5 06:40 (WEA 07 (GRN)) 21:15	25 06:10 (WEA 03 (GRN)) 21:52
19 08:25 15:00 16:56		06:28	06:15	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
20 08:24 14:59 16:55		06:26	06:13	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
21 08:23 14:58 16:54		06:24	06:11	8 06:44 (WEA 07 (GRN)) 21:18	26 06:10 (WEA 03 (GRN)) 21:53
22 08:22 14:57 16:53		06:22	06:09	8 06:44 (WEA 07 (GRN)) 21:18	26 06:10 (WEA 03 (GRN)) 21:53
23 08:21 14:56 16:52		06:20	06:07	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
24 08:20 14:55 16:51		06:18	06:05	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
25 08:19 14:54 16:50		06:16	06:03	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
26 08:18 14:53 16:49		06:14	06:01	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
27 08:17 14:52 16:48		06:12	05:59	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
28 08:16 14:51 16:47		06:10	05:57	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
29 08:15 14:50 16:46		06:08	05:55	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
30 08:14 14:49 16:45		06:06	05:53	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
31 08:13 14:48 16:44		06:04	05:51	7 06:47 (WEA 07 (GRN)) 21:15	26 06:10 (WEA 03 (GRN)) 21:52
Sommerscheinstunden 248					
astr. max. mögl. Beschattung 46	272	196	271	421	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	Zeitpunkt (SS:MM) Schattenende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 42 - IO 42 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 Sonneneinstrahlungsrichtung

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	07:08 (WEA 06 (GRN))	07:17		07:16	08:12	
	21:54	29 06:11 (WEA 05 (GRN))	21:18	19 06:17 (WEA 05 (GRN))	20:10	6 07:14 (WEA 06 (GRN))	18:55		18:44	15:59	
2	04:48	05:21 (WEA 02 (GRN))	05:29	06:00 (WEA 05 (GRN))	06:25	11 07:05 (WEA 06 (GRN))	07:19		07:19	08:14	
	21:53	30 06:11 (WEA 05 (GRN))	21:16	16 06:16 (WEA 05 (GRN))	20:08	11 07:16 (WEA 06 (GRN))	18:53		16:42	15:58	
3	04:48	05:22 (WEA 02 (GRN))	05:31	16 06:02 (WEA 05 (GRN))	06:26	17 07:04 (WEA 06 (GRN))	07:21		07:20	08:15	
	21:53	30 06:12 (WEA 05 (GRN))	21:14	13 06:15 (WEA 05 (GRN))	20:05	14 07:18 (WEA 06 (GRN))	18:50		16:40	15:57	
4	04:49	05:23 (WEA 02 (GRN))	05:33	16 06:03 (WEA 05 (GRN))	06:28	17 07:03 (WEA 06 (GRN))	07:23		07:22	08:17	
	21:52	30 06:13 (WEA 05 (GRN))	21:12	16 06:19 (WEA 03 (GRN))	20:03	16 07:19 (WEA 06 (GRN))	18:48		18:38	15:56	
5	04:50	05:24 (WEA 02 (GRN))	05:34	16 06:11 (WEA 03 (GRN))	06:30	17 07:01 (WEA 06 (GRN))	07:24		07:24	08:18	
	21:52	31 06:14 (WEA 05 (GRN))	21:10	10 06:21 (WEA 03 (GRN))	20:00	17 07:18 (WEA 06 (GRN))	18:45		16:36	15:56	
6	04:51	05:25 (WEA 02 (GRN))	05:36	10 06:10 (WEA 03 (GRN))	06:32	17 07:01 (WEA 06 (GRN))	07:26	06:09 (WEA_G2)	07:26	08:20	
	21:51	30 06:14 (WEA 05 (GRN))	21:08	12 06:22 (WEA 03 (GRN))	19:58	18 07:19 (WEA 06 (GRN))	18:43	6 06:15 (WEA_G2)	16:34	15:55	
7	04:52	05:26 (WEA 02 (GRN))	05:38	10 06:09 (WEA 03 (GRN))	06:34	18 07:01 (WEA 06 (GRN))	07:28	6 06:05 (WEA_G2)	07:28	08:21	14:58 (WEA 10 (GRS))
	21:50	31 06:15 (WEA 05 (GRN))	21:06	13 06:22 (WEA 03 (GRN))	19:55	18 07:19 (WEA 06 (GRN))	18:41	23 06:31 (WEA_G1)	16:32	15:55	5 15:03 (WEA 10 (GRS))
8	04:53	05:26 (WEA 02 (GRN))	05:40	13 06:11 (WEA 03 (GRN))	06:35	18 07:06 (WEA 06 (GRN))	07:30	23 06:03 (WEA_G2)	07:30	08:22	14:57 (WEA 10 (GRS))
	21:50	31 06:15 (WEA 05 (GRN))	21:04	13 06:23 (WEA 03 (GRN))	19:53	15 07:18 (WEA 06 (GRN))	18:38	31 06:34 (WEA_G1)	16:30	15:54	7 15:04 (WEA 10 (GRS))
9	04:54	05:27 (WEA 02 (GRN))	05:41	13 06:11 (WEA 03 (GRN))	06:37	15 07:04 (WEA 06 (GRN))	07:32	31 06:02 (WEA_G2)	07:32	08:23	14:57 (WEA 10 (GRS))
	21:49	31 06:16 (WEA 05 (GRN))	21:02	11 06:22 (WEA 03 (GRN))	19:50	13 07:17 (WEA 06 (GRN))	18:36	34 06:36 (WEA_G1)	16:28	15:54	9 15:06 (WEA 10 (GRS))
10	04:55	05:29 (WEA 02 (GRN))	05:43	10 06:13 (WEA 03 (GRN))	06:39	13 07:06 (WEA 06 (GRN))	07:34	34 06:01 (WEA_G2)	07:34	08:25	14:56 (WEA 10 (GRS))
	21:48	30 06:17 (WEA 05 (GRN))	21:00	10 06:23 (WEA 03 (GRN))	19:48	10 07:16 (WEA 06 (GRN))	18:33	36 06:37 (WEA_G1)	16:27	15:54	11 15:07 (WEA 10 (GRS))
11	04:56	05:30 (WEA 02 (GRN))	05:45	10 06:15 (WEA 03 (GRN))	06:41	10 07:06 (WEA 06 (GRN))	07:36	36 06:03 (WEA_G2)	07:36	08:26	14:56 (WEA 10 (GRS))
	21:47	30 06:18 (WEA 05 (GRN))	20:58	8 06:23 (WEA 03 (GRN))	19:45	7 07:15 (WEA 06 (GRN))	18:31	35 06:38 (WEA_G1)	16:25	15:53	11 15:07 (WEA 10 (GRS))
12	04:58	05:31 (WEA 02 (GRN))	05:47	8 06:23 (WEA 03 (GRN))	06:43	7 07:10 (WEA 06 (GRN))	07:37	35 06:05 (WEA_G2)	07:38	08:27	14:56 (WEA 10 (GRS))
	21:46	29 06:18 (WEA 05 (GRN))	20:56	5 06:21 (WEA 03 (GRN))	19:43	2 07:12 (WEA 06 (GRN))	18:29	33 06:38 (WEA_G1)	16:23	15:53	12 15:08 (WEA 10 (GRS))
13	04:59	05:32 (WEA 02 (GRN))	05:49	5 06:18 (WEA 03 (GRN))	06:44	2 07:39	07:39	33 06:07 (WEA_G2)	07:40	08:28	14:56 (WEA 10 (GRS))
	21:45	28 06:19 (WEA 05 (GRN))	20:54	3 06:21 (WEA 03 (GRN))	19:40	18:26	32 06:39 (WEA_G1)	16:21	15:53	13 15:09 (WEA 10 (GRS))	
14	05:00	05:33 (WEA 02 (GRN))	05:50		06:46	18:26	32 06:39 (WEA_G1)	16:21	15:53	13 15:09 (WEA 10 (GRS))	
	21:44	27 06:19 (WEA 05 (GRN))	20:52		19:38	07:41	25 06:09 (WEA_G2)	07:42	08:29	14:56 (WEA 10 (GRS))	
15	05:01	05:34 (WEA 02 (GRN))	05:52		06:48	07:43	25 06:09 (WEA_G2)	07:42	08:29	14:56 (WEA 10 (GRS))	
	21:43	25 06:19 (WEA 05 (GRN))	20:49		19:35	18:21	28 06:11 (WEA_G1)	07:44	08:30	14:57 (WEA 10 (GRS))	
16	05:03	05:53 (WEA 05 (GRN))	05:54		06:50	18:21	28 06:39 (WEA_G1)	16:18	15:53	13 15:10 (WEA 10 (GRS))	
	21:42	26 06:19 (WEA 05 (GRN))	20:47		19:33	07:45	25 06:13 (WEA_G1)	07:46	08:31	14:57 (WEA 10 (GRS))	
17	05:04	05:54 (WEA 05 (GRN))	05:56		06:52	18:19	25 06:38 (WEA_G1)	16:17	15:53	14 15:11 (WEA 10 (GRS))	
	21:41	26 06:20 (WEA 05 (GRN))	20:45		19:30	07:47	25 06:15 (WEA_G1)	07:47	08:32	14:57 (WEA 10 (GRS))	
18	05:05	05:54 (WEA 05 (GRN))	05:58		06:53	18:17	23 06:38 (WEA_G1)	16:15	15:53	14 15:11 (WEA 10 (GRS))	
	21:39	26 06:20 (WEA 05 (GRN))	20:43		19:28	07:49	23 06:38 (WEA_G1)	16:15	15:53	14 15:11 (WEA 10 (GRS))	
19	05:07	05:53 (WEA 05 (GRN))	05:59		06:55	18:14	21 06:38 (WEA_G1)	16:14	15:53	14 15:12 (WEA 10 (GRS))	
	21:38	27 06:20 (WEA 05 (GRN))	20:41		19:25	07:51	21 06:19 (WEA_G1)	07:51	08:33	14:59 (WEA 10 (GRS))	
20	05:08	05:54 (WEA 05 (GRN))	06:01		06:57	5 07:36 (WEA 08 (GRN))	18:12	18 06:37 (WEA_G1)	16:12	15:54	14 15:13 (WEA 10 (GRS))
	21:37	27 06:21 (WEA 05 (GRN))	20:38		19:23	10 07:38 (WEA 08 (GRN))	18:10	15 06:36 (WEA_G1)	16:11	15:54	14 15:13 (WEA 10 (GRS))
21	05:10	05:54 (WEA 05 (GRN))	06:03		06:59	10 07:26 (WEA 08 (GRN))	07:55	15 06:23 (WEA_G1)	07:55	08:35	14:59 (WEA 10 (GRS))
	21:35	27 06:21 (WEA 05 (GRN))	20:36		19:20	12 07:36 (WEA 08 (GRN))	18:08	12 06:35 (WEA_G1)	16:09	15:54	15 15:14 (WEA 10 (GRS))
22	05:11	05:53 (WEA 05 (GRN))	06:05		07:01	07:27 (WEA 08 (GRN))	07:57	12 06:25 (WEA_G1)	07:57	08:35	14:59 (WEA 10 (GRS))
	21:34	28 06:21 (WEA 05 (GRN))	20:34		19:18	12 07:39 (WEA 08 (GRN))	18:05	9 06:34 (WEA_G1)	16:08	15:55	15 15:14 (WEA 10 (GRS))
23	05:13	05:54 (WEA 05 (GRN))	06:07		07:02	07:29 (WEA 08 (GRN))	07:59	9 06:27 (WEA_G1)	07:59	08:36	15:01 (WEA 10 (GRS))
	21:33	27 06:21 (WEA 05 (GRN))	20:31		19:15	10 07:39 (WEA 08 (GRN))	18:03	5 06:32 (WEA_G1)	16:07	15:55	14 15:15 (WEA 10 (GRS))
24	05:14	05:54 (WEA 05 (GRN))	06:08		07:04	07:31 (WEA 08 (GRN))	08:01	5 06:29 (WEA_G1)	16:07	08:36	15:01 (WEA 10 (GRS))
	21:31	27 06:21 (WEA 05 (GRN))	20:29		19:13	6 07:39 (WEA 08 (GRN))	18:01	1 06:30 (WEA_G1)	16:06	15:56	14 15:15 (WEA 10 (GRS))
25	05:16	05:54 (WEA 05 (GRN))	06:10		07:06	07:33 (WEA 08 (GRN))	07:02		08:02	08:36	15:01 (WEA 10 (GRS))
	21:29	27 06:21 (WEA 05 (GRN))	20:27	8 06:47 (WEA 07 (GRN))	19:10	5 07:38 (WEA 08 (GRN))	18:59		16:04	15:57	14 15:15 (WEA 10 (GRS))
26	05:18	05:54 (WEA 05 (GRN))	06:12	8 06:40 (WEA 07 (GRN))	07:08	07:28 (WEA 08 (GRN))	07:53		16:04	08:37	15:02 (WEA 10 (GRS))
	21:28	27 06:21 (WEA 05 (GRN))	20:24	8 06:48 (WEA 07 (GRN))	19:08	2 07:36 (WEA 08 (GRN))	18:56		16:03	15:57	14 15:16 (WEA 10 (GRS))
27	05:19	05:55 (WEA 05 (GRN))	06:14	8 06:42 (WEA 07 (GRN))	07:10		07:06		16:02	08:37	15:03 (WEA 10 (GRS))
	21:26	26 06:21 (WEA 05 (GRN))	20:22	6 06:48 (WEA 07 (GRN))	19:05		16:54		16:02	15:58	13 15:16 (WEA 10 (GRS))
28	05:21	05:55 (WEA 05 (GRN))	06:16	6 06:44 (WEA 07 (GRN))	07:11		07:08		16:01	08:37	15:03 (WEA 10 (GRS))
	21:25	25 06:20 (WEA 05 (GRN))	20:20	5 06:49 (WEA 07 (GRN))	19:03		16:52		16:01	15:59	14 15:17 (WEA 10 (GRS))
29	05:22	05:56 (WEA 05 (GRN))	06:17	5 06:45 (WEA 07 (GRN))	07:13		07:10		16:00	08:37	15:04 (WEA 10 (GRS))
	21:23	24 06:20 (WEA 05 (GRN))	20:17	3 06:48 (WEA 07 (GRN))	19:00		16:50		16:00	16:00	13 15:17 (WEA 10 (GRS))
30	05:24	05:56 (WEA 05 (GRN))	06:19		07:15		07:12		16:00	08:37	15:05 (WEA 10 (GRS))
	21:21	23 06:19 (WEA 05 (GRN))	20:15		18:58		16:48		15:59	16:01	12 15:17 (WEA 10 (GRS))
31	05:26	05:57 (WEA 05 (GRN))	06:21				07:14			08:37	15:05 (WEA 10 (GRS))
	21:19	21 06:18 (WEA 05 (GRN))	20:12				16:46			16:02	12 15:17 (WEA 10 (GRS))
Sonnenscheinstunden	515		461		383		328		257	231	314
astr.max.mögl.Beschattung	856		179		211		417				

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 43 - IO 43 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 16:03	08:06 16:55	07:08 17:52	06:52 19:51	05:42 20:46	04:51 21:39
2	08:37 16:04	08:04 16:57	07:05 17:54	06:49 19:53	05:39 20:49	04:50 21:40
3	08:37 16:05	08:03 16:59	07:03 17:56	06:47 19:55	05:37 20:51	04:49 21:41
4	08:37 16:07	08:01 17:01	07:01 17:58	06:44 19:57	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	04:46 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 17:09	06:51 18:06	06:35 20:04	05:27 21:00	04:46 21:46
9	08:34 16:14	07:51 17:11	06:49 18:08	06:32 20:06	05:25 21:02	04:45 21:47
10	08:34 16:15	07:49 17:13	06:46 18:09	06:30 20:08	05:24 21:04	04:44 21:48
11	08:33 16:17	07:47 17:16	06:44 18:11	06:27 20:10	05:22 21:06	04:44 21:49
12	08:32 16:18	07:45 17:18	06:41 18:13	06:25 20:12	05:20 21:08	04:44 21:50
13	08:31 16:20	07:43 17:20	06:39 18:15	06:22 20:14	05:18 21:09	04:43 21:50
14	08:30 16:21	07:41 17:22	06:36 18:17	06:20 20:16	05:16 21:11	04:43 21:51
15	08:29 16:23	07:39 17:24	06:34 18:19	06:18 20:18	05:15 21:13	04:43 21:52
16	08:28 16:25	07:37 17:26	06:31 18:21	06:15 20:20	05:13 21:15	04:42 21:52
17	08:27 16:27	07:35 17:28	06:29 18:23	06:13 20:21	05:11 21:16	04:42 21:53
18	08:26 16:28	07:33 17:30	06:27 18:25	06:11 20:23	05:10 21:18	04:42 21:53
19	08:25 16:30	07:31 17:32	06:24 18:27	06:08 20:25	05:08 21:20	04:42 21:54
20	08:24 16:32	07:28 17:34	06:22 18:29	06:06 20:27	05:06 21:21	04:42 21:54
21	08:23 16:34	07:26 17:36	06:19 18:31	06:04 20:29	05:05 21:23	04:43 21:54
22	08:21 16:36	07:24 17:38	06:17 18:32	06:01 20:31	05:03 21:24	04:43 21:54
23	08:20 16:38	07:22 17:40	06:14 18:34	05:59 20:33	05:02 21:26	04:43 21:55
24	08:19 16:39	07:19 17:42	06:12 18:36	05:57 20:35	05:01 21:27	04:43 21:55
25	08:17 16:41	07:17 17:44	06:09 18:38	05:55 20:36	05:00 21:29	04:44 21:55
26	08:16 16:43	07:15 17:46	06:07 18:40	05:52 20:38	04:59 21:30	04:44 21:55
27	08:14 16:45	07:12 17:48	06:04 18:42	05:50 20:40	04:58 21:32	04:44 21:55
28	08:13 16:47	07:10 17:50	06:02 18:44	05:48 20:42	04:57 21:33	04:45 21:55
29	08:11 16:49		05:59 19:46	05:46 20:44	04:56 21:35	04:46 21:54
30	08:10 16:51		05:57 19:48	05:44 20:46	04:55 21:36	04:46 21:54
31	08:08 16:53		05:54 19:49	05:42 20:48	04:54 21:37	04:46 21:54
	Sonnenscheinstunden astr.max.mögl.Beschattung	246 272	248 272	248 272	246 272	246 272

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

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

DNV

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 43 - IO 43 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

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		07:19		07:18	08:14			
	21:53	21:16	20 06:29 (WEA 05 (GRN))	20:08		18:53		16:42	15:58			
3	04:48	05:31	06:09 (WEA 05 (GRN))	06:26		07:21	07:05 (WEA 06 (GRN))	07:20	08:15			
	21:53	21:14	21 06:30 (WEA 05 (GRN))	20:05	6	07:11 (WEA 06 (GRN))	18:50	16:40	15:57			
4	04:49	05:33	06:08 (WEA 05 (GRN))	06:28		07:23	07:02 (WEA 06 (GRN))	07:22	08:17			
	21:52	21:12	21 06:29 (WEA 05 (GRN))	20:03	11	07:13 (WEA 06 (GRN))	18:48	15	08:18 (WEA_G1)	16:38	15:56	
5	04:50	05:34	06:09 (WEA 05 (GRN))	06:30		07:24	07:00 (WEA 06 (GRN))	07:24	08:18			
	21:52	21:10	21 06:30 (WEA 05 (GRN))	20:00	13	07:13 (WEA 06 (GRN))	18:45	24	08:21 (WEA_G1)	16:36	15:56	
6	04:51	05:36	06:09 (WEA 05 (GRN))	06:32		07:26	06:59 (WEA 06 (GRN))	07:26	08:20			
	21:51	21:08	21 06:30 (WEA 05 (GRN))	19:58	15	07:14 (WEA 06 (GRN))	18:43	28	08:23 (WEA_G1)	16:34	15:55	
7	04:52	05:38	06:08 (WEA 05 (GRN))	06:34		07:28	07:01 (WEA 06 (GRN))	07:28	08:21			
	21:50	21:06	21 06:29 (WEA 05 (GRN))	19:55	13	07:14 (WEA 06 (GRN))	18:41	29	08:24 (WEA_G1)	16:32	15:55	
8	04:53	05:40	06:10 (WEA 05 (GRN))	06:35		07:30	07:03 (WEA 06 (GRN))	07:30	08:22			
	21:50	21:04	19 06:29 (WEA 05 (GRN))	19:53	11	07:14 (WEA 06 (GRN))	18:38	27	08:25 (WEA_G1)	16:30	15:54	
9	04:54	05:41 (WEA 02 (GRN))	05:41	06:11 (WEA 05 (GRN))	06:37		07:32	07:04 (WEA 06 (GRN))	07:32	08:23		
	21:49	5 05:46 (WEA 02 (GRN))	21:02	17 06:28 (WEA 05 (GRN))	19:50	9	07:13 (WEA 06 (GRN))	18:36	26	08:25 (WEA_G1)	16:28	15:54
10	04:55	05:41 (WEA 02 (GRN))	05:43	06:13 (WEA 05 (GRN))	06:39		07:34	07:06 (WEA 06 (GRN))	07:34	08:25		
	21:48	7 05:48 (WEA 02 (GRN))	21:00	15 06:28 (WEA 05 (GRN))	19:48	6	07:12 (WEA 06 (GRN))	18:33	24	08:25 (WEA_G1)	16:27	15:54
11	04:56	05:40 (WEA 02 (GRN))	05:45	06:15 (WEA 05 (GRN))	06:41		07:36	07:08 (WEA 06 (GRN))	07:36	08:26		
	21:47	9 05:49 (WEA 02 (GRN))	20:58	12 06:27 (WEA 05 (GRN))	19:45	3	07:11 (WEA 06 (GRN))	18:31	22	08:25 (WEA_G1)	16:25	15:53
12	04:58	05:39 (WEA 02 (GRN))	05:47	06:16 (WEA 05 (GRN))	06:43		07:37	08:05 (WEA_G1)	07:38	08:27		
	21:46	11 05:50 (WEA 02 (GRN))	20:56	10 06:26 (WEA 03 (GRN))	19:43		18:29	20 08:25 (WEA_G1)	16:23	15:53		
13	04:59	05:39 (WEA 02 (GRN))	05:49	06:18 (WEA 05 (GRN))	06:44		07:39	08:07 (WEA_G1)	07:40	08:28		
	21:45	11 05:50 (WEA 02 (GRN))	20:54	9 06:27 (WEA 03 (GRN))	19:40		18:26	17 08:24 (WEA_G1)	16:21	15:53		
14	05:00	05:38 (WEA 02 (GRN))	05:50	06:20 (WEA 03 (GRN))	06:46		07:41	08:09 (WEA_G1)	07:42	08:29		
	21:44	13 05:51 (WEA 02 (GRN))	20:52	7 06:27 (WEA 03 (GRN))	19:38		18:24	15 08:24 (WEA_G1)	16:20	15:53		
15	05:01	05:38 (WEA 02 (GRN))	05:52	06:21 (WEA 03 (GRN))	06:48		07:43	08:11 (WEA_G1)	07:44	08:30		
	21:43	14 21:08 (WEA 33 (LR))	20:49	5 06:26 (WEA 03 (GRN))	19:35		18:21	12 08:23 (WEA_G1)	16:18	15:53		
16	05:03	05:37 (WEA 02 (GRN))	05:54	06:23 (WEA 03 (GRN))	06:50		07:45	08:13 (WEA_G1)	07:46	08:31		
	21:42	16 21:07 (WEA 33 (LR))	20:47	3 06:26 (WEA 03 (GRN))	19:33		18:19	9 08:22 (WEA_G1)	16:17	15:53		
17	05:04	05:38 (WEA 02 (GRN))	05:56	06:25 (WEA 03 (GRN))	06:52		07:47	08:15 (WEA_G1)	07:47	08:32		
	21:41	16 21:06 (WEA 33 (LR))	20:45	1 06:26 (WEA 03 (GRN))	19:30		18:17	6 08:21 (WEA_G1)	16:15	15:53		
18	05:05	05:38 (WEA 02 (GRN))	05:58		06:53		07:25 (WEA 08 (GRN))	07:49	08:17 (WEA_G1)	07:49	08:33	
	21:39	16 21:05 (WEA 33 (LR))	20:43		19:28	4	07:29 (WEA 08 (GRN))	18:14	2 08:19 (WEA_G1)	16:14	15:53	
19	05:07	05:39 (WEA 02 (GRN))	05:59		06:55		07:23 (WEA 08 (GRN))	07:51		07:51	08:33	
	21:38	13 05:52 (WEA 02 (GRN))	20:41		19:25	8	07:31 (WEA 08 (GRN))	18:12		16:12	15:54	
20	05:08	05:41 (WEA 02 (GRN))	06:01		06:57		07:24 (WEA 08 (GRN))	07:53		07:53	08:34	
	21:37	12 05:53 (WEA 02 (GRN))	20:38		19:23	9	07:33 (WEA 08 (GRN))	18:10		16:11	15:54	
21	05:10	05:42 (WEA 02 (GRN))	06:03		06:59		07:25 (WEA 08 (GRN))	07:55		07:55	08:35	
	21:35	11 05:53 (WEA 02 (GRN))	20:36		19:20	7	07:32 (WEA 08 (GRN))	18:08		16:09	15:54	
22	05:11	05:43 (WEA 02 (GRN))	06:05		07:01		07:27 (WEA 08 (GRN))	07:57		07:57	08:35	
	21:34	9 05:52 (WEA 02 (GRN))	20:34		19:18	5	07:32 (WEA 08 (GRN))	18:05		16:08	15:55	
23	05:13	05:45 (WEA 02 (GRN))	06:07		07:02		07:29 (WEA 08 (GRN))	07:59		07:59	08:36	
	21:33	8 05:53 (WEA 02 (GRN))	20:31		19:15	3	07:32 (WEA 08 (GRN))	18:03		16:07	15:55	
24	05:14	05:46 (WEA 02 (GRN))	06:08		07:04			08:01		08:00	08:36	
	21:31	6 05:52 (WEA 02 (GRN))	20:29		19:13			18:01		16:06	15:56	
25	05:16	05:48 (WEA 02 (GRN))	06:10		07:06			07:02		08:02	08:36	
	21:29	4 05:52 (WEA 02 (GRN))	20:27		19:10			16:59		16:04	15:57	
26	05:18	05:49 (WEA 02 (GRN))	06:12		07:08			07:04		08:04	08:37	
	21:28	2 05:51 (WEA 02 (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	7 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	12 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	13 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	16 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		08:14	08:37	
	21:19	17 06:28 (WEA 05 (GRN))	20:12					16:46		16:02	16:02	
Sonnenscheinstunden		515	461		383		328		257	231		
astr.max.mögl.Beschattung		248	242		123		276					

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

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 44 - IO 44 Kälberhof 5 (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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

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

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 44 - IO 44 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 Sonneneinstrahlungsrichtung

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	06:50 (WEA 05 (GRN))	07:17	08:09 (WEA_G1)	07:16	08:12	14:50 (WEA 10 (GRS))		
2	12:54	05:58 (WEA 05 (GRN))	12:18	06:12 (WEA 03 (GRN))	20:10	07:02 (WEA 05 (GRN))	18:55	10	08:19 (WEA_G1)	16:44	15:59	9	15:07 (WEA 10 (GRS))
3	04:48	05:21 (WEA 02 (GRN))	05:29	06:00 (WEA 03 (GRN))	06:25	06:52 (WEA 05 (GRN))	07:19	07:58 (WEA_G2)	07:18	08:14	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 05 (GRN))	07:23	07:53 (WEA_G2)	07:22	08:17	14:57 (WEA 10 (GRS))		
5	12:52	05:58 (WEA 05 (GRN))	12:12	06:12 (WEA 03 (GRN))	20:03	06:59 (WEA 05 (GRN))	18:48	31	08:24 (WEA_G1)	16:38	15:56	14	15:11 (WEA 10 (GRS))
6	04:50	05:24 (WEA 05 (GRN))	05:34	06:05 (WEA 03 (GRN))	06:30	07:02 (WEA 05 (GRN))	18:53	24	08:22 (WEA_G1)	16:42	15:58	11	15:09 (WEA 10 (GRS))
7	12:53	05:58 (WEA 05 (GRN))	12:14	06:12 (WEA 03 (GRN))	20:05	07:01 (WEA 05 (GRN))	18:50	29	08:23 (WEA_G1)	16:40	15:57	12	15:10 (WEA 10 (GRS))
8	04:49	05:24 (WEA 05 (GRN))	05:33	06:03 (WEA 03 (GRN))	06:28	06:56 (WEA 05 (GRN))	07:23	07:53 (WEA_G2)	07:22	08:17	14:57 (WEA 10 (GRS))		
9	12:52	05:58 (WEA 05 (GRN))	12:12	06:12 (WEA 03 (GRN))	20:03	06:59 (WEA 05 (GRN))	18:48	31	08:24 (WEA_G1)	16:38	15:56	14	15:11 (WEA 10 (GRS))
10	04:51	05:24 (WEA 05 (GRN))	05:36	06:07 (WEA 03 (GRN))	06:32	07:02 (WEA 05 (GRN))	18:53	33	08:25 (WEA_G1)	16:36	15:56	15	15:12 (WEA 10 (GRS))
11	12:51	05:59 (WEA 05 (GRN))	12:08	06:12 (WEA 03 (GRN))	19:58	07:01 (WEA 05 (GRN))	18:43	32	08:25 (WEA_G1)	16:34	15:55	15	15:12 (WEA 10 (GRS))
12	04:52	05:25 (WEA 05 (GRN))	05:38	06:08 (WEA 03 (GRN))	06:34	07:02 (WEA 05 (GRN))	18:41	30	08:25 (WEA_G1)	16:32	15:55	15	15:13 (WEA 10 (GRS))
13	12:50	05:59 (WEA 05 (GRN))	12:06	06:10 (WEA 03 (GRN))	19:55	07:00 (WEA 05 (GRN))	18:30	29	08:26 (WEA_G1)	16:30	15:54	17	15:14 (WEA 10 (GRS))
14	04:53	05:24 (WEA 05 (GRN))	05:40	06:11 (WEA 03 (GRN))	06:35	07:02 (WEA 05 (GRN))	18:38	29	08:26 (WEA_G1)	16:30	15:54	17	15:14 (WEA 10 (GRS))
15	12:50	05:59 (WEA 05 (GRN))	12:04	06:11 (WEA 03 (GRN))	19:53	07:02 (WEA 05 (GRN))	18:38	29	08:26 (WEA_G1)	16:30	15:54	17	15:14 (WEA 10 (GRS))
16	04:54	05:24 (WEA 05 (GRN))	05:41	06:12 (WEA 03 (GRN))	06:37	07:02 (WEA 05 (GRN))	18:36	27	08:26 (WEA_G1)	16:28	15:54	17	15:15 (WEA 10 (GRS))
17	12:49	05:59 (WEA 05 (GRN))	12:02	06:12 (WEA 03 (GRN))	19:50	07:02 (WEA 05 (GRN))	18:36	27	08:26 (WEA_G1)	16:28	15:54	17	15:15 (WEA 10 (GRS))
18	04:55	05:25 (WEA 05 (GRN))	05:43	06:13 (WEA 03 (GRN))	06:39	07:03 (WEA 05 (GRN))	18:34	26	08:27 (WEA_G1)	16:26	15:54	17	15:15 (WEA 10 (GRS))
19	12:48	05:59 (WEA 05 (GRN))	12:00	06:13 (WEA 03 (GRN))	19:48	07:03 (WEA 05 (GRN))	18:33	24	08:25 (WEA_G1)	16:27	15:54	17	15:15 (WEA 10 (GRS))
20	04:56	05:25 (WEA 05 (GRN))	05:45	06:14 (WEA 03 (GRN))	06:41	07:03 (WEA 05 (GRN))	18:31	22	08:25 (WEA_G1)	16:25	15:53	17	15:15 (WEA 10 (GRS))
21	12:47	05:59 (WEA 05 (GRN))	12:00	06:14 (WEA 03 (GRN))	19:45	07:03 (WEA 05 (GRN))	18:31	22	08:25 (WEA_G1)	16:25	15:53	17	15:15 (WEA 10 (GRS))
22	04:58	05:25 (WEA 05 (GRN))	05:47	06:15 (WEA 03 (GRN))	06:43	07:03 (WEA 05 (GRN))	18:29	19	08:24 (WEA_G1)	16:23	15:53	16	15:15 (WEA 10 (GRS))
23	12:46	05:59 (WEA 05 (GRN))	12:00	06:15 (WEA 03 (GRN))	19:43	07:03 (WEA 05 (GRN))	18:29	19	08:24 (WEA_G1)	16:23	15:53	16	15:15 (WEA 10 (GRS))
24	04:59	05:25 (WEA 05 (GRN))	05:49	06:16 (WEA 03 (GRN))	06:44	07:04 (WEA 05 (GRN))	18:29	17	08:24 (WEA_G1)	16:21	15:53	15	15:14 (WEA 10 (GRS))
25	12:45	05:59 (WEA 05 (GRN))	12:00	06:16 (WEA 03 (GRN))	19:40	07:04 (WEA 05 (GRN))	18:26	17	08:24 (WEA_G1)	16:21	15:53	15	15:14 (WEA 10 (GRS))
26	05:00	05:26 (WEA 05 (GRN))	05:50	06:17 (WEA 03 (GRN))	06:46	07:04 (WEA 05 (GRN))	18:24	14	08:23 (WEA_G1)	16:20	15:53	15	15:14 (WEA 10 (GRS))
27	12:44	05:59 (WEA 05 (GRN))	12:00	06:17 (WEA 03 (GRN))	19:38	07:04 (WEA 05 (GRN))	18:24	14	08:23 (WEA_G1)	16:20	15:53	15	15:14 (WEA 10 (GRS))
28	05:01	05:26 (WEA 05 (GRN))	05:52	06:18 (WEA 03 (GRN))	06:48	07:05 (WEA 05 (GRN))	18:24	14	08:23 (WEA_G1)	16:20	15:53	15	15:14 (WEA 10 (GRS))
29	12:43	05:59 (WEA 05 (GRN))	12:00	06:18 (WEA 03 (GRN))	19:35	07:05 (WEA 05 (GRN))	18:21	10	08:21 (WEA_G1)	16:18	15:53	14	15:14 (WEA 10 (GRS))
30	05:03	05:26 (WEA 05 (GRN))	05:54	06:19 (WEA 03 (GRN))	06:50	07:05 (WEA 05 (GRN))	18:17	07	08:19 (WEA_G1)	16:17	15:53	14	15:14 (WEA 10 (GRS))
31	12:42	05:59 (WEA 05 (GRN))	12:00	06:19 (WEA 03 (GRN))	19:33	07:05 (WEA 05 (GRN))	18:19	7	08:20 (WEA_G1)	16:17	15:53	14	15:14 (WEA 10 (GRS))
1	05:04	05:27 (WEA 05 (GRN))	05:56	06:20 (WEA 03 (GRN))	06:52	07:06 (WEA 05 (GRN))	18:17	3	08:18 (WEA_G1)	16:15	15:53	13	15:14 (WEA 10 (GRS))
2	12:41	05:59 (WEA 05 (GRN))	12:00	06:20 (WEA 03 (GRN))	19:30	07:06 (WEA 05 (GRN))	18:17	3	08:18 (WEA_G1)	16:15	15:53	13	15:14 (WEA 10 (GRS))
3	05:05	05:28 (WEA 05 (GRN))	05:58	06:21 (WEA 03 (GRN))	06:53	07:06 (WEA 05 (GRN))	18:17	3	08:18 (WEA_G1)	16:15	15:53	13	15:14 (WEA 10 (GRS))
4	12:39	05:59 (WEA 05 (GRN))	12:00	06:21 (WEA 03 (GRN))	19:28	07:06 (WEA 05 (GRN))	18:14	0		16:14	15:53	13	15:14 (WEA 10 (GRS))
5	05:07	05:29 (WEA 05 (GRN))	05:59	06:22 (WEA 03 (GRN))	06:55	07:07 (WEA 05 (GRN))	18:14	0		16:14	15:53	13	15:14 (WEA 10 (GRS))
6	12:38	05:59 (WEA 05 (GRN))	12:01	06:22 (WEA 03 (GRN))	19:25	07:07 (WEA 05 (GRN))	18:12	0		16:12	15:53	13	15:15 (WEA 10 (GRS))
7	05:08	05:31 (WEA 05 (GRN))	06:01	06:31 (WEA 07 (GRN))	06:57	07:07 (WEA 05 (GRN))	18:12	0		16:12	15:53	13	15:15 (WEA 10 (GRS))
8	12:37	05:59 (WEA 05 (GRN))	12:00	06:31 (WEA 07 (GRN))	19:23	07:07 (WEA 05 (GRN))	18:10	0		16:11	15:53	13	15:15 (WEA 10 (GRS))
9	05:10	05:32 (WEA 05 (GRN))	06:03	06:32 (WEA 07 (GRN))	06:59	07:08 (WEA 05 (GRN))	18:10	0		16:11	15:53	13	15:15 (WEA 10 (GRS))
10	12:35	05:57 (WEA 05 (GRN))	12:00	06:32 (WEA 07 (GRN))	19:20	07:08 (WEA 05 (GRN))	18:08	0		16:09	15:53	13	15:16 (WEA 10 (GRS))
11	05:11	05:33 (WEA 05 (GRN))	06:05	06:33 (WEA 07 (GRN))	07:01	07:08 (WEA 05 (GRN))	18:07	0		16:09	15:53	13	15:16 (WEA 10 (GRS))
12	12:34	05:56 (WEA 05 (GRN))	12:00	06:33 (WEA 07 (GRN))	19:18	07:08 (WEA 05 (GRN))	18:05	0		16:08	15:53	13	15:16 (WEA 10 (GRS))
13	05:13	05:34 (WEA 05 (GRN))	06:07	06:34 (WEA 07 (GRN))	07:02	07:09 (WEA 05 (GRN))	18:05	0		16:08	15:53	13	15:16 (WEA 10 (GRS))
14	12:33	05:56 (WEA 05 (GRN))	12:01	06:34 (WEA 07 (GRN))	19:15	07:09 (WEA 05 (GRN))	18:03	0		16:07	15:53	13	15:17 (WEA 10 (GRS))
15	05:14	05:34 (WEA 05 (GRN))	06:08	06:35 (WEA 07 (GRN))	07:04	07:09 (WEA 05 (GRN))	18:01	0		16:07	15:53	13	15:17 (WEA 10 (GRS))
16	12:31	05:54 (WEA 05 (GRN))	12:00	06:35 (WEA 07 (GRN))	19:13	07:09 (WEA 05 (GRN))	18:01	0		16:06	15:53	13	15:17 (WEA 10 (GRS))
17	05:16	05:35 (WEA 05 (GRN))	06:10	06:36 (WEA 07 (GRN))	07:06	07:10 (WEA 05 (GRN))	18:01	0		16:06	15:53	13	15:17 (WEA 10 (GRS))
18	12:29	05:52 (WEA 05 (GRN))	12:00	06:36 (WEA 07 (GRN))	19:10	07:10 (WEA 05 (GRN))	17:59	0		16:04	15:53	14	15:18 (WEA 10 (GRS))
19	05:18	05:36 (WEA 05 (GRN))	06:12	06:37 (WEA 07 (GRN))	07:08	07:11 (WEA 05 (GRN))	17:59	0		16:04	15:53	14	15:18 (WEA 10 (GRS))
20	12:28	05:54 (WEA 05 (GRN))	12:00	06:37 (WEA 07 (GRN))	19:08	07:11 (WEA 05 (GRN))	17:56	0		16:03	15:53	14	15:18 (WEA 10 (GRS))
21	05:19	05:37 (WEA 05 (GRN))	06:14	06:38 (WEA 07 (GRN))	07:10	07:12 (WEA 05 (GRN))	17:56	0		16:03	15:53	14	15:18 (WEA 10 (GRS))
22	12:26	05:52 (WEA 05 (GRN))	12:00	06:38 (WEA 07 (GRN))	19:05	07:12 (WEA 05 (GRN))	17:54	0		16:02	15:53	14	15:18 (WEA 10 (GRS))
23	05:21	05:38 (WEA 05 (GRN))	06:16	06:39 (WEA 07 (GRN))	07:11	07:13 (WEA 05 (GRN))	17:54	0		16:02	15:53	14	15:18 (WEA 10 (GRS))
24	12:25	05:54 (WEA 05 (GRN))	12:00	06:39 (WEA 07 (GRN))	19:03	07:13 (WEA 05 (GRN))	17:52	0		16:01	15:53	15	15:21 (WEA 10 (GRS))
25	05:22	05:39 (WEA 05 (GRN))	06:17	06:40 (WEA 07 (GRN))	07:13	07:14 (WEA 05 (GRN))	17:52	0		16:01	15:53	15	15:21 (WEA 10 (GRS))
26	12:23	05:50 (WEA 05 (GRN))	12:00	06:40 (WEA 07 (GRN))	19:00	07:14 (WEA 05 (GRN))	17:50	0		16:00	15:53	15	15:22 (WEA 10 (GRS))
27	05:24	05:40 (WEA 05 (GRN))	06:19	06:41 (WEA 07 (GRN))	07:15	07:15 (WEA 05 (GRN))	17:50	0		16:00	15:53	15	15:22 (WEA 10 (GRS))
28	12:21	05:59 (WEA 05 (GRN))	12:15	06:41 (WEA 07 (GRN))	18:58	07:16 (WEA 05 (GRN))	17:48	0		16:00	15:53	15	15:22 (WEA 10 (GRS))
29	05:26	05:41 (WEA 05 (GRN))	06:21	06:42 (WEA 07 (GRN))	07:16	07:16 (WEA 05 (GRN))	17:48	0		16:00	15:53	15	15:22 (WEA 10 (GRS))
30	12:19	06:11 (WEA 03 (GRN))	12:12	07:04 (WEA 06 (GRN))	18:51	07:17 (WEA 05 (GRN))	17:46	0		16:00	15:53	15	15:22 (WEA 10 (GRS))
31	Sommerscheinstunden	515	461	383	308	257	231						
	astr max mögl Beschattung	594	181	89	361	6	440						

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		

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 45 - IO 45 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	2 09:14 (WEA 12 (GRS))	16:55	17:52	19:51	20:48					21:39
2	08:37	09:12 (WEA 12 (GRS))	08:04	07:05	06:49	05:40					04:50
	16:04	3 09:15 (WEA 12 (GRS))	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	5 09:16 (WEA 12 (GRS))	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	6 09:17 (WEA 12 (GRS))	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	8 09:18 (WEA 12 (GRS))	17:03	18:00	19:59	20:55	2 06:02 (WEA 03 (GRN))				21:43
6	08:36	09:10 (WEA 12 (GRS))	07:57	06:56	06:39	05:31					04:47
	16:09	9 09:19 (WEA 12 (GRS))	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	11 09:20 (WEA 12 (GRS))	17:07	18:04	20:03	20:59	2 05:58 (WEA 05 (GRN))				21:45
8	08:35	09:08 (WEA 12 (GRS))	07:53	06:51	06:35	05:27	05:54 (WEA 05 (GRN))				04:46
	16:12	12 09:20 (WEA 12 (GRS))	17:09	18:06	20:04	21:00	4 05:58 (WEA 05 (GRN))				21:46
9	08:34	09:07 (WEA 12 (GRS))	07:51	06:49	06:32	05:25	05:53 (WEA 05 (GRN))				04:45
	16:14	14 09:21 (WEA 12 (GRS))	17:11	18:08	20:06	21:02	5 05:58 (WEA 05 (GRN))				21:47
10	08:34	09:06 (WEA 12 (GRS))	07:49	06:46	06:30	05:24	05:51 (WEA 05 (GRN))				04:44
	16:15	15 09:21 (WEA 12 (GRS))	17:14	18:09	20:08	21:04	7 05:58 (WEA 05 (GRN))				21:48
11	08:33	09:06 (WEA 12 (GRS))	07:47	06:44	06:27	05:22	05:49 (WEA 05 (GRN))				04:44
	16:17	17 09:23 (WEA 12 (GRS))	17:16	18:11	20:10	21:06	9 05:58 (WEA 05 (GRN))				21:49
12	08:32	09:05 (WEA 12 (GRS))	07:45	06:41	06:25	05:20	05:47 (WEA 05 (GRN))				04:44
	16:18	18 09:23 (WEA 12 (GRS))	17:18	18:13	20:12	21:08	10 05:57 (WEA 05 (GRN))				21:50
13	08:31	09:03 (WEA 12 (GRS))	07:43	06:39	06:22	05:18	05:46 (WEA 05 (GRN))				04:43
	16:20	20 09:23 (WEA 12 (GRS))	17:20	18:15	20:14	21:09	11 05:57 (WEA 05 (GRN))				21:50
14	08:30	09:04 (WEA 12 (GRS))	07:41	06:36	06:20	05:16	05:47 (WEA 05 (GRN))				04:43
	16:21	20 09:24 (WEA 12 (GRS))	17:22	18:17	20:16	21:11	8 05:55 (WEA 05 (GRN))				21:51
15	08:29	09:04 (WEA 12 (GRS))	07:39	06:34	06:18	05:15	05:49 (WEA 05 (GRN))				04:43
	16:23	20 09:24 (WEA 12 (GRS))	17:24	18:19	20:18	21:13	5 05:54 (WEA 05 (GRN))				21:52
16	08:28	09:05 (WEA 12 (GRS))	07:37	06:32	06:15	05:13					04:43
	16:25	20 09:25 (WEA 12 (GRS))	17:26	18:21	3 06:58 (WEA_G1)	20:20	21:15				21:52
17	08:27	09:05 (WEA 12 (GRS))	07:35	06:29	06:53 (WEA_G1)	06:13	05:11				04:42
	16:27	20 09:25 (WEA 12 (GRS))	17:28	18:23	6 06:59 (WEA_G1)	20:21	21:16				21:53
18	08:26	09:05 (WEA 12 (GRS))	07:33	06:27	06:50 (WEA_G1)	06:11	05:10				04:42
	16:28	20 09:25 (WEA 12 (GRS))	17:30	18:25	9 06:59 (WEA_G1)	20:23	21:18				21:53
19	08:25	09:06 (WEA 12 (GRS))	07:31	06:24	06:48 (WEA_G1)	06:08	05:08				04:42
	16:30	19 09:25 (WEA 12 (GRS))	17:32	18:27	11 06:59 (WEA_G1)	20:25	21:20				21:54
20	08:24	09:07 (WEA 12 (GRS))	07:28	06:22	06:45 (WEA_G1)	06:06	05:06	05:35 (WEA 02 (GRN))			04:42
	16:32	19 09:26 (WEA 12 (GRS))	17:34	18:29	13 06:58 (WEA_G1)	20:27	21:21	1 05:36 (WEA 02 (GRN))			21:54
21	08:23	09:07 (WEA 12 (GRS))	07:26	06:19	06:43 (WEA_G1)	06:04	05:05	05:34 (WEA 02 (GRN))			04:43
	16:34	18 09:25 (WEA 12 (GRS))	17:36	18:31	15 06:58 (WEA_G1)	20:29	21:23	3 05:37 (WEA 02 (GRN))			21:54
22	08:21	09:09 (WEA 12 (GRS))	07:24	06:17	06:40 (WEA_G1)	06:01	05:03	05:33 (WEA 02 (GRN))			04:43
	16:36	16 09:25 (WEA 12 (GRS))	17:38	18:32	17 06:57 (WEA_G1)	20:31	21:24	4 05:37 (WEA 02 (GRN))			21:54
23	08:20	09:09 (WEA 12 (GRS))	07:22	06:14	06:41 (WEA_G1)	05:59	05:02	05:32 (WEA 02 (GRN))			04:43
	16:38	15 09:24 (WEA 12 (GRS))	17:40	18:34	15 06:56 (WEA_G1)	20:33	21:26	4 05:36 (WEA 02 (GRN))			21:55
24	08:19	09:11 (WEA 12 (GRS))	07:19	06:12	06:42 (WEA_G1)	05:57	05:01	05:30 (WEA 02 (GRN))			04:43
	16:39	13 09:24 (WEA 12 (GRS))	17:42	18:36	12 06:54 (WEA_G1)	20:35	21:27	5 05:35 (WEA 02 (GRN))			21:55
25	08:17	09:13 (WEA 12 (GRS))	07:17	06:09	06:45 (WEA_G1)	05:55	04:59	05:30 (WEA 02 (GRN))			04:44
	16:41	9 09:22 (WEA 12 (GRS))	17:44	18:38	6 06:51 (WEA_G1)	20:36	21:29	4 05:34 (WEA 02 (GRN))			21:55
26	08:16	09:16 (WEA 12 (GRS))	07:15	06:07		05:52	04:58				04:44
	16:43	3 09:19 (WEA 12 (GRS))	17:46	18:40		20:38	21:30				21:55
27	08:14		07:12	06:04		05:50	04:57				04:45
	16:45		17:48	18:42		20:40	21:32				21:55
28	08:13		07:10	06:02		05:48	04:56				04:45
	16:47		17:50	18:44		20:42	21:33				21:54
29	08:11			06:59		05:46	04:54				04:46
	16:49			19:46		20:44	21:35				21:54
30	08:10			06:57		05:44	04:53				04:46
	16:51			19:48		20:46	21:36				21:54
31	08:08			06:54			04:52				
	16:53			19:49			21:37				
Sonnenscheinstunden	248		272	367		421	496			513	
astr.max.mögl.Beschattung	352			107			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) Schattenanfang	Zeitpunkt (SS:MM) Schatteneende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 45 - IO 45 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

	July	August	September	Oktober	November	Dezember
1	04:47 21:54	05:21 (WEA 04 (GRN)) 21:18	05:59 (WEA 05 (GRN)) 20:10	07:17 18:55	07:16 16:44	08:12 15:59
2	04:48 21:53	05:21 (WEA 04 (GRN)) 21:16	06:00 (WEA 05 (GRN)) 20:08	07:19 18:53	07:18 16:42	08:14 15:58
3	04:48 21:53	05:31 21:14	06:02 (WEA 05 (GRN)) 20:05	07:21 18:50	07:20 16:40	08:15 15:57
4	04:49 21:52	05:33 21:12	06:03 (WEA 05 (GRN)) 20:03	07:23 18:48	07:22 16:38	08:17 15:56
5	04:50 21:52	05:34 21:10	06:05 (WEA 05 (GRN)) 20:00	07:24 18:46	07:24 16:36	08:18 15:56
6	04:51 21:51	05:36 21:08	06:07 (WEA 05 (GRN)) 19:58	07:26 18:43	07:26 16:34	08:20 15:55
7	04:52 21:50	05:38 21:06	06:08 (WEA 05 (GRN)) 19:55	07:28 18:41	07:28 16:32	08:21 15:55
8	04:53 21:50	05:40 21:04	06:10 (WEA 05 (GRN)) 19:53	07:30 18:38	07:30 16:30	08:22 15:54
9	04:54 21:49	05:41 21:02	06:12 (WEA 05 (GRN)) 19:50	07:32 18:36	07:32 16:28	08:23 15:54
10	04:55 21:48	05:43 21:00	06:39 19:48	07:34 18:33	07:34 16:27	08:25 15:54
11	04:56 21:47	05:45 20:58	06:41 19:45	07:36 18:31	07:36 16:25	08:26 15:53
12	04:58 21:46	05:47 20:56	06:43 19:43	07:38 18:29	07:38 16:23	08:27 15:53
13	04:59 21:45	05:49 20:54	06:44 19:40	07:39 18:26	07:40 16:22	08:28 15:53
14	04:59 21:44	05:50 20:52	06:46 19:38	07:41 18:24	07:42 16:20	08:29 15:53
15	05:01 21:43	05:52 20:49	06:48 19:35	07:43 18:21	07:44 16:18	08:30 15:53
16	05:03 21:42	05:54 20:47	06:50 19:33	07:45 18:19	07:46 16:17	08:31 15:53
17	05:04 21:41	05:56 20:45	06:52 19:30	07:47 18:17	07:48 16:15	08:32 15:53
18	05:06 21:39	05:58 20:43	06:53 19:28	07:49 18:14	07:49 16:14	08:33 15:53
19	05:07 21:38	05:59 (WEA 02 (GRN)) 20:41	06:55 19:25	07:51 (WEA_G1) 18:12	07:51 16:12	08:33 15:54
20	05:08 21:37	06:01 (WEA 02 (GRN)) 20:38	06:57 19:23	07:53 (WEA_G1) 18:10	07:53 16:11	08:34 15:54
21	05:10 21:35	06:03 (WEA 02 (GRN)) 20:36	06:59 19:20	07:55 (WEA_G1) 18:08	07:55 16:09	08:35 15:54
22	05:11 21:34	06:05 (WEA 02 (GRN)) 20:34	07:01 19:18	07:57 (WEA_G1) 18:05	07:57 16:08	08:35 15:55
23	05:13 21:33	06:07 (WEA 02 (GRN)) 20:31	07:02 19:15	07:59 (WEA_G1) 18:03	07:59 16:07	08:36 15:55
24	05:14 21:31	06:08 (WEA 02 (GRN)) 20:29	07:04 19:13	08:01 (WEA_G1) 18:01	08:01 16:06	08:36 15:56
25	05:16 21:29	06:10 20:27	07:06 19:10	08:02 (WEA_G1) 18:00	08:02 16:05	08:36 15:57
26	05:18 21:28	06:12 20:24	07:08 19:08	08:04 (WEA_G1) 18:00	08:04 16:05	08:37 15:57
27	05:19 21:26	06:14 20:22	07:10 19:05	08:06 (WEA_G1) 18:00	08:06 16:02	08:37 15:58
28	05:21 21:25	06:16 20:20	07:12 19:03	08:08 (WEA_G1) 18:00	08:08 16:01	08:37 15:59
29	05:23 21:23	06:17 (WEA 05 (GRN)) 20:17	07:13 19:00	08:09 (WEA_G1) 18:00	08:09 16:00	08:37 16:00
30	05:24 21:21	06:19 (WEA 05 (GRN)) 20:15	07:15 18:58	08:11 (WEA_G1) 18:00	08:11 16:00	08:37 16:00
31	05:26 21:19	06:21 (WEA 05 (GRN)) 20:12	07:17 18:56	08:13 (WEA_G1) 18:00	08:13 16:00	08:37 16:01
	Sonnenscheinstunden astr.max.mögl.Beschattung	515 49	461 37	363 110	328 250	231 162

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 46 - IO 46 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

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

Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 46 - IO 46 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

	Juli		August		September		Oktober		November		Dezember	
1	04:47	05:23 (WEA 04 (GRN))	05:28		06:23		07:17	07:16			08:12	08:47 (WEA 12 (GRS))
2	21:54	10 05:33 (WEA 04 (GRN))	21:18		20:10		18:55	16:44			15:59	16 09:03 (WEA 12 (GRS))
	04:48	05:22 (WEA 04 (GRN))	05:29		06:25		07:19	07:18			08:14	08:49 (WEA 12 (GRS))
	21:53	11 05:33 (WEA 04 (GRN))	21:16		20:08		18:53	16:42			15:58	14 09:03 (WEA 12 (GRS))
3	04:48	05:22 (WEA 04 (GRN))	05:31		06:26		07:21	07:20			08:15	08:51 (WEA 12 (GRS))
	21:53	12 05:34 (WEA 04 (GRN))	21:14		20:05		18:50	16:40			15:57	13 09:04 (WEA 12 (GRS))
4	04:49	05:23 (WEA 04 (GRN))	05:33		06:28		07:23	07:22			08:17	08:52 (WEA 12 (GRS))
	21:52	11 05:34 (WEA 04 (GRN))	21:12		20:03		18:48	16:38			15:56	11 09:03 (WEA 12 (GRS))
5	04:50	05:24 (WEA 04 (GRN))	05:34		06:30		07:24	07:24			08:18	08:54 (WEA 12 (GRS))
	21:52	11 05:35 (WEA 04 (GRN))	21:10	7	06:15 (WEA 05 (GRN))	20:00	18:46	16:36			15:56	10 09:04 (WEA 12 (GRS))
6	04:51	05:25 (WEA 04 (GRN))	05:36		06:32		07:26	07:26			08:20	08:55 (WEA 12 (GRS))
	21:51	10 05:35 (WEA 04 (GRN))	21:08	10	06:17 (WEA 05 (GRN))	19:58	18:43	16:34			15:55	8 09:03 (WEA 12 (GRS))
7	04:52	05:26 (WEA 04 (GRN))	05:38		06:34		07:28	07:28			08:21	08:57 (WEA 12 (GRS))
	21:50	10 05:36 (WEA 04 (GRN))	21:06	9	06:17 (WEA 05 (GRN))	19:55	18:41	16:32			15:55	7 09:04 (WEA 12 (GRS))
8	04:53	05:27 (WEA 04 (GRN))	05:40		06:35		07:30	07:30			08:22	08:58 (WEA 12 (GRS))
	21:50	9 05:36 (WEA 04 (GRN))	21:04	8	06:18 (WEA 05 (GRN))	19:53	18:38	16:30			15:54	6 09:04 (WEA 12 (GRS))
9	04:54	05:28 (WEA 04 (GRN))	05:41		06:37		07:32	07:32			08:23	09:00 (WEA 12 (GRS))
	21:49	8 05:36 (WEA 04 (GRN))	21:02	6	06:18 (WEA 05 (GRN))	19:50	18:36	16:28			15:54	4 09:04 (WEA 12 (GRS))
10	04:55	05:29 (WEA 04 (GRN))	05:43		06:39		07:34	07:34			08:25	09:01 (WEA 12 (GRS))
	21:48	8 05:37 (WEA 04 (GRN))	21:00	4	06:17 (WEA 05 (GRN))	19:48	18:33	16:27			15:54	3 09:04 (WEA 12 (GRS))
11	04:56	05:30 (WEA 04 (GRN))	05:45		06:41		07:36	07:36			08:26	09:02 (WEA 12 (GRS))
	21:47	7 05:37 (WEA 04 (GRN))	20:58	2	06:17 (WEA 05 (GRN))	19:45	18:31	16:25			15:53	2 09:04 (WEA 12 (GRS))
12	04:58	05:31 (WEA 04 (GRN))	05:47		06:43		07:38	07:38			08:27	
	21:46	6 05:37 (WEA 04 (GRN))	20:56	1	06:17 (WEA 05 (GRN))	19:43	18:29	16:23			15:53	
13	04:59	05:32 (WEA 04 (GRN))	05:49		06:44		07:39	07:40			08:28	
	21:45	5 05:37 (WEA 04 (GRN))	20:54	1	06:19 (WEA 05 (GRN))	19:40	18:26	16:22			15:53	
14	05:00	05:33 (WEA 04 (GRN))	05:50		06:46		07:41	07:42			08:29	
	21:44	4 05:37 (WEA 04 (GRN))	20:52		19:38		18:24	16:20			15:53	
15	05:01	05:34 (WEA 04 (GRN))	05:52		06:48		07:43	07:44			08:30	
	21:43	2 05:36 (WEA 04 (GRN))	20:49		19:35		18:21	16:18			15:53	
16	05:03	05:36 (WEA 04 (GRN))	05:54		06:50		07:45	07:46			08:31	
	21:42	1 05:37 (WEA 04 (GRN))	20:47		19:33		18:19	16:17			15:53	
17	05:04		05:56		06:52		07:47	07:48			08:32	
	21:41		20:45		19:30		18:17	16:15			15:53	
18	05:06		05:58		06:53		07:49	07:49		08:48 (WEA 12 (GRS))	08:33	
	21:39		20:43		19:28		18:14	16:14	4	08:52 (WEA 12 (GRS))	15:53	
19	05:07		05:59		06:55		07:51	07:51		08:46 (WEA 12 (GRS))	08:33	
	21:38		20:41		19:25		18:12	16:12	10	08:56 (WEA 12 (GRS))	15:54	
20	05:08		06:01		06:57		07:53	07:53		08:45 (WEA 12 (GRS))	08:34	
	21:37		20:38		19:23		18:10	16:11	12	08:57 (WEA 12 (GRS))	15:54	
21	05:10		06:03		06:59		07:55	07:55		08:44 (WEA 12 (GRS))	08:35	
	21:35		20:36		19:20	7	07:42 (WEA_G1)	18:08	14	08:58 (WEA 12 (GRS))	15:54	
22	05:11		06:05		07:01		07:57	07:57		08:44 (WEA 12 (GRS))	08:35	
	21:34		20:34		19:18	12	07:44 (WEA_G1)	18:05	15	08:59 (WEA 12 (GRS))	15:55	
23	05:13		06:07		07:02		07:59	07:59		08:44 (WEA 12 (GRS))	08:36	
	21:33		20:31		19:15	16	07:46 (WEA_G1)	18:03	16	09:00 (WEA 12 (GRS))	15:55	
24	05:14		06:08		07:04		07:51 (WEA_G1)	18:01	08:00	08:44 (WEA 12 (GRS))	08:36	
	21:31		20:29		19:13	15	07:46 (WEA_G1)	18:01	16:06	09:01 (WEA 12 (GRS))	15:56	
25	05:16	2	05:50 (WEA 02 (GRN))	06:10	07:06		07:53 (WEA_G1)	18:02	08:02	08:44 (WEA 12 (GRS))	08:36	
	21:29	2	05:52 (WEA 02 (GRN))	20:27	19:10	14	07:47 (WEA_G1)	18:00	16:05	09:02 (WEA 12 (GRS))	15:57	
26	05:18		06:12		07:08		07:54 (WEA_G1)	18:04	08:04	08:43 (WEA 12 (GRS))	08:37	
	21:28	5	05:54 (WEA 02 (GRN))	20:24	19:08	12	07:46 (WEA_G1)	18:00	16:03	09:01 (WEA 12 (GRS))	15:57	
27	05:19		06:14		07:10		07:56 (WEA_G1)	18:06	08:06	08:43 (WEA 12 (GRS))	08:37	
	21:26	4	05:55 (WEA 02 (GRN))	20:22	19:05	10	07:46 (WEA_G1)	18:04	16:02	09:02 (WEA 12 (GRS))	15:58	
28	05:21		06:16		07:12		07:58 (WEA_G1)	18:08	08:07	08:44 (WEA 12 (GRS))	08:37	
	21:25	3	05:55 (WEA 02 (GRN))	20:20	19:03	7	07:45 (WEA_G1)	18:05	16:01	09:02 (WEA 12 (GRS))	15:59	
29	05:23		06:17		07:13		07:40 (WEA_G1)	18:10	08:09	08:44 (WEA 12 (GRS))	08:37	
	21:23	2	05:56 (WEA 02 (GRN))	20:17	19:00	5	07:45 (WEA_G1)	18:00	16:00	09:03 (WEA 12 (GRS))	16:00	
30	05:24		06:19		07:15		07:42 (WEA_G1)	18:12	08:11	08:46 (WEA 12 (GRS))	08:37	
	21:21	1	05:56 (WEA 02 (GRN))	20:15	18:58	1	07:43 (WEA_G1)	18:08	15:59	09:03 (WEA 12 (GRS))	16:01	
31	05:26		06:21				07:14				08:37	
	21:19		20:12				16:46				16:02	
Sonnenscheinstunden			461		383		328		257		231	
astr.max.mögl.Beschattung		142		48		99			197			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) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 47 - IO 47 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 Sonneneinstrahlungsrichtung
- 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		04:48	05:19 (WEA 01 (GRN))
	16:08	19 09:54 (WEA 11 (GRS))	17:03	18:00	19:59			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		04:47	05:19 (WEA 01 (GRN))
	16:09	17 09:54 (WEA 11 (GRS))	17:05	18:02	20:01			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		04:46	05:18 (WEA 01 (GRN))
	16:11	17 09:54 (WEA 11 (GRS))	17:07	18:04	20:03			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		04:46	05:20 (WEA 01 (GRN))
	16:12	15 09:53 (WEA 11 (GRS))	17:09	18:06	20:05			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		04:45	
	16:14	14 09:53 (WEA 11 (GRS))	17:11	18:08	20:06			21:02		21:47	
10	08:34	09:40 (WEA 11 (GRS))	07:49	06:46	06:30			05:24	05:51 (WEA 02 (GRN))	04:44	
	16:15	12 09:52 (WEA 11 (GRS))	17:14	18:09	20:08			21:04	1 05:52 (WEA 02 (GRN))	21:48	
11	08:33	09:43 (WEA 11 (GRS))	07:47	06:44	06:27			05:22	05:49 (WEA 02 (GRN))	04:44	
	16:17	9 09:52 (WEA 11 (GRS))	17:16	18:11	20:10			21:06	2 05:51 (WEA 02 (GRN))	21:49	
12	08:32	09:45 (WEA 11 (GRS))	07:45	06:41	06:25			05:20	05:48 (WEA 02 (GRN))	04:44	
	16:18	5 09:50 (WEA 11 (GRS))	17:18	18:13	20:12			21:08	2 05:50 (WEA 02 (GRN))	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		04:43	
	16:25		17:26	18:21	20:20			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 09:00 (WEA 12 (GRS))	17:28	18:23	20:21			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 09:00 (WEA 12 (GRS))	17:30	18:25	20:23			21:18		21:53	
19	08:25	08:56 (WEA 12 (GRS))	07:31	06:24	06:08			05:08	05:37 (WEA 04 (GRN))	04:42	
	16:30	6 09:02 (WEA 12 (GRS))	17:32	18:27	20:25			21:20	2 05:39 (WEA 04 (GRN))	21:54	
20	08:24	08:55 (WEA 12 (GRS))	07:28	06:22	06:06			05:06	05:35 (WEA 04 (GRN))	04:42	
	16:32	8 09:03 (WEA 12 (GRS))	17:34	18:29	20:27			21:21	3 05:38 (WEA 04 (GRN))	21:54	
21	08:23	08:53 (WEA 12 (GRS))	07:26	06:19	06:04			05:05	05:34 (WEA 04 (GRN))	04:43	
	16:34	10 09:03 (WEA 12 (GRS))	17:36	18:31	20:29			21:23	4 05:38 (WEA 04 (GRN))	21:54	
22	08:21	08:52 (WEA 12 (GRS))	07:24	06:17	06:01			05:03	05:33 (WEA 04 (GRN))	04:43	
	16:36	12 09:04 (WEA 12 (GRS))	17:38	18:32	20:31			21:24	6 05:39 (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 09:04 (WEA 12 (GRS))	17:40	18:34	20:33			21:26	7 05:39 (WEA 04 (GRN))	21:55	
24	08:19	08:49 (WEA 12 (GRS))	07:19	06:12	05:57			05:01	05:30 (WEA 04 (GRN))	04:43	
	16:39	15 09:04 (WEA 12 (GRS))	17:42	18:36	20:35			21:27	7 05:37 (WEA 04 (GRN))	21:55	
25	08:17	08:48 (WEA 12 (GRS))	07:17	06:09	05:55			04:59	05:29 (WEA 04 (GRN))	04:44	
	16:41	16 09:04 (WEA 12 (GRS))	17:44	18:38	20:36			21:29	8 05:37 (WEA 04 (GRN))	21:55	
26	08:16	08:48 (WEA 12 (GRS))	07:15	06:07	05:52			04:58	05:29 (WEA 04 (GRN))	04:44	
	16:43	16 09:04 (WEA 12 (GRS))	17:46	18:40	20:38			21:30	7 05:36 (WEA 04 (GRN))	21:55	
27	08:14	08:50 (WEA 12 (GRS))	07:13	06:04	05:50			04:57	05:30 (WEA 04 (GRN))	04:45	
	16:45	14 09:04 (WEA 12 (GRS))	17:48	18:42	20:40			21:32	5 05:35 (WEA 04 (GRN))	21:55	
28	08:13	08:50 (WEA 12 (GRS))	07:10	06:02	05:48		06:14 (WEA 05 (GRN))	04:56		04:45	
	16:47	13 09:03 (WEA 12 (GRS))	17:50	18:44	20:42	2	06:16 (WEA 05 (GRN))	21:33		21:54	
29	08:11	08:51 (WEA 12 (GRS))		06:59	05:46		06:12 (WEA 05 (GRN))	04:54		04:46	
	16:49	11 09:02 (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		06:10 (WEA 05 (GRN))	04:53		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			
	16:53			19:49				21:37	1 05:23 (WEA 01 (GRN))		
	248		272		421			496	1 05:24 (WEA 01 (GRN))		513
Sonnenscheinstunden											
astr.max.mögl.Beschattung		334			11			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) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 47 - IO 47 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 Sonneneinstrahlungsrichtung

Die Windenergieanlage/n ist/sind immer in Betrieb

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

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 48 - IO 48 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 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	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	05:40	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	1 05:58 (WEA 02 (GRN))
7	08:35	07:55	06:54	06:37	05:29	04:46	1 05:59 (WEA 02 (GRN))
	16:11	17:07	18:04	20:03	20:59	21:45	2 05:56 (WEA 02 (GRN))
8	08:35	07:53	06:51	06:35	05:27	04:46	2 05:58 (WEA 02 (GRN))
	16:12	17:09	18:06	20:05	21:01	21:46	3 05:54 (WEA 02 (GRN))
9	08:34	07:51	06:49	06:32	05:26	04:45	3 05:57 (WEA 02 (GRN))
	16:14	09:07 (WEA 12 (GRS))	17:11	18:08	21:02	21:47	
10	08:34	09:06 (WEA 12 (GRS))	07:49	06:46	05:24	04:44	
	16:15	09:09 (WEA 12 (GRS))	17:14	18:09	21:04	21:48	
11	08:33	09:06 (WEA 12 (GRS))	07:47	06:44	05:22	04:44	
	16:17	09:11 (WEA 12 (GRS))	17:16	18:11	21:06	21:49	
12	08:32	09:05 (WEA 12 (GRS))	07:45	06:41	05:20	04:44	
	16:18	09:11 (WEA 12 (GRS))	17:18	18:13	21:08	21:50	
13	08:31	09:03 (WEA 12 (GRS))	07:43	06:39	05:18	04:43	
	16:20	09:11 (WEA 12 (GRS))	17:20	18:15	21:09	21:50	05:46 (WEA 04 (GRN))
14	08:30	09:02 (WEA 12 (GRS))	07:41	06:36	05:16	04:43	1 05:47 (WEA 04 (GRN))
	16:21	09:12 (WEA 12 (GRS))	17:22	18:17	21:11	21:51	05:44 (WEA 04 (GRN))
15	08:29	09:01 (WEA 12 (GRS))	07:39	06:34	05:15	04:43	2 05:46 (WEA 04 (GRN))
	16:23	09:12 (WEA 12 (GRS))	17:24	18:19	21:13	21:52	05:43 (WEA 04 (GRN))
16	08:28	09:00 (WEA 12 (GRS))	07:37	06:32	05:13	04:43	1 05:45 (WEA 04 (GRN))
	16:25	09:13 (WEA 12 (GRS))	17:26	18:21	21:15	21:52	4 05:47 (WEA 04 (GRN))
17	08:27	08:59 (WEA 12 (GRS))	07:35	06:29	05:11	04:42	5 05:41 (WEA 04 (GRN))
	16:27	09:13 (WEA 12 (GRS))	17:28	18:23	21:16	21:53	05:40 (WEA 04 (GRN))
18	08:26	08:57 (WEA 12 (GRS))	07:33	06:27	05:10	04:42	7 05:38 (WEA 04 (GRN))
	16:28	09:13 (WEA 12 (GRS))	17:30	18:25	21:18	21:53	05:37 (WEA 04 (GRN))
19	08:25	08:58 (WEA 12 (GRS))	07:31	06:24	05:08	04:42	8 05:46 (WEA 04 (GRN))
	16:30	09:13 (WEA 12 (GRS))	17:32	18:27	21:20	21:54	05:37 (WEA 04 (GRN))
20	08:24	08:59 (WEA 12 (GRS))	07:28	06:22	05:06	04:42	9 05:46 (WEA 04 (GRN))
	16:32	09:14 (WEA 12 (GRS))	17:34	18:29	21:21	21:54	05:35 (WEA 04 (GRN))
21	08:23	08:59 (WEA 12 (GRS))	07:26	06:19	05:05	04:43	9 05:44 (WEA 04 (GRN))
	16:34	09:13 (WEA 12 (GRS))	17:36	18:31	21:23	21:54	05:37 (WEA 04 (GRN))
22	08:21	09:01 (WEA 12 (GRS))	07:24	06:17	05:03	04:43	6 05:43 (WEA 04 (GRN))
	16:36	09:13 (WEA 12 (GRS))	17:38	18:32	21:24	21:54	05:40 (WEA 04 (GRN))
23	08:20	09:02 (WEA 12 (GRS))	07:22	06:14	05:02	04:43	1 05:41 (WEA 04 (GRN))
	16:38	09:12 (WEA 12 (GRS))	17:40	18:34	21:26	21:55	05:41 (WEA 04 (GRN))
24	08:19	09:04 (WEA 12 (GRS))	07:19	06:12	05:01	04:43	1 05:29 (WEA 01 (GRN))
	16:39	09:11 (WEA 12 (GRS))	17:42	18:36	21:27	21:55	06:22 (WEA 05 (GRN))
25	08:17	07:17	06:09	05:55	04:59	04:44	3 06:25 (WEA 05 (GRN))
	16:41	17:44	18:38	20:36	21:29	21:55	06:20 (WEA 05 (GRN))
26	08:16	07:15	06:07	05:52	04:58	04:44	4 06:24 (WEA 05 (GRN))
	16:43	17:46	18:40	20:38	21:30	21:55	06:18 (WEA 05 (GRN))
27	08:14	07:13	06:04	05:50	04:57	04:45	6 06:24 (WEA 05 (GRN))
	16:45	17:48	18:42	20:40	21:32	21:55	06:16 (WEA 05 (GRN))
28	08:13	07:10	06:02	05:48	04:56	04:45	7 06:23 (WEA 05 (GRN))
	16:47	17:50	18:44	20:42	21:33	21:54	06:15 (WEA 05 (GRN))
29	08:11		06:59	05:46	04:54	04:46	6 06:21 (WEA 05 (GRN))
	16:49		19:46	20:44	21:35	21:54	05:26 (WEA 01 (GRN))
30	08:10		06:57	05:44	04:53	04:46	5 05:30 (WEA 01 (GRN))
	16:51		19:48	20:46	21:36	21:54	05:24 (WEA 01 (GRN))
31	08:08		06:54		04:52		5 05:29 (WEA 01 (GRN))
	16:53		19:49		21:37		05:23 (WEA 01 (GRN))
Sonnenscheinstunden	248				496		5 05:28 (WEA 01 (GRN))
astr.max.mögl.Beschattung	160	272	367	421	496	513	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) Schattende	(WEA mit erstem Schatten)	(WEA mit letztem Schatten)
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SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 48 - IO 48 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 Sonneneinstrahlungsrichtung
- 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
	21:54		21:18		20:10		18:55		16:44		15:59
2	04:48		05:29		06:25		07:19		07:18		08:14
	21:53		21:16		20:08		18:53		16:42		15:58
3	04:48		05:31		06:26		07:21		07:20		08:15
	21:53		21:14		20:05		18:50		16:40		15:57
4	04:49		05:33		06:03 (WEA 02 (GRN))		06:28		07:23		07:22
	21:52		21:12		20:03		18:48		16:38		15:56
5	04:50		05:34		06:05 (WEA 02 (GRN))		06:30		07:24		07:24
	21:52		21:10		20:00		18:46		16:36		15:56
6	04:51		05:36		06:07 (WEA 02 (GRN))		06:32		07:26		07:26
	21:51		21:08		20:09 (WEA 02 (GRN))		19:58		18:43		16:34
7	04:52		05:38		06:08 (WEA 02 (GRN))		06:34		07:28		07:28
	21:50		21:06		19:55		18:41		16:32		15:55
8	04:53		05:40		06:35		07:30		07:30		08:22
	21:50		21:04		19:53		18:38		16:30		15:54
9	04:54		05:41		06:37		07:32		07:32		08:23
	21:49		21:02		19:50		18:36		16:28		15:54
10	04:55		05:43		06:39		07:34		07:34		08:25
	21:48		21:00		19:48		18:33		16:27		15:54
11	04:56		05:45		06:41		07:36		07:36		08:26
	21:47		20:58		19:45		18:31		16:25		15:53
12	04:58		05:47		06:43		07:38		07:38		08:27
	21:46		20:56		19:43		18:29		16:23		15:53
13	04:59		05:49		06:44		07:39		07:40		08:28
	21:45		20:54		19:40		18:26		16:22		15:53
14	05:00		05:50		06:46		07:41		07:42		08:29
	21:44		20:52		19:38		18:24		16:20		15:53
15	05:01		05:52		06:22 (WEA 05 (GRN))		06:48		07:43		07:44
	21:43		20:49		19:35		18:21		16:18		15:53
16	05:03		05:54		06:23 (WEA 05 (GRN))		06:50		07:45		07:46
	21:42		20:47		19:33		18:19		16:17		15:53
17	05:04		05:56		06:25 (WEA 05 (GRN))		06:52		07:47		07:48
	21:41		20:45		19:30		18:17		16:15		15:53
18	05:06		05:58		06:27 (WEA 05 (GRN))		06:53		07:49		07:49
	21:39		20:43		19:28		18:14		16:14		15:53
19	05:07		05:59		06:28 (WEA 05 (GRN))		06:55		07:51		07:51
	21:38		20:41		19:25		18:12		16:12		15:54
20	05:08		06:01		06:57		07:53		07:53		08:34
	21:37		20:38		19:23		18:10		16:11		15:54
21	05:10		06:03		06:59		07:55		07:55		08:35
	21:35		20:36		19:20		18:08		16:09		15:54
22	05:11		06:05		07:01		07:57		07:57		08:35
	21:34		20:34		19:18		18:05		16:08		15:55
23	05:13		06:07		07:02		07:59		07:59		08:36
	21:33		20:31		19:15		18:03		16:07		15:55
24	05:14		06:08		07:04		08:01		08:00		08:36
	21:31		20:29		19:13		18:01		16:06		15:56
25	05:16		06:10		07:06		08:03		08:02		08:36
	21:29		20:27		19:10		18:00		16:05		15:57
26	05:18		06:12		07:08		08:04		08:04		08:37
	21:28		20:24		19:08		18:00		16:03		15:57
27	05:19		06:14		07:10		08:06		08:06		08:37
	21:26		20:22		19:05		18:00		16:02		15:58
28	05:21		06:16		07:12		08:07		08:07		08:37
	21:25		20:20		19:03		18:00		16:01		15:59
29	05:23		06:17		07:13		08:09		08:09		08:37
	21:23		20:17		19:00		18:00		16:00		16:00
30	05:24		06:19		07:15		08:11		08:11		08:37
	21:21		20:15		18:58		18:00		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	79		34						151		123

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

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

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 49 - IO 49 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 Sonneneinstrahlungsrichtung
- 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 04 (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 04 (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 04 (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 04 (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 04 (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	05:08	05:37 (WEA 01 (GRN))	04:42
	16:30	3 08:59 (WEA 12 (GRS))	17:32	18:27	20:25	21:20	4 05:41 (WEA 01 (GRN))	21:54
20	08:24	08:55 (WEA 12 (GRS))	07:28	06:22	06:06	05:06	05:35 (WEA 43 (RW))	04:42
	16:32	6 09:01 (WEA 12 (GRS))	17:34	18:29	20:27	21:21	1 05:36 (WEA 43 (RW))	21:54
21	08:23	08:53 (WEA 12 (GRS))	07:26	06:19	06:04	05:05		04:43
	16:34	7 09:00 (WEA 12 (GRS))	17:36	18:31	20:29	21:23		21:54
22	08:21	08:52 (WEA 12 (GRS))	07:24	06:17	06:01	05:03		04:43
	16:36	9 09:01 (WEA 12 (GRS))	17:38	18:32	20:31	21:24		21:54
23	08:20	08:50 (WEA 12 (GRS))	07:22	06:14	05:59	05:02		04:43
	16:38	11 09:01 (WEA 12 (GRS))	17:40	18:34	20:33	21:26		21:55
24	08:19	08:49 (WEA 12 (GRS))	07:19	06:12	05:57	05:01		04:43
	16:39	13 09:02 (WEA 12 (GRS))	17:42	18:36	20:35	21:27		21:55
25	08:17	08:48 (WEA 12 (GRS))	07:17	06:09	05:55	04:59		04:44
	16:41	13 09:01 (WEA 12 (GRS))	17:44	18:38	20:36	21:29		21:55
26	08:16	08:49 (WEA 12 (GRS))	07:15	06:07	05:52	04:58		04:44
	16:43	11 09:00 (WEA 12 (GRS))	17:46	18:40	20:38	21:30		21:55
27	08:14	08:51 (WEA 12 (GRS))	07:13	06:04	05:50	04:57		04:45
	16:45	9 09:00 (WEA 12 (GRS))	17:48	18:42	20:40	21:32		21:55
28	08:13	08:52 (WEA 12 (GRS))	07:10	06:02	05:48	04:56		04:45
	16:47	7 08:59 (WEA 12 (GRS))	17:50	18:44	20:42	21:33		21:54
29	08:11			06:59	05:46	04:54		04:46
	16:49			19:46	20:44	21:35		21:54
30	08:10			06:57	05:44	04:53		04:46
	16:51			19:48	20:46	21:36		21:54
31	08:08			06:54		04:52		
	16:53			19:49		21:37		
Sonneneinstrahlung	248		272		421		496	513
astr.max.mögl.Beschattung	243				16		45	

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 49 - IO 49 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 Sonneneinstrahlungsrichtung

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

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 Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 50 - IO 50 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 Sonneneinstrahlungsrichtung

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

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
Sommerdeich 14 b
DE-25709 Kaiser-Wilhelm-Koog
(0 48 56)901-0



Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 50 - IO 50 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 Sonneneinstrahlungsrichtung

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	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	15:55		
8	04:53	05:27 (WEA 23 (Kab))	05:40	20:23 (WEA 32 (LR))	06:35		07:30	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 23 (Kab))	05:41	20:23 (WEA 32 (LR))	06:37		07:32	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 23 (Kab))	05:43	20:23 (WEA 32 (LR))	06:39		07:34	07:34	08:25		
	21:48	8 05:37 (WEA 23 (Kab))	21:00	6 20:29 (WEA 32 (LR))	19:48		18:33	16:27	15:54		
11	04:56	05:30 (WEA 23 (Kab))	05:45	06:15 (WEA 43 (RW))	06:41	07:10 (WEA 05 (GRN))	07:36	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 23 (Kab))	05:47	06:16 (WEA 43 (RW))	06:43	07:10 (WEA 05 (GRN))	07:38	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 23 (Kab))	05:49	06:18 (WEA 43 (RW))	06:44	07:11 (WEA 05 (GRN))	07:39	07:40	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 23 (Kab))	05:50	06:20 (WEA 43 (RW))	06:46	07:13 (WEA 05 (GRN))	07:41	07:42	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 23 (Kab))	05:52	06:25 (WEA 01 (GRN))	06:48	07:15 (WEA 05 (GRN))	07:43	07:44	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		05:54	06:23 (WEA 01 (GRN))	06:50		07:45	07:46	08:31		
	21:42		20:47	8 06:31 (WEA 01 (GRN))	19:33		18:19	16:17	15:53		
17	05:04		05:56	06:25 (WEA 01 (GRN))	06:52		07:47	07:48	08:32		
	21:41		20:45	7 06:32 (WEA 01 (GRN))	19:30		18:17	16:15	15:53		
18	05:05		05:58	06:27 (WEA 01 (GRN))	06:53		07:49	07:49	08:33		
	21:39		20:43	6 06:33 (WEA 01 (GRN))	19:28		18:14	16:14	15:53		
19	05:07		05:59	06:28 (WEA 01 (GRN))	06:55		07:51	07:51	08:33		
	21:38		20:41	4 06:32 (WEA 01 (GRN))	19:25		18:12	16:12	15:54		
20	05:08		06:01	06:30 (WEA 01 (GRN))	06:57		07:53	07:53	08:34		
	21:37		20:38	2 06:32 (WEA 01 (GRN))	19:23		18:10	16:11	15:54		
21	05:10		06:03		06:59		07:55	07:55	08:35		
	21:35		20:36		19:20		18:08	16:09	15:54		
22	05:11		06:05		07:01		07:57	07:57	08:35		
	21:34		20:34		19:18		18:05	16:08	15:55		
23	05:13		06:07		07:02		07:59	07:59	08:36		
	21:33		20:31		19:15		18:03	16:07	15:55		
24	05:14		06:08		07:04		08:01	08:00	08:36		
	21:31		20:29		19:13		18:01	16:06	15:56		
25	05:16		06:10		07:06		07:03	08:02	08:36		
	21:30		20:27		19:10		16:59	16:04	15:57		
26	05:18		06:12	06:45 (WEA 04 (GRN))	07:08		07:04	08:04	08:37		
	21:28		20:24	8 06:53 (WEA 04 (GRN))	19:08		16:56	16:03	15:57		
27	05:19		06:14	06:44 (WEA 04 (GRN))	07:10		07:06	08:06	08:37		
	21:26		20:22	10 06:54 (WEA 04 (GRN))	19:05		16:54	16:02	15:58		
28	05:21		06:16	06:44 (WEA 04 (GRN))	07:12		07:08	08:07	08:37		
	21:25		20:20	11 06:55 (WEA 04 (GRN))	19:03		16:52	16:01	15:59		
29	05:22		06:17	06:45 (WEA 04 (GRN))	07:13		07:10	08:09	08:37		
	21:23		20:17	10 06:55 (WEA 04 (GRN))	19:00		16:50	16:00	16:00		
30	05:24		06:19	06:47 (WEA 04 (GRN))	07:15		07:12	08:11	08:37		
	21:21		20:15	8 06:55 (WEA 04 (GRN))	18:58		16:48	15:59	16:01		
31	05:26		06:21	06:49 (WEA 04 (GRN))			07:14		08:37		
	21:19		20:12	6 06:55 (WEA 04 (GRN))			16:46		16:02		
Sonneneinstunden	515		461		383		328	257	231		
astr.max.mögl.Beschattung	128		205		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)	Zeitpunkt (SS:MM) Schattende	(WEA mit letztem Schatten)
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Projekt:

SWP Windpark Großenholz

Lizenzierter Anwender:

GL Garrad Hassan Deutschland GmbH
 Sommerdeich 14 b
 DE-25709 Kaiser-Wilhelm-Koog
 (0 48 56)901-0

Berechnet:

22.06.2022 20:19/3.5.584

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 51 - IO 51 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 Sonneneinstrahlungsrichtung
- Die Windenergieanlage/n ist/sind immer in Betrieb

[Januar]		[Februar]		[März]		[April]		[Mai]		[Juni]	
1	08:37	08:06		07:08	07:46 (WEA 04 (GRN))	06:52		07:22 (WEA 43 (RW))	05:42	06:08 (WEA 41 (RW))	04:51
	16:03	16:55		17:52	07:58 (WEA 04 (GRN))	19:51		19:25 (WEA 33 (LR))	20:48	06:12 (WEA 41 (RW))	21:39
2	08:37	08:04		07:05	07:47 (WEA 04 (GRN))	06:49		07:24 (WEA 43 (RW))	05:39	06:06 (WEA 41 (RW))	04:50
	16:04	16:57		17:54	8 07:55 (WEA 04 (GRN))	19:53		19:26 (WEA 33 (LR))	20:50	6 06:12 (WEA 41 (RW))	21:40
3	08:37	08:03		07:03		06:47		19:15 (WEA 33 (LR))	05:37	06:04 (WEA 41 (RW))	04:49
	16:05	16:59		17:56		19:55		19:28 (WEA 33 (LR))	20:51	9 06:13 (WEA 41 (RW))	21:41
4	08:37	08:01		07:01		06:44		19:15 (WEA 33 (LR))	05:35	06:02 (WEA 41 (RW))	04:48
	16:07	17:01		17:58		19:57		19:28 (WEA 33 (LR))	20:53	11 06:13 (WEA 41 (RW))	21:42
5	08:36	07:59		06:58	07:23 (WEA 03 (GRN))	06:42		19:17 (WEA 33 (LR))	05:33	05:58 (WEA 41 (RW))	04:48
	16:08	17:03		18:00	1 07:24 (WEA 03 (GRN))	19:59		19:27 (WEA 33 (LR))	20:55	13 06:13 (WEA 41 (RW))	21:43
6	08:36	07:57		06:56	07:20 (WEA 03 (GRN))	06:39		19:18 (WEA 33 (LR))	05:31	05:58 (WEA 41 (RW))	04:47
	16:09	17:05		18:02	3 07:23 (WEA 03 (GRN))	20:01		19:23 (WEA 33 (LR))	20:57	14 06:12 (WEA 41 (RW))	21:44
7	08:35	07:55		06:54	07:18 (WEA 03 (GRN))	06:37			05:29	05:57 (WEA 41 (RW))	04:46
	16:11	17:07		18:04	5 07:23 (WEA 03 (GRN))	20:03			20:59	15 06:12 (WEA 41 (RW))	21:45
8	08:35	07:53		06:51	07:15 (WEA 03 (GRN))	06:35			05:27	05:58 (WEA 41 (RW))	04:45
	16:12	17:09		18:06	6 07:21 (WEA 03 (GRN))	20:04			21:01	13 06:11 (WEA 41 (RW))	21:46
9	08:34	07:51		06:49	07:13 (WEA 02 (GRN))	06:32			05:25	05:59 (WEA 41 (RW))	04:45
	16:14	17:11		18:08	6 07:19 (WEA 02 (GRN))	20:06			21:02	12 06:11 (WEA 41 (RW))	21:47
10	08:34	07:49		06:46	07:10 (WEA 02 (GRN))	06:30			05:24	06:00 (WEA 41 (RW))	04:44
	16:15	17:13		18:09	8 07:18 (WEA 02 (GRN))	20:08		9 07:06 (WEA 23 (Kab))	21:04	10 06:10 (WEA 41 (RW))	21:48
11	08:33	07:47		06:44	07:08 (WEA 02 (GRN))	06:27			05:22	06:01 (WEA 41 (RW))	04:44
	16:17	17:16		18:11	10 07:18 (WEA 02 (GRN))	20:10		15 07:08 (WEA 23 (Kab))	21:06	7 06:08 (WEA 41 (RW))	21:49
12	08:32	07:45		06:41	07:05 (WEA 01 (GRN))	06:25			05:20		04:44
	16:18	17:18		18:13	12 07:17 (WEA 02 (GRN))	20:12		17 07:09 (WEA 23 (Kab))	21:08		21:50
13	08:31	07:43	08:10 (WEA 05 (GRN))	06:39	07:03 (WEA 01 (GRN))	06:22			05:18		04:43
	16:20	17:20	3 08:13 (WEA 05 (GRN))	18:15	12 07:15 (WEA 02 (GRN))	20:14			21:09		21:51
14	08:30	07:41	08:08 (WEA 05 (GRN))	06:36	07:00 (WEA 01 (GRN))	06:20			05:16		04:43
	16:21	17:22	6 08:14 (WEA 05 (GRN))	18:17	10 07:11 (WEA 02 (GRN))	20:16		21 07:10 (WEA 23 (Kab))	21:11		21:51
15	08:29	07:39	08:05 (WEA 05 (GRN))	06:34	06:58 (WEA 01 (GRN))	06:18			05:15		04:43
	16:23	17:24	8 08:13 (WEA 05 (GRN))	18:19	12 07:10 (WEA 01 (GRN))	20:18			21:13	5 05:48 (WEA 25 (Kab))	21:52
16	08:28	07:37	08:03 (WEA 05 (GRN))	06:32	06:55 (WEA 01 (GRN))	06:15			05:13		04:42
	16:25	17:26	11 08:14 (WEA 05 (GRN))	18:21	14 07:09 (WEA 01 (GRN))	20:20			21:15	9 05:50 (WEA 25 (Kab))	21:52
17	08:27	07:35	08:01 (WEA 05 (GRN))	06:29	06:53 (WEA 01 (GRN))	06:13			05:11		04:42
	16:27	17:28	13 08:14 (WEA 05 (GRN))	18:23	16 07:09 (WEA 01 (GRN))	20:21			21:16	11 05:51 (WEA 25 (Kab))	21:53
18	08:26	07:33	08:01 (WEA 05 (GRN))	06:27	06:53 (WEA 01 (GRN))	06:11			05:10		04:42
	16:28	17:30	13 08:14 (WEA 05 (GRN))	18:25	19 17:58 (WEA 32 (LR))	20:23			21:18	14 05:52 (WEA 25 (Kab))	21:53
19	08:25	07:31	08:01 (WEA 05 (GRN))	06:24	06:54 (WEA 01 (GRN))	06:08			05:08		04:42
	16:30	17:32	11 08:12 (WEA 05 (GRN))	18:27	20 18:00 (WEA 32 (LR))	20:25			21:20	16 05:53 (WEA 25 (Kab))	21:54
20	08:24	07:28	07:54 (WEA 04 (GRN))	06:22	06:54 (WEA 01 (GRN))	06:06			05:06		04:42
	16:32	17:34	13 08:11 (WEA 05 (GRN))	18:29	18 18:01 (WEA 32 (LR))	20:27			21:21	18 05:53 (WEA 25 (Kab))	21:54
21	08:23	07:26	07:52 (WEA 04 (GRN))	06:19	06:56 (WEA 01 (GRN))	06:04			05:05		04:42
	16:34	17:36	8 08:00 (WEA 04 (GRN))	18:31	16 18:04 (WEA 32 (LR))	20:29			21:23	20 05:54 (WEA 25 (Kab))	21:54
22	08:21	07:24	07:49 (WEA 04 (GRN))	06:17	17:56 (WEA 32 (LR))	20:31			05:03		04:43
	16:36	17:38	11 08:00 (WEA 04 (GRN))	18:32	6 18:02 (WEA 32 (LR))	20:31			21:24	21 05:54 (WEA 25 (Kab))	21:54
23	08:20	07:22	07:47 (WEA 04 (GRN))	06:14		06:05			05:02		04:43
	16:38	17:40	14 08:01 (WEA 04 (GRN))	18:34		20:33			21:26	23 05:54 (WEA 25 (Kab))	21:55
24	08:19	07:19	07:45 (WEA 04 (GRN))	06:12		06:07			05:01		04:43
	16:39	17:42	17 08:02 (WEA 04 (GRN))	18:36		20:35			21:27	24 05:54 (WEA 25 (Kab))	21:55
25	08:17	07:17	07:43 (WEA 04 (GRN))	06:09		06:05			04:59		04:44
	16:41	17:44	18 08:01 (WEA 04 (GRN))	18:38		20:36			21:29	26 05:55 (WEA 25 (Kab))	21:55
26	08:16	07:15	07:43 (WEA 04 (GRN))	06:07	06:30 (WEA 43 (RW))	05:52			04:58		04:44
	16:43	17:46	18 08:01 (WEA 04 (GRN))	18:40	3 06:33 (WEA 43 (RW))	20:38			21:30	26 05:55 (WEA 25 (Kab))	21:55
27	08:14	07:13	07:43 (WEA 04 (GRN))	06:04	06:28 (WEA 43 (RW))	05:50			04:57		04:44
	16:45	17:48	17 08:00 (WEA 04 (GRN))	18:42	6 06:34 (WEA 43 (RW))	20:40			21:32	25 05:55 (WEA 25 (Kab))	21:55
28	08:13	07:10	07:44 (WEA 04 (GRN))	06:02	06:25 (WEA 43 (RW))	05:48			04:55		04:45
	16:47	17:50	15 07:59 (WEA 04 (GRN))	18:44	9 06:34 (WEA 43 (RW))	20:42			21:33	25 05:55 (WEA 25 (Kab))	21:54
29	08:11			06:59	07:23 (WEA 43 (RW))	05:46			04:54		04:46
	16:49			19:46	12 19:19 (WEA 33 (LR))	20:44			21:35	24 05:55 (WEA 25 (Kab))	21:54
30	08:10			06:57	07:21 (WEA 43 (RW))	05:44			04:53		04:46
	16:51			19:48	17 19:21 (WEA 33 (LR))	20:46			21:36	24 05:55 (WEA 25 (Kab))	21:54
31	08:08			06:54	07:21 (WEA 43 (RW))	05:44			04:52		04:46
	16:53			19:49	18 19:22 (WEA 33 (LR))	20:47			21:37	23 05:55 (WEA 25 (Kab))	21:54
	246	272	196	367		421		496		513	416
Sonnenscheinstunden											
astr. max. mögl. Beschattung											

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

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

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 51 - IO 51 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 Sonneneinstrahlungsrichtung
- 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			
	17	05:57 (WEA 25 (Kab))	21:18	2	06:16 (WEA 41 (RW))	20:10	15	07:08 (WEA 23 (Kab))	18:55	12	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
	17	05:57 (WEA 25 (Kab))	21:16	8	06:19 (WEA 41 (RW))	20:08	9	07:04 (WEA 23 (Kab))	18:53	11	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
	18	05:58 (WEA 25 (Kab))	21:14	10	06:20 (WEA 41 (RW))	20:05			18:50	9	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
	17	05:58 (WEA 25 (Kab))	21:12	13	06:21 (WEA 41 (RW))	20:03			18:48	7	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
	17	05:59 (WEA 25 (Kab))	21:10	14	06:22 (WEA 41 (RW))	20:00			18:46	6	07:57 (WEA 03 (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
	17	06:00 (WEA 25 (Kab))	21:08	14	06:22 (WEA 41 (RW))	19:58	4	19:19 (WEA 33 (LR))	18:43	6	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
	17	06:00 (WEA 25 (Kab))	21:06	14	06:22 (WEA 41 (RW))	19:55	10	19:22 (WEA 33 (LR))	18:41	4	07:59 (WEA 03 (GRN))	16:32	15:55
8	04:53	05:26 (WEA 40 (RW))	05:40		06:10 (WEA 41 (RW))	06:35		19:10 (WEA 33 (LR))	07:30		07:57 (WEA 03 (GRN))	07:30	08:22
	17	06:00 (WEA 25 (Kab))	21:04	12	06:22 (WEA 41 (RW))	19:53	13	19:23 (WEA 33 (LR))	18:38	2	07:57 (WEA 03 (GRN))	16:30	15:54
9	04:54	05:43 (WEA K04)	05:41		06:11 (WEA 41 (RW))	06:37		19:08 (WEA 33 (LR))	07:32			07:32	08:24
	18	06:01 (WEA 25 (Kab))	21:02	10	06:21 (WEA 41 (RW))	19:50	14	19:22 (WEA 33 (LR))	18:36			16:28	15:54
10	04:55	05:42 (WEA K04)	05:43		06:13 (WEA 41 (RW))	06:39		19:08 (WEA 33 (LR))	07:34			07:34	08:25
	20	06:02 (WEA 25 (Kab))	21:00	8	06:21 (WEA 41 (RW))	19:48	11	19:19 (WEA 33 (LR))	18:33			16:27	15:54
11	04:56	05:42 (WEA K04)	05:45		06:15 (WEA 41 (RW))	06:41		07:14 (WEA 43 (RW))	07:36		08:25 (WEA 04 (GRN))	07:36	08:26
	21	06:03 (WEA 25 (Kab))	20:58	6	06:21 (WEA 41 (RW))	19:45	18	19:17 (WEA 33 (LR))	18:31	1	08:26 (WEA 04 (GRN))	16:25	15:53
12	04:58	05:41 (WEA K04)	05:47		06:16 (WEA 41 (RW))	06:43		07:13 (WEA 43 (RW))	07:38		08:20 (WEA 04 (GRN))	07:38	08:27
	22	06:03 (WEA 25 (Kab))	20:56	3	06:19 (WEA 41 (RW))	19:43	18	19:15 (WEA 33 (LR))	18:29	10	08:30 (WEA 04 (GRN))	16:23	15:53
13	04:59	05:40 (WEA K04)	05:49			06:44		07:11 (WEA 43 (RW))	07:39		08:18 (WEA 04 (GRN))	07:40	08:28
	23	06:03 (WEA 25 (Kab))	20:54			19:40	18	19:12 (WEA 33 (LR))	18:26	14	08:32 (WEA 04 (GRN))	16:21	15:53
14	05:00	05:40 (WEA K04)	05:50			06:46		07:13 (WEA 43 (RW))	07:41		08:17 (WEA 04 (GRN))	07:42	08:29
	24	06:04 (WEA 25 (Kab))	20:52			19:38	13	19:10 (WEA 33 (LR))	18:24	16	08:33 (WEA 04 (GRN))	16:20	15:53
15	05:01	05:39 (WEA K04)	05:52			06:48		07:15 (WEA 43 (RW))	07:43		08:16 (WEA 04 (GRN))	07:44	08:30
	25	06:04 (WEA 25 (Kab))	20:49			19:35	9	07:24 (WEA 43 (RW))	18:21	17	08:33 (WEA 04 (GRN))	16:18	15:53
16	05:03	05:38 (WEA K04)	05:54			06:50		07:17 (WEA 43 (RW))	07:45		08:15 (WEA 04 (GRN))	07:46	08:31
	26	06:04 (WEA 25 (Kab))	20:47			19:33	7	07:24 (WEA 43 (RW))	18:19	18	08:33 (WEA 04 (GRN))	16:17	15:53
17	05:04	05:39 (WEA K04)	05:56			06:52		07:18 (WEA 43 (RW))	07:47		08:15 (WEA 04 (GRN))	07:48	08:32
	26	06:05 (WEA 25 (Kab))	20:45			19:30	4	07:22 (WEA 43 (RW))	18:17	18	08:33 (WEA 04 (GRN))	16:15	15:53
18	05:05	05:38 (WEA K04)	05:58		06:59 (WEA 23 (Kab))	06:53		07:22 (WEA 43 (RW))	07:49		08:17 (WEA 04 (GRN))	07:49	08:33
	26	06:04 (WEA 25 (Kab))	20:43	10	07:09 (WEA 23 (Kab))	19:28			18:14	16	08:33 (WEA 04 (GRN))	16:14	15:53
19	05:07	05:39 (WEA K04)	05:59		06:29 (WEA 42 (RW))	06:55			07:51		08:19 (WEA 04 (GRN))	07:51	08:33
	25	06:04 (WEA 25 (Kab))	20:41	18	07:10 (WEA 23 (Kab))	19:25			18:12	13	08:32 (WEA 04 (GRN))	16:12	15:54
20	05:08	05:41 (WEA K04)	06:01		06:30 (WEA 42 (RW))	06:57			07:53		08:21 (WEA 04 (GRN))	07:53	08:34
	24	06:05 (WEA 25 (Kab))	20:38	22	07:12 (WEA 23 (Kab))	19:23			18:10	10	08:31 (WEA 04 (GRN))	16:11	15:54
21	05:10	05:42 (WEA K04)	06:03		06:32 (WEA 42 (RW))	06:59		18:42 (WEA 32 (LR))	07:55		08:23 (WEA 04 (GRN))	07:55	08:35
	22	06:04 (WEA 25 (Kab))	20:36	23	07:13 (WEA 23 (Kab))	19:20	5	18:47 (WEA 32 (LR))	18:08	11	08:39 (WEA 05 (GRN))	16:09	15:54
22	05:11	05:43 (WEA K04)	06:05		06:33 (WEA 42 (RW))	07:01		07:42 (WEA 01 (GRN))	07:57		08:25 (WEA 04 (GRN))	07:57	08:35
	21	06:04 (WEA 25 (Kab))	20:34	24	07:13 (WEA 23 (Kab))	19:18	14	18:49 (WEA 32 (LR))	18:05	12	08:41 (WEA 05 (GRN))	16:08	15:55
23	05:13	05:45 (WEA K04)	06:07		06:35 (WEA 42 (RW))	07:02		07:39 (WEA 01 (GRN))	07:59		08:31 (WEA 05 (GRN))	07:59	08:36
	19	06:04 (WEA 25 (Kab))	20:31	23	07:14 (WEA 23 (Kab))	19:15	19	18:47 (WEA 32 (LR))	18:03	12	08:43 (WEA 05 (GRN))	16:07	15:55
24	05:14	05:46 (WEA K04)	06:08		06:51 (WEA 23 (Kab))	07:04		07:38 (WEA 01 (GRN))	08:01		08:30 (WEA 05 (GRN))	08:00	08:36
	17	06:03 (WEA 25 (Kab))	20:29	23	07:14 (WEA 23 (Kab))	19:13	19	18:44 (WEA 32 (LR))	18:01	13	08:43 (WEA 05 (GRN))	16:06	15:56
25	05:16	05:48 (WEA K04)	06:10		06:50 (WEA 23 (Kab))	07:06		07:37 (WEA 01 (GRN))	07:03		07:31 (WEA 05 (GRN))	08:02	08:36
	15	06:03 (WEA 25 (Kab))	20:27	23	07:13 (WEA 23 (Kab))	19:10	19	18:42 (WEA 32 (LR))	16:59	12	07:43 (WEA 05 (GRN))	16:04	15:57
26	05:18	05:49 (WEA K04)	06:12		06:50 (WEA 23 (Kab))	07:08		07:35 (WEA 01 (GRN))	07:04		07:33 (WEA 05 (GRN))	08:04	08:37
	13	06:02 (WEA 25 (Kab))	20:24	23	07:13 (WEA 23 (Kab))	19:08	18	18:39 (WEA 32 (LR))	16:56	10	07:43 (WEA 05 (GRN))	16:03	15:57
27	05:19	05:51 (WEA K04)	06:14		06:50 (WEA 23 (Kab))	07:10		07:36 (WEA 01 (GRN))	07:06		07:35 (WEA 05 (GRN))	08:06	08:37
	10	06:01 (WEA 25 (Kab))	20:22	23	07:13 (WEA 23 (Kab))	19:05	15	07:51 (WEA 01 (GRN))	16:54	8	07:43 (WEA 05 (GRN))	16:02	15:58
28	05:21	05:52 (WEA K04)	06:16		06:51 (WEA 23 (Kab))	07:12		07:38 (WEA 01 (GRN))	07:08		07:38 (WEA 05 (GRN))	08:07	08:37
	7	05:59 (WEA 25 (Kab))	20:20	22	07:13 (WEA 23 (Kab))	19:03	13	07:51 (WEA 01 (GRN))	16:52	5	07:43 (WEA 05 (GRN))	16:01	15:59
29	05:22	05:54 (WEA 25 (Kab))	06:17		06:50 (WEA 23 (Kab))	07:13		07:40 (WEA 01 (GRN))	07:10		07:40 (WEA 05 (GRN))	08:09	08:37
	3	05:57 (WEA 25 (Kab))	20:17	21	07:11 (WEA 23 (Kab))	19:00	10	07:50 (WEA 01 (GRN))	16:50	2	07:42 (WEA 05 (GRN))	16:00	16:00
30	05:24		06:19		06:51 (WEA 23 (Kab))	07:15		07:42 (WEA 01 (GRN))	07:12			08:11	08:37
	21		20:15	19	07:10 (WEA 23 (Kab))	18:58	13	07:55 (WEA 02 (GRN))	16:48			16:01	16:01
31	05:26		06:21		06:52 (WEA 23 (Kab))				07:14				08:37
	19		20:12	17	07:09 (WEA 23 (Kab))				16:46				16:02
Sonnenscheinstunden		515		461		383		328		257		231	
astr.max.mögl.Beschattung		543		405		308		275					

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		

SHADOW - Kalender

Berechnung: Gesamtbelastung: Vorbelastung und Projekt Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 52 - IO 52 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	08:34 (WEA 04 (GRN))	07:08	07:52 (WEA 01 (GRN))	06:52		05:42	06:29 (WEA 25 (Kab))	04:51	
	16:03	16:55	16:52 (WEA 04 (GRN))	17:52	2	07:54 (WEA 01 (GRN))	19:51	20:48	22	06:51 (WEA 25 (Kab))	21:39
2	08:37	08:04	08:36 (WEA 04 (GRN))	07:05		06:49		05:39		06:06 (WEA 04)	04:50
	16:04	16:57	17	08:53 (WEA 04 (GRN))	17:54	19:53		20:50	24	06:50 (WEA 25 (Kab))	21:40
3	08:37	08:03	08:36 (WEA 04 (GRN))	07:03		06:47		05:37		06:04 (WEA 04)	04:49
	16:05	16:59	17	08:53 (WEA 04 (GRN))	17:56	19:55		20:51	25	06:49 (WEA 25 (Kab))	21:41
4	08:37	08:01	08:37 (WEA 04 (GRN))	07:01		06:44		05:35		06:02 (WEA 04)	04:48
	16:07	17:01	16	08:53 (WEA 04 (GRN))	17:58	19:57		20:53	25	06:47 (WEA 25 (Kab))	21:42
5	08:36	07:59	08:37 (WEA 04 (GRN))	06:58		06:42		05:33		06:00 (WEA 04)	04:48
	16:08	17:03	15	08:52 (WEA 04 (GRN))	18:00	19:59		20:55	25	06:46 (WEA 25 (Kab))	21:43
6	08:36	07:57	08:39 (WEA 04 (GRN))	06:56		06:39		05:31		05:58 (WEA 04)	04:47
	16:09	17:05	12	08:51 (WEA 04 (GRN))	18:02	20:01		20:57	22	06:43 (WEA 25 (Kab))	21:44
7	08:35	07:55	08:40 (WEA 04 (GRN))	06:54		06:37		05:29		05:56 (WEA 04)	04:46
	16:11	17:07	9	08:49 (WEA 04 (GRN))	18:04	20:03		20:59	15	06:11 (WEA 04)	21:45
8	08:35	07:53		06:51		06:35		05:27		05:54 (WEA 04)	04:45
	16:12	17:09		18:06		07:24 (WEA 23 (Kab))	20:04	2	07:01 (WEA 42 (RW))	21:01	17
9	08:34	07:51		06:49		07:13 (WEA 43 (RW))	06:32		06:56 (WEA 42 (RW))	05:25	
	16:14	17:11		18:08	16	07:31 (WEA 23 (Kab))	20:06	4	07:00 (WEA 42 (RW))	21:02	19
10	08:34	07:49		06:46		07:10 (WEA 43 (RW))	06:30		06:54 (WEA 42 (RW))	05:24	
	16:15	17:13		18:09	23	07:33 (WEA 23 (Kab))	20:08	6	07:00 (WEA 42 (RW))	21:04	20
11	08:33	07:47		06:44		07:08 (WEA 43 (RW))	06:27		06:51 (WEA 42 (RW))	05:22	
	16:17	17:16		18:11	27	07:35 (WEA 23 (Kab))	20:10	7	06:58 (WEA 42 (RW))	21:06	20
12	08:32	07:45		06:41		07:05 (WEA 43 (RW))	06:25		06:49 (WEA 41 (RW))	05:20	
	16:18	17:18		18:13	31	17:46 (WEA 33 (LR))	20:12	6	06:56 (WEA 42 (RW))	21:08	19
13	08:31	07:43		06:39		07:04 (WEA 43 (RW))	06:22		06:47 (WEA 41 (RW))	05:18	
	16:20	17:20		18:15	36	17:48 (WEA 33 (LR))	20:14	6	06:53 (WEA 41 (RW))	21:09	20
14	08:30	07:41		06:36		07:03 (WEA 43 (RW))	06:20		06:44 (WEA 41 (RW))	05:16	
	16:21	17:22		18:17	40	17:50 (WEA 33 (LR))	20:16	9	06:53 (WEA 41 (RW))	21:11	21
15	08:29	07:39		06:34		07:05 (WEA 43 (RW))	06:18		06:42 (WEA 41 (RW))	05:15	
	16:23	17:24		18:19	40	17:52 (WEA 33 (LR))	20:18	12	06:54 (WEA 41 (RW))	21:13	22
16	08:28	07:37		06:32		07:06 (WEA 43 (RW))	06:15		06:40 (WEA 41 (RW))	05:13	
	16:25	17:26		18:21	40	17:54 (WEA 33 (LR))	20:20	15	06:55 (WEA 41 (RW))	21:15	21
17	08:27	07:35		06:29		07:10 (WEA 23 (Kab))	06:13		06:37 (WEA 41 (RW))	05:11	
	16:27	17:28		18:23	37	17:55 (WEA 33 (LR))	20:21	17	06:54 (WEA 41 (RW))	21:16	20
18	08:26	07:33		06:27		07:09 (WEA 23 (Kab))	06:11		06:37 (WEA 41 (RW))	05:10	
	16:28	17:30		18:25	34	17:53 (WEA 33 (LR))	20:23	17	06:54 (WEA 41 (RW))	21:18	17
19	08:25	07:31		06:24		07:10 (WEA 23 (Kab))	06:08		06:37 (WEA 41 (RW))	05:08	
	16:30	17:32	3	07:59 (WEA 01 (GRN))	18:27	24	07:34 (WEA 23 (Kab))	20:25	16	06:53 (WEA 41 (RW))	21:20
20	08:24	07:28		06:22		07:10 (WEA 23 (Kab))	06:06		06:34 (WEA 25 (Kab))	05:06	
	16:32	17:34	7	08:01 (WEA 01 (GRN))	18:29	23	07:33 (WEA 23 (Kab))	20:27	19	06:53 (WEA 41 (RW))	21:21
21	08:23	07:26		06:19		07:11 (WEA 23 (Kab))	06:04		06:32 (WEA 25 (Kab))	05:05	
	16:34	17:36	10	08:02 (WEA 01 (GRN))	18:31	21	07:32 (WEA 23 (Kab))	20:29	19	06:51 (WEA 41 (RW))	21:23
22	08:21	07:24		06:17		07:11 (WEA 23 (Kab))	06:01		06:31 (WEA 25 (Kab))	05:03	
	16:36	17:38	13	08:02 (WEA 01 (GRN))	18:32	19	07:30 (WEA 23 (Kab))	20:31	20	06:51 (WEA 41 (RW))	21:24
23	08:20	07:22		06:14		07:13 (WEA 23 (Kab))	05:59		06:30 (WEA 25 (Kab))	05:02	
	16:38	17:40	15	08:02 (WEA 01 (GRN))	18:34	15	07:28 (WEA 23 (Kab))	20:33	22	06:52 (WEA 25 (Kab))	21:26
24	08:19	07:19		06:12		07:16 (WEA 23 (Kab))	05:57		06:29 (WEA 25 (Kab))	05:01	
	16:39	2	08:51 (WEA 05 (GRN))	17:42		07:24 (WEA 23 (Kab))	20:35	23	06:52 (WEA 25 (Kab))	21:27	
25	08:17	07:17		06:09		07:45 (WEA 01 (GRN))	06:09		06:29 (WEA 25 (Kab))	04:59	
	16:41	4	08:51 (WEA 05 (GRN))	17:44		08:01 (WEA 01 (GRN))	18:38		23	06:52 (WEA 25 (Kab))	21:29
26	08:16	07:15		06:07		07:46 (WEA 01 (GRN))	06:07		06:28 (WEA 25 (Kab))	04:58	
	16:43	6	08:51 (WEA 05 (GRN))	17:46		08:01 (WEA 01 (GRN))	18:40		20:38	25	06:53 (WEA 25 (Kab))
27	08:14	07:13		06:04		07:46 (WEA 01 (GRN))	06:04		06:28 (WEA 25 (Kab))	04:57	
	16:45	9	08:53 (WEA 05 (GRN))	17:48		07:59 (WEA 01 (GRN))	18:42		20:40	25	06:53 (WEA 25 (Kab))
28	08:13	07:10		06:02		07:48 (WEA 01 (GRN))	06:02		06:28 (WEA 25 (Kab))	04:55	
	16:47	11	08:53 (WEA 05 (GRN))	17:50		07:58 (WEA 01 (GRN))	18:44		20:42	24	06:52 (WEA 25 (Kab))
29	08:11			06:59					06:28 (WEA 25 (Kab))	04:54	
	16:49	12	08:52 (WEA 05 (GRN))				19:46		20:44	24	06:52 (WEA 25 (Kab))
30	08:10			06:57					06:28 (WEA 25 (Kab))	04:53	
	16:51	14	08:52 (WEA 05 (GRN))				19:48		20:46	23	06:51 (WEA 25 (Kab))
31	08:08			06:54					06:28 (WEA 25 (Kab))	04:52	
	16:53	16	08:52 (WEA 04 (GRN))				19:49		21:37	5	06:46 (WEA 40 (RW))
Sonnenscheinstunden		248		272		367		421		496	
astr.max.mögl.Beschattung		74		222		438		364		552	

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 Großenholz (3 x V150-6.0) **Schattenrezeptor:** IO 52 - IO 52 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

	July	August	September	Oktober	November	Dezember								
1	04:47	05:27	06:02 (WEA K04)	06:23	06:51 (WEA 42 (RW))	07:17	07:44 (WEA 43 (RW))	07:16		08:12				
	21:54	21:18	06:20 (WEA K04)	20:10	06:56 (WEA 42 (RW))	18:55	18:27 (WEA 33 (LR))	16:44		15:59				
2	04:48	05:29	06:02 (WEA K04)	06:25	06:52 (WEA 42 (RW))	07:19	07:46 (WEA 43 (RW))	07:18		08:14				
	21:53	21:16	06:21 (WEA K04)	20:08	6	06:58 (WEA 42 (RW))	18:53	28	08:14 (WEA 23 (Kab))	15:42				
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		08:15				
	21:53	21:14	06:22 (WEA K04)	20:05	4	06:56 (WEA 42 (RW))	18:50	24	08:11 (WEA 23 (Kab))	15:40				
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		08:17				
	21:52	21:12	06:21 (WEA K04)	20:03	2	06:58 (WEA 42 (RW))	18:48	20	08:09 (WEA 23 (Kab))	15:38				
5	04:50	05:34	06:05 (WEA K04)	06:30		07:24	07:51 (WEA 43 (RW))	07:24		08:18				
	21:52	21:10	06:21 (WEA K04)	20:00		18:45	11	08:06 (WEA 23 (Kab))	16:36	13	08:21 (WEA 04 (GRN))	15:56		
6	04:51	05:36	06:07 (WEA K04)	06:32		07:26		07:26		08:20				
	21:51	21:08	06:51 (WEA 25 (Kab))	19:58		18:43		16:34	15	08:22 (WEA 04 (GRN))	15:55			
7	04:52	05:38	06:08 (WEA K04)	06:34		07:28		07:28		08:21				
	21:50	21:06	06:53 (WEA 25 (Kab))	19:55		18:41		16:32	16	08:22 (WEA 04 (GRN))	15:55			
8	04:53	05:40	06:10 (WEA K04)	06:35		07:30		07:30		08:22				
	21:50	21:04	06:56 (WEA 25 (Kab))	19:53		18:38		16:30	17	08:23 (WEA 04 (GRN))	15:54			
9	04:54	05:41	06:11 (WEA K04)	06:37		07:32		07:32		08:24				
	21:49	21:02	06:56 (WEA 25 (Kab))	19:50		18:36		16:28	18	08:23 (WEA 04 (GRN))	15:54			
10	04:55	05:43	06:13 (WEA K04)	06:39		07:34		07:34		08:25				
	21:48	21:00	06:58 (WEA 25 (Kab))	19:48		18:33		16:27	18	08:24 (WEA 04 (GRN))	15:54			
11	04:56	05:45	06:15 (WEA K04)	06:41		07:36		07:36		08:26				
	21:47	20:58	06:59 (WEA 25 (Kab))	19:45		18:31		16:25	16	08:24 (WEA 04 (GRN))	15:53			
12	04:58	05:47	06:36 (WEA 25 (Kab))	06:43		07:38		07:38		08:27				
	21:46	4	05:54 (WEA 40 (RW))	20:56	22	06:58 (WEA 25 (Kab))	19:43	18:29	14	08:24 (WEA 05 (GRN))	15:53			
13	04:59	05:48 (WEA 40 (RW))	05:49	06:36 (WEA 25 (Kab))	06:44		07:39		08:23 (WEA 01 (GRN))	07:40	08:12 (WEA 05 (GRN))	08:28		
	21:45	8	05:56 (WEA 40 (RW))	20:54	23	06:59 (WEA 25 (Kab))	19:40	18:26	6	08:29 (WEA 01 (GRN))	16:21	12	08:24 (WEA 05 (GRN))	15:53
14	05:00	05:47 (WEA 40 (RW))	05:50	06:38 (WEA 25 (Kab))	06:46		07:41		08:20 (WEA 01 (GRN))	07:42	08:14 (WEA 05 (GRN))	08:29		
	21:44	10	05:57 (WEA 40 (RW))	20:52	24	07:00 (WEA 25 (Kab))	19:38	18:24	12	08:32 (WEA 01 (GRN))	16:20	10	08:24 (WEA 05 (GRN))	15:53
15	05:01	05:46 (WEA 40 (RW))	05:52	06:35 (WEA 25 (Kab))	06:48		07:43		08:19 (WEA 01 (GRN))	07:44	08:16 (WEA 05 (GRN))	08:30		
	21:43	12	05:58 (WEA 40 (RW))	20:49	24	06:59 (WEA 25 (Kab))	19:35	18:21	14	08:33 (WEA 01 (GRN))	16:18	8	08:24 (WEA 05 (GRN))	15:53
16	05:03	05:46 (WEA 40 (RW))	05:54	06:35 (WEA 25 (Kab))	06:50		07:45		08:18 (WEA 01 (GRN))	07:46	08:18 (WEA 05 (GRN))	08:31		
	21:42	12	05:58 (WEA 40 (RW))	20:47	24	06:59 (WEA 25 (Kab))	19:33	18:19	15	08:33 (WEA 01 (GRN))	16:17	6	08:24 (WEA 05 (GRN))	15:53
17	05:04	05:46 (WEA 40 (RW))	05:56	06:35 (WEA 25 (Kab))	06:52		07:47		08:17 (WEA 01 (GRN))	07:48	08:20 (WEA 05 (GRN))	08:32		
	21:41	14	06:00 (WEA 40 (RW))	20:45	24	06:59 (WEA 25 (Kab))	19:30	18:17	17	08:34 (WEA 01 (GRN))	16:15	4	08:24 (WEA 05 (GRN))	15:53
18	05:05	05:45 (WEA 40 (RW))	05:58	06:35 (WEA 25 (Kab))	06:53		07:49		08:17 (WEA 01 (GRN))	07:49	08:23 (WEA 05 (GRN))	08:33		
	21:40	15	06:00 (WEA 40 (RW))	20:43	24	06:59 (WEA 25 (Kab))	19:28	18:14	17	08:34 (WEA 01 (GRN))	16:14	2	08:25 (WEA 05 (GRN))	15:53
19	05:07	05:44 (WEA 40 (RW))	05:59	06:35 (WEA 25 (Kab))	06:55		07:51		08:19 (WEA 03 (GRN))	07:51	08:19 (WEA 05 (GRN))	08:33		
	21:38	16	06:00 (WEA 40 (RW))	20:41	23	06:58 (WEA 25 (Kab))	19:25	18:12	14	08:33 (WEA 01 (GRN))	16:12		15:54	
20	05:08	05:45 (WEA 40 (RW))	06:01	06:38 (WEA 25 (Kab))	06:57	5	08:10 (WEA 23 (Kab))	18:12		08:01 (WEA 23 (Kab))	07:53		08:34	
	21:37	16	06:01 (WEA 40 (RW))	20:38	21	06:57 (WEA 25 (Kab))	19:23	18:10	13	08:14 (WEA 23 (Kab))	07:53		15:54	
21	05:10	05:44 (WEA 40 (RW))	06:03	06:36 (WEA 25 (Kab))	06:59		07:57 (WEA 23 (Kab))	07:55		08:23 (WEA 03 (GRN))	07:55		08:35	
	21:35	17	06:01 (WEA 40 (RW))	20:36	20	06:56 (WEA 25 (Kab))	19:20	18:08	9	08:32 (WEA 01 (GRN))	16:09		15:54	
22	05:11	05:44 (WEA 40 (RW))	06:05	06:37 (WEA 25 (Kab))	07:01		07:56 (WEA 23 (Kab))	07:57		08:25 (WEA 03 (GRN))	07:57		08:35	
	21:34	17	06:01 (WEA 40 (RW))	20:34	19	06:56 (WEA 41 (RW))	19:18	18:05	6	08:31 (WEA 01 (GRN))	16:08		15:55	
23	05:13	05:45 (WEA 40 (RW))	06:07	06:38 (WEA 25 (Kab))	07:02		07:55 (WEA 23 (Kab))	07:59		08:27 (WEA 01 (GRN))	07:59		08:36	
	21:33	17	06:02 (WEA 40 (RW))	20:31	19	06:57 (WEA 41 (RW))	19:15	18:03	2	08:29 (WEA 01 (GRN))	16:07		15:55	
24	05:14	05:46 (WEA 40 (RW))	06:08	06:41 (WEA 41 (RW))	07:04		07:54 (WEA 23 (Kab))	08:01		08:00			08:36	
	21:31	15	06:01 (WEA 40 (RW))	20:29	16	06:57 (WEA 41 (RW))	19:13	18:01		16:06			15:56	
25	05:16	05:48 (WEA 40 (RW))	06:10	06:39 (WEA 41 (RW))	07:06		07:53 (WEA 23 (Kab))	07:03		08:02			08:36	
	21:30	14	06:02 (WEA 40 (RW))	20:27	17	06:58 (WEA 41 (RW))	19:10	18:00		16:04			15:57	
26	05:18	05:49 (WEA 40 (RW))	06:12	06:40 (WEA 41 (RW))	07:08		07:52 (WEA 23 (Kab))	07:04		08:04			08:37	
	21:28	18	06:14 (WEA K04)	20:24	17	06:57 (WEA 41 (RW))	19:08	35	18:37 (WEA 33 (LR))	16:56			15:57	
27	05:19	05:51 (WEA 40 (RW))	06:14	06:42 (WEA 41 (RW))	07:10		07:51 (WEA 23 (Kab))	07:06		08:06			08:37	
	21:26	21	06:17 (WEA K04)	20:22	14	06:56 (WEA 41 (RW))	19:05	37	18:36 (WEA 33 (LR))	16:54			15:58	
28	05:21	05:52 (WEA 40 (RW))	06:16	06:44 (WEA 41 (RW))	07:12		07:46 (WEA 43 (RW))	07:08		08:07			08:37	
	21:25	22	06:18 (WEA K04)	20:20	12	06:56 (WEA 41 (RW))	19:03	41	18:34 (WEA 33 (LR))	16:52			15:59	
29	05:22	05:54 (WEA 40 (RW))	06:17	06:45 (WEA 41 (RW))	07:13		07:45 (WEA 43 (RW))	07:10		08:09			08:37	
	21:23	21	06:19 (WEA K04)	20:17	9	06:54 (WEA 41 (RW))	19:00	40	18:32 (WEA 33 (LR))	16:50			16:00	
30	05:24	05:55 (WEA 40 (RW))	06:19	06:47 (WEA 41 (RW))	07:15		07:44 (WEA 43 (RW))	07:12		08:11			08:37	
	21:21	21	06:20 (WEA K04)	20:15	6	06:53 (WEA 41 (RW))	18:58	37	18:29 (WEA 33 (LR))	16:48			16:01	
31	05:26	05:57 (WEA 40 (RW))	06:21	06:49 (WEA 41 (RW))			07:14			08:12			08:37	
	21:19	19	06:21 (WEA K04)	20:12	5	06:56 (WEA 42 (RW))		18:46		15:59			16:02	
Sonnenscheinstunden	515		461		383		328		241		257		231	
astr.max.mögl.Beschattung	309		594		341		241		181					

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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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.